United States District Court,
C.D. California.

INTERNATIONAL RECTIFIER CORPORATION,
Plaintiff.
v.
SGS-THOMSON MICROELECTRONICS, INC., et al,
Defendants.

No. CV 90-4802 R

Aug. 22, 1994.

David E. Killough, Kenneth R. O'Rourke, Glenn W. Trost, John A. Crose, Jr., O'Melveny & Myers, Los Angeles, California, for Plaintiff International Rectifier Corporation.

FINDINGS OF FACT AND CONCLUSIONS OF LAW IN SUPPORT OF ORDER GRANTING INTERNATIONAL RECTIFIER'S MOTIONS TO ENFORCE SETTLEMENT AGREEMENT AND DENYING SGS-THOMSON'S MOTION TO ENFORCE SETTLEMENT AGREEMENT

REAL**, J.**

FILED UNDER SEAL PURSUANT TO PROTECTIVE ORDER

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Three motions to enforce the parties' February 1991 Settlement Agreement FN1 were submitted to the Court: (1) the motion of International Rectifier Corporation ("IR") filed May 27, 1993 to compel SGS-Thomson Microelectronics, Inc. ("ST") to account for and pay royalties on its sales of power integrated

circuit ("PIC") products using IR's '666 and/or '699 patents; FN2 (2) IR's motion filed October 19, 1993 to compel ST to account for and pay royalties on its sales of discrete power MOSFET wafers manufactured in Carrollton, Texas, and which use IR's '666 and/or '699 patents; and (3) ST's motion filed on or about November 15, 1993 seeking a declaration that its power MOSFET products do not use IR's '666 or '699 patents.FN3

FN1. Amended and Restated Patent License Agreement, Plaintiff's Exhibit (hereinafter "P.Ex.") 1056, executed February 13/14, 1991.

FN2. U.S. Patent Nos. 4,642,666 (P.Ex. 1010) and 4,959,699 (P.Ex. 1012).

FN3. ST noted in its moving papers that: "The issues raised by ST's motion are identical to issues presented by IR's two pending motions to enforce the settlement agreement...." (SGS-Thomson's Notice of Motion and Motion, etc., filed on or about Nov. 15, 1993, p. 6.)

On July 11, 1994, following extensive briefing by the parties, an evidentiary hearing and oral argument, the Court ruled from the bench that IR's motions were granted and that ST's motion was denied. Concurrent with the entry of its written Order on these motions, the Court now makes its findings of fact and conclusions of law.

FINDINGS OF FACT

I. PROCEDURAL HISTORY AND JURISDICTIONAL FACTS

1. IR commenced this action on September 5, 1990, alleging infringement of IR's '666 patent against ST and its Italian affiliate, SGS-Thomson Microelectronics, S.r.l. ("ST-Italy"). (P.Ex. 1049 [Complaint for Patent Infringement].) IR amended its complaint on September 27, 1990 to charge ST and ST-Italy with infringement also of IR's '699 patent, which had issued two days earlier on September 25, 1990. (P.Ex. 1050 [First Amended Complaint for Patent Infringement].)

2. This action was then settled as between ST and IR, with the execution of the Settlement Agreement on February 13/14, 1991 and this Court's dismissal of the action against ST filed February 19 and entered February 20, 1991. (P.Ex. 1056 [Settlement Agreement]; P.Ex. 208 [Stipulated Dismissal and Order].) In the Order of dismissal, this Court expressly "retain[ed] jurisdiction over IR and [ST] with respect to any controversy that may arise out of the Amended and Restated Patent License Agreement [the Settlement Agreement] entered into by IR and [ST] as of December 7, 1990 [executed February 13/14, 1991] in settlement of their dispute." (P.Ex. 208.) ST-Italy was later dismissed without prejudice.

3. The parties' respective motions to enforce the Settlement Agreement, described above, were each brought pursuant to and are each within the scope of this Court's retention of jurisdiction in its Order dismissing the action as against ST. (International Rectifier's Notice or Motion and Motion to Enforce Settlement Agreement, filed May 27, 1993, pp. 2, 5; Memorandum of Points and Authorities in Support of Second Motion to Enforce Settlement Agreement (Re Power MOSFET Wafers Made by SGS-US and Sold to SGS-Italy), filed Oct. 19, 1993, p. 2; SGS-Thomson's Notice of Motion and Motion to Enforce Settlement Agreement, etc., filed on or about Nov. 16, 1993, pp. 1, 3.)

4. As described in Section II, below, the Court has concluded that all of the ST products at issue-ST's discrete power MOSFETs and PICs (those VIPower, BCD I and BCD II products that employ a vertical conduction MOS power stage)-use IR's '699 spaced base invention as described in Claim 1 of the patent. Royalties are due to IR under the Settlement Agreement at a rate of 4 1/2% on ST's sales of products using IR's '699 patent. (P.Ex. 1056 [Settlement Agreement]. para.para. 1.10, 3.1(c).) FN4

FN4. Under paragraph 3.2 of the Settlement Agreement, die or wafers sold in unassembled form are deemed sold in assembled form and the rate on such sales is three times the rate specified in paragraph 3.1 of the Settlement Agreement. (P.Ex. 1056, para. 3.2.)

5. As described in Section III, below, the Court has concluded that ST's discrete power MOSFETs, VIPower PICs and BCD I PICs use IR's '666 deep base invention as embodied in Claim 1 of the patent. Royalties are due to IR under the Settlement Agreement at a rate of 6%, instead of 4 1/2%, on ST's sales of products using IR's '666 patent. (P.Ex. 1056, para.para. 1.9, 3.1(b), 3.3, *see also* note 4, supra.)

6. As described in Section IV, below, the Court has rejected ST's contention that the scope of the Settlement Agreement does not reach ST's PIC products covered by the licensed patents.

II. ALL OF THE ST PRODUCTS AT ISSUE ARE COVERED BY IR'S '699 PATENT**.**

A. Claim Interpretation

7. The '699 patent requires, in pertinent part, a power MOSFET having "at least first and second spaced base regions ... the space between said at least first and second base regions defining a common conduction region ... at least said first base region being a cellular polygonal region; said cellular polygonal region being surrounded by said common conduction region...." (P.Ex. 1012 [the '699 patent], col. 7, line 32-col. 8, line 14.) The specification of the '699 patent describes one such device: a power MOSFET having one polygonal base within an annular base. (P.Ex. 1012, Figs. 7, 8; Lidow 12/14/93 Trans., pp. 107-08.FN5) The claim expressly contemplates, however, circumstances where the "common conduction region" may constitute the space between more than two bases- *i.e.,* that the "common conduction region" may be defined by "the space between said at least first and second base regions." (P.Ex. 1012, col. 7, lines 47-49, emphasis added.) Thus, this claim language applies literally to, *inter alia,* devices having an array of polygonal base regions where the space between a number of them defines a "common conduction region" surrounding at least one of them. (Lidow, 12/13/93 Trans., pp. 42-45; A. Lidow 10/26/93 Depo., pp. 726-29, 736-41, 783-89, P.Exs. 203, 205 [Depo. Exs. 1134, 1135]; P.Ex. 1133 [at Ex. E]; P.Ex. 1158.)

FN5. Citations herein to the hearing transcript first name the testifying witness (omitted for comments of counsel), then state the date the testimony was given, followed by "Trans." for "transcript," concluding with identification of the transcript page number(s) where the cited testimony appears.

8. ST and Dr. Schlecht assert that the '699 patent specification does not specifically teach and so the patent's claims cannot read on an array of polygonal bases. (Schlecht, 4/14/94 Trans., pp. 88-89; ST's Post-Hearing Memorandum, filed May 16, 1994, pp. 31-32.) ST thus would limit the claims to a "device in which an outer base region surrounds an inner base region." (Declaration of Martin F. Schlecht, etc. [filed Dec. 7, 1993 as Ex. H to Declaration of William Archer, etc.] (hereinafter "Schlecht Decl."), para. 22.) " '[T]hat a

claim may be broader than the specific embodiment disclosed in a specification is in itself of no moment.' " Raiston Purina Co. v. Far-Mar-Co., Inc., 772 F.2d 1570 (Fed.Cir.1985) (quoting In re Rasmussen, 650 F.2d 1212, 1215 (C.C.P.A.1981)); *see also* Specialty Composites v. Cabot Corp., 845 F.2d 981, 987 (Fed.Cir.1988). "The law does not require the impossible. Hence, it does not require that an applicant describe in his specification every conceivable and possible future embodiment of his invention." SRI Intern. v. Matsushita Elec. Corp. of America, 775 F.2d 1107, 1121 (Fed.Cir.1985) (en banc).

9. In a variation on the foregoing argument. ST and Dr. Schlecht also assert that IR disclaimed the '699 patent's coverage of an array of polygonal bases during the post-settlement reexamination of IR's '725 patent (U.S. Patent 5,008,725). (Schlecht Decl., para.para. 109-12; Defendant's Memorandum, etc., filed Aug. 12, 1993, pp. 14-17; ST's Post-Hearing Memorandum, filed May 16, 1994, p. 30.) The '725 invention-a power MOSFET with an array of identical polygonal bases arranged symmetrically over the device surface-is an advancement over the basic '699 design that was not known at the time of the '699 invention-and so could not have been taught by the '699 specification. (Defendant's Exhibit (hereinafter "D.Ex.") 72, pp. 2-4 [the '725 patent claims]; A. Lidow 10/26/93 Depo., pp. 773, 780, 806-09; Lidow, 12/14/93 Trans., p. 110.) While the '725 invention is patentably distinct from the '699 invention, the '699 patent is still a dominating patent to the '725 patent.

10. The '699 patent was at issue in the '725 reexamination because the examiner preliminarily rejected various claims of the '725 patent based on the '699 patent. (D.Ex.72, pp. 16, 27.) IR's reexamination arguments were thus (1) that the invention claimed in the '725 patent was not disclosed in or made obvious by the '699 patent and (2) that the '725 patent did not claim the same invention as the '699 patent, but claimed a narrower invention which was an improvement over the basic '699 invention. (D.Ex.72.) FN6 There was nothing improper or inconsistent about these arguments. FN7 Thus, the claims of the '699 patent can read on a structure that also is claimed in the '725 patent, the '725 patent is not thereby rendered invalid and '699 infringement is not defeated simply because the structure contains further limitations found in the '725 claims but not in the claims of the '699 patent.FN8

FN6. Specifically, IR argued that the '699 patent nowhere disclosed or suggested the '725 patent's symmetrical array of identical bases (D.Ex.72, pp. 11-12, 20, 22) and that "claim 1 of the '699 patent does not call for and could not support a *limitation* [an additional claim limitation found in the later '725 patent] of first and second spaced base regions having identical polygonal configurations ..." (id. at pp. 27-28).

FN7. Just as ST argues that the '725 and '699 patents cannot both validly read on its products, the Patent Office in In re Benno, 768 F.2d 1340, 1345, 1346 (Fed.Cir.1985), rejected as obvious a claim that covered a structure because that structure fell within the claims of an earlier patent. On appeal, the Federal Circuit rejected this "plainly indefensible" reasoning, employing the following illustration:
"Samuel F.B. Morse, the inventor of the telegraph, had a patent thereon, issued in 1840, containing a claim (which the Supreme Court held invalid) which was broad enough to read on the modern Telex. By the board's reasoning, Morse's telegraph patent therefore would have made the Telex obvious. The scope of a patent's claims determines what infringes the patent; it is no measure of what it discloses. A patent discloses only that which it describes, whether specifically or in general terms, so as to convey intelligence to one capable of understanding."

Id. at 1346 (citation omitted).

FN8. "It is fundamental that one cannot avoid infringement merely by adding elements if each element recited in the claims is found in the accused device. For example, a pencil structurally infringing a patent claim would not become noninfringing when incorporated into a complex machine that limits or controls what the pencil can write. Neither would infringement be negated simply because the patentee failed to contemplate use of the pencil in that environment." A.B. Dick Co. v. Burroughs Corp., 713 F.2d 700, 703 (Fed.Cir.1983). *cert. denied,* 464 U.S. 1042, 104 S.Ct. 707, 79 L.Ed.2d 171 (1984) (citation omitted).

11. Claims in both the '699 patent and later '725 patent cover symmetrical arrays of identical polygonal bases. (P.Ex. 1012 [the '699 patent]; D.Ex. 72, pp. 2-4 [the '725 patent claims]; A. Lidow 10/26/93 Depo., pp. 867-75; A. Lidow 10/27/93 Depo., pp. 914-23.) The dominating '699 patent covers the individual bases in such devices generically, while the later '725 patent (as an improvement over the '699 patent) covers the overall array of bases more specifically. (Id.; Lidow 12/14/93 Trans., pp. 113-14.) "There is no inconsistency in awarding a generic count to one inventor, while awarding a patentably distinct species count to another [or to the same inventor]...." Utter v. Hiraga, 845 F.2d 993, 998 (Fed.Cir.1988). FN9

FN9. "A subsequent species invention, even if ... patentable over an earlier generic invention, does not render the generic invention unpatentable and does not require restriction of the literal scope of the generic invention so as to exclude the later species." Rohm and Haas Co. v. Dawson Chemical Co., Inc., 557 F.Supp. 739, 806 (S.D.Tex.), *rev'd on other* grounds, 722 F.2d 1556 (Fed.Cir.1983), *cert. denied,* 469 U.S. 851, 105 S.Ct. 172, 83 L.Ed.2d 107 (1984). "It is well established that an improver cannot appropriate the basic patent of another and that the improver without a license (though he may have a patent on the improvement) is an infringer and may be sued as such." Temco Co. v. APCO Mfg. Co., 275 U.S. 319, 328, 48 S.Ct. 170, 72 L.Ed. 298 (1928).

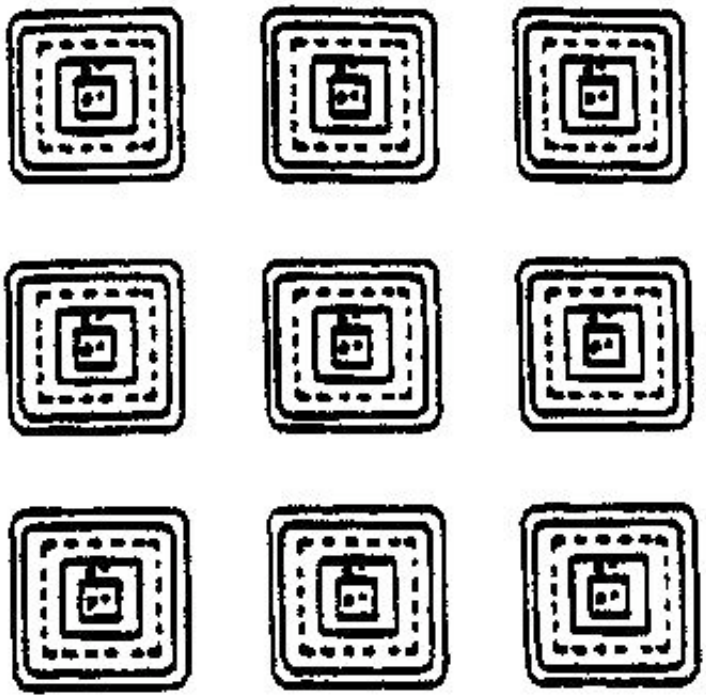
12. To borrow Dr. Alexander Lidow's analogy from the hearing, the '699 invention can be thought of as analogous to a light bulb, with the '725 invention analogous to a novel arrangement of individual light bulbs in a structure such as a chandelier. It could well be the case that a chandelier could infringe the chandelier patent while its individual light bulbs also infringe the light bulb patent, and that the chandelier configuration was not taught by the light bulb patent. (Lidow 12/13/93 Trans., pp. 113-14.) Extending this logic, ST's accused products employ arrays of bases that fall within the claims of the '725 patent and whose individual bases also fall within the claims of the '699 patent. This simultaneous infringement of two patents is possible even though the array concept of the '725 invention is not taught by the '699 patent.

13. Based on the foregoing, and on the testimony (which the Court credits) of Dr. Lidow and Dr. Shott from which the Court could determine the relevant understanding of those of ordinary skill, the Court finds that the elements of Claim 1 of the '699 patent requiring "at least first and second spaced base regions ... the space between said at least first and second base regions defining a common conduction region ... at least said first base region being a cellular polygonal region; said cellular polygonal region being surrounded by said common conduction region" (P.Ex. 1012, col. 7, line 32-col. 8, line 14) are not limited in application to devices in which an outer annular base surrounds an inner base, but may apply also to devices where the "common conduction region" constitutes the space between more than two bases, for example, to devices having an array of polygonal base regions where the space between a number of them defines a "common conduction region" surrounding at least one of them.

B. ST's Products Infringe Claim 1 Of IR's '699 Patent**.**

14. ST's arguments against coverage of the '699 patent do not differ depending on the particular product in question: rather ST makes the same arguments as to all of its products. (*See, e.g.,* ST's Post-Hearing Memorandum, filed May 16, 1994, pp. 20, 29-32; Schlecht Decl., para.para. 102-12.) FN10 As pertinent to the '699 patent, the structure of ST's products (both discrete power MOSFETs and PICs) is not in dispute. ST's expert, Dr. Schlecht, describes the identical base regions in these products as arranged in a "checkerboard fashion, with each square base region being bordered by four other square base regions." (Schlecht Decl., para. 107.) Isolated from the many other such base regions on a single chip, nine of these bases appear in top view as follows (*see, e.g.,* P.Exs. 84, 216, 238, 243, 244, 6616; Schlecht Decl., p. 57):

FN10. ST has withdrawn its "inequitable conduct" arguments against the '699 patent and also has withdrawn its argument that its discrete power MOSFET wafers made in the U.S. are "incomplete." (4/14/94 Trans., pp. 4-5.)



15. Dr. Schlecht testified, and ST argues, that ST's products are not covered by Claim 1 of the '699 patent because no one of any given pair of bases lifted off the device and viewed in isolation is "surrounded" by a "common conduction region." (Schlecht, 4/14/94 Trans., p. 87; *see also* ST's Post-Hearing Memorandum, filed May 16, 1994, p. 30.) FN11 The claim language, however, does not permit ST to view only two base regions out of context of the array of bases on ST's products-Claim 1 expressly states that the "common conduction region" is defined by "the space between said at least first and second base regions." (P.Ex. 1012, col. 7, lines 47-49, emphasis added.) In ST's products, any one of the bases "bordered [as described by Dr. Schlecht (Schlecht Decl., para. 107)] by four other square base regions" is "surrounded" by the "common conduction region" (Lidow, 12/13/93 Trans., pp. 43-45).

FN11. The hypothetical device Dr. Schlecht described would appear as follows (id.):

16. At the hearing, Dr. Lidow explained Claim 1 of the '699 patent (Lidow, 12/13/93 Trans., pp. 42-43; *see also* A. Lidow 10/26/93 Depo., pp. 783-89; P.Ex. 1133 [at Ex. E]) and has applied each and every element of that claim to each of the categories of ST products at issue (Lidow 12/13/93 Trans., pp. 43-45; *see also* P.Ex. 203 [at Exs. C-F]; P.Ex. 1133 [at Ex. E]; P.Ex. 1158; A. Lidow 10/26/93 Depo., pp. 726-29, 736-41, P.Exs. 203, 205 [Depo. Exs. 1134, 1135]). The Court credits the testimony of Dr. Lidow and Dr. Shott as to claim interpretation and coverage. All of ST's discrete power MOSFETs and MOS-based PICs at issue (those VIPower, BCD I and BCD II products that employ a vertical conduction MOS power stage) use IR's '699 patented spaced base invention as described in Claim 1 of the patent.

17. Under the Settlement Agreement, ST is obligated to account for and to pay IR a 4 1/2% royalty on sales of products employing the '699 invention. (P.Ex. 1056, para.para. 1.10, 3.1(c), 3.4, 4.1.) Accordingly, ST should be ordered to account for and pay royalties to IR at the 4 1/2% rate on all of the ST products at issue.FN12

FN12. As to ST's products which practice IR's '666 deep base patent, the rate of 6% will instead apply. (Id. at para.para. 1.9, 3.1(b), 3.3.) The higher 6% rate applies, for the reasons discussed below, to all ST products at issue except ST's BCD II PICs (which ST has represented do not include a deep base region). In addition, under paragraph 3.2 of the Settlement Agreement, die or wafers sold in unassembled form are deemed sold in assembled form and the rate on such sales is three times the rate specified in paragraph 3.1 of the Settlement Agreement. (P.Ex. 1056, para. 3.2.)

III. ST'S DISCRETE POWER MOSFET, VIPOWER AND BCD I PRODUCTS ARE COVERED BY IR'S '666 PATENT.

A. Claim Interpretation

18. The parties advanced evidence and argument concerning the proper interpretation of Claim 1 of the '666 patent, and in particular the "three terminal" and "laterally spaced" elements of that claim. In general terms, Claim 1 describes a MOSFET device employing "spaced" base regions- *i.e.,* at least two physically distinct base regions that face each other across a "common conduction region," with gates and source regions formed to define a channel in each base between its source region and the common conduction region. (P.Ex. 1010, col. 7, line 26-col. 8, line 4.) When the appropriate gate voltage is applied. channels are created that permit current to flow from the source electrodes, into the source regions, through their associated channel regions and into the common conduction region, and then downwardly into the drain and ultimately to the drain electrode. (P.Ex. 1010, col. 4, lines 22-28.)

1. "*Three-Terminal*"

19. The preamble of Claim 1 of the '666 patent calls out "A three-terminal power metal oxide silicon field effect transistor device." (P.Ex. 1010, col. 7, lines 26-27.) Those three "terminals" are then defined in the body of Claim 1 itself:

"[1] ... source electrode means connected to said source regions and comprising a first terminal;

[2] ... gate electrode means on said gate insulation layer means, overlying said first and second channel regions comprising a second terminal; ... [and]

[3] a drain electrode coupled to said drain conductive region and comprising a third terminal...."

(P.Ex. 1010, col. 8, lines 5-17, emphasis added.) ST argues that those "terminals" must be the pins "accessible to the user" on the outside of the plastic or metal housing encapsulating the PIC chip. (ST's Post-Hearing Memorandum, filed May 16, 1994, p. 15, 17; Schlecht Decl., para. 63.)

20. The '666 patent specifically discloses two distinct embodiments of the invention: the "serpentine" embodiment depicted in top view in Figure 1 and in cross section in Figure 2, and the "ring-shaped" embodiment depicted in top view in Figure 7 and in cross section in Figure 8. (P.Ex. 1010, col. 6, lines 12-19.) Both of these embodiments are depicted with four electrode structures: The serpentine embodiment depicts two source electrodes (regions 22 and 23), a gate electrode (region 24) and a drain electrode (region 26) (P.Ex. 1010, Figs. 1, 2 and col. 3, lines 45-57), and the ring-shaped embodiment also depicts two source electrodes (regions 81 and 82), a gate electrode (region 80) and a drain electrode (region 85) (P.Ex. 1010, Figs. 7, 8 and col. 6, lines 16-25). The two source electrodes are at the same electrical potential and used in concert as a single "terminal." (Lidow 12/14/93 Trans., pp 112-13; A. Lidow 10/27/93 Depo., pp. 957-58.) The specification also states that the separate source electrodes can be formed of a single conductive layer:

"The source electrodes 22 and 23 have been shown as separate electrodes which can be connected to separate leads. Clearly, the sources 22 and 23 could be directly connected as shown in Fig. 8a...."

(P.Ex. 1010, col. 6, lines 63-66.) Such a common source electrode structure would result in a device with three active electrodes. These source, gate and drain electrodes "comprise" the three "terminals" called for by Claim 1 of the '666 patent. (Lidow 12/13/93 Trans., pp. 31-34, 63, 67-68; Lidow 12/14/93 Trans., 112-13; A. Lidow 10/26/93 Depo., pp. 880-81; A. Lidow 10/27/93 Depo., pp. 952-58, 967; Bruzga 10/22/93 Depo., pp. 154-59; Herman 11/23/93 Depo., pp. 360-61.)

21. The '666 patent specification expressly contemplates the possibility of additional electrical connection in structures physically separated and electrically isolated from the junctions defining the claimed MOSFET structure. Thus, the "ring-shaped" embodiment of the invention is shown with an additional electrode at the bottom of the wafer (connected to ground potential), as well as "isolation diffusion 96 to isolate the device from other devices [and other 'terminals'] on the same chip or wafer." (P.Ex. 1010, Fig. 8, col. 6, lines 44-45; Lidow 12/13/93 Trans., pp. 33-35, 45-46; A. Lidow 10/27/93 Depo., pp. 937-38.) Those of ordinary skill thus would understand that there could well be additional external "terminals" (such as in an integrated circuit) that would not affect the use of the claimed "three-terminal" MOSFET. (Lidow 12/13/93 Trans., pp. 33-35, 45-46; A. Lidow 10/27/93 Depo., pp. 937-38; A. Lidow 10/27/93 Depo., p. 967.)

22. The prosecution history of the '666 patent reveals that the "three-terminal" language was included in order to distinguish the '666 structure from the Sakai '688 reference that described a structure with four distinct and electrically active electrodes (a source electrode, a drain electrode, an insulated gate electrode, and an additional electrode (analogous to a JFET gate electrode) in contact with the "base" region). (P.Exs. 5, 1137; Bruzga 10/22/93 Depo., p. 152; A. Lidow 10/26/93 Depo., pp. 899-900; A. Lidow 10/27/93 Depo., pp. 941-49.) Whether these electrodes were available to the user off the chip (*i.e.,* whether they met ST's definition of "terminal") was completely irrelevant to IR's attempt to distinguish Sakai '688. (Id.) ST nevertheless relies on IR's distinction of the Sakai '688 reference during the patent prosecution based on that

reference's use of four terminals. (ST's Post-Hearing Memorandum, filed May 16, 1994, pp. 16-17; Schlecht Decl., para.para. 54-62.) ST misses the point that Sakai's added terminal was intimately involved with the physics of the semiconductor device he described (a device where the same junctions defined an active, controllable JFET and an active, controllable MOSFET). (A. Lidow 10/26/93 Depo., pp. 895-98; A. Lidow 10/27/93 Depo., pp. 941-43, 967; Bruzga 10/22/93 Depo., pp. 154-59.) Moreover, while ST argues that Dr. Lidow's reading of the relevant claim language failed to take into account the '666 patent's prosecution history (ST's Post-Hearing Memorandum, filed May 16, 1994, pp. 16-17), Dr. Lidow in fact reviewed the amendment and Sakai reference relied on by ST and specifically testified that he took such information into account, but that it did not change his interpretation of the claim. (A. Lidow 10/26/93 Depo., pp. 895-96; A. Lidow 10/27/93 Depo., pp. 941-43; Lidow 12/13/93 Trans., pp. 64-67; *see also,* P.Ex. 1158, para. 4.)

23. Based on the foregoing, and on the testimony (which the Court credits) of Dr. Lidow and Dr. Shott from which the Court could determine the relevant understanding of those of ordinary skill, the Court finds that the "three-terminal" requirement of the '666 patent refers to the "gate electrode means," "source electrode means," and "drain electrode" further specified in the claim, whether or not off-chip connections are provided to those electrodes. The Court further finds that the "three-terminal" requirement of the '666 patent does not preclude the presence of additional electrodes or terminals in physical proximity to the junctions of the claimed MOSFET structure, so long as those additional electrodes are electrically isolated from those junctions.

2. "*Laterally Spaced*"

24. Claim 1 of the '666 patent also provides that each of the spaced base regions should be made up of two component regions:

-> a "relatively shallow depth region[ ] extending from said common region and underlying" the source, and

-> a "relatively deep, relatively large radius region[ ] extending from said shallow depth region[ ][and] laterally spaced from beneath [the source] on the side of said source region[ ] which is away from said common region."

(P.Ex. 1010, col. 8, lines 20-28.)

25. There is no dispute concerning the extent to which the deep base region must extend out from under the source on the side of the source away from the common region (the parties apparently agree that it is sufficient if at least some of the deep base is on that side of the source). Nor is it disputed that the deep and shallow base regions must overlap to some degree (otherwise a single composite base diffusion would not be formed). Thus, the parties agree that the claim requires a composite base diffusion, with a shallow region on the side of the source near the common region, and a deep region on the side of the source away from the common region. The parties disagree, however, regarding the permissible lateral position (in relation to the source) where the deep and shallow regions meet.

26. ST does not assert that this claim language must be interpreted to require the deep base to be *completely* removed from beneath the source (*i.e.,* that the portion of the base under the source must be defined by the shallow base only and no portion of the source may be underlain by the deep base); rather, ST argues that the prosecution history of the '666 patent "precluded the '666 patent claims from covering any product in which there was a 'substantial' lateral overlap of the source and deep base regions." (Defendant's Surreply in

Opposition to Plaintiff's Motion to Enforce Settlement Agreement, filed on or about Aug. 27, 1993, pp. 17-19.) For its part, IR interprets this claim language to require the deep base to meet the shallow base before reaching the edge of the source near the channel (*i.e.,* the portion of the base under the source may be partly or even predominately defined by the deep base, so long as the deep base does not extend all the way under the source and into the channel). (12/13/93 Trans., p. 25; Lidow 12/13/93 Trans., pp. 78-79.)

27. Both embodiments of the invention depicted in the '666 specification show the intersection between the deep and shallow base (as one moves away from the common region) occurring somewhere under the source. Figure 2 shows this point for the serpentine embodiment to be near the edge of the source away from the common region, while Figure 8 shows this point for the ring-shaped embodiment to be near the edge of the source closest to the common region (*i.e.,* the deep base extends very close to the channel). (P.Ex. 1010; Lidow 12/13/93 Trans., p. 74.) These depictions are consistent with the written specification's explanation that

"In accordance with another feature of the present invention, the p-type region which defines the channel beneath the gate oxide has a relatively deeply diffused portion beneath the source...."

(P.Ex. 1010, col. 2, lines 35-38 (emphasis added).)

28. The '666 patent specification also discloses a process for manufacturing a claimed device with the deep base extending under the source. As described in Figures 3-6 and the accompanying text, the deep bases are formed by an implantation (and subsequent diffusion) through windows 51 and 52, while the sources are formed through windows 61 and 62. Because windows 61 and 62 are shown to overlap in part (or are at least to be coincident with) windows 51 and 52, the deep base diffusion will necessarily diffuse laterally under at least a portion of the source. (Shott 12/14/93 Trans., pp. 146-47.) FN13 This overlap between the deep base diffusion and the window for the source diffusion is explicitly shown in Figures 4, 5 and 6. (P.Ex. 1010.)

FN13. Dr. Schlecht testified that lateral diffusion about 80% of the vertical diffusion. (Schlecht 4/14/94 Trans., pp. 45-47.) Dr. Shott testified that the engineering "rule of thumb" is that lateral diffusion will be 70% to 80% of vertical diffusion. (Shott 12/14/93 Trans., pp. 157-58.) The patent discloses a preferred depth for the deep base of about 4 microns (P.Ex. 1010, col. 5, line 20), which would suggest to those of skill in the art that the deep base was to extend at least about 3 microns under the source.

29. ST also points to two events in the prosecution history as bearing on this claim interpretation: issue. The first such event is the Board of Patent Appeals' decision that the '666 claims were not anticipated or made obvious by U.S. Patent No. 4,072,975 to Ishitani. (*See, e.g.,* Schlecht Decl., para.para. 78-80.) As the Board noted. Ishitani taught the use of a deep, highly conductive base region "beneath the entire width of the source region." (D.Ex.70, p. 5.) In reaching its decision that Ishitani did not teach or suggest (and, indeed, taught away from) the '666 structure, the Board stated

"In our view, the broadest reasonable interpretation of the ['666] claim consistent with the disclosure would exclude any substantial portion of the relatively deep and large radius region from extending beneath the source region."

(D.Ex.70, p. 4.) Taken literally, this statement indicates that the Board interpreted the claim to permit

(consistent with the disclosure) some portion of the deep base under the source, so long as that portion was not "substantial" when compared to the entire deep base (Id.)

30. In interpreting the Board's interpretation of the claim (and in particular the Board's use of the term "substantial"), the Court must consider the purpose of the deep base structures in both the '666 and Ishitani patents. Dr. Lidow testified (and the Board apparently agreed) that the Ishitani base extended completely under the source in order to prevent the source from "spiking" through the base (thereby causing a short circuit) (P.Ex. 1035 (Ishitani], col. 7, lines 5-17; A. Lidow 11/11/93 Depo., pp. 1254-56, 1262), while the '666 deep base was intended to improve the breakdown performance of the structure without compromising on-state performance (*see, e.g.,* Lidow 12/13/93 Trans., pp. 38-39). The '666 invention achieved this goal by having the deep base present on the side of the source away from the channel and by having the deep base extend under the source, but not all the way under the source and into the channel. (Id.) Thus, in the Ishitani context, the deep base must extend all the way under the source and into the channel to achieve the Ishitani objective (the portion under the source is "substantial"), while in the '666 context, there is an important role for the deep base on the side of the source away from the channel, with additional benefits to be gained by extending the deep base less than all the way under the source (the portion under the source is not "substantial").

31. The other event in the prosecution history on which ST relies is an erroneous statement made by IR's patent counsel concerning the Sakai '688 reference after the Patent Office had approved the '666 patent. (*See, e.g.,* Schlecht: Decl., para.para. 81-83.) This statement, which purported to distinguish Figure 7 of the Sakai '688 reference on the grounds that the Sakai deep base was not "laterally spaced" from the source, was plainly wrong because the relationship of the Sakai deep base to the source fell in between that depicted in Figure 2 and Figure 8 of the '666 patent (*i.e.,* it showed the deep base part but not all the way under the source). (P.Exs. 5, 1010, 1137; Lidow 12/13/93 Trans., p. 76; Bruzga 10/22/93 Depo., pp. 191-92; A. Lidow 11/11/93 Depo., pp. 1251-54.) FN14

FN14. This error was harmless in that there were other grounds for distinguishing the Sakai '688 reference. (*See, e.g.,* Lidow 12/14/93 Trans., pp. 114-15.)

32. The Patent Office is presumed to give claims under examination the broadest interpretation to which they are reasonably susceptible. In re Yamamoto, 740 F.2d 1569, 1571 (Fed.Cir.1984). Although the claims as written, the specification and the Board of Appeal's prior opinion all indicated that the "laterally spaced" portion of the claim was broad enough to cover the Sakai structure, no additional limitation was required by the Patent Office in view of Sakai before the '666 Claim 1 was allowed to issue. It must be presumed, therefore, that the Patent Office found other grounds on which to distinguish Sakai and did not rely on the erroneous statement made by counsel.FN15

FN15. "The presumption of validity under 35 U.S.C. s. 282 carries with it a presumption the examiner did his duty and knew what claims he was allowing. In any event, the claims as allowed are what we have to deal with and it is not for the courts to say that they contain limitations which are not in them." Intervet America, Inc. v. Kee-Vet Lab., Inc., 887 F.2d 1050, 1054 (Fed.Cir.1989). "When it come to the question of which should control, an erroneous remark by an attorney in the course of prosection of an application or the claims of the patent as finally worded and issued by the Patent and Trademark Office as an official grant, we think the law allows for no choice. The claims themselves control." Id.

33. A similar issue was litigated in a plenary bench trial before this Court in *International Rectifier v. Siliconix,* Case No. CV-86-4198-R. Siliconix in that case-based on the same prosecution history on which ST now relies-made the argument that Claim 1 of the '666 patent should be interpreted to require that the deep base be *completely* laterally spaced from beneath the source (*i.e.,* that no portion of the deep base could underlie the source) and that in no event could the deep base "substantially" underlie the source. The Court rejected Siliconix' arguments in that case, and, while ST is not collaterally estopped to dispute those findings, the parties have here stipulated that the Court's written findings from the *Siliconix* case be admitted in this proceeding. (P.Ex. 207; Stipulation, etc., filed 12/13/93.)

34. Based on the foregoing, and on the testimony (which the Court credits) of Dr. Lidow and Dr. Shott from which the Court could determine the relevant understanding of those of ordinary skill, the Court finds that the '666 patent describes and claims a structure with at least a portion of the deep base extending beneath the source, so long as the deep base also is present on the side of the source away from the channel and does not extend all the way under the source and into the channel.

B. ST's VIPower And BCD I PICs Infringe Claim 1 Of The '666 Patent**.**

35. ST's "principal" argument against coverage by the '666 patent is that its PICs are not "three-terminal" devices within the meaning of Claim 1 of the patent. (Schlecht Decl., para.para. 23-36.) FN16 ST asserts that all of its BCD and VIPower products have at least five terminals, with but a single exception (ST's Post-Hearing Memorandum, filed May 16, 1994, p. 18; Schlecht Decl., para. 65), and lack a gate terminal (ST's Post-Hearing Memorandum, p. 15; Schlecht 4/14/94 Trans., pp. 91-92). ST's argument, however, is based on the false premise that the "terminals" referenced by Claim 1 must be the pins "accessible to the user" on the outside of the plastic or metal housing encapsulating the PIC chip. (ST's Post-Hearing Memorandum, filed May 16, 1994, p. 15; Schlecht Decl., para. 63.)

FN16. ST's counsel in closing argument identified ST's "terminals" argument as its "principal contention" as to its PICs. (4/14/94 Trans., p. 152.)

Although ST does not contend (as it does with its discrete power MOSFETs) that the deep base regions in its VIPower and BCD I PICs extend into the channel (Schlecht, 4/14/94 Trans., pp. 66-68), ST nonetheless asserts the argument that the deep base of the '666 invention cannot "substantially" underlie the source. (ST's Post-Hearing Memorandum. filed May 16, 1994, pp. 18-19.) ST rests this non-coverage argument on the specific factual assertion that "[i]n ST's BCD I and VIPower products, the source region overlies the deepened portion of the P-well by about eighty percent" (Defendant's Memorandum, etc., filed Aug. 12, 1993, p. 12, lines 10-12; *see also* ST's Post-Hearing Memorandum, filed May 16, 1994, p. 19), which Dr. Schlecht reduced to something "more than 50%" (Schlecht, 4/14/94 Trans., p. 68). Even an 80% overlap is nothing more than the configuration ST says was found in the ST discrete power MOSFETs which, according to ST, preceded its so-called "avalanche rugged" design. (Ferla 8/10/93 Depo., pp. 83-85.) This argument was abandoned when the parties settled this case in 1991 (*see* findings 52-56, infra) and is, moreover, premised on an erroneous interpretation of the '666 claims (*see* findings 24-34, supra).

Nor has ST carried its burden with respect to its "reverse doctrine of equivalents" argument. (Defendant's Memorandum of Points and Authorities in Opposition to Plaintiff's Motion to Enforce Settlement Agreement, filed August 12, 1993, pp. 12-14.) SRI Intern., 775 F.2d at 1123-24. The structure of ST's PIC

products is not "so far changed in principal from [the '666 invention] that it performs the same or a similar function in a substantially different way." Graver Tank & Mfg. Co. v. Linde Air Prod. Co., 339 U.S. 605, 608-09, 70 S.Ct. 854, 94 L.Ed. 1097 (1950). ST's reliance on the declaration of Dr. Cunningham is insufficient. It states only that "the deepened portion in the center of the base does not materially affect the device breakdown voltage performance." (Declaration of James A. Cunningham, etc., filed Aug. 12, 1993, para. 15.) If breakdown voltage is improved to any degree by use of the deep base, then that benefit of the '666 invention is achieved. Nor does Dr. Cunningham explain the basis for his opinion. "An expert who supplies nothing but the bottom line supplies nothing to the judicial process." Mid-State Fertilizer v. Exchange Nat. Bank, 877 F.2d 1333, 1339 (7th Cir.1989); *see also,* Barmag Barmer Machinenfabrik AG v. Murata Machinery, Ltd., 731 F.2d 831, 836 (Fed.Cir.1984); United States v. Various Slot Machines, 658 F.2d 697, 700 (9th Cir.1981).

36. Because sections on the PIC chip other than the power MOSFET section perform additional functions, additional pins protrude from the housing to implement those functions.FN17 Because the MOSFET gate electrode is internally connected within the PIC to control circuitry, no pin directly connected to the gate protrudes from the housing. (ST's Post-Hearing Memorandum, filed May 16, 1994, p. 15; Schlecht 4/14/94 Trans., pp. 91-92.) These additional exterior pins are not, however, "terminals" having any relevance to the '666 patent. Instead, they relate to functions physically and electrically separate from the junctions defining the MOSFET (*see, e.g.,* P.Ex. 190, p. 4) and also, in the case of BCD products, relate to a ground terminal for electrical isolation that does not interact with the active power MOSFET portion of the device (A. Lidow 12/13/93 Trans., pp. 33-34; A. Lidow 10/27/93 Depo., p. 967).

FN17. "The addition of features does not avoid infringement, if all the elements of the patent claims have been adopted." Northern Telecom. Inc. v. Datapoint Corp., 908 F.2d 931, 945 (Fed.Cir.), *cert. denied,* 498 U.S. 920, 111 S.Ct. 296, 112 L.Ed.2d 250 (1990), emphasis added. The Research Director for ST's BCD PIC product line even admitted that ST studied cross-sections of IR's HEXFET power MOSFET when designing the power MOSFET section for ST's BCD product:

"Q. Have you seen cross-sections of the IR HEXFET?

A. When are you referring to, at what point?

Q. At any point.

A. The answer is yes.

Q. When did you first see one?

A. I don't remember.

Q. Do you remember if you saw one during the time that the power IC was being developed in your group?

A. I think so, I think so."

(Murari 11/3/93 Depo., pp. 23-25.) Indeed, the ST BCD PIC illustrated in Plaintiff's Exhibit 110 is approximately 80% power MOSFET. (P.Ex. 110; Schlecht 4/14/94 Trans., p. 82.)
37. The source, gate and drain power MOSFET electrodes found in ST's PIC products "comprise" the three "terminals" called for by the claim. (Lidow 12/13/93 Trans., pp. 31-34, 63, 67-68, 112-13; A. Lidow 10/26/93 Depo., pp. 880-81; A. Lidow 10/27/93 Depo., p. 967; Bruzga 10/22/93 Depo., pp. 154-59; Herman 11/23/93 Depo., pp. 360-61.) ST's own PIC literature labels these terminals "D" (drain), "S" (source) and "G" (gate). (*See, e.g.,* P.Ex. 190, p. 4; P.Ex. 99.) FN18 There are no other "electrodes" or "terminals" that interact with the MOSFET portion on those integrated circuits.

FN18. SGS-Thornson Microelectronics, S.t.l.'s ("ST-Italy's") VIPower and Power MOSFET Research Director, Dr. Ferla, also labelled in his own hand those source, gate and drain terminals on the power MOSFET section of both ST's VIPower and BCD 1 products at his deposition. (Ferla 8/10/93 Depo., pp. 58-60, 75-77, 125-30, P.Exs. 85, 98-100.)

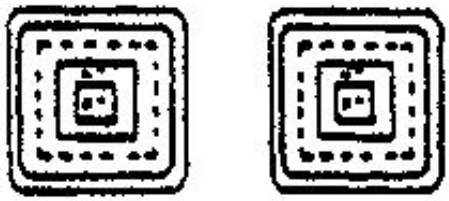
38. Since it is these three power MOSFET electrodes that the claim defines as the "terminals" of the device (P.Ex. 1010, col. 8, lines 5-17), and because those three "terminals" (and no others) are present on the active power MOSFET section of ST's PICs (Schlecht Decl., pp. 33-34; Ferla 8/10/93 Depo., pp. 58-60, 72-77, 125-30; P.Exs. 85, 98-100). ST cannot avoid the patent's coverage by counting external pins on its PIC housings not connected to the MOSFET or by failing to count the gate electrode ("terminal") without which the MOSFET could not function. The '666 patent applies only to the MOSFET junctions in ST's PICs, not to other ancillary circuit elements that may or may not be present.

39. Dr. Lidow has explained how each and every element of Claim 1 of the '666 patent applies to ST's PIC products. (Lidow, 12/13/93 Trans., pp. 31-42; P.Ex. 203 [at Exs. A-B]; A. Lidow 10/26/93 Depo., pp. 726-29, 736-41; P.Exs. 203, 205 [Depo. Exs. 1134, 1135]; A. Lidow 10/27/93 Depo., pp. 952-58.) The Court credits the testimony of Dr. Lidow and Dr. Shott as to claim interpretation and coverage.

C. ST's Discrete Power MOSFETs Infringe Claim 1 Of IR's '666 Patent**.**

1. Before IR Filed Its Second (Power MOSFET Wafer) Motion, ST's Own Engineers Testified That The Deep Base In ST's Discrete Power MOSFETs Does Not Extend Into The Channel.

40. Prior to the time IR filed its motion directed to ST's discrete power MOSFET wafer sales, ST's Mr. Wilson declared in support of ST's non-infringement motion in related case CV-92-6779-R that the cross-sectional figure below from ST's 1988 databook accurately depicts ST's power MOSFET devices. (P.Ex. 206, para.2).



41. ST engineer William Donley, who worked at ST's Carrollton. Texas, facility at the time power MOSFET wafers were first manufactured there, at his deposition (in contrast to his declaration in opposition to IR's power MOSFET wafer motion) also endorsed this databook figure as representative of the cross-section of ST's power MOSFETs. (Donley Decl. [Ex. O to Zessar Decl., filed Nov. 1, 1993], para.para. 2, 6; Donley 9/15/93 Depo., pp. 84-88.) Prior to the filing of IR's motion. Mr. Donley was identified as the "best person" to ask about the appearance of the cross-section of products made in Carrollton. (Gonsalves 7/30/93 Depo., p. 88.)

42. Although ST-Italy's Research Director for power MOSFETs. Dr. Ferla states in his declaration in opposition to IR's power MOSFET wafer motion that his deposition testimony endorsing the accuracy of this same figure (referred to during the deposition as Figure 4 of Exhibit 95) should not be read as applicable to "the current state" of ST's power MOSFETs (Ferla Decl. [Ex. U to Zessar Decl., filed Nov. 1, 1993], para. 6], at the time of his deposition Dr. Ferla said exactly the opposite. (Ferla 8/11/93 Depo., p. 172.) Indeed, when asked at his deposition. Dr. Ferla could not recall the last time a process change was made in ST's power MOSFETs that would significantly impact their cross-section. (Id. at p. 170.) And when asked to identify any differences between the processes used to manufacture power MOSFETs in Italy and Carrollton. Texas, that would alter the cross-section of those devices. Dr. Ferla testified that there were no differences that would change the cross-section from that of ST's databook depiction reproduced above. (Ferla 8/11/93 Depo., pp. 170-72.) FN19

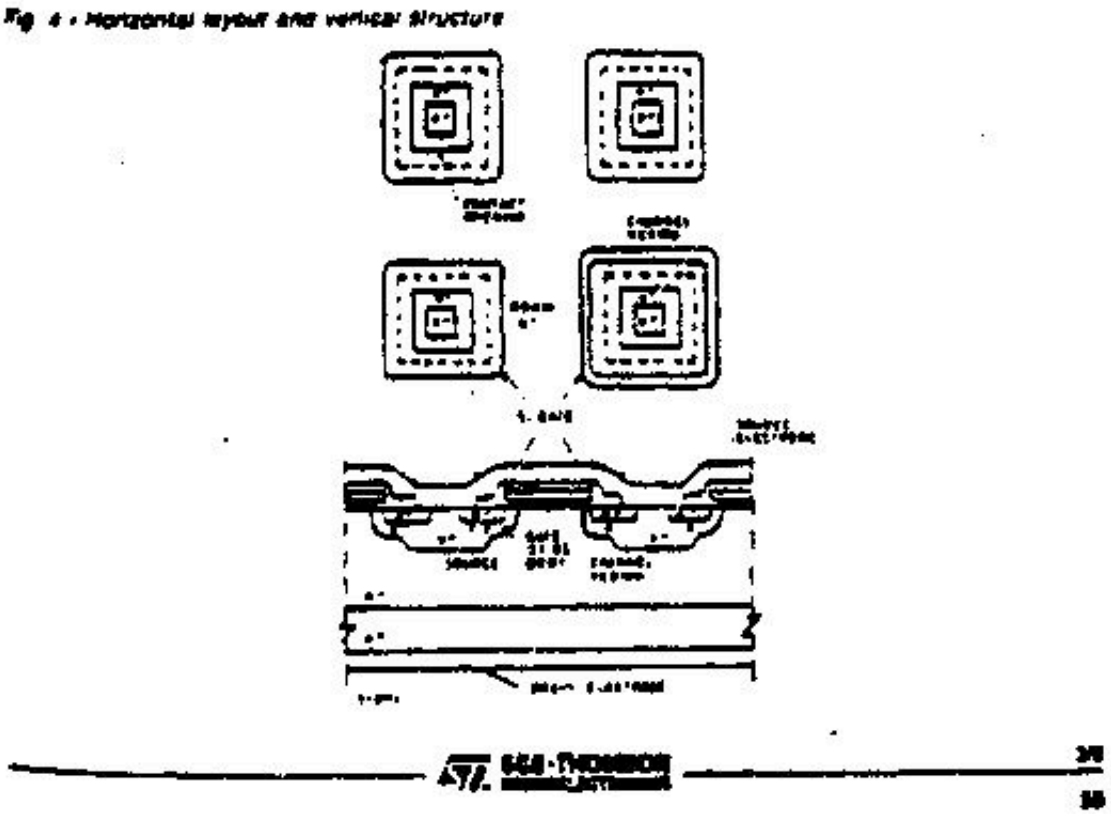
FN19. ST's assertion that "[a]t the time of his deposition in August, 1993. Dr. Ferla was not aware of the design change's effect on the deep base profile" (ST's Post-Hearing Memorandum, filed May 16, 1994, p. 28) is not credible in view of Dr. Ferla's long-held position as Research Director for ST's power MOSFET product line (Ferla 8/10/93 Depo., pp. 14-15).

43. ST advanced in opposition to IR's motion a position inconsistent with this prior testimony- *i.e.,* that the deep base in all its discrete power MOSFETs extends fully under the source and into the channel. On this issue, the Court credits the above-cited pre-motion testimony of ST's witnesses.

2. Testimony By Dr. Shott And By ST's Own Expert Established That The Deep Base Does Not Extend Into The Channel In ST Power MOSFETs Made From At Least Four Of Seven ST Manufacturing Processes.

44. ST's pre-bearing memoranda and declarations in opposition to IR's power MOSFET wafer motion unequivocally represented that the deep base in *all* of ST's discrete power MOSFET products extends *fully* underneath the source regions and this the channel regions-and so are not covered by the '666 patent. (*See, e.g.,* Trial Memorandum of Defendant, etc., filed Dec. 9, 1993 [four days before the commencement of the

hearing], p. 6.) For example, Dr. Schlecht's declaration stated "all of these wafers [made in ST's Carrollton. Texas plant] have had deep base regions extending beneath their respective source regions and into their respective channel regions, as shown in the following illustration:"



(Schlecht Decl., para. 87.) ST-Italy's Drs. Ferla and Frisina were equally unequivocal in their declarations. (Ferla Decl. [Ex. U to Zessar Decl., filed Nov. 1, 1993], para. 5; (Frisina Decl. [Ex. I to Archer Decl., filed Dec. 6, 1993], para.para. 6, 18.)

45. When he testified at the evidentiary hearing, however, Dr. Schlecht conceded that four of ST's seven discrete power MOSFET processes produce power MOSFETs in which the deep base regions do not extend beneath the full width of the source regions and into the channel. (Schlecht, 4/14/94 Trans., pp. 48-50, 75-76; D.Exs. 343, 344, 345, 349.) FN20 Although Dr. Schlecht suggested at the hearing that misalignment in the actual manufacturing implementation of these four processes could result in a deep base extending into the channel in some portion of the resulting devices is qualification Dr. Schlecht did not state in his declaration and inconsistent with the foregoing sketch he sponsored) (Schlecht, 4/14/94 Trans., pp. 51-52, 68, 75), on cross-examination Dr. Schlecht conceded that he could not draw a conclusion as to whether or not the deep base would extend into the channel in power MOSFETs made from these four processes (id. at p. 69.) FN21

FN20. Dr. Schlecht also admitted that, prior to submitting his declaration stating that such was not the case, he had reviewed computer simulations showing the deep base terminating on the source. (Schlecht, 4/14/94

Trans., p. 74, lines 7-11.)

FN21. Nor would the misalignment phenomenon described by Dr. Schlecht take these devices outside of '666 Claim 1 in any event. There is no language in Claim 1 requiring that the deep base be laterally spaced from beneath the source at every point around its perimeter. (P.Ex. 1010 [the '666 patent], cols. 7-8.) To the contrary, Dr. Lidow testified at his deposition that the claim would apply unless the deep base extends past the source and into the channel everywhere around the perimeter of every base in the device. (A. Lidow 10/27/93 Depo., pp. 980-83.)

46. IR's expert, Dr. Shott, also ran computer simulations of ST's seven discrete power MOSFET processes based on data supplied by ST. (Shott, 4/14/94 Trans., p. 16.) ST's expert, Dr. Schlecht, described Dr. Shott's results as "essentially the same" or "very similar" to his own two-dimensional simulation results. (Schlecht, 4/14/94 Trans., pp. 44, 47.) Both sets of simulations revealed that the deep base in four of the seven ST processes terminated on the source and did not extend into the channel. (Shott, 4/14/94 Trans., p. 16.)

3. ST's Argument That Three Of The Seven Discrete Power MOSFET Processes Result In A Deep Base In The Channel Is Not Credible.

47. Critical to the simulation results presented to the Court by Dr. Schlecht and Dr. Shott was their assumption-supplied by ST-that during the manufacture of the actual devices at issue, the edge of the opening through which the deep base is implanted is spaced 3 microns from the edge of opening in the polysilicon that defines the implantations for the source and shallow base regions. (Shott, 4/14/94 Trans., p. 17, Schlecht, 4/14/94 Trans., p. 76.) Dr. Schlecht did not confirm the validity of this key assumption by measuring masks and testified that "there are several reasons why that 3 micron spacing might be varied, plus or minus." (Schlecht, 4/14/94 Trans., pp. 76-77.) Dr. Shott, on the other hand, concluded from the evidence that, for the three manufacturing processes in issue, this spacing must be greater than 3 microns, resulting in actual products having a deep base of narrower width than the deep base shown in the simulations. (Shott, 4/14/94 Trans., pp. 17-22.)

48. As Dr. Shott explained, if the deep base in actual products extended into the channel region to the extent shown in either his own or Dr. Schlecht's simulations of the three processes where the deep base invaded the channel, this fact could be observed in photomicrographs of those products. (Id.) Dr. Shott compared his simulation of ST's NMOS 123 process (P.Ex. 6665) to photomicrographs of an ST IRFP350 power MOSFET said by ST to be made from that process (P.Ex. 6616). (Shott, 4/14/94 Trans., pp. 17-22.) Dr. Shott testified that if the NMOS 123 simulation results-dependent on the 3 micron spacing assumption supplied by ST-were accurate, then no distinction between the deep and shallow base regions would be observable in a photomicrograph of an actual product, even in the event of a significant misalignment. (Id. at p. 18.) The photomicrograph of the ST IRFP350, however, shows distinct shallow and deep base regions, particularly on the left side of the bases. (Id. at p. 20; P.Ex. 6616.)

49. Dr. Shott further explained that because the photomicrograph shows misalignment, the differentiation between the deep and shallow base region evident on one side of the base should, assuming the spacing used for the simulations was correct, result in a deep base offset on the other side of the device far more than sufficient noticeably to lengthen the channel (at the surface of the device) on the other side of the base. (Shott, 4/14/94 Trans., pp. 21-22, 28-29.) Put another way, if the simulations are correct, then misalignment

should result in the channel (at the surface of the device) being noticeably wider (as much as double) on one side of a base compared to the opposite side. (Id.) Because, however, the photomicrograph shows a channel on both sides of the device cross-section of approximately equal length despite misalignment (P.Ex. 6616). Dr. Shott testified that he is compelled to conclude that the deep base in actual products does not extend as far as the simulations show-which, in turn, compelled him to conclude that the 3 micron spacing assumption (which underlies both his and Dr. Schlecht's simulations of the three processes in question) is wrong. (Id.) FN22 Dr. Shott testified that be would reach this same conclusion whether based on his own simulations or those of Dr. Schlecht. (Id. at pp. 28-29.)

FN22. Although IR requested it, ST did not provided the relevant spacing information for actual ST products. (P.Ex. 753, para. 4; Stipulation for Protective Order: Order Thereon, filed Feb. 9, 1993.) This Court ordered ST to produce this information to IR in related case CV-92-6779-R, and ST defaulted. (Ex. 6514 [Stipulation and Order Re International Rectifier's Motion for an Order Compelling Compliance with Rule 30(b)(6) Notices], para.para. B3, B4 [compelling ST to use its best efforts to produce no later than February 11, 1994, one or more witnesses to provide "[t]he configuration (including feature sizes and positions)" and "including diffusion profiles" of the power MOSFET wafers produced in Carrollton, Texas.]; Order Granting Motion Under Rule 37(b)(2) for Defendants' Failure to Comply with the Court's Order of January 14, 1994, filed June 8 and entered June 9, 1994 in CV-92-6779-R.) Fed.R.Evid. 201.

50. Dr. Shott also testified that several negative device impacts would result from a deep base encroaching into the channel to the degree shown in the simulations. (Shott 4/14/94 Trans., pp. 10, 18.) While Dr. Schlecht testified that he did not view the negative threshold voltage impact as significant (Schlecht, 4/14/94 Trans., pp. 52-56), he did not answer the other negative effects cited by Dr. Shott. (Shott, 4/14/94 Trans., pp. 10, 18.) All these facts lead the Court to conclude that in these three processes, as with the other four ST processes, the deep base in fact falls short of the channel. (*See also* Lidow, 12/13/93 Trans., pp. 38-39; Herman 11/23/93 Depo., p. 269.) Indeed, as described above, there is persuasive pre-motion evidence in the record from ST's own employees that in no ST product does the deep base extend past the source and into the channel.FN23

FN23. Dr. Schlecht also conceded, when trying to explain why ST did not seek to prove its position by running the definitive electrical test Dr. Shott had described (Shott 12/14/93 Trans., pp. 137-39), that he could "easily imagine that in most of these processes, where you find the corners along the diagonal of the square, that the deep P base region did not extend into the channel, even though it did in the perpendicular cross-sections that we were looking at." (Schlecht 4/14/94 Trans., p. 59.) That is not the device described by Dr. Schlecht in his pre-hearing declaration, where he assured the Court that the deep base extended into the channel at every point around the perimeter of the base. (*See* illustration at finding 44, *supra*.)

51. Dr. Lidow has explained how each and every element of Claim 1 of the '666 patent applies to ST's discrete power MOSFET products. (Lidow, 12/13/93 Trans., pp. 31-42; P.Ex. 1133 (at Ex. D).; A. Lidow 10/26/93 Depo., pp. 726-29, 736-41; A. Lidow 10/27/93 Depo., pp. 952-58.) The Court credits the testimony of Dr. Lidow and Dr. Shott as to claim interpretation and coverage.

4. The Parties Settled The Question Of The '666 Patent**s Coverage Of ST's Power MOSFETs When They Originally Settled This Case.**

52. Prior to the time IR brought its motion directed to ST's discrete power MOSFET wafer sales, ST repeatedly stated that its intent when entering into the Settlement Agreement was to deem its power MOSFETs covered by at least the '666 patent:

"While SGS-Thomson-USA has always maintained that its Power MOSFETs do not infringe, for purposes of settlement only SGS-Thomson-USA agreed to treat its Power MOSFETs as covered by one or more of the Patent Rights set forth in the License Agreement. The only patents which even arguably cover SGS-Thomson-USA's Power MOSFETs, however, are the '666 and '699 patents, which are in the 6% and 4 1/2% categories, respectively. Thus SGS-Thomson-USA has been paying IR only at the 6% rate."

(Defendants SGS-Thomson Microelectronics, Inc.'s, etc., Answer to First Amended Complaint, etc., filed July 16, 1993 in CV-92-6779 R. para. 35 (emphasis added): *see also* Robinson Decl., filed Aug. 12, 1993, p. 1, lines 25-26; Defendant's Surreply, etc., submitted August 27, 1993, p. 19, lines 21-23. Memorandum, etc., in Support of Motion for Summary Judgment, etc., filed April 9, 1993 in CV-92-6779 R. p. 8, lines 2-6 and note 11; Stein Decl., filed April 9, 1993 in CV-92-6779 R. para. 9.)

53. ST's Mr. Robinson, an attorney and ST's "Director of Corporate Intellectual Property" (Robinson Decl., filed Dec. 7, 1993, para. 1), explained in his December 3, 1993 declaration that he nevertheless decided to stop payment of royalties on ST's sales of power MOSFETs when

"I learned that the avalanche rugged process is a relatively new process that ST and [ST-Italy] did not begin fully utilizing until mid-1991, *after* the License Agreement was executed.... I understand that because the deep base regions in power MOSFETs made pursuant to the avalanche rugged process totally underlie their respective source regions and extend into the channel regions, such power MOSFETs do not practice the '666 patent even as IR construes the claims."

(Id. at para. 15, emphasis in original.) As discussed above, however, the deep bases in ST's power MOSFETs have not materially changed, if at all, since at least 1988 and, as discussed below, ST's so-called "avalanche rugged" products (assuming such a category of products exists) were being made and sold by ST before the Settlement Agreement was signed on February 13/14, 1991.

54. IR brought suit against ST and ST-Italy on the '666 patent in September of 1990. (P.Ex. 1049.) At the time, ST-Italy was supposedly making so-called "avalanche rugged" power MOSFETs, and by no later than the beginning of October 1990 ST had supposedly begun implementation of that design in its Carrollton. Texas, plant.FN24 ST was shipping these supposed avalanche-rugged power MOSFET wafers from Carrollton to ST-Italy by January 1991, *before* the Settlement Agreement was signed. (Horner 9/16/93 Depo., pp. 30-36; P.Ex. 119; P.Ex. 1056.)

FN24. The so-called "avalanche rugged" design was supposedly developed by ST-Italy in 1990 and then later transferred to ST for use in its U.S. plant. (SGS-Thomson's Notice of Motion and Motion to Enforce, etc., filed on or about Nov. 15, 1993, p. 4; Hwang Depo., pp. 15-16, 20-24; P.Ex. 461; Donley 9/15/93 Depo., pp. 69-70; Frisina Decl. (Ex. 1 to Archer Decl., filed Dec. 6, 1993), para. 3 [although misleading as to dates]; 4/14/94 Trans., p. 153.)

55. Mr. Robinson admitted at the hearing that, prior to settling the suit, he investigated whether or not ST practiced IR's patents (*i.e.,* whether ST made, used or sold products using the inventions, 35 U.S.C. s.

271(a)), considering specifically IR's interpretation of the '666 patent claims bearing on the position of the deep base region. (Robinson, 4/14/94 Trans., pp. 102-04.) Mr. Robinson reviewed the Patent Office file wrappers and met with ST employees "knowledgeable of SGS-Thomson's technologies." (Id.) One of the persons Mr. Robinson met with during his investigation was ST-Italy's Dr. Ferla, ST's Research Director for power MOSFETs, who was "very instrumental" in ST's MOSFET development efforts. (Id. at p. 102-03.) Dr. Ferla reviewed IR's patents and accompanied Mr. Robinson at a settlement meeting with IR on September 27, 1990 where IR described how its patents applied to ST's power MOSFETs. (Id. at p. 113; Ferla 8/11/93 Depo., pp. 203-06, 233-35.) Thus, Mr. Robinson's suggestion (unexpressed to IR) that ST did not intend to include its avalanche rugged products (again assuming such a separate category of products exists) within the group of power MOSFETs ST "agreed to treat as covered" by the '666 patent is not credible, particularly in view of the fact that ST continued to pay royalties on those very products for three years, until after IR filed its motion. (Robinson, 4/14/94 Trans., p. 104-05.) FN25 As ST's Mr. Wilson told this Court in his May 21, 1993 declaration in CV-92-6779-R: "In terms of layout, profile and geometry of the cells, ST's current power MOSFETS are the same today as those sold by ST in 1990 and 1991." (P.Ex. 754, para. 2.)

FN25. Mr. Robinson himself confirmed ST's logic behind the February 1991 settlement in his declaration in support of ST's opposition to IR's May 27, 1993 motion to enforce the Settlement Agreement:
"ST entered into the License Agreement solely to buy peace, not because any of ST's power MOSFETs infringed IR's patents. Consistent with that position, ST's power MOSFET products have been deemed 'royalty bearing products' for purposes of the License Agreement, even though they do not practice any IR patents."

(Robinson Decl., filed Aug. 12, 1993, para. 3, emphasis added.) Similarly, ST's Mr. O'Molesky-ST's Rule 30(b)(6) designee on the 1991 settlement with IR-was unable to evade under cross-examination at the hearing his prior deposition testimony establishing that ST's business understanding of the settlement at the time the agreement was signed requires ST to pay rovalties so long as ST's power MOSFETs "arguably" use IR's patents. (O'Molesky, 4/14/94 Trans., pp. 129-35.)
56. The Court has found that each and every element of Claim 1 of the '666 patent is present in ST's discrete power MOSFET products. (*See* Findings 40-51. supra.) The Court also finds that the parties in any event agreed to treat ST's power MOSFETs (including any so-called "avalanche-rugged" power MOSFETs) as covered by the '666 patent for purposes of the Settlement Agreement when they originally settled this action.

IV. THE SETTLEMENT AGREEMENT REQUIRES THAT ST PAY ROYALTIES TO IR ON SALES OF PIC PRODUCTS.

A. The Express Terms Of The Settlement Agreement Cover ST's PIC Products.

57. The Settlement Agreement between IR and ST prescribes that PICs are "Royalty Bearing Products." "Royalty Bearing Product" is defined to include, among other things, a "Power MOSFET Die" and a "Hybrid MOSFET Device." (P.Ex. 1056, para.para. 1.1, 1.3, 1.5, 1.7.) In turn, "Power MOSFET Die" is defined as "a completed and unpackaged semiconductor die which contains semiconductor junctions which define a metal oxide semiconductor field effect transistor ('MOSFET')." (Id. at para. 1.1.) The structure of ST's PICs meets the definition of "Power MOSFET Die," the most basic definition in the agreement. (Lidow, 12/13/93 Trans., p. 47.) In addition, the structure of ST's PICs meets the definition of "Hybrid MOSFET device" which includes, *inter alia,* devices having at least one "Power MOSFET Die, in

combination with other active or passive circuit elements...." (Id. at para.para. 1.1, 1.3; Lidow, 12/13/93 Trans., p. 47.) FN26

FN26. The applicability of the "Hybrid MOSFET Device" definition is in ST's benefit, since it has the effect of reducing the royalty otherwise due on the entire chip under the "Power MOSFET Die" provision to a calculated amount due on only the power MOSFET section of ST's PICs. (P.Ex. 1056, para. 3.1(d); Lidow 12/13/93 Trans., pp. 47-48; D. Lidow 10/6/93 Depo. pp. 175-78; A. Lidow 10/27/93 Depo., pp. 1006-08.) The fact that PICs include other circuit elements elsewhere on the same chip is of no consequence to the coverage of the claims of the licensed patents, Northern Telecom. Inc., 908 F.2d at 945 ("The addition of features does not avoid infringement, if all the elements of the patent claims have been adopted."), and thus is of no consequence to coverage of ST's PICs under the Settlement Agreement.

58. ST-Italy's Dr. Ferla testified at his deposition that the definitions both of "Power MOSFET Die" and of "Hybrid MOSFET Device" in the Settlement Agreement accurately describe ST's PICs having a power MOSFET section. (Ferla 8/11/93 Depo., 190-92; P.Exs. 85, 99.) Similarly, Dr. Schlecht also conceded at the evidentiary hearing that the Settlement Agreement's definitions of "Power MOSFET Die" and "Hybrid MOSFET Device" cover the ST PICs at issue. (Schlecht, 4/14/94 Trans., p. 65.) FN27

FN27. Dr. Schlecht's testimony at the hearing applying the definitions of the Settlement Agreement to ST's PICs contrasts with his declaration testimony where he concludes that the agreement does not cover PICs based on his view of what the terms used in the contract might mean in other contexts, apart from their contractual definitions. (Schlecht Decl., para.para. 23-38.) While custom and usage of words in a certain trade are admissible to explain the meaning of the terms used in a contract such evidence may not be used to vary the terms of the contract. Horsemen's Benevolent & Protective Assn. v. Valley Racing Assn., 4 Cal.App.4th 1538, 1560, 6 Cal.Rptr.2d 698 (1992).

59. In addition, both the '666 and '699 patents state that the inventions can be employed in PICs and include a figure showing a PIC configuration for the inventions.FN28 IR also told ST in briefing before this Court less than a month before the settlement was signed that the patents covered PICs:

FN28. Figure 8 of the patents shows the use of the inventions in a PIC (Lidow, 12/13/93 Trans., pp. 34, 45-46; A. Lidow 10/27/93 Depo., pp. 937-39; P.Exs. 1010, 1012) and each of the patents describes that figure, in part, as follows: "the drain contact 85 in surrounded by a p (+) isolation diffusion 96 to isolate the device from other devices on the same chip or wafer" (P.Ex. 1010 [the '666 patent], col.6, lines 43-45; P.Ex. 1012 [the '699 patent], col. 6, lines 49-51, emphasis added; Lidow, 12/13/93 Trans., pp. 34, 45-46; A. Lidow 10/27/93 Depo., pp. 937-39).

"Products coming under the IR Patent Rights can be sold in many forms: wafers; unhoused die; devices having a single die assembled in a housing; integrated circuits in which only a part of a die is devoted to the power MOSFET; and hybrids in which one MOSFET die shares a common housing with other die." (Memorandum of Points and Authorities in Support of Opposition to Motion of SGS-Thomson, etc., filed Jan. 16, 1991, p. 8, emphasis added.) In the draft of the Settlement Agreement existing at the time, as in the final agreement, PICs and hybrids both fell under the definitions of "Power MOSFET Die" and "Hybrid MOSFET Device." (*See,* finding 57-58, *supra*.)

60. Because the grant of the license under the Settlement Agreement is coextensive with ST's obligation to pay royalties, if the agreement were deemed to except ST's PICs then ST would be subject to suit on those products under the patents included in the license.FN29 That would not be a settlement. Indeed, ST told this Court just three weeks before it signed the Settlement Agreement that the scope of the settlement between the parties was governed by the scope of the claims of the licensed patents and not limited to particular products:

FN29. The grant clause in the Settlement Agreement reads: "Rectifier hereby grants to Licensee and its subsidiaries, subject to the provisions of this Agreement, a non-exclusive, non-transferable license to make, have made, use or sell any Royalty Bearing Product under the Patent Rights for the term of the Agreement." (P.Ex. 1056, para. 2.1.)

"[ST] sales of products in the U.S. that use the 'claimed subject matter' of the six patents are covered by the license. The claims of IR's six patents provide the concise formal definition of the invention. [Citation omitted.] Thus, any detailed definition of the licensed products is unnecessary as superfluous to the definition contained in the claims of the licensed patents."
(Reply Memorandum in Support of Motion of SGS-Thomson, etc., filed on or about Jan. 23, 1991, p. 15.) IR's view is also that both the license and ST's royalty obligation under the Settlement Agreement are coextensive with the scope of the claims of the licensed patents. (Lidow, 12/13/93 Trans., p. 50; Koris 11/18/93 Depo., pp. 239-40.) The Court agrees.

B. ST's Actions Following IR's Request That ST Account For And Pay Royalties On Its PIC Sales Demonstrates ST's Belief That The Scope Of The Settlement Agreement Includes PICs Covered By The Licensed Patents.

61. Prior to the filing of IR's motion on May 26, 1993, IR's Mr. Koris corresponded with ST's Mr. Robinson for five months on the subject of ST's PICs.FN30 During that correspondence. Mr. Robinson at no time suggested that PICs were beyond the scope of the Settlement Agreement. (Robinson, 4/14/94 Trans., p. 100.) If the Settlement Agreement had nothing to do with ST's PICs. Mr. Robinson would have so informed Mr. Koris immediately.FN31 What Mr. Robinson did tell Mr. Koris is also significant. On March 3, 1993, Mr. Robinson said "I will investigate and if the sales were not reported, we will take corrective action." (P.Ex. 52.) On March 25, Mr. Robinson reported that ST's PIC group "was unaware of IR's patents" and that he was "in the process of bringing them up to date on the reporting requirements of the license agreement." (P.Ex. 57.) On April 2, Mr. Robinson reported a few PIC product sales, represented that ST would pay royalties to IR on those sales and advised that he hoped to complete his investigation the next week. (P.Ex. 59.) ST actually paid royalties to IR on these PIC sales on April 8. (Robinson Decl., filed Dec. 7, 1993, para. 10.)

FN30. ST observes that IR did not pursue ST for royalties on its PIC sales until December 1992. (4/14/94 Trans., p. 150; ST's Post-Hearing Memorandum, filed May 16, 1994, p. 12.) After Derek Lidow assumed responsibility for licensing matters in about November, 1992, he conducted a study to determine whether ST and other licensees were properly accounting for sales and paying royalties due. (D. Lidow 10/6/93 Depo., pp. 20-25, 183-96.) No one else had undertaken such a study previously. (Id.) Derek Lidow concluded from his study that, while the royalty payments received from other licensees seemed roughly consistent with his sales estimates. ST's royalty payments appeared far too low. (Id.) While ST suggests that IR should have know from the outset that ST was not paying royalties on its PIC sales because ST's first payments referred to "RELEVANT POWER MOSFET PRODUCTS" and "relevant MOSFET products," respectively

(O'Molesky, 4/14/94 Trans., pp. 121-22, 124; D.Ex. 97; D.Ex. 98). "Power MOSFET" is a defined term in the Settlement Agreement which includes, *inter alia,* "Power MOSFET Die" and "Hybrid MOSFET Device" (P.Ex. 1056, para. 1.5). In addition, ST's first payment was in response to a letter from IR stating that IR was "offering a tiered royalty schedule based on the use of the claimed subject matter" of the six IR patents later listed in the Settlement Agreement. (D.Ex.96.)

FN31. Mr. Robinson tried to excuse this lapse by stating that he was unfamiliar with the term "power integrated circuit" because it is not used at ST, that he only later learned that Mr. Koris was referring to BCD products and that he had not read the license agreement so he did not realize that PICs had been excluded. (Robinson, 4/14/94 Trans., pp. 100-02.) Mr. Robinson's testimony is inconsistent with the following facts: (1) on December 3, 1992, Mr. Koris' first letter to Mr. Robinson's colleague Mr. Stein referred to ST's "VIPower" PIC line by that ST trademarked name and attached ST brochures referring to ST's VIPower and BCD products, the last page of which referred to ST's BCD products as "power ICs" (P.Ex. 23); (2) on January 6, 1993, following a discussion with Mr. Robinson, Mr. Koris sent studies of an ST VIPower and BCD product to Mr. Robinson to "facilitate your review of my December 3, 1993 letter to Mr. Stein" (P.Ex. 47); (3) on March 23 and April 2, 1993 Mr. Robinson wrote to Mr. Koris reporting on sales of "VIPower" and "BCD" products, respectively, without disclaiming that the Settlement Agreement applied to such products (P.Exs. 55, 59); and (4) Mr. Robinson, who claims not to have read the agreement at any time prior or during his correspondence with Mr. Koris, nevertheless admits that he advised his client on patent issues throughout the negotiation of the settlement (Robinson, 4/14/94 Trans., 113-14).

62. These are not the statements and actions of a party that does not believe the Settlement Agreement concerns PICs, and ST's court papers continued this pattern after IR's May 26, 1993 filing of its motion to enforce as to PICs. In a July 20, 1993 filing ST equated the question of whether ST's PICs are "Royalty Bearing Products" under the Settlement Agreement with the sole question of "whether ST's PICs practice the IR patents." (Ex Parte Application, etc., filed on or about July 20, 1993, p. 4, lines 18-22.) ST's August 12 opposition to IR's motion to enforce as to PICs nowhere argued that PICs are outside the scope of the Settlement Agreement, but instead again equated the question of what is a "Royalty Bearing Product" with the question of patent coverage. (Defendant's Memorandum, etc., filed Aug. 12, 1993, p. 4, lines 3-8.) Even ST's surreply on the motion two weeks later did not argue that the Settlement Agreement was irrelevant to PICs, but instead emphasized that "[t]he issue is not whether ST's PICs fall within the contractual definition of Power MOSFET, but whether ST's PICs are ... *covered by the Patent Rights*." (Defendant's Surreply, etc., submitted Aug. 27, 1993, p. 7, emphasis in original.)

C. ST's Reliance On IR's License Negotiations With Others To Prove The Scope Of The Settlement Agreement Between IR And ST Is Misplaced.FN32

FN32. Evidence of matters unknown to ST at the time the settlement between IR and ST was struck is legally irrelevant to the interpretation of the Settlement Agreement. United Commercial Ins. Service, Inc. v. Paymaster Corp., 962 F.2d 853, 856 (9th Cir.), *cert. denied,* 13 S.Ct. 660 (1992): Mission Valley East. Inc. v. County of Kern, 120 Cal.App.3d 89, 97, 174 Cal.Rptr. 300 (1981). Nonetheless, consideration of such evidence by the Court does not change its interpretation of the Settlement Agreement, *i.e.,* that it requires ST to account for and pay royalties on sales of ST PICs covered by licensed patents.

63. ST's argument that its PICs are not within the scope of the Settlement Agreement, even if covered by the licensed patents, appeared for the first time in Dr. Schlecht's declaration filed December 6, 1993 (Schlecht Decl., pp. 11-20), just seven days before the evidentiary hearing began, seven months after IR filed its motion to enforce relating to PICs and a full year after Mr. Koris began his correspondence with ST on the subject of ST's PIC sales.FN33

FN33. In opening argument, ST's counsel told the Court that Mr. Koris raised the issue with ST in correspondence in February, 1993. (12/13/93 Trans., p. 24.) Mr. Koris' declaration describes a letter to ST's Mr. Stein of February 23, 1993 as *asking* ST whether it was taking the position that its PICs were not covered by the Settlement Agreement (P.Ex. 202, para. 12); the letter itself reveals that IR was concerned that "SGS may be taking the position that its integrated circuit products are not covered by the licensed International Rectifier patents" (id., at Ex. I). Even if IR had asked the question (it did not). Mr. Robinson admits he never told IR that ST believed the Settlement Agreement to exclude PICs. (Robinson, 4/14/94 Trans., p. 100.)

64. In support of this argument, ST relies on the negotiating history of agreements between IR and other (non-ST) companies. (4/14/94 Trans., pp. 147-49.) ST places the greatest emphasis on IR's license agreement with Hitachi. (Trial Memorandum of Defendant, etc., filed Dec. 9, 1993 (four days before the start of the hearing), pp. 3-4.) ST argues that PICs are not covered by ST's agreement with IR, because its agreement "employs virtually the same definitions" as the Hitachi agreement from which definitions of "Power MOSFET Integrated Circuit Die" and "Power MOSFET Integrated Circuit Device" were removed during the drafting process. (*Id*.)

65. Derek Lidow negotiated IR's patent license agreement with Hitachi in 1987 (but was not involved in negotiating the Settlement Agreement with ST in 1990/91). (D. Lidow 1/26/93 Depo., pp. 17-19; D. Lidow 10/6/93 Depo., pp. 131-32, 204-05, 217, 236-39.) FN34 Derek Lidow testified that the definitions found in the first draft of the Hitachi agreement (the first of IR's patent license agreements) were carried forward from IR's technical assistance agreement (not a mere patent license agreement) with Unitrode. (D. Lidow 10/6/93 Depo., pp. 159, 172.) The Unitrode agreement included not only a generic definition of "Hybrid Device" broad enough to encompass PICs, but also included definitions of "Power MOSFET Integrated Circuit Die" and "Power MOSFET Integrated Circuit Device." (D.Ex.120, pp. 2-3.) The specific PIC definitions were used in the Unitrode agreement, for example, because "Technical Information relating to Power Mosfet Integrated Circuit Dies [was] excluded from [the exchange of knowhow under] this Agreement...." (*Id*. at para. 2.1.)

FN34. In turn, Alexander Lidow, who negotiated the Settlement Agreement with ST, was not involved in negotiating the agreement with Hitachi. (A. Lidow 10/26/93 Depo., pp. 675-77.)

66. When similar definitions appeared in the first draft of the Hitachi agreement (D.Ex.120), Hitachi informed IR that Hitachi was not making PICs with MOSFET elements, requested that IR delete the definitions of "Power MOSFET Integrated Circuit Die" and "Power MOSFET Integrated Circuit Device" and requested that IR limit the basic definition of "Power MOSFET Die" (which was sued, in turn, in all other device definitions) to "vertical type" MOSFETs. (D.Ex. 119, p. IRF0065.) Derek Lidow acceded to Hitachi's requests upon Hitachi's further agreement that, if it ever began making PICs covered by IR's patents, then the agreement would be amended. (D. Lidow 10/6/93 Depo., pp. 163-66.) Since there was no

doubt in his mind that the definition of "Hybrid MOSFET Device" in the Hitachi agreement included PICs (*id*. at pp. 172-75, 180-81), Derek Lidow "was willing to do the handshake agreement with Hitachi to let them sort of not craft in specifically the power IC in their face-saving way of excluding it because it was there in terms of hybrid MOSFET definition" (*id*. at p. 172).

67. When, five years later, Hitachi began making covered PICs and asked IR to amend the agreement, Hitachi's concern was not with the absence in the agreement of a recitation of the words "power integrated circuit." (Fiedler 11/22/93 Depo., pp. 87-98, 104-09, 112-13.) Rather, Hitachi was concerned that the definition of "Power MOSFET Die" (which had originally been limited at Hitachi's request to "vertical type" MOSFETs) might exclude its PICs from the agreement. (*Id*.) FN35 The Hitachi agreement was therefore amended by, *inter alia,* deleting from the definition of "Power MOSFET Die" the words "vertical type" and adding a definition of "MOSFET Power Integrated Circuit." (D.Ex. 112.) When Hitachi first paid royalties under the amended agreement, it stated that it was doing so pursuant to paragraph 3.1(d), applicable to "Hybrid MOSFET Devices." (D.Ex. 113 at para. 3.1(d), D.Ex. 115.) IR's negotiations and agreements with third parties thus have no bearing on IR's and ST's intent in striking their settlement.FN36

FN35. The definition of "Power MOSFET Die" in the IR/ST Settlement Agreement, in contrast, does not include the "vertical type" limitation. (P.Ex. 1056, para. 1.1.)

FN36. That IR has, in recognition of the growing prevalence of PICs with power MOSFET elements, mentioned PICs (in the words ST apparently prefers) in more recent license agreements and drafts exchanged with others is of no consequence to the 1991 Settlement Agreement with ST. (Id.) This is particularly true when one considers that the mention ST cites in other agreements and drafts comes not in a separate definition for PICs, but as a tag-on to the definition of "Hybrid MOSFET Device." (D.Ex. 123, para. 1.6; D.Ex. 158, para. 1.6; D.Ex. 254, para. 1.5.)

V. CONCLUSIONS OF LAW DEEMED FINDINGS OF FACT

68. Any conclusion of law set forth below which constitutes a finding of fact is incorporated herein as such by this reference.

CONCLUSIONS OF LAW

1. Any finding of fact set forth above which constitutes a conclusion of law is incorporated herein as such by this reference.

2. This Court had jurisdiction over the original action commenced herein by IR in 1990 under 28 U.S.C. s. 1338(a). This Court has jurisdiction over the parties' respective motions to enforce the Settlement Agreement as a result of its retention of jurisdiction under the Order dismissing the action in 1991 as against ST-US. Kokkonen v. Guardian Life Ins. Co. of America, 511 U.S. 375, 114 S.Ct. 1673, 1677, 128 L.Ed.2d 391 (1994); Interspiro USA, Inc. v. Figgie Int'l Inc., 18 F.3d 927, 930 (Fed.Cir.1994).

3. "Questions regarding settlements are governed by state law applicable to contracts in general." S and T Mfg. Co., Inc. v. Hillsborough County, Fla., 815 F.2d 676, 678 (Fed.Cir.1987); *see also* United Commercial Ins. Service, Inc. v. Paymaster Corp., 962 F.2d 853, 856 (9th Cir.1992). The Settlement Agreement here is governed by California law (P.Ex. 1056 [Settlement Agreement], para. 8). Cal. Civ.Code s.s. 1646, 1646.5.

4. Under California law, "[a] contract must be so interpreted as to give effect to the mutual intention of the parties as it existed at the time of contracting, so far as the same is ascertainable and lawful. (Civ.Code, s. 1636.) A contract may be explained by reference to the circumstances under which it was made, and the matter to which it relates. (Civ.Code s. 1647.)" Horsemen's Benevolent & Protective Assn. v. Valley Racing Assn., 4 Cal.App.4th 1538, 1559, 6 Cal.Rptr.2d 698 (1992); *see also* United Commercial, 962 F.2d at 856.

5. "The law governing interpretation of written instruments establishes that the *subjective intent* of a party is of no moment in ascertaining the meaning of the words used in the instruments.... Although Civil Code s. 1636 provides that a contract must be interpreted so as to give effect to the 'mutual intention' of the parties as it existed at the time of contracting, it is well settled that the correct approach is to avoid the terminology of 'intention' and look for the *expressed intent* under an *objective standard*." Mission Valley East. Inc. v. County of Kern, 120 Cal.App.3d 89, 97, 174 Cal.Rptr. 300 (1981) (emphasis in original); *see also* United Commercial, 962 F.2d at 856 ("The relevant intent is 'objective'-that is, the intent manifested in the agreement and by surrounding conduct-rather than the subjective beliefs of the parties. [Citations omitted.] For this reason, the true intent of a party is irrelevant if it is unexpressed. [Citations omitted.]").

6. "Under California law, the interpretation of a contract is a question of law subject to de novo review [on appeal]. If interpretation requires the resolution of disputed facts or a determination of the credibility of extrinsic evidence, the appellate court will defer to the district court's resolution of those issues [of fact] if it is supported by substantial evidence." United Commercial, 962 F.2d at 856; *see also* Horsemen's, 4 Cal.App.4th at 1559-60, 6 Cal.Rptr.2d 698. The Court has resolved all such factual issues in favor of the Court's interpretation of the Settlement Agreement set forth in its findings of fact.

7. Under the Settlement Agreement, royalties are payable to IR on ST's sales of "Royalty Bearing Products." (P.Ex. 1056 [Settlement Agreement], para. 3.1.) A "Royalty Bearing Product" under the Settlement Agreement must be "covered by" IR's "Patent Rights" (id. at para. 1.7, 6 Cal.Rptr.2d 698), which include the claims of the '666 and '699 patents (id. at para. 1.6, 6 Cal.Rptr.2d 698). The parties agree and the Court has found that ST products are "covered by" the claims of the '666 or '699 patents under the terms of the Settlement Agreement if those products infringe those claims. (SGS-Thomson's Post-Hearing Memorandum on Motions to Enforce Settlement Agreement, p. 1; International Rectifier's Post-Hearing Memorandum in Support of Its Motions to Enforce Settlement Agreement, p. 29.) The Court has also found that the parties intended when entering into the Settlement Agreement to treat all of ST's discrete power MOSFET products as "covered by" the claims of at least the '666 patent for purposes of settlement, regardless of the parties' then-existing disagreement as to infringement. (*See* Findings of Fact 52-56, supra.)

8. "The first step in determining infringement is to construe the claims. The then-properly construed claims are compared to the alleged infringing device." Moeller v. Ionetics, Inc., 794 F.2d 653, 656 (Fed.Cir.1986) (citation omitted). "It is only after the claims have been construed without reference to the accused device that the claims, as so construed, are applied to the accused device to determine infringement." SRI Intern. v. Matsushita Elec. Corp. of America, 775 F.2d 1107, 1118 (Fed.Cir.1985) (en banc). The Court has followed this methodology in interpreting and applying the claims of the '666 and '699 patents.

9. Claim language should be interpreted as one skilled in the art would have interpreted the claim at the time of the invention. Moeller, 794 F.2d at 657 (citations omitted).FN37 "[C]laim interpretation is a question of law. However, resort to certain extrinsic evidence (*i.e.,* the specification, prosecution, history, and other claims) is always necessary to interpret disputed claims." Id. at 656 (citations omitted). "A disputed issue of

fact may, of course, arise in connection with interpretation of a term in a claim if there is a genuine evidentiary conflict created by the underlying probative evidence pertinent to the claim's interpretation." Johnston v. IVAC Corp., 885 F.2d 1574, 1579 (Fed.Cir.1989) (citation omitted). The testimony of experts concerning claim construction "is evidence of construction of the claims as they would be construed by those skilled in the art." McGill Inc. v. John Zink Co., 736 F.2d 666, 675 (1984). The Court has resolved all such factual issues in favor of the Court's interpretation of the claims set forth in its findings of fact.

FN37. "Factors that may be considered in determining level of ordinary skill in the art include: (1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field. Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case." Environmental Designs. Ltd. v. Union Oil Co. of Cal., 713 F.2d 693, 696-97 (Fed.Cir.1983), *cert. denied,* 464 U.S. 1043, 104 S.Ct. 709, 79 L.Ed.2d 173 (1984) (citation omitted). "The person of ordinary skill in the art of power semiconductor device design and processing in 1978 and 1979 would likely have held a B.S. degree in electrical engineering or related fields such as physics of applied physics, and have had a few years of industrial experience." (P.Ex. 207 [Findings of Fact and Conclusions of Law in *IR. v. Siliconix*), p. 55 n. 41; *see also,* Schlecht Decl., para. 16; P.Ex. 200 [Curriculum Vitae of Alexander Lidow].)

10. "Literal infringement requires that every limitation of the patent claim must be found in the accused device." ZMI Corp. v. Cardiac Resuscitator Corp., 844 F.2d 1576, 1578 (Fed.Cir.1988). As set forth in the Court's findings of fact, each and every limitation of Claim 1 of the '699 patent is found in ST's discrete power MOSFET products and in its VIPower, BCD I and BCD II PIC products employing a vertical conduction power MOS element, and each and every limitation of Claim 1 of the '666 patent is found in ST's discrete power MOSFET products and its VIPower and BCD I PIC products employing a vertical conduction power MOS element.

11. ST has materially breached the Settlement Agreement by failing to account to IR for ST's sales of relevant PIC products (VIPower and BCD I and BCD II products employing a vertical conduction power MOS element). (P.Ex. 1056 [Settlement Agreement], para.para. 3.4, 4.1.) ST also has materially breached the Settlement Agreement by failing to pay to IR royalties due on ST's sales of those PIC products: at the rate of 6% on sales of ST's VIPower and BCD I PICs (which are covered by both the '666 and '699 patents) and at the rate of 4 1/2% on sales of ST's BCD II PICs (which are covered by the '699 patent). (Id. at para.para. 1.9, 1.10, 3.1., 3.3, 3.4, 4.1.) FN38

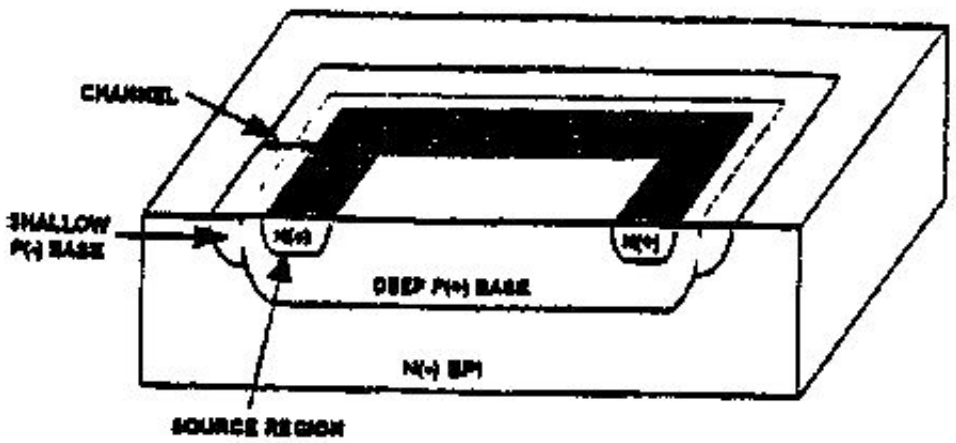
FN38. Under paragraph 3.2 of the Settlement Agreement, die or wafers sold in unassembled form are deemed sold in assembled form and the rate on such sales is three times the rate specified in paragraph 3.1 of the Settlement Agreement. (P.Ex. 1056, para. 3.2.)

12. ST has materially breached the Settlement Agreement by failing to account to IR for ST's sales of discrete power MOSFET wafers to ST-Italy. (Id. at para.para. 3.3, 4.1.) ST also has materially breached the Settlement Agreement by failing to pay to IR royalties due on ST's sales of those wafers (which are covered by both the '666 and '699 patents) at the rate of 18%. (Id. at para.para. 1.9, 1.10, 3.1., 3.2, 3.3, 3.4, 4.1.) In addition, ST materially breached the Settlement Agreement (following IR's filing of its motion to enforce as to discrete power MOSFET wafer sales to ST-Italy) by reducing from 6% to 4 1/2% the royalty rate paid to

IR generally on ST's sales of discrete power MOSFETs (which are covered by both the '666 and '699 patents). (Robinson Decl., filed Dec. 7, 1993, para. 15; P.Ex. 1056 [Settlement Agreement], para.para. 1.9, 1.10, 3.1., 3.3, 4.1.)

13. "Every person who is entitled to recover damages certain, or capable of being made certain by calculation, and the right to recover which is vested in him upon a particular day, is entitled also to recover interest thereon from that day...." Cal. Civ.Code s. 3287(a). "If a contract entered into after January 1, 1986, does not stipulate a legal rate of interest, the obligation shall bear interest at a rate of 10 percent per annum after a breach." Cal. Civ.Code s. 3289(b). An award of such interest in mandatory. Parvin v. Davis Oil Co., 655 F.2d 901, 905 (9th Cir.1979), *cert. denied,* 445 U.S. 965, 100 S.Ct. 1654, 64 L.Ed.2d 241 (1980).

14. The Settlement Agreement required that ST on December 7, 1990 account for and pay royalties to IR on Royalty Bearing Products sold by ST from February 10, 1987 to December 7, 1990. (P.Ex. 1056 [Settlement Agreement], para. 3.4; D.Ex. 97.) Interest is due at a rate of 10% per annum commencing December 7, 1990 on all royalties due to IR and not yet paid on sales made from January 10, 1987 through December 7, 1990. The Settlement Agreement required that ST on January 29, 1991 account for and pay royalties to IR on Royalty Bearing Products sold by ST from December 7, 1990 through December 31, 1990. (P.Ex. 1056, para. 3.4; D.Ex. 98.) Interest is due at a rate of 10% per annum commencing January 29, 1991 on all royalties due to IR and not yet paid on sales made from December 7, 1990 through December 31, 1990. For sales made after December 31, 1990, the Settlement Agreement requires that "[o]n or before the forty-fifth (45) day after each and every calendar quarter during the term of this Agreement, [ST] shall pay to [IR] by wire transfer in United States Dollars, any royalties due on sales made by it in such quarter." (P.Ex. 1056, para. 4.1.) Interest is due at a rate of 10% per annum commencing with the forty-fifth day following the close of each calendar quarter after December 31, 1990 on all royalties due to IR and not yet paid on sales made during such calendar quarters.



ORDER GRANTING INTERNATIONAL RECTIFIER'S MOTIONS TO ENFORCE SETTLEMENT AGREEMENT AND DENYING SGS-THOMSON'S MOTION TO ENFORCE SETTLEMENT AGREEMENT

SUBMITTED UNDER SEAL PURSUANT TO PROTECTIVE ORDER

The motions of plaintiff International Rectifier Corporation ("IR") filed May 27, 1993 and October 19, 1993, and the motion of defendant SGS-Thomson Microelectronics, Inc. ("ST"), filed on or about November 15, 1993, to enforce the parties Settlement Agreement FN1 have been fully briefed and argued by the parties in memoranda accompanied by declarations and other evidentiary submissions filed with the Court, the Court has received additional evidence and has heard additional argument during an evidentiary hearing on December 13 and 14, 1993 and April 14, 1994, the parties have each filed post-hearing memoranda and final argument was had from each party on July 11, 1994.

FN1. The Amended and Restated Patent License Agreement entered into as of December 7, 1990 and executed by the parties' on February 13/14, 1991 in settlement of the above-captioned civil action.

The Court, having considered all of the argument and evidence offered by each party, now finds and rules that IR's motions each should be, and hereby is, GRANTED, that ST's motion should be, and hereby is, DENIED, and hereby ORDERS as follows:

1. ST shall account to IR for ST's past sales of its VIPower, BCD I and BCD II power integrated circuit ("PIC") products having a MOS power stage (or any other PIC products covered by the licensed patents) and shall pay the royalties due to IR thereon on or before August 25, 1994 (45 days from the date of this Court's oral ruling granting IR's motions and denying ST's motion) FN2 as follows: on U.S. sales of such VIPower and BCD I products, the royalty rate shall be 6% (calculated under paragraph 3.1(d) of the Settlement Agreement on the power MOS portion of the PIC as if sold separately in an arm's length transaction with third parties as a comparably rated discrete devices and on U.S. sales at such BCD II products, the royalty rate shall be 4 1/2% (calculated under paragraph 3.1(d) of the Settlement Agreement on the power MOS portion of the PIC as if sold separates in an arm's length transaction with third parties as a comparably rated discrete device), except that in either case the royalties on U.S. sales of unassembled die or wafers of these products shall be three times said rates.

FN2. Under paragraph 4.1 of the Settlement Agreement, an accounting and payment is due to IR for ST's sales made during a given calendar quarter within 45 days after the end of that calendar quarter. Forty-five days thus appears a reasonable time to allow ST to make its accountings and payments under this Order.

Prejudgment Interest. ST is also ordered to, at the same time, account for and pay to IR interest on all such past due royalties at the rate of 10% per annum from the date due and payable under the terms of the Settlement Agreement.

Bond Pending Appeal. Enforcement of this order as to payments relating to ST's past sales of PIC products may be stayed under Rule 62 of the Federal Rules of Civil Procedure by ST's filing of an appropriate notice of appeal and giving of a supersedeas bond through an admitted surety insurer in an amount one and one-half times the sum of all amounts ST is ordered hereinabove to pay as to its PICs. The stay shall become effective when the notice of appeal is filed and the Court has approved the supersedeas bond.

2. ST shall account to IR for ST's past sales of power MOSFET wafers to ST-Italy and shall pay the royalties due to IR thereon on or before August 25, 1994 at the royalty rate of 18%.

Prejudgment Interest. ST is also ordered to, at the same time, account for and pay to IR interest on all such

past due royalties at the rate of 10% per annum from the date due and payable under the terms of the Settlement Agreement.

Bond Pending Appeal. Enforcement of this order as to payments relating to ST's past sales of power MOSFET wafers may be stayed under Rule 62 of the Federal Rules of Civil Procedure by ST's filing of an appropriate notice of appeal and giving of a supersedeas bond through an admitted surety insurer in an amount one and one-half times the sum of all amounts ST is ordered hereinabove to pay as to its power MOSFET wafers. The stay shall become effective when the notice of appeal is filed and the Court has approved the supersedeas bond.

3. With respect to all sales of discrete power MOSFETs (including IGBTs) in the United States on which ST has reduced the base royalty rate paid from 6% to 44%, ST is hereby ordered to account for and pay to IR on or before August 25, 1994 the difference between such reduced rate and the higher rate at which royalties were in fact due. ST is also ordered to, at the same time, account for and pay to IR interest on all such past due royalties at the rate of 10% per annum from the date due and payable under the terms of the Settlement Agreement.

Bond Pending Appeal. Enforcement of this order as to payments relating to ST products as to which ST has in the past paid a reduced royalty may be stayed under Rule 62 of the Federal Rules of Civil Procedure by ST's filing of an appropriate notice of appeal and giving of a supersedeas bond through an admitted surety insurer in an amount one and one-half times the sum of all amounts ST is ordered hereinabove to pay as to its products as to which it has paid a reduced royalty. The stay shall become effective when the notice of appeal is filed and the Court has approved the supersedeas bond.

4. *Bond Pending Appeal as to Future Royalties Coming Due*. During the pendency of any appeal, ST shall either pay to IR any future royalties as and when they become due under the Settlement Agreement or give a supersedeas bond through an admitted surety insurer in an amount one and one-half times all such amounts as and when they become due under the Settlement Agreement. A stay as to ST's obligation to payment sums shall become effective, if an appropriate notice of appeal has been filed, when the Court has approved the supersedeas bond.

5. All amounts due hereunder shall bear post-judgment interest (including as to future royalty payments not made interest from the date such payment becomes due) as prescribed by 28 U.S.C. s. 1961.

6. As the prevailing party, IR is entitled to costs on an appropriate application under Local Rule 16. ST shall have and take nothing from IR by reason of its motion.

The Court has made separately findings of fact and conclusions of law consistent with this Order.

C.D.Cal.,1994.
International Rectifier Corp. v. Sgs-Thomson Microelectronics Inc.