**IN THE UNITED STATES DISTRICT COURT**
**DISTRICT OF DELAWARE**

| | | |
|---|---|---|
| PSEMI CORP., | ) | |
| | ) | |
| Plaintiff | ) | |
| | ) | |
| v. | ) | C.A. No.: |
| | ) | |
| CIRRUS LOGIC, INC. and LION SEMICONDUCTOR INC., | ) | **JURY TRIAL DEMANDED** |
| | ) | |
| | ) | |
| Defendants. | ) | |

## COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff pSemi Corp. ("pSemi" or "Plaintiff"), through its undersigned counsel, brings this action against Cirrus Logic, Inc. ("Cirrus Logic") and Lion Semiconductor Inc. ("Lion Semi") (collectively, "Defendants"). In support of this Complaint ("Complaint"), pSemi alleges as follows:

## THE PARTIES

1. Plaintiff pSemi Corp. is a Delaware corporation with its principal place of business at 9369 Carroll Park Drive, San Diego, California 92121.

2. pSemi is the owner by assignment of U.S. Patent No. 12,113,438, U.S. Patent No. 12,143,010, and U.S. Patent No. 12,212,232 (collectively, the "Patents-in-Suit").

3. Defendant Cirrus Logic, Inc. is a Delaware corporation with its principal place of business at 800 W Sixth Street, Austin, Texas 78701.

4. Defendant Lion Semiconductor Inc. is a Delaware corporation with its principal place of business at 800 W Sixth Street, Austin, Texas 78701.

5. In 2021, Cirrus Logic acquired Lion Semiconductor. On information and belief, Cirrus Logic continues to develop, offer for sale, and sell the infringing products that were originally developed, offered for sale, and sold by Lion Semiconductor.

## JURISDICTION AND VENUE

6. This is a Complaint including causes of action for patent infringement arising under 35 U.S.C. § 271, *et seq.* The Court has subject matter jurisdiction under 28 U.S.C. §§ 1331, 1338(a), and 1367.

7. This Court has general personal jurisdiction over Defendants because both Defendants are incorporated in Delaware, and thus reside in this District.

8. Venue is proper in this District under 28 U.S.C. § 1400(b) because, *inter alia*, Defendants are incorporated in Delaware, and thus reside in this District.

## BACKGROUND

9. pSemi is, and has for the last three decades been, a pioneer in the development of electronics technology for switching, transforming, or otherwise manipulating radio frequency ("RF") signals, including RF switches, RF attenuators, RF transceivers, RF receivers, and RF modules for controlling signal phase and amplitude, power limiters, and mixers. In March 2017, pSemi acquired Arctic Sand Technologies Inc. ("Arctic Sand") a Massachusetts Institute of Technology ("MIT") "spin-out" semiconductor company that had pioneered power converters using novel switched capacitor technology based on research originating from MIT. Arctic Sand understood that using capacitive energy transfer rather than more traditional inductive switching converters would establish higher power conversion density and efficiency in low-profile form factors previously thought to be unobtainable. Arctic Sand and pSemi have made substantial developments in, and developed a substantial body of intellectual property around, switched capacitor technology to bring products to market that are robust, reliable, and with substantially higher performance than conventional power converters.

10. In particular, power converters, such as voltage or current regulators, converters, or transformers, are a core component to modern-day consumer electronics. Consumer electronics, such as smart phones, have increasingly demanded more power to offer additional features, while overall phone size, and therefore space available to the components in such phones, is shrinking. To meet the competing requirements of power demand and shrinking footprint, power converters need a higher power conversion density while maintaining or improving efficiency to reduce the greater power loss from regulating, converting, and/or transforming higher voltages and currents.

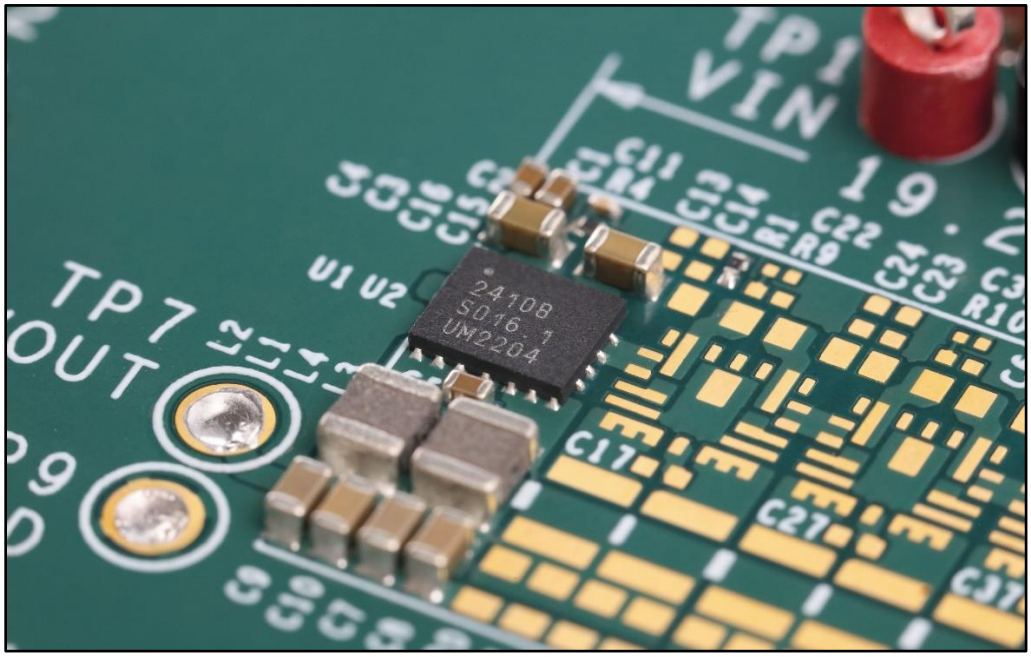
11. A common solution for power regulation and/or conversion in consumer devices is a buck converter. Buck converters, in their simplest form, are a combination of two transistors (switches) followed by an inductor. In the case of a step-down buck converter, the buck converter would convert an input voltage to a lower output voltage. In operation, the buck converter's transistors switch on and off at a high frequency creating a choppy signal, which is subsequently stored in the inductor and then output at a lower output voltage level. The reduction in voltage is varied by changing the frequency at which the transistors switch on and off.

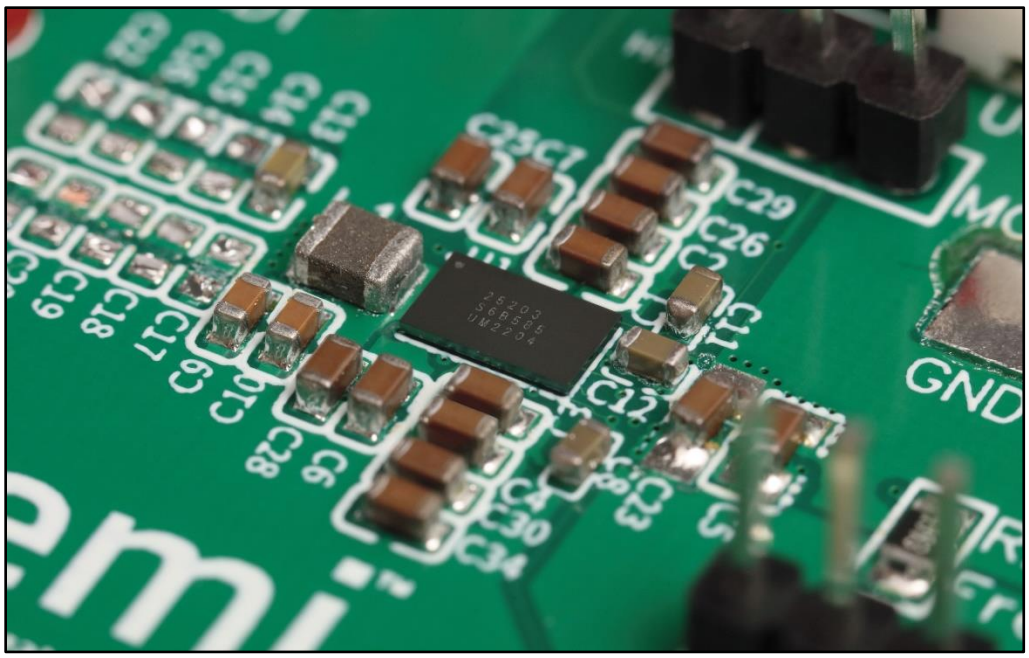
12. However, the buck converter approach has disadvantages, such as large components and high heat generation. In particular, inductors can be quite large relative to the other devices on a circuit board. In space constrained applications, these large inductors can be a pain-point, and reducing the size of the inductor will typically result in poorer efficiency in the power conversion process which results in increased heat. These disadvantages are notable in portable consumer electronics, like mobile phones, which have space constraints, are held when in use, and lack active cooling solutions like fans.

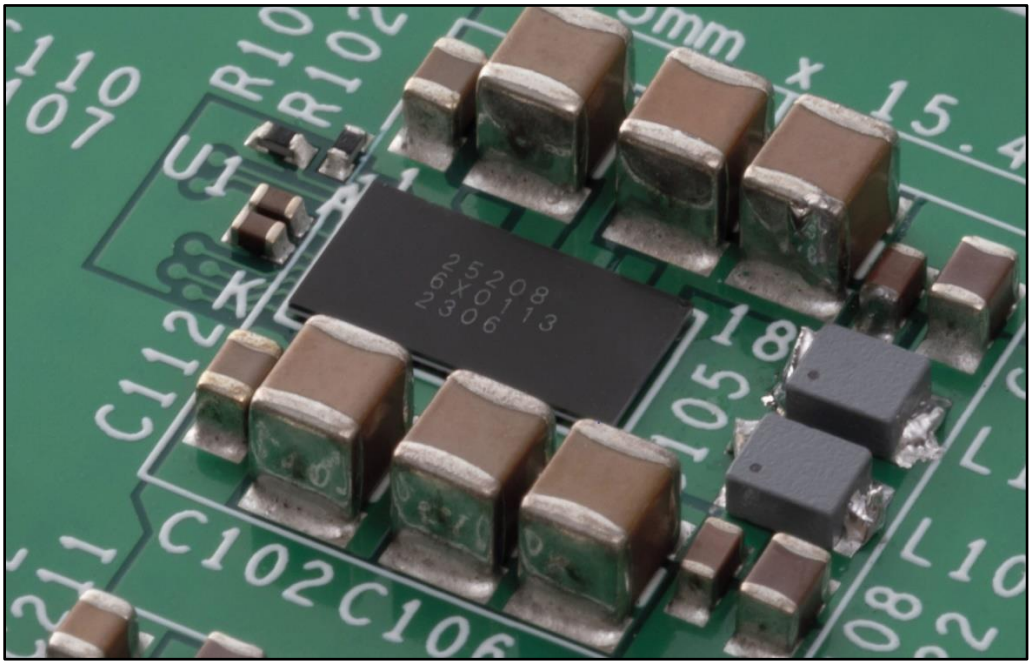
13. Charge pumps, or switched capacitor circuits, can remedy some of the problems found with buck converters because charge pumps provide a greater power conversion density and

have better efficiency. Charge pumps generally consist of a set of transistors (*i.e.*, switches) and a set of capacitors. Repeatedly switching the set of transistors in a certain order causes the capacitors to alternate between charging from an input terminal and discharging to an output terminal, performing voltage conversion in the process. While not without other drawbacks, the difference in components and operation allows charge pumps to improve overall power conversion, either as stand-alone charge pumps, or when used in conjunction with smaller and more efficient buck converters, while also reducing converter size and heat generation. As an example, for a given amount of energy stored and released, capacitors have a much smaller footprint and height on a circuit board than inductors. In other words, capacitors have higher energy density than inductors. So, using capacitors to do most or all of the work of storage and release of energy in power conversion will yield the aforementioned benefits.

14. Today, pSemi offers high-performance power conversion ICs based on their capacitive-based power conversion technology, such as those shown below:






**Images of pSemi Charge Pump Products**

15. The claims of the Patents-in-Suit disclose a number of innovations pSemi has introduced for charge pumps. Each of these patent-protected innovations is used by Defendants without pSemi's permission in one or more of its integrated circuits, including as set forth below.

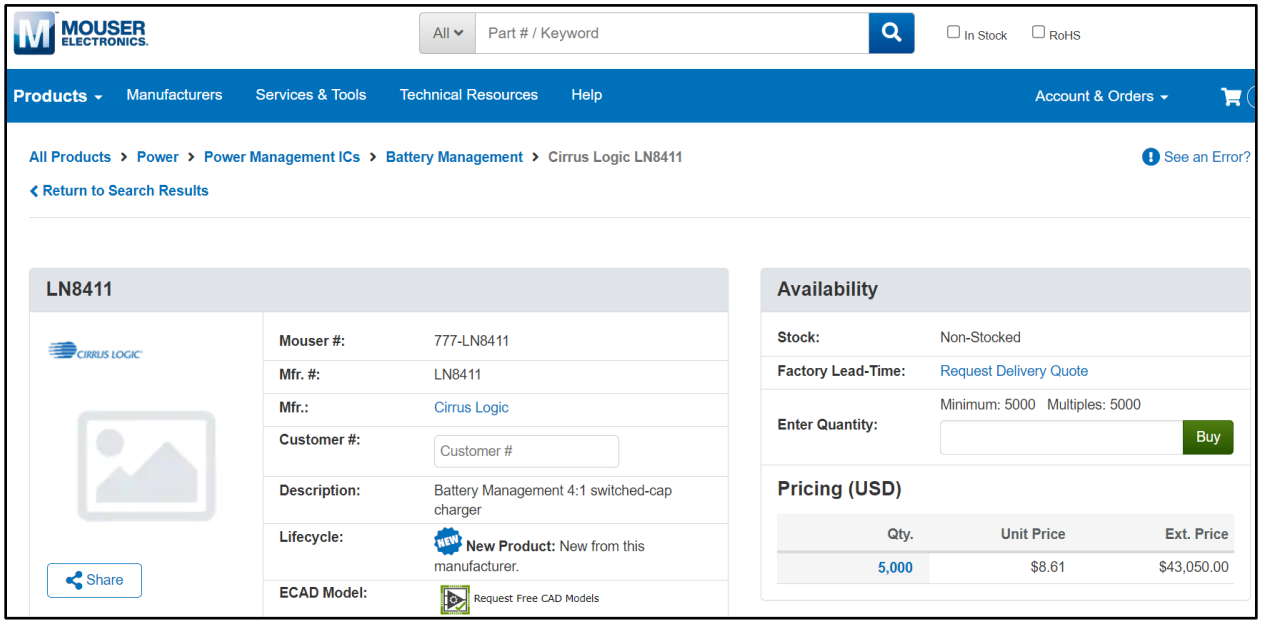
## COUNT I

### Defendants' Infringement of U.S. Patent No. 12,113,438

16. pSemi restates and incorporates by reference all of the allegations made in the preceding paragraphs as though fully set forth herein.

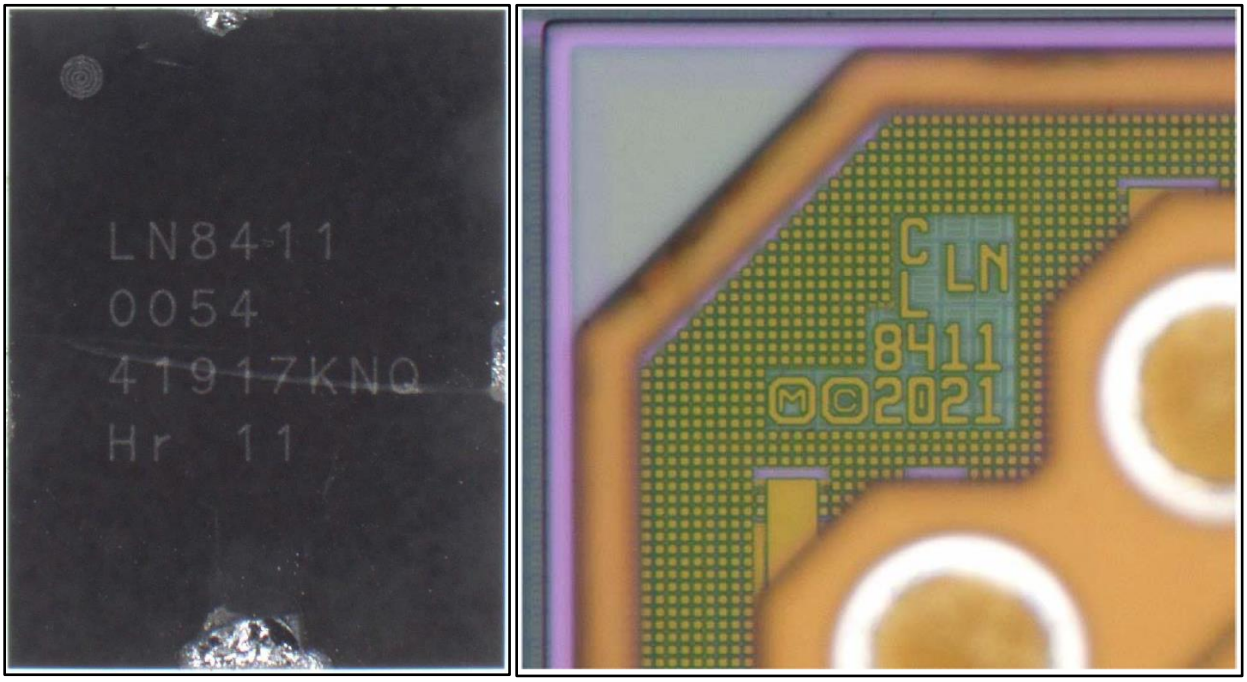
17. pSemi is the owner, by assignment, of U.S. Patent No. 12,113,438 ("'438 Patent"), titled "Protection of Switched Capacitor Power Converter." A true and correct copy of the '438 Patent is attached as Exhibit 1.

18. Defendants infringed, and are continuing to infringe, literally or under the doctrine of equivalents, at least claim 1 of the '438 Patent by making, using, selling, and/or offering for sale its LN8411 in the United States, in violation of 35 U.S.C. § 271(a). For example, on information and belief, Defendants use the LN8411 in testing inside the U.S. and by demonstrating the device to one or more U.S. customers. In addition, the LN8411 is available for purchase by U.S. customers through electronics distributors such as Mouser:




**Mouser Electronics, "Cirrus Logic LN8411", Mouser, https://www.mouser.com/ProductDetail/Cirrus-**

**Logic/LN8411?qs=sGAEpiMZZMug9GoBKXZ75xu0EBo%252BQ%2F%252BGiHLNimxiaL1A569%2FlPkmJQ%3D%3D (last visited April 2, 2025).**

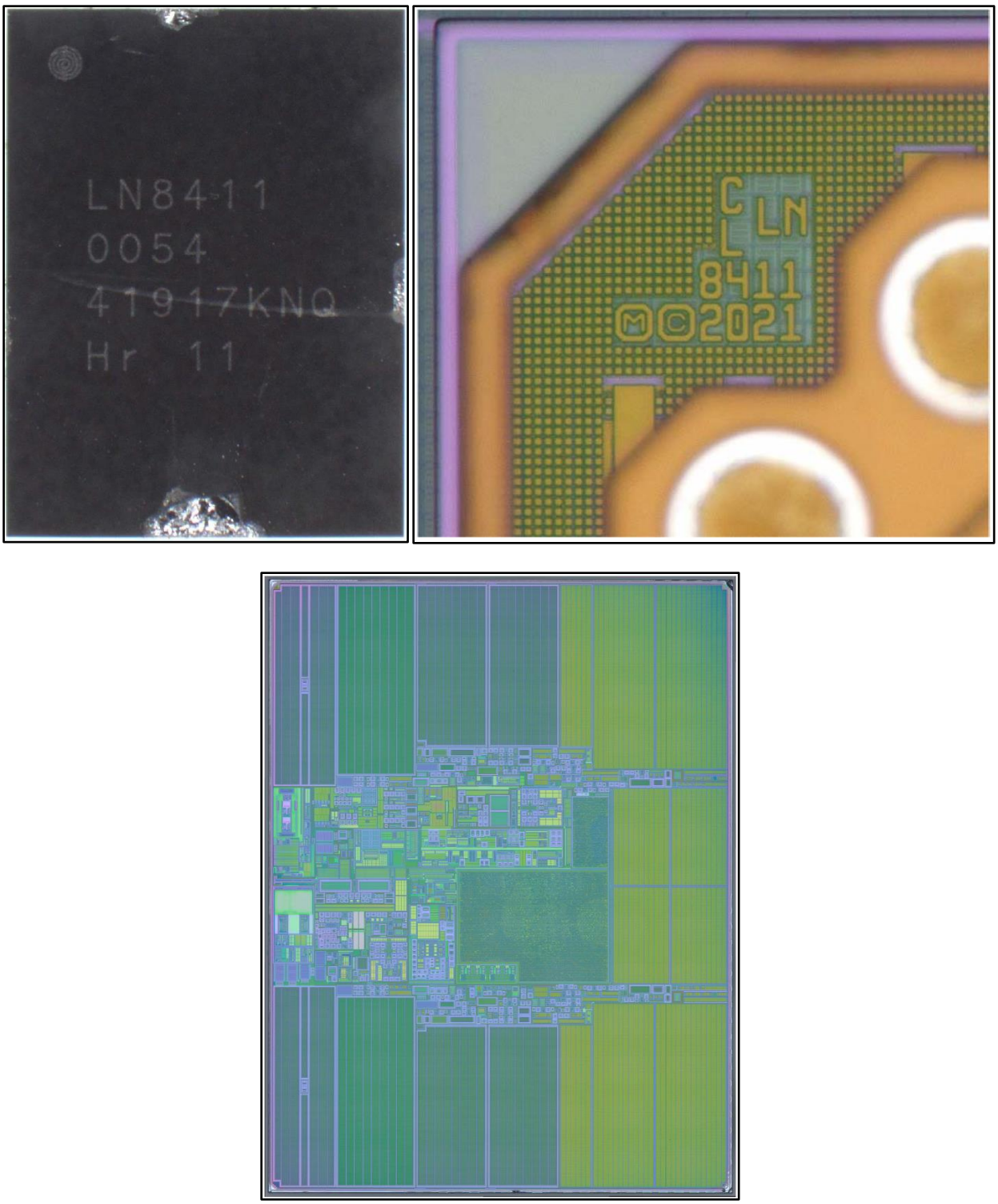



**Images of the LN8411 Packaging (left) and Die Marking on the Integrated Circuit (right)**

19. At least as of the filing of the Complaint, Defendants have knowledge of the '438 Patent.

20. Below pSemi identifies exemplary evidence illustrating non-limiting features of the LN8411 that practice each and every element of at least one claim (*e.g.*, claim 1 as shown below) of the '438 Patent.

21. As a non-limiting example, the Lion Semi LN8411 comprises an integrated circuit.




**Images of the LN8411 Packaging (top left), Die Marking on the Integrated Circuit (top right), and Integrated Circuit (bottom).**

22. The LN8411 comprises a fault detector configured to sense a voltage and/or current at an internal node of a voltage converter.

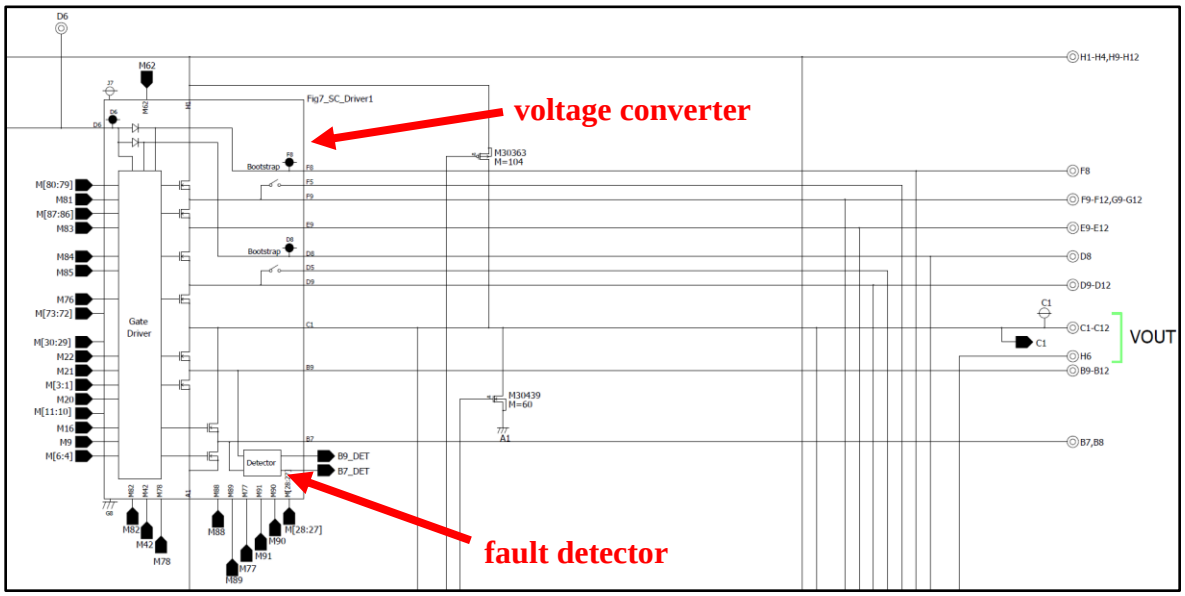



**Image of LN8411 Schematics (annotated).**

23. The LN8411 comprises a voltage converter comprising a plurality of switches connected in series between an input terminal and an output terminal, the plurality of switches operable to selectively charge and/or discharge one or more of a plurality of capacitors in successive stages of the voltage converter in accordance with a switching configuration to convert an input voltage received at the input terminal to an output voltage at the output terminal.

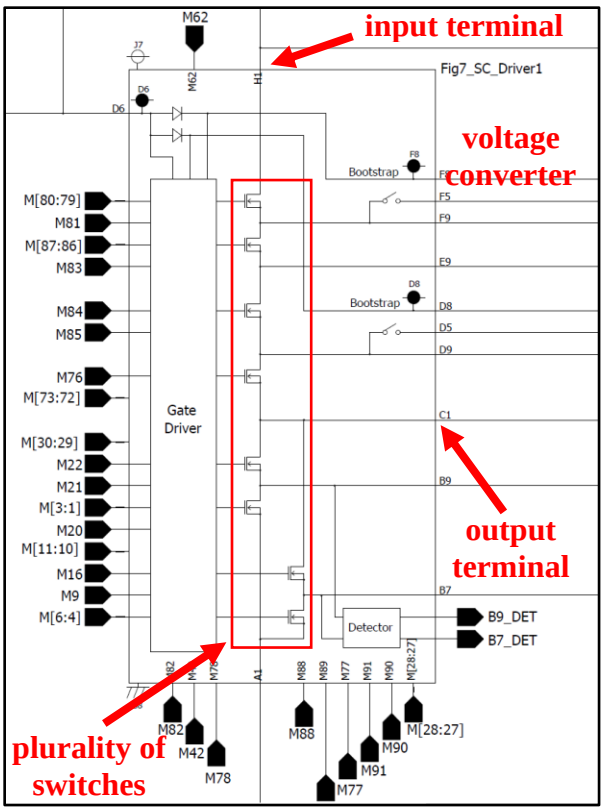



**Image of LN8411 Schematics (annotated).**

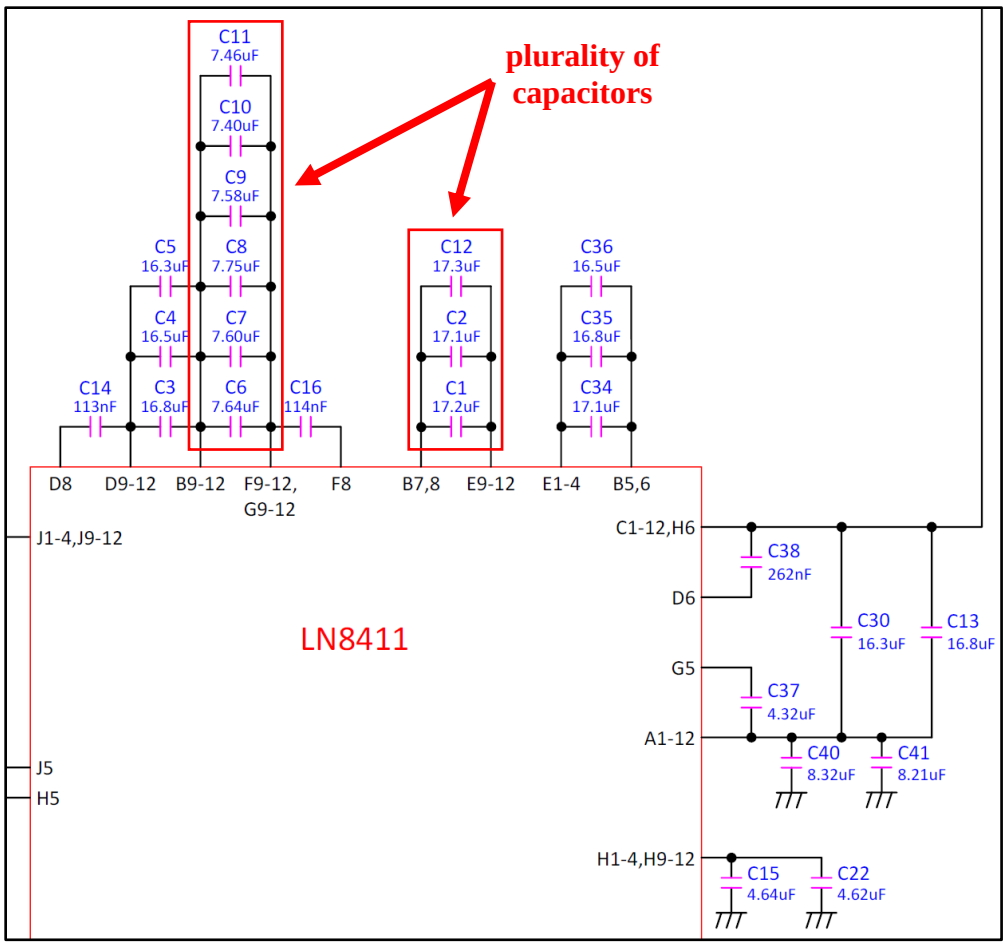



**Image of LN8411 Schematics (annotated).**

24. Upon information and belief, the plurality of switches will selectively charge and/or discharge the plurality of capacitors in successive stages of the voltage converter in accordance with a switching configuration to convert an input voltage.

25. The LN8411's fault detector is configured to sense a voltage and/or current at an internal node of a voltage converter, wherein the internal node is disposed between a first pair of switches of the plurality of switches.

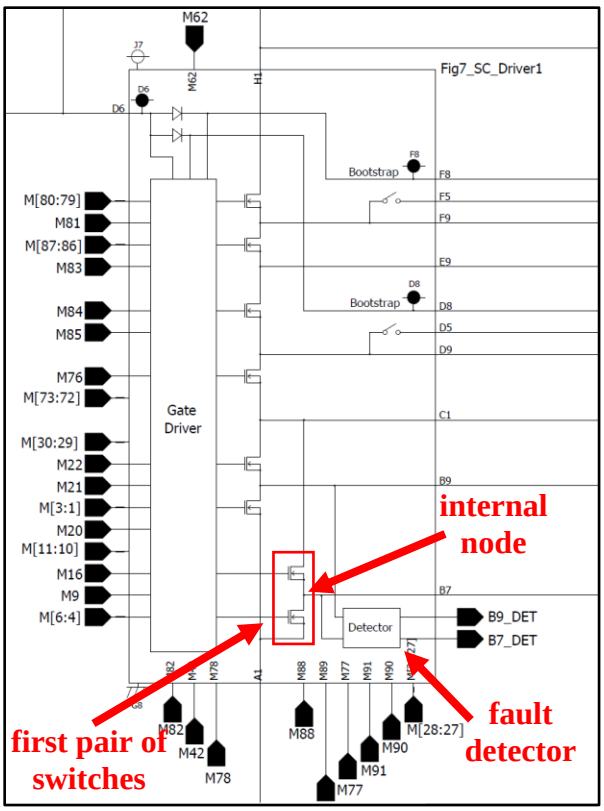



**Image of LN8411 Schematics (annotated).**

26. Upon information and belief, the fault detector senses a voltage and/or current.

27. The LN8411's fault detector is configured to detect one or more fault events of the switching configuration at the internal node during operation of the voltage converter and to generate one or more fault signals with respect to the one or more detected fault events.

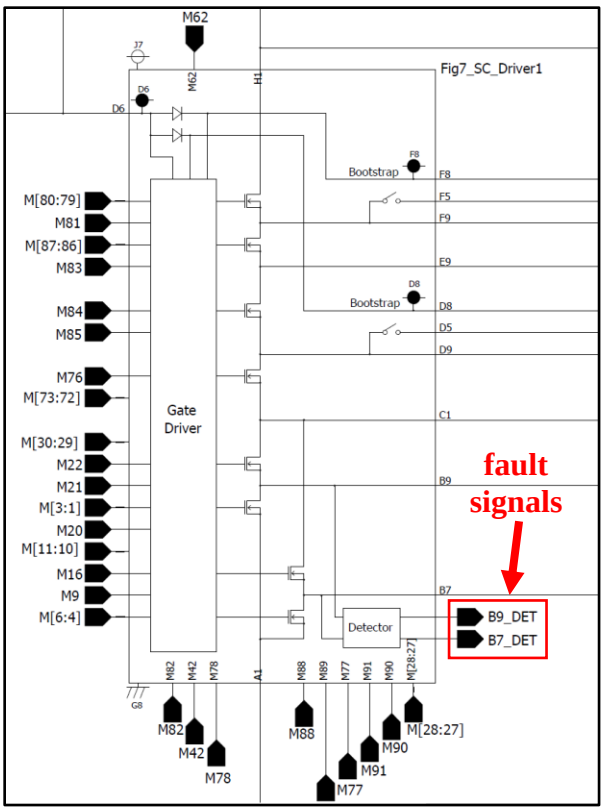



**Image of LN8411 Schematics (annotated).**

28. Upon information and belief, the fault signals are with respect to one or more detected fault events.

29. On information and belief, Defendants, with knowledge of the '438 Patent, and without authority, have actively induced and continue to actively induce infringement by its customers of at least one claim of the '438 Patent, under 35 U.S.C. § 271(b), by intentionally inducing the use, importation, offer for sale, and/or sale of LN8411 or products including the LN8411, intending to encourage, and in fact encouraging, its customer to directly infringe the '438 Patent. On information and belief, Defendants actively induced infringement by, *inter alia*, providing data sheets and other materials to direct and assist its customers to integrate the LN8411 into the devices, and to instruct in the operation of the accused devices in an infringing manner and by offering support and technical assistance to their customers that encourage use of the accused

products in ways that infringe the asserted claims. In addition, Defendants have had actual knowledge of end users' direct infringement and that Defendants' acts induced such infringement since at least the date of this filing.

30. Defendants' infringement has damaged and continues to damage pSemi in an amount yet to be determined, and pSemi will suffer irreparable injury unless the infringement is enjoined by this Court.

**COUNT II**

**Defendants' Infringement of U.S. Patent No. 12,143,010**

31. pSemi restates and incorporates by reference all of the allegations made in the preceding paragraphs as though fully set forth herein.

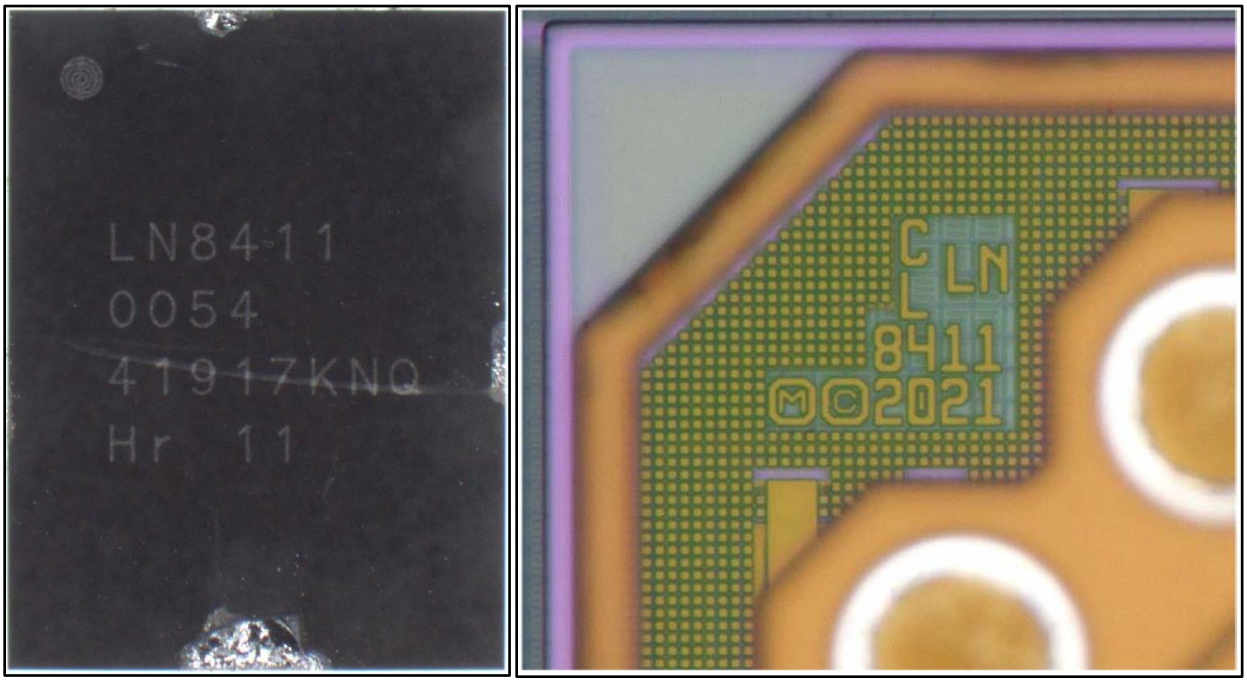
32. pSemi is the owner, by assignment, of U.S. Patent No. 12,143,010 ("'010 Patent"), titled "Protection of Switched Capacitor Power Converter." A true and correct copy of the '010 Patent is attached as Exhibit 2.

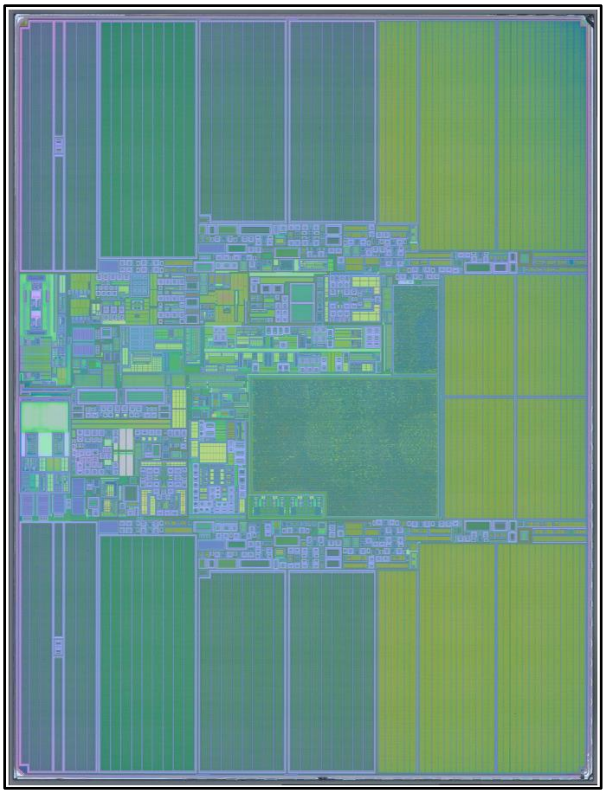
33. Defendants infringed, and are continuing to infringe, literally or under the doctrine of equivalents, at least claim 1 of the '010 Patent by making, using, selling, and/or offering for sale its LN8411 in the United States, in violation of 35 U.S.C. § 271(a). For example, on information and belief, Defendants use the LN8411 in testing inside the U.S. and by demonstrating the device to one or more U.S. customers. In addition, the LN8411 is available for purchase by U.S. customers through electronics distributors such as Mouser. *See supra* ¶ 18.

34. At least as of the filing of the Complaint, Defendants have knowledge of the '010 Patent.

35. Below pSemi identifies exemplary evidence illustrating non-limiting features of the LN8411 that practice each and every element of at least one claim (*e.g.*, claim 1 as shown below) of the ’010 Patent.

36. As a non-limiting example, the Lion Semi LN8411 comprises an integrated circuit.





**Images of the LN8411 Packaging (top left), Die Marking on the Integrated Circuit (top right), and Integrated Circuit (bottom).**

37. The LN8411 comprises a set of switches configured to form at least a portion of a step-down voltage converter.

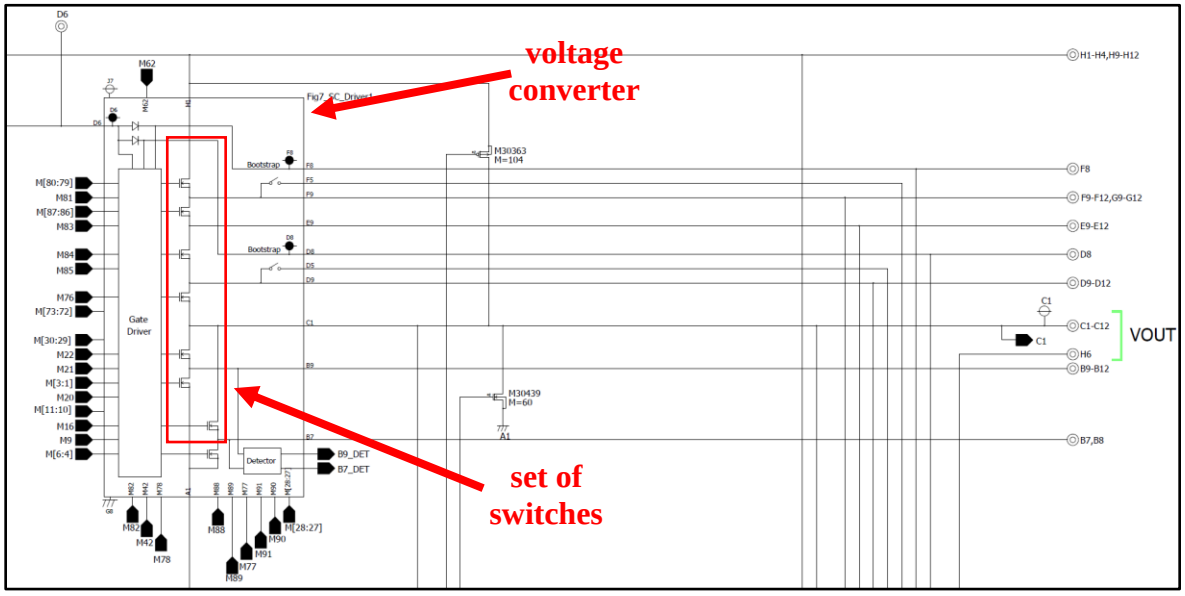


**Image of LN8411 Schematics (annotated).**

38. The LN8411 comprises a fault detector configured to detect one or more fault events during operation of the step-down voltage converter and configured to generate one or more fault signals with respect to the one or more fault events.

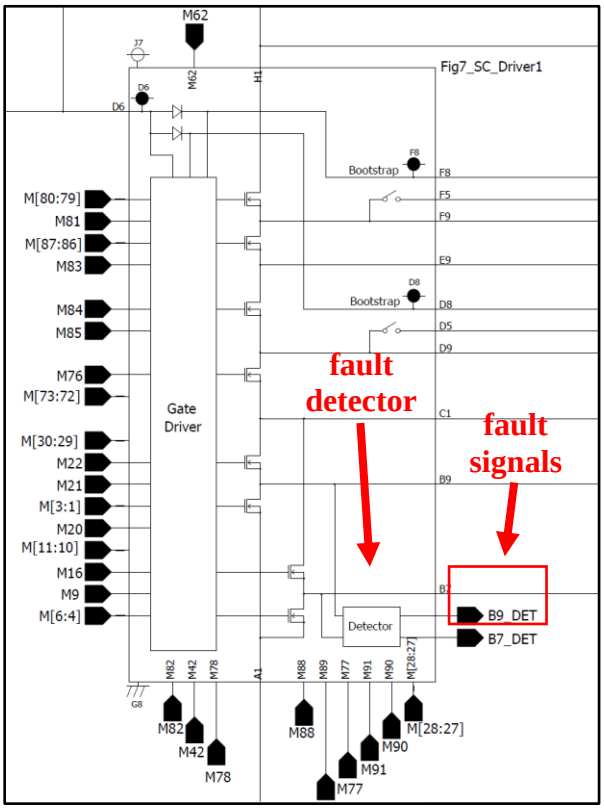



**Image of LN8411 Schematics (annotated).**

39. Upon information and belief, the fault signals are with respect to one or more detected fault events.

40. The LN8411's set of switches is configured to couple to a set of capacitors arranged to form a configuration such that at least some switches in the set of switches operate in a manner to form an electrical connection of at least some of the capacitors to respective alternate voltages in successive stages of operation of the step-down voltage converter.

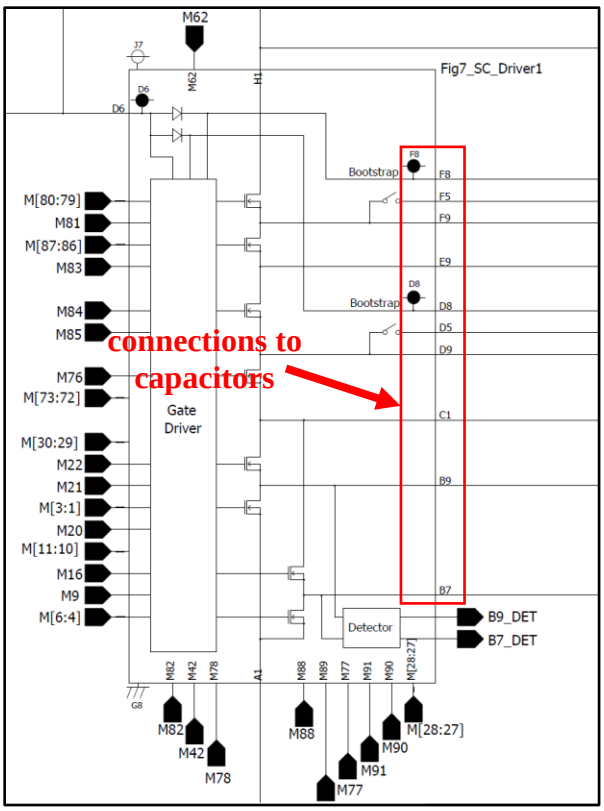



**Image of LN8411 Schematics (annotated).**

41. Upon information and belief, some of the switches in the set of switches operate in a manner to form an electrical connection of at least some of the capacitors to respective alternate voltages in successive stages of operation.

42. The LN8411 comprises a disconnect switch configured to have a drain-to-source (DS) voltage rating greater than an input voltage during normal operation of the step-down voltage converter and greater than a DS voltage rating of at least one switch in the set of switches.

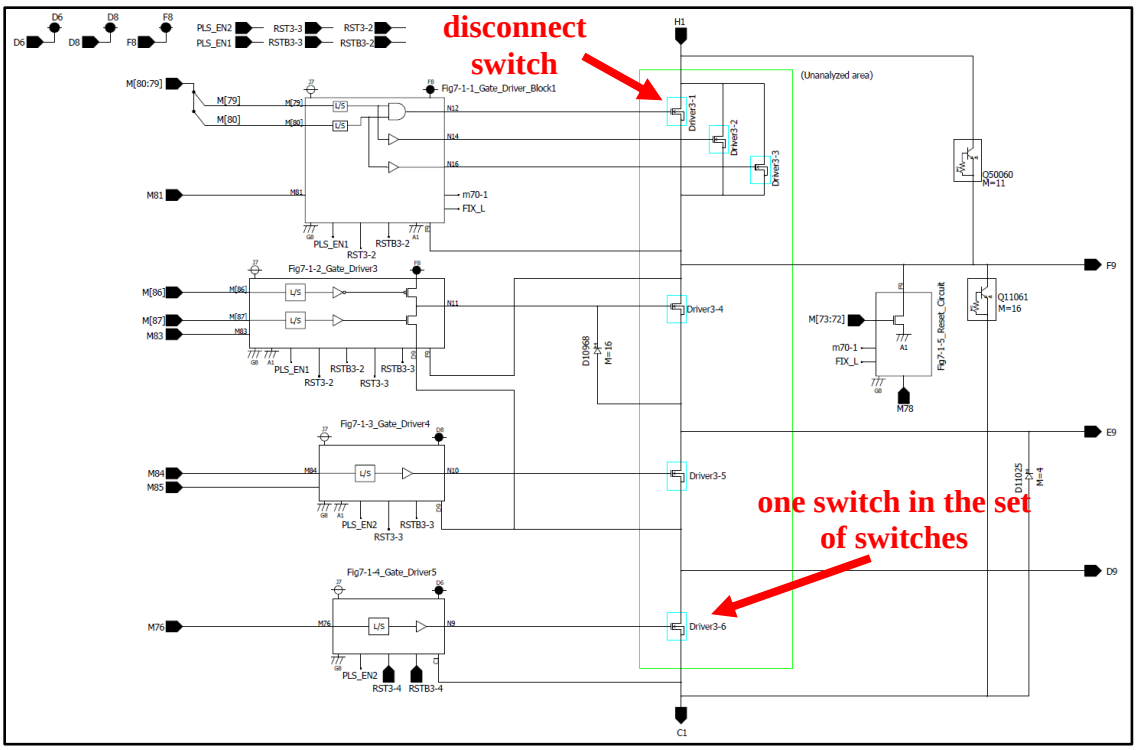



**Image of LN8411 Schematics (annotated).**

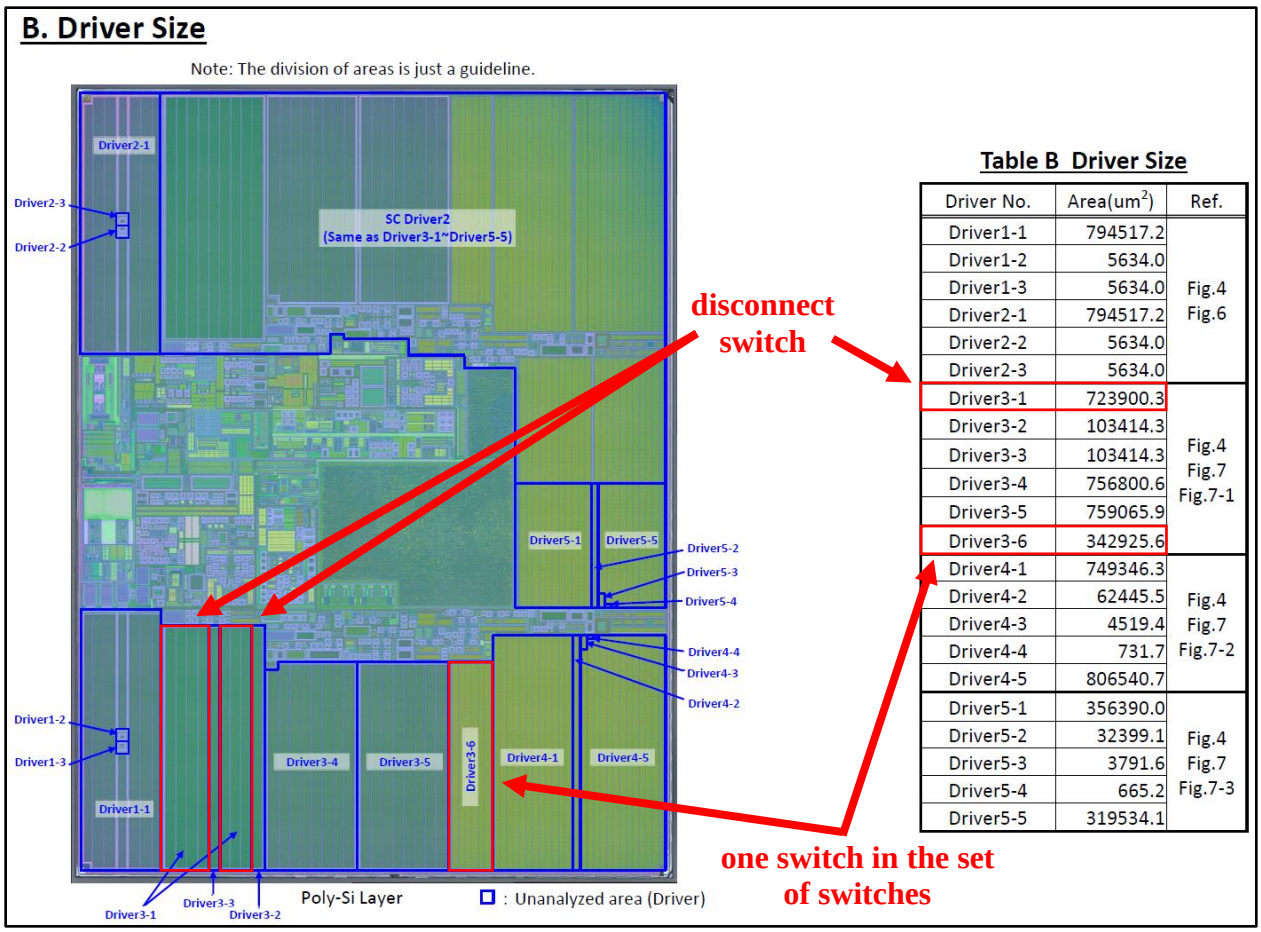
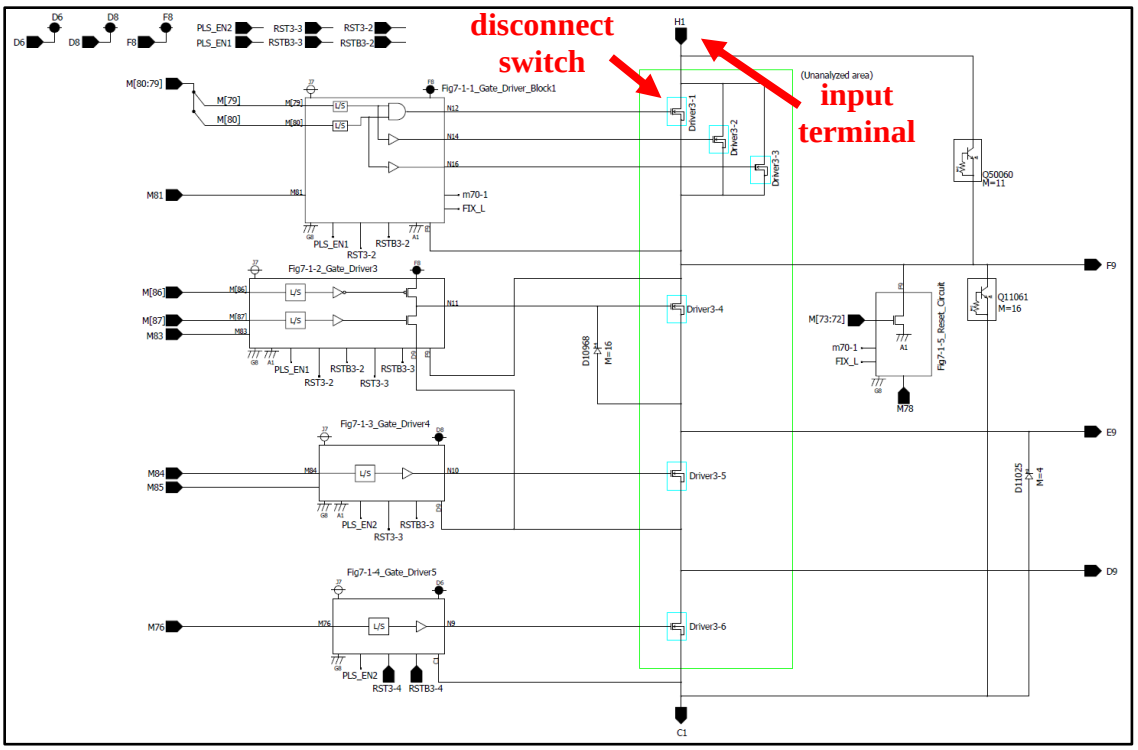



**Image of the LN8411 Integrated Circuit (annotated).**

43. Upon information and belief, the disconnect switch has a drain-to-source (DS) voltage rating greater than an input voltage of the voltage converter and greater than a DS voltage rating of at least one switch in the set of switches.

44. The LN8411's disconnect switch is configured, based on the one or more fault signals, to open to electrically disconnect the input voltage from the at least one switch in the set of switches.




**LN8411 Schematics (annotated).**

45. Upon information and belief, the disconnect switch is configured, based on the one or more fault signals, to open to electrically disconnect the input voltage from the at least one switch in the set of switches.

46. On information and belief, Defendants, with knowledge of the ’010 Patent, and without authority, have actively induced and continue to actively induce infringement by its customers of at least one claim of the ’010 Patent, under 35 U.S.C. § 271(b), by intentionally inducing the use, importation, offer for sale, and/or sale of LN8411 or products including the LN8411, intending to encourage, and in fact encouraging, its customer to directly infringe the ’010 Patent. On information and belief, Defendants actively induced infringement by, *inter alia*, providing data sheets and other materials to direct and assist its customers to integrate the LN8411 into the devices, and to instruct in the operation of the accused devices in an infringing manner and by offering support and technical assistance to their customers that encourage use of the accused

products in ways that infringe the asserted claims. In addition, Defendants have had actual knowledge of end users' direct infringement and that Defendants' acts induced such infringement since at least the date of this filing.

47. Defendants' infringement has damaged and continues to damage pSemi in an amount yet to be determined, and pSemi will suffer irreparable injury unless the infringement is enjoined by this Court.

**COUNT III**

**Defendants' Infringement of U.S. Patent No. 12,212,232**

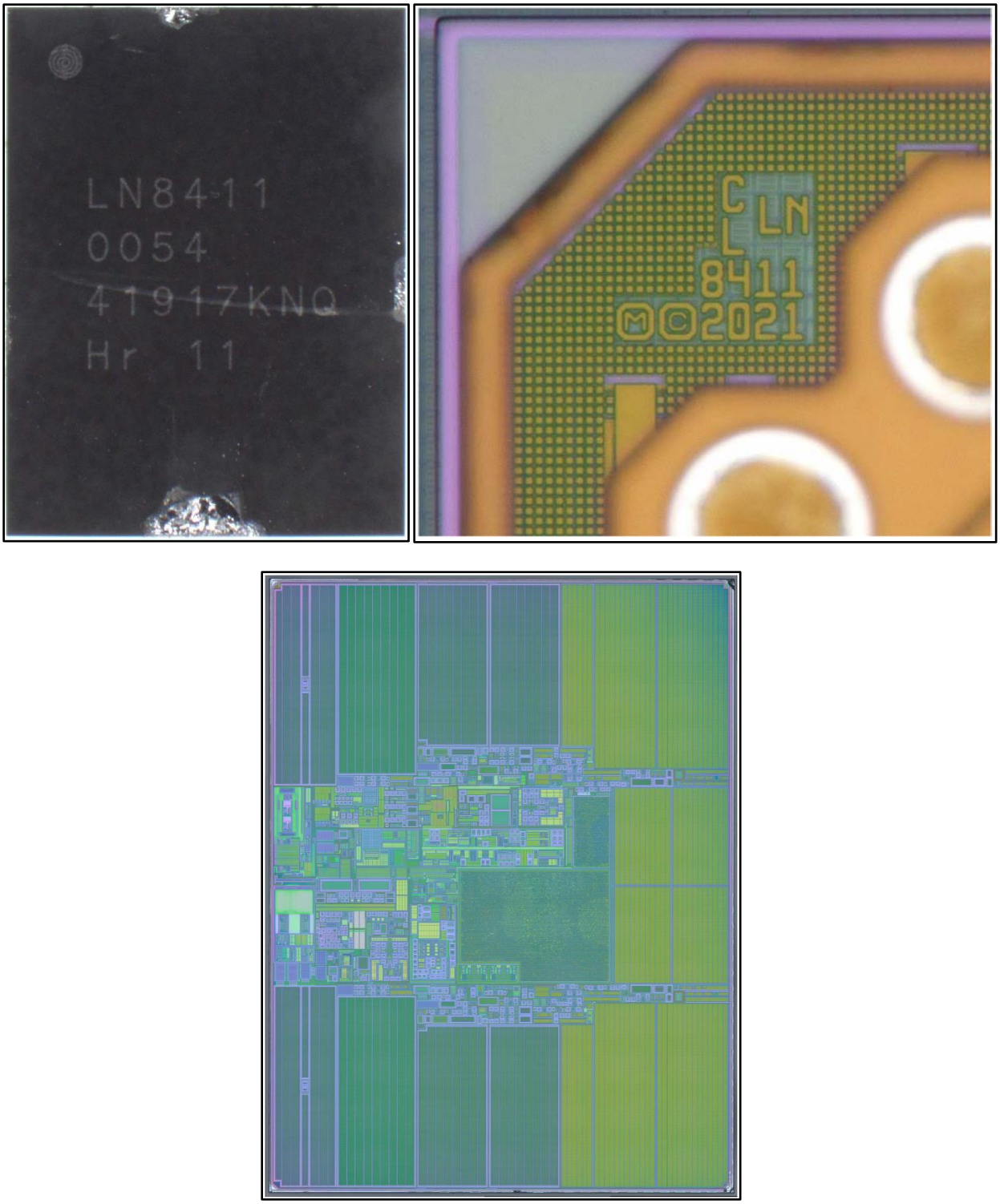
48. pSemi restates and incorporates by reference all of the allegations made in the preceding paragraphs as though fully set forth herein.

49. pSemi is the owner, by assignment, of U.S. Patent No. 12,212,232 ("'232 Patent"), titled "Power Supply for Gate Driver in Switched-Capacitor Circuit." A true and correct copy of the '232 Patent is attached as Exhibit 3.

50. Defendants infringed, and are continuing to infringe, literally or under the doctrine of equivalents, at least claim 22 of the '232 Patent by making, using, selling, and/or offering for sale its LN8411 in the United States, in violation of 35 U.S.C. § 271(a). For example, on information and belief, Defendants use the LN8411 in testing inside the U.S. and by demonstrating the device to one or more U.S. customers. In addition, the LN8411 is available for purchase by U.S. customers through electronics distributors such as Mouser. *See supra* ¶ 18

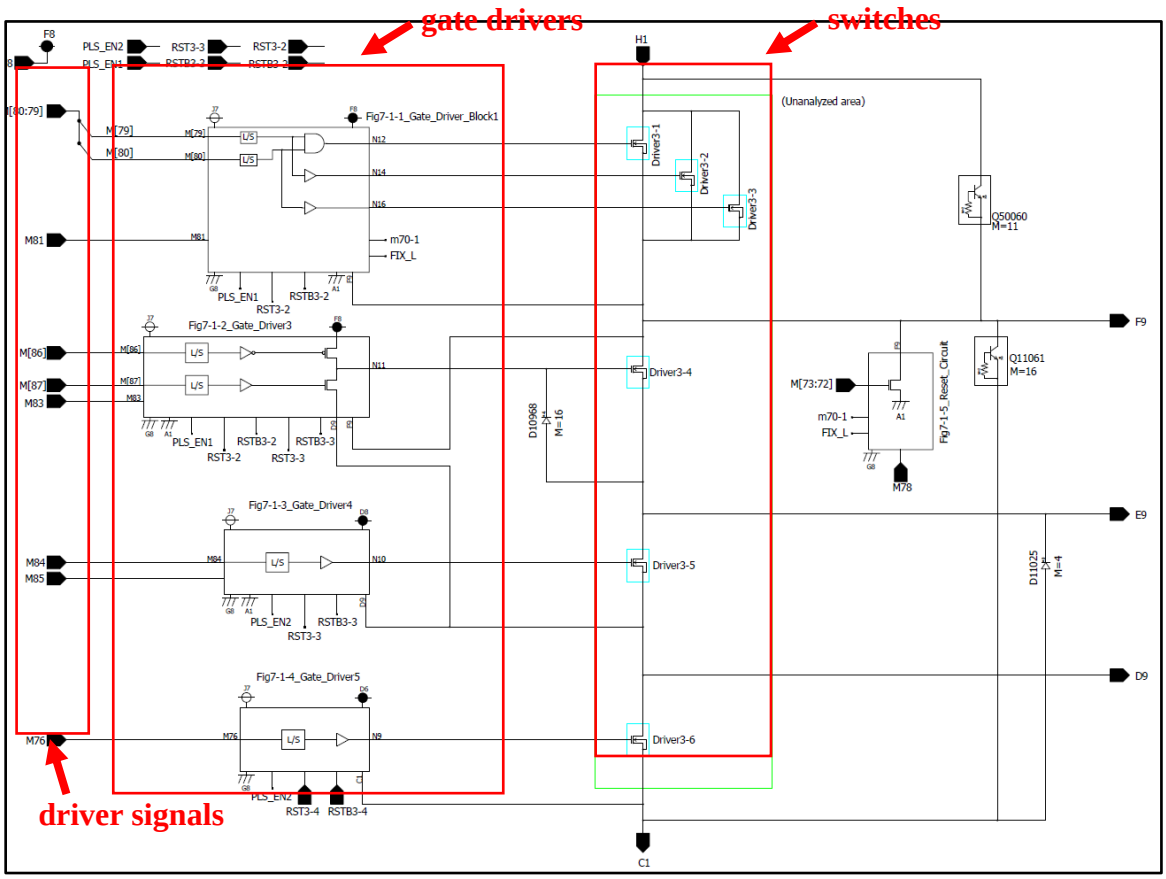
51. Below pSemi identifies exemplary evidence illustrating non-limiting features of the LN8411 that practice each and every element of at least one claim (*e.g.*, claim 41 as shown below) of the '232 Patent.

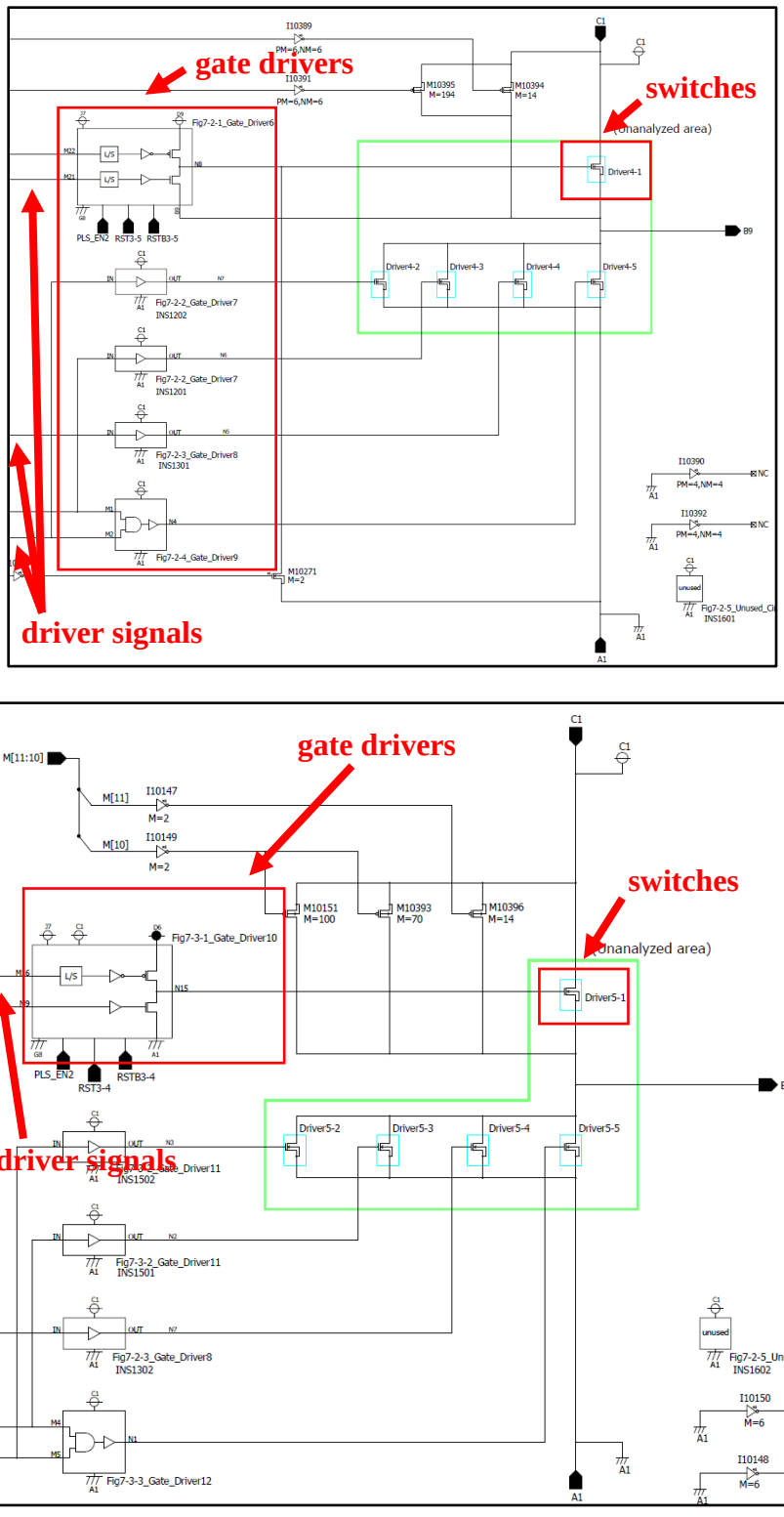
52. As a non-limiting example, the Lion Semi LN8411 is an integrated circuit.




**Images of the LN8411 Packaging (top left), Die Marking on the Integrated Circuit (top right), and Integrated Circuit (bottom).**

53. The LN8411 comprises a plurality of gate drivers configured to receive corresponding driver signals, and comprises a plurality of switches respectively connected to and configured to be driven by the plurality of gate drivers.









**Images of the LN8411 Schematics (annotated).**

54. The LN8411 comprises a first switch configured to be driven by a first gate driver of the plurality of gate drivers, and configured to be connected to a first terminal of a first flying capacitor.

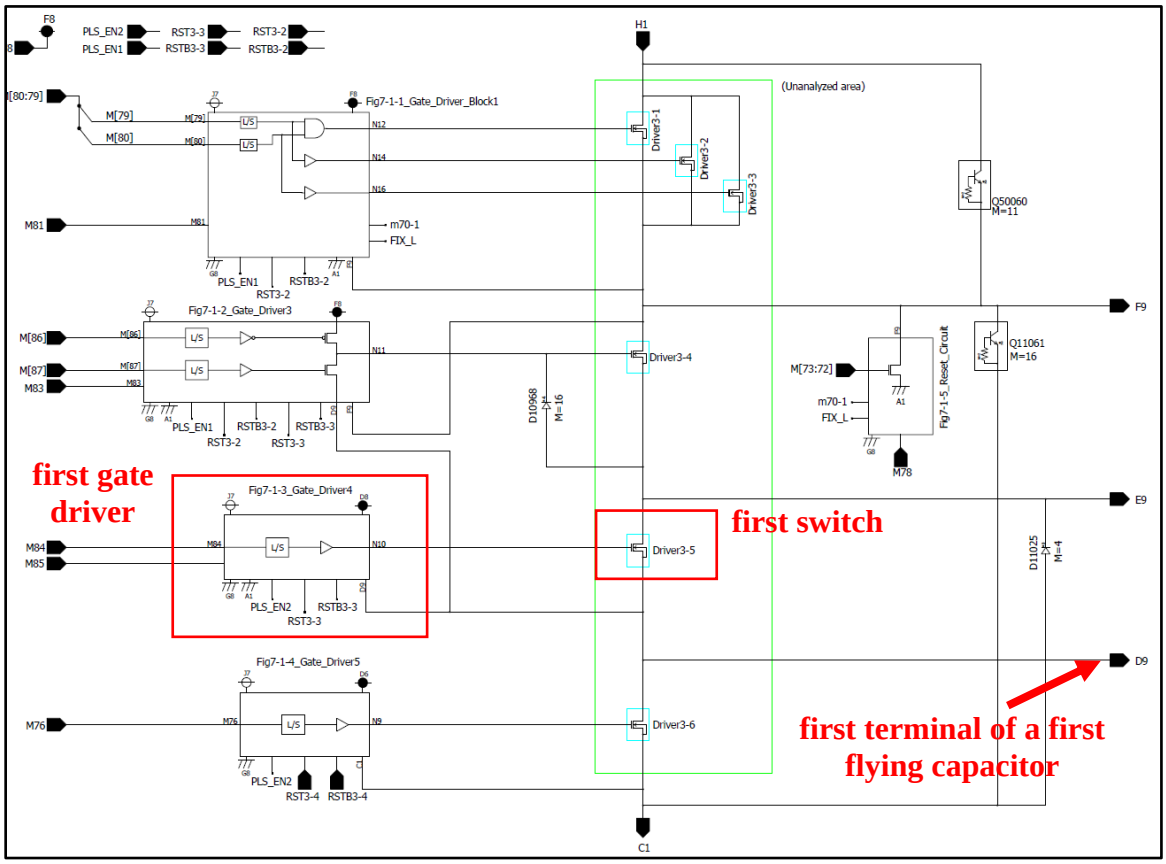



**Image of the LN8411 Schematics (annotated).**

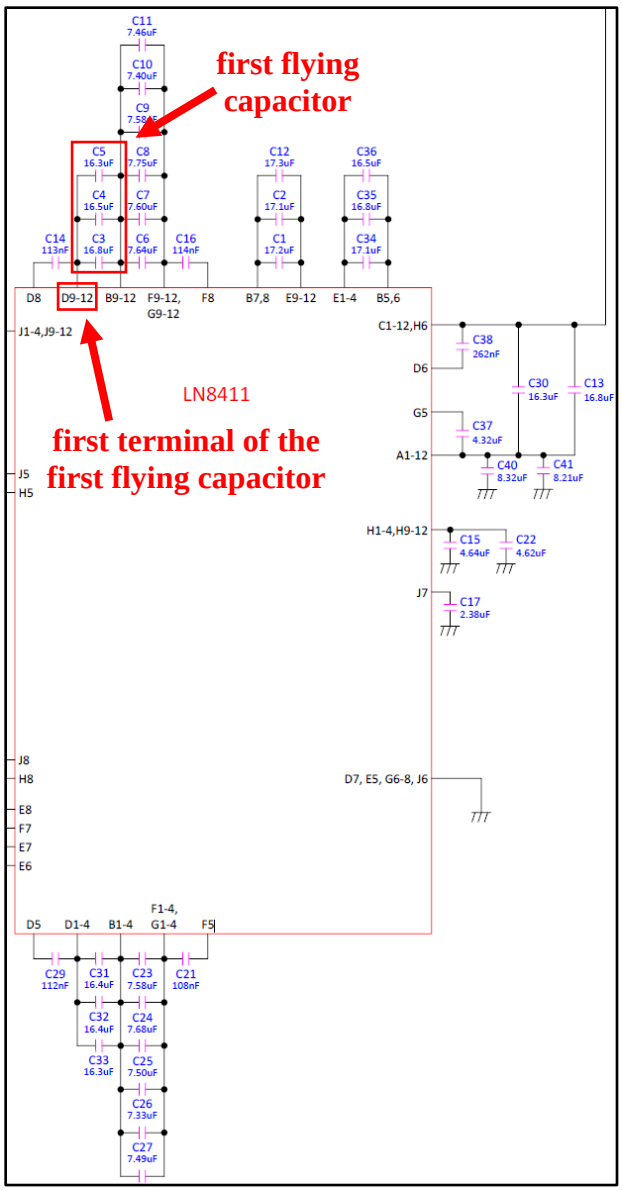



**Image of the LN8411 Schematics (annotated).**

55. The LN8411 comprises a second switch configured to be driven by a second gate driver of the plurality of gate drivers, and configured to be connected between the first terminal of the first flying capacitor and an output terminal for outputting an output voltage.

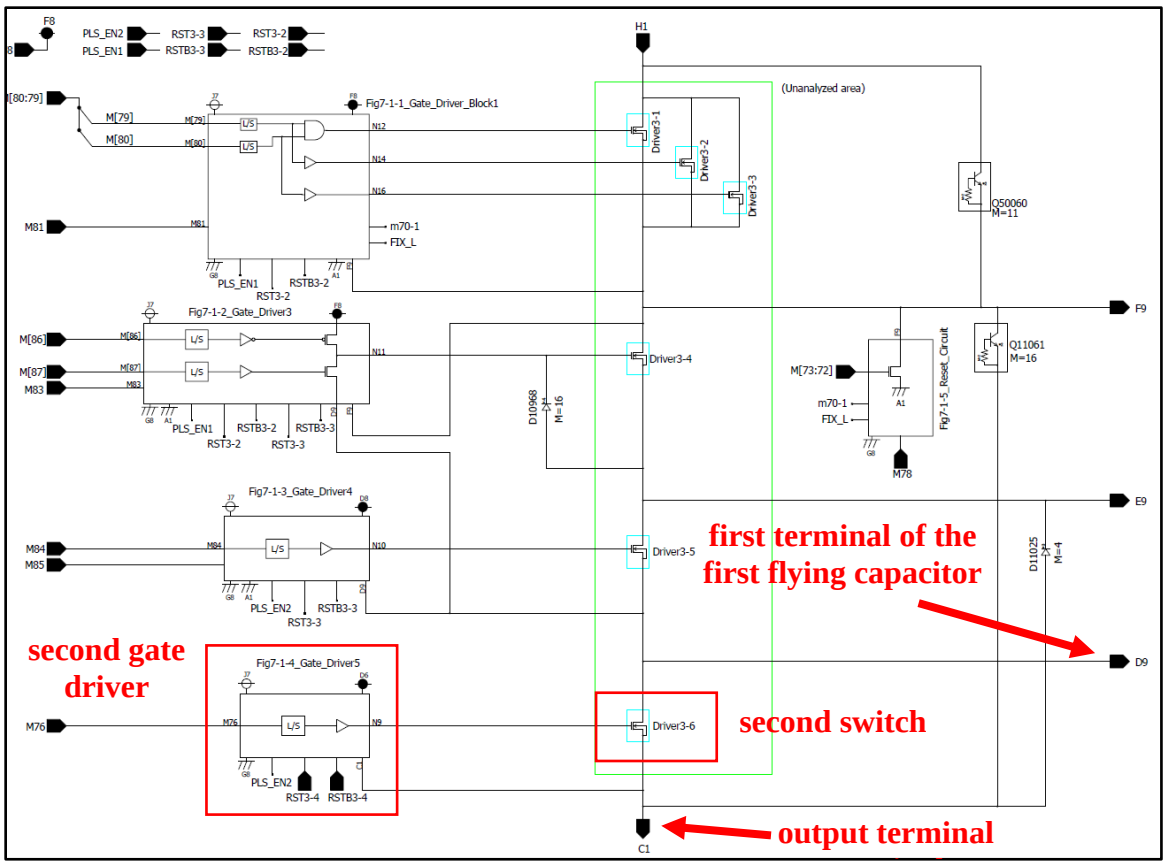



**Image of the LN8411 Schematics (annotated).**

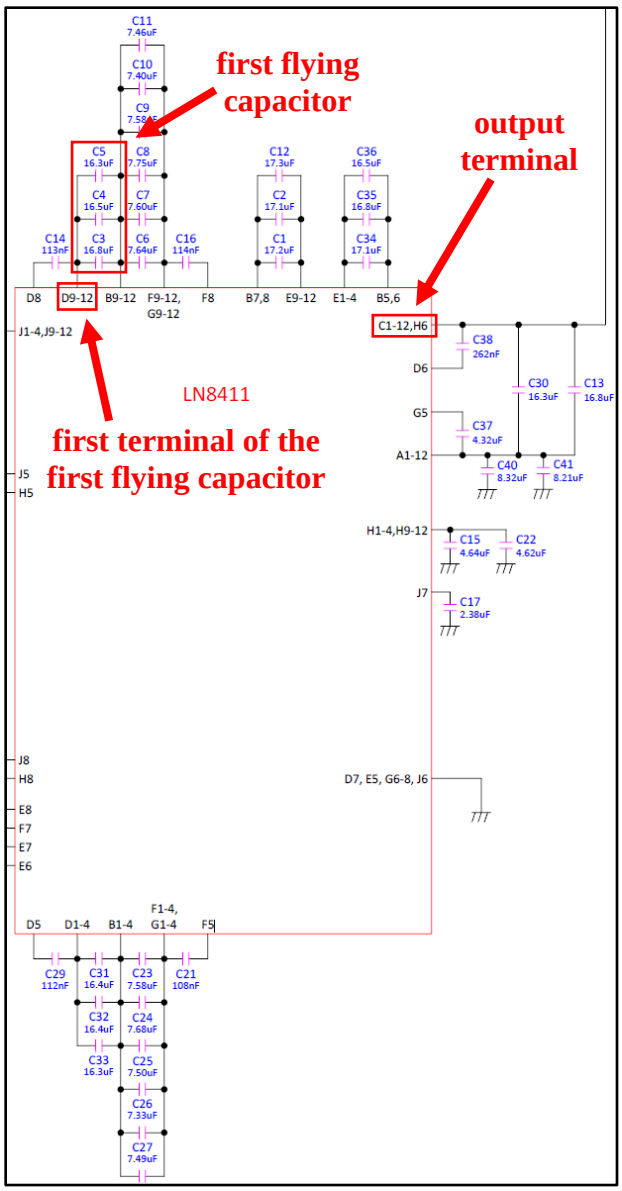



**Image of the LN8411 Schematics (annotated).**

56. The LN8411 comprises a third switch configured to be driven by a third gate driver of the plurality of gate drivers, and configured to be connected between the output terminal and a second terminal of the first flying capacitor, wherein a first supply terminal of the third gate driver is configured to be connected to the first terminal of the first flying capacitor to receive a voltage from the first terminal of the first flying capacitor.

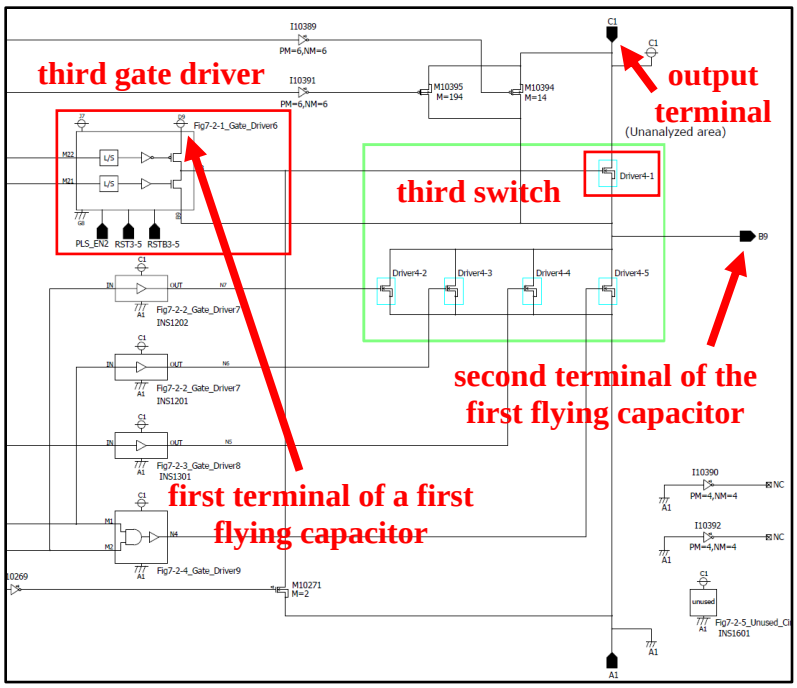



**Image of the LN8411 Schematics (annotated).**

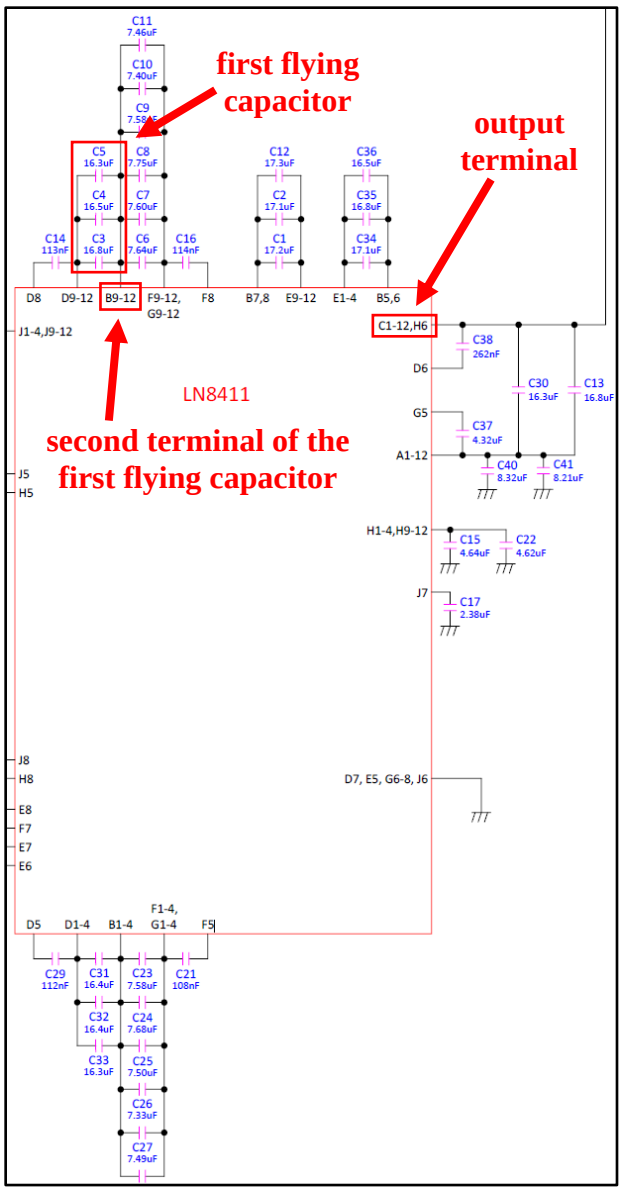
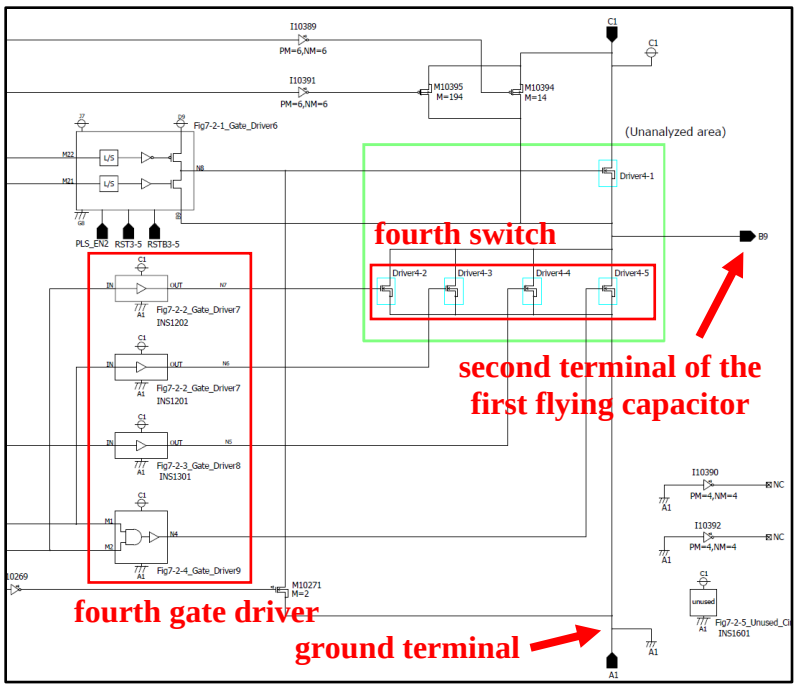



**Image of the LN8411 Schematics (annotated).**

57. The LN8411 comprises a fourth switch configured to be driven by a fourth gate driver of the plurality of gate drivers, and configured to be connected between the second terminal of the first flying capacitor and a ground terminal.




**Images of the LN8411 Schematics (annotated).**

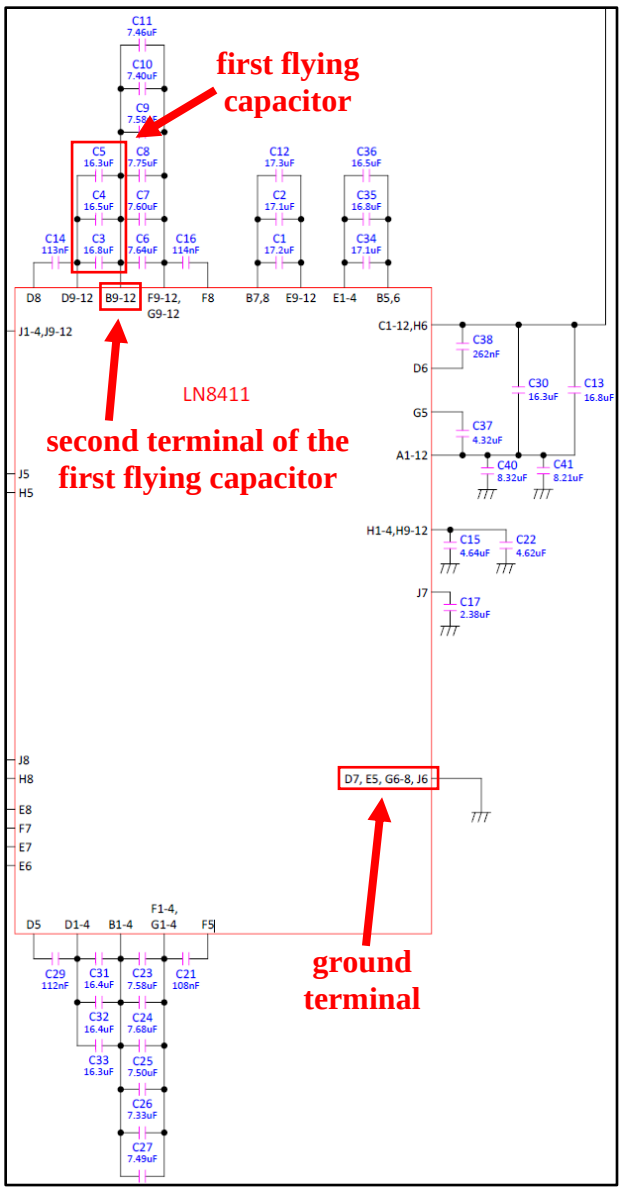



**Image of the LN8411 Schematics (annotated).**

58. Upon information and belief, the LN8411 comprises a fifth switch configured to be driven by a fifth gate driver of the plurality of gate drivers, and configured to be connected to a first terminal of a second flying capacitor, a sixth switch configured to be driven by a sixth gate driver of the plurality of gate drivers, and configured to be connected between the first terminal of the second flying capacitor and the output terminal, a seventh switch configured to be driven by a seventh gate driver of the plurality of gate drivers, and configured to be connected to the output

terminal and to a second terminal of the second flying capacitor, wherein a first supply terminal of the seventh gate driver is configured to be connected to the first terminal of the second flying capacitor to receive a voltage from the first terminal of the second flying capacitor, and an eighth switch configured to be driven by an eighth gate driver of the plurality of gate drivers, and configured to be connected between the second terminal of the second flying capacitor and the ground terminal. . Namely, on information and belief, the LN8411 includes a mirror image arrangement of drivers, switches, and capacitors discussed above with respect to the limitations relating to first through fourth switches, and this mirror image arrangement satisfies the limitations relating to the fifth through eight switches.

59. On information and belief, Defendants, with knowledge of the ’232 Patent, and without authority, have actively induced and continue to actively induce infringement by its customers of at least one claim of the ’232 Patent, under 35 U.S.C. § 271(b), by intentionally inducing the use, importation, offer for sale, and/or sale of LN8411 or products including the LN8411, intending to encourage, and in fact encouraging, its customer to directly infringe the ’010 Patent. On information and belief, Defendants actively induced infringement by, *inter alia*, providing data sheets and other materials to direct and assist its customers to integrate the LN8411 into the devices, and to instruct in the operation of the accused devices in an infringing manner and by offering support and technical assistance to their customers that encourage use of the accused products in ways that infringe the asserted claims. In addition, Defendants have had actual knowledge of end users’ direct infringement and that Defendants’ acts induced such infringement since at least the date of this filing.

60. Defendants' infringement has damaged and continues to damage pSemi in an amount yet to be determined, and pSemi will suffer irreparable injury unless the infringement is enjoined by this Court.

## DEMAND FOR JURY TRIAL

Plaintiff demands a jury trial for all issues deemed to be triable by a jury.

## PRAYER FOR RELIEF

WHEREFORE, pSemi requests the Court grant the relief set forth below:

A. Enter judgment that Defendants have infringed, and continue to infringe, one or more claims of the '438 Patent, the '010 Patent, and the '232 Patent;

B. Temporarily, preliminarily, and/or permanently enjoin Defendants, their parents, subsidiaries, affiliates, divisions, officers, agents, servants, employees, directors, partners, representatives, all individuals and entities in active concert and/or participation with them, and all individuals and/or entities within their control from engaging in the aforesaid unlawful acts of patent infringement;

C. Order Defendants to account for and pay damages caused to pSemi by Defendants' unlawful acts of patent infringement in an amount to be proven at trial, together with pre-judgment and post-judgment interest at the maximum rate permitted by law;

D. Award pSemi the interest and costs incurred in this action; and

E. Award pSemi such other and further relief, including equitable relief, as the Court deems just and proper.

DATED: April 2, 2025

Respectfully submitted,

*/s/ Michael A. Barlow*

Michael A. Barlow (#3928)
QUINN EMANUEL URQUHART
& SULLIVAN, LLP
500 Delaware Avenue, Suite 220
Wilmington, Delaware 19801
(302) 302-4000
michaelbarlow@quinnemanuel.com

*Attorneys for Plaintiff pSemi Corp.*

OF COUNSEL:

Sean S. Pak (*pro hac vice* forthcoming)
Jodie W. Cheng (*pro hac vice* forthcoming)
QUINN EMANUEL URQUHART
& SULLIVAN, LLP
50 California Street, 22nd Floor
San Francisco, California 94118
(415) 875-6600
seanpak@quinnemanuel.com
jodiecheng@quinnemanuel.com

Nathan Hamstra (*pro hac vice* forthcoming)
QUINN EMANUEL URQUHART
& SULLIVAN, LLP
191 N. Wacker Drive, Suite 2700
Chicago, Illinois 60606
(312) 705-7400
nathanhamstra@quinnemanuel.com

Jared W. Newton (*pro hac vice* forthcoming)
QUINN EMANUEL URQUHART
& SULLIVAN, LLP
1300 I Street NW, 9th Floor
Washington, DC 20005
(202) 538-8108
jarednewton@quinnemanuel.com