IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

THETA IP LLC,	§	
	§	
Plaintiff,	§	
	§	
v.	§	NO. 2:16-CV-527-JRG-RSP
	§	
SAMSUNG ELECTRONICS CO., LTD., and SAMSUNG ELECTRONICS AMERICA, INC.	§	
	§	
Defendants.	§	

MEMORANDUM AND ORDER ON CLAIM CONSTRUCTION

On May 23, 2017, the Court held a hearing to determine the proper construction of disputed claim terms in United States Patents No. 7,010,330 and 9,331,728. Having reviewed the arguments made by the parties at the hearing and in their claim construction briefing [Dkt. # 63, 69 & 71],[1] having considered the intrinsic evidence, and having made subsidiary factual findings about the extrinsic evidence, the Court issues this Claim Construction Memorandum and Order. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005); *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015).

[1] Citations to documents (such as the parties' briefs and exhibits) in this Claim Construction Memorandum and Order refer to the page numbers of the original documents rather than the page numbers assigned by the Court's electronic docket unless otherwise indicated.

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I. BACKGROUND

Plaintiff Theta IP LLC ("Plaintiff" or "Theta") has alleged infringement of United States Patents No. 7,010,330 ("the '330 Patent") and 9,331,728 ("the '728 Patent") (collectively, the "patents-in-suit") by Defendants Samsung Electronics Co., Ltd. and Samsung Electronics America, LLC ("Defendants" or "Samsung"). Plaintiff submits that "[t]he '330 and '728 patents describe and claim systems and methods to achieve reduced power dissipation in wireless transceivers." [Dkt. # 63] at 2. Plaintiff has asserted Claims 29 and 30 of the '330 Patent and Claims 1, 2, 3, 4, 6, and 7 of the '728 Patent. *Id.*

The '330 Patent, titled "Power Dissipation Reduction in Wireless Transceivers," issued on March 7, 2006, and bears an earliest priority date of March 1, 2003. The '728 Patent issued on May 3, 2016, and is a continuation of the '330 Patent. The named inventor of both of the patents-in-suit is Yannis Tsividis. The Abstract of the '330 Patent states:

> Methods and circuits for reducing power dissipation in wireless transceivers and other electronic circuits and systems. Embodiments of the present invention use bias current reduction, impedance scaling, and gain changes either separately or in combination to reduce power dissipation. For example, bias currents are reduced in response to a need for reduced signal handling capability, impedances are scaled thus reducing required drive and other bias currents in response to a strong received signal, or gain is increased and impedances are scaled in response to a low received signal in the presence of no or weak interfering signals.

Shortly before the start of the May 23, 2017 hearing, the Court provided the parties with preliminary constructions with the aim of focusing the parties' arguments and facilitating discussion. Those preliminary constructions are set forth below within the discussion for each term.

II. LEGAL PRINCIPLES

"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)). Claim construction is clearly an issue of law for the court to decide. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970–71 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996). "In some cases, however, the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Teva*, 135 S. Ct. at 841 (citation omitted). "In cases where those subsidiary facts are in dispute, courts will need to make subsidiary factual findings about that extrinsic evidence. These are the 'evidentiary underpinnings' of claim construction that we discussed in *Markman*, and this subsidiary factfinding must be reviewed for clear error on appeal." *Id.* (citing 517 U.S. 370).

To determine the meaning of the claims, courts start by considering the intrinsic evidence. *See Phillips*, 415 F.3d at 1313; *see also C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1314; *C.R. Bard*, 388 F.3d at 861. Courts give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the

context of the entire patent. *Phillips*, 415 F.3d at 1312–13; *accord Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

The claims themselves provide substantial guidance in determining the meaning of particular claim terms. *Phillips*, 415 F.3d at 1314. First, a term's context in the asserted claim can be very instructive. *Id.* Other asserted or unasserted claims can aid in determining the claim's meaning because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim terms can also assist in understanding a term's meaning. *Id.* For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id.* at 1314–15.

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id.* at 1315 (quoting *Markman*, 52 F.3d at 979 (en banc)). "[T]he 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.'" *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *accord Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow the claim scope. *Phillips*, 415 F.3d at 1316. In these situations, the inventor's lexicography governs. *Id.* The specification may also resolve the meaning of ambiguous claim terms "where the ordinary and accustomed meaning of the

words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone." *Teleflex*, 299 F.3d at 1325. But, "[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims." *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *accord Phillips*, 415 F.3d at 1323.

The prosecution history is another tool to supply the proper context for claim construction because a patent applicant may also define a term in prosecuting the patent. *Home Diagnostics, Inc., v. Lifescan, Inc.*, 381 F.3d 1352, 1356 (Fed. Cir. 2004) ("As in the case of the specification, a patent applicant may define a term in prosecuting a patent."). "[T]he prosecution history (or file wrapper) limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance." *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985).

Although extrinsic evidence can be useful, it is "less significant than the intrinsic record in determining the legally operative meaning of claim language." *Phillips*, 415 F.3d at 1317 (citations and internal quotation marks omitted). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent.

Id. at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition are entirely unhelpful to a court. *Id.* Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id.*

III. THE PARTIES' STIPULATED TERMS

The parties did not reached agreement on any constructions in their February 28, 2017 Joint Claim Construction and Pre-Hearing Statement. [Dkt. # 50] at 1. Plaintiff's opening brief, however, states that the parties have agreed that "the terms 'a first signal strength indicator circuit' and 'an output-level-sensing circuit' from the '330 patent should be given their plain and ordinary meanings." [Dkt. # 63] at 2. This agreement is also set forth in the parties' May 9, 2017 Joint Claim Construction Chart. [Dkt. # 73] at A1–A2.

IV. CONSTRUCTION OF DISPUTED TERMS

A. "dynamically adjust[ed]"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
Plain and ordinary meaning. Alternatively, "changing during operation"	"adjust[ed] in a continuous manner, as opposed to discrete steps"

[Dkt. # 50-1] at 1, 17; [Dkt. # 63] at 5; [Dkt. # 69] at 1; [Dkt. # 71] at 1; [Dkt. # 73] at A-1. The parties submit that this term appears in Claims 23, 26, 29, and 30 of the '330 Patent. *Id.*

Shortly before the start of the May 23, 2017 hearing, the Court provided the parties

with the following preliminary construction: "adjust[ed] during operation without being limited to whether a threshold has been crossed."

(1) The Parties' Positions

Plaintiff argues: "A person of ordinary skill in the art would understand that a first parameter, such as signal strength, is identified during operation of the system and would thus further understand that an adjustment/change of a second parameter based on or in response to the identification of the first parameter, such as a change in impedance based on or in response to the identified signal strength, likewise occurs during operation of the system." [Dkt. # 63] at 6. Plaintiff further argues that Defendants' proposal of "continuous manner, as opposed to discrete steps" is unsupported and is contrary to examples disclosed in the specification, such as in Figure 13. *Id.* at 6–7.

Defendants respond that during prosecution, "[i]n the process of making [a] disclaimer, the patentee clearly defined the term 'dynamically' to mean continuous as opposed to discrete." [Dkt. # 69] at 1. Defendants also argue that Plaintiff is misinterpreting the description of Figure 13 because "Figure 13 merely shows a *resulting* power dissipation rather than any type of *adjustment* of a parameter (impedance or gain) to a discrete set of levels." *Id.* at 5.

Plaintiff replies that "dynamically" as used in the prosecution history "refers to making adjustments without reliance on a threshold. Theta's comments note that 'continuous behavior' is commonly characterized as dynamic; but this does not necessitate an understanding that 'dynamic' must mean 'continuous.'" [Dkt. # 71] at 1. Plaintiff also argues

that the patentee "pointed out that the distinction between the claim and [the] Clark [reference] is not based on 'dynamically' changing—but simply on making any change (i.e., based on the claimed term 'changing' rather than the combined claimed terms 'dynamically changing'[).]" *Id.* at 2.

At the May 23, 2017 hearing, Defendants argued that the prosecution history repeatedly described "dynamically" in terms of levels rather than in terms of time. Defendants reiterated that the patentee referred to "dynamically" as being "continuous," which Defendants argue means being able to select any value within an operable range of values. Defendants concluded that the ultimate question of whether the adjustability is "continuous" is a factual question for expert witnesses to opine upon. Plaintiff responded that the patentee used "dynamically" to refer to making changes in response to changing conditions. Plaintiff had no objection to the Court's preliminary construction.

(2) Analysis

Claim 29 of the '330 Patent, for example, recites (emphasis added):

> 29. A wireless transceiver integrated circuit comprising:
>
> a receiver comprising a signal path, the signal path comprising:
>
> a first circuit; and
>
> a second circuit having an input coupled to an output of the first circuit; and
>
> a first signal strength indicator circuit coupled to the signal path, and configured to determine a first signal strength;
>
> wherein a gain of the first circuit is configured to be *dynamically adjusted* in response to the first signal strength, and
>
> wherein an impedance in the second circuit is configured to be *dynamically adjusted* in response to the first signal strength.

Surrounding claim language thus provides context suggesting that "dynamically" refers to adjustment being responsive to the "first signal strength" that is determined by an indicator circuit coupled to the signal path. *See Phillips*, 415 F.3d at 1314 ("the context in which a term is used in the asserted claim can be highly instructive").

Also, the specification contrasts "dynamic" with "fix[ed]" when describing Figure 13:

> FIG. 13 is an example shown [*sic*] how power may be saved as a function of time by employing one or more of these methods consistent with embodiments of the present invention. Power is plotted along a Y-axis 1304 as a function of time along X-axis 1302. Conventional worst case design would *fix power dissipation at line 1310*. As can be seen, *dynamic power dissipation 1320* under the control of variable gains, impedances, biasing, or combination thereof, allows for a lower average power 1330 as compared to the power dissipated 1310 by the conventional design.

'330 Patent at 11:30–39 (emphasis added).

Defendants have relied extensively upon the prosecution history of the '728 Patent, asserting that the patentee defined "dynamically" or otherwise disclaimed claim scope.

As a threshold matter, Defendants have not shown that any purported disclaimer in the prosecution history of the '728 Patent can be applied to the recitals of "dynamically" in the parent '330 Patent, which issued several years prior to the '728 Patent prosecution history cited by Defendants. The authorities cited by Defendants involved disclaimers applied from a parent patent to a child patent, or between sibling patents, not from a child patent to a parent patent. *See Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1334 (Fed.

Cir. 2003) (finding disclaimer applicable to child patent because "we presume, unless otherwise compelled, that the same claim term in the same patent or related patents carries the same construed meaning"); *see also Alloc*, 342 F.3d at 1372 (similar); *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 980 (Fed. Cir. 1999) ("When multiple patents derive from the same initial application, the prosecution history regarding a claim limitation in any patent that has issued applies with equal force to *subsequently* issued patents that contain the same claim limitation.") (emphasis added).

Defendants rely primarily upon *Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1349–50 (Fed. Cir. 2004), but although *Microsoft* applied a disclaimer to a related patent that issued prior to the prosecution history that included the disclaimer, that related patent was a sibling (or, arguably, a cousin), not a parent. Defendants presumably are asserting that this is a distinction without a difference, but it is noteworthy that whereas precedent supports applying a disclaimer to a child patent, such as cited above, Defendants have cited no binding or persuasive precedent that applied a disclaimer to a parent patent, and the Court finds none.

One of the authorities cited by Defendants nonetheless states that later prosecution history can be "relevant" to earlier claims. *Absolute Software, Inc. v. World Computer Sec. Corp.*, No. A-09-CV-142-LY, 2014 WL 496879, at *8 (W.D. Tex. Feb. 6, 2014). Also, *Microsoft* noted:

> We rejected the argument that the patentee was bound, or estopped, by a statement made in connection with a later application on which the examiner of the first application could not have relied. We did not suggest, however,

> that such a statement of the patentee as to the scope of the disclosed invention would be irrelevant. Any statement of the patentee in the prosecution of a related application as to the scope of the invention would be relevant to claim construction, and the relevance of the statement made in this instance is enhanced by the fact that it was made in an official proceeding in which the patentee had every incentive to exercise care in characterizing the scope of its invention.

Microsoft, 357 F.3d at 1350 (discussing *Georgia–Pacific Corp. v. United States Gypsum Co.*, 195 F.3d 1322 (Fed. Cir. 1999)).

Even when the prosecution history of the ’728 Patent is considered, however, the patentee distinguished the “Clark” reference on the basis that “dynamic” adjustment “uses no threshold” and occurs “as SNR [(signal-to-noise ratio)] varies”:

> Clark in US patent 5,001,776 (hereinafter “Clark”) is teaching a system with a “High current mode” and a “Low current mode”. This is shown in his Fig. 2. Also, Column 2, line 7 discusses a “threshold” which is always necessary in any so called “two-level” system. This is also discussed in the Abstract, stating that when the quality of the desired signal is low and the strength of all received signals is also low, or *when the quality of the desired signal is above a threshold*, the receiver operates in a lower current mode to conserve power and maximize battery lifetime. By contrast, *Tsividis uses no threshold*; rather, the control adjusts *dynamically* the power dissipation *as the received external signal’s SNR varies* as set forth in all independent claims in the case as now amended.

Aug. 27, 2014 Amendment [Dkt. # 69-10] at 8 (emphasis modified). The patentee thus used “dynamically” with reference to a *varying* signal-to-noise *ratio* as contrasted with merely evaluating whether the quality of the desired signal exceeded a threshold. A review of Clark itself further reinforces that the patentee was distinguishing Clark as disclosing a signal quality threshold rather than dynamic adjustments based on signal strength ratios. *See, e.g.*,

U.S. Patent 5,001,776 [Dkt. # 7] at 2:6–8. Likewise, the patentee further stated:

> For that purpose, consider for example the 1st row of Clark's Table 1 that teaches that when the desired signal is low and the received signal is low, the Clark system operates in a low bias. By contrast, as Tsividis teaches, the *relation* between the desired signal and the interference is checked and when the desired signal is larger than the interference signal (even if both are low) then the power dissipation decreases, however, if the desired signal is smaller than the interference signal (even if both are low) then the power dissipation increases. The same is possible in the case described in the 4th row of Clark when both the desired signal and the interference are high, it is still possible that the desired signal is higher than the interference or vice versa, leading to different operation of the circuit, and therefore not teaching the same case.

Aug. 27, 2014 Amendment [Dkt. # 69-10] at 9 (emphasis added).

Defendants have emphasized statements by the patentee referring to "continuous behavior" as the basis for Defendants' proposed construction:

> Applicant disagrees with Examiner's assertion that Clark teaches dynamically adjust [*sic*, adjusting] impedance in the signal path as Clark teaches away therefrom. In fact Clark teaches an on/off solution that is based on a threshold and therefore Clark does not dynamically respond but rather responds when a threshold is crossed. In other words, Clark does not teach a *continuous behavior, commonly characterized as dynamic*, and rather teaches away therefrom by teaching a[] two-state solution, or discrete at best.

Id. at 11 (emphasis modified).

This disclosure that "continuous" can be "characterized" as dynamic does not amount to a definition and does not necessarily mean that all that is "dynamic" is necessarily "continuous," particularly in light of the other prosecution statements discussed above and herein. *See CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) ("the claim term will not receive its ordinary meaning if the patentee acted as

his own lexicographer and *clearly* set forth a definition of the disputed claim term in either the specification or prosecution history") (emphasis added); *see also Golight, Inc. v. Wal-Mart Stores, Inc.*, 355 F.3d 1327, 1332 (Fed. Cir. 2004) ("Because the statements in the prosecution history are subject to multiple reasonable interpretations, they do not constitute a clear and unmistakable departure from the ordinary meaning of the term . . . .").

Also, whereas the patentee in another portion of the prosecution history distinguished Clark as "seem[ing] to teach adaptation between a *lower current mode and a higher current mode* (see Col. 3 lines 26–57), which therefore reaches [*sic*, teaches] away from *dynamically varying an impedance*," the patentee further asserted that "nothing taught in Clark teaches any kind of change in impedance." Feb. 24, 2014 Amendment [Dkt. # 69-8] at 9, 12; *see* Aug. 27, 2014 Amendment [Dkt. # 69-10] at 9 ("Furthermore, Clark teaches shutting down certain stages, which is a simple 'on/off' control. Tsividis does not shut off any circuits.").

Instead, the patentee appears to have used "dynamically" to refer to during operation. Such a reading is also consistent with other portions of the prosecution history. *See* Feb. 10, 2012 Amendment [Dkt. # 69-5] at 27 ("Yamamoto [(U.S. Patent 6,370,210)] seems to teach discrete gain adjustment during the preamble portion of a transmission . . ."; "after the time T4 . . ., while still in the preamble period, there cannot be any *dynamic* changing of the AGC [(automatic gain control)]") (emphasis added).

Still, the patentee distinguished using a signal strength threshold rather than variable

ratios between signals, as discussed above, and Plaintiff appears to acknowledge this distinction in its reply brief, noting that the patentee referred to "making adjustments without reliance on a threshold." [Dkt. # 71] at 1 (discussing Aug. 27, 2014 Amendment [Dkt. # 69-10] at 8, 11 (quoted above)).

The Court therefore construes **"dynamically adjust[ed]"** to mean **"adjust[ed] during operation without reliance upon a signal strength threshold."**

B. "impedance"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
Plain and ordinary meaning. Alternatively, "a value of electrical resistance, electrical reactance, or both"	"the total opposition (i.e., resistance and reactance) a circuit offers to the flow of alternating current at a given frequency"

[Dkt. # 50-1] 2, 18; [Dkt. # 63] at 7; [Dkt. # 69] at 10; [Dkt. # 71] at 2; [Dkt. # 73] at A-1. The parties submit that this term appears in Claims 1, 2, 4, 17, 20, 23, 24, 25, and 29 of the '330 Patent. *Id.*

Shortly before the start of the May 23, 2017 hearing, the Court provided the parties with the following preliminary construction: "opposition to the flow of current." During the hearing, the parties agreed that "impedance" should be construed to mean "opposition to the flow of alternating current."

Based on this agreement between the parties, the Court construes **"impedance"** to mean **"opposition to the flow of alternating current."**

C. “a component in the receiver signal path”

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
Plain and ordinary meaning. Alternatively, “an active or passive electronic device or circuit element in the receiver signal path”	“a component through which the input signal passes”

[Dkt. # 50] Ex. A at 4 & 20; [Dkt. # 63] at 10; [Dkt. # 69] at 19; [Dkt. # 71] at 3; [Dkt. # 73] at B-1. The parties submit that this term appears in Claim 1 of the ’728 Patent. *Id.*

Shortly before the start of the May 23, 2017 hearing, the Court provided the parties with the following preliminary construction: “plain meaning.”

(1) The Parties’ Positions

Plaintiff argues that the non-limiting examples set forth in the specification include passive as well as active devices. [Dkt. # 63] at 11. Plaintiff also argues that Defendants’ proposal should be rejected because “it remains unclear at what position along the receiver signal path would an ‘input signal’ be sufficiently altered to become an ‘output signal’ (or at least sufficiently altered to no longer be deemed an ‘input signal’).” *Id.* at 12.

Defendants respond that their proposed construction “comports with the plain meaning of the claim phrase, since a component that is ‘in’ the path of the received signal would have the signal pass through it.” [Dkt. # 69] at 20. Defendants also argue that the specification is consistent with their proposal. *Id.* at 20–21.

Plaintiff replies that “[t]o be clear, the language in this instance does *not* recite ‘in the path of the received signal,’ and Defendants’ arguments relying on such alternative language should be disregarded.” [Dkt. # 71] at 3. Plaintiff also argues that “there is no

indication that the input signal received at the upstream component is the same signal received at the downstream component, or any further downstream component." *Id.* at 4.

(2) Analysis

The specification discloses various inputs and outputs, for example as follows:

> When a receiver is actively receiving a desired signal, *each block in the signal path has at its input* the desired signal as well as noise and possibly interfering signals. The desired signal is the useful, information-carrying portion of a received signal.
>
> * * *
>
> FIG. 14 is a block diagram of a portion of a receiver consistent with an embodiment of the present invention. Included are low-noise amplifier 1410, mixer 1420, gain stage 1430, filter 1440, AGC amplifier 1450, and VCO 1460. Signal strength detection is done at the *output* of the low-noise amplifier by signal strength indicator 1470, at the *output* of the mixer by signal strength indicator 1472, and at the *output* of the filter by signal strength indicator 1474. The *outputs* of the signal strength indicator circuits are received by the computational circuit 1470, which in turn controls gain and power control circuits 1480 and 1485. Power and gain control circuits 1480 and 1485 control the gain, biasing, and impedance levels of the circuits in the receiver signal path.

'330 Patent at 5:17–21, 11:40–53 (emphasis added).

Defendants' proposal of referring to "the input signal" is unclear as to whether a received signal remains the "input signal" after having been altered. Defendants' proposal would therefore tend to confuse rather than clarify the scope of the disputed term. *See, e.g.*, *id.* at 2:19–23 ("a signal path having a low-noise amplifier configured to receive the signal, a mixer having an *input* coupled to an output of the low-noise amplifier, and a low-pass filter having an *input* coupled to an output of the mixer") (emphasis added).

The Court therefore expressly rejects Defendants' proposed construction. No further construction is necessary. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *see also O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) ("[D]istrict courts are not (and should not be) required to construe every limitation present in a patent's asserted claims."); *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1207 (Fed. Cir. 2010) ("Unlike *O2 Micro*, where the court failed to resolve the parties' quarrel, the district court rejected Defendants' construction."); *ActiveVideo Networks, Inc. v. Verizon Commcn's, Inc.*, 694 F.3d 1312, 1326 (Fed. Cir. 2012); *Summit 6, LLC v. Samsung Elecs. Co., Ltd*., 802 F.3d 1283, 1291 (Fed. Cir. 2015).

At the May 23, 2017 hearing, neither party had any objection to the Court's preliminary construction of this term as having its plain meaning.

The Court accordingly construes **"a component in the receiver signal path"** to have its **plain meaning**.

D. "scaling . . . impedance"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meaning, Alternatively, "varying a value of electrical resistance, electrical reactance, or both"	"adjusting a load R and a capacitance C using the same factor"

[Dkt. # 50-1] at 5, 20; [Dkt. # 63] at 12; [Dkt. # 69] at 14; [Dkt. # 71] at 4; [Dkt. # 73] at

B-1. The parties submit that this term appears in Claim 1 of the ’728 Patent. *Id.*

Shortly before the start of the May 23, 2017 hearing, the Court provided the parties with the following preliminary construction: “varying the opposition to the flow of current.”

(1) The Parties’ Positions

Plaintiff argues that examples disclosed in the specification “requir[e] only the scaling of a resistance, which is consistent with Theta’s proposed construction that does not require both the resistance and reactance to be varied.” [Dkt. # 63] at 14. Plaintiff further argues that “Defendants’ proposed construction does not make sense when applied to a circuit other than a filter,” and “[t]he plain language of claim 1 does not limit scaling the impedance to a filter, but rather recites scaling an impedance of any type of component.” *Id.* Plaintiff concludes that “Defendants’ construction seeks to impermissibly import limitations from a particular example in the specification into the claims.” *Id.* at 15.

Defendants respond that “this term was coined by the patentee” and therefore “the specification is the single best guide to understanding what the patentee meant by the phrase ‘scaling an impedance.’” [Dkt. # 69] at 14. Defendants argue that reactance must be scaled by adjusting both resistance and reactance, and “[b]ecause resistance is the reciprocal of conductance, an equivalent expression of the patentee’s definition for impedance scaling is dividing conductance by a factor and dividing capacitance by the same factor.” *Id.* at 16.

Plaintiff replies: “If Defendants’ construction was correct, then the claim would be

limited to controlling the impedance of filters only. This is contrary to the plain language of the claims and the clear disclosure of the specification, as the specification describes controlling impedance not just for filters, but also mixers, amplifiers, and other circuits." [Dkt. # 71] at 5 (citing the '728 Patent at 8:7–24). "Moreover," Plaintiff argues, "Defendants' proposed construction requires the impedances of at least *two* components, both a resistor and a capacitor, to be varied. However, claim 1 recites 'scaling an impedance of *at least a* component.'" [Dkt. # 71] at 5 (Plaintiff's emphasis).

At the May 23, 2017 hearing, Defendants urged that "scaling impedance" has a special meaning and that the description of Figure 6 is the only guidance provided by the specification. In response, Plaintiff agreed with the Court's preliminary construction and argued that "scaling" is not a coined term and would be understood when used together with "impedance."

(2) Analysis

Defendants' proposed construction requires both a resistance and a capacitance. The specification discloses an embodiment that involves scaling impedance by doubling a resistance and halving a capacitance:

> FIG. 6 is an example of how a circuit's *impedances may be scaled* to reduce drive currents, and, depending on the circuit configuration used, associated bias currents as well. A driver 612 has a load R 614 and C 616. The frequency response of this circuit is the same as that seen by driver 622, which drives an impedance of 2R 624 and C/2 626. But the impedance of the load seen by driver 622 is double that seen by 612, thus the output current required by the driver 622 is reduced by one-half.
>
> As an example, the output stage of each of these drivers may be a Class A

> emitter follower formed by an emitter follower connected to a current source. When the outputs are driven high, the emitter of driver 622 need supply only one-half the drive current as driver 612. In this way, an *impedance can be scaled* in order to decrease a circuit's required drive current.

'330 Patent at 7:44–59 (emphasis added); *see id.* at Fig. 6.

On balance, however, Defendants' proposal would improperly limit the disputed term to a specific disclosed embodiment. *See Phillips*, 415 F.3d at 1323. In particular, the scaling disclosed with reference to Figure 6 appears applicable to a particular type of filter but might not be applicable to other filters or other types of components.

As to the proper construction, Defendants have cited disclosures by the named inventor regarding "impedance scaling" in one of the cited references of the patents-in-suit:

> The absolute value of the transconductors and capacitors can be *scaled by the same factor, i.e., impedance scaling*, without affecting the transfer function of the main filter 132, since the transfer function depends on the ratios between these values. *Impedance scaling* does not change the transfer function of the main filter 132, however it does change the power dissipation and the noise level of the main filter 132.

WO 02/056470 [Dkt. # 69-24] at 18:21–26 (emphasis added); *see id.* at 41:29–42:3, 49:12–18 (similar). This cited reference is intrinsic evidence. *See V-Formation, Inc. v. Benetton Group SpA*, 401 F.3d 1307, 1311 (Fed. Cir. 2005) ("This court has established that prior art cited in a patent or cited in the prosecution history of the patent constitutes intrinsic evidence.") (citations and internal quotation marks omitted).

Defendants have also cited extrinsic technical papers authored by the named inventor:

> If the requirement for low noise can be relaxed (e.g., when the input signal is large), power dissipation can be decreased through *impedance scaling* as

discussed below.

* * *

> The filter resistor generates thermal noise (assumed dominant), the power of which is proportional to R. If we want to allow the noise to increase, we can increase R; for the cutoff frequency of the filter to stay the same, we must decrease C by the same factor R was decreased. For example, if we want to increase the noise power of the filter by a factor of 2, we can change R to 2R and C to C/2, as shown on the right. Now, however, the total impedance seen by the op amp is increased by a factor of 2. For the op amp to be able to generate the same voltage swing as before, it needs to drive into the filter only half as much current, so its bias current can be reduced by approximately a factor of 2, if the circuit is properly optimized. Thus, the power dissipation will go down by a factor of 2, which is the same factor by which the noise power was increased. In general, if we can allow the noise power to rise k times through *impedance scaling*, we can decrease the power dissipation k times.

Yannis Tsividis, *Strategies for Power Dissipation Reduction in Wireless Transceivers* (Feb. 27, 2002) [Dkt. # 69-26] at 10 (emphasis added); *see* Yannis Tsividis, *Methods for Power Dissipation Savings in the Baseband Filter* (June 10, 2002) [Dkt. # 69-29] at 5 ("To impedance-scale up by a factor n, divide all capacitances by n and increase all resistances by n."). Although extrinsic, this evidence is consistent with the above-discussed characterizations of "scaling" as meaning more than simply adjusting.

On balance, this intrinsic and extrinsic evidence demonstrates that "scaling" in this context refers to changing values based on a common factor. *See Desper Products, Inc. v. QSound Labs, Inc.*, 157 F.3d 1325, 1335 (Fed. Cir. 1998) ("we are interpreting explicit claim language, not importing limitations into the claim").

Defendants have presented extrinsic evidence regarding the meaning of "impedance" in the relevant art as being made up of resistance and reactance. For example, Defendants have cited a technical dictionary that defines "impedance" as follows:

> l. The total opposition (i.e., resistance and reactance) a circuit offers to the flow of alternating current at a given frequency; the ratio of the potential difference across a circuit or element of a circuit to the current through the circuit or element. It is measured in ohms, and its reciprocal is called admittance. Symbol: Z. 2. The combination of resistance and reactance[.] 3. Combined opposition to current resulting from resistance, capacitance, and inductance. 4. The sinusoidal terminal voltage of a circuit divided by the current through it. 5. A speaker's resistance to an alternating current, which varies with frequency. A speaker's rated impedance is usually the value measured at 400 Hz. 6. The opposition to alternating current in a circuit, generally categorized as either high or low, and measured in ohms. 7. The total opposition that a circuit offers to the flow of alternating current or any other varying current at a particular frequency. It is a combination of resistance, R, and reactance, X, measured in ohms.

Modern Dictionary of Electronics (7th ed. 1999) [Dkt. # 69-13] at 364; *see also* [Dkt. # 69] Exs. 14–21.

The specification is consistent with the extrinsic evidence regarding "impedance." For example, the specification refers to impedance being related to resistance and capacitance, as quoted above. *See* '330 Patent at 7:44–52 (quoted above).

Finally, as to Plaintiff's alternative proposal, Plaintiff has submitted that Claim 1 of the '728 Patent recites (emphasis added) "scaling an impedance of at least *a* component," which Plaintiff argues demonstrates that impedance scaling can encompass varying resistance *or* reactance, not necessarily both. Plaintiff has not shown, however, that Claim 1 of the '728 Patent uses the phrase "a component" to refer to, for example, a single resistor

or a single capacitor rather than, for example, a filter that includes both a resistor and a capacitor. In other words, Plaintiff has not shown that "a component" cannot include multiple subcomponents that could be involved in impedance scaling.

The Court therefore construes **"scaling . . . impedance"** to mean **"varying values of resistance and reactance based on a common factor."**

E. "interfering signals"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
Plain and ordinary meaning. Alternatively, "signals that interfere with the receipt of the received desired signal"	"signals generated outside the transceiver by other transceivers or nearby electronic equipment that interfere with the receipt of the received desired signal"

[Dkt. # 50-1] at 7–8, 22; [Dkt. # 63] at 15; [Dkt. # 69] at 21; [Dkt. # 71] at 5; [Dkt. # 73] at B-2. The parties submit that this term appears in Claim 1 of the '728 Patent. *Id.*

Shortly before the start of the May 23, 2017 hearing, the Court provided the parties with the following preliminary construction: "signals generated outside the transceiver that interfere with the receipt of the received desired signal." During the hearing, both sides agreed to the Court's preliminary construction.

The Court therefore construes **"interfering signals"** to mean **"signals generated outside the transceiver that interfere with the receipt of the received desired signal."**

F. "interferer signal"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
Plain and ordinary meaning. Alternatively, "a signal that interferes with the receipt of the received desired signal"	"a signal generated outside the transceiver by other transceivers or nearby electronic equipment that interferes with the receipt of the received desired signal"

[Dkt. # 50-1] at 9, 23; [Dkt. # 63] at 19; [Dkt. # 69] at 21; [Dkt. # 71] at 5; [Dkt. # 73] at B-2. The parties submit that this term appears in Claims 1, 2, 7, and 8 of the '728 Patent. *Id.*

Shortly before the start of the May 23, 2017 hearing, the Court provided the parties with the following preliminary construction: "a signal generated outside the transceiver that interferes with the receipt of the received desired signal." During the hearing, both sides agreed to the Court's preliminary construction.

The Court therefore construes **"interferer signal"** to mean **"a signal generated outside the transceiver that interferes with the receipt of the received desired signal."**

G. "substantially the desired signal with the interferer signal reduced by filtering from the input signal"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
Plain and ordinary meaning. Alternatively, "the useful, information-carrying portion of a received signal and the interferer signal, wherein the interferer signal has been reduced by a filter circuit from a level that the interferer signal had before the filter circuit"	Indefinite

[Dkt. # 50-1] at 11, 24; [Dkt. # 63] at 20; [Dkt. # 69] at 23; [Dkt. # 73] at B-3 to B-4. The

parties submit that this term appears in Claim 2 of the '728 Patent. [Dkt. # 73] at B-3.

Shortly before the start of the May 23, 2017 hearing, the Court provided the parties with the following preliminary construction: "a signal in which the desired signal is stronger than the interferer signal after the interferer signal has been reduced by filtering the input signal."

(1) The Parties' Positions

Plaintiff submits that "the '728 patent describes the operation of a filter to reduce the interfering signals relative to the desired signal." [Dkt. # 63] at 21. Plaintiff also argues: "These are real world signals that are being processed, and as such, are never exactly at a specified level. The language 'substantially' would be understood by one of ordinary skill in the art as merely not requiring an excessive amount of precision." *Id.* at 22. Likewise, Plaintiff argues that the presence of signal noise gives rise to the need for using the term "substantially." *Id.*

Defendants respond that "[t]his limitation is indefinite because neither the claims nor the specification provide any guidance as to what ratio of desired signal to interferer signal qualifies as being 'substantially the desired signal.'" [Dkt. # 69] at 23–24. In particular, Defendants argue that "there is no guidance as to what the *upper bound* on the strength of the interferer signal can be such that the signal at the second node is still 'substantially the desired signal.'" *Id.* at 25. Further, Defendants argue, Plaintiff's proposed construction fails to resolve "how much must the interferer signal be reduced by filtering in order for the remaining signal to be 'substantially' the 'useful, information-carrying portion' of the

signal." *Id.* at 27.

Plaintiff replies that "[t]his claim term does not limit or describe how much of the interferer signal is permitted to be present after filtering, because this claim term merely identifies which signal in the receiver signal path is relevant, namely, the signal present after filtering has been performed." [Dkt. # 71] at 7.

At the May 23, 2017 hearing, Plaintiff agreed with the Court's preliminary construction. Defendants responded by emphasizing that the disclosure regarding Figure 4 does not involve measuring relative strengths of signals.

(2) Analysis

As a threshold matter, the constituent term "interferer signal" is addressed separately above.

Figure 4 of the '728 Patent illustrates using filtering to reduce the strength of interferers 464 and 466 relative to the desired signal 462. *See* '728 Patent at 6:36–56, Fig. 4. The specification indicates that some amount of interference and noise may nonetheless remain present together with the desired signal. *See, e.g.*, '728 Patent at 5:9–11 ("When a receiver is actively receiving a desired signal, each block in the signal path has at its input the desired signal as well as noise and possibly interfering signals.") & 5:44–46.

Claim 2 of the '728 Patent recites (emphasis added):

> 2. A method of controlling power dissipation in a receiver, when a receiver is receiving and processing an input signal that includes a desired signal and at least an interferer signal, the method comprising:
>
> determining at a first node a strength of the input signal;

> determining at a second node a strength of a signal, that is *substantially the desired signal with the interferer signal reduced by filtering from the input signal*;
>
> comparing the signal levels at the first node and the second node to deduce the relative increase or decrease in strengths of the desired signal and the at least an interferer signal; and
>
> causing a variable decrease in power dissipation within the receiver and a resultant decrease in a battery drain of the receiver, by variably changing an impedance of at least a component in the receiver, based on the input signal strength, upon determination that the relative strength of the desired signal has increased or the relative strength of the interferer signal has decreased; and,
>
> causing a variable increase in power dissipation within the receiver and a resultant increase in the battery drain of the receiver, by variably changing the impedance of the at least a component in the receiver, based on the input signal, upon determination that the relative strength of the desired signal has decreased or the strength of the interferer signal has increased.

Although Defendants have emphasized that the word "substantially" appears in Claim 2 of the '728 Patent but does not appear in Claim 1, Defendants have not shown how this distinction between these two independent claims demonstrates indefiniteness.

The word "substantially" is a term of degree, as the parties appeared to agree at the May 23, 2017 hearing. Such terms can be "problematic." *Liberty Ammunition, Inc. v. United States*, 835 F.3d 1388, 1395 (Fed. Cir. 2016) ("We begin our analysis by recognizing that the term 'reduced area of contact' is one of degree, as it necessarily calls for a comparison against some baseline. Terms of degree are problematic if their baseline is unclear to those of ordinary skill in the art."). Such terms, however, are not necessarily indefinite. *See Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1370 (Fed. Cir. 2014) ("We do not

understand the Supreme Court to have implied in *Nautilus* . . . that terms of degree are inherently indefinite.") (discussing *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120 (2014)).

As to Plaintiff's alternative proposal of "the useful, information-carrying portion of a received signal and the interferer signal, wherein the interferer signal has been reduced by a filter circuit from a level that the interferer signal had before the filter circuit," however, Plaintiff's proposal would apparently be satisfied by any reduction in the strength of the interferer signal. Plaintiff's alternative proposal thus fails to give meaning to the claim language that requires (emphasis added) "a signal, that is *substantially* the desired signal." *See Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950 (Fed. Cir. 2006) ("claims are interpreted with an eye toward giving effect to all terms in the claim."). This remains true even though, as Plaintiff has noted, subsequent limitations in above-reproduced Claim 2 recite operations based on "the relative strength of the desired signal."

Instead, the term "substantially" is used to refer to a relatively greater signal strength. Such a reading is consistent with Figures 2A and 2B and the description thereof:

> FIGS. 2A and 2B illustrate examples of desired signals, interferers, and noise that may be received by one of the various circuits in a wireless receiver. In each of these figures, the signal strength is plotted along a Y-axis 204 or 254 as a function of frequency along an X-axis 202 or 252. In the example of FIG. 2A, a received desired signal 206 is *large in comparison* to interfering signals 208 and 210. In these examples, two interfering signals are shown for illustrative purposes, though there may be no such signals, one such signal, or more than two such signals in the frequency range of interest. Also, while for these examples the interferers are shown as being at a higher frequency than the desired signal, there may be one or more interferers at higher or

lower frequencies as the desired signal. In this specific example, the acceptable noise floor 214 is relatively high, while maximum signal handling capability Smax 212 (that is the maximum signal power that can be handled with an acceptably low distortion) needs only to be high enough to accommodate the desired signal. For this specific example, the circuit receiving this input spectrum only requires a relatively small dynamic range for proper operation, that is the range between Smax 212 and the noise floor 214 is relatively small.

Conversely, in the example shown in FIG. 2B, the desired signal 256 is *relatively weak* compared to the large interferers 258 and 260. In this example, the noise floor 264 should be relatively low so as to prevent an unacceptable level of error in the recovery [of] the desired signal 256. The maximum signal handling capability Smax 262 should be relatively high to accommodate the large interferers in order to avoid the creation of intermodulation products as described below. Accordingly, in this specific example, the circuit receiving this input spectrum should have a large dynamic range, particularly in comparison to the example of FIG. 2A.

'330 Patent at 5:28–62 (emphasis added). Figure 2A, for example, is reproduced here:

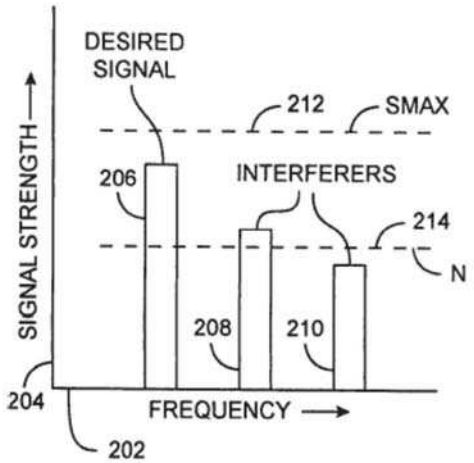

FIG. 2A

The specification thus provides context for understanding "substantially the desired

signal" as referring to the desired signal being relatively larger than another signal. Defendants argue that the description of Figures 2A and 2B relates to a received signal, not a filtered signal, but the disclosed relationships of "large in comparison" and "relatively weak" nonetheless inform the usage of "substantially" in Claim 2 of the '728 Patent, particularly in light of the recital of "relative strength" in the claim. *See id.*

Defendants also caution that "it is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue." *See Hockerson-Halberstadt v. Avia Group Int'l, Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000). Here, however, the Figures of the patents-in-suit need not be relied upon to provide "precise proportions" (*id.*) but rather merely illustrate relative strengths, consistent with the above-reproduced description. *See* '330 Patent at 5:28–62; *see also id.* at 6:30–31 ("when a weak desired signal 306 is accompanied by large interferers 310 and 312"), 9:43–45 ("the desired signal 936 is strong, while the interfering signals 937 and 938 are relatively weak"), 10:2–3 ("the desired signal 1036 and interferers 1037 and 1038 are each relatively large") & 10:29–31 ("the desired signal 1136 is relatively low or weak while the interfering signals 1137 and 1138 are large"). Defendants themselves refer to "the claim language requiring the signal to be substantially the desired signal (*i.e.*, the desired signal is *relatively larger*, to some undefined degree, compared to the interferer)." [Dkt. # 69] at 26 (emphasis added).

The Court accordingly construes **"substantially the desired signal with the interferer signal reduced by filtering from the input signal"** to mean **"a signal in which the**

desired signal is stronger than the interferer signal after the interferer signal has been reduced by filtering the input signal."

H. "variably changing . . . impedance"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
Plain and ordinary meaning. Alternatively, "varying a value of electrical resistance, electrical reactance, or both"	"adjust[ed] in a continuous manner, as opposed to discrete steps"

[Dkt. # 50-1] 12, 25; [Dkt. # 63] at 23; [Dkt. # 69] at 7; [Dkt. # 73] at B-4. The parties submit that this term appears in Claim 2 of the '728 Patent.

Shortly before the start of the May 23, 2017 hearing, the Court provided the parties with the following preliminary construction: "varying the opposition to the flow of current."

(1) The Parties' Positions

Plaintiff argues that "construing the term 'variably changing . . . impedance' consistently with the term 'scaling . . . impedance' is consistent with the specification." [Dkt. # 64] at 24. In other words, Plaintiff submits, "the use of the word 'variable' in the specification of the '728 patent is consistent with the use of the word 'scaling' in the specification." *Id.* Also, Plaintiff argues that Defendants' proposed construction "is incorrect because it is contrary to the usage of the term by the '728 patent and seeks to exclude an embodiment described in the patent." *Id.*

Defendants argue that the prosecution history discussed as to the term "dynami-

cally adjust[ed]," above, applies as to the term "variably changing . . . impedance" because "the patentee never revoked the previous disclaimer or made clear that it did not apply to the substantially similar language in claim 2" and "the patentee affirmatively linked claim 2 (pending claim 176) and its 'variably changing' language to the term 'dynamically change,' which is subject to the foregoing disclaimer." [Dkt. # 69 at 7].

Plaintiff replies that "even if there was a disclaimer, Theta effectively revoked any such earlier disclaimers in the October 12, 2015 Amendment." [Dkt. # 71] at 8.

(2) Analysis

Prosecution history regarding "dynamically" is discussed above as to the term "dynamically adjust[ed]." *See, e.g.*, Aug. 27, 2014 Amendment [Dkt. # 69-10] at 8, 11.

Defendants have cited *Alloc, Inc. v. International Trade Commission* for the proposition that a previous disclaimer can apply to newly added claims where the patentee "did not . . . retract or modify the representations that secured allowance of the original claims." *Alloc, Inc.*, 342 F.3d at 1372. *Alloc* is distinguishable, however, because whereas regarding the "play" in the original claims "the USPTO relied on the patentee's statement distinguishing the invention from the prior art based on the invention's ability to displace panels ('slide movably') and to release adjacent panels by rotation about the joint," and whereas "[a]fter gaining allowance of these claims, the patentee added new claims nearly identical to those allowed, except without the term play," the patentee then "represented to the USPTO examiner that play facilitated its novel system set forth in the revised claims." *Id.* at 1371–72.

Here, by contrast, Defendants have not demonstrated that any of the original claims in the application for the ’728 Patent were found allowable before application claim 176 was added. Further, Defendants have not shown that the patentee relied upon any previous disclaimer when arguing for allowance of new application claim 176. *Alloc* is thus distinguishable.

Defendants have also cited *Hakim v. Cannon Avent Group*, in which a disclaimer in a parent application requiring a “slit” as part of a leak-resistant drinking cup was applied to a continuation application because the applicant did not express an intent to withdraw the “slit” requirement but instead merely informed the examiner that the continuation claims were broader than the previously allowed claims. *Hakim v. Cannon Avent Group*, 479 F.3d 1313, 1315–18 (Fed. Cir. 2007). Here, by contrast, the patentee stated that “[b]ecause of the extent of the amendments and the nature of the new claims, it appears that the rejections of the claims are no longer directly applicable,” and the patentee omitted “dynamically” from the claims at issue. Oct. 12, 2015 Amendment [Dkt. # 69-11] at 6.

Hakim is further distinguishable because the claims of the continuation patent application in *Hakim* were allowed without any rejections. *See Hakim*, 479 F.3d at 1316 (“The continuation claims were allowed without any comment or rejection by the examiner.”). Here, by contrast, the patentee responded to a rejection based on the “Lee” reference, explaining that “Lee does not dynamically change an impedance in the receive circuit” because “Lee is changing signal paths, not an impedance in a signal path,” and “in Lee, no

change in impedance is made while either signal path *is being used*." Oct. 12, 2015 Amendment [Dkt. # 69-11] at 6–7 (emphasis modified).

As to the proper construction, the above-discussed prosecution history directs that the recited "variably changing" requires varying impedance during operation. *See id.*; *see, e.g., Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1381 (Fed. Cir. 2011) ("The patentee is bound by representations made and actions that were taken in order to obtain the patent."). Further, Claim 2 of the '728 Patent recites, in relevant part (emphasis added):

> causing a *variable decrease in power dissipation* within the receiver and a resultant decrease in a battery drain of the receiver, by *variably changing an impedance* of at least a component in the receiver, based on the input signal strength, upon determination that the relative strength of the desired signal has increased or the relative strength of the interferer signal has decreased; and,
>
> causing a *variable increase in power dissipation* within the receiver and a resultant increase in the battery drain of the receiver, by *variably changing the impedance* of the at least a component in the receiver, based on the input signal, upon determination that the relative strength of the desired signal has decreased or the strength of the interferer signal has increased.

Thus, the "variably changing" phrases correspond to a "variable decrease in power dissipation" and a "variable increase in power dissipation." A person of ordinary skill in the art would thus understand that the recited "variably changing" refers to changes that are not permanent, such that there could be subsequent additional changes. *See Phillips*, 415 F.3d at 1314 ("the context of the surrounding words of the claim also must be considered in determining the ordinary and customary meaning of those terms") (quoting *ACTV, Inc. v. Walt Disney Co.*, 346 F.3d 1082, 1088 (Fed. Cir. 2003)).

Finally, during the May 23, 2017 hearing, the parties agreed that "impedance" should be construed to mean "opposition to the flow of alternating current," as noted above regarding the '330 Patent. No party gave any indication contrary to applying this agreed-upon meaning to "variably changing . . . impedance" in the continuation '728 Patent. *See, e.g., Omega Eng'g*, 334 F.3d at 1334.

The Court therefore construes **"variably changing . . . impedance"** to mean **"varying the opposition to the flow of alternating current during operation."**

I. "at least a component in the receiver path"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
Plain and ordinary meaning. Alternatively, "an active or passive electronic device or circuit element in the receiver signal path"	Indefinite

[Dkt. # 50-1] at 15, 26; [Dkt. # 63] at 27; [Dkt. # 69] at 28; [Dkt. # 73] at B-5. The parties submit that this term appears in Claim 3 of the '728 Patent. *Id.*

Shortly before the start of the May 23, 2017 hearing, the Court provided the parties with the following preliminary construction: "the at least a component in the receiver."

(1) The Parties' Positions

Plaintiff submits that the specification discloses "non-limiting examples [that] are illustrative of electronic devices, as well as circuits incorporating such devices, which may be present in the receiver signal path" and which Plaintiff argues can include passive as well as active devices. [Dkt. # 63] at 28.

Defendants respond that "[i]n claim 3, the lack of antecedent basis prevents a

POSITA from ascertaining the scope of the claim with reasonable certainty, because other than in the disputed language, there is no mention of a 'path' of any kind in claims 2 and 3." [Dkt. # 69] at 29.

Plaintiff replies that despite the absence of explicit antecedent basis, the claim scope is reasonably clear in light of usage of the term "path" in the specification and in Claim 1 of the '728 Patent. [Dkt. # 71] at 10. Plaintiff concludes that a person of ordinary skill in the art would understand that "receiver path" refers to a "receiver signal path." *Id.*

At the May 23, 2017 hearing, Plaintiff alternatively proposed "a at least a component in the receiver signal path." Defendants responded that referring to a "receiver path" or "receiver signal path" would be unclear because the specification discloses multiple receiver paths and receiver signal paths.

(2) Analysis

As a general matter, "a claim could be indefinite if a term does not have proper antecedent basis where such basis is not otherwise present by implication or the meaning is not reasonably ascertainable." *See Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1249 (Fed. Cir. 2008); *see also Nautilus*, 134 S. Ct. at 2130 ("[W]e read [35 U.S.C.] § 112, ¶ 2 to require that a patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty.").

The disputed term appears in dependent Claim 3 of the '728 Patent. Claim 3 depends from independent Claim 2. Whereas Claim 1 recites a "receiver signal path" in several

instances, neither Claim 2 nor Claim 3 provides any explicit antecedent basis for "the receiver path" recited in the disputed term in Claim 3. Claims 1–3 of the '728 Patent recite (emphasis added):

> 1. A method of controlling power dissipation in a *receiver signal path* of a receiver comprising:
>
> a) receiving an input signal by the receiver;
>
> b) providing a first signal indicative of the sum of a desired signal and interfering signals in the input signal at a first location in the *receiver signal path*;
>
> c) providing a second signal indicative of the sum of a desired signal and interfering signals at a second location in the *receiver signal path*, the relative proportions of the desired signal and the interfering signals in the second signal being different from the relative proportions of the desired signal and the interfering signals in the first signal;
>
> d) deducing a strength of the desired signal relative to the strength of interferer signals in the input signal from a combination of the desired signal and the interfering signals in the first signal relative to a combination of the desired signal and the interfering signals in the second signal;
>
> e) scaling an impedance of at least a component in the *receiver signal path* responsive to the result obtained in d);
>
> wherein the scaling of the impedance of the at least a component in the *receiver signal path* results in lower power dissipation for higher strengths of the desired signal relative to the respective strength of an [*sic*] interferer signals in the input signal than for lower strengths of the desired signal relative to a strength of the respective interferer signals in the input signal.
>
> 2. A method of controlling power dissipation in a receiver, when a receiver is receiving and processing an input signal that includes a desired signal and at least an interferer signal, the method comprising:
>
> determining at a first node a strength of the input signal;
>
> determining at a second node a strength of a signal, that is substantially

the desired signal with the interferer signal reduced by filtering from the input signal;

comparing the signal levels at the first node and the second node to deduce the relative increase or decrease in strengths of the desired signal and the at least an interferer signal; and

causing a variable decrease in power dissipation within the receiver and a resultant decrease in a battery drain of the receiver, by variably changing an impedance of *at least a component in the receiver*, based on the input signal strength, upon determination that the relative strength of the desired signal has increased or the relative strength of the interferer signal has decreased; and,

causing a variable increase in power dissipation within the receiver and a resultant increase in the battery drain of the receiver, by variably changing the impedance of *the at least a component in the receiver*, based on the input signal, upon determination that the relative strength of the desired signal has decreased or the strength of the interferer signal has increased.

3. The method of controlling power dissipation in the receiver of claim 2, wherein *the at least a component in the receiver path* comprises one or more components enabled for impedance change.

"[C]laims are interpreted with an eye toward giving effect to all terms in the claim." *Bicon*, 441 F.3d at 950. Nonetheless, "surplusage may exist in some claims." *Decisioning.com, Inc. v. Federated Dep't Stores, Inc.*, 527 F.3d 1300, 1312 n.6 (Fed. Cir. 2008); *accord ERBE Elektromedizin GmbH v. Canady Tech. LLC*, 629 F.3d 1278, 1286 (Fed. Cir. 2010) (same).

On balance, "the at least a component in the receiver path" in Claim 3 has implicit antecedent basis in the recital of "at least a component in the receiver" and "the at least a component in the receiver" in Claim 2. *See Energizer Holdings Inc. v. Int'l Trade Comm'n*,

435 F.3d 1366, 1371 (Fed. Cir. 2006) (holding that "an anode gel comprised of zinc as the active anode component" provided implicit antecedent basis for "said zinc anode"); *see also Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1319 (Fed. Cir. 2005); *Ex Parte Porter*, 25 U.S.P.Q. 2d (BNA) 1144, 1145 (B.P.A.I. 1992) ("The term 'the controlled fluid' . . . finds reasonable antecedent basis in the previously recited 'controlled stream of fluid . . . .'"). Not only is the implicit antecedent basis reasonably clear on the face of this claim language, but it is also noteworthy that these three above-reproduced recitals of "at least a component" in Claims 2 and 3 are all in the context of impedance changes.

Defendants have cited this Court's findings of lack of antecedent basis in *Cellular Communications Equipment LLC v. AT&T, Inc.*, but those findings were based on the particular contexts in which the terms there in dispute appeared. *See* No. 2:15-CV-576, 2016 WL 7364266, at *8–*11 (E.D. Tex. Dec. 19, 2016).

Because the antecedent basis is "at least a component in the receiver," Defendants' argument regarding there being many different disclosed receiver signal paths is moot.

The Court therefore expressly rejects Defendants' indefiniteness argument and finds that **the antecedent basis for "the at least a component in the receiver path" in Claim 3 of the '728 Patent is "at least a component in the receiver" in Claim 2 of the '728 Patent.**

V. CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms

of the patents-in-suit. The parties are ordered to not refer to each other's claim construction positions in the presence of the jury. Likewise, in the presence of the jury, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court. The Court's reasoning in this order binds the testimony of any witnesses, and any reference to the claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

SIGNED this 6th day of June, 2017.

ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE