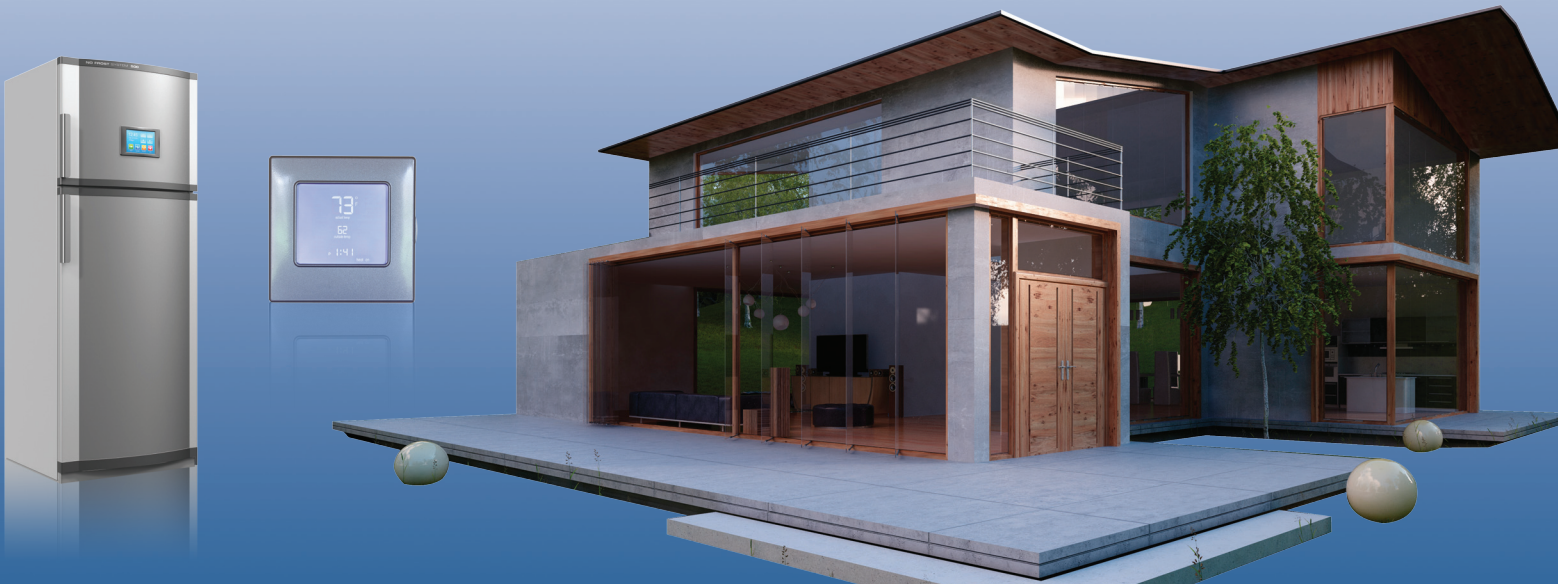
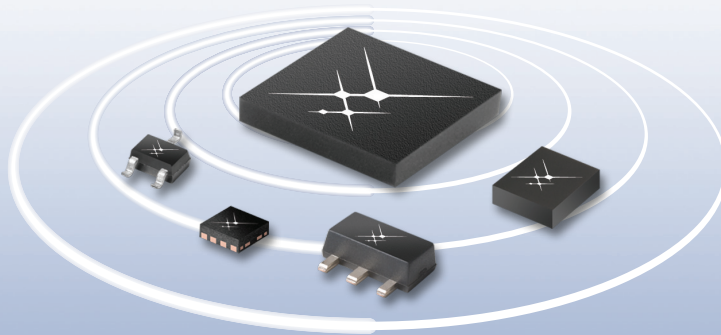




Smart Energy Solutions

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Smart Energy Solutions

Applications

- ZigBee® (IEEE 802.15.4)
- Industrial and Control Unlicensed Band Radios
- Plug-in Hybrid Electric Vehicles (PHEVs)
- 802.15.4g
- Home Security and Automation

Products

- Front-end Modules (FEMs)
- Power Amplifiers (PAs) and Drivers
- Low Noise Amplifiers (LNAs)
- Switches
- Phase Lock Loops (PLLs)
- Voltage Control Oscillators (VCOs)
- Synthesizers
- Diodes
- Power Management

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Select products and sample/designer kits available for purchase online. www.skyworksinc.com



Skyworks lead (Pb)-free products are compliant to all applicable materials legislation. For additional information, refer to *Skyworks Definition of Lead (Pb)-Free*, document number SQ04-0073. Tin/lead (SnPb) packaging is not recommended for new designs.

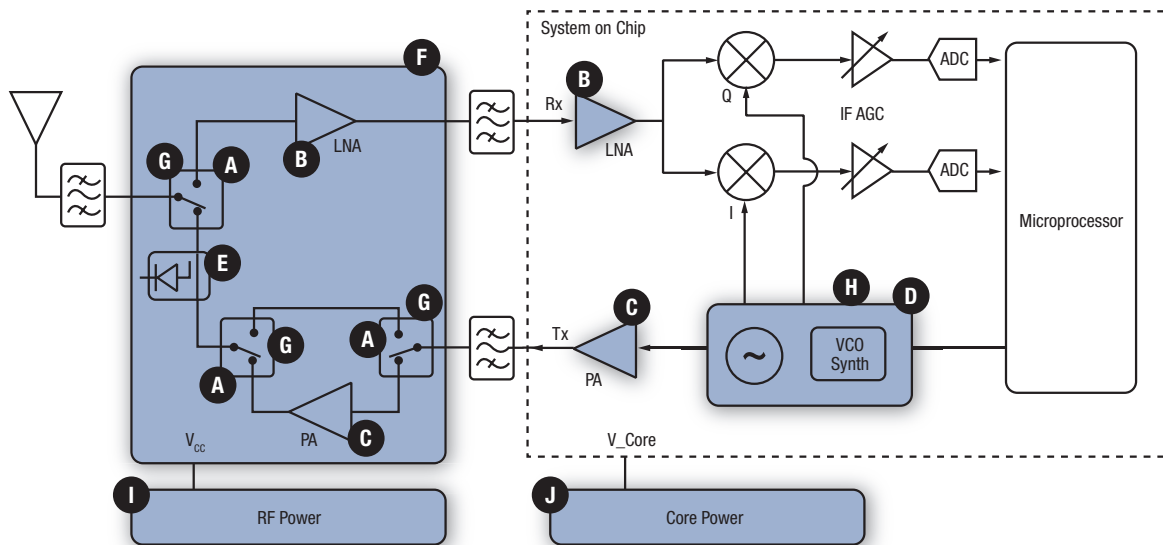


Skyworks Green™ products are compliant to all applicable materials legislation and are halogen-free. For additional information, please refer to *Skyworks Definition of Green™*, document number SQ04-0074.

Smart Energy Solutions

The Right Products for Your System Applications

Skyworks is committed to developing leading edge products for designs targeted at < 170, 410–470, 868–930, and 2400–2500 MHz radios. These solutions are ideal for wireless local area networks (WLAN), automated metering infrastructure (AMI), automated meter reading (AMR), professional mobile radio (PMR), and other ISM band applications. Figure 1 shows a short range radio block diagram.



Switches

- A** AS179-92LF
- AS193-73LF
- AS214-92LF
- SKY13270-92LF
- SKY13299-321LF
- SKY13309-370LF
- SKY13318-321LF
- SKY13348-374LF
- SKY13370-374LF

PIN Diodes

- G** SMP1302-040LF
- SMP1302-079LF
- SMP1320-040LF
- SMP1320-079LF
- SMP1322-017LF
- SMP1340-040LF
- SMP1340-079LF
- SMP1345-518

LNAs

- B** SKY65045-70LF
- SKY65047-360LF
- SKY67013-396LF

Power Drivers/Amplifiers

- C** SE2425U-R
- SE2433T-R
- SKY65006-348LF
- SKY65009-70LF
- SKY65045-70LF
- SKY65111-348LF
- SKY65116
- SKY65131
- SKY65132
- SKY65135
- SKY65146
- SKY65152
- SKY65162-70LF

Synthesizers/PLLs/VCOs

- D** SKY72300-21
- SKY72300-362
- SKY72301-22
- SKY72302-21
- SKY72310-362
- SKY73120

Varactor Diodes

- H** SMV1142-011LF
- SMV1233-011LF
- SMV1235-040LF
- SMV1235-079LF
- SMV1236-004LF
- SMV1247-011LF
- SMV1247-040LF
- SMV1249-040LF
- SMV1249-079LF
- SMV1251-001LF
- SMV1253-079LF
- SMV1255-011LF
- SMV1405-040LF
- SMV1405-079LF
- SMV1408-001LF
- SMV1413-079LF
- SMV1763-040LF
- SMV1763-079LF

Schottky Diodes

- E** SMS3926-023LF
- SMS3927-023LF
- SMS3928-023LF
- SMS7621-040LF
- SMS7621-060
- SMS7621-079LF
- SMS7630-040LF
- SMS7630-061
- SMS7630-079LF

Tx/Rx Front-end Modules

- F** SE2431L-R
- SE2432L-R
- SE2435L-R
- SE2436L-R
- SE2438T-R
- SE2442L-R
- SKY65313-11
- SKY65342-11
- SKY65346-21
- SKY65364-11
- SKY65367-11
- SKY66100-11

RF Power

- I** AAT2114A
- SKY87201

Core Power

- J** AAT2114A
- SKY87201

Figure 1. Short Range Radio Block Diagram

Custom Front-end Modules (FEMs)

Skyworks' custom FEMs allow for significant size and cost reduction. In addition, many of Skyworks' FEMs are designed to allow for "plug and play" functionality, thus drastically reducing the design time for new products. Customized FEMs can be created depending on transceiver implementation requirements. Various modules are being targeted at < 170, 410–470, 868–930, and 2400–2500 MHz frequency bands. Figure 2 shows a custom FEM block diagram.

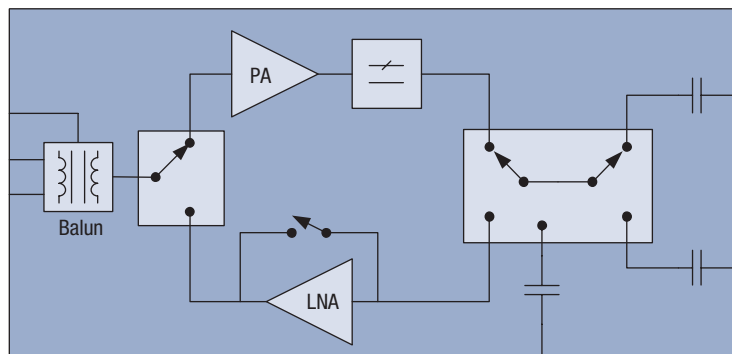


Figure 2. Custom Front-end Module (FEM)

Possibilities for Integration Include:

- T/R Switches
- Power Amplifiers
- Low Noise Amplifiers (LNAs)
- Mixers
- Harmonic Filters

Product Specifications

Specification tables for all of our latest Smart Energy products are provided on the following pages.

FRONT-END MODULES

Table 1. Front-end Modules

Part Number	Function	P _{OUT} (dBm)	Tx Gain (dB)	Rx Gain (dB)	I _{CC} Tx (mA)	Package (mm)	Frequency Band (MHz)			
							< 170	410–470	868–930	2400–2500
 SKY66100-11	Tx / Rx Front-end Module with Rx / Tx Bypass	20–27	30	-0.5	110–300	MCM 4 x 4	•			
 SKY65367-11	High Power Tx / Rx Front-end Module with Rx / Tx Bypass	30	35	-0.5	600	MCM 4 x 4	•			
 SKY65342-11	High Power Tx / Rx Front-end Module with Rx Bypass	29	34	-0.6	650	MCM 8 x 8		•		
 SKY65378-11	Low Power Front-end Module with Tx Bypass and LNA	–	–	14–17	3–7 ⁽¹⁾	QFN 4 x 4			•	
 SKY65346-21	Tx / Rx Front-end Module with LNA	26	35	13.7	200	MCM 5 x 5			•	
 SKY65313-21	Tx / Rx Front-end Module with LNA	30.5	28	16.6	695	MCM 6 x 6			•	
 SKY65364-11	High Power Tx / Rx Front-end Module with LNA, PA, Tx/ Rx Bypass, HD Filter	30.5	30	15	730	MCM 6 x 6			•	
 SE2435L-R	High Power Tx / Rx Front-end Module with LNA	30	28	16	550	QFN 4 x 4			•	
 SE2442L-R	High Power Tx / Rx Front-end Module with Rx Bypass	30	28	-0.7	550	QFN 4 x 4			•	
 SE2438T-R	Low Power Tx / Rx Front-end Module with LNA	10–14	16	12.3	20–33	QFN 3 x 3				•
 SE2431L-R	Tx / Rx Front-end Module with LNA	20	23	12	110	QFN 3 x 4				•
 SE2432L-R	Tx / Rx Front-end Module with LNA	20	22	11.5	110	QFN 3 x 4				•
 SE2436L-R	High Power Tx / Rx Front-end Module with LNA	27	28	11.5	400	QFN 4 x 4				•

1. SKY65378: I_{CC} Rx gain value shown.

New products indicated in **blue, bold** are continually being introduced at Skyworks. For the latest information, please visit the new products section of our Web site at www.skyworksinc.com.

AMPLIFIERS

Table 2. Power Amplifiers

Part Number	Function	P _{OUT} (dBm)	Gain (dB)	P _{1 dB} (dBm)	Package (mm)	Frequency Band (MHz)		
						450	915	2400
 SE2433T-R	2-Stage Power Amplifier	24	22	24	QFN 2.5 x 2			•

Part Number	Function	Gain (dB)	P _{1 dB} (dBm)	I _{CC} (mA)	Package (mm)	Frequency Band (MHz)		
						450	915	2400
SKY65116	2-Stage Power Amplifier	33	33	320	MCM 8 x 8	•		
SKY65111-348LF	3-Stage Power Amplifier	39.5	29.5	250	QFN 3 x 3		•	
SKY65006-348LF	3-Stage Power Amplifier	27.5	23.4	50	QFN 3 x 3			•
SKY65131	2-Stage Power Amplifier	26	28	150	MCM 4 x 4			•
SKY65132	3-Stage Power Amplifier	33	30	330	MCM 6 x 6			•
 SKY65009-70LF	Single Stage Driver	17	25	110	SOT-89 4.5 x 2.4	•	•	•
 SKY65045-70LF	Single Stage Driver	14 dB @ 900 MHz	25	60	SOT-89 4.5 x 2.4	•	•	
SKY65162-70LF	Single Stage Driver	20	29	185	SOT-89 4.5 x 2.4	•	•	•
SKY65152-11	3-Stage Power Amplifier	32	33	490	MCM 6 x 6			•
 SKY67130-396LF	Single Stage Driver	13	16	22	DFN 2 x 2	•	•	•

Table 3. Low Noise Amplifiers

Part Number	Function	Gain (dB)	NF (dB)	I _{CC} (mA)	IP _{1 dB} (dBm)	Package (mm)	Frequency Band (MHz)		
							450	915	2400
 SKY65050-372LF	LNA, Discrete (250–6000 MHz)	16 dB @ 900 MHz	0.6	10	-9	SC-70 2.2 x 1.35	•	•	•
 SKY65047-360LF	LNA with Shutdown Mode	16.5 dB @ 915 MHz	0.85	7.8	-7	QFN 2 x 2	•	•	•
SKY65405-21	LNA with Shutdown Mode	14	1	12	-3	QFN 1.5 x 1.5			•
 SKY67012-396LF	LNA, Discrete (300–600 MHz)	16	0.9	15	-1	DFN 2 x 2	•		
 SKY67013-396LF	LNA, Discrete (600–1500 MHz)	14.5	0.85	15	2.5	DFN 2 x 2		•	
 SKY67014-396LF	LNA, Discrete (1500–3000 MHz)	12	0.95	5	5	DFN 2 x 2			•
 SKY67110-396LF	LNA, High Linearity	21	0.65	77	2	DFN 2 x 2	•		
 SKY67101-396LF	LNA, High Linearity	17.9	0.5	56	2.6	DFN 2 x 2		•	
 SKY67102-396LF	LNA, High Linearity	17.2	0.8	50	-1	QFN 2 x 2			•

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POWER MANAGEMENT

Battery Chargers

Table 4. Supercapacitor Charger

Part Number	Function	Fault Flag	V_{IN} (V)	Package (mm)
 AAT4712	Supercapacitor Charger with Input Current Limit	POK; RDY	2.5–5.5	TDFN34 16L 3 x 4

Voltage Regulation–DC/DC Converters (Switching Regulators)

Table 5. Step Down Converter

Part Number	Min. V_{IN} (V)	Max. V_{IN} (V)	Min. V_{OUT} (V)	Max. V_{OUT} (V)	I_{OUT} (mA)	f_{OSC} (kHz)	Typ. I_Q (μ A)	Package (mm)
 AAT2114A	2.7	5.5	1	V_{IN}	2500	3000	70	QFN 16L 3 x 3 x 0.9
 SKY87201-11	2.7	5.5	0.6	V_{IN}	600	2000	37	SC70JW 8L 2 x 2.1 x 1.05

Table 6. Step Up Converter

Part Number	Function	V_{OUT} (V)	Typ. I_Q (μ A)	I_{OUT} (mA)	Package (mm)
 AAT1219	Step Up Converter	2.4 to $V_{OUT} + 0.25$	58	1200	TDFN33 12L 3 x 3

Low Drop-Out (LDO) Linear Regulator

Table 7. Low Drop-Out (LDO) Linear Regulator

Part Number	Function	V_{IN} (V)	Typ. I_Q (μ A)	Max. I_{OUT} (mA)	Package (mm)
 AAT3221	Ultra Low IQ LDO	$V_{OUT} - 5.5$	1.1	150	SOT-23 5L 2.85 x 2.80 SC70JW 8L 2.2 x 2.0

Port Protection and Power Distribution

Table 8. Slew Rate Controlled

Part Number	Function	V_{IN} (V)	Typ. I_Q (μ A)	Typ. $R_{DS(ON)}$ (m Ω)	Package (mm)
 AAT4282B	Dual Slew Rate Limited Load Switch with Ultra Low Shutdown Current	1.5–6.5	0.1	70	TDFN22 8L 2 x 2

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SWITCHES

Table 9. SPDT Switches

Part Number	Function	Insertion Loss (dB)	Isolation (dB)	P _{1dB} (dBm)	Input IP3 (dBm)	Package (mm)	Frequency Band (MHz)		
							450	915	2400
SKY13268-344LF	SPDT Switch, Low Loss	0.3	25	30	50	SOT-666 1.5 x 1.2	•	•	•
SKY13309-370LF	SP3T Switch, Low Loss	0.5	25	29	—	QFN 2 x 2	•	•	•
AS179-92LF	SPDT Switch, Low Loss	0.3	25	30	48	SC-88 2.2 x 2	•	•	•
AS214-92LF	SPDT Switch, Low Loss	0.3	30	20	40	SC-88 2.2 x 2	•	•	•
SKY13270-92LF	SPDT Switch, Low Loss	0.35	24	>37	56	SC-88 2.1 x 2.0	•	•	•
AS193-73LF	SPDT Switch, Low Loss	0.35	24	37	55	SOT-6 2.8 x 2.9	•	•	•
SKY13348-374LF	SPDT Switch	0.6	27	37	52	DFN 1.5 x 1.5	•	•	•
SKY13370-374LF	SPDT Switch	0.7	31	39	55	DFN 1.5 x 1.5	•	•	•
SKY13299-321LF	SPDT Switch	0.3–0.75	30–22	39	57	QFN 3 x 3	•	•	•
SKY13318-321LF	DPDT Switch	0.95–1.15	22–15	34	57	QFN 3 x 3	•	•	•

SYNTHESIZERS

Table 10. Dual and Single Fractional-N Synthesizers

Part Number	Function	Phase Noise (dBc/Hz)	Direct Modulation	I _{DD} (mA)	Package (mm)	Frequency Band (MHz)		
						450	915	2400
SKY72300-21	Dual Frac-N Synthesizer	-91	FSK, FM, GMSK	12.5	TSSOP 9.7 x 6.4	•	•	
SKY72300-362	Dual Frac-N Synthesizer	-91	FSK, FM, GMSK	12.5	QFN 4 x 4	•	•	
SKY72301	Dual Frac-N Synthesizer	-96	FSK, FM, GMSK	11	TSSOP 9.7 x 6.4	•	•	
SKY72302	Dual Frac-N Synthesizer	-80	FSK, FM, GMSK	18	TSSOP 9.7 x 6.4	•	•	•
SKY72310-362LF	Single Frac-N Synthesizer	-91	FSK, FM, GMSK	12.5	QFN 4 x 4	•	•	

VOLTAGE CONTROLLED OSCILLATORS (VCOs)

Table 11. Voltage Controlled Oscillators (VCOs)

Part Number	Function	Phase Noise (dBc/Hz)	Direct Modulation	I _{DD} (mA)	Package (mm)	Frequency Band (MHz)		
						450	915	2400
SKY73120	CMOS VCO	-110 @ 25 kHz Offset	0	26	MCM 6 x 6		•	

DIODES

Table 12. Varactor Diodes for Tuning Applications

Part Number	Function	Capacitance (C _T)	Capacitance Ratio (C _R)	Series Resistance (R _S)/Quality Factor	Package (mm)	Frequency Band (MHz)		
						450	915	2400
SMV1405-079LF	VCO Tuning	1.8 pF @ 1 V	C _{T0} /C _{T30} = 4.1	Q @ 4 V 50 MHz = 3200	SC-79 1.6 x 0.8	•	•	•
SMV1405-040LF	VCO Tuning	1.8 pF @ 1 V	C _{T0} /C _{T30} = 4.1	Q @ 4 V 50 MHz = 3200	0402 1.0 x 0.6	•	•	•
SMV1413-079LF	VCO Tuning	6.4 pF @ 1 V	C _{T0} /C _{T30} = 4.2	Q @ 4 V 50 MHz = 2400	SC-79 1.6 x 0.8	•	•	•
SMV1408-001LF	VCO Tuning	2.9 pF @ 1 V	C _{T0} /C _{T30} = 4.1	Q @ 4 V 50 MHz = 2900	SOT-23 2.9 x 2.35	•	•	•
SMV1247-011LF	VCO Tuning	7 pF @ 0.3 V	C _{T0.3} /C _{T4.7} = 10	Q @ 3 V 50 MHz = 1500	SOD-323 2.5 x 1.25	•	•	•
SMV1247-040LF	VCO Tuning	7 pF @ 0.3 V	C _{T0.3} /C _{T4.7} = 10	Q @ 3 V 50 MHz = 1500	0402 1.0 x 0.6	•	•	•
SMV1249-040LF	VCO Tuning	31 pF @ 0.3 V	C _{T0.3} /C _{T4.7} = 12.1	R _S @ 3 V 500 MHz = 1.2 Ω	0402 1.0 x 0.6	•	•	•

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DIODES (CONTINUED)

Table 13. Varactor Diodes for Tuning Applications (Continued)

Part Number	Function	Capacitance (C_j)	Capacitance Ratio ($C_{10.3}/C_{14.7}$)	Series Resistance (R_s)/ Quality Factor	Package (mm)	Frequency Band (MHz)		
						450	915	2400
 SMV1249-079LF	VCO Tuning	31 pF @ 0.3 V	$C_{10.3}/C_{14.7} = 12.1$	$R_s @ 3 \text{ V } 500 \text{ MHz} = 2.2 \Omega$	SC-79 1.6 x 0.8	•	•	•
 SMV1251-001LF	VCO Tuning	42 pF @ 0.3 V	$C_{10.3}/C_{14.7} = 12.2$	$R_s @ 3 \text{ V } 500 \text{ MHz} = 1.6 \Omega$	SOT-23 2.9 x 2.35	•	•	•
 SMV1253-079LF	VCO Tuning	53 pF @ 0.3 V	$C_{10.3}/C_{14.7} = 12.3$	$R_s @ 3 \text{ V } 500 \text{ MHz} = 1.4 \Omega$	SC-79 1.6 x 0.8	•	•	•
 SMV1255-011LF	VCO Tuning	64 pF @ 0.3 V	$C_{10.3}/C_{14.7} = 12.3$	$R_s @ 3 \text{ V } 500 \text{ MHz} = 1.3 \Omega$	SOD-323 2.5 x 1.25	•	•	•
 SMV1233-011LF	VCO Tuning	3.3 pF @ 1 V	$C_{11}/C_{13} = 1.5$	$R_s @ 3 \text{ V } 500 \text{ MHz} = 1.2 \Omega$	SOD-323 2.5 x 1.25	•	•	•
 SMV1236-004LF	VCO Tuning	17 pF @ 1 V	$C_{11}/C_{13} = 1.6$	$R_s @ 3 \text{ V } 500 \text{ MHz} = 0.5 \Omega$	SOT-23 2.9 x 2.35	•	•	•
 SMV1763-040LF	VCO Tuning	5.2 pF @ 1 V	$C_{10.5}/C_{12.5} = 2.3$	$R_s @ 1 \text{ V } 900 \text{ MHz} = 0.7 \Omega$	0402 1.0 x 0.6	•	•	•
 SMV1763-079LF	VCO Tuning	5.2 pF @ 1 V	$C_{10.5}/C_{12.5} = 2.5$	$R_s @ 1 \text{ V } 500 \text{ MHz} = 0.7 \Omega$	SC-79 1.6 x 0.8	•	•	•
 SMV1142-011LF	VCO Tuning	8.2 pF @ 1 V	$C_{11}/C_{13} = 1.5$	$R_s @ 3 \text{ V } 500 \text{ MHz} = 0.7 \Omega$	SOD-323 2.5 x 1.25	•	•	•
 SMV1235-079LF	VCO Tuning	11.5 pF @ 1 V	$C_{11}/C_{13} = 1.8$	$R_s @ 3 \text{ V } 500 \text{ MHz} = 0.6 \Omega$	SC-79 1.6 x 0.8	•	•	•
 SMV1235-040LF	VCO Tuning	11.5 pF @ 1 V	$C_{11}/C_{13} = 1.8$	$R_s @ 3 \text{ V } 500 \text{ MHz} = 0.6 \Omega$	0402 1.0 x 0.6	•	•	•

Table 14. PIN Diodes for Switching Applications

Part Number	Function	Voltage Breakdown (V_B)	Capacitance (C_j)	Series Resistance (R_s)	Package (mm)	Frequency Band (MHz)		
						450	915	2400
SMP1345-518	Antenna Switch	50 V @ 10 μ A	0.18 pF @ 5 V	$R_s @ 10 \text{ mA} = 1.5 \Omega$	LGA 1.2 x 1.4	•	•	•
 SMP1340-040LF	T/R Switch	50 V @ 10 μ A	0.20 pF @ 5 V	$R_s @ 10 \text{ mA} = 0.9 \Omega$	0402 1.0 x 0.6	•	•	•
 SMP1340-079LF	Antenna Switch	50 V @ 10 μ A	0.20 pF @ 5 V	$R_s @ 10 \text{ mA} = 0.9 \Omega$	SC-79 1.6 x 0.8	•	•	•
SMP1322-017LF	T/R Switch	50 V @ 10 μ A	1.0 pF @ 30 V	$R_s @ 10 \text{ mA} = 0.5 \Omega$	SOT-143 2.37 x 2.92	•	•	•
 SMP1320-040LF	T/R Switch	50 V @ 10 μ A	0.25 pF @ 30 V	$R_s @ 10 \text{ mA} = 0.9 \Omega$	0402 1.0 x 0.6	•	•	•
 SMP1320-079LF	T/R Switch	50 V @ 10 μ A	0.30 pF @ 30 V	$R_s @ 10 \text{ mA} = 0.9 \Omega$	SC-79 1.6 x 0.8	•	•	•
 SMP1302-079LF	Attenuator Switch	200 V @ 10 μ A	0.30 pF @ 30 V	$R_s @ 10 \text{ mA} = 3.0 \Omega$	SC-79 1.6 x 0.8	•	•	•
 SMP1302-040LF	T/R Switch	50 V @ 10 μ A	0.30 pF @ 30 V	$R_s @ 10 \text{ mA} = 0.9 \Omega$	0402 1.0 x 0.6	•	•	•

Table 15. Schottky Diodes for Detector and Mixer Applications

Part Number	Function	Voltage Breakdown (V_B)	Capacitance (C_j)	Forward Voltage (V_F)	Package (mm)	Frequency Band (MHz)		
						450	915	2400
 SMS7630-040LF	Detector	1 V @ 10 μ A	0.30 pF @ 0.15 V	$V_F @ 0.1 \text{ mA} = 60\text{--}120 \text{ mV}$	SC-79 1.6 x 0.8	•	•	•
 SMS7630-079LF	Detector	1 V @ 10 μ A	0.30 pF @ 0.15 V	$V_F @ 0.1 \text{ mA} = 60\text{--}120 \text{ mV}$	0402 1.0 x 0.6	•	•	•
 SMS7630-061	Detector	1 V @ 10 μ A	0.30 pF @ 0.15 V	$V_F @ 0.1 \text{ mA} = 60\text{--}120 \text{ mV}$	0201 0.60 x 0.30	•	•	•
 SMS7621-040LF	Detector/Mixer	2 V @ 10 μ A	0.18 pF @ 0.15 V	$V_F @ 1.0 \text{ mA} = 260\text{--}320 \text{ mV}$	0402 1.0 x 0.6	•	•	•
 SMS7621-079LF	Detector/Mixer	2 V @ 10 μ A	0.18 pF @ 0.15 V	$V_F @ 1.0 \text{ mA} = 260\text{--}320 \text{ mV}$	SC-79 1.6 x 0.8	•	•	•
 SMS7621-060	Detector/Mixer	2 V @ 10 μ A	0.18 pF @ 0.15 V	$V_F @ 1.0 \text{ mA} = 260\text{--}320 \text{ mV}$	0201 0.60 x 0.30	•	•	•
SMS3926-023LF	Low Drive Mixer	2 V @ 10 μ A	0.30 pF @ 0 V	$V_F @ 1.0 \text{ mA} = 200\text{--}270 \text{ mV}$	SOT-143 2.37 x 2.92	•	•	•
SMS3927-023LF	Medium Drive Mixer	2 V @ 10 μ A	0.30 pF @ 0 V	$V_F @ 1.0 \text{ mA} = 310\text{--}370 \text{ mV}$	SOT-143 2.37 x 2.92	•	•	•
SMS3928-023LF	High Drive Mixer	4 V @ 10 μ A	0.30 pF @ 0 V	$V_F @ 1.0 \text{ mA} = 520\text{--}580 \text{ mV}$	SOT-143 2.37 x 2.92	•	•	•

New products indicated in **blue, bold** are continually being introduced at Skyworks. For the latest information, please visit the new products section of our Web site at www.skyworksinc.com.

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Skyworks Solutions

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