



Solving Higher Data Rates and Increased Capacity

Qorvo 5G Solutions Continue to Transform the World



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all around you

Qorvo is making 5G deployment a reality and supporting the growth of mobile data with a broad range of RF connectivity solutions. Our robust RF portfolio for both infrastructure and smartphone applications include PAs, phase shifters, amplifiers, switches, integrated modules and other high-performance RF solutions. Qorvo's early start in 5G comes from our legacy of millimeter wave (mmW) R&D and product development in the defense and aerospace markets, as well as a leading supplier of sub 6 GHz RF solutions to the world's leading 2G, 3G and 4G base station manufacturers.

Qorvo offers a family of high-performance discrete RF components to provide flexibility to system designers, as well as the highest level of integration of multifunction building blocks to reduce size, lower costs and accelerate time to market.

Our highly integrated front-end modules feature switch LNA modules in a single- or dual-channel configuration and are targeted for 5G massive MIMO or TDD macro base stations.

Switch LNA Modules for Sub 6 GHz 5G

Frequency (GHz)	# of Channels	Insertion Loss (dB)	Noise Figure (dB)	Gain (dB)	OP1dB (dBm)	OIP3 (dBm)	Package (mm)	Part Number
1.8-4.2	2	0.7	1.45	37	19	34	7x7	QPB9319
1.85-2.02	1	0.5	1.1	32.5	21	31.5	8x8	QPB9320
2.3-2.7	1	0.5	1.2	33	23	34	8x8	QPC9314
2.3-3.8	2	0.5	1.3	30.5	20	33.5	5x5	QPB9318
3.4-3.6	1	0.5	1.2	33.8	18.4	33	8x8	QPB9324
3.6-3.8	1	0.5	1.2	34	19	32	8x8	QPB9325
3.8-5.0	2	1.1	1.8	31.5	16.5	33	7x7	QPB9329
4.4-5.0	2	0.65	1.8	32	19	34.6	6x6	QPB9328

Qorvo continues to lead the industry with lowest noise figure amplifiers across multiple process technologies. Qorvo's portfolio includes gain block amplifiers to be used in systems where additional gain is required.

Low Noise Amplifiers for Sub 6 GHz 5G

Frequency (GHz)	Noise Figure (dB)	Gain (dB)	OP1dB (dBm)	OIP3 (dBm)	Vd (V)	Package (mm)	Part Number
0.05-4	0.8	15.3	22.3	34	5	3x3	TQP3M9005
0.05-6	0.65	16.5	22.5	37	5	2x2	TQP3M9035
0.1-4	0.65	18.9	22.8	38	5	2x2	SPF5122
0.4-2	0.45	19	20	35	5	2x2	TQP3M9036
0.6-4.2	0.67	20	21.7	41.5	5	2x2	TQL9093
0.6-4.2	0.53	22.6	19	37	5	2x2	TQL9092
0.6-6	0.9	21.6	19	35	5	2x2	QPL9503
0.7-6	0.4	20	20	35	5	2x2	TQP3M9037

Gain Block Amplifiers for Sub 6 GHz 5G

Frequency (GHz)	Gain (dB)	OP1dB (dBm)	OIP3 (dBm)	Noise Figure (dB)	Vd (V)	Package (mm)	Part Number
0.02-4	22	22	39.5	1.3	5	3x3	TQP3M9019
0.02-4	20.5	21	37	1.3	5	3x3	TQP3M9018
0.05-4	21.8	22	39.5	1.3	5	SOT-89	TQP3M9009
0.05-4	20.6	20	36	1.3	5	SOT-89	TQP3M9008
0.05-4	13.5	22.4	38.5	1	5	3x3	TQP3M9006
0.05-4	14.9	21.6	39.5	2	5	3x3	TQP3M9038
0.05-4	14.5	20.7	40	1.8	5	SOT-89	TQP3M9028
0.05-4	14.5	22	40.5	1.7	5	2x2	TQL9048
0.05-4	14.5	20.8	35.5	1.6	5	2x2	TQL9047
0.05-6	16	21.3	40.3	1.5	5	2x2	TQL9062
0.1-4	13	23.6	41	1.3	5	SOT-89	TQP3M9007

Qorvo continues to leverage its significant GaN experience for 5G applications. Below, Doherty® modules and transistors are shown.

Doherty Amplifier Modules for Sub 6 GHz 5G

Frequency (GHz)	Vd (V)	Gain (dB)	Pout Avg (W)	PAE @ Pout Avg (%)	Part Number
2.496-2.69	28	34	5	42	QPA2705
3.4-3.6	28	32	3	33	QPA3503
3.4-3.6	28	30	5	40	QPA3506
4.4-5	28	34	1.25	27	QPA4501

GaN Transistor Solutions for Sub 6 GHz 5G

Frequency (GHz)	Vd (V)	Gain (dB)	Psat (W)	PAE @ Pout Avg (%)	Part Number
DC-2.7	65	22	150	64.8	QPD1013
DC-3.6	48	22	75	80	QPD0050
DC-3.6	48	25	90	73	QPD0060
DC-4.0	48	22	45	71.5	QPD0030
DC-4.0	50	24	15	72	QPD1009
DC-4.0	50	25	10	70	QPD1010
DC-4.0	32	19	5	64	TQP0102
DC-4.0	32	19	15	63	TQP0103
DC-4.0	32	17	30	60	TQP0104

Switch Solutions for Sub 6 GHz 5G

Frequency (GHz)	Type	Type	IL (dB)	Isolation (dB)	Max Pin (dBm)	Vcc (V)	Package	Part Number
0.005-3.8	SPDT	R	0.3	37	37	3	2x2	RFSW1012
0.005-6	SPTD	R	0.25	46	37	2.4 to 5.8	1.1x.5	QPC1022
0.005-6	SP3T	R	0.4	37	35	3 to 5	2.5x2.5	RFSW6032
0.005-6	SP4T	R	0.45	34	35	3 to 5	2.5x2.5	RFSW6042
0.005-6	SP6T	R	0.5	28	32	3 to 5	2x2	RFSW6062
0.005-6	SPDT	A	0.7	70	35	3 to 5	4x4	RFSW6024
0.005-6	2xSPDT	R	0.3	35	30	3	2x2	RFSW6222
0.7-2.7	SP8T	R	0.4	31	32	2.4 to 4.5	2x2	QPC6082
0.15-5	SPDT	R	0.6	26	40	2.5 to 5	3x3	RFSW6023

Higher frequency mmW bands are expected to expand both network capacity and wireless use cases, with theoretical 5G transfer speeds of up to 10 gigabits per second. These mmW bands operate over a significantly shorter range than lower frequency bands, driving a significant increase in residential and commercial placements of short-range, smaller cell sites.

Qorvo has over a decade of experience supporting mmW applications and solutions. Qorvo combines mmW systems expertise and the industry's most comprehensive high-power RF product and technology portfolio to help leading manufacturers quickly launch next-generation infrastructure products.

Solutions for mmW 5G

Frequency (GHz)	Function	Channels	Rx IL (dB)	Rx Gain (dB)	Tx Psat (W)	Tx Gain (dB)	Tx PAE (%)	Package (mm)	Part Number
26.5-29.5	Front-End Module	2	3.5	18	2	25	10	5x8	QPF4002*
		1			1			5x4	QPF4001*
37-40.5	Front-End Module	2	4.2	18	2	23	7	4.5x6	QPF4006
		1			2			4.5x4	QPF4005

* Coming soon

Frequency (GHz)	Function	Tx Psat (W)	Tx Gain (dB)	Tx PAE (%)	Package (mm)	Part Number
17-37	Driver	0.2	20	-	3x3	TGA4030-SM
27-31	PA	4	25	25	7x7	TGA2594-HM

Frequency (GHz)	Function	Noise Figure (dB)	Gain (dB)	P1dB (%)	OIP3 (dBm)	Bias (V)	Package (mm)	Part Number
22-32	LNA	1.6	23	19	27	3.5	4x4	QPA2628