

# RFMD.

## Smart Energy: Advanced Metering Infrastructure (AMI) and ZigBee® Front End Module Portfolio

The RFMD® 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, and 433MHz ISM bands. The RF3858, RFFM69xx, RFFM64xx, RFFM62xx series, and RF5745 are specifically designed to address the need for aggressive size reduction in a typical 802.15.4 front end design and offer a reduced footprint and minimized component count, outside the core chipset.

The RF3858, RF65x9, and RFFM69xx series integrate a 915/868MHz high-power amplifier (PA) 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 RFFM6401 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.

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 >1W
- High gain: 28 to 31dB
- High efficiency: >55%
- Advanced module packaging

### APPLICATIONS

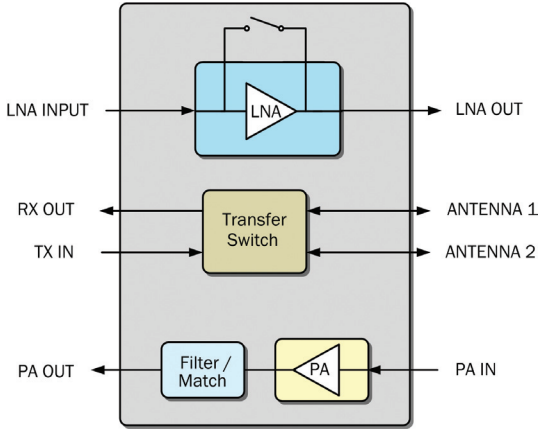
- ISM Band
- Smart Energy
- Automatic Metering Infrastructure (AMI)
- Alarm Systems
- Home Area Network (HAN)
- Home Automation

### SPECIFICATIONS

Architecture	Freq Range (MHz)	Gain (dB)	Avg P <sub>OUT</sub> (dBm)	V <sub>CC</sub> (V)	Current at P <sub>OUT</sub> (mA)	Package (mm)	Part Number
PA, SP2T, DP2T, LNA	2400 to 2500	25.0	18.0	2.0 to 3.6	70	5.0 x 5.0 x 1.0	RF6555
PA, SP2T	2400 to 2500	28.0	20.0	3.3	160	3.5 x 3.5 x 0.5	RF6515
PA, DP2T, LNA	2400 to 2500	28.0	20.0	3.3	160	3.5 x 3.5 x 0.5	RF6525
PA, DP2T, SPDT	2400 to 2500	28.0	20.0	3.3	160	3.5 x 3.5 x 0.5	RF6545
PA, DPDT, SPDT, LNA	2400 to 2500	28.0	20.0	3.3	160	3.5 x 3.5 x 0.5	RF6575
PA, DP2T, LNA	2400 to 2500	28.0	22.0	3.3	210	3.5 x 3.5 x 0.5	RF6535
PA, SP3T, LNA	2400 to 2500	30.0	23.0	3.3	230	3.0 x 3.0 x 0.5	RF5745
PA, SP2T, DP2T, LNA	2400 to 2500	25.0	23.0	2.0 to 3.6	175	5.0 x 5.0 x 1.0	RFFM6201
PA, SP2T, DP2T, LNA	2400 to 2500	28.0	27.0	3.6	500	3.5 x 3.5 x 0.6	RF6505
PA, DP2T	902 to 928, 868	16.5	20.0	3.6	90	5.0 x 5.5 x 1.2	RF6539
PA, SP2T, DP2T, LNA	902 to 928, 868	30.0	26.0	4.2	225	5.0 x 5.5 x 1.0	RF6519
PA, DP2T	902 to 928, 868	16.5	26.0	3.6	215	5.0 x 5.5 x 1.2	RF6599
PA, 2-SP3T, LNA	902 to 928, 868	31.0	27.0	3.3	550	8.0 x 8.0 x 1.2	RF6509
PA, DP2T, SP2T, LNA	902 to 928, 868	30.0	27.0	4.2	215	6.0 x 6.0 x 1.2	RF6549
PA, 2-SP2T, LNA	902 to 928, 868	42.0	28.0	4.2	340	5.0 x 5.5 x 1.0	RF6559
PA, SP2T	902 to 928, 868	14.0	30.0	3.6	850	5.0 x 5.5 x 1.2	RF6569
PA, DP2T, LNA	902 to 928, 868	30.0	31.5*	4.0	950	8.0 x 8.0 x 1.2	RF3858
PA, SPDT	433 to 470	15.0	30.0	3.6	850	5.0 x 5.5 x 1.2	RF6504
PA, SP2T	433 to 470	30.0	30.0	3.5	750	5.0 x 5.5 x 1.2	RFFM6401
PA, SPDT	470 to 510	15.0	30.0	3.6	850	5.0 x 5.5 x 1.2	RF6514

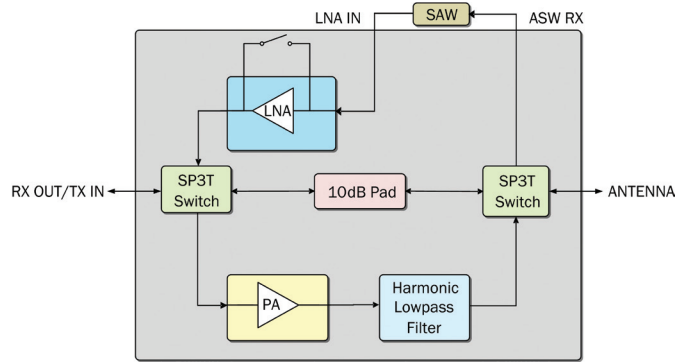
### RF3858

- 915 and 868MHz PA, Tx filtering, LNA w/bypass, and DPDT switch
- 31.5dBm output power at PA OUT
- 8.0 x 8.0 x 1.2mm



### RF6509

- 915 and 868MHz PA, Tx filtering, LNA w/bypass, and SP3T switches
- 0.5W output power
- 8.0 x 8.0 x 1.2mm



### RF6539

- 915 and 868MHz PA, Tx filtering, and Tx/Rx DPDT switch
- 20dBm output power
- 5.0 x 5.5 x 1.2mm



### RF6569

- 915 and 868MHz PA, Tx filtering, and Tx/Rx SPDT switch, and Rx balun
- 30dBm output power
- 5.0 x 5.5 x 1.2mm



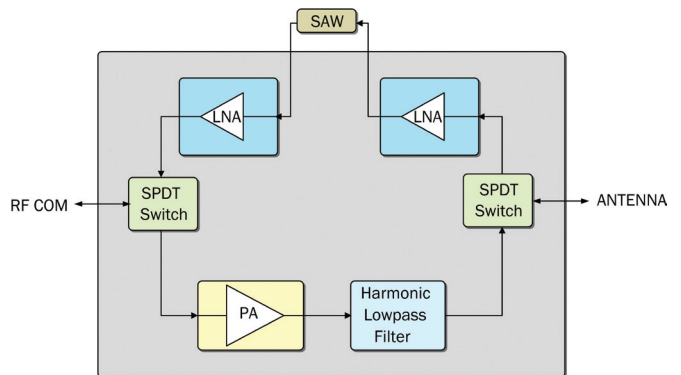
### RF6599

- 915 and 868MHz PA, Tx filtering, Tx/Rx DPDT switch
- 26dBm output power
- 5.0 x 5.5 x 1.2mm

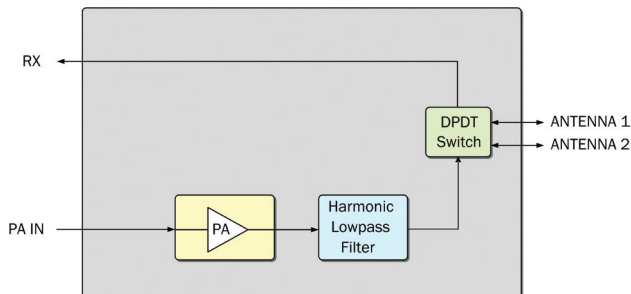


### RF6559

- 915 and 868MHz PA, Tx filtering, and LNA and SP2T switches
- 28dBm output power
- 6.0 x 6.0 x 1.0mm



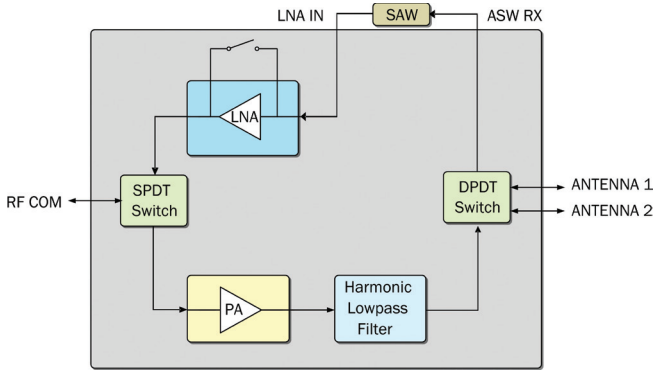
RF6539, RF6569, and RF6599 Block Diagram



Note: RF6569 has integrated Rx Balun and SPDT switch.

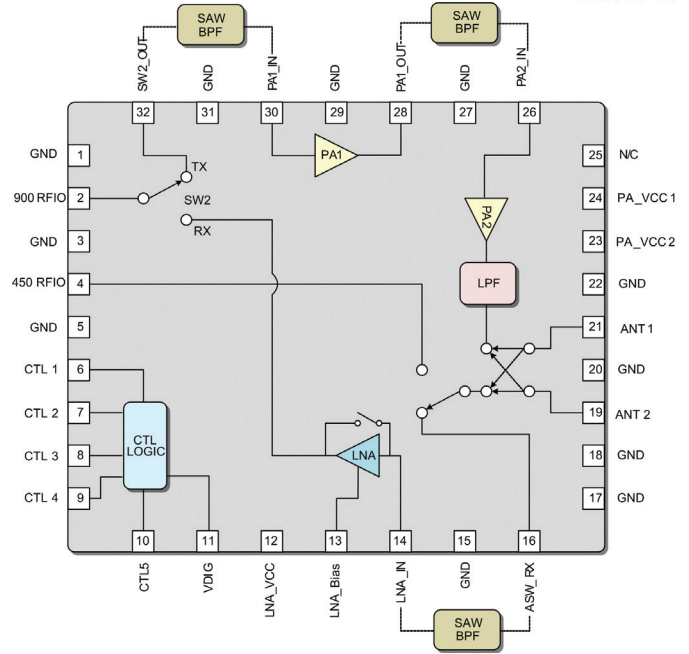
### RF6519

- 915 and 868MHz PA, Tx filtering, LNA w/bypass, SPDT, and DPDT switch
- 26dBm output power
- 5.0 x 5.5 x 0.9mm



### RF6549

- 915 and 868MHz PA, Tx filtering, Tx bypass, LNA w/bypass, a DPDT and SPDT switch
- 0.5W output power
- 6.0 x 6.0 x 1.2mm



### RF6505

- 2.4GHz PA, Tx filtering, LNA w/bypass, SPDT, and DPDT switch
- 27dBm output power
- 3.5 x 3.5 x 0.5mm



### RF6555

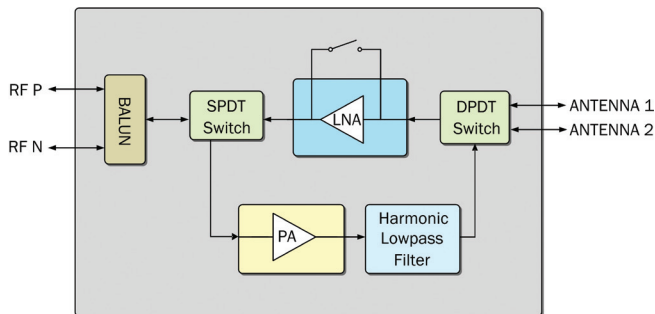
- 2.4GHz PA, Tx filtering, LNA w/bypass, SPDT, and DPDT switch
- 18dBm output power
- 5.0 x 5.0 x 1.0mm

### RFFM6201

- 2.4GHz PA, Tx filtering, LNA w/bypass, SPDT, and DPDT switch
- 23dBm output power
- 5.0 x 5.0 x 1.0mm

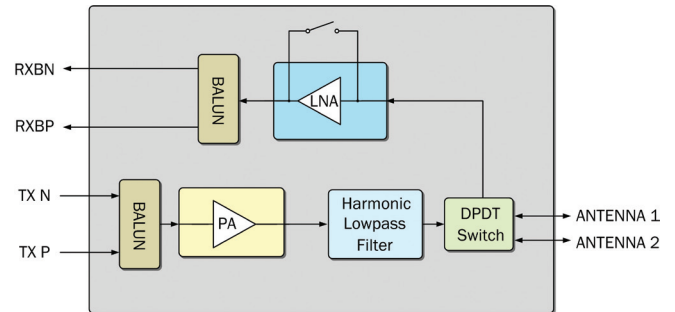


RF6505, RF6555, and RFFM6201 Block Diagram



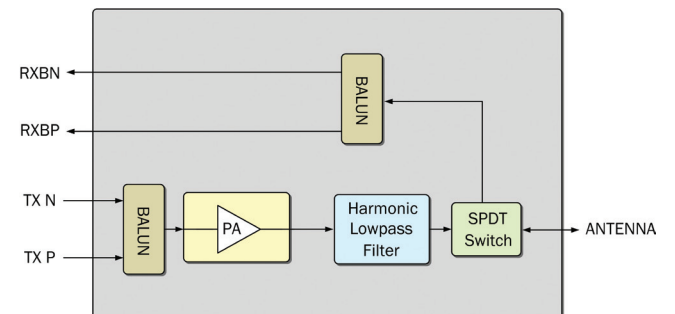
### RF6525

- 2.4GHz PA, Tx filtering, LNA w/bypass, and DPDT switch
- 20dBm output power
- 3.5 x 3.5 x 0.5mm



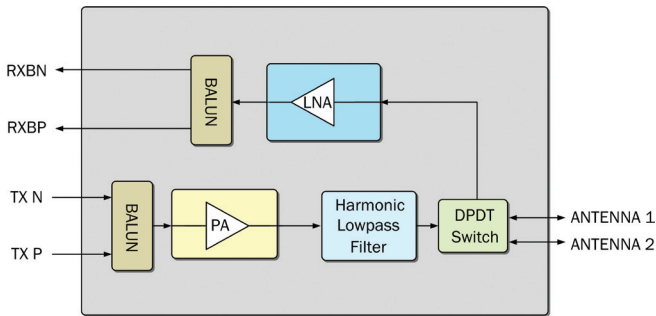
### RF6515

- 2.4GHz PA, Tx filtering, and SPDT switch
- 20dBm output power
- 3.5 x 3.5 x 0.5mm
- 1.8V logic



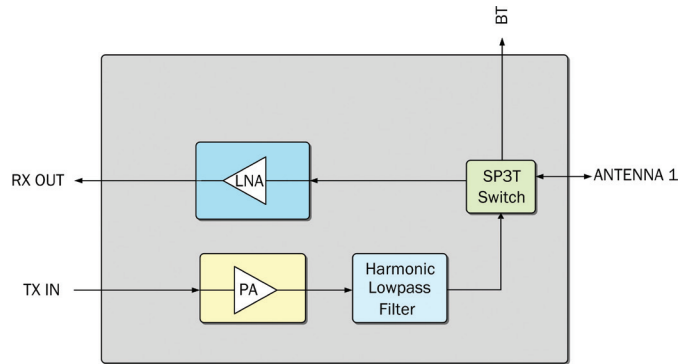
### RF6535

- 2.4GHz PA, Tx filtering, LNA, and a DPDT switch
- 20dBm output power
- 3.5 x 3.5 x 0.5mm
- 1.8V logic
- LNA limiter



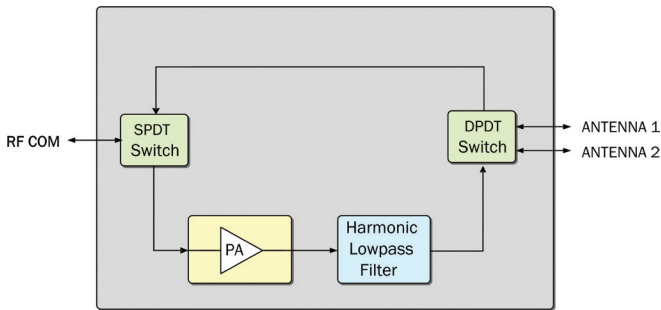
### RF5745

- 2.4GHz PA, Tx filtering, LNA, and a SP3T switch
- 20dBm output power
- 3.0 x 3.0 x 0.5mm



### RF6545

- 2.4GHz PA, Tx filtering, SPDT, and DPDT switch
- 20dBm output power
- 3.5 x 3.5 x 0.5mm



### RF6504

- 433MHz to 470MHz PA, Tx filtering, and SPDT switch
- 30dBm output power
- 5.0 x 5.5 x 1.2mm



### RF6514

- 470MHz to 510MHz PA, Tx filtering, and SPDT switch
- 30dBm output power
- 5.0 x 5.5 x 1.2mm



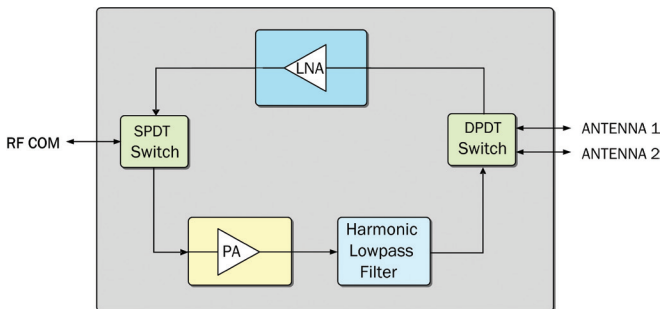
### RFFM6401

- 433MHz to 470MHz PA, Tx filtering, and SPDT switch
- 30dBm output power, 30db gain
- 5.0 x 5.5 x 1.2mm

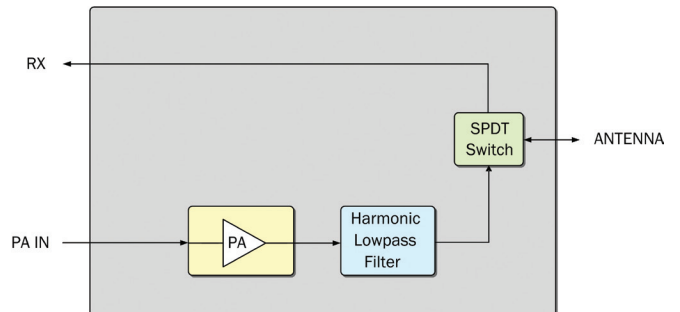


### RF6575

- 2.4GHz PA, Tx filtering, LNA, SPDT, and DPDT switch
- 20dBm output power
- 3.5 x 3.5 x 0.5mm



RF6504, RF6514 and RFFM6401 Block Diagram



MPG-AMI/ZigBee® 0212.100

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