

Reverse Costing® CATALOGUE

LED

IC

MEMS

IMAGING

PACKAGING

SYSTEM

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REVERSE COSTING®

A complete set of information to understand the technology and cost of the electronic devices on the market. System Plus Consulting Reverse Costing® reports are based on in-house developed methodology and costing tools which ensure their single format. The full collection is regularly updated on our website. These reports can be ordered individually or under our Annual Subscription.

IC & RF

Ref.	Date Pages	Manufacturer Product	Type of Product	Overview
RF IC				
SP18394	2018/4 85	Texas Instruments AWR1642	AWR1642 77 & 79 GHz RFCMOS Radar Chipset <small>from TI</small>	Single-chip radar (76 - 81 GHz) in an SoC device featuring MCU and DSP
SP18389	2018/4 600	Various RF Front-End Module	RF Front-End Modules Comparison 2018	Description of each component and statistical analyses for most front-end modules.
SP18379	2018/2 160	Broadcom AFEM-8072	Broadcom AFEM-8072	Analysis of the full FEM SiP, including the RF IC and its IPDs, the filtering dies and the internal and external EMI shielding.
SP17364	2017/11 140	Various	RF SiPs	Description of each component and important data, including type of substrate, proportion of silicon in the module and line spacing.
SP17328	2017/12 300	Various RF IPD	RF Integrated Passive Devices	Description of each component, its major characteristics (substrate type (GaAs, silicon, glass), passivation layers, passive integration, etc.) and a comparison of all devices.
SP17327	2017/5 122	Taiyo Yuden	SAW and BAW Band 7 Duplexer	Taiyo Yuden's Well-Proven Metal Seal Packaging and SAW/BAW technology in LTE Band 7 high isolation duplexer used in Skyworks' PAMiD
SP16283	2016/8 93	Murata FAJ15	SAW filter	The Samsung Galaxy S7 smartphone is the latest one to integrate Murata's front-end module with the FAJ15, featuring Murata's thermo-compensated technology
SP16274	2016/6 112	Avago AFEM9040	FBAR-BAW	Avago has introduced a new generation of film bulk acoustic resonator (FBAR-BAW) technology in the Samsung Galaxy S7
SP16263	2016/3 126	Freescale NXP MR2001	Radar Rx/Tx/VCO Fan- Out RCP Chipset	The new 77 GHz Radar Chipset for ADAS from NXP/Freescale. SiGe:C xHBT technology & Fan-Out RCP Wafer-Level Packaging.
SP16254	2016/3 86	Qorvo TQF6405	SMR BAW High Band Filter	Apple integrates in its smartphone the innovative solid mounted resonators developed by Qorvo
SP15235	2015/10 104	Infineon RRN7745P-RTN7735P	Radar Receiver & Transmitter	New 77GHz Receiver & Transmitter components with a SiGe: CHBT technology from Infineon and eWLB Fan Out Package.
SP15220	2015/6 106	Cavendish Kinetics 32CK417R	MEMS Antenna Tuner	Cavendish Kinetics's extra small (only 2mm2) and very low insertion loss Antenna tuner using MEMS technology.
INTEGRATED CIRCUIT				
SP17341	2017/5 76	Adesto RM24C512C	CBRAM memory	Ultra-low power, ultra-fast memory die designed for the Internet-of-Things & Wearables
SP17335	2017/8 146	Various Bipolar-CMOS-DMOS	BCD Technology & Cost review	Details on the manufacturing process and materials used, estimation of the cost structure highlighting the influence of the technological innovations.
SP16285	2016/10 60	Texas Instruments Jacinto DRA726	Infotainment IC	Cost-optimized in-vehicle infotainment for entry- to mid-level automobile segments.
SP16270	2016/5 60	Broadcom BCM89501	Ethernet Switch	The BCM89501 uses Broadcom's high-performance BroadR-Reach Ethernet technology to deliver 100Mbps over unshielded single-twisted pair cable.

Ref.	Date Pages	Manufacturer Product	Type of Product	Overview
VISIBLE				
SP18387	2018/3 100	ams Color Sensor	ams'sColor Sensor in the Apple iPhone 8	Full analysis of the package and sensor die, cost analysis and price estimate for the device. Comparison with the ams TCS3400.
SP17377	2017/12 99	ams Apple iPhone X	Multi-Spectral Sensor	Analysis of the complete multi-spectral ALS, from the sensor die to the custom packaging developed for the device. Complete cost analysis and a price estimate for the device
SP17348	2017/11 350	Various	Camera Module	Explanation of the main players' technology choices and comparison between competitors.
SP17338	2017/8 122	Samsung Galaxy S8	Iris Scanner	Description of the supply chain of the full system including the IR camera module, CIS and infrared LED. Comparison with the Fujitsu iris.
SP17334	2017/6 94	NanoLambda NSP32-V1	NanoLambda NSP32-V1 Nano Spectrometer	First plasmonic filter sensor for consumer devices could disrupt optical applications
SP17326	2017/3 113	STMicroelectronics iPhone7	Time of Flight Proximity Sensor	A look inside Single Photon Avalanche Diode (SPAD) Technology from STMicroelectronics entering the High-End Apple Handset
SP17304	2017/3 165	Consumer Physics Scio	Spectrometer	World's first pocket size Molecular sensor that can be integrated into consumer smartphones
SP16293	2016/11 145	Apple iPhone 7 Plus	MEMS Microphone	In the iPhone 7 Plus, Apple introduced a dual rear camera module. The module features two sensors, one with a totally new structure.
SP16278	2016/7 145	Huawei p9	Dual Camera Module	The P9 camera module is equipped with two sub-modules each including a Sony CIS, a closed loop voice coil motor (VCM) and a 6-element lens.
SP16266	2016/5 130	Samsung Galaxy S7 Edge	Rear Camera	The Samsung Galaxy S7 camera module integrates a 12Mpixel resolution CMOS image sensor with a pixel size of 1.4µm and an aperture of f/1.7.
INFRARED				
SP18383	2018/1 172	ST ty Sensor & Flood Illum	ST TOF Proximity Sensor & Flood Illuminator in iPhone X	Complete analysis of the microsystem, from the two illumination devices (VCSEL) to the collector (based on the SPAD developed by STMicroelectronics).
SP17378	2017/12 97	STMicroelectronics Apple iPhone X	Camera Sensor	Analysis of the complete NIR camera sensor (module and the sensor die) and cost analysis and a price estimate of the device.
SP17376	2017/12 150	Apple iPhone X	Infrared Dot Projector	Description of the full system's technology and manufacturing process, including the package, VCSEL, electronics, the folded optic and the DOE.
SP17349	2017/9 170	Boson Flir Boson Camera	FLIR Boson Camera and 12µm microbolometer	Detailed teardown and cost analysis of the microbolometer, lens and WLP. bill-of-material (BOM) of the camera core, and manufacturing cost of the infrared camera.
SP17337	2017/7 79	Texas Instrument	Time of Flight Image Sensor	A look into Texas Instruments' system-on-chip, including Sony/Softkinetic's time-of-flight pixel technology, for industrial applications
SP17336	2017/7 80	Melexis MLX75023	ToF imager	A cutting-edge ToF imager technology from Sony/Softkinetic, adapted by Melexis for automotive in-cabin applications
SP17330	2017/6 203	Autoliv ISC0901	Night Vision Automotive Camera	Autoliv's 3rd Generation Automotive Night Vision Camera with FLIR's ISC0901 Microbolometer
SP17305	2017/1 170	Lenovo	3D Time of Flight (ToF) Camera	World's first 3D tri-camera bundle including Infineon/pmd REAL3TM ToF image sensor integrated into a consumer smartphone
SP16264	2016/8 170	i3system Thermal Expert	IR camera and microbolometer	Based on a high definition microbolometer from I3system (I3BOL384_17A), the Thermal Expert infrared camera is a high-end product for smartphones.
SP16244	2016/2 260	FLIR One 2G & Lepton 3	Infrared Camera & IR sensor	Second Generation FLIR ONE for Android and iOS Platforms Featuring a Completely New LEPTON Core with 160x120 Pixels Resolution and 12µm Pixel Size
SP15221	2015/7 166	Opgal Therm-App	Infrared Camera	The highest resolution thermal camera for smartphone, 384x 288 pixels, using a microbolometer with 17 µm pixel from Ulis, compatible with Android 4.1 and up.
SP15201	2015/1 166	Seek Thermal - Raytheon EXC001	Seek Thermal Infrared Camera & Raytheon IR Microbolometer	The highest resolution thermal camera for smartphone, 156 x 206 pixels, using a microbolometer with 12 µm pixel from Raytheon, compatible with Android and IOS

LED

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WHITE/BLUE LED				
SP17317	2017/3 70	Samsung LM101A	Chip Scale Package LED	The first Samsung Chip Scale Package LED is developed according to technical choices to reduce the manufacturing cost.
SP15224	2015/6 107	Toshiba TL1L4	GaN on Silicon LED	Third generation GaN on Silicon LED by Toshiba: new architecture without top electrode to increase the light extraction and a ceramic package with sintering.
UV LED				
SP16273	2016/6 170	SETi UVTOP270TO39HS	UV LED	The UVTOP270TO39HS and SS35DF227513 are two 275nm UVC LEDs from Sensor Electronic Technology Inc. (SETi).
SP16272	2016/6 115	Crystal IS OPTAN280K-BL	UV LED	The OPTAN280K-BL and OPTAN-265N-SMD are two UVC LEDs, of 280nm and 265nm respectively, from Crystal IS.

MEMS & SENSOR

Ref.	Date Pages	Manufacturer Product	Type of Product	Overview
PRESSURE SENSOR				
SP17358	2017/11 108	Bosch BMP380	Digital Barometric Pressure Sensor	Deep technological and cost analyses of the BMP380. Technical and price comparison with the LPS22HB from STMicroelectronics and Bosch BME280 and BME680.
SP17308	2017/2 104	Infineon DPS310	Capacitive Pressure Sensor	Tiny MEMS digital barometer for smartphones and wearables
SP16295	2016/11 128	STMicroelectronics LPS22HB	Nano Pressure Sensor	The new pressure sensor from ST, is compared with the 1st-generation STMicroelectronics LPS331AP pressure sensor and the Bosch Sensortec BMP280
SP16279	2016/9 96	Melexis MLX91802	TPMS	The Melexis MLX91802 is an absolute pressure sensor used in tire pressure monitoring systems (TPMS) for cars and trucks.
SP16255	2016/3 77	Melexis MLX90809	Relative Pressure Sensor	Second generation integrated pressure sensor for harsh environments.
SP15203	2015/1 150	Freescale FXTH87	TPMS	The TPMS solution featuring the smallest footprint and lowest RF power consumption.
OSCILLATOR				
SP15214	2015/7 97	SiTime SiT1552	MEMS Oscillator	The smallest MEMS oscillator on the market assembled in an innovative Wafer Level Chip Size Package.
MICROPHONE				
SP18384	2018/3 215	Various iPhone X: MEMS Micro	iPhone X – MEMS Microphones	Complete teardown and comparison between each supplier.
SP17314	2017/2 109	Vesper VM1000	Piezoelectric Microphone	Disruptive first Piezoelectric MEMS microphone for consumer applications.
SP16296	2016/10 106	Goertek iPhone7 Microphone	MEMS Microphone iPhone 7	Goertek MEMS Microphone (Infineon solution) in Apple iPhone 7 Plus
SP16294	2016/10 106	STMicroelectronics iPhone7 Microphone	MEMS Microphone iPhone 7	STMicroelectronics MEMS Microphone in Apple iPhone 7 Plus
SP16292	2016/10 113	Knowles iPhone7 Microphone	MEMS Microphone iPhone 7	Knowles MEMS Microphone in Apple iPhone 7 Plus
MEDICAL				
SP17346	2017/7 130	Thermo Fisher Ion 520	Ion 520 Sequencing chip	Complete analysis of the Ion 520 chip from Thermo Fisher, featuring chip disassembly and die analyses, processes and cross-sections.

MEMS & SENSOR

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LIGHT				
SP16268	2016/5 112	Maxim MAX30102	Pulse Oximeter Heart-Rate Sensor	The sensor is an optical heart-rate module and a pulse oximeter sensor in a LED reflective solution. The main die includes a photodiode area and an analysis part.
SP16237	2016/1 70	ams TSV TSL2584TSV	Ambient Light Sensor (ALS)	World's Smallest Ambient Light Sensor for Wearable Applications.
IMU/COMBO				
SP18382	2018/1 190	Bosch 6-Axis IMU	Bosch's 6-Axis IMU in the Apple iPhone X	Physical analysis, with process description and manufacturing cost analysis. Comparison with Bosch Sensortec's BMI160, InvenSense and STMicroelectronics' latest 6axis IMUs.
SP17361	2017/10 175	InvenSense ICM-20789	Pressure Sensor Combo	Detailed technology and cost analysis of the ICM-20789 7-axis motion tracking device. Comparison with the previous generation of combo sensors from InvenSense
SP16297	2016/12 155	STMicroelectronics LSM6DSM	6-axis IMU dedicated to OIS	Complete reports and comparison of the latest generation of inertial measurement units for consumer optical image stabilization applications
SP16291	2016/12 136	InvenSense iPhone 7 Plus	6-axis IMU	Complete reports and comparison of the latest generation of inertial measurement units for consumer optical image stabilization applications
SP16261	2016/4 246	BOSCH Sensortec BMF055	9-axis IMU	The BMF055 is a new version of the BOSCH Sensortec 9-axis device (3-axis Gyroscope + 3-axis Accelerometer + 3-axis Magnetometer), with a MCU included in the package.
SP16260	2016/4 153	InvenSense ICM-30630	6-axis IMU	World's first tri-core 6-axis motion tracking solution with integrated sensor-hub framework software.
SP15241	2015/11 160	Murata SCC2000 Series	Automotive MEMS Combo	Murata's Second Generation Combo Sensor (1-axis gyro and 3-axes accelero) for Automotive & Harsh Environments
SP15230	2015/9 140	Fairchild FIS1100	6-Axis MEMS IMU	Fairchild's first consumer IMU manufactured using a completely new bulk micro machining process and interconnection structure.
SP15218	2015/6 140	STMicroelectronics LSM6DS3	MEMS IMU	ST's extra small (only 6mm3) and sub-mA IMU named 2014 MEMS device of the year 50% footprint reduction, many process & design innovation.
GYROSCOPE				
SP18381	2018/1 141	Tronics Microsystems GYPRO3300	Tronics GYPRO3300 Angular Rate Sensor	Analysis of the complete component, including the package, MEMS, and ASIC dies description of the ASIC and MEMS functionalities.
SP16299	2016/11 87	Invensense IDG-2030	Gyroscope fo OIS	2-axis thin gyroscope for camera OIS
SP16298	2016/11 105	STMicroelectronics L2G2IS	Gyroscope fo OIS	2-axis thin gyroscope for camera OIS
FINGERPRINT				
SP17318	2017/4 115	Fingerprint Cards FPC1228	Capacitive under glass fingerprint sensor	Huawei P10 and Mate 9 pro capacitive fingerprint successfully integrated under glass in collaboration with TPK
SP16282	2016/8 130	Qualcomm Sense™ ID 3D	Ultrasonic Fingerprint	Powered by an ultrasonic-based fingerprint biometric solution, the sensor provides a more secure, reliable alternative to capacitive-based fingerprint sensors.
SP16271	2016/5 105	Next Biometrics NB-1010-U	Fingerprint Sensor	The sensor die is manufactured on glass with LTPS technology and uses a very specific coating to ensure the device's functionality.
SP16248	2016/2 89	EgisTec ET300	Fingerprint Sensor	Philips integrates in its smartphone the innovative fingerprint sensor developed by EgisTec
ENVIRONMENT				
SP18372	2018/2 125	Sensirion SGP30	Sensirion SGP30 Gas Sensor	Analysis of the entire component, including the package, MEMS, and ASIC die. Full description of the ASIC and MEMS functionalities as well as manufacturing processes.
SP17342	2017/7 152	Bosch BME680	Bosch BME680 Environnement Sensor	The world's first environmental sensor combining gas, pressure, humidity and temperature sensing functions in a 3mm x 3mm footprint package.
SP16223	2016/2 99	Humidity Sensors Industry 2015	Relative Humidity Sensors Technology and Cost Review	Humidity Sensors from the main players analyzed and compared!

MEMS & SENSOR

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DISPLAY/OPTICS				
SP15229	2015/9 143	Intel RealSense	3D camera	Innovative 3D camera for facial analysis and hand/finger tracking, based on resonant micro-mirror, IR laser, visible and near infrared image sensors.
COMPASS				
SP15222	2015/10 160	eCompass Review	3-Axis & 6-Axis	Over 20 eCompasses from the main players analyzed and compared !
ACCELEROMETER				
SP17315	2017/3 130	mCube MC3672	WLCSP MEMS Accelerometer	Ultra-low power - Highly integrated WLCSP Accelerometer with Via-Middle TSV
SP17269	2017/1 110	Safran Colibrys VS1000	High End Accelerometer	Single-Axis High Performance Accelerometer with new ASIC design
SP16256	2016/4 114	mCube MC3635	3-axis Accelerometer	Ultra-low power 3D TSV MEMS Single-Chip 3-axis Accelerometer
SP16074	2016/7 97	Bosch Sensortec BMA250E	3-Axis Accelerometer-Consumer	The BM250E is a low power digital accelerometer packaged in in a tiny 2x2x0.9mm ³ LGA package.

PACKAGING

Ref.	Date Pages	Manufacturer Product	Type of Product	Overview
WLP				
SP16267	2016/4 93	Qualcomm WCD9335	FOWLP	The Qualcomm WDC9335 is an audio codec wafer-level packaged with fan-out technology. It is used in Samsung Galaxy S7.
SIP				
SP16277	2016/7 130	Intel Curie	SiP Module	This tiny system-in-package (SiP) includes the Intel Quark chip, Bluetooth radio, sensors, and battery charging in less than 150mm ³ .
EMBEDDED				
SP17306	2017/6 90	TDK AN-T2541 bluetooth	TDK SESUB-PAN-T2541 bluetooth module	TDK SESUB-PAN-D14580 Module: world's smallest Bluetooth 4.1 low energy (LE)
SP15233	2015/10 68	GaN Systems AT&S ECP®	GaNpx Top Cooled	Latest GS66508T power transistor of GaN Systems packaged with a top - side cooling.
3D PACKAGING				
SP18374	2018/1 145	Qualcomm QCA9500	Qualcomm QCA9500 WiGig Chipset	Full investigation of the module, featuring a detailed study of the SiP and the antenna board including die analyses, processes and board cross-sections.
SP18373	2018/2 140	TSMC Apple A11 inFOPoP	TSMC's Integrated Fan-Out (inFO) Packaging for the Apple A11 found in	Analysis of the packaging from the DRAM memory to the LSC developed by TSMC. Comprehensive cost analysis and price estimation of the device.
SP17360	2017/11 130	AMD eon Vega Frontier Edii	AMD	Complete physical analysis of the packaging process.Comparison with NVIDIA's Tesla P100 and AMD's Fury X.
SP17353	2017/10 130	TSMC, Samsung NVIDIA Tesla P100	GPU	Complete physical analysis of the packaging process, description of the manufacturing supply chain and calculation of the manufacturing costs.
SP17352	2017/10 300	Various MEMS Packaging	Mems Packaging	Multiple comparisons based on physical analyses of over 100 MEMS components.
SP17339	2017/6 133	NXP SCM-i.MX6	Quad High Density Fan-Out Wafer-Level System-in-Package	NXP SCM-i.MX6 Quad High Density Fan-Out Wafer-Level System-in-Package
SP16303	2016/12 100		Application Processors Comparison	Comparison of main players AP: Apple A10 with inFO vs. Qualcomm Snapdragon 820 with MCEPpackaging technology vs. HiSiliconKirin 955 & Samsung Exynos8 with standard PoP

PACKAGING

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SP16290	2016/10 100	TSMC inFO	Package-on-Package	Deep Analysis and reverse costing of the new inFO packaging technology from TSMC used for the latest Apple's Application processor, the A10 found in the iPhone 7
SP16276	2016/6 113	Qualcomm Snapdragon 820	Package-on-Package	The Galaxy S7 integrates the Exynos 8 with classic PoP packaging or the Snapdragon 820, with Molded Core Embedded Package (MCeP) technology, developed by Shinko.
SP15231	2015/9 100	AMD Radeon R9 Fury X	AMD Radeon R9 Fury X	World's First HBM-Powered products.
SP15226	2015/7 100	Samsung M393A8G40D40	DRAM with TSV	The DDR4 memory chips are manufactured using Samsung's 20nm process technology and 3D TSV via-middle package technology.

PASSIVE

Ref.	Date Pages	Manufacturer Product	Type of Product	Overview
SP17344	2017/9 140	Various Silicon Capacitor	Silicon Capacitor	Details on the manufacturing process and materials used, component design, and die size. Comparison of the components' sizes, materials and characteristics.
SP16300	2016/10 100	TSMC Silicon Capacitor	Deep Trench Capacitor	Deep analysis and Reverse Costing of the new silicon capacitor technology from TSMC used for the latest Apple's Application processor, the A10 found in the iPhone 7

POWER

Ref.	Date Pages	Manufacturer Product	Type of Product	Overview
SiC				
SP18390	2018/4 55	Littelfuse LSIC1MO120E0080	LittelfuseSiC MOSFET LSIC1MO120E0080	Complete BoM, die manufacturing, and packaging processes. Estimated manufacturing cost, a comparison with similar products from STMicroelectronics and CREE.
SP17310	2017/4 65	Rohm SCT2H12NZGC11	1700V SiC MOSFET	In its new series of SiC MOSFETs, Rohm uses trench structures for 650V and 1200V products, while 1700V products use planar structures
SP17309	2017/1 66	STMicroelectronics STC30N120	1200V SiC MOSFET	The 1st generation 1200V SiC MOSFET device from STMicroelectronics has good current density at a very competitive cost
SP16275	2016/7 94	Rohm BSM180D12P3C007	SiC MOSFET	The BSM180D12P3C007 is a 1200V 180A SiC MOSFET module from Rohm for high power applications. The trench structure reduces on-resistance and switching losses.
SP16262	2016/8 81	Wolfspeed C3M	900V SiC MOSFET	The SiC C3M™ Platform is the first 900V SiC MOSFET platform, designed by Wolfspeed for high-power applications like DC/DC converters, and telecom power supplies.
MOSFET				
SP18380	2018/1 75	Wolfspeed C2M0025120D	1200V SiC MOSFET	Deep technology analysis of the package and components, with images of the planar SiC structure. Comparisons with Rohm and ST SiC MOSFETs and 1200V silicon IGBTs.
SP18366	2018/2 140	Infineon DF11MR12W1M1_B11	Infineon DF11MR12W1M1_B11 1200V CoolSiC MOSFET	Full teardown of the module's components and housing.
SP17350	2017/8 335	Various 100V MOSFET	100V MOSFET	Details on the manufacturing processes and materials used, packaging structures, component designs, die sizes, electrical performance and current densities, and cost structure
SP16289	2016/11 171	Various	40V Silicon MOSFET	Technology and Cost Review of 40V Si MOSFET
IGBT				
SP18375	2018/1 115	Infineon FF400R07A01E3	Infineon FF400R07A01E3 Double Side Cooled IGBT Module	Estimation of the production cost of the IGBT, diode and package and technical and cost comparison between Infineon's design and the Toyota Prius inverter's DSC power module
SP17332	2017/6 87	Infineon FS820R08A6P2B	750V IGBT Module	The HybridPACK™ Drive is a very compact power module optimized for hybrid and electric vehicle.

POWER

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SP16288	2016/12 195	Various	IGBT vs SiC MOSFET comparison	1200V SiCMOSFET vs Silicon IGBT: Technology and cost comparison
SP16281	2016/9 80	Infineon CooliR ²	IGBT module	The CooliR ² Die™ power module from Infineon is an IGBT module for automotive applications integrated into different vehicles' Traction Power Inverter Module (TPIM).
SP15232	2015/9 110	Semikron SKiM306GD12E4	Solderless module	SKIM 63, solderless, sinter technology power module developed for high reliability operation in a light module.
GaN				
SP18365	2018/4 200	Various GaN on Si Transistor	GaN-on-Silicon Transistor Comparison	Estimated production cost for the integrated circuit gate driver, transistor, and package. Comparison of the different components available on the market.
SP18363	2018/2 100	Texas Instruments LMG5200	TI LMG5200 80V GaN FET Power Stage	Estimated production cost for the IC gate driver, FET, and package. Comparison with the packaging and epitaxy from GaN Systems, Transphorm, and Panasonic.
SP17362	2017/9 82	EPC EPC2045	EPC2045 100V GaN-on-Silicon Transistor	Estimation of the production cost of the epitaxy and the package, comparison with previous EPC devices and epitaxy.
SP17331	2017/7	Texas Instruments LMG3410	600V GaN-on-Silicon HEMT	The LMG3410 Single-Channel Gallium-Nitride (GaN) Power Stage contains a 70-mΩ, 600-V GaN power transistor and specialized driver in an 8-mm by 8-mm QFN package.
SP17322	2017/5 72	Panasonic PGA26E19BA	600V GaN-on-Silicon HEMT	Panasonic abandons the TO220 package for its GaN HEMTs and proposes the DFN 8x8 package for the latest 600V device.
SP17319	2017/5 98	Transphorm TPH3208PS	Transphorm TPH3208PS 650V GaN HEMT	A new 650V GaN HEMT from Transphorm with a simplified cascode structure and enhanced electrical characteristics.
SP17311	2017/2 78	Panasonic PGA26C09	600V GaN-on-Silicon HEMT	The first 600V GaN HEMT of Panasonic is designed with an innovative structure to integrate a normally Off transistor in a standard package without cascode.
SP16302	2016/11 120	Transphorm TPH3206PS	GaN-on-Silicon HEMT	Transphorm's TPH3206PS transistor has a new die design and manufacturing process. The die contacts are optimized on the die area to save space, and increase current density.
SP16286	2016/10 66	Wolfspeed CGHV40100	GaN-on-Silicon HEMT	General-purpose, unmatched 50V GaN HEMTs from Wolfspeed specifically designed to solve long-standing issues for radar systems employing traditional TWT amplifiers.
SP16257	2016/4 86	EPC EPC2040	GaN FET	Efficient Power Conversion EPC2040 15V eGaN FET for LiDAR Systems
SP16250	2016/3 210	Various	GaN on Si HEMT vs SJ MOSFET	Will SJ MOSFETs still be attractive compared to GaN devices?

SYSTEM

Ref.	Date Pages	Manufacturer Product	Type of Product	Overview
REVERSE TECHNOLOGY				
SP18402	2018/3 50	Samsung Galaxy S9+	Galaxy S9+	Teardown photos, detailed package identifications and descriptions. Excel file summarizing the S9+ chipset and breaking down the devices by supplier, packages.
SP17369	2017/11 150	Various	Thermal Management in Smartphones	Multiple comparisons based on physical analyses of the latest flagship smartphones. Evolution of thermal management technology tracked by manufacturer.
ENERGY				
SP17307	2017/1 81	Enphase S280	Solar microinverter	Best in class SmartGrid-ready 280VA inverter with new generation ASIC-based topology for lighter design and enhanced solar power management
SP16253	2016/3 94	SMA Sunny Island 6.0H	Off-grid and on-grid PV Inverter	The Sunny Island 6.0H supports a wide range of on-grid and off-grid applications from operation in remote off-grid areas to home energy management
CONSUMER				
SP17325	2017/3 132	Oculus Rift	Virtual Reality Head-Mounted Display	Detailed analysis of Oculus's HMD for VR experience
SP17280	2017/2 131	HTC Vive	VR Head-Mounted Display	HTC Vive Virtual Reality Head-Mounted Display

SYSTEM

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SP16249	2016/2 73	Avogy olt Laptop Charger Plu	Laptop charger	A SiC Transistor inside the smallest and most performant Laptop Charger currently available.
AUTOMOTIVE				
SP17357	2017/10 76	Continental SRL1	Short Range Lidar	Details on the full Continental SRL1 system's manufacturing and packaging processes, estimation of the manufacturing cost and selling price.
SP17354	2017/8 64	Bosch Ultrasonic sensor	Ultrasonic Sensor	Bill-of-material(BOM) and manufacturing cost physical analysis and manufacturing cost estimation of the Bosch transceiver IC.
SP17340	2017/6 35	LG _G LA080WV3 – 8-inch	Display with Touch Panel for Car Navigation	LG LA080WV3 – 8-inch Display with Touch Panel for Car Navigation
SP17329	2017/4 80	Continental MFC430	Forward Automotive Camera	Continental attempts to penetrate the forward camera market with a distinctive architecture and cost effective solution
SP17324	2017/4 62	Bosch MPC2	Forward Automotive Camera	Bosch attempts to penetrate the forward camera market with a distinctive architecture and cost effective solution
SP17323	2017/4 77	TRW S-Cam3	Forward Automotive Camera	Third and latest version of TRW's best-selling S-Cam series forward camera
SP17321	2017/3 85	Continental ARS4A	77GHz Radar	Simultaneous long and short range 77GH7 radar
SP17320	2017/4 192	Leddar tech LeddarVU	solid state high-definition LiDAR module	Without moving part, smallest form factor on the market and integrating the latest solid state technology, the LeddarVU8 is ready to compete with radars.
SP17313	2017/4 88	Bosch LRR4	77GHz Long Range Radar Sensor	The fourth generation of Bosch long range radar sensor set new boundaries for a more elegant, compactness and cost effectiveness module
SP17312	2017/1 80	Autoliv MRR	77GHz Multi Mode Radar	A compact, cost-effective (combining Long and Middle Range detection) and high-performance driving assistance system
SP16287	2016/9 135	Toyota Prius 4	Power control Unit	The Prius 4 module integrates Toyota's latest power card packaging, with double side cooling.
SP16284	2016/9 82	Delphi RSDS	76Ghz radar	Delphi's Rear and Side Detection System (RSDS) utilizes 76Ghz single-beam mono-pulse radar. Its compact design enables simplified vehicle integration.
SP16251	2016/1 104	Delphi RACam	Radar and Camera System	A compact, cost-effective and high-performance Advanced Driving Assistance System (ADAS).

TECHNOLOGY & PATENT

Ref.	Date Pages	Manufacturer Product	Type of Product	Overview
PATENT INFRINGEMENT				
SK15003	2015/11 120		Capacitive Fingerprint Sensors	Technology & Patent Infringement Risk Analysis.
SK15002	2015/4 172		MEMS Microphones	Technology & Patent Infringement Risk Analysis.

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