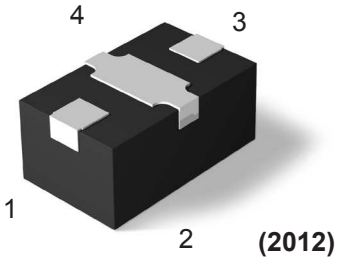
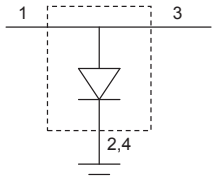
MSWSH-020-30

PIN DIODE SHUNT SWITCH ELEMENT





(2012)
Plastic Molded DFN

LEAD FREE
RoHS COMPLIANT

Description

A broadband, high linearity, medium power shunt switch element in a 1.9 X 1.1 mm QFN package. This device is designed for WiMax, Wibro, WLAN, TD-SCDMA and other wireless infrastructure applications. It is also suited for 0.1 ~ 6 GHz applications with up to 20 watts of power.

Features

- Supports up to 20 watts power when cold switched
- Low insertion loss 0.25 dB typical up to 2.7 GHz
- High Isolation 31 dB typical up to 2.7 GHz

Electrical Specifications, T_A = +25 °C

SYMBOL	TEST CONDITIONS			MINIMUM	TYPICAL	MAXIMUM	UNITS
V_{BR}	I_R = 10 µA			100	–	–	V
C_J	V_R = 10 V	F = 1 MHz		–	0.13	–	pF
R_S	I_F = 50 mA	F = 500 MHz		–	0.6	0.9	Ω
Tau	I_F = 10mA	I_R = 10 mA	measured at 50%	–	600	–	ns
W	I-Layer			–	15	–	um
IL	V_R = 10 volts	F = 2.3 ~ 2.7 GHz		–	0.25	0.35	dB
		F = 6.0 GHz		–	0.35	0.45	dB
IRL	V_R = 10 volts	F = 2.3 ~ 2.7 GHz		15	19	–	dB
		F = 6.0 GHz		10	14	–	dB
Iso	I_F = 50 mA	F = 2.3 ~ 2.7 GHz		26	31	–	dB
		F = 6.0 GHz		25	27	–	dB

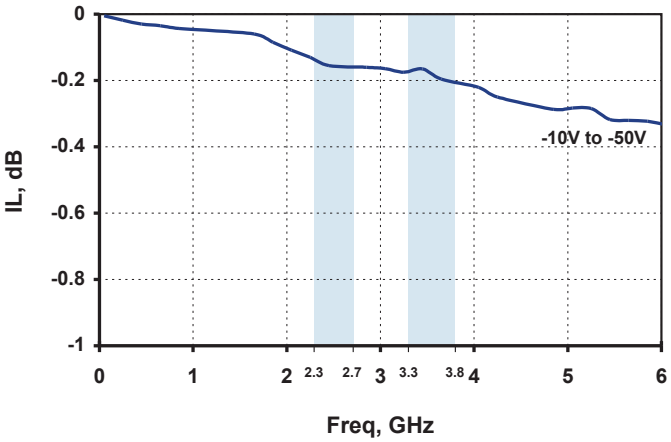
Absolute Maximum Ratings

RATING	LIMITS	UNITS
V_R	100	V
I_F	100	mA
θ_{JC}	30	°C/W
T_J	+175	°C
T_{STG}	-65 to +150	°C
T_{SOLDER}	+260 °C per JEDEC J-STD-20C	

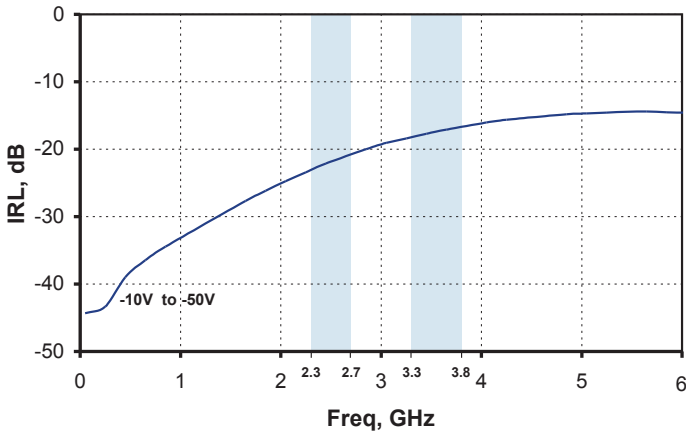
METELICS

Typical RF Performance at T_A = 25 °C, Zo = 50 Ω, Small Signal
(Unless Otherwise Specified)

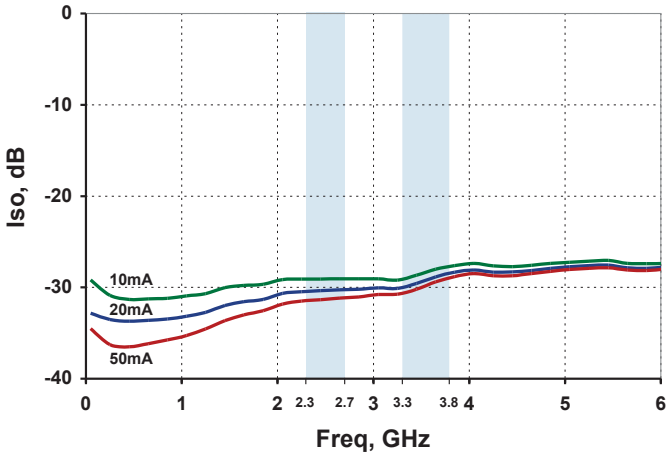
Insertion Loss



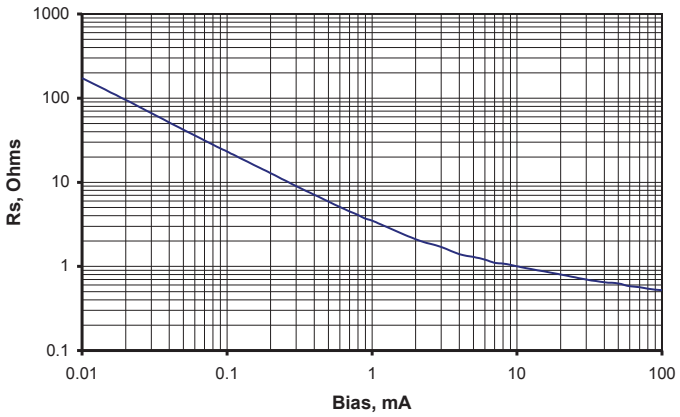
Input Return Loss



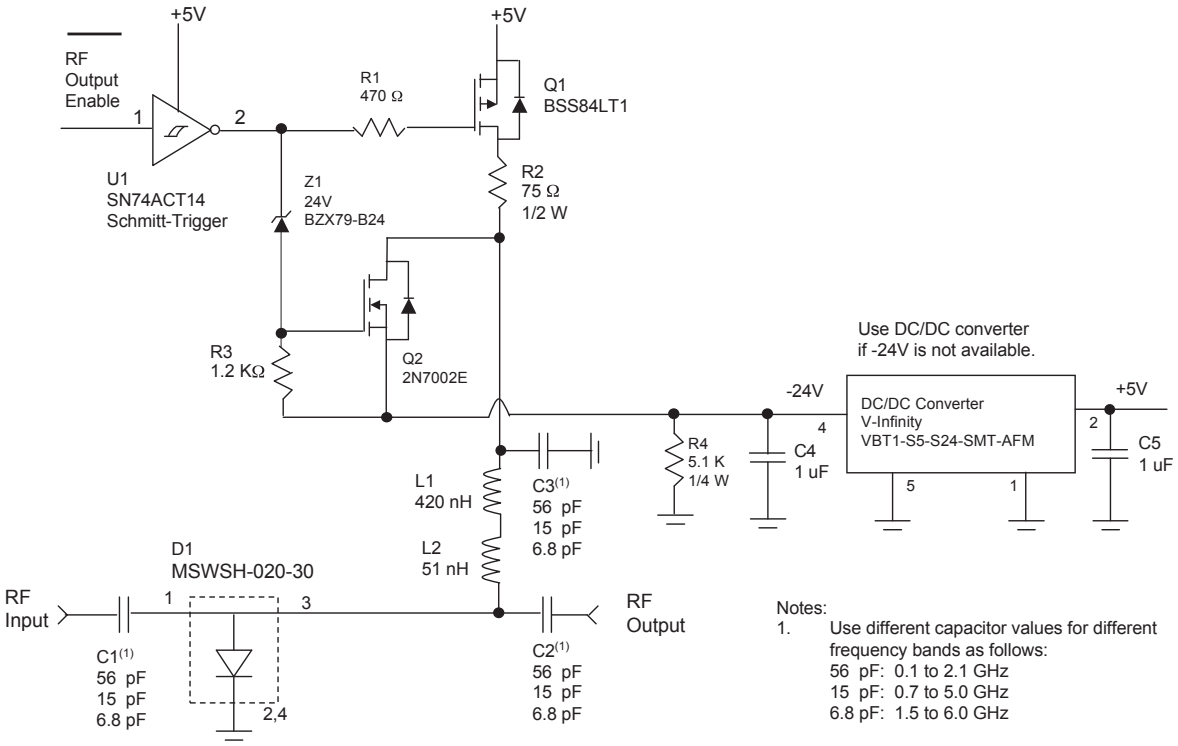
Isolation



Series Resistance vs. Current
(Freq = 500 MHz)



Bias Schematic (0.1 to 6 GHz)



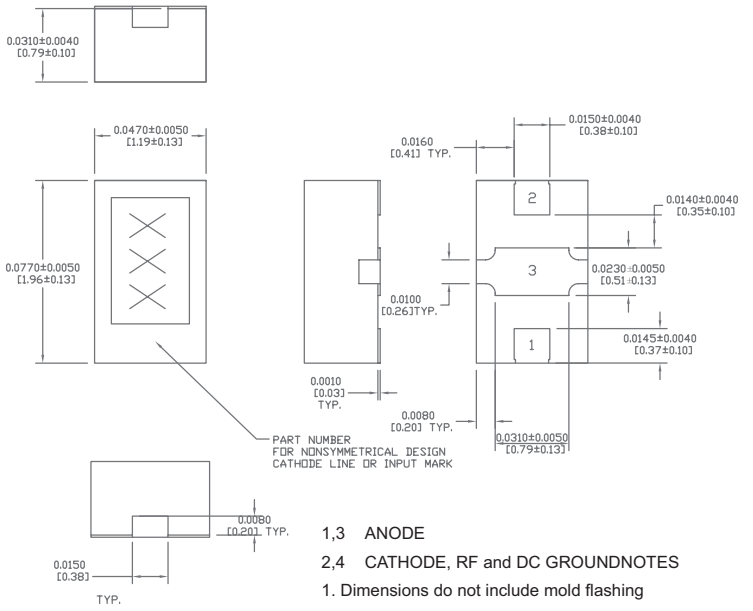
Parts List

COMPONENT	DESCRIPTION	MANUFACTURE	P/N
R1	470Ω, 1/10W, 0603 chip resistor	KOA Speer	RK73B1JTTD471J
R2	75Ω, 1/2W, 1210 chip resistor	KOA Speer	RK73B2ETTD750J
R3	1.2KΩ, 1/10 W, 0603 chip resistor	KOA Speer	RK73B1JTTD122J
R4	5.1KΩ, 1/4W, 1206 chip resistor	KOA Speer	RK73B2BTTD512J
C1,C2,C3 (1)	56pF, 250VDC Capacitor, 0603 pkg	ATC	ATC600S560JT250XT
C1,C2,C3 (1)	15pF, 250VDC Capacitor, 0603 pkg	ATC	ATC600S150JT250XT
C1,C2,C3 (1)	6.8pF, 250VDC Capacitor, 0603 pkg	ATC	ATC600S6R8JT250XT
C4,C5	1uF, 50WVDC Capacitor, 1206 pkg	ATC	ATC1206Z5U105MT2AT
L1	420nH, 340mA, 700MHz SRF Inductor	Coilcraft	0402AF-421XJLW
L2	51nH, 330mA, 2.3GHz SRF, Inductor	Coilcraft	0402HP-51NXJLW
Q1	50V, 130mA, P-Channel MOSFET	ON SEMI	BSS84LT1
Q2	60V, 310mA, N-Channel MOSFET	ON SEMI	2N7002E
U1	Hex Schmitt-Trigger TTL Inverter	Texas Instruments	SN74ACT14
Z1	24V, 2%, 500mW Zener Diode	Philips	BZX79-B24
DC1	1W, 5V to 24V DC/DC Converter	V-Infinity	VBT1-S5-S24-SMT-AFM
D1	PIN Diode Shunt Switch	Aeroflex-Metelics	MSWSH-20-30

Notes:
1. Use different capacitor values for different frequency bands as follows:
   56 pF: 0.1 to 2.1 GHz
   15 pF: 0.7 to 5.0 GHz
   6.8 pF: 1.5 to 6.0 GHz

MSWSH-020-30

Package Outline (2012):



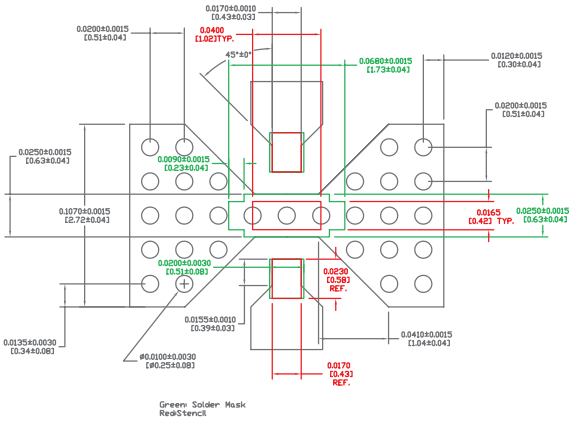
1,3 ANODE

2,4 CATHODE, RF and DC GROUNDNOTES

1. Dimensions do not include mold flashing
2. Burrs and dumbar shall not exceed 0.002" per surface.
3. Lead co-planarity is 0.003" max

Dimensions: inches [mm]

PCB Layout

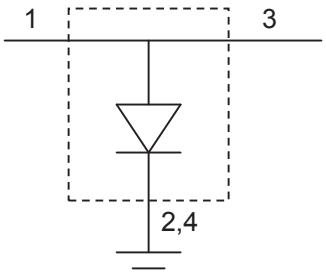


NOTE: If possible, use copper filled vias underneath pin 3 for better thermals; otherwise, use vias that are plated through, filled and plated over.

Solder mask should provide a 60 um clearance between copper pad and soldermask. Rounded pkg pads should have matching rounded solder mask openings.

Use circles or squares for the thermal land stencil such that only get 50% to 80% solder paste coverage.

Electrical Schematic



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