

Capacitive Fingerprint Sensors

TMDR92 (AuthenTec-Apple), FPC1020 (Fingerprint Cards), VAL004A8-T (Synaptics) and B1202A0-01 (Synaptics)

Who risk to be deprived of its imprint in future infringement lawsuits?

REPORT OUTLINE

- Technology and patent infringement risk analysis of fingerprint sensors TMDR92 (AuthenTec), FPC1020 (Fingerprint Cards), VAL004A8-T (Synaptics) and B1202A0-01 (Synaptics)
- November 2015
- PDF (110+ slides) & Excel file
- €5,990 (corporate license)

KEY FEATURES OF THE REPORT

- Deep insight on technology data and manufacturing processes
- Comparative studies of product features (similarities & differences)
- Key patents related to the target product features per company
- Cross analysis of potential patent infringement risks
- Excel database with all patents analyzed in the report

OBJECTIVE OF THE REPORT

- Find the technical and manufacturing process similarities and differences of TMDR92, FPC1020, VAL004A8-T and B1202A0-01 fingerprint sensors
- Identify key patents held by AuthenTec-Apple, Fingerprint Cards, Synaptics-Validity, and related to the target product features
- Find the link between patented technological solutions and marketed products
- Discover the potential infringing parties and help to find evidence of use
- Understand potential risks of patent infringement and identify the patents which require a more in depth legal assessment

RELATED REPORTS

Patent Landscape:

- [Capacitive Fingerprint Sensors 2015](#)

Tear down:

- [Apple iPhone 5S Fingerprint Sensor](#)
- [Samsung Galaxy S6 Fingerprint Sensor](#)
- [Huawei Ascend Mate 7 Fingerprint Sensor](#)

WILL APPLE AND SAMSUNG CONFRONT EACH OTHER ON THE FINGERPRINT SENSOR FIELD?

Fingerprint sensors using capacitive technology represent a fast growing market, especially in smartphones. The fingerprint sensor vendor IDEX forecasts an increase of 360% of the number of fingerprint sensor units in mobile devices and of the fingerprint sensor market between 2014 and 2017 (source : N+1 Singer, IDEX, 2014). A new generation of capacitive fingerprint sensors has emerged in the last few years and have been incorporated in the last generations of smartphones of companies like **Apple**, **Samsung** or **Huawei**. The market growth for fingerprint sensors is also supported by a new phase of IP development, revealed by an increase in the number of new patents related to capacitive fingerprint sensor published since 2012 (source: Knowmade, 'Capacitive Fingerprint Sensors Patent Landscape', 2015).

Fingerprint sensors are greatly appreciated by smartphone's users. Indeed, such biometric authentication mode is easier and quicker than a password to access the device. It also allows to give selected access to applications for each user of the device. Thus the fingerprint sensor needs to be trustworthy.

In a patent infringement action, the potential sales volume plays a major role for assessing the damage award. Thereby, this study is naturally focused on the fingerprint sensor components designed by 3 leaders of fingerprint sensing solutions and integrated in the devices of 3 major smartphone vendors : **TMDR92 (AuthenTec, Apple iPhone 5S)**, **FPC1020 (Fingerprint Cards, Huawei Ascend Mate 7)**, **VAL004A8-T (Synaptics-Validity, Samsung Galaxy S5)** and **B1202A0-01 (Synaptics-Validity, Samsung Galaxy S6)**.

Fingerprint Sensor Packaging

Product A Company X	• Capacitive window • Glassine substrate • Bonding the sensor to a rigid PCB • Glassine sheet under	 Product A (AuthenTec) – cross section
Product B Company Y	• Low Package and encapsulation molding • Aluminum ring • Glassine substrate • Bonding the sensor to a rigid PCB and conduct to a Flex PCB substrate wire • Protection elastomer	 Product B (Fingerprint Cards) – cross section
Product C Company Z	• Plastic cover and Aluminum ring • Bonding the sensor to the ASIC display support pillars and to the Flex PCB by solder balls • ASIC die supporting the Flex PCB • Glassine sheet under	 Product C (Synaptics) – cross section
Product D Company Z	• Plastic cover and Aluminum ring • Bonding the sensor to the ASIC display support pillars and to the bottom PCB by solder balls • ASIC die supporting the assembly of rigid and flex PCB • Aluminum plate	 Product D (Synaptics) – cross section

Knowmade, System Plus 2015

Those 4 fingerprint sensors represent different technological choices but sharing common characteristics. Thus, combining the data obtained by the tear down of each sensor performed by System Plus Consulting with the IP analysis of Knowmade, this report highlights the IP behind each fingerprint sensor and analyzes the risk of patent infringement between **AuthenTec-Apple**, **Fingerprint Cards** and **Synaptics-Validity**. It appears that main risks concern the packaging and the integration of the fingerprint sensor in the device.

A LINK BETWEEN PRODUCTS AND PATENTS

Key patents held by **AuthenTec-Apple, Fingerprint Cards,** and **Synaptics-Validity** related to these technology features have been identified. For each product feature, the links between the patented technologies and the target product have been established.

[illegible]

ASSESSMENT OF PATENT INFRINGEMENT RISK

[illegible]

AN USEFUL PATENT DATABASE

- Patent publication number
- Hyperlinks to the original documents
- Priority date
- Title
- Abstract
- Applicants
- Legal status for each patent

Patent Database

A	B	C	D	E	F	G	H
FAMILY NUMBER	PATENT NUMBER	PATENT ASSIGNEE	PRIORITY DATE	TITLE	PDF	ABSTRACT	LEGAL STATUS
			PRIORITY DATE				ACTUAL OR EXPECTED EXPIRATION DATE
6813760A	AU20101000000	METRO ENGINEERING I	2000-12-05	Seioped apparatus for measuring	Open	A fingerprint sensing system	LEGAL DETAILS FOR AU 2007-06-18
6813761A	WO2011024020	VALIDITY	2000-12-05	Seioped apparatus for measuring	Open	A fingerprint sensing system	LEGAL DETAILS FOR WO 2011-12-05
6813762A	EP201000000	VALIDITY SENSORS	2000-12-05	Seioped apparatus for measuring	Open	A fingerprint sensing system	LEGAL DETAILS FOR EP 2011-12-05
6813763A	AT201000000	VALIDITY SENSORS	2000-12-05	System and method for	Open	A fingerprint sensing system	LEGAL DETAILS FOR AT 2006-04-15
6813764A	HU201000000	VALIDITY SENSORS	2000-12-05	Seioped apparatus for measuring	Open	A fingerprint sensing system	LEGAL DETAILS FOR HU 2011-12-05
6813765A	DE201000000	VALIDITY SENSORS	2000-12-05	System and method for	Open	A fingerprint sensing system	LEGAL DETAILS FOR DE 2012-10-11
6813766A	US201000000	DYNAMICS	2000-12-05	Seioped apparatus for measuring	Open	A fingerprint sensing system	LEGAL DETAILS FOR US 2011-12-05
6813767A	US201000000	VALIDITY	2000-12-05	Seioped apparatus for measuring	Open	A fingerprint sensing system	LEGAL DETAILS FOR US 2011-12-05
6813768A	US201000000	VALIDITY SENSORS	2000-12-05	Capacitive touch of a device	Open	A fingerprint sensing system	LEGAL DETAILS FOR HU 2011-12-05
6813769A	DE201000000	VALIDITY SENSORS	2000-12-05	Kapacitance	Open	A fingerprint sensing system	LEGAL DETAILS FOR DE 2012-12-05
7070876A	WO201000000	FINGERPRINT CARDS	2014-02-21	Method of manufacturing a card	Open	The present invention relates to a	LEGAL DETAILS FOR WO 2005-02-18
7070877A	US201000000	FINGERPRINT CARDS	2014-02-21	Method of manufacturing a card	Open	The present invention relates to a	LEGAL DETAILS FOR US 2014-02-02
4378109A	US1100000	APPLE	1997-09-11	Electronic device for a user	Open	A planar fingerprint pattern	LEGAL DETAILS FOR US 2017-09-11
1392102A	US1100000	APPLE	2001-05-07	Fingerprint device for a user	Open	A fingerprint pattern having a	LEGAL DETAILS FOR US 2011-05-07
1392103A	US1100000	UPKX	2001-05-07	Fingerprint device for a user	Open	A fingerprint detector having a	LEGAL DETAILS FOR EP 2012-05-03
1392104A	DE1000000	UPKX	2001-05-07	Fingerprint device for a user	Open	A fingerprint detector having a	LEGAL DETAILS FOR DE 2011-05-03
1392105A	JP200000000	ST MICROELECTRONICS	2001-05-07	The hardware structure of a	Open	PROBLEM TO BE SOLVED TO	LEGAL DETAILS FOR JP 2012-02-18
1392106A	US1100000	APPLE	1999-05-11	Fingerprint device for a user	Open	A fingerprint sensor package	LEGAL DETAILS FOR US 2010-05-09
1392107A	US1100000	APPLE	1999-05-11	Fingerprint device for a user	Open	A fingerprint sensor includes a	LEGAL DETAILS FOR US 2017-07-02
1400000A	EP1000000	APPLE	1997-07-02	Solid state fingerprint sensor	Open	A planar, capacitive-type,	LEGAL DETAILS FOR EP 2018-06-30
1400001A	EP1000000	ST MICROELECTRONICS	1997-07-02	Solid state fingerprint sensor	Open	A planar, capacitive-type,	LEGAL DETAILS FOR DE 2012-01-03
1400002A	DE1000000	ST MICROELECTRONICS	1997-07-02	Gerat und Verfahren zur	Open	A planar, capacitive-type,	LEGAL DETAILS FOR JP 2011-08-15
7007100A	JP1000000	ST MICROELECTRONICS	1997-07-02	Solid-state fingerprint sensor	Open	PROBLEM TO BE SOLVED TO	LEGAL DETAILS FOR US 2008-10-09
6899999A	US201000000	DYNAMICS	2010-12-14	Biometric sensor and method	Open	A method for providing a	LEGAL DETAILS FOR US 2018-09-10
6899998A	US201000000	DYNAMICS	2013-10-01	Computer interface button with	Open	A biometric sensor and button	LEGAL DETAILS FOR US 2018-09-29
6899997A	WO201000000	DYNAMICS	2010-10-01	Computer interface button with	Open	A biometric sensor and button	LEGAL DETAILS FOR WO 2010-09-29

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ABOUT KNOWMADE

Headquartered in Sophia Antipolis, France, **Knowmade** is a Technology Intelligence and IP Strategy consulting company. We provide Patent Search, Patent Analysis, Patent Valuation, IP Landscape, Scientific Literature Landscape, Technology Scouting, Technology Transfer and Technology Tracking. Our service offer consists of custom studies, on-demand tracking, analysis reports and strategy consulting. We combine information search services, scientific expertise, powerful analytics and visualization tools, and proprietary methodologies for analyzing patents and scientific information. With a solid focus on Microelectronics, Compound Semiconductors, LED, MEMS, Nanotechnology and Biotechnology, **Knowmade** supports research laboratories, industrial companies and investors in their business development. <http://www.knowmade.fr>

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I hereby accept Knowmade's Terms and Conditions of Sale

TERMS AND CONDITIONS OF SALES

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