

**UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
WACO DIVISION**

PARKERVISION, INC.,

Plaintiff,

v.

NXP SEMICONDUCTORS N.V., NXP B.V.,
NXP USA, INC. D/B/A NXP
SEMICONDUCTORS USA, INC.,

Defendants.

Case No. 6:23-cv-00389-ADA

JURY TRIAL DEMANDED

**PLAINTIFF PARKERVISION, INC.'S
RESPONSIVE CLAIM CONSTRUCTION BRIEF**

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Exhibit 1	6:20-cv-00108-ADA – <i>ParkerVision, Inc. v. Intel Corporation</i> – ParkerVision’s Opening Claim Construction Brief
Exhibit 2	6:20-cv-00870-ADA – <i>ParkerVision Inc. v. Hisense Co., Ltd. et al.</i> – ParkerVision’s Responsive Claim Construction Brief
Exhibit 3	6:20-cv-00945-ADA – <i>ParkerVision Inc. v. TCL Industries Holdings Co., et al.</i> – ParkerVision’s Responsive Claim Construction Brief
Exhibit 4	6:20-cv-00870-ADA – <i>ParkerVision, Inc. v. Hisense Co., Ltd. et al.</i> – Declaration of Dr. Michael Steer
Exhibit 5	6:20-cv-00945-ADA – <i>ParkerVision Inc. v. TCL Industries Holdings Co., et al.</i> – Declaration of Dr. Michael Steer
Exhibit 6	Appeal No. 2022-1548 – <i>ParkerVision, Inc. v. Vidal</i> – Opinion
Exhibit 7	IPR2020-01265 – Intel Corporation v. ParkerVision, Inc. – Final Written Decision
Exhibit 8	6:20-cv-00108-ADA – <i>ParkerVision, Inc. v. Intel Corporation</i> – ParkerVision’s Responsive Claim Construction Brief
Exhibit 9	6:14-cv-687-Orl-40LRH – <i>ParkerVision, Inc. v. Qualcomm Inc. et al.</i> – Order

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I. Introduction.

NXP asks this Court to reconsider claim constructions this Court has construed *multiple* times in ParkerVision’s litigations with Intel, TCL, Hisense, and LG: “switch,” and “the energy discharged during any given discharge cycle is not completely discharged.” Each time, the Court has consistently maintained its constructions. The Court should continue to do so now. NXP just reiterates the exact same arguments this Court has heard (and rejected) so many times before. It provides no basis showing how the Court made a mistake.

For the other terms, NXP seeks constructions that *ignore* the intrinsic record, *exclude* disclosed embodiments, and avoid reading the claims in view of the specification. ParkerVision’s constructions should be adopted, and NXP’s constructions rejected.

II. Technology background.

On multiple occasions, the Court has considered the cellular/wireless technology set forth in the patents-in-suit.¹ As such, ParkerVision does not repeat its discussion of the technology here. These discussions are set forth in ParkerVision’s Opening Claim Construction Brief in Case No. 6:20-cv-00108 and ParkerVision’s Responsive Claim Construction Brief (and accompanying Expert Declaration) in Case Nos. 6:20-cv-00870, 6:20-cv-00945. *See* Ex. 1 (“PV 108 Op. Br.”) at Sections II, III; Ex. 2 (“PV 870 Op. Br.”) at Sections II, III; Ex. 3 (“PV 945 Op. Br.”) at Sections II, III; Ex. 4 (“Steer 870 Decl.”); Ex. 5 (“Steer 945 Decl.”).

III. Disputed claim terms.

A. “storage module” / “energy storage element” (’686 patent, claim 11; ’528 patent, claims 1, 5, 8, 17, 18, 19, 23, 26, 35, 36)

ParkerVision’s Construction	NXP’s Construction
Storage module: “a module of an energy transfer system that stores non-negligible	“an element or module that stores non-negligible amounts of energy from an input

¹ The patents-in-suit in this case are U.S. Patent Nos. 7,483,686 (“the ’686 patent”); 7,865,177 (“the ’177 patent”); and 9,118,528 (“the ’528 patent”).

amounts of energy from an input electromagnetic signal”	electromagnetic signal.”
Energy storage element: “an element of an energy transfer system that stores non-negligible amounts of energy from an input electromagnetic signal”	

On December 15, 2023, in an appeal related to IPR2020-01265 (ParkerVision’s U.S. Patent No. 7,110,444), the Federal Circuit held that “a ‘storage element’ is ‘an element of a system that stores non-negligible amounts of energy from an input EM signal.” Ex. 6 at 15. But another appeal in IPR2021-0990 relating to the same patent and claim term is currently pending before the Federal Circuit, and oral argument is set for May 9, 2024.

For the following reasons, the Court should maintain its prior construction of “energy storage element” as “an element *of an energy transfer system* that stores non-negligible amounts of energy from an input electromagnetic signal.” *See* D.I. 34-4 (“108 CC Order”) at 5-6; D.I. 34-5 (“Amended 562 CC Order”) at 3; D.I. 34-7 (“Special Master’s Rec.”) at 29-34; D.I. 34-6 (“520 CC Order”) at 13-20.

1. The intrinsic evidence supports the Court’s prior construction.

The patents-in-suit disclose only two methods/systems for down-converting a signal: (1) under-sampling (sample-and-hold/voltage sampling); and (2) energy transfer (energy sampling). Though both systems use the same circuit components (e.g., switches, capacitors, loads), their respective operations are very different. *See* PV 108 Op. Br., Sections II, III; PV 870 Op. Br., Sections II, III; PV 945 Op. Br., Sections II, III; Steer 870 Decl., Section IV; Steer 945 Decl., Section IV.

To readily distinguish between the capacitors of the two systems, the specification *expressly* distinguishes the claimed “storage” module from a “holding” module, which is not

claimed. The term “storage” module² is reserved exclusively for a component used in an energy transfer system whereas a “holding” module³ is reserved exclusively for a component used in a sample-and-hold system. *Compare, e.g.,* ’528 patent at 72:55-74:35 (describing an energy transfer system) *with id.* at 61:1-52 (describing a sample-and-hold system).

A “storage” module is not simply an element of *any* type of system. Thus, a “storage” module must be construed in a way that distinguishes it from a “holding” module. As discussed below, the distinctions between a “storage” module in an energy transfer system and a “holding” module in a sample-and-hold system are spelled out in the patent specification. Just like defendants before it, NXP ignores this.

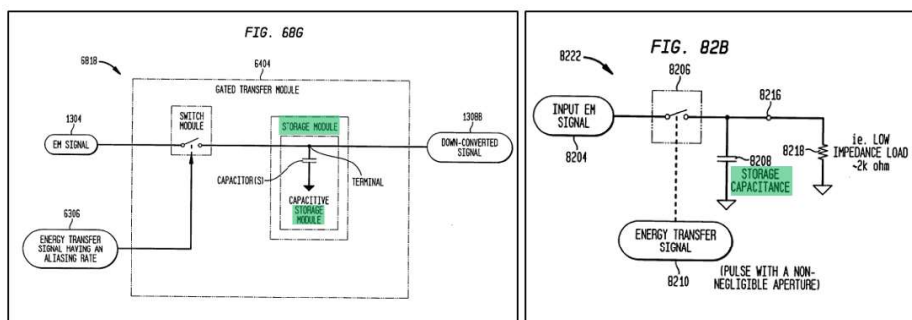
The parties agree that an energy “storage” module “stores non-negligible amounts of energy from an input electromagnetic (EM) signal.” But this feature alone does not distinguish a “storage” module from a “holding” module. There is a key distinguishing feature—the “storage” module is part “of an energy transfer system.” *See, e.g.,* ’528 patent, 69:51-62; 72:55-74:35; 103:44-108:21; Figs. 65, 68A-G, 74, 82A, 82B, 95.

Unlike an energy *transfer* system which, as the name implies, *transfers* (discharges) non-negligible amounts of energy, a sample-and-*hold* system uses a high impedance load to *hold* (i.e., *not* transfer/discharge) voltage/charge. ’528 patent, 70:19-26, 44-60. In other words, whereas a “storage” module stores energy for subsequent transfers/discharges of energy, a “holding” module is “holding a voltage value.” PV 108 Op. Br. at Section III. Thus, a “storage” module is used in an “energy transfer system” and a “holding” module is used in a sample-and-*hold* system. The Court’s prior construction recognizes this important distinction.

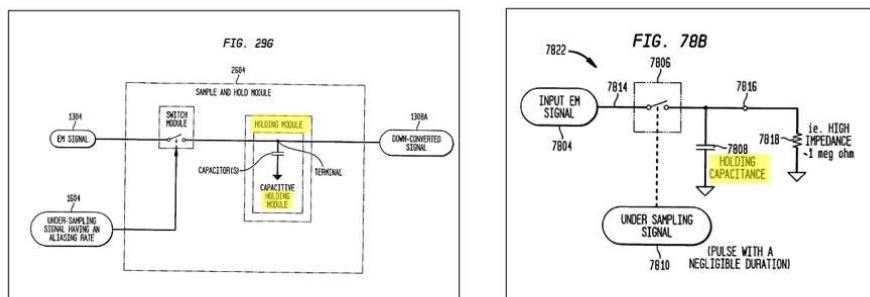
² “Storage module” will be used as shorthand for a “storage” element, module, or device.

³ “Holding module” will be used as shorthand for a “holding” element, module, or device.

Indeed, in addition to the textual description in the specification, this distinction between “storage” and “holding” modules is readily apparent in the patent figures.



Energy transfer system

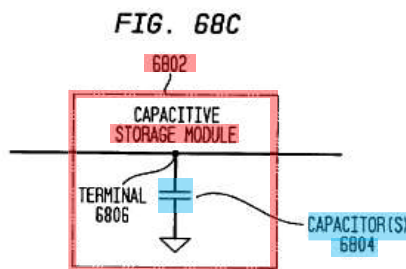


Sample and hold system

For example, as shown in Figures 68G and 82B above, when discussing an energy transfer system, the specification uses the term “storage” module/capacitance (green). *See also* ’528 patent at Figs. 65, 68A-G, 74, 82A, 82B, 95. On the other hand, as shown in Figures 29G and 78B above, when discussing a sample-and-hold system, the specification uses the term “holding” module/capacitance (yellow). *See also id.* at Figs. 24A, 27, 29A-G, 42, 78A, 78B. Thus, ParkerVision’s construction is consistent with this distinguishing feature and recites that the energy “storage” module is part of an “energy transfer system.”

The patent specifications and figures also refer to and identify capacitors *separately* from “storage” modules and “holding” modules. This is because a capacitor can be implemented as either a “storage” module or “holding” module depending on the system that the capacitor is

used in and/or how the capacitor is used in the system.



As shown in Figure 68C of the '528 patent, the patentees draw a separate box around capacitor 6804 (blue) and label the box as storage module 6802 (red). This is because Figure 68C is a specific implementation where the capacitor is used as a module of an energy transfer system. Other figures showing a capacitor as a module of a sample-and-hold system, however, include a box around a capacitor labeled as a “holding” module. *See, e.g.*, '528 patent, Fig. 29C.

Moreover, the term “storage” module is first introduced under a sub-section entitled “0.1.2 Introduction to *Energy Transfer*” ('528 patent, 72:55),⁴ which states:

FIG. 82A illustrates an exemplary *energy transfer system* 8202 for down-converting an input EM signal 8204. The *energy transfer system* 8202 includes a switching module 8206 and a *storage module* illustrated as a *storage capacitance* 8208. The terms *storage module* and *storage capacitance*, as used herein, are *distinguishable* from the terms *holding module* and *holding capacitance*, respectively. *Holding modules* and *holding capacitances*, as used above, **identify systems** that store negligible amounts of energy from an under-sampled input EM signal with the *intent of 'holding' a voltage value*. *Storage modules and storage capacitances, on the other hand, refer to systems* that store non-negligible amounts of energy from an input EM signal.

Id., 73:9-22; *see also id.* at 61:1-65:43 (discussing sample-and-hold systems); 72:55-74:35; 103:44-108:21 (discussing energy transfer systems).

The green language in the passage describes a “storage” module in the context of an *energy transfer system*. The passage then provides guidance that allows a POSITA to identify

⁴ Unless indicated otherwise, all emphasis has been added.

whether a *system* is an energy transfer system or a sample-and-hold system based on what *component* (capacitor) is being used in that system. Specifically, the passage states that “holding” modules “*identify systems*” that store negligible amounts of energy (i.e., sample-and-hold systems) whereas “storage” modules “*refer to systems*” (i.e., identify systems) that store non-negligible amounts of energy. In other words, if a “holding” module is being used, the system is a sample-and-hold system; if a “storage” module is being used, the system is an energy transfer system. The phrase “refer to *systems*” provides a clear indication that the last sentence is not intended to define a “storage” module, which is just a mere *component* of a *system*.

Notably, like other defendants before it, NXP does not dispute that a “storage” module is a module found only in an energy transfer system. Indeed, NXP provides no substantive argument as to why including “*of an energy transfer system*” is wrong. Instead, NXP points to the PTAB’s (and Federal Circuit’s) reliance on a single sentence (in red above) and asserts that this one sentence, standing alone, is enough to define the “storage” terms. As Judge Gilliland noted, this ignores *Phillips* and the patentee’s full description in the specification. *See* 520 CC Order at 17-20.

2. NXP’s construction is technically and legally wrong.

NXP (and the PTAB/Federal Circuit) incorrectly omits the concept that a storage module is a component of an “energy transfer system.” NXP’s construction would cover any system in the world that stored non-negligible amounts of energy.⁵ But the patents are not that broad.

As even the PTAB admitted, (1) there are *only two* systems disclosed in the patent –

⁵ NXP’s construction can lead to illogical results. If a sample-and-hold system had a module that stored non-negligible amounts of energy, under NXP’s construction, that module would be a “storage module.” This is at odds with the patent specification, which discloses that sample-and-hold systems use “holding” modules to hold voltage (negligible amounts of energy), *not* “storage” modules.

energy transfer and under-sampling (sample-and-hold), (2) a “holding module” is “expressly link[ed]” to an under-sampling system. Ex. 7 at 33, 37. Logically, if there are only two systems and a “holding” element is only used in an “under-sampling” system, then a “storage” element must necessarily be “an element *of an energy transfer system*.”

Just like the PTAB and the defendants before it, NXP places too much emphasis on this single last sentence (in red above) to the exclusion of the complete disclosure in the specification. But NXP cannot simply cast aside the distinction the patentee makes between a “storage” and “holding” module and the two distinct systems of which they are a part.

NXP claims to be adhering to the patentee’s lexicography, but it is not. The last sentence alone is *not* a lexicographic definition of “storage” module. To act as his/her own lexicographer, the patentee must “clearly set forth a definition of the disputed claim term,” and “‘clearly express an intent’ to [define] the term.” *Thorner v. Sony Computer Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012). That is not the case here. *See* 520 CC Order at 17.

Tellingly, NXP modifies the so-called lexicography, changing the word “systems” to “an element or module.” This is because the specification makes clear that a “storage” element/module is not a system, but instead a type of *component* used *within* an energy transfer system. If the single last sentence were true lexicography, there would be no need for NXP to modify the purported lexicography.

The last sentence is part of the specification’s entire teachings regarding the “storage” module. And notably, this last sentence uses the language “*on the other hand*” and “*refer to systems*” as a way to *distinguish* between a “holding” module in contrast to a “storage” module and the two different systems of which they are a part. NXP completely ignores this. NXP’s reliance on, and misreading of the last sentence (in red above) cannot negate the entirety of the

specification's teachings regarding the "storage" terms.

The specification and figures *repeatedly* compare/contrast energy transfer systems (which use "storage" modules) with sample-and-hold (under-sampling) systems (that use "holding" modules). Indeed, the specification devotes separate sections to compare these different systems. The specification includes a section entitled "0.1 Energy Transfer Compared to Under-Sampling" which, in turn, includes sub-sections "0.1.2 Introduction to *Energy Transfer*" (the section discussing energy transfer systems) and "0.1.1 Review of Under-sampling" (the section discussing sample-and-hold/voltage sampling systems). '528 patent, 17:13-21; *see also id.* at 69:26-74:35. The sentence that NXP relies on for lexicography is found in sub-section "0.1.2 Introduction to *Energy Transfer*" and includes the language "on the other hand" when comparing a storage module to a holding module. Thus, POSITA would understand that the sentence NXP relies on is comparative, *not* definitional.

For the foregoing reasons, the Court should maintain its prior construction.

B. "switch" / "switching device" ('686 patent, claim 11; '528 patent, claims 1, 5, 8, 17, 18, 19, 23, 26, 35, 36)

ParkerVision's Construction	NXP's Construction
Plain-and-ordinary meaning wherein the plain-and-ordinary meaning is "an electronic device for opening and closing a circuit as dictated by an independent control input"	Plain-and-ordinary meaning wherein, the plain-and-ordinary meaning is "an electronic device for opening and closing a circuit."

The dispute between the parties comes from the language that the opening and closing of the switch is "dictated by an independent control input" as set forth in ParkerVision's construction. But this language should not be controversial. This Court has already considered and construed the term *multiple* times. Each time, the Court rejected a construction similar to what NXP proposes here and adopted ParkerVision's construction. *See, e.g.*, Ex. 108 CC Order at 7; Amended 562 CC Order at 3; Special Master's Rec. at 87-89; 520 CC Order at 33.

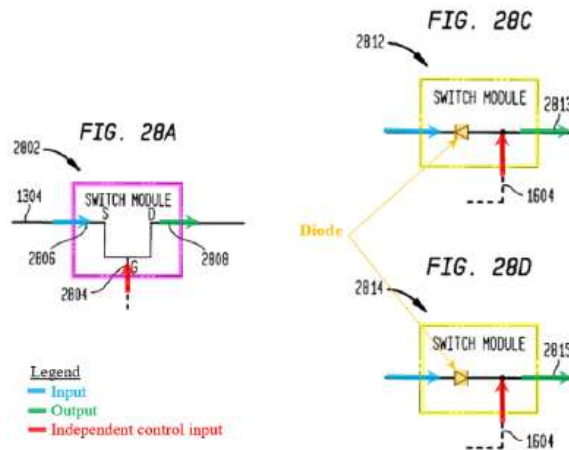
With prior defendants already exhausting all arguments, NXP stretches to find something new to say. NXP disingenuously (and without explanation) suggests that the Court using its prior construction would complicate the proceedings and confuse the jury. Op. Br., 19. Not so. The intrinsic evidence is clear and supports the language “as dictated by an independent control input.” *See* PV 108 Op. Br. at 23-24; Ex. 8 (“PV 108 Resp. Br.”) at 16-18.

Indeed, this Court is not the first court to adopt the language “as dictated by an independent control input” when defining a “switch” in ParkerVision’s patent. The Orlando district court also used this language and rejected the same types of arguments NXP raises for omitting the language.⁶ Ex. 9 at 25-33.

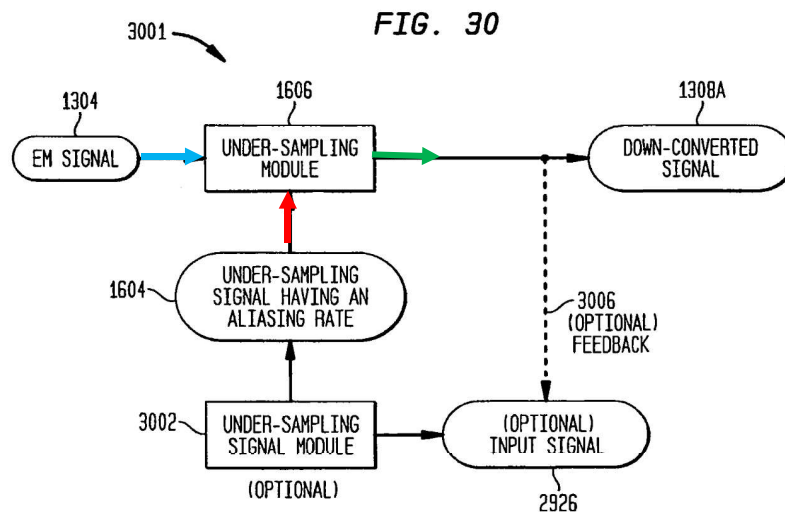
Just like defendants before it, NXP argues that a diode is a type of switch, and diodes are not opened and closed by an independent control input. Op. Br., 12. But NXP’s unsubstantiated attorney argument ignores what the intrinsic evidence actually says about diodes.

First, the specification does not refer to a “diode” by itself, but instead refers to a “diode switch,” “diode switch device” and, as shown in the Figures 28C, 28D, a “switch module.” ’528 patent, 62:64-67; *see also* Figures 66C, 66D; 105:31-34.

⁶ In the Orlando Court (Case No. 6:14-cv-687), the parties disputed the meaning of the term “switch” with regard to U.S. patent no. 6,091,940. The ’940 patent discloses the same type of technology as set forth in the patents-in-suit. Consistent with this Court’s prior construction, the Orlando Court construed “switch” to be a “device with an input and output that can take two states, open and closed, as dictated by an independent control input.” Ex. 9 at 33.



As shown in Figures 28C and 28D (above right), a diode (orange) is merely *a part* of a “switch module” (“diode switch” or “diode switch device”) (yellow box). Second, as shown above, the “diode switch,” “diode switch device” and “switch module” shown and described in the patents-in-suit have three ports—an input (blue arrow), an output (green arrow) and an independent control input (a second input port) (red arrow). ’528 patent, 62:64-67; *see also* Figures 66C, 66D; 105:31-34. It is the “independent control input” that causes the opening and closing of the circuit. Indeed, this configuration is similar to Figure 28A (above left) and Figure 28B, the only other types of switch module (purple box) shown and described in the specification. Third, NXP’s reliance on portions of the ’686 patent is misplaced because the cited disclosure describes a diode as part of a UFT module 202, not as part of a “diode switch,” “diode switch device,” or “switch module.”



Similar to Figures 28A, 28C, and 28D (above), the under-sampling module 1606 (which includes a switch) has three ports—an input (blue arrow), an output (green arrow) and a control *input* (a second input) (red arrow), which is *independent* from the input (blue arrow). To distract from this, NXP makes an argument based on the Optional Feedback 3006 of Figure 30. But this is a red herring. Specifically, NXP asserts that the Optional Feedback 3006 shows some alleged dependence between the control input and the output of the under-sampling module 1606. Op. Br., 19. Even if NXP were correct (which it is not), it does not change the fact that there is a second input (red arrow) (i.e., an *independent* control input) coming into the switch. In other words, even if a signal from the output (green) of the under-sampling module 1606 is fed back into signal module 3002, the second input (red) is still independent of the input (blue). Nevertheless, the specification makes it clear that the Optional Feedback 3006 (which is the same signal as down-converted signal 1308A) is a separate/independent signal from the EM signal 1304 (blue arrow) and the under-sampling signal 1604 (red arrow): “the *down-converted signal 1308A* is used as the feedback 3006 to control the frequency and phase relationship

between *the EM signal 1304* and *the under-sampling signal 1604*.” ’528 patent, 68:36-39.

Moreover, consistent with the figures above, the claims themselves demonstrate that the “switch” / “switching device” must have an “independent control *input*.” The ’686 patent discloses, for example, an *input control* signal that is coupled to the switch and separate from the input signal: “a switch configured to operate according to an *energy transfer signal*, and to sub-sample and transfer energy from *a first electromagnetic (EM) signal*.” ’686 patent, claim 11. Similarly, claim 1 of the ’528 patent recites “a first switch coupled to *a first control signal* . . . , wherein the first switch is on and a portion of energy that is distinguishable from noise is transferred from *the modulated carrier signal* as an *output* of said first switch.” Indeed, it was this type of language that the Orlando court relied on in construing “switch”/ “switch module” to include “as dictated by an independent control input.” Ex. 9 at 32 (“a switch module having a first input connected to a bias signal, a control input connected to a control signal . . .”) (emphasis in original).

For the foregoing reasons, the Court should maintain its prior construction.

C. “coupled” (’686 patent, claim 11; ’528 patent, claims 1, 19)

ParkerVision’s Construction	NXP’s Construction
Plain-and-ordinary meaning	directly connected or connected through a wire (or a closed switch)

The term “coupled” is straightforward and readily understood by a jury. The term does not require construction and should be given its plain and ordinary meaning. Though ParkerVision recognizes that this Court has previously construed “coupled” in connection with U.S. patent nos. 7,292,835 and 7,539,474, ParkerVision respectfully requests the Court to reconsider its construction in light of these specific patents-in-suit. There are important distinctions in the specifications of the patents-in-suit.

The Court’s prior constructions would be improper here because they exclude express embodiments described in the ’686 and ’528 patent specifications. *See Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1276 (Fed. Cir. 2008) (“We normally do not interpret claim terms in a way that excludes embodiments disclosed in the specification.”). Indeed, for specific embodiments, the ’686 and ’528 patents use the term “coupled” to describe a connection between one circuit component (such as a UFT module) and another (such as a reference potential) that includes an intervening component (such as a resistor). This is seen below. As such, *according to the ’686 and ’528 patent specifications*, “coupling” can include *indirect* coupling, i.e., where there is an intermediate component(s) (such as a resistor) that exists between two components but that maintains an electrical connection therebetween.

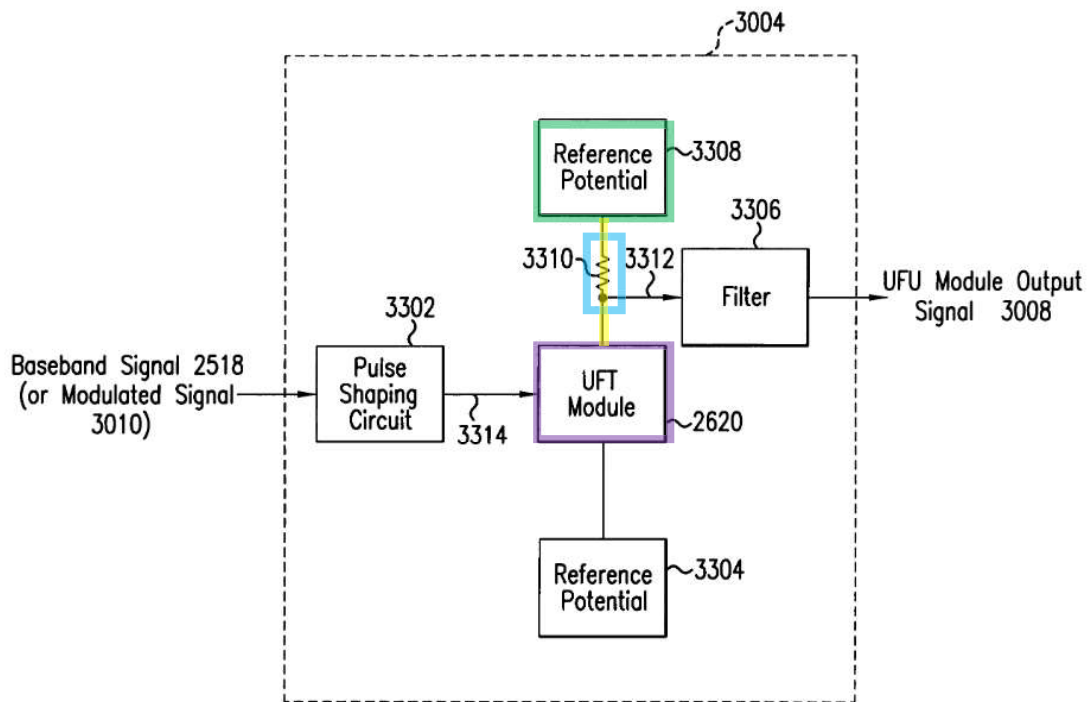
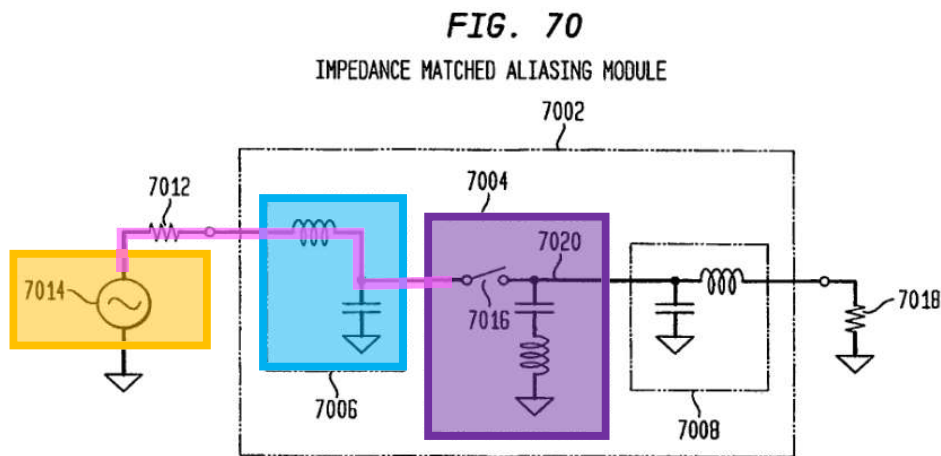


FIG.33

Figure 33 of the ’686 patent (above) illustrates a UFT module 2620 (purple box) connected to a reference potential 3308 (green box) along a conductive path (yellow). Here, there

is an intervening resistor 3310 (blue box) in the conductive path (yellow) between the UFT module 2620 and reference potential 3308. And, the specification describes “[o]ne terminal of UFT module 2620 is coupled to a first reference potential 3304. The second terminal of UFT module 2620 is coupled through resistor 3310 to a second reference potential 3308.” ’686 patent, 46:45-48.



Likewise, Figure 70 of the ’528 patent (above) illustrates a switch 7016 connected to a voltage source 7014 (orange box) along a conductive path (pink). Here, there is an intervening matching circuit (blue) in the conductive path (pink) between the switch (purple) and voltage source (orange). And, the specification explains that this intervening matching circuit 7006 (blue) “can be utilized to efficiently couple an input EM signal [orange box] that has a source impedance of, for example, 50 ohms, with the energy transfer module’s [purple box] impedance of, for example, 300 ohms.” ’528 patent, 122:13-17.

For the foregoing reasons, the term should be given its plain and ordinary meaning, and NXP’s construction should be rejected, which here for the ’686 and ’528 patents seeks to improperly limit the term “coupled” to directly connected or connected through a wire (or a closed switch).

D. “matched filtering/correlating module” (’177 patent, claim 14)

ParkerVision’s Construction	NXP’s Construction
“linear time-variant circuitry that samples a modulated RF (radio frequency) carrier signal at an aliasing rate using a switch with an independent control input driven by a control signal with a non-negligible, periodic aperture, such that the samples, having non-negligible available energy, are accumulated and transferred to a load while the switch is closed and discharged through the load while the switch is open, thereby transferring available real power from the modulated RF carrier signal to the load and producing a downconverted signal with enhanced signal-to-noise power ratio”	Plain-and-ordinary meaning

The District Court for the Middle District of Florida (Orlando division) (Case No. 6:14-cv-00687) adopted ParkerVision’s proposed construction here for “matched filtering/correlating module.” *See* Ex. 9, at 11-25. The ’177 specification explains that “the description of the present invention contained herein is *a unique and specific application* of matched filter theory, sampling theory, and frequency domain techniques. It is *not taught or suggested* in the present literature.” ’177 patent, 130:4-9. As such, the term is not straightforward or as plain and ordinary as NXP contends.

Claim 14 of the ’177 patent discloses a first and second “matched filtering/correlating module.” ParkerVision’s proposed construction comes directly from the specification, and captures a number of structural details, which together provide an accurate description of the ’177 matched filter/correlator embodiments (as shown in Figures 149, 151, and 153) as shown below:

- **linear time-variant circuitry:** The disclosed embodiments are linear time-variant circuits. *See, e.g.,* ’177 patent at Figs. 149, 151, 153; 172:50-51 (“Embodiments of the present invention can be modeled as a linear, time-variant (LTV) device.”).

- **that samples a modulated RF (radio frequency) carrier signal at an aliasing rate:** The '177 Patent explains that the matched filter/correlator embodiments are designed to efficiently down-convert RF (radio frequency) signals. As explained in the “Matched Filtering/Correlating Characterization/Embodiment” section of the '177 Patent, “[t]he matched filter of such embodiments is not a traditional realization of a matched filter designed to extract information at the data bandwidth. Rather, the correlation properties of the filter of the embodiments exploit specific attributes of bandpass waveforms to *efficiently down convert signals from RF.*” *Id.* at 136:46, 51-56.⁷

To down-convert signals from RF, the matched filter/correlator embodiments apply the matched filter recursively to the carrier waveform. *Id.* at 154:25-29. Each such application results in a sample. *Id.* at 154:29-31. The “matched filter output correlation contains information modulated onto the carrier. If many such matched filter correlation *samples* are extracted, the original information modulated onto the carrier is recovered.” *Id.* at 140:41-46. The matched filter/correlator embodiments of Figures 171-173 (which correspond to the embodiments of Figures 149, 151, and 153 discussed above) employ “finite duration *sample* windows,” “where energy or charge is the desired output.” *Id.* at 145:31-33; 145:38-40; 145:46-49.

The RF waveform is sampled at an aliasing rate. An “Aspect[] of the Invention” is that “[c]ontrary to conventional wisdom, the present invention is a method and system for down-converting an electromagnetic (EM) signal by aliasing the EM signal. . . . By taking a carrier and *aliasing* it at an *aliasing* rate, the invention can down-convert that carrier to lower frequencies.” *Id.* at 26:22-28.

- **using a switch with an independent control input driven by a control signal with a non-negligible, periodic aperture:** The embodiments shown in each of Figures 149, 151, and 153 include a switch (14904, 15102, and 15304, respectively) with an independent control input that controls the switch by a windowing function, $u(t) - u(t - T_A)$. *Id.* at Figs. 149, 151, 153; 131:59; 131:66-67; 133:27; 133:29-30; 134:34; 134:37-38. The aperture during which each control signal causes its switch to close has non-negligible length T_A (e.g., the length of a half cycle of the carrier signal). *Id.* at 132:1-3. The aperture is periodic as it, for example, “ensures that half cycles of the carrier signal are normally operated on at a sub-harmonic rate.” *Id.* at 132:3-5; 133:29-34; 134:37-42.
- **such that the samples, having non-negligible available energy:** The matched filter/correlating embodiments of the '177 Patent “convert an electromagnetic signal by repeatedly transferring energy from portions of the electromagnetic signal.” *Id.* at 129:61-64. This is done by “repeatedly performing a matched filtering or correlating operation on a received carrier signal,” “operat[ing] on or near approximate half-cycles (e.g., $\frac{1}{2}$, $1\frac{1}{2}$, $2\frac{1}{2}$, etc.) of the received signal.” *Id.* at 130:23-27. The energy transferred is non-negligible, because “a matched/filtering/correlating process . . . preserves the energy of the electromagnetic signal and transfers it through the processor.” *Id.* at 130:37-39.

⁷ Unless otherwise indicated, all emphasis has been added.

- **are accumulated and transferred to a significant load while the switch is closed and discharged through the load while the switch is open:** The matched filter/correlator embodiments down-convert electromagnetic signals by performing a matched filter/correlating operation repeatedly on a carrier signal. *Id.* at 130:23- 25. “The results of each matched filtering/correlating process are accumulated, for example using a capacitive storage device, and used to form a down-converted version of the electromagnetic signal.” *Id.* at 130:28-31.

When the switch is closed (i.e., during the aperture period), energy is accumulated in a storage device and ultimately reaches its maximum. *Id.* at 148:17-24; Figure 175C. At the same time, energy is transferred to a load (e.g., resistor R_L in Figure 175A or resistor R in Figure 175B), because the load is connected across the storage device (e.g., capacitor C in Figure 175A or capacitor C_S in Figure 175B). *Id.* at 147:35- 42, Figs. 175A-C. When the switch is opened, “the final voltage that occurred at the sampling instance $t = T_A$ becomes an initial condition for a *discharge* cycle across [the load resistor].” *Id.* at 148:1-4.

- **thereby transferring available real power from the modulated RF carrier signal to the load:** The result of energy being transferred to the load when the switch is closed and discharged through the load when the switch is open is the transfer of available real power from the modulated RF carrier signal to the load. *Id.* at 148:25-149:19. The ’177 patent derives equations that describe the effect that circuit and aperture timing values have on the power transferred to the load. *Id.*
- **and producing a downconverted signal with enhanced signal-to-noise power ratio:** The matched filter/correlator embodiments produce downconverted signals with enhanced signal-to-noise power ratios. The matched filter/correlator embodiments “*downconvert an electromagnetic signal* by repeatedly performing a matched filtering or correlating operation on a received carrier signal.” *Id.* at 23-25. The matched filtering/correlating operations “produce[] *enhanced (and in some cases the best possible) signal-to-noise ration (SNR) for the processed waveform.*” *Id.* at 130:34-37.

Contrary to NXP’s position, each component of ParkerVision’s proposed construction of “matched filter/correlating module” is thus grounded in the ’177 patent’s detailed descriptions of its matched filter/correlating embodiments. ParkerVision’s construction is therefore consistent with the directive in *Phillips*.

Though the Court will make its own determination regarding the meaning of “matched filtering/correlating module,” as mentioned above, there is prior litigation history related to this term that ParkerVision brings to the Court’s attention. ParkerVision’s construction of “matched

filtering/correlating module” adopts the construction of the U.S. District Court for the Middle District of Florida (Orlando division) (Case No. 6:14-cv-00687), which previously construed “matched filtering/correlating module” in the context of the ’177 patent. *See* Ex. 9, at 11-25.

The Orlando district court also rejected the same types of arguments that NXP raises here. *Id.* For example, NXP argues that the “specification describes no other embodiments of a matched filtering/correlating module” other than Figure 149. Op. Br., 22. But the Orlando Court disagreed, finding “that Figures 151 and 153 are additional embodiments of matched filtering/correlating module.” Ex. 9, at 19. Indeed, the ’177 patent states that Figure 151 is an exemplary system for implementing matched filtering/correlating: “FIG. 151 illustrates an example finite time integrating system 15100, which can be used to implement method 15000” (’177 patent, 133:22-23), where method 15000 is “an example method ... for down-converting an electromagnetic signal using a *matched filtering/correlating operation*” (*Id.* at 132:51-53). The ’177 patent also states that Figure 153 is an exemplary matched filtering/correlating module: “FIG. 153 illustrates an example RC processing system 15300, which can be used to implement method 15200” (*id.* at 134:31-32), where method 15200 is an “example method ... for down-converting an electromagnetic signal using a matched filtering/correlating operation.” (*Id.* at 133:59-61). NXP’s argument is plain wrong. These examples show that NXP’s proposal of “matched filtering/correlating module” is improper, and excludes multiple embodiments that are expressly characterized as “matched filtering/correlating modules.” *See Accent Packaging, Inc. v. Leggett & Platt, Inc.*, 707 F.3d 1318, 1326 (Fed. Cir. 2013) (“[A] claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct.”). ParkerVision’s proposal, in contrast, includes the complete range of embodiments disclosed in the ’177 patent.

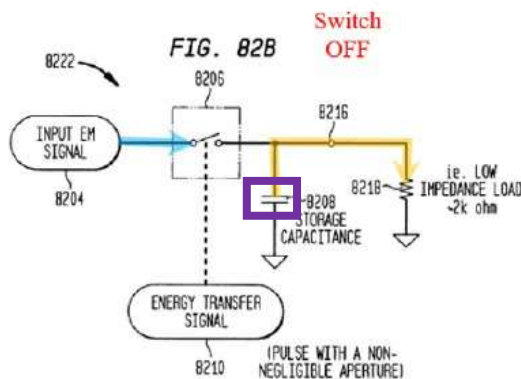
For the foregoing reasons, ParkerVision’s proposal is the proper construction and should be adopted by the Court.

E. “the energy discharged during any given discharge cycle is not completely discharged” (’528 patent, claims 9, 27)

ParkerVision’s Construction	NXP’s Construction
Plain-and-ordinary meaning wherein the plain-and-ordinary meaning is “the energy that could potentially be discharged during any given discharge cycle is not completely discharged”	Plain and ordinary meaning

The Court already construed this term twice in ParkerVision’s litigations against Intel and LG involving the *same* patent. In both cases, the Court construed the term as “plain-and-ordinary meaning.” But in Case No. 6:20-cv-00108 (“the Intel-108 case”), this Court provided additional clarification, construing the term as “Plain-and-ordinary meaning wherein the plain-and-ordinary meaning is ‘the energy that could potentially be discharged during any given discharge cycle is not completely discharged.’” D.I. 34-4 at 8. ParkerVision’s proposed construction adopts the Court’s construction in the Intel-108 case.

NXP argues that the Court’s prior construction improperly “re-wrote the claim phrase.” Op. Br., 28. Not so. NXP fails to analyze the term in the context of the full claim language and in view of the specification. As shown below in Figure 82B, the orange arrow represents the discharged energy from the storage element (capacitor) 8208 (purple box) when the switch is OFF (open).



Claim 8 of the '528 patent recites “a portion of the transferred energy is discharged during the discharging part of the cycle for each respective switching device when the switching device is off.” Claim 9 further recites: “for each respective storage element, the energy discharged during any given discharge cycle is not completely discharged, with the remaining undischarged energy from the given discharge cycle becoming an initial condition for the next charging cycle.”

As shown below, the patent specification discusses that when the storage element (capacitor) is not completely discharged, the energy remaining in the storage element provides the initial condition for the next charging (acquisition) cycle.

This result is valid only over the acquisition aperture. After the switch is opened, the final voltage that occurred at the sampling instance $t \approx T_A$ becomes an initial condition for a discharge cycle across R_L 17504. The discharge cycle possesses the following response:

$$V_D = \frac{V_A \cdot e^{-\frac{t}{R_L C}}}{R_L C} u(t - T_A) \text{ (single event discharge)} \quad \text{EQ. (63)}$$

V_A is defined as $V_0(t \approx T_A)$. Of course, if the capacitor 17506 does not completely discharge, there is an initial condition present for the next acquisition cycle.

'528 patent, 147:25-39.

In context, the term “the energy discharged during any given discharge cycle is not completely discharged” simply means that out of all of the energy stored in the storage element available for discharge (the energy that could potentially be discharged), not *all* of the energy is discharged during any given discharge cycle. In other words, there is some energy left in the storage element after a discharge cycle. This is consistent with the claim language, which states that “the *remaining undischarged energy* from the given discharge cycle becoming an initial condition for the next charging cycle” and the specification. In this way, for the next charging cycle, the storage element will not start with an empty tank (zero electrical charge).

It is obvious NXP is seeking its construction for the purposes of non-infringement. Though NXP argues for plain-and-ordinary meaning, it urges the Court not to clarify or correct the claim language “[r]egardless of how nonsensical the claim language is.” Op. Br., 25. For the foregoing reasons, NXP’s gamesmanship should be rejected, and the Court should maintain its prior construction from the Intel-108 case.

F. “multi-platform module” (’686 patent, claim 11)

ParkerVision’s Construction	NXP’s Construction
Plain-and-ordinary meaning	Plain and ordinary meaning, where “platform” refers to a communications protocol or bearer service.

The language of the term is straightforward. There are no words that are unclear (nor does NXP allege there are), and thus the term does not require construction. Indeed, though NXP claims that it does not seek a construction of the disputed term, under the guise of “plain and ordinary meaning,” it seeks to limit the word “platform” to *either* “a communications protocol or bearer service.” NXP’s proposal is contrary to the specification.

NXP’s purported justification for re-defining the term is that the word “platform” is not

readily understood by a layperson. Op. Br., 30. Not so. NXP’s proposal is nothing more than an attempt to protect its defenses in this case by adding limitations to a claim term that is otherwise well understood.

Though NXP acknowledges that the “multi-platform module” of claim 11 is illustrated as a universal platform module (UPM) (*see* Op. Br., 30-31), NXP simply cherry-picks portions of the specification to support its construction, while *purposefully omitting* others. The ’686 specification discloses, however, that “[t]he UPM utilizes *protocols and/or bearer services and/or combinations thereof* to exchange and/or process information with other components on any given network or networks (or any communication medium, for that matter).” ’686 patent, 7:48-52; *see also id.* at 7:52-8:18. The specification further describes embodiments that “can operate according to *multiple protocol/bearer service combinations* (FIG. 39) and/or *multiple communication link/types* (FIG. 40).” *Id.* at 38:39-43; *see also, e.g., id.* at 38:44-55; 8:30-36. NXP provides no justification to re-define the term to exclude such embodiments. Nor can it.

For the foregoing reasons, the term should be given its plain and ordinary meaning and NXP’s construction, which seeks to narrow the term, should be rejected.

Dated: March 29, 2024

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