



SURFACE MOUNT top hat
RF Choke

TCCH-80A+

Mini-Circuits

50Ω 50 to 8200 MHz Very Wideband

KEY FEATURES

- Very broadband
- Miniature size, 0.15"x0.15"
- Low parasitic capacitance, 0.1 pf typ.
- Effective parallel resistance, Rch 500 ohm typ.
- Usable up to 10 GHz
- Aqueous washable
- Low DC resistance, 0.1Ω
- Protected by U.S. Patent 7,012,485

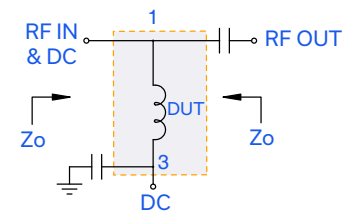


Generic photo used for illustration purposes only

APPLICATIONS

- Biasing amplifiers
- Biasing of laser diodes
- Biasing of active antennas

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' TCCH-80A+ RF Choke achieves very wide bandwidth from 50 up to 8200 MHz. The RF Choke features 200 mA max DC Current, excellent Insertion Loss and VSWR (1.1:1 typ.), flatness and its 0.15x0.15x0.15" size makes it an ideal solution for rf-choke applications across a very wide frequency range and dense circuit board layouts. These units support a broad range of system and test applications.

ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units	
Frequency Range	-	50	-	8200	MHz	
Insertion Loss ¹	50-8200	-	0.5	1.1	dB	
VSWR	50-8200	-	1.1	1.7	:1	
DC Current	50-8200	-	-	200	mA	
Inductance at:	0 mA	-	2.7	-	μH	
	50 mA	-	1.4	-		
	100 mA	50-8200	-	1.3		-
	200 mA	-	0.9	-		

1. Tested with circuit shown below, Zo=50 ohms

ABSOLUTE MAXIMUM RATINGS²

Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
DC Current	300 mA

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

REV. OR
 ECO-021815
 TCCH-80A+
 MCL NY
 240606





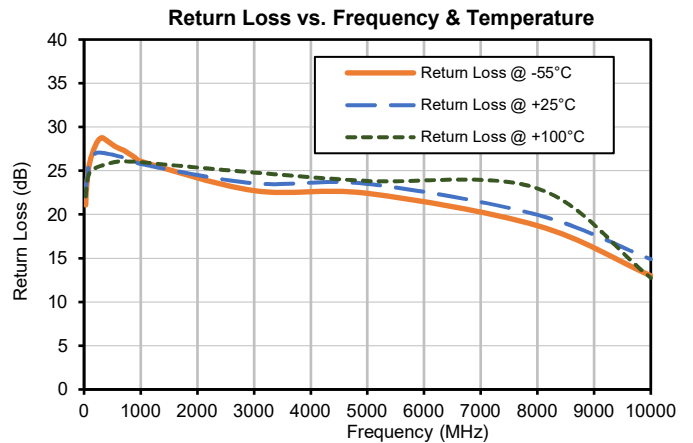
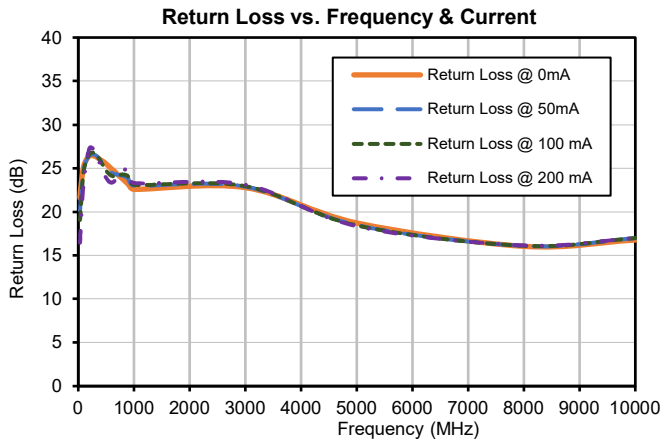
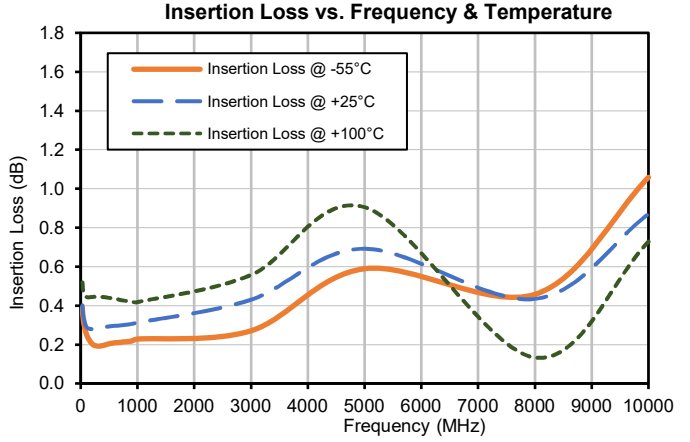
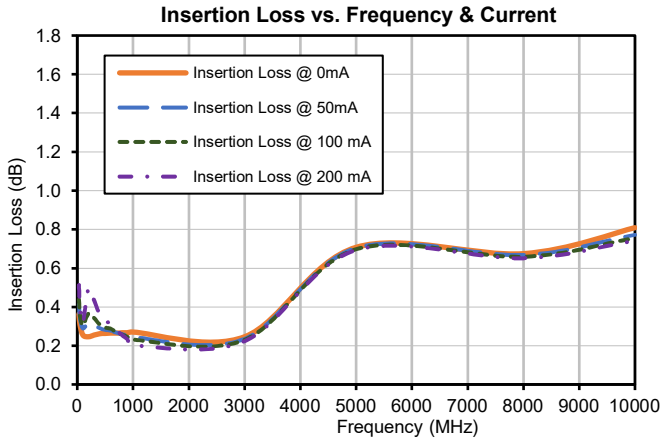
top hat
SURFACE MOUNT
RF Choke

TCCH-80A+

Mini-Circuits

50Ω 50 to 8200 MHz Very Wideband

TYPICAL PERFORMANCE GRAPHS





ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD.

[CLICK HERE](#)

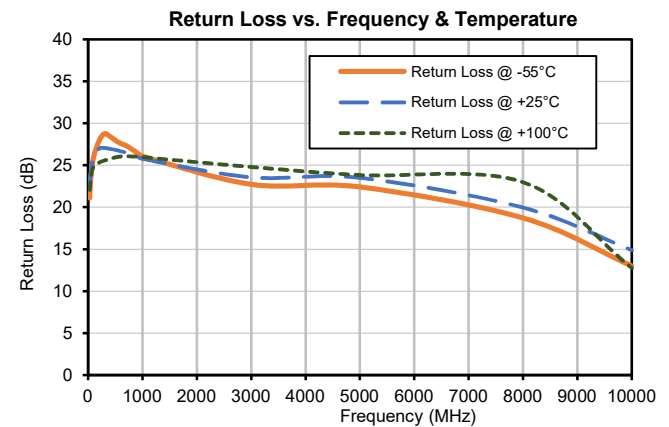
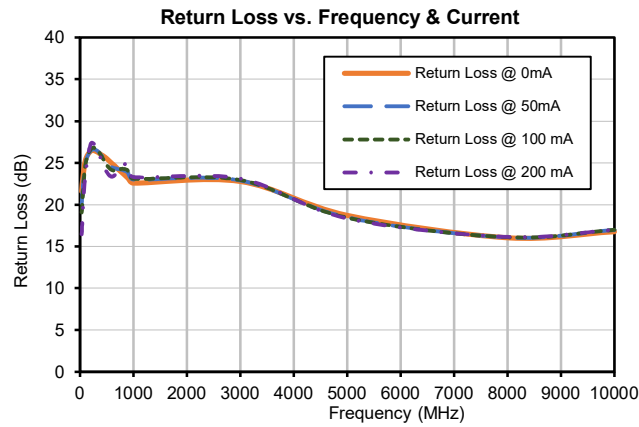
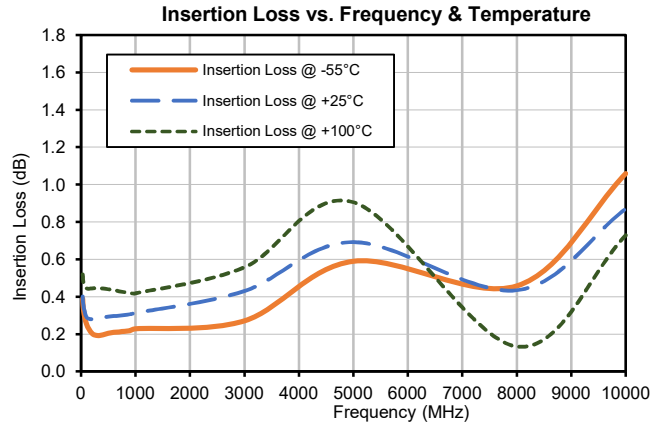
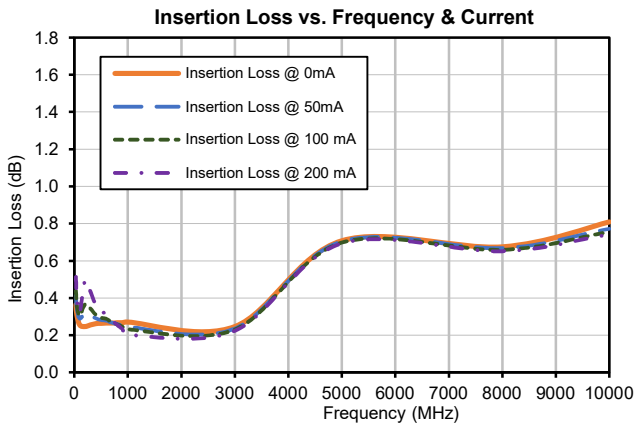
Performance Data & Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	GU1604 Lead Finish: Palladium Silver
RoHS Status	Compliant
Tape and Reel	F77
Suggested Layout for PCB Design	PL-147
Evaluation Board	TB-TCCH-80A+ Gerber File
Environmental Rating	ENV02T1

- 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/terms/viewterm.html

Typical Performance Data

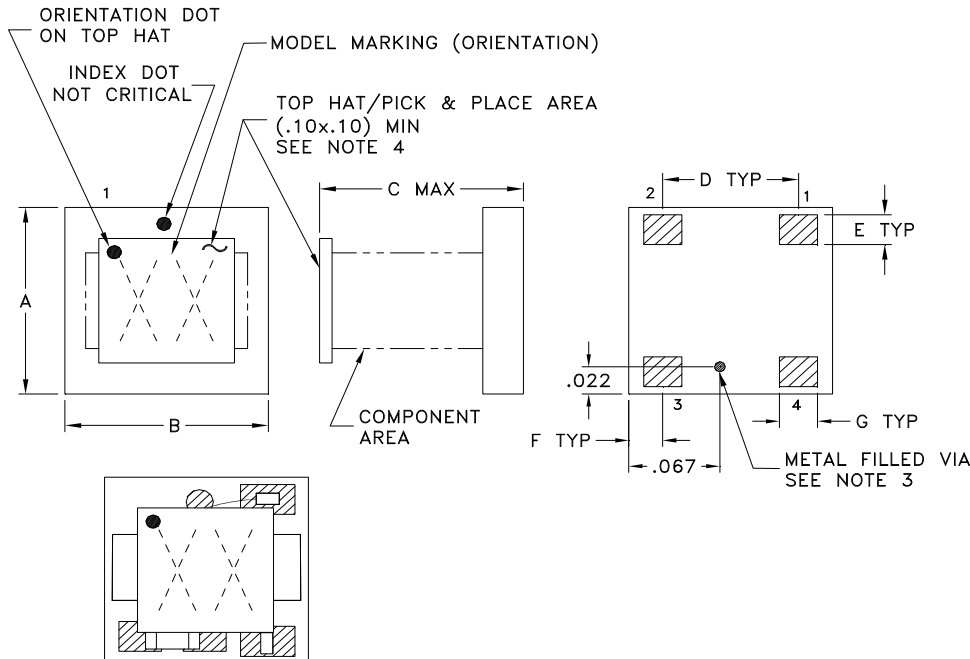
FREQUENCY (MHz)	Insertion Loss vs. Current (dB)				Return Loss vs. Current (dB)				Insertion Loss vs. Temperature (dB)			Return Loss vs. Temperature (dB)		
	0mA	50mA	100mA	200mA	0mA	50mA	100mA	200mA	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C
30	0.36	0.41	0.44	0.51	21.6	20.1	19.1	16.5	0.39	0.40	0.52	21.1	22.2	22.1
50	0.31	0.34	0.35	0.39	23.2	21.9	21.1	19.1	0.32	0.34	0.47	23.3	23.9	23.5
100	0.25	0.29	0.30	0.32	25.3	25.0	24.8	23.7	0.25	0.29	0.44	25.9	26.0	24.8
200	0.25	0.32	0.37	0.49	26.4	26.5	26.6	27.3	0.20	0.28	0.44	27.9	27.0	25.3
300	0.25	0.31	0.34	0.43	26.4	26.5	26.7	26.9	0.19	0.29	0.45	28.8	27.1	25.6
400	0.26	0.29	0.31	0.36	26.0	25.9	25.8	25.4	0.20	0.29	0.44	28.5	27.0	25.8
500	0.26	0.28	0.29	0.33	25.5	25.1	24.7	23.9	0.20	0.29	0.44	28.0	26.8	25.9
600	0.27	0.28	0.29	0.31	24.9	24.5	24.1	23.3	0.21	0.30	0.44	27.6	26.7	26.1
700	0.26	0.27	0.27	0.28	24.3	24.3	24.2	23.9	0.21	0.30	0.43	27.3	26.5	26.1
800	0.27	0.26	0.26	0.26	23.7	24.1	24.3	24.7	0.22	0.30	0.42	26.9	26.3	26.0
900	0.27	0.25	0.25	0.23	23.2	23.8	24.0	24.7	0.22	0.31	0.42	26.5	26.0	26.0
1000	0.27	0.24	0.23	0.20	22.6	23.0	23.1	23.3	0.23	0.31	0.42	26.1	25.8	26.0
3000	0.25	0.24	0.23	0.22	22.8	22.9	22.9	23.1	0.27	0.43	0.56	22.7	23.6	24.8
5000	0.71	0.70	0.70	0.69	18.7	18.5	18.4	18.3	0.59	0.69	0.91	22.4	23.5	23.8
8000	0.68	0.67	0.66	0.65	16.0	16.1	16.1	16.1	0.46	0.43	0.13	18.7	20.0	23.0
10000	0.81	0.77	0.76	0.74	16.7	17.0	17.0	17.0	1.06	0.87	0.73	13.0	14.9	12.7

Typical Performance Curves

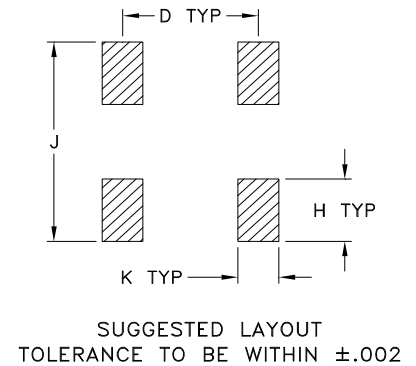


Outline Dimensions

GU1604



PCB Land Pattern



TOP VIEW OF "TCBT" SERIES MODELS

CASE #	A	B	C	D	E	F	G	H	J	K	WT.GRAMS
GU1604	.150 (3.81)	.150 (3.81)	.150 (3.81)	.100 (2.54)	.030 (.76)	.025 (.64)	.028 (.71)	.050 (1.27)	.160 (4.06)	.030 (.76)	.10

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

Notes:

1. Open style, Ceramic Base.
2. Termination finish: Silver Palladium or Gold Over Nickel based on stock availability.
3. Must be isolated from external conductors on mounting surface. Suggested solder mask area is .025 x .025.
At Mini-Circuits option via may be removed.
4. Top-Hat total thickness: .013 inches MAX.
5. Orientation Dot on Top Hat corresponds to Pin #1.



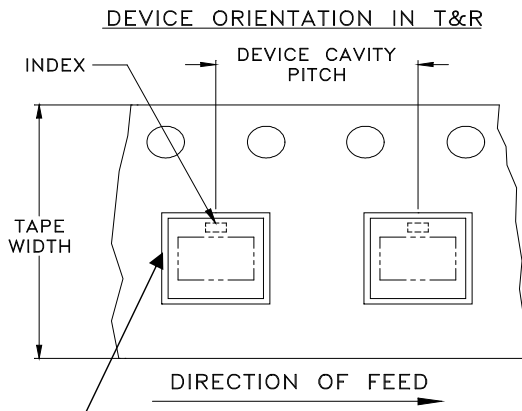
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



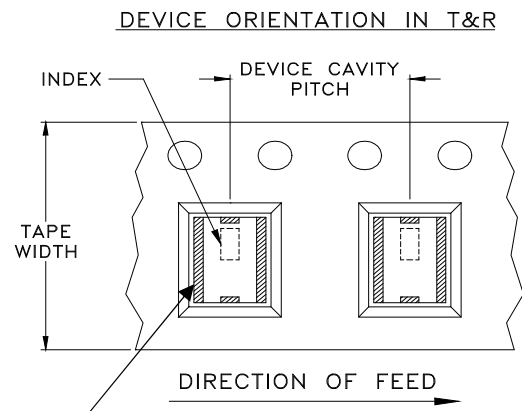
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F77



Note: The shape of the pocket may differ



Note: The location and shape of the metallization may differ

Applicable Case Styles

GU1604, GU1804, GU2644,
TT1618-2

Applicable Case Styles

MZ4532C, NM1812C,
NM1812C-1, NM1812C-2,
NM1812C-3, NM1812C-5,
NM1812C-6, NM3237

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

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



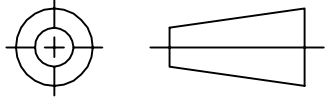
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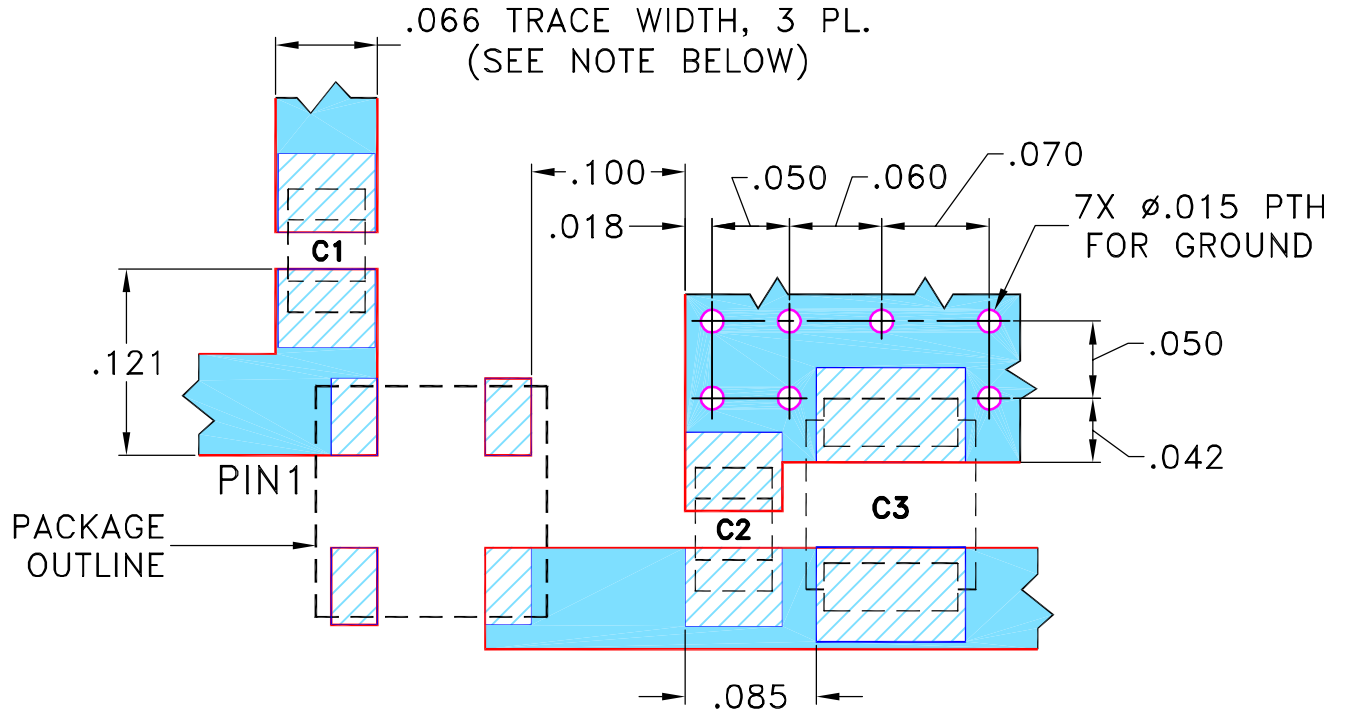
THIRD ANGLE PROJECTION



REVISIONS



REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M89280	NEW RELEASE	12/31/03	MMG	DJ
A	M90577	TCCH-80 WAS TCH-80 IN TITLE	01/19/04	AV	DJ
B	M102713	ADDED "...WITH SMOBC"	01/12/06	GF	IL

SUGGESTED MOUNTING CONFIGURATION
FOR GU1041 CASE STYLE, "pe" PIN CONNECTION



CAPACITORS C1,C2: 39000 pF, EIA CODE (MM): 2012
CAPACITORS C3: TANT, 1 uF, EIA CODE (MM): 3528

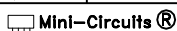
- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

 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	12/30/03
TOLERANCES ON:	CHECKED AV	12/31/03
2 PL DECIMALS ±	APPROVED DJ	12/31/03
3 PL DECIMALS ± .005		
ANGLES ±		
FRACTIONS ±		

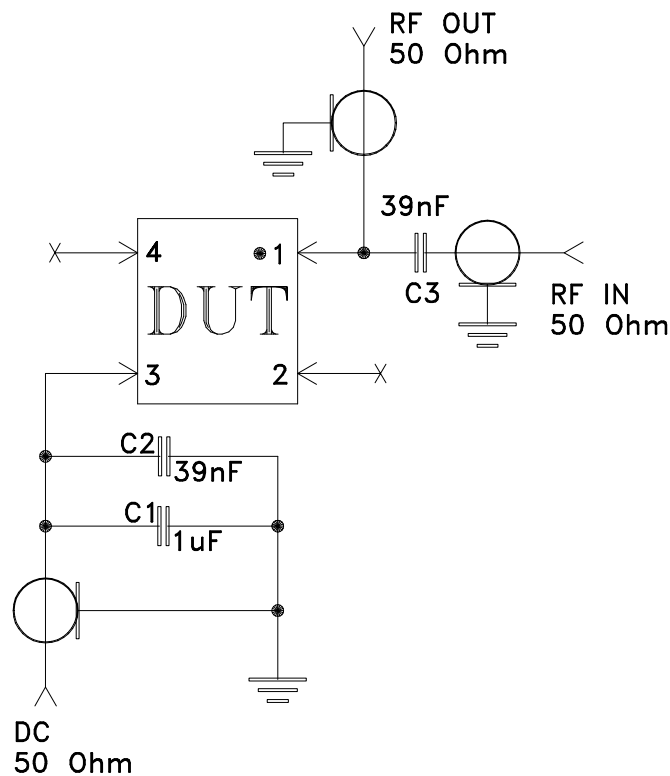
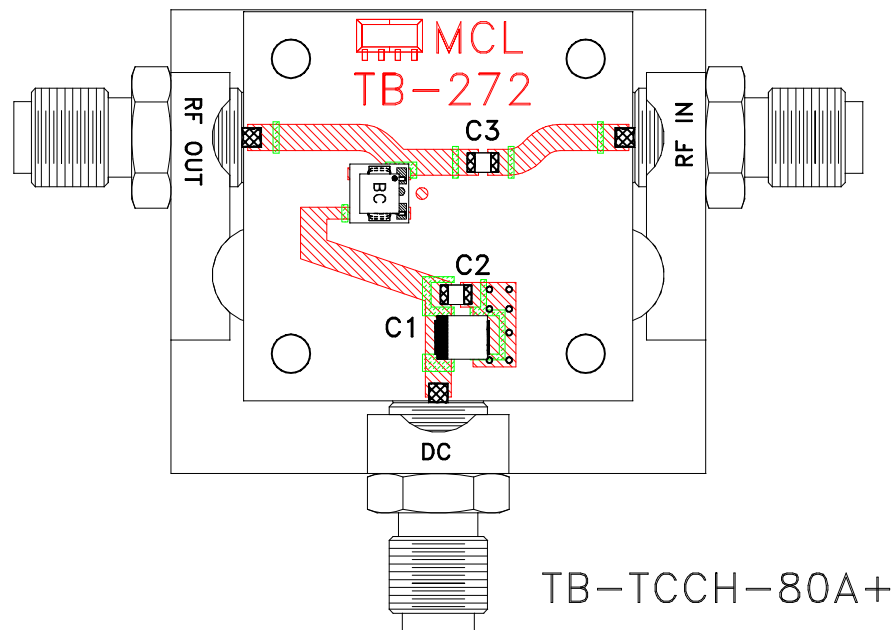
 **Mini-Circuits®** 13 Neptune Avenue
Brooklyn NY 11235

PL, pe, GU1041, TCCH-80, TB-272

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SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-147	B
FILE:	98PL147	SCALE:	SHEET:
		8:1	1 OF 1


Evaluation Board and Circuit



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.030 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	-40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° 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, 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
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