

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

MICROCHIP TECHNOLOGY, INC.

Plaintiff

v.

APTIV SERVICES US, LLC,

Defendant

Case No. 1:23-cv-00778-JDW

MEMORANDUM

Microchip Technology, Inc. sued Aptiv Services US, LLC alleging that Aptiv infringes three of Microchip's patents. The Parties have presented disputes over the meaning of four disputed claim terms stemming from two patents: (1) U.S. Patent No. 7,564,665 ('665 Patent); (2) U.S. Patent No. 9,471,074 ('074 Patent). I held a *Markman* hearing on June 21, 2024, and now resolve the disputed constructions.

I. LEGAL STANDARD

A. General Principles Of Claim Construction

"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 v. AWS Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (quote omitted). Claim construction is a matter of law. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 325 (2015). "[T]here is no magic formula or catechism" for construing a patent claim, nor is a court "barred from considering any particular sources or required to analyze sources in any specific

sequence[.]” *Phillips*, 415 F. 3d at 1324. Instead, a court is free to attach the appropriate weight to appropriate sources “in light of the statutes and policies that inform patent law.” *Id.* (citation omitted).

A court generally gives the words of a claim “their ordinary and customary meaning,” which is the “meaning the term would have to a person of ordinary skill in the art at the time of the invention, i.e., as of the effective filing date of the patent application.” *Id.* at 1312-13 (quotations omitted). Usually, a court first considers the claim language; then the remaining intrinsic evidence; and finally, the extrinsic evidence in limited circumstances. *See Interactive Gift Exp., Inc. v. Compuserve, Inc.*, 256 F.3d 1323, 1331-32 (Fed. Cir. 2001). While “the claims themselves provide substantial guidance as to the meaning of particular claim terms[.]” a court also must consider the context of the surrounding words. *Phillips*, 415 F. 3d at 1314. In addition, the patent specification “is always highly relevant to the claim construction analysis and indeed is often the single best guide to the meaning of a disputed term.” *AstraZeneca AB v. Mylan Pharms. Inc.*, 19 F.4th 1325, 1330 (Fed. Cir. 2021) (quotation omitted). But, while a court must construe claims to be consistent with the specification, it must “avoid the danger of reading limitations from the specification into the claim” *Phillips*, 415 F.3d at 1323. This is a “fine” distinction. *Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186-87 (Fed. Cir. 1998). In addition, “even when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless

the patentee has demonstrated a clear intention to limit the claim scope using 'words or expressions of manifest exclusion or restriction.'" *Hill-Rom Svcs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1372 (Fed. Cir. 2014) (quotation omitted) (cleaned up).

A court may refer to extrinsic evidence only if the disputed term's ordinary and accustomed meaning cannot be discerned from the intrinsic evidence. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1584 (Fed. Cir. 1996). Although a court may not use extrinsic evidence to vary or contradict the claim language, extrinsic materials "may be helpful to explain scientific principles, the meaning of technical terms, and terms of art that appear in the patent and prosecution history." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995). Extrinsic evidence is used "to ensure that the court's understanding of the technical aspects of the patent is consistent with that of a person of skill in the art[.]" *Phillips*, 415 F.3d at 1318. The Federal Circuit has cautioned against relying upon expert reports and testimony that is generated for the purpose of litigation because of the likelihood of bias. *Id.*; *see also Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 595 (1993) ("Expert evidence can be both powerful and quite misleading because of the difficulty in evaluating it.") (quotation omitted).

B. Construction Of Means-Plus-Function Limitations

When construing claim terms, a court must consider whether they are "means-plus-function" limitations. 35 U.S.C. § 112(f) governs the interpretation of means-plus-function claim terms:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

35 U.S.C. § 112(f). For patents that predate the America Invents Act, the same standard applies under 35 U.S.C § 112, ¶ 6.

To determine whether Section 112, ¶ 6 governs a claim, the “essential inquiry” is “whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure.” *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (en banc).¹ If a claim term does not use the word “means,” there is a rebuttable presumption that means-plus-function claiming under Section 112, ¶ 6 does not apply. *See id.* at 1349. To rebut it, a challenger must demonstrate that a claim term either fails to “recite sufficiently definite structures” or recites “function without reciting sufficient structure for performing that function.” *Id.* “The ultimate question is whether the claim language, read in light of the specification, recites sufficiently definite structure to avoid [Section] 112, ¶ 6.” *MTD Prods. Inc. v. Iancu*, 933 F.3d 1336, 1341 (Fed. Cir. 2019) (quote omitted).

Courts use a two-step process to construe means-plus-function limitations. First, the court must determine the claimed function. *See Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 1361 (Fed. Cir. 2000). Second, the court must identify the

¹ An *en banc* Federal Circuit joined the portion of the *Williamson* decision discussing the applicability of Section 112. *See Williamson*, 892 F.3d at 1347-49 & n.3.

corresponding structure that the specification discloses to perform that function. *See id.* When the specification discloses “distinct and alternative structures for performing the claimed function,” the proper construction should embrace each one. *Creo Prods., Inc. v. Presstek, Inc.*, 305 F.3d 1337, 1346 (Fed. Cir. 2002). The structure disclosed in the patent specification that corresponds to the claimed function limits the scope of a means-plus-function claim. *See Med. Instrumentation & Diagnostics Corp. v. Elektra AB*, 344 F.3d 1205, 1219 (Fed. Cir. 2003).

C. Indefiniteness

“Indefiniteness is a matter of claim construction, and the same principles that generally govern claim construction are applicable to determining whether allegedly indefinite claim language is subject to construction.” *Kyowa Hakka Bio, Co., Ltd. v. Ajinomoto Co.*, No. CV 17-313, 2020 WL 3403207, at *5 (D. Del. June 19, 2020) (internal quotations omitted). “The internal coherence and context assessment of the patent, and whether it conveys claim meaning with reasonable certainty, are questions of law.” *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 789 F.3d 1335, 1342 (Fed. Cir. 2015). A party seeking to prove indefiniteness must do so by clear and convincing evidence. *See BASF Corp. v. Johnson Matthey Inc.*, 875 F.3d 1360, 1365 (Fed. Cir. 2017); *see also Cox Commc’ns, Inc. v. Sprint Commc’n Co. LP*, 838 F.3d 1224, 1228 (Fed. Cir. 2016).

“A patent’s specification must ‘conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as

[the] invention.” *Teva*, 789 F.3d at 1340 (quoting 35 U.S.C. § 112, ¶ 2). A patent claim is indefinite if, “viewed in light of the specification and prosecution history, [it fails] to inform those skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014).

II. CONSTRUCTION OF THE DISPUTED TERMS

A. ‘665 Patent

1. “second voltage rail”²

Microchip’s Construction	Aptiv’s Construction	Court’s Construction
Plain and Ordinary Meaning Alternatively, “a second voltage rail that is distinct from the third voltage rail but may or may not be distinct from the first voltage rail”	“a second voltage rail that is distinct from the first voltage rail”	“a second voltage rail that is distinct from the third voltage rail but may or may not be distinct from the first voltage rail”

My construction of the disputed claim term is grounded in the patentee’s definitions in the specification because the specification is the “single best guide to the meaning of a disputed term” *Phillips*, 415 F.3d at 1315; *see also Thorner v. Sony Computer Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012). The plain and ordinary meaning of “first” and “second” connotes two distinct rail structures. But the

² I only identify the independent claim where a term first appears, but my construction applies to relevant dependent claims as well. This term appears in Claim 1 of the ‘665 Patent.

specification “clearly express[es] an intent to redefine the [claim] term.” *Thorner*, 669 F.3d at 1365 (citation omitted).

The patent discloses circuitry for protecting a chip from the damaging effects of electrostatic discharge (“ESD”). When ESD enters the chip through a pad, the invention enables transistors to connect those pads to voltage supply rail(s) to disperse the ESD. Claim 1 discloses a “first voltage rail[,] ... a second voltage rail and a third voltage rail.” (‘665 Patent at 6:32-43) The Parties agree that as described in the patent, the moniker “VDDIO” corresponds to the “first voltage rail” and “VIOESD” to the “second voltage rail.” The specification discloses an embodiment where the circuitry employs multiple voltage rails (both VIOESD and VDDIO). It goes on to recite: “[i]t should also be noted that VIOESD 244 and VDDIO 122 *may in fact be the same power/supply rail.*” (*Id.* at 5:57-58) (emphasis added). “In general, the ESD rail and the power supply rail can be the same supply rail, and separate supply rails (e.g. VIOESD 244 and a distinct VDDIO 122) may not be required.” (*Id.* at 5:62-65.) Because the specification is clear that the same structure can act as the first and second voltage rail, I adopt Microchip’s construction.

Aptiv does not dispute the thrust of the specification’s teaching but says that this alternate embodiment applies only to Claim 6 and not Claim 1. “While limitations in the specification must not be routinely imported into the claims because a patentee need not describe all embodiments of his invention ... a definition of a claim term in the specification will prevail over a term’s ordinary meaning if the patentee has acted as his

own lexicographer and clearly set forth a different definition." *3M Innovative Properties Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1371 (Fed. Cir. 2003). Microchip "is entitled to the full scope of its claim language" as it has defined its terms in the specification. *Home Diagnostics, Inc. v. LifeScan, Inc.*, 381 F.3d 1352, 1358 (Fed. Cir. 2004). And nothing in the specification suggests that Microchip intended to limit the description in its specification to one claim and not the other.

Aptiv's citations to caselaw analyzing ordinal numbering in claim language bolsters Microchip's reading. In *Gillette*, the claimed razor was comprised of "a group of first, second, and third blades." *See Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1373 (Fed. Cir. 2005). The Federal Circuit held that the term "third" did not limit the number of blades in the claimed razor to just three. *See id.* at 1371. Analyzing the claim language, the Federal Circuit concluded that the patentee used the terms "first, second, third ... [not] to show a consecutive numerical limit but only to distinguish or identify the various members of the group." *Id.* at 1373. So too here, the specification instructs that "first" and "second" is an identifier and not a statement of quantity.

Aptiv's citation to *Acera Surgical, Inc.* also misses the mark. *See Acera Surgical, Inc. v. Nanofiber Sols., LLC*, No. CV 20-980-CFC-JLH, 2022 WL 6948855, at *4 (D. Del. Oct. 12, 2022), *report and recommendation adopted sub nom. Acera Surgical, Inc. v. Nanofiber Sols., LLC*, No. CV 20-980-CFC/JLH, 2023 WL 2139699 (D. Del. Feb. 21, 2023). The court's task was to construe the terms "first layer" and "second layer" in patents

relating to biomedical patches and grafts from electospun nanofibers. The court adopted a construction that the first and second layers must be “distinct and separate” based in part on the patent holder’s concession that those layers could not be the same thing. *See id.* Microchip makes no such concession, and if I were to agree with Aptiv, I would disregard the specification’s express definition.

B. ‘074 Patent

The ‘074 Patent discloses a voltage regulator, which is circuitry for providing consistent and stable voltage. Aptiv argues that three terms from the ‘074 patent are indefinite. For the first disputed term, Aptiv argues that the term “an enable/disable function to enable/disable the biasing circuit for reducing standby current” is a means-plus-function term without any corresponding structure. For the second and third disputed terms, Aptiv argues that they are of an undefined degree and overly reliant on external factors. To demonstrate indefiniteness, Aptiv must offer clear and convincing evidence. *See Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1249–50 (Fed. Cir. 2008). Aptiv hasn’t carried this burden for any of the disputed terms.

1. “an enable/disable function to enable/disable the biasing circuit for reducing standby current”³

Microchip’s Construction	Aptiv’s Construction	Court’s Construction
Not subject to 35 U.S.C. 112 ¶ 6. To the extent the court	Indefinite; Subject to 35 U.S.C. § 112 ¶ 6 without any corresponding structure	Not subject to 35 U.S.C. 112 ¶ 6.

³ This term appears in Claim 1 of the ‘074 Patent.

determines that § 112 ¶ 6 applies: Function: to enable/disable the biasing circuit for reducing standby current Structure: enable/disable signal input line (Node M)		
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I begin with the presumption that 35 U.S.C. § 112 ¶ 6 does not apply because the claim does not use the word “means.” Aptiv then has the burden of demonstrating “that the claim term fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function.” *MTD Prod. Inc. v. Iancu*, 933 F.3d 1336, 1341 (Fed. Cir. 2019) (citation omitted). Aptiv hasn’t met its burden.

The term “enable/disable function” discloses a known structure. Microchip’s expert, Dr. Taylor, testifies that a POSITA would have understood the claim language to connote a switch—an input for turning on or off transistors that draw current. In support, he cites prior art documents that use the terms “enable,” “enable pin,” or “EN” to refer to a physical pin and/or wire. (D.I. 98-9 ¶ 60.) One datasheet for a commercially available voltage regulator uses the term “smart enable” and “smart enable input circuit” to refer to circuitry. (D.I. 98-8 ¶ 58.) These documents demonstrate that a POSITA would understand the term “enable/disable function” to refer to a structure (like physical pins or circuitry), so the term is not means-plus-function.

Aptiv advances three arguments in response, but none rebuts the presumption.

First, Aptiv quarrels with Dr. Taylor's conclusion because the technical documents on which he relied do not use the exact claim term "enable/disable function." (D.I. 97 at 32.) But citing to variations of the term "enable" in prior art is permissible when those citations reveal the term "as the name for structure [that] has a reasonably well understood meaning in the art." *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583 (Fed. Cir. 1996). And a term need not evoke a "particular structure" if it evokes a class of structures. *Personalized Media Commc'ns, LLC v. Int'l Trade Comm'n*, 161 F.3d 696, 705 (Fed. Cir. 1998). Aptiv's expert, Dr. Shanfield, doesn't dispute that these documents equate "enable" to physical pins and/or circuitry. Dr. Shanfield says that one reference uses "enable signal" to "refer to various voltage signals, not to refer to any structure." (D.I. 98-9 ¶ 60.) But Dr. Taylor shows that "these enable inputs as controlling transistors to enable or disable the flow of current through the circuitry using physical inputs to the transistors." (D.I. 98-10 ¶ 12.)

Second, Aptiv says that Dr. Taylor's cited class of structures don't perform the function of *enabling* a circuit (only disabling). Dr. Shanfield cites examples of structures that only disable. That does not negate the fact that a POSITA would read the patent to refer to a class of structures that can do both. The specification explains that "Node M is the enable signal coming to the regulator circuitry so that the module *can be turned off when disabled*." ('074 patent at 4:44-45 (emphasis added).)

Third, Aptiv says that the switch lacks the logic to determine when to enable or disable. That's true, but it doesn't matter because the claim term doesn't claim that function. This patent discloses a modular part to be incorporated into a larger circuit. It isn't necessary that this specific modular component control when to switch on or off. Some other part can function as the brains of the operation.

2. "wherein the gm-boost circuit enables the current buffer driver to have large gm value"⁴

Microchip's Construction	Aptiv's Construction	Court's Construction
Not Indefinite Plain and ordinary Meaning Alternatively, "wherein the gm boost circuit increases the gm value of the current buffer driver to be sufficiently large to provide pole-splitting"	Indefinite	wherein the gm boost circuit increases the gm value of the current buffer driver to be sufficiently large to provide pole-splitting

Based on the specification, a POSITA would read the claimed gm value as being sufficiently large to achieve a pole-splitting effect. The specification teaches that "[a] current buffer driver [pushes] this pole to a high frequency beyond unity-gain frequency due to its low-impedance characteristics in order to get the pole-splitting effect. To achieve this, it is necessary to provide a fairly large gm value of the current buffer driver." ('074 patent at 4:11-15.) As Microchip's expert explains, this passage instructs

⁴ This term appears in Claim 4 of the '074 Patent.

that “pole splitting could be accomplished by increasing the transconductance (gm) of the current buffer driver.” (D.I. 98-8 ¶ 68.)

The claimed gm value is one boosted enough to achieve the invention’s goal. The specification’s use of the phrase “fairly large gm value,” instead of the phrase “large gm value” in Claim 4 does not sow confusion. Aptiv’s argument to the contrary based on *Intellectual Ventures* is unpersuasive. *See Intell. Ventures I LLC v. AT&T Mobility LLC*, No. CV 13-1668-LPS, 2016 WL 4363485, at *17 (D. Del. Aug. 12, 2016), *aff’d in part, vacated in part, remanded sub nom. Intell. Ventures I LLC v. T-Mobile USA, Inc.*, 902 F.3d 1372 (Fed. Cir. 2018). That case involved a patent in which a claim term used the word “large,” and the specification used the phrase “relatively large.” The court held that the claim was indefinite, but no intrinsic or extrinsic evidence provided guidance about the scope of the term “large.” *See id.* In the absence of any evidence defining “large[,]” the specification’s use of the term “relatively large” only increased uncertainty. *See id.* But this case is different because there’s evidence from both the specification and Microchip’s expert that a large gm value is one sufficient to achieve pole-splitting.

The Parties agree that a gm value sufficient to provide pole-splitting is a context-dependent value. They also agree that the external factor affecting this value is load (*i.e.*, the device that the regulator is driving). “When a proposed construction requires that an artisan make a separate infringement determination for every set of circumstances in which the composition may be used, and when such determinations are likely to result

in differing outcomes (sometimes infringing and sometimes not), that construction is likely to be indefinite." *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1255 (Fed. Cir. 2008).

But Microchip's expert, Dr. Taylor, explains that the load "ultimately has a negligible effect on the location of the poles." (D.I. 98-10 ¶ 18.) A POSITA reading the patent would have understood that the inventors intended the design of the claimed circuit to handle changes in load. Aptiv's expert, Dr. Shanfield, says that the electrical characteristics of the load (*e.g.*, EST for a capacitive load) and of the transistors (*e.g.*, the gate capacitance) "affects the amount of transconductance required to achieve adequate pole-splitting." (D.I. 98-9 ¶ 70.) But, as Dr. Taylor explains, Figure 4 of the specification shows that "the circuit remains stable even when ESR values of the external capacitor vary by a factor of 200 and/or when the capacitance is varied by a factor of 10." (D.I. 98-10 ¶ 19.)

The load affects the gm value, but in a manner not so variable as to render the term indefinite. *Cf. Solocron Media, LLC v. Verizon Commc'ns Inc.*, No. 2:13-CV-1059-JRG-RSP, 2015 WL 1011310, at *29 (E.D. Tex. Mar. 5, 2015) (declining to find indefiniteness when a claim term relied on an external factor with a known range). Aptiv hasn't shown that a POSITA would have to make separate infringement determinations for a wide set of circumstances where some would result in infringement and others not.

See *Halliburton Energy Servs., Inc.*, 514 F.3d at 1255. It therefore has not carried its heavy burden of demonstrating that the claim is indefinite.

3. “low gain and high bandwidth amplifier”⁵

Microchip’s Construction	Aptiv’s Construction	Court’s Construction
Not indefinite	Indefinite	Not indefinite
Plain and Ordinary Meaning		
Alternatively, “amplifier optimized for high bandwidth with a commensurate reduction of gain”		

Operational Amplifiers (“OpAmps”) have a range of bandwidth they can handle and a “gain,” which is a comparison of the size of its input and output. The gain and bandwidth vary on the OpAmp’s configuration, but the gain/bandwidth property of a particular OpAmp is a constant. The term “low gain and high bandwidth amplifier” is not indefinite because it “provide[s] enough certainty to one of skill in the art when read in the context of the invention.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1363 (Fed. Cir. 2018) (citation omitted).

The amplifier must 1) have a low gain/high bandwidth and 2) be capable of pole-splitting. A POSITA would know that gain and bandwidth are inversely related such that a decrease in one increases the other according to a mathematical constant. Traditional

⁵ This term appears in Claims 8 and 9 of the ‘074 Patent.

amplifiers are high-gain and low bandwidth. So, the term “low gain and high bandwidth” signals that this amplifier is configured in the opposite manner of a traditional one. The specification teaches that the “amplifier design was selected ... for the following reasons: (1) The architecture forms only one pole at the output of the folded stage which reduces the complexity of frequency compensation, (2) it provides a good driving capability for the source follower stage of the current buffer ...”is designed to achieve the pole-splitting effect. ('074 patent at 4:31-36).

A term of degree without a numerical limit poses some degree of ambiguity. *See Niazi Licensing Corp. v. St. Jude Med. S.C., Inc.*, 30 F.4th 1339, 1347 (Fed. Cir. 2022). But contrary to Aptiv's position, the lack of a numerical measure of gain to define “low gain” doesn't render the claim indefinite. The patent provides that the amplifier must be of low enough gain to achieve pole-splitting. That's an objective boundary to a POSITA. *See Berkheimer*, 881 F.3d at 1364.

The Parties dispute whether the term is indefinite based on substantially the same arguments as with the term “large gm value.” Aptiv argues that this system claim is indefinite because when a POSITA is determining whether an accused voltage regulator infringes, he wouldn't know the load that will drive the amplifier. For the reasons I've stated, Aptiv can't carry its burden in the face of Dr. Taylor's testimony that the load has a negligible effect.

During the *Markman* hearing, Aptiv's counsel argued that *additional* external factors affect the amplifier's gain in a manner that renders the term indefinite. Aptiv cited to paragraph 69 of Dr. Taylor's declaration, which describes certain external factors that affect the performance of the amplifier. However, Dr. Taylor ultimately concludes that "a POSITA would have understood based on the '074 patent and their general background knowledge, how to calculate a gm sufficiently large in any given scenario to push the second most dominant pole above and beyond the unity gain frequency." (D.I. 98-8 ¶ 69.) Aptiv's expert does not opine that external factors beyond the load affect the gain/bandwidth in a manner to render the term indefinite. Absent evidence contradicting Dr. Taylor's conclusion that these factors are knowable to a POSITA, I conclude that Aptiv's attorney argument doesn't meet its burden to invalidate the claim.

III. CONCLUSION

I will construe the disputed claims as described above and will adopt the Parties' agreed-upon constructions. An appropriate Order follows.

BY THE COURT:

/s/ Joshua D. Wolson

JOSHUA D. WOLSON, J.

July 15, 2024