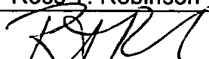


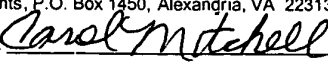
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UTILITY PATENT APPLICATION TRANSMITTAL (ONLY FOR NEW NONPROVISIONAL APPLICATIONS UNDER 37 CFR 1.53(B))		Attorney Docket No. 53807-00113USPT	
		First Inventor Thomas Mattsson	
		Title	METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING
		Express Mail Label No. EV 361364974 US	

APPLICATION ELEMENTS See MPEP chapter 600 concerning utility patent application contents.	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450	
1. ☒ Fee Transmittal Form (e.g., PTO/SB/17) (Submit an original and a duplicate for fee processing)	7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)	
2. ☐ Applicant claims small entity status. See 37 CFR 1.27.	8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)	
3. ☒ Specification [Total Pages 25] (preferred arrangement set forth below) - Descriptive title of the invention - Cross Reference to Related Applications - Statement Regarding Fed sponsored R & D - Reference to sequence listing, a table, or a computer program listing appendix - Background of the Invention - Brief Summary of the Invention - Brief Description of the Drawings (if filed) - Detailed Description - Claim(s) - Abstract of the Disclosure	a. ☐ Computer Readable Form (CRF) b. Specification Sequence Listing on: i. ☐ CD-ROM or CD-R (2 copies); or ii. ☐ Paper c. ☐ Statements verifying identity of above copies	
4. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 6]	ACCOMPANYING APPLICATION PARTS	
5. Oath or Declaration [Total Sheets] a. ☐ Newly executed (original or copy) b. ☐ Copy from a prior application (37 CFR 1.63(d)) (for continuation/divisional with Box 18 completed) i. ☐ DELETION OF INVENTOR(S) SIGNED STATEMENT ATTACHED DELETING INVENTOR(S) NAMED IN THE PRIOR APPLICATION. SEE 37 CFR 1.63(D)(2) AND 1.33(B).	9. ☐ Assignment Papers (cover sheet & document(s))	
6. ☐ Application Data Sheet. See 37 CFR 1.76	10. ☐ 37 CFR 3.73(b) Statement (when there is an assignee) ☐ Power of Attorney	
	11. ☐ English Translation Document (if applicable)	
	12. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations	
	13. ☐ Preliminary Amendment	
	14. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized)	
	15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)	
	16. ☐ Nonpublication Request under 35 U.S.C. 122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent.	
	17. ☐ Other:	
18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76: ☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____ Prior application information: Examiner _____ Art Unit: _____ For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.		
19. CORRESPONDENCE ADDRESS		
☒ Customer Number: 23932 OR ☐ Correspondence address below		
Name		
Address		
City	State	Zip Code
Country	Telephone	Fax
Name (Print/Type)	Ross T. Robinson	Registration No. (Attorney/Agent)
Signature		47,031
	Date	August 16, 2004

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Dated: August 16, 2004

Signature:  (Carol Mitchell)

DALLAS2 1050520v1 53807-00113USPT

19587 U.S. PTO
10/919130

081604

081604

20427 U.S. PTO

PTO/SB/17 (10-03)

Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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**FEE TRANSMITTAL
for FY 2004**

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27**TOTAL AMOUNT OF PAYMENT** (\$) 842.00**Complete if Known**

Application Number	Not Yet Assigned
Filing Date	Concurrently Herewith
First Named Inventor	Thomas Mattsson
Examiner Name	Not Yet Assigned
Art Unit	N/A
Attorney Docket No.	53807-00113USPT

METHOD OF PAYMENT (check all that apply)
☒ Check ☐ Credit Card ☐ Money Order ☐ Other ☐ None
☐ Deposit Account:Deposit
Account
Number

10-0447

Deposit
Account
NameJenkins & Gilchrist, a
Professional Corporation

The Director is authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☒ Credit any overpayments☐ Charge any additional fee(s) or any underpayment of fee(s)☐ Charge fee(s) indicated below, except for the filing fee
to the above-identified deposit account.**FEE CALCULATION****1. BASIC FILING FEE**

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1001	770	2001	385	Utility filing fee	770.00
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) (\$) 770.00**2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE**

Total Claims		Extra Claims		Fee from below		Fee Paid	
24	-20** =	4	x	18.00	=	72.00	
3	-3** =		x		=	0.00	
Independent Claims							
Multiple Dependent							

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$) 72.00

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)**3. ADDITIONAL FEES**

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet.	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for <i>ex parte</i> reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37CFR 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify)

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$) 0.00**SUBMITTED BY**

(Complete if applicable)

Name (Print/Type) Ross T. Robinson

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Telephone (214) 965-7300

Signature

RTM

Date

August 16, 2004

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Dated: August 16, 2004

Signature:

Carol Mitchell

(Carol Mitchell)

DALLAS2 1050523v1 53807-00113USPT

APPLICATION FOR UNITED STATES LETTERS PATENT

entitled

METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING

by

THOMAS MATTSSON

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DATE OF DEPOSIT:	August 16, 2004
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Signature:	Carol Mitchell

METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING

CROSS-REFERENCE TO RELATED APPLICATIONS

[01] This application claims priority from, and hereby incorporates by reference the entire disclosure of, U.S. Provisional Application No. 60/549,611, bearing Docket No. 53807-00113USPL, entitled "Inductor Design for Reduced VCO Coupling", and filed on
5 March 3, 2004.

FIELD OF THE INVENTION

[02] The present invention relates to voltage-controlled oscillators (VCO) of the type used in radio frequency (RF) transceivers and, in particular, to an improved inductor
10 design in a VCO.

BACKGROUND OF THE INVENTION

[03] Recent advances in wireless communication technology have allowed an entire RF transceiver to be implemented on a single semiconductor die or chip. However,
15 integrating a complete RF transceiver on a single chip presents a number of challenges. For example, in wideband code division multiple access (WCDMA) transceivers, a single-chip solution requires two RF VCOs to be running on the chip at the same time. Such an arrangement may produce undesired interaction between the two VCOs due to various types of mutual coupling mechanisms, which may result in spurious receiver
20 responses and unwanted frequencies in the transmit spectrum. The primary mutual coupling mechanism is usually the fundamental electromagnetic (EM) coupling between the resonators, i.e., the large inductor structures in the VCOs.

[04] A number of techniques exist for reducing the mutual EM coupling between the VCOs due to the inductors. One technique involves reduction of EM coupling by careful design of the inductors to provide maximum isolation of the inductors. Another techniques calls for frequency separation by operating the two VCOs at different even
5 harmonics of the desired frequency. Still another technique involves frequency separation by using a regenerative VCO concept. The frequency separation methods exploit the filtering properties of the resonator to reduce interference. However, these solutions require additional circuitry (dividers, mixers, etc.) that may increase current consumption, making them less attractive than other mutual EM coupling reduction
10 alternatives.

SUMMARY OF THE INVENTION

[05] An inductor design for reducing mutual EM coupling between VCO resonators and a method of implementing the same on a single semiconductor chip. A method and
15 system involve using inductors that are substantially symmetrical about their horizontal and/or their vertical axes and providing current to the inductors in a way so that the resulting magnetic field components tend to cancel each other by virtue of the symmetry. In addition, two such inductors may be placed near each other and oriented in a way so that the induced current in the second inductor due to the magnetic field originating from
20 first inductor is significantly reduced. The inductors may be 8-shaped, four-leaf clover-shaped, single-turn, multi-turn, rotated relative to one another, and/or vertically offset relative to one another.

[06] In general, in one aspect, an inductor having a reduced far field comprises a first loop having a shape that is substantially symmetrical about a first predefined axis, and a second loop having a size and shape substantially identical to a size and shape of the first loop. The second loop is arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from the first loop.

[07] In general, in another aspect, a method of reducing mutual electromagnetic coupling between two inductors on a semiconductor die comprises the step of forming a first inductor on the semiconductor die having a shape that is substantially symmetrical about a first predefined axis, the shape causing the first inductor to have a reduced far field, at least in some directions. The method further comprises the step of forming a second inductor on the semiconductor die at a predetermined distance from the first inductor, wherein a mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the first inductor having a reduced far field.

[08] In general, in another aspect, an inductor layout having reduced mutual electromagnetic coupling comprises a first inductor having a shape that is substantially symmetrical about a first predefined axis, the shape causing the first inductor to have a reduced electromagnetic field at a certain distance from the first inductor, at least in some directions. The inductor layout further comprises a second inductor positioned at a predetermined distance from the first inductor, wherein a mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the first inductor having a reduced electromagnetic field.

[09] It should be emphasized that the term comprises/comprising, when used in this specification, is taken to specify the presence of stated features, integers, steps, or

components, but does not preclude the presence or addition of one or more other features, integers, steps, components, or groups thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

- 5 [10] The foregoing and other advantages of the invention will become apparent from the following detailed description and upon reference to the drawings, wherein:
- [11] FIGURE 1 illustrates a prior art O-shaped inductor;
- [12] FIGURE 2 illustrates an 8-shaped inductor;
- [13] FIGURE 3 illustrates a prior art O-shaped inductor arrangement;
- 10 [14] FIGURE 4 illustrates an 8-shaped inductor arrangement;
- [15] FIGURE 5 illustrates an 8-shaped inductor arrangement wherein one inductor is rotated;
- [16] FIGURE 6 illustrates the impact of distance on EM coupling using the 8-shaped inductor arrangement;
- 15 [17] FIGURE 7 illustrates an 8-shaped inductor arrangement wherein one inductor is offset from the other inductor;
- [18] FIGURE 8 illustrates the impact of distance on decoupling coefficient using the inductor arrangements;
- [19] FIGURE 9 illustrates a VCO layout wherein symmetry is retained;
- 20 [20] FIGURE 10 illustrates a four-leaf clover shaped inductor;
- [21] FIGURE 11 illustrates a four-leaf clover shaped inductor arrangement;
- [22] FIGURE 12 illustrates the impact of distance on EM coupling using the four-leaf clover shaped inductor arrangement; and

[23] FIGURE 13 illustrates a two-turn 8-shaped inductor.

DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS OF THE INVENTION

[24] As mentioned above, various embodiments of the invention provide an inductor design and method of implementing the same where mutual EM coupling is reduced. The inductor design and method serve to reduce the EM field at a certain distance from the inductor (i.e., the far field), at least in some directions, by using inductor shapes that are substantially symmetrical. As used herein, the term “symmetrical” refers to symmetry relative to at least one axis. This reduced far field may then be used to reduce the mutual coupling between two inductors. The inductor design and method may also be used to reduce the coupling between an inductor and another on-chip or external structure (e.g., an external power amplifier). This helps reduce the sensitivity of the VCO to interfering signals from other than a second on-chip VCO.

[25] Choosing a substantially symmetrical shape (e.g., a figure-8 or a four-leaf clover shape) for the first inductor helps reduce the EM field at far distances. This will, in turn, reduce mutual EM coupling to the second inductor, regardless of its shape. If the second inductor also has a similar or substantially identical shape, the tendency of the second inductor to pick up the EM field from the first inductor is also reduced via the same mechanisms. Thus, the overall isolation between the two inductors is further improved. Note, however, that the two inductors need not have the same size or the same shape as long as they have a substantially symmetrical shape. To the extent identical inductor layouts are shown in the figures, it is for illustrative purposes only.

[26] Further, although various embodiments of the invention are described herein mainly with respect to VCO-related isolation issues, RF amplifiers and mixers with tuned LC loads or inductive degeneration may also couple to each other or to a VCO and create interference problems. Thus, a person having ordinary skill in the art will appreciate that the inductor design and method may be used to reduce coupling between two functional blocks of any type so long as each contains one or more inductors.

[27] In order to reduce EM coupling between two inductors, it is typically necessary to reduce the far field generated by the inductor coils. Unfortunately, this is not a simple task because there are many topological constraints on a planar integrated inductor. For example, a typical inductor design uses two or more stacked metal layers. Normally the top layer is much thicker (i.e., has lower resistance) than the other layers. It is therefore desirable to mainly use this layer in order to achieve a maximum Q-factor. Where the wires are crossing, thinner metal layers are usually used and careful design of the crossings is needed to combine high Q-factor with minimum coupling. Further, negative electromagnetic coupling between parallel wire segments close to each other should be avoided so that the inductance per wire length unit is maximized. However, by exploiting the symmetry of the inductor in one or more dimensions together with controlling the EM field components emanating from different parts of the inductor coil, the far field may be reduced in some directions due to canceling effects.

[28] Existing VCO inductor designs are optimized for maximum Q-factor given the constraints regarding silicon area, wire width, and the like. FIGURE 1 shows an example of an existing inductor 100 commonly used in RF VCOs. The inductor 100 is a differential 1.25 nH inductor with an inductor coil 102 having two terminals 104. As can

be seen, the positions of the terminals 104a and 104b have been optimized for connection to the rest of the VCO, including any varactors and MOS switches (not shown) that may be present, but little attention was paid to mutual EM coupling apart from keeping a certain minimum distance from other metal wires in the vicinity.

5 **[29]** FIGURE 2 shows an example of an inductor 200. The inductor 200 has an inductor coil 202 and terminals 204a and 204b, and has been designed so that it is substantially symmetrical about a horizontal axis X. In the present example, the inductor coil 202 is in the form of a single-turn 8-shaped structure with an upper loop 206a and a lower loop 206b. By virtue of the figure-8 shape, current in the upper loop 206a travels
10 in a direction (e.g., counterclockwise, see arrows) that is opposite to current in the lower loop 206b (e.g., clockwise). As a result, the EM field components emanating at a certain distance from the two substantially symmetrical loops 206a and 206b also have opposite directions and tend to counteract each other. The directions of the EM field components are indicated by conventional notation in the middle of each loop 206a and 206b.
15 Consequently, the inductor 200 has been found to have a significantly reduced far field at a certain distance from the inductor coil 202. Thus, by making the two loops 206a and 206b substantially symmetrical, cancellation of a significant amount of far field on either side of the horizontal symmetry axis X may be achieved. It should be noted, however, that perfect symmetry between the two loops 206a and 206b may be difficult to achieve
20 given the presence of the terminals 204a and 204b.

[30] In addition, the positioning of the terminals 204a and 204b may help minimize the far field. For example, positioning the two terminals 204a and 204b as close to each other as possible helps make the field contributions from the two parts of the inductor

200 identical. It is also desirable to minimize the additional loop external to the inductor 200 created by the connections to the varactors and switches. This extra loop may compromise the symmetry of the inductor itself to some extent and may reduce the canceling effect. In theory, it should be possible to modify the geometry of the inductor 5 (e.g., make the upper loop slightly larger) to compensate for this effect. The symmetry of the inductor 200 with respect to a center vertical axis is also important for minimizing the generation of common-mode signal components.

[31] Other considerations may include basic layout parameters, such as the width and height of the inductor coil 202 together with the width and spacing of the surrounding 10 metal wires. These parameters, however, are mainly determined by requirements on inductance, Q-factor, chip area, and process layout rules and have only minor influence on mutual coupling characteristics as long as symmetry of the inductor coil is maintained.

[32] FIGURE 3 illustrates a prior art inductor arrangement of two O-shaped inductors 300 and 302. The two inductors 300 and 302 are placed side-by-side and have O-shaped 15 inductor coils 304 and 306. The inductors coils 304 and 306 in this embodiment are substantially the same size as the 8-shaped inductor coil (e.g., 350 x 350 μm) of FIGURE 2 and are symmetrical relative to their vertical axes Y. The terminals for the two inductor coils 304 and 306 are labeled as 308a & 308b and 310a & 310b, respectively. Because each O-shaped inductor 300 and 302 provides little or no EM 20 reduction individually, the arrangement as a whole provides little or no mutual EM coupling reduction.

[33] On the other hand, an inductor arrangement involving two 8-shaped inductors like the one in FIGURE 2 may provide further reduced mutual EM coupling. This is

illustrated in FIGURE 4, where an inductor arrangement similar to the arrangement in FIGURE 3 is shown, except the two inductors 400 and 402 have 8-shaped inductor coils 404 and 406 instead of O-shaped inductor coils. The terminals for the inductor coils 404 and 406 are labeled as 408a & 408b and 410a & 410b, respectively. Each individual
5 inductor 400 and 402 has a reduced far field by virtue of the 8-shaped inductor coil 404 and 406, as explained above with respect to FIGURE 2. In addition, there is also a reduction in the mutual coupling between the two inductors 400 and 402. This is because the same mechanism that causes the radiated EM field from the first inductor to be reduced also causes the “EM field receive sensitivity” of the second inductor to be
10 reduced. Thus, the combined effect of the two inductors upon each other provides the desired coupling reduction.

[34] Note that it is not necessary for the two inductors 400 and 402 to have the same size. All that is needed for mutual EM coupling reduction is for them to have similar, EM reducing shapes. Further, a combination of an O-shaped inductor and an 8-shaped
15 inductor may still result in mutual coupling reduction. However, since such an arrangement only uses the EM canceling effect of one inductor (the O-shaped inductor has little or no EM cancellation), the total isolation between the two inductors is less.

[35] In some embodiments, it has been found that even greater isolation may be achieved by rotating one of the inductor coils, as shown in FIGURE 5. Here, two
20 inductors 500 and 502 having nearly identical 8-shaped inductor coils 504 and 506 have again been placed side-by-side. Their terminals are again labeled as 508a & 508b and 510a & 510b, respectively. However, one of the inductor coils, say, the inductor coil 504 on the left, has been rotated by 90 degrees to further reduce mutual EM coupling.

[36] In addition to the above designs, other more complex inductor designs that are symmetrical in more than one dimension, for example, a four-leaf clover shape, may also be used. These complex inductor designs are useful because higher inductance values typically need to have more than one turn in order not to consume too much chip area. In addition, such complex inductor designs are often less sensitive to sub-optimal placement and orientation.

[37] To determine the effectiveness of the above inductor designs in reducing mutual EM coupling, simulations were performed using the Momentum 2D EM Simulator™ from Agilent Technologies, with some simulations also repeated in FastHenry™ from the Computational Prototyping Group to verify the results. The simulations used a simple semiconductor substrate model that described the metal and dielectric layers on top of a typical semiconductor substrate. The four terminals of the two mutually coupled inductors were defined as the ports of a linear 4-port network (see FIGURE 4). The interaction between the inductors in such a network may often be expressed using an s-parameter matrix. Those having ordinary skill in the art understand that s-parameter theory is a general technique used to describe how signals are reflected and transmitted in a network. The below s-parameter matrix S gives a substantially complete description of the network's behavior when it is connected to the surrounding components.

$$S = \begin{bmatrix} S_{11} & S_{12} & S_{13} & S_{14} \\ S_{21} & S_{22} & S_{23} & S_{24} \\ S_{31} & S_{32} & S_{33} & S_{34} \\ S_{41} & S_{42} & S_{43} & S_{44} \end{bmatrix} \quad (1)$$

[38] However, the mutual coupling between the two inductors is often difficult to extract directly from the s-parameters where, as here, the network has four single-ended

ports. For this type of analysis, it is sometimes more convenient to treat the two inductors as a differential 2-port network by transforming the single-ended s-parameter matrix into a mixed-mode s-parameter matrix S^{mm} :

$$S^{mm} = M \cdot S \cdot M^T \quad (2)$$

5 [39] where M is the transformation of voltages and currents at the four single-ended ports to differential and common-mode voltages and currents at the two differential ports, and is given by:

$$M = \frac{1}{\sqrt{2}} \cdot \begin{bmatrix} 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & -1 \\ 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix} \quad (3)$$

[40] and M^T is the transposed version of the original matrix M (i.e., with the rows and
10 columns exchanged). For more information regarding this transformation, the reader is referred to David E Bockelman et al., *Combined Differential and Common-Mode Scattering Parameters: Theory and Simulation*, IEEE Trans. on Microwave Theory and Techniques, vol. MTT-43, pp. 1530-1539, July 1995. The results of the transformation is:

$$15 \quad S^{mm} = \begin{bmatrix} \begin{bmatrix} S_{d1d1} & S_{d1d2} \\ S_{d2d1} & S_{d2d2} \end{bmatrix} & \begin{bmatrix} S_{d1c1} & S_{d1c2} \\ S_{d2c1} & S_{d2c2} \end{bmatrix} \\ \begin{bmatrix} S_{c1d1} & S_{c1d2} \\ S_{c2d1} & S_{c2d2} \end{bmatrix} & \begin{bmatrix} S_{c1c1} & S_{c1c2} \\ S_{c2c1} & S_{c2c2} \end{bmatrix} \end{bmatrix} \quad (4)$$

[41] As can be seen, the upper left 2-by-2 sub-matrix contains the purely differential 2-port s-parameters, while the other sub-matrices contain the common-mode behavior.

The voltage transfer gain G_{vdd} was then calculated using standard 2-port s-parameter formulas, for example:

$$G_{vdd} = \text{real}\left(\frac{s_{d2d1}}{1 + s_{d1d1}}\right) \quad (5)$$

[42] This theoretical gain parameter G_{vdd} extracted from the 4-port s-parameter simulation results was then used to compare the mutual coupling between different combinations of inductor layouts.

[43] Using the above mixed-mode s-parameters, the differential voltage gain G_{vdd} from the ports of the first inductor to the ports of the second inductor was calculated at 3.7 GHz. The corresponding coupling coefficient was then estimated based on s-parameter simulations on a test circuit with two coupled inductors. Table 1 shows a summary of the simulation results for the mutual coupling between different coil shapes and orientations for two inductors at a center distance of 1 mm. In Table 1, the “notation 8_shape_90” represents a figure-8 shaped inductor that has been rotated 90 degrees and the notation “8_shape_-90” represents a figure-8 shaped inductor that has been rotated by -90 degrees, “Q1” is the Q-factor for the Inductor 1, “Att” is the attenuation of the mutual EM coupling between the two inductors, and k is the estimated coupling coefficient.

Inductor 1	Inductor 2	L1 [nH]	Q1	Gvdd [dB]	Att [dB]	K
O-shape	O-shape	0.841	16.93	-54.0	reference	0.002077
8-shape	O-shape	1.216	15.20	-75.6	21.6	0.000173
8-shape_90	O-shape	1.218	15.63	-74.9	20.9	0.000187
8-shape	8-shape	1.216	15.84	-86.5	32.5	0.000049
8-shape_90	8-shape	1.216	15.19	-89.7	35.7	0.000034
8-shape_90	8-shape_-90	1.217	15.69	-92.8	38.8	0.000024

Table 1

[44] As can be seen, making one of the inductors 8-shaped was shown to reduce the mutual coupling by up to 20 dB. Making both of them 8-shaped was shown to improve the isolation by up to 30 dB. Making both connectors 8-shaped and rotating them by 90 degrees in opposite directions was shown to improve the isolation nearly 40 dB.

5 [45] A second series of simulations was performed where the center distance between the coils was varied from 0.5 mm up to 2.0 mm for two 8-shaped inductors compared to two O-shaped inductors. The results are plotted in FIGURE 6, where the vertical axis represents the differential transfer gain G_{vdd} and the horizontal axis represents the distance between the centers of the two inductors in millimeters (mm). As can be seen,
10 the 8-shaped inductors (plot 600) resulted in much lower mutual coupling relative to the O-shaped inductors (plot 602). In addition, the 8-shaped inductors show a degree of resonant behavior where the mutual coupling is very low at a certain distance (depending on the frequency). The “average” isolation improvement for the second series (ignoring the sharp minima near 2.0 mm) is between 30 and 40 dB.

15 [46] Positioning of the inductors relative to each other may also affect the amount of mutual coupling. In order to get an understanding of how much the positioning of the inductors affects mutual coupling, additional simulations were done where one of the inductor coils was offset from the ideal symmetry axis by a varying amount. This is illustrated in FIGURE 7, where two inductors 700 and 702 having nearly identical
20 8-shaped inductor coils 704 and 706 are shown. As can be seen, however, the connector coil 704 on the left has been offset vertically from the ideal symmetry axis X by a certain distance Z to a new axis X'. The details of the simulation are shown in Table 2 below, where Deg is the degradation in dB. With this arrangement, some degradation of the

inductor isolation was observed, but even at a 1 mm offset, which corresponds to an orientation of 45 degrees, an improvement of about 30 dB in mutual coupling reduction is achieved for the 8-shaped inductor.

Offset [mm]	L1 [nH]	Q1	Gvdd [dB]	Att [dB]	Deg [dB]	k estim
0.0	1.216	15.19	-89.7	35.7	reference	0.000034
0.1	1.216	15.19	-85.3	31.3	4.4	0.000057
0.2	1.216	15.19	-82.5	28.5	7.2	0.000078
0.3	1.216	15.19	-81.0	27.0	8.7	0.000093
0.5	1.216	15.19	-81.8	27.8	7.9	0.000085
0.7	1.216	15.19	-85.8	31.8	3.9	0.000053
1.0	1.216	15.19	-103.4	49.4	-13.7	0.000007

Table 2

[47] To investigate the relationship between differential voltage gain G_{vdd} and coupling coefficient k , s-parameter simulations of the two inductors were performed in Spectre™. Thereafter, an estimated coupling coefficient k was able to be calculated from Momentum 2D EM Simulator™ results and included in Table 1 and Table 2.

[48] To verify the results of the coupling coefficient estimation, an alternative tool FastHenry™ was used to calculate k . The simulated results are plotted in FIGURE 8. In FIGURE 8 the horizontal axis again represents the distance between the centers of the inductors in mm, but the vertical axis now represents the coupling coefficient k , the bottom plot 800 represents the FastHenry™ results, and the top plot 802 represents the Momentum 2D EM Simulator™ results. The agreement between the two sets of results appears quite good for distances up to 1.5 mm, but some discrepancy may be noted at 2 mm. The most likely explanation for the discrepancy is that the Momentum 2D EM Simulator™ results are more reliable.

[49] From the foregoing, it can be clearly seen that mutual coupling reduction is closely related to the symmetry of the inductor. Therefore, the layout of the rest of the VCO should be designed to minimize any additional inductor loops that may be created when the inductor is connected to the VCO components (e.g., varicaps and capacitive switches), since the magnetic field from this additional loop will affect the balance between the up field components of opposite signs and reduce any canceling effect.

[50] FIGURE 9 shows an exemplary layout for a typical 4 GHz VCO 900 with an 8-shaped inductor 902 that may be used to minimize any additional inductor loops. As can be seen, the layout for the resonator (e.g., switches, varactor) and active parts is substantially symmetrical around the vertical axis Y. The supply voltage (e.g., bias and decoupling) is also applied symmetrically, with the wires routed on top of each other so that they will not create an additional loop. Preferably, all capacitive resonator components are fully differential and have a symmetrical layout.

[51] As alluded to above, more complex inductor designs that are symmetrical in more than one dimension, for example, a four-leaf clover shape design, may also be used. In general, by increasing the number of loops from two to four, the canceling effect may be improved further in some directions and for some distances. This is because, in general (and at least for the 8-shaped inductors), the isolation between inductors is dependent on the relative placement of the coils. FIGURE 10 illustrates an example of a four-leaf clover-shaped inductor 1000. The four loops 1002, 1004, 1006, and 1008 of the inductor 1000 are connected in such a way that the magnetic field emanating from any two adjacent loops have opposite directions and tend to cancel one another. Thus, the cancellation of the different magnetic field components is less dependent, for example, on

the direction of the second inductor coil where two four-leaf clover-shaped inductors are present on the same chip.

[52] Furthermore, as shown in FIGURE 12, a configuration where one of the inductors (e.g., inductor 1100) is rotated 45 degrees relative to the other inductor (e.g., inductor 1102) has been observed to have even lower EM coupling between the two inductors 1100 and 1102.

[53] The differential transfer gain G_{vdd} is plotted in FIGURE 12 for two four-leaf clover shaped inductor arrangement (plot 1200) as a function of center distance together with the performance of two 8-shaped inductors (plot 1202) and two O-shaped inductors (plot 1204). One of the four-leaf clover shaped inductors has been rotated by about 45 degrees (indicated by the “r”) and likewise one of the 8-shaped inductors has been rotated by about 90 degrees (again indicated by the “r”). The vertical axis of the chart represents the differential transfer gain G_{vdd} and the horizontal axis represents the center distance. As can be seen, the isolation for the two four-leaf clover shaped inductor arrangement is nearly 10 dB better than the 8-shaped inductor arrangement for distances below 1 mm and show no resonant behavior at larger distances.

[54] The improvement in the directional behavior of the four-leaf clover shaped inductor arrangement is shown in Table 3. As can be seen, there is no degradation in isolation when moving away from the symmetry axis, only a smaller improvement due to the increasing distance. However, due to the more complex wire layout, resulting in less inductance per length of wire, the Q-factor is slightly lower compared to the 8-shaped inductor arrangement.

Offset [mm]	L1 [nH]	Q1	Gvdd [dB]	Att [dB]	Deg [dB]	k estim
-------------	---------	----	-----------	----------	----------	---------

0.0	1.300	13.09	-92.5	38.5	reference	0.000025
0.1	1.300	13.09	-92.9	38.9	-0.4	0.000024
0.2	1.300	13.09	-92.9	38.9	-0.4	0.000024
0.3	1.300	13.09	-93.4	39.4	-0.9	0.000022
0.5	1.300	13.09	-94.1	40.1	-1.6	0.000021
0.7	1.300	13.09	-94.9	40.9	-2.4	0.000019
1.0	1.300	13.09	-97.1	43.1	-4.6	0.000015

Table 3

[55] In applications where higher inductance values are needed, it is possible to use inductor coils with more than one turn, since single turn designs tend to take up too much chip area. An example of a two-turn 8-shaped inductor 1300 is shown in FIGURE 13. As can be seen, the two-turn 8-shaped inductor 1300 is essentially similar to the 8-shaped inductor 200 of FIGURE 2, except that the two outer loops 1302 and 1304 of the inductor 1300 each turn into an inner loop 1306 and 1308, respectively. The terminals 1310a and 1310b of the inductor 1300 are then connected to the lower inner loop 1308. Such a two-turn inductor 1300 may provide a higher inductance value without taking up too much chip area, while also reducing the Q-factor. In the embodiment shown here, the Q-factor maybe reduced from approximately 15 to 12.5 at 4 GHz.

[56] Although a two-turn 8-shaped inductor has been shown, those of ordinary skill and they are will understand that other configurations may also be used, such as a two-turn four-leaf clover shaped inductor, provided that near symmetry can be maintained given the crossing of the inner and outer loops and positioning requirements of the terminals. Other symmetrical shapes besides those described thus far may also show the same or even better coupling reduction if a satisfactory balance between parameters such as Q-factor, coil size, and coupling coefficient can be reached.

[57] While the present invention has been described with reference to one or more particular illustrative embodiments, those skilled in the art will recognize that many changes may be made thereto without departing from the spirit and scope of the present invention. For example, although only reduction in electro-magnetic coupling has been
5 described in the foregoing, other coupling mechanisms via the substrate or supply lines as well as the effects of components placed between the two VCOs can have an important influence on the maximum achievable isolation. Therefore, each of the foregoing embodiments and variations thereof is contemplated as falling within the spirit and scope of the claimed invention, which is set forth in the following claims.

WHAT IS CLAIMED IS:

1. An inductor layout having reduced mutual electromagnetic coupling,
comprising:
 - a first inductor having a shape that is substantially symmetrical about a first
5 predefined axis, said shape causing said first inductor to have a reduced electromagnetic
field at a certain distance from said first inductor, at least in some directions; and
 - a second inductor positioned at a predetermined distance from said first inductor,
wherein a mutual electromagnetic coupling between said first inductor and said second
inductor is reduced as a result of said first inductor having a reduced electromagnetic
10 field.
2. The inductor layout according to claim 1, wherein said first inductor and
said second inductor are formed on a single semiconductor die.
- 15 3. The inductor layout according to claim 1, wherein said first inductor and
said second inductor are oriented in a same direction.
4. The inductor layout according to claim 1, wherein said first inductor and
said second inductor are oriented in different directions.
20
5. The inductor layout according to claim 1, wherein said first inductor and
said second inductor share a common axis.

6. The inductor layout according to claim 1, wherein said first inductor and said second inductor share no common axis.

7. The inductor layout according to claim 1, wherein said first inductor and said second inductor are substantially 8-shaped.

8. The inductor layout according to claim 7, further comprising an inner loop within each outer loop of said substantially 8-shaped first and second inductors.

9. The inductor layout according to claim 1, wherein said first inductor and said second inductor are substantially four-leaf clover-shaped.

10. The inductor layout according to claim 1, wherein said first inductor and said second inductor are symmetrical about a second predefined axis.

11. A method of reducing mutual electromagnetic coupling between two inductors on a semiconductor die, comprising:

forming a first inductor on said semiconductor die having a shape that is substantially symmetrical about a first predefined axis, said shape causing said first inductor to have a reduced far field, at least in some directions; and

forming a second inductor on said semiconductor die at a predetermined distance from said first inductor, wherein a mutual electromagnetic coupling between said first inductor and said second inductor is reduced as a result of said first inductor having a reduced far field.

12. The method according to claim 11, wherein said second inductor has a shape that is substantially identical to said shape of said first inductor.

5 13. The method according to claim 11, further comprising orienting said first inductor and said second inductor in a same direction.

14. The method according to claim 11, further comprising orienting said first inductor and said second inductor in different directions.

10

15. The method according to claim 11, further comprising placing said first inductor and said second inductor on a common axis that is shared by said first inductor and said second inductor.

15 16. The method according to claim 11, further comprising placing said first inductor and said second inductor so that they share no common axis.

17. The method according to claim 11, wherein said steps of forming said first and second inductors include forming said first and second inductors in a substantially 8
20 shape.

18. The method according to claim 17, further comprising forming an inner loop within each outer loop of said substantially 8-shaped first and second inductors.

19. The method according to claim 11, wherein said steps of forming said first and second inductors include forming said first and second inductors in a substantially four-leaf clover shape.

5 20. The method according to claim 11, wherein said first inductor and said second inductor are symmetrical about a second predefined axis.

21. An inductor having a reduced far field, comprising:
a first loop having a shape that is substantially symmetrical about a first
10 predefined axis; and
a second loop having a size and shape substantially identical to a size and shape of said first loop, said second loop arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from said first loop.

15 22. The inductor according to claim 21, wherein said first loop and said second loop are substantially symmetrical about a second predefined axis.

23. The inductor according to claim 21, further comprising:
a third loop in said inductor having a size and shape substantially identical to said
20 size and shape of said first loop, said third loop arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from said first loop; and
a fourth loop in said inductor having a size and shape substantially identical to a size and shape of said second loop, said fourth loop arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from said second loop.

24. The inductor according to claim 23, wherein said third loop is inside said first loop and said fourth loop is inside said second loop.

ABSTRACT

[58] Method and system are disclosed for reducing mutual EM coupling between VCO resonators and for implementing the same on a single semiconductor chip. The method and system involve using inductors that are substantially symmetrical about their horizontal and/or their vertical axes and providing current to the inductors in a way so that the resulting magnetic field components tend to cancel each other by virtue of the symmetry. In addition, two such inductors may be placed near each other and oriented in a way so that the induced current in the second inductor due to the magnetic field originating from first inductor is significantly reduced. The inductors may be 8-shaped, four-leaf clover-shaped, single-turn, multi-turn, rotated relative to one another, and/or vertically offset relative to one another. This Abstract is submitted with the understanding that it will not be used to interpret or limit the scope or meaning of the claims. 37 CFR 1.72(b).

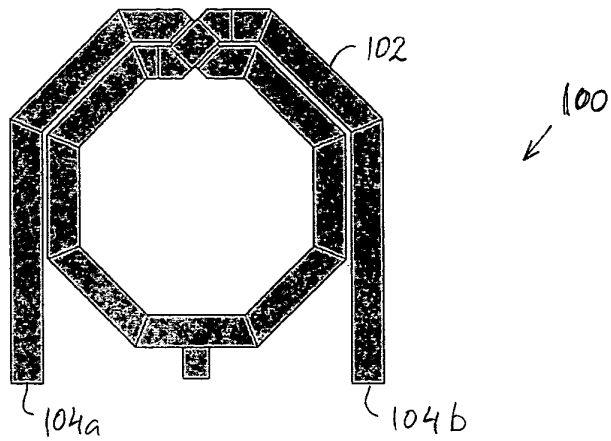


FIG. 1
(Prior Art)

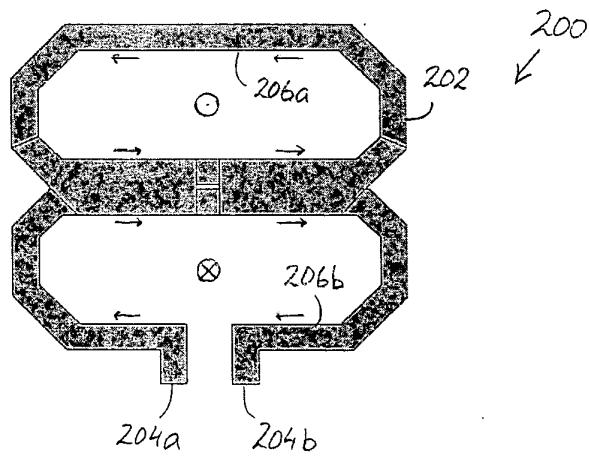


FIG. 2

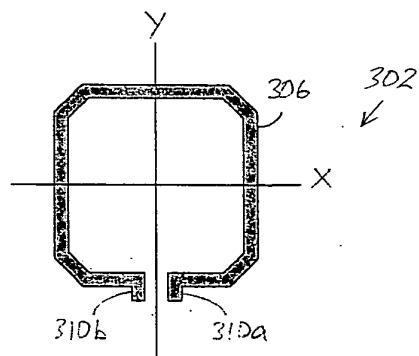
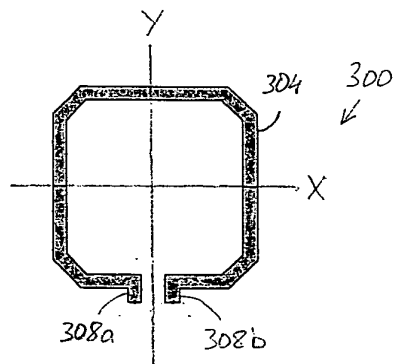


FIG. 3
(Prior Art)

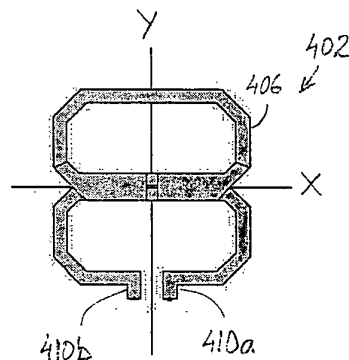
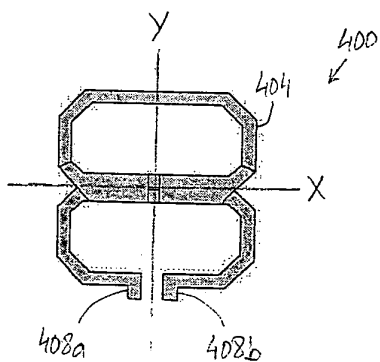


FIG. 4

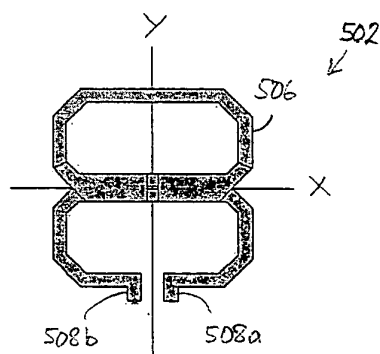
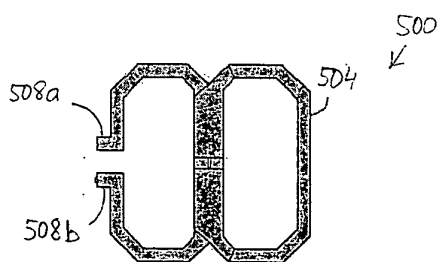


FIG. 5

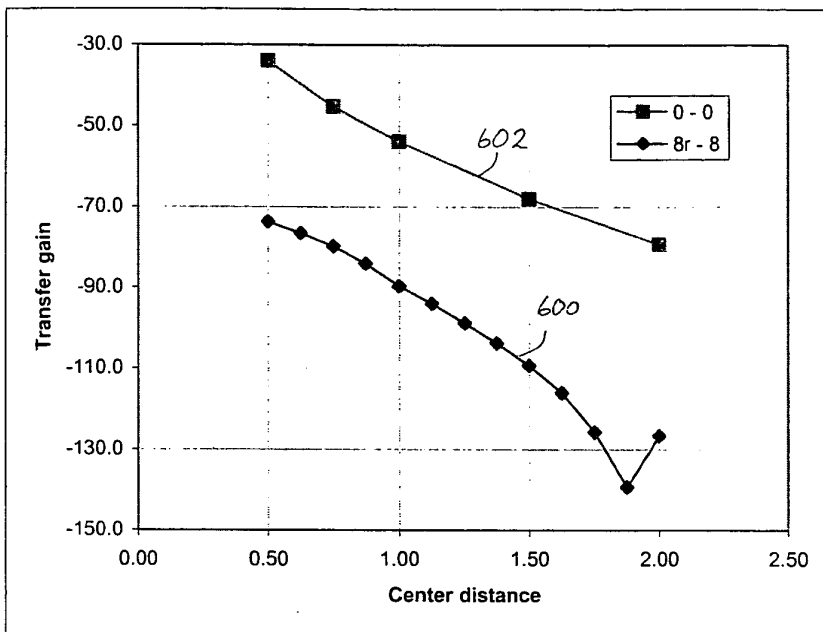


FIG. 6

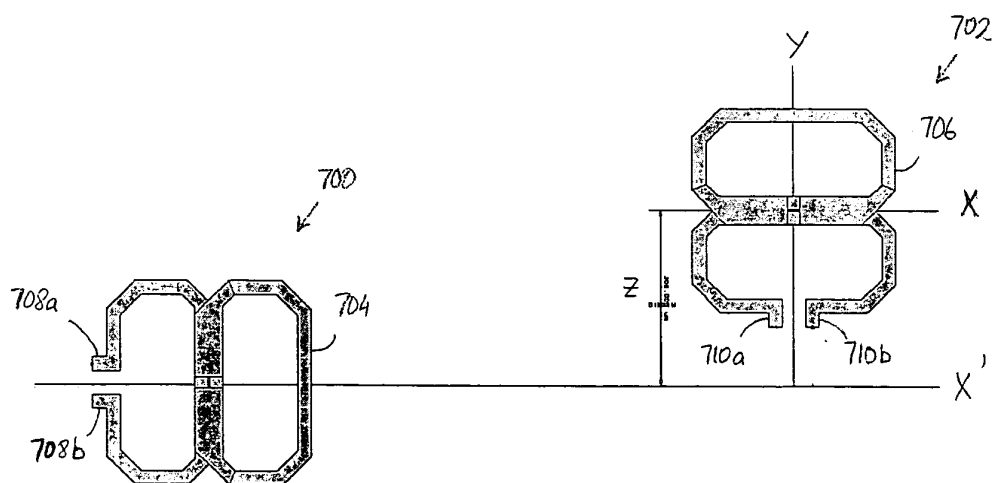


FIG. 7

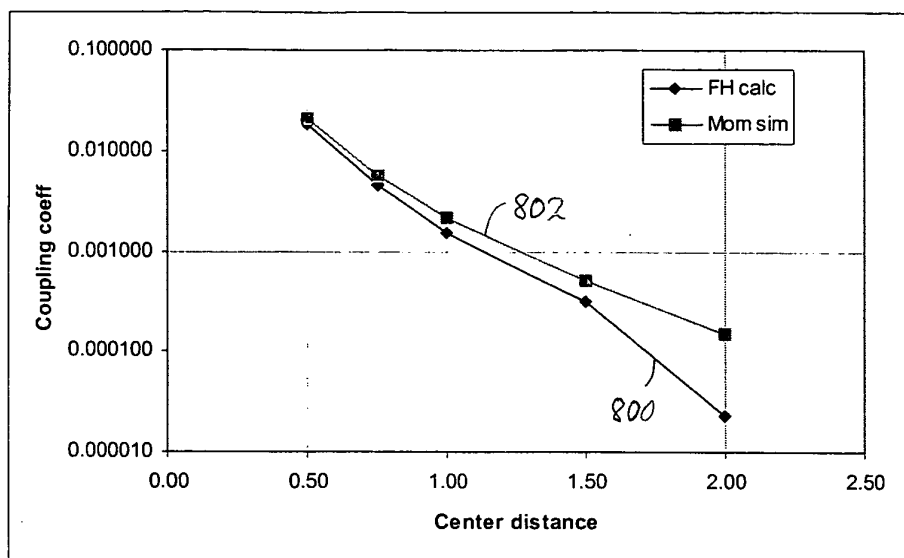


FIG. 8

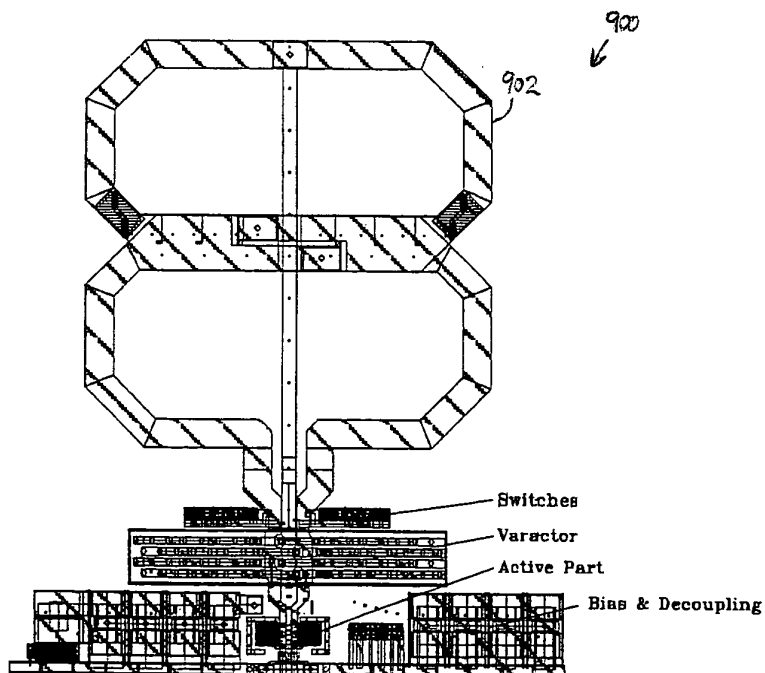


FIG. 9

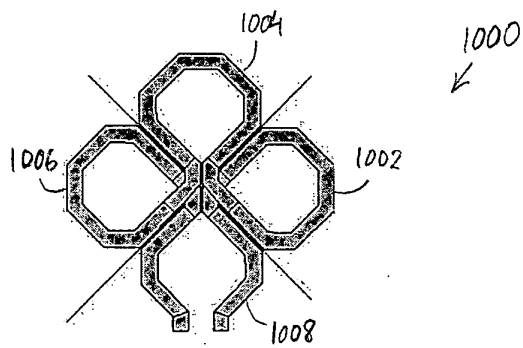


FIG. 10

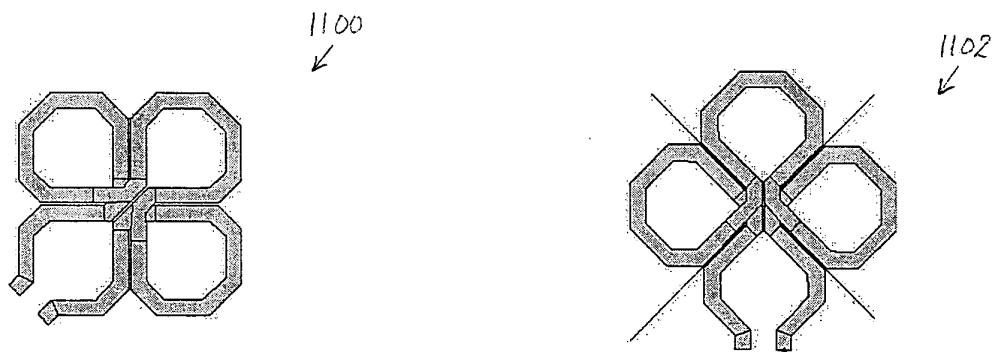


FIG. 11

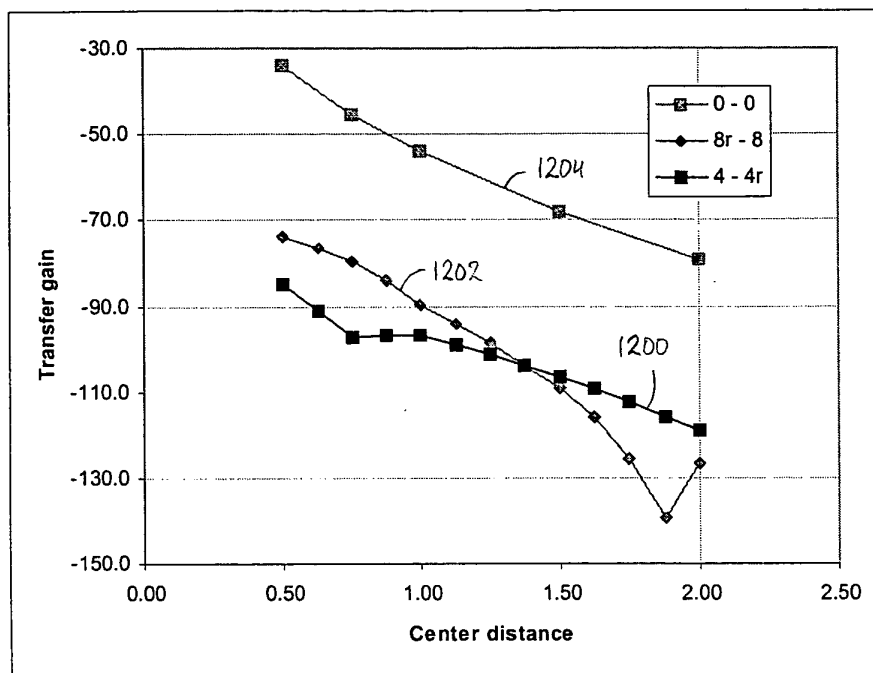


FIG. 12

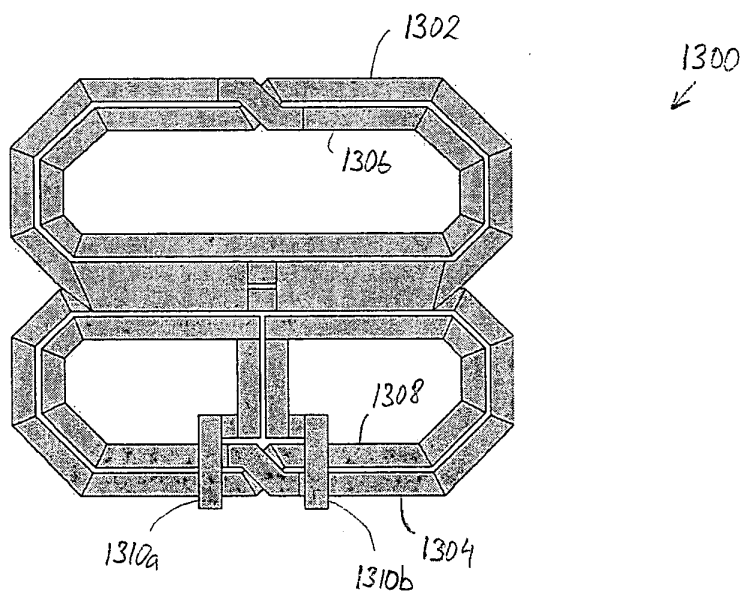


FIG. 13

PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 2003

Application or Docket Number

10919130

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	24	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	24 minus 20 =	4
INDEPENDENT CLAIMS	3 minus 3 =	
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	=
Independent	*	Minus	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

SMALL ENTITY TYPE ☐

OR OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	385.00
XS 9=	
X43=	
+145=	
TOTAL	

OR

RATE	FEE
BASIC FEE	770.00
XS18=	72
X86=	
+290=	
TOTAL	842

SMALL ENTITY

OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
XS 9=	
X43=	
+145=	
TOTAL	
ADDITIONAL FEE	

OR

RATE	ADDITIONAL FEE
XS18=	
X86=	
+290=	
TOTAL	
ADDITIONAL FEE	

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	=
Independent	*	Minus	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

RATE	ADDITIONAL FEE
XS 9=	
X43=	
+145=	
TOTAL	
ADDITIONAL FEE	

OR

RATE	ADDITIONAL FEE
XS18=	
X86=	
+290=	
TOTAL	
ADDITIONAL FEE	

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	=
Independent	*	Minus	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

RATE	ADDITIONAL FEE
XS 9=	
X43=	
+145=	
TOTAL	
ADDITIONAL FEE	

OR

RATE	ADDITIONAL FEE
XS18=	
X86=	
+290=	
TOTAL	
ADDITIONAL FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

08/18/2004 AADQF01 00000015 10919130

01 FC:1001	770.00 OP
02 FC:1202	72.00 OP

PTO-1556
(5/87)

*U.S. Government Printing Office: 2002 — 489-267/69033



UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
10/919,130	08/16/2004	Thomas Mattsson	53807-00113USPT

CONFIRMATION NO. 6733

23932
 JENKENS & GILCHRIST, PC
 1445 ROSS AVENUE
 SUITE 3200
 DALLAS, TX 75202

FORMALITIES LETTER



OC000000014083568

Date Mailed: 10/14/2004

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

*Filing Date Granted***Items Required To Avoid Abandonment:**

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing.
A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(e) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121 are required. The drawings submitted are not acceptable because:
 - The drawings have a line quality that is too light to be reproduced (weight of all lines and letters must be heavy enough to permit adequate reproduction) or text that is illegible (reference characters, sheet numbers, and view numbers must be plain and legible) see 37 CFR 1.84(l) and (p)(1)); See Figure(s) 1-13.

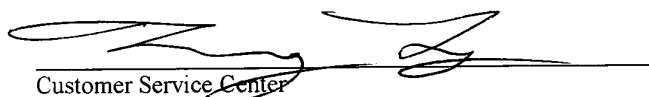
SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **\$130** for a Large Entity

- **\$130** Late oath or declaration Surcharge.

Replies should be mailed to: Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

A copy of this notice MUST be returned with the reply.

A handwritten signature in black ink, appearing to be "M. J. Z.", is written over a horizontal line.

Customer Service Center
Initial Patent Examination Division (703) 308-1202

PART 3 - OFFICE COPY



I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as First Class Mail, in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.

Dated: October 13, 2004

Signature:

(Rebecca Butler)

Docket No.: 53807-00113USPT
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Thomas Mattsson

Application No.: 10/919130

Art Unit: N/A

Filed: August 16, 2004

Examiner: Not Yet Assigned

For: METHOD OF AND INDUCTOR LAYOUT
FOR REDUCED VCO COUPLING

FIRST PRELIMINARY AMENDMENT

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

INTRODUCTORY COMMENTS

Prior to examination on the merits, please amend the above-identified U.S. patent application as follows:

Amendments to the Specification begin on page 2 of this paper.

Remarks/Arguments begin on page 3 of this paper.

DALLAS2 1056029v1 53807-00113USPT

AMENDMENTS TO THE SPECIFICATION

Please add the following new paragraph before the paragraph beginning at page 1 line 6:

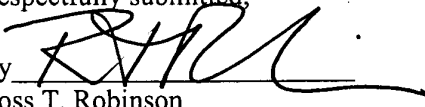
-- This application claims priority from U.S. Provisional Application No. 60/565,328, bearing Docket No. 53807-00113USPL.01, entitled "Inductor Design for Reduced VCO Coupling", and filed on April 26, 2004.—

REMARKS

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Dated: October 12, 2004

Respectfully submitted,

By 

Ross T. Robinson

Registration No.: 47,031

JENKENS & GILCHRIST, A PROFESSIONAL
CORPORATION

1445 Ross Avenue, Suite 3200

Dallas, Texas 75202

(214) 855-4500

Attorneys For Applicant



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Dated: October 29, 2004

Signature:

[Handwritten Signature]
Rebecca Butler

Docket No.: 53807-00113USPT
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Thomas Mattsson

Application No.: 10/919130

Confirmation No.: 6733

Filed: August 16, 2004

Art Unit: 2832

For: METHOD OF AND INDUCTOR LAYOUT
FOR REDUCED VCO COUPLING

Examiner: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT (IDS)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 CFR 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is filed before the mailing date of a first Office Action on the merits as far as is known to the undersigned (37 CFR 1.97(b)(3)).

A copy of each reference on the PTO/SB/08 is attached.

In accordance with 37 CFR 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR 1.56(a) exists. In accordance with 37 CFR 1.97(h), the filing of this Information Disclosure statement shall not be construed to be an admission that any patent, publication or other information referred to therein is "prior art" for this invention unless specifically designated as such.

DALLAS2 1058617v1 53807-00113USPT

It is submitted that the Information Disclosure Statement is in compliance with 37 CFR 1.98 and the Examiner is respectfully requested to consider the listed references.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 10-0447, under Order No. 53807-00113USPT. A duplicate copy of this paper is enclosed.

Dated: October 28, 2004

Respectfully submitted,

By



Ross T. Robinson

Registration No.: 47,031

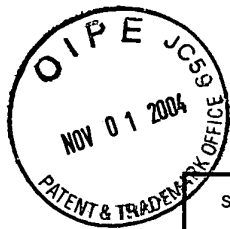
JENKENS & GILCHRIST, A PROFESSIONAL
CORPORATION

1445 Ross Avenue, Suite 3200

Dallas, Texas 75202

(214) 855-4500

Attorneys For Applicant



ALTERNATIVE TO PTO/SB/08a/b (06-03)

Substitute for form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)			Complete if Known		
			Application Number	10/919130	
			Filing Date	August 16, 2004	
			First Named Inventor	Thomas Mattsson	
			Art Unit	2832	
			Examiner Name	Not Yet Assigned	
Sheet	1	of	1	Attorney Docket Number	53807-00113USPT

U.S. PATENT DOCUMENTS				
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document
		Number-Kind Code ² (if known)		
	A1	US-6,664,606	12-16-2003	Estes
	A2	US-6,529,720	03-04-2003	Jovenin et al.
	A3	US-6,512,422	01-28-2003	Dufour et al.
	A4	US-6,268,778	07-31-2001	Mucke et al.
	A5	US-2003/0155630	08-21-2003	Woo
	A6	US-2003/0186674	10-02-2003	Keeney et al.

FOREIGN PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	T ⁶
		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)	MM-DD-YYYY		
	B1	WO-03/084295	10-09-2003	M/A Com Eurotec, B.V.	

*EXAMINER: Initial if information considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²

*EXAMINER: Initial if information considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

DALLAS2 1058618v1 53807-00113USPT



Docket No.: 53807-00113USPT
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Thomas Mattsson

Application No.: 10/919130

Confirmation No.: 6733

Filed: August 16, 2004

Art Unit: 2832

For: METHOD OF AND INDUCTOR LAYOUT
FOR REDUCED VCO COUPLING

Examiner: Not Yet Assigned

REQUEST FOR CORRECTED FILING RECEIPT

MS Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant hereby requests that a corrected Filing Receipt be issued in the above-identified patent application. The official Filing Receipt received by Applicant, a copy of which is attached hereto, has an error in Domestic Priority data as claimed by applicant:

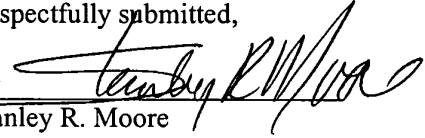
Please add "this application claims priority from 60/565,328 filed April 26, 2004".

DALLAS2 1058525v1 53807-00113USPT

Applicant additionally requests that all pertinent U.S. Patent and Trademark Office records relating to the subject application be changed to reflect this correction.

Dated: December 6, 2004

Respectfully submitted,

By 

Stanley R. Moore

Registration No.: 26,958

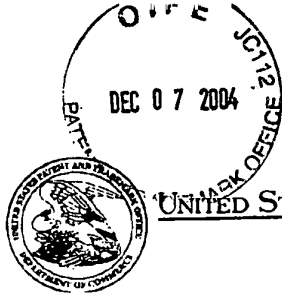
JENKENS & GILCHRIST, A PROFESSIONAL
CORPORATION

1445 Ross Avenue, Suite 3200

Dallas, Texas 75202

(214) 855-4500

Attorneys For Applicant



DEC 07 2004

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/919,130	08/16/2004	2832	842	53807-00113USPT	6	24	3

CONFIRMATION NO. 6733

23932
 JENKENS & GILCHRIST, PC
 1445 ROSS AVENUE
 SUITE 3200
 DALLAS, TX 75202

FILING RECEIPT



OC000000014083567

INTELLECTUAL PROPERTY

OCT 18 2004

Date Mailed: 10/14/2004

JENKENS & GILCHRIST

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Filing Receipt Corrections, facsimile number 703-746-9195. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

Applicant(s)

Thomas Mattsson, Residence Not Provided;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 60/549,611 03/03/2004

and 60/565,328 04/26/2004

Foreign Applications

If Required, Foreign Filing License Granted: 10/13/2004

The number of your priority application, to be used for filing abroad under the Paris Convention is,
US10/919,130

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

* DOCKETED
 Int: W DT: 10/20/04
 FILING RECEIPT
 Action: Comp Date: 10/14/04

Title

Method of and inductor layout for reduced VCO coupling

Preliminary Class

336

**LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15**

GRANTED

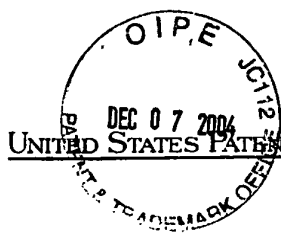
The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Office of Export Administration, Department of Commerce (15 CFR 370.10 (j)); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



12/08/04

JFW#

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
10/919,130	08/16/2004	Thomas Mattsson	53807-00113USPT

CONFIRMATION NO. 6733

23932
 JENKENS & GILCHRIST, PC
 1445 ROSS AVENUE
 SUITE 3200
 DALLAS, TX 75202

FORMALITIES LETTER



OC00000014083568

Date Mailed: 10/14/2004

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

12/09/2004 MAHME1 00000077 10919130

01 FC:1051

130.00 OP

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted**Items Required To Avoid Abandonment:**

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing.
A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(e) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121 are required. The drawings submitted are not acceptable because:
 - The drawings have a line quality that is too light to be reproduced (weight of all lines and letters must be heavy enough to permit adequate reproduction) or text that is illegible (reference characters, sheet numbers, and view numbers must be plain and legible) see 37 CFR 1.84(l) and (p)(1)); See Figure(s) 1-13.

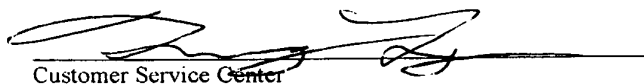
SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **\$130** for a Large Entity

- **\$130** Late oath or declaration Surcharge.

Replies should be mailed to: Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

A copy of this notice MUST be returned with the reply.

A handwritten signature in black ink, appearing to be "J. S. [unclear]", is written over a horizontal line.

Customer Service Center

Initial Patent Examination Division (703) 308-1202

PART 2 - COPY TO BE RETURNED WITH RESPONSE



I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail, Airbill No. EL859412065 US, in an envelope addressed to: MS Missing Parts, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.

Dated: December 7, 2004

Signature:

(Rebecca Butler)

EL859412065US

Docket No.: 53807-00113USPT
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Thomas Mattsson

Application No.: 10/919130

Filed: August 16, 2004

For: METHOD OF AND INDUCTOR LAYOUT
FOR REDUCED VCO COUPLING

Confirmation No.: 6733

Art Unit: 2832

Examiner: Not Yet Assigned

RESPONSE TO NOTICE TO FILE MISSING PARTS OF APPLICATION

MS Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Notice to File Missing Parts of Application – Filing Date Granted mailed October 14, 2004, Applicant respectfully submits a Combined Declaration and Power of Attorney, Part 2 Copy of Notice., and 6 Sheets of Formal Drawings.

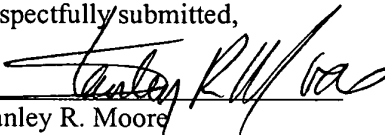
Our check in the amount of \$130.00 covering the fee set forth in 37 CFR 1.16(e) is enclosed. The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this

DALLAS2 1077933v1 53807-00113USPT

application by this firm) to our Deposit Account No. 10-0447, under Order No. 53807-00113USPT. A duplicate copy of this paper is enclosed.

Dated: December 6, 2004

Respectfully submitted,

By 

Stanley R. Moore

Registration No.: 26,958

JENKENS & GILCHRIST, A PROFESSIONAL
CORPORATION

1445 Ross Avenue, Suite 3200

Dallas, Texas 75202

(214) 855-4500

Attorneys For Applicant



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

DECLARATION FOR PATENT APPLICATION

As the below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING

the specification of which was filed on August 16, 2004 as U.S. Application Serial No. 10/919,130.

In the event that the filing date and/or Application No. are not entered above at the time I execute this document, and if such information is deemed necessary, I hereby authorize and request my attorneys/agent(s) at **Jenkins & Gilchrist, a Professional Corporation**, 1445 Ross Avenue, Suite 3200, Dallas, Texas 75202, to insert above the filing date and/or Application No. of said application.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by an amendment, if any, specifically referred to herein.

I acknowledge the duty to disclose all information known to me that is material to patentability in accordance with Title 37, Code of Federal Regulations, § 1.56.

FOREIGN PRIORITY CLAIM

I hereby claim foreign priority benefits under Title 35, United States Code § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

☒ no such foreign applications have been filed

☐ such foreign application have been filed as follows:

**EARLIEST FOREIGN APPLICATION(S), IF ANY FILED WITHIN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION**

Application Number	Country	Date of Filing	Priority Claimed Under 35 USC 119
			___ Yes No ___
			___ Yes No ___
			___ Yes No ___

**ALL FOREIGN APPLICATION(S), IF ANY FILED MORE THAN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION**

Application Number	Country	Date of Filing

CLAIM FOR BENEFIT OF EARLIER U.S. PROVISIONAL APPLICATIONS

I hereby claim priority benefits under Title 35, United States Code § 119(e), of any United States provisional patent application(s) listed below:

☐ no such U.S. provisional applications have been filed.

☒ such U.S. provisional application have been filed as follows:

Application Number	Date of Filing	Priority Claimed Under 35 USC 119
60/549611	March 3, 2004	<u> x </u> Yes No ___
60/565328	April 26, 2004	<u> x </u> Yes No ___
		___ Yes No ___

CLAIM FOR BENEFIT OF EARLIER U.S./PCT APPLICATION(S)

I hereby claim the benefit under Title 35, United States Code, § 120 of the United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose all information that is material to patentability in accordance with Title 37, Code of Federal Regulations, § 1.56 which became available to me between the filing date of the prior application and the national or PCT international filing date of this application:

Page 2 of 4

DALLAS2 1050527v1 53807-00113USPT

☒ no such U.S./PCT applications have been filed.

☐ such U.S./PCT application have been filed as follows:

Application Number	Relationship	Parent Application	Date of Filing

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint:

All practitioners at Customer Number 23932

all of **Jenkins & Gilchrist, a Professional Corporation**, 1445 Ross Avenue, Suite 3200, Dallas, Texas 75202, jointly, and each of them severally, my attorneys at law/patent agent(s), with full power of substitution, delegation and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the U. S. Patent and Trademark Office connected therewith.

Please mail all correspondence to Ross T. Robinson, whose address is:

Jenkins & Gilchrist, a Professional Corporation
1445 Ross Avenue, Suite 3200
Dallas, Texas 75202

Please direct telephone calls to: Ross T. Robinson at (214) 965-7300.

Please direct facsimiles to: (214) 855-4300



1/6

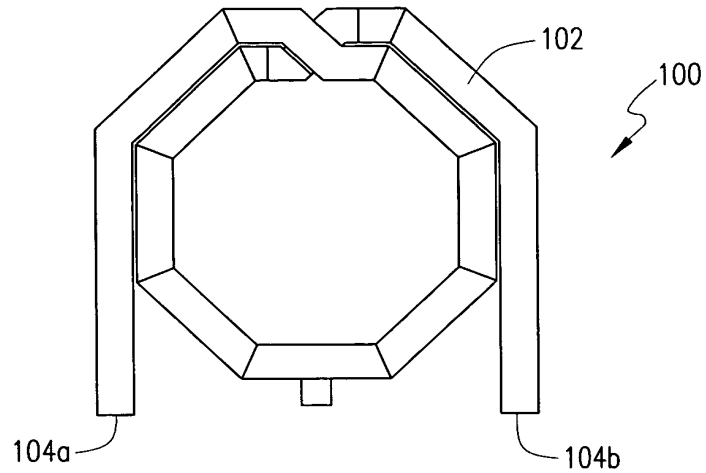


FIG. 1
(PRIOR ART)

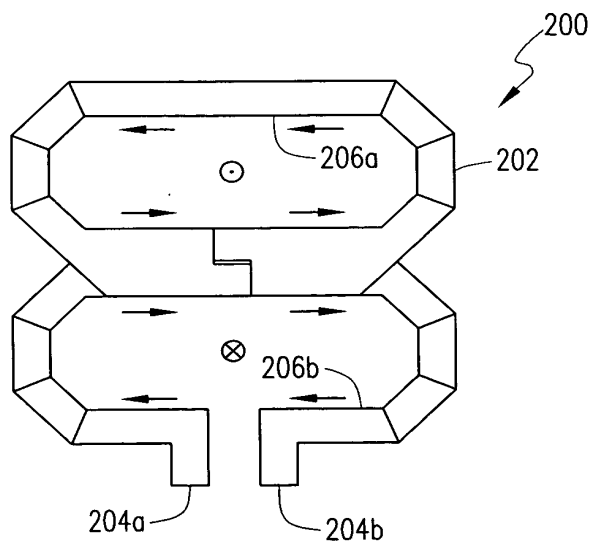
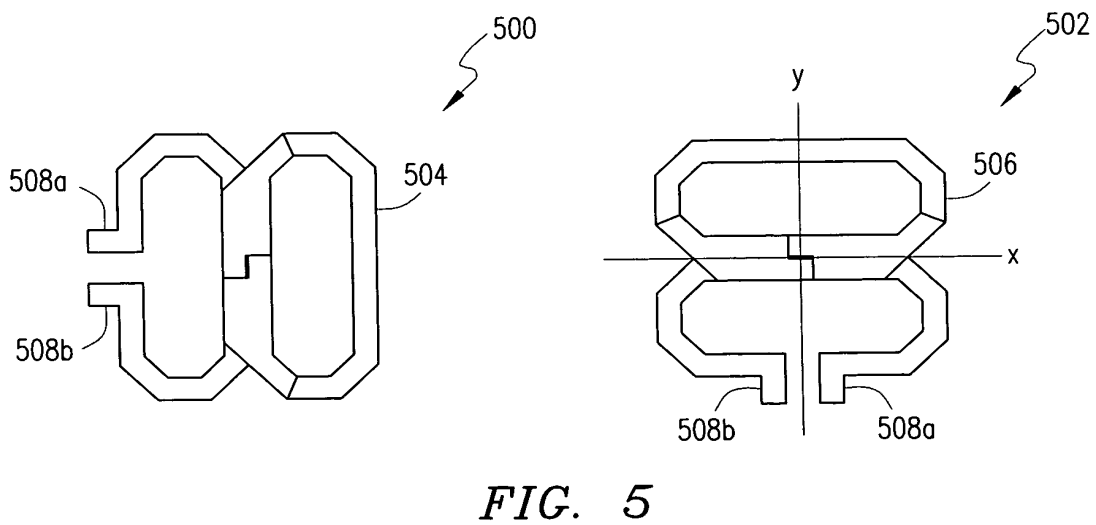
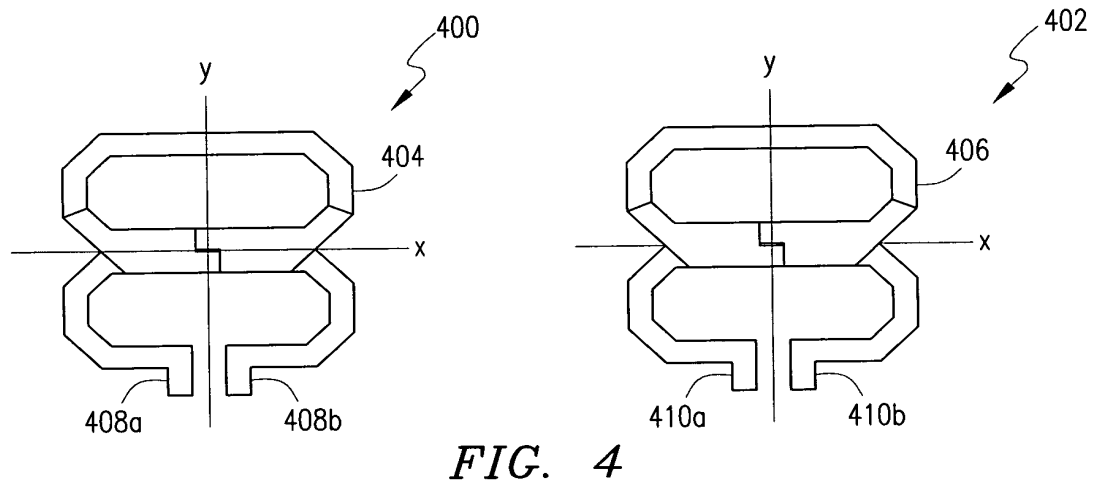
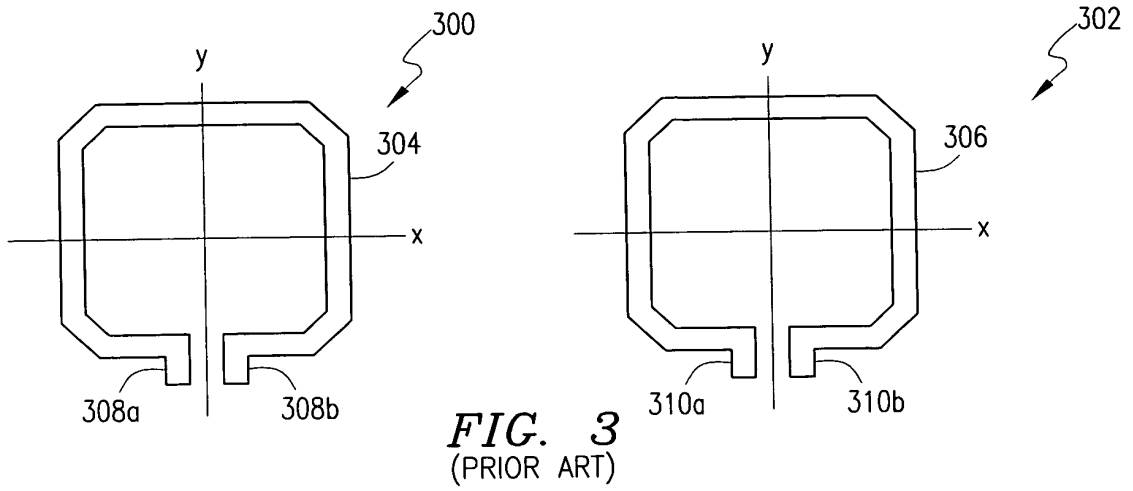


FIG. 2



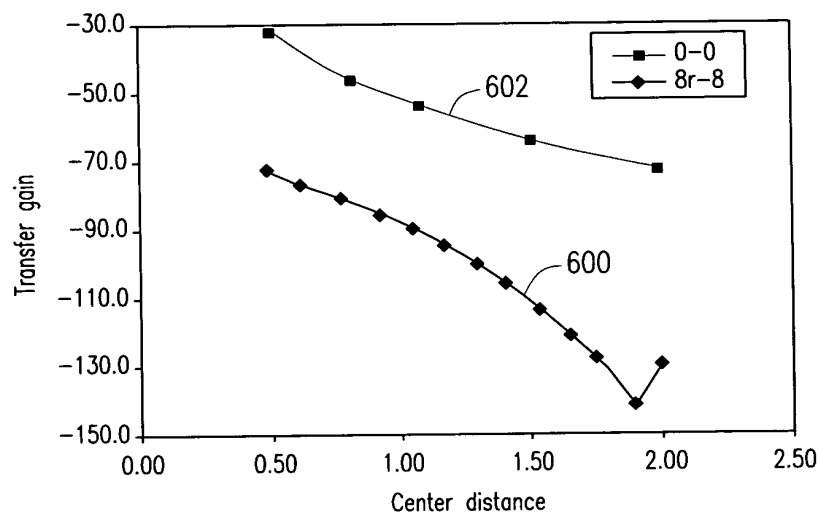


FIG. 6

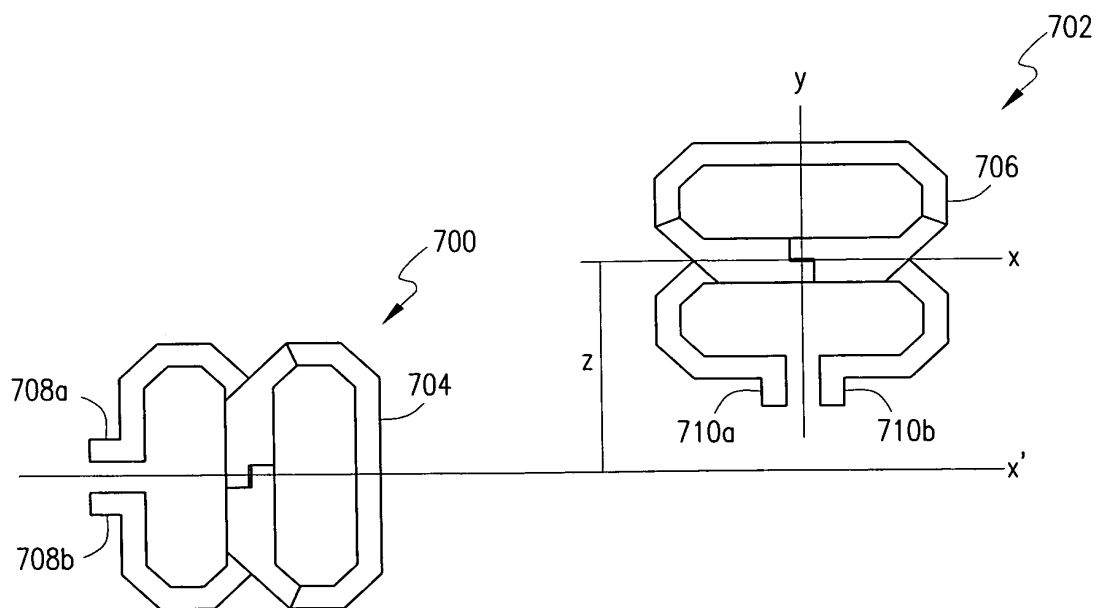


FIG. 7

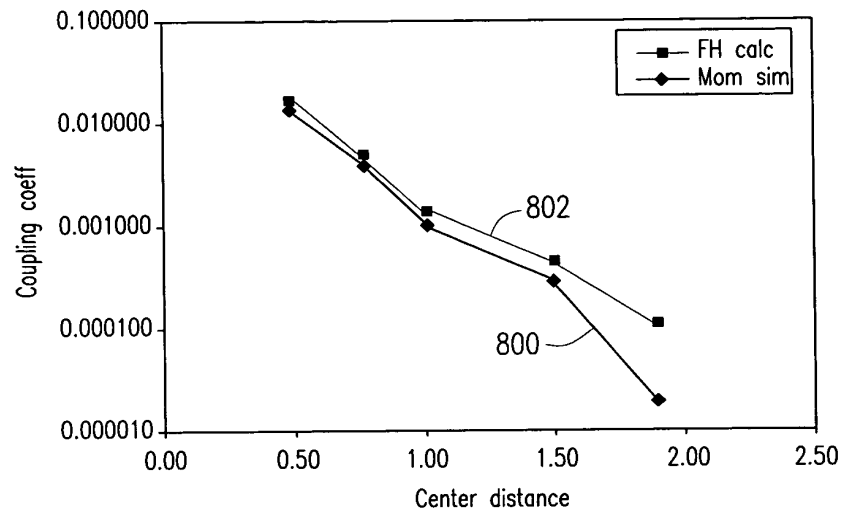


FIG. 8

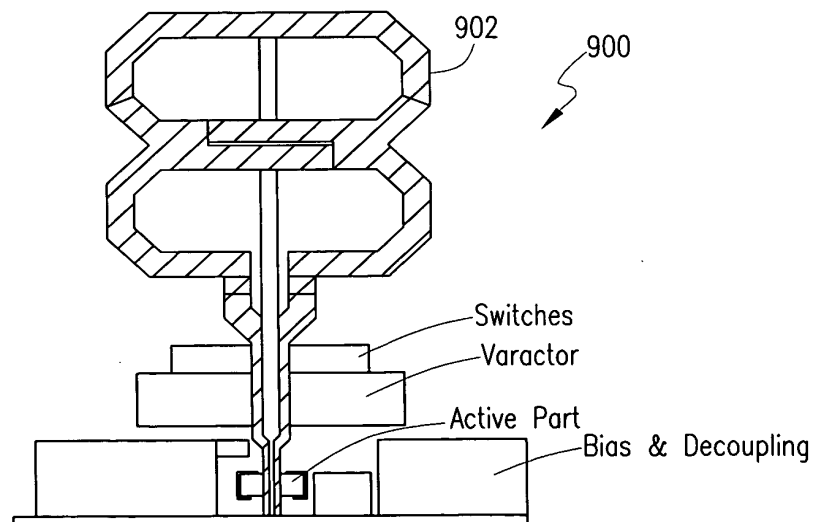


FIG. 9

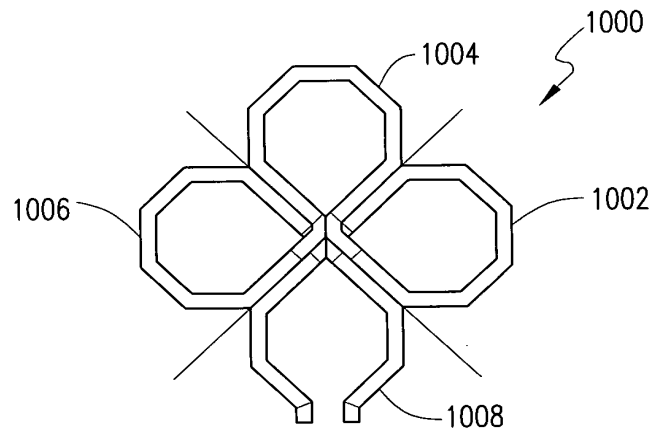


FIG. 10

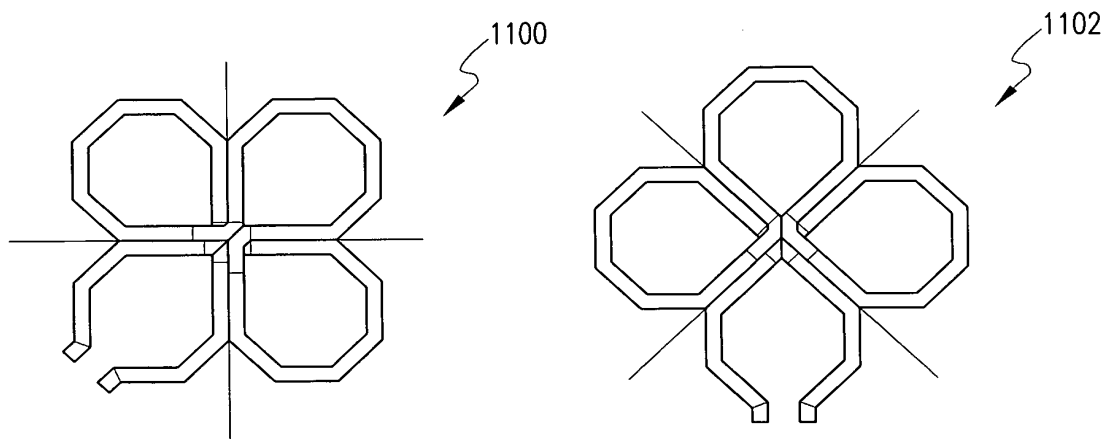


FIG. 11

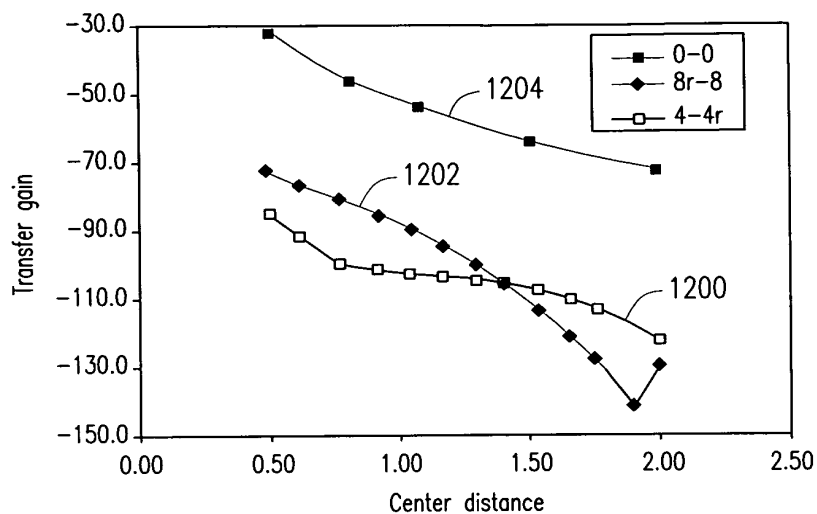


FIG. 12

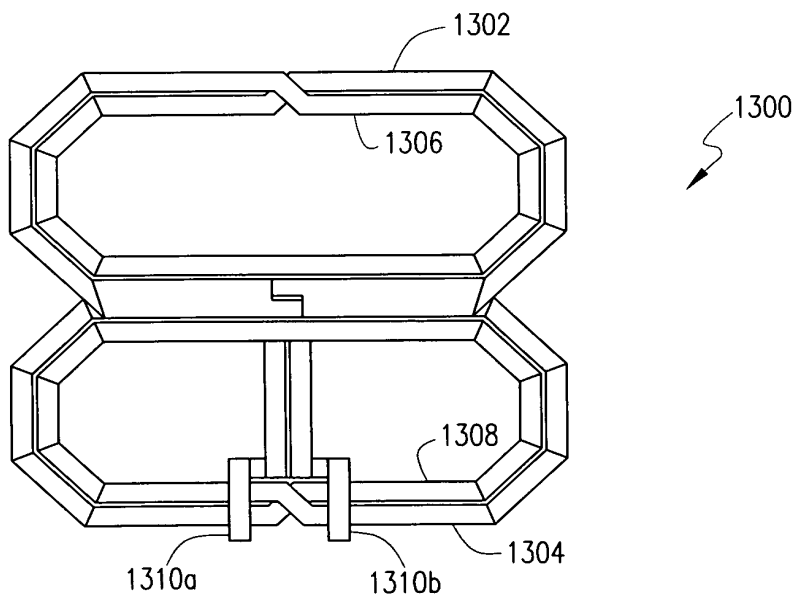


FIG. 13

CLAIMS ONLY						Application Number 10/919130		Filing Date		
						Applicant(s)				
* May be used for additional claims or amendments										
CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT					
	Indep	Depend	Indep	Depend	Indep	Depend	Indep	Depend	Indep	Depend
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99										
100										
Total Indep	3									
Total Depend	21									
Total Claims	24									

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AUG 25 2005

MODIFIED PTO/SB/82 (04-05)

Approved for use through 11/30/2005. OMB 0851-0035

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**REVOCATION OF POWER OF
ATTORNEY WITH
NEW POWER OF ATTORNEY
AND
CHANGE OF CORRESPONDENCE ADDRESS**

Application Number	10/919,130
Filing Date	August 16, 2004
First Named Inventor	Thomas Mattason
Art Unit	2832
Examiner Name	Unassigned
Attorney Docket Number	P19235-US3

I hereby revoke all previous powers of attorney given in the above-identified application.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint the practitioners associated with the Customer Number:**27045**☒ Please change the correspondence address for the above identified application to:☒ The address associated with
Customer Number:**27045**

OR

☐ Firm or
Individual Name

Address

City

State

Zip

Country

Telephone

Fax

I am the:

☐ Applicant/Inventor.☒ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96)**SIGNATURE of Applicant or Assignee of Record**

Signature

Name

Date

Lage Lövgren

Aug 16, 2005

Telephone

+46 8 7198151

Signature

Name

Date

Monica Magnusson

Aug 16, 2005

Telephone

+46 8 4048929

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representatives are required. Submit multiple forms if more than one signature is required, see below.

☒ Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.36. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

MODIFIED PTO/SB/86 (08-04)

Approved for use through 7/31/2008. OMB 0851-0035

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)Applicant/Patent Owner: Thomas MattssonApplication No./Patent No.: 10/919,130 Filed/Issue Date: August 16, 2004

Entitled:

METHOD AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING

Telefonaktiebolaget LM Ericsson (publ)

a Swedish corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title and interest.
The extent (by percentage) of its ownership interest is _____ %

in the patent application/patent identified above by virtue of either:

- A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 015430 Frame 0205 or for which a copy thereof is attached.

OR

- B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark office at Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

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3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark office at Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.☐ Copies of assignments or other documents in the chain of title are attached.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature

Dated: August 16, 2005Printed name: Pete LövgrenTitle: Director, Licensing & Patent Development

Signature

Dated: Aug 16, 2005Printed name: Monica MagnussonTitle: Director, Patent Unit Radio Networks

This collection of information is required by 37 CFR 1.36. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/919,130	08/16/2004	Thomas Mattsson	53807-00113USPT

23932
 JENKENS & GILCHRIST, PC
 1445 ROSS AVENUE
 SUITE 3200
 DALLAS, TX 75202

CONFIRMATION NO. 6733



OC000000016953940

Date Mailed: 09/07/2005

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/25/2005.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

QUOC TRAN
 PTOSS (703) 305-3208

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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/919,130	08/16/2004	Thomas Mattsson	P19235-US3

27045
ERICSSON INC.
6300 LEGACY DRIVE
M/S EVR C11
PLANO, TX 75024

CONFIRMATION NO. 6733



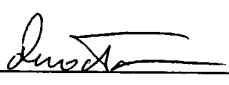
OC000000016953973

Date Mailed: 09/07/2005

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/25/2005.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.



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Attorney Docket No.: P19235-US3

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SEP 30 2005

September 30, 2005

Via Facsimile 571-273-8300Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450**CERTIFICATE OF MAILING OR TRANSMISSION**

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, or being facsimile transmitted to the USPTO on the date indicated below.

Date: September 30, 2005
Pamela S. Newton

Re: Patent Application for:
"METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING"
Serial No. 10/919,130
Attorney Docket No. P19235-US3

Dear Sir:

Enclosed for filing please find the following items relating to the above-identified application:

- (1) Amendment Transmittal Letter (1 page); and
- (2) Amendment (7 pages).

The commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1379.

Should you have any questions or comments concerning this matter, please feel free to contact the undersigned at 972/583-1572.

Sincerely,

Steven W. Smith
Reg. No. 36,684

SWS/psn

Ericsson Inc.
6300 Legacy Drive

Telephone: 972-583-0000

PAGE 1/8 * RCVD AT 9/30/2005 4:13:23 PM [Eastern Daylight Time] * SVR:USPTO-EFXXRF-6/25 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):02-24



ISO 9001

SEP 30 2005

Attorney Docket No. P19235-US3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Thomas Mattsson

Serial No: 10/919,130

Filed: August 16, 2004

§ Group Art Unit: 2832
§
§ Examiner: Unknown
§
§
§

For: METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING

Via Facsimile - 571-273-8300Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450**CERTIFICATE OF MAILING OR TRANSMISSION**

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Date: September 30, 2005Pamela S. Newton
Pamela S. Newton

Dear Sir:

PRELIMINARY AMENDMENT NO. 2

Please amend the application as follows prior to the substantive examination thereof:

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

Preliminary Amendment -- Page 1 of 7
EUS/J/P:05-9198

PAGE 2/8 * RCVD AT 9/30/2005 4:13:23 PM [Eastern Daylight Time] * SVR:USPTO-EFXXRF-6/25 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):02-24

Attorney Docket No. P19235-US3

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims

1. (Canceled)
2. (Currently Amended) The inductor layout according to ~~claim 4~~ claim 25, wherein said first inductor and said second inductor are formed on a single semiconductor die.
3. (Currently Amended) The inductor layout according to ~~claim 4~~ claim 25, wherein said first inductor and said second inductor are oriented in a same direction.
4. (Currently Amended) The inductor layout according to ~~claim 4~~ claim 25, wherein said first inductor and said second inductor are oriented in different directions.
5. (Currently Amended) The inductor layout according to ~~claim 4~~ claim 25, wherein said first inductor and said second inductor share a common axis.
6. (Currently Amended) The inductor layout according to ~~claim 4~~ claim 25, wherein said first inductor and said second inductor share no common axis.
7. (Currently Amended) The inductor layout according to ~~claim 4~~, claim 25, wherein the second inductor also includes two loops, and said first inductor and said second inductor are substantially 8-shaped.
8. (Currently Amended) The inductor layout according to claim 7, further comprising an inner loop within each ~~outer loop~~ of the two loops of said substantially 8-shaped first and second inductors.

Preliminary Amendment – Page 2 of 7
EUS/J/P:05-9198

PAGE 3/8 * RCVD AT 9/30/2005 4:13:23 PM [Eastern Daylight Time] * SVR:USPTO-EFXXRF-6/25 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):02:24

Attorney Docket No. P19235-US3

9. (Currently Amended) The inductor layout according to ~~claim 1~~ claim 25, wherein said first inductor and said second inductor are ~~substantially four-leaf clover-shaped~~ also includes a third loop connected to the second loop and a fourth loop connected to the third loop and to the first loop, wherein the first inductor is substantially four-leaf clover-shaped.

10. (Currently Amended) The inductor layout according to ~~claim 1~~ claim 25, wherein said first inductor and said second inductor are symmetrical about a second predefined axis.

11-12. (Canceled)

13. (Currently Amended) The method according to ~~claim 11~~, further comprising claim 26, wherein the step of positioning the second inductor includes orienting said first inductor and said second inductor in a same direction.

14. (Currently Amended) The method according to ~~claim 11~~, further comprising claim 26, wherein the step of positioning the second inductor includes orienting said first inductor and said second inductor in different directions.

15. (Currently Amended) The method according to ~~claim 11~~, further comprising claim 26, wherein the step of positioning the second inductor includes placing said first inductor and said second inductor on a common axis that is shared by said first inductor and said second inductor.

16. (Currently Amended) The method according to ~~claim 11~~, further comprising claim 26, wherein the step of positioning the second inductor includes placing said first inductor and said second inductor so that they share no common axis.

Preliminary Amendment – Page 3 of 7
EUS/J/P:05-9198

PAGE 4/8 * RCVD AT 9/30/2005 4:13:23 PM [Eastern Daylight Time] * SVR:USPTO-EFXXRF-6/25 * DNIS:2738300 * CSID:9725837864 * DURATION (mm:ss):02:24

Attorney Docket No. P19235-US3

17. (Currently Amended) The method according to ~~claim 14~~ claim 26, wherein ~~said steps of forming said first and second inductors include forming said first and second inductors in a substantially 8 shape~~ the step of orienting the second loop in relation to the first loop includes placing the first and second loops in a substantially 8-shape.

18. (Currently Amended) The method according to claim 17, further comprising forming an inner loop within each ~~outer loop~~ of the two loops of said substantially 8-shaped first and second inductors.

19. (Canceled)

20. (Currently Amended) The method according to ~~claim 14~~ claim 26, wherein the step of positioning the second inductor includes positioning said first inductor and said second inductor so that they are symmetrical about a second predefined axis.

21. (Currently Amended) An inductor having a reduced far field, comprising:
a first loop having a shape that is substantially symmetrical about a first predefined axis; and
a second loop having a size and shape substantially identical to ~~a size and shape of said~~ the first loop, said second loop arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from said first loop; and
two closely spaced terminals connected to the first loop for supplying electrical current to the first and second loops while minimizing magnetic field contributions from the terminals.

22. (Original) The inductor according to claim 21, wherein said first loop and said second loop are substantially symmetrical about a second predefined axis.

23-24. (Canceled)

Preliminary Amendment – Page 4 of 7
EUS/J/P:05-9198

PAGE 5/8 * RCVD AT 9/30/2005 4:13:23 PM [Eastern Daylight Time] * SVR:USPTO-EFAXF-6/25 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):02-24

Attorney Docket No. P19235-US3

25. (New) An inductor layout having reduced mutual electromagnetic coupling, comprising:

a first inductor having a reduced far field, said first inductor comprising:

a first loop having a shape that is substantially symmetrical about a first predefined axis;

a second loop connected to the first loop, said second loop having a size and shape substantially identical to the first loop, said second loop arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from the first loop; and

two closely spaced terminals connected to the first loop for supplying electrical current to the first and second loops while minimizing magnetic field contributions from the terminals; and

a second inductor positioned at a predetermined distance from the first inductor, wherein a mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the first inductor having a reduced electromagnetic field.

26. (New) A method of reducing mutual electromagnetic coupling between a first inductor and a second inductor on a semiconductor die, comprising:

forming the first inductor to reduce a far field, said step of forming the first inductor comprising:

forming a first loop having a shape that is substantially symmetrical about a first predefined axis;

forming a second loop having a size and shape substantially identical to the first loop;

orienting the second loop in relation to the first loop such that a magnetic field emanating from the second loop tends to cancel a magnetic field emanating from the first loop; and

connecting two closely spaced terminals to the first loop for supplying electrical current to the first and second loops while minimizing magnetic field contributions from the terminals; and

Preliminary Amendment – Page 5 of 7
EUS/J/P:05-9198

PAGE 6/8 * RCVD AT 9/30/2005 4:13:23 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/25 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):02-24

Attorney Docket No. P19235-US3

positioning a second inductor at a predetermined distance from the first inductor, wherein the mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the first inductor having a reduced electromagnetic field.

27. The method according to claim 26, wherein the step of forming the first inductor also includes:

forming a third loop having a size and shape substantially identical to the first and second loops;

forming a fourth loop having a size and shape substantially identical to the first, second, and third loops; and

orienting the first, second, third, and fourth loops to form a substantially four-leaf clover-shape.

28. (New) An inductor having a reduced far field, comprising:

four electrically connected loops symmetrically arranged in a cloverleaf formation around a common central axis, each of said loops having substantially the same size and shape, wherein a first loop and a third loop are on opposite sides of the axis, and are adjacent to a second and a fourth loop, which are on opposite sides of the axis;

two closely spaced terminals connected to the first loop for supplying electrical current to the four loops while minimizing magnetic field contributions from the terminals;

wherein the current flows in the first and third loops in a first direction, and the current flows in the second and fourth loops in a second direction; and

wherein a magnetic field emanating from the first and third loops tends to cancel a magnetic field emanating from the second and fourth loops.

Preliminary Amendment – Page 6 of 7
EUS/J/P:05-9198

PAGE 7/8 * RCVD AT 9/30/2005 4:13:23 PM [Eastern Daylight Time] * SVR:USPTO-EFXXRF-6/25 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):02-24

Attorney Docket No. P19235-US3

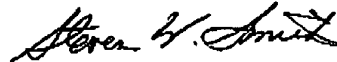
REMARKS

Claims 2-10, 13-18, 20-22, and 25-28 are pending in this application. Claims 1, 11, 12, 19, 23, and 24 have been cancelled herein. Claims 2-10, 13-18, 20, and 21 have been amended. Claims 25-28 have been added.

Applicant respectfully submits no new matter has been added. The claims have been amended to place them in better form, and to recite two closely spaced terminals connected to the first loop for supplying electrical current to the first and second loops. Basis for this amendment is found in the originally filed specification in FIG. 2 and in paragraph [30].

Favorable consideration of the pending claims is respectfully requested.

Respectfully submitted,



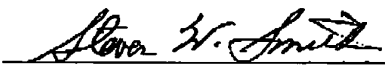
Steven W. Smith
Reg. No. 36,684

Date: 9-30-2005

Ericsson Inc.
6300 Legacy Drive
M/S EVR 1-C-11
Plano, TX 75024
972-583-1572
steve.xl.smith@ericsson.com

Preliminary Amendment – Page 7 of 7
EUS/J/P:05-9198

PAGE 8/8 * RCVD AT 9/30/2005 4:13:23 PM [Eastern Daylight Time] * SVR:USPTO-EFXXRF-6/25 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):02-24

TRANSMITTAL OF INFORMATION DISCLOSURE STATEMENT (Under 37 CFR 1.97(b) or 1.97(c))			Docket No. P19235-US3
In Re Application Of: Thomas Mattsson			
Serial No. 10/919,130	Filing Date August 16, 2004	Examiner Unknown	Group Art Unit 2832 RECEIVED
Title: METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING			CENTRAL FAX CENTER SEP 30 2005
Address to: Commissioner for Patents P. O. Box 1450, Alexandria, VA 22313-1450			
37 CFR 1.97(b)			
1. ☒ The Information Disclosure Statement submitted herewith is being filed within three months of the filing of a national application other than a continued prosecution application under 37 CFR 1.53(d); within three months of the date of entry of the national stage as set forth in 37 CFR 1.491 in an international application; before the mailing of a first Office Action on the merits, or before the mailing of a first Office Action after the filing of a request for continued examination under 37 CFR 1.114.			
37 CFR 1.97(c)			
2. ☐ The Information Disclosure Statement submitted herewith is being filed after the period specified in 37 CFR 1.97(b), provided that the Information Disclosure Statement is filed before the mailing date of a Final Action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or an Action that otherwise closes prosecution in the application, and is accompanied by one of:			
☐ the statement specified in 37 CFR 1.97(e);			
OR			
☐ the fee set forth in 37 CFR 1.17(p).			
 Steven W. Smith Reg. No. 36,684 Ericsson Inc. 6300 Legacy Drive, M/S EVR 1-C-11 Plano, TX 75024 972-583-1572 steve.xl.smith@ericsson.com		Dated: <u>9-30-2005</u>	

P104REV02

PAGE 1/59 * RCVD AT 9/30/2005 4:29:47 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/32 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):10-42

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant.

PATENT APPLICATION FEE DETERMINATION RECORD

Effective December 8, 2004

10919130

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS		
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	minus 20=	*
INDEPENDENT CLAIMS	minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 23	Minus ** 24	=
Independent	* 4	Minus *** 3	= 1
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus **	=
Independent	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus **	=
Independent	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

SMALL ENTITY TYPE ☐

OR OTHER THAN SMALL ENTITY

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X\$ 25=	
X100=	
+180=	
TOTAL	

RATE	FEE
BASIC FEE	3 00.00
X\$50=	
X200=	
+360=	
TOTAL	

SMALL ENTITY OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
X\$ 25=	
X100=	
+180=	
TOTAL ADDIT. FEE	

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X\$ 25=	
X100=	
+180=	

RATE	ADDITIONAL FEE
X\$50=	
X200=	
+360=	

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EUS/J/P/05-9263

NOV 18 2005

November 18, 2005

Via Facsimile 571-273-8300Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

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Date: November 18, 2005Pamela S. Newton
Pamela S. Newton

Re: Patent Application for:
"METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING"
Serial No. 10/919,130
Attorney Docket No. P19235-US3

Dear Sir:

Enclosed for filing please find the following items relating to the above-identified application:

- (1) Amendment Transmittal Letter (1 page);
- (2) Amendment (9 pages); and
- (3) Drawing Replacement Sheet (1 page).

The commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1379.

Should you have any questions or comments concerning this matter, please feel free to contact the undersigned at 972/583-1572.

Sincerely,

Steven W. Smith
Reg. No. 36,684

SWS/psn

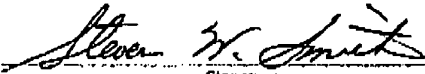
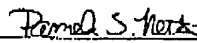
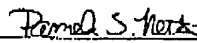
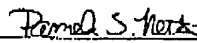
Ericsson Inc.
6300 Legacy Drive
Plano, Texas 75024

Telephone: 972.583.0000



PAGE 1/12 * RCVD AT 11/18/2005 12:17:44 PM [Eastern Standard Time] * SVR:USPTO-EFXXRF-6/24 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):03-02

NOV 18 2005

AMENDMENT TRANSMITTAL LETTER (Large Entity)					Docket No. P19235-US3											
Applicant(s): Thomas Mattsson																
Application No. 10/919,130	Filing Date August 16, 2004	Examiner Unknown	Customer No. 27045	Group Art Unit 2832	Confirmation No. 6733											
Invention: METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING																
COMMISSIONER FOR PATENTS:																
Transmitted herewith is an amendment in the above-identified application. The fee has been calculated and is transmitted as shown below.																
CLAIMS AS AMENDED																
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST # PREV. PAID FOR	NUMBER EXTRA CLAIMS PRESENT	RATE	ADDITIONAL FEE											
TOTAL CLAIMS	22 -	24 =	0 x	\$50.00	\$0.00											
INDEP. CLAIMS	4 -	4 =	0 x	\$200.00	\$0.00											
Multiple Dependent Claims (check if applicable) ☐																
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT					\$0.00											
☒ No additional fee is required for amendment. ☐ Please charge Deposit Account No. 50-1379 in the amount of \$0.00 ☐ A check in the amount of to cover the filing fee is enclosed. ☒ The Director is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account 50-1379 ☒ Any additional filing fees required under 37 C.F.R. 1.16. ☒ Any patent application processing fees under 37 CFR 1.17.																
 Steven W. Smith Reg No. 36,684 Ericsson Inc. 6300 Legacy Drive, M/S EVR 1-C-11 Plano, TX 75024			Dated: 11-18-2005													
CC:			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">CERTIFICATE OF MAILING OR TRANSMISSION</td> </tr> <tr> <td colspan="2" style="font-size: small;">I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, or being facsimile transmitted to the USPTO on the date indicated below.</td> </tr> <tr> <td colspan="2" style="text-align: center;">  Signature </td> </tr> <tr> <td style="text-align: center;">Pamela S. Newton</td> <td style="text-align: center;">November 18, 2005</td> </tr> <tr> <td colspan="2" style="text-align: center;">Depositor's Name and Date</td> </tr> </table>				CERTIFICATE OF MAILING OR TRANSMISSION		I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, or being facsimile transmitted to the USPTO on the date indicated below.		 Signature		Pamela S. Newton	November 18, 2005	Depositor's Name and Date	
CERTIFICATE OF MAILING OR TRANSMISSION																
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, or being facsimile transmitted to the USPTO on the date indicated below.																
 Signature																
Pamela S. Newton	November 18, 2005															
Depositor's Name and Date																

P11LARGE/REV07

PAGE 2/12 * RCVD AT 11/18/2005 12:17:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/24 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):03-02

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NOV 18 2005

Attorney Docket No. P19235-US3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Thomas Mattsson

Serial No: 10/919,130

Filed: August 16, 2004

§ Group Art Unit: 2832

§

§ Examiner: Unknown

§

§

§

For: METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING

Via Facsimile - 571-273-8300

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

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Date: November 18, 2005

Pamela S. Newton
Pamela S. Newton

Dear Sir:

PRELIMINARY AMENDMENT NO. 3

Please amend the application as follows prior to the substantive examination thereof:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims, which begins on page 3 of this paper.

Amendments to the Drawings begin on page 8 of this paper and include an attached replacement sheet.

Remarks begin on page 7 of this paper.

Preliminary Amendment – Page 1 of 9
EUS/J/P:05-9263

PAGE 3/12 * RCVD AT 11/18/2005 12:17:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/24 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):03-02

Attorney Docket No. P19235-US3

AMENDMENTS TO THE SPECIFICATION

Please replace paragraph [18] with the following rewritten paragraph:

FIGURE 8 illustrates the impact of distance on ~~decoupling~~ the coupling coefficient using the inductor arrangements;

Please replace paragraph [46] with the following rewritten paragraph:

Positioning of the inductors relative to each other may also affect the amount of mutual coupling. In order to get an understanding of how much the positioning of the inductors affects mutual coupling, additional simulations were done where one of the inductor coils was offset from the ideal symmetry axis by a varying amount. This is illustrated in FIGURE 7, where two inductors 700 and 702 having nearly identical 8-shaped inductor coils 704 and 706 are shown. As can be seen, however, the ~~connector~~ inductor coil 704 on the left has been offset vertically from the ideal symmetry axis X by a certain distance Z to a new axis X'. The details of the simulation are shown in Table 2 below, where Deg is the degradation in dB. With this arrangement, some degradation of the inductor isolation was observed, but even at a 1 mm offset, which corresponds to an orientation of 45 degrees, an improvement of about 30 dB in mutual coupling reduction is achieved for the 8-shaped inductor.

Please replace paragraph [52] with the following rewritten paragraph:

Furthermore, as shown in ~~FIGURE 12~~ FIGURE 11, a configuration where one of the inductors (e. g. , inductor 1100) is rotated 45 degrees relative to the other inductor (e.g., inductor 1102) has been observed to have even lower EM coupling between the two inductors 1100 and 1102.

Attorney Docket No. P19235-US3

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims

1. (Canceled)
2. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor are formed on a single semiconductor die.
3. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor are oriented in a same direction.
4. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor are oriented in different directions.
5. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor share a common axis.
6. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor share no common axis.
7. (Previously Presented) The inductor layout according to claim 25, wherein the second inductor also includes two loops, and said first inductor and said second inductor are substantially 8-shaped.
8. (Previously Presented) The inductor layout according to claim 7, further comprising an inner loop within each of the two loops of said substantially 8-shaped first and second inductors.

Preliminary Amendment – Page 3 of 9
EUS/J/P:05-9263

PAGE 5/12 * RCVD AT 11/18/2005 12:17:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/24 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):03-02

Attorney Docket No. P19235-US3

9. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor also includes a third loop connected to the second loop and a fourth loop connected to the third loop and to the first loop, wherein the first inductor is substantially four-leaf clover-shaped.

10. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor are symmetrical about a second predefined axis.

11-12. (Canceled)

13. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes orienting said first inductor and said second inductor in a same direction.

14. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes orienting said first inductor and said second inductor in different directions.

15. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes placing said first inductor and said second inductor on a common axis that is shared by said first inductor and said second inductor.

16. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes placing said first inductor and said second inductor so that they share no common axis.

17. (Previously Presented) The method according to claim 26, wherein the step of orienting the second loop in relation to the first loop includes placing the first and second loops in a substantially 8-shape.

Preliminary Amendment – Page 4 of 9
EUS/J/P:05-9263

PAGE 6/12 * RCVD AT 11/18/2005 12:17:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/24 * DNIS:2738300 * CSID:9725837864 * DURATION (mm:ss):03-02

Attorney Docket No. P19235-US3

18. (Currently Amended) The method according to claim 17, further comprising forming an inner loop within each of the two loops of said substantially 8-shaped first ~~and second inductors~~ inductor.

19. (Canceled)

20. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes positioning said first inductor and said second inductor so that they are symmetrical about a second predefined axis.

21. (Previously Presented) An inductor having a reduced far field, comprising:
a first loop having a shape that is substantially symmetrical about a first predefined axis;

a second loop having a size and shape substantially identical to the first loop, said second loop arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from said first loop; and

two closely spaced terminals connected to the first loop for supplying electrical current to the first and second loops while minimizing magnetic field contributions from the terminals.

22. (Original) The inductor according to claim 21, wherein said first loop and said second loop are substantially symmetrical about a second predefined axis.

23-24. (Canceled)

25. (Previously Presented) An inductor layout having reduced mutual electromagnetic coupling, comprising:

a first inductor having a reduced far field, said first inductor comprising:

a first loop having a shape that is substantially symmetrical about a first predefined axis;

Preliminary Amendment – Page 5 of 9
EUS/J/P:05-9263

PAGE 7/12 * RCVD AT 11/18/2005 12:17:44 PM [Eastern Standard Time] * SVR:USPTO-EFAXRF-6/24 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):03-02

Attorney Docket No. P19235-US3

a second loop connected to the first loop, said second loop having a size and shape substantially identical to the first loop, said second loop arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from the first loop; and

two closely spaced terminals connected to the first loop for supplying electrical current to the first and second loops while minimizing magnetic field contributions from the terminals; and

a second inductor positioned at a predetermined distance from the first inductor, wherein a mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the first inductor having a reduced electromagnetic field.

26. (Previously Presented) A method of reducing mutual electromagnetic coupling between a first inductor and a second inductor on a semiconductor die, comprising:

forming the first inductor to reduce a far field, said step of forming the first inductor comprising:

forming a first loop having a shape that is substantially symmetrical about a first predefined axis;

forming a second loop having a size and shape substantially identical to the first loop;

orienting the second loop in relation to the first loop such that a magnetic field emanating from the second loop tends to cancel a magnetic field emanating from the first loop; and

connecting two closely spaced terminals to the first loop for supplying electrical current to the first and second loops while minimizing magnetic field contributions from the terminals; and

positioning a second inductor at a predetermined distance from the first inductor, wherein the mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the first inductor having a reduced electromagnetic field.

Preliminary Amendment – Page 6 of 9
EUS/J/P:05-9263

PAGE 8/12 * RCVD AT 11/18/2005 12:17:44 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/24 * DNIS:2738300 * CSID:9725837864 * DURATION (mm:ss):03-02

Attorney Docket No. P19235-US3

27. (Previously Presented) The method according to claim 26, wherein the step of forming the first inductor also includes:

forming a third loop having a size and shape substantially identical to the first and second loops;

forming a fourth loop having a size and shape substantially identical to the first, second, and third loops; and

orienting the first, second, third, and fourth loops to form a substantially four-leaf clover-shape.

28. (Previously Presented) An inductor having a reduced far field, comprising:

four electrically connected loops symmetrically arranged in a cloverleaf formation around a common central axis, each of said loops having substantially the same size and shape, wherein a first loop and a third loop are on opposite sides of the axis, and are adjacent to a second and a fourth loop, which are on opposite sides of the axis;

two closely spaced terminals connected to the first loop for supplying electrical current to the four loops while minimizing magnetic field contributions from the terminals;

wherein the current flows in the first and third loops in a first direction, and the current flows in the second and fourth loops in a second direction; and

wherein a magnetic field emanating from the first and third loops tends to cancel a magnetic field emanating from the second and fourth loops.

Attorney Docket No. P19235-US3

AMENDMENTS TO THE DRAWINGS

The attached sheet of drawings includes changes to Fig. 5. This sheet replaces the original sheet including Fig. 5.

Attachment: Replacement Sheet (1)

Preliminary Amendment – Page 8 of 9
EUS/J/P:05-9263

PAGE 10/12 * RCVD AT 11/18/2005 12:17:44 PM [Eastern Standard Time] * SVR:USPTO-EFXXRF-6/24 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):03-02

Attorney Docket No. P19235-US3

REMARKS

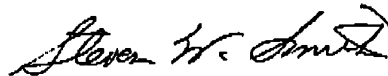
Claims 2-10, 13-18, 20-22, and 25-28 are pending in this application. Claims 1, 11, 12, 19, 23, and 24 were previously canceled. Claim 18 has been amended to correct an antecedent basis problem.

FIGURE 5 has been amended to correct reference numbers 508a and 508b on the right-hand inductor to read 510a and 510b, which is consistent with the text of the specification.

Applicant respectfully submits no new matter has been added.

Favorable consideration of the pending claims is respectfully requested.

Respectfully submitted,



Steven W. Smith
Reg. No. 36,684

Date: 11-18-2005

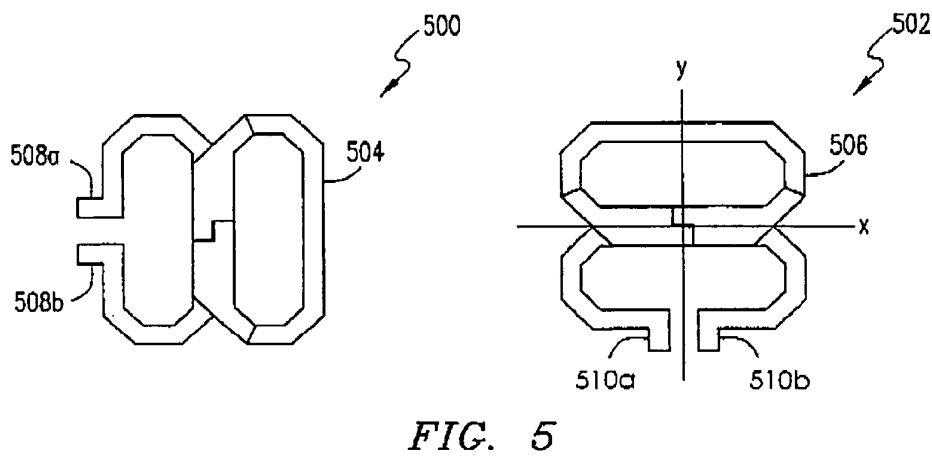
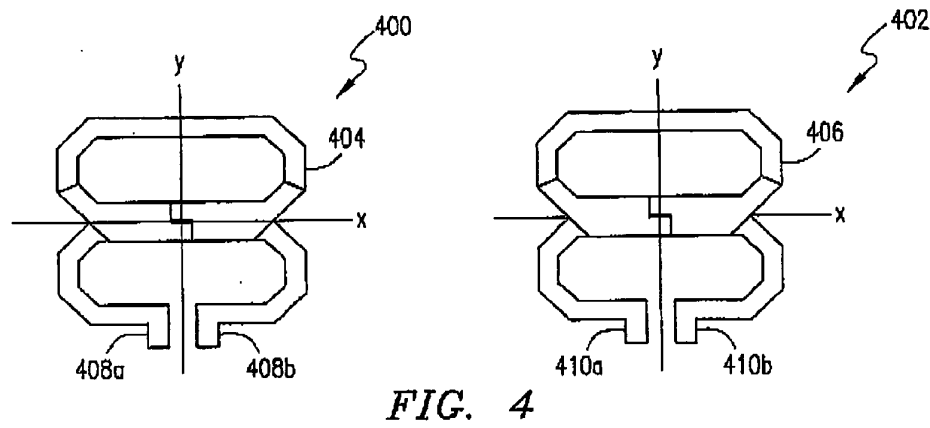
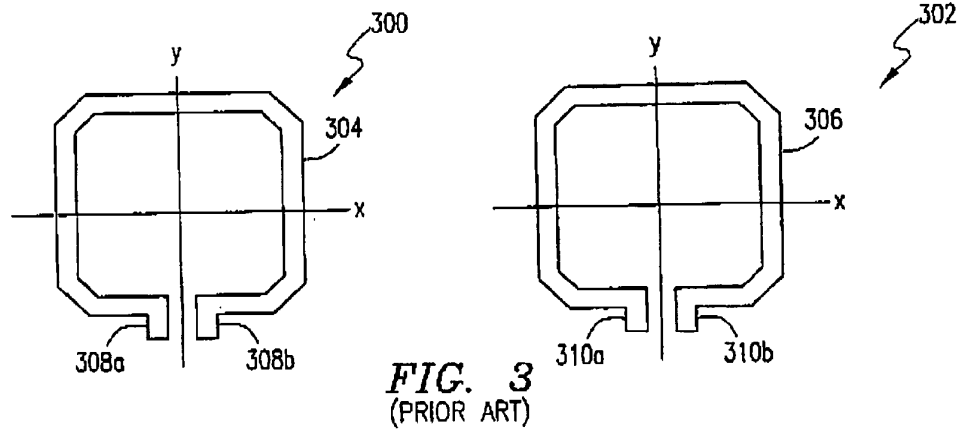
Ericsson Inc.
6300 Legacy Drive
M/S EVR 1-C-11
Plano, TX 75024
972-583-1572
steve.xl.smith@ericsson.com

Preliminary Amendment – Page 9 of 9
EUS/J/P:05-9263

PAGE 11/12 * RCVD AT 11/18/2005 12:17:44 PM [Eastern Standard Time] * SVR:USPTO-EFXXRF-6/24 * DNIS:2738300 * CSID:9725837864 * DURATION (mm-ss):03-02

Replacement Sheet

2/6



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11/22/2005 JDOZIER 00000005 501379 10919130
Sale Ref: 00000005 DA#: 501379 10919130
01 FC:1201 200.00 DA

PATENT APPLICATION FEE DETERMINATION RECORD

Effective December 8, 2004

10919130

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS		
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	minus 20=	
INDEPENDENT CLAIMS	minus 3 =	
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

*If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)		(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	23	Minus	24	=
Independent	4	Minus	3	= 1
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

SMALL ENTITY TYPE ☐ OR OTHER THAN SMALL ENTITY

RATE	FEE		RATE	FEE
BASIC FEE	150.00	OR	BASIC FEE	300.00
X\$ 25=		OR	X\$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL		OR	TOTAL	

SMALL ENTITY OR OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 25=		OR	X\$50=	
X100=		OR	X200=	200
+180=		OR	+360=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	200.00

Re/Amend

	(Column 1)		(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
11/18/05	22	Minus	24	=
Independent	4	Minus	4	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☒				

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 25=		OR	X\$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

	(Column 1)		(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total		Minus		=
Independent		Minus		=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 25=		OR	X\$50=	
X100=		OR	X200=	
+180=		OR	+360=	

PLUS Search Results for S/N 10919130, Searched December 29, 2005

The Patent Linguistics Utility System (PLUS) is a USPTO automated search system for U.S. Patents from 1971 to the present. PLUS is a query-by-example search system which produces a list of patents that are most closely related linguistically to the application searched. This search was prepared by the staff of the Scientific and Technical Information Center, SIRA.

5243289	5745013	6236297
5696471	5770984	6239367
5204809	6084362	4518840
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6211738	5621323	5937072
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4959764	5406224	4868505
5635892	3593154	5659464
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5243308	5548255	4177494
5321373	5745838	4264867
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6356162	6114937	4319359
6188295	6380608	4321958
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5770982	4569084	4553039
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5804963	5021758	4591037
5884990	5276282	4598423
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6891444	4276082	4897766
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4257087	5844419	5202820
4873497	5994759	5223749
5336921	6103134	5227676
5372967	6163221	5231078
5719539	6208528	5274346
5784687	6222437	5285191
6020799	6222437	5291180
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6304156	5406226	5392011
5585770	5805043	5392018



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/919,130	08/16/2004	Thomas Mattsson	P19235-US3	6733
27045	7590	04/04/2006	EXAMINER	
ERICSSON INC. 6300 LEGACY DRIVE M/S EVR C11 PLANO, TX 75024			MAI, ANH T	
			ART UNIT	PAPER NUMBER
			2832	

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/919,130	Applicant(s) MATTSSON, THOMAS	
	Examiner Anh T. Mai	Art Unit 2832	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-10,13-18,20-22 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 2-10,13-18,20-22 and 25-28 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) ☐ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) ☐ Notice of Informal Patent Application (PTO-152) |
| 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) ☐ Other: ____ |

DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species:

Species I: figures 2, 4-9;

Species II: figures 10-12;

Species III: figures 13.

The species are independent or distinct because the figures are not disclosed the species as capable of use together

2. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claim 21 is generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103(a) of the other invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh T. Mai whose telephone number is 571-272-1995. The examiner can normally be reached on 5/4/9 Schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on 571-272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2832

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

032706

am



ANH MAI
PRIMARY EXAMINER

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Thomas Mattsson	§	Group Art Unit:	2832
		§		
Serial No:	10/919,130	§	Examiner:	Mai, Tan V
		§		
Filed:	August 16, 2004	§	Confirmation No.:	6733
		§		

For: METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING

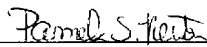
Via EFS-Web

Mail Stop AMENDMENT
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, or being transmitted via facsimile or EFS-Web to the USPTO on the date indicated below.

Date: April 27, 2006


Pamela S. Newton

Dear Sir:

RESPONSE TO RESTRICTION REQUIREMENT

In response to the Restriction Requirement dated April 4, 2006, the Applicant provisionally elects, without traverse, Species I, represented by Figures 2 and 4-9, and comprising claims 2-7, 10, 13-17, 20-22, 25, and 26 for further prosecution in this application.

Please withdraw claims 8, 9, 18, 27, and 28 from consideration until such time that generic claim 21 is held to be allowable.

A complete listing of claims begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims

1. (Canceled)
2. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor are formed on a single semiconductor die.
3. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor are oriented in a same direction.
4. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor are oriented in different directions.
5. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor share a common axis.
6. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor share no common axis.
7. (Previously Presented) The inductor layout according to claim 25, wherein the second inductor also includes two loops, and said first inductor and said second inductor are substantially 8-shaped.
8. (Withdrawn) The inductor layout according to claim 7, further comprising an inner loop within each of the two loops of said substantially 8-shaped first and second inductors.

9. (Withdrawn) The inductor layout according to claim 25, wherein said first inductor also includes a third loop connected to the second loop and a fourth loop connected to the third loop and to the first loop, wherein the first inductor is substantially four-leaf clover-shaped.

10. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor are symmetrical about a second predefined axis.

11-12. (Canceled)

13. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes orienting said first inductor and said second inductor in a same direction.

14. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes orienting said first inductor and said second inductor in different directions.

15. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes placing said first inductor and said second inductor on a common axis that is shared by said first inductor and said second inductor.

16. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes placing said first inductor and said second inductor so that they share no common axis.

17. (Previously Presented) The method according to claim 26, wherein the step of orienting the second loop in relation to the first loop includes placing the first and second loops in a substantially 8-shape.

18. (Withdrawn) The method according to claim 17, further comprising forming an inner loop within each of the two loops of said substantially 8-shaped first inductor.

19. (Canceled)

20. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes positioning said first inductor and said second inductor so that they are symmetrical about a second predefined axis.

21. (Previously Presented) An inductor having a reduced far field, comprising:
a first loop having a shape that is substantially symmetrical about a first predefined axis;

a second loop having a size and shape substantially identical to the first loop, said second loop arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from said first loop; and

two closely spaced terminals connected to the first loop for supplying electrical current to the first and second loops while minimizing magnetic field contributions from the terminals.

22. (Original) The inductor according to claim 21, wherein said first loop and said second loop are substantially symmetrical about a second predefined axis.

23-24. (Canceled)

25. (Previously Presented) An inductor layout having reduced mutual electromagnetic coupling, comprising:

a first inductor having a reduced far field, said first inductor comprising:

a first loop having a shape that is substantially symmetrical about a first predefined axis;

a second loop connected to the first loop, said second loop having a size and shape substantially identical to the first loop, said second loop arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from the first loop; and

two closely spaced terminals connected to the first loop for supplying electrical current to the first and second loops while minimizing magnetic field contributions from the terminals; and

a second inductor positioned at a predetermined distance from the first inductor, wherein a mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the first inductor having a reduced electromagnetic field.

26. (Previously Presented) A method of reducing mutual electromagnetic coupling between a first inductor and a second inductor on a semiconductor die, comprising:

forming the first inductor to reduce a far field, said step of forming the first inductor comprising:

forming a first loop having a shape that is substantially symmetrical about a first predefined axis;

forming a second loop having a size and shape substantially identical to the first loop;

orienting the second loop in relation to the first loop such that a magnetic field emanating from the second loop tends to cancel a magnetic field emanating from the first loop; and

connecting two closely spaced terminals to the first loop for supplying electrical current to the first and second loops while minimizing magnetic field contributions from the terminals; and

positioning a second inductor at a predetermined distance from the first inductor, wherein the mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the first inductor having a reduced electromagnetic field.

27. (Withdrawn) The method according to claim 26, wherein the step of forming the first inductor also includes:

forming a third loop having a size and shape substantially identical to the first and second loops;

forming a fourth loop having a size and shape substantially identical to the first, second, and third loops; and

orienting the first, second, third, and fourth loops to form a substantially four-leaf clover-shape.

28. (Withdrawn) An inductor having a reduced far field, comprising:

four electrically connected loops symmetrically arranged in a cloverleaf formation around a common central axis, each of said loops having substantially the same size and shape, wherein a first loop and a third loop are on opposite sides of the axis, and are adjacent to a second and a fourth loop, which are on opposite sides of the axis;

two closely spaced terminals connected to the first loop for supplying electrical current to the four loops while minimizing magnetic field contributions from the terminals;

wherein the current flows in the first and third loops in a first direction, and the current flows in the second and fourth loops in a second direction; and

wherein a magnetic field emanating from the first and third loops tends to cancel a magnetic field emanating from the second and fourth loops.

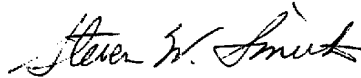
REMARKS

Claims 2-10, 13-18, 20-22, and 25-28 are pending in the application. Of these claims, claims 8, 9, 18, 27, and 28 have been withdrawn from consideration until a generic claim is found to be allowable.

The Applicant believes all of the claims currently pending in the Application to be in condition for allowance. An early action on the merits is respectfully requested.

The Applicants request a telephonic interview if the Examiner has any questions or requires any additional information that would further or expedite the prosecution of the Application.

Respectfully submitted,



Steven W. Smith
Registration No. 36,684

Date: April 27, 2006

Ericsson Inc.
6300 Legacy Drive, M/S EVR 1-C-11
Plano, Texas 75024

(972) 583-1572
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Electronic Acknowledgement Receipt

EFS ID:	1032659
Application Number:	10919130
Confirmation Number:	6733
Title of Invention:	Method of and inductor layout for reduced VCO coupling
First Named Inventor:	Thomas Mattsson
Customer Number:	27045
Filer:	Steven Ware Smith/Pam Newton
Filer Authorized By:	Steven Ware Smith
Attorney Docket Number:	P19235-US3
Receipt Date:	27-APR-2006
Filing Date:	16-AUG-2004
Time Stamp:	14:19:39
Application Type:	Utility
International Application Number:	

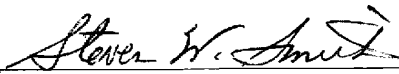
Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part	Pages
1		06-9107-Response-to-Office-Action-dated-4-4-06.pdf	378016	yes	8

	Multipart Description		
	Doc Desc	Start	End
	Transmittal letter	1	1
	Amendment - After Non-Final Rejection	2	2
	Claims	3	7
	Applicant Arguments/Remarks Made in an Amendment	8	8
Warnings:			
Information:			
Total Files Size (in bytes):		378016	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.			

AMENDMENT TRANSMITTAL LETTER (Large Entity)				Docket No. P19235-US3											
Applicant(s): Thomas Mattsson															
Application No. 10/919,130	Filing Date August 16, 2004	Examiner Mai, Tan V	Customer No. 27045	Group Art Unit 2832	Confirmation No. 6733										
Invention: METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING															
<u>COMMISSIONER FOR PATENTS:</u>															
Transmitted herewith is an amendment in the above-identified application. The fee has been calculated and is transmitted as shown below.															
CLAIMS AS AMENDED															
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST # PREV. PAID FOR	NUMBER EXTRA CLAIMS PRESENT	RATE	ADDITIONAL FEE										
TOTAL CLAIMS	22 -	24 =	0 x	\$50.00	\$0.00										
INDEP. CLAIMS	4 -	4 =	0 x	\$200.00	\$0.00										
Multiple Dependent Claims (check if applicable) ☐															
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT					\$0.00										
☒ No additional fee is required for amendment. ☐ Please charge Deposit Account No. 50-1379 in the amount of \$0.00 ☐ A check in the amount of to cover the filing fee is enclosed. ☒ The Director is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account 50-1379 ☒ Any additional filing fees required under 37 C.F.R. 1.16. ☒ Any patent application processing fees under 37 CFR 1.17.															
 _____ Signature			Dated: 04-27-2006												
Steven W. Smith Reg No. 36,684 Ericsson Inc. 6300 Legacy Drive, M/S EVR 1-C-11 Plano, TX 75024			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">CERTIFICATE OF MAILING OR TRANSMISSION</td> </tr> <tr> <td colspan="2" style="font-size: small;">I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, or being facsimile transmitted, or transmitted via EFS-Web to the USPTO on the date indicated below.</td> </tr> <tr> <td colspan="2" style="text-align: center;">  _____ Signature </td> </tr> <tr> <td style="text-align: center;">Pamela S. Newton</td> <td style="text-align: center;">April 27, 2006</td> </tr> <tr> <td colspan="2" style="text-align: center;"><i>Depositor's Name and Date</i></td> </tr> </table>			CERTIFICATE OF MAILING OR TRANSMISSION		I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, or being facsimile transmitted, or transmitted via EFS-Web to the USPTO on the date indicated below.		 _____ Signature		Pamela S. Newton	April 27, 2006	<i>Depositor's Name and Date</i>	
CERTIFICATE OF MAILING OR TRANSMISSION															
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, or being facsimile transmitted, or transmitted via EFS-Web to the USPTO on the date indicated below.															
 _____ Signature															
Pamela S. Newton	April 27, 2006														
<i>Depositor's Name and Date</i>															
CC:															

P11LARGE/REV07

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	92	((("5243289") or ("5696471") or ("5204809") or ("6211738") or ("6211738") or ("6806785") or ("5917722") or ("4584544") or ("4959764") or ("5635892") or ("6215374") or ("6215374") or ("6538532") or ("5243308") or ("5321373") or ("6026286") or ("6356162") or ("6188295") or ("6249190") or ("4777458") or ("4800328") or ("5343177") or ("5483683") or ("5770982") or ("5793272") or ("5804963") or ("5884990") or ("6054329") or ("6114930") or ("6153489") or ("6215449") or ("6215449") or ("6891444") or ("6980075") or ("4352111") or ("4559590") or ("5363323") or ("6025261") or ("6072373") or ("6239684") or ("4257087") or ("4873497") or ("5336921") or ("5372967") or ("5719539") or ("5784687") or ("6020799") or ("6177715") or ("6304156") or ("5585770")).PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	OFF	2006/05/09 07:43
S2	6	("5545916" "5610433" "5831331" "6002161" "6380608" "6549112").PN. OR ("6980075").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2006/05/09 08:00
S3	2063	(magnetic adj field) NEAR cancel\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/05/09 08:52
S4	1645	inductor WITH (vCO voltage NEAR3 oscillator)	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/05/09 08:02
S5	6	S3 and S4	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/05/09 08:03
S6	2638	(336/200,223,226).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	OFF	2006/05/09 08:04
S7	16	S3 and S6	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/05/09 08:06
S8	12529	induct\$3 WITH loop	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/05/09 08:08
S9	168	S4 same S8	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/05/09 08:21

5/9/06 2:17:03 PM

Page 1

10/919,130

EAST Search History

S10	22	S3 same S8	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/05/09 08:23
S11	102	S3 AND S8	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/05/09 08:42
S12	870	far adj field WITH (reduc\$3 eliminat\$3 minimiz\$3decreas\$3)	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/05/09 08:43
S13	1	S3 SAME S12	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/05/09 08:45
S14	5	S3 AND S12	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/05/09 08:45
S15	8	("2843829" "4638270" "5034717" "5852866" "5886394" "5892425").PN. OR ("6194987"). URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2006/05/09 08:47
S16	44	(336/226).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	OFF	2006/05/09 08:52



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/919,130	08/16/2004	Thomas Mattsson	P19235-US3	6733

27045 7590 05/22/2006

ERICSSON INC.
6300 LEGACY DRIVE
M/S EVR C11
PLANO, TX 75024

EXAMINER

MAI, ANH T

ART UNIT PAPER NUMBER

2832

DATE MAILED: 05/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/919,130

Applicant(s)

MATTSSON, THOMAS

Examiner

Anh T. Mai

Art Unit

2832

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-10,13-18,20-22 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) 28 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-10,13-18,25-27 is/are allowed.
- 6) ☒ Claim(s) 21 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2pgs.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of species I, figures 2, 4-9 in the reply filed on 4/27/06 is acknowledged.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhou et al. [6194987].

Zhou discloses:

- a first loop 40 having a shape that is substantially symmetrical about a first predefined axis;
- a second loop 50 having a size and shape substantially identical to the first loop;
- the second loop arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field from the first loop, see figure 4, column 3, line 62 to column 4, line 27;
- two closely spaced terminals 20, 30 connected to the first loop 40 for supplying current i_2 , i_3 to the first and second loops while minimizing magnetic field contributions from the terminals;
- the first and second loops are substantially symmetrical a second predefined axis.

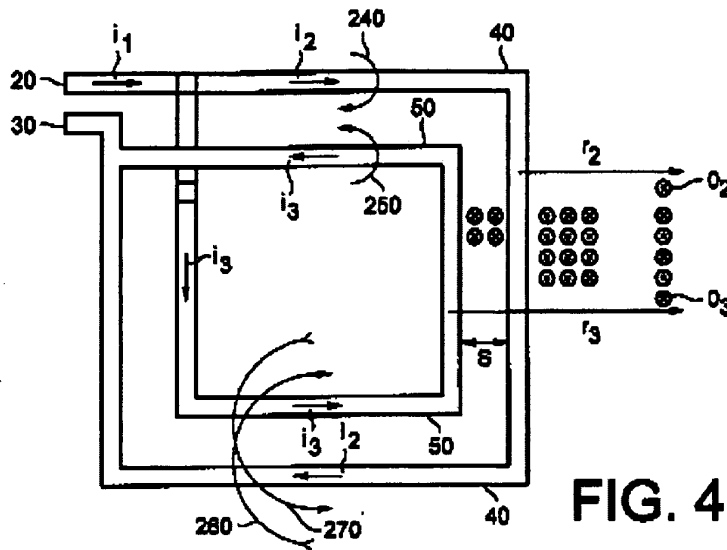


FIG. 4

Allowable Subject Matter

3. Claims 2-7, 10, 13-17, 20 and 25-26 are allowed.

Claims 25 and 26 recite inter alia, *a second inductor positioned at a distance from the first inductor, wherein a mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the first inductor having a reduced electromagnetic field.*

4. Claims 25-26 are allowable. The restriction requirement of group I, as set forth in the Office action mailed on April 4, 2006, has been reconsidered in view of the allowability of claims to the elected invention pursuant to MPEP § 821.04(a). **The restriction requirement is hereby withdrawn as to any claim that requires all the limitations of an allowable claim.** Claim 28 directed to non-elected species remains withdrawn from further consideration because it does not require all the limitations of an allowable generic linking claim as required by 37 CFR 1.141.

In view of the above noted withdrawal of the restriction requirement, applicant is advised that if any claim(s) presented in a continuation or divisional application include all the limitations of a claim that is allowable in the present application, such claims may be subject to

Art Unit: 2832

provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Conclusion

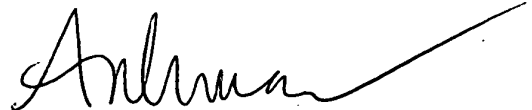
5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892 Form.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh T. Mai whose telephone number is 571-272-1995. The examiner can normally be reached on 5/4/9 Schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on 571-272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

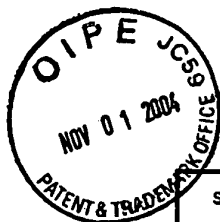
051006
\\am



ANH MAI
PRIMARY EXAMINER

Examiner Signature		Date Considered	May 6, 1960
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INTEL-1002
U.S. Patent 7,151,430



ALTERNATIVE TO PTO/SB/08a/b (08-03)

Substitute for form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Complete if Known	
				Application Number	10/919130
				Filing Date	August 16, 2004
				First Named Inventor	Thomas Mattsson
				Art Unit	2832
				Examiner Name	Not Yet Assigned
Sheet	1	of	1	Attorney Docket Number	53807-00113USPT

U.S. PATENT DOCUMENTS				
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document
		Number-Kind Code ² (if known)		
Am	A1	US-6,664,606	12-16-2003	Estes
	A2	US-6,529,720	03-04-2003	Jovenin et al.
	A3	US-6,512,422	01-28-2003	Dufour et al.
	A4	US-6,268,778	07-31-2001	Mucke et al.
	A5	US-2003/0155630	08-21-2003	Woo
	A6	US-2003/0186674	10-02-2003	Keeney et al.

FOREIGN PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T ⁶
		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)			
Am	B1	WO-03/084295	10-09-2003	M/A Com Eurotec, B.V.	

*EXAMINER: Initial if information considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS					
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.			T ²

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¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature		Date Considered	May 06, 06
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DALLAS2 1058618v1 53807-00113USPT

Notice of References Cited	Application/Control No. 10/919,130	Applicant(s)/Patent Under Reexamination MATTSSON, THOMAS	
	Examiner Anh T. Mai	Art Unit 2832	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2003/0202331	10-2003	Jessie et al.	361/764
*	B	US-6,894,598	05-2005	Heima, Tetsuya	336/200
*	C	US-6,891,444	05-2005	Jacobsson et al.	331/117R
*	D	US-6,194,987	02-2001	Zhou et al.	336/200
*	E	US-5,831,331	11-1998	Lee, Sheng-Hann	257/659
*	F	US-6,974,740	12-2005	Lowther et al.	438/214
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

[illegible]

Anh T. Mai

2832

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

[illegible]

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Thomas Mattsson	§	Group Art Unit:	2832
		§		
Serial No:	10/919,130	§	Examiner:	Mai, Tan V
		§		
Filed:	August 16, 2004	§	Confirmation No.:	6733
		§		

For: METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING

Via EFS-Web

Mail Stop AMENDMENT
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

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Date: August 14, 2006

Pamela S. Newton
Pamela S. Newton

Dear Sir:

AMENDMENT UNDER 37 CFR 1.111

In response to the Office Action dated May 22, 2006, the Applicant submits the following remarks. If any extension of time for this Response is required, the Applicant requests that this be considered a petition therefore. The Commissioner is hereby authorized to charge any additional fee to Deposit Account No. 50-1379.

SUMMARY OF AMENDMENTS

The claims have not been amended.

Claims 2-10, 13-18, 20-22, and 25-28 are pending in the application.

A complete list of pending claims follows.

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims

1. (Canceled)
2. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor are formed on a single semiconductor die.
3. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor are oriented in a same direction.
4. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor are oriented in different directions.
5. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor share a common axis.
6. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor share no common axis.
7. (Previously Presented) The inductor layout according to claim 25, wherein the second inductor also includes two loops, and said first inductor and said second inductor are substantially 8-shaped.
8. (Withdrawn) The inductor layout according to claim 7, further comprising an inner loop within each of the two loops of said substantially 8-shaped first and second inductors.

9. (Withdrawn) The inductor layout according to claim 25, wherein said first inductor also includes a third loop connected to the second loop and a fourth loop connected to the third loop and to the first loop, wherein the first inductor is substantially four-leaf clover-shaped.

10. (Previously Presented) The inductor layout according to claim 25, wherein said first inductor and said second inductor are symmetrical about a second predefined axis.

11-12. (Canceled)

13. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes orienting said first inductor and said second inductor in a same direction.

14. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes orienting said first inductor and said second inductor in different directions.

15. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes placing said first inductor and said second inductor on a common axis that is shared by said first inductor and said second inductor.

16. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes placing said first inductor and said second inductor so that they share no common axis.

17. (Previously Presented) The method according to claim 26, wherein the step of orienting the second loop in relation to the first loop includes placing the first and second loops in a substantially 8-shape.

18. (Withdrawn) The method according to claim 17, further comprising forming an inner loop within each of the two loops of said substantially 8-shaped first inductor.

19. (Canceled)

20. (Previously Presented) The method according to claim 26, wherein the step of positioning the second inductor includes positioning said first inductor and said second inductor so that they are symmetrical about a second predefined axis.

21. (Previously Presented) An inductor having a reduced far field, comprising:
a first loop having a shape that is substantially symmetrical about a first predefined axis;

a second loop having a size and shape substantially identical to the first loop, said second loop arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from said first loop; and

two closely spaced terminals connected to the first loop for supplying electrical current to the first and second loops while minimizing magnetic field contributions from the terminals.

22. (Original) The inductor according to claim 21, wherein said first loop and said second loop are substantially symmetrical about a second predefined axis.

23-24. (Canceled)

25. (Previously Presented) An inductor layout having reduced mutual electromagnetic coupling, comprising:

a first inductor having a reduced far field, said first inductor comprising:

a first loop having a shape that is substantially symmetrical about a first predefined axis;

a second loop connected to the first loop, said second loop having a size and shape substantially identical to the first loop, said second loop arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from the first loop; and

two closely spaced terminals connected to the first loop for supplying electrical current to the first and second loops while minimizing magnetic field contributions from the terminals; and

a second inductor positioned at a predetermined distance from the first inductor, wherein a mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the first inductor having a reduced electromagnetic field.

26. (Previously Presented) A method of reducing mutual electromagnetic coupling between a first inductor and a second inductor on a semiconductor die, comprising:

forming the first inductor to reduce a far field, said step of forming the first inductor comprising:

forming a first loop having a shape that is substantially symmetrical about a first predefined axis;

forming a second loop having a size and shape substantially identical to the first loop;

orienting the second loop in relation to the first loop such that a magnetic field emanating from the second loop tends to cancel a magnetic field emanating from the first loop; and

connecting two closely spaced terminals to the first loop for supplying electrical current to the first and second loops while minimizing magnetic field contributions from the terminals; and

positioning a second inductor at a predetermined distance from the first inductor, wherein the mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the first inductor having a reduced electromagnetic field.

27. (Withdrawn) The method according to claim 26, wherein the step of forming the first inductor also includes:

forming a third loop having a size and shape substantially identical to the first and second loops;

forming a fourth loop having a size and shape substantially identical to the first, second, and third loops; and

orienting the first, second, third, and fourth loops to form a substantially four-leaf clover-shape.

28. (Withdrawn) An inductor having a reduced far field, comprising:

four electrically connected loops symmetrically arranged in a cloverleaf formation around a common central axis, each of said loops having substantially the same size and shape, wherein a first loop and a third loop are on opposite sides of the axis, and are adjacent to a second and a fourth loop, which are on opposite sides of the axis;

two closely spaced terminals connected to the first loop for supplying electrical current to the four loops while minimizing magnetic field contributions from the terminals;

wherein the current flows in the first and third loops in a first direction, and the current flows in the second and fourth loops in a second direction; and

wherein a magnetic field emanating from the first and third loops tends to cancel a magnetic field emanating from the second and fourth loops.

REMARKS/ARGUMENTS

1.) Claim Amendments

Claims 2-10, 13-18, 20-22, and 25-28 are pending in the application. Of these, claims 8, 9, 18, 27, and 28 have been withdrawn in response to a restriction requirement. Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and the following remarks.

2.) Allowable Subject Matter

The Applicant gratefully acknowledges the allowance of claims 2-7, 10, 13-17, 20 and 25-26 in paragraph 3 of the Office action.

3.) Claim Rejections – 35 U.S.C. § 102(b)

In paragraphs 1-2 of the Office action, the Examiner rejected claims 21-22 under 35 U.S.C. § 102(b) as being anticipated by Zhou, et al. (US 6,194,987). The Applicant respectfully disagrees.

The Examiner cited FIG. 4 of Zhou for teaching every element of claims 21 and 22, without further comment.

Independent claim 21 recites an inductor having a reduced far field. The inductor includes a second loop having a size and shape substantially identical to a first loop. In addition, it is recited that the second loop is arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from the first loop.

The currents in the two loops of Zhou's FIG. 4 are flowing in opposite directions, so the far field will be reduced to some extent. However, the loop areas are completely different (approx. 6:1 ratio as shown) so the reduction is marginal. The claimed invention makes the two loops more equal in size to significantly improve cancellation of the far magnetic field while maintaining a good Q-factor.

It is also noted that the embodiment shown in Zhou's FIG. 8 has two loops that are more similar in size (although one is still noticeably smaller), but the two loops are connected in parallel, not in series. As a result, the currents in the two loops flow in the

same direction, and the magnetic fields are added to each other everywhere outside the two loops. Thus, no far field reduction is achieved.

None of the embodiments described in Zhou teach or suggest an inductor configuration that combines a large far field reduction with a good inductor Q-factor. In particular, Zhou does not teach or suggest an inductor having a reduced far field in which the inductor includes first and second loops of substantially identical size and shape, and in which the second loop is arranged such that a magnetic field emanating therefrom tends to cancel a magnetic field emanating from the first loop. Therefore, the allowance of claim 21 is respectfully requested.

Claim 22 depends from amended claim 21 and recites further limitations in combination with the novel elements of claim 21. Therefore, the allowance of claim 22 is respectfully requested.

4.) Prior Art Not Relied Upon

In paragraph 5 of the Office Action, the Examiner stated that the prior art made of record and not relied upon is considered pertinent to the Applicant's disclosure. Applicant's reading of these references, however, has not revealed any teaching or suggestion of the claimed invention.

5.) Reinstatement of Withdrawn Claims

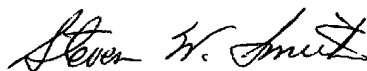
The Examiner has noted that claim 21 is generic. Therefore, the Applicant respectfully requests the reinstatement and allowance of withdrawn claims 8, 9, 18, 27, and 28.

CONCLUSION

In view of the foregoing remarks, the Applicant believes all of the claims currently pending in the Application to be in a condition for allowance. The Applicant, therefore, respectfully requests that the Examiner withdraw all rejections and issue a Notice of Allowance for claims 2-10, 13-18, 20-22, and 25-28.

The Applicant requests a telephonic interview if the Examiner has any questions or requires any additional information that would expedite the prosecution of the Application.

Respectfully submitted,



Steven W. Smith
Registration No. 36,684

Date: August 14, 2006

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Plano, Texas 75024

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Electronic Acknowledgement Receipt

EFS ID:	1153904
Application Number:	10919130
Confirmation Number:	6733
Title of Invention:	Method of and inductor layout for reduced VCO coupling
First Named Inventor:	Thomas Mattsson
Customer Number:	27045
Filer:	Steven Ware Smith/Pam Newton
Filer Authorized By:	Steven Ware Smith
Attorney Docket Number:	P19235-US3
Receipt Date:	14-AUG-2006
Filing Date:	16-AUG-2004
Time Stamp:	19:07:39
Application Type:	Utility
International Application Number:	

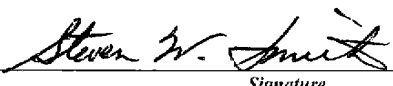
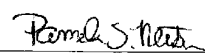
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part	Pages
1		06-9197-Response-to-Office-Action-dated-5-22-06.pdf	515362	yes	10

	Multipart Description		
	Doc Desc	Start	End
	Transmittal letter	1	1
	Amendment - After Non-Final Rejection	2	2
	Claims	3	7
	Applicant Arguments/Remarks Made in an Amendment	8	10
Warnings:			
Information:			
Total Files Size (in bytes):		515362	
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AMENDMENT TRANSMITTAL LETTER (Large Entity)				Docket No. P19235-US3	
Applicant(s): Thomas Mattsson					
Application No. 10/919,130	Filing Date August 16, 2004	Examiner Mai, Tan V	Customer No. 27045	Group Art Unit 2832	Confirmation No. 6733
Invention: METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING					
<u>COMMISSIONER FOR PATENTS:</u>					
Transmitted herewith is an amendment in the above-identified application. The fee has been calculated and is transmitted as shown below.					
CLAIMS AS AMENDED					
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST # PREV. PAID FOR	NUMBER EXTRA CLAIMS PRESENT	RATE	ADDITIONAL FEE
TOTAL CLAIMS	22 -	24 =	0 x	\$50.00	\$0.00
INDEP. CLAIMS	3 -	4 =	0 x	\$200.00	\$0.00
Multiple Dependent Claims (check if applicable) ☐					
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT					\$0.00
☒ No additional fee is required for amendment. ☐ Please charge Deposit Account No. 50-1379 in the amount of \$0.00 ☐ A check in the amount of to cover the filing fee is enclosed. ☒ The Director is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account 50-1379 ☒ Any additional filing fees required under 37 C.F.R. 1.16. ☒ Any patent application processing fees under 37 CFR 1.17. Dated: 8-14-2006  Steven W. Smith Reg No. 36,684 Ericsson Inc. 6300 Legacy Drive, M/S EVR 1-C-11 Plano, TX 75024 CERTIFICATE OF MAILING OR TRANSMISSION I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, or being facsimile transmitted, or transmitted via EFS-Web to the USPTO on the date indicated below.  <i>Signature</i> Pamela S. Newton August 14, 2006 <i>Depositor's Name and Date</i>					
CC:					

P11LARGE/REV07

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	2919	(336/200,223,232).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	OFF	2006/09/13 10:51
L5	50132	((magnetic adj field) (far adj field)) WITH (reduc\$3 cancel\$4 eliminat\$3 minimiz\$3 decreas\$3)	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/09/13 10:53
L6	191	2 AND 5	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/09/13 10:53
L7	143	6 AND @pd <="20040815"	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	ON	2006/09/13 11:13
L8	46	(336/226).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT ; IBM_TDB	OR	OFF	2006/09/13 11:23
L9	0	(inductor AND (first ADJ loop) AND (second ADJ loop) AND symmetrial AND identical AND size AND shape AND (magnetic ADJ field) AND cancel AND terminal).CLM.	US-PGPUB	OR	OFF	2006/09/13 11:37



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27045 7590 09/19/2006
ERICSSON INC.
6300 LEGACY DRIVE
M/S EVR C11
PLANO, TX 75024

EXAMINER

MAL, ANH T

ART UNIT

PAPER NUMBER

2832

DATE MAILED: 09/19/2006

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/919,130

08/16/2004

Thomas Mattsson

P19235-US3

6733

TITLE OF INVENTION: METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$300	\$0	\$1700	12/19/2006

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

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B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

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27045 7590 09/19/2006

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(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/919,130 08/16/2004 Thomas Mattsson P19235-US3 6733

TITLE OF INVENTION: METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional NO \$1400 \$300 \$0 \$1700 12/19/2006

EXAMINER	ART UNIT	CLASS-SUBCLASS
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MAI, ANH T 2832 336-200000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
 2 _____
 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

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5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
- ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/919,130	08/16/2004	Thomas Mattsson	P19235-US3	6733
27045	7590	09/19/2006	EXAMINER	
ERICSSON INC. 6300 LEGACY DRIVE M/S EVR C11 PLANO, TX 75024			MAI, ANH T	
			ART UNIT	PAPER NUMBER
			2832	
DATE MAILED: 09/19/2006				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 170 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 170 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/919,130

Examiner

Anh T. Mai

Applicant(s)

MATTSSON, THOMAS

Art Unit

2832

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 8/25/06.
2. ☒ The allowed claim(s) is/are 2-10,13-18,20-22 and 25-27.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. ☐ Notice of References Cited (PTO-892) | 5. ☐ Notice of Informal Patent Application |
| 2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. ☒ Examiner's Amendment/Comment |
| 4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. ☒ Examiner's Statement of Reasons for Allowance |
| | 9. ☐ Other _____. |

Anh T. Mai
Primary Examiner
Art Unit: 2832

EXAMINER'S AMENDMENT

Election/Restrictions

1. This application is in condition for allowance except for the presence of claims 28 non-elected without traverse. Accordingly, claim 28 has been cancelled.
2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
3. The application has been amended as follows:
Cancel claim 28.
4. Claims 2-10, 13-18, 20-22, 26-27 are allowed.
5. The following is an examiner's statement of reasons for allowance:

Claim 21 recites, inter alia, *two closely spaced terminals connected to the first loop for supplying electrical current to the first and second loops while minimizing magnetic field contributions from the terminals.*

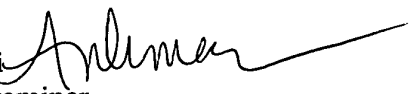
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Art Unit: 2832

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh T. Mai whose telephone number is 571-272-1995. The examiner can normally be reached on 5/4/9 Schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on 571-272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anh T. Mai 
Primary Examiner
Art Unit 2832

091206

Issue Classification 	Application/Control No.	Applicant(s)/Patent under Reexamination	
	10/919,130	MATTSSON, THOMAS	
	Examiner	Art Unit	
	Anh T. Mai	2832	

ISSUE CLASSIFICATION												
ORIGINAL					CROSS REFERENCE(S)							
CLASS		SUBCLASS			CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)						
336		200			336	232						
INTERNATIONAL CLASSIFICATION												
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(Assistant Examiner) (Date)		 ANH MAI PRIMARY EXAMINER	Total Claims Allowed: 21	
 T. BELL (Legal Instruments Examiner)	9/13/06 (Date)		O.G. Print Claim(s)	O.G. Print Fig.
			20	1

☐ Claims renumbered in the same order as presented by applicant												☐ CPA		☐ T.D.		☐ R.1.47	
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		31		61		91		121		151		181				
2	2		32		62		92		122		152		182				
3	3		33		63		93		123		153		183				
4	4		34		64		94		124		154		184				
5	5		35		65		95		125		155		185				
6	6		36		66		96		126		156		186				
7	7		37		67		97		127		157		187				
8	8		38		68		98		128		158		188				
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10	10		40		70		100		130		160		190				
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	30		60		90		120		150		180		210				

Search Notes 	Application/Control No.		Applicant(s)/Patent under Reexamination	
	10/919,130		MATTSSON, THOMAS	
	Examiner		Art Unit	
	Anh T. Mai		2832	

SEARCHED			
Class	Subclass	Date	Examiner
336	226 200.223 232	9/13/2006	AM

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner
search history printout		9/13/2006	AM

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
text search only; search history printout	9/13/2006	AM

Index of Claims



Application/Control No.

10/919,130

Examiner

Anh T. Mai

Applicant(s)/Patent under Reexamination

MATTSSON, THOMAS

Art Unit

2832

√	Rejected
=	Allowed

—	(Through numeral) Cancelled
÷	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

Claim		Date									
Final	Original	9/13/06									
	1										
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Bib Data Sheet

CONFIRMATION NO. 6733

SERIAL NUMBER 10/919,130	FILING OR 371(c) DATE 08/16/2004 RULE	CLASS 336	GROUP ART UNIT 2832	ATTORNEY DOCKET NO. P19235-US3
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APPLICANTS

Thomas Mattsson, Limhamn, SWEDEN;

** CONTINUING DATA *****

This appln claims benefit of 60/549,611 03/03/2004 and claims benefit of 60/565,328 04/26/2004

** FOREIGN APPLICATIONS *****

IF REQUIRED, FOREIGN FILING LICENSE GRANTED **

10/13/2004

Foreign Priority claimed 35 USC 119 (a-d) conditions met	☐ yes ☒ no ☐ yes ☒ no Met after Allowance	STATE OR COUNTRY SWEDEN	SHEETS DRAWING 6	TOTAL CLAIMS 21	INDEPENDENT CLAIMS 3
Verified and Acknowledged	Examiner's Signature _____ Initials _____				

ADDRESS

27045

TITLE

Method of and inductor layout for reduced VCO coupling

FILING FEE RECEIVED 1172	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit
------------------------------------	---	---

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address.)

27045 7590 09/19/2006

ERICSSON INC.
 6300 LEGACY DRIVE
 M/S EVR C11
 PLANO, TX 75024

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Pamela S. Newton	(Depositor's name)
<i>Pamela S. Newton</i>	(Signature)
November 3, 2006	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/919,130	08/16/2004	Thomas Mattsson	P19235-US3	6733

TITLE OF INVENTION: METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$300	\$0	\$1700	12/19/2006

EXAMINER	ART UNIT	CLASS-SUBCLASS
MAI, ANH T	2832	336-200000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
 2 _____
 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Telefonaktiebolaget LM Ericsson (publ) Stockholm, Sweden

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
- ☒ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 50-1379 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature *Steven W. Smith*
 Typed or printed name Steven W. Smith

Date Nov. 3, 2006
 Registration No. 36,684

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Electronic Patent Application Fee Transmittal

Application Number:	10919130			
Filing Date:	16-Aug-2004			
Title of Invention:	METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING			
First Named Inventor/Applicant Name:	Thomas Mattsson			
Filer:	Steven Ware Smith/Pam Newton			
Attorney Docket Number:	P19235-US3			
Filed as Large Entity				
Utility Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	1501	1	1400	1400
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1700

Electronic Acknowledgement Receipt

EFS ID:	1292333
Application Number:	10919130
International Application Number:	
Confirmation Number:	6733
Title of Invention:	METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING
First Named Inventor/Applicant Name:	Thomas Mattsson
Customer Number:	27045
Filer:	Steven Ware Smith/Pam Newton
Filer Authorized By:	Steven Ware Smith
Attorney Docket Number:	P19235-US3
Receipt Date:	03-NOV-2006
Filing Date:	16-AUG-2004
Time Stamp:	15:06:44
Application Type:	Utility

Payment information:

Submitted with Payment	yes
Payment was successfully received in RAM	\$ 1700
RAM confirmation Number	86
Deposit Account	501379
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 and 1.17	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment Recorded	Issue-Fee-Payment.pdf	125595	no	1
Warnings:					
Information:					
2	Fee Worksheet (PTO-875)	fee-info.pdf	8308	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			133903		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.					



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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/919,130	12/19/2006	7151430	P19235-US3	6733

27045 7590 11/29/2006
ERICSSON INC.
6300 LEGACY DRIVE
M/S EVR C11
PLANO, TX 75024

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 170 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

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Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Thomas Mattsson, Limhamn, SWEDEN;

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF: U.S. Patent No. 7,151,430

USPTO CONFIRMATION CODE: 6733

APPLICATION NO.: 10/919,130

FILED: August 16, 2004

EXAMINER: Anh Mai

GROUP ART UNIT: 2832

FOR: METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING

37 CFR 1.322 & 37 CFR 1.323 REQUEST FOR CERTIFICATE OF CORRECTION
FOR USPTO MISTAKE

HONORABLE COMMISSIONER OF PATENTS & TRADEMARKS

SIR:

The following is a request for a certificate of correction in Serial Number 10/919,130, now Patent Number 7,151,430.

A certificate of correction under 35 USC 254 is respectfully requested in the above-identified patent.

The errors were the fault of both the applicant and USPTO and, accordingly, please charge \$100.00 to our Deposit Account No. 50-1379. In the event that a further fee is required, please charge the amount to the same Deposit Account.

The exact locations where the errors appear in the patent and patent application are as follows:

In Column 1, line 9, after “bearing” insert - - Docket No. 53807-00113USPL - -, (ORIGINALLY FILED SPECIFICATION DATED AUGUST 16, 2004, PAGE 1, LINES 3 & 4)

In Column 1, line 13, delete “01” and insert - - Docket No. 53807-00113USPL.01 - -, therefor. (AMENDMENTS TO THE SPECIFICATION DATED OCTOBER 20, 2004, PAGE 2, LINE 5)

In Column 7, line 47, delete “degmdation” and insert - - degradation - -, therefor. (AMENDMENTS TO THE SPECIFICATION DATED NOVEMBER 18, 2005, PAGE 2 of 9, LINE 14)

In Column 9, line 55, after “skill” delete “and they are”. (ORIGINALLY FILED SPECIFICATION DATED AUGUST 16, 2004, PAGE 17, LINE 14)

In Column 9, line 65, delete “ilustrative” and insert - - illustrative - -, therefor. (ORIGINALLY FILED SPECIFICATION DATED AUGUST 16, 2004, PAGE 18, LINE 2)

In Column 10, line 19, in Claim 1, delete “ioop” and insert - - loop - -, therefor. (AMENDMENTS TO THE CLAIMS DATED AUGUST 14, 2006, PAGE 5 of 9, CLAIM 25, LINE 7)

In Column 11, line 18, in Claim 12, delete “ioop” and insert - - loop - -, therefor. (AMENDMENTS TO THE CLAIMS DATED AUGUST 14, 2006, PAGE 6 of 9, CLAIM 27, LINE 3)

The requested corrections are attached on Form PTO 1050.

Respectfully Submitted

November 6, 2007

/Sidney L. Weatherford, Reg. #45602/

DATE

Sidney L. Weatherford
Registration No. 45602

Attorney of Record

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

Page 1 of 1

PATENT NO. : 7,151,430 B2

APPLICATION NO. : 10/919,130

ISSUE DATE : December 19, 2006

INVENTOR(S) : Mattsson

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In Column 1, Line 9, after "bearing" insert - - Docket No. 53807-00113USPL - -.

In Column 1, Line 13, delete "01" and insert - - Docket No. 53807-00113USPL.01 - -, therefor.

In Column 7, Line 47, delete "degmdation" and insert - - degradation - -, therefor.

In Column 9, Line 55, after "skill" delete "and they are".

In Column 9, Line 65, delete "ilustrative" and insert - - illustrative - -, therefor.

In Column 10, Line 19, in Claim 1, delete "ioop" and insert - - loop - -, therefor.

In Column 11, Line 18, in Claim 12, delete "ioop" and insert - - loop - -, therefor.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

6300 Legacy, MS EVR 1-C-11
Plano, TX 75024
972-583-8656

This collection of information is required by 37 CFR 1.322, and 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patent, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Patent Application Fee Transmittal				
Application Number:		10919130		
Filing Date:		16-Aug-2004		
Title of Invention:		METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING		
First Named Inventor/Applicant Name:		Thomas Mattsson		
Filer:		Steven Ware Smith/Pamela J Shultz		
Attorney Docket Number:		P19235-US3		
Filed as Large Entity				
Utility Filing Fees				
Description		Fee Code	Quantity	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Certificate of correction	1811	1	100	100
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				100

Electronic Acknowledgement Receipt

EFS ID:	2433251
Application Number:	10919130
International Application Number:	
Confirmation Number:	6733
Title of Invention:	METHOD OF AND INDUCTOR LAYOUT FOR REDUCED VCO COUPLING
First Named Inventor/Applicant Name:	Thomas Mattsson
Customer Number:	27045
Filer:	Steven Ware Smith/Pamela J Shultz
Filer Authorized By:	Steven Ware Smith
Attorney Docket Number:	P19235-US3
Receipt Date:	06-NOV-2007
Filing Date:	16-AUG-2004
Time Stamp:	18:08:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment was successfully received in RAM	\$ 100
RAM confirmation Number	2855
Deposit Account	501379
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 and 1.17	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	P19235-US3_2007-11-06_07-4994_Request-for-Certificate-of-Correction-for-7151430.pdf	92185	no	4
			4c5dbd6257cc7761cef1729eef6afe21622066cb		
Warnings:					
Information:					
2	Fee Worksheet (PTO-06)	fee-info.pdf	8176	no	2
			644ad1960295ce452c0f1429fd86316d54db5efb		
Warnings:					
Information:					
Total Files Size (in bytes):			100361		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,151,430 B2
APPLICATION NO. : 10/919130
DATED : December 19, 2006
INVENTOR(S) : Mattsson

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In Column 1, Line 9, after "bearing" insert -- Docket No. 53807-00113USPL --.

In Column 1, Line 13, delete "01" and insert -- Docket No. 53807-00113USPL.01 --, therefor.

In Column 7, Line 47, delete "degmdation" and insert -- degradation --, therefor.

In Column 9, Line 55, after "skill" delete "and they are".

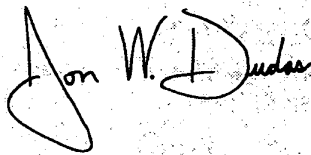
In Column 9, Line 65, delete "ilustrative" and insert -- illustrative --, therefor.

In Column 10, Line 19, in Claim 1, delete "ioop" and insert -- loop --, therefor.

In Column 11, Line 18, in Claim 12, delete "ioop" and insert -- loop --, therefor.

Signed and Sealed this

Eighteenth Day of December, 2007

A handwritten signature in black ink, appearing to read "Jon W. Dudas", is written over a rectangular area of the document.

JON W. DUDAS
Director of the United States Patent and Trademark Office

AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
---	---

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas (Marshall Division) on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO. 2:15-cv-288	DATE FILED 2/26/2015	U.S. DISTRICT COURT Eastern District of Texas (Marshall Division)
PLAINTIFF ERICSSON INC. and TELEFONAKTIEBOLAGET LM ERICSSON		DEFENDANT APPLE INC.
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 6,037,798	3/14/2000	Ericsson
2 6,100,770	8/8/2000	Ericsson
3 6,597,787	7/22/2003	Ericsson
4 7,151,430 B2	12/19/2006	Ericsson
5 7,580,683 B2	8/25/2009	Ericsson
6 8,626,086	1/7/2014	Ericsson

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT ORDERED that the Joint Motion to Dismiss All Claims and Counterclaims is GRANTED in its entirety. All claims for patent infringement asserted in the above-captioned matter are DISMISSED WITH PREJUDICE. All other claims and counterclaims are DISMISSED WITHOUT PREJUDICE.

CLERK <i>David A. O'Poole</i>	(BY) DEPUTY CLERK Nakisha Love	DATE 12/28/15
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Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the Eastern District of Texas on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO. 2:21-cv-00001	DATE FILED 1/8/2021	U.S. DISTRICT COURT for the Eastern District of Texas
PLAINTIFF ERICSSON INC., TELEFONAKTIEBOLAGET LM ERICSSON, AND ERICSSON AB		DEFENDANT SAMSUNG ELECTRONICS CO., LTD., AND SAMSUNG ELECTRONICS AMERICA, INC.
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 7,151,430	12/19/2006	TELEFONAKTIEBOLAGET LM ERICSSON
2 6,879,849	4/12/2005	TELEFONAKTIEBOLAGET LM ERICSSON
3 7,286,823	10/23/2007	TELEFONAKTIEBOLAGET LM ERICSSON
4 9,313,178	4/12/2016	ERICSSON AB
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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 Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court _____ for the Eastern District of Texas _____ on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO. 2:21-cv-00001	DATE FILED 1/8/2021	U.S. DISTRICT COURT for the Eastern District of Texas
PLAINTIFF ERICSSON INC., TELEFONAKTIEBOLAGET LM ERICSSON, AND ERICSSON AB		DEFENDANT SAMSUNG ELECTRONICS CO., LTD., AND SAMSUNG ELECTRONICS AMERICA, INC.
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 7,151,430	12/19/2006	TELEFONAKTIEBOLAGET LM ERICSSON
2 6,879,849	4/12/2005	TELEFONAKTIEBOLAGET LM ERICSSON
3 7,286,823	10/23/2007	TELEFONAKTIEBOLAGET LM ERICSSON
4 9,313,178	4/12/2016	ERICSSON AB
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT ORDERED that all of Ericsson's patent infringement claims and all of Samsung's patent infringement counterclaims are DISMISSED WITH PREJUDICE
--

CLERK <i>David A. O'Toole</i>	(BY) DEPUTY CLERK ch	DATE 6/2/21
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Western District of Texas on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO. 6:22-CV-61	DATE FILED 1/17/2022	U.S. DISTRICT COURT Western District of Texas
PLAINTIFF ERICSSON INC., AND TELEFONAKTIEBOLAGET LM ERICSSON		DEFENDANT APPLE, INC
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 7,151,430	12/19/2006	ERICSSON
2 7,957,770	6/7/2011	ERICSSON
3 8,472,999	6/25/2013	ERICSSON
4 8,792,454	7/29/2014	ERICSSON
5 9,509,273	11/29/2016	ERICSSON

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
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AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Western District of Texas on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO. 6:22-CV-61	DATE FILED 1/17/2022	U.S. DISTRICT COURT Western District of Texas
PLAINTIFF ERICSSON INC., AND TELEFONAKTIEBOLAGET LM ERICSSON		DEFENDANT APPLE, INC
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 9,705,400	7/11/2017	ERICSSON
2 9,853,621	12/26/2017	ERICSSON
3 10,880,794	12/29/2020	ERICSSON
4		
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
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TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of North Carolina, Western Division on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO. 5:23-CV-570-D-RJ	DATE FILED 10/11/2023	U.S. DISTRICT COURT Eastern District of North Carolina, Western Division
PLAINTIFF Telefonaktiebolaget LM Ericsson et al.		DEFENDANT Lenovo (United States), Inc. et al.
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 7,151,430	12/19/2006	Telefonaktiebolaget LM Ericsson
2 9,509,273	11/29/2016	Telefonaktiebolaget LM Ericsson
3 9,313,178	4/12/2016	Ericsson AB
4 11,122,313	9/14/2021	Ericsson AB
5 10,972,654	4/6/2021	Telefonaktiebolaget LM Ericsson

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK Peter A. Moore, Jr.	(BY) DEPUTY CLERK <i>Stephanie Mann</i>	DATE 10/12/2023
------------------------------	--	--------------------

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
 Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy
 Case 5:23-cv-00570-D-RJ Document 7 Filed 10/12/23 Page 1 of 1