

Complainant Realtek Semiconductor Corporation's *Markman* Hearing Presentation

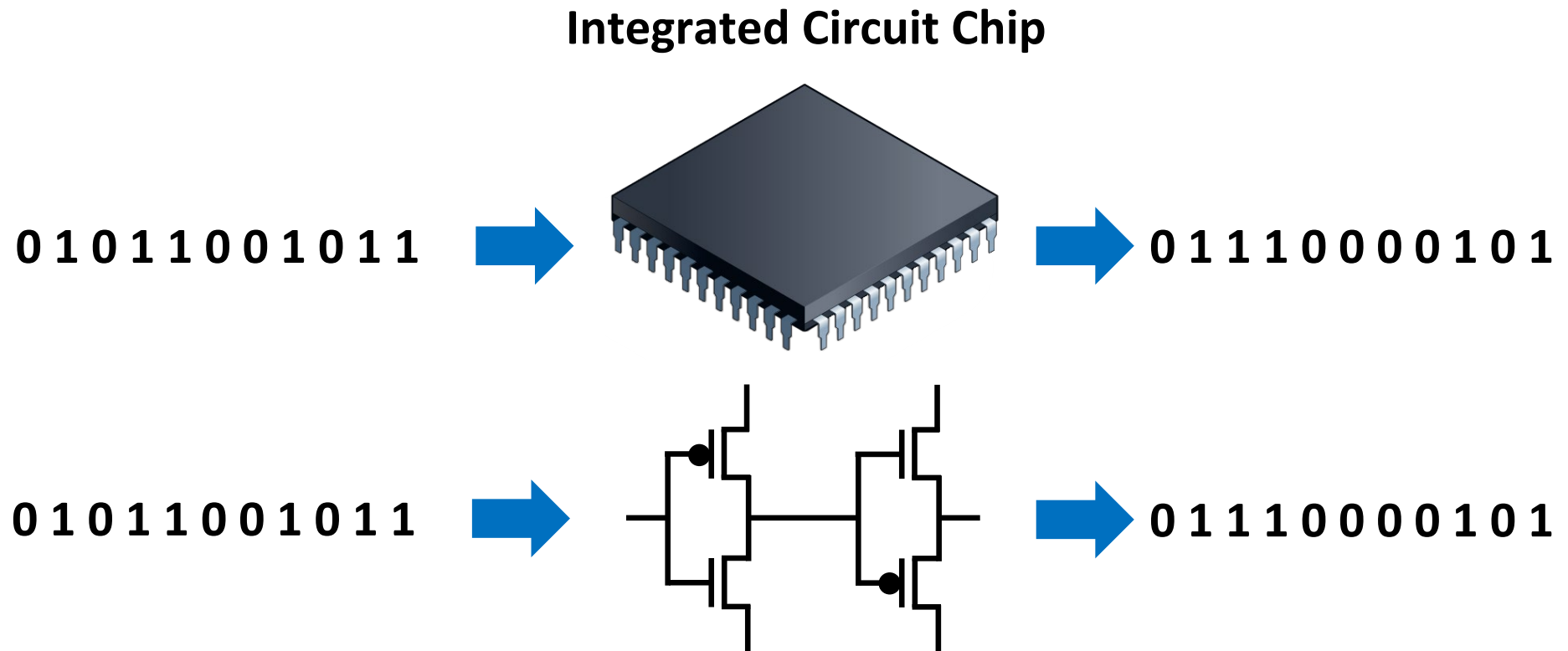
*Certain Integrated Circuits, Components Thereof, and
Products Containing the Same*

Inv. No. 337-TA-1350

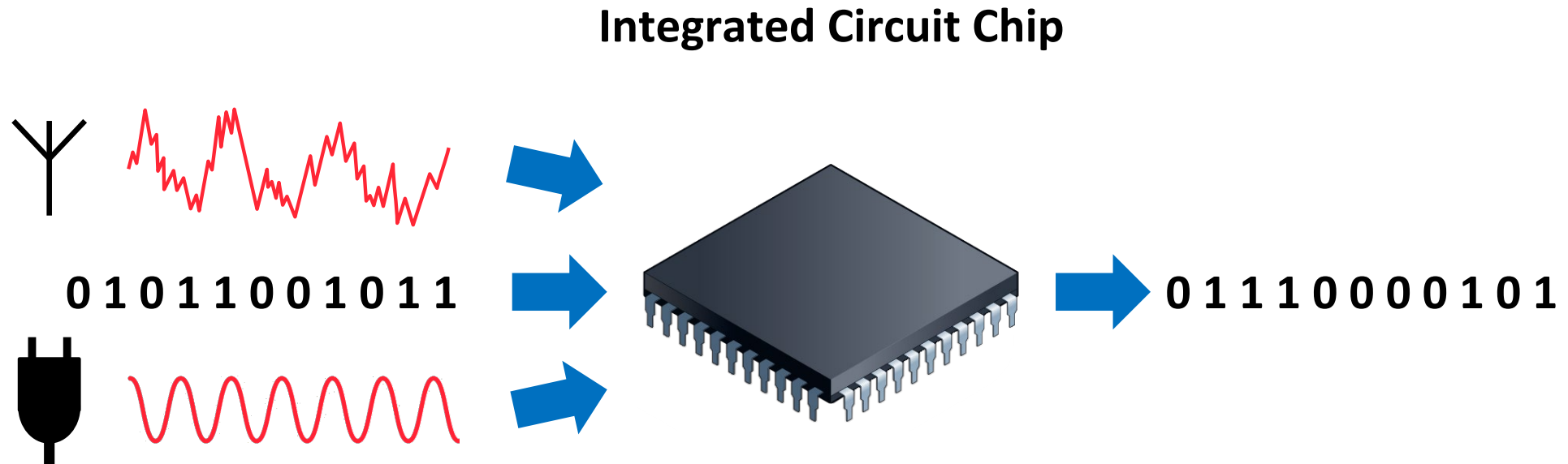
June 5, 2023

Technology Background

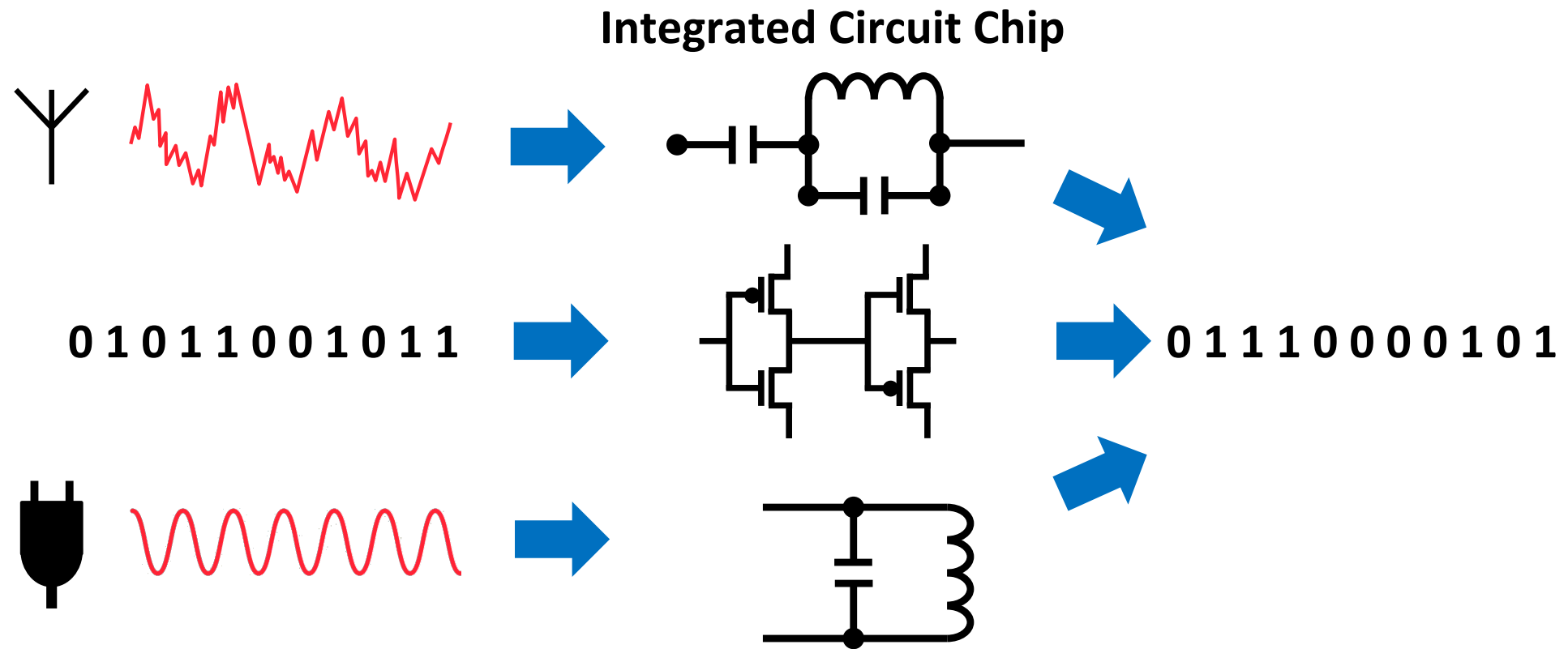
Technology Background – Not Just 1's and 0's



Technology Background – IC Chips Include Analog Circuits

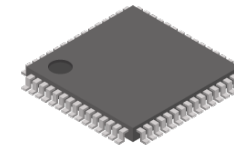
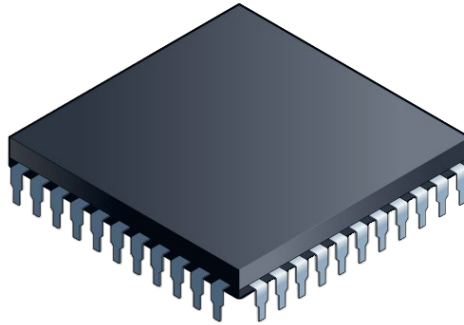


Technology Background – IC Chips Require Analog Circuits

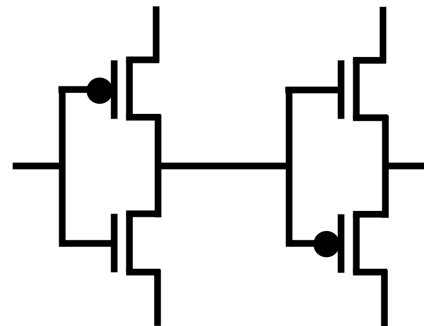


Technology Background – Shrinking Transistors Was Easy

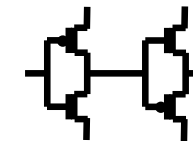
Integrated Circuit Chip



Transistors



=

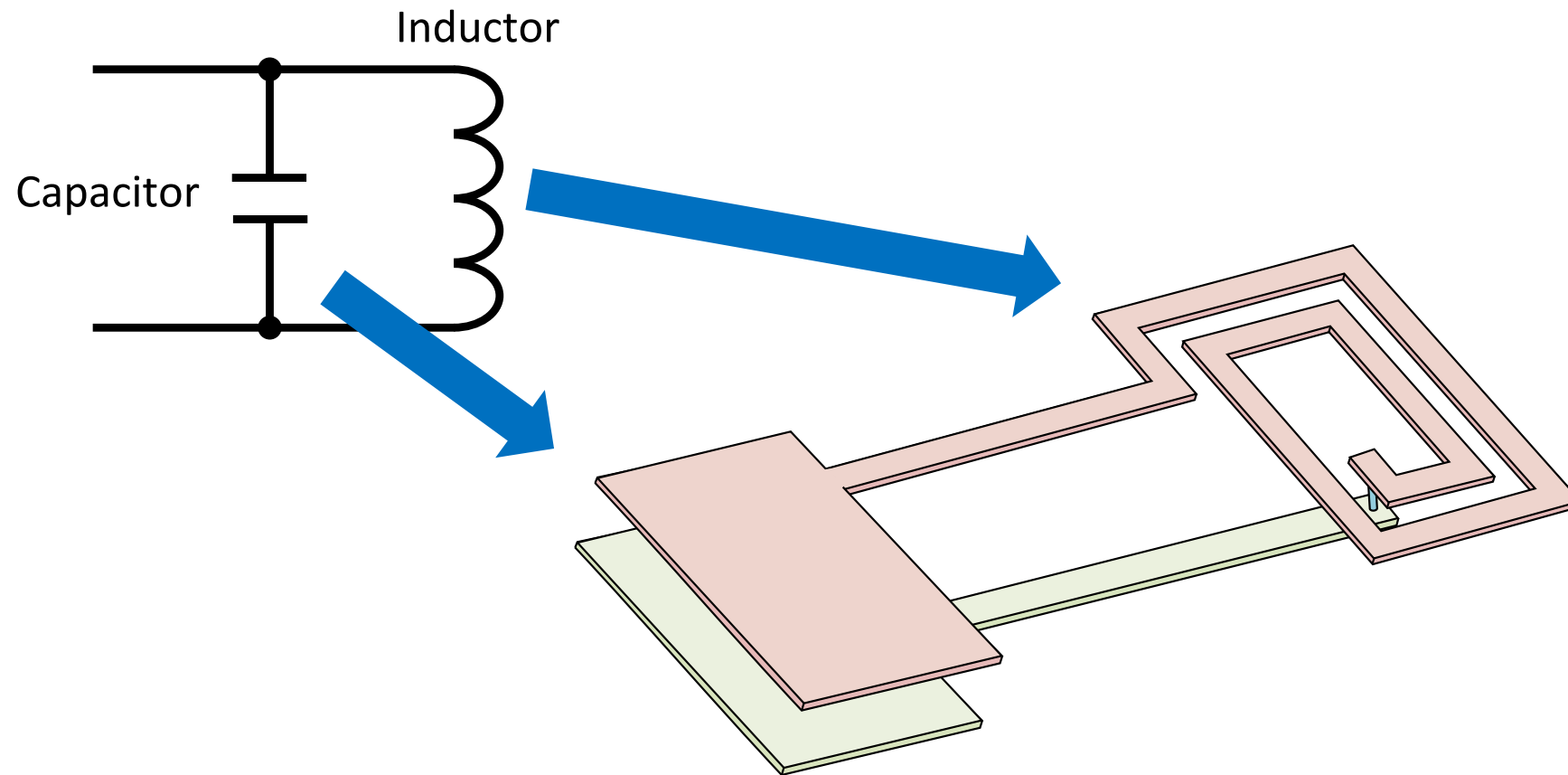


Background Technology – Shrinking Analog Circuits Was Hard

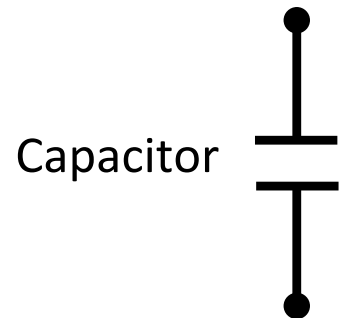
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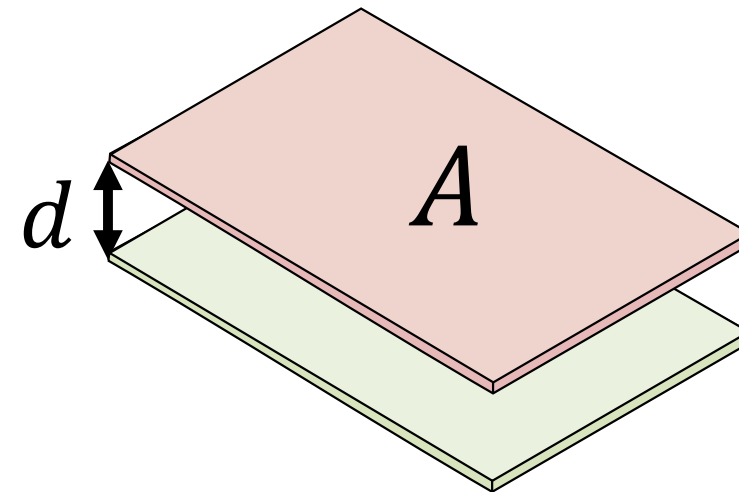
'582



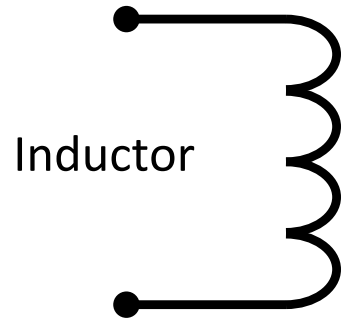
Capacitance is a Function of Area and Distance



$$C = \epsilon \frac{A}{d}$$

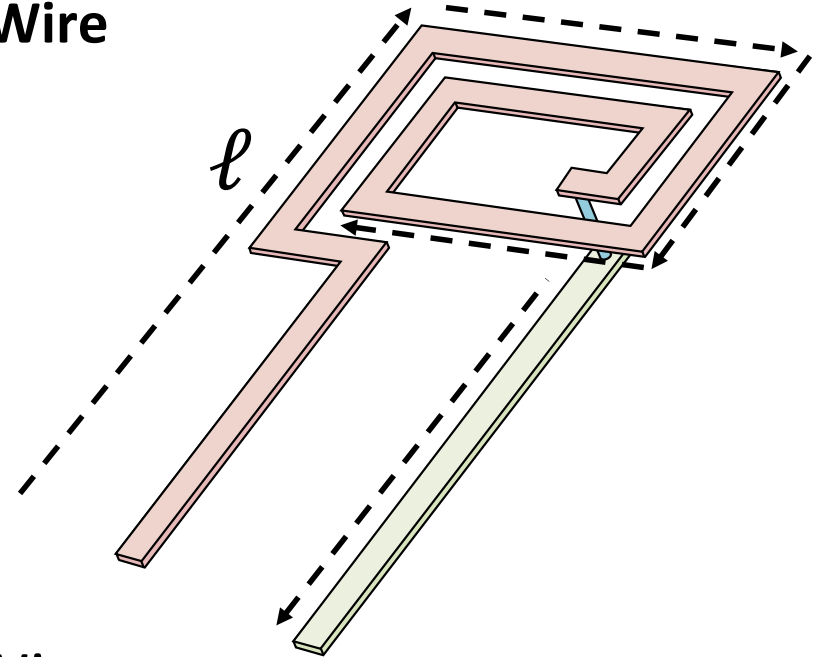


Inductance is a Function of Length
and Cross-Section of Wire



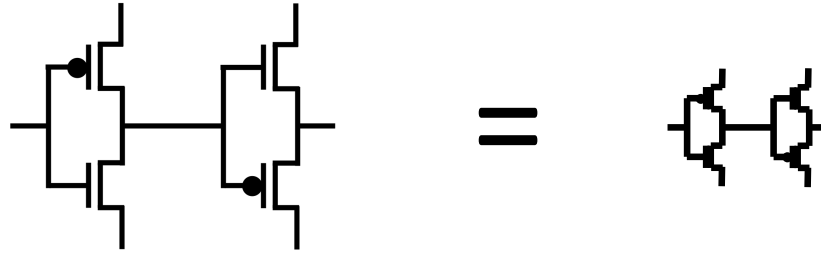
$$L \approx \frac{\mu_0}{4\pi} [\ell Y]$$

ℓ = The Length of the Wire

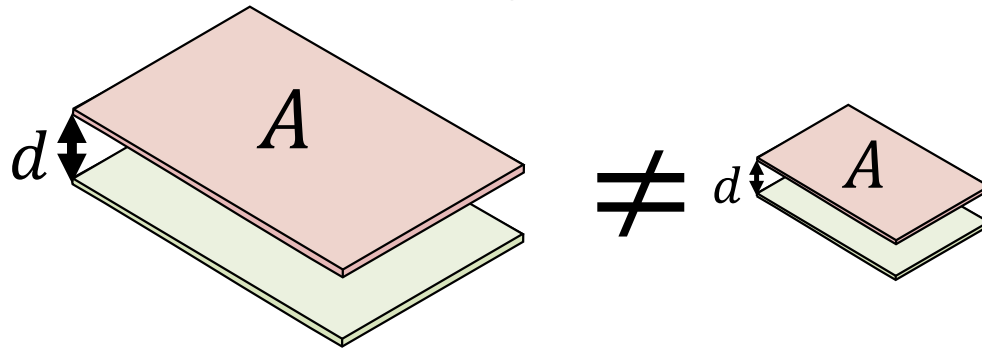


Background Technology – Shrinking Analog Circuits Was Hard

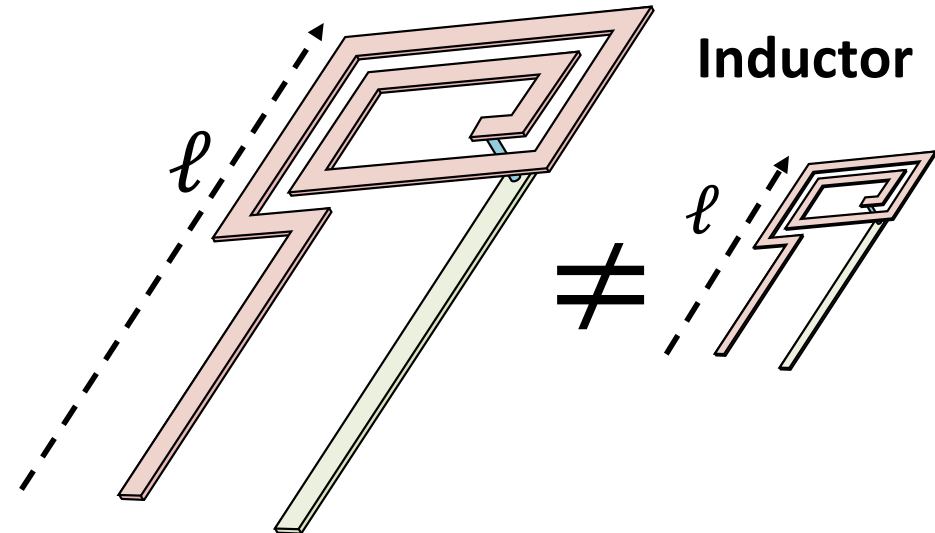
Transistors



Capacitor



Inductor

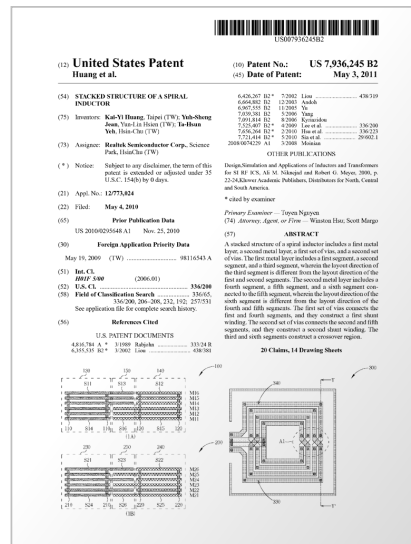


The Asserted Patents

Overview of the Three Asserted Patents

Spiral Inductor

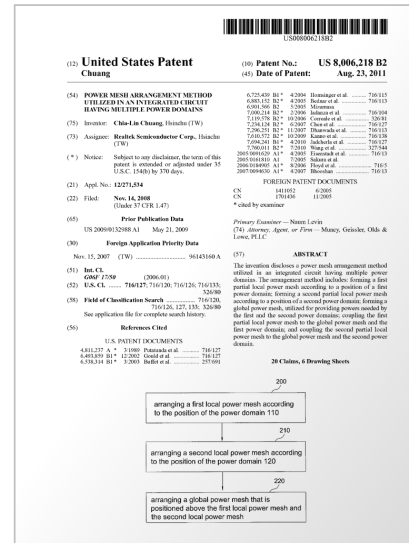
U.S. Patent No.
7,936,245



Stacked Structure of a Spiral Inductor

Power Mesh

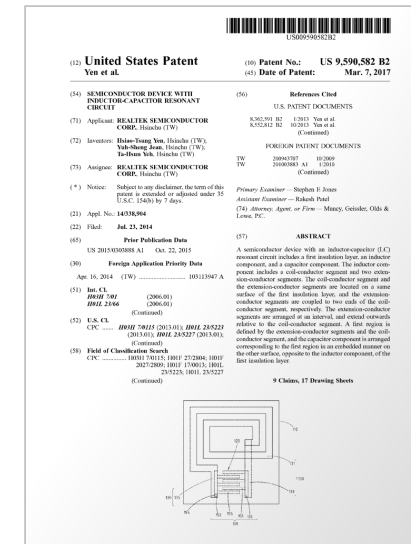
U.S. Patent No.
8,006,218



Power Mesh Arrangement Method Utilized in an Integrated Circuit Having Multiple Power Domains

LC Tank

U.S. Patent No.
9,590,582



Semiconductor Device with Inductor-Capacitor Resonant Circuit

Summary of Disputed Terms – ‘218 Patent

No.	Term	Claims
1	“global power mesh”	12-13 & 15-18

Summary of Disputed Terms – ‘582 Patent

Complainant's Proposed Terms

No.	Term	Claims
2	"two extension-conductor segments"	1, 2-4 & 9
3	"coil-conductor segment"	1, 2-4 & 9

Respondent's Proposed Terms

No.	Term	Claims
4	"capacitor component"	1, 2-4 & 9
5	"plurality of connecting segments are respectively overlapped with the two extension-conductor segments in a vertical direction"	1, 2-4 & 9

The '218 Patent

Patent Overview – The '218 Patent

US08006218B2

(12) **United States Patent**
Chuang

(10) Patent No.: **US 8,006,218 B2**
(45) Date of Patent: **Aug. 23, 2011**

(54) **POWER MESH ARRANGEMENT METHOD UTILIZED IN AN INTEGRATED CIRCUIT HAVING MULTIPLE POWER DOMAINS**

(75) Inventor: **Chia-Lin Chuang**, Hsinchu (TW)

(73) Assignee: **Realtek Semiconductor Corp.**, Hsinchu (TW)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 370 days.

(21) Appl. No.: **12/271,534**

(22) Filed: **Nov. 14, 2008**
(Under 37 CFR 1.47)

(65) **Prior Publication Data**
US 2009/0132988 A1 May 21, 2009

(30) **Foreign Application Priority Data**
Nov. 15, 2007 (TW) 96143160.A

(51) **Int. Cl.** (2006.01) **G06F 1/50**

(52) **U.S. Cl.** 716/127; 716/120; 716/126; 716/133; 326/80

(58) **Field of Classification Search** 716/120; 716/126, 127, 133; 326/80
See application file for complete search history.

(56) **References Cited**
U.S. PATENT DOCUMENTS
4,811,237 A * 3/1989 Potamides et al. 716/127
6,493,890 B1 * 12/2002 Gould et al. 716/127
6,538,314 B1 * 3/2003 Buffet et al. 257/691

(74) **Attorney, Agent, or Firm**—Mincey, Geisker, Olds & Lowe, PLLC

(57) **ABSTRACT**
The invention discloses a power mesh arrangement method utilized in an integrated circuit having multiple power domains. The arrangement method includes: forming a first partial local power mesh according to a position of a first power domain; forming a second partial local power mesh according to a position of a second power domain; forming a global power mesh, utilized for providing powers needed by the first and the second power domains; coupling the first partial local power mesh to the global power mesh and the first power domain; and coupling the second partial local power mesh to the global power mesh and the second power domain.

20 Claims, 6 Drawing Sheets

arranging a first local power mesh according to the position of the power domain 110

arranging a second local power mesh according to the position of the power domain 120

arranging a global power mesh that is positioned above the first local power mesh and the second local power mesh

'218 Patent

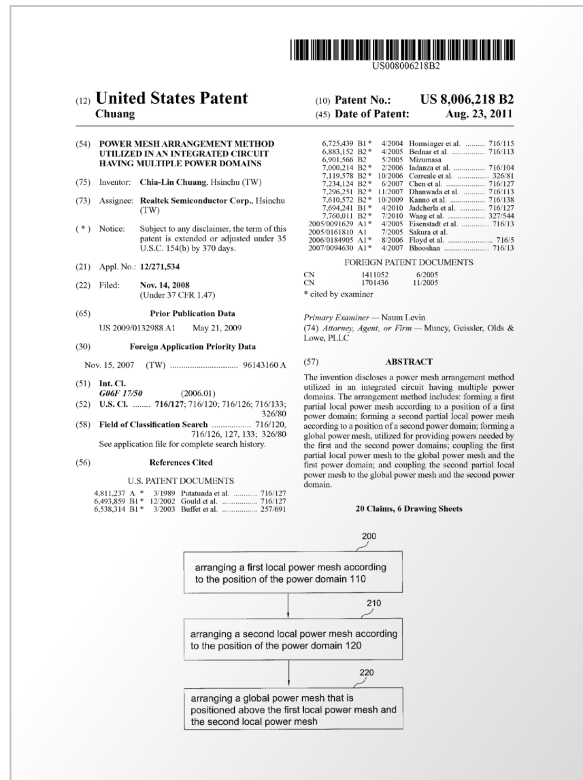
Power Mesh Arrangement Method Utilized in an Integrated Circuit Having Multiple Power Domains

- Issue Date: Aug. 23, 2011
- Inventor: Chia-Lin Chuang
- Claims Priority to a Nov. 15, 2007 Taiwanese Application

Patent Overview – The '218 Patent

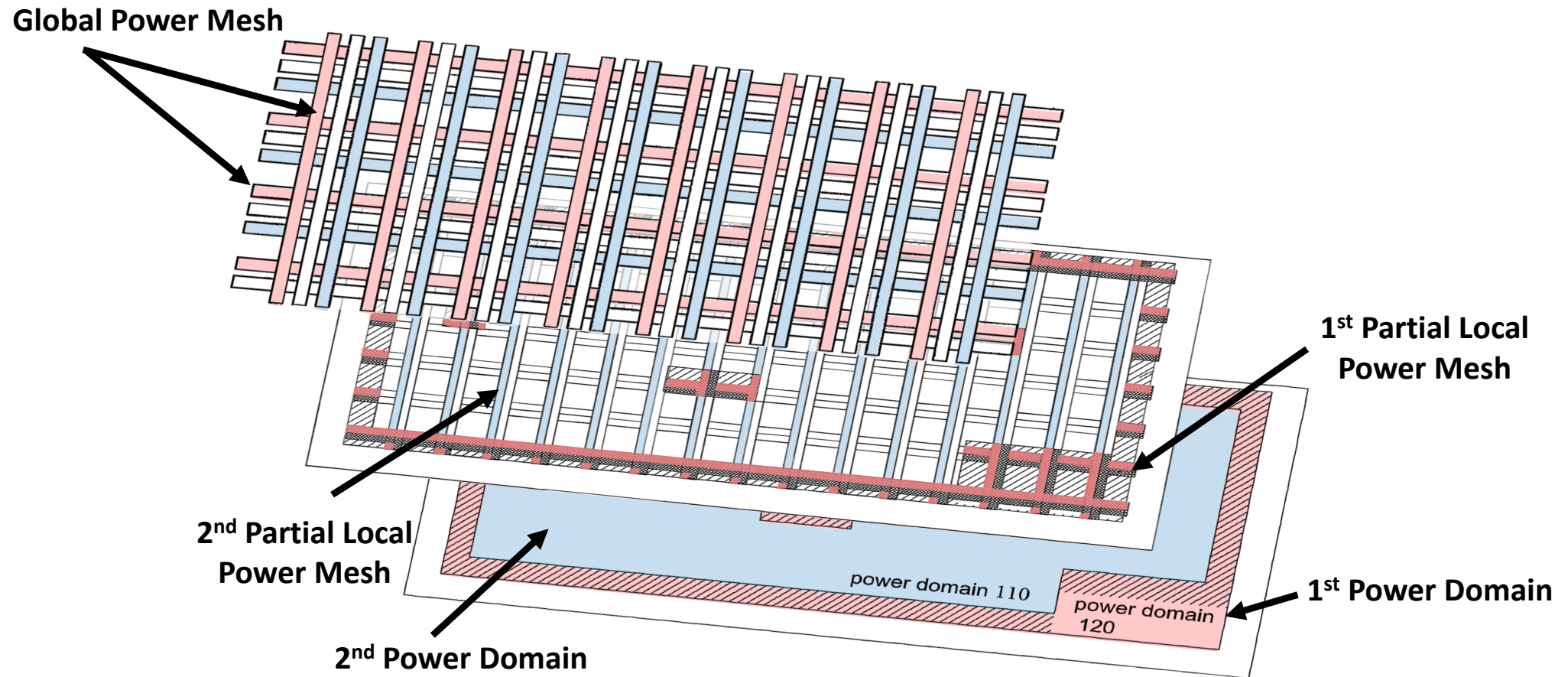
Benefits of the Invention

- Advanced ICs have components that need separate power
- Claims teach a novel, efficient power routing structure for ICs with multiple power domains:
 - A two-layer global power mesh; and
 - Two partial local power meshes positioned according to two power domains

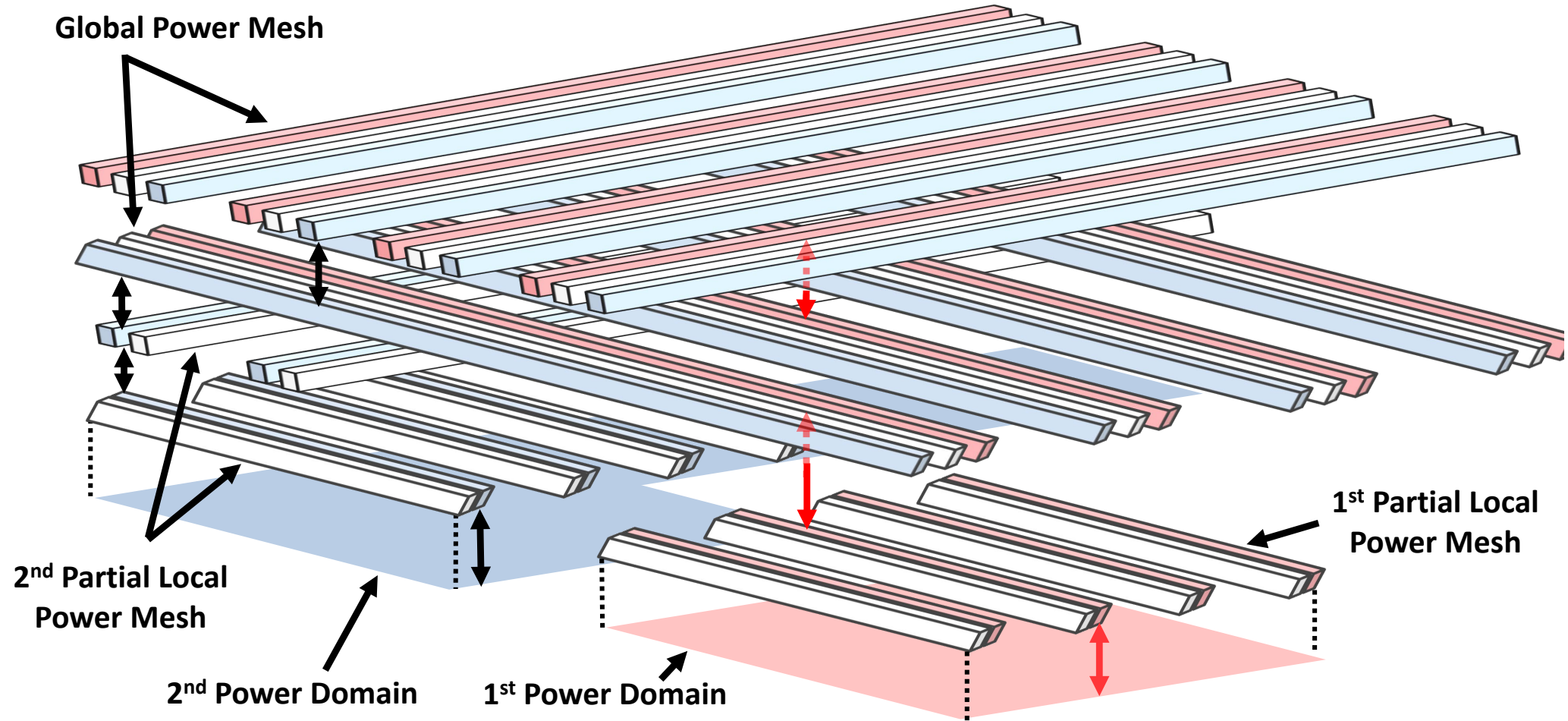


'218 Patent

Patent Overview – One Embodiment of The '218 Patent

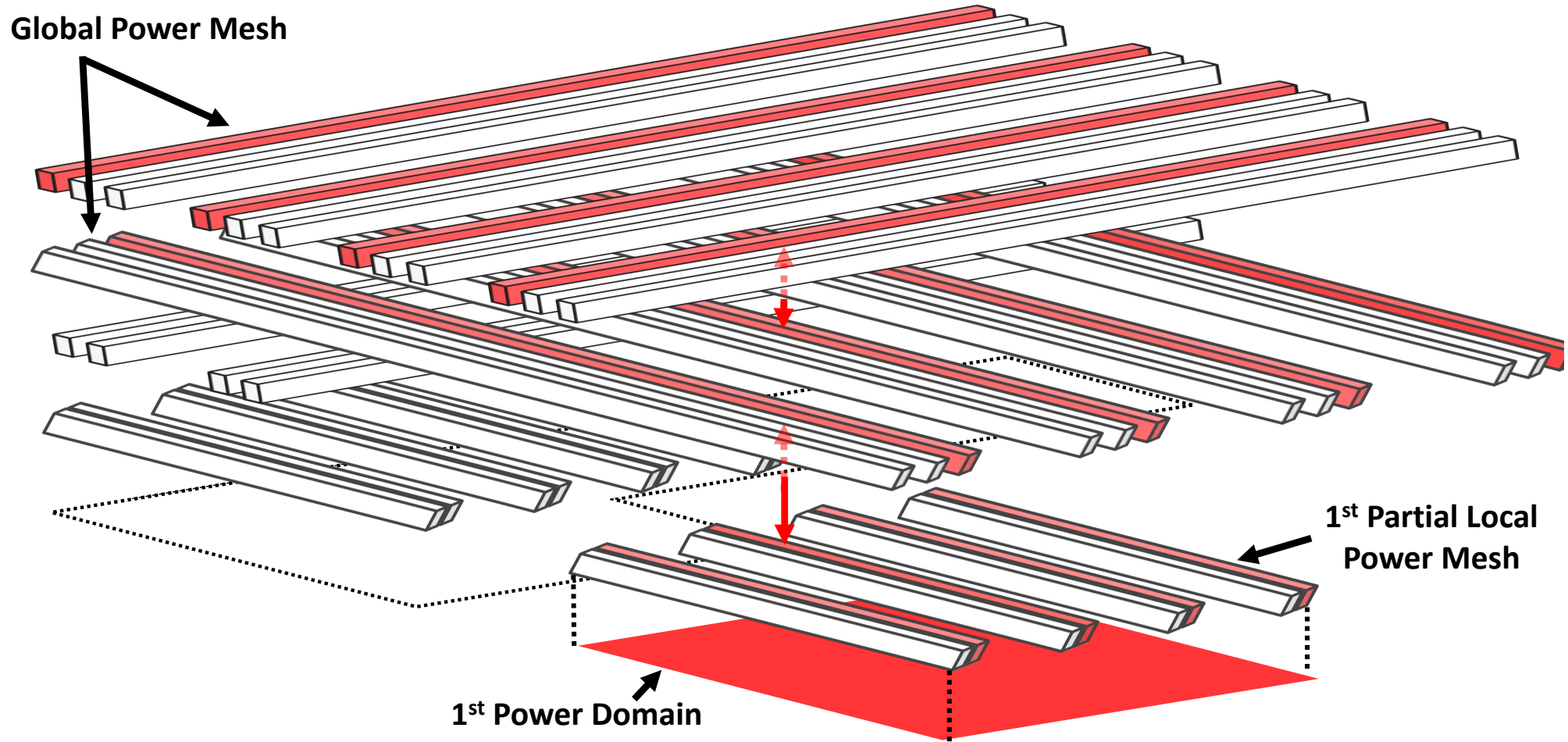


Patent Overview – One Embodiment of The '218 Patent



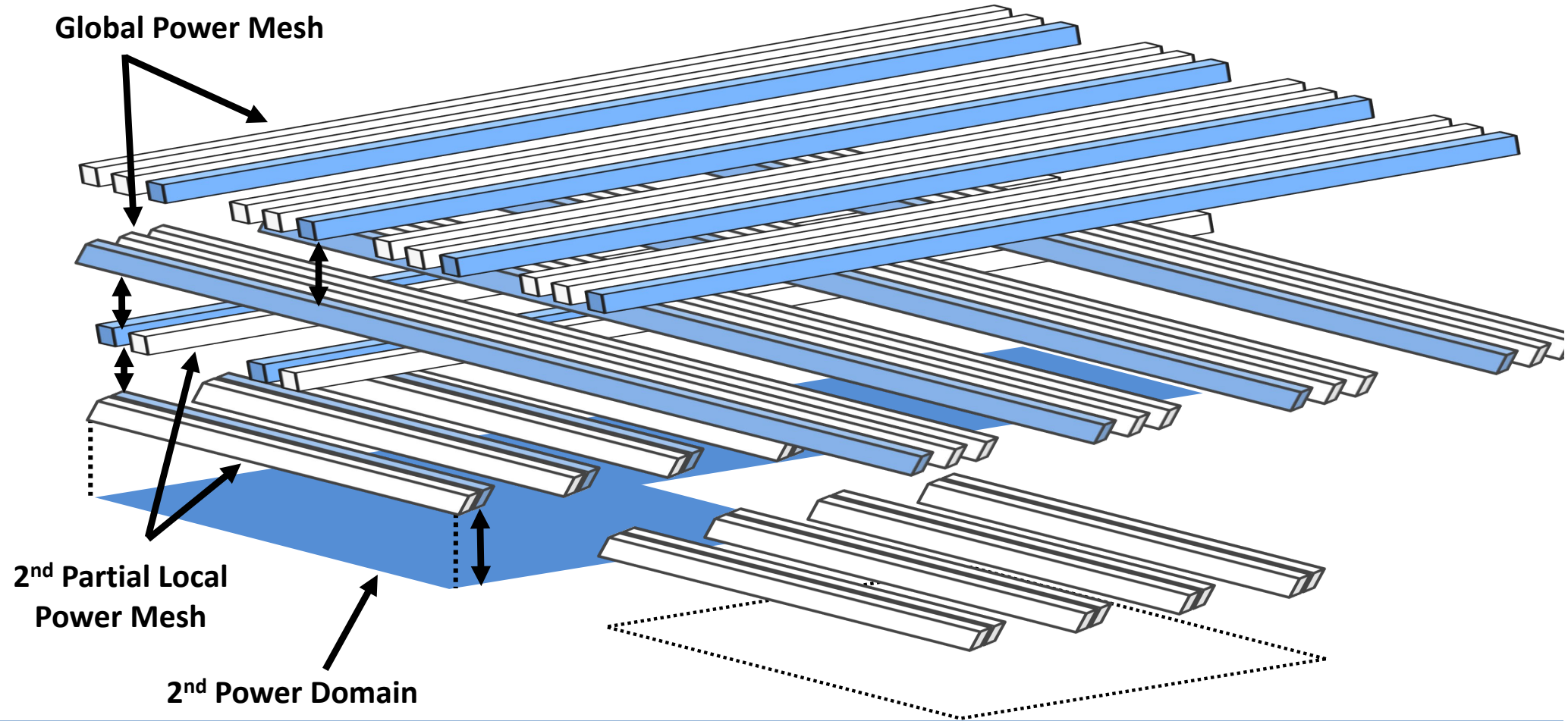
CX-1863.0019

Patent Overview – One Embodiment of The '218 Patent



CX-1863.0020

Patent Overview – One Embodiment of The '218 Patent



CX-1863.0021

'218 Patent, Claims 1, 2-4 & 9

COMPLAINANTS' PROPOSED CONSTRUCTION	RESPONDENTS' PROPOSED CONSTRUCTION	KEY DISPUTE
Ordinary and customary meaning "a power mesh capable of distributing power to multiple power domains"	A power mesh distributed across the full area of the chip's circuitry for conducting external power into the chip	Whether the global power mesh must cover the full chip and conduct external power into the chip

The “Global Power Mesh” Distributes Power to Multiple Power Domains

1. Realtek’s construction reflects the intrinsic record
 - A “global power mesh” can distribute power to more than one power domain
 - “Global” does not require any specific geography
 - Realtek’s construction is not redundant
2. AMD’s construction wrongly imports limitations from the specification
3. AMD’s construction is contrary to the intrinsic record
 - A chip can have more than one global power mesh
 - The specification teaches the need to save space
 - There is no requirement that the global power mesh is “for conducting external power”

1 Realtek's Construction Reflects the Intrinsic Record

'245 '218 '582

Realtek's construction: "a power mesh capable of distributing power to multiple power domains"

(57)

ABSTRACT

The invention discloses a power mesh arrangement method utilized in an integrated circuit having multiple power domains. The arrangement method includes: forming a first partial local power mesh according to a position of a first power domain; forming a second partial local power mesh according to a position of a second power domain; **forming a global power mesh, utilized for providing powers needed by the first and the second power domains;** coupling the first partial local power mesh to the global power mesh and the first power domain; and coupling the second partial local power mesh to the global power mesh and the second power domain.

'218 Patent at Abstract

"forming a global power mesh, utilized for providing powers needed by the first and the second power domains"

- Global power mesh is "global" because it "provid[es] powers needed by the first and second power domains"
- "Global" does not require any specific geography

1 Realtek's Construction Reflects the Intrinsic Record

'245 '218 '582

Realtek's construction: "a power mesh capable of distributing power to multiple power domains"

Please refer to FIG. 3 which shows a schematic diagram illustrating a local power mesh according to one embodiment of the invention. As shown in FIG. 3, the local power mesh can be partitioned into two different partial local power meshes 310, 320 at the positions corresponding to the positions of the power domains 110, 120. In one embodiment of the inven-

induces electrical uncertainty. Each of the partial local power meshes 310, 320 comprises a plurality of horizontal power supply wires and a plurality of vertical power supply wires. Please note that, as each of the partial local power meshes 310, 320 is only used to supply the powers needed by the power domains 110, 120, each of the horizontal and the vertical power supply wires only needs to comprise one ground wire and one power wire. For example, the partial

"Figure 3 which shows . . . a local power mesh according to one embodiment of the invention"

"Each of the partial local power meshes 310, 320 is only used to supply the powers needed by the power domains 110, 120"

'218 Patent at 3:33-38, 3:49-56

1 Realtek's Construction Reflects the Intrinsic Record – Realtek's Construction Is Not Redundant

'245 '218 '582

Realtek's construction: "a power mesh capable of distributing power to multiple power domains"

12. A power routing structure applied in an integrated circuit having multiple power domains, comprising:

* * *

a global power mesh, coupling to the first local power mesh and the second local power mesh, to provide the power needed by the first power domain and the second domain separately;

The "coupling" "provide[s] the power needed by the first power domain and the second domain separately"

'218 Patent at Claim 12

1 AMD's construction wrongly imports limitations from the specification

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The Federal Circuit Strongly Condemns Effort to Import Limitations from the Embodiments into the Claims



“While we read claims in view of the specification, of which they are a part, we do not read limitations from the embodiments in the specification into the claims.”

Hill-Rom Services, Inc. v. Stryker Corp., 755 F.3d 1367, 1371-72 (Fed. Cir. 2014)



“The patentee is entitled to the full scope of his claims, and we will not limit him to his preferred embodiment or import a limitation from the specification into the claims.”

Kara Tech. Inc. v. Stamps.com Inc., 582 F.3d 1341, 1348 (Fed. Cir. 2009)

1 AMD's construction wrongly imports limitations from the specification

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AMD's construction: “. . . distributed across the full area of the chip's circuitry”

Please refer to FIG. 4 which shows a schematic diagram illustrating a global power mesh 400 according to one embodiment of the invention. As shown in FIG. 4, the global power mesh 400 also comprises a web-like structure. Each global power mesh also comprises a plurality of horizontal power supply wires and a plurality of vertical power supply wires that are evenly distributed on top of the chip circuitry. In

➤ In one embodiment “each global power mesh” is “on top of the chip circuitry”

- AMD may not import this limitation
- Also, the limitation does not require covering the entire area of the circuitry

➤ AMD impermissibly seeks to import a limitation not even recited in the specification

'218 Patent at 4:19–25

1

AMD's construction is contrary to the intrinsic record

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AMD's construction: “. . . distributed across the full area of the chip's circuitry”

Please refer to FIG. 4 which shows a schematic diagram illustrating a global power mesh 400 according to one embodiment of the invention. As shown in FIG. 4, the global power mesh 400 also comprises a web-like structure. Each global power mesh also comprises a plurality of horizontal power supply wires and a plurality of vertical power supply wires that are evenly distributed on top of the chip circuitry. In

- “Each global power mesh”
- Certain embodiments allow multiple global power meshes on a chip
- A chip with multiple global power meshes would not have each global power mesh distributed across its entire circuitry

'218 Patent at 4:19–25

1

AMD's construction is contrary to the intrinsic record

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AMD's construction: “. . . distributed across the full area of the chip's circuitry”

It should be noted that in comparison with the embodiment of the invention illustrated in FIG. 6, implementing the global power mesh that comprises two power wires and one common ground wire directly in the metal layers M5, M6 will consume a larger area on the metal layers M5, M6. But, as the global power mesh uses only one common ground wire to supply the ground potential to the various power domains, such implementation will not waste excess large area.

➤ The desire not to “waste [an] excess large area” is inconsistent with AMD's construction

- “Consum[ing] a larger area” is disfavored
- The global power mesh only extends as far across the circuitry as needed

'218 Patent at 6:33-40.

1 AMD's construction is contrary to the intrinsic record

'245 '218 '582



Disavowal requires a “clear and unmistakable disavowal of scope during prosecution” by the applicant.

Purdue Pharma L.P. v. Endo Pharms., Inc., 438 F.3d 1123, 1136 (Fed. Cir. 2006)



Disavowal does not apply where “alleged disavowal of claim scope is ambiguous.”

Omega Eng'g, Inc. v. Raytek Corp., 334 F.3d 1314, 1324 (Fed. Cir. 2003)

1 AMD's construction is contrary to the intrinsic record

'245 '218 '582



AMD's construction: "... for conducting external power into the chip"

Action), the Examiner equates the global power mesh 400 and the local power mesh 300 of the present application as being comparable to the second power grid 22 and the first power grid 21 of Chen (FIG. 2). Applicant disagrees. In the present application (see paragraph [0020], for

of Chen (FIG. 2). Applicant disagrees. In the present application (see paragraph [0020], for example), the global power mesh 400 couples to the external power (such as: by way of the I/O pin of the chip) to conduct the external power into the chip while the local power mesh 300 couples to the global power mesh 400 and the chip circuitry. In other words, the internal circuits

In contrast, Chen has no electrical connections between the second power grid 22 and the first power grid 21 and no electrical connections between the VDD_g power network 11 and the VDD_i-VDD_n power networks 15 (see FIGS. 1 and 2). In addition, the VDD_g power network 11 and the VDD_i-VDD_n power networks 15 respectively have their own power sources.

AMD Ex. 107 at RLTK1350_002282

- Examiner equated Chen's power grid 22 and power grid 21 to the global power mesh and partial local power meshes
- Realtek explained that its invention requires connections between the global power mesh and the partial local power meshes
- Chen has no connections between its power grids

1 AMD's construction is contrary to the intrinsic record

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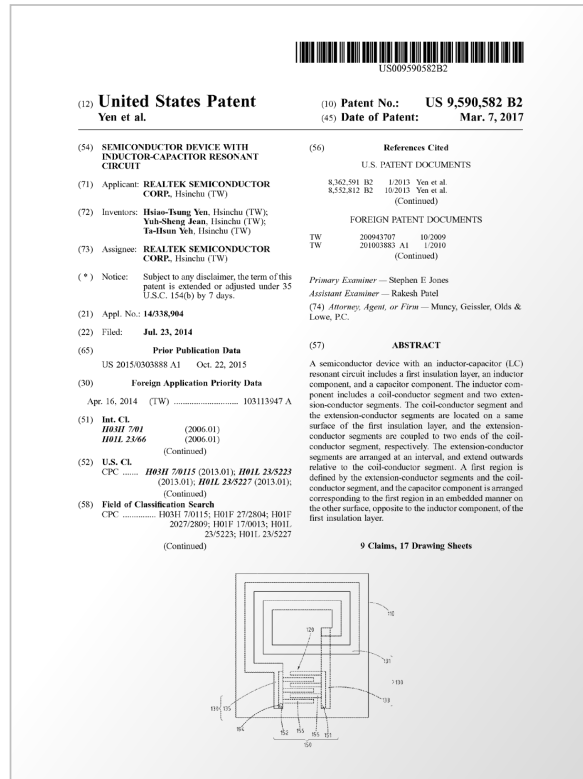
AMD's construction: "... for conducting external power into the chip"

wires that are evenly distributed on top of the chip circuitry. In one embodiment of the invention, the global power mesh 400 is distributed just above the local power mesh 300 so that the global power mesh 400 can conduct the external power into the chip by via to couple to the local power mesh 300 located below.

- "In one embodiment . . . The global power mesh 400 *can* conduct the external power to the chip"
- The claims do not require that functionality

'218 Patent at 4:25–30

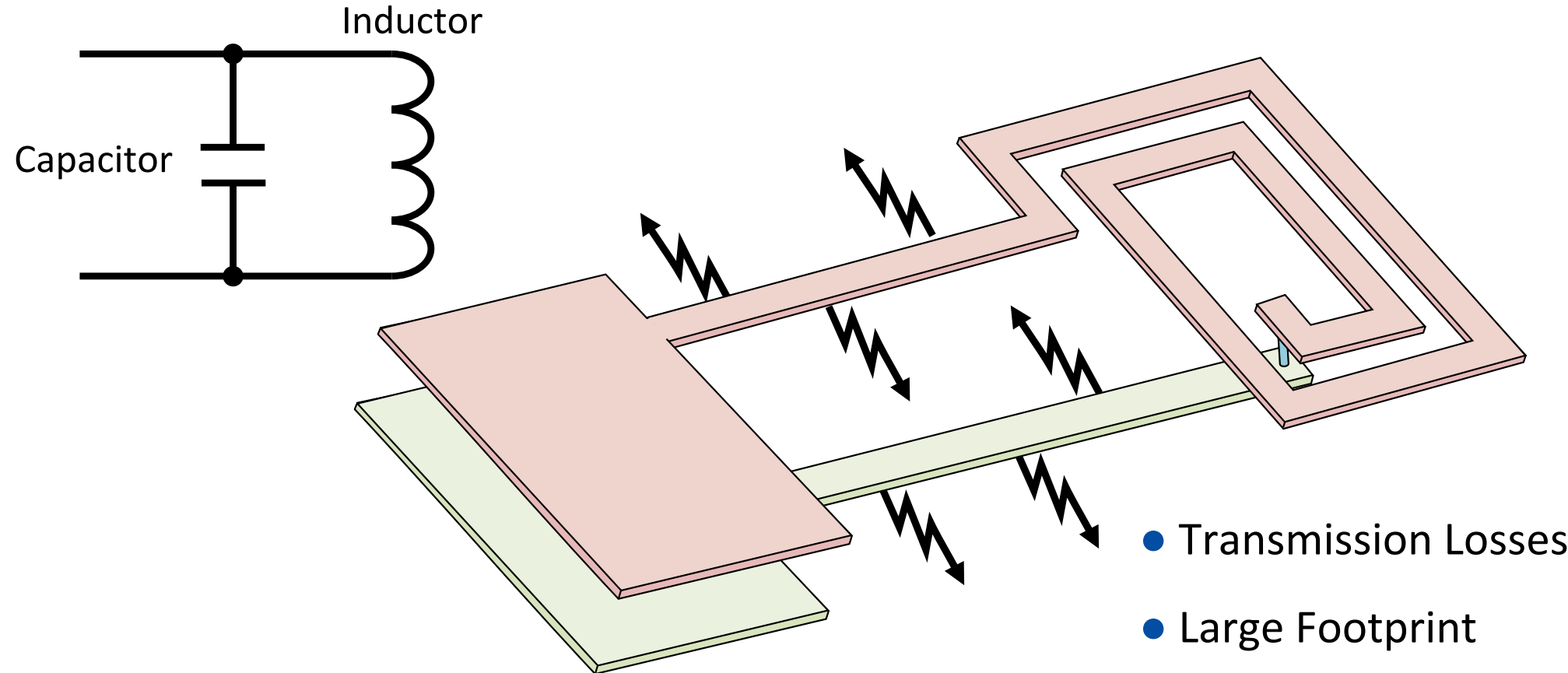
The '582 Patent



'582 Patent

Semiconductor Devices with Inductor-Capacitor Resonant Circuit

- Issue Date: March 7, 2017
- Inventors: Hsiao-Tsung Yen, Yuh-Sheng Jean, Ta-Hsun Yeh
- Claims priority to an April 16, 2014 Taiwanese application



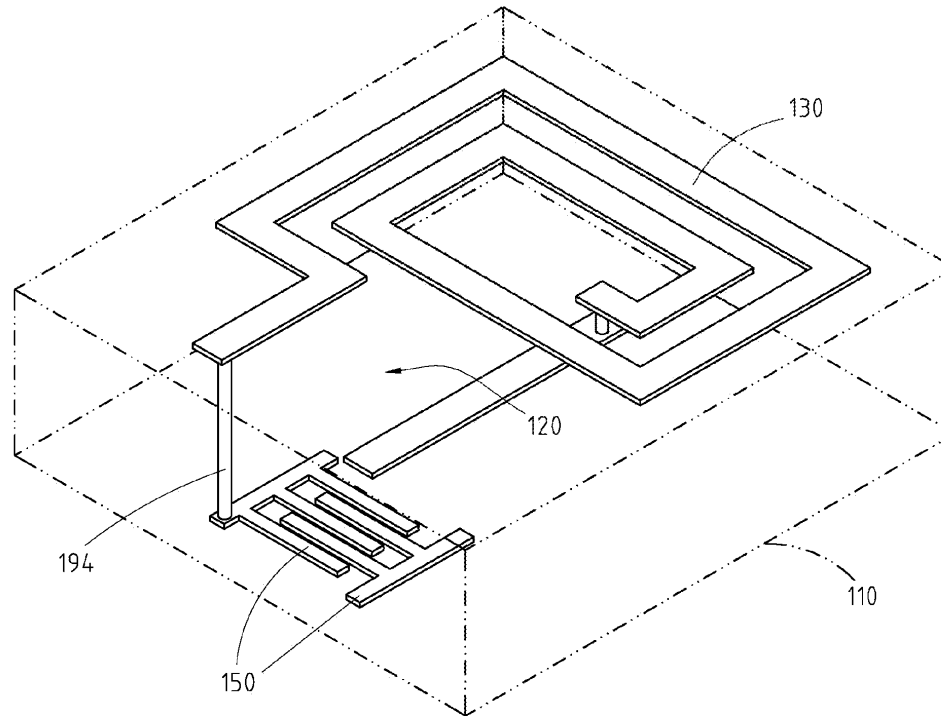
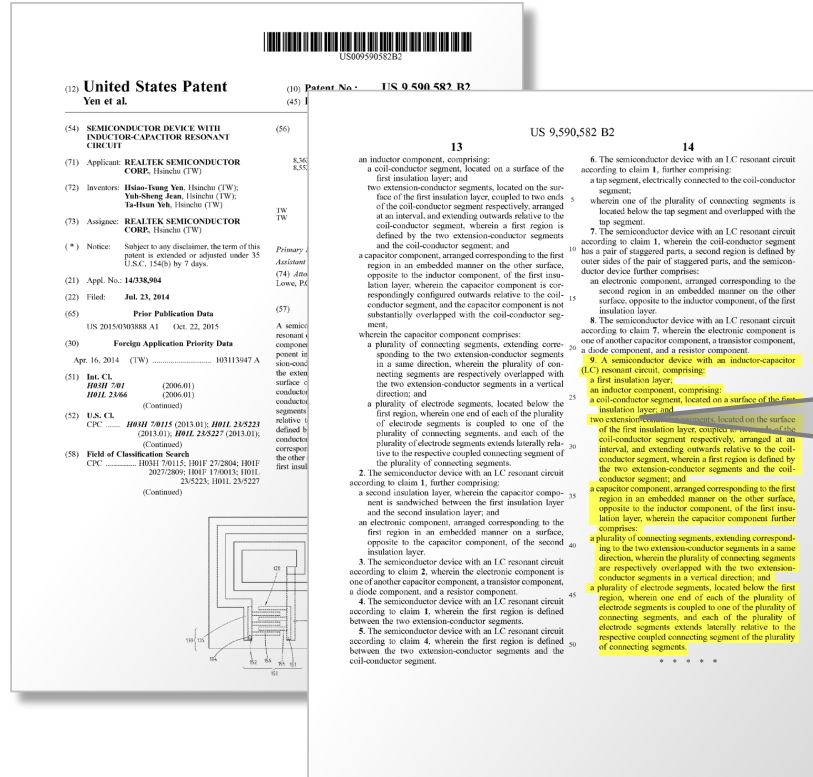


FIG. 1

- The '582 Patent solves this problem through innovative positioning of a carefully structured capacitor component
- It reduces transmission losses, simplifies the arrangement of interconnecting wires, and reduces the overall size.

Patent Overview – The '582 Patent

'245 '218 '582



9. A semiconductor device with an inductor-capacitor (LC) resonant circuit, comprising:
a first insulation layer;
an inductor component, comprising:
a **coil-conductor segment**, located on a surface of the first insulation layer; and
two **extension-conductor segments**, located on the surface of the first insulation layer, coupled to two ends of the **coil-conductor segment** respectively, arranged at an interval, and extending outwards relative to the **coil-conductor segment**, wherein a first region is defined by the two **extension-conductor segments** and the **coil-conductor segment**; and
a **capacitor component**, arranged corresponding to the first region in an embedded manner on the other surface, opposite to the inductor component, of the first insulation layer, wherein the **capacitor component** further comprises:
a plurality of connecting segments, extending corresponding to the two **extension-conductor segments** in a same direction, wherein the plurality of connecting segments are respectively overlapped with the two **extension-conductor segments** in a vertical direction; and
a plurality of electrode segments, located below the first region, wherein one end of each of the plurality of electrode segments is coupled to one of the plurality of connecting segments, and each of the plurality of electrode segments extends laterally relative to the respective coupled connecting segment of the plurality of connecting segments.

'582 Patent at Claim 9

2 3 Extension-Conductor and Coil-Conductor Segments

'245 '218 '582

'582 Patent, Claims 1, 2-4 & 9

“Extension-Conductor Segments”

COMPLAINANTS' PROPOSED CONSTRUCTION	RESPONDENTS' PROPOSED CONSTRUCTION	KEY DISPUTE
Ordinary and customary meaning	Input/output parts for receiving or transmitting a signal	Where the two extension-conductor segments begin

“Coil-Conductor Segment”

COMPLAINANTS' PROPOSED CONSTRUCTION	RESPONDENTS' PROPOSED CONSTRUCTION	KEY DISPUTE
“the portion of the inductor that forms any part of the coil”	“induction part for electromagnetic induction”	Whether the coil-conductor segment includes the entire coil

**The shaded boxes
are part of the coil-
conductor segment**

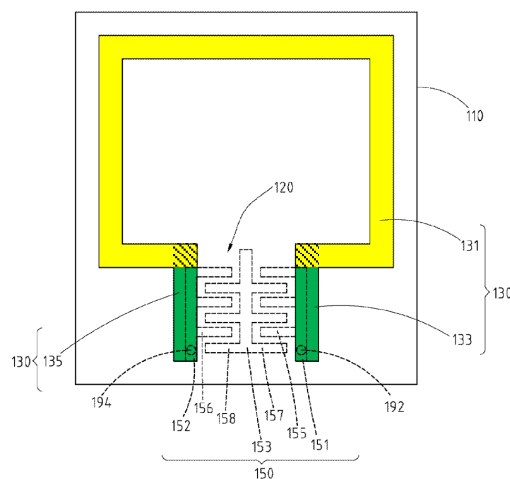


FIG. 5

1. Extension-Conductor Segment: Extend Outward from the Coil-Conductor AND Perpendicular to Joining Position
2. AMD's construction is improper
 - Contrary to intrinsic evidence
 - Impermissibly imports limitations and unclaimed functional limitations
 - Does not resolve the parties' dispute
3. Realtek's construction
 - Reflects the intrinsic evidence
 - Supported by AMD's own documents

1. Perpendicular to the **Joining Position**

- **Joining Position is Between** the Coil-Conductor Segment End and the Extension-Conductor Segments

2. **Extend Outward** from the Coil-Conductor Segment

- Perpendicular to **Joining Position**

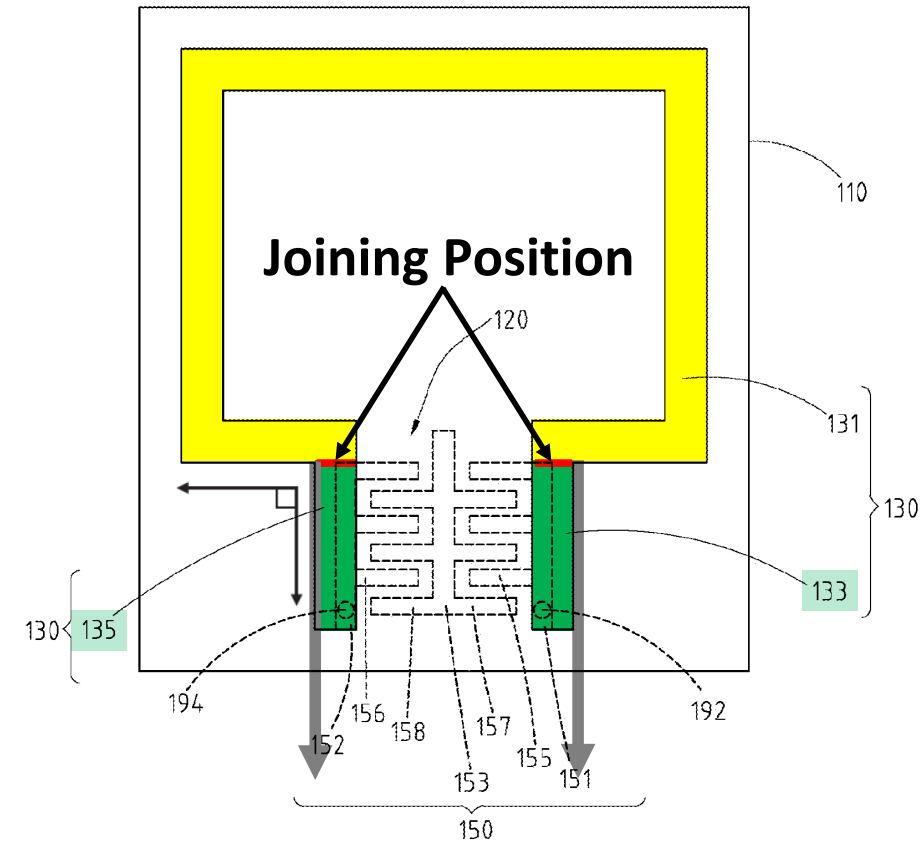


FIG. 5

2

3

Dispute Depicted Visually – Realtek's Construction

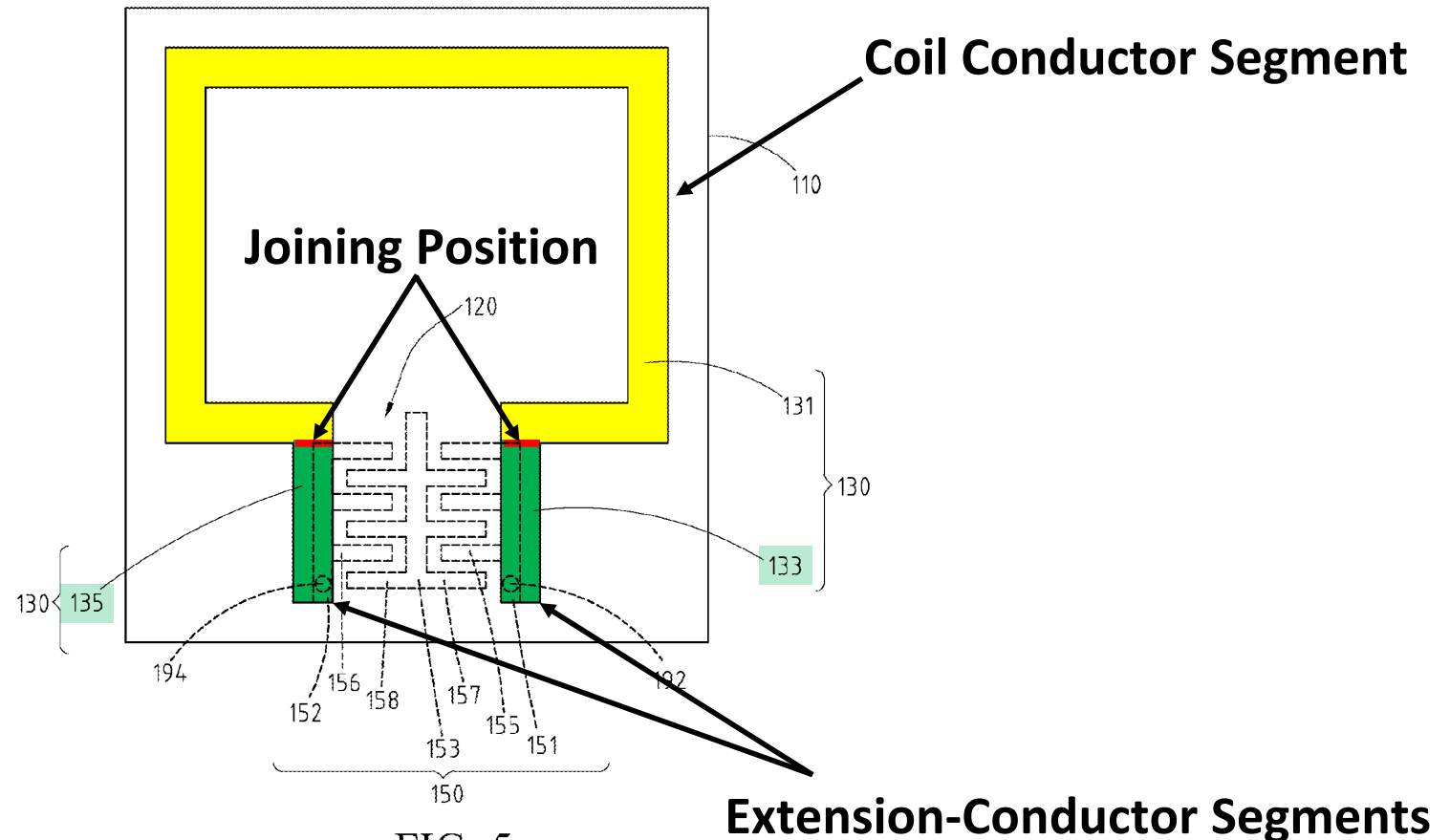
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Realtek's
Construction
Satisfies:

1. Perpendicular
to Joining
Position
2. Extend
Outward from
Coil-Conductor
Segment



2

3

Dispute Depicted Visually – AMD's Construction

'245

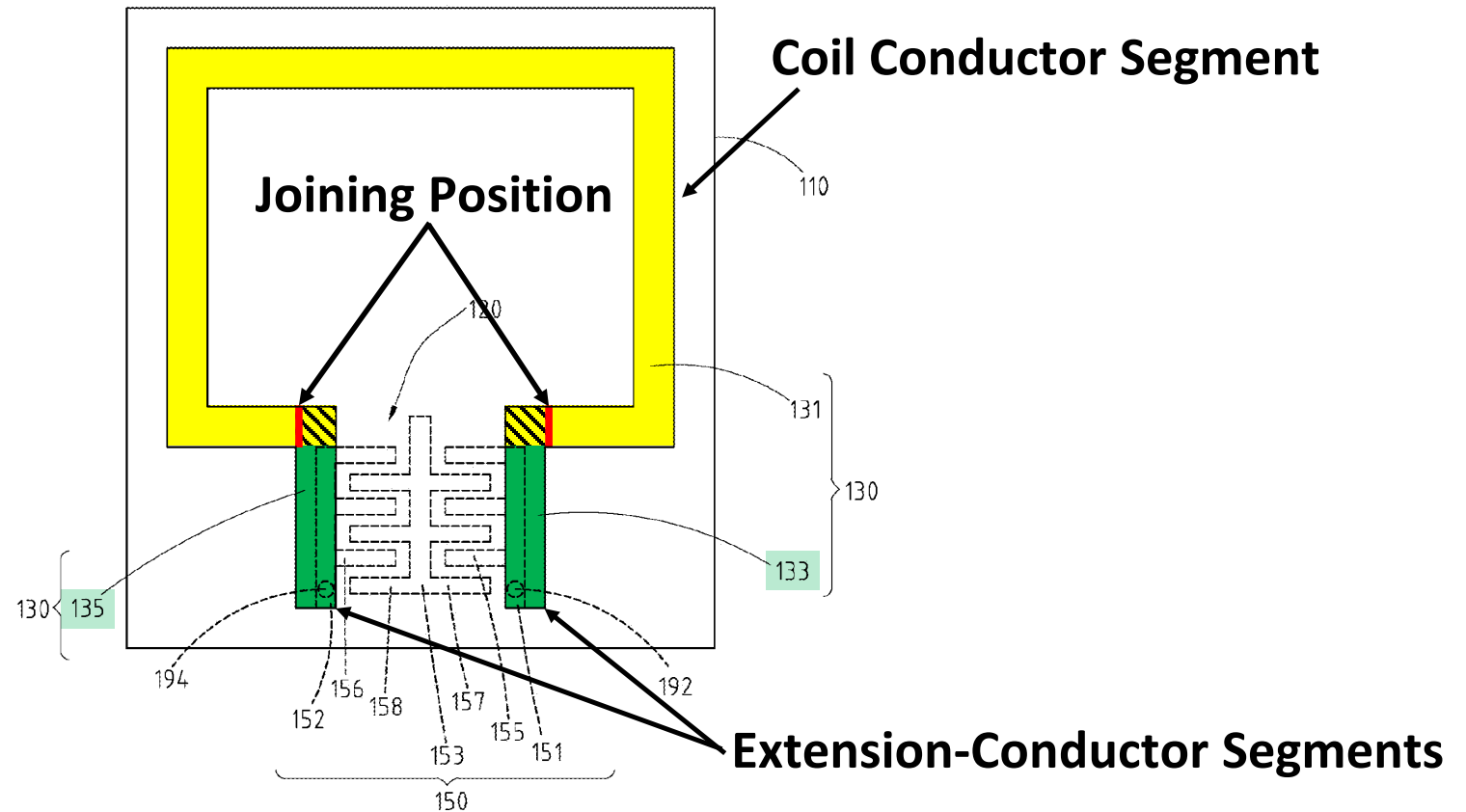
'218

'582

Input/output parts
for receiving or
transmitting a
signal

Not Perpendicular;

Not Extending
Outward



2

3

Dispute Depicted Visually

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Whether the shaded boxes are Part of the Coil Conductor Segment or the Extension-Conductor Segments

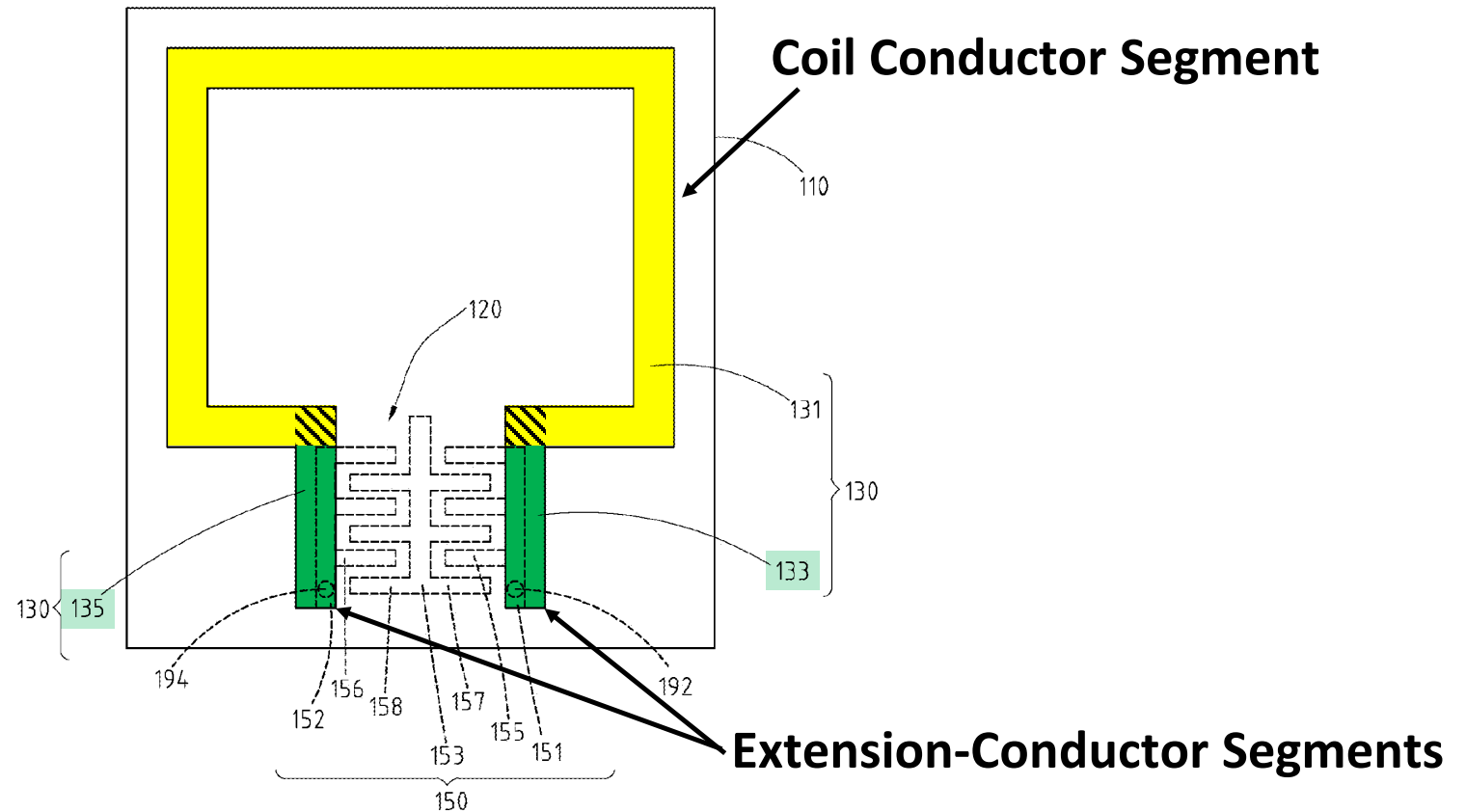


FIG. 5

Claim 1: "Extending outwards relative to a coil-conductor segment"

- Two extension-conductor segments
- Extending outwards relative to the coil-conductor segment

1. A semiconductor device with an inductor-capacitor (LC) resonant circuit, comprising:
a first insulation layer;
an inductor component, comprising:
a coil-conductor segment, located on a surface of the first insulation layer; and
two extension-conductor segments, located on the surface of the first insulation layer, coupled to two ends of the coil-conductor segment respectively, arranged at an interval, and extending outwards relative to the coil-conductor segment, wherein a first region is defined by the two extension-conductor segments and the coil-conductor segment; and

'582 Patent

Claim 1: "Extending outwards relative to a coil-conductor segment"

- "Extend outwards" from the "two ends of the coil-conductor segment"



the two extension-conductor segments 133 and 135 are directly connected to the two ends of the coil-conductor segment 131 and extend outwards relative to the coil-conductor segment 131 from the two ends of the coil-conductor segment 131. In other words, the extension-conductor segments 133 and 135 extend in a direction away from the coil-conductor segment 131.

'582 Patent at 3:36-42

2

3

Realtek's Construction Is Supported by the Intrinsic Evidence

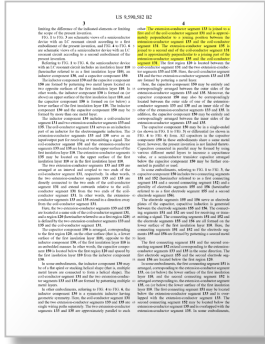
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Claim 1: "Extending outwards relative to a coil-conductor segment"

Perpendicular to the Joining Position



other. The extension-conductor segment 133 is joined to a first end of the coil-conductor segment 131 and is approximately perpendicular to a joining position between the extension-conductor segment 133 and the coil-conductor segment 131. The extension-conductor segment 135 is joined to a second end of the coil-conductor segment 131 and is approximately perpendicular to a joining part of the extension-conductor segment 135 and the coil-conductor segment 131. The first region 120 is located between the coil-conductor segment 131 and the two extension-conductor segments 133 and 135. Here, the coil-conductor segment 131 and the two extension-conductor segments 133 and 135 are formed by patterning a metal layer.

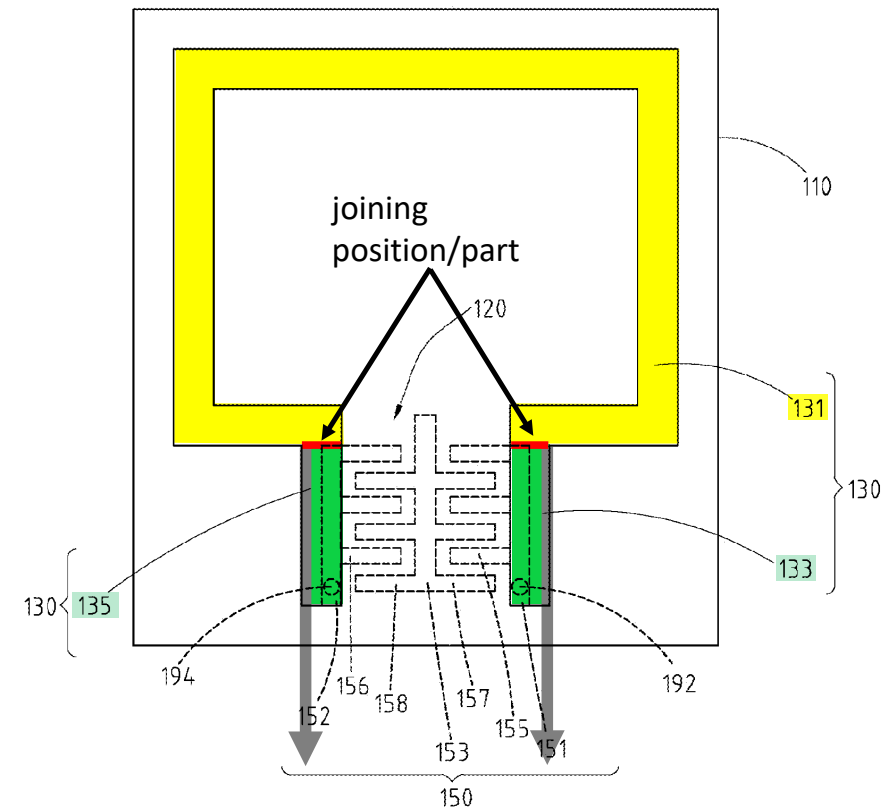


FIG. 5

2

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AMD's Construction Is Contrary to the Intrinsic Evidence

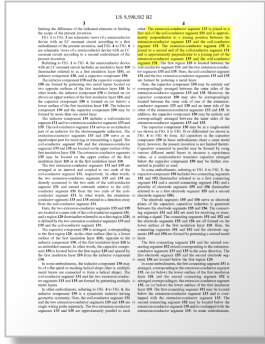
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Claim 1: "Extending outwards relative to a coil-conductor segment"

Perpendicular to the Joining Position



other. The extension-conductor segment 133 is joined to a first end of the coil-conductor segment 131 and is approximately perpendicular to a joining position between the extension-conductor segment 133 and the coil-conductor segment 131. The extension-conductor segment 135 is joined to a second end of the coil-conductor segment 131 and is approximately perpendicular to a joining part of the extension-conductor segment 135 and the coil-conductor segment 131. The first region 120 is located between the coil-conductor segment 131 and the two extension-conductor segments 133 and 135. Here, the coil-conductor segment 131 and the two extension-conductor segments 133 and 135 are formed by patterning a metal layer.

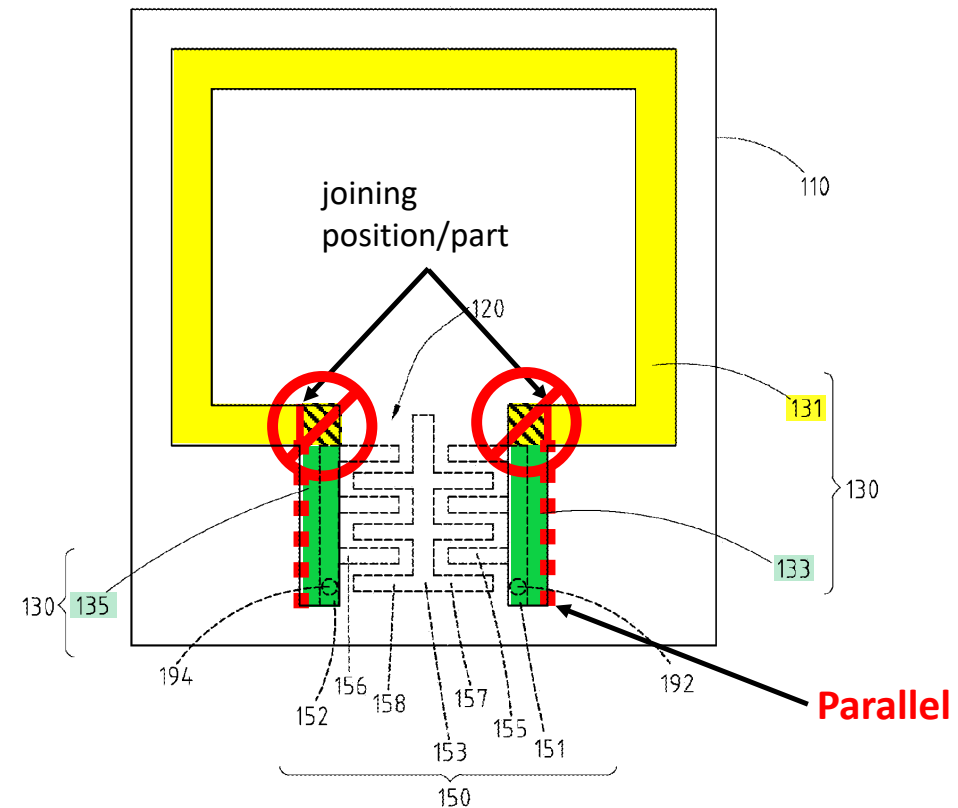


FIG. 5

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AMD's Construction Is Contrary to the Intrinsic Evidence

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Claim 1: "Extending outwards relative to a coil-conductor segment"

Perpendicular to the Joining Position

Realtek's Construction

Outward

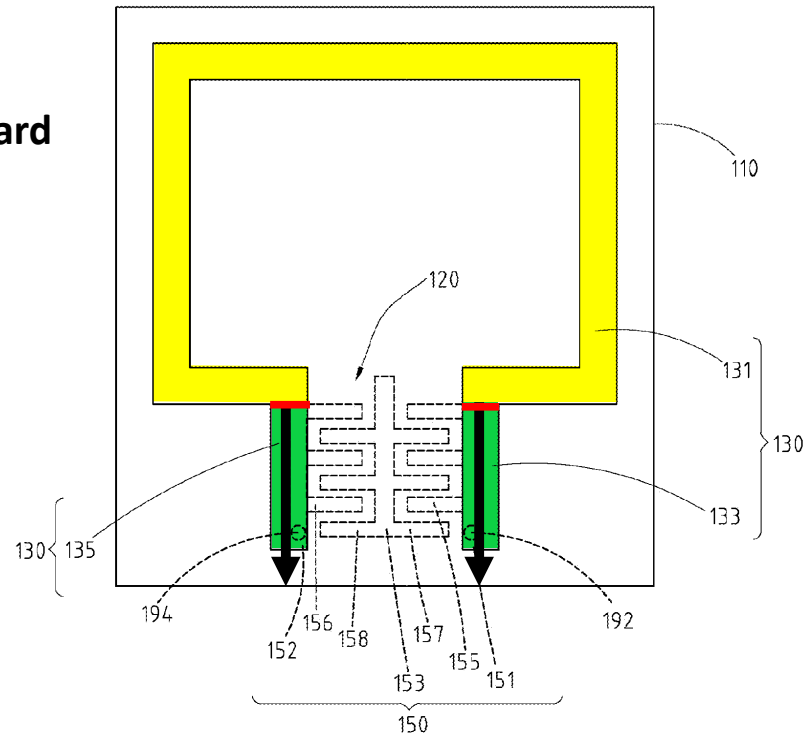


FIG. 5

AMD's Construction

Inward

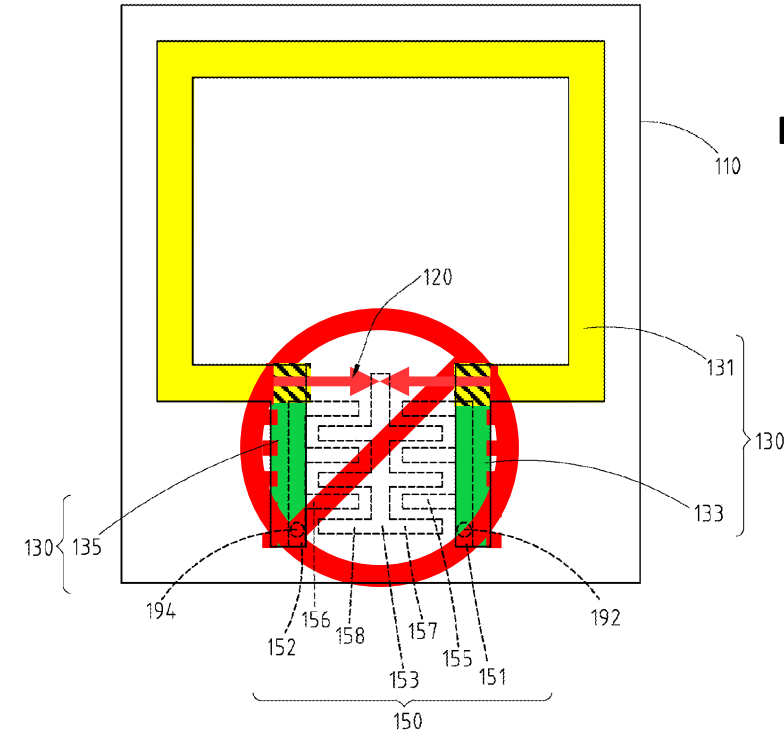


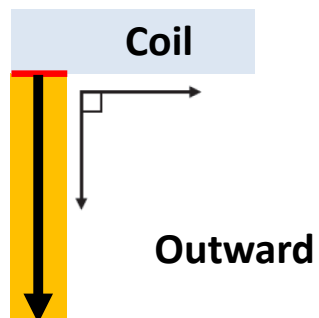
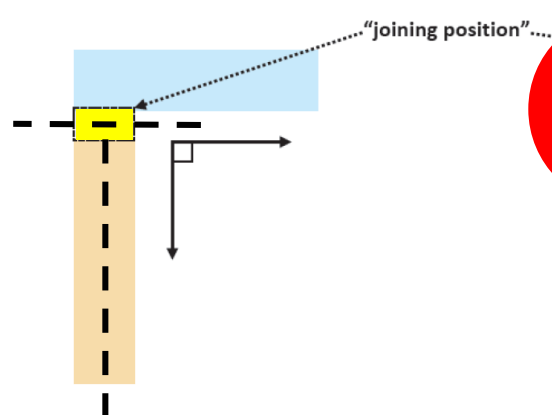
FIG. 5

'582 Patent at Fig. 5 (annotated).

2 3 AMD's Construction Is Contrary to the Intrinsic Evidence

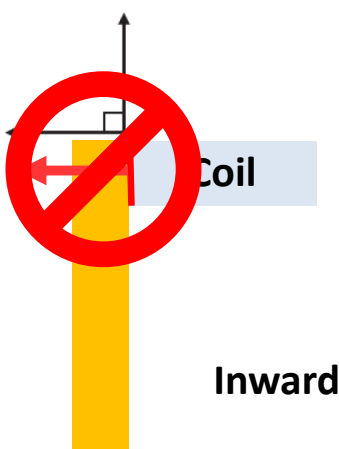
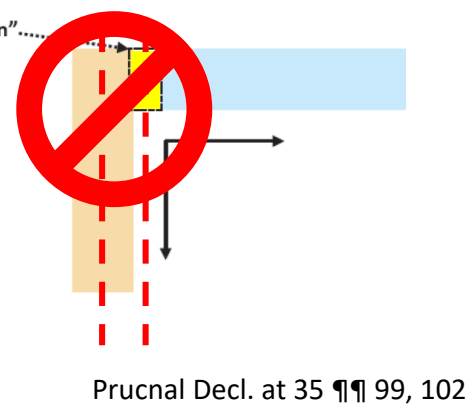
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Realtek's Construction



Outward

AMD's Construction



Inward

- AMD's expert created the images reproduced here
- AMD orients the extension conductor segments parallel to the joining position, not perpendicular
- The joining position cannot be an arbitrary box
- With proper joining position, AMD extends the extension conductor segments inwards to the coil

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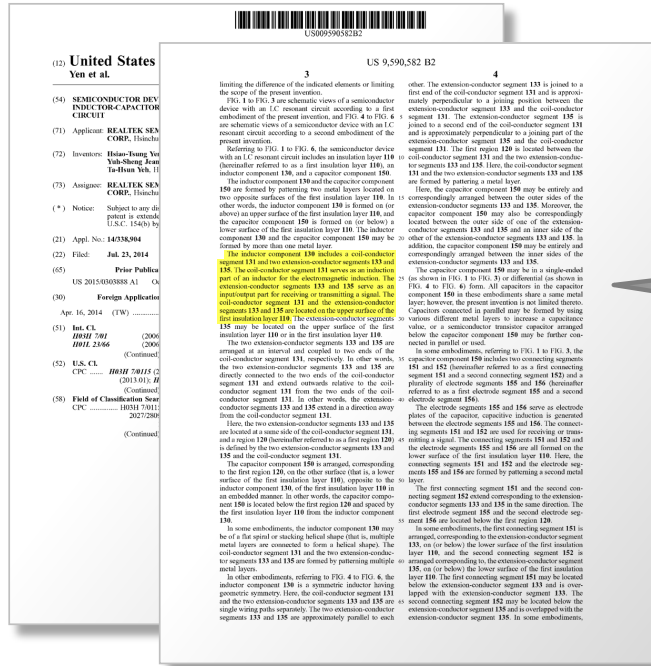
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AMD Wrongly Imports Functional Limitations from the Specification – “Input/Output”

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“ The inductor component 130 includes a coil-conductor segment 131 and two extension-conductor segments 133 and 135. The coil conductor segment 131 serves as an induction part of an inductor for the electromagnetic induction. The extension-conductor segments 133 and 135 serve as an input/output part for receiving or transmitting a signal”

- There are not definitions
- AMD is improperly trying to import functional limitations from the specification

AMD proposes functional limitations, which violates Federal Circuit precedent



“Where the function is not recited in the claim itself by the patentee, we do not import such a limitation.”

Ecolab v. Envirochem, 264 F.3d 1358, 1367 (Fed.Cir. 2001)



“[F]unctions do not become part of the claimed structure unless claimed as such.”

Toro Co. v. White Consol. Indus., Inc., 383 F.3d 1326, 1371 (Fed. Cir. 2004)

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AMD Wrongly Imports Functional Limitations from the Specification – “Input/Output”

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12) United States
Yen et al.

13) SEMICONDUCTOR DEVICE
INDUCTOR-CAPACITOR
CIRCUIT

14) Applicant: REALTEK SEN
CORP., Hsinchu

15) Inventors: Hsin-Tung Yen
Yuh-Sheng Iann
Yu-Fan Yeh, U.

16) Assignee: REALTEK SEN
CORP., Hsinchu

17) Notice: Subject to any dis
posit in extend
U.S.C. 154(b) by

18) Appl. No.: 14/783,804

19) Filed: Jul. 23, 2014

20) Prior Publica
US 2015/0100385 A1

21) Foreign Application
Apr. 16, 2014, (TW)

22) Int. CL
H01H 7/01
H01L 23/66

23) U.S. CL
CPC: H01H 7/015 (2
2013.01); H

24) Field of Classification New
CPC: H01H 7/011
2017.01

(Continued)

US 9,590,582 B2

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limiting the difference of the indicated elements or limiting
the scope of the present invention.
FIG. 1 to FIG. 3 are schematic views of a semiconductor
device with an LC resonant circuit according to a first
embodiment of the present invention, and FIG. 4 to FIG. 6
are schematic views of a semiconductor device with an LC
resonant circuit according to a second embodiment of the
present invention.
Referring to FIG. 1 to FIG. 6, the semiconductor device
with an LC resonant circuit includes an insulation layer 110
(hereinafter referred to as a first insulation layer 110), an
inductor component 130, and a capacitor component 150.
The inductor component 130 and the capacitor component 150
are formed by patterning two metal layers located on
two opposite surfaces of the first insulation layer 110. In
other words, the inductor component 130 is formed on (or
above) an upper surface of the first insulation layer 110, and
the capacitor component 150 is formed on (or below) a
lower surface of the first insulation layer 110. The inductor
component 130 and the capacitor component 150 may be
formed by more than one metal layer.
The inductor component 130 includes a coil-conductor
segment 131 and two extension-conductor segments 133 and
135. The coil-conductor segment 131 serves as an inductive
part of an inductor for the electromagnetic induction. The
extension-conductor segments 133 and 135 serve as an
input/output part for receiving or transmitting a signal. The
coil-conductor segment 131 and the extension-conductor
segments 133 and 135 are located on the upper surface of the
first insulation layer 110. The extension-conductor segments
133 and 135 may be located on the upper surface of the first
insulation layer 110 or in the first insulation layer 110.
The two extension-conductor segments 133 and 135 are
arranged at an interval and coupled to two ends of the
coil-conductor segment 131, respectively. In other words,
the two extension-conductor segments 133 and 135 are
directly connected to the two ends of the coil-conductor
segment 131 and extend outwards relative to the coil-
conductor segment 131. In other words, the extension-
conductor segments 133 and 135 extend in a direction away
from the coil-conductor segment 131.
Here, the two extension-conductor segments 133 and 135
are located at a same side of the coil-conductor segment 131,
and a region 120 (hereinafter referred to as a first region 120)
is defined by the two extension-conductor segments 133 and
135 and the coil-conductor segment 131.
The capacitor component 150 is arranged corresponding
to the first region 120, on the other surface (that is, a lower
surface of the first insulation layer 110), opposite to the
inductor component 130. In other words, the capacitor com-
ponent 150 is located below the first region 120 and spaced by
the first insulation layer 110 from the inductor component
130.
In some embodiments, the inductor component 130 may
be of a flat spiral or stacking helical shape (that is, multiple
metal layers are connected to form a helical shape). The
coil-conductor segment 131 and the two extension-conduc-
tor segments 133 and 135 are formed by patterning multiple
metal layers.
In other embodiments, referring to FIG. 4 to FIG. 6, the
inductor component 130 is a symmetric inductor having
geometric symmetry. Here, the coil-conductor segment 131
and the two extension-conductor segments 133 and 135 are
single wiring paths separately. The two extension-conductor
segments 133 and 135 are approximately parallel to each

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other. The extension-conductor segment 133 is joined to a
first end of the coil-conductor segment 131 and is approxi-
mately perpendicular to a joining position between the
extension-conductor segment 133 and the coil-conductor
segment 131. The extension-conductor segment 135 is
joined to a second end of the coil-conductor segment 131
and is approximately perpendicular to a joining part of the
extension-conductor segment 135 and the coil-conductor
segment 131. The first region 120 is located between the
coil-conductor segment 131 and the two extension-conduc-
tor segments 133 and 135. Here, the coil-conductor segment
131 and the two extension-conductor segments 133 and 135
are formed by patterning a metal layer.
Here, the capacitor component 150 may be entirely and
correspondingly arranged between the outer sides of the
extension-conductor segments 133 and 135. Moreover, the
capacitor component 150 may also be correspondingly
located between the outer side of one of the extension-
conductor segments 133 and 135 and an inner side of the
other of the extension-conductor segments 133 and 135. In
addition, the capacitor component 150 may be entirely and
correspondingly arranged between the inner sides of the
extension-conductor segments 133 and 135.
The capacitor component 150 may be in a single-ended
or shown in FIG. 1 to FIG. 3, or differential (as shown in
FIG. 4 to FIG. 6) form. All capacitors in the capacitor
component 150 in these embodiments share a same metal
layer; however, the present invention is not limited thereto.
Capacitors connected in parallel may be formed by using
various different metal layers to increase a capacitance
value, or a semiconductor transitive capacitor arranged
below the capacitor component 150 may be further con-
nected in parallel or used.
In some embodiments, referring to FIG. 1 to FIG. 3, the
capacitor component 150 includes two connecting segments
151 and 152 (hereinafter referred to as a first connecting
segment 151 and a second connecting segment 152) and a
plurality of electrode segments 155 and 156 (hereinafter
referred to as a first electrode segment 155 and a second
electrode segment 156).
The electrode segments 155 and 156 serve as electrode
plates of the capacitor, capacitive induction is generated
between the electrode segments 155 and 156. The connect-
ing segments 151 and 152 are used for receiving or trans-
mitting a signal. The connecting segments 151 and 152 and
the electrode segments 155 and 156 are all formed on the
lower surface of the first insulation layer 110. Here, the
connecting segments 151 and 152 and the electrode seg-
ments 155 and 156 are formed by patterning a second metal
layer.
The first connecting segment 151 and the second con-
necting segment 152 extend corresponding to the extension-
conductor segments 133 and 135 in the same direction. The
first electrode segment 155 and the second electrode seg-
ment 156 are located below the first region 120.
In some embodiments, the first connecting segment 151 is
arranged corresponding to the extension-conductor segment
133, on (or below) the lower surface of the first insulation
layer 110, and the second connecting segment 152 is
arranged corresponding to the extension-conductor segment
135, on (or below) the lower surface of the first insulation
layer 110. The first connecting segment 151 may be located
below the extension-conductor segment 133 and is over-
lapped with the extension-conductor segment 133. The
second connecting segment 152 may be located below the
extension-conductor segment 135 and is overlapped with the
extension-conductor segment 135. In some embodiments,

“ The inductor component 130 includes a coil-conductor segment 131 and two extension-conductor segments 133 and 135. The coil conductor segment 131 serves as an induction part of an inductor for the electromagnetic induction. The extension-conductor segments 133 and 135 serve as an input/output part for receiving or transmitting a signal”

➤ These functional descriptions are not part of the claims



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AMD Admits that its Proposed Constructions Do NOT Resolve the Dispute

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The Federal Circuit rejects proposed constructions that do not resolve the dispute



Constructions must resolve the parties' disputes regarding "the *scope* that should be encompassed by the claim language."

O2 Micro Intern. Ltd. v. Beyond Innovation Tech. Co., 521 F.3d 1351, 1361 (Fed. Cir. 2008)

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AMD Admits that its Proposed Constructions Do NOT Resolve the Dispute

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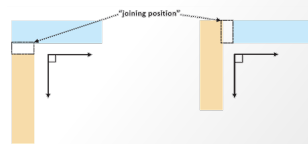
UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.
Before the Honorable Cameron R. Elliot
Administrative Law Judge

In the Matter of
CERTAIN COMPOSITE PRODUCTS

1. Plaintiff, Paul Inc.'s Initial Complaint, true, and all subsequent amendments. Although I am not expressed here, related litigation.

102. In this regard, the specification explains that the extension-conductor segment 133 is joined to a first end of the coil-conductor segment 131 and is approximately perpendicular to the joining position between the extension-conductor segment 133 and the coil-conductor segment 131. The extension-conductor segment 135 is joined to a second end of the coil-conductor segment 131 and is approximately perpendicular to the joining position between the extension-conductor segment 133 and the coil-conductor segment 131.

EX. E at 3:66-4:9; 3:33-40. But here too, the specification does not provide a clear statement that explains where the "ends" of the coil-conductor segment are located or where the "joining portion" is located. This language could be reasonably interpreted as being met by either version A or B above, as shown below:



103. Without any such clear guidance in the specification or figures, a POSITA would have understood that the decision of where to identify the end of the coil-conductor segment is a design choice, and as such either Version A or Version B of Fig. 5 shown above would be the claim language. This is another reason why I believe a POSITA would have understood AMD's proposed constructions to be the correct ones, as those constructions do not require determining where the coil-conductor segment ends but instead would correctly encompass either Version A or Version B in the color-coded figures above.

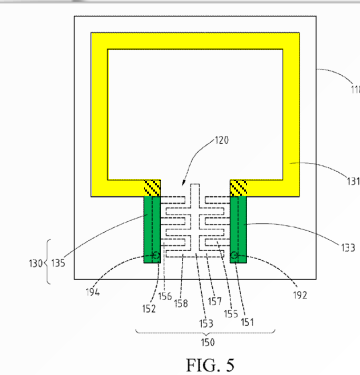


FIG. 5

“This is another reason why I believe a POSITA would have understood AMD’s proposed constructions to be the correct ones, as those constructions do not require determining where the coil-conductor segment ends but instead would correctly encompass either [AMD’s or Realtek’s constructions] in the color-coded figures above.”

Prucnal Decl. ¶103

➤ AMD concedes its constructions do not resolve the dispute



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Realtek's construction is supported by AMD's own documents

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AMD's own documents show that the shaded boxes are part of the coil-conductor segment

Decl. of Joshua Phinney ¶¶ 48-49 (Citing AMD-ITC-0188418)

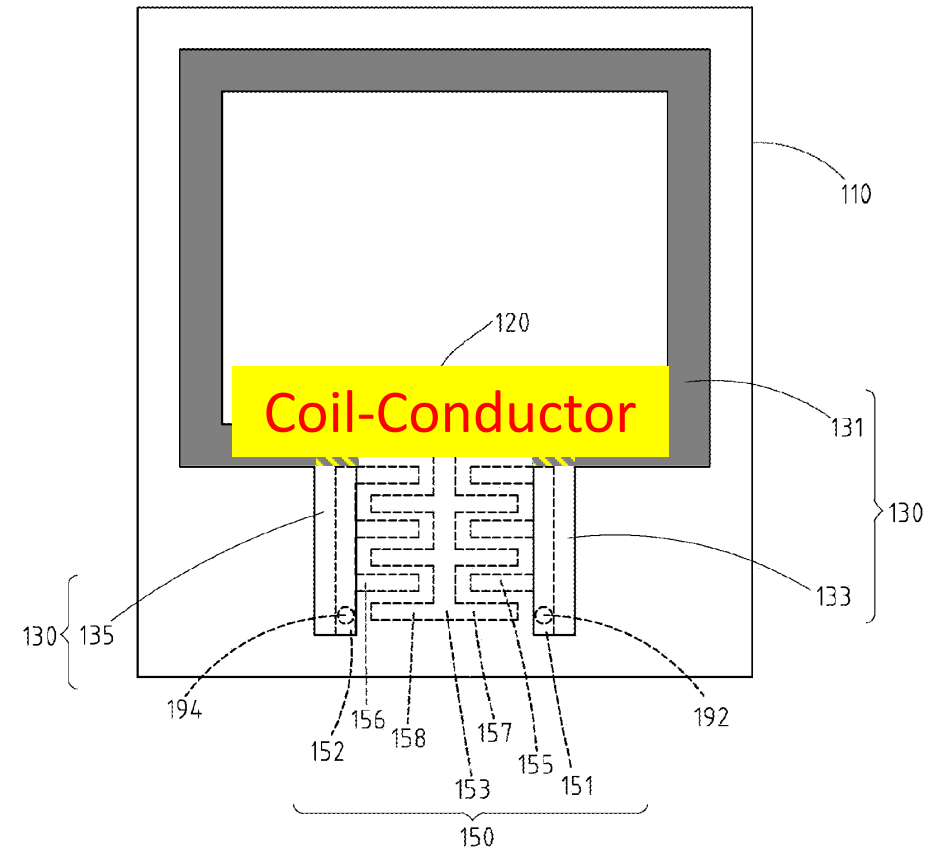


FIG. 5

'582 Patent, Claims 1, 2-4 & 9

COMPLAINANTS' PROPOSED CONSTRUCTION	RESPONDENTS' PROPOSED CONSTRUCTION	KEY DISPUTE
Ordinary and customary meaning: a component that includes one or more capacitors	One capacitor structure, as opposed to multiple capacitor structures separated by switches	Whether Realtek disavowed a capacitor component with multiple capacitors and multiple structures

The “Capacitor Component” Contains one or more Capacitors

1. AMD’s Construction is Incorrect
 - No disavowal
 - Contrary to the intrinsic record
 - Improper negative limitation
2. Realtek’s Construction reflects the intrinsic record

The Notice of Allowance Is Not a Disavowal

- The Examiner's statements are unilateral—not the product of discussions with Realtek
- The Examiner's statements are also based on obvious errors

The Federal Circuit Has Held that Unilateral Examiner Views do not Limit the Claims



“In sum, Procter & Gamble does not present any case law that stands for the proposition that an examiner’s unilateral statements in a Notice of Allowance constitute a clear and unambiguous disavowal of claim scope. Once again, the applicant has disavowed nothing. This court refuses to create a rule or presumption that the applicant in this case disavowed claim scope by silence.”

Salazar v. Procter & Gamble Co., 415 F.3d 1342, 1347 (Fed. Cir. 2005) (emphasis added)

- Realtek never agreed with, or even discussed, the Examiner’s views expressed in the Notice of Allowance
- As in *Salazar*, Realtek “disavowed nothing”

4 No Disavowal - Must Be Clear and Unmistakable

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Disavowal requires a “clear and unmistakable disavowal of scope during prosecution” by the applicant.

Purdue Pharma L.P. v. Endo Pharms., Inc., 438 F.3d 1123, 1136 (Fed. Cir. 2006)



Disavowal does not apply where “alleged disavowal of claim scope is ambiguous.”

Omega Eng'g, Inc. v. Raytek Corp., 334 F.3d 1314, 1324 (Fed. Cir. 2003)

The Examiner
Misquoted and
Misapplied the Claim
Language

- In the Notice of Allowance, the Examiner misquoted the allowed claims

Notice of Allowability (Nov. 22, 2016) at 2

- He then applied language not included in the claims
 - He analyzed overlap of the “capacitor component” rather than the “connecting segments”

Id.

AMD's proposed construction is contrary to the intrinsic record:

1. Reads out *every* preferred embodiment
2. Includes an unwarranted negative limitation.

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AMD's Proposed Construction Is Contrary to the Intrinsic Record – Improperly Excludes All Preferred Embodiments

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“The district court’s construction is incorrect because it reads out preferred embodiments.”

EPOS Technologies Ltd. v. Pegasus Technologies Ltd., 766 F.3d 1338, 1347 (Fed. Cir. 2014)

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AMD's Proposed Construction Is Contrary to the Intrinsic Record –The Specification Teaches Multiple Capacitors

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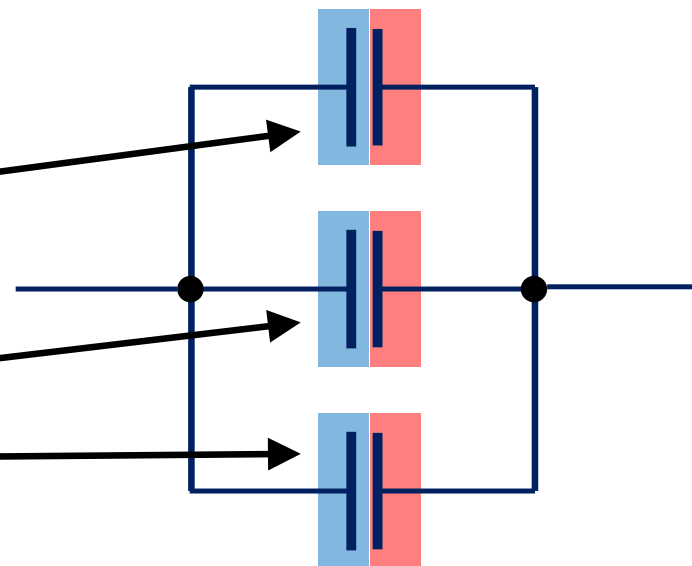
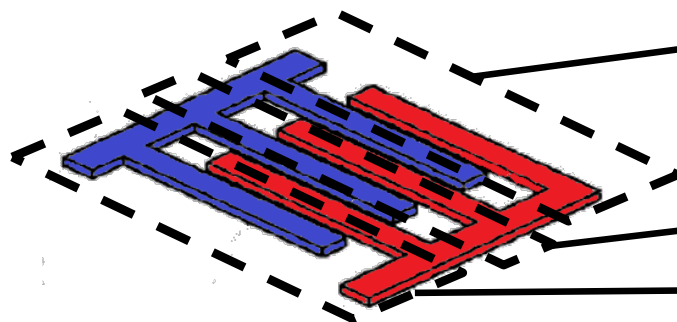
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AMD's Construction: "One capacitor structure, as opposed to multiple capacitor structures separated by switches"

The capacitor component **150** may be in a single-ended (as shown in FIG. 1 to FIG. 3) or differential (as shown in FIG. 4 to FIG. 6) form. All capacitors in the capacitor component **150** in these embodiments share a same metal layer; however, the present invention is not limited thereto.

➤ The capacitor component may have multiple capacitors.



'582 Patent at Fig. 3 (annotated).

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AMD's Proposed Construction Is Contrary to the Intrinsic Record –The Specification Teaches Multiple Capacitor Structures

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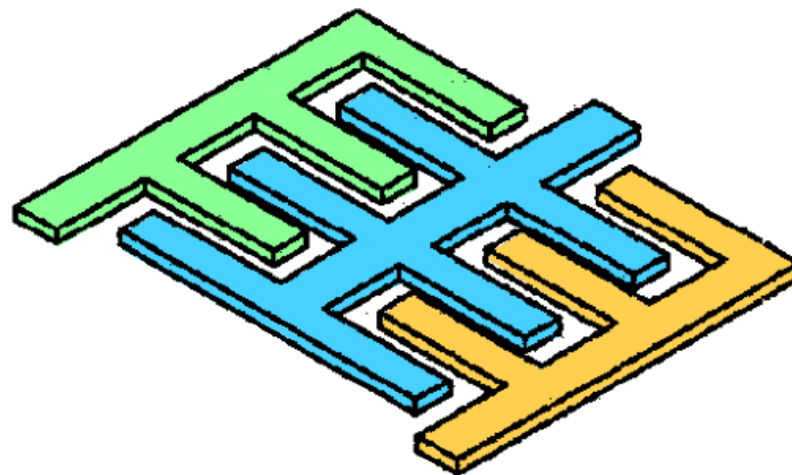
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AMD's Construction: "One capacitor structure, as opposed to multiple capacitor structures separated by switches"

The capacitor component **150** may be in a single-ended (as shown in FIG. 1 to FIG. 3) or differential (as shown in FIG. 4 to FIG. 6) form. All capacitors in the capacitor component **150** in these embodiments share a same metal layer; however, the present invention is not limited thereto.

➤ The capacitor component may comprise multiple physical structures.



'582 Patent at 4:24-28; Fig. 6 (annotated).

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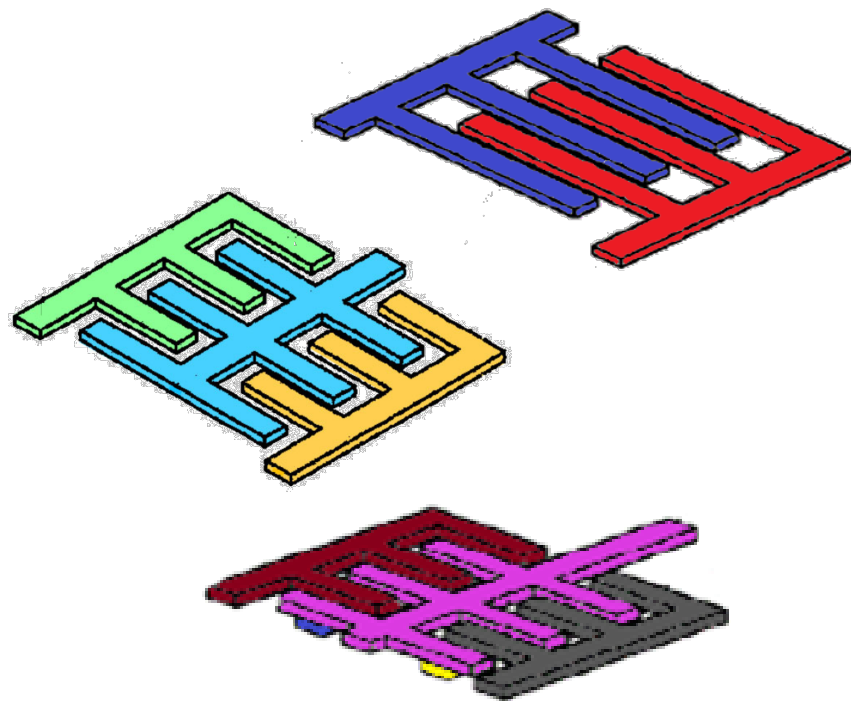
AMD's Proposed Construction Is Contrary to the Intrinsic Record – Improperly Excludes All Preferred Embodiments

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 AMD's Construction: "One capacitor structure, as opposed to multiple capacitor structures separated by switches"



'582 Patent Figs. 3, 6, 9, 12 (annotated).

- The capacitor components identified in the other embodiments comprise at least 2 structures (Figures 1–17).
- Thus, AMD's construction reads out preferred embodiments.

4 AMD's construction includes an improper negative limitation

'245 '218 '582



Construction: "One capacitor structure, as opposed to multiple capacitor structures separated by switches"



Negative limitations are disfavored if the "additional negative limitation finds no anchor in the explicit claim language."

Omega Eng'g, Inc, v. Raytek Corp., 334 F.3d 1314, 1322 (Fed. Cir. 2003)

- "Capacitor structure" does not appear in the specification or the claims
- "Switch" does not appear in the specification or the claims
- There is no basis in the claims or specification for excluding a capacitor component with multiple structures or with a switch

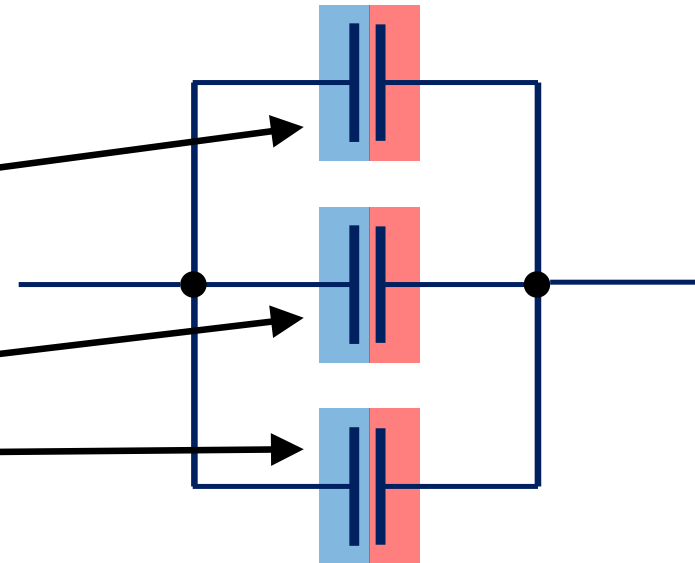
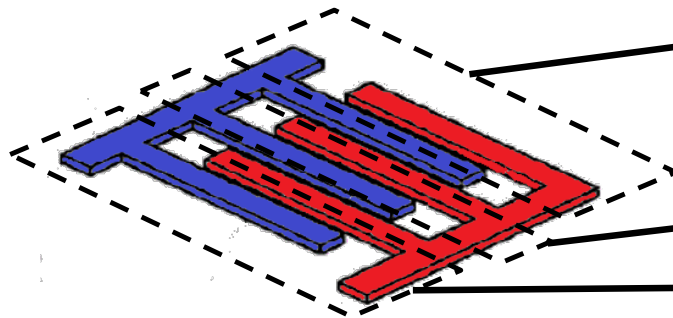
4 Realtek's proposed construction reflects the intrinsic record

'245 '218 '582

Realtek's construction: "a component that includes one or more capacitors"

The capacitor component 150 may be in a single-ended (as shown in FIG. 1 to FIG. 3) or differential (as shown in FIG. 4 to FIG. 6) form. All capacitors in the capacitor component 150 in these embodiments share a same metal layer; however, the present invention is not limited thereto.

➤ The capacitor component may have multiple capacitors.



'582 Patent at Fig. 3 (annotated).

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“plurality of connecting segments are respectively overlapped with the two extension-conductor segments in a vertical direction”

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'582 Patent, Claims 1, 2-4 & 9

COMPLAINANTS' PROPOSED CONSTRUCTION	RESPONDENTS' PROPOSED CONSTRUCTION	KEY DISPUTE
Ordinary and customary meaning – no construction necessary	The plurality of connecting segments of the capacitor component are overlapped with the two extension-conductor segments, wherein each connecting segment of the capacitor component overlaps with a respective extension-conductor segment in a vertical direction	Whether or not there was a disavowal based on the examiner's notice of allowance

This term needs no construction

1. Realtek did not disavow any scope
2. AMD improperly rewrites claim language
3. AMD's changed language reads out the preferred embodiments

The Examiner's Statements in the Notice of Allowance are not a Disavowal

- No disavowal
 - The Examiner's statements are unilateral—not the product of discussions with Realtek
 - The Examiner's statements are based on obvious errors

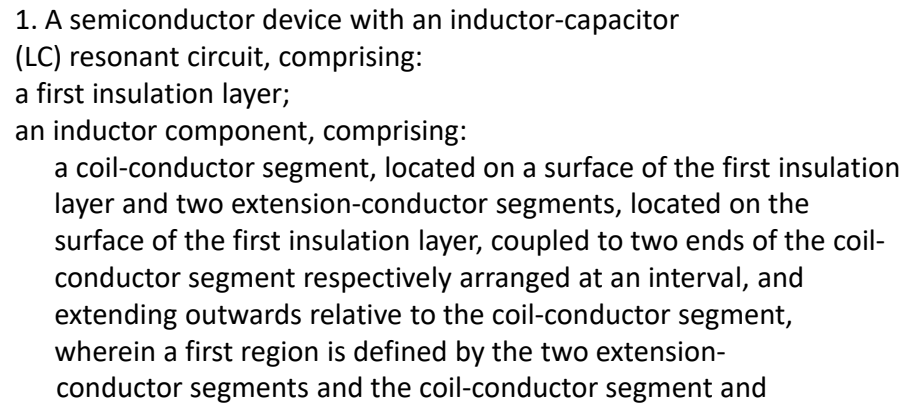
5 AMD Improperly Rewrites the Claim Language

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AMD improperly adds a requirement that *every* connecting segment must be overlapped

Claim language	AMD's construction (Added words in red)
plurality of connecting segments are respectively overlapped with the two-extension conductor segments in a vertical direction	The plurality of connecting segments of the capacitor component are overlapped with the two extension-conductor segments, wherein each connecting segment of the capacitor component overlaps with a respective extension-conductor segment in a vertical direction

'245 '218 '582



wherein the capacitor component comprises:
a plurality of connecting segments, extending corresponding to the two extension-conductor segments in a same direction, wherein the plurality of connecting segments are respectively overlapped with the two extension-conductor segments in a vertical direction

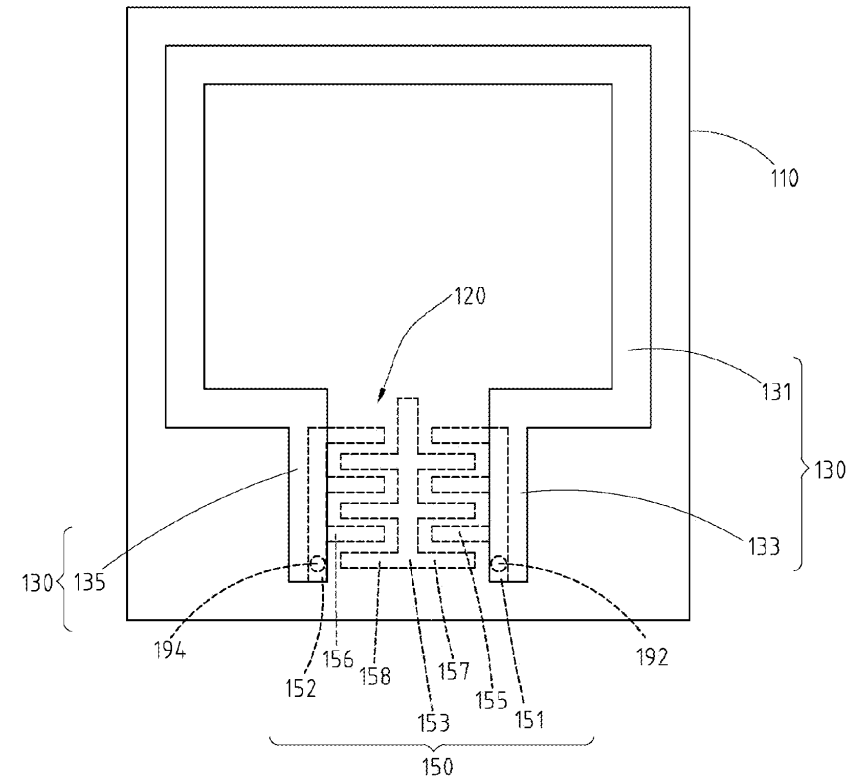


FIG. 5

5 AMD's proposed construction improperly reads out preferred embodiments

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1. A semiconductor device with an inductor-capacitor (LC) resonant circuit, comprising:
a first insulation layer;
an inductor component, comprising:
a coil-conductor segment, located on a surface of the first insulation layer and two extension-conductor segments, located on the surface of the first insulation layer, coupled to two ends of the coil-conductor segment respectively arranged at an interval, and extending outwards relative to the coil-conductor segment, wherein a first region is defined by the two extension-conductor segments and the coil-conductor segment and

* * *

wherein the capacitor component comprises:
a plurality of connecting segments, extending corresponding to the two extension-conductor segments in a same direction, wherein the plurality of connecting segments are respectively overlapped with the two extension-conductor segments in a vertical direction

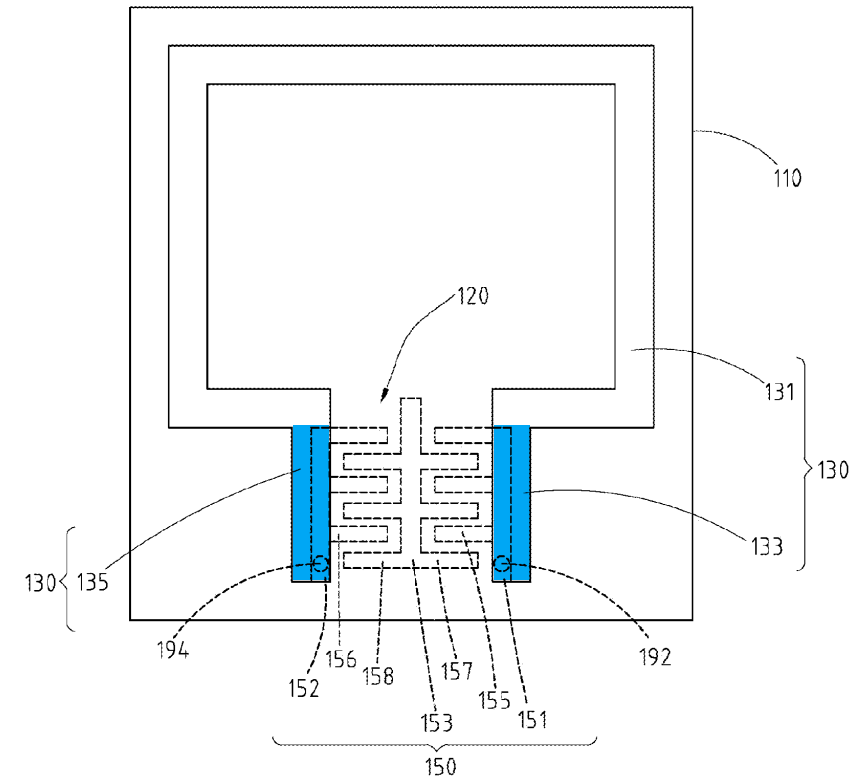


FIG. 5

5 AMD's proposed construction improperly reads out preferred embodiments

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The Claim Does Not Preclude **Non-Overlapping** Connecting Segments

wherein the capacitor component comprises:

a plurality of connecting segments, extending corresponding to the two extension-conductor segments in a same direction, wherein the plurality of connecting segments are respectively overlapped with the two extension-conductor segments in a vertical direction

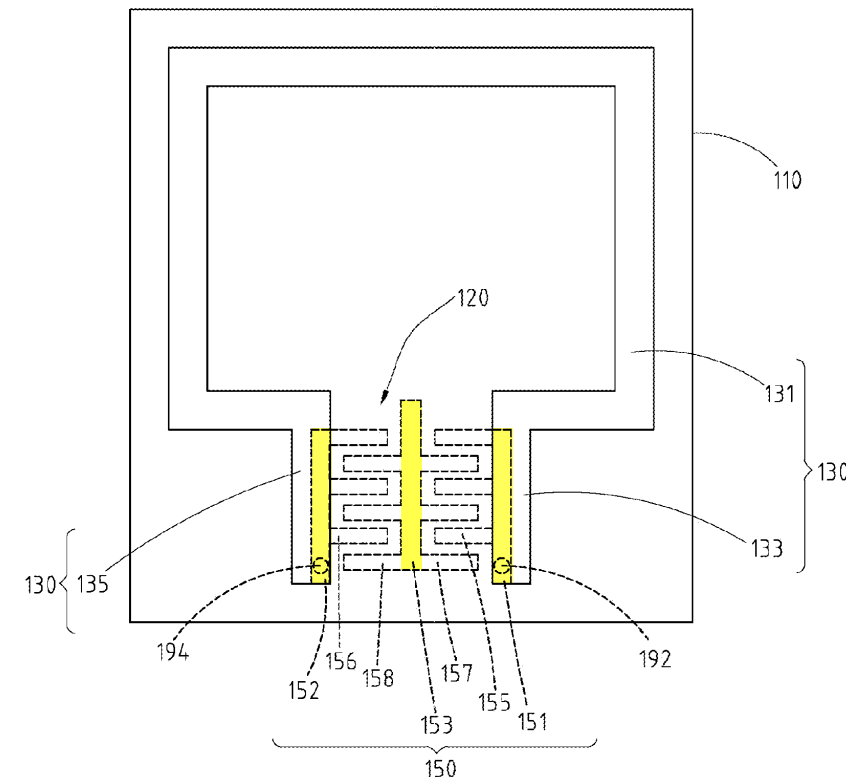


FIG. 5

5 AMD's proposed construction improperly reads out preferred embodiments

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The Claim Does Not Preclude **Non-Overlapping** Connecting Segments

wherein the capacitor component comprises:

a plurality of connecting segments, extending corresponding to the two extension-conductor segments in a same direction, wherein the plurality of connecting segments are respectively overlapped with the two extension-conductor segments in a vertical direction

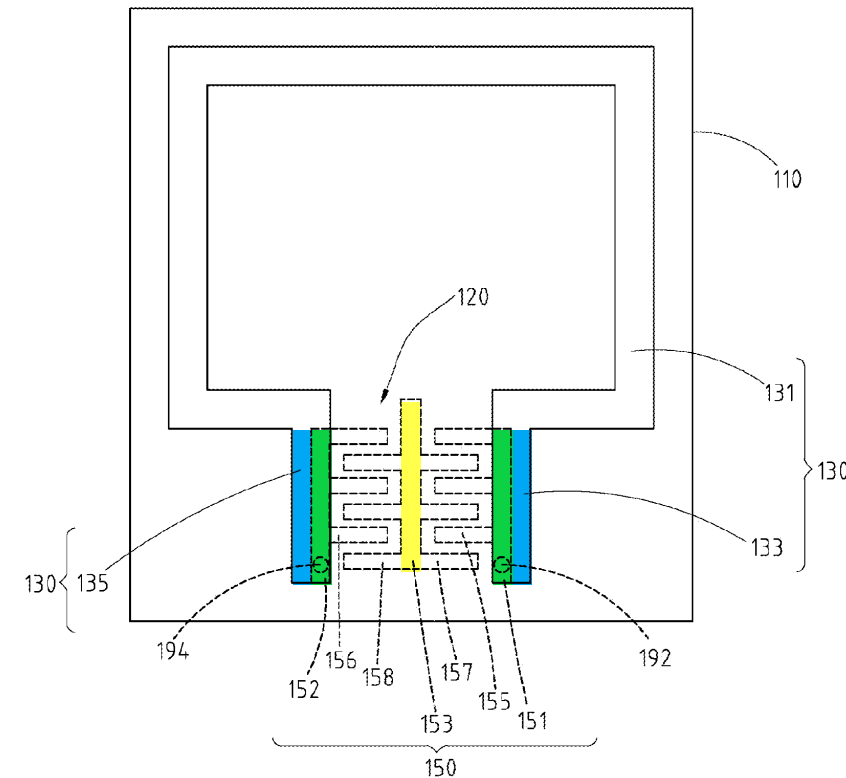


FIG. 5

5 AMD's proposed construction improperly reads out preferred embodiments

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The Claim Does Not Preclude
Non-Overlapping Connecting Segments

AMD's construction (Added words in red)

The plurality of connecting segments of the capacitor component are overlapped with the two extension-conductor segments, wherein each connecting segment of the capacitor component overlaps with a respective extension-conductor segment in a vertical direction

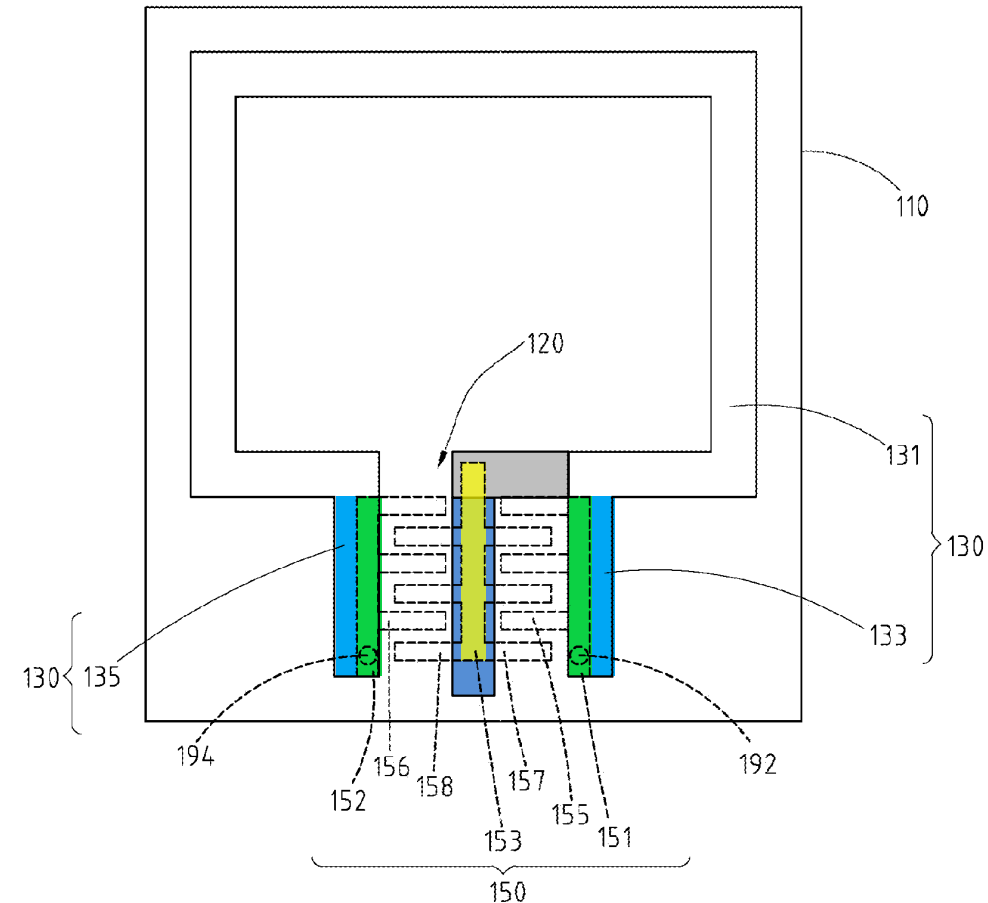


FIG. 5

End

Rebuttal

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Capacitor Component – No Disavowal – Jing First Analyzed Unilaterally by Examiner Upon Notice of Allowance

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Timeline

- Event 1 (9/30/15) - Office action – **No identification of Jing**
- Event 2 (12/30/15) - Amendment – **No identification of Jing**
- Event 3 (3/18/16) - Office action – **No identification of Jing**
- Event 4 (6/17/16) - Amendment – **No identification of Jing**
- Event 5 (7/28/16) - Office action – **No identification of Jing**
- Event 6 (9/16/16) - Amendment – **No identification of Jing**
- Event 7 (9/26/16) - Interview - Examiner cites Jing Fig. 5 against Claim 1 without analysis
- Event 8 (10/28/16) - Amendment - **No mention of Jing**
- Event 9 (11/22/16) – Notice of Allowance – Examiner analyzes Jing Fig. 7 against Claim 5

Timeline

- Event 1 (9/30/15) - Office action – Examiner recognizes Daley’s connecting segments not overlapped
- Event 2 (12/30/15) - Amendment – **No relevant discussion**
- Event 3 (3/18/16) - Office action – Examiner suggests adding “respectively” to claim 5 for clarity
- Event 4 (6/17/16) - Amendment – Realtek adds “respectively” overlapping in a “vertical direction”
- Event 5 (7/28/16) - Office action – **No relevant discussion**
- Event 6 (9/16/16) - Amendment – **No relevant discussion**
- Event 7 (9/26/16) - Interview - **No relevant discussion**
- Event 8 (10/28/16) - Amendment - Realtek adds elements of claim 5 to claim 1
- Event 9 (11/22/16) – Notice of Allowance
 - First analysis (unilateral by Examiner) of whether “capacitor component” is overlapped
 - First analysis (unilateral by Examiner) of structures that constitute capacitor component
 - First analysis (unilateral by Examiner) of a switch

5 The examiner's mistakes make the file history unclear and ambiguous

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The Examiner wrongly equated “capacitor component” and “connecting segments”

Claim language	Examiner's analysis
“wherein the plurality of connecting segments are respectively overlapped with the two extension-conductor segments in a vertical direction”	“Each of the capacitor components overlaps with only a single one of the ‘extension conductor segments’ in a vertical direction and not both”

4 No Disavowal - the Examiner Committed Obvious Errors

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1. A semiconductor device with an inductor-capacitor (LC) resonant circuit, comprising:

* * *

wherein the capacitor component comprises:
a plurality of **connecting segments**, extending **corresponding to the two extension-conductor segments in a same direction**,

...

Jing Reference

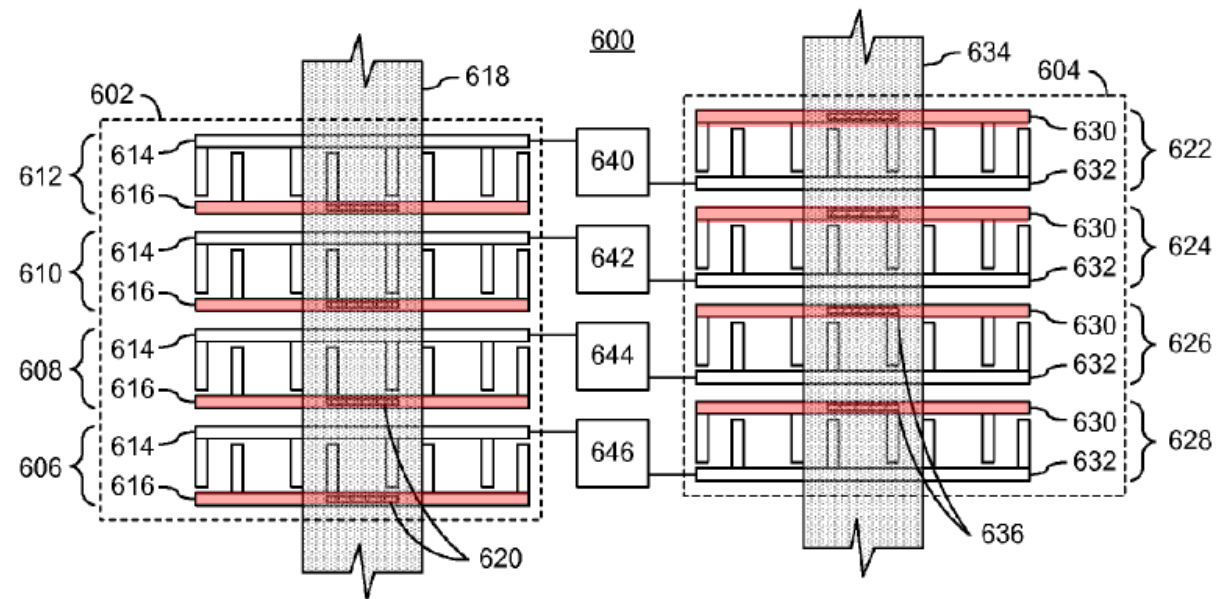


FIG. 6