

# United States Court of Appeals for the Federal Circuit

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**POWER INTEGRATIONS, INC.,**  
*Plaintiff-Cross Appellant,*

v.

**FAIRCHILD SEMICONDUCTOR INTERNATIONAL,  
INC. AND FAIRCHILD SEMICONDUCTOR  
CORPORATION,**  
*Defendants-Appellants.*

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2011-1218, -1238

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Appeals from the United States District Court for the District of Delaware in case No. 04-CV-1371, Judge Leonard P. Stark.

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Decided: March 26, 2013

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FRANK E. SCHERKENBACH, Fish & Richardson P.C., of Boston, Massachusetts, argued for plaintiff-cross appellant. With him on the brief were CRAIG E. COUNTRYMAN, of San Diego, California, and HOWARD G. POLLACK and MICHAEL R. HEADLEY, of Redwood City, California.

BLAIR M. JACOBS, McDermott Will & Emery LLP, of Washington, DC, argued for defendants-appellants. With

him on the brief were NATALIA V. BLINKOVA and DAVID M. DESROSIER; LEIGH J. MARTINSON, of Boston, Massachusetts. Of counsel was CHRISTINA A. ONDRICK, of Washington, DC.

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Before LOURIE, O'MALLEY, and REYNA, *Circuit Judges*.

REYNA, *Circuit Judge*.

This is an appeal from a final judgment of the United States District Court for the District of Delaware finding that Fairchild Semiconductor International, Inc. and Fairchild Semiconductor Corporation (collectively, “Fairchild”) willfully infringed several valid patents belonging to Power Integrations, Inc. (“Power Integrations”). After two jury trials, a bench trial, and post-trial proceedings including a motion for remittitur, the district court entered final judgment in favor of Power Integrations and awarded compensatory and enhanced damages in the amount of \$12,866,647.16. Fairchild on appeal asserts that the district court erred in its claim construction, in denying Fairchild’s motion for judgment as a matter of law that one of Power Integrations’ claimed inventions would have been obvious, in formulating its remitted damages award, and in finding Fairchild’s infringement willful. On cross-appeal, Power Integrations argues that it was error for the district court to grant Fairchild’s motion for remittitur, thereby reducing the jury’s original damages award by eighty-two percent. Power Integrations asserts further error in the district court’s exclusion of evidence related to price erosion prior to the date Fairchild was notified of its infringement, and in the district court’s denial of Power Integrations’ motion for a post-verdict accounting.

For the reasons set out below, we affirm the district court's finding of non-obviousness; we affirm-in-part and reverse-in-part on claim construction; we vacate the district court's order of remittitur and its attendant damages award; we find error in the district court's exclusion of evidence related to pre-notice price erosion and in its refusal to grant Power Integrations a post-verdict accounting; we vacate the district court's finding of willful infringement; and we remand to the district court for further proceedings consistent with this opinion.

### I. PROCEDURAL POSTURE

In 2004, Power Integrations sued Fairchild for infringement of four U.S. patents related to power supplies for electronic devices: U.S. Patent Nos. 6,249,876 (filed Nov. 16, 1998) (the '876 Patent); 6,107,851 (filed Aug. 20, 2000) (the '851 Patent); 6,229,366 (filed May 8, 2001) (the '366 Patent); and 4,811,075 (filed Apr. 24, 1987) (the '075 Patent). The patented technology is used in electric chargers for mobile phones.

In 2006, following its claim construction order, the district court bifurcated infringement and damages issues from those relating to validity of the asserted patents. The parties tried the issues before separate juries, and both juries rendered verdicts in favor of Power Integrations.

In the trial on infringement and damages, a first jury found that Fairchild had willfully infringed claim 1 of the '876 Patent, claims 1 and 4 of the '851 Patent, claims 9 and 14 of the '366 Patent, and claims 1 and 5 of the '075 Patent. The jury awarded Power Integrations lost profits due to lost sales (\$14,981,828), lost profits due to price erosion (\$1,952,893), future lost profits due to price ero-

sion (\$13,018,379), and a lump sum reasonable royalty (\$4,028,681), for a total damages award of \$33,981,781.

In the trial on validity, a second jury found all asserted claims valid. After the validity trial, the district court denied Fairchild's motion for judgment as a matter of law ("JMOL") that the invention of Power Integrations' '876 Patent would have been obvious to one of ordinary skill in the art.

Fairchild subsequently moved for remittitur, JMOL, or in the alternative, a new trial on damages. Expressing concern over the testimony of Power Integrations' damages expert, the district court granted Fairchild's motion for remittitur and reduced the jury's combined damages award by 82%, resulting in a total award of \$6,116,720.58. On the same day, the district court issued a permanent injunction covering all claims of the asserted patents. The court also granted Fairchild's motion for a new trial on willfulness in view of our decision in *In re Seagate Tech., LLC*, 497 F.3d 1360 (Fed. Cir. 2007) (en banc).

Fairchild filed an emergency request to stay the injunction pending appeal. In support of its request, Fairchild cited favorable actions taken by the U.S. Patent and Trademark Office ("Patent Office") in the reexaminations of three Power Integrations patents.<sup>1</sup> The district court denied the stay request, Fairchild appealed to this court, and we dismissed for lack of jurisdiction. *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 345 F. App'x 563 (Fed. Cir. 2009).

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<sup>1</sup> We note that Fairchild filed the requests for reexamination with the Patent Office after conclusion of the first jury trial but before conclusion of the second.

In June 2009, following a bench retrial of the issue of willfulness, the district court concluded in view of *Seagate* that Fairchild's infringement was willful. The district judge who had been presiding over the case retired, and a new judge assumed the bench. In January 2011, the district court reaffirmed its willfulness finding, and pursuant to its authority under 35 U.S.C. § 284, the court granted Power Integrations' motion for enhanced damages. The court awarded Power Integrations enhanced damages for willful infringement by doubling its remitted damages award of \$6,116,720.58, for a total award of \$12,233,441.16, not including interest.

These appeals followed. We have jurisdiction under 35 U.S.C. § 1295(a)(1).

## II. STANDARDS OF REVIEW

We review issues of claim construction without deference. *See Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456 (Fed. Cir. 1998) (en banc). Whether a claim limitation invokes means-plus-function claiming under 35 U.S.C. § 112, ¶ 6 (now 35 U.S.C. § 112(f)), is an exercise in claim construction which we review without deference. *Inventio AG v. ThyssenKrupp Elevator Ams. Corp.*, 649 F.3d 1350, 1356 (Fed. Cir. 2011).

We review a district court's denial of a JMOL motion under the law of the regional circuit, in this case the Third Circuit. *See Therasense, Inc. v. Becton, Dickinson & Co.*, 593 F.3d 1325, 1330 (Fed. Cir. 2010) (en banc). The Third Circuit reviews a district court's denial of a JMOL motion without deference. *Rinehimer v. Cemcolift, Inc.*, 292 F.3d 375, 383 (3d Cir. 2002).

Obviousness is a question of law based on underlying factual findings. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S.

398, 427 (2007); *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1068 (Fed. Cir. 2012). We review a jury's ultimate conclusions on obviousness without deference, but review the jury's findings of fact for substantial evidence. *LNP Eng'g Plastics, Inc. v. Miller Waste Mills, Inc.*, 275 F.3d 1347, 1353 (Fed. Cir. 2001). Objective evidence of secondary considerations of patentability are fact determinations which we review for substantial evidence. *Para-Ordnance Mfg., Inc. v. SGS Importers Int'l, Inc.*, 73 F.3d 1085, 1088 (Fed. Cir. 1995).

We review admissibility of evidence under the law of the regional circuit. *Ethicon, Inc. v. U.S. Surgical Corp.*, 135 F.3d 1456, 1465 (Fed. Cir. 1998). The Third Circuit reviews a district court's ruling on admissibility of expert testimony for abuse of discretion. *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 749 (3d Cir. 1994). To the extent the district court's ruling turns on an interpretation of a Federal Rule of Evidence, our review is plenary. *DeLuca v. Merrell Dow Pharm.*, 911 F.2d 941, 944 (3d Cir. 1990).

We review a district court's decision to set aside a jury's damages award by applying the standard of review applicable in the regional circuit. *Siemens Med. Solutions USA, Inc. v. Saint-Gobain Ceramics & Plastics, Inc.*, 637 F.3d 1269, 1289 (Fed. Cir. 2011). The Third Circuit will not disturb a jury's damages award unless unsupported by substantial evidence, *Thabault v. Chait*, 541 F.3d 512, 532 (3d Cir. 2008), or contrary to the limits established by law, *Scott v. Baltimore & O. R. Co.*, 151 F.2d 61, 65 (3d Cir. 1945). We consider issues regarding what types of damages are legally compensable in an action for patent infringement under the law of our own circuit, without deference to the trial court. *See Rite-Hite Corp. v. Kelley Co., Inc.*, 56 F.3d 1538, 1544 (Fed. Cir. 1995) (en banc).

We review a district court's decision to grant or withhold a remittitur under the law of the regional circuit. The Third Circuit has held that "[a] remittitur is in order when a trial judge concludes that a jury verdict is 'clearly unsupported' by the evidence and exceeds the amount needed to make the plaintiff whole." *Starceski v. Westinghouse Elec. Corp.*, 54 F.3d 1089, 1100 (3d Cir. 1995). The Third Circuit has emphasized that it is not the function of the appellate court to assess what would constitute fair recompense for the injuries sustained by the plaintiff, but rather to ascertain whether the trial judge, weighing all the evidence on damages, "has exercised his considered judgment as to a rational verdict in a judicial manner." *Russell v. Monogahela Ry. Co.*, 262 F.2d 349, 352 (3d Cir. 1958). Thus, "[t]he trial judge's decision to grant or withhold a remittitur cannot be disturbed absent a manifest abuse of discretion." *Starceski*, 54 F.3d at 1100; accord *2660 Woodley Rd. Joint Venture v. ITT Sheraton Corp.*, 369 F.3d 732, 745 (3d Cir. 2004) ("We review a grant of remittitur for abuse of discretion.").

While we review for abuse of discretion the district court's decision to order a remittitur, *Starceski*, 54 F.3d at 1100, we review the amount of the court's remittitur on the basis of whether it exceeds the maximum award supported by the evidence, see *Garrett v. Faust*, 183 F.2d 625, 629 (3d Cir. 1950); see also 11 Charles Alan Wright, Arthur R. Miller and Mary Kay Kane, *Federal Practice and Procedure* § 2815, at 159 (2d ed.1995). We thus consider whether the amount of the district court's remittitur order is supported by substantial evidence.

The issue of willful infringement has two components, each with a different standard of review. First, the "patentee must show by clear and convincing evidence that the infringer acted despite an objectively high likelihood that its actions constituted infringement of a valid pa-

tent.” *In re Seagate Tech., LLC*, 497 F.3d 1360, 1371 (Fed. Cir. 2007). This first inquiry is a question of law that we review without deference. *Bard Peripheral Vascular, Inc. v. W.L. Gore & Assocs., Inc.*, 682 F.3d 1003, 1006–07 (Fed. Cir. 2012). Second, “the patentee must . . . demonstrate that this objectively-defined risk . . . was either known or so obvious that it should have been known to the accused infringer.” *Seagate*, 497 F.3d at 1371. This second inquiry is a question of fact which we review for substantial evidence. *Bard*, 682 F.3d at 1006.

### III. THE PATENTED TECHNOLOGY

Power Integrations’ patented technology is used in power supplies for electronic devices. The ’851, ’366, and ’876 Patents describe techniques for alleviating electromagnetic interference and current flow problems associated with prior art power supplies. The ’075 Patent describes a type of transistor useful in high voltage power circuits. Although the patented technologies are applicable generally in the field of electronics, the present case focuses on their use in chargers for mobile phones.

Electrical outlets throughout much of the world, including standard wall outlets in the United States, provide electrical energy by way of an alternating current (AC). The electric current provided by such power outlets is called “alternating” because the direction of current flow reverses periodically. In operation, current flows first from the wall outlet through a power cable, toward the powered device. Flow then reverses, and electric current flows back from the powered device through the power cable, toward the wall outlet. These current flow reversals occur many times per second. An AC power source such as a standard wall outlet accomplishes these current flow reversals by providing a voltage, sometimes called a “power signal,” which changes cyclically over time

from positive to negative. When the power signal voltage is positive, current tends to flow in one direction; when the power signal voltage is negative, current tends to flow in the opposite direction. As a result of these rapid changes in voltage and current flow, AC power signals continually fluctuate.

Some devices can utilize an AC power signal directly, but most electronic devices must convert the rapidly fluctuating AC power signal to a more stable “direct current” (DC) power signal. A DC power signal does not change over time; rather, it provides a steady, constant voltage, and current tends to flow in only one direction. Electronic devices that require DC rather than AC power often utilize external adapters to convert the AC power from standard wall outlets into suitable DC power. This process of converting AC to DC is known as “rectification.” Popular examples of rectifying power supplies are wall-chargers for laptops and mobile phones.

After rectification, most power supplies must adjust the voltage of the rectified DC power signal. This adjustment brings the voltage of the DC power signal within an appropriate operating range for the powered electronic device. Many modern power supplies carry out this voltage adjustment by using semiconductor switches, called transistors, to switch the rectified DC power signal rapidly on and off. This is similar to operating a light switch, which can be turned quickly on and off to simulate medium light (not fully lit, but not completely dark). By using this rapid on-and-off switching technique, a switching power supply can produce an output power signal that can be used as if it were a steady DC voltage. To fine-tune the voltage of this output DC power signal, the power supply can adjust its “pulse-width,” which measures the time the power supply spends in the “on” switching stage relative to the “off” stage. More switching

time spent in the “on” stage transfers more voltage to the output DC power signal. This voltage-adjustment technique is called pulse-width modulation (PWM), and it is the technology implicated in this appeal.

#### A. THE '851 AND '366 PATENTS

There are two notable problems with pulse-width modulated (PWM) power converters: electromagnetic interference (EMI) and inrush current. EMI results when the rapid switching in a PWM power supply generates a high frequency signal that interferes with other electronic devices. The power supply can radiate this high frequency signal, thereby affecting nearby devices; it can also inject the high frequency signal back into the power grid, thereby affecting other devices on the grid.

PWM power supplies are also susceptible to large inrush currents. When a PWM power supply first turns on, current rushes in and charges the internal capacitors. This initial inrush current is much higher than the current utilized during normal, steady-state operation. Inrush current stresses the components of the power supply and decreases its useful life. Substituting components capable of handling a large inrush current can add significantly to the power supply's cost.

To address EMI and inrush current, the '851 Patent and its divisional, the '366 Patent, disclose improved integrated circuitry for PWM power supplies. The improved circuitry provides “frequency-jittering” functionality for reducing EMI, and “soft-start” functionality for reducing inrush current.

“Frequency-jittering” is a technique that varies the frequency of the on-off switching in a PWM power supply. This frequency variation disperses generated EMI by

spreading it out over a range of frequencies. In a PWM power supply, a periodically repeating signal known as an oscillating drive signal drives the power supply's rapid on-off switching. The '851 Patent discloses a technique for varying the frequency of a PWM power supply's oscillating drive signal by using an independent "frequency variation signal." By changing the frequency variation signal, the PWM power supply can vary the frequency of its oscillating drive signal. This frequency variation in the oscillating drive signal spreads generated EMI over a spectrum of frequencies, thereby reducing interference with other devices.

"Soft-start" circuitry attempts to reduce inrush current that stresses internal components of a PWM power supply. The '851 Patent describes an improvement over prior art soft-start circuits, which in some cases suffer from brief initial periods of large current flow. To alleviate this problem, the '851 Patent discloses a PWM power supply with soft-start circuitry driven by the same independent frequency variation signal used for frequency-jittering. Tying soft-start circuitry to the independent frequency variation signal allows soft-start functionality to operate independently of the electrical characteristics of a powered device. It also eliminates the brief initial inrush current suffered by prior art soft-start circuits.

## B. THE '876 PATENT

The '876 Patent discloses a "frequency-jittering" circuit that provides frequency-jittering functionality in a manner distinct from the '851 and '366 Patents. Unlike the '851 and '366 Patents, the circuit of the '876 Patent does not provide "soft-start" functionality. Representative Figure 1 of the '876 Patent is shown below:

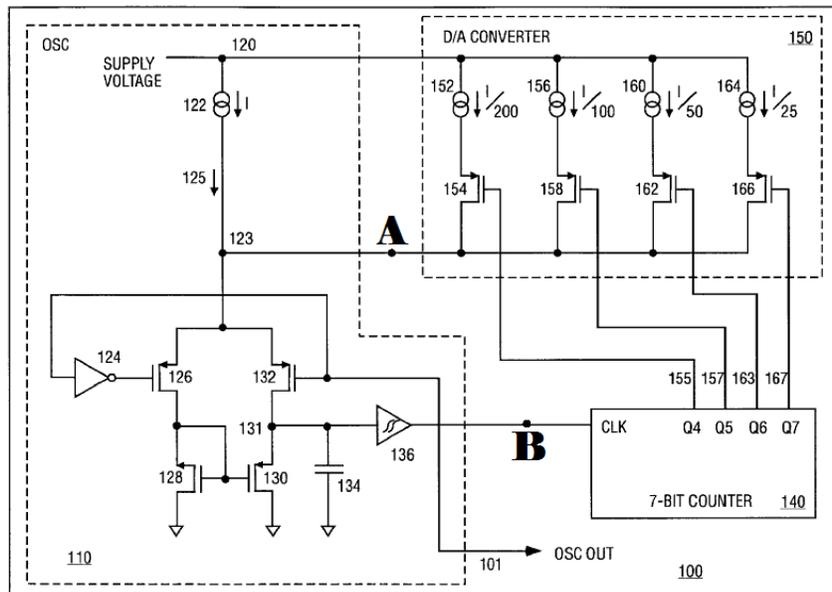


FIG. 1

'876 Patent fig.1 (labels "A" and "B" added). The circuit of the '876 Patent uses an analog "control signal" (designated in Fig. 1 by "A") to control the frequency of the power supply's oscillating drive signal ("B"). This analog "control signal" is similar to the frequency variation signal of the '851 and '366 Patents, which also controls oscillating drive signal frequency. In the circuit depicted in Fig. 1, the analog "control signal" ("A") periodically changes, thus changing the frequency of the oscillating drive signal ("B"). These periodic changes in the drive signal's frequency help dissipate generated EMI by spreading it over a range of frequencies.

At the heart of the '876 Patent is the process by which the analog "control signal" changes, thus varying the frequency of the oscillating drive signal. Generally, this process works as follows: A digital counter (box 140) monitors the power supply's oscillating drive signal ("B"), which repeats periodically. As the oscillating drive signal

repeats, the digital counter counts the drive signal's repetitions. After the count reaches a maximum value, the digital counter resets to zero. Essentially, the digital counter keeps a tally of how many times the oscillating drive signal repeats. A digital-to-analog converter (dotted area 150) reads the outputs of the digital counter (signal lines 155, 157, 163, and 167). Based on the counter's outputs, the digital-to-analog converter generates an analog signal proportional to the counter's tally. This analog signal is the analog "control signal" ("A") that controls the frequency of the oscillating drive signal. An oscillator (dotted area 110) generates the oscillating drive signal ("B") based on the analog control signal ("A").

As the digital counter counts the cycles of the power supply's oscillating drive signal, the outputs of the digital counter change, thereby changing the analog control signal. The analog control signal, in turn, changes the frequency of the oscillating drive signal. Each time the digital counter increments, the frequency of the oscillating drive signal changes with it. The end result is that the frequency of the power supply's oscillating drive signal—and thus the frequency of its generated EMI—steps through an ordered set of frequencies. This frequency stepping repeats when the counter resets to zero. Because the frequency of the power supply's generated EMI is continually changing, EMI is spread out over a wide range of frequencies and interference with other devices is reduced.

### C. THE '075 PATENT

The '075 Patent, now expired, discloses a type of metal-oxide semiconductor field-effect transistor (MOSFET) for use in high voltage electronic devices such as power supplies. The disclosed transistor provides improved ability to incorporate high and low voltage circuitry on a

single chip. Power Integrations notes that the technology of the '075 Patent served as the cornerstone for the company's founding. Fairchild does not raise any claim construction or validity issues with regard to the '075 Patent. We therefore do not describe the technology in depth.

#### IV. CLAIM CONSTRUCTION

The district court conducted a *Markman* hearing and construed various terms of the claims in the asserted patents. On appeal, Fairchild argues that the district court erred in its construction of two terms in particular: "frequency variation signal" and "soft start circuit," both of which appear in the claims of the '851 and '366 Patents.

Claim construction begins with the language of the claim. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) ("[T]he claims are of primary importance, in the effort to ascertain precisely what it is that is patented."). We presume that the terms in the claim mean what they say. *Tate Access Floors, Inc. v. Interface Architectural Res., Inc.*, 279 F.3d 1357, 1370 (Fed. Cir. 2002). We interpret the claim's words "in light of the intrinsic evidence of record, including the written description, the drawings, and the prosecution history." *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1324 (Fed. Cir. 2002). Where the intrinsic record is ambiguous, and when necessary, we have authorized district courts to rely on extrinsic evidence, which "consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Phillips*, 415 F.3d at 1317 (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996)).

### A. FREQUENCY VARIATION SIGNAL

The district court construed the term “frequency variation signal” in the ’851 and ’366 Patents as “an internal signal that cyclically varies in magnitude during a fixed period of time and is used to modulate the frequency of the oscillation signal within a predetermined frequency range.”

On appeal, Fairchild argues that the district court erred by improperly reading features of the preferred embodiments into the claims. Specifically, Fairchild argues that the claimed “frequency variation signal” is not limited to an internal signal (the “internal signal” limitation) and that “frequency variation signal” is not limited to a signal that varies cyclically in magnitude during a fixed period of time (the “cyclically varies” limitation). These limitations, Fairchild insists, appear in the patents’ preferred embodiments and not in the claims, and because the district court’s construction incorporates both limitations, that construction is incorrect as a matter of law. Fairchild argues that we should not look to the patent specification to define the disputed term “frequency variation signal” because the term has a plain and ordinary meaning. Fairchild would have us construe “frequency variation signal” more broadly as “a signal that is used to vary the frequency of the oscillation signal.”

Power Integrations argues that the district court correctly construed “frequency variation signal.” Power Integrations argues that “frequency variation signal” does not have a plain and ordinary meaning. Because we must consider claim terms in light of the entire patent, Power Integrations insists that we must look to the specification to define “frequency variation signal.” Power Integrations argues that, although the claims do not explicitly recite

the “internal signal” and “cyclically varies” limitations, these limitations are necessary and inherent components of the term “frequency variation signal.” Power Integrations further argues that failing to include the “internal signal” limitation would cause the claims to read on the prior art, and would likewise ignore a fundamental aspect of the invention’s improvement.

With respect to the “cyclically varies” limitation, Power Integrations maintains that all examples and descriptions in the patents limit the “frequency variation signal” to a “signal that cyclically varies in magnitude during a fixed period of time.” Without this limitation, Power Integrations argues, the invention would experience the same problem with “unpredictably, externally influenced variations the patent set out to solve.” Power Integrations urges that the district court correctly construed the claims to uphold their validity, as required by our precedent.

In construing a claim term, we look to the words of the claim itself. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). If the claim term has a plain and ordinary meaning, our inquiry ends. *Id.* If, however, the claim term does not have an ordinary meaning, and its meaning is not clear from a plain reading of the claim, “we turn to the remaining intrinsic evidence, including the written description, to aid in our construction of that term.” *Telemac Cellular Corp. v. Topp Telecom, Inc.*, 247 F.3d 1316, 1326 (Fed. Cir. 2001). As we have said, “the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Vitronics*, 90 F.3d at 1582. The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction. *Renishaw PLC v.*

*Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998).

With these principles in mind, we turn to the claims of the '851 and '366 Patents. Claim 1 of the '851 Patent recites both

a frequency variation circuit that provides a *frequency variation signal*

and

an oscillator that provides an oscillation signal having a frequency range, said frequency of said oscillation signal varying within said frequency range according to said *frequency variation signal*.

'851 Patent col. 12 ll. 22–27 (emphases added). Similarly, claim 14 of the '366 Patent includes

a frequency variation circuit that provides a *frequency variation signal* and wherein said maximum time period varies according to a magnitude of said *frequency variation signal*.

'366 Patent col. 14 ll. 14–17 (emphases added). Claims 1 and 14 do not further define “frequency variation signal.”

Although Fairchild argues that “frequency variation signal” has a plain and ordinary meaning, an expert for Power Integrations, Mr. Blauschild, testified that “[t]he term ‘frequency variation signal,’ recited in the '851 Patent, is not a term of art.” “Nor would this term have had,” Mr. Blauschild continued, “a plain and ordinary meaning to one of skill in the art at the time of the invention.” J.A. 359. Turning to the specification, Mr. Blauschild opined that “the specification of the '851

Patent clearly defines such a signal as an internal signal that cyclically varies in magnitude during a fixed period of time.” *Id.* Fairchild offers no evidence to contradict the testimony of Mr. Blauschild other than its own assertion that “frequency variation signal” has a plain and ordinary meaning.

We are not persuaded that the claims inform a plain and ordinary meaning of the term “frequency variation signal,” nor do we agree with Fairchild that we need only a dictionary to discern the meaning of “frequency variation signal.” Unless the inventor intended a term to cover more than the ordinary and customary meaning *revealed by the context of the intrinsic record*, it is improper to read the term to encompass a broader definition simply because it may be found in a dictionary, treatise, or other extrinsic source. *Nystrom v. TREX Co., Inc.*, 424 F.3d 1136, 1145 (Fed. Cir. 2005). In any event, our inquiry here starts with the intrinsic record, including the specification, and not with a dictionary definition of the disputed term. *Phillips*, 415 F.3d at 1321 (“The problem is that if the district court starts with the broad dictionary definition in every case and fails to fully appreciate how the specification implicitly limits that definition, the error will systematically cause the construction of the claim to be unduly expansive.”).

Here, the specification of the ’851 Patent describes the frequency variation signal:

Although the presently preferred frequency variation signal 400 is a triangular waveform, alternate frequency variation signals such as *ramp signals, counter output signals or other signals that vary in magnitude during a fixed period of time may be utilized as the frequency variation signal.*

'851 Patent col. 6 ll. 34–38 (emphases added). The patent thus contemplates frequency variation signals other than the preferred embodiment's triangular waveform. The specification describes these alternatives as “other signals that vary in magnitude during a fixed period of time.” *Id.* col. 6 ll. 36–37. Specifically limiting the expansive term “other signals” to “signals that vary in magnitude during a fixed period of time” suggests that the patentee contemplated only frequency variation signals having a periodic waveform. The intrinsic record thus clearly indicates the patentee's precise conception and formulation, which here must control our construction. *See Renishaw*, 158 F.3d at 1250 (“Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim.”).

We also note that the specification, in describing the frequency variation signal, lists several specific examples followed by the general phrase “or other signals . . . .” When a general phrase follows a list of specific items, this can be a good indication that the general phrase refers to additional items of the same kind. Here, the specification lists a preferred “triangular waveform” along with two alternatives, “ramp signals” and “counter output signals.” All of these signals have periodic waveforms. '851 Patent col. 6 ll. 35–36. Thus, in context, the general phrase “other signals” suggests other *periodic* signals. This implicit limitation is confirmed by the words that follow: “other signals *that vary in magnitude during a fixed period of time.*” *Id.* col. 6 ll. 36–37 (emphasis added). We thus agree with the district court that the proper construction of “frequency variation signal” includes the “cyclically varies” limitation.

With regard to the “internal signal” limitation, the specification indicates that the term “frequency variation

signal” refers to an internal signal. In two separate places, the specification provides,

That is, the switching frequency of the pulse width modulated switch 262 varies according to an *internal frequency variation signal*. This has an advantage over the frequency jitter operation of [the prior art circuit of] FIG. 1 *in that the frequency range of the presently preferred pulse width modulated switch 262 is known and fixed*, and is *not subject to the line voltage or load magnitude variations*.

’851 Patent col. 6 ll. 12–18, col. 11 ll. 44–49 (emphases added). This description confirms that the patentee contemplated a fixed-range, periodic frequency variation signal, and it further indicates that the internal character of the frequency variation signal is essential to the invention. It is the internal character of the signal that makes the frequency-jittering functionality “not subject to the line voltage or load magnitude variations.” *Id.* col. 6 ll. 17–18, col. 11 ll. 48–49. As the specification reflects, the patentee did not employ the term “frequency variation signal” to refer to external signals, nor did the patentee consider external frequency variation signals as part of the invention. In fact, the patentee sought to alleviate problems with the prior art’s external frequency variation techniques.

For these reasons, the district court properly limited the claimed “frequency variation signal” to an internal, periodic signal. We thus conclude that the district court correctly construed “frequency variation signal” as “an internal signal that cyclically varies in magnitude during a fixed period of time and is used to modulate the frequency of the oscillation signal within a predetermined frequency range.”

## B. SOFT START CIRCUIT

The district court construed the term “soft start circuit” in the ’851 and ’366 Patents as means-plus-function limitations under paragraph 6 of 35 U.S.C. § 112 (now 35 U.S.C. § 112(f)). In the district court’s view, an ordinarily skilled artisan would not “know the precise structures for a soft start circuit, because the function of a soft start circuit can be achieved in a variety of ways making it unclear what the specific structures are for performing the recited functions.” *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 422 F. Supp. 2d 446, 459 (D. Del. 2006). Thus, the district court concluded that “the term ‘soft start circuit’ should be construed in accordance with Section 112, ¶ 6” and limited to the structure described in the specification and its equivalents. *Id.* at 460.

On appeal, Fairchild argues that the district court incorrectly construed the “soft start circuit” limitations in the ’851 and ’366 Patents as means-plus-function limitations. Fairchild contends that these limitations do not include the word “means,” which creates a strong presumption that mean-plus-function claiming does not apply. Rather, Fairchild argues, the claims disclose sufficient structure to remove the “soft start circuit” limitations from the reach of means-plus-function claiming.

Power Integrations seeks an affirmance of the district court’s construction. Power Integrations argues that the term “soft start circuit,” does not suggest sufficiently definite structure to the skilled artisan. Power Integrations would have us affirm the district court’s construction and limit the term “soft start circuit” to the structures described in the specifications of the ’851 and ’366 Patents.

Means-plus-function limitations permit a patentee to claim an element of her invention in terms of the element's function, without in the claim itself reciting corresponding structure:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

35 U.S.C. § 112, ¶ 6.<sup>2</sup> If a claim term does not use the word “means,” we presume that means-plus-function claiming does not apply. *See CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1369 (Fed. Cir. 2002). If, however, the claim term recites a function *without reciting sufficient structure* for performing that function, the presumption falls and means-plus-function claiming applies. *See, e.g., Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000). We assess whether a claim limitation recites sufficient structure to avoid means-plus-function claiming from the vantage point of an ordinarily skilled artisan. *See Inventio*, 649 F.3d at 1357; *Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 1372 (Fed. Cir. 2003). To this end, “considering intrinsic and extrinsic evidence is usually helpful [in determining whether] a claim limitation is so devoid of structure that the drafter

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<sup>2</sup> In 2011, Congress reformatted the paragraphs of § 112 as subsections. Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284 (2011). Section 112, ¶ 6, is now codified as § 112(f). To maintain consistency with the district court's opinion, we refer to § 112, ¶ 6.

constructively engaged in means-plus-function claiming.” *Inventio*, 649 F.3d at 1357. With respect to intrinsic evidence, a patent’s specification may inform the skilled artisan’s understanding of the structure required by a claim limitation.

We have previously held on several occasions that the term “circuit” connotes structure. See *MIT v. Abacus Software*, 462 F.3d 1344, 1355 (Fed. Cir. 2006) (“[D]ictionary definitions establish that the term ‘circuitry,’ by itself, connotes structure.”); see also *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1320–21 (Fed. Cir. 2004) (holding that the term circuit is not a means-plus-function limitation when the patent provides “a recitation of the respective circuit’s operation in sufficient detail to suggest structure to persons of ordinary skill in the art”); *Apex*, 325 F.3d at 1373 (“[T]he term ‘circuit’ with an appropriate identifier such as ‘interface,’ ‘programming’ and ‘logic,’ certainly identifies some structural meaning to one of ordinary skill in the art.”). In *Abacus*, we said,

The claim language here too does not merely describe a circuit; it adds further structure by describing the operation of the circuit. The circuit’s input is “appearance signals” produced by the scanner; its objective is to “interactively introduce[e] [sic] aesthetically desired alterations into said appearance signals”; and its output is “modified appearance signals.” This description of the operation of the circuit is sufficient to avoid 112 ¶ 6.

462 F.3d at 1356 (citation omitted).

*Abacus* establishes that in determining whether the word “circuit” invokes means-plus-function claiming, the

pivotal issue is “whether the [circuit limitation] as properly construed recites *sufficiently definite* structure.” *Personalized Media Commc’ns., LLC v. Int’l Trade Comm’n*, 161 F.3d 696, 704 (Fed. Cir. 1998) (emphasis added). A description of the circuit’s operation may provide sufficiently definite structure, *Abacus*, 462 F.3d at 1356, as can certain “adjectival qualifications,” *Apex*, 325 F.3d at 1374 (“interface circuit”). Nevertheless, not just any adjectival qualification or functional language will suffice. *See Abacus*, 462 F.3d at 1362–63 (Michel, C.J., dissenting). The proper inquiry is whether the claim limitation itself, when read in light of the specification, connotes to the ordinarily skilled artisan sufficiently definite structure for performing the identified functions. *Apex*, 325 F.3d at 1373.

#### 1. CLAIM 4 OF THE ’851 PATENT

Turning to the claims at issue, claim 4 of the ’851 Patent recites a “soft start circuit” that performs a function:

a *soft start circuit* that provides a signal instructing said drive circuit to discontinue said drive signal when said magnitude of said oscillation signal is greater than a magnitude of said frequency variation signal.

’851 Patent col. 12 ll. 46–49 (emphasis added). Although the claim includes a functional description of the “soft start circuit,” the claim does not include the word “means.” Further, the claimed “soft start circuit” performs a straightforward function when a simple test is met: it “provides a signal” that cuts off the drive signal “when said magnitude of said oscillation signal is greater than a magnitude of said frequency variation signal.” This test is nothing more than a comparison of the magnitudes of two signals. The end result is simple: if the

comparison is met, an “off” signal is provided. The word “circuit” in combination with such a clear and unambiguous description of the circuit’s operation weighs heavily in favor finding sufficient structure to avoid means-plus-function claiming.

The district court expressed concern that an ordinarily skilled artisan would not “know the precise structures for a soft start circuit, because the function of a soft start circuit can be achieved in a variety of ways.” *Power Integrations*, 422 F. Supp. 2d at 459. Yet, we require only that the claim term be used in common parlance or by ordinarily skilled artisans to designate *sufficiently definite* structure, “even if the term covers a broad class of structures.” *Lighting World*, 382 F.3d at 1359–60. Here, as the district court pointed out, a variety of structures can be used to provide the claimed function. Nevertheless, viewed in the context of the claimed invention, the function recited is sufficiently clear, and definitely described, to suggest to the ordinarily skilled artisan a defined class of structures. As in *Abacus*, we have an input to the circuit (the oscillation and frequency variation signals), a straightforward function (comparing of the magnitudes of these signals), and an output (the signal provided to the drive circuit based on the comparison). This is sufficient structure in the context of the claimed invention to avoid the ambit of means-plus-function claiming.

The “soft start circuit” limitation of claim 4 of the ’851 Patent, therefore, recites sufficient structure to avoid means-plus-function claiming. The district court erred in construing this term as a means-plus-function limitation under § 112, ¶ 6.

## 2. CLAIMS 9 AND 14 OF THE '366 PATENT

We turn next to claims 9 and 14 of the '366 Patent. Claim 9 also includes a “soft start circuit”:

*a soft start circuit that provides a signal instructing said drive circuit to disable said drive signal during at least a portion of said maximum time period.*

'366 Patent col. 13 ll. 33–35 (emphasis added). Claim 14 depends from claim 9 and is therefore subject to the same limitation. This “soft start circuit” in the '366 patent, like the soft start circuit in claim 4 of the '851 Patent, provides a signal that cuts off the drive signal. The claim further informs us that the soft start circuit provides the cutoff signal “during at least a portion of said maximum time period.”

While we agree that this functional description is less illuminating than that recited in claim 4 of the '851 patent, we find that it suggests sufficient structure to an ordinarily skilled artisan. Power Integrations conceded that a skilled artisan would understand the claim limitation as referring to “various soft start circuit structures [which] accomplish the functions recited in the patent claims . . . .” J.A. 358. As such, an ordinarily skilled artisan reading the claim limitation in the context of the claimed invention, and in light of the specification, would understand that the limitation connotes “sufficiently definite structure for performing the identified functions.” *Apex*, 325 F.3d at 1373.

Having concluded our review of claim construction, we reverse the district court’s construction of the “soft start circuit” limitations in claim 4 of the '851 Patent and in claims 9 and 14 of the '366 patent. On remand, the

district court shall construe those claims according to our instructions and assess what effects, if any, the new constructions have on the validity of those claims and on Fairchild's infringement thereof. If the court determines that its constructions raise new, material issues of validity or infringement, the court shall determine whether to order a new trial. The court shall determine whether any such new, material issues are "distinct and separable" such that a new trial limited to those issues would not unduly prejudice either party. *Cf. Gasoline Prods. Co. v. Champlin Ref. Co.*, 283 U.S. 494, 500 (1931). If, in its discretion, the district court finds that any such new, material issues may be tried separately without prejudice, the court may limit any new trial accordingly. The court should consider the effects of any amendments made in reexamination.

#### V. OBVIOUSNESS

At trial, Fairchild argued that claim 1 of the '876 Patent would have been obvious in view of the prior art, which included U.S. Patent No. 4,638,417 (filed Jan. 20, 1987) ("Martin"). The jury returned a verdict of nonobviousness, and the district court denied Fairchild's motion for judgment as a matter of law (JMOL). Fairchild appeals the district court's denial of its JMOL motion, and asserts that claim 1 of the '876 Patent would have been obvious in view of Martin.

The parties agree that the salient difference between Martin and the '876 Patent is Martin's inclusion of an EPROM memory. Fairchild contends, however, that Martin's EPROM memory is not related to frequency-jittering and is only necessary to mask the signature of the power supply. Fairchild thus argues that removing the EPROM would have been obvious if signature masking was not required. Because frequency-jittering is

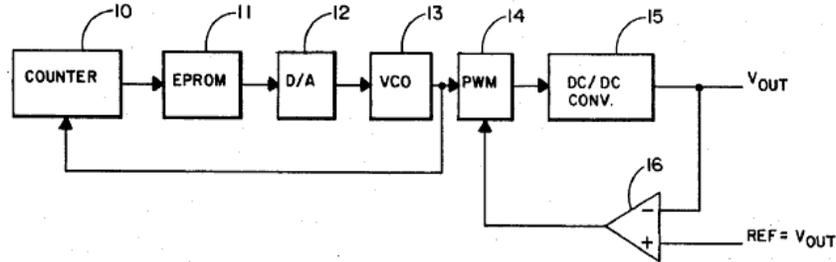
desirable independent of signature masking, Fairchild argues that the invention of the '876 Patent would have been obvious in view of Martin.

Power Integrations counters that nothing in the prior art suggests that Martin's EPROM "could or should be removed." Appellee's Br. 65. Power Integrations directs our attention to the many prior art references considered by Fairchild's expert, who by his own admission failed to uncover a single reference lacking Martin's EPROM memory. Power Integrations also cites evidence of secondary considerations of non-obviousness. The evidence of secondary considerations, Power Integrations argues, is sufficient to uphold the jury's verdict that the '876 Patent would not have been obvious.

Martin teaches "spread spectrum techniques" that operate in a manner similar to the "frequency-jittering" functionality of Power Integrations' '876 Patent. Martin's spread spectrum techniques, like the frequency-jittering of the '876 Patent, reduce generated EMI by spreading it over a range of frequencies. Martin discloses

[a] power density spectrum controller circuit which incorporates a programming element in conjunction with a voltage controlled oscillator and which uses spread spectrum techniques to provide a relatively clean output signal having little or no ripple, little or no noise and little or no signature while having a minimum output filtering requirement.

Martin, at [57] (abstract). Martin's sole figure shows the general layout of the disclosed power circuit:



A voltage controlled oscillator (VCO) (13) produces an oscillating signal which drives a pulse width modulator (PWM) (14). The VCO also feeds the oscillating drive signal back to a counter (10), which counts at a rate dependent on the oscillating drive signal's frequency. The output of the counter is connected to a memory device, EPROM (11), which stores a pseudo-random code in digital form. The counter output causes the EPROM to "selectively step[] . . . through its addressing routine in order to select the contents of a particular address." Martin col. 2 ll. 30–32. The digital output of the EPROM serves as input to a digital-to-analog converter (D/A) (12), which converts the digital output to an analog signal. This analog signal, in turn, controls the frequency of the oscillating drive signal produced by the VCO. The result is that the frequency of Martin's oscillating drive signal steps through a pseudo-random set of discrete frequency values, spreading out the power circuit's generated EMI and limiting its observable signature.<sup>3</sup> Martin refers to

<sup>3</sup> Limiting a power supply's signature—a unique signal pattern that "identifies [the power supply] much in the nature of a fingerprint"—is desirable in high-security applications. Martin col. 1 ll. 24–27. Without signature masking, a "signature signal can be used to identify a particular source . . . by means of appropriate spectrum analyzing." *Id.* col. 1 ll. 29–36.

this as “spread spectrum” technology.

Martin’s “spread spectrum” technology operates in essentially the same manner as the frequency-jittering in the ’876 Patent, with the exception that the ’876 Patent does not use an EPROM memory. Martin, on the other hand, always includes an EPROM memory between the counter and digital-to-analog converter (D/A). Martin does not teach removing the EPROM memory as in the ’876 Patent, nor does Martin suggest that it would be feasible to do so. Martin’s sole figure indicates that the EPROM is just as integral as the circuit’s other components. Nevertheless, on its face, Martin suggests to the ordinarily skilled artisan that the purpose of the EPROM is to mask the power circuit’s signature, not to reduce EMI through frequency-jittering.

Martin’s “spread spectrum” functionality arises from periodically changing the frequency of the oscillating drive signal. The cycles of the oscillating drive signal increment a counter, and changes to the counter’s value cause changes in the frequency of the oscillating drive signal. This is the same principle disclosed in Power Integrations’ ’876 Patent. Although Martin teaches, without exception, an EPROM memory between the counter and D/A, the ordinarily skilled artisan would understand that the EPROM is necessary only for signature masking. Essentially, Martin’s EPROM converts ordinary frequency-jittering, as in the ’876 Patent, to “masked” frequency-jittering. We thus agree with Fairchild that an ordinarily skilled artisan would have understood that Martin’s EPROM was used for signature masking and not for frequency-jittering.<sup>4</sup>

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<sup>4</sup> Listing Martin as an anticipatory prior art reference, the Patent Office’s Board of Patent Appeals and

Our inquiry does not end here, however, and we next turn to objective considerations, which we sometimes refer to as “secondary considerations,” as essential components of our obviousness analysis. *In re Cyclobenzaprine*, 676 F.3d at 1076–79. Objective evidence of nonobviousness can include copying, long felt but unsolved need, failure of others, commercial success, unexpected results created by the claimed invention, unexpected properties of the claimed invention, licenses showing industry respect for the invention, and skepticism of skilled artisans before the invention. *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998) (collecting cases). These objective considerations can protect against the prejudice of hindsight bias, which often overlooks that “[t]he genius of invention is often a combination of known elements which in hindsight seems preordained.” *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351 (Fed. Cir. 2001).

The record here is replete with testimony and other evidence demonstrating that Power Integrations’ patented technology was far less obvious than Martin on its face suggests. Power Integrations offered testimony that Martin’s EPROM adds expense and imposes design constraints, a good indication that removing the EPROM provided otherwise unexpected benefits. Another witness testified that, because of its components, Martin’s circuit cannot be integrated on a single chip. Dr. Horowitz, Fairchild’s obviousness expert, testified that he found approximately “fifty pieces of prior art,” which he “filtered down to seven.” When asked at trial whether “each and

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Interferences affirmed the examiner’s final rejection of claim 1 of the ’876 Patent in *ex parte* reexamination. *Ex parte Power Integrations, Inc.*, No. 2010-011021, Reexamination No. 90/008,326 (B.P.A.I. 22 Dec. 2010).

every one of those [seven] references . . . included [EP]ROMs,” Dr. Horowitz responded, “Of course.” More than 11 years passed between Martin’s 1987 issuance and Power Integrations’ filing of the ’876 Patent in 1998. Yet no one during those 11 years tapped Martin’s EPROM as a candidate for removal. One expert, who previously worked for Philips Electronics, testified that no one in the industry, including Philips, was able to come up with the patented invention.

Power Integrations also provided evidence of commercial success of the ’876 Patent. Various witnesses testified to the overwhelming success of the patented products, and they uniformly attributed this success to the patented features. Power Integrations touted the patented features in its advertising and marketing materials, as did Fairchild. One of Fairchild’s data sheets, for example, exclaims in bold, “Low EMI through Frequency modulation!”. A Fairchild engineer testified that Fairchild added “frequency scaling” functionality because it was “more effective” to reduce EMI and “because it was required by the customers.” Power Integrations has received a number of awards for its innovations. It characterizes its invention as collapsing customers’ demands “into a sexy power supply, something small.”

Significantly, Fairchild competed with Power Integrations by reverse engineering and copying of Power Integrations’ products. One Fairchild engineer testified to “looking at the circuit” of the ’876 Patent while developing the accused products. He testified that Fairchild obtained Power Integrations’ products and datasheets for “benchmarking,” which he said is “the same” as reverse engineering. Internal documents indicate that Fairchild kept track of at least some of its efforts to reverse engineer Power Integrations’ products. The record indicates that Fairchild fostered a corporate culture of copying, which

was not limited to the '876 Patent.

Considering Martin in light of the evidence in the record, the jury in the validity trial returned a general verdict that claim 1 of the '876 Patent would not have been obvious. Although the ultimate conclusion of obviousness is an issue of law, we must “presume that the jury resolved the underlying factual disputes in favor of the verdict winner and leave those presumed findings undisturbed if they are supported by substantial evidence.” *Starceski v. Westinghouse Elec. Corp.*, 54 F.3d 1089, 1100 (3d Cir. 1995). Objective evidence of secondary considerations is a factual dispute underlying obviousness. *Para-Ordnance*, 73 F.3d at 1088. We are thus bound to assume that the jury resolved the evidence of secondary considerations in favor of Power Integrations.

Having reviewed the record, we find substantial evidence of objective considerations of non-obviousness to support the jury's conclusion that claim 1 of Power Integrations' '876 Patent would not have been obvious to the ordinarily skilled artisan. Consequently, the district court was correct to deny Fairchild's motion for judgment as a matter of law.

## VI. DAMAGES

The district court bifurcated Power Integrations' infringement suit into two jury trials: the first addressing issues of infringement and damages, including willfulness, and the second addressing validity of Power Integrations' patents. Before the trial on infringement and damages, the parties agreed to a stipulation that Fairchild made or sold within the United States, or imported into the United States, a number of accused devices having a total value of \$765,724. At trial, counsel for Power Integrations read this stipulation into evidence

prior to testimony of Power Integrations' damages expert. Ultimately, the jury found that Fairchild had willfully infringed all asserted patents and awarded past lost profits due to lost sales (\$14,981,828) and price erosion (\$1,952,893), future lost profits due to price erosion (\$13,018,379), and a lump sum reasonable royalty (\$4,028,681), for a total damages award of \$33,981,781. In the trial on validity, the jury found all asserted claims valid.

After the trial on infringement and damages, Fairchild moved for remittitur, JMOL, or in the alternative, a new trial on damages. In its motion, Fairchild contended that the jury's damages award was contrary to law and unsupported by evidence. Specifically, Fairchild asserted that the jury's award was based on worldwide sales and therefore improperly rooted in Fairchild's extraterritorial use of the patented inventions.

The district court agreed with Fairchild and ruled that the total amount of the jury's damages award was contrary to law. The court nevertheless found that, because the jury heard evidence involving third-party sales in the United States, a portion of the award was supportable and appropriate under a theory of infringement by inducement. The court noted that Power Integrations had presented an inducement theory at trial, and pointed to evidence of Fairchild's intent to cause infringement in the United States. Based on this theory of inducement, the district court granted Fairchild's motion for remittitur and reduced the jury's damages award by 82%. The remaining 18%, the court said, represented U.S. sales for which Fairchild was liable by way of inducement. The court thus remitted the jury's original \$33 million award by 82% resulting in a total award to Power Integrations of \$6,116,720.58.

Concurrent with its order of remittitur, the district court issued a permanent injunction covering all asserted patent claims, and granted Fairchild's motion for a new trial on willfulness given this court's then-recent decision in *Seagate*, 497 F.3d 1360. Following a bench retrial of the willfulness issue held during June 2009, the district court found that Fairchild's infringement was willful in view of *Seagate*. In January 2011, the district court awarded Power Integrations enhanced damages for willful infringement by doubling the remitted damages award of \$6,116,720.58, for a total award of \$12,233,441.16, not including interest.

In reaching its determination of damages, the district court made two threshold decisions. First, the district court found that the jury's total damages award of over 33 million dollars was contrary to law. Second, the district court granted Fairchild's motion for remittitur and reduced the worldwide damages award by 82% based on a theory of induced infringement.

#### A. JURY AWARD

On cross-appeal, Power Integrations asserts error in the district court's determination that the jury's original damages award was contrary to law. Accordingly, Power Integrations asks us to reinstate the jury's original award as supported by both law and evidence.

In response, Fairchild makes two separate arguments. First, Fairchild argues that the district court correctly determined that the jury's damages award was based on worldwide sales and thus contrary to law. Second, Fairchild argues that in formulating its award the jury relied on inadmissible expert testimony.

We first consider whether the jury's original award has a valid basis in law.

### 1. WORLDWIDE SALES

Power Integrations argues that the jury's original award of worldwide damages was legally appropriate. Specifically, Power Integrations argues that it was foreseeable that Fairchild's infringement in the United States would cause Power Integrations to lose sales in foreign markets. Thus, Power Integrations argues, the law supports an award of damages for the lost foreign sales which Power Integrations would have made but for Fairchild's domestic infringement.

As legal authority for its position, Power Integrations recites established law that once a patentee demonstrates an underlying act of domestic infringement, the patentee is entitled to receive full compensation for "any damages" suffered as a result of the infringement.<sup>5</sup> *Gen. Motors Corp. v. Devex Corp.*, 461 U.S. 648, 654–55 (1983).

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<sup>5</sup> Our patent damages statute mandates, "[u]pon finding for the claimant the court shall award the claimant damages *adequate to compensate for the infringement*, but in no event less than a reasonable royalty." 35 U.S.C. § 284 (emphasis added). "Congress sought [by the statute] to ensure that the patent owner would in fact receive full compensation for 'any damages' he suffered as a result of the infringement." *Gen. Motors Corp.*, 461 U.S. at 654–55. Thus, "when a wrong has been done, and the law gives a remedy, . . . [t]he injured party is to be placed, as near as may be, in the situation he would have occupied if the wrong had not been committed." *Albemarle Paper Co. v. Moody*, 422 U.S. 405, 418–19 (1975) (quoting *Wicker v. Hoppock*, 73 U.S. (6 Wall.) 94, 99 (1867)).

According to Power Integrations, this principle of “full compensation” has no inherent, per se geographical limits. Power Integrations cites this court’s decision in *Rite-Hite*, where we explained that “[i]f a particular injury was or should have been reasonably foreseeable by an infringing competitor in the relevant market, broadly defined, that injury is generally compensable absent a persuasive reason to the contrary,” 56 F.3d at 1546, and urges us here to incorporate Fairchild’s foreign sales as part of “the relevant market.”

Power Integrations’ argument that the broad principles of “full compensation,” extend to cover Fairchild’s worldwide sales is not persuasive. It is axiomatic that U.S. patent law does not operate extraterritorially to prohibit infringement abroad. *Deepsouth Packing Co. v. Laitram Corp.*, 406 U.S. 518, 531 (1972), *superseded by statute*, Patent Law Amendments Acts of 1984, Pub. L. No. 98-622, 98 Stat. 3383 (codified at 35 U.S.C. § 271(f)), *as recognized in Microsoft Corp. v. AT&T Corp.*, 550 U.S. 437 (2007); *see also Brown v. Duchesne*, 60 U.S. (19 How.) 183, 195 (1856) (“Our patent system makes no claim to extraterritorial effect; these acts of Congress do not, and were not intended to, operate beyond the limits of the United States . . . .” (internal quotation marks omitted)). Even indirect infringement, which can encompass conduct occurring elsewhere, *see Merial Ltd. v. Cipla Ltd.*, 681 F.3d 1283, 1302–03 (Fed. Cir. 2012), requires underlying direct infringement in the United States, *Deepsouth*, 406 U.S. at 531. Our patent laws allow specifically “damages adequate to compensate *for the infringement.*” 35 U.S.C. § 284 (emphasis added). They do not thereby provide compensation for a defendant’s foreign exploitation of a patented invention, which is not infringement at all. *Brown*, 60 U.S. at 195 (“And the use of it outside of the jurisdiction of the United States is not an infringement of

his rights, and he has no claim to any compensation for the profit or advantage the party may derive from it.”).

Power Integrations’ “foreseeability” theory of worldwide damages sets the presumption against extraterritoriality in interesting juxtaposition with the principle of full compensation. Nevertheless, Power Integrations’ argument is not novel, and in the end, it is not persuasive. Regardless of how the argument is framed under the facts of this case, the underlying question here remains whether Power Integrations is entitled to compensatory damages for injury caused by infringing activity that occurred outside the territory of the United States. The answer is no.

Power Integrations is incorrect that, having established one or more acts of direct infringement in the United States, it may recover damages for Fairchild’s worldwide sales of the patented invention because those foreign sales were the direct, foreseeable result of Fairchild’s domestic infringement. Power Integrations has not cited any case law that supports an award of damages for sales consummated in foreign markets, regardless of any connection to infringing activity in the United States. To the contrary, the entirely extraterritorial production, use, or sale of an invention patented in the United States is an independent, intervening act that, under almost all circumstances, cuts off the chain of causation initiated by an act of domestic infringement. *Cf. Morrison v. Nat’l Australia Bank Ltd.*, 130 S. Ct. 2869, 2884 (2010) (“But the presumption against extraterritorial application would be a craven watchdog indeed if it retreated to its kennel whenever *some* domestic activity is involved in the case.”).

The district court determined that the jury had “clearly adopted the measure of damages posed by Power Inte-

grations expert, Dr. Troxel” in reaching the combined damages award of over \$33 million. In view of this determination, the district court correctly concluded that there was “no legal basis that supports the jury award in the amount of \$33 million” because Dr. Troxel’s estimate of \$30 million in damages was not “rooted in Fairchild’s activity in the United States.” Indeed, Dr. Troxel testified on cross-examination that he did not quantify an amount of damages based on any offer for sale by Fairchild in the United States. We find neither compelling facts nor a reasonable justification for finding that Power Integrations is entitled to “full compensation” in the form of damages based on loss of sales in foreign markets which it claims were a foreseeable result of infringing conduct in the United States. *See F. Hoffmann-La Roche Ltd. v. Empagran S.A.*, 542 U.S. 155, 166 (2004) (finding it unreasonable to apply the law at issue to conduct that is significantly foreign, “*insofar as that conduct causes independent foreign harm and that foreign harm alone gives rise to the plaintiff’s claim*”).

We thus reject Power Integrations’ argument that there exists a legal basis sufficient to uphold the jury’s original damages award, which was based on worldwide sales and hold that the district court correctly decided that the jury’s original damages award was contrary to law.

## 2. EXPERT TESTIMONY ON DAMAGES

Fairchild additionally challenges the evidentiary basis of the jury’s award, which was based on a damages estimate provided at trial by Power Integrations’ damages expert Dr. Troxel. Dr. Troxel formulated his estimate based on a document describing worldwide shipments of mobile phones during the third quarters of 2004 and 2005. Although the document relates generally to world-

wide sales of mobile phones from all vendors, it contains more detailed information for some vendors, including Samsung. Specifically, Dr. Troxel relied on a table in the document that indicates that during the third quarter of 2005, Samsung shipped 26.8 million phones worldwide, up from 22.7 million phones during the third quarter in 2004. Dr. Troxel used the worldwide sales data for Samsung's mobile phones to estimate sales of the accused power circuits, which Samsung incorporated into its mobile phone chargers.

On appeal, Fairchild argues that Dr. Troxel's testimony was speculative and his data inadmissible. In Fairchild's view, Dr. Troxel's methodology suffered from layered assumptions and unwarranted speculation. Fairchild insists that Dr. Troxel made two speculative leaps in his analysis: First, he assumed that each Samsung mobile phone included a charger. Second, he assumed that each of these chargers incorporated an infringing power circuit. Fairchild further argues that the document on which Dr. Troxel relied for Samsung's sales data was an unauthenticated hearsay "press release" retrieved from the Internet. In sum, Fairchild argues that Dr. Troxel's testimony, in view of his methodology and data sources, was uniquely unreliable and legally inadmissible.

Power Integrations responds that Dr. Troxel's methodology was reasonable and his data source reliable. According to Power Integrations, Dr. Troxel's methodology did not require any more speculation than is usually permitted in calculating compensatory damages. Power Integrations further argues that because the document on which Dr. Troxel relied in his expert analysis would be reasonably relied upon by experts in his field, the document need not be independently admissible.

In determining damages, a jury may rely on expert testimony. 35 U.S.C. § 284. District courts, as gatekeepers, must nevertheless ensure that all expert testimony is rooted in firm scientific or technical ground. *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 589–90 (1993); *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 148 (1999). To that end, the Federal Rules of Evidence require that an expert’s testimony be the product of reliable principles and methods applied to sufficient facts or data. Fed. R. Evid. 702(b),(c). The trial judge must ensure that the expert has “reliably applied the principles and methods to the facts of the case.” *Id.* at 702(d). Data relied on by the expert “need not be admissible for the opinion to be admitted” if experts in the field would reasonably rely on such data. Fed. R. Evid. 703. The trial judge must have considerable leeway in deciding how to determine whether the expert’s testimony is sufficiently reliable. *Kumho Tire*, 526 U.S. at 152.

Here, Dr. Troxel’s damages testimony was unreliable in several respects. Initially, the source of the documents on which Dr. Troxel relied for his estimate of Samsung’s worldwide sales is unclear. When asked whether the provider of the documents “found [them] off the internet,” Dr. Troxel responded, “I can only assume so.” Power Integrations’ only response to the questionable source of Dr. Troxel’s sales documents is that Dr. Troxel “was a qualified expert, and he found the [documents] and other materials he considered, while researching the case.” We disagree with Power Integrations that the source and reliability of data relied upon by an expert is otherwise immaterial. Our rules of evidence require that an expert’s testimony be “the product of reliable principles and methods” applied to “sufficient facts or data.” Fed. R. Evid. 702(b),(c). Thus, while an expert’s data need not be admissible, the data cannot be derived from a manifestly unreliable source. *See Montgomery County v. Microvote*

*Corp.*, 320 F.3d 440, 448 (3d Cir. 2003) (finding expert's data source unreliable where "some of the things that were shown to [the expert] he didn't seem to know where they were from or what the source of them were"); *cf. Emigh v. Consol. Rail Corp.*, 710 F. Supp. 608, 612 (W.D. Pa. 1989) ("[W]hen the underlying source is so unreliable as to render it more prejudicial than probative, . . . Rule 703 cannot be used as a backdoor to get the evidence before the jury.").

While Dr. Troxel's data source was unreliable, so was his methodology. Here, Dr. Troxel made two speculative leaps. First, the document on which Dr. Troxel relied for his worldwide damages estimate indicated worldwide shipments of Samsung's mobile phones. As Dr. Troxel testified, however, the infringing power circuits were found in mobile phone chargers, not in mobile phones. Dr. Troxel's sales document does not mention chargers or otherwise indicate sales of chargers. His analysis assumed that each of Samsung's phones shipped with a charger. While Power Integrations is quick to point out that Dr. Troxel's assumption was not unreasonable, the document relied upon by Dr. Troxel does not specify the nature of the shipments, nor does it provide any reliable link which might indicate that the shipped phones included chargers. Without more, we cannot safely assume that all of these shipments must have included a charger.

Dr. Troxel's second speculative step was when he assumed from his document not only that each of Samsung's shipments included a charger, but that each of these chargers incorporated an infringing power circuit. Dr. Troxel's sales document lists no model numbers or other indicia from which he could reasonably infer that chargers assumed to be included incorporated Fairchild's infringing power circuits. Power Integrations' Vice President of Worldwide Sales testified at trial that several

other companies sold competing power circuits to Samsung. Further, Power Integrations retained more than 50% of Samsung's business. Thus, the data indicate that at least some of Samsung's chargers could have incorporated the competing power circuits or Power Integrations' own circuits, which do not infringe. Dr. Troxel had no way to distinguish between infringing and noninfringing chargers, and his assumption that all chargers incorporated an infringing power circuit was speculation.

In the end, we are left with an expert opinion derived from unreliable data and built on speculation. Without more, Dr. Troxel's testimony and data regarding worldwide shipments of Samsung's mobile phones are too far removed from the facts of this case, which involves Fairchild's infringing power circuits. Dr. Troxel's layered assumptions lack the hallmarks of genuinely useful expert testimony. *Kumho Tire*, 526 U.S. at 156. Such unreliable testimony frustrates a primary goal of expert testimony in any case, which is meant to place experience from professional specialization at the jury's disposal, not muddle the jury's fact-finding with unreliability and speculation.

For these reasons, we find that the district court abused its discretion in admitting Dr. Troxel's testimony, which was both unreliable and based on insufficient data. In view of our other holdings in this case, we do not find that the district court's decision to admit Dr. Troxel's testimony warrants a new trial.

#### B. REMITTITUR

Upon rejecting the jury's original damages award, the district court considered "the alternatives presented at trial," and accepted Power Integrations' argument that 18% of the infringing devices sold worldwide are eventual-

ly imported into the United States by unnamed third parties. Although in such cases the unnamed third parties—not Fairchild—would directly infringe the patents, the court found that the jury had grounds to find Fairchild liable under a theory of infringement by inducement. As evidence of Fairchild’s intent to induce infringement, the district court cited Power Integrations’ evidence that Fairchild had indemnified its largest offshore customers for potential infringement in the United States, including Fairchild’s “joint defense agreement with Samsung and one of [Samsung’s] largest cell phone charger subcontractors, Dongyang.”

Based on its review, the district court determined that sufficient evidence existed to support a portion of the jury’s award “to the extent it was based on inducement of infringement.” *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 589 F. Supp. 2d 505, 512 (D. Del. 2008). The court based its determination on testimony from Power Integrations’ expert that 18% of Samsung’s worldwide sales were eventually imported into the United States. “[T]his figure,” the court said, “necessarily means that 82% are not imported into the United States.” *Id.* Accordingly, the court “reduce[d] the jury’s damages award by 82%, representing that portion of the infringing products not imported into the United States.” *Id.*

The 18% domestic sales figure which the district court adopted is based in the testimony of Dr. Troxel, Power Intergrations’ expert. To support his testimony that 18% of Samsung’s mobile phones sold worldwide are imported into the United States, Dr. Troxel relied on a combination of two documents: The first document, which we discuss above in relation to the jury’s award, indicates worldwide shipments of Samsung mobile phones for the third quarters of 2004 and 2005. The second document indicates total sales of Samsung mobile phones in the United

States during the third quarter of 2005. Like the first document, the data in the second document relate only to mobile phones, and not to chargers or power circuits. Combining the data in these two documents, Dr. Troxel calculated the percentage of Samsung's worldwide sales during the third quarter of 2005 that represented mobile phones eventually sold in the United States.

On appeal, Fairchild argues that the district court improperly relied on Dr. Troxel's estimates in formulating its remitted damages award. Specifically, Fairchild argues that Dr. Troxel's testimony regarding domestic infringing sales was speculative, based on hearsay internet articles, and ultimately inadmissible. Thus, Fairchild argues that Dr. Troxel's testimony regarding third-party domestic sales was not sufficient to sustain the district court's remitted damages award. Fairchild further argues that the evidence does not support an award of damages for infringement by inducement, which requires both specific intent and underlying direct infringement. Accordingly, while Fairchild agrees with the district court that the original jury award was contrary to law and unsupported by the evidence, Fairchild argues that the district court's remitted damages award was similarly improper.

The district court's decision to base its remittitur on the 18% figure provided by Dr. Troxel gives credence to the saying that a tainted data base produces flawed results. Setting aside whether the decision to grant remittitur was correct, the evidence on the record does not support the district court's decision to base its remitted damages award on a percentage of Samsung's worldwide sales of mobile phones.

First, the district court erred when it relied on Samsung's worldwide sales of mobile phones as evidence, in

value or quantity, of sales of Fairchild's infringing components. As we hold above with respect to the testimony of Dr. Troxel, such reliance is impermissibly speculative. The subject data include no indicators that could appropriately be used to identify infringing sales. Thus, the evidence demonstrates no direct connection between Samsung's worldwide sales of mobile phones and sales of Fairchild's infringing power circuits. See *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 1 F. App'x 879, 883–84 (Fed. Cir. 2001) (“[I]n cases in which there is a question whether every sale leads to an instance of direct infringement, a patentee must . . . establish the connection between sales and direct infringement.”).

Second, the district court erred when it accepted Dr. Troxel's assumption that 18% of Samsung's worldwide sales, in value or quantity, were infringing sales made in the United States. Dr. Troxel based his assumption on a combination of his first document indicating worldwide sales of Samsung's mobile phones, and his second document indicating sales of the same in the United States. Arguably, Dr. Troxel's data indicate that during the relevant period 18% of Samsung's worldwide sales of mobile phones were sales in the United States. Nevertheless, the data do not support Dr. Troxel's assumption that the 18% of Samsung's mobile phones sold in the United States included chargers incorporating Fairchild's infringing circuits. In fact, evidence was presented that Samsung sold chargers that did not incorporate Fairchild's infringing circuits. As a result, Dr. Troxel's assumption that all purported U.S. sales included infringing circuits amounts to pure speculation. Although direct evidence of infringement is not required, we consistently require that the record demonstrate something more than speculation that infringing activity has occurred. See *E-Pass Techs., Inc. v. 3Com Corp.*, 473 F.3d 1213, 1222 (Fed. Cir. 2007)

("[I]t requires too speculative a leap to conclude that any customer actually performed the claimed method.").

In sum, Dr. Troxel did not present evidence linking Samsung's mobile phone sales data to Fairchild's infringing power circuits, other than to say that Fairchild sold its infringing components to Samsung. There is no evidence that the imports of Samsung products included chargers, nor is there evidence that any included chargers incorporated Fairchild's infringing circuits. Accordingly, the amount of the district court's remittitur is not supported by substantial evidence, and we hold that the district court erred in relying on Dr. Troxel's inherently speculative 18% figure.

For the reasons above, we find that Power Integrations adduced insufficient evidence of induced infringement to sustain the district court's award of damages under that theory. Because there was no basis upon which a reasonable jury could find Fairchild liable for induced infringement, we vacate the district court's damages award.

### C. DIRECT INFRINGEMENT

Before the trial on infringement and damages, the parties agreed to a stipulation that Fairchild made or sold within the United States, or imported into the United States, accused devices having a total value of \$765,724.<sup>6</sup>

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<sup>6</sup> While the parties on appeal do not dispute that \$765,724 is the correct value of the accused products included in their stipulation, we note an ambiguity in the record: The stipulation to which the parties have directed us, and which was read into evidence at trial, specifies that between February 2004 and October 2005 Fairchild

The parties' stipulation relates to Fairchild's own manufacture, sale, or importation, which on a finding of infringement would amount to stipulated direct infringement. Fairchild noted the stipulation before the district court in its motion for remittitur, JMOL, or a new trial on damages, and again notes the stipulation in its brief on appeal. At trial, counsel for Power Integrations read the parties' stipulation into evidence prior to testimony of Power Integrations' damages expert Dr. Troxel. Power Integrations ultimately argued at trial that Fairchild was liable for infringing activity beyond the scope of the stipulation, based on comingled theories of direct and induced infringement.

The jury returned a general verdict awarding Power Integrations a total of \$33,981,781 in damages. The jury's total award was divided into individual awards for past lost profits due to lost sales (\$14,981,828), past and future lost profits due to price erosion (\$1,952,893 and \$13,018,379), and a lump sum reasonable royalty (\$4,028,681). Although the district court instructed the jury on both direct and indirect infringement, the verdict form did not specify whether the jury's award was based on a finding of direct infringement, infringement by inducement, or both. In its order of remittitur, however, the district court made clear that its remitted award, representing 18% of the jury's original damages award, was based on Power Integrations' theory of induced infringement.

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manufactured, using a particular process, 2.73 million units of a particular accused device at a fabrication facility in Portland, Maine for a total *revenue* to Fairchild of \$547,724. On remand, the district court should review and evaluate this discrepancy.

As we have already concluded, the record contains insufficient evidence to support Fairchild's liability for induced infringement. The record, however, does reflect evidence that would support a finding of Fairchild's liability for direct infringement. Fairchild stipulated that it made or sold within the United States, or imported into the United States, accused devices worth \$765,724. This stipulation to Fairchild's domestic activity was read into evidence and considered by the jury in the infringement trial. Following the jury's infringement verdict, Fairchild's stipulation became essentially a stipulation to direct infringement. Thus, the record supports a finding of Fairchild's liability for direct infringement, at least with respect to the products included in the stipulation.

Where, as here, the jury returns a general verdict, we must "presume[] the existence of fact findings implied from the jury's having reached that verdict." *Starceski v. Westinghouse Elec. Corp.*, 54 F.3d 1089, 1100 (3d Cir. 1995) (quoting *R.R. Dynamics, Inc. v. A. Stucki Co.*, 727 F.2d 1506, 1516 (Fed. Cir. 1984)). Infringement and damages are findings of fact, and we review a jury's findings on both issues for substantial evidence. *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1309–10 (Fed. Cir. 2009). Here, we must presume that the jury's original \$33 million award was based on a finding of direct infringement, and we must honor's the jury's determination of damages to the extent supported by substantial evidence. See U.S. Const. amend. VII; *Starceski*, 54 F.3d at 1100.

Based on the foregoing, we affirm the jury's implicit finding that Fairchild is liable to Power Integrations for direct infringement. See *Starceski*, 54 F.3d at 1100. We find the issue of damages from Fairchild's direct infringement "so distinct and separable from the others that a trial of it alone may be had without injustice." See

*Gasoline Prods.*, 283 U.S. at 500. On remand, therefore, the district court shall hold a new trial to determine the proper amount of damages for Fairchild’s direct infringement that is supported by substantial evidence in the existing record. We anticipate that Fairchild’s liability for direct infringement will be commensurate in scope with the accused domestic activity to which Fairchild stipulated. Nevertheless, the parties on appeal have not briefed this issue, and we acknowledge that the district court is most fit to make this determination in the first instance.

#### D. PRICE EROSION

Before the trial on infringement and damages, Fairchild moved the district court for partial summary judgment on the issue of pre-suit damages. In its motion, Fairchild asserted that Power Integrations had failed to mark its patented products in accordance with 35 U.S.C. § 287, the patent marking statute. Therefore, Fairchild argued, the marking statute precluded Power Integrations from relying on *any* “economic or market data prior to the date” Fairchild was notified of its infringement.<sup>7</sup>

The district court granted Fairchild’s motion for par-

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<sup>7</sup> We refer to the date Power Integrations first notified Fairchild of its alleged infringement as “the date of notice” or “the notice date.” Here, the district court determined and the parties do not dispute that the notice date is October 20, 2004, the date on which Power Integrations first filed suit against Fairchild. *See* 35 U.S.C. § 287(a) (“Filing of an action for infringement shall constitute such notice.”); *see also U.S. Philips Corp. v. Iwasaki Elec. Co. Ltd.*, 505 F.3d 1371, 1374 (Fed. Cir. 2007).

tial summary judgment. The court specifically “grant[ed] Fairchild’s request that all actual damages calculations be based on conditions occurring on or after the October 20, 2004 notice date.” *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, No. 04-CV-1371, ECF No. 265 (D. Del. Jun. 2, 2006). By its ruling, the court prohibited Power Integrations from introducing evidence that Fairchild’s pre-notice infringing sales had depressed the market price of the patented products, thus reducing Power Integrations’ profits on sales *after* the notice date.

Power Integrations cross-appeals the district court’s decision to exclude evidence of pre-notice price erosion for the purpose of calculating damages from Fairchild’s post-notice infringement. Power Integrations urges that, while the marking statute precludes recovery of damages for infringement before the notice date, the statute does not require courts to ignore pre-notice price erosion when calculating damages for post-notice infringement. Thus, Power Integrations argues the district court erred in excluding evidence of pre-notice market data for use in calculating damages for Fairchild’s infringement that occurred after the notice date. According to Power Integrations, the court should have admitted evidence regarding price changes from the start of Fairchild’s infringing activity for use in determining compensation for Fairchild’s post-notice infringements. Power Integrations suggests that, when assessing compensable price erosion for post-notice infringements, we must assess market conditions at the time Fairchild’s infringing products first entered the market.

Lost revenue caused by a reduction in the market price of a patented good due to infringement is a legitimate element of compensatory damages. Indeed, an “infringer’s activities do more than divert sales to the infringer. They also depress the price [of the patented

product]. Competition drives price toward marginal cost.” *In re Mahurkar Double Lumen Hemodialysis Catheter Patent Litig.*, 831 F. Supp. 1354, 1384 (N.D. Ill. 1993), *aff’d.*, 71 F.3d 1573 (Fed. Cir. 1995). Because the patentee is entitled to what she would have made “had the Infringer not infringed,” *Aro*, 377 U.S. at 507, damages for infringement may account for both lost sales and reduction of prices due to infringing competition, see *Yale Lock Mfg. Co. v. Sargent*, 117 U.S. 536, 551 (1886) (“Reduction of prices, and consequent loss of profits, enforced by infringing competition, is a proper ground for awarding damages.”). We thus recognize the economic principle of “price erosion” in calculating compensatory damages for patent infringement. See *Crystal Semiconductor Corp. v. TriTech Microelectronics Int’l, Inc.*, 246 F.3d 1336, 1357 (Fed. Cir. 2001).

The patent marking statute limits recoverable damages where a patentee fails to mark her patented products. 35 U.S.C. § 287; see also *Wine Ry. Appliance Co. v. Enter. Ry. Equip. Co.*, 297 U.S. 387, 397 (1936) (“All these acts reveal the purpose to require that marks be put on patented articles for the information of the public.”). Where a patentee does not appropriately mark her products, she may not recover damages for infringement occurring before notice to the infringer.<sup>8</sup>

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<sup>8</sup> The marking statute provides, with respect to damages,

In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event *damages*

The marking statute provides a temporal limitation on *damages* for infringement. It does not define—nor does it redefine—acts of infringement. That task is left to 35 U.S.C. § 271(a), which provides that “whoever without authority makes, uses, offers to sell, or sells any patented invention . . . infringes the patent.” 35 U.S.C. § 271(a). While the marking statute limits recovery of damages for infringement occurring before the “infringer was notified *of the infringement*,” the statute refers to the pre-notice infringing activity as “infringement.” 35 U.S.C. § 287(a) (emphasis added). Indeed, pre-notice infringement is still infringement. What differs is that a patentee may not recover damages for such pre-notice infringement.

In *Wang*, we were faced with a similar situation. There, the patentee’s failure to mark its patented products precluded recovery of damages for infringement prior to notice. There were, however, post-notice infringing sales for which damages were legally recoverable, and the district court endeavored to determine a reasonable royalty rate for these post-notice sales. The district court determined that the date of a hypothetical royalty negotiation should be the date of notice rather than “the earlier date, the date on which the patents issued and infringement of the invention technically began, but for which plaintiffs are barred by 35 U.S.C. § 287 from seeking damages.” We reversed on appeal because “the court confused limitation on damages due to lack of notice with determination of the time when damages first began to accrue, and it is the latter which is controlling in a hypothetical royalty determination.” *Wang Labs., Inc. v.*

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*may be recovered only for infringement occurring after such notice.*

35 U.S.C. § 287(a) (emphasis added).

*Toshiba Corp.*, 993 F.2d 858, 870 (Fed. Cir. 1993).

We thus acknowledged in *Wang* that while the marking statute precludes recovery of damages for pre-notice infringement, we must assess damages for post-notice infringement relative to market conditions at the point in time when infringement began.<sup>9</sup> Even the infringer's pre-notice infringing activity is part of her whole infringement, and it is the whole of her infringement which we must consider in calculating damages for legally compensable post-notice infringement. To the extent an infringer's pre-notice infringement erodes the market price of a patented product, that price erosion is relevant in determining for each post-notice act of infringement what the patentee would have made *but for the infringement*. See *Aro*, 377 U.S. at 507 (asking what the patentee would have made "had the [i]nfringer *not infringed*" (emphasis added)); *Amstar Corp. v. Envirotech Corp.*, 823 F.2d 1538, 1543 (Fed. Cir. 1987) ("In a market with only two viable competitors, one may infer that the patentee would have made the infringer's sales or charged higher prices but for the infringing competition."). Accordingly, we hold that a price erosion analysis relating to damages arising from post-notice infringement must measure price changes against *infringement-free* market conditions, and thus the proper starting point of such a price erosion analysis is the date of first infringement.

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<sup>9</sup> Indeed, the marking statute's temporal limitation on damages does not legitimize pre-notice infringement. That infringing activity, quite definitely, remains an intrusion on the patentee's exclusive right. Rather, the marking statute operates precisely to preclude recovery of each quantum of damage—that is, each lost sale or reasonable royalty payment—that arises from an act of pre-notice infringement.

The district court's decision to exclude Power Integrations' evidence of pre-notice price erosion was incorrect as a matter of law. We thus reverse the district court's grant of partial summary judgment for Fairchild. In the new trial on damages for direct infringement, the district court shall admit Power Integrations' evidence of pre-notice price erosion that is relevant in calculating damages for Fairchild's post-notice direct infringement.

#### E. ACCOUNTING

Following both jury trials, Power Integrations moved the district court for an accounting of Fairchild's post-verdict infringing sales. The district court denied the motion due to Power Integrations' failure to request an accounting either in its amended complaint or in the parties' joint pretrial order. The district court acknowledged some ambiguity as to whether Fairchild had agreed to an accounting earlier in litigation; nevertheless, the court found that Power Integrations had not "preserved its rights to an accounting by expressly requesting one in either its Amended Complaint or the Final Pretrial Order." *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, No. 04-CV-1371, 2008 WL 5263899, at \*1 (D. Del. Dec. 12, 2008).

Power Integrations cross-appeals the district court's denial of its post-trial motion for an accounting. Power Integrations contends that our decision in *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1213 (Fed. Cir. 2010), requires an accounting of post-verdict damages.

In Fairchild's view, *Finjan* does not control here. Unlike in *Finjan*, Fairchild argues, the timing of Power Integrations' motion for a post-verdict accounting is extremely prejudicial. Fairchild insists that Power Integrations' request for an accounting is a veiled attempt to

remedy its deficient damages case. Fairchild urges us not to give Power Integrations a “second bite at the apple.”

Despite Fairchild’s objection, our decision in *Finjan* is on point. There, Finjan challenged the district court’s decision to deny Finjan an accounting for post-judgment damages. *Id.* at 1212. The defendants argued that Finjan had waived its right to an accounting because Finjan’s complaint sought only “such damages as it shall prove *at trial.*” *Id.* at 1213. We found that “nothing in this statement forfeited the right to prove damages for sales that occurred after trial,” and accordingly, we rejected the defendant’s waiver argument. *Id.* We noted that Finjan’s complaint additionally sought “[s]uch further and other relief as the Court and/or jury may deem proper and just,” and we found no prejudice from the timing of Finjan’s motion. *Id.* “Therefore,” we held, “the district court should have awarded compensation for any infringement prior to the injunction.” *Id.*

Power Integrations is correct that it was entitled to an accounting for Fairchild’s post-verdict infringement.<sup>10</sup> We

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<sup>10</sup> See *Finjan*, 626 F.3d at 1212–13; see also 35 U.S.C. § 284 (2012) (“When damages are not found by a jury, the court *shall* assess them.”) (emphasis added); *Ecolab, Inc. v. FMC Corp.*, 569 F.3d 1335, 1353, *amended on reh’g in part*, 366 F. App’x 154 (Fed. Cir. 2009) (“To the extent that an accounting is so required—e.g. to calculate and award damages for post-verdict sales—the district court should order an accounting on remand.”); *Fresenius USA, Inc. v. Baxter Int’l, Inc.*, 582 F.3d 1288, 1303 (Fed. Cir. 2009) (“A damages award for pre-verdict sales of the infringing product does not fully compensate the patentee because it fails to account for post-verdict sales of repair parts.”); *Carborundum Co. v. Molten Metal Equip. Innova-*

see nothing in the record to suggest that Power Integrations waived its right to a post-verdict accounting. In its complaint, Power Integrations requested, among other things, “money damages sustained as a result of defendants’ infringement.” This statement contains no temporal limit on the damages requested. Power Integrations’ complaint further requested “such other and further relief as this Court finds just and proper.” As in *Finjan*, this open-ended request confirms that Power Integrations intended no waiver of any appropriate remedy. In any event, Power Integrations’ purported waiver was unclear enough that the district court found it “ambiguous” whether Fairchild had actually agreed at some point to an accounting. Based on the foregoing, we cannot see how Power Integrations waived its right to an accounting.

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*tions, Inc.*, 72 F.3d 872, 882 (Fed. Cir. 1995) (explaining that patentee is “not fully compensated” if “damages award did not include future lost sales.”); accord *Edwards Lifesciences AG v. CoreValve, Inc.*, No. 08-91-GMS, 2011 WL 446203, at \*16 (D. Del. Feb. 7, 2011), *aff’d in part, remanded in part*, 699 F.3d 1305 (Fed. Cir. 2012) (“The court will grant . . . an accounting of the number of [infringing] devices made, used, sold . . . through the date of the order accompanying this memorandum.”); *TruePosition Inc. v. Andrew Corp.*, No. Civ. 05-747-SLR, 2009 WL 1651042, at\*1 n.2 (D. Del. June 10, 2009), *aff’d*, 389 F. App’x 1000 (Fed. Cir. 2010) (“The court permitted additional discovery . . . to complete a post-trial accounting of damages.”); *Becton Dickinson & Co. v. Tyco Healthcare Grp. LP*, No. 02-1694 GMS, 2008 WL 4745882, at \*5 (D. Del. Oct. 29, 2008) (“BD’s request for a post-verdict accounting of damages and interest that BD has incurred from the sale of [the infringing devices] . . . since October 7, 2007, is GRANTED.”).

We reverse the district court's denial of Power Integrations' motion for an accounting. We are nevertheless sympathetic to Fairchild's insistence that a reversal on this issue should not give Power Integrations "a second bite at the apple." Accordingly, the district court on remand shall limit the scope of its accounting to those post-verdict infringing sales, if any, which are substantially related to the direct infringement by Fairchild which the district court finds supported by the existing record. *See* Fed. R. Civ. P. 59 ("The court may, on motion, grant a new trial on all or some of the issues . . ."); *cf.* *Gasoline Prods.*, 283 U.S. at 500 (explaining that partial new trial is permissible if "issue to be retried is so distinct and separable from the others that a trial of it alone may be had without injustice"). At this point, Power Integrations has had a full and fair opportunity to develop the record, and its right to a post-verdict accounting is not an unlimited after-hours hunting license.

## VII. CONCLUSION

In accordance with the foregoing, we affirm the district court's ruling on obviousness. We reverse the district court's construction of the "soft start circuit" limitations in claim 4 of the '851 Patent and in claims 9 and 14 of the '366 Patent. We remand for the district court to construe those claims and determine what effects, if any, the new constructions have on the validity of those patents and on Fairchild's infringement thereof. We vacate the district court's award of damages based on infringement by inducement, and we remand for a new trial on damages resulting from Fairchild's direct infringement. We order an accounting limited to post-verdict infringing sales related to Fairchild's direct infringement. Finally, we vacate the district court's finding of willful infringement, and we remand with instructions to reassess willfulness in view of our other holdings in this case.

**AFFIRMED-IN-PART, REVERSED-IN-PART,  
VACATED-IN-PART, AND REMANDED**

**COSTS**

Each party shall bear its own costs.