

POWER

Ref.	Date Pages	Manufacturer Product	Type of Product	Overview
SP19467	2019/8 200	UnitedSiC	UnitedSiC Cascode JFET 650V Family	Detailed manufacturing cost analysis of the JFET, the MOSFET and the package as well as the estimated selling price of each one of 5 five cascode components
SP19449	2019/5 289	Various SiC MOSFET	Comparison 2019	Estimated manufacturing cost of the MOSFET devices & analysis of their selling prices. Technological & manufacturing cost comparisons between the analyzed MOSFETs.
SP18413	2018/6 100	STMicroelectronics Tesla Model 3	Tesla Model 3 Inverter with SiC Power Module	Estimation of the production cost of the SiC MOSFET and package. Technical and cost comparison with the Mitsubishi J-Series TP-M power module.
OTHER				
SP20474	2020/5 165	Various	Industrial Power Module Packaging Comparison 2020	Insight into several packaging technologies to analyze their structures, processes and costs
SP18399	2018/7 110	Various	Automotive Power Module Packaging	Comparison 2018 of the structures and costs of the different technological choices made by key manufacturers of the automotive industry
SP18359	2018/5 115	Various	Power Discrete Packaging	Comparison 2018 : Summary of the state of the art of packaging power semiconductors at a discrete level. Comparison of 20 types of packages.
IGBT				
SPR2161	2021/5 138	Vitesco Technologies	Power Module in Jaguar I-PACE Inverter	Multiple optimized packaging innovations for this automotive power module from Vitesco Technologies.
SPR2154	2021/1 287	Various	Si IGBT comparison 2021	Exhaustive technology and cost comparisons of 31 Silicon IGBTs
SP20572	2020/10 125	Infineon FS100R12W2T7	Infineon EasyPACK	Discover the newest IGBT technology from Infineon: TRENCHSTOP™ IGBT7 with EC7 diode in EasyPACK™ module
SP20541	2020/3 100	StarPower GD820HTX75P6H	Tri-Pack IGBT Module	Tri-Pack power module from StarPower with direct liquid cooling pin-fin structure.
SP20516	2020/1 127	Hitachi Audi e-tron's Inverter	Double-Side Cooling Power Module	Discover Hitachi's power module and its innovative assembling technology of integrated double-side cooling structure.
SP19492	2019/10 163	Infineon PrimePACK™2	1200V Power Module with IGBT5 and EC5 Diode	Full teardown of the module's components and housing, as well as estimated manufacturing cost of all the module's components and a selling price analysis
SP19455	2019/3 140	ABB 5SNG 1000X170300	Power Module	Insights into the structure, technical choices, design, processes, and supply chain positions. Manufacturing cost of the module's components and analyses its selling price.
GaN				
SPR2155	2021/2 77	EPC 152	Half-Bridge Monolithic GaN IC	EPC's 70 V ePower stage with separate and independent high and low side control inputs.
SP20580	2020/11 93	STMicroelectronics MASTERGAN1	Half-Bridge Driver	The first 600V system-in-package half-bridge driver from STMicroelectronics integrating two GaN-based HEMTs.
SP20563	2020/7 78	Innoscence	650V GaN-on-Si Transistor	The first 100% Chinese GaN-on-Si power device found in Rock's fast charger, manufactured on an 8-inch platform.
SP20550	2020/3 101	Nexperia GAN063-650WSA	GaN-based Power Device	Deep analysis of the GAN063-650WSA, Nexperia's first GaN product
SP20547	2020/2 127	OPPO	GaN-based in-box fast charger	Competitive analysis of Power Integrations' GaN and silicon technology used in OPPO's high power chargers.
SP20538	2020/10 279	Various Various	GaN Power Transistor Comparison 2020	Comparison of the technology and cost of 18 GaN devices from: EPC, GaN Systems, Infineon, Innoscence, Navitas, Nexperia, Panasonic, Power Integrations, TI
SP19493	2019/10 108	Macom NPA1008	RF Power Amplifier with GaN-on-Si HEMT	Estimation of the production costs of the HEMT, the passive die, and the package as well as the estimated selling price of the component.
SP19480	2019/7 156	Anker SC1933C	GaN-on-Sapphire HEMT Power IC	Teardown analysis of the SC1933C. Estimation of the production costs of the ICs, the HEMT & the package as well as the estimated selling price of the component.
SP19464	2019/5 112	Navitas NV6115 & NV6252	GaNFast Power IC Family	Insights into the HEMT structure, the epitaxy, technical choices, design, processes, and supply chain positions.

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SP19453	2019/7 169	Various	GaN-Based Wall Charger Comparison 2019	Detailed BOM and manufacturing analysis for all the chargers' devices and packages. Different supply chains and the technical choices made by the manufacturers.
SP19415	2019/9 86	EPC EPC2112	HEMT with Monolithic Optimized Gate Driver	Complete teardown analysis and detailed manufacturing cost analysis of the die and the package as well as the estimated selling price of the device,
SP18411	2018/10 110	Qorvo QPF4006 39GHz	Qorvo QPF4006 39GHz GaN MMIC	Detailed analysis of the packaging and the GaN on SiC transistor with optical SEM Pictures as well as a cost analysis.
	2019/11 260	Various	GaN-on-Si HEMT vs Superjunction MOSFET Comparison 2019	Detailed pictures of device structures, details on manufacturing processes and materials, comparison of electrical performance, and cost breakdown analysis of the process.
	2019/6 97	Infineon 600V	CoolGaN Transistor	Complete teardown analysis including optical and SEM pictures of metal layers, delayering of the GaN, cross-section of the HEMT part and the diode part of the die.

RF

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RF MODULE				
SPR2162	2021/5 387	Oppo Reno3	5G Sub-6 Front-End Module	Study of innovative 5G Sub-6 modules from Qorvo and Skyworks integrated into Oppo's phones.
SP20524	2020/11 270	Various Various	RF Front-End Module Comparison 2020 –V4	Technical and cost overview of the latest radio frequency front-end module technologies integrated in Asian based smartphones manufacturers.
SP20523	2020/10 203	Various Various	RF Front-End Module Comparison 2020 –V3	Technical and cost overview of the latest Radio Frequency connectivity Front-End technologies, with deep analysis of Wifi 6.0 and Ultra-Wide Band architecture
SP20522	2020/4 304	Various	RF Front-End Module Comparison 2020 V2	Insights into technology and cost data for FEMs and several other components found in ten smartphones.
SP20504	2020/1 266	various	RF Front-End Module Comparison 2020 – V1	Technical and cost overview of the latest Radio Frequency Front-End module technologies, with deep analysis of the Apple iPhone 11 Pro, Samsung Galaxy Note 10+ and OnePlus 7 Pro 5G.
SP19478	2019/10 162	Qorvo QM76018	RFFEM	Complete analysis of the FEM SiP, including the LNA, the filtering dies, the internal and external EMI shielding and the Power Amplifier.
SP19445	2019/2 167	Broadcom AFEM-8092	Apple iPhone Xs/Xr Series	Complete analysis of the FEM SiP, including an analysis of the matching IC, the filtering dies, the internal and external EMI shielding and the Power Amplifier.
SP19433	2019/5 81	Accoreer A111 60 GHz	Pulsed Coherent Radar	Review of the A111, including a complete die analysis, cost analysis, and price estimate for the chips. Physical and technical comparison with Texas Instruments' IWR6843AoP
SP19392	2019/4 121	Analog Devices ADI ADGM 304/1004	RF MEMS Switch	Detailed physical description of the Analog Devices ADGM1304 along with a cost analysis. physical and cost comparison with the ADGM1001.
SP18368	2018/10 397	Various Automotive Radar	Automotive Radar	Comparison 2018 : Description of each component and statistical analyses for most radar systems focusing on the RF board.

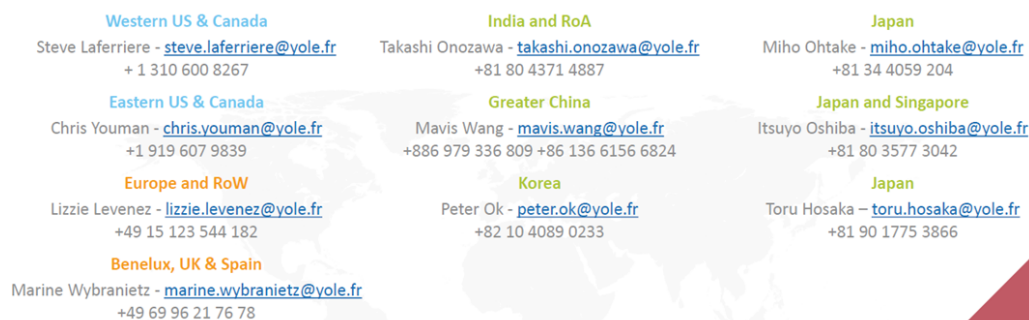
RF IC				
SPR2160	2021/2 231	Broadcom AFEM-8200	PAMiD in the Apple iPhone 12 Series	Deep dive analysis of the fourth generation of mid/high band front-end module for 4G and 5G from Broadcom.
SPR2158	2021/3 316	Various	RF Front-End Module Comparison 2021 – Vol. 1	Technical and cost overview of the evolution of the radio frequency front-end module technologies integrated in the Apple iPhone series from 2016 - 2020
SPR2158	2021/2 250	Apple iPhone 12 series	mmWave 5G Chipset & Antenna	A study of the complete 1st generation of the 5G millimeter-wave chipset for Apple's phones including custom antenna, front-end module and antenna-onpackage.
SPR2153	2021/4 272	Various	RF Front-End Module Comparison 2021 – Vol. 2	Technical and cost overview of the evolution of radio frequency front-end module technologies integrated in 5G mmWave and Sub-6 GHz Phones in 2020.
SP20521	2020/3 205	Broadcom AFEM-8100	SiP in the Apple iPhone 11 Series	Cost effective third generation of mid/high band Front-End Module with advanced and innovative packaging.
SP20519	2020/4 173	Infineon & Knowles T60TR13C & DSP IA85	Google Pixel 4XL Gesture Recognition Chipset	Deep dive into the first Human Machine Interaction (HMI) system with Infineon's 60 GHz Radar On-Chip AoP BGT60TR13C and Knowles' DSP IA8508.

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SP20517	2020/5 216	Qualcomm	2nd Generation 5G mmWave Chipset, from Modem to Antenna	Full investigation of the system, featuring a detailed study of the SiPs, including die analyses, processes and board cross-sections
SP19482	2019/9 194	Qualcomm SDX50M & QTM052	Qualcomm's First 5G mmWave Chipset	Full investigation of the system, with detailed study of the SiPs, including die analyses, processes and board cross-sections. Complete cost analysis & selling price estimation. System
SP19481	2019/8 100	Texas Instruments AWR1843AoP	77/79 GHz Radar Chipset	Complete package and die analysis, cost analysis, and price estimate for the component.
RF FILTER				
SP20546	2020/7 100	Skyworks SKY78221	FBAR-BAW Filter Technology in 28/110nm BAW	First High-Volume Manufacturing (HVM) BAW filter on the market from Skyworks, integrated in the Apple iPhone 11 Pro Max and iPad Pro second generation.
SP20490	2020/6 201	Various	SAW Filter Comparison 2020	Description of each process flow for the thirteen SAW technologies on the market. It also contains a complete cost analysis of each process and tries to explain OEM choices.
SP19454	2019/10 100	Murata IHP	SAW Filter	Complete analysis of the IHP SAW component including analyses of the filter die and the CSP, along with cost analysis and price estimation for the component.
OTHER				
SP20561	2020/9 105	Vayyar VYYR2401	4D UWB Radar Imaging SoC	Deep dive analysis of Vayyar's 4D UWB Radar Imaging System-on-Chip from the Walabot Home Fall Detection System
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.

SOLID STATE LIGHTING

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VCSEL				
SP19426	2019/4 190	Various VCSEL	Comparison 2019	Complete cost analysis and a cost estimate of the VCSEL
OTHER				
SPR2161	2021/3 215	II-VI/Finisar FTLC1157RGPL	100Gb CWDM4 optical transceiver	Deep analysis of FTLC1157RGPL-TE, the 100Gb CWDM4 optical transceiver from the US leading supplier
SPR2157	2021/1 217	InnoLight DP4CNT	400G Optical Transceiver	Deep analysis of the 400Gb optical transceiver from a leading Chinese company.
SP20545	2020/4 105	Butterfly Network	CMUT Sensor	Focus on the analysis of the CMUT semiconductor. It includes an ultrasonic MEMS transducer and the ASIC die developed by Butterfly Network.



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