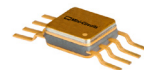


Surface Mount Switch

50Ω SPDT, Reflective DC⁴ to 4.6 GHz

KSW-2-46+



Generic photo used for illustration purposes only

CASE STYLE: XX112

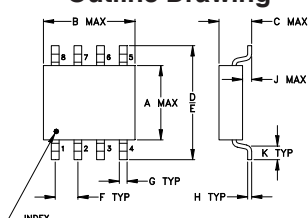
Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 150°C
Input Power	see Note 1
Control V	see Note 2
Permanent damage may occur if any of these limits are exceeded.	

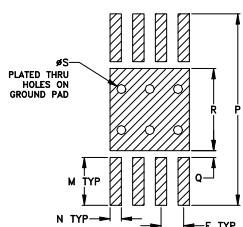
Pin Connections

RF IN	2
RF OUT 1	5
RF OUT 2	8
CONTROL 1	3
CONTROL 2	1
GROUND	4,6,7

Outline Drawing



PCB Land Pattern

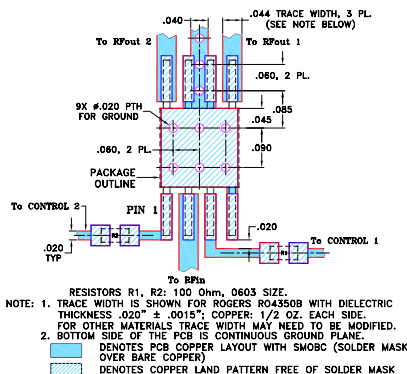


Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch)

A	B	C	D	E	F	G	H	
.180	.180	.070	.400	.350	.050	.015	.005	
4.57	4.57	1.78	10.16	8.89	1.27	0.38	0.13	
J	K	M	N	P	Q	R	S	wt.
.005	.070	.105	.025	.420	.015	.180	.020	grams
0.13	1.78	2.67	0.64	10.67	0.38	4.57	0.51	0.15

Demo Board MCL P/N: TB-204 Suggested PCB Layout (PL-217)



Notes

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Features

- wideband, DC to 4.6 GHz
- low insertion loss, 1.3 dB typ.
- aqueous washable
- low video leakage, 30 mVp-p typ.

Applications

- PCN
- cellular
- 2-way radio
- receiver antenna switching

Electrical Specifications

FREQ. ⁴ (GHz)		INSERTION LOSS (dB)				1dB COMPR. (dBm)				IN-OUT ISOLATION (dB)					
		DC-200 MHz	200-1000 MHz	1000-3000 MHz	3000-4600 MHz	DC-200 MHz	200-1000 MHz	1000-4600 MHz		DC-200 MHz	200-1000 MHz	1000-4600 MHz			
f _L	f _U	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.		Typ.	Min.	Typ.	Min.	Typ.	Min.
DC	4.6	0.9	1.1	1.0	1.3	1.3	1.8	2.0	2.8	10	17	27	60	50	28

Additional Specifications

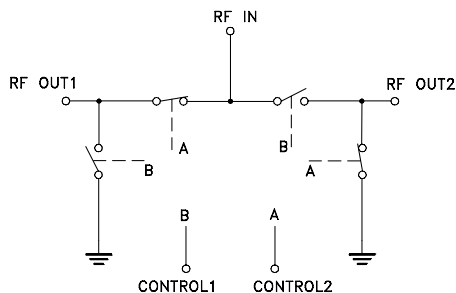
Control Voltage, volts	
Low State	-0.2 to 0
High State (negative)	-8
for compression specs	-5 to -8
for other specs	
Control Current, mA	2.5 typ. at -8V
VSWR(:1)	1.3 typ.
Rise/Fall time (10%-90%), ns	2 typ.
Switching time, 50% of Control to	
90% RF(Turn-on), ns	4 typ.
10% RF(Turn-off), ns	2.5 typ.
**Video Leakage, mVp-p	30 typ.
0/-5V Control	
MTBF, hrs @ 100°C case	7X10 ⁶

1. Max. Input RF power, +27 dBm except below 500 MHz +24 dBm
2. Control voltage (-10V) maximum.
3. Video leakage or break through is defined as leakage of switching signal to RF output ports.
4. All RF connections must be DC blocked or held at 0V DC.

CONTROL LOGIC

Control Ports		RF outputs	
1	2	1	2
-V	0	On	Off
0	-V	Off	On

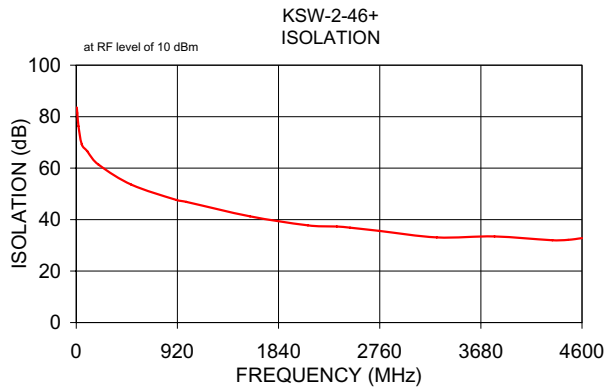
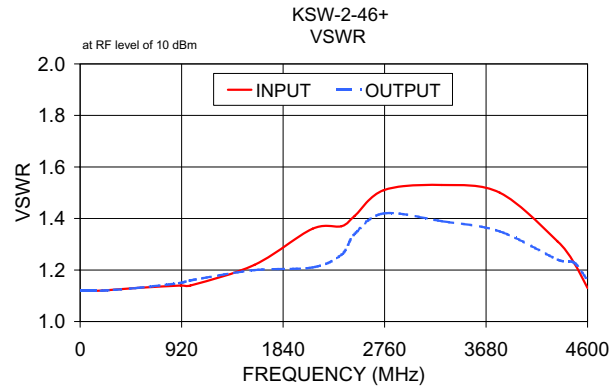
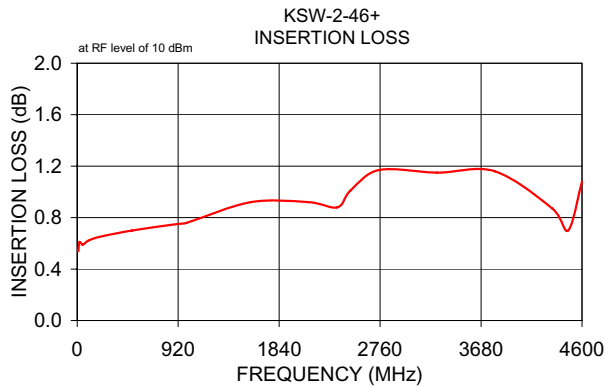
Electrical Schematic



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Typical Performance Data

FREQ. (MHz)	ON INSERTION LOSS (dB) Control @ 0V/-5V IN-OUT		OFF ISOLATION (dB) Control @ 0V/-5V IN-OUT		VSWR		
	$\bar{x}$	σ	$\bar{x}$	σ	IN $\bar{x}$	ON $\bar{x}$	OUT OFF $\bar{x}$
3.00	0.54	0.04	83.44	4.68	1.12	1.12	16.46
5.00	0.54	0.04	83.46	2.97	1.12	1.12	16.21
10.00	0.54	0.04	81.44	2.66	1.12	1.12	16.21
20.00	0.61	0.06	76.29	2.13	1.12	1.12	16.04
50.00	0.59	0.04	69.27	0.92	1.12	1.12	15.37
100.00	0.62	0.04	66.59	1.42	1.12	1.12	14.63
200.00	0.65	0.04	61.43	0.74	1.12	1.12	14.00
500.00	0.70	0.04	53.61	0.93	1.13	1.13	12.83
911.55	0.75	0.04	47.64	0.59	1.14	1.15	11.86
1000.00	0.76	0.04	46.91	0.61	1.14	1.16	11.79
1581.00	0.92	0.05	41.27	0.47	1.22	1.20	11.85
2107.00	0.92	0.06	37.77	0.41	1.36	1.21	11.91
2370.00	0.88	0.06	37.33	0.42	1.37	1.26	9.64
2489.55	1.01	0.07	36.86	0.43	1.41	1.34	9.98
2752.55	1.17	0.09	35.65	0.39	1.51	1.42	9.70
3278.55	1.15	0.11	33.10	0.42	1.53	1.39	13.14
3804.55	1.16	0.08	33.46	0.37	1.50	1.35	13.37
4330.55	0.87	0.05	31.99	0.42	1.31	1.24	15.41
4474.00	0.70	0.04	32.16	0.40	1.23	1.23	17.84
4600.00	1.08	0.04	32.78	0.42	1.13	1.16	14.40



Notes

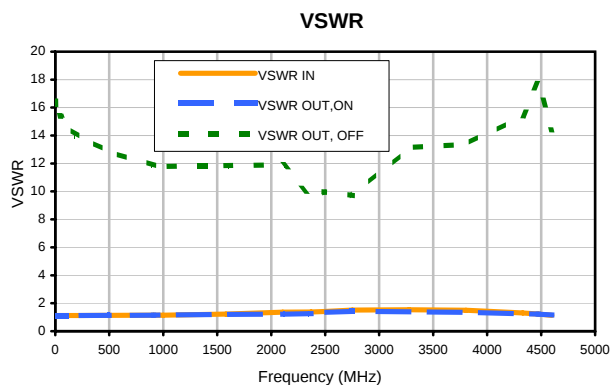
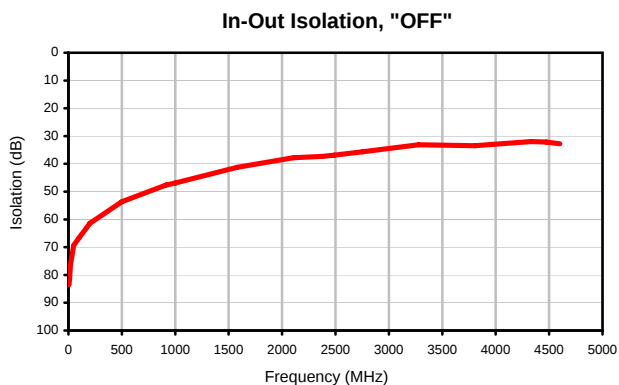
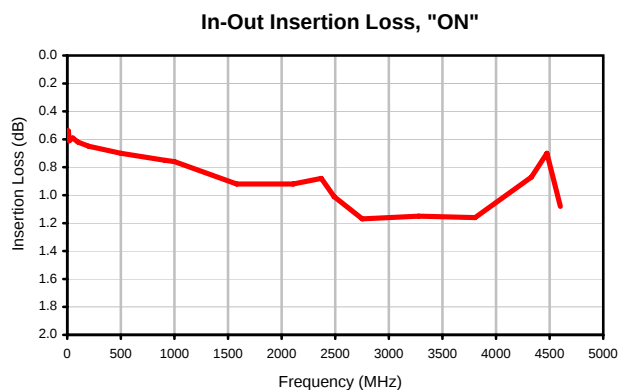
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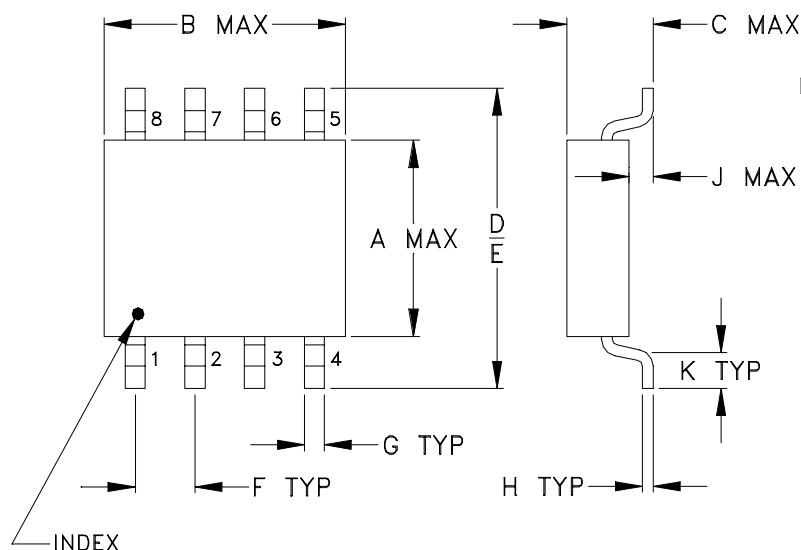
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS Control @ 0V/-5V (dB) IN-OUT , "ON"	ISOLATION Control @ 0V/-5V (dB) IN-OUT , "OFF"	VSWR		
			IN	(:1) OUT , "ON"	OUT , "OFF"
3	0.54	83.44	1.12	1.12	16.46
5	0.54	83.46	1.12	1.12	16.21
10	0.54	81.44	1.12	1.12	16.21
20	0.61	76.29	1.12	1.12	16.04
50	0.59	69.27	1.12	1.12	15.37
100	0.62	66.59	1.12	1.12	14.63
200	0.65	61.43	1.12	1.12	14.00
500	0.70	53.61	1.13	1.13	12.83
912	0.75	47.64	1.14	1.15	11.86
1000	0.76	46.91	1.14	1.16	11.79
1581	0.92	41.27	1.22	1.20	11.85
2107	0.92	37.77	1.36	1.21	11.91
2370	0.88	37.33	1.37	1.26	9.64
2490	1.01	36.86	1.41	1.34	9.98
2753	1.17	35.65	1.51	1.42	9.70
3279	1.15	33.10	1.53	1.39	13.14
3805	1.16	33.46	1.50	1.35	13.37
4331	0.87	31.99	1.31	1.24	15.41
4474	0.70	32.16	1.23	1.23	17.84
4600	1.08	32.78	1.13	1.16	14.40

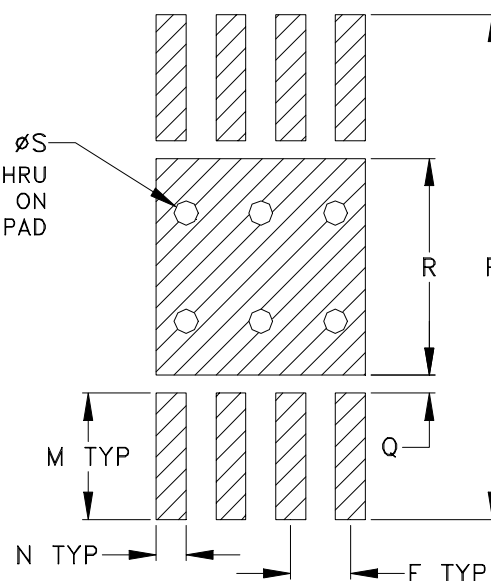
Typical Performance Curves



Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	N	P
XX112	.180 (4.57)	.180 (4.57)	.070 (1.78)	.400 (10.16)	.350 (8.89)	.050 (1.27)	.015 (0.38)	.005 (0.13)	.005 (0.13)	.070 (1.78)	--	.105 (2.67)	.025 (0.64)	.420 (10.67)

CASE #	Q	R	S	WT. GRAM
XX112	.015 (0.38)	.180 (4.57)	.020 (0.51)	.15

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .01$; 3 Pl. $\pm .005$

Notes:

1. Case material: Kovar.
2. Termination Finish: 50 μ inch (1.27 microns) Gold over 50-350 μ inch (1.27-8.89 microns) Nickel plate.
3. Special Tolerances: Termination thickness $\pm .002$ inch.



INTERNET <http://www.minicircuits.com>

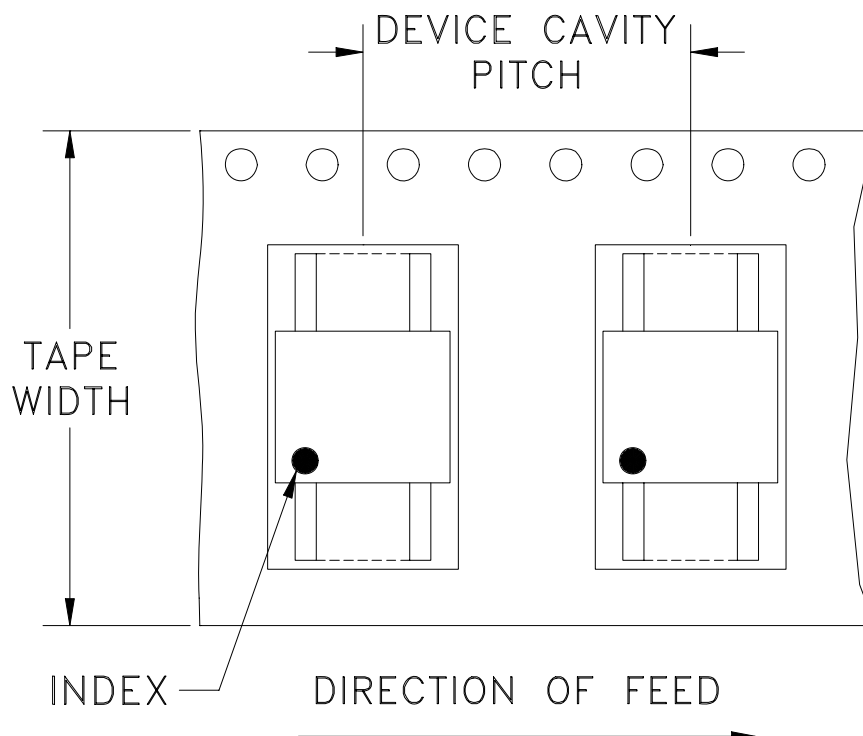
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Tape & Reel Packaging TR-F19

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
16	8	7	Small quantity standards (see note)	20
				50
				100
				200
		7	Standard	500

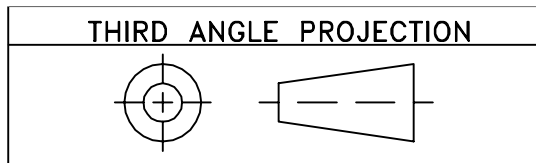
Note : Please Consult individual model data sheet to determine device per reel availability

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

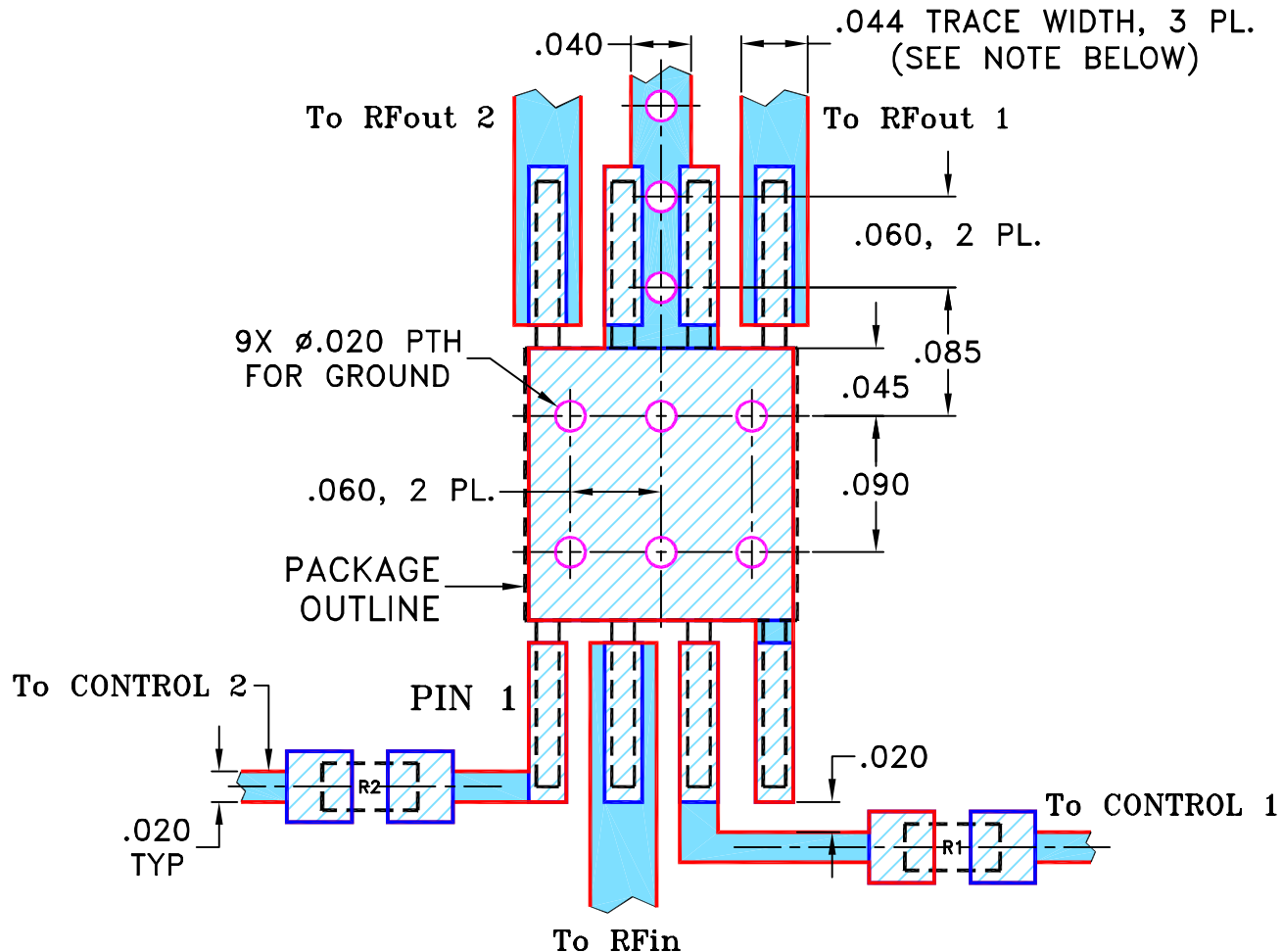


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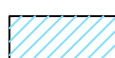
REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M100859	NEW RELEASE	10/12/05	MMG	IG
A	M102713	ADDED "...WITH SMOBC"	01/12/06	GT	IL

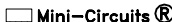
**SUGGESTED MOUNTING CONFIGURATION
FOR XX112 CASE STYLE, "eh" PIN CONNECTION.**



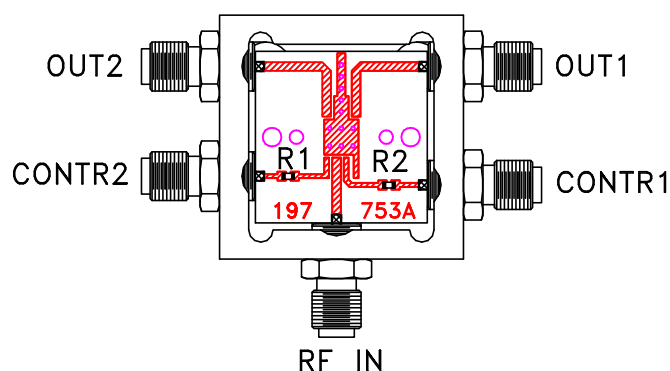
RESISTORS R1, R2: 100 Ohm, 0603 SIZE.

- NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .020" $\pm$.0015"; COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

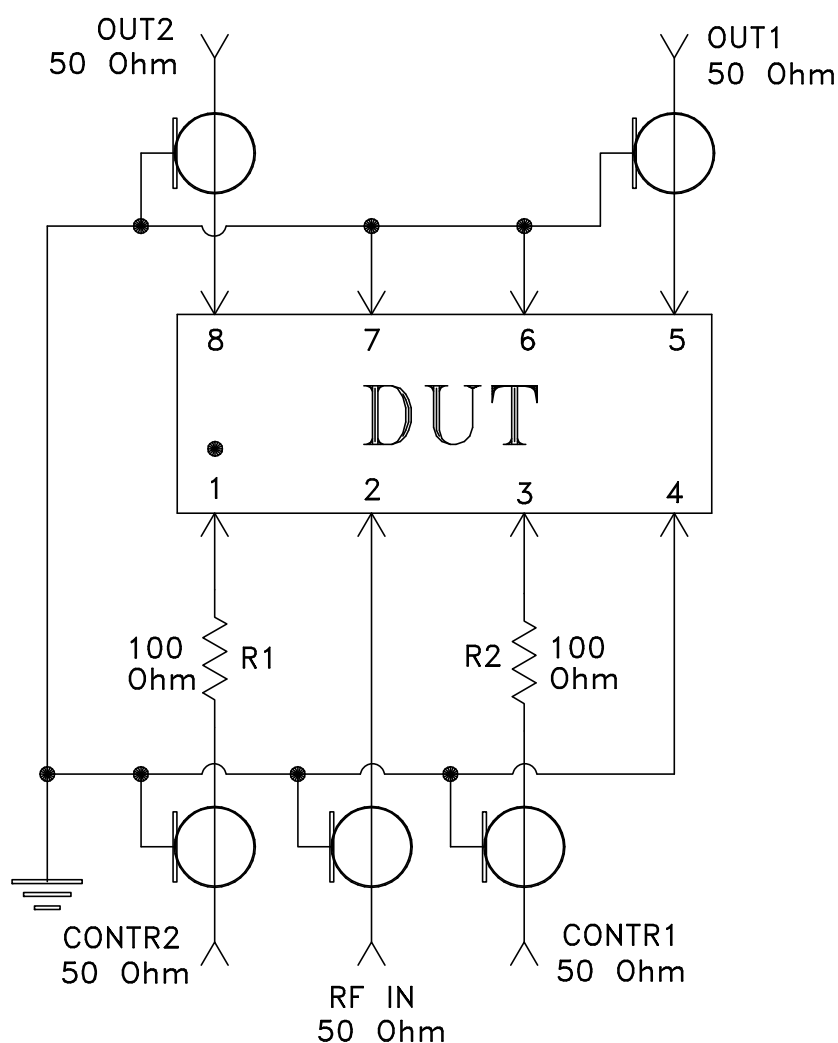
 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE	 Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235	
DIMENSIONS ARE IN INCHES		DRAWN	MMG		
TOLERANCES ON:		CHECKED	IL		
2 PL DECIMALS $\pm$		APPROVED	IG		
3 PL DECIMALS $\pm$.005				PL, eh, XX112, KSW(A)-2-46, TB-204	
ANGLES $\pm$				SIZE A CODE IDENT 15542 DRAWING NO: 98-PL-217 REV: A	
FRACTIONS $\pm$				FILE: 98PL217 SCALE: 8:1 SHEET: 1 OF 1	
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Evaluation Board and Circuit



TB-204



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent,
Dielectric Constant=3.5, Thickness=.020 inch.

 **Mini-Circuits®**



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Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 150°C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Solderability	10X Magnification	J-STD-002, 95% Coverage
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Seal	Gross leak	MIL-STD-202, Method 112, Condition.D
Lead Integrity	Tension parallel to axis of lead, 1.70 x 10 ⁷ grams-force per square inch of cross-sectional lead area (1.3 kg-force)	MIL-STD-883, Method 2028
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215