

Low Pass Filter

50Ω DC to 3300 MHz

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 125°C

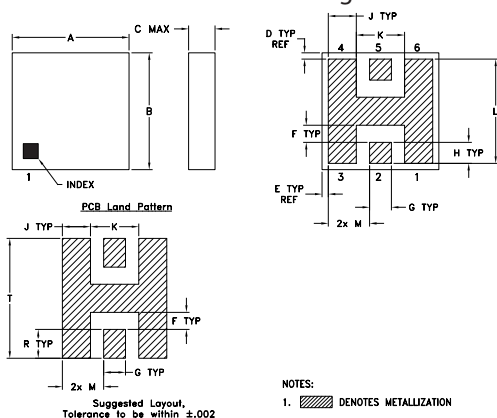
Permanent damage may occur if any of these limits are exceeded.

Pin Connections

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

Product Marking: LF9

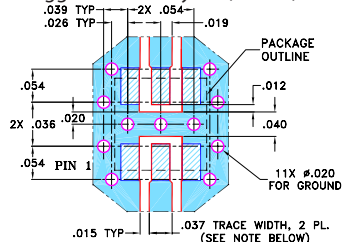
Outline Drawing



Outline Dimensions ($\frac{\text{inch}}{\text{mm}}$)

A	B	C	D	E	F	G	H
.150	.150	.034	.008	.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	
	.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 $0.020" \pm 0.0015"$; COPPER: 1/32 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

A. 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.

B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.

C. 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



www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

LFTC-3300+



Generic photo used for illustration purposes only

CASE STYLE: FR933

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

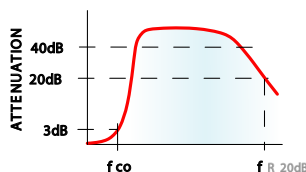
Electrical Specifications¹ (T_{AMB}=25°C)

PASSBAND (MHz)	fco, MHz Nom.	STOP BAND (MHz)	VSWR (:1) Passband	POWER INPUT* (W)	MARKING	NO. OF SECTIONS
(loss < 1 dB)	(loss 3 dB)	fr20 dB				
Typ.	Typ.	(> 20 dB)	Typ.	Typ.		
DC-3300	4100	5600	10000	1.2	10	LF9

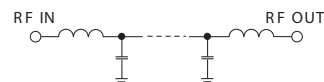
* Derate linearly to 4W at 100°C ambient.

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

typical frequency response

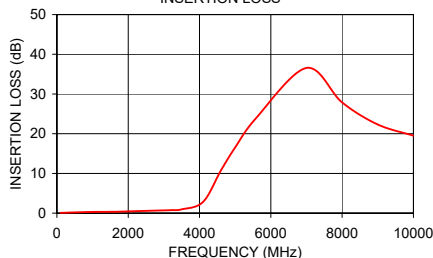


electrical schematic

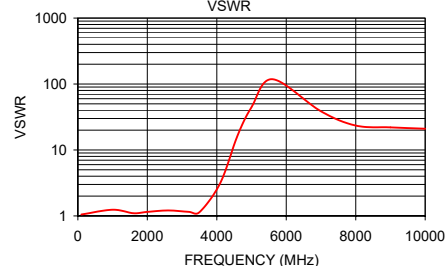


Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
100.00	0.08	1.05
1000.00	0.29	1.24
1600.00	0.34	1.10
2000.00	0.44	1.15
2600.00	0.60	1.21
3200.00	0.76	1.15
3500.00	0.95	1.14
4100.00	2.83	3.16
4600.00	10.72	16.69
5000.00	16.54	44.51
5600.00	24.07	118.44
7000.00	36.57	38.64
8000.00	27.88	23.45
9000.00	22.32	22.03
10000.00	19.50	21.00

LFTC-3300+
INSERTION LOSS

LFTC-3300+



REV. M
ECO-006052
LFTC-3300+
EDB-020617
AD/YB/CP/AM
210216

Ceramic Low Pass Filter

LFTC-3300+

Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS @ +25° C (dB)	INPUT RETURN LOSS @ +25° C (dB)	OUTPUT RETURNLOSS @ +25° C (dB)
50	0.09	31.70	32.05
100	0.12	29.26	29.26
500	0.26	19.22	19.48
1000	0.37	17.15	17.13
1700	0.41	25.29	26.05
2000	0.47	23.13	24.16
2500	0.61	18.95	18.69
3000	0.70	27.93	28.24
3300	0.80	28.89	28.99
3640	1.00	23.85	20.99
4060	2.50	7.38	6.86
4100	2.89	6.42	5.94
4120	3.10	5.98	5.52
4280	5.20	3.39	3.09
4580	10.26	1.44	1.26
4870	15.10	0.86	0.74
5200	20.03	0.62	0.54
5500	24.08	0.53	0.46
5570	25.00	0.53	0.47
5600	25.37	0.51	0.45
5950	29.87	0.52	0.43
6400	35.86	0.55	0.45
6740	39.19	0.60	0.48
7400	33.72	0.70	0.57
8150	28.08	0.84	0.68
9000	25.62	0.96	0.81
9500	24.71	1.11	0.96
10000	23.42	1.32	1.06
10500	19.25	1.96	1.34
11000	18.69	1.72	1.70
11500	15.12	3.52	2.27
12000	22.02	1.64	1.17
13000	17.54	1.34	1.11
14000	17.14	1.34	1.35
15000	14.48	1.83	5.01
15500	12.05	2.55	2.39
15880	7.68	8.53	3.77
16100	7.53	9.53	3.92
16500	12.85	2.75	2.06
17000	15.62	2.19	1.52

REV. X1
LFTC-3300+
071007
Page 1 of 1



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant

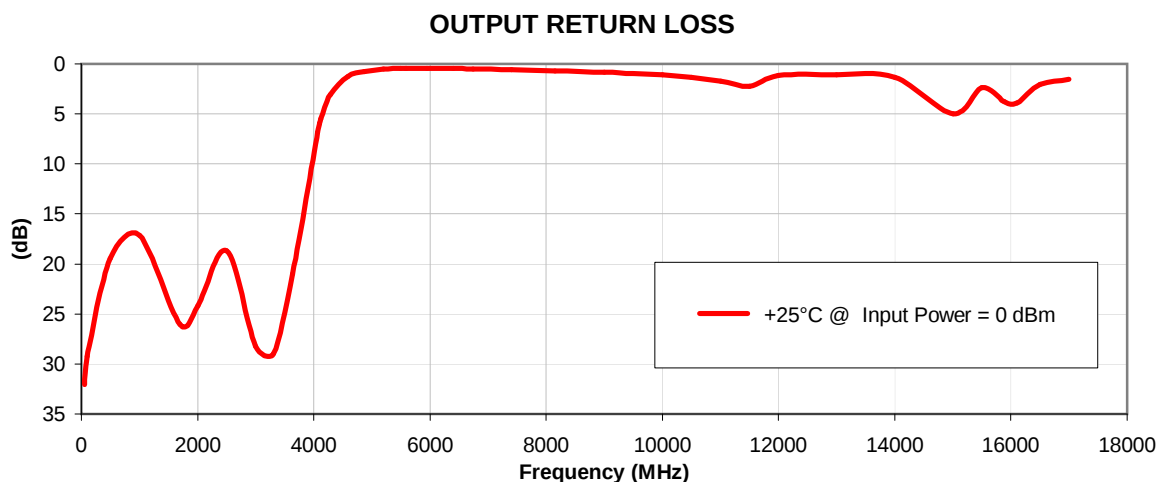
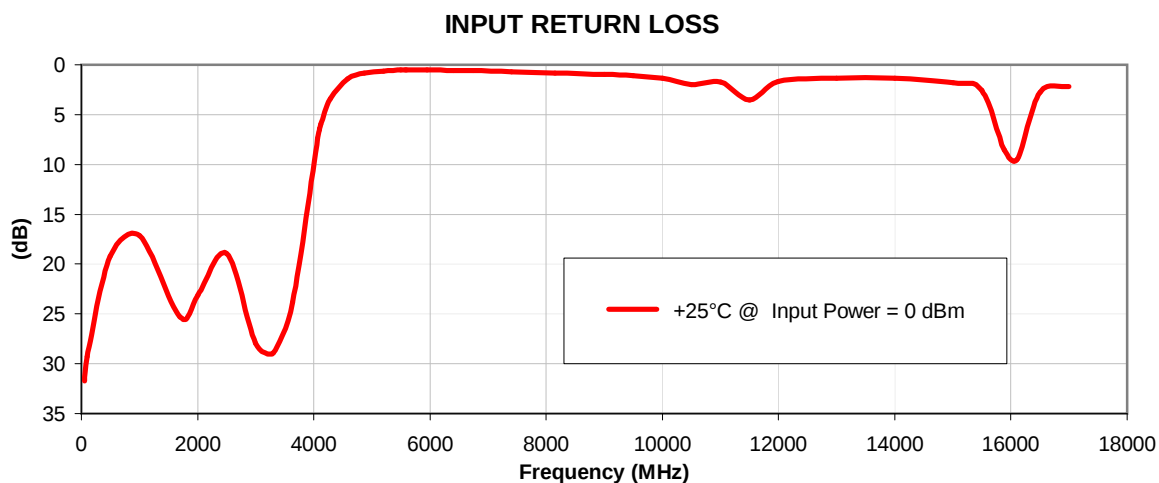
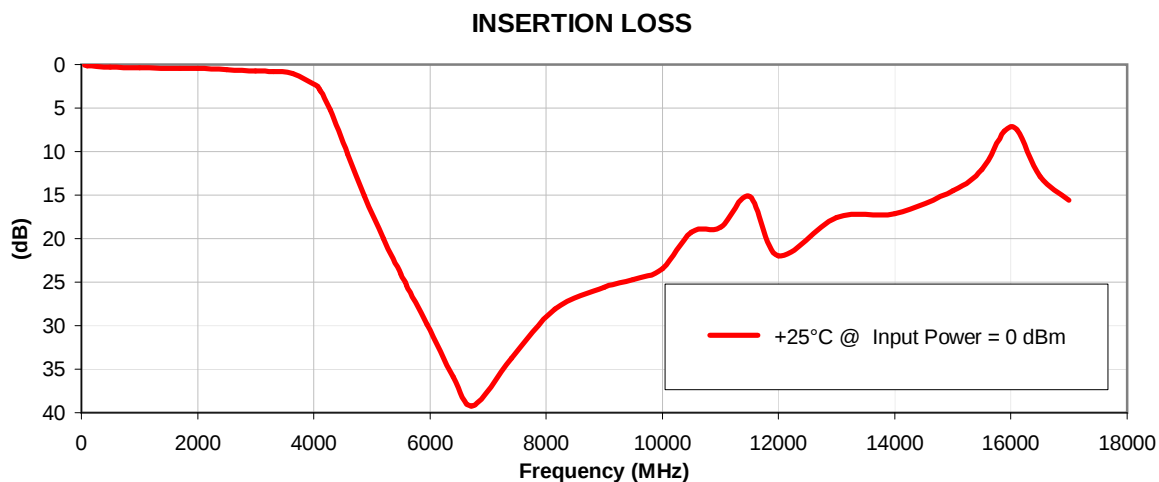
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



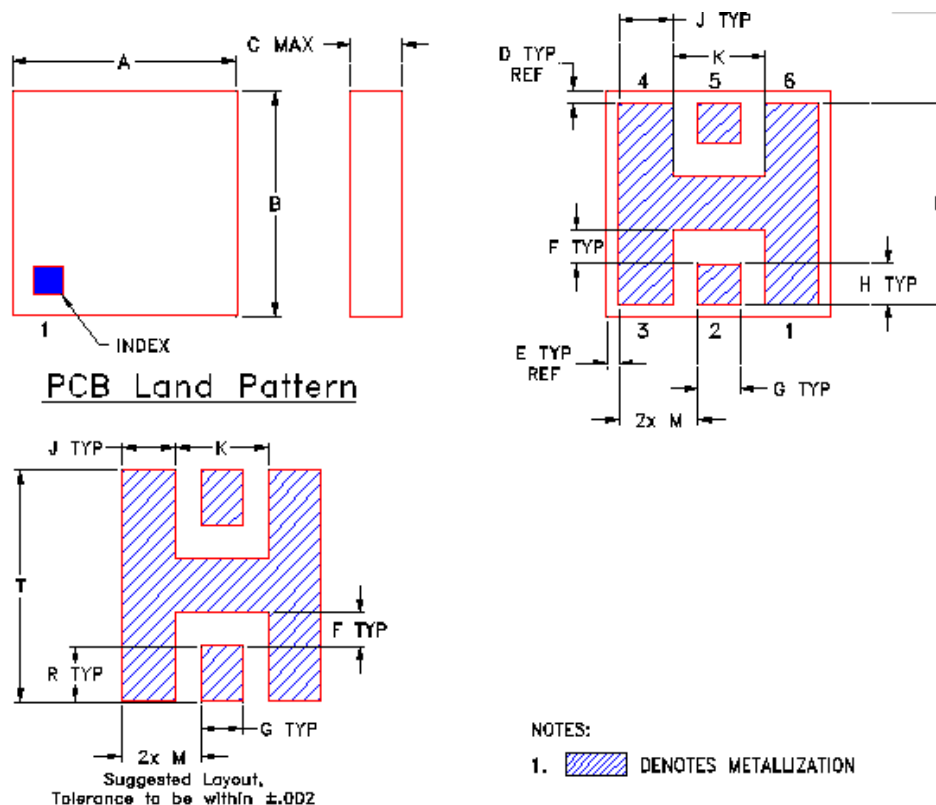
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



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.



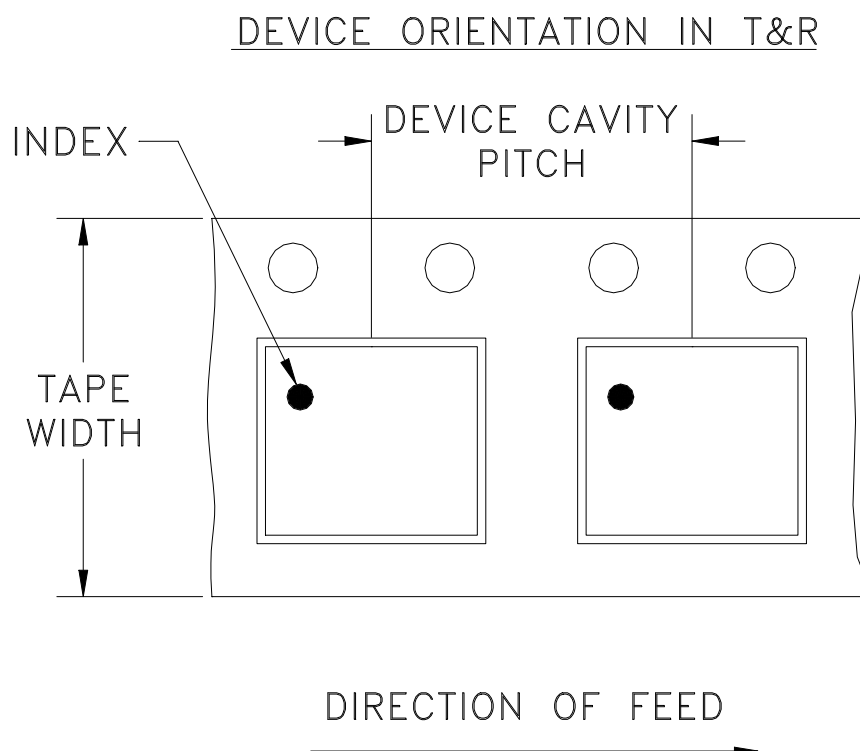
INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified

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

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



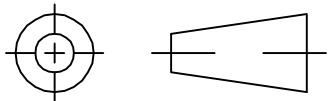
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • **EUROPE** 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified

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

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

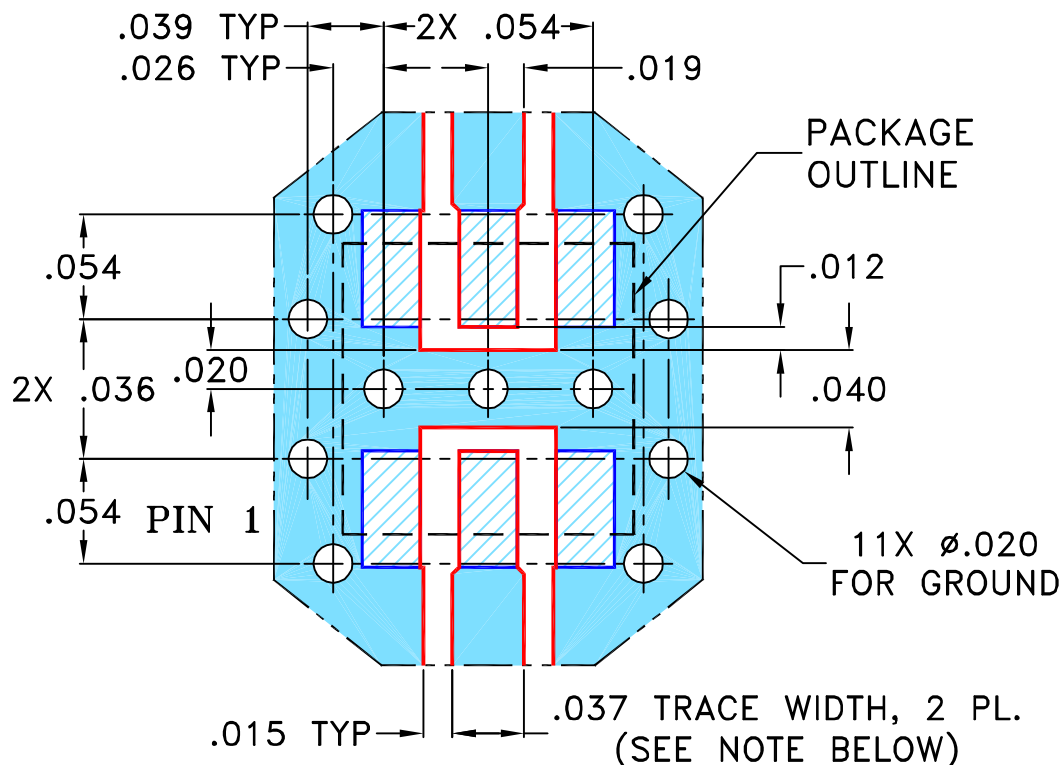
THIRD ANGLE PROJECTION



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

DIMENSIONS ARE IN INCHES

TOLERANCES ON:
2 PL DECIMALS $\pm$
3 PL DECIMALS $\pm$
ANGLES $\pm$
FRACTIONS $\pm$



INITIALS

DATE

DRAWN

MMG

09/04/02

CHECKED

APPROVED

LER(BC)

09/04/02

Mini-Circuits®

THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

ASHEETA1.DWG REV:A DATE:01/12/95



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

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

SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-112

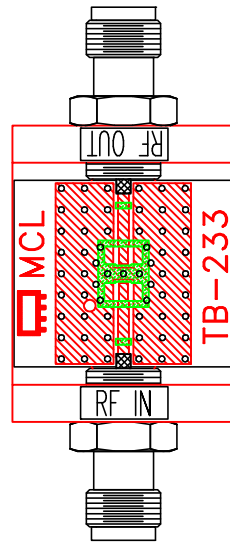
REV:
C

FILE: 98PL112

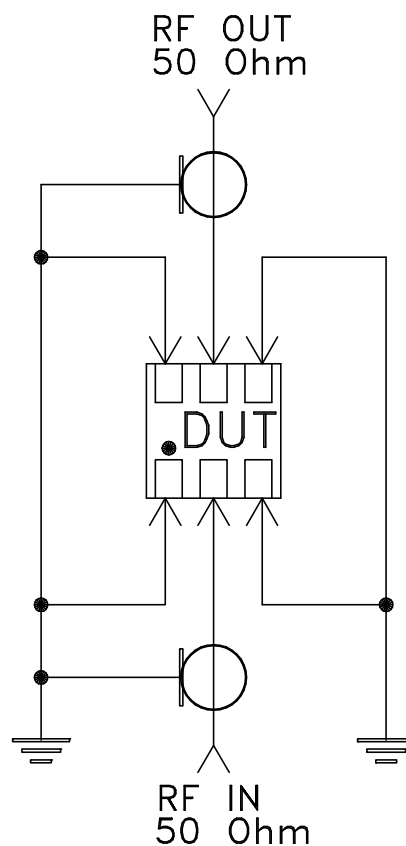
SCALE: 10:1

SHEET: 1 OF 1

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.

 **Mini-Circuits®**



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