

**UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.**

**Before the Honorable MaryJoan McNamara  
Administrative Law Judge**

**In the Matter of**

**CERTAIN WIRELESS FRONT-END  
MODULES AND DEVICES  
CONTAINING SAME**

**Inv. No. 337-TA-1413**

**COMMISSION INVESTIGATIVE STAFF'S *MARKMAN* BRIEF**

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## **I. INTRODUCTION**

Pursuant to Order No. 10 (Adopted Procedural Schedule) and Ground Rule 1.14, the Commission Investigative Staff (“Staff”) hereby respectfully submits its Markman Brief setting forth and explaining its proposed constructions for each of the disputed claim terms in the asserted patents in this investigation.

The Staff’s proposed claim constructions are supported by the claim language, the specification, and the prosecution history of the patents. In contrast, the opposing constructions violate some of the most well-settled, fundamental canons of claim construction by, for example, ignoring intrinsic evidence in favor of extrinsic evidence, improperly redrafting claim language, and improperly reading limitations from the specification into the claim language.

## **II. PROCEDURAL BACKGROUND**

This investigation was instituted on August 22, 2024, based on a complaint and supplement filed by Complainants Skyworks Solutions, Inc., Skyworks Solutions Canada, Inc., and Skyworks Global Pte. Ltd. (“Complainants” or “Skyworks”). Notice of Institution of Investigation, 89 Fed. Reg. 67969 (EDIS Doc. ID 830286). The Notice of Investigation names Kangxi Communication Technologies (Shanghai) Co., Ltd. and Grand Chip Labs, Inc. (collectively, “KCT”); D-Link Corporation and D-Link Systems, Inc. (collectively, “D-Link”) and Ruijie Networks Co., Ltd. (“Ruijie”) as respondents (all collectively, “Respondents”). The complaint alleges violations of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, based on the importation and sale of certain wireless front-end modules and wireless

routers that allegedly infringe U.S. Patent No. 8,717,101 (“the ’101 patent”); U.S. Patent No. 9,917,563 (“the ’563 patent”); and U.S. Patent No. 9,450,579 (“the ’579 patent”).<sup>1</sup>

In accordance with Ground Rule 1.14 and the adopted procedural schedule (Order No. 10), the parties exchanged lists of claim terms to be construed on November 1, 2024. The parties subsequently exchanged proposed constructions for those terms and met and conferred in order to reduce the number of claim terms in dispute. Currently, there are six disputed claim terms across three patents, in addition to three agree-upon constructions. *See* Joint Claim Construction Chart (EDIS Doc. ID 838211). A Markman hearing is scheduled for January 23, 2025. *See* Order No. 19.

### **III. GENERAL CLAIM CONSTRUCTION PRINCIPLES**

The purpose of claim construction is to explain disputed and material claim language in a way that will be useful to the decision maker. *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co. Ltd.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008); *see also Abbott Labs. v. Sandoz, Inc.*, 544 F.3d 1341, 1360 (Fed. Cir. 2008) (noting that “claims are construed as an aid to the decision-maker, by restating the claims in non-technical terms”). Claims should generally be given their ordinary and customary meaning as understood by a person of ordinary skill in the art, viewing the claim terms in the context of the entire patent. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc). In some cases, the ordinary meaning of claim language is readily apparent and claim construction will involve “little more than the application of the widely accepted

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<sup>1</sup> U.S. Patent No. 7,409,200 was terminated from the investigation. Commission Decision Not to Review Initial Determination Partially Terminating the Investigation as to a Patent (EDIS Doc ID 838990) (December 10, 2024) (not reviewing order terminating the ’200 patent). Complainants have filed an unopposed motion to terminate the investigation as to U.S. Patent No. 9,148,194, which is pending. Complainants’ Motion to Partially Terminate the Investigation as to Patent No. 9,148,194, Motion Dkt. No. 1413-009 (EDIS Doc ID 838189).

meaning of commonly understood words.” *Id.* at 1314. In other cases, claim terms have a specialized meaning and it is necessary to determine what a person of ordinary skill in the art would have understood the disputed claim language to mean by analyzing “the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” *Id.* (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004)). The patentee may also act as a lexicographer. “When a patentee defines a claim term, the patentee’s definition governs, even if it is contrary to the conventional meaning of the term.” *Honeywell Int’l, Inc. v. Universal Avionics Sys. Corp.*, 493 F.3d 1358, 1361 (Fed. Cir. 2007).

In addition to intrinsic evidence, that is, the claims, the specification, and the prosecution history, extrinsic evidence may be considered if necessary to explain scientific principles, technical terms, and terms of art that appear in the patent and prosecution history. In contrast to intrinsic evidence, extrinsic evidence consists of all evidence external to the patent and prosecution history, including “expert [and] inventor testimony, dictionaries, and technical treatises and articles.” *Vitronics Corp. v. Conceptoronic, Inc.*, 90 F.3d 1576, 1584 (Fed. Cir. 1996). Expert testimony may be useful to “provide background on the technology at issue, to explain how an invention works, 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, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field.” *Phillips*, 415 F.3d at 1318.

Questions of claim indefiniteness may also be addressed during claim construction. A patent is invalid for indefiniteness only when clear and convincing evidence shows that the

“claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.”

*Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014).

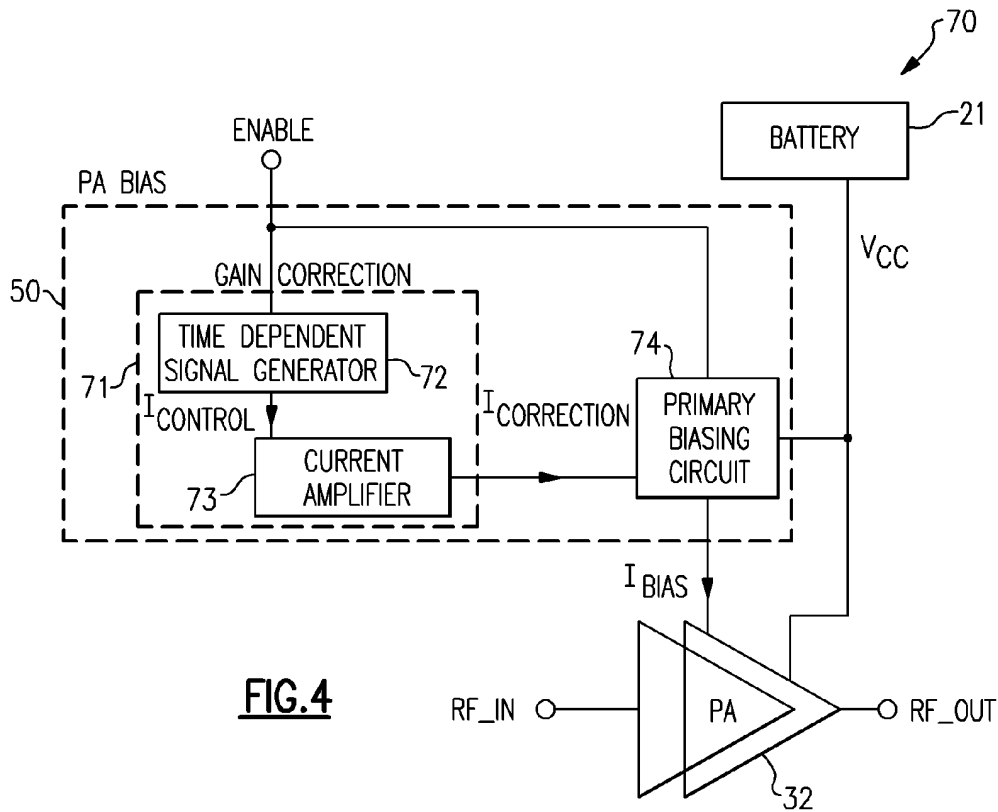
#### **IV. PROPER CONSTRUCTIONS OF THE '101 AND '563 PATENT CLAIMS**

##### **A. Background and Overview of the Invention**

The '101 and '563 patents, both entitled “Apparatus and Methods for Biasing Power Amplifiers,” are in the same patent family and share the same specification. The '563 patent issued from U.S. Patent Application No. 15/377,842, filed on December 13, 2016, which is a continuation of U.S. Patent Application No. 14/825,053, which is a continuation of U.S. Patent Application No. 14/242,150, which is a continuation of the application that issued as the '101 patent. The '101 and '563 patents claim priority to U.S. Provisional Application No. 61/486,186 filed on May 13, 2011. The '101 patent issued on May 6, 2014, and the '563 patent issued on March 13, 2018. *See* JX-0001 (the '101 patent) and JX-0002 (the '563 patent). The '101 and '563 patents name Ping Li and Paul T. DiCarlo as named inventors. *Id.*

The '101 and '563 patents are directed to “[a]pparatus and methods for biasing a power amplifier.” JX-0001 ('101 patent), Abstract. According to the specification, “RF power amplifiers can be used to boost the power of a RF signal having a relatively low power.” '101 patent, 1:19-20; *see also* 1:27-28 (stating that “a power amplifier can be used to amplify the RF signal”). The patent acknowledges that “[i]t can be important [to] manage the amplification of a RF signal, as amplifying the RF signal to an incorrect power level can cause a wireless device to transmit out of band.” *Id.* at 1:28-30. Therefore, the patent states that “[t]here is a need for improved power amplifier systems . . . [and a need for improving power amplifier biasing.” *Id.* at 1:31-33.

Figure 4 shows “a schematic block diagram of *one example* of a power amplifier system including a power amplifier bias block according to one embodiment.” *Id.* at 3:51-54 (emphasis added).



**FIG. 4**

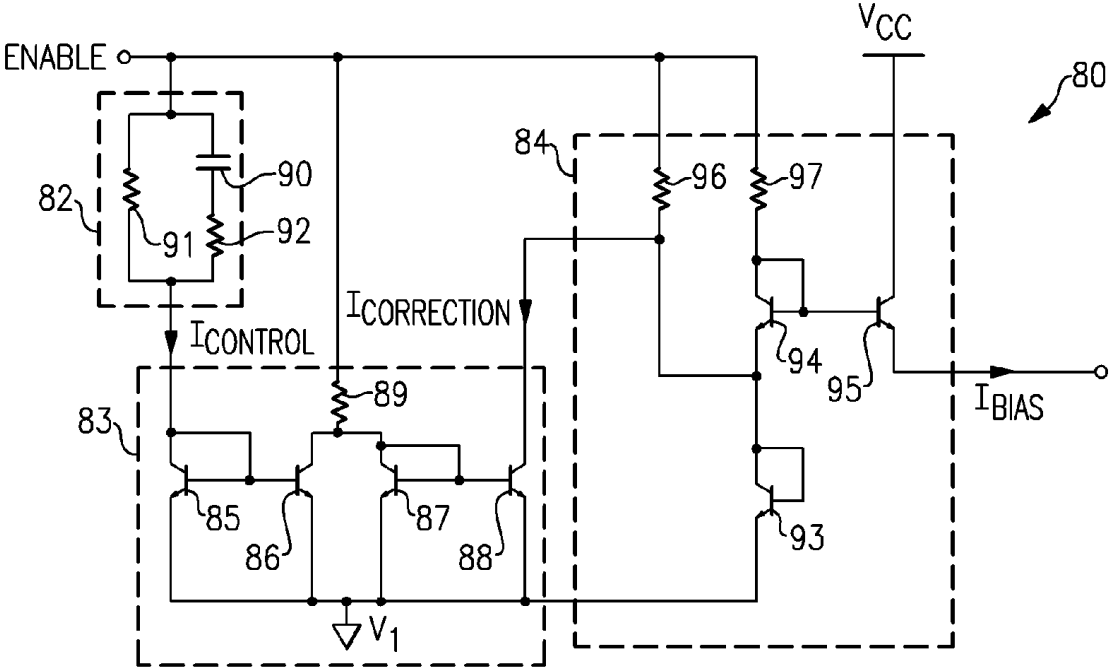
'101 patent, Fig. 4. As shown above, Figure 4 shows a power amplifier system 70 including a power amplifier bias block 50 and power amplifier 32. *See* '101 patent, 8:64-9:8. The specification states that “[t]he power amplifier bias block 50 and the power amplifier 32 can be integrated on a single die.” *Id.* at 9:8-13. The bias block 50 includes a gain correction block 71 (which includes a time-dependent signal generator 72 and a current amplifier 73) and a primary biasing circuit 74. *Id.* at 9:13-19. The operation of these blocks is described in the excerpt below:

The power amplifier bias block 50 includes the time-dependent signal generator 72, which can be used to generate a control current

$I_{CONTROL}$  when the enable signal ENABLE is transitioned from a disabled state to an enabled state. The control current  $I_{CONTROL}$ , can be provided to the current amplifier 73, which can amplify the control current  $I_{CONTROL}$  to generate a correction current  $I_{CORRECTION}$ . The correction current  $I_{CORRECTION}$  can be used by the primary biasing circuit 74 to correct for a variation in gain over time that can occur shortly after the power amplifier 32 is enabled. For example, shortly after the power amplifier 32 is enabled, absent compensation the current of the primary biasing circuit 74 can come up slow due to thermal effects, and the gain of the power amplifier 32 can be low. By using the time-dependent signal generator 72 and the current amplifier 73 to provide a transient current boost to the power amplifier 32 after being enabled, the power amplifier 32 can be configured to have a substantially constant gain over time.

*Id.* at 9:47-64.

Figure 5 (shown below) shows “a circuit diagram of a power amplifier bias block according to one embodiment.” *Id.* at 3:54-55.



**FIG. 5**

*Id.* at Figure 5. The power amplifier bias block 80 includes a resistor-capacitor (RC) network 82 (that operates as a time-dependent signal generator), a current mirror 83 (that operates as a current amplifier), and a primary bias circuit 84. The current mirror 83 includes NPN bipolar transistors 85, 86, 87, and 88. *Id.* at 11:7-10. In Figure 5, the first NPN bipolar transistor 85 includes “a base and a collector electrically connected to a base of the second NPN bipolar transistor 86 at an input of the current mirror 83.” *Id.* at 11:11-16. The patent provides the following description of the operation of the circuit in Figure 5:

The RC network 82 can be used to shape the enable signal ENABLE so as to generate the control current  $I_{\text{CONTROL}}$ . For example, the capacitor 90 and the second resistor 92 can have an RC time-constant selected to achieve the desired shape of the control current  $I_{\text{CONTROL}}$ . The RC time-constant can be selected based on a system parameter of the electronic system that the power amplifier bias block 80 is used in, including, for example, a transition time of the enable signal ENABLE. In certain implementations, the time-constant of the second resistor 92 and the capacitor 90 is in the range of about 0.1  $\mu\text{s}$  to about 10  $\mu\text{s}$ , for example, about 1  $\mu\text{s}$ .

*Id.* at 10:37-47. The patent further discloses the following regarding design of the current mirror so reduce the area of the RC network such that the power amplifier bias block 80 can be integrated on-chip with the power amplifier:

To aid in reducing the area of the RC network 82, the current mirror 83 can be used to amplify the control current  $I_{\text{CONTROL}}$  to generate the correction current  $I_{\text{CORRECTION}}$ . Thus, the amplifier 83 can be used to obtain a correction current  $I_{\text{CORRECTION}}$  of a suitable magnitude, while reducing the size of the components of the RC network 82 relative to a scheme omitting a current amplifier. By amplifying the control current  $I_{\text{CONTROL}}$  in this manner, the power amplifier bias block 80 can be integrated on-chip with a power amplifier without having to use a relatively large resistor, which may not provide enough current variation to provide suitable gain compensation.

'101 patent, 10:62-11:6. However, the patent states that “in other implementations, the current mirror 83 *can be configured in other ways.*” *Id.* at 11:36-38. For example, the patent provides the following examples about the functionality and structure of the claimed current mirror:

The current mirror 83 can have any suitable gain. In one implementation, the current mirror 83 is configured to amplify the control current  $I_{\text{CONTROL}}$  by a factor ranging between about 5 to about 50, for example, about 10. As used herein, the term current mirror can refer to current amplification circuits including a plurality of current mirrors combined (e.g., cascaded) to achieve a target gain.

*Id.* at 11:39-45.

The claims of the '101 and '563 patents that contain limitations to be construed are reproduced below, with the disputed terms highlighted:

Asserted claim 1 of the '101 patent is reproduced below:

1. A power amplifier system comprising:

a power amplifier configured to amplify a radio frequency (RF) signal; and

a bias block for biasing the power amplifier, the bias block including a time-dependent signal generator configured to shape an enable signal of the power amplifier to generate a control current, *a current amplifier configured to amplify the control current to generate a correction current*, and a primary biasing circuit configured to generate a bias current for the power amplifier based at least partly on the correction current, the bias current configured to correct for a variation in gain of the power amplifier when the power amplifier is enabled, the current amplifier including a *current mirror*.

Asserted claim 17 of the '101 patent is reproduced below:

17. A method of biasing a power amplifier, the method comprising:  
shaping an enable signal using a time-dependent signal generator to generate a control current;

*amplifying the control current using a current mirror of a current amplifier to generate a correction current*; and

generating a bias current for a power amplifier using a primary biasing circuit, the primary biasing circuit configured to use the

correction current to correct for a variation in gain of the power amplifier when the power amplifier is enabled.

Asserted claim 14 of the '563 patent is reproduced below:

14. A packaged module comprising:

a package substrate; and

an *integrated circuit* attached to the package substrate and including a power amplifier configured to provide amplification to a radio frequency signal and a bias circuit configured to receive a power amplifier enable signal and to generate a bias signal that biases the power amplifier, the bias circuit including a gain correction circuit configured to generate a control current in response to activation of the power amplifier enable signal and to mirror the control current to generate a correction current, and a primary biasing circuit configured to generate the bias signal based on the correction current and the power amplifier enable signal.

#### **B. One of Ordinary Skill in the Art**

Complainants contend that a person of ordinary skill in the art at the time of the alleged invention would have had “at least a bachelor’s degree in Electrical Engineering or a related field and at least two years of training or additional work experience in the area of RF electronics, or a related field.” CMB at fn. 4.

Respondents propose that a person of ordinary skill in the art would have “gained knowledge of these concepts through a mixture of training and work experience, such as by having at least a Bachelor’s degree in electrical engineering, or related field, and at least two to three years of training or additional work experience in the area of RF electronics, or a related field.” RMB, Ricketts Decl. at ¶ 23. Respondents state that “[a]dditional hands-on and design experience could compensate for less formal education, and vice versa, at the time of the priority date of each patent.” *Id.*

The private parties’ definitions are very similar and require work in the same area—RF electronics. It does not appear to the Staff that the difference between the parties’ proposed skill

levels will impact the appropriate claim constructions for the disputed terms of the '101 and '563 patents. In any event, the Staff submits that the level of ordinary skill proposed by Respondents is more appropriate because it provides flexibility by allowing hands-on and design experience to compensate for less formal education and vice versa.

**C. Disputed Constructions**

**1. “amplify” / “amplifying”**

Term	Complainants	Respondents and Staff <sup>2</sup>
<p>“a current amplifier configured to amplify the control current to generate a correction current”</p> <p>[’101 patent, claims 1, 2, 10, 11, 21, 22]</p>	<p>Plain meaning, which is “a current amplifier configured to achieve a target gain of a control current to generate a correction current”</p>	<p>Plain meaning, such as “a current amplifier configured to increase the control current to generate a correction current”</p>
<p>“amplifying the control current using a current mirror of a current amplifier to generate a correction current”</p> <p>[’101 patent, claims 17, 18, 20]</p>	<p>Plain meaning, which is “achieving a target gain of a control current, using a current mirror of a current amplifier, to generate a correction current”</p>	<p>Plain meaning, such as “increasing the control current using a current mirror of a current amplifier to generate a correction current”</p>

The dispute over these amplify/amplifying terms centers on whether the verb “amplify” means “*increase*” the control current to generate a correction current or “*achieve a target gain*” of a control current to generate a correction current. According to Complainants, its construction, “achieve a target gain,” includes increasing, decreasing, and not changing the control current to generate a correction current. CMB, Wentzoff Decl. at ¶ 58 (“A person of ordinary skill in the art

<sup>2</sup> The Staff notes that the words “such as” in this construction should be “which is.” This clarifies that the proposed construction is not just one example of the plain meaning of the claim term.

would understand that such a ‘target gain’ could be a gain of 1 or greater, or even less than one.”).

Respondents and Staff’s construction is consistent with the claim language and specification. The claim language in claims 1 and 21 confirms that the claim is directed to a current amplifier configured to perform a certain function—“to amplify.” The specification further confirms that the claims are directed to a current amplifier configured with certain functionality (in claims 1 and 21) or a certain method performed by a current mirror (in claim 17). In particular, the specification repeatedly states that by “amplifying the control current” using a current amplifier, the components for the time-dependent signal generator can be reduced in size.” Below is an excerpt from the specification:

Including both the current amplifier and the time-dependent signal generator can permit the power amplifier bias block to be included on-die with the power amplifier. For example, *by amplifying the control current* generated by the time-dependent signal generator, *the magnitude of the components of the time-dependent signal generator can be reduced to a size suitable for on-chip integration*. In certain implementations, the time-dependent signal generator can include a resistor-capacitor (RC) network, and the current amplifier *can be used to amplify* the control current *so as to reduce a magnitude of the resistor and/or capacitor needed to generate a suitable correction current, thereby permitting the time-dependent signal generator to be integrated on-chip with the power amplifier*.

’101 patent, 8:50-63 (emphasis added); *see also* 9:64-10:7. In other words, a person of ordinary skill in the art would readily acknowledge that the current amplifier must *increase* the control current to generate a suitable correction current so that that the size of the time-dependent signal generator components (e.g., the resistor and/or capacitor) can be reduced. RMB, Ricketts Decl. at ¶¶ 55-58.

Similarly, with respect to claim 17, which recites “amplifying the control current *using a current mirror* of a current amplifier,” the specification confirms by “amplifying” using a

current mirror, the size of the components of the RC network can be reduced. As reproduced below, the specification discloses the following:

*To aid in reducing the area of the RC network 82, the current mirror 83 can be used to amplify the control current  $I_{CONTROL}$  to generate the correction current  $I_{CORRECTION}$ . Thus, the amplifier 83 can be used to obtain a correction current  $I_{CORRECTION}$  of a suitable magnitude, while reducing the size of the components of the RC network 82 relative to a scheme omitting a current amplifier. By amplifying the control current  $I_{CONTROL}$  in this manner, the power amplifier bias block 80 can be integrated on-chip with a power amplifier without having to use a relatively large resistor, which may not provide enough current variation to provide suitable gain compensation.*

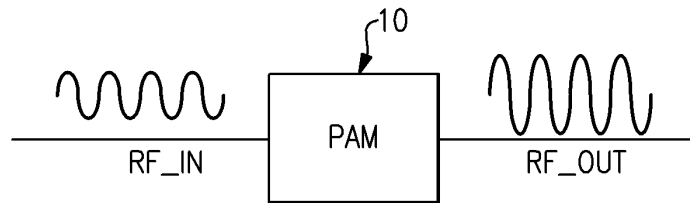
'101 patent, 10:62-11:6 (emphasis added). A person of ordinary skill in the art would understand that the current mirror must *increase* the control current to achieve the stated benefit of reducing the size of the RC network components.<sup>3</sup> RMB, Ricketts Decl. at ¶¶ 55-58. By using the term “can be used,” the specification acknowledges that the current mirror can be used in other ways (e.g., not changing, achieving a gain of 1).

Further, the claim language uses the term “amplify” to mean “increase” in the context of a power amplifier. Claim 1 also recites “a power amplifier configured to *amplify* a radio frequency (RF) signal.” The specification states that “RF power amplifiers can be used to *boost the power of a RF signal* having a relatively low power.” '101 patent, 1:19-20 (emphasis added); *see also* Fig. 1. Figure 1 (shown below) “is a schematic diagram of a power amplifier module 10 for *amplifying* a radio frequency (RF) signal,” where the “power amplifier module

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<sup>3</sup> Complainants mischaracterizes this portion of the specification as disclosing that the current mirror can have “a gain of *any ‘suitable magnitude.’*” CMB at 36 (emphasis in original). As shown above in the full excerpt of the paragraph, the current mirror 83 is used to obtain a correction current of a suitable magnitude for *a specific purpose*—to aid in “reducing the size of the components of the RC network.” '101 patent, 10:65-11:1. A person of ordinary skill would understand that to achieve the specific purpose, the term control current must be increased to a suitable magnitude for this specific purpose, not just *any* suitable magnitude.

(PAM) 10 can be configured to *amplify* an RF signal RF\_IN to generate an *amplified* signal RF\_OUT.” ’101 patent, 4:44-48 (emphasis added).



**FIG.1**

Therefore, the term “amplify” should be construed consistently for the current amplifier, current mirror, and power amplifier. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc) (“Claim terms are (normally used consistently throughout the patent such that the usage of a term in one claim can often illuminate the meaning of the same term in both the same claim and other claims.”); *Integrated Claims Systems, LLC v. Travelers Indemnity Company*, 2019 WL 856598, \*2 (Fed. Cir. 2019) (nonprecedential) (rejecting patentee’s contention that the term “field” in the phrase “identifiable field” should be given a different meaning when used in the phrase “fields of the GUI” since nothing in the specification showed that the term should have a different meaning when used in the two phrases); *Research Plastics, Inc. v. Federal Packaging Corp.*, 421 F.3d 1290, 1295 (Fed. Cir. 2005) (“[C]laim terms are presumed to be used consistently throughout the patent, such that the usage of a term in one claim can often illuminate the meaning of the same term in other claims.”); *Omega Engineering, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1334 (Fed. Cir. 2003) (“[W]e presume, unless otherwise compelled, that the same claim term in the same patent or related patents carries the same construed meaning.”).

The intrinsic record does not support Complainants’ construction, “achieve a target gain,” which includes increase, decrease, and not change. Complainants (and their expert, Dr. Wentzloff) do not address the portions of the specification discussing reducing the components

of the time dependent signal generator or RC network by *amplifying* the control current. Nor do Complainants reconcile the use of the term “amplify” in the context of power amplifiers with its proposed construction.

Instead, Complainants argue that that “because it is undisputed that a ‘*current mirror*’ can achieve a ‘target gain’ that can be unity, [and] the claimed ‘*current amplifier*’ can also achieve a target gain such as unity,” “the claimed current amplifier need not ‘increase’ the control current.” CMB at 37 (emphasis added). While it may be true that both a “current mirror” and a “current amplifier” are capable of achieving a gain such as unity, the term that requires a construction is the verb “amplify” or “amplifying.”<sup>4</sup> Complainants also argue that construing the term “amplify” to mean “increase” would “exclude embodiments squarely within the ’101 patent’s ‘any suitable gain’ / any ‘suitable magnitude’ disclosures.”<sup>5</sup> CMB at 37. But claims do not necessarily cover all embodiments described in the specification. *See, e.g., Baran v. Med. Device Techs., Inc.*, 616 F.3d 1309, 1316 (Fed. Cir. 2010) (“It is not necessary that each claim read on every embodiment.”); *TIP Sys. LLC v. Phillips & Brooks/Gladwin Inc.*, 529 F.3d 1364, 1373 (Fed. Cir. 2008) (noting Federal Circuit “precedent is replete with examples of subject matter that is included in the specification, but is not claimed”). The specification states that “conditional language use herein, such as, among others, ‘can’ . . . is generally intended to convey that certain embodiments include, while other embodiments do not include, certain

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<sup>4</sup> Complainants also argue that because “the Examiner thus confirmed that the claimed ‘current amplifier’ is a ‘current mirror’ type amplifier,” the “prosecution history further confirms that the claimed ‘amplifying the control current using a current mirror of a current amplifier . . .’ does not require increasing the control current to generate the correction current.” CMB at 36. But the amendment adding the language “current mirror” cannot be used to broaden the claim scope of a claim which already recited “amplify” or “amplifying.”

<sup>5</sup> As discussed above, the alleged “any ‘suitable magnitude’” disclosure does not support Complainants’ construction. *See supra* at fn. 2.

features, elements, and/or states.” ’101 patent, 15:27-33. As discussed above, the specification discloses that the current amplifier or current mirror “*can be* used to amplify” the control current. ’101 patent, 8:50-63 (stating that “the current amplifier *can be used to amplify* the control current”); 10:62-11:6 (stating that “the current mirror 83 *can be used to amplify* the control current”). Therefore, the patent conveys that there are some embodiments where the current amplifier or current mirror *is used* to amplify, and there are some embodiments where the current amplifier or current mirror *is not used* to amplify. It would logically follow that the term amplify is narrower than the full scope of what a current amplifier or current mirror is capable of doing (i.e., achieving *any* gain). By reciting the term “amplify” or “amplifying,” claims 1, 17, and 21 of the ’101 patent are directed to the embodiments where the current amplifier or current mirror is configured to amplify (increase) the control current. As further confirmation, claim 14 of the ’563 patent does not recite “amplify” or “amplifying.” See JX-0002 (’563 patent) at claim 14. Instead, claim 14 of the ’563 patent recites “a gain correction circuit configured . . . to *mirror* the control current to generate a correction current,” which would include unity gain. *Helmsderfer v. Bobrick Washroom Equipment, Inc.*, 527 F.3d 1379, 1383 (Fed. Cir. 2008) (“It is often the case that different claims are directed to and cover different disclosed embodiments. The patentee chooses the language and accordingly the scope of his claims.”).

The extrinsic evidence further supports Respondents’ and Staff’s construction. See, e.g., RXM-0001 p. 12 (technical dictionary defining “amplification” as “the increase in signal level, amplitude or magnitude”). While Complainants allege that extrinsic evidence shows that “it is [] common to amplify with unity gain” (CMB at 37-39), that extrinsic evidence is clearly at odds with the intrinsic record and should be rejected. *McRO, Inc. v. Bandai Namco Games America Inc.*, 959 F.3d 1091, 1099 (Fed. Cir. 2020) (stating that “the existence of one broader meaning in

the field is not controlling,” “[w]hat matters is the meaning most appropriate in the context of the particular patent”); *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999) (“The court may receive extrinsic evidence to educate itself about the invention and the relevant technology, but the court may not use extrinsic evidence to arrive at a claim construction that is clearly at odds with the construction mandated by the intrinsic evidence.”); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 981, (Fed. Cir. 1995), *aff’d*, 517 U.S. 370, (1996) (“Extrinsic evidence is to be used for the court’s understanding of the patent, not for the purpose of varying or contradicting the terms of the claims.”).

Thus, for the reasons stated above, the Staff submits that its and Respondents’ proposed constructions for the “amplify” and “amplifying” terms should be adopted.

## 2. “current mirror”

Term	Complainants	Respondents and Staff <sup>6</sup>
“current mirror” '101 patent, claims 1, 2, 10, 11, 17, 18, 20, 21, 22	Plain meaning, which is “one or more circuits configured to mirror a current, which can be configured to achieve a target gain, having at least two transistors with their base or gate terminals tied together”	Plain meaning, such as “one or more circuits configured to mirror a current, which can be configured to achieve a target gain”

There appears to be agreement between the parties regarding the function of a current mirror (i.e., to mirror current, and can be configured to achieve a target gain). This is consistent with the intrinsic evidence. For example, the specification states that “[a]s used herein, the term

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<sup>6</sup> The Staff notes that the words “such as” in this construction should be “which is.” This clarifies that the proposed construction is not just one example of the plain meaning of the claim term.

current mirror can refer to current amplification circuits including a plurality of current mirrors combined (e.g., cascaded) *to achieve a target gain.*” ’101 patent, 11:42-45 (emphasis added).

The dispute over the term “current mirror” appears to center on whether a current mirror must “hav[e] at least two transistors with their base or gate terminals tied together” as Complainants propose. The Staff is of the view that the “current mirror” does not require two transistors with their base or gate terminals tied together.

The intrinsic evidence supports Respondents’ and the Staff’s construction. The claims themselves suggest a difference between a “current mirror” and the two-transistor configuration in Complainants’ construction. For example, claim 6 specifies that “the current mirror includes a first bipolar transistor and a second bipolar transistor” that are electrically connected in a specific way. Further, the specification does not limit the claimed “current mirror” to the specific structure in Complainants’ proposed construction. In one embodiment (Fig. 5), the specification states that “[t]he illustrated current mirror 83 includes” bipolar transistors, 85, 86, 87, and 88. ’101 patent, 10:28-29 (“FIG. 5 is a circuit diagram of a power amplifier bias block 80 according to one embodiment.”); 11:7-10. The specification specifically states that “[h]owever, in other implementations, the current mirror 83 *can be configured in other ways.*” ’101 patent, 11:36-38 (emphasis added). While the sole embodiment of the specification discloses a current mirror with at least two transistors with their base or gate terminals tied together, the Staff is of the view that this does not provide sufficient reason limit the claims to this embodiment. *Continental Circuits LLC v. Intel Corp.*, 915 F.3d 788, 796-98 (Fed. Cir. 2019) (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005) (en banc)) (The Federal Circuit has repeatedly ““rejected the contention that [even] if a patent describes only a single embodiment, the claims of the patent must be construed as limited to that embodiment.””). Absent here are words or expressions of

manifest exclusion demonstrating a clear intention to limit the claim scope in the manner proposed by Complainants. Unlike Complainants' proposed construction, Respondents and Staff's proposed construction does not seek to improperly import a limitation from the specification into the claims. *See Phillips*, 415 F.3d at 1323 (“While claim terms are understood in light of the specification, a claim construction must not import limitations from the specification into the claims.”).

The prosecution history supports not narrowing the claimed “current mirror” to require at least two transistors. Nothing in the prosecution history clearly shows that the applicant or the Examiner understood that a current mirror must have more than one transistor. Pointing to the Examiner's notice of allowance, Complainants argue that “[t]he Examiner [] recognized a distinction between a current amplifier comprised of a single field effect transistor, which the Examiner deemed unpatentable, versus use of a current mirror for a current amplifier, which the Examiner found to be patentably distinct from the prior Alon reference.”<sup>7</sup> CMB at 26. In the notice of allowance, the Examiner merely stated that the “prior art of record considered individually and in combination, fails to fairly teach or suggest the claimed circuit comprising, among other limitations and unobvious limitations of “. . . the current amplifier including a current mirror” *structurally and functionally* interconnected with other limitations in the manner as cited in the claim.” JX-0004, Notice of Allowability at Skyworks\_ITC\_0000232344-345 (emphasis added). Thus, the allowance over Alon could be due to *structural or functional differences*. Further, a single transistor can be connected and configured in a circuit such that it

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<sup>7</sup> While Complainants argue that their proposed construction “is consistent with and required by this prosecution history” (CMB at 27), it does not appear to the Staff that Complainants argue that there was a prosecution disclaimer or disavowal that narrows the claimed “current mirror” to the specific configuration in Complainants' proposed construction.

is a current mirror, but it can also be connected and configured in a circuit such that it is *not* a current mirror. RMB, Ricketts Decl. at ¶ 115. Because there are different possibilities as to why the amendment was allowed, it is not clear that the applicant disclaimed a single transistor. *SanDisk Corp. v. Memorex Products, Inc.*, 415 F.3d 1278, 1286-87 (Fed. Cir. 2005) (“An ambiguous disclaimer, however, does not advance the patent’s notice function or justify public reliance, and the court will not use it to limit a claim term’s ordinary meaning. There is no ‘clear and unmistakable’ disclaimer if a prosecution argument is subject to more than one reasonable interpretation, one of which is consistent with a proffered meaning of the disputed term.”); *Avid Technology, Inc. v. Harmonic, Inc.*, 812 F.3d 1040, 1045 (Fed. Cir. 2016) (“Where the alleged disavowal is ambiguous, or even ‘amenable to multiple reasonable interpretations,’ we have declined to find prosecution disclaimer.”)

The extrinsic evidence further supports Respondents’ and Staff’s construction. There are examples of current mirrors that do not include “two transistors with their base or gate terminals tied together.” For example, *Gilbert* states that “[i]n the simplest possible scenario, a single BJT can be used as a mirror.” RXM-0005 at 242; *see also* Fig. 6.4. Even though Complainants’ point to extrinsic evidence supporting its proposed construction, the Staff is of the view that the term “current mirror” should be construed to encompass all of these meanings because they are consistent with the intrinsic evidence. *Texas Digital Systems, Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1203 (Fed. Cir. 2002) (“If more than one dictionary definition is consistent with the use of the words in the intrinsic record, the claim terms may be construed to encompass all such consistent meanings.”).

### 3. “integrated circuit”

Term	Complainants and Staff	Respondents
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“integrated circuit” [’563 patent, claims 14, 15, 17, 20]	Plain meaning, which is “a circuit made up of multiple interconnected electronic components integrated on one or more dies”	Plain meaning, which is “a circuit made up of multiple interconnected electronic components integrated on a die”
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The dispute regarding the term “integrated circuit” is whether the components must be integrated on one or more dies (as Complainants and Staff propose) or is limited to being integrated on a single die (as Respondents propose). The Staff is of the view that the term “integrated circuit,” as properly construed in light of the intrinsic evidence, is not limited to a single die.

The ’563 patent specification discloses that the claimed invention can be formed on “die(s),” plural. *Id.* at 14:66-15:2 (module “formed over the packaging substrate 320 and the components and die(s) disposed thereon.”). Further, the patent describes the embodiments of “a die including the power amplifier 32 and the power amplifier bias block 50” as an “example.” This disclosure confirms that the patent contemplates embodiments where there is more than one die. *See i4i Ltd. P’ship v. Microsoft Corp.*, 598 F.3d 831, 844 (Fed. Cir. 2012) (holding that “permissive language” describing advantages of the claimed invention does not “disclaim system lacking these benefits.”).

Respondents argue that “[t]he inventors use the term ‘IC’ and ‘die’ interchangeably.”<sup>8</sup> RMB at 38. In support, Respondents point to the following portion of the specification discussing Figures 10A and 10B:

The packaged power amplifier module 300 includes an *IC or die 301*, surface mount components 303, wirebonds, 308, a package substrate 320, and encapsulation 340.

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<sup>8</sup> It does not appear that Respondents contend that the patentee acted as its own lexicographer by defining integrated circuit as a die.

See RMB at 38 (citing '563 patent, 14:15-17) (emphasis in original). The specification's recitation of "an IC or die 301" does not support a clear intent to define an "integrated circuit" as a single die. It is not clear whether this portion of the specification refers to an IC and die as alternatives or equates the two. *Apple Inc. v. Wi-LAN Inc.*, 25 F.4th 960, 965-69 (Fed. Cir. 2022) (holding that it is unclear whether the sentence in the specification reciting "fixed subscriber stations or Customer Premises Equipment (CPE)" "describes fixed subscriber stations and CPEs as alternatives or equates the two."). Therefore, the specification does not clearly state that an "integrated circuit" has the same scope as a "single die."

Respondents argue that "[t]he unmistakable conclusion from the specification is that forming an integrated circuit having both the bias circuit and power amplifier was significant, and that significance shows up in the structural hierarchy that appears in claim 14 of the '563 Patent." RMB at 41. But significance of a feature does not compel importing a limitation into the claims. While one of the stated objectives is to include the power amplifier and bias circuit on a single die, it is not the only goal of the '563 patent. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1326-27 (Fed. Cir. 2005) (stating that "[t]he fact that a patent asserts that an invention achieves several objectives does not require that each of the claims be construed as limited to structures that are capable of achieving all of the objectives."). For example, the objective of the '563 patent can more broadly be directed to correct for the variation in gain of the power amplifier. See, e.g., '563 patent at 8:54-67. As further confirmation that a "single die" is not required, claim 14 of the '563 patent does not require "amplifying" the control current which, according to the patent, allows the power amplifier and bias circuit to be "integrated on-chip." '563 patent, 9:1-14, 10:19-28, 11:19-30, 14:36-41.

The extrinsic evidence further supports Complainants and Staff’s construction. For example, the IEEE 100 dictionary defines a “multichip integrated circuit” as “[a]n integrated circuit whose elements are formed on or within two or more semiconductor chips that are separately attached to a substrate.” CXM-0001 at 712. Even though Respondents point to several definitions of an “integrated circuit” that refer to a single die (*see* RMB at 42), the Staff is of the view that the term should encompass both alternatives because they are both consistent with the intrinsic evidence. *Inverness Medical Switzerland GmbH v. Warner Lambert Co.*, 309 F.3d 1373, 1379 (Fed. Cir. 2002) (“[A] word that has an ordinary meaning encompassing two relevant alternatives may be construed to encompass both alternatives. However, before finally concluding that the term encompasses both meanings, we must determine whether the specification or prosecution history clearly demonstrates that only one of the multiple meanings was intended.”).

**D. Agreed Constructions**

**1. “gain correction circuit”**

Claim Term	Agreed Construction
“a gain correction circuit configured to generate a control current in response to activation of the power amplifier enable signal and to mirror the control current to generate a correction current” [’563 patent, claims 14, 15, 17, 20]	Plain meaning, which is “a circuit for gain correction of the power amplifier configured to generate a control current in response to activation of the power amplifier enable signal and to mirror the control current to generate a correction current”

The parties have agreed on a construction for the term “gain correction circuit” as recited in the longer claim term phrase above. The parties agree that the “gain correction circuit” as recited should be construed as “a circuit for gain correction of the power amplifier.” The language of the terms and of the claims in which the terms appear support the proposed plain and ordinary meaning.

The specification exclusively and repeatedly states that the correction current is “to correct for a variation in gain *of the power amplifier* that can occur shortly after the power amplifier is enabled.” *E.g.*, ’563 patent, 8:61-64; 4:52-55, Fig. 8. The specification recognizes that “[c]ompensating for gain variation in the power amplifier can improve the power amplifier’s performance including, for example, the power amplifier’s dynamic error vector magnitude.” ’563 patent, 8:64-67.

**2. “time dependent signal generator”**

Claim Term	Agreed Construction
<p>“time dependent signal generator configured to shape an enable signal of the power amplifier to generate a control current” / “shaping an enable signal using a time-dependent signal generator to generate the control current”</p> <p>[’101 patent, claims 1, 2, 10, 11, 17, 18, 20, 21, 22]</p>	<p>Plain meaning, which is “a circuit configured to change an enable signal of the power amplifier to achieve a desired shape of a control current, where the control current changes based on time” / “changing an enable signal using a circuit to achieve a desired shape of a control current, where the control current changes based on time”</p>

The parties have agreed to the construction of the “time dependent signal generator” terms above. The construction clarifies that the “time dependent signal generator” changes the enable signal to produce a control current that changes based on time. The intrinsic record supports the agreed construction. The specification states:

The time-dependent signal generator or control block can be used to shape the enable signal so as to generate a control current, which can be amplified by the current amplifier to generate a correction current. The primary biasing circuit can use the correction current to correct for a variation in gain of the power amplifier that can occur shortly after the power amplifier is enabled.

JXM-0001 (’101 patent) at 8:39-49.

The RC network 82 can be used to shape the enable signal ENABLE so as to generate the control current I<sub>CONTROL</sub>. For example, the capacitor 90 and the second resistor 92 can have an RC time-

constant selected to achieve the desired shape of the control current  
 $I_{\text{CONTROL}}$ .

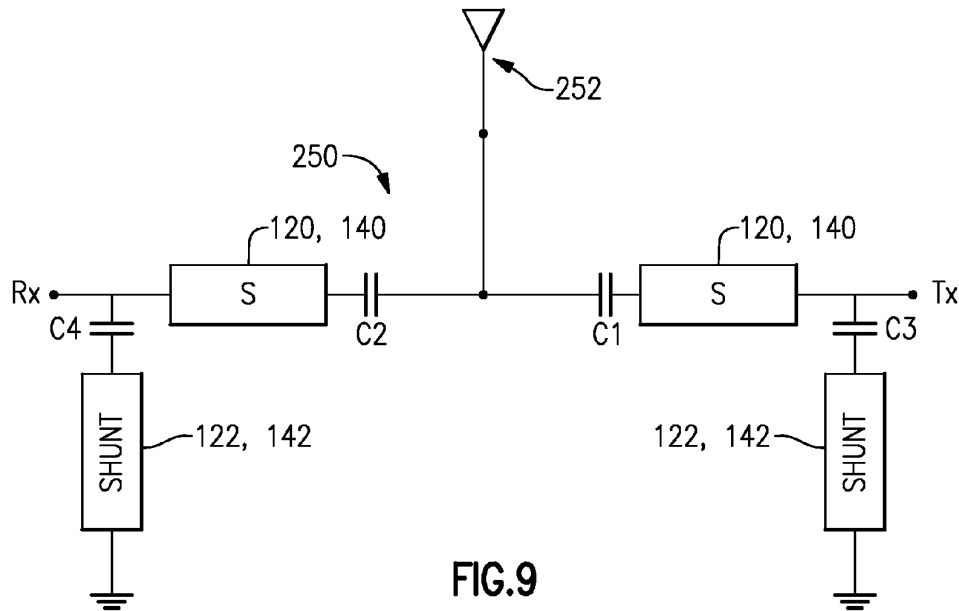
*Id.* at 10:37-41. Additionally, the specification states that the “time-dependent signal generator is used to generate a signal that can be used to adjust a power amplifier’s bias current during a time period within about  $8\mu\text{s}$  after the power amplifier is enabled.” ’101 patent, 12:38-41. These examples show that the control current changes based on time.

## V. PROPER CONSTRUCTIONS FOR THE ’579 PATENT

### A. Background and Overview of the Invention

The ’579 patent is entitled “Radio frequency devices having reduced intermodulation distortion.” JXM-0003 (’579 patent). The patent issued from U.S. Patent Application No. 14/833,076, filed on August 22, 2015, which claims priority to U.S. Patent Application No. 13/936,175, filed on July 6, 2013. The ’579 patent claims priority to U.S. Provisional Application No. 61/669,045, which was filed on July 7, 2012. The ’579 patent names Anuj Madan, Fikret Altunkilic, and Guillaume Alexandre Blin as named inventors.

The ’579 patent is directed to radio frequency devices with “reduced intermodulation distortion.” JX-0003 (’579 patent), Abstract. Specifically, the specification states that the “[d]esign and use of bias and/or coupling circuits in connection with RF switches can affect switching performance.” *Id.* at 1:28-30. Figure 9 (shown below) is “an example where an RF switching configuration can include one or more capacitors to, for example, inhibit a low-frequency blocker from mixing with a fundamental frequency.” *Id.* at 3:7-10.



**FIG.9**

*Id.* at Figure 9. As shown below, the schematic Figure 9 includes “capacitors [(i.e., C1, C2, C3, and C4)] to inhibit a low-frequency blocker from mixing with a fundamental frequency.” *Id.* at 9:39-49. Using these capacitors, “a low-frequency jammer signal can be blocked or reduced from mixing with any ON or OFF paths.” *Id.* at 9:49-51. According to the patent, “[t]his can lead to improvement in IMD [(intermodulation distortion)] performance, especially for low-frequency blocker signals.” *Id.* at 9:49-53.

The claim of the '579 patent that contains the claim terms to be construed is reproduced below with disputed terms highlighted:

7. A method for operating a radio-frequency (RF) device, the method comprising:

providing an RF device including a first switch circuit connected between an antenna node and a transmit node, a second switch circuit connected between the antenna node and a receiver node, a first capacitor connected in series with the first switch circuit between the first switch circuit and the antenna node, a second capacitor connected in series with the second switch circuit between the second switch circuit and the antenna node, and a first shunt arm

connected to the first switch circuit and the transmit node, the first shunt arm including a third switch circuit connected to ground;

controlling an RF switch of the RF device by placing the first switch circuit in an ON state and placing the third switch circuit in an OFF state; and

*inhibiting* a *low-frequency* blocker signal from mixing with a fundamental-frequency signal in the RF switch using the first capacitor.

*Id.* at claim 7 (emphasis added).

### **B. One of Ordinary Skill in the Art**

Complainants contend that a person of ordinary skill in the art at the time of the alleged invention would have had “at least a bachelor’s degree in Electrical Engineering or a related field and at least two years of training or additional work experience in the area of RF electronics, or a related field.” CMB at fn. 4.

Respondents contend that a person of ordinary skill in the art “would have gained knowledge of [RF electronics] through a mixture of training and work experience, such as by having a Bachelor’s degree in electrical engineering, or related field, and approximately two to three years of related experience; or by obtaining a Master’s degree in electrical engineering, or related field, but having only a year of related experience; or by having no formal education but experience in RF electronics and semiconductor packaging of at least six to eight years.” RMB, Fayad Decl. at ¶ 15.

The private parties’ definitions are very similar and require work in the same area—RF electronics. It does not appear to the Staff that the difference between the parties’ proposed skill levels will impact the appropriate claim constructions for the disputed terms of the ’579 patent. In any event, the Staff submits that the level of ordinary skill proposed by Respondents is more

appropriate because it provides flexibility by allowing related experience instead of formal education and vice versa.

**C. Disputed Constructions**

Claim 7 recites “**inhibiting** a **low-frequency** blocker signal from mixing with a fundamental-frequency signal in the RF switch using the first capacitor.” ’579 patent, claim 7. Against the backdrop of the claim language and the patent specification, the Staff is of the view that Respondents have not shown with clear and convincing evidence that the terms “inhibiting” and “low-frequency” are indefinite.<sup>9</sup>

**1. “inhibiting”**

Term	Complainants and Staff	Respondents
“inhibiting” [’579 patent, claim 7]	Plain meaning, which is “suppressing or reducing”  This term is not indefinite	Indefinite

Based on the intrinsic evidence, the Staff is of the view that “inhibiting” should be construed consistent with its plain and ordinary meaning, which means “suppressing” or “reducing.” In the context of the claim language, a person of ordinary skill in the art would understand that the term “inhibiting” to mean “suppressing or reducing” the mixing of the low-frequency block signal and the fundamental-frequency signal. CMB, Kinget Decl. at ¶¶ 51-53.

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<sup>9</sup> Respondents contend that “the Court should wait until fact and expert presentations have been completed [at the evidentiary hearing] to rule on indefiniteness.” RMB at 58-59 (citing to cases where indefiniteness issues were reserved for the jury). Because the ALJ is the factfinder in Section 337 investigations, it is not necessary to wait until the evidentiary hearing to decide indefiniteness issues. Further, the Staff is of the view that additional evidence is not necessary to determine the indefiniteness issues presented in Respondents’ brief. Therefore, while recognizing the ALJ may choose to defer her decision on indefiniteness, the Staff is of the view that there is no need to wait until the evidentiary hearing to resolve these indefiniteness issues.

Further, the specification discloses, in the context of the capacitors in Figure 9, a “low-frequency jammer signal can be blocked or *reduced* from mixing with any ON or OFF paths.” JXM-0003 (’579 patent), 9:49-51 (emphasis added). Because the specification discloses both blocking and reducing, a person skilled in the art would understand “inhibiting” to mean both. CMB, Kinget Decl. at ¶¶ 53-55.

Respondents appear to agree that “inhibit” can refer to “blocking” or “preventing.” See RMB at 48 (stating that “[t]he verb ‘inhibit’ generally refers to the act of blocking, or preventing”).<sup>10</sup> While Respondents also agree that the term “inhibiting” read in light of the specification can also mean “reducing,” Respondents argue that a construction including “reducing” renders the claim indefinite because “there is no objective metric for a [person of ordinary skill in the art] to judge how much attenuation is required to meet the ‘inhibiting’ limitation.” RMB at 48-49 (arguing that “the specification alters the plain meaning of the term by adding the concept of ‘reducing.’”). The Staff’s answer to the Respondents’ question is that the claim covers reducing any amount of low-frequency blocker signal that would have been mixed with a fundamental-frequency signal in the RF switch had there been no capacitor. Therefore, the Staff is of the view that Respondents have not shown clear and convincing evidence that the term “inhibiting” is indefinite.

## 2. “low-frequency”

Term	Complainants and Staff	Respondents
“low-frequency” [’579 patent, claim 7]	Plain meaning, which is “below the lower edge of the band containing the fundamental frequency”	Indefinite

<sup>10</sup> It appears that Respondents do not believe the term “inhibiting” is indefinite if it is construed as “blocking” or “preventing” (and not “reducing”).

The Staff is of the view that the term “low-frequency” should be given its plain and ordinary meaning, such as “below the lower edge of the band containing the fundamental frequency.” The intrinsic evidence supports this construction. The claim language differentiates the “low-frequency blocker signal” and the “fundamental-frequency signal.” A person of ordinary skill would understand that in the context of the claim, which requires inhibiting mixing of the low-frequency blocker signal and fundamental-frequency signal, the low-frequency blocker signal is lower in frequency than the fundamental-frequency signal. Therefore, a person of ordinary skill in the art would understand that the blocker signal is low frequency where it is below the lower edge of the fundamental-frequency signal band. *See* CMB at 52. The extrinsic evidence supports this construction. Complainants’ expert, Dr. Kinget, explained that a person of ordinary skill in the art reading the ’579 patent would readily understand the meaning of “low-frequency” in the context of claim 7 to be “below the lower edge of the band containing the fundamental frequency.” CMB, Kinget Decl. at ¶¶ 58-66.

While Respondents acknowledge that claim 7 contrasts the “low-frequency blocker signal” with the “fundamental frequency signal” (RMB at 53), Respondents argue that the intrinsic record does not provide objective boundaries for “low-frequency” relative to the fundamental frequency. *See* RMB at 55-57. Respondents argue that a capacitor would inhibit the blocker signal and fundamental frequency signal to the same degree if their frequencies are too close to each other. *Id.* Although there may be some blocker signals at frequencies where inhibiting mixing with the fundamental frequency using a capacitor is impossible, that does not render the term “low-frequency” indefinite. Instead, it appears to the Staff that such a hypothetical would not be within the scope of the claims because it does not “inhibit” the mixing

of the alleged low-frequency blocker signal and fundamental frequency signal. Therefore, the Staff is of the view that Respondents have not shown with clear and convincing evidence that the term “low-frequency” is indefinite.

## VI. CONCLUSION

For the reasons set forth above, the Staff respectfully submits that the Staff’s proposed constructions for the disputed claim terms and the “agreed” construction should be adopted.

Date: January 6, 2025

Respectfully submitted,

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## CERTIFICATE OF SERVICE

The undersigned certifies that on January 6, 2025, she caused the foregoing **Commission Investigative Staff's Markman Brief** to be filed with the Secretary (in electronic format), served electronically upon Administrative Law Judge MaryJoan McNamara, (McNamara337@usitc.gov), and served upon the parties in the manner indicated below:

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