RFMD PRODUCT SELECTION GUIDE

2013-2014

- Amplifiers
- Attenuators
- Modulators
- Switches
- Upconverters/Downconverters
- Voltage-Controlled Oscillators
- Synthesizers
- CATV Amplifiers and Tuners
- High Reliability Components
- Components for Cellular Applications
- Open Foundry Services

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RFMD Product Selection Guide

RFMD is a global leader addressing the RF industry's complex challenges by delivering a broad portfolio of high-performance RF components for a diverse range of applications and end markets. Our product leadership, extensive portfolio breadth, and exceptional technical support enable us to accelerate our customers' time to market.

AS9100, ISO 9001: 2008 Certified, ISO 14001: 2004 Certified, ISO/TS 16949: 2009 Certified, OHSAS 18001: 2007 Certified

APPLICATION DIAGRAMS/PACKAGE INFORMATION

New Products Preview

InGaP Active Bias Gain Blocks

- Cost effective gain block family
- Active bias provides stable performance over temperature

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Small Signal Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
NEW	50	1000	15.1	4.0	18.8	39.3	5.0	82	SOT-89	RFGA0014
NEW	50	1000	20.4	3.5	20.1	37.8	5.0	80	SOT-89	RFGA0024
NEW	50	3000	15.1	4.3	18.8	30.5	5.0	68	SOT-89	RFGA2044
NEW	50	3000	18.8	3.6	20.0	30.5	5.0	68	SOT-89	RFGA2054

Digital Variable Gain Amplifiers

- Wideband digital variable gain amplifier
- Excellent linearity versus DC power

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Number of Bits	Gain (dB)	Step Size (dB)	P1dB (dBm)	OIP3 (dBm)	Channels	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
NEW	400	2700	6	29.5	0.5	25.0	46.0	One	5.0	180.0	MCM	RFDA2125

Voltage-Controlled Attenuators

- RFSA2033 offers lowest insertion loss
- RFSA2113 offers microwave frequency coverage

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Insertion Loss (Min) (dB)	Gain Control Range (dB)	IP1dB (dBm)	IIP3 (dBm)	Supply Voltage (V)	Package	Part Number
NEW	50	6000	1.0	25.0	24.0	40.0	5.0	QFN	RFSA2033
NEW	50	18000	2.5	34.0	29.0	45.0	5.0	MCM	RFSA2113

Linear Power Amplifiers

- Output stages for small-cell base stations
- Improved ACPR with pre-distorion correction
- Good efficiency and gain

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	OP1dB (dBm)	P_{OUT} (dBm)	ACPR (Uncorrected) (dB)	V_{cc} (V)	I_{cc} (mA)	Package	Part Number
NEW	700	2700	36.0	31.4	21.0	-45.0	5.0	305.0	MCM	RFPA2016
NEW	700	2700	38.0	33.0	24.0	-48.0	5.0	623.0	MCM	RFPA2026
NEW	700	2700	15.0	38.0	30.0	-33.0	10.0	275.0	MCM	RFPA2156

High-Linearity Driver Amplifiers

- PA Driver Amplifiers for base station applications

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	OP1dB (dBm)	OIP3 (dBm)	Gain (dB)	NF (dB)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
NEW	700	2700	33.0	50.0	21.5	4.3	5.0	855.0	QFN	RFPA3805
NEW	700	2700	29.7	45.0	14.1	5.3	5.0	265.0	DFN	RFPA2224
NEW	700	2700	32.8	47.0	13.0	5.0	5.0	455.0	DFN	RFPA2235

High-Power GaN Unmatched Power Transistors

- Uses an advanced 0.5µm GaN process
- Excellent peak drain efficiency
- Excellent gain flatness over broadband frequency

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	P_{SAT} (dBm)	Drain Efficiency (%)	V_D (V)	I_{DQ} (mA)	Package	Condition	Part Number
NEW	DC	4000	16.0	35.4	60.0	28.0	44.0	SOIC-8	CW at 2.14GHz	RFHA3960

High-Power GaN Matched Power Transistors

- High peak pulsed power
- High peak drain efficiency
- Optimized I/O match for broadband performance

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	P_{SAT} (dBm)	Drain Efficiency (%)	V_D (V)	I_D (mA)	Package	Condition	Part Number
NEW	1200	1400	16.0	57.0	55.0	50.0	750.0	RF565-2	100µsec PW 10% DC	RFHA1027
NEW	1200	1400	26.5	52.0	48.0	45.0	350.0	RF565-10	100µsec PW 10% DC	RFHA1028
NEW	3100	3500	26.0	47.5	45.0	50.0	262.0	FRMD-8	100µsec PW 10% DC	RFHA1021U

WiFi and Connectivity HIgh-Power Amplifiers

- Utilizes new DFN package and process for footprint compatible parts

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	P_{OUT} (dBm)	EVM (%)	Gain (dB)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
NEW	2200	2700	26.0	2.5	13.5	5.0	570.0	DFN	RFPA2226
NEW	4900	5900	25.0	2.5	9.0	5.0	650.0	DFN	RFPA5026

WiFi CPE Front End Modules

- Improved linearity to address 256QAM operation
- Optimized for CPE (Customer Premise Equipment) applications

	Freq Range (GHz)	Functionality	WiFi Standard	Gain (dB)	Linear P_{OUT} (dBm)	EVM (%)	V_{CC} (V)	Current at Po (mA)	Package Style (dim. in mm)	Part Number
NEW	2.4 to 2.5	PA + SP3T + LNA	11b/g/n	26.5	19.5	2.5	3.3	210	LGA 3.0 x 3.0	RFFM4203
					21.5		5.0	260		
NEW	2.4 to 2.5	PA + SPDT + LNA	11b/g/n	32.0	20.0	1.8	3.3	260	LGA 4.0 x 4.0	RFFM4205
					21.5	3.0		295		
NEW	2.4 to 2.5	PA + SPDT + LNA	11b/g/n	32.0	24.5	1.8	5.0	370	LGA 6.0 x 6.0	RFFM4204
					25.5	3.0		420		
NEW	4.9 to 5.85	PA + SPDT + LNA	11a/n/ac	26.0	17.0	2.5	3.3	200	LGA 3.0 x 3.0	RFFM4501
NEW	4.9 to 5.85	PA + SPDT + LNA	11a/n/ac	29.0	18.0	1.8	3.3	230	LGA 3.0 x 3.0	RFFM4501F
					20.0		5.0	280		

2.4GHz WiFi Front End Modules

- Devices average 18dBm of 11ac 256 QAM linear power capability (40MHz)
- Small packages delivering optimum space and layout savings in today's shrinking form-factor applications
- MIrrored variants allow for alignment with all of the leading chipset provider solutions

	Functionality	11g/n P_{OUT} (dBm)	11b P_{OUT} (dBm)	11b/g/n Gain (dB)	11g/n EVM (%)	LNA Gain (dB)	LNA Noise Figure (dB) (including switch)	V_{CC} (V)	11g/n Operating Current (mA)	11b Operating Current (mA)	Package	Part Number
NEW	PA with Harmonic Filter and PDET, SP3T, LNA with Bypass	19.0	22.0	26.0	2.5	11.0	2.5	3.3	230.0	275.0	QFN	RFFM8205
NEW	PA with Harmonic Filter and PDET, SP3T, LNA with Bypass	19.0	22.0	26.0	2.5	11.0	2.5	3.3	230.0	275.0	QFN	RFFM8209

5GHz WiFi Front End Modules

- Devices average 17.5dBm of 11ac 256 QAM linear power capability (80MHz)
- Small packages delivering optimum space and layout savings in today's shrinking form-factor applications
- Mirrored variants allow for alignment with all of the leading chipset provider solutions

	Architecture	WiFi Standard	Freq (GHz)	Gain (dB)	Avg P_{OUT} (dBm)	EVM %	V_{CC} (V)	Current at Po (mA)	Package (dim. in mm)	Part Number
NEW	5GHz FEM, PA, SPDT SW, LNA, LPF, and PDET	11a/n/ac	4.9 to 5.85	29.0	16.0	1.8	3.0 to 4.8	190	QFN 2.5 x 2.5 x 0.40	RFFM8505
NEW					18.0	2.5	3.0 to 4.8	210		RFFM8509
NEW	5GHz FEM, PA, SPDT, HF, and LNA	11a/n/ac	4.9 to 5.85	29.0	16.0	1.4	3.0 to 4.8	210	QFN 2.5 x 2.5 x 0.45	RFFM8506
					19.0	3.0		270		

Smart Energy AMI/ZigBee® Power Amplifiers/LNA/Switch Front End Modules

- Highest level of integration for these Industrial, Scientific, Medical (ISM) Band applications
- Best-in-class harmonic performance, simplifying traditional RF layout and design challenges
- Industry leading current consumption for ZigBee/AMI/HAN applications
- Small footprint for targeting low-power consumption form factors

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	PA Gain (dB)	P_{OUT} (dBm)	OP1dB (dBm)	V_{CC} (V)	PA I_{CC} (mA)	Efficiency (%)	LNA Gain (dB)	NF (dB)	LNA I_{CC} (mA)	Switch Type	Package	Part Number
NEW	433	470	25.0	30.0	28.5	3.6	1100.0	50.0	15.0	1.9	5.0	SP3T	Module-28	RFFM6403
NEW	868	928	25.0	30.0	28.5	3.6	850.0	52.0	16.0	1.7	5.0	SP3T	Module-28	RFFM6903
NEW	2400	2500	25.0	23.0	23.0	3.3	175.0	45.0	9.0	3.0	7.0	DPDT	Module-24	RFFM6201
NEW	2400	2500	15.0	13.0	13.0	3.0	20.0	50.0	12.0	2.0	4.0	SP3T	QFN-16	RFFM6204

Smart Energy AMI/ZigBee® Power Amplifiers/Switch Front End Modules

- Fully integrated module supporting Southern Europe AMR/AMI/HAN applications
- Small footprint and high integration level with best-in-class harmonics
- Simplifies traditional RF performance and layout challenges

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	PA Gain (dB)	P_{OUT} (dBm)	OP1dB (dBm)	V_{CC} (V)	PA I_{CC} (mA)	Efficiency (%)	Switch Type	Package	Part Number
NEW	168	171	27.0	27.0	25.0	3.6	400.0	55.0	SP2T	Module-32	RFFM6500
NEW	405	475	30.0	30.0	29.0	3.6	750.0	60.0	SP2T	Module-28	RFFM6401

Switches (Packaged)

- General purpose broadband RF switch with low insertion loss and high linearity

	Switch Type	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Insertion Loss (dB)	Isolation (dB)	Switching Speeds (ns)	OP1dB (dBm)	V_{CC} (V)	Package	Part Number
NEW	SPDT	5	6000	0.35	28.0	2000.0	41.0	3.0	QFN	RFSW1012
NEW	SPDT	5	6500	0.55	29.0	300.0	—	3.0	QFN	RFSW8000

≥1GHz Power Doublers

- High output featuring GaN based amplifiers
- Maximum frequency bandwidth up to 1600MHz
- Industry standard SOT-115J or surface mount Multi-Chip-Module (MCM)

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Power Gain at F_{MAX} (Min) (dB)	Current (Max) (mA)	Max NF (dB)	Package	Part Number
NEW	40	1000	22.5	480.0	3.70	SOT-115J	RFPD2940
NEW	40	1600	22.5	450.0	4.00	SOT-115J	RFPD3020
NEW	40	1000	22.5	450.0	4.00	MCM - 8x9	RFCM2680
NEW	40	1000	24.5	450.0	5.00	MCM - 11x8.5	RFCM3050

≥1GHz Push-Pull Hybrid Amplifiers

- Flexible gain control Push Pull amplifiers
- Integrated CATV Head-End EQAM application
- Industry standard SOT-115J or surface mount Multi-Chip-Module (MCM)

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Power Gain at F_{MAX} (Min) (dB)	Current (Max) (mA)	NF (Max) (dB)	Package	Part Number
NEW	40	1000	28.5	270.0	5.0	SOT_115J	RFPP2870
NEW	40	1000	20.0-28.0	410.0	5.0	MCM 11x11	RFAM2790
NEW	40	1000	28.0-34.0	410.0	5.0	MCM 11x11	RFAM3060
NEW	40	1000	28.5	270.0	5.0	MCM 11x8.5	RFCM3080

Reverse Path Hybrid Amplifiers

- Expanded Maximum frequency up to 300 MHz
- High gain and excellent linearity
- Industry standard SOT-115J package

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Power Gain at F_{MAX} (Min) (dB)	Current (Max) (mA)	NF (Max) (dB)	Package	Part Number
NEW	5	100	37.6	160.0	4.2	SOT-115J	RFRP2920
NEW	5	300	30.0	160.0	6.3	SOT-115J	R3005300L
NEW	5	300	35.0	160.0	5.5	SOT-115J	RFRP3120

CATV 75Ω Push-Pull Amplifier ICs

- Leading linearity versus supply current
- Supports both forward and return path amplification

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	CTB (dBc)	CSO (dBc)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
NEW	5	1000	17.4	4.0	23.0	40.0	-76.0	-80.0	5.0	215.0	SOIC-8	RFCA1008*

* Channel Loading: 34dBmV, 79 channels, flat

CATV 75Ω Single-Ended Linear Amplifiers

- High gain, low distortion MMIC amplifier
- Integrated active bias provides stable gain over temperature and process

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
NEW	50	1000	21.0	3.0	24.0	41.0	8.0	140.0	SOT-89	RFCA3306

CATV Digital Step Attenuators

- 75Ω digital attenuator with excellent step accuracy and linearity

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Number of Bits	Step Size (dB)	Attenuation Range (dB)	Insertion Loss (dB)	IIP3 (dBm)	V_{CC} (V)	Package	Part Number
NEW	5	2000	6	0.5	31.5	1.3	52.0	5.0	MCM	RFSA2654

CATV Voltage-Controlled Attenuators

- Fully monolithic attenuator with a temperature compensated linear in DB control profile
- Excellent linearity

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain Control Range (dB)	Min. Insertion Loss (dB)	CTB* (dBc)	CSO* (dBc)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
NEW	50	3000	35.0	2.5	-70.0	-65.0	5.0	1.0	QFN	RFSA3013
NEW	50	3000	35.0	2.7	-70.0	-65.0	3.3	1.0	QFN	RFSA3023

*112 Channel, +39dBmV input flat tilt

High-Reliability Amplifiers

- Wide bandwidth, low-voltage amplifiers
- Packaged and tested for harsh environments

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
NEW	50	6000	20.0	4.2	19.0	35.0	5.0	71.0	2L Gullwing	SBB-5082S

InGaP Active Bias Gain Blocks

- Active bias provides stable performance over temperature
- Runs directly off a 5V supply with no dropping resistor required
- Flat gain over frequency bandwidth

Table 01

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Small Signal Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	V_{cc} (V)	I_{cc} (mA)	Package	Part Number
	50	850	15.5	3.5	19.0	43.0	5.0	90.0	SOT-89	SBB1089Z
	50	850	20.0	2.7	20.0	43.0	5.0	90.0	SOT-89	SBB2089Z
	50	6000	16.4	3.9	15.2	29.5	5.0	42.0	SOT-89	SBB3089Z
	50	6000	15.5	4.5	19.5	35.0	5.0	80.0	SOT-89	SBB4089Z
	50	6000	20.0	4.2	20.5	35.0	5.0	75.0	SOT-89	SBB5089Z
NEW	50	1000	15.1	4.0	18.8	39.3	5.0	82.0	SOT-89	RFGA0014
NEW	50	1000	20.4	3.5	20.1	37.8	5.0	80.0	SOT-89	RFGA0024
NEW	50	3000	15.1	4.3	18.8	30.5	5.0	68.0	SOT-89	RFGA2044
NEW	50	3000	18.8	3.6	20.0	30.5	5.0	68.0	SOT-89	RFGA2054

InGaP Active Bias Gain Blocks (SBB Series)

- High-linearity InGaP HBT die
- Active bias network providing stable current over temperature
- Optimized for applications requiring excellent gain flatness

Table 02

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Small Signal Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	V_{cc} (V)	I_{cc} (mA)	Package	Part Number
	50	6000	16.4	3.9	15.2	29.5	5.0	42.0	Die	SBB3000
	50	6000	16.0	4.2	19.5	36.5	5.0	82.0	Die	SBB4000
	50	6000	20.5	3.9	20.5	35.0	5.0	75.0	Die	SBB5000

SiGe Active Bias Gain Blocks (SGC Series)

- Active bias provides stable performance over temperature
- 3V and 5V supply voltage with no dropping resistor

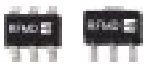


Table 03

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Small Signal Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	V_{cc} (V)	I_{cc} (mA)	Package	Part Number
	50	3500	19.5	2.4	19.2	32.8	5.0	82.0	SOT-89	SGC6489Z
	50	4000	14.0	3.3	15.1	30.0	3.0	55.0	SOT-363	SGC4263Z
	50	4000	12.8	3.7	18.6	34.5	5.0	84.0	SOT-89	SGC6389Z
	50	4000	13.1	3.7	10.1	23.0	3.0	26.0	SOT-363	SGC2363Z
	50	4000	12.7	4.0	12.4	26.5	3.0	54.0	SOT-363	SGC4363Z
	50	4000	14.4	3.5	10.5	23.5	3.0	26.0	SOT-363	SGC2463Z
	50	4000	14.4	3.7	12.9	27.0	3.0	52.0	SOT-363	SGC4463Z
	50	4000	20.5	1.7	15.6	28.5	3.0	48.0	SOT-363	SGC4563Z

SiGe Gain Blocks (SGA Series)

- Industry-leading 50Ω gain blocks
- Wide range of OP1dB, gain, and package styles

Table 04

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Small Signal Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	Min. V_{CC} (V)	I_{CC} (mA)	Package	Part Number
DC	2500	20.2	2.4	12.8	26.2	6.0	45.0	SOT-363	SGA4563Z
DC	3000	18.5	3.3	20.0	33.0	7.0	115.0	SOT-89	SGA7489Z
DC	3500	12.7	3.7	12.5	25.7	6.0	45.0	SOT-363	SGA4263Z
DC	3500	16.3	3.6	15.0	28.0	6.0	60.0	SOT-86	SGA5486Z
DC	3500	17.0	2.8	12.3	24.8	6.0	45.0	SOT-363	SGA4463Z
DC	3500	17.5	3.0	18.7	32.0	6.0	75.0	SOT-89	SGA6489Z
DC	3500	20.0	3.0	19.0	32.0	6.0	80.0	SOT-89	SGA6589Z
DC	4000	15.0	2.5	-9.5	1.0	3.6	8.0	SOT-363	SGA1263Z
DC	4000	14.8	3.1	13.0	25.7	6.0	45.0	SOT-363	SGA4363Z
DC	4000	17.9	2.4	14.6	27.4	6.0	60.0	SOT-89	SGA5489Z
DC	4000	18.7	2.6	15.8	28.8	6.0	60.0	SOT-86	SGA5586Z
DC	4000	18.4	3.1	19.0	32.2	6.0	80.0	SOT-86	SGA6586Z
DC	4000	17.9	1.9	13.7	27.7	6.0	45.0	SOT-86	SGA4586Z
DC	4000	20.8	3.4	16.2	29.2	6.0	60.0	SOT-89	SGA5589Z
DC	4500	12.0	4.6	-1.8	9.8	5.0	8.0	SOT-363	SGA0163Z
DC	4500	12.6	4.0	15.0	29.3	5.0	60.0	SOT-363	SGA5263Z
DC	4500	12.6	4.0	17.8	32.0	6.0	75.0	SOT-89	SGA6289Z
DC	4500	14.0	4.2	18.9	32.6	6.0	80.0	SOT-89	SGA6389Z
DC	4500	15.4	3.5	15.0	28.1	6.0	60.0	SOT-89	SGA5389Z
DC	4500	14.6	3.1	13.0	26.9	6.0	45.0	SOT-86	SGA4386Z
DC	4500	15.9	2.8	12.8	26.7	6.0	45.0	SOT-86	SGA4486Z
DC	4500	16.4	3.3	18.5	32.0	6.0	75.0	SOT-86	SGA6486Z
DC	5000	17.2	3.0	2.3	14.0	5.0	11.0	SOT-363	SGA0363Z
DC	5000	9.2	5.0	12.4	25.5	6.0	45.0	SOT-86	SGA4186Z
DC	5000	9.3	4.4	6.7	19.6	5.0	20.0	SOT-86	SGA2186Z
DC	5000	9.8	4.4	6.2	18.0	5.0	20.0	SOT-363	SGA2163Z
DC	5000	9.7	5.0	12.1	25.4	6.0	45.0	SOT-363	SGA4163Z
DC	5000	12.7	3.8	14.4	28.1	6.0	60.0	SOT-89	SGA5289Z
DC	5000	12.0	3.7	13.0	26.5	6.0	45.0	SOT-86	SGA4286Z
DC	5000	12.0	4.9	14.0	27.2	6.0	60.0	SOT-86	SGA5286Z
DC	5000	13.0	3.8	11.3	24.8	5.0	35.0	SOT-86	SGA3286Z
DC	5000	13.5	3.5	6.1	18.0	5.0	20.0	SOT-363	SGA2263Z
DC	5000	14.0	3.5	7.0	19.4	5.0	20.0	SOT-86	SGA2286Z
DC	5000	13.6	3.8	10.9	24.1	5.0	35.0	SOT-363	SGA3263Z
DC	5000	13.5	4.0	19.0	34.0	6.0	80.0	SOT-86	SGA6386Z
DC	5000	14.9	4.0	14.7	29.0	6.0	60.0	SOT-86	SGA5386Z
DC	5000	15.3	3.2	7.5	19.5	5.0	20.0	SOT-86	SGA2386Z
DC	5000	16.1	3.2	7.2	19.0	5.0	20.0	SOT-363	SGA2363Z
DC	5000	16.7	3.2	7.5	20.8	5.0	20.0	SOT-86	SGA2486Z
DC	5000	17.1	3.0	7.2	18.0	5.0	20.0	SOT-363	SGA2463Z
DC	5000	18.0	3.2	12.5	26.9	5.0	35.0	SOT-86	SGA3486Z
DC	5000	19.0	3.2	11.0	24.6	5.0	35.0	SOT-363	SGA3463Z
DC	5000	20.0	2.5	12.5	25.0	5.0	35.0	SOT-86	SGA3586Z
DC	5000	21.5	2.7	12.5	24.5	5.0	35.0	SOT-363	SGA3563Z
DC	5500	15.9	3.5	10.5	23.1	5.0	35.0	SOT-363	SGA3363Z
DC	5500	12.4	4.2	17.8	33.0	6.0	75.0	SOT-86	SGA6286Z

GaAs Gain Blocks

- Internally matched input and output
- High frequency performance

Table 05

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Small Signal Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
DC	6000	12.0	3.7	13.0	26.0	4.8	40.0	SOT-89	RF3378
DC	6000	15.5	3.0	13.0	25.5	4.5	40.0	SOT-89	RF3377
DC	6000	18.9	3.5	17.5	32.0	6.0	65.0	SOT-89	RF3374
DC	6000	18.7	3.5	17.5	32.0	6.0	65.0	QFN	RF3394
DC	6000	19.8	2.0	11.5	23.4	5.0	35.0	SOT-89	RF3376

InGaP Gain Blocks

- Broadband performance with excellent thermal performance
- Increased breakdown voltage and minimal leakage current between junctions

Table 06

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Small Signal Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	V_D (V)	I_{CC} (mA)	Package	Part Number
DC	500	14.8	3.3	20.1	42.0	>7.5	90.0	SOT-89	SBF4089Z
DC	500	20.0	2.8	21.0	41.0	>7.5	90.0	SOT-89	SBF5089Z
DC	4000	19.0	3.2	14.0	26.5	3.9	35.0	Ceramic Micro-X	NBB-500
DC	4000	19.0	4.0	14.0	23.0	3.9	35.0	Ceramic MPGA	NBB-502
DC	5000	14.2	4.8	19.0	33.5	>7.5	80.0	SOT-86	SBA4086Z
DC	5000	14.6	4.8	19.0	33.5	>7.5	80.0	SOT-89	SBA4089Z
DC	5000	17.2	4.5	19.5	34.0	>7.5	80.0	SOT-86	SBA5086Z
DC	5000	18.0	4.5	19.5	34.0	>7.5	80.0	SOT-89	SBA5089Z
DC	6000	16.0	4.1	14.6	29.6	3.9	47.0	Plastic Micro-X	NLB-400
DC	8000	15.0	4.3	15.4	26.0	3.8	47.0	Ceramic MPGA	NBB-402
DC	8000	15.5	4.3	14.6	28.1	3.9	47.0	Ceramic Micro-X	NBB-400
DC	10000	12.0	4.9	14.1	28.6	3.8	50.0	Plastic Micro-X	NLB-300
DC	10000	12.0	5.0	14.9	28.9	4.6	50.0	Plastic Micro-X	NLB-310
DC	12000	12.5	4.9	15.2	24.0	4.7	50.0	Ceramic Micro-X	NBB-310
DC	12000	12.0	5.1	13.8	27.1	3.9	50.0	Ceramic Micro-X	NBB-300
DC	12000	12.0	5.5	14.8	23.5	3.9	50.0	Ceramic MPGA	NBB-302
DC	12000	12.5	4.9	15.8	24.0	4.6	50.0	Ceramic MPGA	NBB-312

pHEMT Low Noise Amplifiers

- Low noise figure <1.0dB
- Excellent output power
- Versatile with extended frequency ranges

Table 07

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Small Signal Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	V_{cc} (V)	I_{cc} (mA)	Package	Part Number
50	4000	12.8	0.8	22.7	39.5	5.0	90.0	SOT-89	SPF5189Z
50	4000	12.9	0.8	22.7	35.0	5.0	46.0	SOT-343	SPF5043Z
50	4000	12.2	0.7	23.4	40.5	5.0	90.0	QFN	SPF5122Z
800	4000	24.5	0.8	22.4	39.0	5.0	120.0	QFN	SPF5344Z
1550	1600	13.5	0.9	13.5	-17.5	2.3	8.0	SMT	RF2815

Low Noise Amplifiers

- Low noise figure <3.0dB, minimal matching components
- Excellent output power
- Versatile with extended frequency ranges

Table 08

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Small Signal Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	V_{cc} (V)	I_{cc} (mA)	Package	Part Number
5	1500	20.5	1.3	25.0	38.0	7.0	120.0	QFN	RF3827
5	2000	20.0	1.1	2.5	12.9	3.0	5.2	SOT-363	SGL0363Z
5	4000	23.0	2.0	5.3	11.0	3.0	11.0	QFN	SGL0622Z
45	2500	15.0	1.5	5.0	19.0	3.0	6.0	QFN	RF2884
50	4000	19.3	1.1	9.0	27.8	3.0	10.0	SOT-343	SGA8343Z
150	2500	20.0	1.4	14.0	26.0	3.0	22.0	SOT-23	RF2878
300	2500	11.7	1.9	16.0	15.0	3.0	8.0	SOIC-8	RF2304
400	4000	28.0	1.3	>10.0	>20.0	3.3	50.0	SOT-5-Lead	RF2373
800	3800	14.5	1.3	>10.0	>20.0	3.0	7.0	QFN-8	RF2374*
900	4000	14.0	1.3	12.0	22.0	3.0	7.0	SOT-6	RF2370*
900	4000	14.0	1.3	14.0	23.0	3.3	8.5	QFN-16	RF3857
1550	1600	13.5	0.9	13.5	-17.5	2.3	8.0	SMT	RF2815
1560	1590	13.8	1.8	—	—	2.7	8.0	Module	RF2817
1560	1590	14.0	1.55	—	—	2.7	7.0	Module	RF2818
4900	5900	12.0	1.8	8.0	21.0	3.3	12.0	QFN-8	RF5601*
4900	5900	11.0	1.7	10.0	22.0	3.3	12.0	QFN-8	RF5515

*Integrated bypass

Analog Variable Gain Amplifiers

- Amplifiers with voltage variable attenuators
- High linearity power control, >20dB range
- Excellent gain flatness

Table 09

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	P_{OUT} at Rated ACPR (dBm)	Output P1dB (dBm)	OIP3 (dBm)	ACPR (dBc)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
	400	2700	29.0	10.0	24.0	40.0	-64.0	5.0	185.0	MCM	RFVA0016

Digital Variable Gain Amplifiers

- Amplifiers with digital step attenuators
- Serial and dual channels available
- High linearity power control

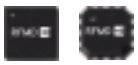


Table 10

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Number of Bits	Gain (dB)	Step Size (dB)	P1dB (dBm)	OIP3 (dBm)	Channels	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
	5	1000	6	44.5	0.5	22.0	39.0	One	5.0	230.0	MCM	RFDA0066
	10	850	6	43.0	0.5	19.5	38.0	One	5.0	155.0	MCM	RFDA0045
	50	850	6	18.7	0.5	20.0	42.0	One	5.0	90.0	MCM	RFDA0025
	50	4000	6	17.6	0.5	20.4	37.7	One	5.0	82.0	MCM	RDA1005L
	50	1000	6	38.5	0.5	19.7	42.0	One	5.0	175.0	MCM	RFDA0016
	50	500	5	19.3	1.0	21.0	42.0	Two	5.0	240.0	QFN	RFDA0035
	300	1100	6	36.0	0.5	25.0	44.0	One	5.0	215.0	MCM	RFDA0056
	400	2700	6	13.0	0.5	19.0	39.0	Two	5.0	170.0	MCM	RFDA0047
	400	2700	6	18.5	0.5	19.0	38.0	Two	5.0	155.0	MCM	RFDA0057
	500	2500	6	11.5	0.5	25.0	43.0	One	5.0	115.0	MCM	RFDA2025
	850	1035	6	31.5	0.5	23.8	40.0	One	5.0	192.0	MCM	RFDA0026
	1800	2400	6	32.0	0.5	25.0	42.0	One	5.0	192.0	MCM	RFDA2026
	2000	2800	6	31.5	0.5	28.0	41.0	One	5.0	360.0	MCM	RFDA2046
NEW	400	2700	6	29.5	0.5	25.0	46.0	One	5.0	180.0	MCM	RFDA2125

Digital Step Attenuators

- Broadband 50MHz to 4000MHz operation
- Single supply, 3V to 5V operation
- High linearity, wireless infrastructure grade performance

Table 11

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Number of Bits	Step Size (dB)	Attenuation Range (dB)	Insertion Loss (dB)	IIP3 (dBm)	Interface	V_{CC} (V)	Package	Part Number
	5	2000	6	0.5	31.5	1.3	52.0	Serial	5.0	MCM	RFSA2654
	50	4000	5	0.5	15.5	1.3	49.0	Serial	5.0	MCM	RFSA2514
	50	4000	5	1.0	31.0	1.3	49.0	Serial	5.0	MCM	RFSA2524
	50	4000	6	0.5	31.5	1.2	48.0	Serial	5.0	MCM	RFSA2644
	50	4000	7	0.25	31.75	1.1	50.0	Serial	5.0	MCM	RFSA2724

Voltage-Controlled Attenuators

- 3V and 5V versions available
- High linearity suitable for wireless and CATV infrastructure applications
- Linear in dB control characteristic

Table 12

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Insertion Loss (Min) (dB)	Gain Control Range (dB)	IP1dB (dBm)	IIP3 (dBm)	Supply Voltage (V)	Package	Part Number
	50	3000	2.5	35.0	30.0	50.0	5.0	QFN	RFSA3013
	50	3000	2.7	35.0	30.0	50.0	3.3	QFN	RFSA3023
	50	4000	2.6	33.2	30.0	50.0	5.0	QFN	RFSA2013
	50	4000	2.6	33.2	30.0	50.0	3.3	QFN	RFSA2023
NEW	50	6000	1.0	25.0	24.0	40.0	5.0	QFN	RFSA2033
NEW	50	18000	2.5	34.0	29.0	45.0	5.0	MCM	RFSA2113

Temperature-Compensating Attenuators

- 3V and 5V versions available
- High linearity suitable for wireless and CATV infrastructure applications
- Selectable attenuation versus temperature slopes

Table 13

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain Range Over Temperature (dB)	Gain Slope (dB/°C)	IP1dB (dBm)	IIP3 (dBm)	Supply Voltage (V)	Package	Part Number
	50	4000	8	0.043-0.066	30.0	55.0	5.0	QFN	RFSA4013
	50	4000	8	0.045-0.066	30.0	55.0	3.3	QFN	RFSA4023

High-Efficiency Power Amplifiers

- Final stage power amplifier
- High efficiency amplifier
- High gain

Table 14

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Small Signal Gain (dB)	Efficiency (%)	P_{SAT} (dBm)	V_{CC} (V)	I_{CQ} (mA)	Package	Part Number
	100	1000	33.0	54.5	36.3	3.6	390.0	QFN	RF6886
	150	960	34.5	53.0	32.0	3.5	200.0	QFN	RF5110G
	380	960	32.0	65.0	28.0	3.6	230.0	QFN	RFPA0133

Linear Power Amplifiers

- Output stages for small-cell base stations
- Improved ACPR with pre-distortion correction
- Good efficiency and gain

Table 15

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	OP1dB (dBm)	P_{OUT} (dBm)	ACPR (Uncorrected) (dB)	V_{cc} (V)	I_{cc} (mA)	Package	Part Number
NEW	700	2700	36.0	31.4	21.0	-45.0	5.0	305.0	MCM	RFPA2016
NEW	700	2700	38.0	33.0	24.0	-48.0	5.0	623.0	MCM	RFPA2026
NEW	700	2700	15.0	38.0	30.0	-33.0	10.0	275.0	MCM	RFPA2156

High-Linearity Driver Amplifiers

- Pre-driver for base station power amplifiers
- Final LNA stages for wireless infrastructure
- OIP3 >40dBm

Table 16

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	OP1dB (dBm)	OIP3 (dBm)	Gain (dB)	NF (dB)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
	5	2500	24.5	43.0	17.0	4.7	5.0	135.0	SOT-89	SXB2089Z
	50	2700	24.7	38.5	19.2	3.7	5.0	138.0	SOT-89	RFPA2089
	150	960	36.0	49.0	15.0	3.2	7.0	650.0	SOIC-8	RFPA3800
	200	2200	23.0	40.0	12.5	3.0	5.0	150.0	SOT-89	RF3315
	400	2500	25.0	43.0	13.6	4.8	5.0	115.0	SOT-89	SXA389BZ
	400	2500	27.5	44.5	15.0	3.3	5.0	265.0	SOT-89	SXB4089Z
	400	2700	24.0	42.0	13.7	2.9	5.0	90.0	SOIC-8	RFPA3807
	400	2700	29.0	47.0	12.4	3.1	5.0	275.0	SOIC-8	RFPA3809
	400	2700	27.0	42.5	14.5	2.8	5.0	155.0	SOT-89	RFPA2189
	400	2700	27.0	41.5	15.7	3.8	5.0	165.0	QFN	RFPA2013
	400	2700	22.5	42.0	13.9	3.2	5.0	90.0	DFN	RFPA1012
	700	2200	33.8	45.0	13.7	5.2	5.0	445.0	SOF-26	SPB2026Z
NEW	700	2700	33.0	50.0	21.5	4.3	5.0	855.0	QFN	RFPA3805
NEW	700	2700	29.7	45.0	14.1	5.3	5.0	265.0	DFN	RFPA2224
NEW	700	2700	32.8	47.0	13.0	5.0	5.0	455.0	DFN	RFPA2235

Linear Amplifiers

- Low noise figure
- Small package styles

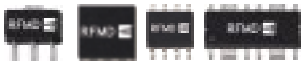


Table 17

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	OP1dB (dBm)	OIP3 (dBm)	Gain (dB)	NF (dB)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
	DC	2500	18.5	33.0	15.1	4.2	5.5	100.0	SOIC-8	RF2312
	DC	3000	22.0	37.0	14.3	4.9	9.3	180.0	CJ2BAT0	RF2317
	5	65	25.0	37.5	25.4	3.0	12.0	130.0	SOIC-8	CGR-0118Z
	50	3000	22.9	38.5	11.7	3.2	5.0	128.0	SOT-89	SXE1089Z
	50	3000	13.5	35.0	14.5	1.6	3.3	23.0	DFN	RFGA2012

High-Linearity Discrete Transistors

- Low noise figure
- Low current consumption
- PA stage for medium-power applications

Table 18

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Power Gain (dB)	OIP3 (dBm)	OP1dB (dBm)	NF (dB)	V_D (V)	I_D (mA)	Package	Part Number
	50	3500	14.0	34.6	20.6	2.4	3.3	86.0	SOT-343	SGA8543Z
	DC	6000	19.3	27.8	9.0	1.4	3.0	10.0	SOT-343	SGA8343Z
	50	3000	12.2	39.0	25.5	2.6	5.0	180.0	SOT-89	SGA9189Z

High-Power GaN Unmatched Power Transistors

- Uses an advanced 0.5µm GaN process
- Excellent peak drain efficiency
- Excellent gain flatness over broadband frequency

Table 19

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	P_{SAT} (dBm)	Drain Efficiency (%)	V_D (V)	I_{DQ} (mA)	Package	Condition	Part Number
	DC	3500	14.0	46.5	65.0	48.0	130.0	RF360-2	CW at 2.14GHz	RF3931
	DC	3500	14.0	48.7	66.0	48.0	220.0	RF360-2	CW at 2.14GHz	RF3932
	DC	3500	13.5	49.5	65.0	48.0	300.0	RF360-2	CW at 2.14GHz	RF3933
	DC	3500	13.0	51.46	60.0	48.0	440.0	RF360-2	CW at 2.14GHz	RF3934
	DC	4000	13.0	51.46	60.0	48.0	440.0	Die	CW at 2.14GHz	RF3934D
	DC	4000	13.5	49.5	65.0	48.0	300.0	Die	CW at 2.14GHz	RF3933D
	DC	4000	14.0	46.5	65.0	48.0	130.0	Die	CW at 2.14GHz	RF3931D
	DC	4000	14.0	48.75	66.0	48.0	220.0	Die	CW at 2.14GHz	RF3932D
	DC	4000	14.5	47.8	60.0	48.0	540.0	RF360-2	CW at 2.14GHz	RFHA3944
	DC	4000	15.0	45.5	56.0	48.0	300.0	RF360-2	CW at 2.14GHz	RFHA3942
	DC	4000	19.0	42.0	70.0	48.0	55.0	Die	CW at 2.14GHz	RF3930D
	DC	10000	16.0	36.3	60.0	28.0	44.0	Die-on-Carrier	CW at 2.14GHz	RFHA1101
	DC	10000	16.0	36.3	60.0	28.0	44.0	Die	CW at 2.14GHz	RFHA1101D
NEW	DC	4000	16.0	35.4	60.0	28.0	44.0	SOIC-8	CW at 2.14GHz	RFHA3960

High-Power GaN Matched Power Transistors

- High peak pulsed power
- High peak drain efficiency
- Optimized I/O match for broadband performance

Table 20

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	P_{SAT} (dBm)	Drain Efficiency (%)	V_D (V)	I_D (mA)	Package	Condition	Part Number
	960	1215	17.0	54.5	55.0	50.0	440.0	RF565-2	100µsec PW 10% DC	RFHA1025
	1200	1400	15.0	53.52	58.0	36.0	440.0	RF565-2	100µsec PW 10% DC	RFHA1023
	1200	1400	15.0	54.5	55.0	50.0	440.0	RF565-2	100µsec PW 10% DC	RFHA1020
NEW	1200	1400	16.0	57.0	55.0	50.0	750.0	RF565-2	100µsec PW 10% DC	RFHA1027
NEW	1200	1400	26.5	52.0	48.0	45.0	350.0	RF565-10	100µsec PW 10% DC	RFHA1028
NEW	3100	3500	26.0	47.5	45.0	50.0	262.0	FRMD-8	100µsec PW 10% DC	RFHA1021U
	2800	3400	12.0	54.5	52.0	50.0	440.0	RF565-2	100µsec PW 10% DC	RF3928
	2800	3400	13.0	55.8	50.0	65.0	440.0	RF565-2	100µsec PW 10% DC	RF3928B

High-Power GaN Broadband Power Transistors

- Ideal for linear and pulse applications
- Excellent broadband power performance
- Optimal for Doherty or envelope tracking

Table 21

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	OP1dB (W)	Linear Drain Efficiency (%)	V_D (V)	I_D (mA)	Package	Part Number
	700	1000	20.0	180.0	39.0	48.0	600.0	RF400-2	RFG1M09180
	700	1000	20.0	90.0	38.0	48.0	300.0	RF400-2	RFG1M09090
	1800	2200	15.0	180.0	36.6	48.0	600.0	RF400-2	RFG1M20180
	1800	2200	15.5	90.0	35.0	48.0	300.0	RF400-2	RFG1M20090

High-Power GaN Power ICs

- Excellent broadband power performance
- High peak power-added efficiency
- Small form factor, 50Ω input match

Table 22

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	OP3dB (dBm)	Power-Added Efficiency (%)	V_D (V)	I_D (mA)	Package	Condition	Part Number
	30	2500	11.0	39.0	40.0	28.0	55.0	AIN SOIC-8	CW Instantaneous BW	RF3826
	30	512	19.0	39.5	70.0	28.0	55.0	AIN SOIC-8	CW Instantaneous BW	RFHA1003
	50	1000	16.0	41.3	53.0	28.0	88.0	AIN SOIC-8	CW Instantaneous BW	RFHA1000
	225	1215	16.5	39.5	57.0	28.0	88.0	AIN SOIC-8	CW Instantaneous BW	RFHA1006

WiFi and Connectivity High-Power Amplifiers

- High gain, high P_{OUT} performance
- Optimized for CPE (Customer Premise Equipment) applications
- Improved linearity targeting all WiFi standards

Table 23

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	P_{OUT} (dBm)	EVM (%)	Gain (dB)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
	2000	2700	22.0	3.0	25.0	5.0	300.0	QFN	SZA2044Z
NEW	2200	2700	26.0	2.5	13.5	5.0	570.0	DFN	RFPA2226
	2300	2700	23.5	2.5	34.0	3.3	350.0	QFN	RF5602
	2300	2700	27.0	2.5	36.0	6.0	900.0	QFN	SZM2166Z
	2300	2700	28.0	2.5	36.0	5.0	950.0	QFN	RF5632
	2300	3800	30.0	3.0	11.0	6.0	900.0	QFN	RF5643
	2300	2700	30.0	2.5	35.0	5.0	1400.0	QFN	RF5652
	2400	2500	27.0	2.5	33.0	5.0	470.0	Laminate Package	RFPA5200
	2400	2500	29.0	2.5	33.5	5.0	850.0	Laminate Package	RFPA5201E
	2400	2700	26.5	2.5	34.0	5.0	710.0	QFN	SZM2066Z
	2700	3800	24.0	2.5	25.0	5.0	340.0	QFN	SZA3044Z
	3300	3800	26.0	3.0	30.0	5.0	500.0	QFN	RF5603
	3300	3800	26.0	3.0	30.0	5.0	480.0	QFN	RF5623
	3300	3800	26.0	2.5	34.0	5.0	760.0	QFN	SZM3066Z
	3300	3800	26.0	2.5	12.0	5.0	580.0	SOF-26	SZP3026Z
	3300	3800	27.0	2.5	35.0	5.2	900.0	QFN	SZM3166Z
	3300	3800	28.0	2.5	34.0	5.0	1050.0	QFN	RF5633
	4900	5900	22.0	3.0	28.0	5.0	270.0	QFN	SZA5044Z
	4900	5900	25.0	2.5	17.0	5.0	800.0	QFN	SZM5066Z
NEW	4900	5900	25.0	2.5	9.0	5.0	650.0	DFN	RFPA5026
	4900	5900	24.5	2.5	34.0	5.0	450.0	QFN	RF5626

WiFi CPE Front End Modules

- Improved linearity to address 256QAM operation
- Optimized for CPE (Customer Premise Equipment) applications

Table 24

	Freq Range (GHz)	Functionality	WiFi Standard	Gain (dB)	Linear P_{OUT} (dBm)	EVM (%)	V_{CC} (V)	Current at Po (mA)	Package Style (dim. in mm)	Part Number
NEW	2.4 to 2.5	PA + SP3T + LNA	11b/g/n	26.5	19.5	2.5	3.3	210	LGA 3.0 x 3.0	RFFM4203
					21.5		5.0	260		
NEW	2.4 to 2.5	PA + SPDT + LNA	11b/g/n	32.0	20.0	1.8	3.3	260	LGA 4.0 x 4.0	RFFM4205
					21.5	3.0		295		
NEW	2.4 to 2.5	PA + SPDT + LNA	11b/g/n	32.0	24.5	1.8	5.0	370	LGA 6.0 x 6.0	RFFM4204
					25.5	3.0		420		
	2.4 to 2.5	PA + SPDT	11b/g/n	34.0	25.5	2.5	5.0	435	LGA 6.0 x 6.0	RFFM4200
	2.4 to 2.5	PA + SPDT	11b/g/n	34.0	25.5	2.5	5.0	435	LGA 6.0 x 6.0	RFFM4201
	2.4 to 2.5	PA + SPDT	11b/g/n	34.0	27.5	2.5	5.0	925	LGA 6.0 x 6.0	RFFM4202
	2.4 to 2.5	PA + SPDT	11b/g/n	34.0	27.0	2.5	5.0	900	LGA 6.0 x 6.0	RF5605
	2.5 to 2.7	PA + SPDT	11b/g/n	34.0	27.0	2.5	5.0	825	LGA 6.0 x 6.0	RFFM7600
NEW	4.9 to 5.85	PA + SPDT + LNA	11a/n/ac	26.0	17.0	2.5	3.3	200	LGA 3.0 x 3.0	RFFM4501
NEW	4.9 to 5.85	PA + SPDT + LNA	11a/n/ac	29.0	18.0	1.8	3.3	230	LGA 3.0 x 3.0	RFFM4501F
					20.0		5.0	280		

WiFi and Connectivity High-Power Amplifier Reference Designs

- High efficiency and linear output power
- Gerber files and evaluation layout available

Table 25

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	P_{OUT} (dBm)	EVM (%)	Gain (dB)	V_{CC} (V)	I_{CC} (mA)	Reference Design BOM	Evaluation Board Part Number
2300	2400	29.0	3.0	32.0	5.0	1000.0	2-RF5602	RF5602HWB
2300	2500	>30.0	2.5	35.0	6.0	1400.0	SZA-2044 and RF5643	RF5643WDA
2400	2500	29.0	3.0	32.0	5.0	1000.0	2-RF5602	RF5602HWL
2500	2700	29.0	3.0	31.0	5.0	1200.0	2-RF5602	RF5602HWM
2500	2700	>30.0	2.5	35.0	6.0	1400.0	SZA-2044 and RF5643	RF5643WDB
2700	2900	>30.0	2.5	35.0	6.0	1500.0	SZA-3044 and RF5643	RF5643WDC
3300	3800	29.0	2.5	32.0	5.0	1500.0	SZA-3044 and SZP-3026	SZP3026HWD
3300	3800	>30.0	2.5	35.0	6.0	1500.0	SZA-3044 and RF5643	RF5643WDD
3300	3600	29.0	3.0	30.0	5.0	1000.0	2-RF5623	RF5623HL
3600	3800	29.0	3.0	30.0	5.0	1200.0	2-RF5623	RF5623HH
5100	5850	25.0	2.5	32.0	5.0	1000.0	STA-5063 and SZM-5066	SZM5066WD

Low-Noise Amplifier + Switch

- Integrated LNA with bypass and switch
- Integrated input and output match, reducing external components
- High-performance WiFi applications

Table 26

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Switch Type	Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	Switch Insertion Loss (dB)	IIP3 (dBm)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
2400	2500	SP3T	11.5	1.8	5.0	19.0	0.6	7.0	3.3	9.0	QFN	RF5501
2400	2500	SP3T	11.5	1.9	5.0	19.0	0.6	7.0	3.3	9.0	QFN	RF5521
2400	2500	SP3T	11.0	2.2	5.0	19.0	0.8	7.0	3.3	9.0	QFN	RF5611
4900	5850	SPDT	13.0	2.3	8.0	16.0	0.7	3.0	3.3	10.0	QFN	RF5540

2.4GHz WiFi Front End Modules

- Linear Power supporting 256 QAM operation
- Antenna sharing *Bluetooth*® and WLAN operation
- Efficiency targeting mobile applications

Table 27

	Functionality	11g/n P_{OUT} (dBm)	11b P_{OUT} (dBm)	11b/g/n Gain (dB)	11g/n EVM (%)	LNA Gain (dB)	LNA Noise Figure (dB) (including switch)	V_{CC} (V)	11g/n Operating Current (mA)	11b Operating Current (mA)	Package	Part Number
	PA, SP3T, Rx Balun, 2170 MHz and 2 Fo Filter	16.0	20.5	33.0	3.0	—	—	3.3	150.0	190.0	QFN	RF3482E
	PA, SP3T, 2 Fo Rejection	17.0	20.0	27.0	3.0	—	—	3.3	130.0	160.0	QFN	RF5325
	PA, SP3T, LNA, 2170 MHz and 20 Rejection	17.0	20.0	25.0	3.3	10.5	2.8	3.3	150.0	200.0	QFN	RF5345
	2.5GHz Amplifier, SP3T, Power Detector Coupler	18.0	21.0	25.0	2.5	—	—	3.3	170.0	210.0	QFN	RF5365
	2.5GHz Amplifier, SP3T, Power Detector Coupler	18.0	21.0	25.0	4.0	—	—	3.3	150.0	210.0	QFN	RF5375
	PA, SP3T, LNA, and 2 Fo Rejection	17.0	20.0	26.0	3.0	13.0	2.1	3.3	130.0	190.0	QFN	RF5725
	PA, SP3T, LNA, and 2 Fo Rejection	19.0	22.0	30.0	3.3	18.0	2.1	3.3	200.0	250.0	QFN	RF5755
	PA, LNA, SP3T Switch, and PDC	19.0	22.0	30.0	3.3	18.0	2.1	3.3	200.0	250.0	QFN	RF5765
	PA, SP3T, Rx Balun	17.0	20.0	30.0	3.0	—	—	3.3	180.0	240.0	QFN	RF5924
	PA, SP3T Switch, and POUT	20.0	23.0	25.0	3.0	—	—	3.3	250.0	300.0	QFN	RF5385
	PA, SP3T Switch, and POUT	20.0	23.0	25.0	3.0	—	—	3.3	250.0	300.0	QFN	RF5395
	PA, SP3T Switch, LNA LPF, and POUT	19.0	22.0	30.0	3.0	14.0	2.2	3.3	200.0	250.0	QFN	RF5565
	PA, SP3T, LNA, and 2 Fo Rejection	19.0	22.0	30.0	—	18.0	2.1	3.3	200.0	250.0	QFN	RFFM5765Q
	PA, SP3T, Rx Balun	16.0	21.0	33.0	—	—	—	3.3	150.0	190.0	QFN	RFFM3482Q
	PA, SP3T, LNA, and 2 Fo Rejection	18.0	22.0	24.0	2.0	13.0	2.0	3.3	185.0	210.0	Laminate Module	RFFM8200
	PA, SP3T, LNA, and 2 Fo Rejection	18.0	21.0	24.0	3.0	13.0	1.5	3.3	160.0	190.0	QFN	RFFM8202
	PA, SP3T, and 2 Fo Rejection	19.0	21.0	24.0	—	—	—	3.3	160.0	190.0	QFN	RFFM8204
NEW	PA with Harmonic Filter and PDET, SP3T, LNA with Bypass	19.0	22.0	26.0	2.5	11.0	2.5	3.3	230.0	275.0	QFN	RFFM8205
NEW	PA with Harmonic Filter and PDET, SP3T, LNA with Bypass	19.0	22.0	26.0	2.5	11.0	2.5	3.3	230.0	275.0	QFN	RFFM8209

5GHz WiFi Front End Modules

- High linear output power supporting 11ac 80MHz standard
- Integrated harmonic filter and core functions for complete front-end solution
- Efficiency targeting mobile applications

Table 28

	Architecture	WiFi Standard	Freq (GHz)	Gain (dB)	Avg P_{OUT} (dBm)	EVM %	V_{CC} (V)	Current at Po (mA)	Package (dim. in mm)	Part Number
NEW	5GHz FEM, PA, SPDT SW, LNA, LPF, and PDET	11a/n/ac	4.9 to 5.85	29.0	16.0	1.8	3.0 to 4.8	190	QFN 2.5 x 2.5 x 0.40	RFFM8505
NEW					18.0	2.5	3.0 to 4.8	210		RFFM8509
NEW	5GHz FEM, PA, SPDT, HF, and LNA	11a/n/ac	4.9 to 5.85	29.0	16.0	1.4	3.0 to 4.8	210	QFN 2.5 x 2.5 x 0.45	RFFM8506
					19.0	3.0		270		
	5GHz FEM, PA, SPDT, and HF	11a/n/ac	4.9 to 5.85	29.0	16.0	1.4	3.0 to 4.8	210	QFN 2.5 x 2.5 x 0.45	RFFM8504
					19.0	3.0	3.0 to 4.8	270		
	5GHz FEM, PA, SPDT SW, LNA, LPF, and PDET	11a/n	4.9 to 5.85	29.0	17.5	3.0	3.0 to 4.8	210	QFN 2.5 x 2.5 x 0.45	RFFM8502
	5GHz FEM, PA, SPDT SW, LNA, LPF, and PDET	11a/n	4.9 to 5.85	30.0	16.0	2.0	3.0 to 4.8	200	Laminate 3 x 3 x 1.1	RFFM8500
	5GHz FEM, PA, SW, LNA, LPF, and PDET	11a/n	4.9 to 5.85	32.0	15.5	2.5	3.0 to 4.8	175	QFN 3 x 3 x 0.5	RF5516
	5GHz FEM, PA, SW, LNA, LPF, and PDET	11a/n	4.9 to 5.85	32.0	15.5	2.5	3.0 to 4.8	175	QFN 3 x 3 x 0.5	RF5506
	5GHz FEM, PA, SW, LPF, and PDET	11a/n	4.9 to 5.85	27.0	15.5	3.0	3.0 to 4.8	150	QFN 3 x 3 x 0.5	RF5836

Dual-Band WiFi Front End Modules

- High efficiency
- High linear output power
- Fully integrated front end for both low band and high band

Table 29

	Functionality	11g/n P_{OUT} (dBm)	11a/n P_{OUT} (dBm)	11b/g/n Gain (dB)	11a/n Gain (dB)	11g/n EVM (%)	11a/n EVM (%)	V_{CC} (V)	11g/n Operating Current (mA)	11a/n Operating Current (mA)	Package	Part Number
	2.4GHz PA, SP3T, Rx Balun 5.0GHz PA, SPDT, Rx Balun	17.0	16.5	33.0	32.0	2.4	2.4	3.3	170.0	170.0	QFN	RF3688
NEW	2.4GHz PA, SP3T, LNA 5.0GHz PA, SPDT, LNA	19.0	17.5	24.0	28.0	2.5	3.0	3.3	190.0	215.0	Laminate	RFFM8800

WiFi Power Amplifiers

- High efficiency PA
- Optimized for battery applications

Table 30

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	P_{OUT} (dBm)	EVM (%)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
	400	2500	28.0	10.0	3.0	3.3	55.0	QFN	RF5373
	1800	2800	26.0	>18.0	4.0	3.0 to 5.0	500.0	QFN-16	RF5117
	2400	2500	28.0	>21.0	3.0	3.3 to 5.0	210.0	QFN	RF5112
	2400	2500	25.5	18.0	2.5	3.3	120.0	QFN	RF5122
	2400	2500	28.0	>21.0	3.0	3.3 to 5.0	210.0	QFN	RF5125
	2400	2500	34.0	18.0	3.0	3.3	130.0	QFN	RF5152
	2400	2500	25.0	>18.0	<4.0	3.0 to 5.0	220.0	QFN-12	RF5189
	2400	2500	31.0	17.0	3.0	3.6	125.0	QFN	RF5222
	2400	2500	25.5	18.0	2.5	3.3	120.0	QFN	RF5322
	2400	2500	30.0	18.0	3.0	3.3	95.0	QFN	RF5622*
	2400	2500	25.5	18.0	2.5	3.3	120.0	QFN	RF5722*
	3300	6200	10.0	4.0	14.0	3.3	52.0	SOT-363	STA5063Z
	4900	5850	30.0	18.0	4.0	4.0	265.0	QFN	RF5300
	4900	5850	28.0	17.0	3.0	3.3	140.0	QFN	RF5355
	4900	5850	29.0	>19.0	<3.0	3.3	200.0	QFN	RF5616*

*Integrated 2nd harmonic filter

Smart Energy AMI/ZigBee® Power Amplifiers

- High efficiency
- High output power

Table 31

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	P_{OUT} (dBm)	OP1dB (dBm)	V_{CC} (V)	I_{CC} (mA)	Efficiency (%)	Package	Part Number
	150	960	33.0	35.0	35.0	3.6	1500.0	57.0	QFN-16	RF5110G
	400	2500	28.0	20.0	22.0	3.6	90.0	45.0	QFN-8	RF5373
	868	2500	0 to 28.0	23.5	25.0	3.6	145.0	45.0	QFN-16	RF2172
	2400	2500	25.0	30.0	32.0	5.0	220.0	45.0	QFN-12	RF5189

Smart Energy AMI/ZigBee® Power Amplifiers/LNA/Switch Front End Modules

- Integrated harmonic filter
- Highly integrated, small form factor
- Antenna diversity switch

Table 32

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	PA Gain (dB)	P_{OUT} (dBm)	OP1dB (dBm)	V_{CC} (V)	PA I_{CC} (mA)	Efficiency (%)	LNA Gain (dB)	NF (dB)	LNA I_{CC} (mA)	Switch Type	Package	Part Number
NEW	433	470	25.0	30.0	28.5	3.6	1100.0	50.0	15.0	1.9	5.0	SP3T	Module-28	RFFM6403
	868	928	27.0	31.5	32.0	3.6	970.0	40.0	21.0	1.3	12.0	DPDT	Module-32	RF3858
	868	928	29.0	30.0	26.0	3.6	740.0	54.0	18.0	2.4	12.0	SP3T	Module-32	RF6509
	868	928	30.0	26.0	27.0	4.2	225.0	45.0	17.0	1.5	10.0	DPDT	Module-28	RF6519
	868	928	27.0	26.5	26.5	4.2	214.0	68.0	17.0	1.5	10.0	DPDT	Module-32	RF6549
	868	928	42.0	28.0	26.5	4.2	340.0	57.0	32.0	1.8	8.0	SPDT	Module-28	RF6559
	868	928	30.0	30.0	30.5	4.0	600.0	62.0	17.0	1.5	8.0	DPDT	Module-32	RFFM6901
	868	928	30.0	33.5	30.0	4.0	700.0	65.0	21.0	1.3	12.0	DPDT	Module-32	RFFM6904
NEW	868	928	25.0	30.0	28.5	3.6	850.0	52.0	16.0	1.7	5.0	SP3T	Module-28	RFFM6903
	2400	2500	27.0	23.0	26.0	3.3	220.0	35.0	12.5	2.2	10.0	SP3T	QFN-16	RF5745
	2400	2500	28.0	22.0	22.0	3.6	200.0	30.0	13.5	2.5	7.0	DPDT	QFN-20	RF6525
	2400	2500	28.0	23.0	23.0	3.3	240.0	35.0	11.5	3.0	8.0	DPDT	QFN-20	RF6535
	2400	2500	25.0	18.0	20.0	3.0	70.0	48.0	11.5	2.5	8.0	DPDT	Module-24	RF6555
	2400	2500	28.0	27.0	27.0	3.6	550.0	35.0	10.0	2.2	7.0	DPDT	QFN-20	RF6505
	2400	2500	28.0	22.0	22.0	3.3	200.0	35.0	11.5	2.5	8.0	DPDT	QFN-20	RF6575
	2400	2500	30.0	22.0	27.0	3.3	220.0	35.0	13.0	1.9	10.0	SP3T	QFN-16	RF5755
NEW	2400	2500	25.0	23.0	23.0	3.3	175.0	45.0	9.0	3.0	7.0	DPDT	Module-24	RFFM6201
NEW	2400	2500	15.0	13.0	13.0	3.0	20.0	50.0	12.0	2.0	4.0	SP3T	QFN-16	RFFM6204

Smart Energy AMI/ZigBee® Power Amplifiers/Switch Front End Modules

- Integrated harmonic filter
- Highly integrated, small form factor
- High gain, low noise

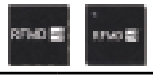


Table 33

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	PA Gain (dB)	P_{OUT} (dBm)	OP1dB (dBm)	V_{CC} (V)	PA I_{CC} (mA)	Efficiency (%)	Switch Type	Package	Part Number
NEW	168	171	27.0	27.0	25.0	3.6	400.0	55.0	SP2T	Module-32	RFFM6500
NEW	405	475	30.0	30.0	29.0	3.6	750.0	60.0	SP2T	Module-28	RFFM6401
	433	470	15.0	30.0	28.0	3.6	650.0	55.0	SP2T	Module-28	RF6504
	470	510	15.5	31.0	28.0	3.6	800.0	55.0	SP2T	Module-28	RF6514
	868	928	16.5	22.0	22.0	3.6	120.0	40.0	DPDT	Module-28	RF6539
	868	928	15.0	30.0	29.0	3.6	680.0	60.0	SP2T	Module-28	RF6569
	868	928	14.0	26.0	25.5	3.6	215.0	68.0	DPDT	Module-28	RF6599
	2400	2500	28.0	20.0	22.0	3.3	180.0	30.0	SP2T	QFN-20	RF6515
	2400	2500	28.0	22.0	22.0	3.3	200.0	35.0	DPDT	QFN-20	RF6545
	2400	2500	26.0	20.0	22.0	3.3	170.0	35.0	SP3T	QFN-16	RF5325

High-Frequency pHEMT Amplifiers

- Monolithically matched high OIP3 broadband pHEMT MMIC
- Low noise efficient amplifiers
- Broadband performance

Table 34

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	V_D (V)	I_D (mA)	Package	Part Number
DC	20000	9.5	4.8	13.7	24.3	5.0	46.0	QFN	SUF1033
DC	20000	10.5	4.5	14.0	26.0	5.0	46.0	Die	SUF1000

High-Frequency GaAs pHEMT Distributed Amplifiers (SDA Series)

- Directly coupled GaAs microwave monolithic MMIC
- Operating in the DC to 50GHz frequency range
- Support high-frequency commercial, military, and space applications

Table 35

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	OIP3 (dBm)	OP1dB (dBm)	OP3dB (dBm)	NF (dB)	I_{CC} (mA)	V_{CC} (V)	Package	Part Number
DC	20000	14.5	36.0	25.0	26.5	4.0	8.0	300.0	Die	SDA1000
DC	22000	12.0	38.0	24.0	25.0	6.0	8.0	410.0	Die	SDA2000
DC	24000	16.8	32.0	23.0	25.0	2.1	8.0	160.0	Die	SDA3000
DC	32000	14.5	27.0	18.0	22.0	3.2	5.0	160.0	Die	SDA4000
DC	35000	11.8	25.0	15.0	17.5	4.0	6.5	100.0	Die	SDA5000
DC	50000	8.0	24.0	14.5	16.5	5.0	5.0	80.0	Die	SDA6000
DC	40000	11.0	32.0	21.0	23.0	5.0	5.0	200.0	Die	SDA7000

High-Frequency Power Amplifiers

- Designed for use in high-frequency transmitters such as Point-to-Point and satellite communication
- >25dB of small-signal gain
- Optimized for linear operation with an output third order intercept point (OIP3) of ≥ +40dBm

Table 36

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Small Signal Gain (dB)	OIP3 (dBm)	V_D (V)	I_D (mA)	Package	Part Number
17700	19700	25.0	40.0	5.5	1.3A	QFN	RFPA1702

Direct Quadrature Modulators

- Cellular infrastructure-grade performance
- Low noise floor
- High linearity

Table 37

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	OIP3 (dBm)	Broadband Noise Floor (dBm/Hz)	Carrier Feedthrough (dBc)	Sideband Suppression (dBc)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
	700	1000	26.0	-160.0	-40.0	-40.0	5.0	185.0	QFN	RFMD0014
	1450	2700	26.0	-160.0	-40.0	-40.0	5.0	210.0	QFN	RFMD2014
	45	2700	18.0	-150.0	-45.0	-45.0	3.0	155.0	QFN	RFMD2080**
	45	2700	17.0	-162.0	-40.0	-45.0	3.0	135.0	QFN	RFMD2081*

* With integrated wideband fractional-N PLL/VCO
** With integrated baseband interface including baseband input biasing, baseband filtering, and gain control

Switches (Packaged)

- Broadband performance
- Excellent insertion loss and isolation
- Reflective and absorptive options

Table 38

	Switch Type	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Insertion Loss (dB)	Isolation (dB)	Switching Speeds (ns)	OP1dB (dBm)	V_{CC} (V)	Package	Part Number
	DPDT	10	6000	0.65	33.0	35.0	30.5	3.0	QFN	RFSW6223
	SP3T	DC	6000	0.5	27.0	25.0	27.0	3.0	DFN	RFSW6131
	SP3T	2400	2500	0.6	25.0	—	—	3.0 to 4.5	QFN	RF5570
	SP3T	2400	2500	0.6	23.0	—	—	3.0 to 4.5	QFN	RF5840
NEW	SPDT	5	6000	0.35	28.0	2000.0	41.0	3.0	QFN	RFSW1012
	SPDT	50	6000	0.75	70.0	150.0	—	5.0	QFN	RFSW6124
	SPDT	0.3	4000	0.3	26.0	40.0	28.0	2.5 to 5.0	SC70	RF3023
	SPDT	0.3	4000	0.3	26.0	40.0	28.0	2.5 to 5.0	SC70	RF3024
	SPDT	10	6000	0.6	58.0	120.0	30.0	3.0 to 5.0	QFN	RF3021
	SPDT	10	6000	0.5	52.0	120.0	30.0	3.0 to 5.0	QFN	RF3025
NEW	SPDT	5	6500	0.55	29.0	300.0	—	3.0	QFN	RFSW8000
	Transmit/Receive	DC	2500	1.0	24.0	12.0	—	3.0	SOT-23	RF2436

Discrete Switches

- Versatility of operation over broad range of frequency bands
- Excellent insertion loss and isolation performance
- Primary path and diversity options

Table 39

Switch Type	Part Number	Freq (MHz)	Control Lines	Control Voltage (V)	P0.1dB Max Power Handling (dBm)	Insertion Loss (dB)	Isolation (dB)	Switching Speed (µ/b)	IIP2 (dBm)	IIP3 (dBm)	Package (mm)	Notes
SPDT	RF1200	DC to 2500	2	0/+2.6	37.0	0.30	26.0	0.55	118.0	73.0	2.0 x 2.0 x 0.85	—
	RF1201	DC to 2500	2	0/+2.6	41.0	0.30	26.0	0.55	118.0	73.0	2.0 x 2.0 x 0.85	—
	RF1602	DC to 3500	1	0/+1.8	37.0	0.26	40.0	2.00	125.0	74.0	2.0 x 2.0 x 0.55	No DC blocks required
	RF1126	DC to 6000	2	0/+3.0	23.0	0.26	27.0	0.25	96.0	62.0	2.0 x 1.3 x 0.38	—
	RF1127	DC to 3500	1	0/+1.8	23.0	0.45	29.0	0.30	100.0	65.0	2.0 x 1.3 x 0.38	—
	RF1128	DC to 3500	2	0/+2.85	32.0	0.35	27.0	0.35	111.0	67.0	2.0 x 1.3 x 0.38	—
SP3T	RF1130	DC to 2500	2	0/+1.8	38.0	0.30	29.0	1.00	114.0	70.0	3.0 x 3.0 x 0.55	No DC blocks required
	RF1131	DC to 2500	3	0/+2.6	37.0	0.30	32.0	0.80	—	62.0	2.0 x 2.0 x 0.55	—
	RF1132	DC to 2500	3	0/+2.6	37.0	0.48	30.0	0.80	—	67.0	2.0 x 2.0 x 0.55	—
	RF1136	DC to 3500	2	0/+1.8	29.0	0.25	28.0	0.55	110.0	63.0	2.5 x 2.5 x 0.55	No DC blocks required
	RF1603A*	DC to 3500	2	0/+1.8	37.0	0.40	35.0	2.00	120.0	73.0	2.5 x 2.5 x 0.55	No DC blocks required
SP4T	RF1450	DC to 2500	2	0/+1.8	38.0	0.40	29.0	1.00	128.0	—	3.0 x 3.0 x 0.9	—
	RF1140	DC to 2500	2	0/+1.8	38.0	0.30	28.0	1.00	110.0	70.0	3.0 x 3.0 x 0.55	No DC blocks required
	RF1146	DC to 2500	2	0/+1.8	29.0	0.30	29.0	0.55	106.0	63.0	3.0 x 3.0 x 0.45	No DC blocks required
	RF1147	DC to 3500	2	0/+1.8	29.0	0.30	29.0	0.55	106.0	63.0	3.0 x 3.0 x 0.45	No DC blocks required
	RF1604*	DC to 3500	2	0/+1.8	37.0	0.40	35.0	2.00	115.0	73.0	2.5 x 2.5 x 0.55	No DC blocks required
SP5T	RF1156	DC to 2500	3	0/+1.8	28.0	0.35	29.0	0.55	108.0	60.0	3.0 x 3.0 x 0.85	No DC blocks required
DP4T	RF1226	DC to 2500	2	0/+2.6	26.0	0.22	27.0	0.35	106.0	68.0	2.0 x 2.0 x 0.55	—
	RF1622*	DC to 2500	1	0/+1.8	37.0	0.25	35.0	2.00	111.0	73.0	2.0 x 2.0 x 0.55	No DC blocks required
	RF1623	DC to 2700	1	0/+1.8	23.0	0.3	28.0	1.50	—	—	1.6 x 1.6 x 0.55	—
DP6T	RF1236	DC to 3500	3	0/+2.6	26.0	0.30	27.0	0.40	106.0	68.0	2.0 x 2.0 x 0.55	—
	RF1633*	DC to 2500	2	0/+1.8	32.0	0.35	26.0	2.00	111.0	73.0	2.0 x 2.0 x 0.55	No DC blocks required

* ESD enhanced > 2kV HBM

High-Power GaN Switches

- DC-6GHz wideband operation
- Low insertion loss and high isolation
- Hot switchable

Table 40

Switch Type	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Insertion Loss (dB)	Isolation (dB)	Switching Speed (ns)	OP0.1dB (dBm)	Package	Part Number
SPDT	30	6000	0.45	35.0	40.0	46.0	QFN	RFSW2100
SPDT	30	6000	0.25	40.0	40.0	46.0	Die	RFSW2100D

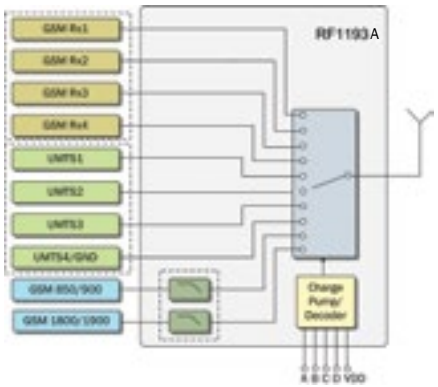
ASM/SFM/SDM Switches

- Excellent insertion loss and isolation performance
- Best-in-class linearity performance
- Various ASM, SFM, and SDM options from SP8T to SP10T

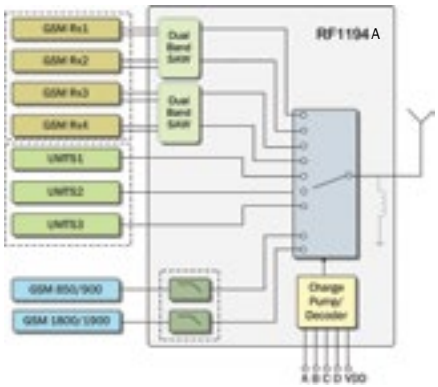
Table 41

Description	Band Coverage	Switch Type	V_{CC} (V)	Number of GSM Rx Ports	Number of Generic TRx Ports	Package (mm)	Part Number
Antenna Switch Module	QB GSM, QB UMTS	SP10T	2.5 to 3.3	4	4	3.0 x 3.8 x .85	RF1193A
Antenna Switch Module	QB GSM, TB UMTS	SP9T	2.5 to 3.3	4	3	3.0 x 3.8 x .85	RF1193B
Antenna Switch Module	TB GSM, PB UMTS	SP10T	2.5 to 3.3	3	5	3.0 x 3.8 x .85	RF8888
Antenna Switch Module	TB GSM, PB UMTS	SP10T	2.4 to 3.3	3	5	3.0 x 3.8 x .85	RF8889A
Antenna Switch Module	QB/TB GSM, QB/PB UMTS capable	SP10T	—	—	8	3.2 x 3.2 x 1.0	RF1291
Antenna Switch Module	QB/TB GSM, DB/TB UMTS capable	SP8T	—	—	6	3.2 x 2.5 x 1.0	RF1292
Switch Filter Module	QB GSM, TB UMTS	SP9T	2.5 to 3.3	4	3	4.5 x 4.5 x 1.0	RF1194A
Switch Filter Module	QB GSM, TB UMTS	SP9T	2.5 to 3.3	4	3	4.5 x 4.5 x 1.0	RF1194B
Switch Filter Module	QB GSM, QB UMTS	SP10T	2.5 to 3.3	4	4	4.5 x 4.5 x 1.0	RF1195
Switch Filter Module	TB GSM, Penta band UMTS capable	SP10T		3	5	3.2 x 3.5 x 1.1	RF1293
Switch Duplexer Module (Band 1)	QB GSM, TB UMTS	—	2.4 to 3.0	4	2	4.5 x 4.5 x 1.0	RF1196

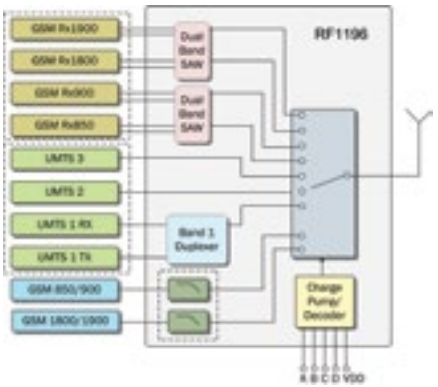
Antenna Switch Module



Switch Filter Module



Switch Duplexer Module



Upconverters

- Integrated I/Q mixer, LO amplifier, and output buffer amplifier
- Wide bandwidth with excellent image frequency rejection and high output power IP3
- Designed to meet requirements of next generation Point-to-Point systems

Table 42

RF Freq (Min) (MHz)	RF Freq (Max) (MHz)	IF Freq (Min) (MHz)	IF Freq (Max) (MHz)	LO Freq (Min) (MHz)	LO Freq (Max) (MHz)	Conversion Gain (dB)	OIP3 (dBm)	Image Rejection (dBc)	LO Input Power (Min) (dBm)	LO Input Power (Max) (dBm)	Dynamic Range	Bias (mA at V)	Package	Part Number
9000	14000	DC	4000	5000	18000	22.0	28.0	20.0	0	5.0	30.0	380 at 5.0	QFN	RFUV1002
12000	16000	DC	4000	8000	20000	22.0	28.0	20.0	0	5.0	30.0	380 at 5.0	QFN	RFUV1003
17700	23600	DC	4000	6850	13800	20.0	27.0	15.0	0	5.0	30.0	500 at 5.0	QFN	RFUV1702
21000	26500	DC	4000	8500	15250	20.0	27.0	15.0	0	5.0	30.0	500 at 5.0	QFN	RFUV1703

Downconverters

- Integrated I/Q mixer, LO amplifier, and output buffer amplifier
- Wide bandwidth combining excellent IMD3 performance with low noise figure
- Designed to meet requirements of next generation Point-to-Point systems

Table 43

RF Freq (Min) (MHz)	RF Freq (Max) (MHz)	IF Freq (Min) (MHz)	IF Freq (Max) (MHz)	LO Freq (Min) (MHz)	LO Freq (Max) (MHz)	Conversion Gain (dB)	NF (dB)	IIP3 (dBm)	Image Rejection (dBc)	LO Input Power (Min) (dBm)	LO Input Power (Max) (dBm)	Bias (mA at V)	Package	Part Number
9000	14000	DC	4000	5000	18000	14.0	1.7	4.0	15.0	0	5.0	210 at 4.0	QFN	RFRX1002
10000	15400	DC	4000	6000	19400	12.0	2.1	4.0	15.0	0	5.0	210 at 4.0	QFN	RFRX1001
17700	26500	DC	4000	6850	15250	13.0	2.5	6.0	15.0	0	5.0	350 at 3.0 to 5.0	QFN	RFRX1701
17700	19700	DC	4000	6850	11850	13.0	2.0	6.0	15.0	0	5.0	350 at 2.8 to 4.5	QFN	RFRX1702

Voltage-Controlled Oscillators

RFMD offers one of the industry's largest selections of discrete Voltage-Controlled Oscillator (VCO) modules. RFMD has a broad selection of oscillator topologies, resonator technologies, supply voltages, and substrate materials available, allowing us to provide customers with a VCO that meets specific cost, performance, and size requirements for their application. All RFMD® VCO modules are 100% RF-tested and RoHS-compliant. The following tables offer a sampling of component designs RFMD provides.

In addition to our vast library of existing VCO products, RFMD also provides custom developed modules. If you would like RFMD to consider designing a custom module, please fill out and submit the Custom VCO Request Form (www.rfmd.com/products/vco/customvcorequest.aspx) or contact us at 1.480.756.6070.

VCO Guide

Freq Range	Resonator	Previous Product Family Series	New Product Family Series	Table No.
10 to 400MHz	Aircoil	UMJ	RFVC66XX	45
25 to 3500MHz	Microstrip	UMS	RFVC64XX	46
50 to 4000MHz	Aircoil or Microstrip	VC0190, 191, 790, 793	RFVC7XXX	47-50
100 to 6000MHz	Microstrip	UMZ	RFVC2XXX	51
500 to 5000MHz	Ceramic	UMX	RFVC4XXX	52
800 to 4000MHz	Microstrip	UMV	RFVC62XX	53
4000 to 8000MHz	Microstrip	UMZ-T2	RFVC6XXX	54
4000 to 14900MHz	MMIC	—	RFVC18XX	44

Note: All new VCO designs will have part numbers beginning with RFVC.

MMIC VCOs

- No external resonator required
- Excellent phase noise performance
- Monolithic structure provides superior shock/vibration performance

Table 44

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Tuning Voltage (Min) (V)	Tuning Voltage (Max) (V)	Typical Phase Noise (dBc/Hz at 10kHz)	Typical Phase Noise (dBc/Hz at 100kHz)	V_{CC} (V)	P_{OUT} (dBm)	Package	Part Number
8000	12000	0	13.0	-66.0	-93.0	5.0	4.0	QFN	RFVC1800
5000	10000	0	18.0	-72.0	-96.0	5.0	3.0	QFN	RFVC1801
4000	8000	0	18.0	-74.0	-99.0	5.0	4.0	QFN	RFVC1802
6000	9000	0	15.0	-73.0	-97.0	5.0	3.5	QFN	RFVC1803
4450	5200	1.5	14.5	-84.0	-108.0	3.0	8.0	QFN	RFVC1821
5000	5500	0	12.0	-80.0	-103.0	3.0	9.0	QFN	RFVC1822
6100	6750	0	10.0	-76.0	-101.0	3.0	8.0	QFN	RFVC1823
7200	8300	1.5	14.0	-80.0	-106.0	3.0	12.0	QFN	RFVC1824
7800	8700	0	12.0	-80.0	-107.0	3.0	11.0	QFN	RFVC1825
6800	7400	0	12.0	-80.0	-103.0	3.0	12.0	QFN	RFVC1829
6600	7700	2.0	12.0	-90.0	-114.0	5.0	10.0	QFN	RFVC1830*
7300	8200	1.5	14.5	-91.0	-115.0	5.0	10.0	QFN	RFVC1831*
7900	8800	1.5	14.5	-90.0	-115.0	5.0	9.0	QFN	RFVC1832*
8400	9600	1.5	14.5	-90.0	-114.0	5.0	8.0	QFN	RFVC1833*
9000	10200	1.5	14.5	-90.0	-114.0	5.0	9.0	QFN	RFVC1834*
9600	10800	1.5	14.5	-88.0	-114.0	5.0	8.0	QFN	RFVC1835*
10400	11600	1.5	14.5	-89.0	-113.0	5.0	8.0	QFN	RFVC1836*
11100	12500	1.5	14.5	-88.0	-113.0	5.0	8.0	QFN	RFVC1837*
11570	12700	1.5	14.5	-87.0	-113.0	5.0	8.0	QFN	RFVC1838*
12100	13150	2.0	12.0	-87.0	-112.0	5.0	8.0	QFN	RFVC1838A*
11400	12620	1.5	14.5	-87.0	-113.0	5.0	8.0	QFN	RFVC1838B*
12440	13760	1.5	14.5	-87.0	-112.0	5.0	8.0	QFN	RFVC1839*
13600	14900	1.5	14.5	-84.0	-110.0	5.0	7.0	QFN	RFVC1840*
9300	10700	1.5	14.5	-90.0	-115.0	5.0	8.0	QFN	RFVC1842*
9800	11300	1.5	14.5	-90.0	-114.0	5.0	7.0	QFN	RFVC1843*
10800	12100	1.5	14.5	-88.0	-113.0	5.0	7.0	QFN	RFVC1844*

* Narrowband MMIC VCO with an integrated frequency divider providing additional FO/2 and FO/4 output.

VCOs for IF Conversion (UMJ and RFVC66xx Series)

- Ultra-low phase noise/low current
- Frequency: 10MHz to 400MHz
- Resonator: Aircoil
- PCB: Rogers
- Package size: 12.75 x 12.75mm

Applications

- IF conversion applications
- Low phase noise agile clock applications
- Low phase noise applications

Table 45

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Tuning Voltage (Min) (V)	Tuning Voltage (Max) (V)	K_{VCO} (MHz/V)	P_{OUT} (dBm)	Second Harmonic (dBc)	Phase Noise at 10kHz (dBc/Hz)	V_{CC} (V)	Part Number
50	60	1.0	4.0	4.5	9.0	-25.0	-124.0	5.0	UMJ-123-D14-G
180	190	0.5	4.5	3.6	9.0	-25.0	-128.0	5.0	UMJ-967-D14-G
200	200	0	5.0	1.0	9.0	-20.0	-133.0	5.0	UMJ-1106-R14-G
295	296	0	10.0	1.25	9.0	-25.0	-130.0	10.0	UMJ-1109-D14-G
400	400	1.0	4.0	4.0	9.0	-20.0	-125.0	5.0	UMJ-858-D14-G

Octave Band VCOs (UMS and RFVC64xx Series)

- Octave band tuning
- Frequency: 25MHz to 3500MHz
- Resonator: Microstrip
- PCB: Rogers
- Package size: 12.75 x 12.75mm

Applications

- Wide bandwidth applications
- Built-in test applications
- First LO applications
- Frequency synthesizers

Table 46

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Tuning Voltage (Min) (V)	Tuning Voltage (Max) (V)	K_{VCO} (MHz/V)	P_{OUT} (dBm)	Second Harmonic (dBc)	Phase Noise at 10kHz (dBc/Hz)	V_{CC} (V)	Part Number
25	50	1.0	15.0	2.4	9.0	-15.0	-125.0	12.0	UMS-50-R16-G
50	100	1.0	15.0	4.5	9.5	-30.0	-105.0	12.0	UMS-100-R16-G
500	1000	0.5	11.0	55.0	10.0	-20.0	-103.0	12.0	UMS-1000-A16-G
600	1200	0.5	12.0	60.0	12.0	-20.0	-104.0	12.0	UMS-1200-A16-G
2000	3000	1.0	14.0	90.0	10.0	-18.0	-98.0	12.0	UMS-3000-R16-G

5V Narrowband VCOs (VCO190 and RFVC7xxx Series)

- Linear tuning/low phase noise
- Multiple supply voltage and package options available
- Low cost/high-volume series
- Frequency: 40MHz to 4000MHz
- Resonator: Aircoil or microstrip
- PCB: FR-4 and S1170
- Package size: 12.75 x 12.75mm

Applications

- Wireless infrastructure
- RFID
- General wireless

Table 47

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Tuning Voltage (Min) (V)	Tuning Voltage (Max) (V)	K_{VCO} (MHz/V)	P_{OUT} (dBm)	Second Harmonic (dBc)	Phase Noise at 10kHz (dBc/Hz)	V_{CC} (V)	Part Number
100	200	1.0	16.0	7.0	0	-15.0	-114.0	5.0	VCO190-150TY
600	660	0.5	4.5	22.0	1.0	-13.0	-110.0	5.0	VCO190-630TY
845	875	1.0	4.0	15.0	3.0	-15.0	-113.0	5.0	VCO190-860TY
902	928	1.0	4.0	12.0	5.0	-15.0	-113.0	5.0	VCO190-915TY

3V Narrowband VCOs (VCO191 and RFVC7xxx Series)

Table 48

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Tuning Voltage (Min) (V)	Tuning Voltage (Max) (V)	K_{VCO} (MHz/V)	P_{OUT} (dBm)	2nd Harmonic (dBc)	Phase Noise at 10kHz (dBc/Hz)	V_{CC} (V)	Part Number
210	230	1.0	2.9	16.0	0	-13.0	-115.0	3.0	VCO191-220UY
760	786	0.4	2.6	18.0	-3.0	-12.0	-109.0	3.0	VCO191-773UY
889	915	0.4	2.6	18.0	-3.0	-14.0	-108.0	3.0	VCO191-902UY
902	928	0.4	2.6	18.0	-3.0	-16.0	-109.0	3.0	VCO191-915UY
2400	2500	0.4	2.7	55.0	-3.0	-15.0	-93.0	3.0	VCO191-2450UY

5V Wideband VCOs (VCO790 and RFVC7xxx Series)

Table 49

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Tuning Voltage (Min) (V)	Tuning Voltage (Max) (V)	K_{VCO} (MHz/V)	P_{OUT} (dBm)	2nd Harmonic (dBc)	Phase Noise at 10kHz (dBc/Hz)	V_{CC} (V)	Part Number
400	800	0.5	20.0	30.0	5.5	-5.0	-102.0	5.0	VCO790-600TY
950	2150	0.5	22.0	75.0	6.0	-8.0	-98.0	5.0	VCO790-1550TY
2400	2685	0.9	3.5	217.0	6.0	-21.0	-89.0	4.1	VCO790-2560KY
2865	3065	0.8	3.5	170.0	6.0	-20.0	-89.0	4.1	VCO790-2965KY

12V Wideband VCOs (VCO793 and RFVC7xxx Series)

Table 50

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Tuning Voltage (Min) (V)	Tuning Voltage (Max) (V)	K_{VCO} (MHz/V)	P_{OUT} (dBm)	2nd Harmonic (dBc)	Phase Noise at 10kHz (dBc/Hz)	V_{CC} (V)	Part Number
500	1000	0	20.0	40.0	6.0	-6.0	-104.0	12.0	VCO793-750TY
950	2150	0.5	22.0	75.0	7.0	-8.0	-98.0	12.0	VCO793-1550TY
1000	2000	0.5	20.0	75.0	7.0	-9.0	-100.0	12.0	VCO793-1500TY

Microstrip VCOs (UMZ and RFVC2xxx Series)

- Ultra-linear tuning/low phase noise
- Frequency: 100MHz to 6000MHz
- Resonator: Microstrip
- PCB: Rogers
- Package size: 12.75 x 12.75mm

Applications

- Frequency synthesizers
- Upconverters and Downconverters
- Instrumentation
- Wideband frequency applications

Table 51

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Tuning Voltage (Min) (V)	Tuning Voltage (Max) (V)	K_{VCO} (MHz/V)	P_{OUT} (dBm)	2nd Harmonic (dBc)	Phase Noise at 10kHz (dBc/Hz)	V_{CC} (V)	Part Number
100	100	0.5	4.5	1.0	9.0	-25.0	-135.0	5.0	UMZ-1155-R16-G
1460	1825	0.5	18.0	24.0	0.0	-20.0	-107.0	8.0	UMZ-1089-D16-G
1500	1600	0.5	4.5	36.0	2.0	-20.0	-108.0	5.0	UMZ-140-A16-G
3700	3700	0.5	5.0	50.0	3.0	-15.0	-102.0	5.0	UMZ-281-A16-G
4850	4950	0.5	4.5	50.0	3.0	-18.0	-95.0	8.0	UMZ-837-D16-G

Ultra-Low Noise CROs (UMX and RFVC4xxx Series)

- Ultra-linear tuning/ultra-low phase noise
- Frequency: 500MHz to 5000MHz
- Resonator: Ceramic
- PCB: Rogers
- Package size: 12.75 x 12.75mm

Applications

- Point-to-Point radio
- DRO/YIG multiplied replacements
- Low phase noise applications
- SAW VCO replacement

Table 52

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Tuning Voltage (Min) (V)	Tuning Voltage (Max) (V)	K_{VCO} (MHz/V)	P_{OUT} (dBm)	2nd Harmonic (dBc)	Phase Noise at 10kHz (dBc/Hz)	V_{CC} (V)	Part Number
818	847	3.0	12.0	5.5	6.0	-15.0	-120.0	7.0	UMX-870-D16-G
1045	1055	1.0	11.0	3.0	4.0	-13.0	-125.0	5.0	UMX-1035-D16-G
1780	1780	0.5	4.5	6.0	7.0	-16.0	-123.0	8.0	UMX-538-D16-G
2100	2120	0.5	4.5	9.5	7.0	-12.0	-120.0	8.0	UMX-599-D16-G
4000	4000	0.5	4.5	6.5	0	-15.0	-116.0	5.0	UMX-806-D16-G

Ultra-Linear Tuning VCOs (UMV and RFVC62xx Series)

- Linear tuning/100MHz frequency
- Frequency: 800MHz to 4000MHz
- Resonator: Microstrip
- PCB: Rogers
- Package size: 12.75 x 12.75mm

Applications

- Frequency synthesizers
- Upconverters and Downconverters
- Narrow V_{TUNE} and V_{CC} applications

Table 53

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Tuning Voltage (Min) (V)	Tuning Voltage (Max) (V)	K_{VCO} (MHz/V)	P_{OUT} (dBm)	2nd Harmonic (dBc)	Phase Noise at 10kHz (dBc/Hz)	V_{CC} (V)	Part Number
900	1000	0.5	4.5	36.0	0	-15.0	-110.0	5.0	UMV-950-R16-G
1800	1900	0.5	4.5	36.0	0	-20.0	-107.0	5.0	UMV-1850-R16-G
2200	2300	0.5	4.5	36.0	0	-20.0	-106.0	5.0	UMV-2250-R16-G
2400	2500	0.5	4.5	36.0	0	-20.0	-105.0	5.0	UMV-2450-R16-G
3900	4000	0.5	4.5	45.0	0	-15.0	-102.0	5.0	UMV-3950-R16-G

VCOs with Internal Doubler (UMZ-T2 and RFVC6xxx Series)

- Internal frequency doubler and buffer AMP
- ½ frequency output provided
- Frequency: 4000MHz to 8000MHz
- Resonator: Microstrip or Ceramic
- PCB: Rogers
- Package size: 12.75 x 12.75mm

Applications

- DRO replacements
- Higher frequency applications
- Wide bandwidth applications
- Test instrumentation

Table 54

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Tuning Voltage (Min) (V)	Tuning Voltage (Max) (V)	K_{VCO} (MHz/V)	P_{OUT} (dBm)	2nd Harmonic (dBc)	Phase Noise at 10kHz (dBc/Hz)	V_{CC} (V)	Part Number
4200	4400	2.0	10.0	75.0	0	-20.0	-97.0	5.0	UMZ-T2-1078-016-G
4460	4615	0.5	4.5	60.0	0	-18.0	-98.0	5.0	UMZ-T2-1045-016-G
5200	5800	1.0	12.0	80.0	0	-20.0	-95.0	8.0	UMZ-T2-1080-016-G
6525	6525	0.5	4.5	60.0	0	-20.0	-96.0	5.0	UMZ-T2-397-016-G
6600	8100	1.0	15.0	130.0	-2.0	-15.0	-86.0	5.0	UMZ-T2-447-016-G

Phase Locked Loop (PLL) Modules

RFMD offers complete Phase Locked Modules (PLLs) integrating a PLL IC, a VCO, loop filter components, and buffer amplifiers. RFMD has a broad selection of oscillator topologies, resonator technologies, supply voltages, and substrate materials available, allowing us to provide customers with a PLL solution that meets the specific cost, performance, and size requirements for their applications. All of RFMD's PLL modules are 100% RF-tested and RoHS-compliant. The following tables offer a sampling of component designs RFMD provides.

In addition to our vast library of existing PLL products, RFMD also provides custom developed modules. If you would like RFMD to consider designing a custom module, please fill out and submit the Custom PLL/PNP Request Form (www.rfmd.com/products/vco/customvcorequest.aspx) or contact us at 1.480.756.6070.

PLL Guide

Freq Range	Resonator	Previous Product Family Series	New Product Family Series	Table No.
100 to 3500MHz	Aircoil	PLL350	RFPK6XXX	55
700 to 2500MHz	Aircoil	PLL400	RFPK7XXX	56

Note: All new PLL modules will have part numbers beginning with RFPK.

5V Narrowband PLLs (PLL350 and RFPK6xxx Series)

- Low phase noise/fast settling time
- SPI BUS compatible
- Frequency: 100MHz to 3500MHz
- Resonator: Aircoil
- PCB: FR-4 and S1170
- Package size: 20.3 x 14.7mm

Applications

- Cellular infrastructure
- RFID
- General wireless

Table 55

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Step Size (Min) (kHz)	Settling Time to <1kHz (mS)	P_{OUT} (dBm)	Phase Noise at 100kHz (dBc/Hz)	Second Harmonic (dBc)	V_{CC1} (V)	Part Number
869	894	200.0	0.4	3.0	-123.0	-25.0	5.0	PLL350-881Y
1090	1150	100.0	15.0	2.0	-127.0	-15.0	5.0	PLL350-1120Y
1230	1290	100.0	15.0	2.0	-125.0	-15.0	5.0	PLL350-1260Y
2940	3048	125.0	25.0	2.0	-119.0	-35.0	5.0	PLL350-2944Y

5V Narrowband PLLs (PLL400 and RFPK7xxx Series)

- Low phase noise/fast settling time
- SPI BUS compatible
- Frequency: 700MHz to 2500MHz
- Resonator: Aircoil
- PCB: FR-4 and S1170
- Package size: 15.2 x 15.2mm

Applications

- Cellular infrastructure
- RFID
- General wireless

Table 56

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Step Size (Min) (kHz)	Settling Time to <1kHz (mS)	P_{OUT} (dBm)	Phase Noise at 100kHz (dBc/Hz)	Second Harmonic (dBc)	V_{CC1} (V)	Part Number
750	1000	250.0	5.0	0	-111.0	-15.0	5.0	PLL400-875Y
902	928	200.0	5.0	3.0	-133.0	-15.0	5.0	PLL400-915AY
951	977	30.0	12.0	3.0	-130.0	-15.0	5.0	PLL400-964AY
1450	1550	1000.0	1.0	1.0	-120.0	-20.0	5.0	PLL400-1500Y
2000	2400	1000.0	1.5	0	-110.0	-11.0	5.0	PLL400-2200AY

Plug-N-Play Synthesizers

RFMD offers complete Plug-N-Play Synthesizers (PNPs) for low noise frequency synthesizer applications consisting of a VCO, PLL, loop filter, and micro-controller interface. The PNP family of RF signal sources is the world's first family of truly configurable frequency synthesizer modules. These synthesizers can make quick adjustments with amazing accuracy, speed, and performance. All of RFMD's PNP modules are 100% RF-tested and RoHS-compliant. The following tables offer a sampling of component designs RFMD provides.

In addition to our vast library of existing PNP products, RFMD also provides custom developed modules. If you would like RFMD to consider designing a custom module, please fill out and submit the Custom PLL/PNP Request Form (www.rfmd.com/products/vco/customvcorequest.aspx) or contact us at 1.480.756.6070.

PNP Synthesizer Guide

Freq Range	Resonator	Previous Product Family Series	New Product Family Series	Table No.
500 to 4000MHz	Microstrip	PNP	RFPK3XXX	57
500 to 4000MHz	Microstrip or Coaxial	PNP	RFPK4XXX	58

Note: All new PNP modules will have part numbers beginning with RFPK.

Plug-N-Play Narrowband Synthesizers (PNP L22 and RFPK3xxx Series)

- Internal microcontroller
- Programmable start/stop/step size
- SPI BUS compatible
- Frequency: 500MHz to 4000MHz
- Resonator: Microstrip
- PCB: Rogers
- Package size: 12.75 x 12.75mm

Applications

- Highly integrated radio designs
- High performance radios
- Microwave radio IF conversion
- Instrumentation
- Frequency synthesizers

Table 57

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Step Size (Min) (kHz)	Step Size (Max) (kHz)	P_{OUT} (dBm)	Phase Noise at 100kHz (dBc/Hz)	Second Harmonic (dBc)	V_{CC1} (V)	V_{CC2} (V)	Part Number
800	900	25.0	10000.0	0	-130.0	-15.0	5.0	3.0	PNP-850-L22-G
1100	1200	25.0	10000.0	0	-130.0	-18.0	5.0	3.0	PNP-1150-L22-G
2400	2500	25.0	10000.0	0	-125.0	-18.0	5.0	3.0	PNP-2450-L22-G
2500	2600	25.0	10000.0	0	-125.0	-18.0	5.0	3.0	PNP-2550-L22-G
2700	2800	25.0	10000.0	0	-126.0	-18.0	5.0	3.0	PNP-2750-L22-G
3900	4000	25.0	10000.0	0	-122.0	-18.0	5.0	3.0	PNP-3950-L22-G

Plug-N-Play Wideband Synthesizers (PNP P22 and RFPK4xxx Series)

- Internal microcontroller
- Programmable start/stop/step size
- SPI BUS compatible
- Frequency: 500MHz to 4000MHz
- Resonator: Microstrip or Coaxial
- PCB: Rogers
- Package: 15.2 x 15.2mm

Applications

- Highly integrated radio designs
- High performance radios
- Microwave radio IF conversion
- Instrumentation
- Frequency synthesizers

Table 58

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Step Size (Min) (kHz)	Step Size (Max) (kHz)	P_{OUT} (dBm)	Phase Noise at 100kHz (dBc/Hz)	2nd Harmonic (dBc)	V_{CC1} (V)	V_{CC2} (V)	Part Number
750	860	1000.0	10000.0	0	-125.0	-20.0	12.0	3.0	PNP-744-P22-G
1550	1825	5000.0	10000.0	0	-126.0	-15.0	12.0	3.0	PNP-1623-P22-G
1900	2000	250.0	10000.0	0	-134.0	-15.0	12.0	3.0	PNP-1620-P22-G
2525	2735	250.0	10000.0	3.0	-130.0	-15.0	12.5	3.0	PNP-1622-P22-G
4165	4375	2500.0	10000.0	3.0	-120.0	-15.0	12.5	3.0	PNP-1617-P22-G

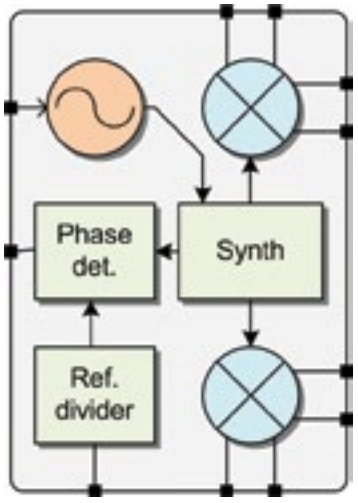
Integrated Synthesizers with Mixers

- Single placement wideband frequency conversion
- Programmable linearity mixers for power saving
- Fractional-N PLL for flexibility and optimum spur performance

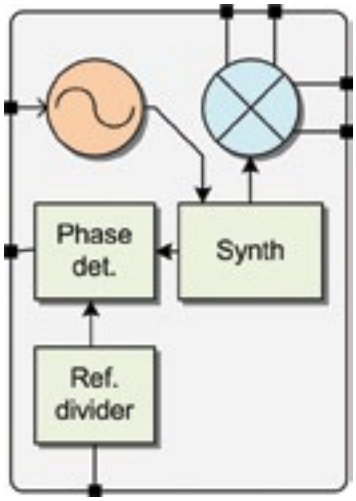
Table 59

Block Diagram (see below)	Mixer RF/IF Freq (Min) (MHz)	Mixer RF/IF Freq (Max) (MHz)	LO Freq Range (Min) (MHz)	LO Freq Range (Max) (MHz)	Phase Noise at 2GHz (dBc/Hz) (1kHz)	Phase Noise at 2GHz (dBc/Hz) (10kHz)	Mixer Conversion Gain (dB)	Mixer IIP3 (dBm)	I_{CC} (mA)	Package	Part Number
A	30	2500	300.0	2400.0	-85.0	-90.0	-2.0	18.0	65.0	QFN	RF2051
B	30	2500	300.0	2400.0	-85.0	-90.0	-2.0	18.0	65.0	QFN	RF2052
C	30	2500	300.0	2400.0	-85.0	-90.0	-2.0	23.0	60.0	QFN	RF2053
A	30	2500	1900.0	2400.0	-85.0	-90.0	-2.0	18.0	65.0	QFN	RF2057
A	30	2500	1550.0	2050.0	-85.0	-90.0	-2.0	18.0	65.0	QFN	RF2059
A	30	2700	85.0	2700.0	-95.0	-102.0	-2.0	23.0	120.0	QFN	RFFC2071A
B	30	2700	85.0	2700.0	-95.0	-102.0	-2.0	23.0	120.0	QFN	RFFC2072A
A	30	6000	85.0	4200.0	-95.0	-102.0	-2.0	23.0	125.0	QFN	RFFC5071A
B	30	6000	85.0	4200.0	-95.0	-102.0	-2.0	23.0	125.0	QFN	RFFC5072A

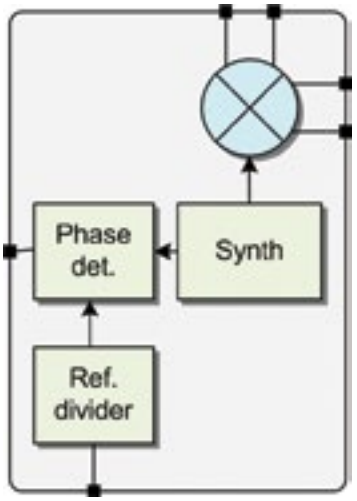
A



B



C



≥1GHz Power Doublers

- High-output and low-current products featuring GaN technology
- Extremely low distortion and superior return loss
- Industry standard SOT-115J and MCM package

Table 60

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Power Gain at F_{MAX} (Min) (dB)	Current (Max) (mA)	Max NF (dB)	Package	Part Number
	40	1000	19.0	375.0	6.50	SOT-115J	D10040180GT
	40	1000	19.0	440.0	6.50	SOT-115J	D10040180GTH
	40	1000	20.0	375.0	6.50	SOT-115J	D10040200GT
	40	1000	20.0	440.0	6.50	SOT-115J	D10040200GTH
	40	1000	22.5	375.0	6.50	SOT-115J	D10040220GT
	40	1000	22.5	440.0	6.50	SOT-115J	D10040220GTH
	40	1000	24.0	375.0	6.00	SOT-115J	D10040240GT
	40	1000	24.0	440.0	6.00	SOT-115J	D10040240GTH
	40	1000	24.5	375.0	5.50	SOT-115J	D10040250GT
	40	1000	24.5	440.0	5.50	SOT-115J	D10040250GTH
	40	1000	27.0	375.0	5.00	SOT-115J	D10040270GT
	40	1000	27.0	440.0	5.00	SOT-115J	D10040270GTH
	40	1000	27.0	325.0	5.00	SOT-115J	D10040270GTL
	40	1000	30.5	440.0	4.50	SOT-115J	D10040300GTH
	40	1000	20.0	450.0	4.00	SOT-115J	D10040200PH1
	40	1000	20.0	380.0	4.00	SOT-115J	D10040200PL1
	40	1000	22.5	450.0	4.00	SOT-115J	D10040230PH1
	40	1000	22.5	380.0	4.00	SOT-115J	D10040230PL1
	40	1000	22.5	450.0	4.50	SOT-115J	RFPD2650
	40	1000	24.5	450.0	4.00	SOT-115J	RFPD2710
	40	1200	22.5	450.0	4.50	SOT-115J	RFPD2580
	40	1000	24.5	450.0	4.00	SOT-115J	RFPD2930
	40	1000	22.5	440.0	5.50	SOT-115J	RFPD2660
	40	1000	24.5	440.0	5.50	SOT-115J	RFPD2670
NEW	40	1000	22.5	480.0	3.70	SOT-115J	RFPD2940
NEW	40	1600	22.5	450.0	4.00	SOT-115J	RFPD3020
NEW	40	1000	22.5	450.0	4.00	MCM - 8x9	RFCM2680
NEW	40	1000	24.5	450.0	5.00	MCM - 11x8.5	RFCM3050

870MHz Power Doublers

- Extremely low distortion
- Superior return loss
- Industry standard SOT-115J package

Table 61

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Power Gain at F_{MAX} (Min) (dB)	Current (Max) (mA)	Max NF (dB)	Package	Part Number
	40	870	18.5	375.0	6.5	SOT-115J	D8740180GT
	40	870	18.5	440.0	6.5	SOT-115J	D8740180GTH
	40	870	20.5	375.0	6.5	SOT-115J	D8740200GT
	40	870	20.5	440.0	6.5	SOT-115J	D8740200GTH
	40	870	22.0	375.0	6.5	SOT-115J	D8740220GT
	40	870	22.0	440.0	6.5	SOT-115J	D8740220GTH
	40	870	24.0	375.0	6.0	SOT-115J	D8740240GT
	40	870	24.0	440.0	6.0	SOT-115J	D8740240GTH
	40	870	25.0	375.0	5.5	SOT-115J	D8740250GT
	40	870	25.0	440.0	5.5	SOT-115J	D8740250GTH
	40	870	27.0	375.0	5.0	SOT-115J	D8740270GT
	40	870	27.0	440.0	5.0	SOT-115J	D8740270GTH
	40	870	30.5	440.0	4.5	SOT-115J	D8740300GTH
	40	870	32.0	375.0	4.5	SOT-115J	D8740320GT
	40	870	32.0	440.0	4.5	SOT-115J	D8740320GTH

≥1GHz Push-Pull Hybrid Amplifiers

- Extremely low distortion
- Superior return loss
- Industry standard SOT-115J and MCM package

Table 62

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Power Gain at F_{MAX} (Min) (dB)	Current (Max) (mA)	NF (Max) (dB)	Package	Part Number
	40	1000	14.0	260.0	5.5	SOT-115J	S10040140P1
	40	1000	18.0	260.0	4.0	SOT-115J	S10040180P1
	40	1000	20.0	260.0	4.5	SOT-115J	S10040200P
	40	1000	22.0	270.0	3.5	SOT-115J	S10040220P
	40	1000	22.0	450.0	3.5	SOT-115J	S10040220P12
	40	1000	23.0	240.0	6.2	SOT-115J	S10040220GT
	40	1000	23.5	250.0	6.0	SOT-115J	S10040230GT
	40	1000	24.0	255.0	3.5	SOT-115J	S10040240P
	40	1000	28.0	260.0	5.0	SOT-115J	S10040280GT
	40	1000	34.5	280.0	4.5	SOT-115J	S10040340
	40	1000	28.0	270.0	5.0	SOT_115J	RFPP2870
	40	1200	22.5	240.0	6.5	SOT_115J	RFPP2590
NEW	40	1000	28.5	270.0	5.0	SOT_115J	RFPP2870
NEW	40	1000	20.0-28.0	410.0	5.0	MCM 11x11	RFAM2790
NEW	40	1000	28.0-34.0	410.0	5.0	MCM 11x11	RFAM3060
NEW	40	1000	28.5	270.0	5.0	MCM 11x8.5	RFCM3080

870MHz Push-Pull Hybrid Amplifiers

- Extremely low distortion
- Superior return loss
- Industry standard SOT-115J package

Table 63

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Power Gain at F_{MAX} (Min) (dB)	Current (Max) (mA)	NF (Max) (dB)	Package	Part Number
	40	870	18.7	240.0	7.5	SOT-115J	S8740180GT
	40	870	20.0	260.0	4.5	SOT-115J	S8740200P
	40	870	22.0	255.0	3.5	SOT-115J	S8740220P
	40	870	22.7	240.0	6.2	SOT-115J	S8740220GT
	40	870	23.5	255.0	3.5	SOT-115J	S8740240P
	40	870	24.2	240.0	6.5	SOT-115J	S8740240GT
	40	870	26.0	240.0	5.5	SOT-115J	S8740260GT
	40	870	28.0	260.0	5.0	SOT-115J	S8740280GT
	40	870	34.5	280.0	4.0	SOT-115J	S8740340
	40	870	34.5	300.0	4.0	SOT-115J	S8740340PT

Reverse Path Hybrid Amplifiers

- Extremely low distortion
- Superior return loss
- Industry standard SOT-115J package

Table 64

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Power Gain at F_{MAX} (Min) (dB)	Current (Max) (mA)	NF (Max) (dB)	Package	Part Number
	5	65	24.3	140.0	3.0	SOT-115J	R0605250L
	5	65	24.7	200.0	3.0	SOT-115J	R0605250
	5	65	29.3	200.0	2.5	SOT-115J	R0605300
	5	65	29.3	140.0	3.0	SOT-115J	R0605300L
	5	100	29.3	140.0	3.0	SOT-115J	R1005300L
	5	100	24.6	140.0	3.4	SOT-115J	R1005250L
NEW	5	100	37.6	160.0	4.2	SOT-115J	RFRP2920
	5	200	27.3	140.0	3.0	SOT-115J	R2005280L
	5	200	29.3	140.0	5.0	SOT-115J	R2005300L
	5	200	34.5	160.0	5.0	SOT-115J	R2005350L
	5	200	19.5	360.0	5.0	SOT-115J	R2005200P12
	5	300	24.2	140.0	3.5	SOT-115J	R3005250L
	5	300	29.1	160.0	6.3	SOT-115J	R3005300L
	5	100	37.6	160.0	4.2	SOT-115J	RFRP2920
NEW	5	300	30.0	160.0	6.3	SOT-115J	R3005300L
NEW	5	300	35.0	160.0	5.5	SOT-115J	RFRP3120

Optical Receivers (Forward Path)

- Extremely low distortion and superior return loss
- Low EINC
- Industry standard SOT-115J package

Table 65

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Responsivity at F_{MAX} (Min) (V/W)	Current (Max) (mA)	EINC (pA/√(Hz))	Part Number
	40	1000	3000	260.0	5.0 (40MHz to 400MHz), 5.5 (400MHz to 1000MHz)	OS10040320PW
	40	1200	2800	260.0	5.0 (50MHz to 400MHz), 5.5 (400MHz to 1000MHz), 6.3 (1000MHz to 1200MHz)	RFOS6012
	40	1200	2800	260.0	5.0 (50MHz to 400MHz), 5.5 (400MHz to 1000MHz), 6.3 (1000MHz to 1200MHz)	RFOS6013

CATV 75Ω Push-Pull Amplifier ICs

- Push-pull topology for excellent CSO
- Excellent third order performance at low power dissipation
- Positive gain slope avaliable on some models

Table 66

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	CTB (dBc)	CSO (dBc)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
	5	120	25.0	3.0	25.0	37.5	-60.0	-80.0	12.0	138.0	ESOP-8	CGR-0118Z*
	5	210	17.0	4.0	24.0	42.0	-67.0	-80.0	5.0	217.0	ESOP-8	CGR-0218Z*
	5	900	12.5	4.5	20.0	38.0	-68.0	-70.0	8.0	150.0	ESOP-8	CGA-3318Z**
	5	1000	14.1	5.4	21.0	40.0	-70.0	-81.0	8.0	150.0	ESOP-8	CGA-6618Z**
	40	1008	17.0	2.0	26.0	37.0	-70.0	-72.0	7.0	220.0	ESOP-8	RFCA8818**
NEW	5	1000	17.4	4.0	23.0	40.0	-76.0	-80.0	5.0	215.0	ESOP-8	RFCA1008**

* Channel Loading: 50dBmV, 7 channels, flat
** Channel Loading: 34dBmV, 79 channels, flat

CATV 75Ω Single-Ended Linear Amplifiers

- Excellent linearity
- Low power consumption
- Small footprint

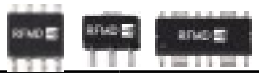


Table 67

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
	DC	2500	16.0	4.2	18.5	30.0	5.5	100.0	SOIC-8	RF2312
	DC	3000	15.0	4.8	21.0	38.0	9.3	180.0	CJ2BAT0	RF2317
	40	1008	21.5	3.0	19.0	38.0	5.0	125.0	SOT-89	RFCA3302
	50	1000	16.0	3.5	18.0	35.0	5.0	80.0	SOT-89	CGB-1089Z
	50	1200	13.0	3.0	18.5	38.5	5.0	110.0	SOT-89	CXE-1089Z
NEW	50	1000	21.0	3.0	24.0	41.0	8.0	140.0	SOT-89	RFCA3306

CATV Digital Step Attenuators

- Broadband 5MHz to 2000MHz operation
- Single Supply, 3V and 5V operation
- High linearity, CATV infrastructure grade performance

Table 68

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Number of Bits	Step Size (dB)	Attenuation Range (dB)	Insertion Loss (dB)	IIP3 (dBm)	V_{CC} (V)	Package	Part Number
NEW	5	2000	6	0.5	31.5	1.3	52.0	5.0	MCM	RFSA2654

CATV Voltage-Controlled Attenuators

- 3V and 5V versions available
- High linearity suitable for CATV infrastructure applications
- Linear in dB control characteristic

Table 69

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain Control Range (dB)	Min. Insertion Loss (dB)	CTB* (dBc)	CSO* (dBc)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
NEW	50	3000	35.0	2.5	-70.0	-65.0	5.0	1.0	QFN	RFSA3013
NEW	50	3000	35.0	2.7	-70.0	-65.0	3.3	1.0	QFN	RFSA3023

* 112 channel, +39dBmV input flat tilt

75Ω Low Noise Amplifiers

- Excellent linearity
- Low noise figure
- Small footprint

Table 70

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	NF (dB)	CTB (dBc)	CSO (dBc)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
	5	1000	20.0	1.5	-75.0	-65.0	7.0	105.0	SOT-89	CXE-2089Z*
	40	1008	17.0	2.0	-70.0	-72.0	7.0	220.0	SOIC-8	RFCA8818**

* 110 Channels, flat tilt, +20dBmV out
** 77 Channels to 550MHz, 34dBmV P_{OUT}

CATV Set-Top Application-Specific ICs

- Diverse RFICs for set-top specific applications

Table 71

	Function	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	NF (dB)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
	Out-of-Band Tuner	50	150	77.0	15.0	3.3	106.0	QFN	RFFC0085
	Out-of-Band Tuner	50	150	82.0	13.0	3.3	117.0	QFN	S510065-55Z
	Broadband MoCA PA	300	2200	12.5	3.0	5.0	150.0	SOT-89	RF3315

High-Reliability Components for Military and Space

Standard and custom products available

Wide range of testing capability to meet your needs

- AS9100 Certified
- DOD Cleared
- Class 10000 Clean Room, Class 100 Laminar Flow Hoods

Standard	*Application*
MIL-PRF-38534 Class H and K	Hybrids
MIL-PRF-38535 Class H and K	Die
MIL-STD-883 Class S and B	Environmental Test Procedures
MIL-STD-202	Mixers
MIL-DTL-28837	Power Dividers
MIL-DTL-23971	Transformers
MIL-T-55631/MIL-STD-202	DOD Electronic Parts, Materials, and Process for Space Vehicles
MIL-HDBK-1547	MIL-STD-5011
MIL-STD-5011	• Potting Material is STYCAST EFF-15, Emerson & Cumming
	• Non-Conductive Epoxy Ablebond 84-3
	• Conductive Epoxy Ablebond 84-1LMI
	Soldering, Solderability
J-STD-001, 202/208	

- Complete reliability and analysis lab
- Assembly and test in Class 100 environment
- Full in-house production and test capabilities

High-Reliability Mixers

- Wide bandwidth, low conversion loss
- Rugged packaging

Table 72

Freq Range (Min) (MHz)	*Freq Range (Max) (MHz)*	*IF Freq (Min) (MHz)*	*IF Freq (Max) (MHz)*	*Conversion Loss (dB)*	*IIP3 (dBm)*	*Isolation (dB)*	*Package*	*Part Number*
0.4	400	DC	100	5.3	10.0	30.0	TO-5	DBM-141
0.5	450	DC	100	6.0	30.0	25.0	SMT	DBM-188
0.5	500	DC	100	7.5	13.0	25.0	SMT	CM-1
1	3500	10	500	7.0	10.0	20.0	SMA Connectorized Module	DBM-400
1	3500	50	800	8.5	17.0	20.0	SMA Connectorized Module	DBM-700
1	3500	50	800	8.5	20.0	15.0	Flatpack	DBM-700H
2	3000	5	100	8.0	20.0	20.0	Flatpack	DBM-184
5	1500	DC	500	5.9	10.0	35.0	TO-8	DBM-177
10	1500	DC	1000	8.5	10.0	35.0	Flatpack	DBM-143
10	1500	DC	500	6.3	25.0	30.0	Flatpack	DBM-178
10	4000	50	400	8.5	20.0	30.0	Flatpack	DBM-183
10	4000	50	1000	8.5	17.0	15.0	TO-8	DBM-186
50	13000	5	5000	8.0	15.0	25.0	SMA Connectorized Module	DBM-1200
200	1800	5	6000	9.0	16.0	25.0	SMA Connectorized Module	DBM-1800
500	8000	5	1000	10.5	16.0	17.0	Flatpack	DBM-601
1700	4200	DC	100	6.5	8.0	10.0	SMA Connectorized Module	DBM-500

High-Reliability VCOs

- Low phase noise
- Optimized tuning sensitivity
- Custom products available

Table 73

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Phase Noise at 10kHz (dBc/Hz)	Phase Noise at 100kHz (dBc/Hz)	P_{OUT} (dBm)	Package	Part Number	Available Options*
25	50	-115.0	-135.0	12.5	TO-8/SMA Connectorized Module	VCO-102	TC/STC
100	200	-99.0	-122.0	12.5	TO-8	VCO-104	TC
200	400	-97.0	-120.0	12.5	TO-8/SMT	VCO-105	TC/SMT
400	800	-95.0	-120.0	12.5	TO-8/SMT	VCO-106	TC/SMT
500	1000	-92.0	-117.0	13.5	TO-8/SMA Connectorized Module	VCO-107	TC
800	1600	-92.0	-115.0	13.0	TO-8/SMT/SMA Connectorized Module	VCO-108	TC/SMT
900	1800	-90.0	-112.0	12.5	TO-8/SMT/SMA Connectorized Module	VCO-109	TC/SMT
1000	2000	-88.0	-112.0	13.0	TO-8/SMT/SMA Connectorized Module	VCO-110	TC/SMT
1500	2725	-78.0	-100.0	12.0	TO-8/SMT/SMA Connectorized Module	VCO-111	TC/SMT
2000	3200	-85.0	-105.0	12.5	TO-8/SMA Connectorized Module	VCO-112	TC
60	120	-110.0	-130.0	12.5	TO-8/SMA Connectorized Module	VCO-114	TC
300	600	-100.0	-122.0	13.0	TO-8/SMA Connectorized Module	VCO-117	TC
250	500	-100.0	-123.0	13.0	TO-8/SMA Connectorized Module	VCO-118	TC
3000	4800	-67.0	-97.0	13.0	TO-8	VCO-119	TC
600	1200	-90.0	-113.0	13.0	TO-8/SMA Connectorized Module	VCO-120	TC
100	200	-112.0	-135.0	13.0	TO-8/SMA Connectorized Module	VCO-204	TC
200	400	-105.0	-130.0	12.0	SMA Connectorized Module	VCO-205	TC
400	800	-100.0	-125.0	12.5	SMA Connectorized Module	VCO-206	TC
150	300	-110.0	-130.0	13.0	SMT/SMA Connectorized Module	VCO-216	SMT/S
3490	3510	-100.0	-122.0	0.5	SMA Connectorized Module	VCO-3500	TC
4490	4510	-98.0	-120.0	1.5	SMA Connectorized Module	VCO-4500	TC
2700	3200	-90.0	-115.0	1.0	SMA Connectorized Module	VCO-500	TC
4900	5900	-77.0	-102.0	-1.0	TO-8/SMA Connectorized Module	VCO-520	TC
5700	6700	-74.0	-99.0	-1.0	TO-8/SMA Connectorized Module	VCO-530	TC
5490	5510	-96.0	-118.0	0.5	TO-8/SMA Connectorized Module	VCO-5500	TC

*Note:

- VCO-xxxTC → TO-8 Package, Temperature-Compensated
- VCO-xxxSMT → SMT Package
- VCO-xxxSMTTC → SMT Package, Temperature-Compensated
- VCO-xxxS → SMA Connectorized Module Package
- VCO-xxxSTC → SMA Connectorized Module Package, Temperature-Compensated

High-Reliability Power Dividers

- Low insertion loss
- Outstanding amplitude and phase balance
- Miniature flatpack packaging style

Table 74

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Insertion Loss (dB)	Isolation (dB)	Impedance Ratio	Package	Type	Part Number
1	500	0.3	30.0	1.3:1	Flatpack	3-Way Power Divider	PS-3-500F
1	500	0.3	30.0	1.3:1	Flatpack	4-Way Power Divider	PS-4-500F
5	1000	0.3	35.0	1.2:1	Flatpack	2-Way Power Divider	PS-2-1000F
10	500	0.3	35.0	1.2:1	Flatpack	2-Way Power Divider	PS-2-500F
20	4000	0.4	25.0	1.3:1	Flatpack	2-Way Power Divider	PS-2-4000F
25	1000	0.5	25.0	1.5:1	Flatpack	4-Way Power Divider	PS-4-1000F

High-Reliability Transformers

- Outstanding for harsh environmental conditions
- Low insertion loss with high VSWR

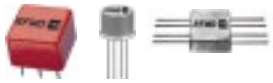


Table 75

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Insertion Loss (dB)	VSWR	Package	Part Number
	0.01	5	.75	2.5:1	Leaded	LF-454
	0.01	10	.75	2:1	Leaded	LF-452
	0.01	25	.50	1.5:1	Leaded	LF-412
	0.01	25	.75	1.5:1	Leaded	LF-432
	0.01	50	.50	2:1	Leaded	LF-428
	0.01	80	.75	1.3:1	Leaded	LF-422
	0.01	100	.50	2:1	Leaded	LF-410
	0.5	650	.50	1.75:1	TO-5	TO-212
	0.1	100	1.50	1.5:1	Leaded	HF-132
	0.15	600	.75	2:1	Leaded	HF-112
	0.25	200	.75	2:1	TO-5	TO-228
	0.5	150	.75	1.5:1	Plastic Flatpack	DP-330
	0.5	200	1.00	2.5:1	Leaded	HF-128
	0.5	400	.75	2.5:1	Leaded	HF-118
	0.5	1000	.75	2.5:1	Leaded	HF-102
	1.0	80	1.00	2:1	Plastic Flatpack	FP-532
	1.0	250	.75	1.3:1	Plastic Flatpack	FP-528
	1.0	500	.50	1.3:1	Plastic Flatpack	FP-514
	1.0	700	1.20	1.5:1	Leaded	HF-122
	1.0	750	.50	1.3:1	Plastic Flatpack	FP-518
	1.0	1000	.75	1.5:1	Plastic Flatpack	FP-510
	1.0	1200	.75	1.3:1	Plastic Flatpack	FP-512
	2.0	750	1.00	1.3:1	Plastic Flatpack	FP-522

High-Reliability Amplifiers

- Wide bandwidth, low-voltage amplifiers
- Packaged and tested for harsh environments

Table 76

	Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	V_{CC} (V)	I_{CC} (mA)	Package	Part Number
	5	4000	27.0	1.4	5.5	-	3.3	10.0	2L Gullwing	SGL-06SMT2
	50	850	20.2	3.1	19.5	40.5	5.0	86.0	2L Gullwing	SBB-2082S
	50	6000	16.4	4.0	15.1	29.0	5.0	42.0	2L Gullwing	SBB-3082S
	50	6000	15.5	4.5	19.0	38.0	5.0	80.0	2L Gullwing	SBB-4082S
NEW	50	6000	20.0	4.2	19.0	35.0	5.0	71.0	2L Gullwing	SBB-5082S

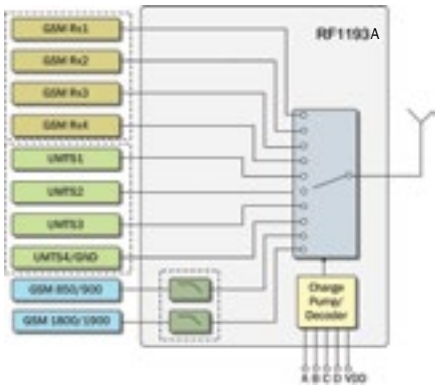
ASM/SFM/SDM Switches

- Excellent insertion loss and isolation performance
- Best-in-class linearity performance
- Various ASM, SFM, and SDM options from SP8T to SP10T

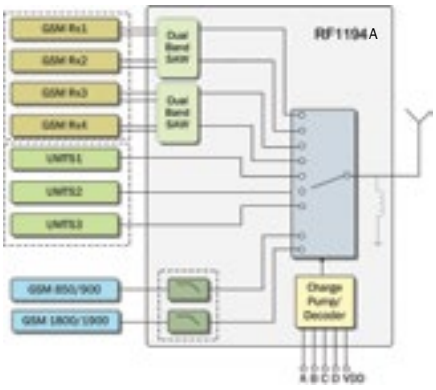
Table 77

Description	Band Coverage	Switch Type	V_{DD} (V)	Number of GSM Rx Ports	Number of Generic TRx Ports	Package (mm)	Part Number
Antenna Switch Module	QB GSM, QB UMTS	SP10T	2.5 to 3.3	4	4	3.0 x 3.8 x .85	RF1193A
Antenna Switch Module	QB GSM, TB UMTS	SP9T	2.5 to 3.3	4	3	3.0 x 3.8 x .85	RF1193B
Antenna Switch Module	TB GSM, PB UMTS	SP10T	2.5 to 3.3	3	5	3.0 x 3.8 x .85	RF8888
Antenna Switch Module	TB GSM, PB UMTS	SP10T	2.4 to 3.3	3	5	3.0 x 3.8 x .85	RF8889A
Antenna Switch Module	QB/TB GSM, QB/PB UMTS capable	SP10T	2.4 to 3.0	—	8	3.2 x 3.2 x 1.0	RF1291
Antenna Switch Module	QB/TB GSM, DB/TB UMTS capable	SP8T	2.4 to 3.3	—	6	3.2 x 2.5 x 1.0	RF1292
Antenna Switch Module	QB/TB GSM, QB/PB UMTS capable	SP10T	2.5 to 3.5	—	8	2.6 x 3.4 x 0.55	RF1296
Antenna Switch Module	QB/TB GSM, QB/PB UMTS capable	SP12T	2.5 to 3.5	—	10	3.0 x 3.8 x 0.85	RF1295
Antenna Switch Module	QB/TB GSM, TB/QB UMTS capable	Dual ASM (SP4T + SP5T)	2.5 to 3.3	—	7	2.8 x 3.6 x 1.0	RF1255
Switch Filter Module	QB GSM, TB UMTS	SP9T	2.5 to 3.3	4	3	4.5 x 4.5 x 1.0	RF1194A
Switch Filter Module	QB GSM, TB UMTS	SP9T	2.5 to 3.3	4	3	4.5 x 4.5 x 1.0	RF1194B
Switch Filter Module	QB GSM, QB UMTS	SP10T	2.5 to 3.3	4	4	4.5 x 4.5 x 1.0	RF1195
Switch Filter Module	TB GSM, Penta band UMTS capable	SP10T	2.4 to 3.0	3	5	3.2 x 3.5 x 1.1	RF1293
Switch Filter Module	TB GSM, Penta band UMTS capable	SP10T	2.4 to 3.0	3	5	3.2 x 3.5 x 1.1	RF1293A
Switch Duplexer Module (Band 1)	QB GSM, TB UMTS	—	2.4 to 3.0	4	2	4.5 x 4.5 x 1.0	RF1196

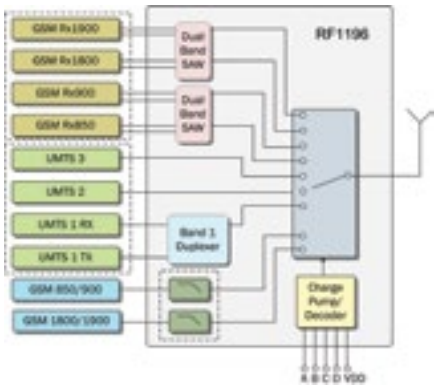
Antenna Switch Module



Switch Filter Module



Switch Duplexer Module



3G/4G Power Amplifiers

- Enabling longer talk-time and superior thermal performance
- Designed for leading 3G/4G cellular platforms
- Multi-band for increased functional density and ultimate ease-of-use

Table 78

Air Standard	3GPP Band	Architecture	DC to DC Converter	Package (mm)	Part Number
TD & WCDMA	39,34	Conventional	—	3.0 x 3.0	RF7234
TD-SCDMA	39,34	Dual Gain	—	3.0 x 3.0	RF7234A
TD-SCDMA, TD-LTE	1, 39, 34	Conventional	—	3.0 x 3.0	RF7239
HSUPA	Band-x (1, 2, 5 or 8)	Conventional	—	3.0 x 3.0	RF722x
HSPA+/LTE	3,4	Conventional	—	3.0 x 3.0	RF7203
HSUPA	Band-x (1, 2, 4, 5 or 8)	High Efficiency	RF6650/52	3.0 x 3.0	RF724x
LTE	Band-x (1, 2, 4, 5 or 8)	High Efficiency	RF6650	3.0 x 3.0	RF724x-1
HSPA+/LTE	Band-x (1, 2, or 8)	High Efficiency	RF6650/52	3.0 x 3.0	RF741x*
HSPA+/LTE	3, 4, 9, 10	High Efficiency	RF6650/52	3.0 x 3.0	RF7413*
HSPA+/LTE	5, 6, 18, 19	High Efficiency	RF6650/52	3.0 x 3.0	RF7415*
LTE	12, 17	High Efficiency	RF6650	3.0 x 3.0	RF7317
LTE	13, 14	High Efficiency	RF6650	3.0 x 3.0	RF7313
LTE	20	High Efficiency	RF6650	3.0 x 3.0	RF7320
LTE	21	High Efficiency	RF6650	3.0 x 3.0	RF7321
LTE	3, 4, 9, 10	High Efficiency	RF6650	3.0 x 3.0	RF7303
C2K, EV-DO, LTE, HSPA+	5,6,18,19	High Efficiency	RF6650	3.0 x 3.0	RF7255**
C2K, EV-DO,LTE, TD-LTE, HSPA+	2, 39	High Efficiency	RF6650	3.0 x 3.0	RF7252**

*Peak efficiency focused, ideal for data cards
**SV-LTE focused

2G Power Amplifiers

- Industry standard 5.0 x 5.0mm footprint compatible options to scale between GPRS and EDGE
- Proven **PowerStar**® core for repeatable RF performance and power margin
- Options cover polar and linear EDGE architectures from major chipset providers

Table 79

Description	Transmit Band	Package (mm)	Part Number
Quad-band EDGE PA (polar)	GSM850/EGSM900/DCS1800/PCS1900	5.0 x 5.0	RF3225
Quad-band GPRS PA	GSM850/EGSM900/DCS1800/PCS1900	5.0 x 5.0	RF3194
Quad-band EDGE PA (linear)	GSM850/EGSM900/DCS1800/PCS1900	5.0 x 5.0	RF3189
Quad-band GPRS PA	GSM850/EGSM900/DCS1800/PCS1900	5.0 x 5.0	RF3183
Quad-band EDGE PA (fixed gain linear)	GSM850/EGSM900/DCS1800/PCS1900	5.0 x 5.0	RF6818

Note: TxM typically designed to deliver >33dBm LB and >30dBm HB at typical V_{BATT} of 3.5V

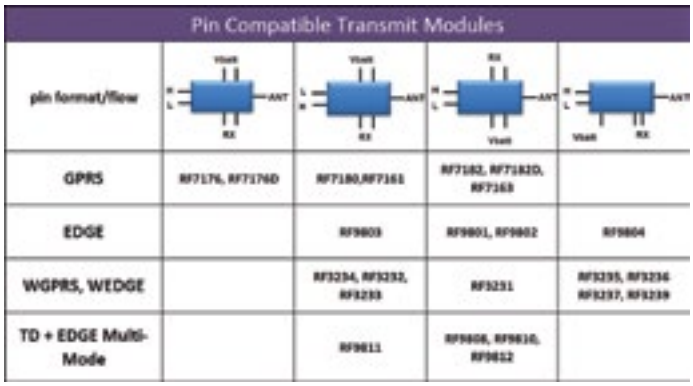
WEDGE/WGPRS Transmit Modules (TxMs)

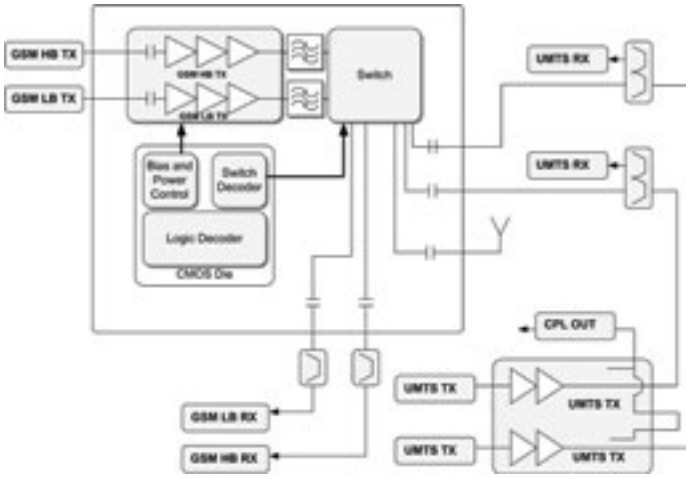
- High level of integration (PA + Switch), matching and filtering for power and harmonics with ESD protection on antenna port
- Footprint-compatible options scale in-band coverage and air standard
- Proven **PowerStar**® core for repeatable RF performance and power margin
- Options cover polar and linear EDGE architectures from major chipset providers

Table 80

Description	Transmit Band	Number of Receive Ports	Number of TRx Ports for UMTS	Package (mm)	Part Number
WGPRS	GSM850/EGSM900/DCS1800/PCS1900	6	*	6.0 x 6.0	RF3235
WGPRS	GSM850/EGSM900/DCS1800/PCS1900	4	*	6.0 x 6.0	RF3237
WEDGE (Linear)	GSM850/EGSM900/DCS1800/PCS1900	6	*	6.0 x 6.0	RF3236
WEDGE (Linear)	GSM850/EGSM900/DCS1800/PCS1900	4	*	6.0 x 6.0	RF3239
WEDGE (Polar)	GSM850/EGSM900/DCS1800/PCS1900	4	2	6.0 x 7.0	RF3171
WEDGE (Polar)	GSM850/EGSM900/DCS1800/PCS1900	2	3	6.0 x 7.0	RF3228
WGPRS	GSM850/EGSM900/DCS1800/PCS1900	2	3	6.0 x 7.0	RF3229
WGPRS	GSM850/EGSM900/DCS1800/PCS1900	4	2	6.0 x 7.0	RF3230
WGPRS	EGSM900/DCS1800	2	1	6.6 x 5.2	RF3231
WGPRS	GSM850/EGSM900/DCS1800/PCS1900	2	2	6.6 x 5.2	RF3232
WEDGE (Linear)	GSM850/EGSM900/DCS1800/PCS1900	2	2	6.6 x 5.2	RF3233

Note: TxMs typically designed to deliver >33dBm LB and >30dBm HB at typical V_{BATT} of 3.5V
*Switch ports can be used for GSM or UMTS (high linearity, low loss)





2G Transmit Modules (TxMs)

- High level of integration (PA + Switch), matching and filtering for power and harmonics with ESD protection on antenna port
- Footprint compatible options scale to EDGE or band coverage
- Proven **PowerStar**® core for repeatable RF performance and power margin

Table 81

Description	Transmit Band	Number of Receive Ports	Package (mm)	Part Number
GSM/GPRS Dual Band TxM	EGSM900/DCS1800	2	6.6 x 5.2	"RF7176D RF7182D"
GSM/GPRS Quad band TxM	GSM850/EGSM900/DCS1800/PCS1900	2	6.6 x 5.2	RF7176 RF7180 RF7182
GSM/GPRS Quad band TxM	GSM850/EGSM900/DCS1800/PCS1900	4	6.6 x 5.2	RF7161 RF7163
GSM/GPRS Quad band TxM	GSM850/EGSM900/DCS1800/PCS1900	2	6.0 x 5.93	RF7185*
GSM/GPRS Dual Band TxM	EGSM900/DCS1800 (GSM850/PCS1900)	2	6.0 x 5.9	RF7188** RF7189**
Linear EDGE/GSM/GPRS Dual Band TxM	EGSM900/DCS1800	2	6.6 x 5.2	RF9801
Linear EDGE/GSM/GPRS Quad band TxM	GSM850/EGSM900/DCS1800/PCS1900	4	6.6 x 5.2	RF9802
Linear EDGE/GSM/GPRS Quad band TxM	GSM850/EGSM900/DCS1800/PCS1900	2	6.6 x 5.2	RF9803***
GSM/GPRS Dual Band TxM	EGSM900/DCS1800	2	5.2 x 4.5	RF7190D/RF7192D
GSM/GPRS Quad band TxM	GSM850/EGSM900/DCS1800/PCS1900	2	5.2 x 4.5	RF7190/RF7192
GSM/GPRS Quad band TxM	GSM850/EGSM900/DCS1800/PCS1900	4	6.6 x 7.2	RF7183****

Note: TxMs typically designed to deliver >33dBm LB and >30dBm HB at typical V_{BATT} of 3.5V.
*Design optimized for low current consumption.
**Design optimized for low current consumption at 29dBm, harmonic and power margin into VSWR.
***Pin compatible with WEDGE RF3233.
****Filtering and balanced output on the Rx ports.

2G + TD Transmit Modules

- High level of integration (PA + Switch), matching and filtering for power and harmonics with ESD protection on antenna port
- Footprint-compatible options scale from EDGE DL to EDGE Tx and two different levels of TD-SCDMA performance
- Proven **PowerStar**® core for repeatable RF performance and power margin

Table 82

Description	Transmit Band	Number of Receive Ports	Package (mm)	Part Number
GSM/GPRS/EDGE DL/Band 39, 40 TD Multi-Mode TxM	GSM850/EGSM900/DCS1800/ PCS1900/B34/B39	4	6.6 x 5.2	RF9808
GSM/GPRS/EDGE TX and DL/Band 39, 40 TD Multi-Mode TxM	GSM850/EGSM900/DCS1800/ PCS1900/B34/B39	4	6.6 x 5.2	RF9810
GSM/GPRS/EDGE TX and DL/Band 39, 40 TD Multi-Mode TxM	GSM850/EGSM900/DCS1800/ PCS1900/B34/B39	4	6.6 x 5.2	RF9812*

Note: TxMs typically designed to deliver >33dBm LB and >30dBm HB at typical V_{BATT} of 3.5V.
*Design optimized for low current consumption in Low Power Mode.

GaN Open Foundry Services

RFMD® GaN Technologies

- 0.5µm gate length pHEMT transistor AlGaN/GaN on SiC
- MTTF > 1x10^7 hours at $T_{channel}$ = 200°C
- 100Ω/☐ thin-film resistor and high-resistance epi resistor
- 135pf/mm^2 MIM capacitor with 340V breakdown
- Through wafer vias

Process Technology Offerings

GaN1 - High Power

- Power density – up to 8W/mm
- High breakdown voltage >400V
- Enables 65V operation

GaN2 - High Linearity

- Enhanced linearity versus GaN1
- 22dB better IM3
  - Power density – up to 4W/mm
  - High breakdown voltage >300V
- Enables 48V operation

GaN3 - High Power & High Linearity

- Optimized power process for high linearity applications
- 36V 65V operation
- Improved linearity over GaN1
- Power Density up to 5.5W/mm
- High peak efficiency

rGaN-HV™ - High Voltage

- 1.0µm gate-length pHEMT transistor AlGaN/GaN on SiC
- High peak current density
- Ultra-fast switching time
- Ultra-high breakdown voltage >1000V
- Enables 600V operation

Applications Benefiting from RFMD GaN Technology

- Wireless infrastructure
- Military communications
- Radar
- Electronic warfare
- Power control devices
- SATCOM

GaAs Open Foundry Services

RFMD® GaAs Technologies

- Through wafer vias
- TaN or NiCr thin-film resistors
- Two interconnect metal layers

Process Technology Offerings

FET1H - GaAs Switching pHEMT

- 0.6µm switch pHEMT
- Drain voltage up to 7V
- Capacitor density of 295pF/mm^2
- Provides low noise, high-linearity switching of RF signals for applications
  - Wireless front ends
  - Transmit/receive modules
  - Phased arrays

FET2 E/D pHEMT

- 0.5µm E/D pHEMT
- Enhancement and depletion mode operation
- Drain voltage up to 7V
- Capacity density 295 pf/mm^2

HBT8 Rugged Linear InGaP HBT

- f_T = 35GHz, f_{MAX} = 65GHz
- BV (CEO, CBO, EBO) = 17, 27, 8V
- Capacitor density of 135 and 750 pf/mm^2

HBT11 - Enhanced Rugged, Linear InGaP HBT

- f_T = 38GHz, f_{MAX} = 65GHz
- BV (CEO, CBO, EBO) = 17, 25, 7V
- Capacitor density of 135 and 750 pf/mm^2

IPC3 - Integrated Passive Components for High Power

- Passives only, on 6” GaAs wafers
- 3 metal layers for complex interconnections and for high current capability (up to 28mA/µm)
- High breakdown voltage capacitors – up to 340V

Applications Benefiting from RFMD GaAs Technology

- Phased arrays radar
- Electronic warfare
- Wireless connectivity
- Wireless infrastructure
- Broadband communications
- SATCOM

Package Assembly & Test Open Foundry Services

From die probe/pick through assembly and test, RFMD offers turn-key packaging services for both high volume commercial and military applications

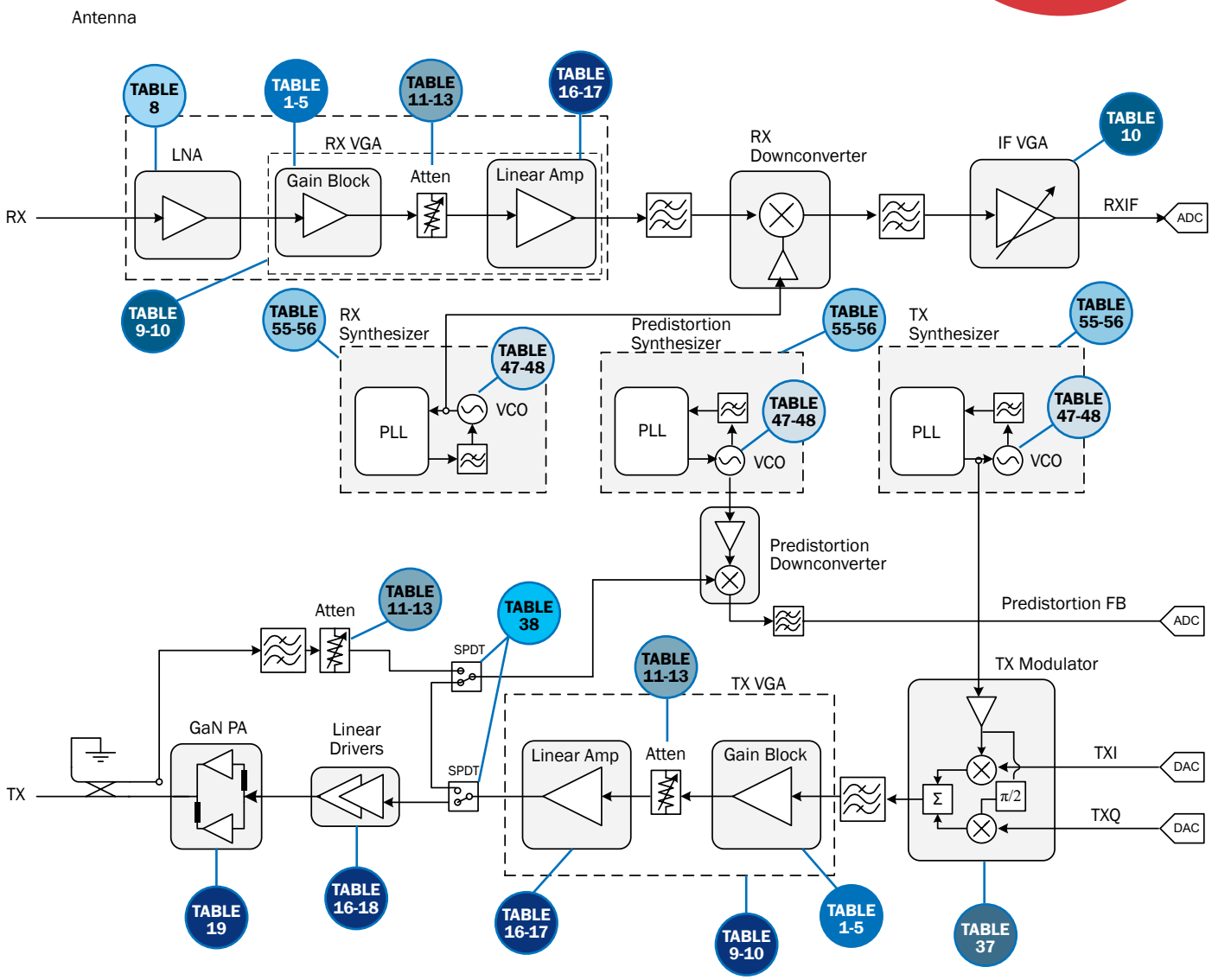
- Hi-REL / Space Qualified Assembly
- AS9100 Certified Facility
- DoD Cleared Facility
- Class 10000 Clean Rooms, Class 100 Laminar Flow Hood
- Complete 883 screening and test capabilities
- Hermetic and non-hermetic packages
- Eutectic and epoxy die bonding
- Ball, wedge and ribbon bonding as well as gap welding
- Seam, single-shot and SST sealing (solder and epoxy)
- Statistical Process Controls

For more information about RFMD Open Foundry Services, contact:
RFMDFoundryServices@rfmd.com or visit our website: www.rfmd.com/foundry

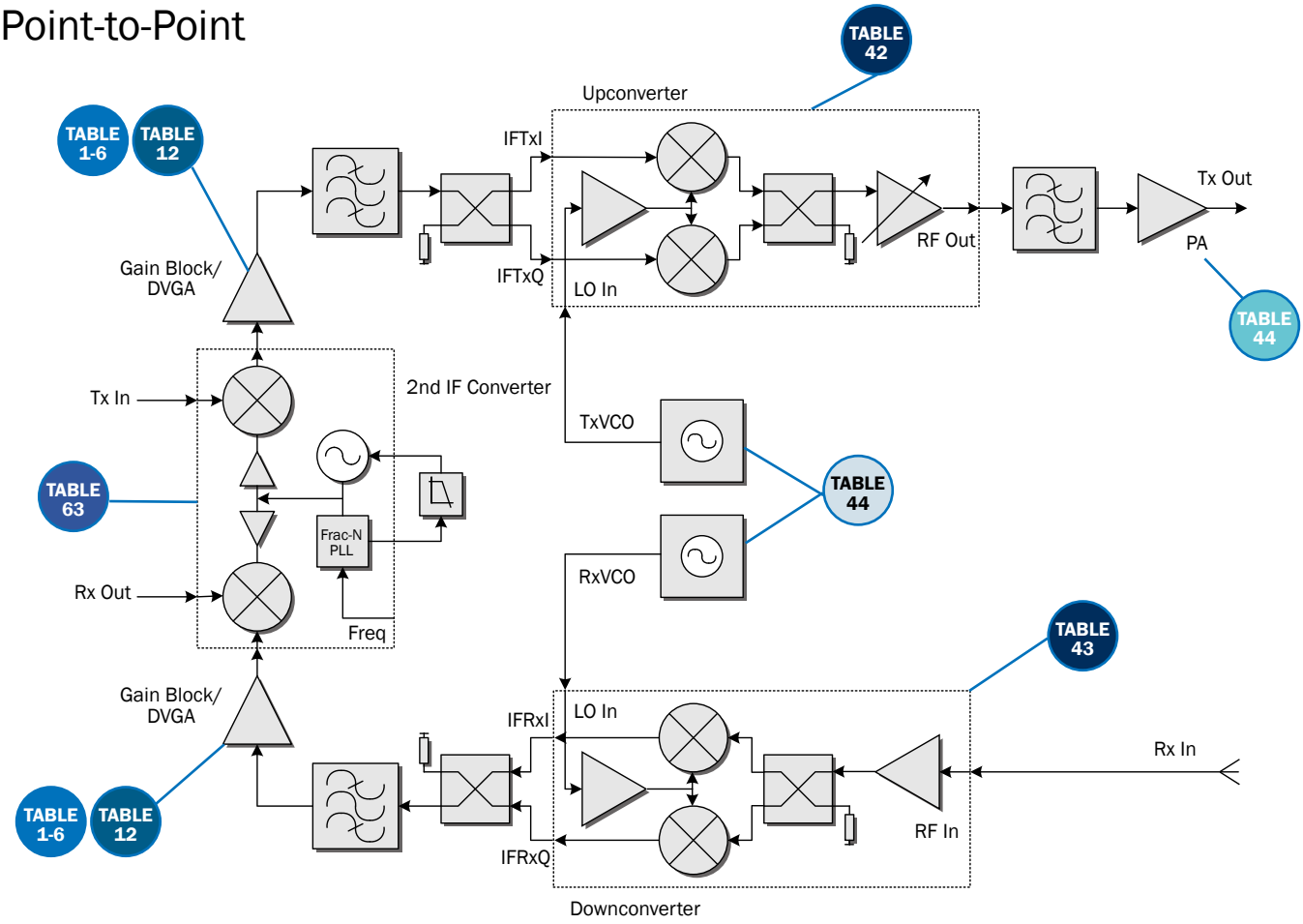
Wireless Infrastructure

Cellular Infrastructure Base Station

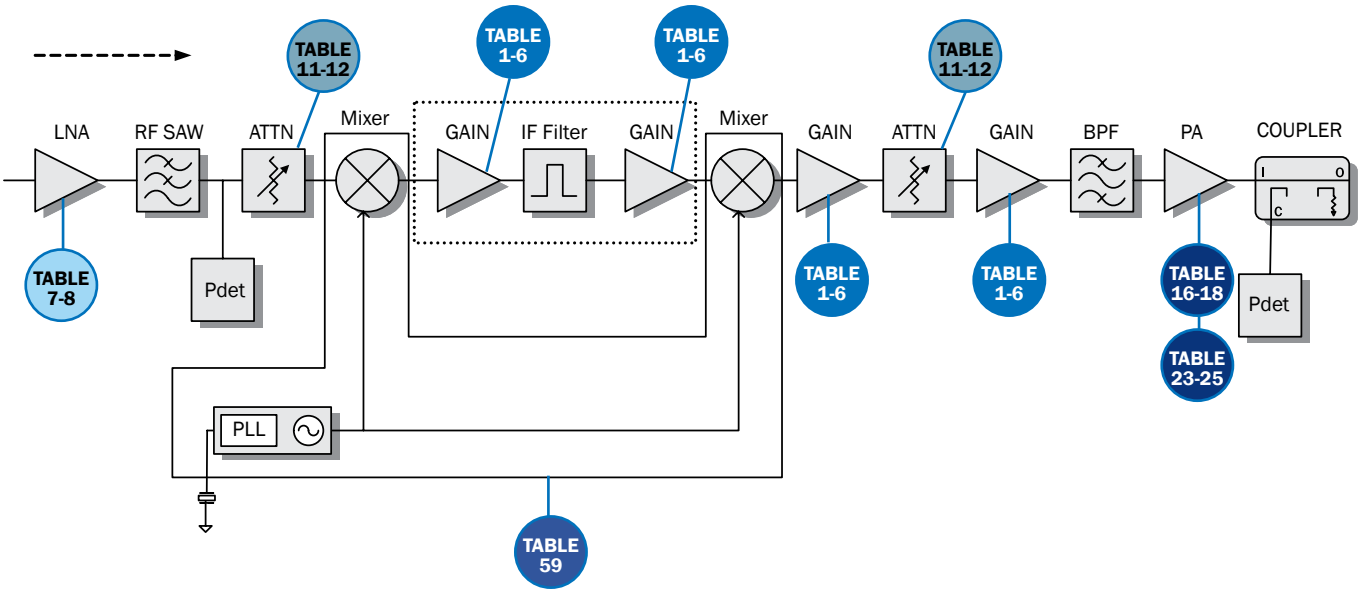
Parts shown in the diagrams in this section can be cross-referenced throughout the product guide using the table number indications.



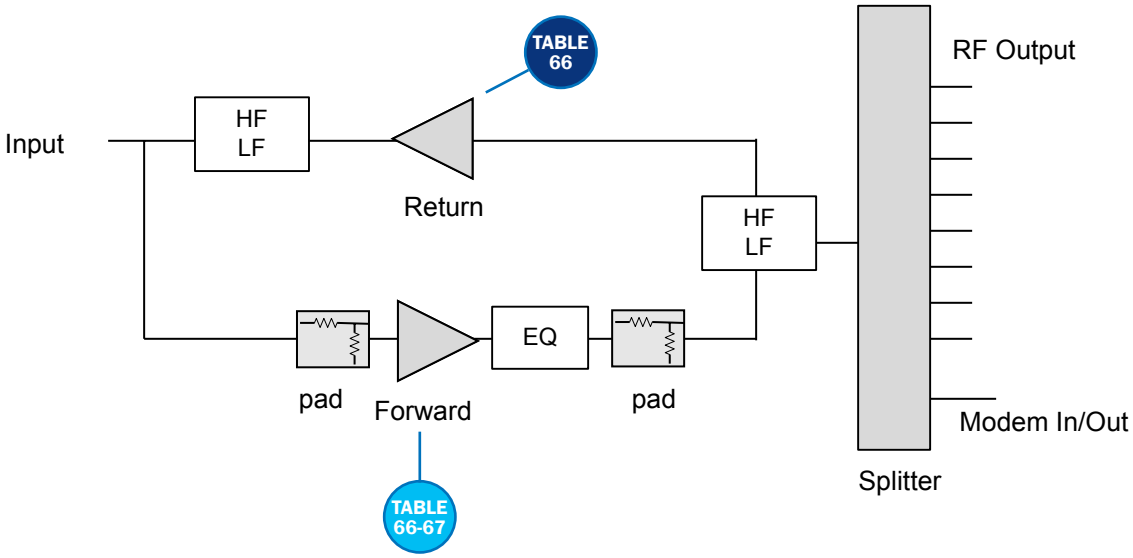
Point-to-Point



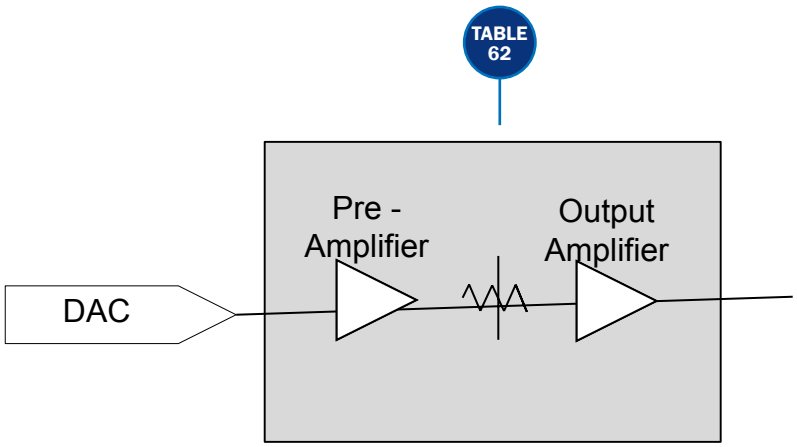
Wireless Repeater



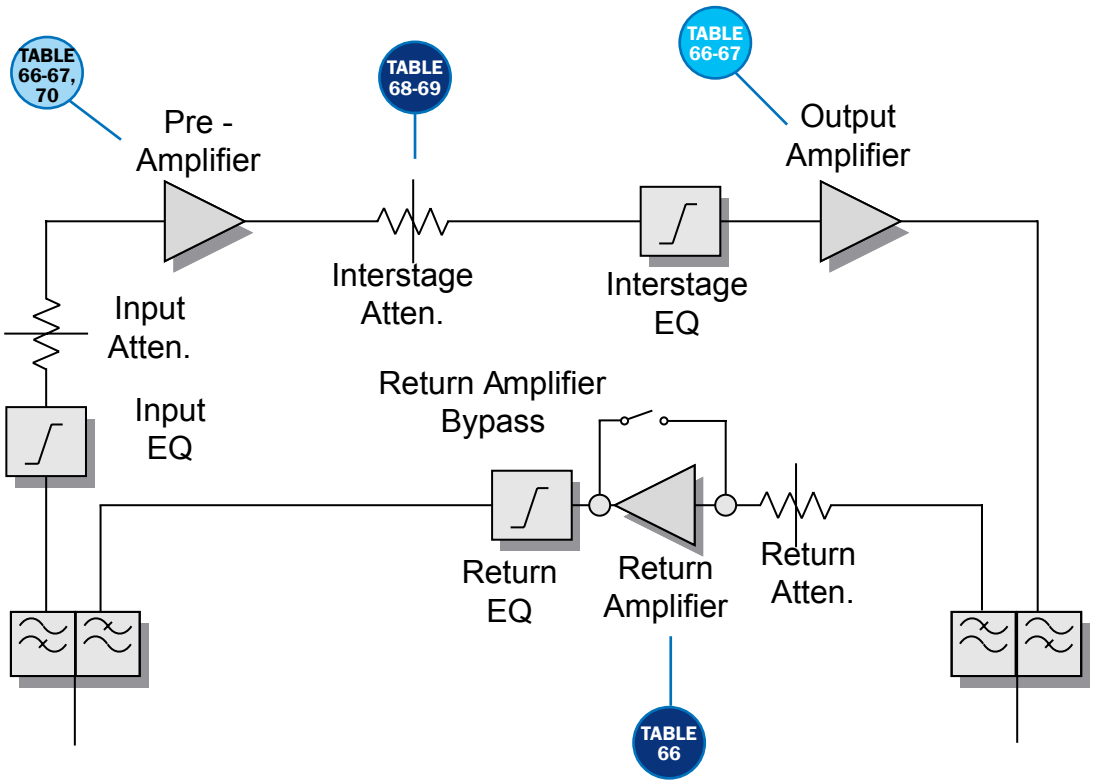
CATV Line Amplifiers



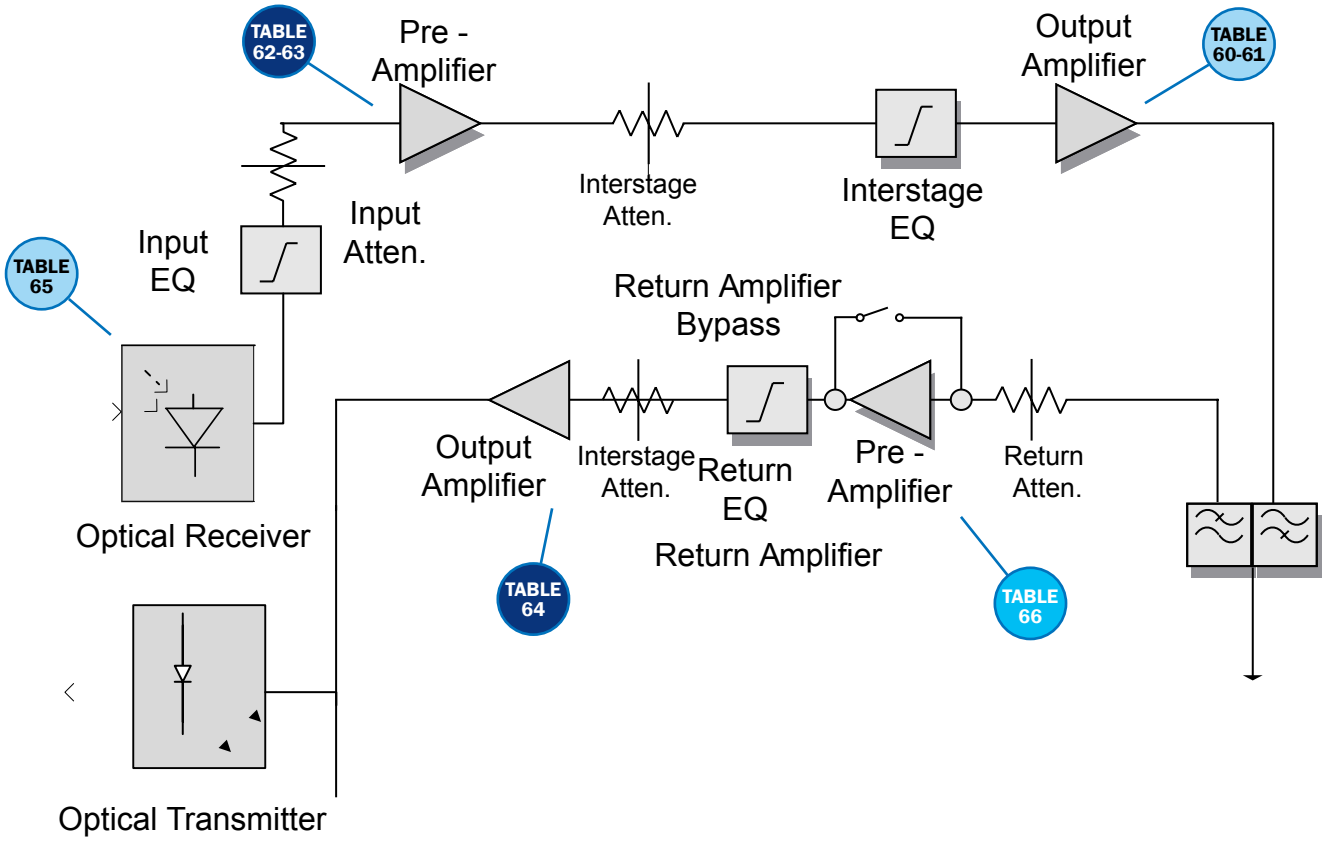
Edge QAM Amplifier, Docsis 3. x



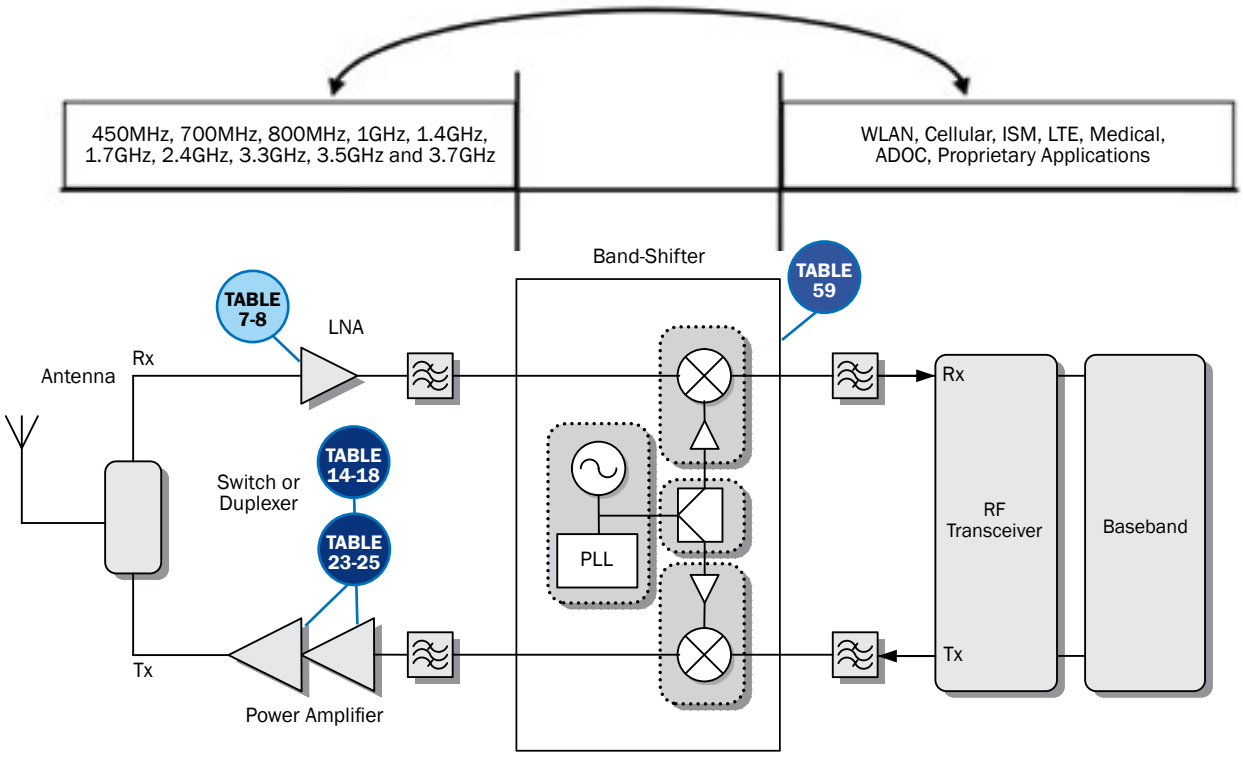
CATV Multi-Dwelling Unit (MDU) Amplifier



CATV Optical Nodes

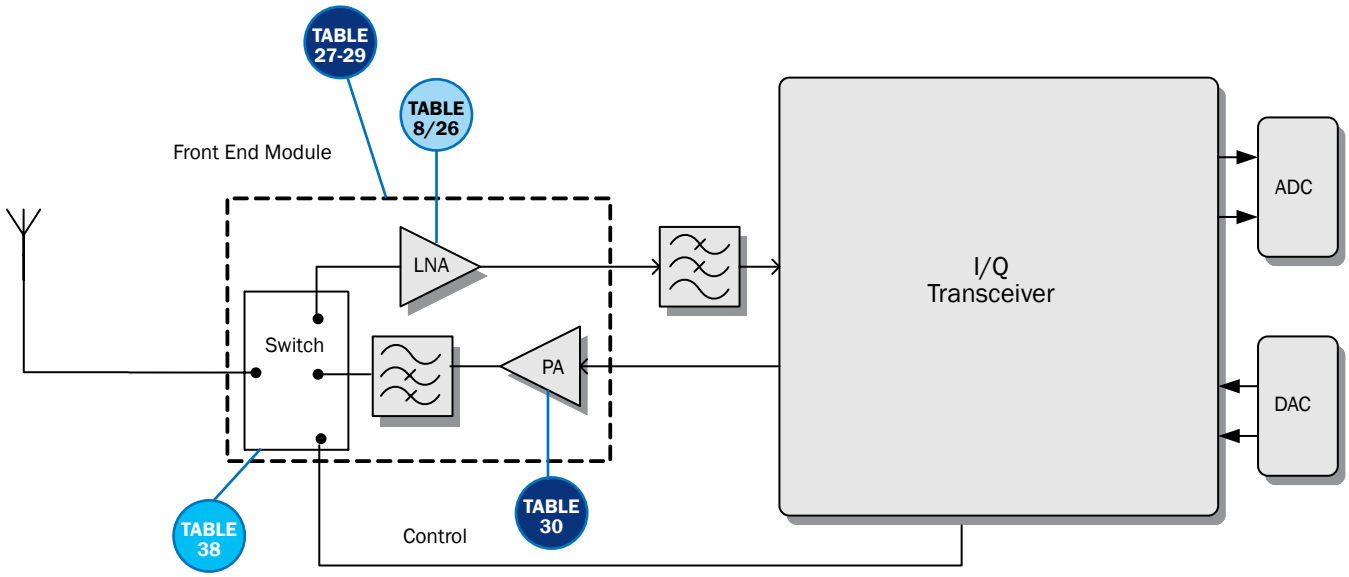


Band-Shifter

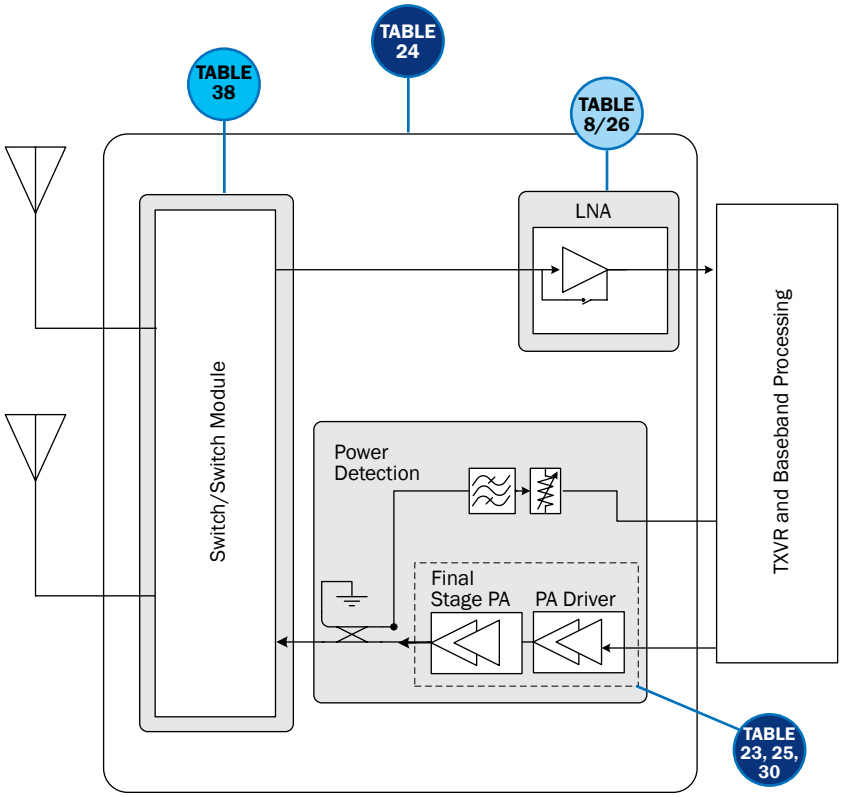


WiFi and WiMAX

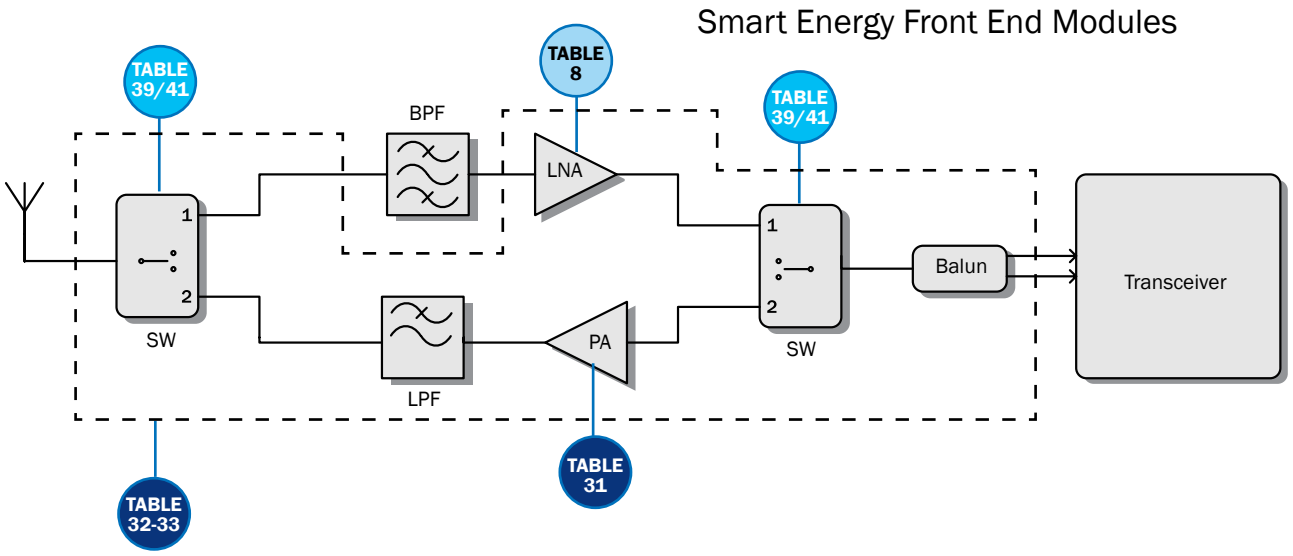
WiFi Mobile and Embedded



WiFi Customer-Premises Equipment (CPE)



Smart Energy AMI/ZigBee®



PACKAGE INFORMATION

					
QFN/LPCC	Ceramic Micro-X	P70	SOT-363/SC70	SOT-343	SOT-86
					
RF400-2	SOT-89	SOT-23	S06	S10	RF360-2
					
SOT-115J	DFN	Ceramic MPGA	SOIC-8	MSOP-8	SMT2
					
SOP Batwing	CJBATO	TSSOP	RF565-2	PNP	PLL
					
VCO	Module	SOF	TO-5	AIN-SOIC-8	LQFP/TQFP
					
Flatpack	SMA	LF	MMIC VCO	TO-8	Conn. Module

VSWR / Return Loss Conversion Table

Return Loss (dB)	VSWR	Return Loss (dB)	VSWR	Return Loss (dB)	VSWR	Return Loss (dB)	VSWR	Return Loss (dB)	VSWR
46.064	1.01	13.842	1.51	9.485	2.01	7.327	2.51	5.999	3.01
40.086	1.02	13.708	1.52	9.428	2.02	7.294	2.52	5.970	3.02
36.607	1.03	13.577	1.53	9.372	2.03	7.262	2.53	5.956	3.03
34.151	1.04	13.449	1.54	9.317	2.04	7.230	2.54	5.935	3.04
32.256	1.05	13.324	1.55	9.262	2.05	7.198	2.55	5.914	3.05
30.714	1.06	13.201	1.56	9.208	2.06	7.167	2.56	5.893	3.06
29.417	1.07	13.081	1.57	9.155	2.07	7.135	2.57	5.872	3.07
28.299	1.08	12.964	1.58	9.103	2.08	7.105	2.58	5.852	3.08
27.318	1.09	12.849	1.59	9.051	2.09	7.074	2.59	5.832	3.09
26.444	1.10	12.736	1.60	8.999	2.10	7.044	2.60	5.811	3.10
25.658	1.11	12.625	1.61	8.949	2.11	7.014	2.61	5.791	3.11
24.943	1.12	12.518	1.62	8.899	2.12	6.984	2.62	5.771	3.12
24.289	1.13	12.412	1.63	8.849	2.13	6.954	2.63	5.751	3.13
23.686	1.14	12.308	1.64	8.800	2.14	6.925	2.64	5.732	3.14
23.127	1.15	12.207	1.65	8.752	2.15	6.896	2.65	5.712	3.15
22.607	1.16	12.107	1.66	8.705	2.16	6.867	2.66	5.693	3.16
22.120	1.17	12.009	1.67	8.657	2.17	6.839	2.67	5.674	3.17
21.664	1.18	11.913	1.68	8.611	2.18	6.811	2.68	5.654	3.18
21.234	1.19	11.818	1.69	8.565	2.19	6.783	2.69	5.635	3.19
20.828	1.20	11.725	1.70	8.519	2.20	6.755	2.70	5.617	3.20
20.443	1.21	11.634	1.71	8.474	2.21	6.728	2.71	5.598	3.21
20.079	1.22	11.545	1.72	8.430	2.22	6.700	2.72	5.579	3.22
19.732	1.23	11.457	1.73	8.386	2.23	6.673	2.73	5.561	3.23
19.401	1.24	11.370	1.74	8.342	2.24	6.646	2.74	5.542	3.24
19.085	1.25	11.285	1.75	8.299	2.25	6.620	2.75	5.524	3.25
18.783	1.26	11.202	1.76	8.257	2.26	6.594	2.76	5.506	3.26
18.493	1.27	11.120	1.77	8.215	2.27	6.567	2.77	5.488	3.27
18.216	1.28	11.039	1.78	8.173	2.28	6.541	2.78	5.470	3.28
17.949	1.29	10.960	1.79	8.138	2.29	6.516	2.79	5.452	3.29
17.690	1.30	10.881	1.80	8.091	2.30	6.490	2.80	5.435	3.30
17.445	1.31	10.804	1.81	8.051	2.31	6.465	2.81	5.417	3.31
17.207	1.32	10.729	1.82	8.011	2.32	6.440	2.82	5.400	3.32
16.977	1.33	10.654	1.83	7.972	2.33	6.415	2.83	5.383	3.33
16.755	1.34	10.581	1.84	7.933	2.34	6.390	2.84	5.365	3.34
16.540	1.35	10.509	1.85	7.894	2.35	6.366	2.85	5.348	3.35
16.332	1.36	10.437	1.86	7.856	2.36	6.341	2.86	5.331	3.36
16.131	1.37	10.367	1.87	7.818	2.37	6.317	2.87	5.315	3.37
15.936	1.38	10.298	1.88	7.781	2.38	6.293	2.88	5.298	3.38
15.747	1.39	10.230	1.89	7.744	2.39	6.270	2.89	5.281	3.39
15.563	1.40	10.163	1.90	7.707	2.40	6.246	2.90	5.265	3.40
15.385	1.41	10.097	1.91	7.671	2.41	6.223	2.91	5.248	3.41
15.211	1.42	10.032	1.92	7.635	2.42	6.200	2.92	5.232	3.42
15.043	1.43	9.968	1.93	7.599	2.43	6.177	2.93	5.216	3.43
14.879	1.44	9.904	1.94	7.564	2.44	6.154	2.94	5.200	3.44
14.719	1.45	9.842	1.95	7.529	2.45	6.131	2.95	5.184	3.45
14.564	1.46	9.780	1.96	7.494	2.46	6.109	2.96	5.168	3.46
14.412	1.47	9.720	1.97	7.460	2.47	6.086	2.97	5.152	3.47
14.264	1.48	9.660	1.98	7.426	2.48	6.064	2.98	5.137	3.48
14.120	1.49	9.601	1.99	7.393	2.49	6.042	2.99	5.121	3.49
13.979	1.50	9.542	2.00	7.360	2.50	6.021	3.00	5.105	3.50

dBm-to-Watts Conversion Table

dBm	Watts	dBm	Watts	dBm	Watts
0	1.0 mW	16	40 mW	32	1.6 W
1	1.3 mW	17	50 mW	33	2.0 W
2	1.6 mW	18	63 mW	34	2.5 W
3	2.0 mW	19	79 mW	35	3 W
4	2.5 mW	20	100 mW	36	4 W
5	3.2 mW	21	126 mW	37	5 W
6	4 mW	22	158 mW	38	6 W
7	5 mW	23	200 mW	39	8 W
8	6 mW	24	250 mW	40	10 W
9	8 mW	25	316 mW	41	13 W
10	10 mW	26	398 mW	42	16 W
11	13 mW	27	500 mW	43	20 W
12	16 mW	28	630 mW	44	25 W
13	20 mW	29	800 mW	45	32 W
14	25 mW	30	1.0 W	46	40 W
15	32 mW	31	1.3 W	47	50 W

Microwave Frequency Bands

Letter Designation	Frequency Range
L band	1 to 2 GHz
S band	2 to 4 GHz
C band	4 to 8 GHz
X band	8 to 12 GHz
Ku band	12 to 18 GHz
K band	18 to 26.5 GHz
Ka band	26.5 to 40 GHz
Q band	33 to 50 GHz
U band	40 to 60 GHz
V band	50 to 75 GHz
E band	60 to 90 GHz
W band	75 to 110 GHz
F band	90 to 140 GHz
D band	110 to 170 GHz

PART NUMBER INDEX

PART NUMBER INDEX

PART NUMBER INDEX

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