

NOTE: This disposition is nonprecedential.

**United States Court of Appeals  
for the Federal Circuit**

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**TQ DELTA, LLC,**  
*Plaintiff-Appellant*

v.

**COMMSCOPE HOLDING COMPANY, INC.,  
COMMSCOPE, INC., ARRIS INTERNATIONAL  
LIMITED, ARRIS GLOBAL LTD., ARRIS U.S.  
HOLDINGS, INC., ARRIS SOLUTIONS, INC., ARRIS  
TECHNOLOGY, INC., ARRIS ENTERPRISES LLC,**  
*Defendants-Cross-Appellants*

**AVAGO TECHNOLOGIES INTERNATIONAL SALES  
PTE. LIMITED, BROADCOM INCORPORATED,  
BROADCOM CORPORATION,**  
*Defendants/Third Party Plaintiffs/Counterclaimants*

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2024-1587, 2024-1588

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Appeals from the United States District Court for the  
Eastern District of Texas in No. 2:21-cv-00310-JRG, Judge  
J. Rodney Gilstrap.

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Decided: April 24, 2026

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JEFFREY A. LAMKEN, MoloLamken LLP, Washington, DC, argued for plaintiff-appellant. Also represented by JENNIFER ELIZABETH FISHELL, RAYINER HASHEM, LIDIYA MISHCHENKO; ELIZABETH KATHLEEN CLARKE, Chicago, IL; CATHERINE MARTINEZ, New York, NY; RAJENDRA A. CHIPLUNKAR, PETER J. MCANDREWS, DAVID Z. PETTY, McAndrews, Held & Malloy, Ltd., Chicago, IL.

BRETT M. SCHUMAN, Goodwin Procter LLP, San Francisco, CA, argued for defendants-cross-appellants. Also represented by JESSE LEMPEL, Boston, MA.

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Before LOURIE, WALLACH, and CHEN, *Circuit Judges*.

LOURIE, *Circuit Judge*.

TQ Delta, LLC (“TQ Delta”) appeals from a final decision of the United States District Court for the Eastern District of Texas denying its motion for judgment as a matter of law (“JMOL”) or a new trial on the jury’s finding of non-infringement of U.S. Patent 8,090,008 (“the ’008 patent”). *See* J.A. 208–224 (“’008 Decision”). TQ Delta also appeals from the district court’s claim construction decision, which it argues affected the jury’s finding of invalidity of U.S. Patent 8,462,835 (“the ’835 patent”) and requires JMOL of no invalidity or a new trial. *See TQ Delta, LLC v. CommScope Holding Co., Inc.*, No. 2:21-CV-309-JRG, 2022 WL 2071073 (E.D. Tex. June 8, 2022) (“*Claim Construction Decision*”). Finally, TQ Delta appeals from the district court’s final decision denying a new trial on damages. *See* J.A. 166–190, (“*Damages Decision*”). For the following reasons, we *af-*  
*firm*.<sup>1</sup>

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<sup>1</sup> CommScope Holding Company, Inc., CommScope Inc., ARRIS International Limited, ARRIS Global Ltd., ARRIS US Holdings, Inc., ARRIS Solutions, Inc., ARRIS

## BACKGROUND

TQ Delta owns the '008 and '835 patents. Those patents generally relate to digital subscriber line (“DSL”) technology, which enables high-speed data transmission over copper telephone lines. Industry participants establish global standards for DSL technology through the International Telecommunication Union (“ITU”). The ITU receives declarations from patent owners informing the industry of any patents covering DSL technologies included in those standards. Some of those patents are considered standard-essential patents (“SEPs”), *i.e.*, the standard cannot be practiced without infringing those patents. The ITU requires SEPs owners to license their SEPs on fair, reasonable, and non-discriminatory (“FRAND”) terms. For purposes of the infringement issue in this appeal, it is disputed as to whether the '008 and '835 patents are SEPs.

TQ Delta brought suit against CommScope alleging that certain CommScope DSL modems (“the accused products”) infringe several of its patents, including the '008 and '835 patents. At trial, as relevant to this appeal, the asserted claims included claim 14 of the '008 patent and claim 10 of the '835 patent. CommScope sells the accused products to telephone companies like AT&T, which distributes them to DSL subscribers. TQ Delta’s infringement theory at trial was that, because both patents are standard-essential to the ITU’s VDSL2 standard, and CommScope’s accused products undisputedly comply with that standard, the accused products necessarily practice every limitation of the asserted claims and therefore infringe. CommScope contested the patents’ standard-essentiality and denied infringement. It also argued that the

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Technology, Inc., and ARRIS Enterprises LLC (collectively, “CommScope”) conditionally cross-appeal. CommScope Resp. Br. at 3. Because we affirm the district court’s decisions, CommScope’s conditional cross-appeal is moot.

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asserted claims were invalid as both anticipated and obvious.

At trial and before the close of evidence, both parties moved for JMOL under Rule 50(a). Both sides' motions were denied, and the district court proceeded to instruct the jury. The jury ultimately returned a mixed verdict. It found, in part, that claim 14 of the '008 patent was not invalid but also not infringed and that claim 10 of the '835 patent was infringed but invalid. The jury also found that CommScope infringed other TQ Delta patents and awarded \$11.125 million in reasonable royalty damages accordingly.<sup>2</sup> The parties renewed their JMOL motions, which the district court again denied as discussed below.

## I

The '008 patent discloses systems and methods directed to phase scrambling in multicarrier systems to reduce peak-to-average ratio ("PAR") mitigating the issues that an increased PAR can create: high-power consumption and an increased likelihood of clipping the transmission signal. '008 patent, Abstract; *id.* at col. 2 ll. 25–27. Claim 14 recites:

A multicarrier system including a first transceiver that uses a plurality of carrier signals for modulating a bit stream, wherein each carrier signal has a phase characteristic associated with the bit stream, the transceiver capable of:

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<sup>2</sup> The jury found that CommScope infringed claim 17 of U.S. Patent 7,453,881, claim 5 of U.S. Patent 8,276,048, claim 18 of U.S. Patent 8,468,411, and claim 10 of U.S. Patent 9,154,354 (the "infringed patents"). *See* J.A. 1–2. The infringed patents are the basis of the jury's damages award but are otherwise not at issue in this appeal. *Id.*

[a] associating each carrier signal with a value determined independently of any bit value of the bit stream carried by that respective carrier signal, the value associated with each carrier signal determined using a pseudo-random number generator;

[b] *computing a phase shift for each carrier signal based on the value associated with that carrier signal*; and

[c] combining the phase shift computed for each respective carrier signal with the phase characteristic of that carrier signal to substantially scramble the phase characteristics of the plurality of carrier signals, wherein multiple carrier signals corresponding to the scrambled carrier signals are used by the first transceiver to modulate the same bit value.

*Id.* at col. 11 l. 41–col. 12 l. 14 (emphasis added).

After the district court entered final judgment on the jury's noninfringement finding, TQ Delta renewed its JMOL motions, including an argument that CommScope infringed claim 14 of the '008 patent. *'008 Decision*, J.A. 208. TQ Delta's infringement arguments were two-fold. First, as a threshold matter, it argued that CommScope stipulated that the '008 patent was a SEP, foreclosing the jury's finding of noninfringement as to claim 14. *Id.* at 213. CommScope responded that there was no such stipulation for infringement purposes. *Id.* at 214. It argued that it consistently contested both essentiality and infringement at trial, and any reference to essentiality in the instructions was expressly conditional and limited to FRAND damages—*i.e.*, only if the jury first found infringement would it consider damages and thus any relevant FRAND commitments. *Id.* CommScope also pointed to the jury verdict form, which left infringement of the '008 patent for the jury to decide. *Id.* The district court agreed with CommScope, adding that, because there were no objections

to either the instructions or the verdict form, “CommScope could properly contest standard essentiality and infringement.” *Id.* at 215. Accordingly, it rejected TQ Delta’s stipulation-based infringement argument. *Id.*

Second, even absent a stipulation, TQ Delta argued that it met its burden to show that claim 14 mapped onto the VDSL2 standard and that the accused products practice that standard, thus compelling a finding that the accused products infringe claim 14. *Id.* at 216. The dispute centered on whether claim 14’s requirement of “computing a phase shift for each carrier signal,” which the district court construed as “computing the amount by which a phase is adjusted for each carrier signal,” covered the implementations of the VDSL2 standard.<sup>3</sup> *Id.* (citing *Claim Construction Decision*, 2022 WL 2071073, at \*39). TQ Delta contended that it did. *'008 Decision*, J.A. 216. It argued that claim 14 did not require a non-zero amount of phase shift for every carrier, and that, even if it did, zero was still an “amount.” *Id.* at 218–20.

TQ Delta’s evidence amounted to expert testimony that tied the claimed “plurality of carrier signals” in the preamble of claim 14 to the subcarriers listed in Table 12-68 of the VDSL2 standard, and the claimed “phase characteristic[s] . . . to the special operations channel (“SOC”) message[s]” in that same table. *Id.* at 217–18.

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<sup>3</sup> The district court also construed the term “phase characteristic(s)” as “one or more values that represent the angular aspect of a constellation point.” *Claim Construction Decision*, 2022 WL 2071073, at \*32.

**Table 12-68 –Bit mapping for R-P-MEDLEY with two bytes per DMT symbol**

Subcarrier index	Constellation point
5, 10, 15, ..., $5n, \dots$	00
1, 11, 21, ..., $10n + 1, \dots$	SOC message bits 0 and 1
2, 12, 22, ..., $10n + 2, \dots$	SOC message bits 2 and 3
3, 13, 23, ..., $10n + 3, \dots$	SOC message bits 4 and 5
4, 14, 24, ..., $10n + 4, \dots$	SOC message bits 6 and 7
6, 16, 26, ..., $10n + 6, \dots$	SOC message bits 8 and 9
7, 17, 27, ..., $10n + 7, \dots$	SOC message bits 10 and 11
8, 18, 28, ..., $10n + 8, \dots$	SOC message bits 12 and 13
9, 19, 29, ..., $10n + 9, \dots$	SOC message bits 14 and 15
NOTE – The byte is given as (b7, b6, b5, b4, b3, b2, b1, b0), where b7 is the MSB and b0 is the LSB. Mapping, e.g., "SOC message bits 0 and 1" to subcarriers $10n+1$ means that the two-bit value (b1,b0) shall be used to determine the constellation point in accordance with the encoding rules given in clause 10.3.3.2. This constellation point will then be scrambled using the quadrant scrambler described in clause 12.3.6.2.	

J.A. 10021. That mapping is critical to TQ Delta’s infringement theory because it defined the universe of signals to which the rest of claim 14 applies. In TQ Delta’s view, that mapping excluded subcarrier zero (another signal described in the standard), which it alleged is not used to modulate the SOC bit stream and carries only a DC signal. *’008 Decision*, J.A. 218. It added that, even if subcarrier zero is part of the “plurality of carrier signals,” a zero-degree phase shift is an “amount by which a phase is adjusted” because the plain meaning of “amount” includes zero and no reasonable juror could conclude otherwise. *Id.* at 220–21.

CommScope argued in response that TQ Delta’s evidence, including its expert testimony, failed to prove that the VDSL2 standard computed a phase shift for “each carrier signal” as required by claim 14[b]. *Id.* at 219. It identified Section 12.3.6.2 and Table 12-70 of the standard, also relied on by TQ Delta’s expert, which states that each “constellation point” or “phase characteristic” (*i.e.*, the “X, Y” pair) “of each subcarrier shall be pseudo-randomly rotated by  $0, \pi/2, \pi$ , or  $3\pi/2$  depending on the value of a 2-bit

pseudo-random number.” *Id.* (citation modified). Because the X, Y pair are the coordinates before scrambling, *see* J.A. 10023, CommScope argued that this means that the first row in Table 12-70, displaying a “0” degree “Angle of rotation” and a “Final coordinate[]” of “X, Y,” necessarily has no “phase shift” computed. *'008 Decision*, J.A. 219.

**Table 12-70 – Pseudo-random transformation**

$d_{2n}, d_{2n+1}$	Angle of rotation	Final coordinates
0 0	0	(X, Y)
0 1	$\pi/2$	(-Y, X)
1 1	$\pi$	(-X, -Y)
1 0	$3\pi/2$	(Y, -X)

J.A. 10023.

CommScope also argued that TQ Delta failed to prove that the VDSL2 standard “combine[d] the phase shift computed for each respective carrier signal” with “the phase characteristic of that carrier signal as required by claim 14[c].” *Id.* at 220. It identified a portion of TQ Delta’s expert testimony admitting that the standard stated that “subcarrier with index 0 (DC) shall not be rotated” to argue that therefore the standard fails to “combine the phase shift computed for each respective carrier signal.” *Id.* CommScope further concluded that whether zero, in the context of a rotation, is an “amount” is a “quintessential question of fact” that the jury could, and properly did, answer in the negative. *Id.* at 221 (citation modified).

The district court rejected TQ Delta’s arguments, explaining that it “failed to point to evidence of overwhelming effect showing that the Jury must have found infringement.” *Id.* at 223. The district court therefore concluded that “this issue is not so one-sided as to justify overturning the Jury’s verdict.” *Id.* (quoting *Grey v. First Nat’l Bank in Dall.*, 393 F.2d 371, 380 (5th Cir. 1968) (citation modified)).

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It also noted that because TQ Delta's theory relied on establishing the '008 patent as a SEP, it "need not reach the issue of whether the accused products practiced the standard." *Id.*

## II

The '835 patent concerns synchronization of forward error correction ("FEC") and interleaving parameter settings (together, "FIP settings") changes that occur within receiving and transmitting modems to address impulse noise. '835 patent col. 3 ll. 24–36. The receiving and transmitting modems switch between FIP settings in response to the claimed "flag signal." *Id.* at col. 12 ll. 8–37. Claim 8 recites "[a]n apparatus configurable to adapt forward error correction and interleaver parameter (FIP) settings" that comprises "a transceiver, including a processor, configurable to . . . transmit a flag signal" wherein the FIP "switching occurs on a pre-defined forward error correction codeword boundary following the flag signal."<sup>4</sup> *Id.* at col. 21 ll. 33–46.

The district court, adopting a construction from a separate litigation in the District of Delaware concerning the same patent, construed the term "flag signal" to be a "signal used to indicate when an updated FIP setting is to be used (the signal does not include the FEC codeword counter value upon which the updated FIP setting is to be used)." *Claim Construction Decision*, 2022 WL 2071073, at \*45–46 (citing *TQ Delta, LLC v. 2Wire, Inc.*, No. 1:13-CV-01835-RGA, 2018 WL 3238776 (D. Del. July 3, 2018) ("*Delaware Construction I*").

In doing so, the district court rejected TQ Delta's proposed instruction, which precluded a "flag signal" from containing any "message data indicating when the updated

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<sup>4</sup> Asserted claim 10 of the '835 patent depends from independent claim 8.

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FIP setting / interleaver parameter value is to be used.” *Claim Construction Decision*, 2022 WL 2071073, at \*44. Rather, the district court only excluded the “FEC codeword counter” from “flag signal,” noting that such construction is consistent with the specification which contrasts “flag signal” synchronization methods with “other synchronization methods, such as using codeword counters.” *Id.* at \*45 (citing ’835 patent col. 9 ll. 23–27; *id.* at col. 11 ll. 10–65). This reasoning is similar to the Delaware court’s analysis, which treated the “flag signal” and the “FEC codeword counter” synchronization methods as two different embodiments, and found that the “claims read only on the ‘flag signal’ embodiment.” *Delaware Construction I*, 2018 WL 3238776, at \*3.

The jury ultimately found that the ’835 patent was infringed but invalid. J.A. 4549–50. TQ Delta renewed its JMOL motion for the ’835 patent arguing that the patent was not invalid, but it did not dispute the district court’s claim construction of “flag signal.” *See TQ Delta, LLC v. CommScope Holding Co., Inc.*, No. 2:21-CV-00310-JRG, 2023 WL 5511518, at \*2 (E.D. Tex. Aug. 25, 2023). Instead, it challenged whether the prior art disclosed claim 10’s “transceiver.” *Id.* at \*8. The district court denied TQ Delta’s JMOL motion. *Id.* On appeal, TQ Delta challenges only the jury’s finding of invalidity insofar as it argues that the district court’s claim construction of “flag signal” was incorrect and affected the jury verdict such that JMOL of no invalidity or a new trial is warranted. *See TQ Delta Op. Br.* 48–53.

### III

As for damages, on the eve of the jury being instructed, TQ Delta submitted a proposed instruction on damages that stated its “cost-savings model” required the patentee to show “that the *defendant’s* infringement allowed *it* to avoid taking a different, more costly course of action,” wherein the “defendant” is CommScope. J.A. 6413–14

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(emphases added). The next morning, the district court circulated draft jury instructions that proposed the following:

TQ Delta, the Plaintiff, has proposed a cost-savings model of calculating reasonable royalty damages that values the Accused Products that CommScope, the Defendant, provides to its customers. *This approach relies upon estimated costs, if any, that CommScope saved from making, using, or selling the Accused Products.* In considering the amount of reasonable royalty damages under the cost-savings model, *you should focus* on whether CommScope's make, use, or sale of the patented technology allowed it to avoid taking a different, more costly course of action, and if so, *how much CommScope saved by using the Accused Products* instead of taking the more costly course of action.

J.A. 6386 (emphases added). TQ Delta proposed edits to that proposed instruction as follows:

TQ Delta, the Plaintiff, has proposed a cost-savings model of calculating reasonable royalty damages that values the Accused Products that CommScope, the Defendant, provides to its customers. This approach relies upon estimated costs, if any, that ~~CommScope saved from the~~ making, using, or selling of the Accused Products save. In considering the amount of reasonable royalty damages under the cost-savings model, you should focus on whether CommScope's making, using or selling ~~make, use, or sale~~ of the patented technology avoided ~~allowed it to avoid~~ taking a different, more costly course of action, and if so, how much CommScope saved by using the Accused Products instead of taking the more costly course of action.

See J.A. 139–40.<sup>5</sup> Notably, it maintained the last part of that instruction emphasizing that the jury should consider “how much *CommScope* saved by using the Accused Products.” See *id.* (emphasis added). The district court overruled TQ Delta’s objection and proceeded to instruct the jury without their edits. J.A. 140.

The jury awarded TQ Delta \$11.125 million in reasonable royalty damages for the infringed patents. *Damages Decision*, J.A. 169. After final judgment was entered by the district court, TQ Delta renewed its JMOL motion, arguing “that the [district court] committed prejudicial error in its jury instruction on TQ Delta’s damages model.” *Id.* at 170. It contended that the jury instructions improperly focused on cost-savings to CommScope rather than downstream customers like AT&T. *Id.* at 171. In making such argument, it identified that “there is no requirement that a cost-savings model be based on the cost-savings of the defendant and to the exclusion of the defendant’s customer for the infringing product.” *Id.* at 174 (citation modified). And thus, here, TQ Delta claimed that because “it chose to sue the manufacturer . . . it can base its damages on the cost-savings of the end-user customers,” and the jury instruction undercut that theory. *Id.*

CommScope responded that even if TQ Delta had preserved its objection to the instruction, the district court did not abuse its discretion. *Id.* CommScope argued that “the [district court], consistent with long-standing legal precedent, instructed the Jury that the cost-savings model focuses on savings to the defendant” based on “the defendant acting as a willing licensee in a hypothetical negotiation.” *Id.* at 174–75. It also identified that “TQ Delta failed to cite a single case establishing that the cost savings to a

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<sup>5</sup> The text that is underlined and bolded was proposed to be added to the instruction by TQ Delta, and the text that was stricken was proposed to be deleted.

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third party to the hypothetical negotiation may form the basis of a reasonable royalty calculation,” and thus there could be no obvious error or resulting prejudice. *Id.* at 175.

The district court denied TQ Delta’s JMOL motion on damages, finding its objection insufficient, *id.* at 173, and the instruction legally sound, *id.* at 176–77, and further concluding that any alleged error was not prejudicial in light of the damages award, *id.* at 177–180. The district court explained that even under the more lenient abuse of discretion standard, there was no error; it instructed the jury that TQ Delta’s damages theory relied on a cost-savings approach focused on CommScope’s savings, consistent with TQ Delta’s proposed edits and the law, and nothing in the instructions required the jury to ignore TQ Delta’s expert testimony about cost savings involving AT&T or other downstream customers. *Id.* at 173–177.

TQ Delta timely appealed. We have jurisdiction under 28 U.S.C. § 1295(a)(1).

#### DISCUSSION

TQ Delta appeals from the district court’s denial of its JMOL motions and requests for new trials. Specifically, it argues that (1) no reasonable jury could have concluded that claim 14 of the ’008 patent was not infringed, (2) the jury’s finding that claim 10 of the ’835 patent is invalid is flawed because it is based on a faulty claim construction, and (3) a new trial on damages is warranted because the district court provided an erroneous and prejudicial jury instruction. We address each argument in turn.

We apply our own law with respect to patent law issues. *Midwest Indus., Inc. v. Karavan Trailers, Inc.*, 175 F.3d 1356 (Fed. Cir. 1999) (en banc in relevant part). We therefore review the district court’s “claim construction based on intrinsic evidence *de novo* and review any findings of fact regarding extrinsic evidence for clear error.” *Promptu Sys. Corp. v. Comcast Corp.*, 92 F.4th 1372, 1377

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(Fed. Cir. 2024) (citation modified). Moreover, infringement is a question of fact, “which we review for substantial evidence when tried to a jury.” *Wi-LAN, Inc. v. Apple, Inc.*, 811 F.3d 455, 461 (Fed. Cir. 2016).

For matters not unique to patent law, we apply the law of the regional circuit, here, the Fifth Circuit. *Network-1 Techs., Inc. v. Hewlett-Packard Co.*, 981 F.3d 1015, 1026 (Fed. Cir. 2020) (applying Fifth Circuit law). The Fifth Circuit “reviews decisions on motions for JMOL ‘*de novo*, re-applying the JMOL standard.” *Id.* (quoting *Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1293 (Fed. Cir. 2015)). Under Fifth Circuit law, JMOL should be granted only “[i]f the evidence at trial points so strongly and overwhelmingly in the movant’s favor that reasonable jurors could not reach a contrary conclusion.” *Omnitech Int’l, Inc. v. Clorox Co.*, 11 F.3d 1316, 1323 (5th Cir. 1994) (citations omitted). Further, the district court’s denial of a motion for a new trial is reviewed for “an abuse of discretion or a misapprehension of the law,” with any legal error reviewed *de novo*. *Prytania Park Hotel v. Gen. Star Indem. Co.*, 179 F.3d 169, 173 (5th Cir. 1999) (citation omitted).

Regarding the review of jury instructions, “[w]here a specific and timely objection is made” to an instruction, the Fifth Circuit reviews “that objection under an abuse of discretion standard, affording the trial court substantial latitude in describing the law to the jurors.” *Jimenez v. Wood Cnty.*, 660 F.3d 841, 845 (5th Cir. 2011) (en banc) (citation modified). But where a party fails to object to a jury instruction in compliance with Federal Rule of Civil Procedure 51, Fifth Circuit review is limited to plain error. *Id.*

## I

We begin with the ’008 patent. TQ Delta contends that the district court erred in denying JMOL or a new trial on infringement of the ’008 patent. *See* TQ Delta Op. Br. 29–48. Its argument is two-fold. First, it argues that, after the close of evidence but before the jury was instructed,

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CommScope changed course and stipulated that the '008 patent is a SEP, thus compelling an infringement finding for claim 14. *Id.* at 30–37. Second, TQ Delta contends that, even if there was no such stipulation, the evidence nonetheless supported an infringement finding because it showed that claim 14 covered the implementations of the relevant ITU standard and CommScope's accused products practiced that standard. *Id.* at 37–48. We disagree on both counts and discuss each in turn.

## A

TQ Delta argues that “CommScope stipulated that the '008 patent was essential to the VDSL2 standard” for purposes of *infringement* and that the district court improperly “narrow[ed] the stipulation.” *Id.* at 29. We disagree. The jury instructions demonstrate that the stipulation was conditional and directed only to the damages context upon a finding of infringement.

The first sentence of the relevant the stipulation recites: “the '008 Patent . . . [is] subject to commitments with the International Telecommunications Union.” J.A. 6366–67. While TQ Delta claims that this statement “unambiguous[ly]” resolves the issue of standard essentiality, TQ Delta Op. Br. 30, it ignores the language of the statement itself. That statement relates only to the agreement between TQ Delta and the ITU regarding its FRAND “commitments.” J.A. 6366–67. That TQ Delta and the ITU have such an agreement does not end the standard essentiality inquiry for infringement purposes; it merely reflects the existence of a contractual commitment to license those patents on FRAND terms.

The supposed stipulation therefore has no effect on CommScope's ability to contest infringement or to argue that the '008 patent is not, in fact, standard essential in the sense required to prove infringement. TQ Delta's interpretation also ignores the remaining context of the jury instructions, which consistently frame any reference to SEPs

within the discussion of FRAND obligations and the corresponding reasonable royalty determination. *See, e.g.*, J.A. 6390 (“In light of this FRAND commitment, I have referred at times in my instructions to SEPs.”); *id.* (“A reasonable royalty on the patents, which the parties have stipulated are SEPs . . . cannot exceed the amount permitted under TQ Delta’s FRAND obligations.”). The context of the instructions and the jury verdict form also makes clear that infringement remained a fact question for the jury to decide in the first instance. *See* J.A. 6370 (“The Defendants, CommScope, deny that they infringe any of the Asserted Claims.”); J.A. 6385 (“If you find that CommScope has infringed any valid claim of the Asserted Patents, you must then consider what amount of damages, if any, to award to TQ Delta.”); J.A. 4549 (verdict form leaving infringement of the ’008 patent for the jury to decide).

The instructions and verdict form thus confirm that the stipulation did not resolve infringement. The jury was expressly tasked with deciding infringement, and the district court reiterated that any FRAND-based limitation on recovery applied only after such a finding. Consistent with that record, the district court correctly concluded that CommScope “never stipulated to the standard essentiality of the ’008 Patent for infringement purposes,” *’008 Decision*, J.A. 215, and its interpretation of the parties’ stipulation is entitled to deference. *Commonwealth Scientific & Indus. Rsch. Org. v. Buffalo Tech. (USA), Inc.*, 542 F.3d 1363, 1370 (Fed. Cir. 2008) (“Given that the district court is in the best position to understand the position of the parties as expressed through their series of exchanges with the court . . ., we sustain the court’s interpretation of the stipulation.”); *see also Risher v. United States*, 465 F.2d 1, 5 (5th Cir. 1972) (“We are not inclined to disturb the district court’s interpretation of a stipulation agreed upon by the parties during pretrial proceedings and approved by the court.”). The district court appropriately rejected TQ Delta’s stipulation-based argument.

## B

In the alternative, TQ Delta argues that, stipulation aside, the record evidence is clear that claim 14 of the '008 patent covers all implementations of the ITU's VDSL2 standard and therefore there is no substantial evidence supporting the jury's noninfringement finding. *See* TQ Delta Op. Br. 37–48. In so arguing, TQ Delta relies on its own expert testimony, which it characterizes as “without contradiction” apparently because CommScope offered no opposing expert witness of its own. *Id.* at 37.

The question before us is not whether substantial evidence supports TQ Delta's position but whether substantial evidence supports the jury's verdict. *See InTouch Techs., Inc. v. VGO Commc'ns, Inc.*, 751 F.3d 1327, 1343 (Fed. Cir. 2014). And the jury was free to reject the TQ Delta expert's testimony, especially in light of TQ Delta's burden to prove infringement. *See Welker Bearing Co. v. PHD, Inc.*, 550 F.3d 1090, 1095 (Fed. Cir. 2008) (“[T]he burden remains with the patentee to prove infringement, not on the defendant to disprove it.”); *InTouch Techs.*, 751 F.3d at 1343 (“While [expert] testimony was proffered, the jury was free to reject it.”). Therefore, as a threshold matter, TQ Delta's argument is misplaced in that it fails to account for the jury's role in weighing the evidence and assessing credibility. Even uncontradicted expert testimony need not be accepted where, as here, it is subject to cross-examination and competing inferences from the record. *See InTouch Techs.*, 751 F.3d at 1343.

Turning to the evidence, we conclude that substantial evidence supported the jury's finding of noninfringement. TQ Delta's expert testified that “the ['008 patent] claims that are asserted . . . are . . . essential to the VDSL2 standard.” J.A. 5335. Yet, he provided no basis for this statement and conceded on cross examination that he did not know whether the ITU makes any official or binding standard essentiality determination. J.A. 5370–71. Indeed,

CommScope provided evidence that the VDSL2 standard itself provides that the ITU “takes no position” on whether a patent is essential to a standard. J.A. 5371 (quoting the standard at J.A. 9756). The jury therefore could have reasonably discounted TQ Delta’s conclusory testimony and found that it failed to establish that practicing the VDSL2 standard necessarily practices claim 14. Thus, the evidence was not “so one-sided as to” require that the district court overrule the jury’s noninfringement finding. *See Grey*, 393 F.2d at 380 (“[W]hen the party moving for a directed verdict has [the] burden, the evidence to support the granting of the motion must be so one-sided as to be of overwhelming effect.”).

TQ Delta also makes a claim construction-related argument. The district court construed claim 14’s requirement of “computing a phase shift for each carrier signal” as “computing the amount by which a phase is adjusted for each carrier signal.” *Claim Construction Decision*, 2022 WL 2071073 at \*39. TQ Delta contends that “CommScope’s sole ‘defense’ was pointing to the possibility that some carriers will be shifted by a 0-degree angle of rotation under certain conditions.” TQ Delta Op. Br. 37. But in TQ Delta’s view, because “[t]here is no requirement of a non-zero-amount phase shift for every carrier,” that necessarily “foreclose[s] CommScope’s only non-infringement theory from being substantial evidence.” *Id.* We disagree.

The district court’s construction plainly requires that “each carrier signal” is “adjusted.” *Claim Construction Decision*, 2022 WL 2071073, at \*39. The district court’s construction in this case was also consistent with a prior construction provided in a different litigation by the district court in Delaware for the same term of the same patent. *Id.* (citing *TQ Delta, LLC v. 2Wire, Inc.*, No. 1:13-CV-01835-RGA, 2018 WL 582111 (D. Del. Jan. 29, 2018) (“*Delaware Construction IP*”). TQ Delta improperly attempts to rely on the Delaware court’s construction of *different* terms to contend that the relevant term here should be construed

to expressly allow carriers with a phase shift of zero. *See* TQ Delta Br. 39–40. Specifically, it contends that “the Delaware court expressly rejected a construction requiring ‘phase adjustment of a non-zero amount.’” *Id.* at 40 (quoting *Delaware Construction II*, 2018 WL 582111, at \*3). It concluded that the Delaware court’s analysis, which pertained to a different claim term (*i.e.*, the term “scramble the phase characteristics of the plurality of carrier signals”), should control here. *Id.*

TQ Delta’s claim construction argument fails for at least two reasons. First, a construction relating to a different term in a different case has no effect on the relevant claim term here. Second, the Delaware construction was not presented to the jury, nor were any definitions of “amount.” And because the jury was instructed that it “should disregard any evidence presented at trial that contradicts or is inconsistent with the constructions and the definitions that [the district court gave] you,” the district court’s construction left open the possibility that a reasonable jury could conclude that computing a zero-phase shift for a particular carrier signal failed to meet its construction requiring that the phase be adjusted “for each carrier signal.” J.A. 6216; *see* ’008 patent col. 6 ll. 41–46.

The jury was also free to find that compliance with the VDSL2 standard did not require “computing a phase shift,” as the claim requires. Although TQ Delta’s expert testified that the VDSL2 quadrant scrambler meets the “computing a phase shift” limitation, J.A. 5345–46, he conceded on cross-examination that Section 12.3.6.2 describes rotation by zero degrees, J.A. 5382–85, and that the DC subcarrier “shall not be rotated,” J.A. 5385. Both concessions show that practicing the standard does not conform with claim 14.

In sum, TQ Delta’s arguments ask us to reweigh the evidence and credit its expert’s testimony over competing inferences the jury was entitled to draw. The record

contains substantial evidence from which a reasonable jury could find that practicing the VDSL2 standard does not necessarily require “computing a phase shift for each carrier signal,” including evidence that the standard permits zero-degree rotation. That evidence, together with the district court’s construction requiring that the phase be “adjusted” for each carrier signal—which the jury could reasonably understand to exclude zero-rotation—provides a sufficient basis for the jury’s noninfringement finding. We therefore conclude that because the evidence is not “so one-sided” as to compel a finding of infringement, substantial evidence supports the jury’s verdict of noninfringement. *Grey*, 393 F.2d at 380.

## II

Turning to the ’835 patent, TQ Delta argues that the jury’s invalidity verdict cannot stand because the district court erred in construing the term “flag signal.” See TQ Delta Op. Br. 48–53. We disagree. Claim 8, from which asserted claim 10 depends, requires “[a]n apparatus configurable to adapt forward error correction and interleaver parameter (FIP) settings” that comprises “a transceiver” that is capable of “switch[ing]” from “a first FIP setting” to “a second FIP setting following the transmission of the flag signal.” ’835 patent col. 21 ll. 33–40. It further requires that “the switching occurs on a pre-defined forward error correction codeword boundary following the flag signal.” *Id.* at col. 21 ll. 45–46.

The district court, adopting a construction from the District of Delaware, construed the term “flag signal” as a “signal used to indicate when an updated FIP setting is to be used (the signal does not include the FEC codeword counter value upon which the updated FIP setting is to be used).” *Claim Construction Decision*, 2022 WL 2071073, at \*45–46 (citing *Delaware Construction I*, 2018 WL 3238776). That construction appropriately distinguishes between the “flag signal” and the “FEC codeword counter”

embodiments as contrasted in the specification without improperly importing any limitations from the specification into the claims. *Compare* '835 patent col. 19 ll. 15–30, *with* '835 patent col. 11 ll. 10–65. In this way, the construction gives effect to the specification's delineation between the “flag signal” and “FEC codeword counter” approaches, while appropriately avoiding confining the claimed “flag signal” so narrowly so as to not include any timing information.

TQ Delta argues, however, that the district court's construction is too broad and that, in particular, its parenthetical should have had greater exclusionary effect. TQ Delta Op. Br. 48–49. It contends that the plain meaning of “flag” in claim 8 is “an *indicator* that signals the existence of . . . the condition that the FIP settings need to be updated; it does not contain associated commands directing the other modem *when* to update the FIP settings.” *Id.* at 49. Thus, in its view, the district court's construction should have made clear that “the claimed ‘flag’ cannot include timing information.” *Id.* at 51. For support, it draws on the term “pre-defined” in claim 8. *Id.* at 49–50. It notes that the claim “requires switching of FIP settings to ‘occur[] on a *pre-defined* forward error correction codeword boundary following the flag signal.” *Id.* And therefore, it contends, the claim “requires the timing to be ‘pre-defined’—*i.e.*, not ‘defined’ by the flag signal itself.” *Id.* at 50.

But nothing in the claim language prohibits the claimed “flag signal” from including the time of the switch. The claim makes clear that the update to FIP settings must occur at a “*pre-defined* forward error correction codeword boundary,” but that requirement does not limit the permissible content of the “flag signal.” '835 patent, col. 21 ll. 45–46 (emphasis added). Rather, “pre-defined” specifies when the switching must occur—*i.e.*, at a boundary fixed or known in advance—while “flag signal” refers to the signal that indicates or initiates the transition to the updated FIP setting. Those are distinct requirements. Nonetheless, the

“flag signal” that triggers the switching may still carry information identifying that “pre-defined” timing. Put differently, the claim separates the timing constraint from the signaling mechanism, yet nothing in that separation excludes a “flag signal” that conveys timing-related information.

Reading “flag signal” to categorically exclude any timing-related information would improperly import a negative limitation, based on embodiments from the specification, into the claims. *See Sisvel Int’l S.A. v. Sierra Wireless, Inc.*, 81 F.4th 1231, 1236 (Fed. Cir. 2023); *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005) (en banc) (“[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments.”). The district court’s construction, in contrast, appropriately captures that the “flag signal” indicates that an updated FIP setting is to be used, without requiring that it exclude all information bearing on timing. Accordingly, TQ Delta’s proposed construction finds no support in the claims or specification, and we therefore do not disturb the jury’s invalidity verdict based on the district court’s construction.

### III

We now address TQ Delta’s request for a new trial on damages. *See* TQ Delta Op. Br. 53–68. According to TQ Delta, it was error to instruct the jury that “TQ Delta’s damages were based on *CommScope’s* savings.” *Id.* at 63. Recall that TQ Delta urged the district court to make the following changes to its jury instruction, which the district court rejected:

TQ Delta, the Plaintiff, has proposed a cost-savings model of calculating reasonable royalty damages that values the Accused Products that CommScope, the Defendant, provides to its customers. This approach relies upon estimated costs, if any, that

~~CommScope saved from the~~ making, using, or selling of the Accused Products save. In considering the amount of reasonable royalty damages under the cost-savings model, you should focus on whether CommScope's making, using or selling ~~make, use, or sale~~ of the patented technology avoided ~~allowed it to avoid~~ taking a different, more costly course of action, and if so, how much CommScope saved by using the Accused Products instead of taking the more costly course of action.

See J.A. 139–40; *Damages Decision*, J.A. 173–77.

In TQ Delta's view, because "[r]easonable royalties must be based on the 'value of the use of the patented technology,'" *id.* at 53 (citing *AstraZeneca AB v. Apotex Corp.*, 782 F.3d 1324, 1344 (Fed. Cir. 2015)), any evidence about how much a defendant's downstream customers saved should be considered by the jury. And it argues that the jury instructions disregarded that relevant law and improperly narrowed the damages inquiry to only CommScope's savings, undercutting its damages case. *Id.* at 53–54. We conclude that any error was invited.

"Under the invited error doctrine, 'a party cannot complain on appeal of errors which he himself induced the district court to commit.'" *Garcia-Ascanio v. Spring Indep. Sch. Dist.*, 74 F.4th 305, 310 (5th Cir. 2023) (citation modified). That doctrine extends to jury instructions, precluding appellate challenges to such errors "absent manifest injustice." *Id.* (cleaned up); see also *Prism Techs. LLC v. Sprint Spectrum L.P.*, 849 F.3d 1360, 1373 (Fed. Cir. 2017) ("[A] party may not complain on appeal of errors that he himself invited or provoked the . . . court . . . to commit." (quoting *United States v. Wells*, 519 U.S. 482, 488 (1997))). Manifest injustice, in this context, is an error that is "so patent as to have seriously jeopardized the rights of the appellant." *United States v. Green*, 272 F.3d 748, 754 n.16

(5th Cir. 2001) (quoting *United States v. Lemaire*, 712 F.2d 944, 949 (5th Cir.1983)).

TQ Delta invited any alleged error in the district court's damages instructions by repeatedly proposing and endorsing the very language it now challenges. First, it submitted a proposed instruction stating that its "cost-savings model" required showing that "the *defendant's* infringement allowed *it* to avoid taking a different, more costly course of action," J.A. 6413–14 (emphases added), thereby framing damages in terms of CommScope's savings. Second, when presenting edits to the proposed jury instructions to the district court, TQ Delta told the court that the relevant clause (*i.e.*, "how much CommScope saved") should "stay the same," J.A. 6190, expressly promoting language directing the jury to consider "how much *CommScope* saved," J.A. 6386 (emphasis added). Having affirmatively advocated for this instruction, TQ Delta cannot now complain of it on appeal. *See McCaig v. Wells Fargo Bank (Tex.), N.A.*, 788 F.3d 463, 476 (5th Cir. 2015) (citing *United States v. Silvestri*, 409 F.3d 1311, 1337 (11th Cir. 2005) ("When a party responds to a court's proposed jury instructions with the words 'the instruction is acceptable to us,' such action constitutes invited error.")).

Moreover, TQ Delta has not shown that any alleged error resulted in manifest injustice. First, no authority mandates that, in calculating a reasonable royalty for infringement, the cost-savings model must include savings to downstream third parties. The lack of authority underscores that the district court's instruction did not clearly misstate the law or impose an impermissible limitation on the jury's consideration of damages. *See also Jimenez*, 660 F.3d at 847 (declining to extend precedent "cannot be plain error."); *Garcia-Ascanio*, 74 F.4th at 310 (a party "cannot satisfy plain-error review" when "there is no case law supporting [its] position"). Second, even if TQ Delta's position had case law support, the instruction did not preclude the jury from considering evidence relating to

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CommScope's customers' savings, nor did it foreclose TQ Delta's broader damages theory. The instruction simply focused the analysis on CommScope's gains as the accused infringer, which could reflect both direct cost savings and indirect economic benefits derived from its customers' downstream savings—such as increased demand, pricing power, or other value attributable to use of the invention.

In addition, the instructions as a whole did not channel the jury into either party's damages framework or preclude consideration of TQ Delta's theory. In describing CommScope's hypothetical negotiation theory, the jury was instructed to consider a range of evidence, including the "*Georgia-Pacific* factors," which encompass "the benefits to those who have used the invention" and "any evidence probative of the value of that use" among other considerations. J.A. 6387–88. The jury was also instructed that it "can and should consider the evidence that has been presented to you in this case on each of these [*Georgia-Pacific*] factors." *Id.* Thus, the jury was free to consider the full scope of TQ Delta's cost-savings evidence and apply it to either party's damages model. Any alleged limitation in the instruction was neither clear nor so prejudicial as to have seriously jeopardized TQ Delta's rights.

Accordingly, we find no reason to disturb the jury's damages award.

#### CONCLUSION

We have considered TQ Delta's remaining arguments but find them unpersuasive. For the foregoing reasons, we *affirm*.

#### AFFIRMED

#### COSTS

No costs.