IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

PARKERVISION, INC, *Plaintiff*	§	
	§	
	§	**6:21-CV-00520-ADA**
v.	§	
	§	
LG ELECTRONICS, INC., *Defendant*	§	**JURY TRIAL DEMANDED**
	§	
	§	

CLAIM CONSTRUCTION ORDER AND MEMORANDUM IN SUPPORT THEREOF

Before the Court are the Parties' claim construction briefs: Defendant LG Electronics, Inc.'s Opening and Reply briefs (ECF Nos. 33 and 37 respectively) and Plaintiff ParkerVision, Inc.'s Response and Sur-Reply briefs (ECF Nos. 36 and 40, respectively). United States District Judge Alan D Albright referred this case to the undersigned on April 20, 2022. ECF No. 43. The Court provided preliminary constructions for the disputed terms the day before the hearing. The Court held the *Markman* hearing on May 10, 2022. ECF No. 51. During that hearing, the Court informed the Parties of the final constructions for the disputed terms. *Id.* This Order does not alter any of those constructions.

I. BACKGROUND

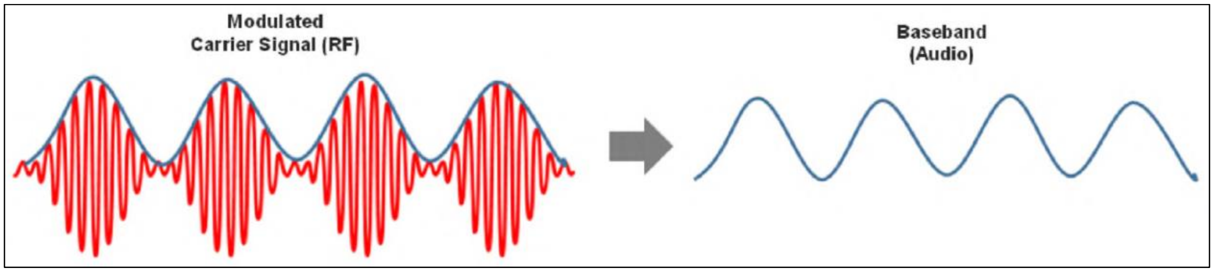
Plaintiff asserts U.S. Patent Nos. 6,049,706, 6,266,518, 6,580,902, 7,110,444, 7,292,835, 8,588,725, 8,660,513, 9,118,528, 9,246,736, and 9,444,673. Plaintiff previously asserted these patents in the Western District of Texas against Intel (6-20-cv-00108, 6-20-cv-00562), Hisense (6-20-cv-00870), and TCL (6-20-cv-00945). Judge Albright held *Markman* hearings in the Intel cases on January 26, 2021 (-00108) and July 22, 2021 (-00562). Judge Albright appointed a special master for the *Hisense* and *TCL* cases, who held the *Markman* hearing on October 27, 2021.

For 28 terms (Terms #3 to #30 below), the parties rely on the briefs from the prior Intel, Hisense, and TCL cases. ECF No. 42 (Joint Claim Construction Statement) at 3–17. The Court adopts the District Judge's and Special Master's final constructions (which were identical) for those terms.

The parties dispute the meaning of two terms which were newly briefed in this litigation.

II. DESCRIPTION OF THE ASSERTED PATENTS

The Asserted Patents describe and claim systems for down-conversion of a modulated carrier signal. '518 Patent at Abstract. Down conversion is the process of recovering the baseband (audio) signal from the carrier signal after it has been transmitted to and received by the receiver. This process is referred to as "down-conversion" because a high frequency signal is being down-converted to a low frequency signal.



The Asserted Patents disclose at least two types of systems for down-conversion: (1) sample-and-hold (*i.e.*, voltage sampling) and (2) "energy transfer" (also known as "energy sampling"). The key difference between the two is that the former takes a small "sample" of the input signal while the latter takes a very large sample, *i.e.*, a large enough sample that a non-negligible amount of energy is transferred from the input signal. The following sub-sections describes each type of system, their respective operation, and compares them.

A. Circuit configuration of down-sampling systems: sample-and-hold and energy transfer.

Figure 78B depicts an exemplary sample-and-hold system while Figure 82B depicts an exemplary energy transfer system. ’518 Patent at 63:19–26 (sample-and-hold) and 7:63–64 (energy transfer).

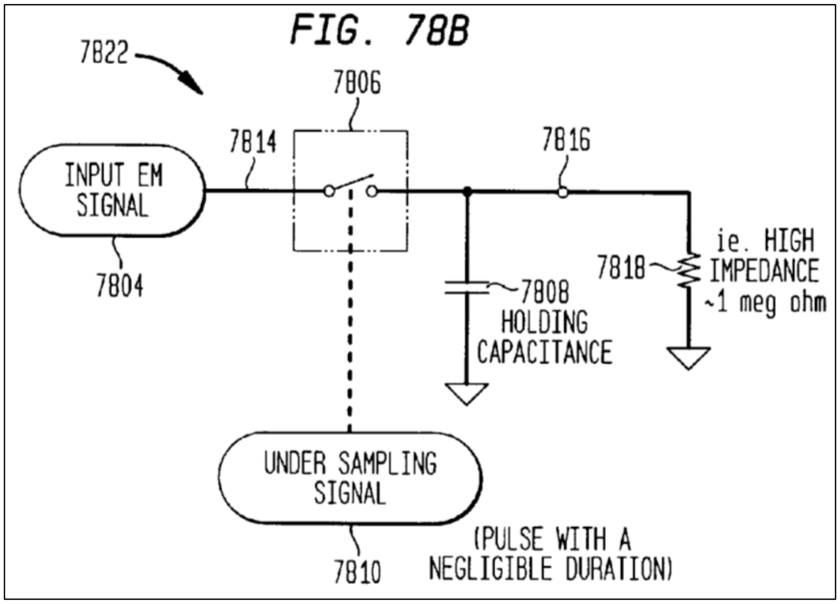


FIG. 78B

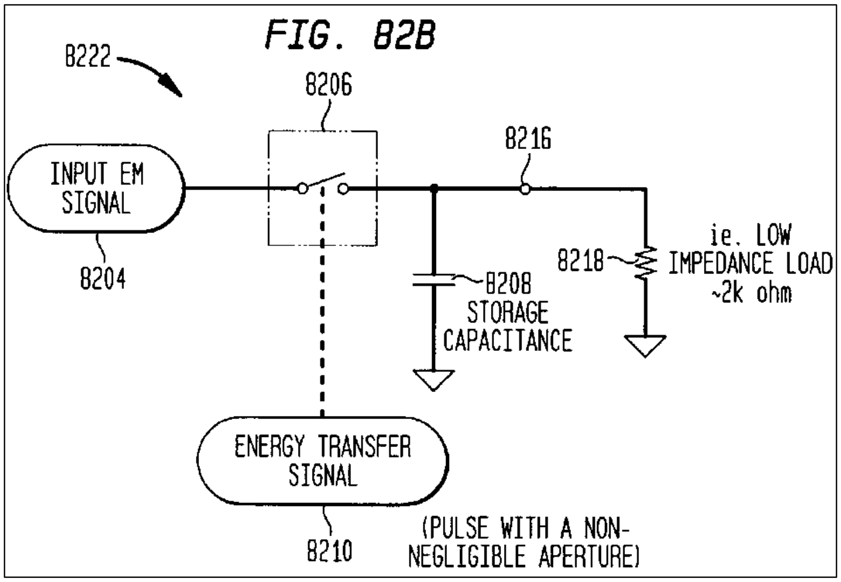


FIG. 82B

While Figs. 78B and 82B depict that the respective circuits have similar structure, their respective parameter values (*e.g.*, capacitor and load impedance values)—and concomitantly their respectively operation—are very different. It is important to note that the input signal, input EM signal, is the same in both figures.

The circuits in both figures include a switching module (7806 in Fig. 78B and 8206 in Fig. 82B). *Id.* at 62:65–66 (switching module 7806), 66:13–14 (switching module 8206). The switching module opens and closes (*i.e.*, turns off and on, respectively) based on under sampling signal 7810 in Fig. 78B and energy transfer signal 8210 in Fig. 82B. *Id.* at 62:67–63:1 (under sampling signal 7810), 66:24–26 (energy transfer signal 8210). When the switching module is "closed," input EM signal 7804 and input EM signal 8204 can propagate across the switching module to holding capacitance 7808 and storage capacitance 8208, respectively, but when the switching module is "open," input EM signals 7804/8204 cannot propagate across the switching module. While both switching module 7806 and switching module 8206 open and close, the duration that each module is closed differs significantly. The specifications of the Asserted Patents describe that under sampling signal 7810 "includes a train of pulses having negligible apertures that tend towards zero time in duration." *Id.* at 63:1–3. The specification discloses an embodiment of the "negligible pulse width" as being "in the range of 1–10 p[ico]sec[onds] for under-sampling signal a 900 MHz signal." *Id.* at 63:3–5. By contrast, the specifications describe that energy transfer signal 8210 "includes a train of energy transfer pulses having non-negligible pulse widths that tend away from zero time in duration." *Id.* at 66:26–28 (emphasis added). The specification discloses an embodiment where the "non-negligible pulse" is approximately 550 picoseconds for a 900 MHz signal.

The specifications describe that holding capacitance 7808 and storage capacitance 8208 are capacitors that charge when switching module 7804 and switching module 8204, respectively, are closed. *Id.* at 63:10–13 (holding capacitance 7808), 66:38–42 (storage capacitance 8208). The specifications disclose that holding capacitance 7808 "preferably has a small capacitance value" and disclose an embodiment wherein holding capacitance 7808 has a value of 1 picoFarad ("pF"). *Id.* at 63:9–15. By contrast, the specifications disclose that storage capacitance 8208 "preferably has the capacity to handle the power being transferred" and disclose an embodiment wherein storage capacitance 8208 has a value "in the range of 18 pF." *Id.* at 66:38–49.

The specifications describe that holding capacitance 7808 and storage capacitance 8208 discharge through load 7812 and load 8212 when switching module 7804 and switching module 8204, respectively, are open. *See id.* at 63:19–26 (load 7812), 66:61–65 (load 8212). Fig. 78B depicts that "high impedance" load 7812 has an impedance of approximately 1 MΩ while Fig. 82B depicts that "low impedance" load 8212 has an impedance of approximately 2 KΩ. The specifications describe that "[a] high impedance load is one that is relatively insignificant to an output drive impedance of the system for a given output frequency. A low impedance load is one that is relatively significant." *Id.* at 66:58–61.

B. Operation of down-converting systems

At a very high level, both systems operate similarly. In particular, when the switching module (switching modules 7806 / 8206) is closed, the input signal (input EM signal 7804 / 8204) propagates to the capacitor (holding capacitance 7808 and storage capacitance 8208) and charge the voltage across the capacitor to the voltage of input signal. But when the switching module is open, the input signal cannot propagate to the capacitor, *i.e.*, cannot charge the voltage across the capacitor to the voltage of input signal. Rather, the charge on the capacitor discharges through the load impedance (load 7812 / 8212).

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