Automotive Solutions Product Portfolio

Wi-Fi, UWB, SDARS, V2X, eCall, Network Attach Devices (NAD), Telematics Control Unit (TCU) and the Connected Car

PAs | LNAs | SWITCHES | FILTERS | SPADs | L-PAMiDs | DUPLEXERS
MULTIPLEXERS | HIGH-LINEARITY FEMs | ANTENNA ROUTING SOLUTIONS

qorvo®

all around you

Qorvo's Expanding Portfolio of World-Class Products for Automotive RF Applications

Qorvo's RF product portfolio for automotive applications includes power amplifiers, low noise amplifiers (LNAs), high-linearity front-end modules (FEMs), temperature-compensated BAW filters, and low-loss switches. These devices meet global automotive OEM Tier 1 needs to fully implement RF data stream support for Wi-Fi, SDARS satellite radio, and vehicle to vehicle, to infrastructure, or to pedestrian (V2X) applications.

Qorvo's automotive product portfolio also includes ultra-low-power operation UWB (Ultra-Wideband) chipsets compliant with the Car Connectivity Consortium (CCC) Phase 3 standards, RF front-end modules aligned to most 4G and 5G Network Attach Device (NAD) chipset suppliers and an innovative portfolio of antenna routing switches for eCall and general switching applications.

Our products are tested to every aspect of AEC-Q100 or AEC-Q200 (for passive devices). Each device follows a safe-launch plan as part of our zero-defect initiative, and are designed to operate over automotive temperature ranging from -40°C to +105°C as needed. Qorvo facilities and our subcontractors are TS16949 certified to ensure the highest quality components.

Qorvo power amplifiers meet critical parameters of efficiency, linearity, and power out-to-antenna for 4G and 5G cellular, V2X, or Wi-Fi applications. These products are defined in unison with customers worldwide, while adhering to specifications set by governing standards bodies, and specified for use by all reference design radio providers.

The high gain LNAs with switching functionality operate with integrated power amp (IPA) modems and are found on all Wi-Fi reference designs. These devices are designed to reduce the development time of Wi-Fi systems by making it easier to implement an automotive PCB design, and fully support IEEE 802.11b/g/n/ac systems in an AEC-Q100, grade 3 qualified package.

Qorvo's automotive switches operate from 5 MHz to 6 GHz and support a variety of general purpose, targeted applications and switching needs. The switches are designed in the silicon-on-insulator (SOI) process insuring an ESD value that complies with AEC-Q100 requirements.

Qorvo offers TC-BAW (zero drift BAW) filters to support SiriusXM® SDARS antennas and BAW filters for Wi-Fi/LTE coexistence. The filters offer minimum drift, steep skirts and very low insertion loss, in an industry-leading small footprint. In some devices, the filter is fully integrated in duplexers, multiplexers or with amplifier and switch components.

Qorvo's rapidly expanding portfolio of automotive RF solutions focus on market-leading linearity, dynamic bias performance and high efficiency. We are committed to simplifying and reducing BOM cost and PCB footprint, while improving our customers' reliability and time-to-market.

Wi-Fi Front-End Modules (FEMs)

802.11ax FEMs AEC-Q100 Grade 2

Freq Range (GHz)	Description	Gain (dB)	Linear P_{OUT} (dBm)	EVM (dBm)	V_{CC} (V)	Part Number
5.15 to 5.925	2xPA+2xSPDT+ 2xLNA	28	14.5	-47	3.85	QPF4539Q
2.402 to 2.481.5	2xPA+2xSP4T+ 2xLNA	30	14.5	-47	3.85	QPF4239Q

Wi-Fi Front-End Modules (FEMs)

802.11ac FEMs AEC-Q100 Grade 3

Freq Range (GHz)	Description	Gain (dB)	Linear P_{OUT} (dBm)	EVM (%)	V_{CC} (V)	Current at Po (mA)	Package (mm)	Part Number
5.18 to 5.825	SPDT+LNA	12	–	–	3.6	12	1.5 x 1.5 DFN	RFFM8550Q
2.4 to 2.5	PA+SP3T+LNA	30	19	3.3	3.3	250	3.0 x 3.0 QFN	RFFM5765Q
2.4 to 2.5	PA+SP3T	33	16	3.3	3.6	160	3.0 x 3.0 QFN	RFFM3482Q
2.412 to 2.484	SP3T+LNA	13	–	–	3.6	10	1.75 x 1.75 QFN	RFFM8250Q

General Purpose Switches

AEC-Q100 Grade 2 and Grade 3

Freq Range (MHz)	Configuration	*Insertion Loss (dB)	Switch P0.1dB (dBm)	*Isolation (dB)	Supply Voltage (V)	Part Number	AEC-Q Grade
100 to 4000	SP3T GPIO	0.5	27	28	2.7 to 4.8	RFSW8006Q	2
100 to 6000	SP2T GPIO	0.3	27	27	2.7 to 4.8	RFSW8007Q	2
617 to 8000	SP2T GPIO	0.3	31	26	1.65 to 3.1	QPC8019Q	2
617 to 6000	SP2T GPIO	0.4	36	31	2.7 to 4.6	QPC8010Q	2
617 to 6000	SP2T GPIO	0.5	26	29	2.4 to 5.5	QPC8015Q	3
617 to 6000	SP4T RFFE	0.5	32	34	1.65 to 1.95	QPC8013Q	3
617 to 6000	SP5T RFFE	0.55	32	34	1.65 to 1.95	QPC8018Q	3
617 to 6000	SP6T RFFE	0.55	32	34	1.65 to 1.95	QPC8014Q	3
617 to 6000	SP8T RFFE	0.65	32	34	1.65 to 1.95	QPC8017Q	3

* Values shown taken at 2700 MHz unless otherwise noted

Antenna Routing and eCall Switches

AEC-Q100 Grade 2

Freq Range (GHz)	Configuration	**Insertion Loss (dB)	Switch P0.1dB (dBm)	*Isolation (dB)	Supply Voltage (V)	Part Number	AEC-Q Grade
700 to 6000	DPDT GPIO	0.3	33	33	2.6 to 5.5	QPC1217Q	2
700 to 6000	eCall Integrated RFFE	0.4-0.95	34.5	25	1.65 to 1.95	QPC1251Q	2
700 to 6000	eCall w/ DSDA Integrated RFFE	0.4-4.25	34.5	25	1.65 to 1.95	QPC1252Q	2

* Values shown taken at 2700 MHz unless otherwise noted
** QPC1251Q and QPC1252Q insertion loss varies by port connection.
All antenna routing and eCall switches are hot swap capable

LTE Filters, Duplexers and Multiplexers

AEC-Q100 Grade 3

Freq Range (GHz)	Band	Bandwidth (MHz)	Insertion Loss (dB)	Package (mm)	Part Number	AEC-Q Grade
777 to 787 Uplink 746 to 756 Downlink	Band 13	10 10	1.8 1.4	8 Pin 1.8 x 1.4 x 0.59	QPQ1013Q	3
2300 to 2400	Band 40	100	1.5	5 Pin 1.1 x 0.9 x 0.55	QPQ1040Q	3
2300 to 2400	Band 41	197	2.4	5 Pin 1.1 x 0.9 x 0.55	QPQ1040Q	3
1920 to 1980 B1 Uplink 2110 to 2170 B1 Downlink 1710 to 1785 B3 Uplink 1805 to 1880 B3 Downlink	Band 1 + Band 3	60 60 75 75	2.6 2.5 4.2 3.4	6 Pin 2.5 x 2.0 x 0.685	QPQ1031Q	3
1850 to 1915 B25 Uplink 1930 to 1995 B25 Downlink 1710 to 1780 B66 Uplink 2110 to 2200 B66 Downlink	Band 25 + Band 66	65 65 70 90	4.5 4.1 3.4 3.1	6 Pin 2.5 x 2.0 x 0.685	QPQ1035Q	3

Coexistence Filters

AEC-Q200 Grade 3 (unless noted otherwise)

Description	Application	Type	Package (mm)	Part Number
WLAN/LTE Coexistence	Wi-Fi, LTE	BAW	1.4 x 1.2	885062-A
WLAN/LTE Coexistence	Wi-Fi, LTE	BAW	1.4 x 1.2	885071-A
SDARS Filter (AEC-Q200 Grade 2)	SDARS	TC-BAW	1.7 x 1.3	885216
V2X to Wi-Fi Coexistence (AEC-Q200 Grade 2)	V2X	BAW	1.1 x 0.9	QPQ2200Q

V2X (802.11p and C-V2X)

AEC-Q100 Grade 2

Freq Range (GHz)	Description	Gain (dB)	Linear P_{OUT} (dBm)	EVM (dBm)	V_{CC} (V)	Current at Po (mA)	Package (mm)	Part Number
5.855 to 5.925	802.11P PA+SP2T +LNA	33	23.5	-28	5.0	330	5.0 x 3.0 QFN	QPF5420Q
5.770 to 5.925	CV2X PA+2X SP3T +LNA	33	28	–	5.0	500	5.0 x 4.0 Laminate	QPF1002Q
5.770 to 5.925	CV2X/802.11P PA +2X SP3T+LNA	33	28	–	5.0	500	5.0 x 4.0 Laminate	QPF1003Q

SDARS LNAs

AEC-Q100 Grade 2

Freq Range (GHz)	Description	Gain (dB)	Output P1dB (dB)	NF (dB)	V_{CC} (V)	Current at Po (mA)	Package (mm)	Part Number
2.32 to 2.345	SDARS LNA	12.5	20	0.45	3.7	52	2.0 x 2.0 DFN	QPL9036Q
2.32 to 2.345	SDARS LNA	19	20	0.55	5.0	70	2.0 x 2.0 DFN	QPL9037Q
2.32 to 2.345	SDARS LNA	18.5	21.5	0.45	4.5	60	2.0 x 2.0 DFN	QPL6207Q
2.32 to 2.345	SDARS LNA	15.1	22.5	0.45	4.5	60	2.0 x 2.0 DFN	QPL6216Q
2.32 to 2.345	SDARS LNA	21.8	19.9	0.52	4.5	55	2.0 x 2.0 DFN	QPL6202Q

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