

**UNITED STATES DISTRICT COURT
MIDDLE DISTRICT OF FLORIDA
JACKSONVILLE DIVISION**

PARKERVISION, INC.,

Plaintiff,

v.

Case No. 3:11-cv-719-Orl-37TEM

QUALCOMM INCORPORATED,

Defendant.

ORDER

This cause is before the Court on the following:

1. Qualcomm's Renewed Motion for Judgment as a Matter of Law and Motion for New Trial Regarding Invalidity (Doc. 499), filed December 20, 2013;
2. Parkervision's Response in Opposition to Qualcomm's Renewed Motion for Judgment as a Matter of Law and Motion for New Trial Regarding Invalidity (Doc. 516), filed January 24, 2014;
3. Qualcomm's Renewed Motion for Judgment as a Matter of Law and Motion for New Trial Regarding Non-Infringement (Doc. 501 (redacted version)), filed December 20, 2013, and (Doc. 514 (sealed version)), filed January 23, 2014; and
4. Parkervision's Response in Opposition to Qualcomm's Renewed Motion for Judgment as a Matter of Law and Motion for New Trial Regarding Non-Infringement (Doc. 518), filed January 24, 2014.

BACKGROUND

The complex technology at issue in this patent infringement action concerns methods and devices for down-converting electromagnetic (radio frequency) signals by “energy sampling.” (See Doc. 336-13.) By using the same components previously used to down-convert modulated high frequency signals by “voltage sampling” (switches, capacitors, and resistors), energy sampling down-converts a modulated high frequency signal by altering the size of the capacitor, the duration that the switch is closed, the impedance of the resistors, and the value of the load. (See Doc. 386, pp. 273–78; Doc. 402, pp. 175–77.) Such alterations result in the energy—not the voltage—of the carrier signal being sampled, stored, and used to generate the desired lower frequency signal. (See Doc. 402, pp. 84–85.) Due to the similarity between energy sampling components and voltage sampling components (see U.S. Patent Number 6,061,551, Figs. 78A, 82A), one cannot discern if energy sampling is used in a receiver merely by viewing the layout of the components. (See Doc. 402, pp. 102–05, 113, 119, 121, 126, 152, 161–64, 176, 242; see also Doc. 403, pp. 173–74, 228, 232–33, 239–40.) Rather, the use of energy sampling can be discerned only by one skilled in the art who knows “how the switches are operated,” what the input and output impedance is, and the “relative value” of the capacitor to the rest of the circuitry. (See Doc. 402, pp. 102–05; see also Doc. 403, pp. 174–82, 228, 232–37, 241–45.)

Employees of Parkervision developed energy sampling in 1996 and 1997 (Doc. 386, pp. 230–39), and Parkervision applied for its first patent related to the technology on October 1, 1998. (PX 1.)¹ On May 9, 2000, the U.S. Patent and

¹ Citations to PX, DX, and JX followed by a number are to the trial exhibits submitted by Parkervision (PX), by Qualcomm (DX), and jointly (JX). Further, in its

Trademark Office (“USPTO”) issued Patent Number 6,061,551, for a “Method and System for Down-Converting Electromagnetic Signals” (“551 Patent”). (*Id.*) Parkervision continued to submit applications for related patents, and by May 25, 2010, the USPTO had granted Parkervision at least five additional related patents.² (See Doc. 158, ¶ 9; see also PX 2 (Patent Number 6,266,518 (“518 Patent”)); PX 3 (Patent Number 6,370,371 (“371 Patent”)); PX 4 (Patent Number 7,496,342 (“342 Patent”)).)

Before any of the patents issued, Parkervision approached Qualcomm in 1998 to license the invention. (See Doc. 336-13, p. 6.) After unsuccessful efforts to reach an agreement in 1998 and 1999, the parties went their separate ways. (*Id.*) More than a decade later, Parkervision initiated this action contending that, in 2006, Qualcomm began directly and indirectly infringing the claims of Parkervision’s patents by using energy sampling in the integrated circuits of various receiver and transceiver products that Qualcomm sold to original equipment manufacturers (“OEM”), who incorporate the products in mobile communication devices (such as smartphones) sold and used in the United States. (See Docs. 1, 158; see also Doc. 336-13, pp. 4–9.) Qualcomm denies that it directly or indirectly infringes Parkervision’s patents and contends that the patents are invalid based on anticipation. (See Doc. 248; Doc. 336-13, pp. 11–12.)

To better understand the complex nature of the technology at issue, the Court held a non-adversarial tutorial on July 24, 2012. (See Doc. 146; see also Docs. 112, 133.) At the tutorial, Parkervision presented the testimony of David Sorrells (a named

citations to the parties’ briefings, the Court uses the ECF page designations (located at the top left corner of each page of each document). The parties’ page designations (located at the bottom of each page) may differ from the ECF page designations.

² During most of the pretrial proceedings, Parkervision claimed that Qualcomm infringed eighty-two claims of these six patents. (See Doc. 158.) Shortly before trial, Parkervision limited the action to eleven claims of four patents. (See Doc. 336-13, p. 4; Doc. 367.)

inventor of the patents and Parkervision's Chief Technology Officer), and Qualcomm presented the testimony of Professor Robert Fox. (Doc. 146.) The witnesses provided the Court with a high-level overview of electronic circuit design and the use of radio frequency signals for wireless communications. (*Id.*) After the tutorial, the Court held a *Markman* hearing. (Docs. 145, 163; *see also* Docs. 119, 122, 136, 137, 141.) The Court issued its claim construction Order on February 20, 2013. (Doc. 243; *see also* Docs. 136, 137, 141.) The parties then filed motions for summary judgment regarding validity (Doc. 269, filed by Parkervision), and non-infringement (Doc. 270, filed by Qualcomm). In August 2013, the Court denied the parties' respective motions for summary judgment. (Docs. 318, 320.)

In October 2013, the parties tried the matter before a jury in two phases—the first phase concerned validity and infringement (Docs. 386–88, 391, 393–94, 402–05, 407, 410–11, 413, 438–39), and the second phase concerned damages and willfulness (Docs. 417, 427, 439–44, 446, 470–71).³ In the first phase, the jury heard live testimony from four witnesses—Mr. Sorrells (Doc. 386, pp. 193–281; Doc. 402, pp. 9–71, 74–138, 141–210, 219–55), Parkervision's President, Jeffrey Parker (Doc. 403, pp. 5–158), Parkervision's retained infringement expert, Dr. Paul Prucnal (*id.* at 160–86, 194–263; Doc. 404, pp. 4–256),⁴ and Qualcomm's retained invalidity expert, Dr. Behzad Razavi (Doc. 405, pp. 11–272). While both parties extensively cross-examined each other's witnesses, Parkervision did not present any expert testimony concerning the prior art discussed by Dr. Razavi, and Qualcomm did not present any testimony concerning

³ In the second phase of the trial, the jury awarded Parkervision damages of \$172,704,600, but rejected Parkervision's claims of willful infringement. (Doc. 468.)

⁴ Parkervision also presented the testimony of Prashant Kantak from his videotaped deposition. (Doc. 403, pp. 158–59.)

infringement or the development and operation of its accused products.⁵

At the conclusion of the first phase of the trial, the jury deliberated for more than ten hours over three days before returning its verdict rejecting Qualcomm's invalidity claims and finding that Qualcomm directly and indirectly infringed: (1) claims 23, 25, 161, 193, and 202 of the '551 Patent; (2) claims 27, 82, 90, and 91 of the '518 Patent; (3) claim 2 of the '371 Patent; and (4) claim 18 of the '342 Patent. (See Doc. 416; see also Docs. 407, 410, 413.) Specifically, the jury indicated by checkmarks on the verdict form that the following products infringe Parkervision's asserted patent claims: Astra, Bahama, Eagleray, GZIF3, GZIF4, Halley, Hercules, Iceman, Iris, Libra/Gemini, Magellan, Marimba,⁶ Merlin, Napoleon, Odyssey, Ramsis, Solo, Volans, Voltron, and Ywing.⁷ (Doc. 416, p. 2.)

Qualcomm timely moved for judgment as a matter of law ("JMOL") concerning invalidity and non-infringement. (Docs. 393, 398, 399, 407, 499, 501, 514.) As to non-infringement, Qualcomm argued that the Court should enter JMOL in its favor because, among other things, the testimony of Dr. Prucnal established that the "generating" and

⁵ Both parties submitted documentary evidence concerning the accused products, including device specifications, user guides, and development documents. (See JX 14–16, JX 44–87, JX 90–93; PX 345–46, PX 483–514, PX 545–48; PX 846–53, DX 500–11.)

⁶ Before trial, Parkervision dismissed its claims related to thirty-five Qualcomm products—including "Marimba" die products. (Doc. 367.) Accordingly, the jury was not presented with any evidence upon which it could have decided that Marimba was an infringing product.

⁷ In design documents, these architectures are commonly referenced only by their corresponding integrated circuits: RGR6240, WCN2243, FTR8700, RTR6275, RTR6237, RTR6280, RTR6285, RTR6285A, MXU6219, QTR9215, RTR8700, RTR9605, WCN3660, WCN1312, MDM6200, MDM6600, QSC6155, QSC6175, QSC6185, QSC6295, QSC6695, QTR8200, QTR8600, QTR8600L, QTR8601, QTR8615, QTR8615L, RTR8600, RTR8601, RTR8605, QSC1105, QSC1100, QSC1110, WTR1605, WTR1605L, QSC6055, QSC6065, QSC6075, QSC6085, MDM6085, QSC6270, QSC6240, MDM6270, ESC6270, ESC6240, WCN1314, RTR6500, and WCN1320. (Doc. 336-13, pp. 7–8.)

“sampling” limitations are not met in the accused products. (Doc. 514, pp. 12–24.) As to invalidity, Qualcomm contends that JMOL is warranted because three prior art references and the testimony of Dr. Razavi provided unrebutted proof of anticipation, and Parkervision presented no contrary evidence and obtained no relevant admissions from Dr. Razavi on cross-examination. (Doc. 499, pp. 5, 13–16.) Qualcomm further argues that Parkervision’s validity opposition at trial depended on a rejected construction of the “generating” limitations. (*Id.* at 5, 12–14.)

The Court established a post-trial briefing schedule (Docs. 486, 487), and Parkervision filed its responses in accordance with the schedule. (Docs. 516, 518.) After the motions were fully briefed, the Court held a hearing on May 1, 2014, where the parties provided thorough argument concerning their respective positions on Qualcomm’s JMOL motions. (Docs. 536, 537.) As explained below, the Court finds that Qualcomm’s non-infringement motion is due to be granted (or, alternatively, that Qualcomm is entitled to a new trial), and Qualcomm’s invalidity motion is due to be denied.

ASSERTED PATENT CLAIMS

Because the infringement and validity analyses hinge on the language of the patent claims,⁸ the text of the asserted claims are set forth in full with brief summaries of the pertinent claim constructions.

I. ‘551 Patent—Method & System for Down-Converting Electromagnetic Signals

The jury found that all of the accused products infringe claims 23, 25, 161, 193, and 202 of the ‘551 Patent. Claim 23 is an independent apparatus claim, and claims 25,

⁸ See *infra* INFRINGEMENT, Part I, Legal Standards, pp. 17–18.

161, 193, and 202 are also apparatus claims that are each dependent on claim 23. These claims include the generating and sampling limitations that are at issue in the post-trial briefing.⁹ Claim 23 covers:

An apparatus for down-converting a carrier signal to a lower frequency signal, comprising:

An energy transfer signal generator;

A switch module controlled by said energy transfer signal generator;

A storage module coupled to said switch module;

Wherein said storage module receives non-negligible amounts of energy transferred from a carrier signal at **an aliasing rate** that is substantially equal to a frequency of the carrier signal plus or minus a frequency of the lower frequency signal divided by n where n represents a harmonic or sub-harmonic of the carrier signal, wherein a lower frequency signal is **generated** from the transferred energy.

Claim 25 covers the apparatus of claim 23, “wherein said circuit comprises: an output impedance match circuit coupled to an output of said apparatus.”

Claim 161 covers the apparatus of claim 23, “wherein said storage device comprises a capacitive storage device sized to store substantial amounts of energy relative to energy contained in a percentage of half cycles of a carrier signal, whereby said capacitive storage device integrates the transferred energy.”

Claim 193 covers the apparatus of claim 23, “wherein the aliasing rate is substantially equal to a frequency of the carrier signal divided by n , and the lower frequency signal is a demodulate [sic] baseband signal.”

Claim 202 covers the apparatus of claim 23:

wherein said storage module receives and integrate [sic] controlled

⁹ Qualcomm argues that the “aliasing rate” limitation is sampling; thus, its sampling arguments apply to the claims of the ‘551 Patent. (Doc. 514.) Parkervision does not dispute this characterization of “aliasing.” (See Doc. 518.)

substantial amounts of energy transferred from the carrier signal over aperture periods wherein said storage module **generates** a lower frequency signal from the integrated energy wherein the transferring of energy substantially prevents accurate voltage reproduction of the carrier signal during the apertures.

II. '518 Patent—Method & System for Down-Converting Electromagnetic Signals by Sampling and Integrating Over Apertures

The jury found that all of the accused products infringe claims 27, 82, 90, and 91 of the '518 Patent. These claims also include the sampling and the generating limitations.

A. Claim 27

Claim 27 of the '518 Patent is a method claim dependent on claim 1, which reads:

A method for down-converting a carrier signal to a baseband signal, comprising the steps of:

- (1) Receiving a carrier signal that includes at least one of amplitude variations, phase variations, or frequency variations at a frequency lower than a carrier frequency of the carrier signal;
- (2) **Sampling** the carrier signal over aperture periods to transfer energy from the carrier signal at an aliasing rate, the aliasing rate determined according to a frequency of the carrier signal divided by N, wherein N indicates a harmonic or sub-harmonic of the carrier signal;
- (3) Integrating the energy over aperture periods; and
- (4) **Generating** the baseband signal from the integrated energy.

Claim 27 covers the method of claim 1, "further comprising the step of transferring energy to a load during an off-time."

B. Claim 82

Claim 82 is an apparatus claim with means-plus-function limitations, which reads:

An apparatus for down-converting a carrier signal to a baseband signal,

the carrier signal including at least one of amplitude variations, phase variations, or frequency variations at a frequency lower than a carrier frequency of the carrier signal, the apparatus comprising:

Means for **sampling** the carrier signal over aperture periods to transfer energy from the carrier signal at an aliasing rate, the aliasing rate determined according to a frequency of the carrier signal divided by N, wherein N indicates a harmonic or sub-harmonic of the carrier signal;

Means for integrating the energy over the aperture periods; and

Means for **generating** the baseband signal from the integrated energy.

C. Claims 90 & 91

Claims 90 and 91 also are apparatus claims with means-plus-function limitations.

Claim 90 is an independent claim, which reads:

An apparatus for down-converting a first signal to a second signal, comprising:

Means for **sub-sampling** the first signal over aperture periods to transfer energy from the first signal;

Means for integrating the transferred energy over the aperture periods;

Means for **generating** the second signal from the integrated energy; and

Means for impedance matching at least one of said first signal and said second signal.

Claim 91 is dependent on claim 90, and further covers: "The apparatus of claim 90, wherein said aperture periods are substantially greater than zero such that energy transferred is to such an extent that accurate voltage reproduction of the first signal is prevented."

III. The '371 Patent—Application of Universal Frequency Translation

The jury found that all of the accused products infringe claim 2 of the '371 Patent, which is an apparatus claim covering:

An apparatus, comprising:

At least one universal frequency down-conversion module, including a switch, an integrator coupled to said switch, and a pulse generator coupled to said switch; and

Wherein said pulse generator outputs pulses to said switch at an aliasing rate that is determined according to: (a frequency of a carrier signal +/- a frequency of a lower frequency signal) divided by N;

Wherein said pulses have apertures and cause said switch to close and **sub-sample** the carrier signal over said apertures, and wherein energy is transferred from the carrier signal and integrated using said integrator during said apertures of said pulses, and wherein the lower frequency signal **is generated** from the transferred energy.

IV. '342 Patent—Down-Converting Electromagnetic Signals, Including Controlled Discharge of Capacitors

The jury found that all of the accused products infringe claim 18 of the '342 Patent. This claim does not have the sampling limitation, but it does have the generating limitation that is at issue in Qualcomm's non-infringement motion. Claim 18 covers:

A method for down-converting an electromagnetic signal comprising the steps of:

- (1) Receiving an information signal;
- (2) Inverting the information signal to generate an inverted information signal;
- (3) Electrically coupling the information signal to a first capacitor and the inverted information signal to a second capacitor;
- (4) Controlling a charging and discharging cycle of the first and second capacitors **to generate** first and second down-converted information signals across first and second impedance devices, respectively;
- (5) Performing a plurality of charging and discharging cycles of the first and second capacitors **to generate** first and second down-converted information signals across first and second impedance devices respectively;

Wherein the information signal is used to store a charge on the first capacitor when the first switching device is closed and the inverted

information signal is used to store a charge on the second capacitor when the second switching device is closed.

V. Claim Constructions

A. Agreed Constructions

The Court addressed forty-four terms in its *Markman* Order (see Doc. 243),¹⁰ and the parties agreed to the meaning of ten claim terms. (Doc. 141, pp. 12–13.) For instance, the parties agreed that a “baseband signal” (used in claim 193 of the ‘551 Patent) is “any generic information signal desired for transmission and/or reception” (*id.* at 12), and a “carrier signal” (used in all asserted claims of the ‘551 and ‘371 Patents and claims 27 and 82 of the ‘518 Patent) is “an electromagnetic wave that is capable of carrying information via modulation” (*id.*). The parties further agreed that an “aliasing rate” (used in all asserted claims of the ‘551 and ‘371 Patents and claims 27 and 82 of the ‘518 Patent) is a “sampling rate that is less than or equal to twice the frequency of the carrier signal” (*id.*) and that “aperture periods” (used in claim 202 of the ‘551 Patent and all asserted claims of the ‘518 Patent) means “the durations of time over which energy is transferred from the carrier signal.” (*id.*) Finally, the parties agreed that “electrically coupling” (used in claim 18 of the ‘342 Patent) means “indirectly or directly connecting such that an electric signal can flow between the coupled points.” (*id.*)

B. Disputed Constructions

The parties disputed the construction of “lower frequency signal,” terms related to “generating” signals, and “transferring” and “sampling” energy. (Doc. 141, pp. 2–4, 7–8.) The Court construed “lower frequency signal” (used in claim 2 of the ‘371 Patent and all

¹⁰ Many of the construed terms were from patent claims that Parkervision subsequently dismissed from this action. (See Doc. 243; *supra* note 1.)

asserted claims of the '551 Patent) as “a signal with frequency below the carrier signal frequency.” (Doc. 243, p. 16.) Terms related to energy transfer (used in claims 23, 161, 193, and 202 of the '551 Patent, and claims 27, 90, and 91 of the '518 Patent) were construed to require the transfer of energy (i.e., voltage and current over time) “in amounts that are distinguishable from noise.” (*Id.* at 13.) The construction of “sampling” and “generating” were disputed in the parties’ *Markman* briefings and in dispositive motion briefings.

1. Sampling

The Court adopted Qualcomm’s proposed construction of the term “sampling” as “reducing a continuous-time signal to a discrete time signal” (Doc. 137, pp. 4–6), and the Court construed “sub-sampling” as a synonym of “under-sample,” which means “sampling at an aliasing rate.” (Doc. 243, pp. 3–10.) “Sampling” was also discussed in the Court’s Order denying Qualcomm’s motion for summary judgment of non-infringement of its 50% duty cycle products (Astra, Bahama, Eagleray, GZIF4, Hercules, Iris, Libra/Gemini, Merlin, Ramsis, Volans, Voltron, and Ywing). (Doc. 320, pp. 6–8.) Qualcomm argued that the 50% duty cycle products do not sample because—as Dr. Prucnal conceded—a 50% duty cycle product always charges. (*Id.* at 6–7.) Absent discharge, there is no reduction to a discrete time signal, and there is no sampling. (*Id.*) In response, Parkervision did not dispute that reducing a continuous time signal to a discrete time signal requires discharge; nonetheless, it argued that the Court should deny summary judgment based on testimony from Dr. Prucnal that the absence of discharge would occur only in an “ideal” 50% duty cycle product, and Qualcomm’s products are not necessarily ideal. (*Id.* at 7–8 (citing Doc. 277, pp. 12–14.) Rather, the 50% duty cycle products have a discharge opportunity: “[I]t’s going to depend upon the

impedance scene looking forward in this circuit where charging the capacitor and then energy is being transferred into it from one or the other of these two . . . ILNA+ or ILNA- but then that has *the opportunity to discharge* as well.” (*Id.* at 7–8 (quoting Dr. Prucnal’s deposition testimony) (emphasis added).) The Court denied Qualcomm’s motion for summary judgment because Parkervision “has put forth sufficient evidence to raise a genuine dispute of material fact regarding the infringement of Qualcomm’s 50% [d]uty [c]ycle [p]roducts.” (*Id.* at 8.)

2. Generating

In its *Markman* briefing, Qualcomm argued that the term “generating” was indefinite¹¹ but that if any construction was possible, it should mean “creating a lower frequency signal from the previously transferred energy.” (Doc. 137, pp. 4–5; see also Doc. 243, pp. 38–39.) Parkervision countered that “generating” need not be construed because it has a plain and ordinary meaning. (Doc. 136, pp. 22–23.) Consistent with Parkervision’s arguments, the Court rejected Qualcomm’s proposed construction, finding that “no construction of these terms is necessary in view of the terms’ use of plain and direct language.”¹² (Doc. 243, pp. 38–40.) The Court again addressed the

¹¹ Recently, the U.S. Supreme Court rejected the indefiniteness standard established by the U.S. Court of Appeals for the Federal Circuit. See *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124, 2131 (2014) (holding that indefiniteness standards measured by what is “amenable to construction” or “insolubly ambiguous” are too “amorphous”). The *Nautilus* Court held that the definiteness command of § 112, ¶ 2 requires 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.” *Id.* at 2129 (explaining that clarity is mandated even though “absolute precision is unattainable”).

¹² Where “generating” is used in means-plus-function claims (claims 82, 90, and 91 of the ‘518 Patent), the Court held that “means for generating the baseband signal from the integrated energy” is “generating the baseband from the integrated energy,” and the corresponding structure is “any arrangement of (i) one or more of the switch circuitry controlled by any one of pulse generators and (ii) one or more of the energy

generating limitation in its Order denying Parkervision's motion for summary judgment that certain prior art did not anticipate its claims. (See Doc. 318, pp. 3–6.) There, the Court rejected Parkervision's argument that generating the lower frequency signal requires discharge of the transferred energy from a storage device. (See *id.* at 5–6 (noting that “a signal could be ‘generated’ from a charge held in a capacitor . . . indirectly, by measuring the voltage across the capacitor”).)

STANDARDS

Federal Rule of Civil Procedure 50 provides in relevant part:

(a) **Judgment as a Matter of Law.**

(1) ***In General.*** If a party has been fully heard on an issue during a jury trial and the court finds that a reasonable jury would not have a legally sufficient evidentiary basis to find for the party on that issue, the court may:

- (A) resolve the issue against the party; and
- (B) grant a motion for judgment as a matter of law against the party on a claim or defense that, under the controlling law, can be maintained or defeated only with a favorable finding on that issue.

(b) **Renewing the Motion After Trial; Alternative Motion for a New Trial.** If the court does not grant [a Rule 50(a) motion] . . . the movant may file a renewed motion for judgment as a matter of law and may include an alternative or joint request for a new trial under Rule 59. . . .

(c) **Granting the Renewed Motion; Conditional Ruling on a Motion for a New Trial.**

(1) ***In General.*** If the court grants a renewed motion for judgment as a matter of law, it must also conditionally rule

storage circuitry disclosed or described in Figures 63, 64A, 64B, 65, 67A, 68G, 69, 74, 76A–E, 77A–C, 82A, 82B, 86, 88, 90, 92, 94A, 95, 101, 110, 111, or equivalents thereof.” (Doc. 243, p. 46.)

on any motion for a new trial by determining whether a new trial should be granted if the judgment is later vacated or reversed. The court must state the grounds for conditionally granting or denying the motion for a new trial.

The U.S. Court of Appeals for the Federal Circuit reviews the grant or denial of a Rule 50 motion under the law of the regional circuit. *i4i Ltd. P'Ship v. Microsoft Corp.*, 598 F.3d 831, 841 (Fed. Cir. 2010). In the U.S. Court of Appeals for the Eleventh Circuit, a district court “should grant judgment as a matter of law when the plaintiff presents no legally sufficient evidentiary basis for a reasonable jury to find for him on a material element of his cause of action.” *Collins v. Marriott Int'l, Inc.*, 749 F.3d 951, 957 (11th Cir. 2014) (citing *Pickett v. Tyson Fresh Meats, Inc.*, 420 F.3d 1272, 1278 (11th Cir. 2005)); see also *Chow v. Chak Yam Chau*, No. 12-15994, 2014 WL 92094, at *3 (11th Cir. Jan. 10, 2014). The district court must deny a renewed Rule 50 motion where “there exists a ‘substantial conflict in the evidence, such that reasonable and fair-minded persons in the exercise of impartial judgment might reach different conclusions.’” *Davila v. Menendez*, 717 F.3d 1179, 1184 (11th Cir. 2013) (quoting *Christopher v. Florida*, 449 F.3d 1360, 1364 (11th Cir. 2006)); see also *Mee Indus. v. Dow Chem. Co.*, 608 F.3d 1202, 1211 (11th Cir. 2010) (holding that JMOL should be granted if the non-movant does not “provide more than a scintilla of evidence that there is a substantial conflict in evidence to support a jury question”).

After the jury’s verdict, a renewed Rule 50 motion is decided “the same way it would have been decided prior to the jury’s verdict, and . . . the jury’s particular findings are not germane to the legal analysis.” *Chow*, 2014 WL 92094, at *3 (citing *Chaney v. City of Orlando, Fla.*, 483 F.3d 1221, 1228 (11th Cir. 2007)). “The district court must view the evidence in the light most favorable to the non-moving party and must refrain

from ‘decid[ing] the credibility of witnesses . . . or weigh[ing] the evidence.’” *Davila*, 717 F.3d at 1184 (quoting *Mich. Millers Mut. Ins. Corp. v. Benfield*, 140 F.3d 915, 921 (11th Cir. 1998)). The court may give “‘credence to . . . that evidence supporting the moving party that is uncontradicted and unimpeached, at least to the extent that [it] comes from disinterested witnesses,’ however, [the court must] ‘disregard all evidence favorable to the moving party that the jury is not required to believe.’” *Mee Indus.*, 608 F.3d at 1211 (quoting *Reeves v. Sanderson Plumbing Prods., Inc.*, 530 U.S. 133, 150–51 (2000)).

Federal Rule of Civil Procedure 59 provides that the district court may, “on motion, grant a new trial on all or some of the issues—and to any party— . . . for any reason for which a new trial has heretofore been granted in federal court.” Fed. R. Civ. P. 59(a)(1)(A). The Federal Circuit reviews such motions under regional circuit law. *Commil USA, LLC v. Cisco Sys., Inc.*, 720 F.3d 1361, 1371 (Fed. Cir. 2013). Under Eleventh Circuit law, new trials should not be granted unless “the verdict is against the great—not merely the greater—weight of the evidence.”¹³ *Lamonica v. Safe Hurricane Shutters, Inc.*, 711 F.3d 1299, 1312–13 (11th Cir. 2013). The court “may consider the credibility of witnesses and weigh evidence.” *Moxness Prods., Inc. v. Xomed, Inc.*, 891 F.2d 890, 893 (Fed. Cir. 1989); see also *Williams v. City of Valdosta*, 689 F.2d 964, 973 (11th Cir. 1982) (“[T]he trial court is to view not only that evidence favoring the jury verdict but evidence in favor of the moving party as well.”).

¹³ A new trial also may be granted based on an erroneous evidentiary ruling if: (1) the “claim was adequately preserved; (2) the district court abused its discretion in interpreting or applying an evidentiary rule; and (3) [the] error affected a substantial right.” See *Proctor v. Fluor Enters., Inc.*, 494 F.3d 1337, 1349 (11th Cir. 2007) (citations and internal quotation marks omitted). To establish that a substantial right was affected, the moving party “bears the burden of proving that the error probably had a substantial influence on the jury’s verdict.” *Id.* at 1352 (citations and internal quotation marks omitted).

INFRINGEMENT

I. Legal Standards

Pursuant to 35 U.S.C. § 271, “whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor, infringes the patent.” 35 U.S.C. § 271(a). “Whoever actively induces infringement of a patent [also] shall be liable as an infringer.” *Id.* § 271(b). “A finding of inducement requires both an underlying instance of direct infringement and a requisite showing of intent.”¹⁴ *Fuji Photo Film Co. v. Jazz Photo Corp.*, 394 F.3d 1368, 1377 (Fed. Cir. 2005); see also *Limelight Networks, Inc. v. Akamai Techs., Inc.*, 134 S. Ct. 2111, 2117 (2014).

Direct infringement exists “when the properly construed claim reads on the accused device exactly.” *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 532 (Fed. Cir. 1996). The two-step process of direct infringement analysis requires: first, an interpretation of the claims in dispute; and second, a comparison of the properly construed claims with the accused product. See *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998) (en banc). If a single limitation is missing or is not met as claimed, there is no literal infringement. See *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538–39 (Fed. Cir. 1991).

Interpretation of patent claims is a question of law, but determining whether the accused device satisfies every claim limitation is a question of fact. See *Cook Biotech Inc. v. Acell, Inc.*, 460 F.3d 1365, 1372–73 (Fed. Cir. 2006). The patentee bears the

¹⁴ The requisite intent requires “knowledge that the induced acts constitute patent infringement.” See *Global-Tech Appliances, Inc. v. SEB S.A.*, 131 S. Ct. 2060, 2068 (2011). “This includes, in part, actual knowledge of the existence of the patent that is infringed.” *SynQor, Inc. v. Artesyn Techs., Inc.*, 709 F.3d 1365, 1379 (Fed. Cir. 2013) (citations and internal quotation marks omitted).

burden of establishing a prima facie showing of infringement as to each accused device by a preponderance of the evidence. See *Medtronic, Inc. v. Mirowski Family Ventures, LLC*, 134 S. Ct. 843, 849–50 (2014) (“It is well established that the burden of proving infringement generally rests upon the patentee.”); see also *Imhaeuser v. Buerk*, 101 U.S. 647, 662 (1879) (“[T]he burden to prove infringement never shifts [to the alleged infringer] if the charge is denied in the plea or answer.”).

II. Discussion

Qualcomm argues that the Court should enter JMOL in its favor because: (1) “Parkervision failed to present evidence that Magellan is representative” of the remaining accused products (Doc. 514, pp. 25–27); (2) Parkervision failed to present necessary testing to the jury, and the testimony of Dr. Prucnal established that the “generating” and “sampling” limitations are not met in the accused products (*id.* at 12–24; Doc. 537, pp. 50–67); (3) Dr. Prucnal’s testimony concerning other limitations was impermissibly conclusory (Doc. 514, pp. 12–24); and (4) Qualcomm’s “substantial defenses to infringement” require JMOL in its favor on Parkervision’s inducement claims (*id.* at 27–28).

Parkervision counters that Qualcomm’s arguments fail because they are “entirely divorced from the claim language and the claim constructions” (Doc. 537, p. 93) and because “legally sufficient evidence supports the jury’s verdict.” (Doc. 518, p. 5.) Specifically, Parkervision points to the expert testimony of Dr. Prucnal and Mr. Sorrells and “Qualcomm’s own circuit schematics and technical documents” as sufficient evidence to support the jury’s verdict. (See *id.*) Finally, at the May 1 hearing, Parkervision sought to defuse its expert’s fatal admissions by “planting the seed” that “multiple signals” meet the lower frequency construction. (See Doc. 537, pp. 93–94;

see also *id.* at 89–92.)

A. Representative Products

At trial, nineteen product architectures were accused of incorporating the energy sampling apparatus and methods, and the jury found that all of these products infringed every asserted claim, and it further found that a product called Marimba (which was erroneously included on the verdict form) also infringed. (Doc. 416.) Parkervision presented no evidence concerning Marimba (*supra* note 4), and only very limited expert witness testimony concerning Astra, Bahama, Eagleray, GZIF3, GZIF4, Halley, Hercules, Iceman, Iris, Libra/Gemini, Merlin, Napoleon, Odyssey, Ramsis, Volans, Voltron, and Ywing. With respect to these seventeen products (and Solo, which Mr. Sorrells discussed), Dr. Prucnal offered the following testimony:

How many different accused architectures or products are there in this case? Is it more than one?

Yes.

And in your opinion, is what you're going to show us, does that apply to each of the accused products?

Yes.

(Doc. 403, p. 212.) Dr. Prucnal further stated that his testimony was specific to the Magellan product, but he had “*concluded that the design documents and circuits show that the circuits are substantially the same as they relate to the patents. And they also infringe.*” (Doc. 404, pp. 64–65 (emphasis added).)

Parkervision contends that Dr. Prucnal’s conclusory testimony concerning non-Magellan products is sufficient to sustain the jury’s verdict because Dr. Prucnal’s testimony is unrebutted and consistent with Qualcomm’s own consolidated treatment of the products. (Doc. 518, pp. 6–9.) Qualcomm argues that it is entitled to JMOL because

such testimony is not “substantial evidence that the Magellan design is a representative product” for the remaining products.¹⁵ (Doc. 514, pp. 21–23.) Reserving for now the issue of whether the record evidence concerning the Magellan and Solo architecture products was sufficient to establish infringement, the Court first will consider only whether Parkervision’s decision to prove its case with representative products is sufficient grounds for granting JMOL as to the non-Magellan products.

The Federal Circuit has rejected arguments similar to Qualcomm’s and permitted a patentee to present evidence concerning one product and “then stat[e] that the same analysis applies to other allegedly infringing devices that operate similarly, without discussing each type of device in detail.” *TiVo, Inc. v. EchoStar Commc’ns Corp.*, 516 F.3d 1290, 1308 (Fed. Cir. 2008); see also *Spansion, Inc. v. Int’l Trade Comm’n*, 629 F.3d 1331, 1350–51 (Fed. Cir. 2010) (finding that the patentee’s selection of fifty-two representative cases was not “improper burden shifting,” but rather that the defendant “simply failed to rebut the substantial evidence set forth” by the patentee).¹⁶

The Federal Circuit has also explicitly approved proof of patent infringement through the conclusory opinions of a patentee’s expert. *Symbol Techs., Inc. v. Opticon*,

¹⁵ Qualcomm raised this issue at trial in relation to its JMOL motion and its objections to Parkervision’s proposed verdict form. (Doc. 411, pp. 6, 58–70, 76–77.) While noting that Dr. Prucnal’s testimony reflected a “50,000 foot” view of the infringement issue, the Court found the testimony sufficient to permit the jury to consider all of the accused products. (*Id.* at 59, 77–78.)

¹⁶ District courts have cited *TiVo* and *Spansion* as authority permitting representative products proof. See *Riverbed Tech., Inc. v. Silver Peak Sys., Inc.*, No. 11-CV-484-RGA-CJB, 2014 WL 266303, at *4 (D. Del. Jan. 24, 2014) (granting partial summary judgment of infringement based on expert’s declaration that he reviewed subsequent versions of a product to confirm that the later versions “contain the same accused functionality” and also infringe); see also *Multimedia Patent Trust v. Apple, Inc.*, No. 10-cv-2618-H KSC, 2012 WL 6863471, at *13 (S.D. Cal. Nov. 9, 2012) (denying summary judgment of non-infringement based on expert’s analysis that product “operate[s] similarly” to infringing product due to use of essentially the same source code).

Inc., 935 F.2d 1569, 1574–75 (Fed. Cir. 1991). In *Symbol*, the Federal Circuit rejected the defendant’s argument that the trial court erred by finding infringement in a non-jury case based on expert testimony “on the ultimate issue of infringement without discussing in detail equivalency between the structures of the accused devices and the structures disclosed in the patent specifications.” *Id.* at 1575. The *Symbol* court noted that “testimony on the ultimate issue of infringement is permissible in patent cases.” *Id.* Indeed, patent cases may be “particularly served” by such method of proof:

[T]he specific purpose behind Rule 705 is to avoid “complex and time consuming” testimony by permitting an expert to “state his opinion and reasons without first specifying the data upon which it is based.” . . . Patent cases, so often typified by lengthy testimony on complex technical issues, are particularly served by this purpose. In short [the patentee] was permitted to rest its prima facie case on [its] expert testimony, including charts, that the patents were infringed, and the District Court was free to accept or reject that evidence.

Id. at 1576 (citations omitted). Notably, a patentee who rests its case “on summary testimony” is left exposed to a “profound risk” that the defendant “during its defense or cross-examination” will demonstrate non-infringement. See *id.* at 1575–76 (observing that the defendant has “the responsibility for challenging the factual underpinnings” of ultimate issue testimony).

Here, Parkervision’s representative product litigation strategy appears to be proper under *TiVo*, *Spanion*, and *Symbol*.¹⁷ Dr. Prucnal testified that he analyzed the

¹⁷ Qualcomm points to *L&W, Inc. v. Shertech, Inc.*, 471 F.3d 1311 (Fed. Cir. 2006), for the proposition that Parkervision “must make a prima facie showing of infringement as to each accused device.” (Doc. 514, pp. 26–27.) *Shertech* does so hold, but it did so in the context of a motion for summary judgment—when cross-examination was not available to the accused infringer. See *Shertech*, 471 F.3d at 1316–18 (holding that the patentee “failed to satisfy its burden of showing that there is no genuine issue of material fact on the issue of infringement” where its expert assumed, “without support,” that all of the defendant’s “accused products are structurally similar” to a tested product). *TiVo* and *Spanion* are therefore the more appropriate cases for assessing

“schematics and the design documents” for each of the accused devices and formed opinions that “they are substantially the same [to Magellan] as they relate to the patents.” (Doc. 404, pp. 64–65.) Qualcomm did not explicitly cross-examine Dr. Prucnal on his “substantially the same” testimony,¹⁸ and it used only Solo and Magellan documents in its cross-examination of Dr. Prucnal—at least suggesting that the products could be treated en masse for the purpose of determining infringement. Based on this record and the law, the Court rejects Qualcomm’s argument that JMOL is warranted because Parkervision “failed to present substantial evidence that the Magellan design is a representative product.” (Doc. 514, pp. 24–27.)

B. Direct Infringement

Qualcomm also argues that JMOL should be entered in its favor because the record is void of the testing and analysis that is required to prove infringement of the complex technology at issue, and “the uncontradicted evidence” establishes that the “generating” and “sampling” limitations are not present in the accused products. (Doc. 514, pp. 12–24.) Parkervision counters that Qualcomm’s motion should be denied because the jury was free to disbelieve Dr. Prucnal’s harmful concessions and instead credit Dr. Prucnal’s testimony on direct and redirect examinations that the generating and sampling limitations are met in the accused products.¹⁹ (Doc. 518, pp. 10–12, 16–

Parkervision’s representative product proof in this case. *But see Medtronic Vascular, Inc. v. Bos. Scientific Corp.*, No. 2:06-cv-78, 2008 WL 2744909, at *2–3 (E.D. Tex. July 11, 2008) (granting JMOL of non-infringement concerning untested products where “plaintiffs failed to present evidence . . . showing that the ESR of a particular model of catheter would not vary with the length of the diameter of the catheter”).

¹⁸ Qualcomm cross-examined Dr. Prucnal on many other points—particularly his opinions concerning satisfaction of the “generating” and “sampling” limitations of the asserted claims.

¹⁹ Qualcomm argued at the May 1 hearing that the jury was not entitled to credit Dr. Prucnal’s testimony because “he testified also that the baseband signal was

17.) The question for the Court is whether, viewed in the light most favorable to Parkervision, the evidence is such that “a reasonable jury could not arrive” at a verdict of infringement. See *Chow*, 2014 WL 92094, at *3.

Assessment of the parties’ respective arguments requires a careful review of the trial testimony in light of the complex technology at issue. Through largely leading questions on direct examination, Dr. Prucnal initially testified that claim 82 of the ‘518 Patent is literally infringed based on his review of various schematics for the Magellan architecture products. (See Doc. 403, pp. 245–63.) According to Dr. Prucnal, the schematics show that after initial amplification, the carrier signals (I and Q) are sampled at an aliasing rate (twice per carrier cycle) by local oscillators (“LO”), which cause the switches in the Magellan mixers to close (permitting energy to flow) and open (stopping energy flow). (*Id.* at 245–52.) Dr. Prucnal then pointed to capacitors after the mixers that collect the sampled energy (see *id.* at 253–55 (noting capacitors on pages 1999 and 2001 of PX 847)), and then he agreed that he had “already shown” that “the accused products have the means for generating the baseband signal.” (*Id.* at 258–59; see also *id.* at 260–61 (noting the transimpedance amplifiers (“TIA”) after the capacitors have a low impedance that “provides a path for the discharge of the capacitor”).) Dr. Prucnal concluded that the “energy storage devices” that follow the mixers are inside the box “labeled TX filter.” (*Id.* at 262; see also Doc. 404, pp. 26–27 (looking to the TX filter output).) Thus, Dr. Prucnal concluded, claim 82 of the ‘518 Patent is literally infringed by the Magellan architecture products. (See Doc. 403, pp. 262–63.)

generated right after the mixer. So he agreed that the lower frequency is generated off the mixer. . . . [O]nce he . . . agree[d] that you have a lower frequency signal generated there, his higher level conclusion that there’s infringement doesn’t matter.” (Doc. 537, p. 64.)

Without reference to any testing of any of the accused products,²⁰ Dr. Prucnal testified that the sampling and generating limitations in the remaining patent claims are also met by the 25% duty cycle products. (Doc. 404, pp. 8–9 (agreeing that the similarities between the claims permit a superficial analysis); see also *id.* at 16, 23–25, 27, 28–29 (stating that all of the elements of claim 23 of the ‘551 Patent are found in claim 82 of the ‘518 Patent); *id.* at 30–35 (stating that claims 25 and 161 of the ‘551 Patent are proved by comparing them to claim 90 of the ‘518 Patent); *id.* at 36–38 (stating that 193 of the ‘551 Patent infringes for the same reasons as claim 82 of the ‘518 Patent).) With respect to the accused 50% duty cycle products, Dr. Prucnal’s testimony was even more conclusory:

Q: What is the duty cycle, Dr. Prucnal?

A: The duty cycle is the period of time during a cycle during which the switch is closed.

Q: What does it mean to have a 50-percent duty cycle?

A: That means the switch is closed for half of the duty cycle and open for the other half.

Q: And what claim element does the 50-percent duty cycle assertion or does the 50-percent duty cycle issue relate to?

A: This relates to sampling.

²⁰ On cross-examination, Dr. Prucnal confirmed that he did not do “any testing on any real Qualcomm circuits.” (Doc. 404, p. 133; see also *id.* at 195–97, 214.) Rather, Dr. Prucnal performed simulations with a computer program using his own inputs that did not model the conditions present in the accused products. (*Id.* at 133–34, 141–43, 153–56, 165, 177, 190–95; see also *id.* at 75–77.) Although Parkervision did not mention the simulations during its direct examination of Dr. Prucnal, he testified on cross-examination that he “relied” on the simulations. (*Id.* at 165–66.) In contrast, on redirect, Dr. Prucnal testified that he “did not” rely on the simulations “to arrive at [his] opinions of infringement.” (*Id.* at 230–31.) Rather, Dr. Prucnal stated that he relied only on the “circuit schematics, the technical documents, the material that I’ve shown with regard to infringement.” (*Id.* at 231.)

Q: Now based on your review of the schematics and the design documents in this case, do any of the accused products have a duty cycle that's always at 50 percent?

A: No.

Q: Can the duty cycles vary to less than 50 percent?

A: Yes.

(Doc. 404, pp. 65–66.)²¹

In his testimony on redirect examination, Dr. Prucnal again pointed to the charging and discharging of the capacitors as evidence of direct infringement:

[B]ecause the energy from the baseband signal—from the carrier signal is transferred through the switch. It's accumulated by the capacitor. And that energy is then used to generate the baseband signal following the capacitor. . . . [And because the switch] completes the circuit and allows energy to flow into the capacitor. If it were not a switch circuit, this would not be a capacitor that's being charged and discharged. It would just be a continuous flow. So the switch is creating the charging cycle. And then when the switch opens, that's creating the discharging cycle. And that's how the energy is then transferred from that point.

(Doc. 404, pp. 246–47.) Dr. Prucnal further testified concerning the crucial discharging of the capacitors in the TX filter:

If the TX filter were just taken out of that circuit, first of all, the TX filter is providing matching to the next stage, which is helping to enable the proper flow of current. Secondly . . . it's not a continuous flow of current from the input to the output. The TX filter is needed in order to provide the charging when the switch is closed, the storing of energy. And then when the switch is opened, be discharging. So it's a necessary part of the energy transfer.

(*Id.* at 247 (testifying “[i]f there were not a switch inside the [mixer of the] accused

²¹ Qualcomm contends that the foregoing testimony “is so imprecise and conclusory it cannot establish infringement.” (Doc. 514, p. 24.) The Court agrees—the 50% duty cycle products could not be found to infringe because such products are designed to carry a continuous time signal. (*See id.*) Indeed, Dr. Prucnal's testimony at trial fell short of that relied on by Parkervision to avoid summary judgment. *See supra* pp. 12–13.

products, there would be no infringement”).²²

Dr. Prucnal’s direct and redirect testimony was notably vague when it came to the generating limitation. Indeed, even on redirect, Dr. Prucnal discussed the charging and discharging cycles as necessary to energy transfer—not to generating a baseband signal. (*Id.*) In contrast, Dr. Prucnal’s testimony on cross-examination was unequivocal that the double balanced mixers create the baseband before the lower frequency signal reaches the capacitors in the TX filter:

So at least in Qualcomm’s architecture, the double balanced mixture [sic] not only is capable of, it does, in fact, create the baseband before it hits the TX filter that you’re talking about now, correct?

Yes.

(*Id.* at 177; see *id.* at 199–200.) Dr. Prucnal further testified that the “output” of the double balanced mixers in the accused products “is the baseband.”²³ (*Id.* at 186–87, 240–41).

At the May 1 hearing, the Court asked Parkervision to explain why “Dr. Prucnal’s concession that the [base]band was created prior to the storage capacitor is not the end of the case.” (Doc. 537, pp. 92–93.) In response, counsel for Parkervision contended that Qualcomm’s arguments were somehow “divorced from the claim language and claim constructions,” and Parkervision “planted the seed” that more than one “baseband signal [or] lower frequency signal” might be created in the Qualcomm products. (*Id.* at

²²In closing, Parkervision argued that the generating limitation is proved by evidence that: “.25 microamps go into the mixer. .11 go out and into the TX filter, where it’s undisputed there are capacitors. And .11 comes out of the TX filter, the capacitors, to form the baseband signal. This proves that the baseband is generated from energy transferred into this storage device.” (Doc. 411, p. 139.)

²³ Mr. Sorrel’s similarly testified that there is no infringement if the accused products “get the baseband signal somehow or somewhere other than from the carrier signal energy that has been stored in the capacitor.” (Doc. 402, p. 174.)

93–94.) Parkervision contended that even if the signal after the mixer is a baseband signal, that does not mean that the “signal here after the capacitors cannot be a baseband signal.” (See *id.* at 98.) During the May 1 hearing, the Court expressed skepticism of this new infringement theory (*id.* at 99–105) and remains skeptical today.

Upon careful review of the record, the Court agrees with Qualcomm that Dr. Prucnal’s concessions during cross-examination as well as his direct testimony are fatal to Parkervision’s infringement case,²⁴ which points to the TX filter as the location of the capacitors that “generate” the baseband by charging and discharging.²⁵ (Doc. 404, pp. 178–80 (agreeing with Mr. Neal that there is “no infringement” if the capacitors in the TX filter “are used for TX filtering and not for energy sampling”).) Indeed, where similarly complex technology has been at issue, testimony like that offered by Dr. Prucnal has been held insufficient to sustain an infringement verdict. See *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1257–58 (Fed. Cir. 2010); *Johns Hopkins Univ. v. Datascope Corp.*, 543 F.3d 1342, 1348–49 (Fed. Cir. 2008); see also *Nobelpharma AB v. Implant Innovations, Inc.*, 141 F.3d 1059, 1065 (Fed. Cir. 1998).

In *Datascope*, the Federal Circuit reversed the district court’s denial of a non-infringement JMOL where the patentee’s expert testimony was “contradictory” and “totally incredible” as a matter of geometry. See *Datascope*, 543 F.3d at 1348–49; see also *Nobelpharma AB*, 141 F.3d at 1065.²⁶ Like the testimony in *Datascope*, Dr.

²⁴ Indeed, at the outset of his infringement analysis on direct examination, Dr. Prucnal identified the baseband signal output as appearing on the “right-hand side of the mixer” designated by “BBOP and BBOM.” (Doc. 403, pp. 215–16 (explaining that BB stands for baseband, O stands for output, P stands for plus, and M stands for minus); see also *id.* at 229–32, 243–45.)

²⁵ At the May 1 hearing, Parkervision confirmed that it “chose the discharge theory” for the purpose of establishing infringement. (Doc. 537, pp. 34–35.)

²⁶ In *Nobelpharma AB*, the Federal Circuit affirmed the district court’s JMOL of

Prucnal's testimony was contradictory on some points; however, it was consistent on the crucial issue that the baseband signal is created in the Qualcomm products before the storage capacitors which precludes a finding of infringement. Accordingly, *Datascope* supports the entry of JMOL in this action. Similarly, in *Becton*, the Federal Circuit held that the district court erred in entering judgment of infringement for the patentee after a jury trial where the patentee provided no "test data or even a single live demonstration" to establish its infringement theory. *Becton*, 616 F.3d at 1257–58 (noting the district court's error in refusing to enter JMOL of non-infringement based on speculation that the hinges "might contain some stored energy").

Finally, the Court rejects Parkervision's argument that the jury's verdict may be saved by Mr. Sorrells' testimony that Parkervision's QSC6270 receiver chip (the Solo product) satisfied each of the limitations of claim 23 of the '551 Patent.²⁷ (Doc. 402, pp. 70–71, 74–89.) There is no dispute that Mr. Sorrells' opinions—like those of Dr. Prucnal—were not based on appropriate testing or simulations. Rather, Mr. Sorrells' opinions were based on a three-page technical paper published by Qualcomm (which Mr. Sorrells' initially considered for "two or three weeks")²⁸ and a reverse engineering report which provided the equivalent of schematics for a Solo chip. (See *id.* at 62; *id.* at 64, 68–71, 75–89; see also PX 842.) The depiction of the Solo chip provided by the

invalidity in favor of the accused infringer based on the patentee's admissions concerning the adequacy of his best mode disclosure that the jury was not "at liberty to disbelieve." 141 F.3d at 1065. Like *Datascope*, *Nobelpharma AB* supports the proposition that a patentee's concessions may be sufficient to grant a defendant's JMOL motion.

²⁷ Mr. Sorrells did not testify concerning any of the other patent claims or accused products. (See Doc. 402, 89–90 (testifying that he was not prepared to testify regarding other accused products because he "was not allowed to review Qualcomm's schematics of the other chips").)

²⁸ (See Doc. 402, pp. 56–62; see also JX 43; DX 835.)

reverse engineering report permitted only the most conclusory testimony from Mr. Sorrells concerning how the limitations of claim 23 were met. (See Doc. 402, pp. 88–89 (asserting that certain “circuitry” depicted in the reverse engineering report “allows” Qualcomm “to generate the lower frequency signal from the transferred energy”).)

On cross-examination and during redirect, Mr. Sorrells testified that infringement could not be determined absent detailed information concerning how a particular circuit functions—not just its components. (See Doc. 402, pp. 102–03, 105, 113, 120–21, 148–49, 152, 163, 175–76; see also *id.* at 241–42.) Dr. Prucnal further testified that infringement could not be determined absent review of materials that were unavailable to Mr. Sorrells. (See Doc. 404, pp. 7–8 (stating that only the schematics and design documents unavailable to Mr. Sorrells provided the “necessary detail” for an infringement determination); *id.* at 73.) Such testimony buttresses the Court’s conclusion as to the inadequacy of Mr. Sorrells’ testimony. See *Datascope*, 543 F.3d at 1348–49; see also *Nobelpharma AB*, 141 F.3d at 1065.

Given the technology at issue, the Court finds that Mr. Sorrells’ superficial analysis is an insufficient evidentiary basis for the jury’s infringement verdict in this action. See *Becton*, 616 F.3d at 1257–58. Further, denial of Qualcomm’s motion concerning non-infringement would have to be based on speculation from Mr. Sorrells and disregard of Dr. Prucnal’s plain testimony concerning the output of the mixers.²⁹ While the Court is loath to overturn the jury’s verdict,³⁰ on this record, it is the Court’s

²⁹ *Becton*, *Datascope*, and *Nobelpharma AB* are persuasive cases for Qualcomm, and Parkervision did not address the cases in its response. (See Doc. 518.)

³⁰ The jury was attentive and deliberated for a significant period of time. Nonetheless, it reached a conclusion not supported by the evidence presented. The jury’s verdict of infringement on the Marimba products is consistent with the conclusion that the jury’s verdict was not supported by the record evidence. See *supra* p. 5, note 6.

only choice. Accordingly, the Court finds that Qualcomm's motion (Docs. 501, 514) is due to be granted. In the alternative, the Court finds that a new trial on infringement is required.

VALIDITY

I. Standards

35 U.S.C. § 102 provides that “[a] person shall be entitled to a patent unless . . . the invention was . . . described in a printed publication . . . or otherwise available to the public before the effective filing date of the claimed invention.” 35 U.S.C. § 102(a)(1); see *Am. Calcar, Inc. v. Am. Honda Motor Co.*, 651 F.3d 1318, 1341 (Fed. Cir. 2011). To anticipate a claim under § 102, “a single prior art reference must expressly or inherently disclose each claim limitation.” See *Finisar Corp. v. DirecTV Grp., Inc.*, 523 F.3d 1323, 1334 (Fed. Cir. 2008); see also *Exergen Corp. v. Wal-Mart Stores, Inc.*, 575 F.3d 1312, 1318 (Fed. Cir. 2009) (reversing denial of motion for JMOL that patent was anticipated). “[A] limitation or the entire invention is inherent and in the public domain if it is the ‘natural result flowing from’ the explicit disclosure.” *Schering Corp. v. Geneva Pharms.*, 339 F.3d 1373, 1379 (Fed. Cir. 2003) (citation omitted).

Anticipation is a question of fact. *SynQor, Inc.*, 709 F.3d at 1373. It requires “a comparison of the construed claim to the prior art.” *In re Omeprazole Patent Litig.*, 483 F.3d 1364, 1371 (Fed. Cir. 2007). When the technology at issue is complex, expert testimony may be required, *Alexsam, Inc. v. IDT Corp.*, 715 F.3d 1336, 1347 (Fed. Cir. 2013), and it must not be too general and conclusory: “Typically, testimony concerning anticipation must be testimony from one skilled in the art and must identify each claim element, state the witnesses’ interpretation of the claim element, and explain in detail how each claim element is disclosed in the prior art reference.” *Koito Mfg. Co. v. Turn-*

Key-Tech, LLC, 381 F.3d 1142, 1152 (Fed. Cir. 2004) (citation omitted).

To establish its anticipation defense, Qualcomm must overcome the presumption of validity found in the first paragraph of 35 U.S.C. § 282, “which provides that ‘[a] patent shall be presumed valid’ and ‘[t]he burden of establishing invalidity . . . rest[s] on the party asserting such invalidity.’” *Microsoft Corp. v. i4i Ltd. P’ship*, 131 S. Ct. 2238, 2243 (2011) (quoting § 282). Clear and convincing evidence must be produced to overcome this presumption. See *id.* This burden of proof is pertinent to the Court’s consideration of Qualcomm’s motion for JMOL. See *Mentor H/S, Inc. v. Med. Device Alliance, Inc.*, 244 F.3d 1365, 1375 (Fed. Cir. 2001) (“Courts grant JMOL for the party bearing the burden of proof only in extreme cases, when the party bearing the burden of proof has established its case by evidence that the jury would not be at liberty to disbelieve and the only reasonable conclusion is in its favor.”).

II. Discussion

A. JMOL

Qualcomm’s invalidity defense is that the asserted claims are anticipated by three references that were not considered by the PTO:

Reference	Claims Allegedly Invalidated
Peter A. Weisskopf, Subharmonic Sampling of Microwave Signal Processing Requirements, <i>Microwave Journal</i> (May 1992) (DX 534) (“ Weisskopf ”)	Claims 23, 25, 161, 193, and 202 of the ‘551 Patent Claims 27, 82, 90, and 91 of the ‘518 Patent Claim 2 of the ‘371 Patent
P. Estabrook and B.B. Lusignam, A Mixer Computer-Aided Design Tool Based in the Time Domain, <i>IEEE MTT-S Digest</i> (1988) (DX369) (“ Estabrook ”)	Claims 23, 161, and 202 of the ‘551 Patent Claims 27, 82, 90, and 91 of the ‘518 Patent Claim 2 of the ‘371 Patent
Doug DeMaw, <i>Practical RF Design Manual</i> , 118–213 (1982) (“ DeMaw ”)	Claim 18 of the ‘342 Patent

According to Qualcomm, JMOL is warranted because the above references and the testimony of Dr. Razavi provided unrebutted proof of anticipation, and Parkervision presented no contrary evidence and obtained no relevant admissions from Dr. Razavi on cross-examination. (Doc. 499, p. 5.) Qualcomm argues in the alternative that a new trial is warranted because the jury was not instructed on the disparagement doctrine or given an *i4i* instruction as Qualcomm requested, and Parkervision's arguments concerning the generating limitation contradicted the Court's claim construction. (Doc. 499, pp. 28–29.)

Parkervision counters that JMOL is inappropriate because “the jury could have reasonably concluded that Dr. Razavi's testimony was not credible” because he: (1) “was repeatedly impeached,” (2) “omitted claim limitations and constructions,” (3) “admitted to errors in his simulations,” and (4) “advanced an understanding of the claim terms incongruent with that offered by Qualcomm for infringement purposes.” (Doc. 516, pp. 5–6.) Parkervision argues that “Dr. Razavi's testimony failed to show that: (1) the ‘energy transfer’ limitations as construed by the Court were disclosed by . . . Weisskopf or Estabrook”; and (2) the “sampling” limitation was disclosed by . . . DeMaw. (*Id.* at 5.) Parkervision further argues that the Court should reject Qualcomm's jury instruction arguments because Qualcomm has not shown the instructions were “legally erroneous” or had a prejudicial effect on the jury. (*Id.* at 14–17.) Finally, Parkervision contends that it did not disregard or contradict the Court's construction of the “generating” limitation. (*Id.* at 21.)

Qualcomm's most compelling argument is that JMOL or a new trial is required because Parkervision's validity opposition (with respect to Weisskopf) is premised on an

incorrect claim construction. (Doc. 499, pp. 9, 11–14 (arguing that Parkervision’s decisions “to disobey” the Court’s claim construction position, “misrepresent the Weisskopf reference, and distract the jury with . . . theatrics left Parkervision with a record that requires JMOL of invalidity and, at a minimum, a new trial”).) Specifically, Qualcomm contends that Parkervision’s validity opposition at trial depended on a finding that the “generating” limitations required a “discharge” of energy. (*Id.* at 1–12.) Qualcomm cites four Federal Circuit cases in support of this argument: (1) *Exergen Corp. v. Wal-Mart Stores, Inc.*, 575 F.3d 1312, 1319 (Fed. Cir. 2009); (2) *Ecolab, Inc. v. FMC Corp.*, 569 F.3d 1335, 1347 (Fed. Cir. 2009);³¹ (3) *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 632 (Fed. Cir. 1987); and (4) *Am. Calcar, Inc. v. Am. Honda Motor Co.*, 651 F.3d 1318, 1341–42 (Fed. Cir. 2011).³²

In *Verdegaal Bros.*, *Exergen Corp.*, and *Ecolab*, the Federal Circuit held that the district courts erred in denying motions for JMOL on invalidity. The patentees in *Verdegaal Bros.* and *Exergen Corp.* conceded that only one limitation was absent from the prior art references. *Verdegaal Bros.*, 814 F.2d at 632; *Exergen Corp.*, 575 F.3d at 1318–19. In both cases, the Federal Circuit rejected the patentees’ arguments that the sole limitation was absent from the prior art because the claims did not include the limitations as advanced by the patentees. *Verdegaal Bros.*, 814 F.2d at 632 (holding that the patentee’s distinction was “inappropriate” because there was “no limitation in

³¹ In *Ecolab*, the Federal Circuit held that the “broadly” written claim language did not support the patentee’s argument that “the claimed method is distinct from Labadie because the claimed method is directed to applying peracetic acid to beef [to] reduce microbial populations in the complex setting of a processing plant.” *Ecolab, Inc.*, 569 F.3d at 1347 (citation and internal quotation marks omitted).

³² *American Calcar* supports Qualcomm’s argument indirectly. In *American Calcar*, the Federal Circuit reversed a district court’s JMOL of invalidity, but there, the incorrect claim construction on which the erroneous validity determination was based was provided by the district court—not the patentee. *Am. Calcar*, 651 F.3d at 1341–42.

the subject claims with respect to the rate at which sulfuric acid is added”); *Exergen Corp.*, 575 F.3d at 1319 (“[N]othing in claim 1 of the ‘205 patent requires the detector to detect radiation solely from the biological tissue.”).

Unlike the plaintiffs in *Verdegaal Bros.* and *Exergen*, Parkervision has not conceded that the “generating” limitations are the only ones at issue as to Weisskopf.³³ Further, Parkervision does not dispute that it represented at trial that generating a lower frequency or baseband signal requires discharge of energy. (Doc. 516, p. 12 (noting that “Dr. Prucnal and Mr. Sorrells opined that the plain and ordinary meaning of the ‘generating’ limitations required the repeated charging and discharging of a capacitor”).) Nonetheless, Parkervision argues that the Court should reject Qualcomm’s arguments as waived because Qualcomm did not object: (1) to the testimony of Dr. Prucnal or Mr. Sorrells; (2) during Parkervision’s cross-examination of Dr. Razavi that “generating” requires discharge;³⁴ and (3) to the Court’s instruction to the jury to apply the “plain

³³ Otherwise, *Verdegaal Bros.* and *Exergen Corp.* do support Qualcomm’s argument, and Parkervision made no effort to distinguish the cases in its response or at the May 1 hearing. (See Doc. 516.)

³⁴ For instance, Parkervision cross-examined Dr. Razavi concerning the Rebuttal Expert Report of Peter Weisskopf (which was not in evidence) on the ground that Dr. Razavi’s opinions differed from Weisskopf. Weisskopf’s rebuttal opinion that his article did not invalidate the claims of the patents-in-suit was premised on the “generating” limitations not being met because his article did not disclose the “discharge of energy.” (Doc. 269-10, pp. 12–15 (“In summary, my paper teaches a voltage sample-and-hold circuit having a sufficiently high impedance load such that the voltage on the storage capacitor can be measured *without* discharging energy from the capacitor.”).) Parkervision then argued in closing that Weisskopf “himself has filed a declaration in this case in which Weisskopf says his article doesn’t show the same thing as the Parkervision patents. They don’t anticipate.” (Doc. 411, pp. 100–01 (“The article describes a sample and hold process. That’s not what the invention does. It doesn’t hold the energy. It transfers it.”); *id.* (“Dr. Razavi told you that he is extraordinary and knows more about the Weisskopf reference than Mr. Weisskopf himself, who says he didn’t describe in his article what the patent describes.”).) Qualcomm did not object, and in its closing, it only argued that the jury should discount the arguments regarding Weisskopf because he did not testify and was paid by Parkervision. (Doc. 411, p. 129.)

meaning” of the term “generating.” (*Id.* at 23–24.) Further, Parkervision contends that its attorney’s argument that Weisskopf and Estabrook do not anticipate was not conduct that impaired “the calm and dispassionate consideration of the case by the jury.” (*Id.* at 23 (quoting *BankAtlantic v. Blythe Eastman Paine Webber, Inc.*, 955 F.2d 1467, 1474 (11th Cir. 1992).)

Parkervision also argues that the jury could reject Dr. Razavi’s testimony that Weisskopf anticipates the “generating” limitations because Dr. Razavi provided contradictory testimony at his deposition and at trial concerning whether “the energy in the capacitor shown in figure 2 . . . is not discharged to create the lower frequency signal.” (*Id.* at 11.) Parkervision also argues that the jury could find that the “energy transfer” limitations were not satisfied because Dr. Razavi failed to testify that the Weisskopf and Estabrook references disclose transferring amounts of energy from the carrier signal “*in amounts distinguishable from noise*” as required under the claim construction. (*Id.* at 7–8.)

The technology in this action and the prior art are of such complexity that Qualcomm cannot establish that it is entitled to JMOL on anticipation absent expert testimony from Dr. Razavi that the jury was “not at liberty to disbelieve.” See *Mentor H/S, Inc.*, 244 F.3d at 1375; *Alexsam*, 715 F.3d at 1347; *Koito Mfg., Co.*, 381 F.3d at 1149. Parkervision’s arguments that the jury had sufficient basis to disbelieve Dr. Razavi’s testimony are persuasive. (Doc. 516.) Accordingly, despite compelling arguments by Qualcomm concerning the “generating” limitations, it would be error to disturb the jury’s verdict that Qualcomm did not prove by clear and convincing evidence that all of the asserted claims were anticipated by Weisskopf, Estabrook, and DeMaw.

B. New Trial

Qualcomm contends that it is entitled to a new trial for all the same reasons that JMOL is warranted and because the Court erred in not giving an *i4i* instruction or an instruction that “[a] reference is no less anticipatory if, after disclosing the invention, the reference then disparages it.” *Celeritas Techs., Ltd. v. Rockwell Int’l Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998). Qualcomm proposed the instruction before trial. (Doc. 336-8, p. 57.) Parkervision concedes that if it had “put forward affirmative misstatements of the law [concerning disparagement] in an attempt to mislead the jury . . . an instruction may very well have been warranted. [But, we] didn’t do that.” (Doc. 537, p. 41.)

The Federal Circuit “reviews the legal sufficiency of jury instructions on an issue of patent law without deference to the district court.” *DSU Med. Corp. v. JMS Co.*, 471 F.3d 1293, 1304 (Fed. Cir. 2006). To alter a judgment based on erroneous jury instructions, the moving party must establish that: “(1) it made a proper and timely objection to the jury instructions, (2) those instructions were legally erroneous, (3) the errors had prejudicial effect, and (4) it requested alternative instructions that would have remedied the error.” *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282, 1311–12 (Fed. Cir. 2005) (citation and quotation marks omitted); see *Bettcher Indus., Inc. v. Bunzl USA, Inc.*, 661 F.3d 629, 639 (Fed. Cir. 2011). The Federal Circuit orders a new trial based on jury instruction errors when the “instructions as a whole clearly mislead the jury.” *DSU Med. Corp.*, 471 F.3d at 1304.

In hindsight, and especially given Parkervision’s closing arguments, *i4i* and disparagement instructions would likely have been appropriate. Nonetheless, viewing the Court’s instructions as a whole, the Court cannot find that omission of the disparagement and *i4i* instructions misled the jury and requires a new trial on validity.

CONCLUSION

Accordingly, it is hereby **ORDERED AND ADJUDGED**:

1. Qualcomm's Renewed Motion for Judgment as a Matter of Law and Motion for New Trial Regarding Invalidity (Doc. 499) is **DENIED**.
2. Qualcomm's Renewed Motion for Judgment as a Matter of Law and Motion for New Trial Regarding Non-Infringement (Docs. 501 (redacted version)); (Doc. 514 (sealed version)) are **GRANTED**.
3. The parties' remaining motions (Docs. 466, 488-90, 497, 500, 521-24) are **DENIED AS MOOT**.
4. The Clerk is **DIRECTED** to enter judgment in favor of Qualcomm and against Parkervision and to close this case.

DONE AND ORDERED in Chambers in Jacksonville, Florida, on June 20, 2014.



ROY B. DALTON JR.
United States District Judge

Copies:

Counsel of Record