UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of **CERTAIN SEMICONDUCTOR DEVICES AND PRODUCTS CONTAINING THE SAME**	**Inv. No. 337-TA-1414**

ORDER NO. 29: CONSTRUING CERTAIN CLAIM TERMS

(April 4, 2025)

Infineon Exhibit 2014
Innoscience v. Infineon
IPR2025-00721

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On October 24, 2024, Complainants Infineon Technologies Austria AG and Infineon Technologies Americas Corp. (collectively, "Infineon") and Respondents Innoscience (Suzhou) Technology Holding Company, Ltd.; Innoscience (Suzhou) Semiconductor Co., Ltd.; Innoscience (Zhuhai) Technology Company, Ltd.; and Innoscience America, Inc. (collectively, "Innoscience") proposed competing constructions for several terms recited in U.S. Patent Nos. 8,264,003 (the "'003 patent"); 8,686,562 (the "'562 patent"); 9,070,755 (the "'755 patent"); and 9,899,481 (the "'481 patent"). *See* Order No. 6 (Sept. 27, 2024). The parties subsequently briefed their positions regarding the terms in accordance with the procedural schedule.[1]

On January 16, 2025, I held a *Markman* hearing. *See* EDIS Doc. ID 841652 ("Tr.").

On April 1, 2025, Infineon moved to terminate all asserted claims of the '003 patent and claim 9 of the '481 patent. *See* Motion No. 1414-023 (EDIS Doc. ID 847564). I granted that motion on April 3, 2025. *See* Order No. 27. Any claim construction issues relating to the '003 patent are now moot.

This order addresses the remaining claim construction issues raised by the parties.

[1] For convenience, the parties' briefs will be referred to as follows:

Title	EDIS Doc. ID	Designation
Complainants' Amended Opening Claim Construction Brief	841736	CMIB
Respondents' Opening Claim Construction Brief		RMIB
Complainants' Amended Responsive Claim Construction Brief	841737	CMRB
Respondents' Amended Responsive Claim Construction Brief	841742	RMRB
Joint Proposed Claim Construction Chart	n/a	JC

I. RELEVANT LAW

"An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly construed claims to the device accused of infringing." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (*en banc*) (internal citations omitted), *aff'd*, 517 U.S. 370 (1996). Claim construction is a "matter of law exclusively for the court." *Id.* at 970-71. "The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims." *Embrex, Inc. v. Serv. Eng'g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000).

Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (*en banc*); *see also Markman*, 52 F.3d at 979. As the Federal Circuit in *Phillips* explained, courts must analyze each of these components to determine the "ordinary and customary meaning of a claim term" as understood by a person of ordinary skill in the art at the time of the invention. 415 F.3d at 1313. "Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language." *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Grp., Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001).

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). "Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claims terms." *Id*. at 1314; *see also Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001) ("In

construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to 'particularly point[ ] out and distinctly claim[ ] the subject matter which the patentee regards as his invention.'"). The context in which a term is used in an asserted claim can be "highly instructive." *Phillips*, 415 F.3d at 1314. Additionally, other claims in the same patent, asserted or unasserted, may also provide guidance as to the meaning of a claim term. *Id.*

The specification "is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Id.* at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). "[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs." *Id.* at 1316. "In other cases, the specification may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor." *Id.* As a general rule, however, the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Id.* at 1323. In the end, "[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be . . . the correct construction." *Id.* at 1316 (quoting *Renishaw PLC v. Marposs Societa´ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998)).

In addition to the claims and the specification, the prosecution history should be examined, if in evidence. *Id.* at 1317; *see also Liebel-Flarsheim Co. v. Medrad, Inc.,* 358 F.3d 898, 913 (Fed. Cir. 2004). The prosecution history can "often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Phillips*, 415 F.3d at 1317; *see also Chimie v. PPG Indus. Inc*., 402 F.3d 1371, 1384 (Fed. Cir.

2005) ("The purpose of consulting the prosecution history in construing a claim is to 'exclude any interpretation that was disclaimed during prosecution.'").

When the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence (*i.e.*, all evidence external to the patent and the prosecution history, including dictionaries, inventor testimony, expert testimony, and learned treatises) may be considered. *Phillips*, 415 F.3d at 1317. Extrinsic evidence is generally viewed as less reliable than the patent itself and its prosecution history in determining how to define claim terms. *Id.* at 1317. "The court may receive extrinsic evidence to educate itself about the invention and the relevant technology, but the court may not use extrinsic evidence to arrive at a claim construction that is clearly at odds with the construction mandated by the intrinsic evidence." *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999).

II. ASSERTED PATENTS

The field of technology concerns "compound" semiconductors and related products made of gallium nitride (GaN) or other crystalline structures comprising two or more different chemical elements. CMIB at 1.

A. The '755 Patent

The '755 patent, titled "Transistor Having Elevated Drain Finger Termination," issued on June 30, 2015, and names Michael A. Briere and Reenu Garg as inventors. '755 patent at cover page. The '755 patent issued from U.S. Application Serial No. 13/941,335 filed on July 12, 2013. *Id*. It claims priority to U.S. Patent Application Serial No. 13/749,477 (filed on January 24, 2013) and U.S. Provisional Patent Application Serial Nos. 61/674,553 (filed on July 23, 2012) and 61/600,469 (filed on February 17, 2012). *Id*. The '755 patent generally describes implementations of a drain finger electrode in a power transistor adapted for high termination electric fields. Compl.,

¶ 52. More specifically, it discloses a transistor having drain finger electrodes with ends that are elevated "such that at least a portion thereof is non-coplanar with the drain finger electrode main body." '755 patent at 2:24-28. Figure 6A shows a top view of the drain finger electrode, while Figures 6B and 6C shows coplanar and noncoplanar configurations.

FIG. 6A

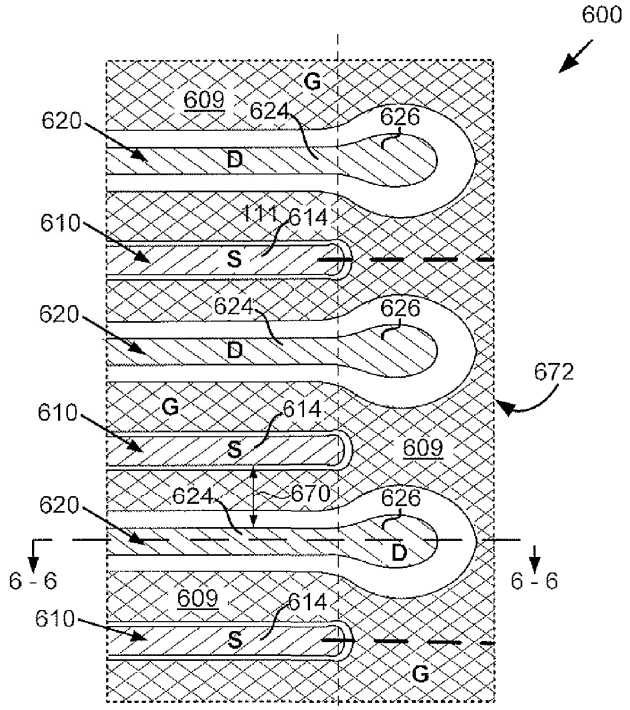


FIG. 6B

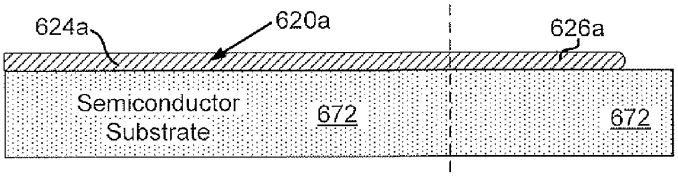
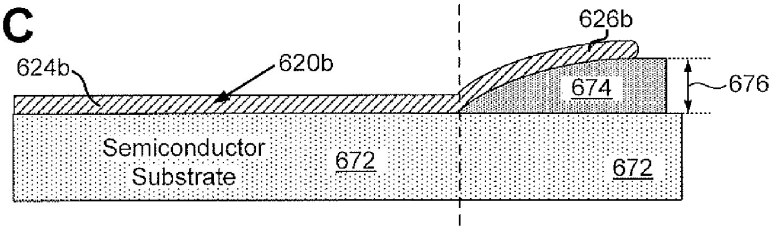


FIG. 6C



Id. at FIGS. 6A-6C.

Infineon asserts claims 1, 2-4, 8, and 9 against Innoscience. Compl., ¶ 4. Infineon additionally asserts that the Domestic Industry Products practice these same claims. *Id.* at ¶ 21. The claims read as follows (with the disputed term highlighted in **bold** and the agreed-upon term underlined):

Claim	Claim Language
1	A transistor comprising:
1[a]	drain finger electrodes interdigitated with source finger electrodes;
1[b]	current conduction paths in a semiconductor substrate between said drain finger electrodes and said source finger electrodes;
1[c]	at least one of said drain finger electrodes having a drain finger electrode main body and a drain finger electrode end, **wherein at least a portion of said drain finger end is non-coplanar with said drain finger electrode main body**.
2	The transistor of claim 1, wherein a dielectric material is situated between said drain finger electrode end and said semiconductor substrate.
3	The transistor of claim 2, wherein said dielectric material elevates said drain finger electrode end over said semiconductor substrate.
4	The transistor of claim 1, wherein said drain finger electrode main body is situated on said semiconductor substrate.
8	The transistor of claim 1, wherein said transistor is a high-electron-mobility transistor (HEMT).
9	The transistor of claim 1, wherein said transistor comprises a group III-V transistor.

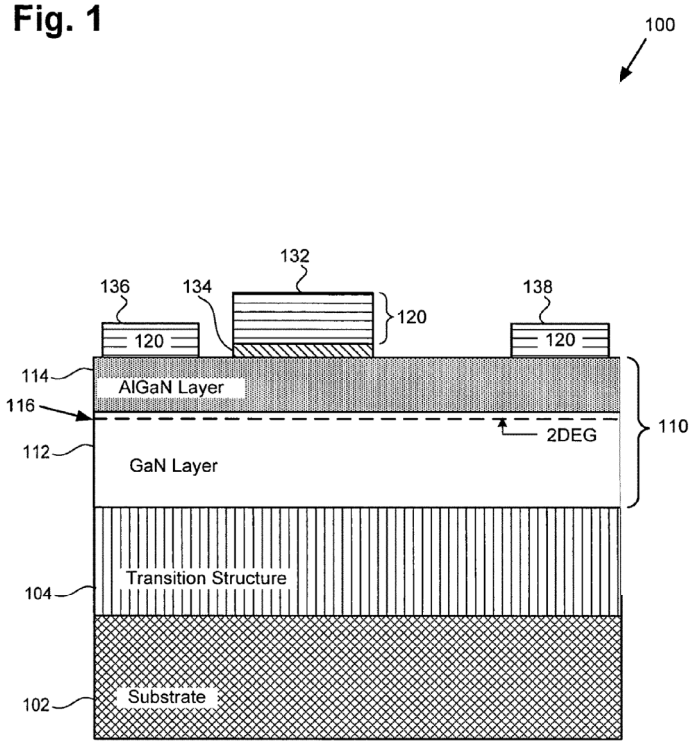
B. The '562 Patent

The '562 patent, titled "Refractory Metal Nitride Capped Electrical Contact and Method for Frabricating [*sic*] Same," issued on April 1, 2014, and names Sadiki Jordan as the inventor.[2] '562 patent at cover page. The '562 patent issued from U.S. Application Serial No. 12/583,809,

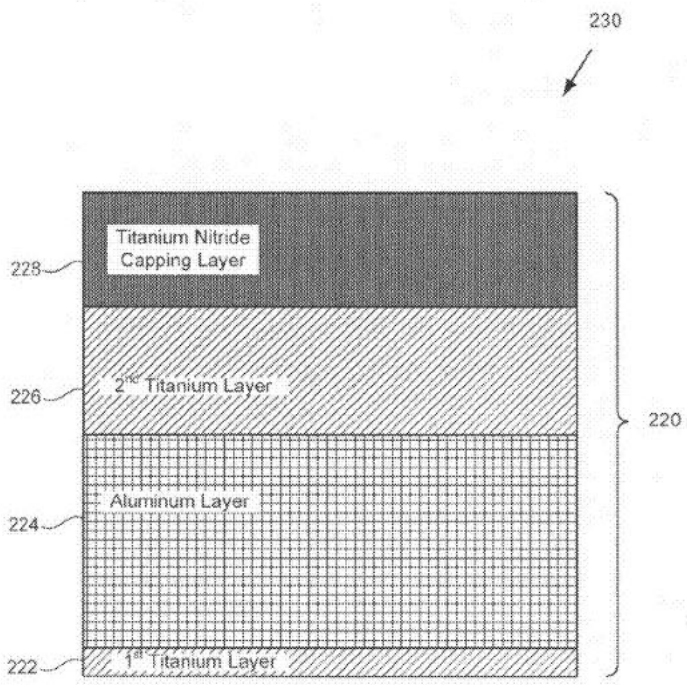
[2] According to Infineon, "[t]he USPTO apparently introduced a typographical error in the patent as issued." Compl., at 12 n.1. It explains that the '809 application as filed was entitled "Refractory Metal Nitride Capped Electrical Contact and Method for Fabricating Same." *Id.*

filed on August 25, 2009. *Id*. The '562 patent relates to an electrical contact for use on a semiconductor device that comprises an electrode stack having a "capping layer" that is made up of a "refractory metal nitride." *Id*. at Abstract, 1:66-67, 2:19-21, 3:19-28. Figure 1 depicts a semiconductor device in which "each of source electrode 136, drain electrode 138, and insulated gate electrode 132 comprises electrode stack 120. Electrode stack 120 includes a refractory metal nitride capping layer (not explicitly shown in FIG. 1), such as a titanium nitride (TiN) capping layer." *Id.* at 3:23-28.

Fig. 1



Id. at FIG. 1. Figure 2 shows an exemplary electrode stack with a first titanium layer, an aluminum layer, a second titanium layer, and a titanium nitride capping layer. *Id*. at 3:42-45.



Id. at FIG. 2.

Infineon asserts claims 1, 2, 8-10, and 13-15 against Innoscience. Compl., ¶ 4. Infineon additionally asserts that the Domestic Industry Products practice claims 1, 2, 8-11, 13, and 14-16. *Id*. at ¶ 21. The claims read as follows (with the disputed term highlighted in **bold** and the agreed-upon term underlined):

Claim	Claim Language
1	An electrical contact for use on a semiconductor device, said electrical contact comprising:
1[a]	an electrode stack including a plurality of metal layers and a capping layer formed over said plurality of metal layers;
1[b]	said capping layer consisting only of a refractory metal nitride, **said refractory metal nitride forming a top of said electrical contact and having a thickness greater than that of a bottom most layer of said plurality of metal layers**.
2	The electrical contact of claim 1, wherein said capping layer comprises titanium nitride (TiN).
8	The electrical contact of claim 1, wherein said electrical contact is configured for implementation on a group III-V semiconductor device.

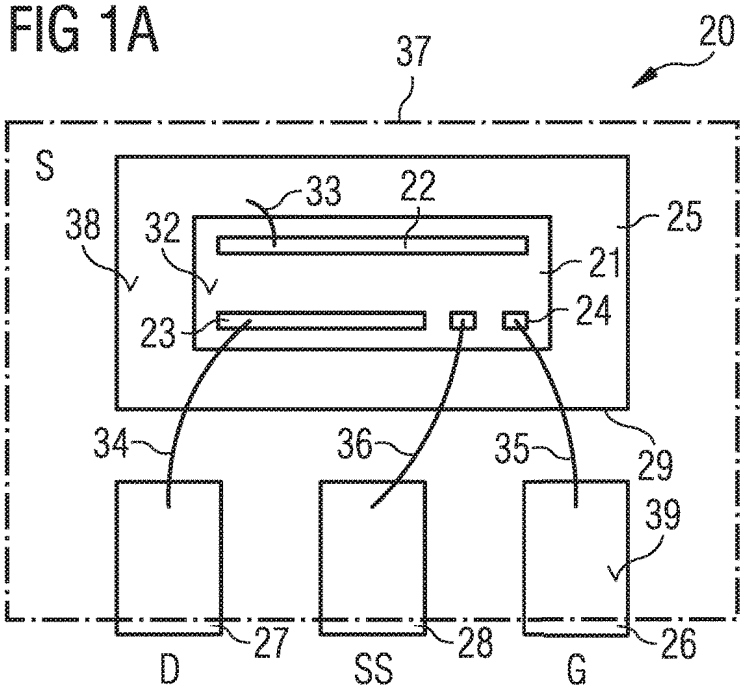
Claim	Claim Language
9	The electrical contact of claim 8, wherein said group III-V semiconductor device comprises a high electron mobility transistor (HEMT).
10	The electrical contact of claim 8, wherein said electrical contact is implemented as a power electrode making ohmic contact with said group III-V semiconductor device.
11	The electrical contact of claim 8, wherein said electrical contact is implemented as a power electrode making ohmic contact with said group III-V semiconductor device.
13	An electrical contact for use on a group III-V semiconductor device, said electrical contact comprising:
13[a]	an electrode stack including a plurality of metal layers and a capping layer formed over said plurality of metal layers;
13[b]	said capping layer consisting only of a metal selected from the group consisting of titanium nitride (TiN) and tantalum nitride (TaN), **said metal forming a top of said electrical contact and having a thickness greater than that of a bottom most layer of said plurality of metal layers**.
14	The electrical contact of claim 13, wherein said group III-V semiconductor device comprises a high electron mobility transistor (HEMT).
15	The electrical contact of claim 13, wherein said electrical contact is implemented as a power electrode making ohmic contact with said group III-V semiconductor device.
16	The electrical contact of claim 13, wherein said electrical contact is implemented as a gate electrode making Schottky contact with said group III-V semiconductor device.

C. The '481 Patent

The '481 patent, titled "Electronic Component and Switch Circuit," issued on February 20, 2018, and names Ralf Otremba and Klaus Schiess as inventors. '481 patent at cover page. The '481 patent issued from U.S. Application Serial No. 14/997,914, filed on January 18, 2016. *Id*. The '481 patent concerns semiconductor device packaging for use with GaN devices. Compl., ¶ 35; '481 patent at Abstract (invention is directed to the packaging of a lateral compound semiconductor transistor device), 1:33-2:17 (describing the different configurations of internal electrical

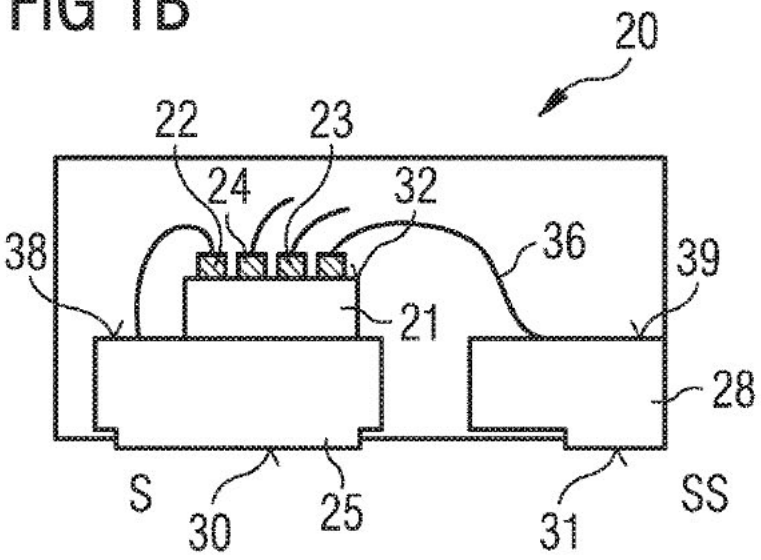
connections between components). Figure 1, for example, shows a compound semiconductor transistor device having "a first current electrode 22, a second current electrode 23 and a control electrode 24" and "a die pad 25, a first lead 26, a second lead 27 and a third lead 28." *Id*. at 4:12-17.

FIG 1A



Id. at FIG. 1A (showing a plan view).

FIG 1B



Id. at FIG. 1B (showing a cross-sectional view).

Infineon asserts claims 1, 2-4, 6, and 17 against Innoscience. Compl., ¶ 4. Infineon additionally asserts that the Domestic Industry Products practice claims 1, 2-4, 6, 9, and 17. *Id*. at ¶ 21. The claims read as follows (with the disputed term highlighted in **bold** and the agreed-upon term underlined):

Claim	Claim Language
1	An electronic component, comprising:
1[a]	a compound semiconductor transistor device comprising a first current electrode, a second current electrode and a control electrode;
1[b]	a **die pad**; and
1[c]	a first lead, a second lead and a third lead,
1[d]	wherein the first lead, the second lead and the third lead are spaced at a distance from the **die pad**,
1[e]	wherein the control electrode is coupled to the first lead, the first current electrode is coupled to the **die pad**, the second current electrode is coupled to the second lead and the third lead is coupled to the compound semiconductor transistor device and provides a source sensing functionality,
1[f]	wherein the compound semiconductor transistor device is a lateral transistor device and a drain or a source of the compound semiconductor transistor device is coupled to the **die pad**,
1[g]	**wherein the first current electrode is coupled to the die pad by a plurality of bond wires or a contact clip**.

Claim	Claim Language
2	The electronic component of claim 1, wherein the compound semiconductor transistor device is one of a SiC transistor device, a III-V compound semiconductor transistor device and a Group III-nitride transistor device.
3	The electronic component of claim 1, wherein the compound semiconductor transistor device has a blocking voltage capability of at least 400V and a switching frequency capability of at least 100 kHz.
4	The electronic component of claim 1, further comprising a housing, wherein lower surfaces of the die pad, the first lead, the second lead and the third lead are exposed from the housing and provide substantially planar contact surfaces.
6	The electronic component of claim 1, **wherein the second current electrode is coupled to the second lead by a plurality of bond wires or a contact clip**.
7	The electronic component of claim 1, **wherein the first current electrode is coupled to the die pad by a contact clip** and a portion of the contact clip is exposed from the upper surface of the housing.
17	An electronic component comprising:
17[a]	a Group III nitride-based transistor device having a blocking voltage capability of at least 400V and a switching frequency capability of at least 100 kHz, a first current electrode, a second current electrode and a control electrode, wherein the control electrode is coupled to a first lead, the first current electrode is coupled to a **die pad**, the second current electrode is coupled to a second lead and a third lead is coupled to the Group III nitride-based transistor device and provides a source sensing functionality; and
17[b]	a housing,
17[c]	wherein the first lead, the second lead and the third lead are spaced at a distance from the **die pad**,
17[d]	wherein lower surfaces of the **die pad**, of the first lead, of the second lead and of the third lead are exposed from the housing and provide substantially planar contact surfaces,
17[e]	wherein the Group III nitride-based transistor device is a lateral transistor device and a drain or a source of the Group III nitride-based transistor device is coupled to the **die pad**,
17[f]	wherein the first current electrode is coupled to the **die pad** by a plurality of bond wires of a contact clip.

III. LEVEL OF ORDINARY SKILL IN THE ART

The ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention. *Phillips*, 415 F.3d at 1313.

Infineon contends that a person of ordinary skill in the art ("POSITA") of the '562 and '755 patents would have "at least a four-year degree in electrical engineering or a closely related field, and at least two years of experience in semiconductor device design or fabrication," while a POSITA of the '481 patent would have "more specific expertise in semiconductor ***packaging***." CMIB at 3 (emphasis in original). Infineon initially proposed that a POSITA of the '481 patent would have "at least a four-year degree in electrical engineering or a closely related field, and at last two years of experience in semiconductor packaging design or fabrication." *Id*. 4.

Innoscience submits that a POSITA would have "at least a four-year degree in electrical engineering, chemical engineering, physics, or material science or a closely related field and at least two years of experience in semiconductor device design or fabrication, including the processing of semiconductor materials, analysis of device operation, or the development of new device topologies." RMIB at 9.

The parties' proposals on the level of skill are similar. While the main difference was Infineon's suggestion that a POSITA should have specialized experience in semiconductor packaging, Infineon and Innoscience subsequently agreed to a level of skill for the '481 patent. *See* EDIS Doc. ID 845782. That level of skill is the same as the one Innoscience previously proposed.

Accordingly, I find that a person of ordinary skill in the art for the Asserted Patents would have at least a four-year degree in electrical engineering, chemical engineering, physics, or

material science or a closely related field and at least two years of experience in semiconductor device design or fabrication, including the processing of semiconductor materials, analysis of device operation, or the development of new device topologies. A higher level of education may substitute for a lesser amount of experience, and vice versa.

IV. CLAIM CONSTRUCTION

A. Construction of Agreed-Upon Claim Terms

The parties have agreed to the following constructions:

Claim Term	Relevant Claims	Parties' Agreed Construction
"Group III-nitride"	'481 patent: claims 2 and 17	A compound semiconductor that includes nitrogen (N) and at least one Group III element including aluminum (Al), gallium (Ga), indium (In), and boron (B), and including but not limited to any of its alloys, such as aluminum gallium nitride ($Al_xGa_{(1-x)}N$), indium gallium nitride ($In_yGa_{(1-y)}N$), aluminum indium gallium nitride ($Al_xInyGa_{(1-x-y)}N$), gallium arsenide phosphide nitride ($GaAs_aP_bN_{(1-a-b)}$), and aluminum indium gallium arsenide phosphide nitride ($Al_xIn_yGa_{(1-x-y)}AsaPbN_{(1-a-b))}$, for example. Aluminum gallium nitride and AlGaN refers to an alloy described by the formula $Al_xGa_{(1-x)}N$, where $0<x<1$
"refractory metal nitride"	'562 patent: claim 1[3]	compound material including nitrogen chemically bonded with elements Ti, zirconium (Zr), or vanadium (Vn), as well as the traditionally recognized refractory metals niobium (Nb), molybdenum (Mo), tantalum (Ta), and tungsten (W), and further may refer to any of TiN, TaN, ZrN, VN, NbN, MoN, and WN2, or any combination of those refractory nitride compounds

[3] The parties indicated that this term was also relevant to claim 13. However, claim 13 makes no references to "refractory metal nitride." *See* '562 patent, cl. 13.

Claim Term	Relevant Claims	Parties' Agreed Construction
"group III-V semiconductor"	'562 patent: claims 8-11 and 13-16	A compound semiconductor that includes at least one group III element and at least one group V element, such as, but not limited to, gallium nitride (GaN), GaAs, AlGaAs, InGaN, and the like.
"group III-V transistor"	'755 patent: claim 9	a transistor including a compound semiconductor that includes at least one group III element and at least one group V element

JC at 3-4. I hereby adopt the parties' proposed constructions and shall construe the terms set forth above according to their agreed-to definitions.

B. Construction of the Disputed Claim Terms

1. "wherein at least a portion of said drain finger end is noncoplanar with said drain finger electrode main body"

The term "wherein at least a portion of said drain finger end is noncoplanar with said drain finger electrode main body" appears in claim 1 of the '755 patent. The parties disagree on the claim construction of this term and have proposed the following constructions:

INFINEON	INNOSCIENCE
Plain and ordinary meaning, e.g., wherein at least a portion of said drain finger end is noncoplanar with the main portion of the drain finger electrode body	wherein at least a portion of said drain finger end is on a horizontal plane that is not on the same horizontal plane as any part of said drain finger electrode main body

JC at 4.

Infineon asserts that "[t]here is nothing ambiguous in this straightforward phrase warranting further construction from the ALJ." CMIB at 23. Infineon explains that "[t]he plain meaning [of this phrase] is consistent with the specification, as well as the ordinary English usage of 'main body,' as evidenced by relevant dictionary definitions." *Id.* According to Infineon: "By contrast, [Innoscience's] proposed construction would improperly rewrite the claim by inserting additional limitations . . . found nowhere in the intrinsic record." *Id.* Infineon also argues that

Innoscience's construction erroneously "lumps at least two separate terms together – namely, 'main body' and 'non-coplanar.'" *Id.* at 23-24.

Innoscience asserts that its construction "explains that 'non-coplanar' refers to the horizontal plane, not the vertical plane." RMIB at 35. It further asserts that the construction "explains that the portion of the drain finger end is on a horizontal plane that is not on the same horizontal plane as any part of the drain finger main body." *Id*. According to Innoscience, "[t]he specification provides strong support for [this] construction." *Id.*

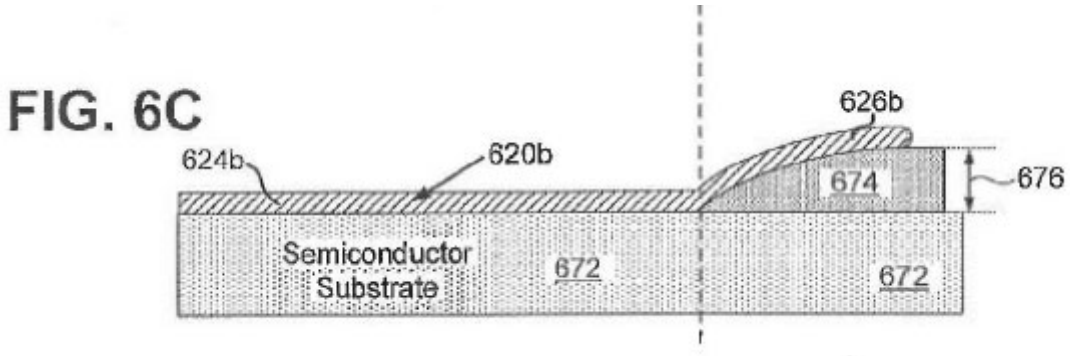
There are three main differences between the parties' constructions: (1) Innoscience proposes a construction for the word "non-coplanar" while Infineon does not; (2) Innoscience's proposal adds the words "any part of" after non-coplanar and before "said drain finger electrode main body"; and (3) Infineon proposes a construction for "drain finger electrode main body" while Innoscience does not. I address each of these differences in turn.

Infineon contends that "non-coplanar" does not need to be further construed, whereas Innoscience asserts that this term should be read as "is on a horizontal plane that is not on the same horizontal plane as." In its reply brief, Infineon states that "[t]here is no dispute between the parties (nor could there be) that the 'planes' at issue are horizontal planes – not vertical planes." CMRB at 13. Thus, while Infineon does not believe this construction is necessary, it does not appear to actually oppose Innoscience's proposal. If Innoscience believes construing non-coplanar in this manner provides clarity, I will do so. As such, I substitute the language "is on a horizontal plane that is not on the same horizontal plane" for the word "non-coplanar" in the construction.

Next, Innoscience argues that the phrase "any part of" should be asserted into the construction. Infineon disagrees. At first blush, this dispute may appear to be over whether the specification supports importing a negative limitation into the claim. The heart of this inquiry,

however, relates to infringement. The parties seek to use claim construction to resolve the question of whether the claim limitation would be met if any part of the drain finger electrode main body was on the same plane as the portion of the drain finger end that is non-coplanar. The parties mention, for example, the possible existence of periphery portions of the drain finger electrode main body. *See, e.g.*, CMIB at 25. I find that an analysis of this issue would benefit from the context in which it arises. I therefore decline to decide this issue as part of the claim construction order and will instead analyze it in the context of infringement in the final initial determination. *See, e.g.*, *Certain Electronic Candle Prods. & Components Thereof*, Inv. No. 337-TA-1195, Order No. 24, at 62 (Sept. 14, 2020) ("*Electronic Candle Prods.*") ("I find that no claim construction with respect to these terms is required at this time. Disputes regarding the application of these terms may be addressed in the context of infringement or invalidity.").

Finally, the parties present different constructions for "drain finger main body." Innoscience asserts that this term need not be further construed. Infineon, on the other hand, proposes that the term be construed as "the main portion of the drain finger electrode body." I find that Infineon's construction is not necessary and may lead to confusion. Both the claims and the specification indicate that the drain finger electrode must have at least two portions: the main body and the ends. '755 patent, cl. 1 (reciting "at least one of said drain finger electrodes having a drain finger electrode main body and a drain finger electrode end"), 9:44-46 ("in transistor 600, drain finger electrodes 620 have drain finger electrode main bodies 624 and drain finger electrode ends 626 (e.g. curved drain finger electrode ends 626)"). The specification further discloses an embodiment (Figure 6C) in which the "drain finger electrode main body 624 is non-coplanar with at least a portion of drain finger electrode end 626." *Id.* at 9:55-58.



Id. at FIG. 6C. Given this guidance, one of skill would understand the scope of "drain finger main body" without the need to further define the term.

Additionally, Infineon's proposed construction could be read as requiring more than the two portions identified in the specification. By advocating for a construction of "the main portion of the drain finger electrode body," this proposal could be read as contemplating some undisclosed non-main portion of the drain finger electrode body.[4] Such a requirement is inconsistent with the intrinsic evidence which does not describe the drain finger main body as having a main and a non-main portion.[5] *See* RMIB at 41 ("[T]he specification provides no support that the drain finger electrode main body has different portions, let alone a 'main portion,' as Infineon's construction requires."). It also leads to ambiguity as to what portion of the drain finger electrode body is the

[4] Indeed, Infineon argues that "the 'main body' of the drain finger electrode would exclude any other periphery portions." CMIB at 25; *see also id.* at 26 ("A POSA would understand that the claims are directed to what is occurring along the drain finger electrode 'main body,' i.e., the main portion of the drain finger electrode body, as opposed to the peripheries."). I make no findings now as to whether the "drain finger electrode main body" includes or excludes any periphery portions.

[5] During its *Markman* presentation, Infineon referred to Figure 3. Tr. at 89:16-21. Infineon explains that "the patent describes the drain figure electrode, 320 [of Figure 3], as having a width, 354." *Id.* at 89:22-23. Infineon asserts that this shows that the patent "is clearly contemplating situations where . . . the drain finger electrode main body could have other portions." *Id.* at 90:5-8. This is a different situation, however, from a claim being construed in a manner in which it could be read to *require* the existence of some nondisclosed portion.

"main portion" and what portion is not. I decline to adopt a construction that creates more problems than it solves.

Accordingly, I find that the term "wherein at least a portion of said drain finger end is noncoplanar with said drain finger electrode main body" should be construed as "wherein at least a portion of said drain finger end is on a horizontal plane that is not on the same horizontal plane with said drain finger electrode main body.

2. "said refractory metal nitride/metal . . . having a thickness greater than that of a bottommost layer of said plurality of metal layers"

The term "said refractory metal nitride/metal . . . having a thickness greater than that of a bottommost layer of said plurality of metal layers" appears in claims 1 and 13 of the '562 patent. The parties disagree on the claim construction of these terms and have proposed the following constructions:

INFINEON	INNOSCIENCE
Plain and ordinary meaning, e.g., a thickness of the refractory metal nitride/metal is greater than a thickness of a bottommost layer	Said refractory metal nitride/metal . . . having a thickness, wherein the thickness along an entire length of the refractory metal nitride/metal is greater than a thickness along an entire length of a bottommost layer of said plurality of metal layers

JC at 3.

Infineon asserts that this term "does not require any construction beyond its plain and ordinary meaning." CMIB at 18. Infineon explains that the claim language is plain on its face – the refractory metal nitride in the capping layer has a "thickness greater than that of a bottommost layer." "This is straightforward plain English. A POSA needs no special or additional construction." *Id*. Infineon argues that Innoscience proposes "a narrowing construction" that requires the thickness be determined "***along an entire length***" of the metal nitride or bottommost

layer. CMRB at 8 (emphasis in original). "But this proposal contradicts the plain claim language and the intrinsic evidence, which nowhere imposes such a requirement." *Id*.

Innoscience insists that the "thickness" is "the thickness along the entire length of the refractory metal nitride and the thickness along the entire length of the bottommost layer." RMIB at 30; RMRB at 10. According to Innoscience, "[t]here is nothing in the claims [or the specification] indicating that the thickness requirement is only relevant to a portion of the layer." RMIB at 29. Innoscience claims that unlike its construction (which "provides clarity"), Infineon's proposal fails to provide "*any* clarity to what the 'thickness' encompasses with respect to the refractory metal nitride or with respect to the bottommost layer." *Id*. at 31. This results in a claim so broad that it covers any thickness of the refractory metal nitride or the bottommost layer. *Id*.

The case law is clear, claims terms must be given their plain and ordinary meaning to one of skill in the art. *Phillips,* 415 F.3d at 1316. "If the claim language is clear on its face, then our consideration of the rest of the intrinsic evidence is restricted to determining if a deviation if a deviation from the clear language of the claims is specified." *Interactive Gift Exp., Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001). A deviation [from the plain language] may be necessary if "a patentee [has chosen] to be his own lexicographer and use terms in a manner other than their ordinary meaning." *Vitronics,* 90 F.3d at 1582. Innoscience does not argue that a person of ordinary skill in the art would not understand this term or that the applicant acted as its own lexicographer to assign a different meaning to the term. Instead, Innoscience argues that construction is needed to determine "how and where you actually compare" thickness.[6] Tr. at 50:9-

[6] Innoscience's position would limit "thickness" to "along an entire length." JC at 3. The intrinsic evidence does not support such a narrowing construction. Neither the claims nor the specification describe thickness as being along a length. In fact, the word "length" does not appear anywhere in the '562 patent. Innoscience nevertheless cites to Figure 2 to argue that the layer thicknesses are

10. As counsel for Infineon noted, this is "not a construction issue." *Id*. at 76:22-23. I agree. The ordinary meaning of this term is "readily apparent" and requires "little more than the application of the widely accepted meaning of commonly understood words." *Phillips,* 415 F.3d at 1314. Thus, the parties' dispute is not as to the plain meaning of the words themselves but how to apply the ordinary meaning to show infringement/noninfringement. As such, it is better addressed in the context in which it arises. *See Biotec Biologische Naturverpackungen GmbH & Co. KG v. Biocorp, Inc.*, 249 F.3d 1341, 1349 (Fed. Cir. 2001) ("[T]he meaning of 'melting' does not appear to have required 'construction,' or to depart from its ordinary meaning. The issue in dispute was the application of the melting step in the accused process, a factual question of infringement."); *see also Electronic Candle Prods.*, Order No. 24 at 62 ("I find that no claim construction with respect to these terms is required at this time. Disputes regarding the application of these terms may be addressed in the context of infringement or invalidity."). If, in conducting the infringement analysis, it is necessary to explicitly define the plain and ordinary meaning of this term, I will do so.

3. "wherein the [first/second] current electrode is coupled to the [die pad/second lead] by a plurality of bond wires or a contact clip"

The term "wherein the [first/second] current electrode is coupled to the [die pad/second lead] by a plurality of bond wires or a contact clip" appears in claims 1, 6, and 7 of the '481 patent. The parties disagree on the claim construction of this term and have proposed the following constructions:

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shown "along an entire length" of the metal nitride and bottommost layers. RMIB at 30. Figure 2 is "a more detailed block diagram showing a refractory metal nitride capped electrical contact." '562 patent at 3:36-39. In its discussion of Figure 2, the patent does not address whether there must be a uniform thickness "along an entire length" of a layer. Even if Innoscience were correct and Figure 2 did show uniform thickness along a length, importing a limitation based upon an embodiment from the specification is in contravention of *Phillips*. *See* 415 F.3d at 1323.

INFINEON	INNOSCIENCE
Plain and ordinary meaning, e.g., wherein the [*first/second*] current electrode is electrically connected either directly or with intervening elements present to the [*die pad/second lead*] by a plurality of wires or a contact clip	Wherein one end of a plurality of bond wires or one end of a contact clip is attached to the [first/second] current electrode and another end of the plurality of bond wires or another end of the contact clip is attached to the [*die pad/second lead*]

JC at 2.

Infineon asserts that the "coupled to" terms should be given their plain and ordinary meaning, "which encompasses any form of connection between the 'coupled' elements, whether connected directly or through intervening elements." CMIB at 6. According to Infineon, this is "understood by POSAs, confirmed by the specification" and courts "have routinely interpreted the plain meaning of 'coupled' to encompass both direct and indirect attachment." CMRB at 2; CMIB at 6. Infineon objects to Innoscience's proposal, arguing that it "improperly rewrite[s] the recited claim language from 'coupled to' (the phrase actually recited) to 'coupled **directly** to" (a narrower phrase that the patentee did not recite." CMRB at 2 (emphasis in original).

Innoscience contends its construction aligns with the intrinsic evidence and the claim language. It argues that "when describing the specific bond wire and contact clip connection, the specification states that the bond wires and contact clips provide 'an additional connector extending from the upper surface of the transistor device to the upper surface of the die pad.'" RMIB at 47. "This additional connector is exclusively described as a direct connection." *Id*. at 47-48. Innoscience also claims that during prosecution, Infineon narrowed "coupled to" "to be coupling through a specific structure, i.e., a plurality of bond wires or a contact clip." RMRB at 22. Innoscience faults Infineon's construction as being impermissibly broad and "fail[ing] to cover the precise invention" of coupling by bond wire or contact clips. RMIB at 50-51.

In *Phillips,* the Federal Circuit described the specification as "the single best guide to the meaning of a disputed term." 415 F.3d at 1315 (citing *Vitronics,* 90 F.3d at 1582). "When the specification explains and defines a term used in the claims, without ambiguity or incompleteness, there is no need to search further for the meaning of the term." *Multiform Desiccants, Inc. v. Medzam, Ltd.,* 133 F.3d 1473, 1478 (Fed. Cir. 1998). Here, the specification unequivocally confirms that the ordinary meaning of this term governs. It states: "As employed in this specification, when an element is referred to as being 'connected' or 'coupled' to another element, it can be directly connected or coupled to the other element or intervening elements may be present." '481 patent at 3:34-37. The term "coupled" is set off by quotation marks, which is, as Infineon noted, "powerful evidence confirming the meaning of the phrase 'coupled to'." *See Sinorgchem Co., Shandong v. Int'l Trade Comm'n*, 511 F.3d 1132, 1136 (Fed. Cir. 2007) (quotation marks are "often a strong indication that what follows is a definition"). The specification then expressly distinguishes between the phrases "directly coupled to," which requires direct connections, and "coupled to," which allows for indirect attachment between elements. '481 patent at 3:37-40 ("In contrast, when an element is referred to as being 'directly connected' or 'directly coupled' to another element, there are no intervening elements present.").

Although Innoscience concedes that the specification describes "connected" or "coupled" as referring to "direct coupling or indirect coupling with intervening elements" (RMIB at 47), it nevertheless maintains that this term requires the electrode be directly connected to the die pad/second lead by bond wires or contact clips without intervening elements. Innoscience points Figures 3 and 4 as evidence that a direct connection is required, but as the Federal Circuit has noted, "it is improper to read limitations from a preferred embodiment described in the specification – even if it is the only embodiment – into the claims absent a clear indication in the

intrinsic record that the patentee intended the claims to be so limited." *GE Lighting Sols. LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (quoting *Liebel–Flarsheim*, 358 F.3d at 913); *see also Bayer AG v. Biovail Corp.*, 279 F.3d 1340, 1348 (Fed. Cir. 2002) ("[A] court may not read into a claim a limitation from a preferred embodiment, if that limitation is not present in the claim itself."). Here, there are no such words; nothing in the claim or specification to indicate that this term should be limited to the embodiments presented in Figures 3 and 4.[7] *See MBO Labs., Inc. v. Becton, Dickson & Co.*, 474 F.3d 1323, 1333-1334 (Fed. Cir. 2007) ("[P]atent coverage is not necessarily limited to inventions that look like the ones in the figures. To hold otherwise would be to import limitations onto the claim from the specification, which is fraught with danger."); *Arlington Indus., Inc. v. Bridgeport Fittings, Inc.,* 632 F.3d 1246, 1254 (Fed. Cir. 2011) (reversing a claim construction where the trial court imported limitations onto the claims from the drawings, despite the lack of "expressions of manifest exclusion or restriction")).

Nor am I persuaded by Innoscience's use of the prosecution history to try and narrow the meaning of this term.[8] Federal Circuit caselaw "requires that the alleged disavowing actions or statements made during prosecution be both clear and unmistakable" to apply prosecution disclaimer. *Omega Eng'g, Inc, v. Raytek Corp.*, 334 F.3d 1314, 1326 (Fed. Cir. 2003). In the cited Office Action, the Examiner rejected pending claim 1 as obvious over two vertical transistor references. *See* CMX-5 at 144-45. In response, claim 1 was amended to recite a lateral transistor device. *Id*. The "wherein the first current electrode is coupled to the die pad by a plurality of bond

[7] In fact, the '481 patent demonstrates that the patentee knew the difference between a direct and indirect attachment and chose not to limit "coupled to" to a direct connection.

[8] It is Innoscience's burden to show that there has been a "clear and unmistakable" disclaimer. *Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1063–64 (Fed. Cir. 2016). Innoscience devoted one paragraph in its opening brief to this issue and nowhere in that paragraph did it ever address the "clear and unmistakable" requirement. *See* RMIB at 50; *see also* RMRB at 22.

wires or a contact clip" language from previously pending claim 7 was also added to claim 1. *Id*. The patentee wrote:

> Importantly, neither Lui nor Otremba '313 teaches or otherwise renders obvious a **package for a lateral transistor** which includes **three leads configured as recited in claim 1**, **each** of the three leads being **spaced at a distance** from the die pad with one of the leads (*i.e.* the claimed third lead) providing a source sensing functionality, the package further including a first current electrode **coupled to the die pad** by a plurality of **bond wires or a contact clip**. Otremba '313 discloses a package with a bidirectional switch with **two vertical transistors** mounted and electrically coupled **to two separate portions of a die pad** by the **drain electrodes**. The upwardly facing source electrodes are coupled by the clip 45 to provide the bidirectional switch. Lui, on the other hand, discloses a **cascode arrangement** that **does not include a source sensing function**. Accordingly, there is further no motivation for the person of ordinary skill in the art to **replace** the **vertical** transistor as taught by Otremba '313 with a **lateral** transistor as claimed because as the **circuit arrangement** taught by Otremba '313 would no longer be operational as the circuit arrangement depends on the **drain electrode located on the rear side of the transistor being electrically connected to the die pad**.

Id. Nothing in the patentee's response suggests that he intended to narrow the meaning of "coupled to" in this limitation to direct coupling. "Absent a clear disavowal in the … prosecution history, the patentee is entitled to the full scope of its claim language." *Home Diagnostics, Inc. v. LifeScan, Inc.*, 381 F.3d 1352, 1358 (Fed. Cir. 2004); *see also Avid Tech., Inc. v. Harmonic, Inc.*, 812 F.3d 1040, 1045 (Fed. Cir. 2016) ("Where the alleged disavowal is ambiguous, or even 'amenable to multiple reasonable interpretations,'" the Federal Circuit has "declined to find prosecution disclaimer.")

For these reasons, I find that the term "wherein the [first/second] current electrode is coupled to the [die pad/second lead] by a plurality of bond wires or a contact clip" should be construed in accordance with its plain and ordinary meaning.

4. "die pad"

The term "die pad" appears in claims 1 and 17 of the '481 patent. The parties disagree on the claim construction of these terms and have proposed the following constructions:

INFINEON	INNOSCIENCE
Part of a leadframe that supports the die of the transistor device	Structure that supports the die of the semiconductor device

JC at 2.

Infineon asserts its construction is consistent with the intrinsic evidence and the specification. CMIB at 12. Infineon explains that leads and the die pad are "part of the larger conductive leadframe." *Id*. at 14. "For example, Figure 3 reflects die pad 43 having an 'L-shaped' form providing leads 45 and 46 (i.e., leads connected to the die pad) while also forming 'cutaway 47' where 'further leads 48 [and[49 are spaced apart' from the die pad." *Id*. It alleges that packaging-related texts and other technical sources confirm that a die pad is part of a lead frame. *Id*. at 11. Infineon objects to Innoscience's construction on three grounds – that it encompasses non-conducive structures, lacks antecedent basis, and is inconsistent with Innoscience's IPR arguments. *Id*. at 10-12; *see also* CMRB at 7-8.

Innoscience asserts that its proposal "provides clarity that the die pad is a structure that supports the die of a semiconductor device." RMIB at 45. Innoscience submits that this is supported by the extrinsic evidence, and in particular, the industry definition of die pad. *Id*. at 46. Innoscience argues that Infineon's construction, on the other hand, improperly adds a leadframe to the claims, which is "not claimed nor is a relationship between the die pad and a leadframe." RMRB at 20.

There is no dispute that the "die pad" supports the die. Tr. at 184:14-16 ("And this supports Innoscience's construction that the die pad supports the die of the semiconductor device."), 193:13-

14 ("We don't dispute that the die pad supports the die. That is the purpose of it."); *see also* '481 patent at 8:24-30 ("The electronic component 70 also include HEMT 41 which is mounted on the upper surface 62 of the die pad 53."), 10:27-29 ("The compound semiconductor device 111 is mounted on the upper surface 126 of the die pad 113"), FIGS. 1A, 1B, 3-5, 7. This understanding is confirmed by Dr. Doolittle, a person of skill in the art.[9] RMIB Ex. 5 at ¶¶ 93-102; *see also Immunex Corp. v. Sanofi-Aventis U.S. LLC*, 977 F.3d 1212, 1221 (Fed. Cir. 2020) ("The key, however, is that we look to how that person would have understood a term in view of the specification"). He opined that based on the patent's disclosures, "[a] POSITA would have understood that the die of semiconductor device 111 would be the portion that the semiconductor device is made on, and therefore is in direct contact with and supported by the die pad." *Id*. at ¶ 94. And while it is not necessary to rely on extrinsic evidence to construe this claim, I note that it too supports Innoscience's construction. *See* RMIB Exs. 11 (defining "die-attach-pad" as "[a] central metalplate, often used in a semiconductor package to support the active device"), 12 ("the part of a leadframe or package substrate where the die is mounted").

The issue thus is whether the "die pad" must be part of a lead frame. As a starting point, I look to the claim language. *See Phillips,* 415 F.3d at 1314 ("[T]he claims themselves provide substantial guidance as to the meaning of particular claim terms."). Nothing in the claims suggests that the "die pad" must be part of the leadframe. '481 patent, cls. 1, 17 (referencing a electrodes, die pad, leads, with no mention of leadframe). Infineon's primary argument for incorporation of "leadframe" into the meaning of this term stems from the specification's disclosure of certain instances that describe a die pad as being part of a leadframe. CMIB at 12. However, while the

[9] Infineon's expert was only asked to provide opinions as to the '003 patent. CMIB Ex. 9 at ¶¶ 3-4.

specification serves as a useful tool in understanding claim limitations, the Federal Circuit has "cautioned against limiting the claimed invention to preferred embodiments or specific examples in the specification." *Williamson v. Citrix Online, LLC,* 792 F.3d 1339, 1346–47 (Fed. Cir. 2015) (quoting *Teleflex, Inc. v. Ficosa N. Am. Corp.,* 299 F.3d 1313, 1328 (Fed. Cir. 2002)). And, as discussed previously, limitations may only be read into claims if there is "a clear indication in the intrinsic record that the patentee intended the claims to be so limited." *Liebel-Flarsheim,* 358 F.3d at 913. Infineon cannot point to any such indication, much less a clear one – especially here, where only two embodiments show a leadframe and the claims do not require a leadframe as part of the electronic component. *See Hill-Rom Servs, Inc. v. Stryker Corp.,* 755 F.3d 1367, 1377 (Fed. Cir. 2014) ("The fact that the specification indicates that in one embodiment, messages are sent to the wall interface unit 'in accordance with the present invention,' does not mean that a wall interface unit must be present in all embodiments of the invention."). I therefore decline to adopt Infineon's proposal because to do so would be to improperly narrow the scope of this term.

As such, I find that the term "die pad" should be construed as "structure that supports the die of the semiconductor device."[10]

SO ORDERED.

Bryan F. Moore
Administrative Law Judge

[10] Contrary to Infineon's assertion, this construction does not lack antecedent basis. CMIB at 15 (arguing that Innoscience's proposal "references 'the semiconductor device' even though there is no 'semiconductor device' recited in the '481 Patent's claims."). As Innoscience correctly noted, however: "Claim 1's recital of 'a compound **semiconductor** transistor **device**' provides antecedent basis for 'the semiconductor device.' And the 'compound semiconductor transistor device' is the only 'semiconductor device' in the claims." RMIB at 21 (emphasis in original) (internal citations omitted).