UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
TEXARKANA DIVISION

NEXGEN CONTROL SYSTEMS, LLC, ***Plaintiff,*** v. **NXP SEMICONDUCTORS N.V. AND NXP B.V.,** ***Defendants.***	**Civil Action No._____** **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

NexGen Control Systems, LLC ("NexGen" or "Plaintiff") bring this action and make the following allegations of patent infringement relating to U.S. Patent Nos.: 8,145,386 (the "'386 patent"); 7,925,395 (the "'395 patent"); and 9,340,188 (the "'188 patent") (collectively, the "patents-in-suit"). Defendants NXP Semiconductors N.V. and NXP B.V. (collectively, "NXP" or "Defendant") infringe the patents-in-suit in violation of the patent laws of the United States of America, 35 U.S.C. § 1 *et seq*.

INTRODUCTION

1. NexGen's portfolio of over 950 patent assets encompasses core technologies in the fields of semiconductors and power management. NexGen's patents arose from the research and development efforts of Mitsubishi Electric Corporation.

2. In an effort to facilitate the licensing of Mitsubishi's foundational technology, NexGen is pursuing remedies for infringement of its patents in venues throughout the world. NexGen is pursuing infringement actions against several large automotive companies throughout the United States, Japan, the People's Republic of China, and Germany.

3. Highlighting the importance of the patents-in-suit is the fact that the NexGen's patent portfolio has been cited by over 2500 U.S. and international patents and patent applications assigned to a wide variety of the largest producers of automotive and semiconductor technologies. NexGen's patents have been cited by companies such as:

- DENSO Corporation[1]
- Robert Bosch GmbH[2]
- Toyota Motor Corporation[3]
- Hitachi, Ltd.[4]
- Hyundai Motor Company[5]
- Siemens AG[6]
- Continental Automotive GmbH[7]
- Toshiba Corporation[8]
- Nissan Motor Co., Ltd.[9]
- Panasonic Corporation[10]

CO-PENDING ENFORCEMENT PROCEEDINGS IN CHINA AND EUROPE

4. NexGen's portfolio of over 950 patent assets encompasses core technologies in the fields of automotive electrical power generation, transformation, and regulation, as well as lifesaving safety innovations. The patent portfolio held by NexGen is international in scope and includes numerous European, Chinese, and Japanese patent grants.

[1] *See, e.g.*, U.S. Patent Nos. 6,906,574; 8,045,345; 8,489,262; 8,083,015; 8,427,004; 8,077,491; and 8,278,855.
[2] *See, e.g.*, U.S. Patent Nos. 6,906,574 and 7,772,806.
[3] *See, e.g.*, U.S. Patent Nos. 8,489,262; 8,083,015; 8,427,004; 8,077,491; and 8,278,855.
[4] *See, e.g.*, U.S. Patent Nos. 8,531,150; 7,772,806; 8,045,345; 8,489,262; 8,547,713; 8,427,004; and 8,077,491.
[5] *See, e.g.*, U.S. Patent Nos. 8,531,150; 7,772,806; 8,045,345 and 8,083,015.
[6] *See, e.g.*, U.S. Patent Nos. 7,772,806 and 8,278,855.
[7] *See, e.g.*, U.S. Patent Nos. 7,772,806 and 8,083,015.
[8] *See, e.g.*, U.S. Patent Nos. 8,489,262; 8,427,004; 8,278,855; and 7,772,806.
[9] *See, e.g.*, U.S. Patent Nos. 8,489,262; 8,083,015; 8,427,004; and 8,278,855.
[10] *See, e.g.*, U.S. Patent Nos. 8,045,345; 8,547,713; and 8,278,855.

5. In an effort to facilitate the licensing of Mitsubishi Electric Corporation's foundational technology, NexGen is pursuing remedies for infringement of its patents in venues throughout the world.

6. On January 13, 2023, NexGen's complaint against NXP (China) Management Co., Ltd. and others for patent infringement was accepted by the Shanghai Intellectual Property Court of the People's Republic of China. The complaint alleges that NXP (China) Management Co., Ltd. and Arrow Electronics (Shanghai) Co., Ltd. have infringed Chinese Patent No. ZL200780100586.7. The case number for NexGen's infringement action is: （2023）沪73知民初72号. NexGen is seeking injunctive relief relating to the sale of the following products: NXP's MC56F83 and MC56F84 series digital signal controllers.

7. NexGen is also concurrently litigating patent infringement claims against Infineon Technology (Wuxi) Co., Ltd., in the Shanghai Intellectual Property Court of the People's Republic of China in Case No. (2021) Hu 73 Zhiminchu No. 1580.

THE PARTIES

NEXGEN CONTROL SYSTEMS, LLC

8. NexGen Control Systems, LLC ("NexGen") is a Delaware limited liability company with its principal place of business at 225 S. 6th Street, Suite 3900, Minneapolis, Minnesota 55402. NexGen is the owner by assignment of all right, title, and interest in each of the patents-in-suit.

NXP

9. Defendant NXP Semiconductors N.V. is a Dutch corporation with a principal place of business at High Tech Campus 60, 5656 AG Eindhoven, Netherlands.

10. Defendant NXP B.V. is a Dutch company with a principal place of business at High

Tech Campus 60, 5656 AG Eindhoven, Netherlands. NXP B.V. is a wholly owned subsidiary of NXP Semiconductors N.V.

11. NXP conducts business operations throughout the United States, and specifically the State of Texas, where it sells, develops, and/or markets the products accused of infringement herein.

JURISDICTION AND VENUE

12. This action arises under the patent laws of the United States, Title 35 of the United States Code. Accordingly, this Court has exclusive subject matter jurisdiction over this action under 28 U.S.C. §§ 1331 and 1338(a).

13. This Court has personal jurisdiction over NXP in this action because NXP has committed acts within the Eastern District of Texas giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over NXP would not offend traditional notions of fair play and substantial justice.

14. Defendant NXP, directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), has committed and continues to commit acts of infringement in this District by, among other things, offering to sell and selling products and/or services that infringe the patents-in-suit.

15. NXP Semiconductors N.V. is the ultimate parent of NXP B.V. and a network of subsidiary entities that conduct NXP's vertically integrated business as "a global semiconductor company and a long-standing supplier in the industry, with over 50 years of innovation and operating history." 2021 NXP U.S. Securities and Exchange Commission 10-K at 3. NXP Semiconductors N.V. operates this network of subsidiaries as one common enterprise. *See id.* at 2 ("[A]ll references herein to 'we,' 'our,' us,' 'NXP' and the 'Company' are to NXP Semiconductors N.V. and its consolidated subsidiaries."); *id.* at 8 ("We manage our manufacturing

assets together through one centralized organization to ensure we realize scale benefits in asset utilization, purchasing volumes and overhead leverage across businesses."). NXP, as a single enterprise of multiple operating subsidiaries acting in consort with one another and in consort with NXP Semiconductors N.V. and NXP B.V., has a common Board of Directors with responsibility "for the overall conduct of the NXP Group." Rules Governing the Board of Directors of NXP Semiconductors N.V. (Aug. 2022) at Article 1.1. Annually, the common Board of Directors of the NXP Group sets "the corporate strategy of the NXP Group." *Id.* at Article 1.3(b).

16. The NXP Group, led by NXP Semiconductors N.V. and NXP B.V. conduct extensive operations directly relevant to the design, development, manufacturing, marketing, and selling of the accused products in the United States and the State of Texas. NXP's United States Headquarters is located in Austin, Texas, and NXP also maintains a manufacturing facility in Austin, Texas.

17. NXP Semiconductors N.V. and NXP B.V. manage and direct the conduct of its subsidiaries, including NXP USA, Inc., to design, develop, manufacture, market, and sell the accused products in the United States and the State of Texas. NXP Semiconductors N.V. and NXP B.V., as ultimate parent companies of a network of vertically integrated operating subsidiary companies with a common executive team, orchestrate through their subsidiaries the accused products' placement in the stream of commerce that end in the extensive sales of products in the United States that infringe NexGen's patents, including the patents-in-suit.

18. Among the various global subsidiaries acting in consort at the direction and control of NXP Semiconductors N.V. and the common executive leadership among the NXP Group is NXP USA, Inc., which is a Delaware corporation with a principal place of business at 6501 W. William Cannon Drive, Austin, Texas 78735. NXP USA, Inc. is a wholly owned subsidiary of

Freescale Semiconductor Holdings V, Inc., which in turn is a wholly owned subsidiary of NXP B.V.

19. NXP has committed acts of infringement in this District by commercializing, marketing, selling, distributing, testing, and servicing certain Accused Products. Venue is proper in in this District pursuant to 28 U.S.C. § 1391(c)(3) because the NXP Defendants are foreign corporations that are not residents of the United States and are subject to personal jurisdiction in this District. The NXP Defendants are subject to venue in any judicial district including this District. *See In re HTC Corp.*, 889 F.3d 1349, 1354 (Fed. Cir. 2018).

20. This Court has personal jurisdiction over NXP. NXP has conducted and does conduct business within the State of Texas. NXP, directly or through subsidiaries or intermediaries (including distributors, retailers, and others), ships, distributes, makes, uses, offers for sale, sells, imports, and/or advertises (including by providing an interactive web page) its products and/or services in the United States and the Eastern District of Texas and/or contributes to and actively induces its customers to ship, distribute, make, use, offer for sale, sell, import, and/or advertise (including the provision of an interactive web page) infringing products and/or services in the United States and the Eastern District of Texas. NXP, directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), has purposefully and voluntarily placed one or more of its infringing products and/or services, as described below, into the stream of commerce with the expectation that those products will be purchased and used by customers and/or consumers in the Eastern District of Texas. These infringing products and/or services have been and continue to be made, used, sold, offered for sale, purchased, and/or imported by customers and/or consumers in the Eastern District of Texas. NXP has committed acts of patent infringement within the Eastern District of Texas. NXP interacts with customers in Texas,

including through visits to customer sites in Texas. Through these interactions and visits, NXP directly infringes the patents-in-suit. NXP also interacts with customers who sell the Accused Products into Texas, knowing that these customers will sell the Accused Products into Texas, either directly or through intermediaries.

21. On information and belief, Defendant NXP B.V. owns and operates the www.nxp.com website, which is a highly interactive website where customers in the United States and within the State of Texas can and have ordered one or more of the accused products, which were shipped by one or more subsidiaries within the NXP Group to customers in the United States and the State of Texas.

22. NXP has minimum contacts with this District such that the maintenance of this action within this District would not offend traditional notions of fair play and substantial justice. Thus, the Court therefore has both general and specific personal jurisdiction over NXP.

THE ASSERTED PATENTS

U.S. PATENT NO. 8,145,386

23. U.S. Patent No. 8,145,386 (the "'386 patent") entitled, *Activation Apparatus for Occupant Protection System*, was filed on August 10, 2007. The term of the '386 patent has been extended pursuant to 35 U.S.C. § 154(b) by 276 days. NexGen is the owner by assignment of the '386 patent. A true and correct copy of the '386 patent is attached hereto as Exhibit 1.

24. The '386 patent teaches a system that utilizes a processor to detect acceleration at multiple points in a vehicle. A "curb trip" is when a vehicle cannot slow down before a curve in the road and the vehicle skids into a curb that leads the vehicle to overturn. In the context of motor vehicle crashes, a "curb trip" is frequent cause of serious injuries and fatalities. The technologies disclosed in the '386 patent help save lives by detecting, among various other types of rollovers

and vehicle crashes, "curb trips" and deploying airbags, curtain airbags, and seatbelt pretensioners in an effort to best ensure occupant survival.

25. The technologies taught in the '386 patent include sensors that detect when there is crash or rollover on one side of a vehicle. The systems utilize a processor receiving data from multiple sensors located throughout the vehicle whether to activate safety systems such as airbags and seatbelt systems.

26. The processor of the systems taught by the '386 patent makes this determination by comparing the information received from the sensors to predetermined thresholds for safe operation of the vehicle in which the system is installed.

27. The '386 patent has been cited by several patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '386 patent as relevant prior art:

- Toyota Motor Corporation
- Robert Bosch GmbH
- Hyundai Motor Company
- Honda Motor Company
- Continental Automotive Systems, Inc.
- Fujitsu Ten Ltd.
- Nissan Motor Company
- Mitsubishi Motors Corporation
- Denso Corporation
- Shaanxi Automobile Group
- Aisin Seiki Co., Ltd.
- Koninklijke Philips Nv
- Autoliv Inc.
- Takata Corporation

U.S. PATENT NO. 7,925,395

28. U.S. Patent No. 7,925,395 (the "'395 patent") entitled, *Rollover Judging Device*, was filed on February 22, 2007. The term of the '395 patent has been extended pursuant to 35 U.S.C. § 154(b) by 706 days. The '395 patent claims priority to Foreign Application JP-2006-

157571 filed on June 6, 2006. NexGen is the owner by assignment of the '395 patent. A true and correct copy of the '395 patent is attached hereto as Exhibit 2.

29. The '395 patent teaches a rollover judging device for vehicles, comprising an angular velocity sensor, an acceleration sensor, an integration processing means, and a judging means. The angular velocity sensor measures the angular velocity component of the vehicle in the direction of rollover, while the acceleration sensor measures the acceleration component in either the rightward/leftward or upward/downward direction.

30. The '395 patent teaches a rollover judgment device adjusts the angular velocity component based on the acceleration component, calculates the angle component through integration, multiplies and adds the measured and calculated components, and outputs a signal indicating a rollover when the sum exceeds a preset threshold.

31. The technologies taught in the '395 patent include an angular velocity sensor, acceleration sensor, integration processor, and judging unit. The angular velocity sensor measures the rate of change of the vehicle's angular orientation over time. When the vehicle is rolling over, the direction of the angular velocity component measured by the sensor will be aligned with the direction of the rollover. The sensor outputs a signal that represents the angular velocity component of the vehicle in the direction of the rollover, which is denoted by ω. This signal is then used in combination with other measurements, such as the acceleration components measured by the acceleration sensor, to determine if the vehicle is in danger of rolling over.

32. The '395 patent teaches the use of an acceleration sensor that measures the acceleration component of the vehicle in either the rightward/leftward or upward/downward direction. For example, the '395 patent teaches that the acceleration sensor is measuring the acceleration component, Gy, of the vehicle in its rightward/leftward direction. When the vehicle

experiences a lateral force due to cornering or sudden swerving, this acceleration sensor detects the corresponding change in the acceleration component. The sensor then outputs a signal that represents the magnitude of this acceleration component, which can be used by the rollover judging device to adjust the magnitude of the angular velocity component measured by the angular velocity sensor.

33. The '395 patent teaches that the integration processor can calculate the angle component by adjusting the angular velocity component measured by the angular velocity sensor. This adjustment accounts for the effect of the lateral acceleration on the vehicle's angular velocity, which is important in determining if the vehicle is in danger of rolling over. The rollover judging device then multiplies and adds the adjusted angular velocity component and the calculated angle component with preset weighting factors to determine if the sum exceeds the preset threshold, indicating a rollover. By combining the measurements from both the angular velocity and acceleration sensors, the rollover judging device taught by the '395 patent can accurately determine if the vehicle is in danger of rolling over and take appropriate action to prevent it.

34. The '395 patent has been cited by several patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '395 patent as relevant prior art:

- Jaguar Land Rover Limited
- Mitsubishi Electric Corporation
- Yamaha Motor Co Ltd
- Illumina, Inc.
- Nankai University
- BYD Co. Ltd.
- Suzhou Qingke Ali Electronic Technology Co Ltd

U.S. PATENT NO. 9,340,188

35. U.S. Patent No. 9,340,188 (the "'188 patent") entitled, *Occupant Protective Apparatus and Pedestrian Protective Apparatus*, was filed on January 10, 2008. The term of the '188 patent has been extended pursuant to 35 U.S.C. § 154(b) by 1,739 days. The '188 patent claims priority to Foreign Application No. JP-2007-125902 filed on May 10, 2007. NexGen is the owner by assignment of the '188 patent. A true and correct copy of the '188 patent is attached hereto as Exhibit 3.

36. The '188 patent teaches technologies used to improve motor vehicle safety. Airbags are a commonly understood staple in the field of automotive safety. However, to ensure airbags can perform their life-saving function in a safe way, they need to work when the vehicle is in a crash of sufficient force where the airbag *should* be deployed, but also critical to the safe operation of the vehicle is that airbags *should not* be deployed when the vehicle is not in danger.

37. Because motor vehicles regularly experience significant vibrations (*e.g.*, driving over rough terrain) and experience substantial, sudden forces (*e.g.*, slamming of car doors), engineers developing systems in the field of automotive safety are presented a difficult challenge—how to make sure airbags are deployed when necessary while avoiding situations where they are unnecessarily deployed or not deployed when necessary. This is where the technologies disclosed in the '188 patent have advanced vehicle safety.

38. The '188 patent teaches systems that monitor sensor outputs while monitoring the state of the vehicle such that the processor takes into account and reduces the effect of unnecessary external forces when determining whether or not to activate automotive safety systems such as airbag systems and seatbelt tighteners.

39. The '188 patent has been cited by several patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '188 patent family as relevant prior art:

- Toyota Motor Corporation
- Continental Automotive Corporation
- Mitsubishi Electric Corporation
- Panasonic Corporation
- Robert Bosch GmbH
- Rohm Semiconductor

COUNT I
INFRINGEMENT OF U.S. PATENT NO. 8,145,386

40. Plaintiff references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

41. NXP designs, makes, uses, sells, and/or offers for sale in the United States activation apparatuses for occupant protection systems.

42. NXP designs, makes, sells, offers to sell, imports, and/or uses the following products: NXP's Peripheral Sensor Interface 5 (PSI5) System including the following components (FXLS93, MMA52xxW, MC33789, S32K1 Series Microcontrollers for Automotive General Purpose, MC33797 Four Channel Squib Driver IC) (collectively, the "NXP '386 Products").

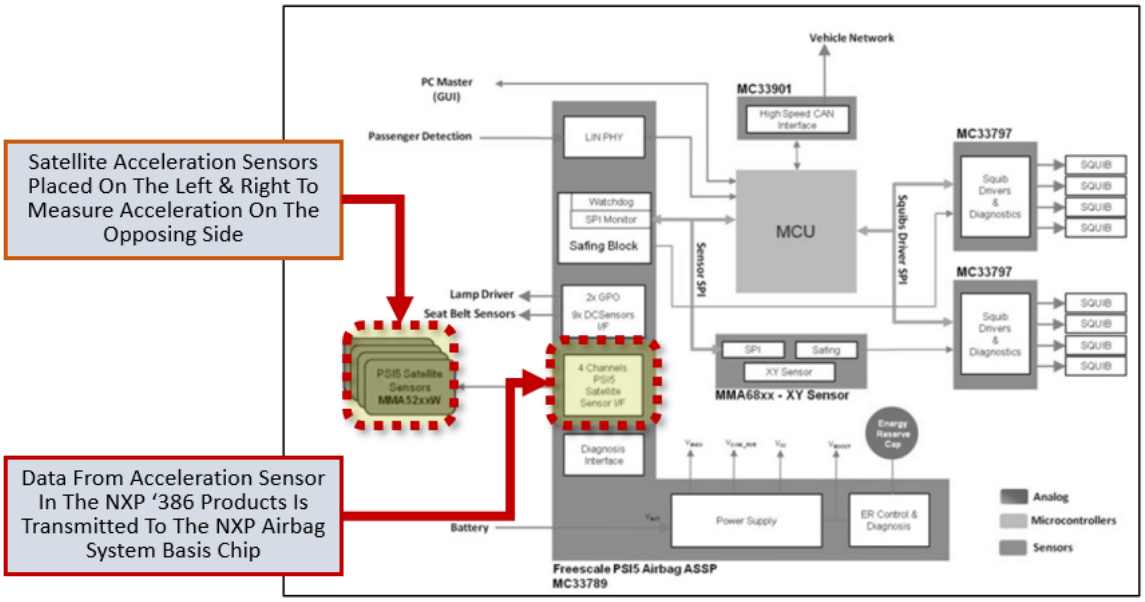
43. One or more NXP subsidiaries and/or affiliates use the NXP '386 Products in regular business operations.

44. One or more of the NXP '386 Products include an activation apparatus for occupant protection systems including right and left acceleration sensors used to determine an acceleration for a side opposite side where the right and left sensors are disposed.

45. One or more of the NXP '386 Products include an activation apparatus for occupant protection systems including a determining unit to determine whether or not the occupant

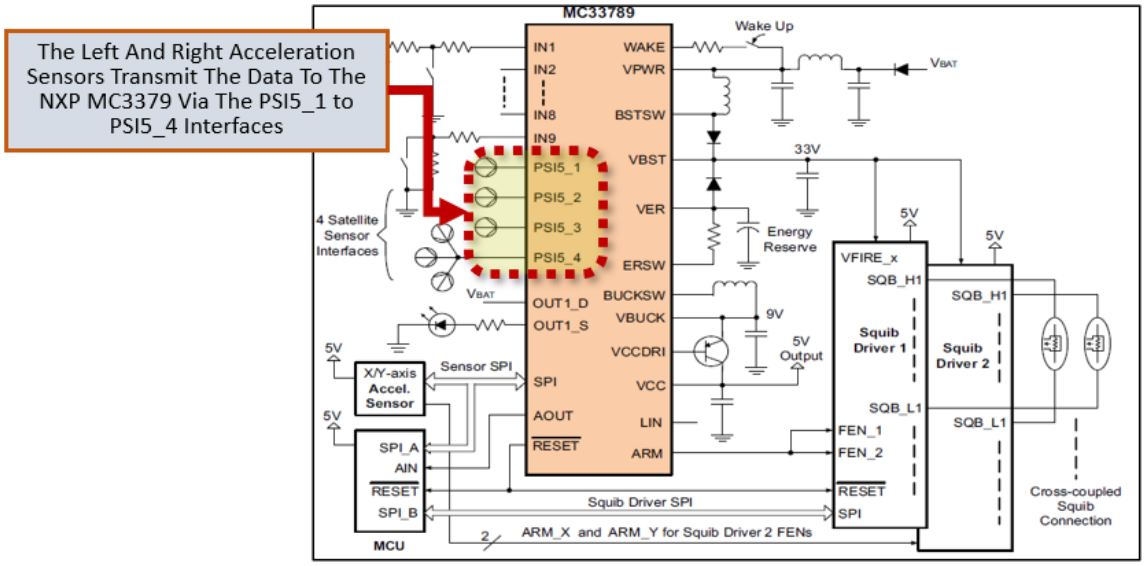
protection system is to be activated by comparing a physical quantity computed based on a value detected from the right or left acceleration sensors with a threshold for activating the occupant protection system.

46. The NXP '386 Products consist of acceleration sensors placed on both the right and left sides of a vehicle, positioned relative to the center of the vehicle. These sensors are used to measure the acceleration of the opposite side of the vehicle from where the respective sensor is located.



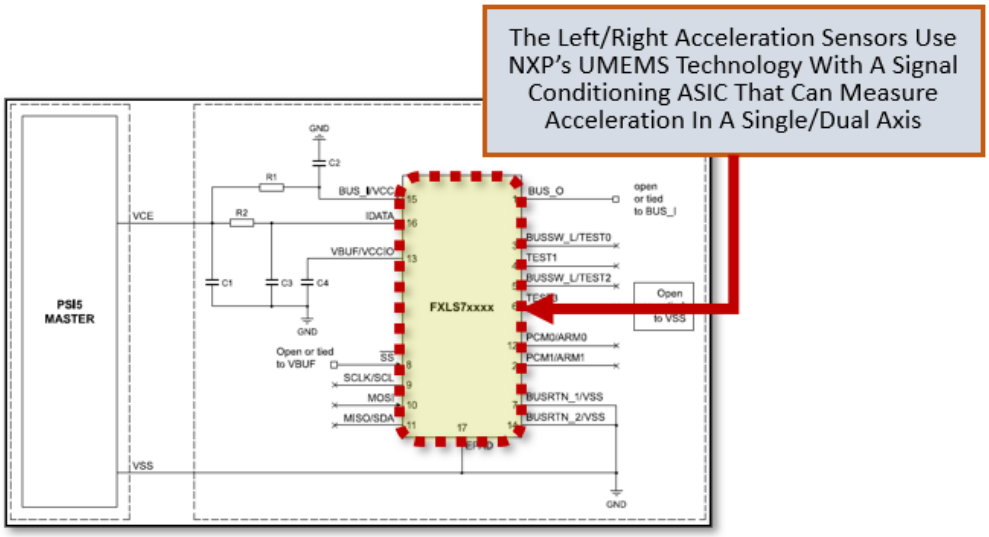
NXP Freescale RDAIRBAGPSI5 Airbag Reference Platform User's Guide Rev. 2.0, NXP DOCUMENTATION at 6 (October 2014) (annotation added).

47. The NXP '386 Products comprise acceleration sensors that are used to determine the acceleration on the opposite side of the vehicle from where the sensor is located. Specifically, the right acceleration sensor may be located on the right side of the vehicle and may be used to detect the acceleration on the left side of the vehicle. Similarly, the left acceleration sensor may be located on the left side of the vehicle and may be used to detect the acceleration on the right side of the vehicle.



NXP Freescale MC33789FS Overview Rev. 3.0, NXP DOCUMENTATION at 1 (2012) (annotation added).

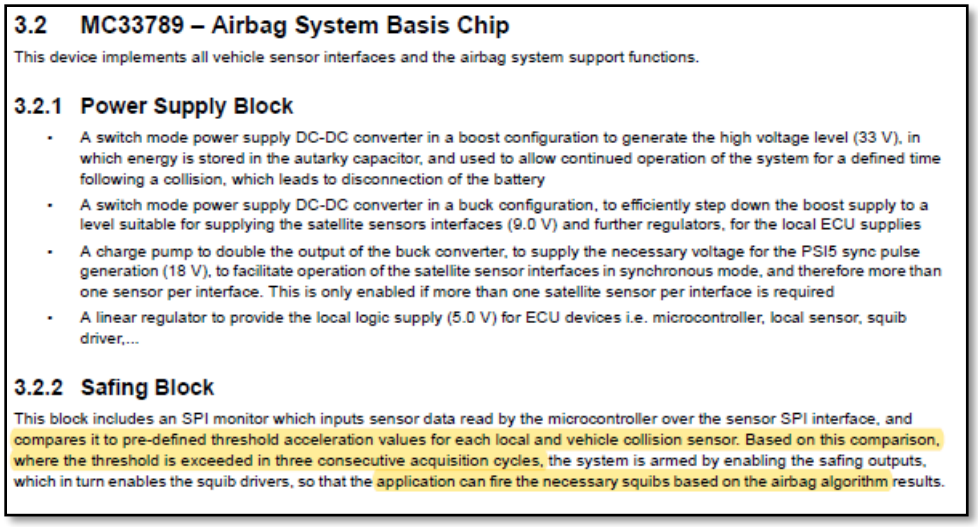
48. The NXP '386 Products by using right and left acceleration sensors in this way can obtain a more accurate and comprehensive view of the vehicle's acceleration and motion.



NXP Application Note AN12776 - PSI5 Normal Mode Initialization and Main Features for the FXLS93xxx Rev. 2.1, NXP DOCUMENTATION at 3 (January 8, 2021) (annotation added).

49. The NXP '386 Products comprise a determination unit that decides whether or not to activate the occupant protection system by comparing a physical quantity calculated from a

value detected and outputted by either the right or left acceleration sensor with a threshold set for activating the system.



3.2 MC33789 – Airbag System Basis Chip

This device implements all vehicle sensor interfaces and the airbag system support functions.

3.2.1 Power Supply Block

- A switch mode power supply DC-DC converter in a boost configuration to generate the high voltage level (33 V), in which energy is stored in the autarky capacitor, and used to allow continued operation of the system for a defined time following a collision, which leads to disconnection of the battery
- A switch mode power supply DC-DC converter in a buck configuration, to efficiently step down the boost supply to a level suitable for supplying the satellite sensors interfaces (9.0 V) and further regulators, for the local ECU supplies
- A charge pump to double the output of the buck converter, to supply the necessary voltage for the PSI5 sync pulse generation (18 V), to facilitate operation of the satellite sensor interfaces in synchronous mode, and therefore more than one sensor per interface. This is only enabled if more than one satellite sensor per interface is required
- A linear regulator to provide the local logic supply (5.0 V) for ECU devices i.e. microcontroller, local sensor, squib driver,...

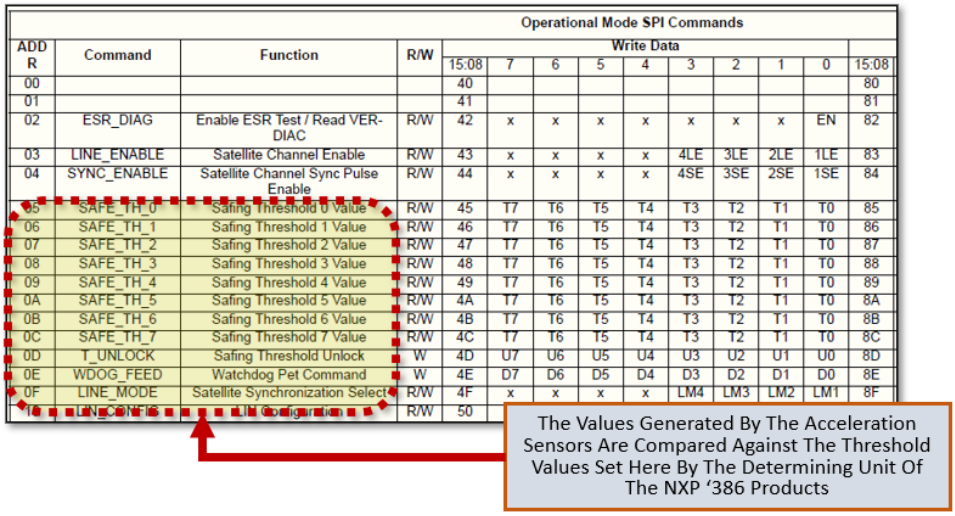
3.2.2 Safing Block

This block includes an SPI monitor which inputs sensor data read by the microcontroller over the sensor SPI interface, and compares it to pre-defined threshold acceleration values for each local and vehicle collision sensor. Based on this comparison, where the threshold is exceeded in three consecutive acquisition cycles, the system is armed by enabling the safing outputs, which in turn enables the squib drivers, so that the application can fire the necessary squibs based on the airbag algorithm results.

NXP Freescale - Airbag Reference Demonstrator: Reference Manual Rev. 3.0, NXP DOCUMENTATION at 3 (April 2012) (emphasis added).

50. The NXP '386 Products contain a determining unit that is used to decide whether or not to activate the system in the event of an impact or collision. The determining unit of the NXP '386 Products achieves this by comparing a physical quantity computed based on a value detected and outputted by the right or left acceleration sensor with a predetermined threshold value for activating the occupant protection system.

51. The value detected and outputted by the acceleration sensor is processed by the determining unit of the NXP '386 Products to compute a physical quantity related to the acceleration of the vehicle. The physical quantity computed by the determining unit of the NXP '386 Products are then compared with a predetermined threshold value. If the computed physical quantity exceeds the threshold value, the NXP '386 Products determining unit activates the occupant protection system. This system may include safety features such as airbags, seat belt pre-tensioners, or other safety devices that help protect the vehicle occupants during a collision or impact.



Operational Mode SPI Commands

ADDR	Command	Function	R/W	Write Data 15:08	7	6	5	4	3	2	1	0	Read Data 15:08
00				40									80
01				41									81
02	ESR_DIAG	Enable ESR Test / Read VER-DIAC	R/W	42	x	x	x	x	x	x	x	EN	82
03	LINE_ENABLE	Satellite Channel Enable	R/W	43	x	x	x	x	4LE	3LE	2LE	1LE	83
04	SYNC_ENABLE	Satellite Channel Sync Pulse Enable	R/W	44	x	x	x	x	4SE	3SE	2SE	1SE	84
05	SAFE_TH_0	Safing Threshold 0 Value	R/W	45	T7	T6	T5	T4	T3	T2	T1	T0	85
06	SAFE_TH_1	Safing Threshold 1 Value	R/W	46	T7	T6	T5	T4	T3	T2	T1	T0	86
07	SAFE_TH_2	Safing Threshold 2 Value	R/W	47	T7	T6	T5	T4	T3	T2	T1	T0	87
08	SAFE_TH_3	Safing Threshold 3 Value	R/W	48	T7	T6	T5	T4	T3	T2	T1	T0	88
09	SAFE_TH_4	Safing Threshold 4 Value	R/W	49	T7	T6	T5	T4	T3	T2	T1	T0	89
0A	SAFE_TH_5	Safing Threshold 5 Value	R/W	4A	T7	T6	T5	T4	T3	T2	T1	T0	8A
0B	SAFE_TH_6	Safing Threshold 6 Value	R/W	4B	T7	T6	T5	T4	T3	T2	T1	T0	8B
0C	SAFE_TH_7	Safing Threshold 7 Value	R/W	4C	T7	T6	T5	T4	T3	T2	T1	T0	8C
0D	T_UNLOCK	Safing Threshold Unlock	W	4D	U7	U6	U5	U4	U3	U2	U1	U0	8D
0E	WDOG_FEED	Watchdog Pet Command	W	4E	D7	D6	D5	D4	D3	D2	D1	D0	8E
0F	LINE_MODE	Satellite Synchronization Select	R/W	4F	x	x	x	x	LM4	LM3	LM2	LM1	8F
10	LINE_CONFIG	LIN Configuration	R/W	50									

The Values Generated By The Acceleration Sensors Are Compared Against The Threshold Values Set Here By The Determining Unit Of The NXP '386 Products

NXP Airbag System Basis Chip (SBC) with Power Supply and PSI5 Sensor Interface – MC33789 Rev. 4.0, NXP DOCUMENTATION at 72 (September 2014) (annotation added).

52. By using a determining unit that compares a physical quantity computed based on the values detected by the right and left acceleration sensors, the NXP '386 Products can make a more accurate and comprehensive assessment of the impact or collision. The NXP '386 Products enable the occupant protection system to be activated in the event of a collision or accident to minimize the risk of injury or harm to the passengers. By comparing a physical quantity calculated from the value detected and outputted by either the right or left acceleration sensor with a predetermined threshold, the determination unit can determine whether the system should be activated, thus ensuring the safety of the occupants of the vehicle.

53. NXP has directly infringed and continues to directly infringe the '386 patent by, among other things, making, using, offering for sale, and/or selling activation apparatuses for occupant protection systems, including but not limited to the NXP '386 Products.

54. The NXP '386 Products are available to businesses and individuals throughout the United States.

55. The NXP '386 Products are provided to businesses and individuals located in the Eastern District of Texas.

56. By making, using, testing, offering for sale, and/or selling acceleration sensor units, including but not limited to the NXP '386 Products, NXP has injured Plaintiff and is liable to Plaintiff for directly infringing one or more claims of the '386 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

57. NXP also indirectly infringes the '386 patent.

58. NXP has had knowledge of the '386 patent since at least service of this Complaint or shortly thereafter, and NXP knew of the '386 patent and knew of its infringement, including by way of this lawsuit.

59. NXP indirectly infringes the '386 patent by actively inducing infringement under 35 U.S.C. § 271(b).

60. NXP intended to induce patent infringement by third-party customers and users of the NXP '386 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. NXP specifically intended and was aware that the normal and customary use of the accused products would infringe the '386 patent. NXP performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '386 patent and with the knowledge that the induced acts would constitute infringement. For example, NXP provides the NXP '386 Products that have the capability of operating in a manner that infringe one or more of the claims of the '386 patent, including at least claim 1, and NXP further provides documentation and training materials that cause customers and end users of the NXP '386 Products to utilize the products in a manner that directly infringe one or more claims of the '386 patent.[11] By providing instruction and training to

[11] *NXP Airbag System Basis Chip (SBC) with Power Supply and PSI5 Sensor Interface – MC33789 Rev. 4.0*, NXP DOCUMENTATION (September 2014); *NXP Freescale - Airbag Reference Demonstrator: Reference Manual Rev. 3.0*, NXP DOCUMENTATION (April 2012); *NXP Application*

customers and end-users on how to use the NXP '386 Products in a manner that directly infringes one or more claims of the '386 patent, including at least claim 1, NXP specifically intended to induce infringement of the '386 patent. NXP engaged in such inducement to promote the sales of the NXP '386 Products, e.g., through NXP user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '386 patent. Accordingly, NXP has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '386 patent, knowing that such use constitutes infringement of the '386 patent.

61. NXP indirectly infringes the '386 patent by contributing to the infringement by its customers and end users under 35 U.S.C. § 271(c) by making, using, importing, selling, or offering to sell within the United States the NXP '386 Products, which incorporate or constitute a material part of the inventions claimed by the '386 patent. NXP does so knowing that these products are especially made or especially adapted for uses that infringe the '386 patent, and not staple articles or commodities of commerce suitable for substantial non-infringing use.

62. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '386 patent.

63. As a result of NXP's infringement of the '386 patent, Plaintiff has suffered monetary damages, and seek recovery in an amount adequate to compensate for NXP's infringement, but in no event less than a reasonable royalty for the use made of the invention by NXP together with interest and costs as fixed by the Court.

Note AN12776 - PSI5 Normal Mode Initialization and Main Features for the FXLS93xxx Rev. 2.1, NXP DOCUMENTATION (January 8, 2021); *NXP Freescale MC33789FS Overview Rev. 3.0*, NXP DOCUMENTATION (2012); and N*XP Freescale RDAIRBAGPSI5 Airbag Reference Platform User's Guide Rev. 2.0*, NXP DOCUMENTATION (October 2014).

COUNT II
INFRINGEMENT OF U.S. PATENT NO. 7,925,395

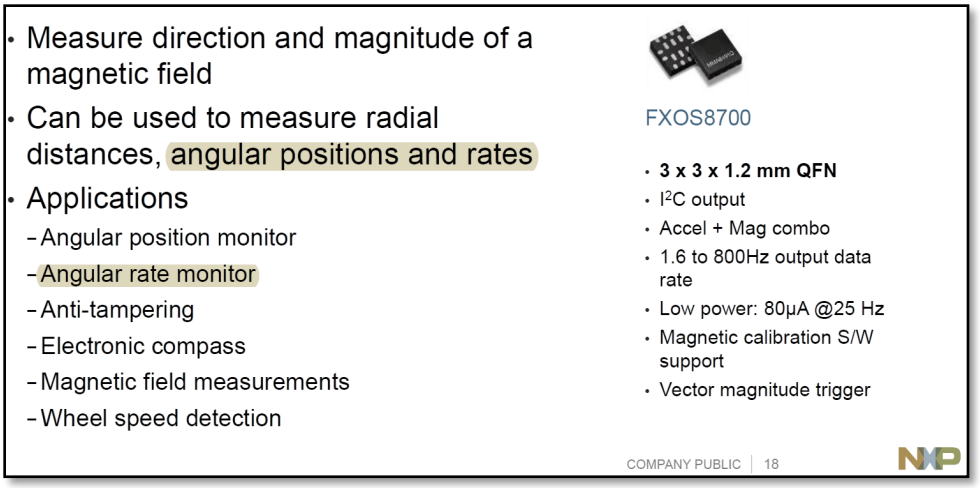
64. Plaintiff references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

65. NXP designs, makes, uses, sells, and/or offers for sale in the United States activation apparatuses for occupant protection systems.

66. NXP designs, makes, sells, offers to sell, imports, and/or uses the following products: FXOS8700CQ series devices (collectively, the "NXP '395 Products").

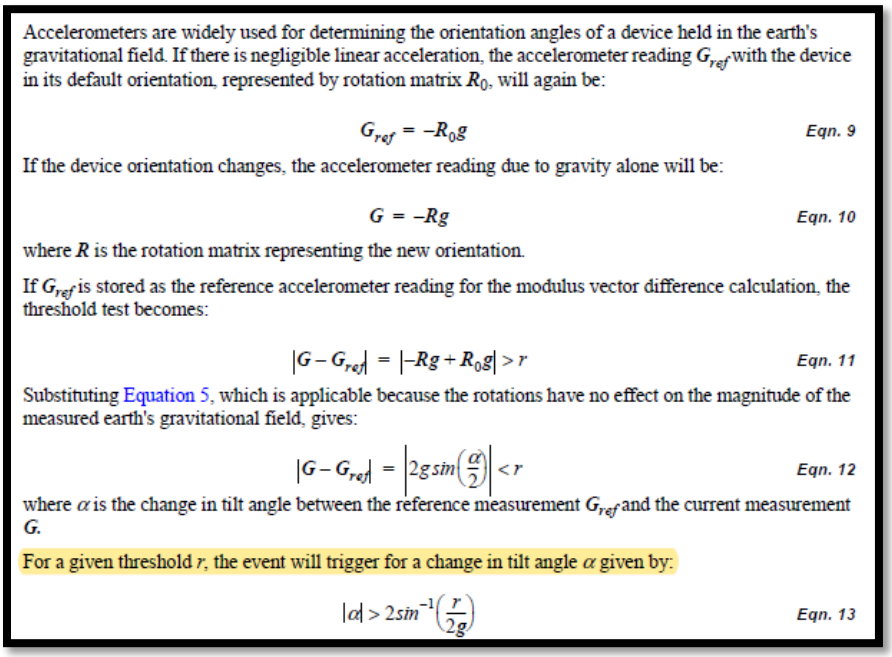
67. One or more NXP subsidiaries and/or affiliates use the NXP '395 Products in regular business operations.

68. The NXP '395 Products consist of a sensor for measuring the angular velocity of a vehicle along the direction of its potential rollover. Specifically, the NXP '395 Products comprise an angular velocity sensor that measures the rate of change of the vehicle's rotational motion around a specific axis.



Michael Kelsey, *Session #AMF-IND-T3669 – Motion, Pressure and Magnetic Sensors for Automotive and IoT Applications*, NXP PRESENTATION at 18 (June 2019) (emphasis added).

69. The NXP '395 Products detect the angular velocity component of the vehicle that is in the direction of a potential rollover.



Accelerometers are widely used for determining the orientation angles of a device held in the earth's gravitational field. If there is negligible linear acceleration, the accelerometer reading G_{ref} with the device in its default orientation, represented by rotation matrix R_0, will again be:

$$G_{ref} = -R_0 g \quad \text{Eqn. 9}$$

If the device orientation changes, the accelerometer reading due to gravity alone will be:

$$G = -Rg \quad \text{Eqn. 10}$$

where R is the rotation matrix representing the new orientation.

If G_{ref} is stored as the reference accelerometer reading for the modulus vector difference calculation, the threshold test becomes:

$$|G - G_{ref}| = |-Rg + R_0 g| > r \quad \text{Eqn. 11}$$

Substituting Equation 5, which is applicable because the rotations have no effect on the magnitude of the measured earth's gravitational field, gives:

$$|G - G_{ref}| = \left|2g\sin\left(\frac{\alpha}{2}\right)\right| < r \quad \text{Eqn. 12}$$

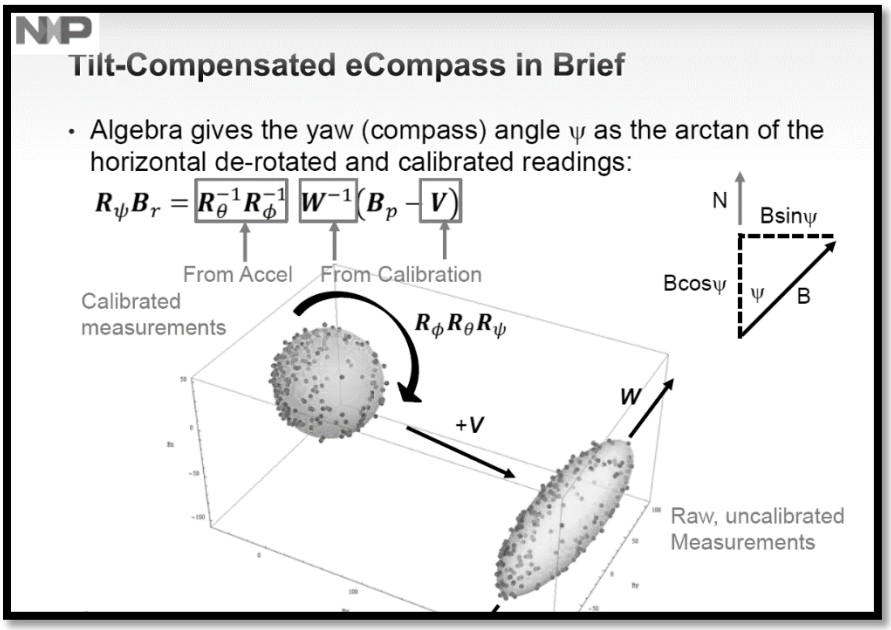
where α is the change in tilt angle between the reference measurement G_{ref} and the current measurement G.

For a given threshold r, the event will trigger for a change in tilt angle α given by:

$$|\alpha| > 2\sin^{-1}\left(\frac{r}{2g}\right) \quad \text{Eqn. 13}$$

Using the Xtrinsic FXOS8700CQ Accelerometer and Magnetometer Vector-Magnitude Function, NXP APPLICATION NOTE AN4458 at 5 (June 2012) (emphasis added).

70. The NXP '395 Products enable the determination of a vehicles angular velocity using tilt compensation.



Marc Holbein, *AMF-CON-T0225 Xtrinsic Sensing Introduction*, NXP-FREESCALE PRESENTATION at 29 (October 2013).

71. The NXP '395 Products contain an angular velocity sensor that detects the changes in the rate of rotation and provides data that can be used to determine the vehicle's angular velocity. NXP documentation shows that the NXP '395 Products enable the detection of changes in the rate of rotation.

72. The NXP '395 Products comprise a sensor for measuring the acceleration of a vehicle in either the left or right direction, as well as the upward or downward direction. The acceleration sensor in the NXP '395 Products measures the acceleration of a vehicle in a particular direction by detecting changes in the vehicle's velocity over time.

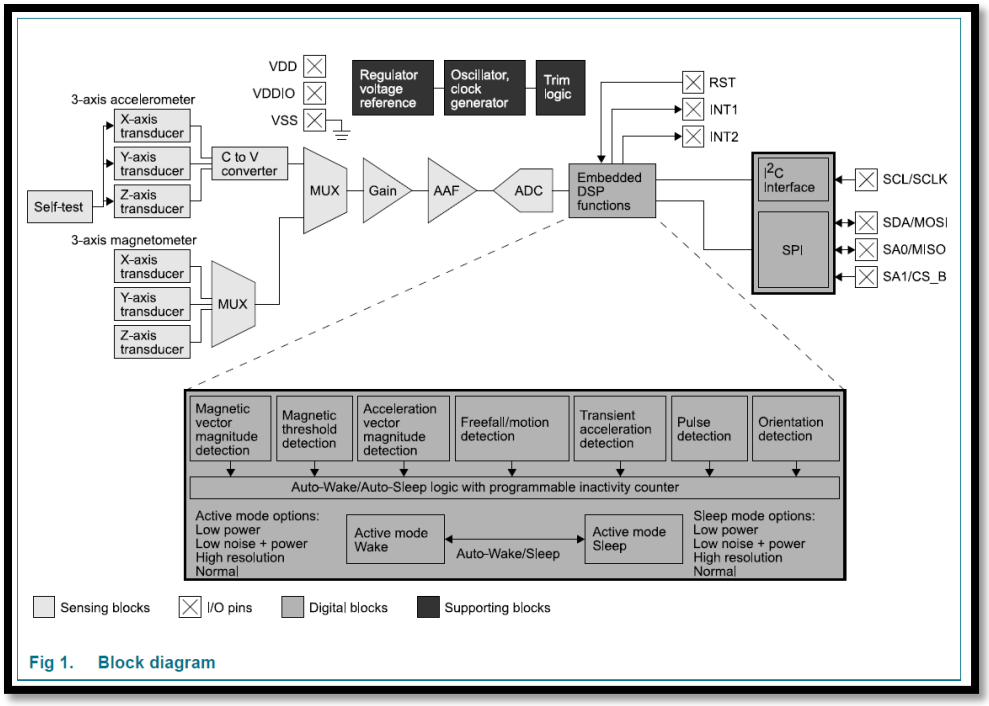
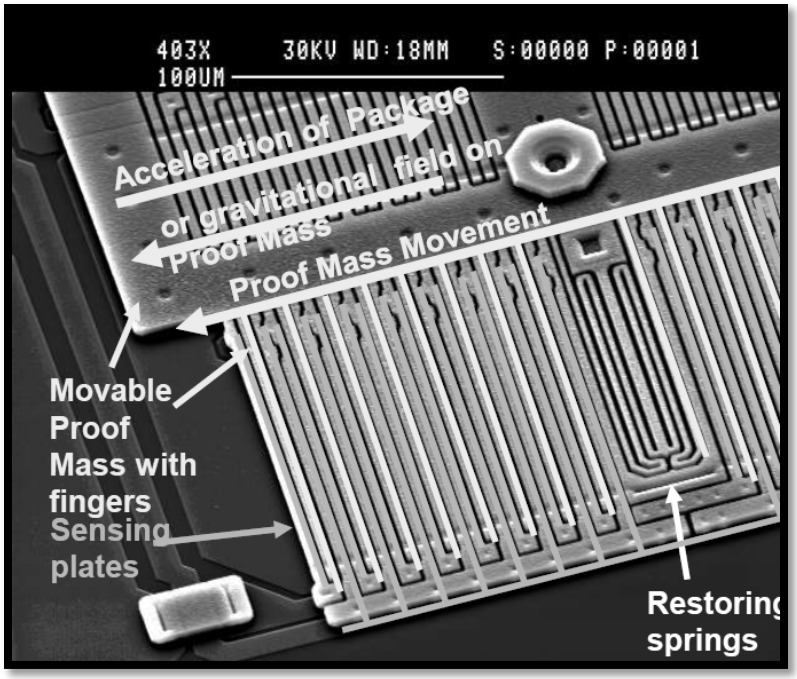


Fig 1. Block diagram

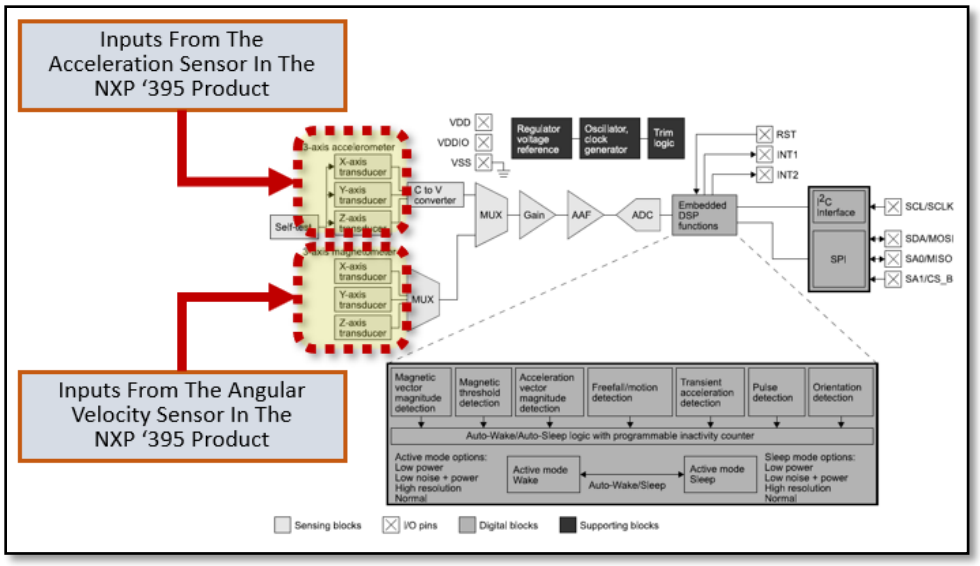
FXOS8700CQ 6-Axis Sensor With Integrated Linear Accelerometer And Magnetometer, NXP DATASHEET at 3 (April 25, 2017).

73. The sensor typically consists of a small mass that is suspended within a housing, which is attached to the vehicle. When the vehicle accelerates, the mass within the sensor is displaced relative to the housing, which creates a force that is proportional to the acceleration. This force is then converted into an electrical signal by the sensor, which can be processed and analyzed by other systems within the vehicle. NXP documentation states that the NXP '395 Products contain a proof of mass that moves in response to both applied acceleration and gravity.



Marc Holbein, *AMF-CON-T0225 Xtrinsic Sensing Introduction*, NXP-FREESCALE PRESENTATION at 12 (October 2013).

74. The NXP '395 Products contains a processor that adjusts the magnitude of the angular velocity component, as measured by the angular velocity sensor, based on the acceleration component measured by the acceleration sensor. NXP documentation shows the NXP '395 Products contain a processor receives inputs from the angular velocity censor and the acceleration sensor.



FXOS8700CQ 6-Axis Sensor With Integrated Linear Accelerometer And Magnetometer, NXP DATASHEET at 3 (April 25, 2017) (annotation added).

75. The processor in the NXP '395 Products calculates the angle component by integrating the adjusted angular velocity component over time. The integration processor in the NXP '395 Products receives input from both the angular velocity sensor and the acceleration sensor to calculate the orientation of a vehicle in three-dimensional space.

Orientation detection

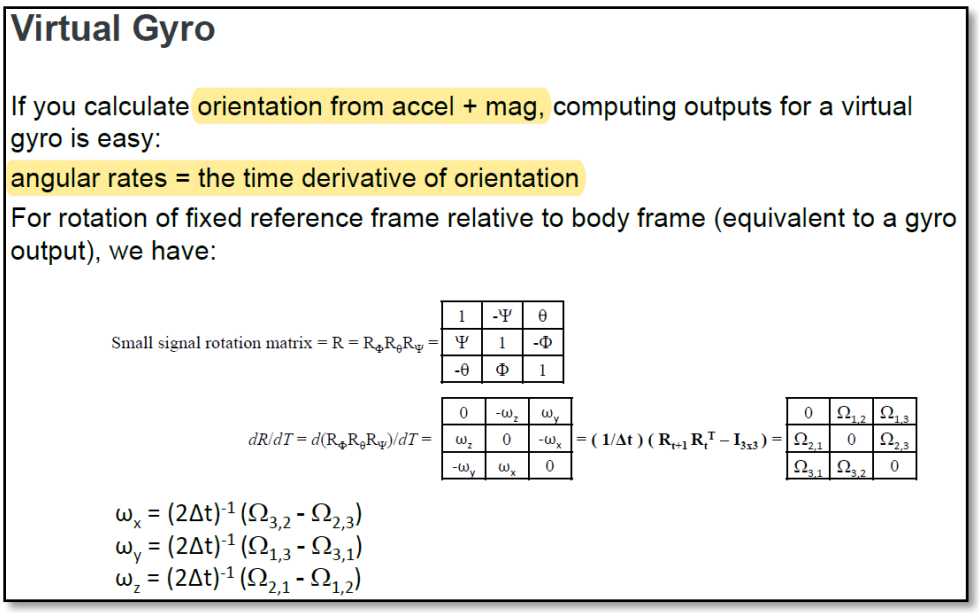
FXOS8700CQ has an embedded orientation detection algorithm with the ability to detect all six orientations. The transition angles and hysteresis are programmable, allowing for a smooth transition between portrait and landscape orientations.

The angle at which the device no longer detects the orientation change is referred to as the "Z-lockout angle". The device operates down to 29° from the flat position. All angles are accurate to ±2°.

FXOS8700CQ 6-Axis Sensor With Integrated Linear Accelerometer And Magnetometer, NXP DATASHEET at 23 (April 25, 2017) (emphasis added).

76. The processor works by integrating the angular velocity measurements over time and adjusting them based on the acceleration measurements to determine the orientation of the vehicle. The first step in this process is to adjust the magnitude of the angular velocity component measured by the angular velocity sensor based on the acceleration component measured by the

acceleration sensor. This is necessary because the angular velocity measurement is affected by the acceleration of the vehicle. For example, if the vehicle is accelerating to the left, the angular velocity measurement will be affected and needs to be adjusted to account for this.



Virtual Gyro

If you calculate orientation from accel + mag, computing outputs for a virtual gyro is easy:

angular rates = the time derivative of orientation

For rotation of fixed reference frame relative to body frame (equivalent to a gyro output), we have:

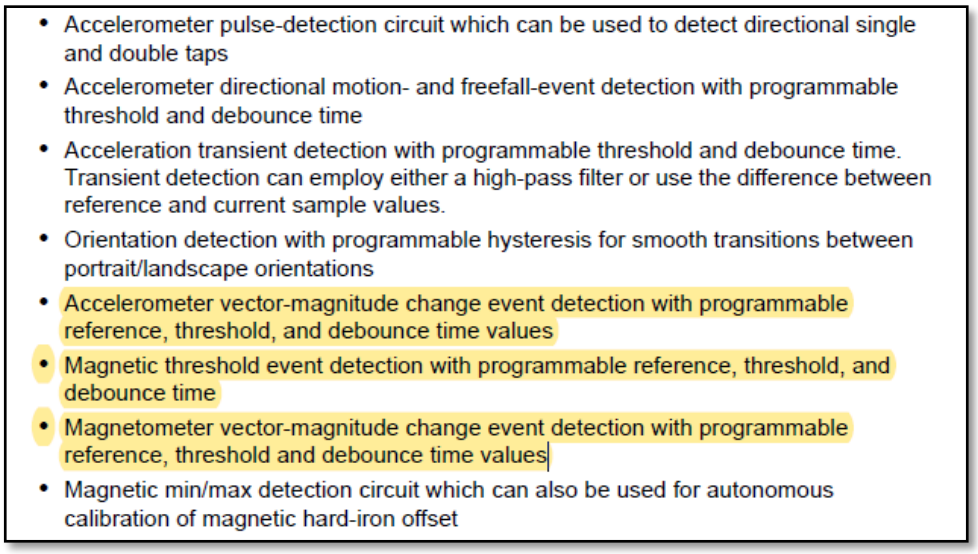
$$\text{Small signal rotation matrix} = R = R_\Phi R_\theta R_\Psi = \begin{bmatrix} 1 & -\Psi & \theta \\ \Psi & 1 & -\Phi \\ -\theta & \Phi & 1 \end{bmatrix}$$

$$dR/dT = d(R_\Phi R_\theta R_\Psi)/dT = \begin{bmatrix} 0 & -\omega_z & \omega_y \\ \omega_z & 0 & -\omega_x \\ -\omega_y & \omega_x & 0 \end{bmatrix} = (1/\Delta t)\,(R_{t+1} R_t^T - I_{3x3}) = \begin{bmatrix} 0 & \Omega_{1,2} & \Omega_{1,3} \\ \Omega_{2,1} & 0 & \Omega_{2,3} \\ \Omega_{3,1} & \Omega_{3,2} & 0 \end{bmatrix}$$

$$\omega_x = (2\Delta t)^{-1}(\Omega_{3,2} - \Omega_{2,3})$$
$$\omega_y = (2\Delta t)^{-1}(\Omega_{1,3} - \Omega_{3,1})$$
$$\omega_z = (2\Delta t)^{-1}(\Omega_{2,1} - \Omega_{1,2})$$

Michael Stanley, *Hands on Workshop: Xtrinsic Sensor Fusion on Kinetis MCUs FTF-SDS-F0178*, NXP FREESCALE PRESENTATION at 33 (April 2014) (emphasis added).

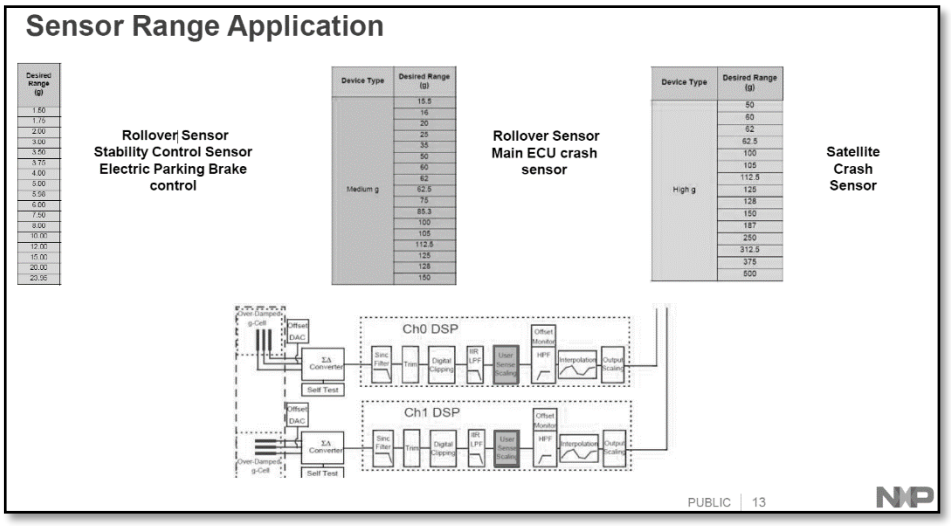
77. The NXP '395 Products contains a judging unit that evaluates whether a rollover has occurred by multiplying the angular velocity component measured by the angular velocity sensor and the angle component calculated by the integration processor using preset weighting factors. The unit outputs a signal indicating the occurrence of a rollover when the absolute value of the sum of these components multiplied by their respective weighting factors exceeds a preset *threshold.*



- Accelerometer pulse-detection circuit which can be used to detect directional single and double taps
- Accelerometer directional motion- and freefall-event detection with programmable threshold and debounce time
- Acceleration transient detection with programmable threshold and debounce time. Transient detection can employ either a high-pass filter or use the difference between reference and current sample values.
- Orientation detection with programmable hysteresis for smooth transitions between portrait/landscape orientations
- Accelerometer vector-magnitude change event detection with programmable reference, threshold, and debounce time values
- Magnetic threshold event detection with programmable reference, threshold, and debounce time
- Magnetometer vector-magnitude change event detection with programmable reference, threshold and debounce time values
- Magnetic min/max detection circuit which can also be used for autonomous calibration of magnetic hard-iron offset

FXOS8700CQ 6-Axis Sensor With Integrated Linear Accelerometer And Magnetometer, NXP DATASHEET at 20 (April 25, 2017) (emphasis added).

78. The judging unit in the NXP '395 Products is a device that uses the data from the angular velocity sensor and integration processor to determine if a rollover is occurring. The device works by multiplying the angular velocity component and angle component by preset weighting factors and then evaluating if the sum of these products exceeds a preset threshold. The angular velocity component measured by the angular velocity sensor provides information about the rate of rotation of the vehicle, while the angle component calculated by the integration processor provides information about the orientation of the vehicle in three-dimensional space. These components are multiplied by preset weighting factors, which are values assigned to each component to indicate their relative importance in determining the likelihood of a rollover.



Kishore Penmetsa, *MEMS For Automotive Safety Applications AMF-AUT-T2762,* NXP PRESENTATION at 13 (August 2017).

79. The angular velocity component may be assigned by the NXP '395 Products a higher weighting factor than the angle component, as the rate of rotation of the vehicle is a more critical factor in determining the likelihood of a rollover. The weighting factors are preset and may vary depending on the type of vehicle and other factors. Once the components have been multiplied by their respective weighting factors, the judging unit calculates the sum of these products. If the absolute value of this sum exceeds a preset threshold, the unit sends a signal indicating the occurrence of a rollover.

```
Using 3-axis model:
   float roll = thisSV_3DOF_G_BASIC.fLPPhi;
   float pitch = thisSV_3DOF_G_BASIC.fLPThe;
   float yaw = thisSV_3DOF_G_BASIC.fLPPsi;

Using 6-axis accel + mag (eCompass) model:
   float roll = thisSV_6DOF_GB_BASIC.fLPPhi;
   float pitch = thisSV_6DOF_GB_BASIC.fLPThe;
   float yaw = thisSV_6DOF_GB_BASIC.fLPPsi;

Using 6-axis accel + gyro Kalman filter model:
   float roll = thisSV_6DOF_GY_KALMAN.fPhiPl;
   float pitch = thisSV_6DOF_GY_KALMAN.fThePl;
   float yaw = thisSV_6DOF_GY_KALMAN.fPsiPl;
```

Michael Stanley, *Hands on Workshop: Xtrinsic Sensor Fusion on Kinetis MCUs FTF-SDS-F0178*, NXP FREESCALE PRESENTATION at 74 (April 2014) (emphasis added).

80. This signal generated by the NXP '395 Products can be used by various systems within the vehicle to trigger appropriate countermeasures, such as deploying airbags, adjusting the vehicle's suspension, or activating other safety features.

81. NXP has directly infringed and continues to directly infringe the '395 patent by, among other things, making, using, offering for sale, and/or selling activation apparatuses for occupant protection systems, including but not limited to the NXP '395 Products.

82. The NXP '395 Products are available to businesses and individuals throughout the United States.

83. The NXP '395 Products are provided to businesses and individuals located in the Eastern District of Texas.

84. By making, using, testing, offering for sale, and/or selling acceleration sensor units, including but not limited to the NXP '395 Products, NXP has injured Plaintiff and is liable to Plaintiff for directly infringing one or more claims of the '395 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

85. NXP also indirectly infringes the '395 patent.

86. NXP has had knowledge of the '395 patent since at least service of this Complaint or shortly thereafter, and NXP knew of the '395 patent and knew of its infringement, including by way of this lawsuit.

87. NXP indirectly infringes the '395 patent by actively inducing infringement under 35 U.S.C. § 271(b).

88. NXP intended to induce patent infringement by third-party customers and users of the NXP '395 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. NXP specifically

intended and was aware that the normal and customary use of the accused products would infringe the '395 patent. NXP performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '395 patent and with the knowledge that the induced acts would constitute infringement. For example, NXP provides the NXP '395 Products that have the capability of operating in a manner that infringe one or more of the claims of the '395 patent, including at least claim 1, and NXP further provides documentation and training materials that cause customers and end users of the NXP '395 Products to utilize the products in a manner that directly infringe one or more claims of the '395 patent.[12] By providing instruction and training to customers and end-users on how to use the NXP '395 Products in a manner that directly infringes one or more claims of the '395 patent, including at least claim 1, NXP specifically intended to induce infringement of the '395 patent. NXP engaged in such inducement to promote the sales of the NXP '395 Products, e.g., through NXP user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '395 patent. Accordingly, NXP has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '395 patent, knowing that such use constitutes infringement of the '395 patent.

89. NXP indirectly infringes the '395 patent by contributing to the infringement by its customers and end users under 35 U.S.C. § 271(c) by making, using, importing, selling, or offering

[12] Michael Kelsey, *Session #AMF-IND-T3669 – Motion, Pressure and Magnetic Sensors for Automotive and IoT Applications*, NXP PRESENTATION (June 2019); *Using the Xtrinsic FXOS8700CQ Accelerometer and Magnetometer Vector-Magnitude Function*, NXP APPLICATION NOTE AN4458 (June 2012); Marc Holbein, *AMF-CON-T0225 Xtrinsic Sensing Introduction*, NXP-FREESCALE PRESENTATION (October 2013); *FXOS8700CQ 6-Axis Sensor With Integrated Linear Accelerometer And Magnetometer,* NXP DATASHEET (April 25, 2017); Michael Stanley, *Hands on Workshop: Xtrinsic Sensor Fusion on Kinetis MCUs FTF-SDS-F0178*, NXP FREESCALE PRESENTATION (April 2014); and Kishore Penmetsa, *MEMS For Automotive Safety Applications AMF-AUT-T2762,* NXP PRESENTATION (August 2017).

to sell within the United States the NXP '395 Products, which incorporate or constitute a material part of the inventions claimed by the '395 patent. NXP does so knowing that these products are especially made or especially adapted for uses that infringe the '395 patent, and not staple articles or commodities of commerce suitable for substantial non-infringing use.

90. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '395 patent.

91. As a result of NXP's infringement of the '395 patent, Plaintiff has suffered monetary damages, and seek recovery in an amount adequate to compensate for NXP's infringement, but in no event less than a reasonable royalty for the use made of the invention by NXP together with interest and costs as fixed by the Court.

COUNT III
INFRINGEMENT OF U.S. PATENT NO. 9,340,188

92. Plaintiff references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

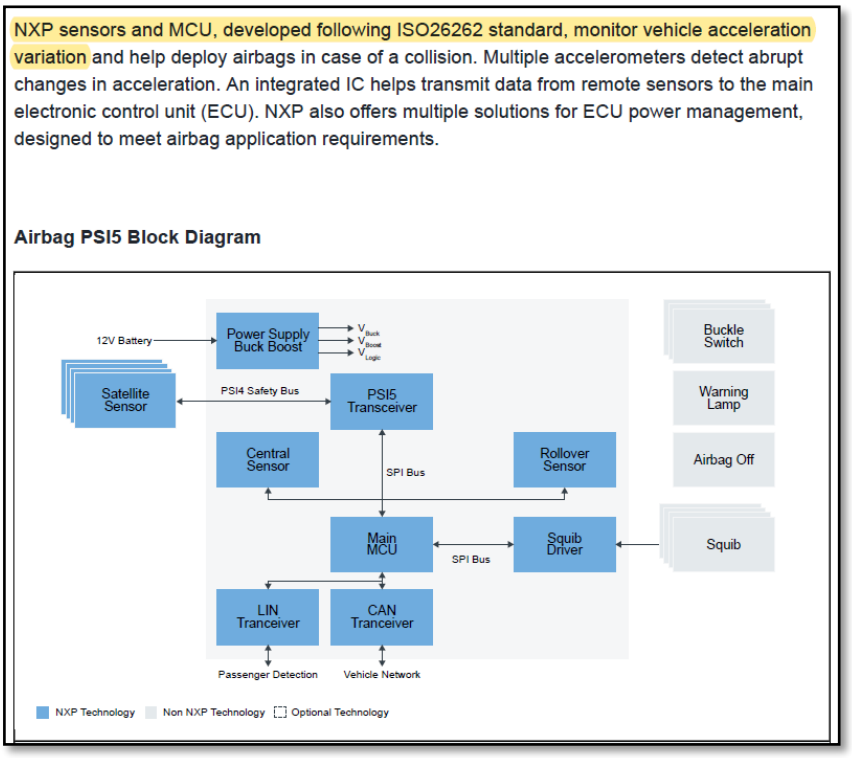
93. NXP designs, makes, uses, sells, and/or offers for sale in the United States occupant protective apparatuses.

94. NXP designs, makes, sells, offers to sell, imports, and/or uses the NXP Airbag System including the MC33789 Airbag System Basis Chip and inertial sensors (including the following inertial sensors: MMA51xxKW series, MMA52xxKW series, MMA68xx series, FXLS90xxx series, FXLS93xxx series, MMA8xxxKEG series, and MMA69xxKQ series) (collectively, the "'NXP '188 Products").

95. One or more NXP subsidiaries and/or affiliates use the NXP '188 Products in regular business operations.

96. One or more of the NXP '188 Products include an occupant protective apparatus including a sensor that detects a behavior of a vehicle and generates a sensor output.

97. The NXP '188 Products consist of a device that identifies a vehicle's actions and produces a corresponding output signal. Specifically, the NXP '188 Products are designed to monitor specific actions or behaviors of a vehicle. Once the NXP '188 Product sensor has detected a behavior, it generates a sensor output, which can include an electrical signal that is sent to a control unit. The below is an excerpt from documentation regarding the NXP '188 Products:



NXP Airbag and Crash Detection Document, NXP DOCUMENTATION at 1 (December 16, 2022) (emphasis added).

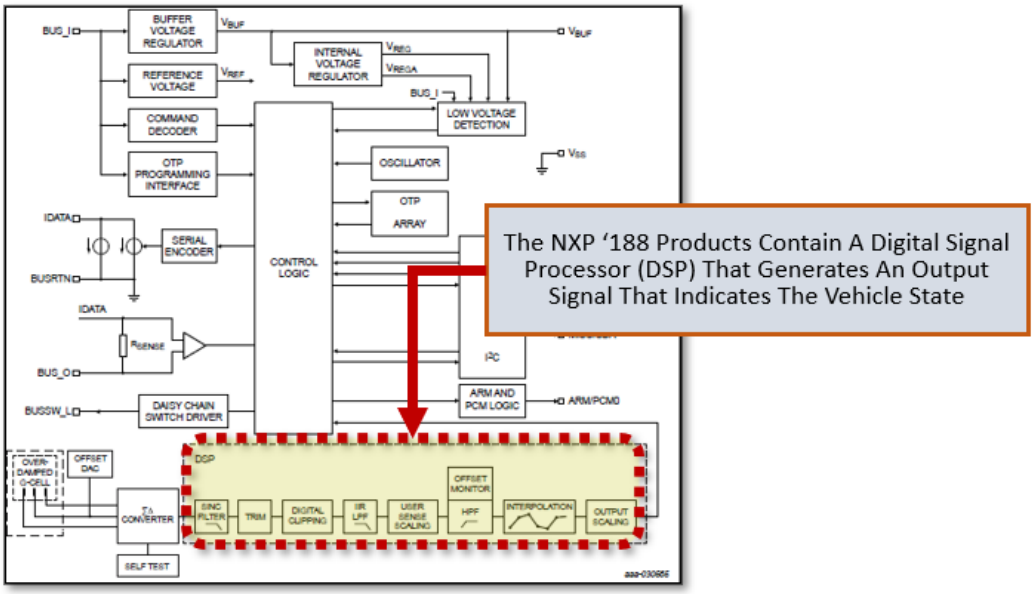
98. The NXP '188 Products comprise a diagnostic device that sends a pulsed autonomous signal to the sensor and performs self-evaluation of the sensor by comparing its output signal, triggered by the autonomous signal, against predetermined upper and lower acceptable limits for the output signal, set within the integration processor.

99. The NXP ‘188 Products are an occupant protection system that includes a diagnoser that provides a self-driving signal in pulses to the sensor and performs a self-diagnosis of the sensor by comparing the output signal from the integration processor with preset upper and lower limits. This comparison is made in response to the pulsed self-driving signal, allowing the diagnoser to determine if the sensor is functioning correctly.

100. The NXP ‘188 Products include a diagnoser, which is a component that verifies the proper operation of the sensor within the system. The diagnoser provides a pulsed self-driving signal to the sensor, which is a signal that simulates the movement or motion that the sensor would detect during a normal operation. The sensor processes this self-driving signal and generates an output signal that is transmitted to the integration processor.

101. The integration processor in the NXP ‘188 Products takes the output signal from the sensor and integrates it over time to calculate the motion or movement of the occupant or the vehicle. The diagnoser then compares the output signal from the integration processor with upper and lower permissible limits, which are pre-set based on the system's specifications. If the output signal falls within these limits, the diagnoser confirms that the sensor is operating correctly. If the output signal falls outside of these limits, the diagnoser identifies a problem with the sensor's performance and triggers a diagnostic or alert to inform the system's user.

102. The NXP ‘188 Products comprise a processor that produces an output signal reflecting the vehicle's condition by integrating physical measurements derived from the sensor output, while minimizing the impact of extraneous external forces, specifically vibration. Specifically, the NXP ‘188 Products contain a digital signal processor.



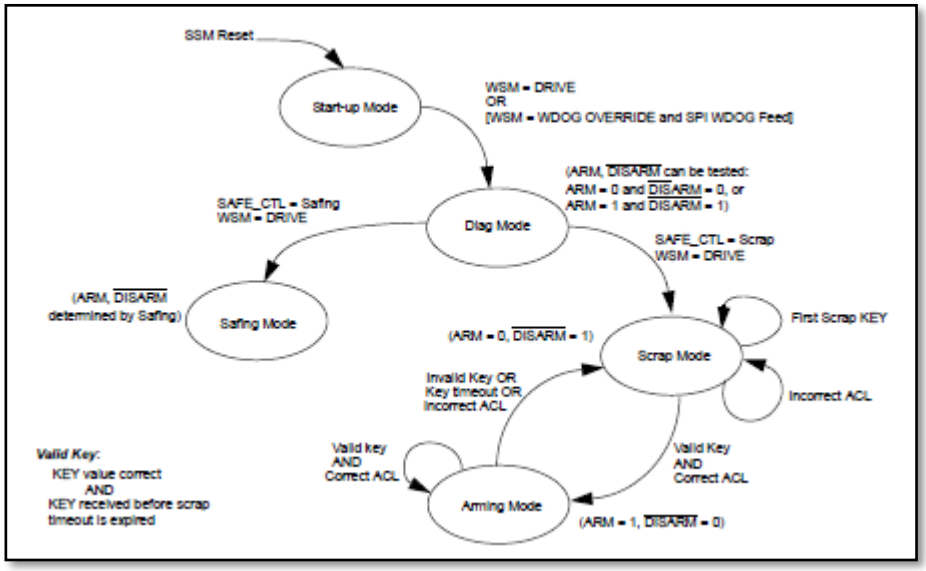
FXLS9xxx0 Single Channel Inertial Sensor Datasheet Rev. 6, NXP DOCUMENTATION at 9 (February 8, 2021) (annotation added).

103. One or more of the NXP '188 Products include an occupant protective apparatus including an integration processor that generates an output signal indicating a state of the vehicle by integrating physical quantity based on the sensor output and thereby reducing an effect of an unnecessary external force which is a vibration component.

104. One or more of the NXP '188 Products include an occupant protective apparatus including a diagnose that supplies the sensor with a pulsed self-driving signal and carries out self-diagnosis of the sensor by comparing the output signal from the integration processor in response to the pulsed self-driving signal with upper and lower permissible limits preset for the output signal.

105. The Safing State Machine (SSM) is used to control the safing function and provide diagnostics. The control logic of the MC33789 Safing State Machine in the NXP '188 Products provides a high level of robustness to the system architecture by restricting the primary safing function while diagnostics are performed. It facilitates key-on and run-time diagnostic tests. It also

provides a means of activating safing for the scrap function, which would be useful to safely activate the Arming outputs for disposal of pyrotechnic devices at the end of vehicle life.

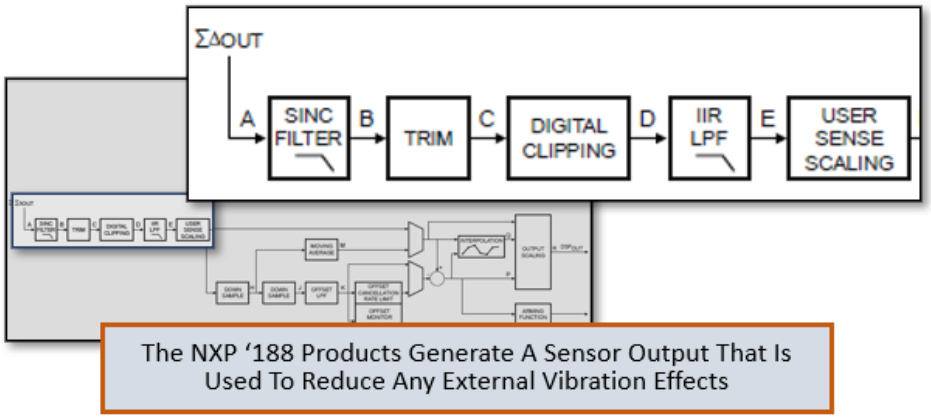


NXP Freescale MC33789 Data Sheet Rev. 4.0, NXP DOCUMENTATION at 75 (2012).

106. By performing self-diagnosis of the sensor in this manner, the NXP '188 Products can ensure that the sensor is functioning correctly and provide reliable occupant protection. This diagnostic process allows the system to detect any malfunctions in the sensor and take corrective action before an accident or emergency occurs.

107. One or more of the NXP '188 Products include an occupant protective apparatus including a decision maker that makes a decision as to necessity for ignition of the occupant protective apparatus by comparing the sensor output to a threshold, said decision maker receiving a result of the self-diagnosis from the diagnose via a first path, said sensor output being transmitted from said sensor to said decision maker via a second path that includes neither said integration processor nor said diagnoser.

108. The digital signal process contained in the NXP '188 Products is used to perform signal filtering and compensation. The below diagram shows the specific steps conducted by the DSP in one of the NXP '188 Products.



FXLS9xxx0 Single Channel Inertial Sensor Datasheet Rev. 6, NXP DOCUMENTATION at 113 (February 8, 2021) (annotation added).

109. The NXP '188 Products comprise a controller that determines whether to activate the occupant protection system by comparing the sensor's output to a specified threshold. The controller receives the diagnostic result from the diagnoser via one path, while receiving the sensor output directly from the sensor via another path that excludes both the integration processor and the diagnose.

110. NXP has directly infringed and continues to directly infringe the '188 patent by, among other things, making, using, offering for sale, and/or selling occupant protective apparatuses, including but not limited to the NXP '188 Products.

111. The NXP '188 Products are available to businesses and individuals throughout the United States.

112. The NXP '188 Products are provided to businesses and individuals located in the Eastern District of Texas.

113. By making, using, testing, offering for sale, and/or selling acceleration sensor units, including but not limited to the NXP '188 Products, NXP has injured Plaintiff and is liable to Plaintiff for directly infringing one or more claims of the '188 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

114. NXP also indirectly infringes the '188 patent.

115. NXP has had knowledge of the '188 patent since at least service of this Complaint or shortly thereafter, and NXP knew of the '188 patent and knew of its infringement, including by way of this lawsuit.

116. NXP indirectly infringes the '188 patent by actively inducing infringement under 35 U.S.C. § 271(b).

117. NXP intended to induce patent infringement by third-party customers and users of the NXP '188 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. NXP specifically intended and was aware that the normal and customary use of the accused products would infringe the '188 patent. NXP performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '188 patent and with the knowledge that the induced acts would constitute infringement. For example, NXP provides the NXP '188 Products that have the capability of operating in a manner that infringe one or more of the claims of the '188 patent, including at least claim 1, and NXP further provides documentation and training materials that cause customers and end users of the NXP '188 Products to utilize the products in a manner that directly infringe one or more claims of the '188 patent.[13] By providing instruction and training to

[13] David Lopez, *Analog Mixed Signal and Power Products for Automotive FTF-AUT-F0556*. NXP PRESENTATION (June 2010); *NXP Freescale User's Guide RDAIRBAGPSI5 Airbag Reference Platform Rev. 2.0*, NXP DOCUMENTATION (October 2014); *NXP Freescale Airbag Reference*

customers and end-users on how to use the NXP '188 Products in a manner that directly infringes one or more claims of the '188 patent, including at least claim 1, NXP specifically intended to induce infringement of the '188 patent. NXP engaged in such inducement to promote the sales of the NXP '188 Products, e.g., through NXP user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '188 patent. Accordingly, NXP has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '188 patent, knowing that such use constitutes infringement of the '188 patent.

118. NXP indirectly infringes the '188 patent by contributing to the infringement by its customers and end users under 35 U.S.C. § 271(c) by making, using, importing, selling, or offering to sell within the United States the NXP '188 Products, which incorporate or constitute a material part of the inventions claimed by the '188 patent. NXP does so knowing that these products are especially made or especially adapted for uses that infringe the '188 patent, and not staple articles or commodities of commerce suitable for substantial non-infringing use.

119. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '188 patent.

Demonstrator Reference Manual Rev. 3.0, NXP DOCUMENTATION (April 2012); *Airbag Evaluation Platform Fact Sheet Document Number: AEPFS REV 2*, NXP DOCUMENTATION (2015); *NXP Freescale White Paper: Addressing the Challenges of Functional Safety in the Automotive and Industrial Markets*, NXP Documentation (2013); *NXP Freescale MC33789 Fact Sheet Document Number: MC33789FS, Rev. 3.0*, NXP DOCUMENTATION (2012); *NXP MC33789 Data Sheet Rev, 4.0*, NXP DOCUMENTATION (September 2014); *MMA51xxKW Inertial Sensor Data Sheet Rev. 11*, NXP DOCUMENTATION (August 2012); *MMA52xxKW Inertial Sensor Data Sheet Rev. 11*, NXP DOCUMENTATION (August 2012); *NXP Freescale MC33789 Data Sheet Rev. 4.0,* NXP DOCUMENTATION (2012); and *FXLS9xxx0 Single Channel Inertial Sensor Datasheet Rev. 6*, NXP DOCUMENTATION (February 8, 2021) .

120. As a result of NXP's infringement of the '188 patent, Plaintiff has suffered monetary damages, and seek recovery in an amount adequate to compensate for NXP's infringement, but in no event less than a reasonable royalty for the use made of the invention by NXP together with interest and costs as fixed by the Court.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff NexGen Control Systems, LLC respectfully requests that this Court enter:

A. A judgment in favor of Plaintiff that NXP has infringed, either literally and/or under the doctrine of equivalents, the '386, '395, and '188 patents;

B. An award of damages resulting from NXP's acts of infringement in accordance with 35 U.S.C. § 284;

C. A judgment and order finding that NXP's infringement was willful, wanton, malicious, bad-faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate within the meaning of 35 U.S.C. § 284 and awarding to Plaintiff enhanced damages.

D. A judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding to Plaintiff its reasonable attorneys' fees against NXP.

E. Any and all other relief to which Plaintiff may show itself to be entitled.

JURY TRIAL DEMANDED

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Plaintiff NexGen Control Systems, LLC requests a trial by jury of any issues so triable by right.

Dated: March 9, 2023

Respectfully submitted,

/s/ *Daniel P. Hipskind*

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