KS104-53

SP3T 20W Switch
0.02 – 3 GHz

KCB SOLUTIONS
RF DESIGN & MANUFACTURING

Description

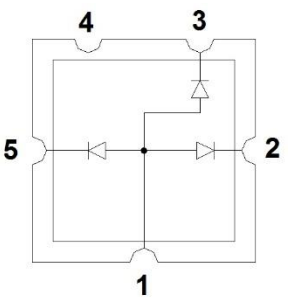
The KS104-53 is a SP3T PIN switch that offers high power handling and low insertion loss in a compact surface mount package. Built on a highly thermally conductive Aluminum Nitride (AlN) substrate, this switch is ideal for high performance commercial and military applications where low loss combined with high adjacent port isolation is required. In addition, the thick copper under metal provides superior loss performance as well as higher bias current handling than traditional metallization schemes. High power diodes have been chosen to provide the optimum blend of loss, isolation and harmonic performance.

Features

- ❑ High Power PIN Diode Design
- ❑ Broadband operation from 0.02 – 3.0 GHz
- ❑ Surface Mount 5mm QFN-style Leadless Package
- ❑ Rugged Aluminum Nitride Carrier with Thick Copper Traces

Applications

- ❑ Microwave Radios
- ❑ Military Radios
- ❑ VSAT
- ❑ Telecom Infrastructure
- ❑ Test Equipment



Pinout

1	RFC
2	RF1/CTL1
3	RF2/CTL2
4	NC
5	RF3/CTL3

Electrical Characteristics (+25°C)

Parameter	Conditions	Min.	Typ.	Max.	Units
Insertion Loss	0.02 – 1.0 GHz		0.2	0.5	dB
	1.0 – 2.0 GHz		0.5	0.8	dB
	2.0 – 3.0 GHz		0.7	1.0	dB
Isolation	0.02 – 1.0 GHz	25	30		dB
	1.0 – 3.0 GHz	20	25		dB
VSWR (I/O)	0.02 – 1.0 GHz		1.2:1	1.3:1	
	1.0 – 2.0 GHz		1.3:1	1.4:1	
	2.0 – 3.0 GHz		1.5:1	2.0:1	

Absolute Maximum Ratings

Characteristic	Min.	Max.	Units
Control Voltage (Vctl)	-200	0.7	Volts
RF Input Power		20	W(1)
Storage Temperature	-65	+150	°C
Operating Temperature	-55	+85	°C
Control Current		150	mA
Operating Frequency	0.02	3.00	GHz

Notes:
1. Max Base Plate Temp =+85°C. For temperatures above +85°C derate linearly to +150°C using $P_{max} = 115.38 - 0.769 * T_{amb}$

Truth Table / Control Voltages

(I_{ctl} = 100mA, V_{LOW} = 50 to 200V)

CTL1	CTL2	CTL3	RFC – RF1	RFC – RF2	RFC – RF3
Ictl	Vrb+	Vrb+	Loss	Isolation	Isolation
Vrb+	Ictl	Vrb+	Isolation	Loss	Isolation
Vrb+	Vrb+	Ictl	Isolation	Isolation	Loss

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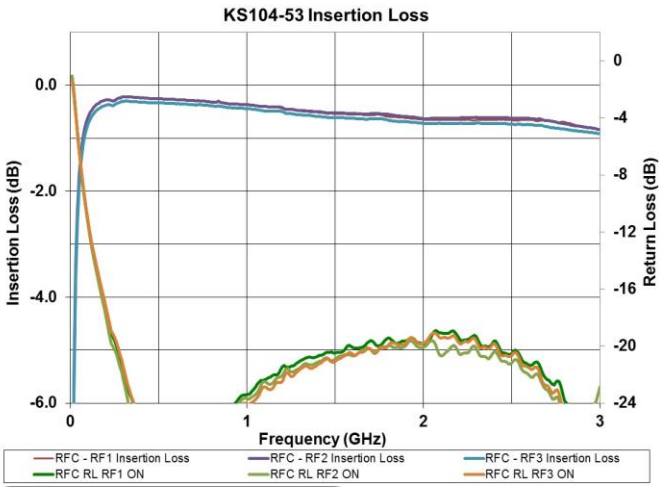
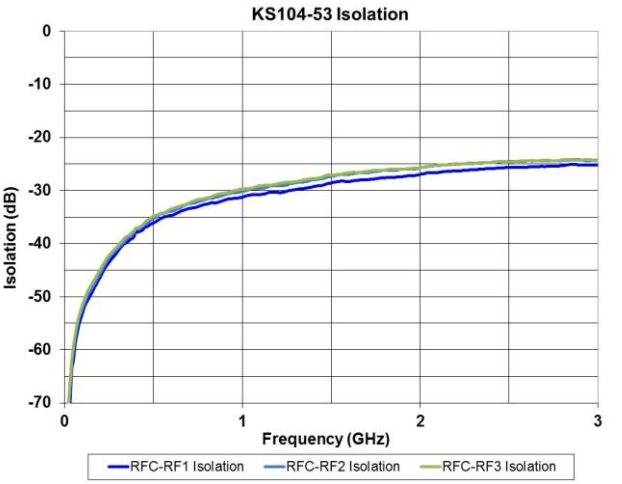
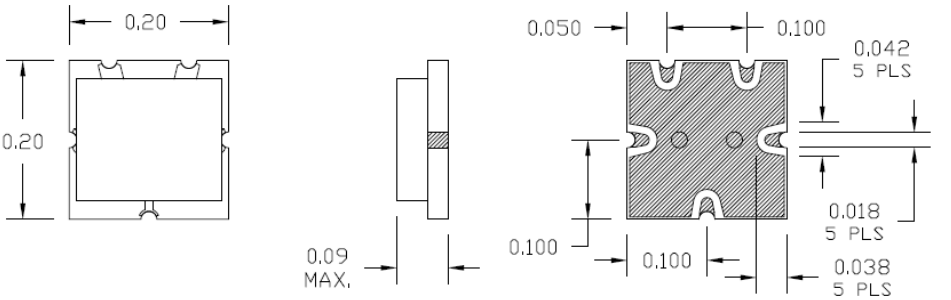
Typical Performance(+25°C)



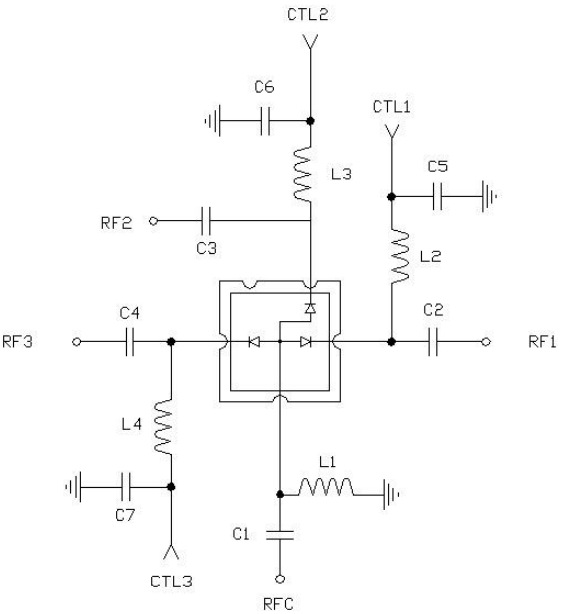


Outline Drawing

Dimensions are shown in inches.



Application Schematic



Schematic Notes:

1. Voltages for CTL1 – CTL3 should be chosen to maintain reverse bias through peak RF voltage excursions during the OFF state and to maintain proper forward bias current (I_{CTL}) during ON state. See truth table.
2. C1 – C4 should be large enough to provide low loss at the lowest operating frequency.
3. L1 – L4 should be large enough to provide high impedances at the lowest operating frequency.
4. C5 – C7 should be large enough to adequately filter supply noise from CTL1 – CTL3.

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