

Ceramic Low Pass Filter

50Ω

DC to 850 MHz

LFTC-850+



Generic photo used for illustration purposes only

CASE STYLE: FR933

Maximum Ratings

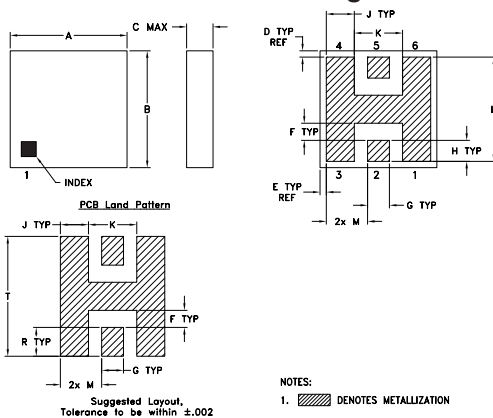
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 125°C
Permanent damage may occur if any of these limits are exceeded.	

Pin Connections

RF IN	2
RF OUT	5
GROUND	1,3,4,6

Product Marking: LF3

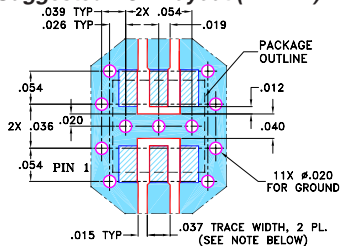
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H
.150	.150	.034	.008	.022	.028	.027	
3.81	3.81	0.864	0.203	0.203	0.559	0.711	0.686
J	K	L	M	R	T	wt	
.036	.062	.134	.053	.037	.154	grams	
0.914	1.575	3.404	1.346	0.940	3.912	0.15	

Demo Board MCL P/N: TB-233 Suggested PCB Layout (PL-112)



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015"; 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

Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

Features

- miniature size, 0.15"X0.15"X0.034"
- low profile, 0.034" height
- excellent power handling, 16W
- hermetically sealed

Applications

- harmonic rejection
- internal rejection
- receivers & transmitters

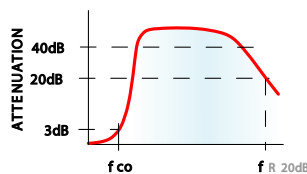
Electrical Specifications¹ (T_{AMB}=25°C)

PASSBAND (MHz)	f _{co} , MHz Nom.	STOP BAND (MHz)			VSWR (:1) Passband	POWER INPUT* (W)	MARKING	NO. OF SECTIONS
(loss < 1 dB)	(loss 3 dB)	(> 20 dB)	(loss > 40 dB)	fr20 dB	Typ.			
Typ.	Typ.			Typ.				
DC-850	1078	1500	2000-3500	5500	1.2	16	LF3	7

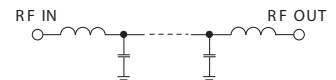
* Derate linearly to 7W at 100°C ambient.

1. Measured on Mini-Circuits Characterization Test Board TB-233.

typical frequency response

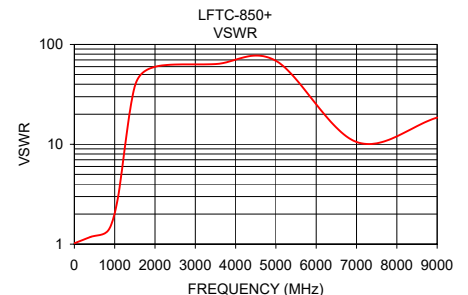
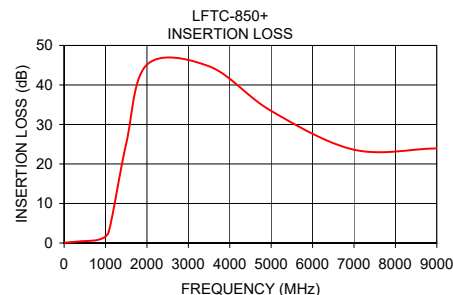


electrical schematic



Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
1.00	0.09	1.02
400.00	0.42	1.18
850.00	0.90	1.39
1078.00	2.87	2.87
1500.00	25.19	38.22
2000.00	45.14	59.79
3500.00	44.71	63.65
5000.00	33.44	68.63
7000.00	23.62	10.54
9000.00	23.95	18.52



Ceramic Low Pass Filter

LFTC-850+

Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS @ +25° C (dB)	INPUT RETURN LOSS @ +25° C (dB)	OUTPUT RETURNLOSS @ +25° C (dB)
1	0.09	40.09	40.09
50	0.17	34.87	34.45
100	0.21	34.84	33.02
500	0.51	23.37	23.01
850	0.88	18.15	17.88
925	0.97	20.56	20.75
1078	2.68	7.03	6.98
1085	2.93	6.41	6.35
1130	4.99	3.59	3.52
1215	10.04	1.47	1.42
1300	15.07	0.88	0.83
1395	20.03	0.62	0.60
1500	24.85	0.51	0.48
1620	29.78	0.43	0.42
1750	34.80	0.37	0.37
1880	39.88	0.35	0.34
2000	44.99	0.31	0.31
2090	49.66	0.32	0.29
2205	59.01	0.29	0.27
2235	63.45	0.30	0.28
2280	73.02	0.30	0.27
2340	63.07	0.30	0.26
2560	52.16	0.30	0.25
3000	47.48	0.32	0.26
3500	45.41	0.34	0.26
4095	42.01	0.37	0.27
4500	37.80	0.40	0.30
5090	31.86	0.49	0.36
5500	26.29	0.69	0.51
5840	19.34	2.95	1.97
6000	17.42	3.63	4.06
6100	13.70	1.91	8.87
6300	21.92	0.89	1.00
6500	26.62	0.82	0.67
6855	28.90	1.37	0.82
6960	21.12	2.07	1.12
7400	16.58	1.12	0.89
7680	10.56	3.50	4.10
7800	13.25	4.14	2.79
8000	21.86	1.13	0.92
9000	25.09	1.09	0.90

REV. X1
LFTC-850+
071007
Page 1 of 1

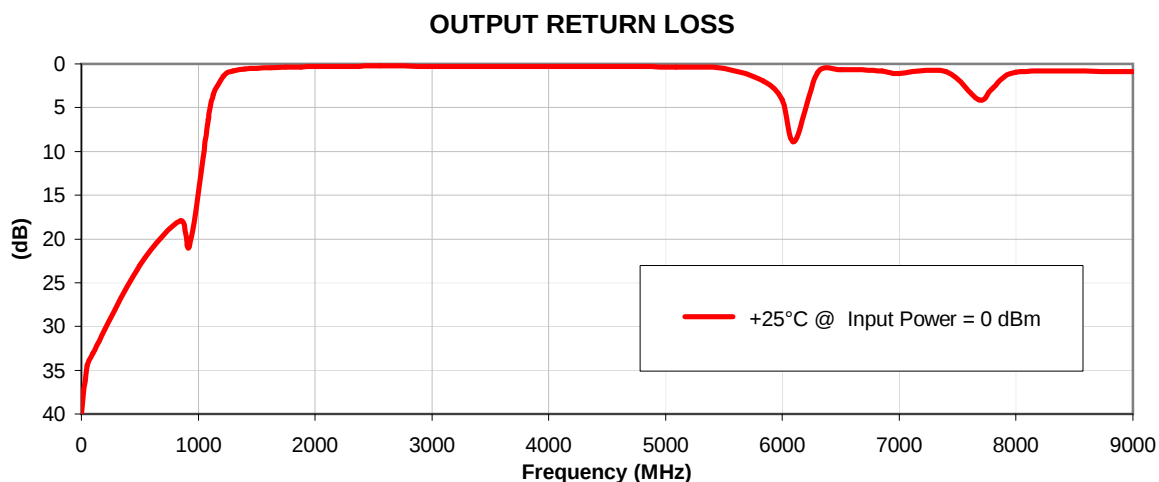
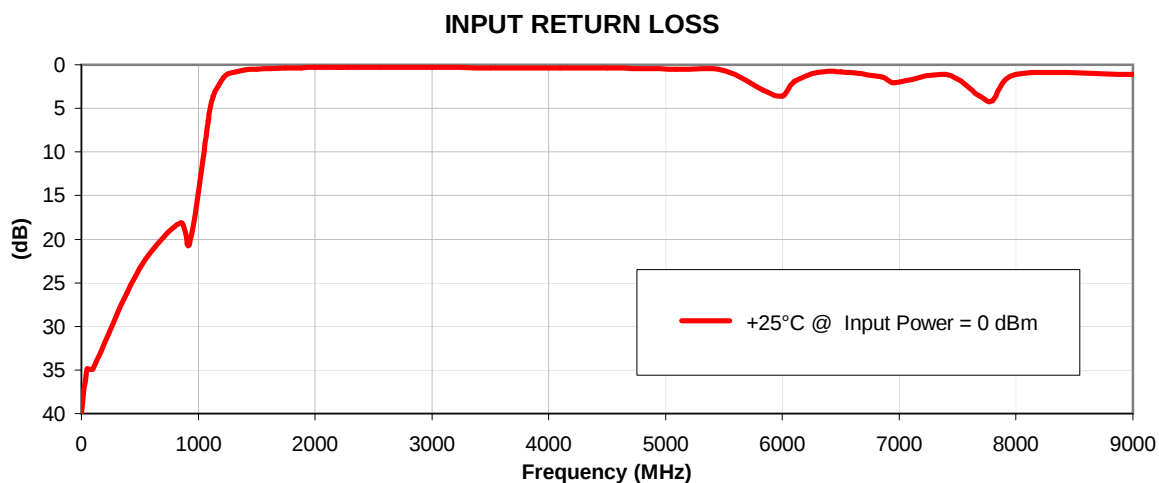
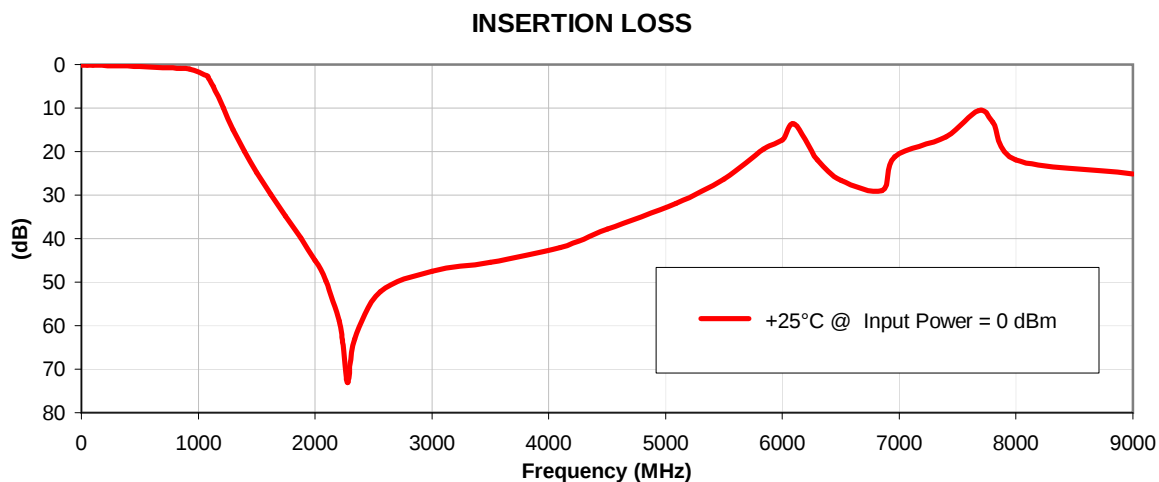


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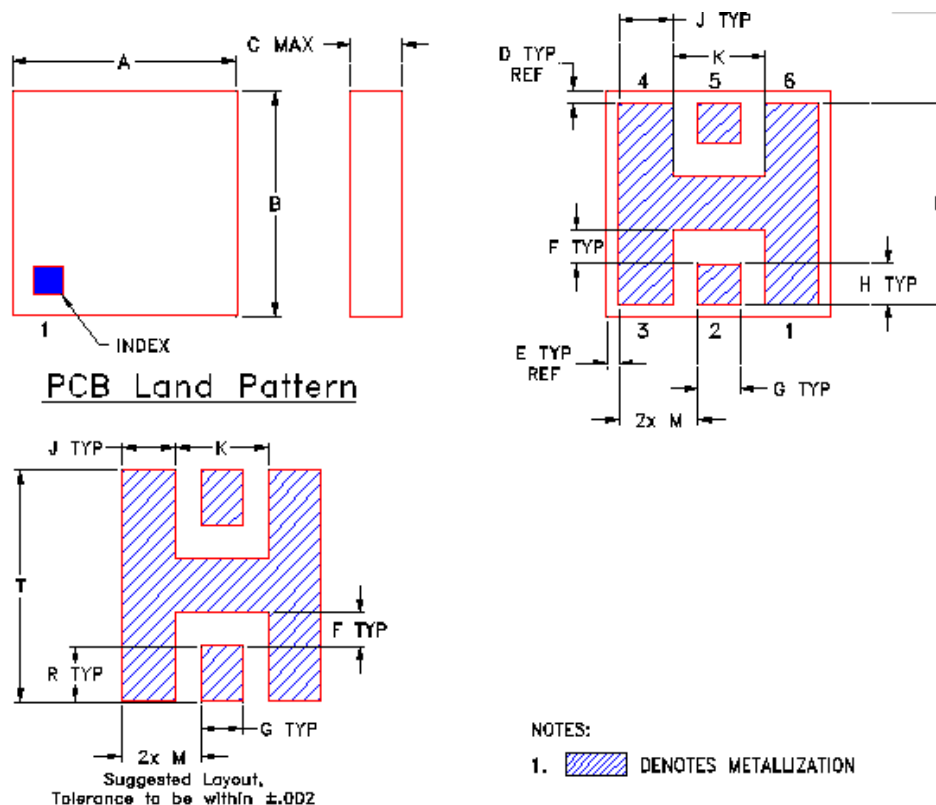
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



Typical Performance Curves



Outline Dimensions



CASE #	A	B	C	D	E	F	G	H	J	K	L	M	R
FR933	.150 (3.81)	.150 (3.81)	.034 (.864)	.008 (.203)	.008 (.203)	.022 (.559)	.028 (.711)	.027 (.686)	.036 (.914)	.062 (1.575)	.134 (3.404)	.053 (1.346)	.037 (.940)

CASE #	T	WT. GRAM
FR933	.154 (3.912)	0.15

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

Notes:

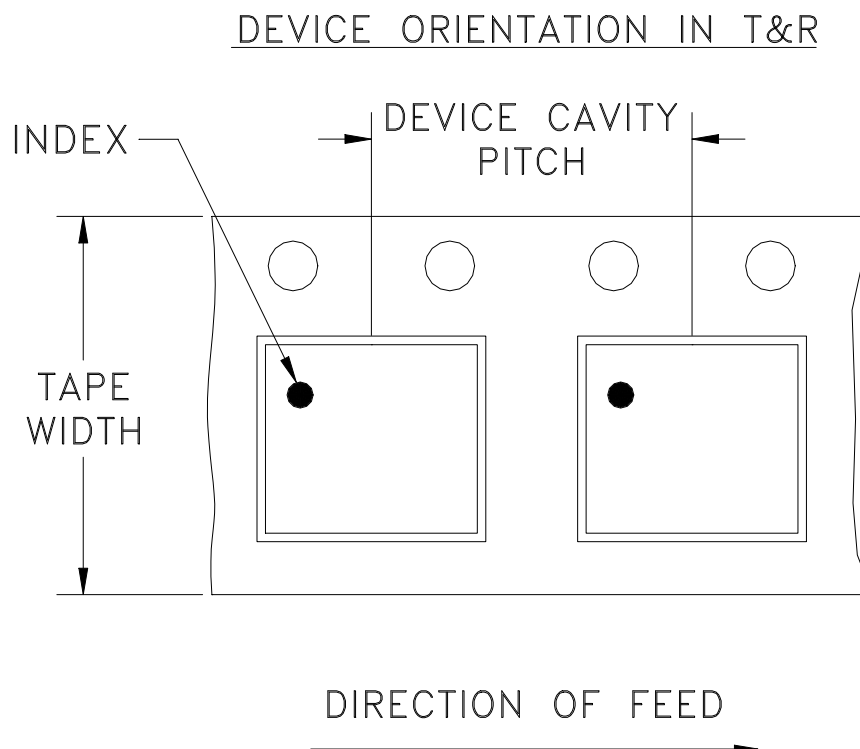
1. Open style, Ceramic Base.
2. Termination finish: Palladium Silver.



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

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Tape & Reel Packaging TR-F68



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
12	8	7	Small quantity standard	20
				50
				100
				200
				500
		7	Standard	1000
		13	Standard	2000
				3000
				4000

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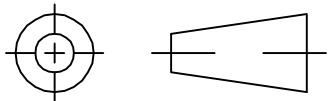
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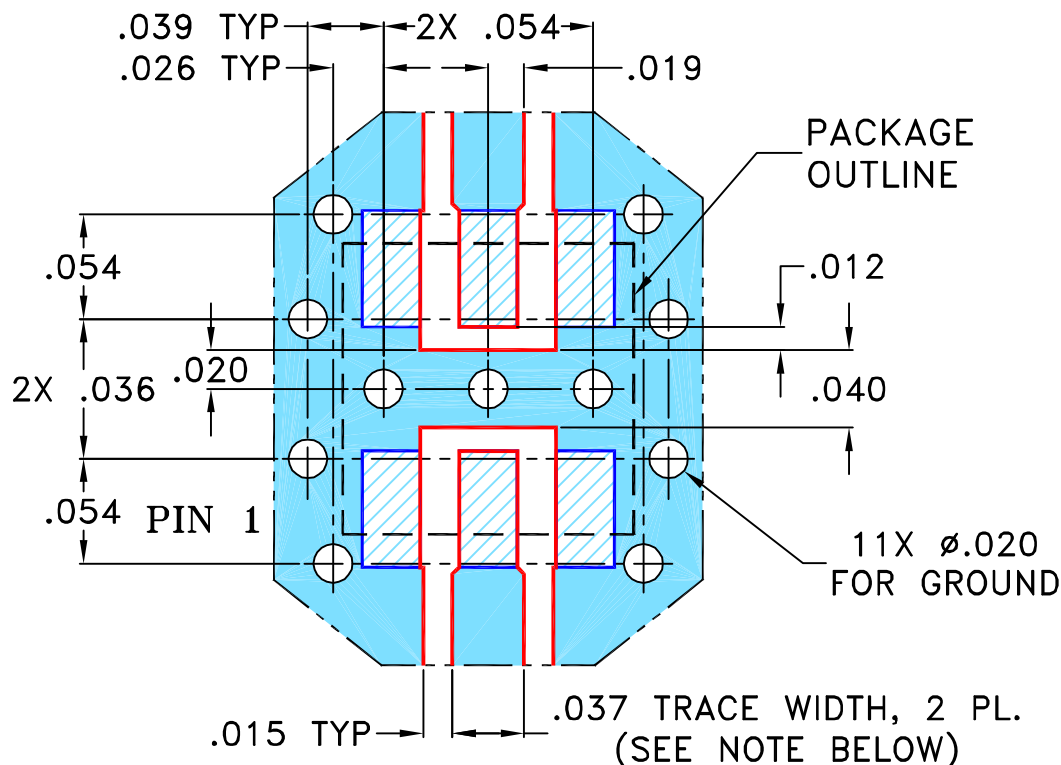
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M83007	NEW RELEASE	09/04/02	MMG	LER
A	M83501	CNG LAYOUT AS PER B14-TB-233	10/01/02	MMG	ABD
B	M102713	ADDED "...WITH SMOBC"	01/14/06	GF	IL
C	M164713	ADDED "933-1 & 06FL03"	11/15/17	CA	IL

SUGGESTED MOUNTING CONFIGURATION
FOR FR932/933/933-1 CASE STYLE, "06FL03" PIN CONNECTION



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.020" $\pm$ 0.0015"; 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

DIMENSIONS ARE IN INCHES

DRAWN

MMG

09/04/02

TOLERANCES ON:

CHECKED

2 PL DECIMALS $\pm$

3 PL DECIMALS $\pm$

ANGLES $\pm$

FRACTIONS $\pm$

APPROVED

LER(BC)

09/04/02

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PL, 06FL03, FR932/933/933-1, TB-233

SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-112

REV:
C

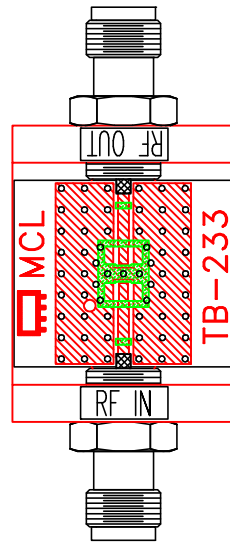
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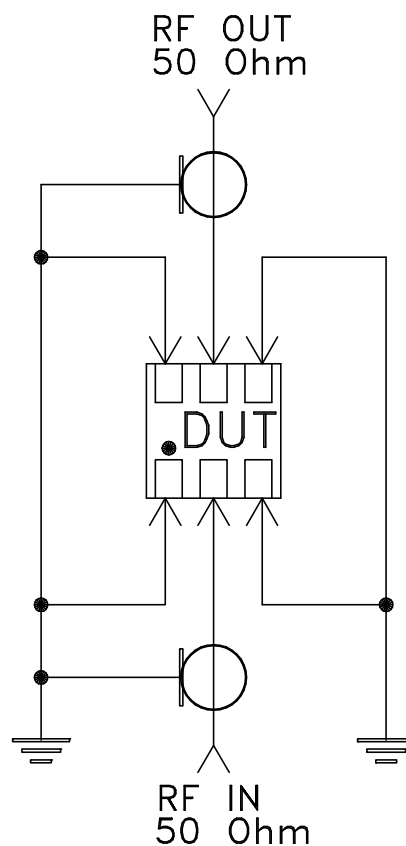
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Evaluation Board and Circuit



TB-233



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.020 inch.

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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 125° C Ambient Environment	Individual Model Data Sheet
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
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 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