United States District Court,
N.D. California.

QUALITY SEMICONDUCTOR, INC,
Plaintiff.
v.
PERICOM SEMICONDUCTOR, INC,
Defendant.

No. C-95-01785 MHP

March 2, 1998.

MEMORANDUM AND ORDER

PATEL**, Chief J.**

Plaintiff Quality Semiconductor, Inc. ("Quality") brought this action against defendant Pericom Semiconductor Corporation ("Pericom"), alleging infringement of U.S. Patent No. 5,289,062 ("the '062 patent") in violation of 37 U.S.C. section 271. Now before this court is the claim construction of the patent terms in dispute.

Having considered the parties' arguments and submissions, and for the reasons set forth below, the court enters the following memorandum and order.

BACKGROUND

Quality is the assignee of the '062 patent, which was issued on February 22, 1994, to David C. Wyland, for an invention entitled "Fast Transmission Gate Switch," also known as the "Quickswitch," a device that switches high speed signals between computer and logic devices. Quality filed a patent infringement suit alleging that Pericom was infringing the '062 patent. Pericom denied the allegation and counterclaimed for a declaratory judgment that the '062 patent is invalid, unenforceable and not infringed by Pericom's fast transmission gate switch products.

Quality asserts claims 1 and 3-6 of its patent against Pericom. Claims 1 and 5 contain similar disputed terms, and claims 4 and 6 contain a similar disputed terms. The parties have agreed that where two claims have similar disputed terms, the same construction will be applied to both claims. Claim 1 of the '062 patent states:

A fast transmission, integrated circuit switching device responsive to at least one external on/off control signal and including a first input/output node and a second input/output node, said switching device operative to pass or block the bidirectional transmission of external data signals between said first node and said second node, said switching device comprising:

a bidirectional field-effect transistor including a first input/output terminal and a second input/output terminal and a gate terminal, said first terminal being connected to said first node and said second terminal being connected to said second node, whereby said transistor passes bidirectional external data signals between said first and second nodes when said transistor is turned on and blocks the passage of external data signals between said first and second nodes when said transistor is turned off;

Wherein said field-effect transistor has a channel length of no more than 1.5 microns and has a channel width of no less than 1,000 microns, whereby said transistor exhibits a time constant of no more than 0.5 nanoseconds;

a driver circuit including an external terminal for receiving at least one external on/off control signal;

Wherein said driver circuit provides an internal on/off control signal to said gate terminal of said field-effect transistor, whereby said transistor is turned off or on.

Claim 4 of the Quickswitch patent states:

The device of claim 1, wherein the first terminal is connected directly to the first input/output node; and the second terminal is connected directly to the second input/output node.

The parties' dispute the meaning of the term "transistor" and the "whereby" clause contained in claim 1, and the phrase "connected directly" as contained in claims 4 and 6.

LEGAL STANDARD

Under Markman v. Westview Instruments, Inc., 52 F.3d 967, 970-71 (Fed.Cir.1995), *aff'd,* 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996), the court "has the power and obligation to construe as a matter of law the meaning of language used in the patent claim." The meaning of claims is ascertained from consideration of three sources: the claim language, the patent specification, and the prosecution history. *See* Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996). In construing the meaning of the claim language, the court should look first to the intrinsic evidence, i.e., to the claims themselves, then to the written description portion of the specifications to aid in defining the terms used in the claims, and finally, to the prosecution history if necessary. Id. Ordinarily, this intrinsic evidence should be sufficient to resolve any ambiguities and determine the meaning of the claims. Id. at 1583. For instance, the Markman court noted that "ideally" there should be no ambiguity in the claim language to one of ordinary skill in the art that would require resort to evidence outside the specification and the prosecution history. Bell & Howell Document Mgmt. Prod. Co. v. Altek Systems, 132 F.3d 701, 705-06 (Fed.Cir.1997) (citing Markman, 52 F.3d at 986). When the intrinsic evidence is unambiguous, it is improper for the court to rely on extrinsic evidence such as expert testimony for the purposes of claim construction. Vitronics, 90 F.3d at 1583.

Reliance on extrinsic evidence to interpret claims is proper only when claim language "remains genuinely ambiguous after consideration of the intrinsic evidence," Bell, 132 F.3d at 706, and should be used only to aid the court in "coming to the proper understanding of the claims" and the technology involved. Vitronics, 90 F.3d at 1583. Expert testimony is to be eschewed and used only as a last resort. Id. Thus, the courts should prefer other types of extrinsic evidence such as dictionaries and prior art documents over expert testimony. Id. at 1585.

The rationale for refraining from turning to expert testimony when the intrinsic evidence is unambiguous applies equally well as a cautionary admonition when using extrinsic evidence to cast light upon ambiguous claim language:

The testimony of an inventor and his attorney concerning claim construction is ... entitled to little or no consideration. The testimony of an inventor often is a self-serving, after-the-fact attempt to state what should have been part of his or her patent application; the testimony of an attorney "amounts to no more than legal opinion-it is precisely the process of construction that the court must undertake."

Bell, 132 F.3d at 706 (quoting Markman, 52 F.3d at 983). Thus, expert testimony should not be "heard to inject a new meaning into terms that is inconsistent with what the inventor set forth in his or her patent," and should be used so long as it is not inconsistent with the unambiguous intrinsic evidence. Id. (citations omitted).

These instructions guide this court in construing the claims at issue here-"transistor," the "whereby" clause and "connected directly."

DISCUSSION

I. ***Transistor***

The parties agree that a transistor is an active semiconductor device with three terminals: a source, a drain, and a gate. Although Quality's opening brief on claim construction is silent on the issue, in its opposition to Pericom's opening brief Quality contends that the singular term "transistor" covers a product with multiple transistors connected in parallel if the aggregate dimensions of the channels in each transistor add up to the specific channel width and length dimensions required by the patent claims.

Pericom counters that where the word "transistor" is used in the claims only a single transistor is meant. In doing so, Pericom focuses primarily on the plain language of the claims and specifications. Pericom asserts that no ambiguity is present in the plain language of the claims and the specifications, and that the patent as a whole indicates that only a single transistor with the specified dimensions is covered. Pericom also makes several arguments based on the prosecution history of the '062 patent. FN1

FN1. Among its many arguments, Pericom suggests that the use of the article "a" before the term "transistor" and all parts of the transistor establishes that these elements are singular. *See* North American Vaccine v. American Cyanamid Co., 7 F.3d 1571 (Fed.Cir.1993), *cert. denied,* 511 U.S. 1069, 114 S.Ct. 1645, 128 L.Ed.2d 365 (1994), in which the court in fact stated that it is "generally accepted in patent parlance that 'a' can mean one or more." Id. at 1576 (citing Robert C. Faber, *Landis on Mechanics of Patent Claim Drafting* 531 (3d ed.1990)). Nonetheless, the court found "no indication in the patent specification" that the inventors intended the term to have anything but its singular meaning. Id. The court further stated that "[w]hile such an interpretation [i.e., a plural meaning] might make sense as a theoretical concept, it has no support in the specification." Id. Similarly, the specifications and accompanying diagrams of the '062 patent provide no indication that the inventor intended the term "a transistor" to encompass several transistors connected in parallel.

Pericom also uses the prosecution history to support its argument. Pericom states that dependent claims 4 and 10 which originally described two transistors arranged in parallel were rejected by the examiner because

they were anticipated by the prior art. Rather than appeal the examiner's decision, Quality dropped the claims. *See* Ex. D (File History, '050 Application) at D-19 (Original Claim 4) (emphasis added); Ex. D (File History, '050 Application) at D-20 (Original Claim 10) (emphasis added).. Not mentioned by Pericom is the fact that one of the examiner's objections to the claim was that the transistors were in fact connected in "inverse parallel," because their conductivity is opposite each other, rather than in parallel as stated in the claim. Heit Opp.Decl., at Ex. H. Although the claim was rejected because anticipated by the prior art, the original claim did not describe the exact configuration in contention, and therefore the rejection of this claim is not relevant. The rejection of claim 10 is not relevant because Claim 10 involved transistors that were two different types, so even though they were arranged in parallel they could not make up a transistor of the same type.

Quality argues that a transistor is often made up of many smaller transistors arranged in parallel, aggregated to meet particular dimensions, and that the resulting device is then referred to as a single transistor. According to Quality, the addition of each smaller transistor is like adding lanes to a road. Although the width is increased, the road is still referred to in the singular. In support of this argument, Quality provides a definition of "transistor" found in *The New IEEE Standard Dictionary of Electrical and Electronics Terms,* quotes the deposition of the device's inventor, David C. Wyland, and quotes the Declaration of Richard D. Crisp, an expert in the field.

The *IEEE* definition of "transistor" provided by Quality sheds no light on its contention that a "transistor" can be comprised of several smaller transistors arranged in parallel: "an active semiconductor device with three or more terminals. It is an analog device." Quality also offers the testimony of Wyland and Crisp to bolster its conclusions. For instance, Wyland, the device's inventor, states in his deposition:

When you have two physical structures on a-two physical transistor structures that are individual transistors when they are separated, if they're the same type made on the same process, when you connect them, gate to gate, source/drain to source/drain, source/drain to source/drain, they become a single transistor. And this is the way transistors are commonly made.

Heit Opp.Decl., at Ex. D., Wyland Dep. 1.6-13. Wyland also provides a simple schematic drawing which he claims represents his explanation of how "a" transistor may be constructed out of several transistors by connecting them in parallel. Heit Opp. at Ex. E. Furthermore, Quality's expert, Crisp, concurs with Wyland's explanation and further states:

Field effect transistors having a channel width greater than 100 to 200 microns are conventionally constructed in the manner described by Mr. Wyland. A semiconductor layout designer will design a transistor by laying out in parallel multiple transistor structures of the same type until the desired dimensions are obtained. This is well known in the art.

Crisp Decl., at para.para. 7, 8. Crisp also indicates that the channel dimensions-both the length and the width of the channel between the source and drain regions-of a MOS type transistor "applies equally as well to a single transistor formed by connecting multiple smaller transistor structures of the same type in parallel." Crisp Decl., at para. 10, 11. Neither Crisp nor Wyland provide any textual or documented evidence supporting what both experts contend is a "common" occurrence in the art. *See,* e.g., Heit Opp.Decl., Ex. C.

Despite Quality's assertions to the contrary, the meaning of the term "transistor" as used in the '062 patent is unambiguous in light of the patent and prosecution history. Nothing in the patent or the prosecution history indicates that "a" transistor may consist of several transistors connected in parallel. For instance, the patent

specification precisely defines the meaning of the channel length and width in reference to a single transistor, and points to Figures 3 and 4, which depict a MOS type transistor as a single device with one source, one drain, and one gate as well as a single channel, with a single channel width and a single channel length. '062 patent at 3:36-49. The specification clearly states that:

As shown in FIGS. 3 and 4, the channel length of a MOS type transistor is the distance L between the source and drain regions of the transistor while the channel width is the dimension W of the transistor ... Another common definition of the channel length is the width of the gate that overlaps the active region of the transistor between the source and drain. Another common definition of the channel width is the length of the gate overlapping the active region of the transistor between the source and drain.

'062 patent, at 3:38-49. Given the diagrams and the language of the specification, it does not appear possible for the "active region" of a transistor as depicted in the diagram to include the separate connections between two or more transistors connected in parallel.

Although Quality correctly suggests that terms of art commonly known in the industry should not be defined in the patent, Spectra-Physics, Inc. v. Coherent, Inc., 827 F.2d 1524, 1534 (Fed.Cir.1987), *cert. denied,* 484 U.S. 954, 108 S.Ct. 346, 98 L.Ed.2d 372 (1987), something more than simple assertions provided by the inventor and a single expert are required to create or establish the presence of an ambiguity. Surprisingly, apart from the *IEEE* definition, Quality provides no documentary evidence showing that transistors are "commonly made" in this manner. For instance, if the channel lengths and widths of several transistors simply "add up" to the desired channel length and width when the transistors are connected in parallel, an elementary electrical engineering textbook would surely state such a simple linear relationship. The court finds it difficult to believe that a "common" occurrence such as the one Quality asserts here is not presented as part of some text or manual on circuit design.

Furthermore, the lack of ambiguity in the meaning of the term "transistor" makes reliance on the presented extrinsic evidence, such as the testimony of the Quality's expert and the device's inventor, inappropriate. As stated by the Vitronics court, expert testimony should only be used as a last resort when the claim language, the prosecution history and the specifications do not remove an ambiguity in the meaning of a term. Vitronics, 90 F.3d, at 1583. As noted by the Bell court, the testimony of the inventor is entitled to little or no consideration since it is often a "self-serving, after-the-fact attempt" to broaden the scope of his or her patent. Bell, 132 F.3d at 706. Such is the case here, especially given the unsupported contentions of the device's inventor. Both the schematic drawings provided by Wyland and the testimony of Wyland and Crisp "inject a new meaning into terms that is inconsistent" with what is set forth in the '062 patent. *See* Bell, 132 F.3d at 706.

Finally, a similar dispute arose in Miles Laboratories Inc. v. Shandon Inc., 997 F.2d 870, 876 (Fed.Cir.1993), *cert. denied,* 510 U.S. 1100, 114 S.Ct. 943, 127 L.Ed.2d 232 (1994). Miles involved a claim for a tissue processing treatment that facilitated the viewing of specimens under a microscope. The plaintiffs claim described a "cabinet" containing the various parts of the apparatus. The claims, specification and drawings all disclosed a single cabinet whereas the accused infringer's invention consisted of three cabinets. The court found that "[b]ecause three does not equal one ... the district court ... erred in finding that the HYPERCENTERs (consisting of three cabinets) literally infringed the single cabinet limitation ..." Id. This case supports Pericom's position that where the claim states a singular item and depicts a singular item in illustrations that item should be considered singular.

The court therefore construes the term "transistor" as used in the '062 patent to comprise only a single transistor with a source, drain and a gate.

II. "*Whereby" Clause*

Claims 1 and 5 both contain the same disputed term: "wherein said field-effect transistor has a channel length of no more than 1.5 microns and has a channel width of no less than 1,000 microns, *whereby said transistor exhibits a time constant of no more, than 0.5 nonseconds*." Quality claims that the "whereby" clause constitutes a limitation on the claim while Pericom contends that the clause merely states an inherent quality of the device with the previously stated channel dimensions and therefore does not limit the claim.

Although a "whereby" clause will sometimes be found to merely state the result of the limitations in the claim and therefore not be considered a limitation on the patent, *see Texas Instrument v. U.S. Intern*. Trade Comm'n, 988 F.2d 1165, 1172 (Fed.Cir.1993), in this case the "whereby" clause was added to the claim in order to overcome the examiner's objection. In the Examiner's Statement of Reasons for Allowance the examiner states:

Crouse does not specifically disclose "a channel length of no more than 1.5 micron" and "a channel width of no less than 1000 microns" and that the "transistor exhibits a time constant of no more than 0.5 nanoseconds." Further, even with the recitation in Crouse that the resistance of the transistor is "4 ohms," it still (sic) not clear that the "time constant" would be "no more than 0 .5 nanoseconds" nor is it seen that it would have been obvious to design the transistor of Crouse to have such a "time constant."

Heit Opp.Decl., at Ex. H. This statement makes clear that the recitation of a specific "time constant" limitation was essential to overcoming the objection that the invention was predicted by the prior art. As such the clause must in fact act as a limitation on the claim rather than merely stating the necessary result of the structure already recited in the body of the claims.

III. "*Connected Directly*"

Both claims 4 and 6 describe terminals "connected directly" to input/output nodes. Quality argues that a direct connection is one which is not interrupted by any "significant electrical characteristics" while Pericom argues that it is a connection with no intervening structures or devices. There is nothing in the claims, specification or prosecution history that defines the meaning of "connected directly," therefore extrinsic evidence must be used to define the term.

Both parties submit dictionary definitions of the word "directly ." Pericom cites *Webster's Unabridged Third New World Dictionary* which defines "directly" as "without any intervening agency or instrumentality or determining influence: without any intermediate step." This definition, particularly the second part, supports Pericom's assertion that a direct connection is one unencumbered by any intervening elements or structures. Quality cites *Webster's Ninth Collegiate Dictionary* which defines "directly" as "having no compromising or impairing elements." This definition somewhat supports Quality's belief that a direct connection is one which is uncompromised by significant electrical characteristics; "compromising or impairing elements," however, could apply to intervening structures or elements as well.

Again, Quality provides the testimony of the device's inventor and Crisp to support its position. When asked what type of connection would not be considered direct, Wyland explained that a connection is direct unless "it introduces any other significant electrical characteristic beyond providing ... an electrical connection

between the two [points]." Wyland Dep. at 154:18-20, Heit Opp.Decl., at Ex. D. Similarly, Crisp states that "[t]o a person of ordinary skill in the art, an integrated circuit's terminals would be considered connected directly to a package pin if a bond wire, among other things, are part of the signal path." Crisp Decl., at para. 5. Although expert testimony may be appropriate where the patent and prosecution history shed no light on the meaning of a term in the claim, Vitronics, 90 F.3d at 1583, as noted by the Bell court, the testimony of the inventor is entitled to little or no consideration since it is often a "self-serving, after-the-fact attempt" to broaden the scope of his or her patent. Bell, 132 F.3d at 706. As before, the court views Wyland's testimony to be particularly self-serving in this instance.

In contrast to claims 4 and 6, claims 1 and 5 specify that the terminals are "connected to" the nodes, omitting the word "directly." Pericom argues that because different language is used, the phrase "connected directly to" is presumed to convey a different meaning from "connected to." Tandon Corp. v. Int'l Trade Comm'n, 831 F.2d 1017, 1023 (Fed.Cir.1987). Although this assertion is correct, it sheds little light on the meaning of the word "directly." Of paramount importance are the words of the claim itself, which should generally be given their "ordinary and customary meaning." Vitronics, 90 F.3d at 1582. Although "a patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning," he or she may do so only if "the special definition of the term is clearly stated in the patent specification or file history." Id.

The ordinary meaning of the word "direct" connection does not encompass a connection that follows a circuitous route through multiple intervening physical structures. The testimony of the device's inventor and Quality's expert implies that no matter how many physical structures intervene between the nodes, as long as none of those structures introduce electrical resistance of their own the connection is direct. This view does not fit the dictionary definition or the way in which the word "direct" is commonly used. Therefore this court finds that "connected directly" means a connection between two points that is unimpaired by an outside electrical force and uncompromised by any intervening physical structures other than a structure that connects the two points. This finding does not preclude the possibility that the accused device infringes the patent in question based on the doctrine of equivalents, however this court does not reach this question.

CONCLUSION

Accordingly,

1. A "transistor" as it appears in the '062 patent may be comprised of only a single transistor with a source, a drain, and a gate;

2. The "whereby" clause in the '062 patent acts as a limitation on the claim; and,

3. "Connected directly" means that structures are connected with structures intervening save that which connects the points, and which is uncompromised by intervening electrical characteristics.

This order fully adjudicates the briefs on claim interpretation reflected at Docket # 31-1 and 34-1, and the Clerk of the Court shall remove it from the pending motions list.

IT IS SO ORDERED.

N.D.Cal.,1998.

Quality Semiconductor, Inc. v. Pericom Semiconductor, Inc.

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