

## RF Discrete Devices Designer Kit

### The Easier, Faster Way to Design Quality RF Solutions

Skyworks Solutions is committed to making your RF designs easier than ever. This design kit includes 5-10 components that encompass some of our newest and most popular products. Also included is a CD of our data sheets and application notes.

We have a long history of providing high-quality RF components for a diversified set of wireless communications applications. We build GaAs and Si discrete devices including amplifiers, switches, attenuators, diodes, power dividers, filters, and more. Our integrated offerings combine discrete components to produce leading-edge products such as mixers, demodulators, variable gain amplifiers, synthesizers, and power amplifier modules.

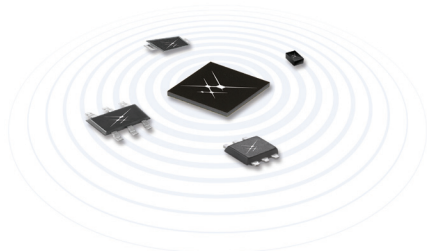
We've made it easy to order our parts, too. Once you find the right products for your design, simply go to our online store to purchase your prototype volumes.

### Buy Now

Innovation to Go™ Select products are now available for purchase online.

To keep up with all of the newest products added to our brand portfolio, visit the Skyworks website at [www.skyworksinc.com](http://www.skyworksinc.com).

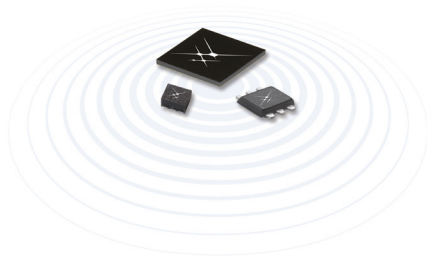
For more information on higher volumes, large volume quotes, or technical questions, contact your local sales representative or email us at [sales@skyworksinc.com](mailto:sales@skyworksinc.com).



## Switches

### Features

- Wide variety of switch offerings including SPST, SPDT, SP3T, SP4T, DPDT, 4 x 2 matrix, and more.
- Wide variety of package options from 1.2 x 1.5 mm LGA to 20-lead QFNs and several low profile (<= 0.6 mm height).
- Individual switch features include low loss, high isolation, good power handling, high linearity, low supply voltage, and more.
- All available switches are lead (Pb)-free and RoHS compliant. Some products are available Green<sup>™</sup>.



Skyworks offers more than 60 switches for all RF applications. These high quality parts can be found in handsets, mobile infrastructure, WLAN systems, GPS systems, automobiles, radar, and much more. Most of the products are fabricated in our GaAs pHEMT and GaAs MESFET facilities; the 4 x 2 matrix switches are fabricated in SiCMOS. All switches are packaged in industry-standard, plastic surface-mount packages.

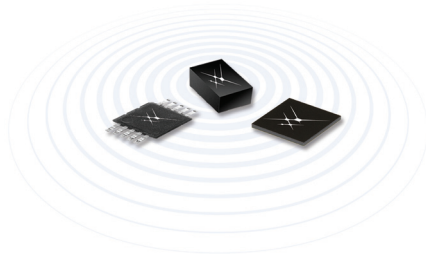
## Switches

Part Number	Description	Frequency Range	Isolation (dB) Typ.	Insertion Loss (dB) Typ.	Package (mm)
SKY13268-344LF	Low loss SPDT	300 kHz–3.0 GHz	30–24	0.30–0.55	SOT-666 (1.65 x 1.65)
SKY13276-334	Low Loss, 1 W SPDT	0.1–6.0 GHz	21–20	0.6–0.7	LGA-6 (1.2 x 1.5)
AS186-302LF	High Isolation, Dual CTL, SPDT	300 kHz–4.0 GHz	70–40	0.8–1.25	MSOP-8 (4.9 x 3.0)
SKY13286-359LF	High Isolation, Single CTL, SPDT	0.1–6.0 GHz	62–42	0.8–1.5	QFN-16 (4.0 x 4.0)
SKY13278-313LF	High Linearity, High Power SPDT	0.1–2.5 GHz	32–18	0.4–0.55	QFN-6 (2.0 x 3.0)
SKY13299-321LF	7 W Broadband SPDT	0.1–4.0 GHz	30–29	0.3–0.65	QFN-12 (3.0 x 3.0)
SKY13277-355LF	High Isolation, SP3T	0.5–3.0 GHz	60	1.2	QFN-20 (5.0 x 5.0)
SKY13296-340LF	Absorptive, SP4T	0.1–2.5 GHz	35–22	0.35–0.75	QFN-20 (4.0 x 4.0)
SKY13309-370LF	Low Loss, SP3T	300 kHz–3.0 GHz	25	0.5–0.6	QFN-8 (2.0 x 2.0)
SKY13306-313LF	Low Loss, 4 W SPDT	0.1–6.0 GHz	26–24	0.7–0.9	QFN-6 (2.0 x 3.0)
SKY13272-340LF	SiCMOS 4 x 2 Switch Matrix	0.25–2.15 GHz	40–31	7.5–8.5	QFN-20 (4.0 x 4.0)
SKY13292-365LF	SiCMOS 4 x 2 Matrix w/Detect	0.25–2.15 GHz	40–30	7.5–9.0	QFN-20 (4.0 x 4.0)

## Attenuators

### Features

- Digital attenuators
  - 1-bit to 6-bit
  - Attenuations of 10 dB to 32 dB
  - Step sizes from 0.5 dB to 32 dB
  - Serial-parallel drivers
  - Frequency ranges up to 6 GHz
- Variable attenuators
  - Attenuation ranges up to 35 dB
  - Either broadband performance or high IP3
  - All available lead (Pb)-free, RoHS-compliant



Skyworks offers over 40 attenuators for all RF applications. Our parts can be found in handsets, mobile infrastructure, WLAN systems, GPS systems, automobiles, radar, and much more. These products are fabricated in our GaAs pHEMT, GaAs MESFET, and Silicon facilities and packaged in industry-standard plastic surface mount packages.

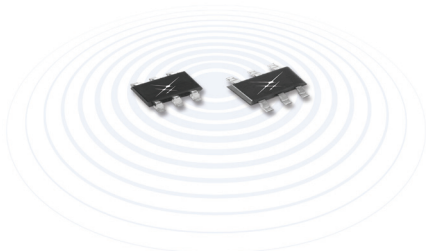
## Attenuators

Part Number	Description	Frequency (GHz)	Attenuation (dB) Typ.	Insertion Loss (dB) Typ.	Package (mm)
SKY12323-303LF	5 Bit, 1 dB LSB	0.5–3.0	31	1.4–2.3	MSOP-10 Exposed Paddle (4.9 x 3.0)
SKY12328-350LF	5 Bit, 0.5 dB LSB	0.5–4.0	15.5	1.1–2.3	QFN-16 (3.0 x 3.0)
AV104-12LF	25 dB-Range Variable Attenuator	0.45–2.5	25	2.7–3.2	SOIC-8 (6.0 x 4.9)
SKY12145-315	HIP3™ Variable Attenuator	2.11–2.17	23	1.5	LGA (3.2 x 4.9)

## Passives

### Features

- Directional couplers
  - Low loss
  - Good isolation and input/output matching
  - Exceptional repeatability
- Directional detectors
  - Detects input signal amplitude
  - Includes temperature compensation diode
- 90° Hybrids
  - Low loss
  - High isolation
  - Exceptional phase/amplitude balance
- Power dividers/combiners
  - 2-way and 4-way in-phase dividers/combiners
  - Low loss
  - High isolation
  - Exceptional phase/amplitude balance
- Phase shifters
  - Voltage controlled
  - ~100° phase shift



Skyworks offers more than 25 plastic-packaged passive components for all RF applications. All products are available in RoHS-compliant packages. These products are also used in combination with our active components to create integrated devices.

## Directional Detector

Part Number	Description	Directivity (dB) Typ.	Insertion Loss (dB) Typ.	Package (mm)
DD02-999LF	Directional Detector	2	0.2	SC-88 (2.1 x 2.0)

## Directional Couplers

Part Number	Description	Isolation (dB) Typ.	Insertion Loss (dB) Typ.	Package (mm)
DC09-73LF	Direction Coupler for 900 MHz	30	0.2	SOT-6 (2.8 x 2.9)

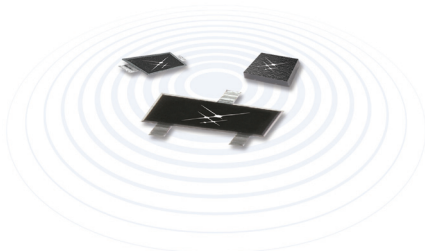
## Power Dividers

Part Number	Description	Isolation (dB) Typ.	Insertion Loss (dB) Typ.	Package (mm)
PD18-73LF	Power Divider	23	0.4	SOT-6 (2.8 x 2.9)

## PIN and Limiter Diodes

### Features

- Limiter diodes
  - Low-distortion performance
  - Low loss
  - Excellent power handling
  - Available in series pair and low inductance configurations
  - Application: Used as a passive receiver protector
- PIN diodes
  - Available as:
    - Very low capacitance
    - Fast switching speed
    - Low resistance and capacitance
    - Low resistance
    - Large signal switching
    - Low distortion attenuator
    - Very low distortion attenuator
  - Available configurations:
    - Single
    - Ring
    - Common cathode
    - Common anode
    - Anti-parallel
    - Low and ultra-low inductance
    - $\pi$  network
    - Series pair



Skyworks offers over 70 packaged PIN diodes for all RF applications. These parts can be found in handsets, mobile infrastructure, WLAN systems, GPS systems, automobiles, radar, and much more. These products are fabricated in our Silicon facilities and packaged in industry-standard, RoHS-compliant, plastic surface mount packages. Many diodes are also available as bare die, beam-lead, or in ceramic packaging.

## PIN Diodes

Part Number	Key Specifications	Description	Package (mm)
SMP1302-079LF	$C_i$ 0.25 pF, 15 $\Omega$ @ 1 mA	Attenuator	SC-79 (1.60 x 0.80 x 0.60)
SMP1307-011LF	$C_i$ 0.25 pF, 75 $\Omega$ @ 1 mA	Low Distortion Attenuator	SOD-323 (2.52 x 1.25 x 1.04)
SMP1320-007LF	$C_i$ 0.28 pF, 0.8 $\Omega$ @ 10 mA	Low cap, Low $R_s$ , Low Inductance	SOT-23 (2.37 x 2.92 x 1.00)
SMP1320-079LF	$C_i$ 0.28 pF, 0.8 $\Omega$ @ 10 mA	Low Cap, Low $R_s$	SC-79 (1.60 x 0.80 x 0.60)
SMP1321-079LF	$C_i$ 0.21 pF, 1.20 $\Omega$ @ 10 mA	Low Cap, Series Pair	SC-79 (1.60 x 0.80 x 0.60)
SMP1322-017LF	$C_i$ 0.80 pF, 0.5 $\Omega$ @ 10 mA	Low $R_s$ , Low Inductance	SOT-143 (2.37 x 2.92 x 1.00)
SMP1340-079LF	$C_i$ 0.18 pF, 1.20 $\Omega$ @ 10 mA	Low Cap, Fast Switching	SC-79 (1.60 x 0.80 x 0.60)
SMP1345-079LF	$C_i$ 0.18 pF, 1.50 $\Omega$ @ 10 mA	Very Low Cap, High Isolation	SC-79 (1.60 x 0.80 x 0.60)
SMP1345-518	$C_i$ 0.18 pF, 1.50 $\Omega$ @ 10 mA	Quad PIN, 0.4 dB IL	LGA (1.47 x 1.23 x 0.70)
SMP1352-079LF	$C_i$ 0.25 pF, 10 $\Omega$ @ 10 mA	Large Signal Switching	SC-79 (1.60 x 0.80 x 0.60)

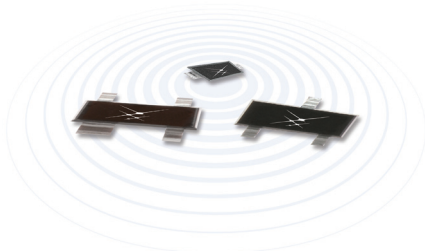
## Limiter Diodes

Part Number	Key Specifications	Description	Package (mm)
SMP1330-005LF	$C_i$ 0.70 pF, 1.25 $\Omega$ @ 10 mA	Limiter	SOT-23 (2.37 x 2.92 x 1.00)

## Schottky Diodes

### Features

- Schottky diodes
  - Available as:
    - General purpose
    - Low capacitance and high voltage
    - Mixer and detector
  - Available configurations:
    - Single
    - Common cathode
    - Series pair
    - Unconnected pair
- Schottky quad mixer diodes
  - Applications: double balanced mixers, modulators, frequency multipliers
  - Available configurations
    - Ring quad
    - Crossover ring quad
    - Bridge quad
    - Ring octoquad
    - Crossover ring octoquad



Skyworks offers over 40 packaged Schottky diodes for RF applications. These quality products are fabricated in our Silicon facilities and packaged in industry standard, RoHS-compliant, plastic surface mount packages. The quad mixers are also available on film frame or chip on board. Others are available as bare die, beam-lead, or in ceramic packaging.

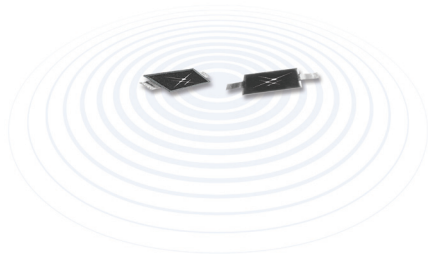
## Schottky Diodes

Part Number	Key Specifications	Description	Package (mm)
SMS3922-079LF	8 V, 280–340 mV @ 1 mA	General Purpose	SC-79 (1.60 x 0.80 x 0.60)
SMS3923-011LF	20 V, 310–370 mV @ 1 mA	General Purpose	SOD-323 (2.52 x 1.25 x 1.04)
SMS3924-079LF	70 V, 490–550 mV @ 1 mA	General Purpose	SC-79 (1.60 x 0.80 x 0.60)
SMS3926-023LF	2 V, 200–270 mV @ 1 mA	Crossover Quad Low Drive	SOT-143 (2.37 x 2.92 x 1.00)
SMS7621-006LF	$C_T = 0.25$ pF Typ.	Low Barrier Detector	SOT-23 (2.37 x 2.92 x 1.00)
SMS7621-079LF	$C_T = 0.25$ pF Typ.	Low Barrier Detector	SC-79 (1.60 x 0.80 x 0.60)
SMS7630-021LF	2 V, 310–370 mV @ 1 mA	Bridge Quad Medium Drive	SOT-143 (2.37 x 2.92 x 1.00)
SMS7630-079LF	$R_V = 5000$ $\Omega$ Typ.	Zero Bias Detector	SC-79 (1.60 x 0.80 x 0.60)
SMS3923-081LF	20 V, 310–370 mV @ 1 mA	General Purpose, Dual Series Pairs	SC-88 (2.10 x 2.005 x 0.95)
SMS7621-081LF	$C_T = 0.25$ pF Typ.	Low Barrier Detector, Dual Series Pairs	SC-88 (2.10 x 2.005 x 0.95)

## Varactor Diodes

### Features

- Types available:
  - Hyperabrupt junction tuning
  - Abrupt junction tuning
- Available configurations:
  - Single
  - Common cathode
  - Common anode



Skyworks offers over 100 packaged varactor diodes for RF applications, in a wide variety of capacitance versus voltage curves. These quality products are fabricated in our Silicon facilities and plastic surface mount packages. Many diodes are also available as bare die, or in ceramic packaging.

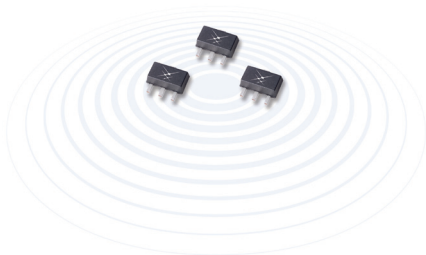
## Varactor Diodes

Part Number	Key Specifications	Description	Package (mm)
SMV1213-004LF	22 pF @ 1 V, 9.5 pF @ 2.5 V	$C_{T1} / C_{T2.5} = 2$	SOT-23 (2.37 x 2.92 x 1.00)
SMV1233-011LF	3.3 pF @ 1 V, 1.8 pF @ 3 V	$C_{T1} / C_{T3} = 1.6$	SOD-323 (2.52 x 1.25 x 1.04)
SMV1234-011LF	6.5 pF @ 1 V, 3.6 pF @ 3 V	$C_{T1} / C_{T3} = 1.6$	SOD-323 (2.52 x 1.25 x 1.04)
SMV1236-011LF	17 pF @ 1 V, 9.2 pF @ 3 V	$C_{T1} / C_{T3} = 1.6$	SOD-323 (2.52 x 1.25 x 1.04)
SMV1247-079LF	4.4 pF @ 1 V, 0.9 pF @ 3 V	$C_{T0.3} / C_{T4.7} = 9.5$	SC-79 (1.60 x 0.80 x 0.60)
SMV1249-079LF	18.2 pF @ 1 V, 3.4 pF @ 3 V	$C_{T0.3} / C_{T4.7} = 12.1$	SC-79 (1.60 x 0.80 x 0.60)
SMV1255-079LF	64 pF @ 0.3 V, 5.2 pF @ 4.7 V	$C_{T0.3} / C_{T4.7} = 11$	SC-79 (1.60 x 0.80 x 0.60)
SMV1263-079LF	6.7 pF @ 0.5 V, 2.6 pF @ 2.5 V	$C_{T0.5} / C_{T2.5} = 2.5$	SC-79 (1.60 x 0.80 x 0.60)
SMV1763-079LF	6.7 pF @ 0.5 V, 2.6 pF @ 2.5 V	$C_{T0.5} / C_{T2.5} = 2.5$	SC-79 (1.60 x 0.80 x 0.60)

## Amplifiers

### Features

- Offerings include gain blocks, power amplifier, amplifier modules, integrated amplifiers, and LNAs.
- Wide variety of package options
- Features vary between wide frequency bandwidth and band-specific ranges—all have high linearity.
- All available lead (Pb)-free, RoHS-compliant. Some products are available Green™.



### Description

Skyworks offers more than 20 amplifiers for all RF applications. These quality parts can be found in handsets, mobile infrastructure, ISM systems, WLAN systems, GPS systems, meter readers, and more. We select the best fabrication process based on the desired features. Most of our gain blocks and power amplifiers are HBT; most of our LNAs are in our pHEMT process.

## Amplifiers

Part Number	Description	Package	Frequency (GHz)	Noise Figure Typ. (dB)	Gain Typ. (dB)	Quiescent Current Typ. (mA)	V <sub>CC</sub> (V)	OIP3 (dBm)	P <sub>1dB</sub> (dBm)
SKY65009-70LF	Linear Driver 0.25–2.5 GHz	SOT-89	0.25-2.5	4	12	110	5	43	27
SKY65028-70LF	Linear Driver 0.45–2.5 GHz	SOT-89	0.45-2.5	5.5	16	125	5	42	25
SKY65013-70LF	Cascadable Amplifier	SOT-89	LF-7	5.5	12.5	40	3.5	29	12.5
SKY65014-70LF	Cascadable Amplifier	SOT-89	LF-6	4.8	16	70	4.7	36	18
SKY65015-70LF	Cascadable Amplifier	SOT-89	LF-6	4.2	18	70	4.7	35	17
SKY65016-70LF	Cascadable Amplifier	SOT-89	LF-3	4.8	20	40	3.5	27	14
SKY65017-70LF	Cascadable Amplifier	SOT-89	LF-6	4.5	20	100	5	35	20

Note: Test frequency 2 GHz.