

Smart Energy

Advanced Metering Infrastructure (AMI) & ZigBee®
Front-End Module Portfolio



qorvoTM
all around you

Front-End Modules for High-Performance AMI & Zigbee® Applications

The Qorvo portfolio of single-chip integrated Front-End Modules (FEMs) is developed for high-performance AMI and ZigBee® applications in the 2.4GHz to 2.5GHz, 915/868MHz, 433MHz and 169MHz ISM bands. The RF3858, RFFM69xx, RFFM65xx, RFFM64xx, RFFM62xx series and RF5745 are specifically designed to address the need for aggressive size reduction in a typical 802.15.4 front-end designs and offer a reduced footprint and minimized component count, outside of the core chipset.

The RF3858, RF65x9 and RFFM69xx series integrate a 915/868MHz High Power Amplifier (HPA) with Transmit (Tx) filtering, a Low Noise Amplifier (LNA) with or without bypass functionality and a remarkably complex combination of Double-Pole Double-Throw (DPDT), Single-Pole Double-Throw (SPDT) and Single-Pole Three-Throw (SP3T) switches. This configuration allows for a high-power design capable of antenna diversity. The pin out of the FEM enables users to implement additional Rx filtering external to the module, if needed.

The RF5745, RF65x5, and RFFM6201 integrate a 2.4GHz PA, Transmit (Tx) filtering, input and output switches, a Tx or Rx attenuation path, and an LNA with or without bypass mode. The RF65x4 and RFFM640x integrate a 470MHz high-power amplifier (PA) with transmit (Tx) filtering and an SPDT switch. This configuration allows for a high-power design with minimal loss in the Rx path. The RFFM6500 integrates a 169MHz High Power Amplifier (HPA) with Transmit (Tx) filtering and a SPDT switch.

Each of our AMI front-end modules meets or exceeds the RF front-end needs for 802.15.4 AMI/ZigBee® RF systems and is fully DC- and RF-tested.

Features

- Integrated PA, Tx harmonic filtering, LNA and switches
- High power: up to >2W
- High gain: 28 to 31dB
- High efficiency: >55%
- Advanced module packaging

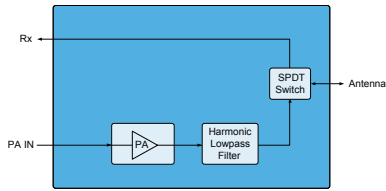
Applications

- ISM band
- Smart energy
- Automatic Metering Infrastructure (AMI)
- Alarm systems
- Home Area Network (HAN)
- Home automation

Specifications

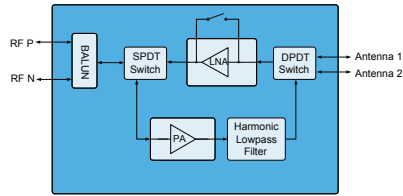
Freq Range (MHz)	Architecture	Gain (dB)	Average P _{OUT} (dBm)	V _{CC} (V)	Current at P _{OUT} (mA)	Package (mm)	Part Number
168 to 171	PA, SPDT	30.0	27.0	2.7 to 4.2	325	6x6x1.2	RFFM6500
405 to 475	PA, SP3T, SP2T, LNA	20.0	30.0	2.5 to 4.2	1250	6x6x1.2	RFFM6403
408 to 455	PA, SP3T, SP2T, LNA	25.0	31	2.5 to 4.2	825	6x6x0.975	RFFM6406
430 to 450	PA, SP2T, LNA	25.0	27.5	2.5 to 4.5	350	6x6x0.975	RFFM6404
433 to 470	PA, SPDT	15.0	30.0	3.3 to 4.0	700	5x5.5x1.2	RF6504
433 to 470	PA, SP2T	30.0	30.0	3.3 to 4.0	750	5x5.5x1.2	RFFM6401
470 to 510	PA, SPDT	15.0	30.0	3.3 to 4.0	800	5x5.5x1.2	RF6514
902 to 928, 868	LNA, DP2T	14.0	-	3.3 to 4.0	8	4x3 LGA	RFFM6909
902 to 928, 868	PA, DP2T	16.5	20.0	3.3 to 4.0	90	5x5.5x1.2	RF6539
902 to 928, 868	PA, DP2T	16.5	26.0	3.3 to 4.0	215	5x5.5x1.2	RF6599
902 to 928, 868	PA, SP2T, DP2T, LNA	30.0	26.0	3.3 to 5.0	225	5x5.5x1	RF6519
902 to 928, 868	PA, DP2T, SP2T, LNA	30.0	27.0	2.7 to 4.4	215	6x6x1.2	RF6549
902 to 928, 868	PA, SP2T	14.0	30.0	3.1 to 3.8	850	5x5.5x1.2	RF6569
902 to 928, 868	PA, SP3T, SP2T, LNA	25.0	30.0	2.5 to 4.2	850	6x6x1.2	RFFM6903
902 to 928, 868	PA, DP2T, LNA	27.0	30.0	3.1 to 3.8	750	5x5.5x1.2	RFFM6906
902 to 928, 868	PA, DP2T, LNA	30.0	30.0	2.8 to 4.2	600	6x6x1.2	RFFM6901
902 to 928, 868	PA, 2-SP3T, LNA	31.0	30.0	2.7 to 3.6	740	8x8x1.2	RF6509
902 to 928, 868	PA, DP2T	13.0	30.5	2.8 to 4.0	550	5x5.5x1.2	RFFM6907
902 to 928, 868	PA, LNA, SP2T, SP3T	20.0	30.5	3.6	650	6x6x0.975	RFFM6900
902 to 928, 868	PA, DP2T, LNA	30.0	31.5*	3.0 to 4.0	950	8x8x1.2	RF3858
902 to 928, 868	PA, DP2T, LNA	30.0	33.5*	3.2 to 4.5	700	8x8x1.2	RFFM6904
2400 to 2500	PA, SP3T x 2, LNA	15.0	13.0	2.0 to 4.0	20	2.5x2.5x0.4	RFFM6204
2400 to 2500	PA, SP3T x 2, LNA	12.0	14.0	2.0 to 4.0	20	2.5x2.5x0.4	RFFM6205
2400 to 2500	PA, SP2T, DP2T, LNA	25.0	18.0	2.0 to 3.6	70	5x5x1	RF6555
2400 to 2500	PA, SP2T	28.0	20.0	2.85 to 4.2	160	3.5x3.5x0.5	RF6515
2400 to 2500	PA, DP2T, LNA	28.0	20.0	3.0 to 4.2	160	3.5x3.5x0.5	RF6525
2400 to 2500	PA, DP2T, SPDT	28.0	20.0	3.0 to 3.6	160	3.5x3.5x0.5	RF6545
2400 to 2500	PA, DPDT, SPDT, LNA	28.0	20.0	3.0 to 3.6	160	3.5x3.5x0.5	RF6575
2400 to 2500	PA, DP2T, LNA	28.0	22.0	3.0 to 4.2	210	3.5x3.5x0.5	RF6535
2400 to 2500	PA, SP2T, DP2T, LNA	25.0	23.0	2.0 to 3.6	175	5x5x1	RFFM6201
2400 to 2500	PA, SP3T, LNA	30.0	23.0	3.0 to 4.5	230	3x3x0.5	RF5745
2400 to 2500	PA, SP2T, DP2T, LNA	28.0	27.0	3.2 to 4.2	500	3.5x3.5x0.6	RF6505

* At PA OUT



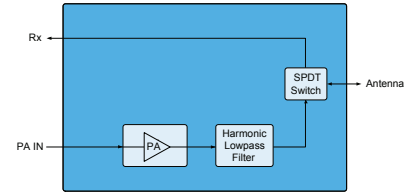
RF6504

PA, Tx filtering, SPDT switch



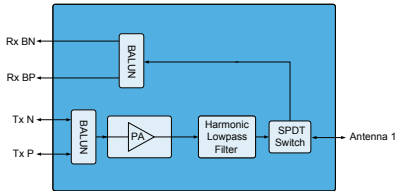
RF6505

PA, Tx filtering, LNA w/bypass, SPDT/DPDT switch



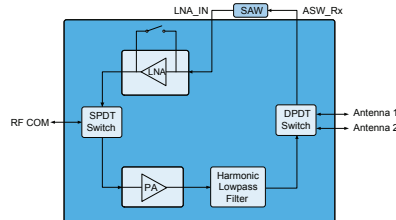
RF6514

PA, Tx filtering, SPDT switch



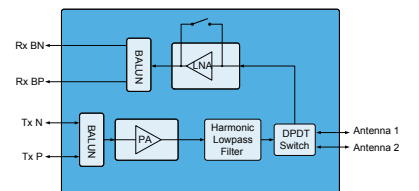
RF6515

PA, Tx filtering, SPDT switch



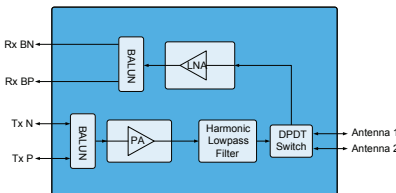
RF6519

PA, Tx filtering, LNA w/bypass, SPDT/SPDT switch



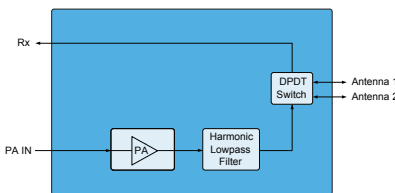
RF6525

PA, Tx filtering, LNA w/bypass, DPDT switch



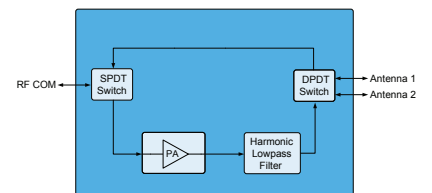
RF6535

PA, Tx filtering, LNA, DPDT switch



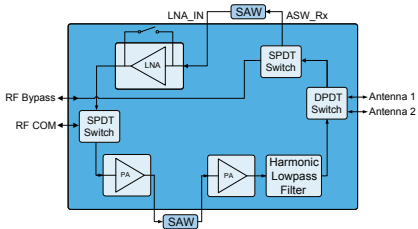
RF6539

PA, Tx filtering, SPDT switch



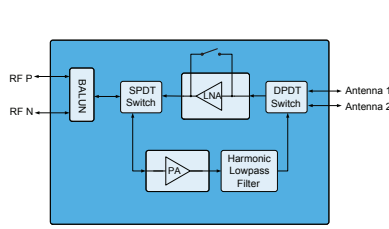
RF6545

PA, Tx filtering, SPDT/DPDT switch



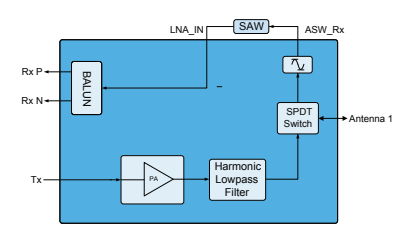
RF6549

PA, Tx filtering, Tx bypass, LNA w/bypass, DPDT/SPDT switch



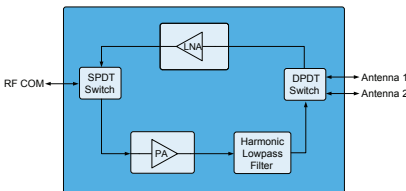
RF6555

PA, Tx filtering, LNA w/bypass, SPDT/DPDT switch



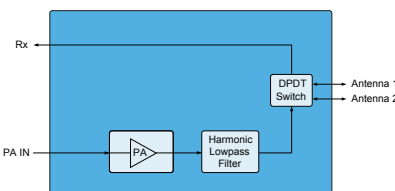
RF6569

PA, Tx filtering, Tx/Rx SPDT switch, Rx balun



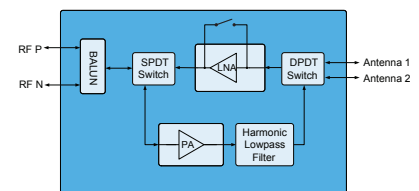
RF6575

PA, Tx filtering, LNA, SPDT/DPDT switch



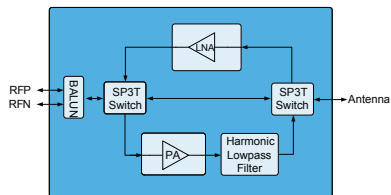
RF6599

PA, Tx filtering, Tx/Rx DPDT switch



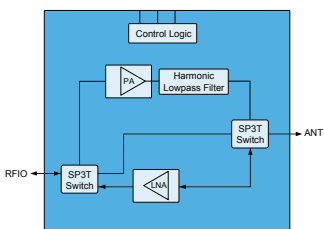
RFFM6201

PA, Tx filtering, LNA w/bypass, SPDT/DPDT switch



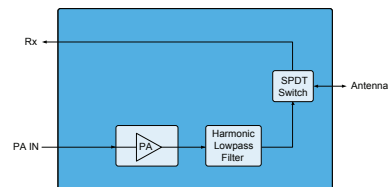
RFFM6204

PA, Tx filtering, LNA, thru path, and 2x SP3T



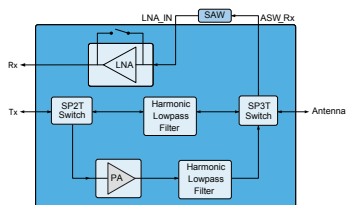
RFFM6205

PA, Tx filtering, LNA, thru path and 2x SP3T



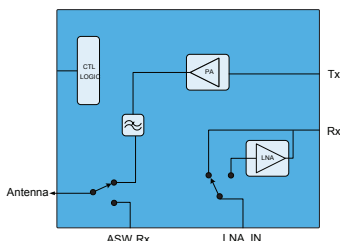
RFFM6401

PA, Tx filtering, SPDT switch



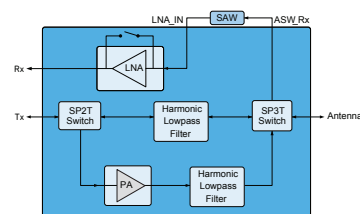
RFFM6403

PA, Tx filtering, LNA w/bypass, SPDT and SP3T switches



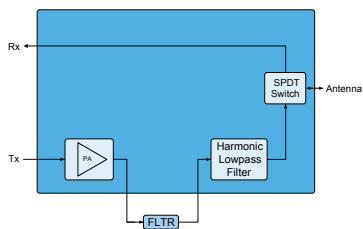
RFFM6404

PA, Tx filtering, LNA w/bypass, SPDT switch



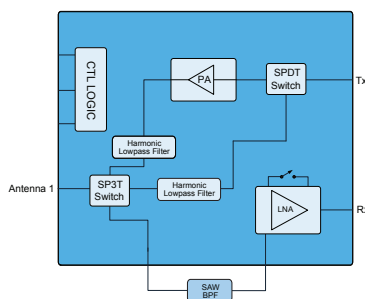
RFFM6406

PA, Tx filtering, LNA w/bypass, SP2T and SP3T switches



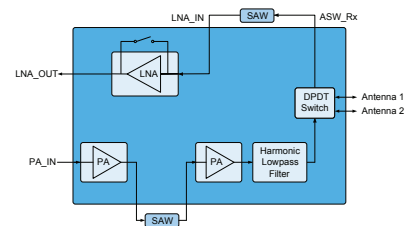
RFFM6500

PA, Tx filtering, SP2T switch



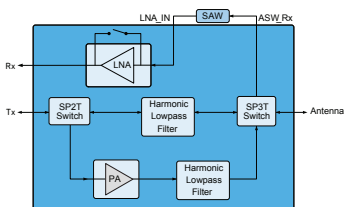
RFFM6900

PA, Tx filtering, Tx thru path, LNA w/bypass, SPDT/SP3T switch



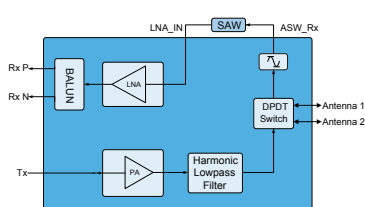
RFFM6901

PA, Tx filtering, LNA w/bypass, DPDT switch



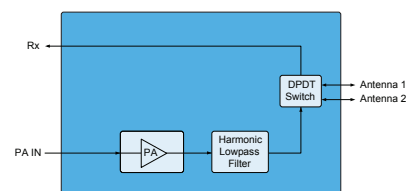
RFFM6903

PA, Tx filtering, LNA w/bypass, SPDT and SP3T switches



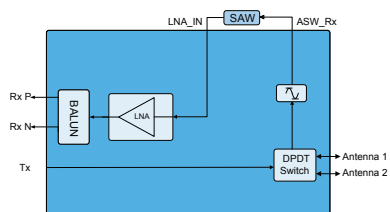
RFFM6906

PA, Tx filtering, LNA w/limiter, DPDT switch



RFFM6907

PA, Tx filtering, Tx/Rx, DPDT switch



RFFM6909

LNA, Rx balun and Tx/Rx SPDT switch