

[Document Name]	Submission of Translation of an Amendment under Article 34 of the Patent Cooperation Treaty
[File No.]	E0225VPA7
[Destination]	Commissioner, Japan Patent Office
[Indication of Application]	
[International Application No.]	PCT/EP2005/001515
[Classification of Application]	Patent
[Patent Applicant]	
[Identification No.]	598036300
[Name or Title]	Telefonaktiebolaget LM Ericsson (Publ.)
[Agent]	
[Identification No.]	100079108
[Patent Attorney]	
[Name or Title]	Yoshiyuki Inaba
[Date of Submission of Written Amendment]	November 28, 2005
[Procedural Amendment 1]	
[Name of Document Subject to Amendment]	Scope of Patent Claims
[Name of Item Subject to Amendment]	Entire text
[Amendment Method]	Correction
[Content of Amendment]	
[Document Name]	Scope of Patent Claims
[Claim 1]	
An inductor layout having reduced mutual electromagnetic coupling, comprising:	
a first inductor having a reduced far field; and	
a second inductor positioned leaving a predetermined distance from the first inductor,	
the first inductor provided with:	
a first loop that is a substantially symmetrical shape relative to a first predetermined axis;	
a second loop connected to the first loop and having a substantially same size and shape as the	
first loop, the second loop being disposed such that a magnetic field generated from the second	
loop has an inclination that negates a magnetic field generated from the first loop; and	
two terminals having an interval left at a near position, the two terminals being connected to	
the first loop to provide a current to the first loop and the second loop, and suppressing a	
contribution to a magnetic field from the two terminals to a minimum, wherein, the mutual	
electromagnetic coupling between the first inductor and the second inductor is reduced as a result	
of the electromagnetic field of the first inductor being reduced.	
[Claim 2]	
The inductor layout according to claim 1, wherein the first inductor and the second inductor	
are formed on a single semiconductor die.	
[Claim 3]	
The inductor layout according to claim 1, wherein the first inductor and the second inductor	
are oriented in the same direction.	
[Claim 4]	
The inductor layout according to claim 1, wherein the first inductor and the second inductor	
are oriented in different directions.	
[Claim 5]	
The inductor layout according to claim 1, wherein the first inductor and the second inductor	
share a common axis.	
[Claim 6]	
The inductor layout according to claim 1, wherein the first inductor and the second inductor	
do not share a common axis.	
[Claim 7]	

The inductor layout according to claim 1, wherein the second inductor also includes another two loops, and the first inductor and the second inductor have a substantially figure eight shape.

[Claim 8]

The inductor layout according to claim 7, further comprising an inner side loop on respective inner sides of the two loops of the first inductor and the second inductor of a substantially figure eight shape.

[Claim 9]

The inductor layout according to claim 1, wherein the first inductor further includes a third loop connected to the second loop and a fourth loop connected to the third loop and the first loop, and the first inductor has a substantially four leaf clover shape.

[Claim 10]

The inductor layout according to claim 1, wherein the first inductor and the second inductor are symmetrical relative to a second predetermined axis.

[Claim 11]

A method of reducing mutual electromagnetic coupling between a first inductor and a second inductor of a semiconductor die, comprising:

a step for forming the first inductor to reduce a far field; and

a step for positioning the second inductor leaving a predetermined distance from the first inductor, the step for forming the first inductor including:

a step for forming a first loop that is a substantially symmetrical shape relative to a first predetermined axis;

a step for forming a second loop having a substantially same size and shape as the first loop;

a step for orienting the second loop relative to the first loop such that a magnetic field generated from the second loop has an inclination that negates a magnetic field generated from the first loop; and

a step for connecting two terminals having an interval left at a near position to the first loop to provide a current to the first loop and the second loop, suppressing a contribution to a magnetic field from the terminals to a minimum, wherein, the mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the electromagnetic field of the first inductor being reduced.

[Claim 12]

The method according to claim 11, wherein the step for positioning the second inductor further includes a step for orienting the first inductor and the second inductor in the same direction.

[Claim 13]

The method according to claim 11, wherein the step for positioning the second inductor further includes a step for orienting the first inductor and the second inductor in different directions.

[Claim 14]

The method according to claim 11, wherein the step for positioning the second inductor further includes a step for disposing the first inductor and the second inductor on a common axis shared by the first inductor and the second inductor.

[Claim 15]

The method according to claim 11, wherein the step for positioning the second inductor further includes a step for disposing the first inductor and the second inductor such that these do not have a common axis.

[Claim 16]

The method according to claim 11, wherein the step for positioning the second inductor further includes a step for disposing the first inductor and the second inductor such that these are symmetrical relative to a second predetermined axis.

[Claim 17]

The method according to claim 11, wherein the step for orienting the second loop relative to the first loop further includes a step for disposing the first loop and the second loop so as to have a

substantially figure eight shape.

[Claim 18]

The method according to claim 11, wherein the step for forming the first inductor further includes:

- a step for forming a third loop having a substantially same size and shape as the first loop and the second loop;

- a step for forming a fourth loop having a substantially same size and shape as the first loop, the second loop, and the third loop; and

- a step for orienting the first loop, the second loop, the third loop, and the fourth loop so as to form a substantially four leaf clover shape.

[Claim 19]

An inductor having a reduced far field, comprising:

- a first loop having a substantially symmetrical shape relative to a first predetermined axis;

- a second loop having a substantially same size and shape as the first loop, the second loop being disposed such that a magnetic field generated from the second loop has an inclination that negates a magnetic field generated from the first loop; and

- two terminals having an interval left at a near position, the two terminals being connected to the first loop to provide a current to the first loop and the second loop, suppressing a contribution to a magnetic field from the two terminals to a minimum.

[Claim 20]

The inductor according to claim 19, wherein the first loop and the second loop are substantially symmetrical relative to a second predetermined axis.

[Claim 21]

An inductor having a reduced far field comprising:

- four electrically connected loops disposed symmetrically in a clover leaf shape about a common central axis and each having a substantially same size and shape; and

- two terminals having an interval left at a near position, the two terminals being connected to the first loop to provide a current to the four loops, suppressing a contribution to a magnetic field from the two terminals to a minimum, and

- provided with two terminals having an interval left at a near position, being connected to the first loop to supply a current to the four loops, suppressing a contribution to a magnetic field to a minimum,

- wherein the first loop and the third loop are on opposite sides of the axis and adjacent to the second loop and the fourth loop, and the second loop and the fourth loop are on opposite sides of the axis,

- the current flows to the first loop and the third loop in a first direction and flows to the second loop and the fourth loop in a second direction, and

- a magnetic field generated from the first loop and the third loop has an inclination that negates a magnetic field generated from the second loop and the fourth loop.

Notice of Reasons for Rejection

Patent Application No.:	JP 2007-501145
Draft Date:	July 7, 2010
Patent Examiner:	Junichi Tanaka 9074 5R00
Agent for Applicant:	Yoshiyuki Inaba (and 2 others)
Applicable Provisions:	Sec. 29(2), Sec. 36

The present application is rejected for the following reasons. If the applicant has any objection to this notice, please submit your written argument within three months from the mailing date of this notice.

Reason(s)

1. The inventions of the following claims of the present application should not be granted a patent under sec. 29(2) of the Japanese Patent Act since they could have been easily invented prior to the present application by a person having ordinary skill in the field of art pertaining to the inventions, based on the inventions taught in the following publications 1 to 7 which have been in circulation in Japan or foreign countries, or inventions made available to the public through electronic communication lines, prior to the present application.

2. The present application does not comply with the requirement stipulated in sec. 36(4)(1) of the Japanese Patent Act with respect to point (1) below concerning the description in the Detailed Description of the Invention.

Record (See Cited Document List for Reference Citations)

[Reason 1]
(Claims 1 to 21) Cited
Documents 1 to 7

Remarks:

The inventions of claims 1 and 11 of the present application amended by the written amendment submitted on November 28, 2005 (hereinafter referred to as the “amended” present application) could easily have been conceived by a person skilled in the art based on the invention taught in cited document 1 (see paragraphs [0040] to [0041], paragraph [0050], paragraphs [0055] to [0057], [FIG. 1], [FIG. 4], and [FIG. 11]) and the invention taught in cited document 2 (see paragraphs [0003] to [0008], paragraphs [0013] to [0015], and [FIG. 2] to [FIG. 3]).

Furthermore, cited document 1 (in particular, see paragraph [0004], paragraphs [0040] to [0041], paragraphs [0055] to [0057], [FIG. 1], [FIG. 4], and [FIG. 11]) teaches matters stated in claims 2 to 5 and 12 to 14 of the amended present application.

Furthermore, cited document 3 (in particular, see paragraphs [0025] and [0026], and [FIG. 4]) teaches matters stated in claims 6 and 15 of the amended present application.

Furthermore, cited document 2 (in particular, see paragraphs [0005] to [0008], paragraphs [0013] to [0015], and [FIG. 2] to [FIG. 3]) teaches matters stated in claims 7, 8, and 17 of the amended present application.

Furthermore, cited document 4 (in particular, see page 10, line 14 to page 11, line 6 and FIG. 1), and cited document 5 (in particular, see paragraph [0017] and [FIG. 1]) teach matters stated in claims 9 and 18 of the amended present application.

Furthermore, cited document 6 (in particular, see paragraph [0046] and [FIG. 5]), and cited document 7 (in particular, see line 5 in the upper right-hand column to line 13 in the lower left-hand column of page 2, and FIG. 1) teach matters stated in claims 10 and 16 of the amended present application.

Furthermore, the inventions of claims 19 to 20 of the amended present application could easily have been conceived by a person skilled in the art based on the invention taught in cited document 2 (see paragraphs [0003] to [0008], paragraphs [0013] to [0015], and [FIG. 2] to [FIG. 3]).

Furthermore, the invention of claim 21 of the amended present application could easily have been conceived by a person skilled in the art based on the inventions taught in cited document 4 (see page 10, line 14 to page 11, line 6, page 12, line 1 to line 6, FIG. 1, and FIG. 3) and cited document 5 (see paragraphs [0010] to [0011], paragraphs [0016] to [0017], and [FIG. 1]).

Accordingly, the inventions of claims 1 to 21 of the amended present application could easily have been invented by a person skilled in the art based on the inventions taught in cited documents 1 to 7.

[Reason 2]

(1) The Detailed Description of the Invention of the present application (see paragraph [0037]) describes, "Moreover, as illustrated in FIG. 12, in a disposition in which one of the inductors (for example, the inductor 1100) is rotated 45 degrees relative to another inductor (for example, the inductor 1102), the EM coupling of the two inductors 1100 and 1102 was acknowledged to be further lower", the description does not correspond to the description in the drawing (see [FIG. 12]). (In reality, is this not actually illustrated in [FIG. 11]?)

Cited Document List

1. JP H8-17656 A
2. JP 2005-534184 A (Translation of PCT Application)
3. JP H10-74625 A
4. WO 98/05048
5. JP H8-181018 A
6. JP 2003-217932 A
7. JP H3-261115 A

Record of Prior Art Literature Search Results

- Searched Technical Field: IPC H01F 17/00 - 21/12
 - H01F 27/00 - 27/02
 - H01F 27/06 - 27/08
 - H01F 27/29
 - H01F 27/36
 - H01F 27/42
 - H01F 30/00
 - H01F 38/42
 - H01L 21/822
 - H01L 25/00 - 25/07
 - H01L 25/10 - 25/11
 - H01L 25/16 - 25/18
 - H01L 27/04
- Prior Art Literature: JP H7-86523 A
 - JP H8-330517
 - AJP H11-243014 A
 - JP 2003-152098
 - AJP S62-5617 U

The record of the prior art literature search results does not constitute a reason for rejection.

Please direct inquiries related to the content of this Notice of Reasons for Rejection and

requests for interviews to the following:

Patent Examination Dept. 4, Interface (Basic Circuit Elements) Junichi Tanka
 TEL. 03 (3581) 1101 Ext. 3565
 FAX. 03 (3580) 6907

Director-General/Agent	Director/Agent	Director	Assistant Examiner
	Tomohiro Sakai	Junichi Tanaka	
	8935	9074	

[Document Name]	Procedural Amendment
[Reference Number]	E0225VPA7
[Addressed to]	Commissioner of the Japanese Patent Office
[Case Indicator]	
[Application No.]	JP 2007-501145
[Amending Party]	
[Identification No.]	598036300
[Name or Title]	Telefonaktiebolaget LM Ericsson (Publ.)
[Agent]	
[Identification No.]	100079108
[Patent Attorney]	
[Name or Title]	Yoshiyuki Inaba
[Procedural Amendment 1]	
[Document Subject to Amendment]	Scope of Patent Claims
[Name of Item Subject to Amendment]	Full text
[Amendment Method]	Change
[Content of Amendment]	
[Document Name]	Scope of Patent Claims
[Claim 1]	

An inductor layout having reduced mutual electromagnetic coupling, comprising:
a first inductor having reduced far field; and
a second inductor positioned leaving a predetermined distance from the first inductor,
the first inductor provided with:
a first loop that is a substantially symmetrical shape relative to a first predetermined axis;
a second loop connected to the first loop and having a substantially same size and shape as the first
loop, the second loop being disposed such that a magnetic field generated from the second loop has an
inclination that negates a magnetic field generated from the first loop; and
two terminals connected to the first loop to provide a current to the first loop and the second loop,
the two terminals having an interval left at a near position such that a distance between the two
terminals is smaller than a width of the first loop, and suppressing a contribution to a magnetic field
from the two terminals to a minimum, wherein,
the mutual electromagnetic coupling between the first inductor and the second inductor is reduced
as a result of the electromagnetic field of the first inductor being reduced.

[Claim 2]

The inductor layout according to claim 1, wherein the first inductor and the second inductor are
formed on a single semiconductor die.

[Claim 3]

The inductor layout according to claim 1, wherein the first inductor and the second inductor are
oriented in the same direction.

[Claim 4]

The inductor layout according to claim 1, wherein the first inductor and the second inductor are
oriented in different directions.

[Claim 5]

The inductor layout according to claim 1, wherein the first inductor and the second inductor share a
common axis.

[Claim 6]

The inductor layout according to claim 1, wherein the first inductor and the second inductor do not
share a common axis.

[Claim 7]

The inductor layout according to claim 1, wherein the second inductor also includes another two loops, and the first inductor and the second inductor have a substantially figure eight shape.

[Claim 8]

The inductor layout according to claim 7, further comprising an inner side loop on respective inner sides of the two loops of the first inductor and the second inductor of a substantially figure eight shape.

[Claim 9]

The inductor layout according to claim 1, wherein the first inductor further includes a third loop connected to the second loop and a fourth loop connected to the third loop and the first loop, and the first inductor has a substantially four leaf clover shape.

[Claim 10]

The inductor layout according to claim 1, wherein the first inductor and the second inductor are symmetrical relative to a second predetermined axis.

[Claim 11]

A method of reducing mutual electromagnetic coupling between a first inductor and a second inductor of a semiconductor die, comprising:

a step for forming the first inductor to reduce far field; and

a step for positioning the second inductor leaving a predetermined distance from the first inductor, the step for forming the first inductor including:

a step for forming a first loop that is a substantially symmetrical shape relative to a first predetermined axis;

a step for forming a second loop having a substantially same size and shape as the first loop;

a step for orienting the second loop relative to the first loop such that a magnetic field generated from the second loop has an inclination that negates a magnetic field generated from the first loop; and

a step for connecting two terminals to the first loop to provide a current to the first loop and the second loop, the two terminals having an interval left at a near position such that a distance between the two terminals is smaller than a width of the first loop, and suppressing a contribution to a magnetic field from the two terminals to a minimum, wherein,

the mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the electromagnetic field of the first inductor being reduced.

[Claim 12]

The method according to claim 11, wherein the step for positioning the second inductor further includes a step for orienting the first inductor and the second inductor in the same direction.

[Claim 13]

The method according to claim 11, wherein the step for positioning the second inductor further includes a step for orienting the first inductor and the second inductor in different directions.

[Claim 14]

The method according to claim 11, wherein the step for positioning the second inductor further includes a step for disposing the first inductor and the second inductor on a common axis shared by the first inductor and the second inductor.

[Claim 15]

The method according to claim 11, wherein the step for positioning the second inductor further includes a step for disposing the first inductor and the second inductor such that these do not have a common axis.

[Claim 16]

The method according to claim 11, wherein the step for positioning the second inductor further includes a step for disposing the first inductor and the second inductor such that these are symmetrical

relative to a second predetermined axis.

[Claim 17]

The method according to claim 11, wherein the step for orienting the second loop relative to the first loop further includes a step for disposing the first loop and the second loop to have a substantially figure eight shape.

[Claim 18]

The method according to claim 11, wherein the step for forming the first inductor further includes: a step for forming a third loop having a substantially same size and shape as the first loop and the second loop;

a step for forming a fourth loop having a substantially same size and shape as the first loop, the second loop, and the third loop; and

a step for orienting the first loop, the second loop, the third loop, and the fourth loop so as to form a substantially four leaf clover shape.

[Claim 19]

An inductor having reduced far field, comprising: a first loop having a substantially symmetrical shape relative to a first predetermined axis;

a second loop having a substantially same size and shape as the first loop, the second loop being disposed such that a magnetic field generated from the second loop has an inclination that negates a magnetic field generated from the first loop; and

two terminals connected to the first loop to provide a current to the first loop and the second loop, the two terminals having an interval left at a near position such that a distance between the two terminals is smaller than a width of the first loop, and suppressing a contribution to a magnetic field from the two terminals to a minimum.

[Claim 20]

The inductor according to claim 19, wherein the first loop and the second loop are substantially symmetrical relative to a second predetermined axis.

[Claim 21]

An inductor having reduced far field comprising: four electrically connected loops disposed symmetrically in a clover leaf shape about a common central axis and each having a substantially same size and shape; and

two terminals connected to the first loop to supply a current to the four loops, the two terminals having an interval left at a near position such that a distance between the two terminals is smaller than a width of the first loop, and suppressing a contribution to a magnetic field from the two terminals to a minimum, and provided with

two terminals leaving an interval at a near position, connected to the first loop to supply a current to the four loops and having a contribution to a magnetic field suppressed, wherein

the first loop and the third loop are on opposite sides of the axis and adjacent to the second loop and the fourth loop, and the second loop and the fourth loop are on opposite sides of the axis,

the current flows to the first loop and the third loop in a first direction and flows to the second loop and the fourth loop in a second direction, and

a magnetic field generated from the first loop and the third loop has an inclination that negates a magnetic field generated from the second loop and the fourth loop.

[Procedural Amendment 2]

[Document Subject to Amendment] Specification

[Name of Item Subject to Amendment] 0037

[Amendment Method] Change

[Content of Amendment]

[0037]

Moreover, as illustrated in FIG. 11, in a disposition in which one of the inductors (for example,

the inductor 1100) is rotated 45 degrees relative to another inductor (for example, the inductor 1102), the EM coupling of the two inductors 1100 and 1102 was observed to be further lower.

1. According to the Notice of Reasons for Rejection (draft date: July 7, 2010, mailing date: July 9, 2010) for the present application, the present application should be rejected based on the following Reasons 1 and 2.

1. JP H8-17656 A
2. JP 2005-534184 A (Translation of PCT Application)
3. JP H10-74625 A
4. WO 98/05048
5. JP H8-181018 A
6. JP 2003-217932 A
7. JP H3-261115 A

However, because the Scope of Patent Claims and the Specification were amended by the procedural amendment submitted on the same date as this written argument, we are convinced that the reasons for rejection have been resolved.

In the amendment to claim 1, it was made clear that the two terminals connected to the first loop have an interval at a near position such that the distance between the terminals becomes smaller than the width of the first loop. This amendment is based on, for example, the descriptions in paragraph [0017] and FIG. 2 of the present application. For example, in the inductor 200 illustrated in FIG. 2, two terminals 204a, 204b are connected to the lower loop 206b, and the distance between terminals 204a, 204b is smaller than the width of the lower loop 206b. By disposing the two terminals in this manner, the contribution of the inductor to the electromagnetic field from the first loop and the second loop can be equalized. This is also described in paragraph [0017] of the present application, "for example, when positioning the two terminals 204a and 204b as close as possible, the contributions to the electromagnetic field from the two portions of the inductor 200 become the same."

Furthermore, the same amendments as claim 1 are made in claims 11, 19, and 21. Note that an example of the inductor of claim 21 is illustrated in FIG. 10 of the present application. In FIG. 10 as well, the two terminals are connected to the loop 1008, and the distance between the terminals is smaller than the width of the loop 1008.

Furthermore, the reference drawing number was corrected in the amendment to paragraph [0037] of the present application in accordance with the instructions of the examiner. The reason for rejection of Reason 2 above is considered to have been resolved by this amendment.

In this manner, it is considered the matters relating to amendments of the Scope of Patent Claims and the Specification of the present application are obvious matters for a person skilled in the art from of the description of the original Specification and the like of the present application in light of common general technical knowledge at the time of application of the present application, and that the amendments satisfy the requirements stipulated in Sec. 17-2(3) of the Japanese Patent Act.

(1) Invention of Present Application

The invention of amended claim 1 of the present application relates to, “an inductor layout having reduced mutual electromagnetic coupling, comprising: a first inductor having reduced far field; and a second inductor having reduced near field.”

INTEL-1015
U.S. Patent 7,151,430

second inductor positioned leaving a predetermined distance from the first inductor, the first inductor provided with: a first loop that is a substantially symmetrical shape relative to a first predetermined axis; a second loop connected to the first loop and having a substantially same size and shape as the first loop, the second loop being disposed such that a magnetic field generated from the second loop has an inclination that negates a magnetic field generated from the first loop; and two terminals connected to the first loop to provide a current to the first loop and the second loop, the two terminals having an interval left at a near position such that a distance between the two terminals is smaller than a width of the first loop, and suppressing a contribution to a magnetic field from the two terminals to a minimum, wherein, the mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the electromagnetic field of the first inductor being reduced.”

In particular, in the invention of amended claim 1 of the present application, two terminals connected to the first loop to supply a current to the first loop and the second loop have an interval at a near position such that a distance between the terminals is smaller than a width of the first loop.

(2) Inventions Taught in the Cited Documents

Cited document 1 discloses two inductor conductors formed at adjacent positions (for example, FIG. 1).

Cited document 2 discloses a planar inductance having two loops (for example, FIGS. 2 to 5).

Cited document 3 discloses a configuration where two inductor elements are aligned parallel on a substrate (for example, FIG. 4).

Cited document 4 discloses a planar inductor having four planar loops (for example, FIG. 1).

Cited document 5 discloses an inductor configured of four coil patterns formed on a substrate (for example, FIG. 1).

Cited document 6 discloses a method for suppressing crosstalk between conductors that configure two adjacent coils by adjusting the number of turns of the coil (for example, FIGS. 5 and 6, paragraphs [0045] to [0049]).

Cited document 7 discloses a configuration where two planar inductance elements formed on the same plane with a coil as an air core are disposed on a flat plate at a predetermined interval (for example, FIG. 1).

(3) Comparison of the Invention of the Present Application and the Inventions Taught in the Cited Examples

In the invention of claim 1 of the present application, the two terminals are connected to the first loop in order to supply current to the first loop and the second loop, and have an interval at a near position such that the distance between the two terminals is less than the width of the first loop. With this kind of configuration, according to the invention of claim 1 of the present application, a unique effect of the invention of the present application can be obtained in that contribution to the electromagnetic field from the first loop and the second loop can be made to be of the same extent.

On the other hand, in the invention taught in cited document 1, for example, as illustrated in FIG. 1, the two loops are independent and each loop has a separate terminal. Furthermore, in the invention taught in cited document 2, the two loops are connected to each other, but the two terminals for supplying current to the two loops are each connected to a different loop. In addition, in the invention taught in cited document 2, the distance between the two terminals for supplying current to the two loops is slightly larger or nearly equal to the width of each loop.

That is, neither of cited documents 1 or 2 disclose a configuration where two terminals are connected to the first loop in order to supply current to the first loop and the second loop, and have an interval at a near position such that a distance between the two terminals becomes smaller than a width of the first loop. Furthermore, this type of configuration is not disclosed in any of the other cited documents.

Therefore, it is believed that the invention of claim 1 of the present application could not be easily conceived by a person skilled in the art based on the inventions taught in cited documents 1 to 7. The same is true of the inventions of claims 11 and 19. Furthermore, for at least the same reason, it is believed that a person skilled in the art could not have easily conceived the inventions of claims 2 to 10, 12 to 18, and 20 that are dependent on claims 1, 11, and 19 based on the inventions taught in cited documents 1 to 7.

Further, in the invention of claim 21 of the present application, the two terminals are connected to the first loop in order to supply current to the four loops, and have an interval at a near position such that the distance between the two terminals becomes smaller than the width of the first loop. With this kind of configuration, according to the invention of claim 21 of the present application, a unique effect of the invention of the present application can be obtained in that contribution to the electromagnetic field from four loops can be made to be of the same extent.

On the other hand, in the inventions taught in cited documents 4 and 5, the two terminals for supplying current to the four loops are connected to the two loops separately.

That is, neither of cited documents 4 or 5 disclose a configuration where two terminals are connected to the first loop in order to supply current to the four loops and have an interval at a near position such that the distance between the two terminals becomes smaller than the width of the first loop. Furthermore, this type of configuration is not disclosed in any of the other cited documents. Therefore, it is believed that the invention of claim 21 of the present application could not be easily conceived by a person skilled in the art based on the inventions taught in cited documents 1 to 7.

Accordingly, that the inventions of amended claims 1 to 21 of the present application could not be easily conceived by a person skilled in the art based on the inventions taught in cited documents 1 to 7, and the reason for rejection of Reason 1 given above is considered to have been resolved.

4. As described above, we are convinced that the reasons for rejection of the present application have been resolved. Therefore, we humbly request an assessment that the invention of the present application should be granted a patent.

End

Notice of Reasons for Rejection

Patent Application No.: JP 2007-501145
 Draft Date: April 1, 2011
 Patent Examiner: Junichi Tanaka 9074 5R00
 Agent for Applicant: Yoshiyuki Inaba (and 2 others)
 Applicable Provisions: Sec. 29(2)

<<<< FINAL >>>>

The present application is rejected for the following reasons. If the applicant has any objection to this notice, please submit your written argument within three months from the mailing date of this notice.

Reason(s)

The inventions of the following claims of the present application should not be granted a patent under sec. 29(2) of the Japanese Patent Act since they could have been easily invented prior to the present application by a person having ordinary skill in the field of art pertaining to the inventions, based on the inventions taught in the following publications 1 to 10 which have been in circulation in Japan or foreign countries, or inventions made available to the public through electronic communication lines, prior to the present application.

Record (See Cited Document List for Reference Citations)

(Claims 1 to 21) Cited

Documents 1 to 10

Remarks:

Cited document 8 (in particular, see [FIG. 1], [FIG. 6], [FIG. 7], and [FIG. 11]), cited document 9 (in particular, see [FIG. 2]), and cited document 10 (in particular, see [FIG. 2] and [FIG. 3]) teach matters concerning the “two terminals” of the inventions of claims 1, 11, 19, and 21 of the present application amended by the written amendment submitted on October 6, 2010 (hereinafter referred to as “amended” present application).

Furthermore, other matters are as stated in the Notice of Reasons for Rejection dated July 7, 2010.

Accordingly, the inventions of claims 1 and 11 of the amended present application could easily have been conceived by a person skilled in the art based on the invention taught in cited document 1 (see paragraphs [0040] to [0041], paragraph [0050], paragraphs [0055] to [0057], [FIG. 1], [FIG. 4], and [FIG. 11]), the invention taught in cited document 2 (see paragraphs [0003] to [0008], paragraphs [0013] to [0015], and [FIG. 2] and [FIG. 3]), and the inventions taught in cited documents 8 to 10.

Furthermore, cited document 1 (in particular, see paragraph [0004], paragraphs [0040] to [0041], paragraphs [0055] to [0057], [FIG. 1], [FIG. 4], and [FIG. 11]) teaches matters stated in claims 2 to 5 and 12 to 14 of the amended present application.

Furthermore, cited document 3 (in particular, see paragraphs [0025] and [0026], and [FIG. 4]) teaches matters stated in claims 6 and 15 of the amended present application.

Furthermore, cited document 2 (in particular, see paragraphs [0005] to [0008], paragraphs [0013] to [0015], and [FIG. 2] and [FIG. 3]) teaches matters stated in claims 7, 8, and 17 of the amended present application.

Furthermore, cited document 4 (in particular, see page 10, line 14 to page 11, line 6 and FIG. 1), and cited document 5 (in particular, see paragraph [0017] and [FIG. 1]) teach matters stated in claims 9 and 18 of the amended present application.

Furthermore, cited document 6 (in particular, see paragraph [0046] and [FIG. 5]), and cited document 7 (in particular, see line 5 in the upper right-hand column to line 13 in the lower left-hand column of page 2, and FIG. 1) teach matters stated in claims 10 and 16 of the amended present application.

Furthermore, the inventions of claims 19 and 20 of the amended present application could easily have been conceived by a person skilled in the art based on the invention taught in cited document 2 (see paragraphs [0003] to [0008], paragraphs [0013] to [0015], and [FIG. 2] and [FIG. 3]) and the inventions taught in cited documents 8 to 10.

Furthermore the invention of claim 21 of the amended present application could easily have been conceived by a person skilled in the art based on the inventions taught in cited document 4 (see page 10, line 14 to page 11, line 6, page 12, line 1 to line 6, FIG. 1, and FIG. 3) and cited document 5 (see paragraphs [0010] and [0011], paragraphs [0016] and [0017], and [FIG. 1]), and the inventions taught in cited documents 8 to 10.

Accordingly, the inventions of claims 1 to 21 of the amended present application could easily have been invented by a person skilled in the art based on the inventions taught in cited documents 1 to 10.

Cited Document List

1. JP H8-17656 A
2. JP 2005-534184 A (Translation of PCT Application)
3. JP H10-74625 A
4. WO 98/05048
5. JP H8-181018 A
6. JP 2003-217932 A
7. JP H3-261115 A
8. JP 2003-229485 A
9. JP H11-243014 A
10. JP H11-265821 A

Reason for Final Notice of Reasons for Rejection

This notice of reasons for rejection notifies only reasons for rejection that became necessary to notify due to the amendments made in response to the first notice of reasons for rejection.

Please direct inquiries related to the content of this Notice of Reasons for Rejection and requests for interviews to the following:

Patent Examination Dept. 4, Interface (Basic Circuit Elements) Junichi Tanaka

TEL. 03 (3581) 1101 Ext. 3565

FAX. 03 (3580) 6907

<u>Director-General/Agent</u>	<u>Director/Agent</u>	<u>Director</u>	<u>Assistant Examiner</u>
	Tomohiro Sakai	Junichi Tanaka	
	8935	9074	

[Document Name]	Written Argument
[File No.]	E0225VPA7
[Addressed to]	JPO Patent Examiner
[Case Indicator]	
[Application No.]	JP 2007-501145
[Patent Applicant]	
[Identification No.]	598036300
[Name or Title]	Telefonaktiebolaget LM Ericsson (publ.)
[Agent]	
[Identification No.]	100079108
[Patent Attorney]	
[Name or Title]	Yoshiyuki Inaba
[Mailing No.]	235536
[Content of the Argument]	

1. According to the Notice of Reasons for Rejection for the present application (draft date: April 1, 2011, mailing date: April 5, 2011), because the inventions of claims 1 to 21 of the present application could easily have been invented by a person skilled in the art based on the inventions taught in cited documents 1 to 10 below, it is determined that a patent cannot be granted under the Japanese Patent Act Sec. 29(2).

1. JP H8-17656 A
2. JP 2005-534184 A (Translation of PCT Application)
3. JP H10-74625 A
4. WO 98/05048
5. JP H8-181018 A
6. JP 2003-217932 A
7. JP H3-261115 A
8. JP 2003-229485 A
9. JP H11-243014 A
10. JP H11-265821 A

However, the applicant cannot agree with this. We will explain the reasons for this below, so we respectfully request another examination.

2. Comparison of the Inventions of the Present Application and the Inventions Taught in the Cited Documents

The invention of claim 1 of the present application is, “an inductor layout having reduced mutual electromagnetic coupling, comprising: a first inductor having reduced far field; and a second inductor positioned leaving a predetermined distance from the first inductor, the first inductor provided with: a first loop that is a substantially symmetrical shape relative to a first predetermined axis; a second loop connected to the first loop and having a substantially same size and shape as the first loop, the second loop being disposed such that a magnetic field generated from the second loop has an inclination that negates a magnetic field generated from the first loop; and two terminals connected to the first loop to provide a current to the first loop and the second loop, the two terminals having an interval left at a near position such that a distance between the two terminals is smaller than a width of the first loop, and suppressing a contribution to a magnetic field from the two terminals to a minimum, wherein, the mutual electromagnetic coupling between the first inductor and the second inductor is reduced as a result of the electromagnetic field of the first inductor being reduced.”

In particular, in the invention of claim 1 of the present application, two terminals connected to the first loop to supply a current to the first loop and the second loop have an interval at a near position such that a distance between the terminals is smaller than a width of the first loop.

As such, in the invention of claim 1 of the present application, it is possible to make a contribution

to an electromagnetic field from the first loop and the second loop to be of the same extent, and as a result, a unique effect of the invention of the present application can be obtained in that it becomes possible to suppress far field. Regarding this, paragraph [0017] of the present application, for example, describes, "furthermore, far field is suppressed to a minimum by the positioning of the terminal 204a and the terminal 204b. For example, when positioning the two terminals 204a and 204b as close as possible, the contributions to the electromagnetic field from the two portions of the inductor 200 become the same."

The examiner indicates that "the matter regarding 'two terminals' is taught in cited document 8 (in particular, see [FIG. 1], [FIG. 6], [FIG. 7], and [FIG. 11]), cited document 9 (in particular, see [FIG. 2]), and cited document 10 (in particular, see [FIG. 2] and [FIG. 3])."

Furthermore, the examiner indicates that "accordingly, the inventions of amended claims 1 and 11 of the present application could have easily been conceived by a person skilled in the art based on the invention taught in cited document 1 (see paragraphs [0040] and [0041], paragraph [0050], paragraphs [0055] to [0057], [FIG. 1], [FIG. 4], and [FIG. 11]), the invention taught in cited document 2 (see paragraphs [0003] to [0008], paragraphs [0013] to [0015], [FIG. 2], and [FIG. 3]), and the inventions taught in cited document 8 to 10."

Here, in cited document 1, as a resolution method for suppressing a magnetic effect from an inductor conductor to the outside to a minimum, a configuration is illustrated where the inductor conductor is covered by a conductive magnetic body via an insulating film. In other words, with the invention taught in cited document 1, this configuration is the point of the invention.

Furthermore, none of cited documents 8 to 10 make any suggestion whatsoever about suppressing far field by positioning of two terminals.

Accordingly, there is no motive for a person skilled in the art who has encountered cited document 1 to adopt the positioning of the terminals taught in cited documents 8 to 10 instead of, or in addition to, the configuration that is the point of the invention taught in cited document 1 in that an inductor conductor is covered by a conductive magnetic body via an insulating film to suppress the magnetic effect from the inductor conductor to the outside to a minimum.

Furthermore, cited document 2 discloses a configuration wherein each winding has an "8" shape, flows a current in the same direction, and has three intersecting conductors that are provided between two loops, as a resolution method for reducing magnetic field components generated on an outside of a winding loop, but contains no suggestion whatsoever regarding suppressing a far field by the positioning of two terminals. Rather, in cited document 2, the two terminals are placed at an interval that is greater than the width of the winding loop, and the configuration is the exact opposite of the invention stated in claim 1 of the present application.

Furthermore, none of cited documents 8 to 10 contain any suggestion whatsoever regarding suppressing a far field by the positioning of two terminals. Therefore, a person skilled in the art who has encountered cited document 2 would have no motive to adopt the positioning of the terminals taught in cited documents 8 to 10 instead of, or in addition to, the configuration taught in cited document 2 in order to reduce the magnetic field components generated on the outside of the winding loop.

Furthermore, as described above, according to the invention of claim 1 of the present application, as described in, for example, paragraph [0017], a unique effect of the invention of the present application of "furthermore, far field is suppressed to a minimum by positioning of the terminal 204a and the terminal 204b. For example, when positioning the two terminals 204a and 204b as close as possible, the contributions to the electromagnetic field from the two portions of the inductor 200 become the same." can be obtained. This affirms the existence of Inventive Step for the invention of claim 1 of the present application, as described in Chapter 2, 2.4(2) of Examination Guidelines for Patent and Utility Model in Japan, "when an advantageous effect compared to cited inventions is clearly understood from descriptions of the Specification and the like, this shall be referred to as a useful fact for affirmatively inferring the existence of Inventive Step."

Accordingly, it is believed that the invention of claim 1 of the present application could not have been easily invented by a person skilled in the art based on the inventions taught in cited documents 1, 2, and 8 to 10. It is also believed that the inventions of the other claims of the present application could not have been easily invented by a person skilled in the art based on the inventions taught in

cited documents 1 to 10 for at least the same reason.

3. As described above, we are convinced that the reasons for rejection of the present application have been resolved. Therefore, we humbly request an assessment that the invention of the present application should be granted a patent.

End

Decision of Rejection

Patent Application No.: JP 2007-501145
Draft Date: September 6, 2011
Patent Examiner: Junichi Tanaka 9074 5R00
Title of Invention: METHOD FOR REDUCING VCO COUPLING
AND INDUCTOR LAYOUT
Applicant: Telefonaktiebolaget LM Ericsson (Publ.)
Agent: Yoshiyuki Inaba (and 2 others)

The present application should be rejected in accordance with the reasons described in the Notice of Reasons for Rejection dated April 1, 2011.

Moreover, the contents of the written argument have been examined, but sufficient basis for overturning the reason for rejection cannot be found.

Remarks

In the written argument submitted on June 28, 2011, the applicant compares the invention of claim 1 of the present application amended by the written amendment submitted on October 6, 2010 (hereinafter referred to as "amended" present application), and the inventions taught in cited documents 1 to 10 cited in the above Notice of Reasons for Rejection, and in particular, makes the following assertions concerning cited document 2 and cited documents 8 to 10.

"Furthermore, cited document 2 discloses a configuration wherein each winding has an "8" shape, flows a current in the same direction, and has three intersecting conductors that are provided between two loops, as a resolution method for reducing magnetic field components generated on an outside of a winding loop, but contains no suggestion whatsoever regarding suppressing a far field by the positioning of two terminals. Rather, in cited document 2, the two terminals are placed at an interval that is greater than the width of the winding loop, and the configuration is the exact opposite of the invention stated in claim 1 of the present application.

Furthermore, none of cited documents 8 to 10 contain any suggestion whatsoever regarding suppressing a far field by the positioning of two terminals. Therefore, a person skilled in the art who has encountered cited document 2 would have no motive to adopt the positioning of the terminals taught in cited documents 8 to 10 instead of, or in addition to, the configuration taught in cited document 2 in order to reduce the magnetic field components generated on the outside of the winding loop."

As the applicant asserts in the written argument, in the invention taught in cited document 2,

the two terminals are placed at an interval that is greater than the width of the winding loop.

However, in the invention taught in cited document 2, the far field is suppressed by the positioning of these terminals, and in terms of "suppressing a far field by the positioning of two terminals" as asserted by the applicant, the invention taught in cited document 2 and the invention of claim 1 of the amended present application are the same.

Meanwhile, the invention taught in cited document 2 and the invention of claim 1 of the amended present application differ in regard to whether the distance between the two terminals is in close proximity.

However, configuring the distance between the two terminals to be in close proximity is well-known art in the technical field, as taught in cited documents 8 to 10. Furthermore, determining the position of the terminals of the inductor is a matter that can be appropriately selected by a person skilled in the art, and there is no particular difficulty in configuring the distance between the two terminals to be in close proximity.

Accordingly, the assertion of the applicant in the above written argument cannot be adopted, and the inventions of claims 1 to 21 of the amended present application could still have been easily invented by a person skilled in the art based on the inventions taught in cited documents 1 to 10.

If dissatisfied with this decision, a request for trial can be made to the Commissioner of the Japan Patent Office within three months (four months for an overseas resident) from the date of transmittal of a certified copy of this decision (sec. 121(1) of the Japanese Patent Act).

(Instructions based on sec. 46(2) of Administrative Litigation Act)

A suit for revocation can be filed against this decision only for a trial decision in relation to a request for trial on this Decision of Rejection (sec. 178(6) of the Japanese Patent Act).

<u>Director-General/Agent</u>	<u>Director/Agent</u>	<u>Director</u>	<u>Assistant Examiner</u>
	<u>Tomohiro Sakai</u>	<u>Junichi Tanaka</u>	
	8935	9074	



Certification of Accuracy of Translation

Sun IP Projects # 23-1605, 24-1109, 24-1153

Japanese to English translation of "INTEL-1015 JP Translation.pdf"

Sun IP hereby certifies that the attached translation has been translated by experienced and qualified translators and that, to the best of our knowledge, the translated text reflects the content, meaning and style of the original text and constitutes a true and accurate translation of the original document.

March 28, 2024

Alexander P. Dockery

SENIOR PROJECT MANAGER