

Smart Energy Reference Design Portfolio

for Smart Energy AMI, and ZigBee® HAN Applications

qorvo
all around you



Smart Energy: Advanced Metering Infrastructure (AMI) & ZigBee® Front-End Module Selection Guide

Features

- A recognized leader in high-performance semiconductor components
- Broad technology and product portfolio
- Diversified across multiple wireless and broadband market segments
- World-class scale and global customer support

Smart Energy Module Summary 2.4GHz to 2.5GHz

Freq Range (MHz)	Pout (dBm)	Antenna Output	RX/TX Interface	LNA	Compatible Tranceivers	Part Number
2400 to 2500	13	DP3T	Bi-directional 100 ohm balun	Yes	EM35x CC24XX, CC25XX, AT86RF231, ATmega128, ATmega256, MC1321, MC1323, KW2xDxxx, ADF7023	RFFM6204
2400 to 2500	14	SP3T	Bi-directional 50 ohm line	Yes	nRF24L, nRF80XX, nRF52	RFFM6205
2400 to 2500	20	DP2T	Bi-directional 100 ohm balun	Yes	EM357, CC24XX, CC25XX, AT86RF231, MC1323x, ATmega128RFA1, ATmega256RFR2	RF6555
2400 to 2500	23	DP2T	Bi-directional 100 ohm balun	Yes	EM357, CC24XX, CC25XX, AT86RF231, MC1323x, ATmega128RFA1, ATmega256RFR2	RFFM6201
2400 to 2500	22	DP2T	200 ohm baluns RX/TX	No	EM250	RF6515
2400 to 2500	22	DP2T	200 ohm baluns RX/TX	Yes	EM357, STM32W	RF6525
2400 to 2500	22	DP2T	Two 200 ohm baluns	Yes	EM250, MC1321x	RF6535
2400 to 2500	22	DP2T	Bi-directional 50 ohm line (SP2T)	No	MC1322x	RF6545
2400 to 2500	22	DP2T	Bi-directional 50 ohm line (SP2T)	Yes	ATmega128RFA1, MC1322x, AT86RF231	RF6575
2400 to 2500	23	DP2T	50 ohm RX, 50 ohm TX	Yes	AT86RF231	RF5745
2400 to 2500	27	DP2T	Bi-directional 100 ohm balun	Yes	EM357, CC24XX, CC25XX, AT86RF231	RF6505

Smart Energy Module Summary 500MHz to 1GHz

Freq Range (MHz)	Pout (dBm)	Antenna Output	RX/TX Interface	LNA	Compatible Tranceivers	Part Number
868 & 900	22	DP2T	50 ohm RX, 50 ohm TX	No	ADF7020, Si4432	RF6539
868 & 900	26	DP2T	50 ohm RX, 50 ohm TX	No	ADF7020, Si4432	RF6599
868 & 900	26.5	DP2T	Bi-directional 50 ohm line (SP2T)	Yes	CC1101, AT86RF212, SX1231	RF6519
868 & 900	27	DP2T	50 ohm RX, 50 ohm TX	Yes	CC1101, AT86RF212	RF6549
868 & 900	28	SP2T	Bi-directional 50 ohm line (SP2T)	Yes	CC1101, SX1211, SX1231	RF6559
868 & 900	30	SP3T	Bi-directional 50 ohm line (SP2T)	Yes	CC1101, SX1211, SX1231	RF6509
868 & 900	30	SP2T	100 ohm baluns/50 ohm RX, 50 ohm TX	No	Si1000, Si446x, CC112x, CC1200	RF6569
868 & 900	30	DP2T	100 ohm baluns/50 ohm RX, 50 Ohm TX	Yes	Si1000, Si446x, CC112x, CC1200	RFFM6906
868 & 900	30	DP2T	50 ohm RX, 50 ohm TX	No	ADF7020, Si4432	RFFM6907
868 & 900	30	SP3T	50 ohm RX, 50 ohm TX with TX bypass	Yes	CC1101, AT86RF212, CC112x	RFFM6903
868 & 900	30	DP2T	50 ohm RX, 50 ohm TX	Yes	ADF7020, ADF7023, Si4432, CC1101	RFFM6901
868 & 900	31.5	DP2T	50 ohm RX, 50 ohm TX	Yes	ADF7020, Si4442, CC1101	RF3858
868 & 900	33.5	DP2T	50 ohm RX, 50 ohm TX	Yes	ADF7020, Si4442, CC1101	RFFM6904
868 & 900	30	SP3T	50 ohm RX, 50 ohm TX with TX bypass	Yes	CC1101, CC1200, AT86RF212, Si446X, SX12XX	RFFM6900
868 & 900	30	2P2T	75 ohm balun or 50 ohm RX line, 50 ohm TX	Yes	CC1200, CC112X, Si446X, SX12XX	RFFM6906
868 & 900	N/A	2P2T	75 ohm balun or 50 ohm RX line, 50 ohm TX	Yes	CC1200, CC112X, Si446X, SX12XX	RFFM6909

Smart Energy Module Summary <500MHz

Freq Range (MHz)	Pout (dBm)	Antenna Output	RX/TX Interface	LNA	Compatible Tranceivers	Part Number
168 to 171	27.5	SP2T	50 ohm RX, 50 ohm TX	No	ADF7020, Si446x, CC112x	RFFM6500
430 to 470	30	SP2T	50 ohm RX, 50 ohm TX	No	ADF7020, Si4432	RF6504
470 to 510	25	SP2T	50 ohm RX, 50 ohm TX	No	Si4432	RF6514
430 to 470	30	SP2T	50 ohm RX, 50 ohm TX	No	ADF7020, Si4432	RFFM6401
405 to 470	30	SP3T	50 ohm RX, 50 ohm TX with TX bypass (SP2T)	Yes	CC1101, AT86RF212, CC112x	RFFM6403
405 to 470	30	SP3T	50 ohm RX, 50 ohm TX with TX bypass	Yes	CC1101, CC1200, Si446X, Si443X, AT86RF212	RFFM6406
430 to 450	27.5	SP2T	50 ohm RX, 50 ohm TX line	Yes	CC1101, CC1200, Si446X, Si443X, AT86RF213	RFFM6404

Orderable Reference Designs by Chipset Partner

Adaptive Network Solutions

Reference Design #	Qorvo Part	Order Part	Range	Qorvo Part
RF6555/ATMega128RFA1	RF6555	-	• -103.5dBm RX sensitivity • 2.4GHz to 2.5GHz ZigBee/IEEE 802.15.4 • 2x AA battery operation	• 2.4GHz PA, TX filtering • LNA w/bypass, SPDT & DPDT switch • 18.0dBm output power • 5.0x5.0x1.0mm

Analog Devices

Reference Design #	Qorvo Part	Order Part #	Range	Qorvo Part
RFFM6901ADF7023	RFFM6901	RFFM6901ADF7023-410	-	• 900MHz PA, TX filtering, LNA • 30dBm output power • 6.0x6.0mm

Atmel

Reference Design #	Qorvo Part	Order Part #	Range	Qorvo Part
RF6575/ATMega128RFA1	RF6575	RFSM6575RC128-410	• 20dBm output power • Small footprint two-chip solution • 2.4GHz to 2.5GHz Zigbee/IEEE 802.15.4	• 2.4GHz PA, TX harmonic filtering • NLA, SPDT & a DPDT switch • 20.0dBm output power • 3.5x3.5x0.5mm
RF6505/ATMega128RFA1	RF6505	RF6505RC128-410	• Extended range 27dBm output power • Small footprint two-chip solution • 2.4GHz to 2.5GHz ZigBee IEEE 802.15.4	• 2.4GHz PA, TX harmonic filtering • LNA with bypass, SPDT & a DPDT switch • 27.0dBm output power • 3.5x3.5x0.5mm
RF6555/ATMega256RFR2	RF6555	RF6555ATM256-410	• Extended range 18-20dBm output power • FCC pre-compliance tested • Operates on Atmel MAC 2.8.0 Stack Software	• 2.4GHz PA, TX filtering • LNA w/bypass, SPDT & DPDT switch • 18.0dBm output power • 5.0x5.0x1.0mm

Freescale

Reference Design #	Qorvo Part	Order Part	Range	Qorvo Part
RF6535/MC1321X	RF6535	RFSM6535MC1321-410	• Extended range 20dBm output power • Freescale Beekit™-compatible • Configuration file available • Small footprint two-chip solution • 2.4GHz to 2.5GHz ZigBee®/IEEE 802.15.4	• 2.4GHz PA, TX filtering, LNA & a DPDT switch • 22.5dBm output power • 3.5x3.5x0.5mm • 1.8V logic • LNA limiter
RF6555/MC1323X	RF6555	RF6555MC1323-410	• Extended range 18-20dBm output power • 2x AA battery operation	• 2.4GHz PA, TX filtering, LNA w/bypass, SPDT & DPDT switch • 18.0dBm output power
RF6555/MKW24D512	RF6555	RF6555KW24D512-410	• Extended range 18-20dBm output power • 2x AA battery operation • -108dBm RX sensitivity • ZigBee PRO feature set from Freescale • 2.4GHz to 2.5GHz ZigBee®/IEEE 802.15.4	• 2.4GHz PA, TX filtering, LNA w/bypass, SPDT & DPDT switch • 5.0x5.0x1.0mm

Semtech

Reference Design #	Qorvo Part	Order Part #	Range	Qorvo Part
SX1231SKC-RF6519	RF6519	SX1231SKRF6519-410	• 26dBm output power	• 900MHz PA, TX filtering, LNA with bypass, DPDT switch • 26dBm output power • 5.6x5.0mm

Orderable Reference Designs by Chipset Partner

Silicon Labs

Reference Design #	Qorvo Part	Order Part #	Range	Qorvo Part
RF6525/EM357	RF6525	RFSM6525EM357-410	- Extended range 20dBm output power - ZigBee® PRO feature set - Small footprint two-chip solution 2.4GHz to 2.5GHz ZigBee/IEEE 802.15.4	2.4GHz PA, TX filtering, LNA with bypass & a DPDT switch 20.0dBm output power 3.5x3.5x0.5mm
RF6555/EM357	RF6555	RF6555EM357-410	- Extended range 18dBm output power - ZigBee® PRO feature set from Ember - Antenna diversity 2.4GHz to 2.5GHz ZigBee/IEEE 802.15.4	2.4GHz PA, TX filtering, LNA with LNA bypass, SPDT & a DPDT switch 18.0dBm output power 5.0x5.0x1.0mm
RFFM6201/EM35X	RF6201	RFFM6201EM357-410	- Extended range 23dBm output power -105dBm RX sensitivity - Maximum EVM (Offset EVM per Agilent) => 6.7% - ZigBee PRO feature set from Silicon Labs 2.4GHz to 2.5GHz ZigBee/IEEE 802.15.4	2.4GHz PA, TX filtering, with LNA bypass, SPDT & a DPDT switch 23.0dBm output power 5.0x5.0x1.0mm
RFFM6204/EM35X	RF6204	RFFM6204EM357-410	13dBm to 15dBm output power -105dBm RX sensitivity 65mA max operating current - ZigBee PRO feature set from Silicon Labs 2.4GHz to 2.5GHz ZigBee/IEEE 802.15.4	2.4GHz PA, TX filtering, LNA, thru path & a SP3T 2x SP3T 13.0dBm output power 2.5x2.5mm 1.6V logic
RF6569Si446x	RF6569	-	- Extended range 30dBm output power 900-930MHz - Connects to Silicon Labs PN# Si4463-915-DK	915MHz and 868MHz PA, TX filtering & TX/ RX SPDT switch & RX balun 30dBm output power 5.0x5.5x1.2mm

Texas Instruments

Reference Design #	Qorvo Part	Order Part #	Range	Qorvo Part
RF3858/CC1101	RF3858	RF3858CC1101-410	- Extended range 30dBm output power - Antenna diversity 900-930MHz and 868MHz - Connects to TI Smart RF04EB/Smart RF Studio 7	900-930MHz and 868MHz PA, TX filtering, LNA with bypass & a DPDT switch 31.5dBm PA output power 8.0x8.0x1.2mm
RF6505/CC2530	RF6505	RF6505CC2530-410	- Extended range 27dBm output power - Antenna diversity 2.4GHz to 2.5GHz ZigBee®/IEEE 802.15.4 - Connects to TI Smart RF04EB/Smart RF Studio 7	2.4GHz PA, TX filtering, LNA with bypass SPDT & a DPDT switch
RF6569/CC1200	RF6569	RF6569CC1200-410	- Extended range 30dBm output power - Connects to TI SmartRF TRXEB/SmartRF Studio 7 - Excellent RX sensitivity - Wireless M-Bus applications 868MHz to 930MHz ZigBee/802.15.4g compliant radio solution	915MHz and 868MHz PA, TX filtering & TX/RX SPDT switch & RX balun 30dBm output power 5.0x5.5x1.2mm 3.1V to 4.0V operation
RF6500/CC1120	RF6500	RFFM6500CC1120-410	- Extended range 27dBm output power - Connects to TI SmartRF TRXEB/SmartRF Studio 7 - Excellent RX sensitivity - Wireless M-Bus applications 169MHz to 171MHz PA, TX filtering, TX/RX SPDT switch	169MHz and 171MHz PA, TX/RX SPDT switch 27dBm output power 6.0x6.0x1.2mm 2.5V to 4.5V operation