

Surface Mount
RF Transformer

TCM2-672X-1+

50Ω

1700 to 6700 MHz



CASE STYLE: DB1627

The Big Deal

- Wideband, 1700 to 6700 MHz
- Low insertion loss, 1.1 dB
- Flat insertion loss, ± 0.4 dB typ.
- Good input return loss, 12 to 31 dB typ.
- Low phase and amplitude unbalance, 6° , 0.8 dB

Product Overview

Mini-Circuits' TCM2-672X-1+ is a surface-mount transmission line core and wire transformer covering a very wide frequency range from 1700 to 6700 MHz. The transformer provides low insertion loss with excellent flatness over its entire frequency range. It achieves low phase and amplitude unbalance and excellent input return loss performance. Featuring core and wire construction on a 6-lead plastic base with tin over nickel termination finish, the unit measures 0.16 x 0.15 x 0.16", accommodating dense circuit board layouts. It also incorporates Mini-Circuits' Top Hat® feature for faster, more accurate pick-and-place assembly and easy visual inspection.

Key Features

Feature	Advantages
Wideband, 1700 to 6700 MHz	Very wide frequency range covers bandwidth requirements for many broadband applications.
Low insertion loss, 1.1 dB	TCM2-672X-1+ provides excellent signal transmission from input to output with consistent performance across its entire frequency range.
Good input return loss, 12 to 31 dB	Provides good matching with minimal signal reflection.
Small footprint (0.16 x 0.15 x 0.16")	Accommodates tight space requirements for dense PCB layouts.
Top Hat® feature	Improves speed and accuracy of pick and place assembly and provides clear device marking for visual inspection.

Surface Mount RF Transformer

50Ω 1700 to 6700 MHz

TCM2-672X-1+

Features

- wide bandwidth 1700 to 6700 MHz
- balanced transmission line
- excellent return loss
- aqueous washable

Applications

- PCS
- wideband push-pull amplifiers
- cellular



Generic photo used for illustration purposes only

CASE STYLE: DB1627

+RoHS Compliant

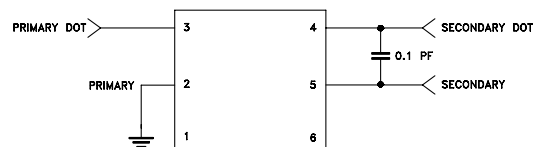
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Available Tape and Reel at no extra cost	
Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500
13"	1000, 2000

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio (secondary/primary)			2		
Frequency Range		1700		6700	MHz
Insertion Loss	1700-6700	—	1.1	2.5	dB
Amplitude Unbalance	1700-6700	—	0.8	—	dB
Phase Unbalance	1700-6700	—	6	—	Degree

Electrical Schematic



Maximum Ratings

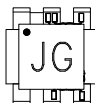
Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	0.4W
DC Current	30mA

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

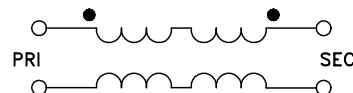
Pin Connections

Function	Pin Number
PRIMARY DOT	3
PRIMARY (GND)	2
SECONDARY DOT	4
SECONDARY	5
NOT USED	1,6

Product Marking

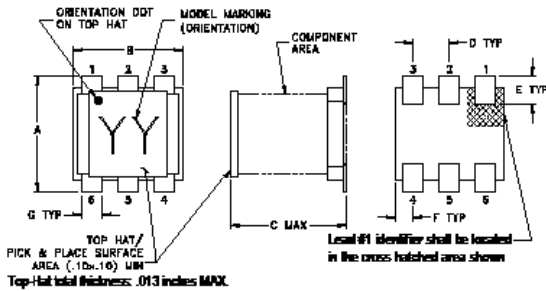


Config. G

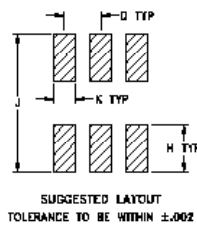


TCM2-672X-1+

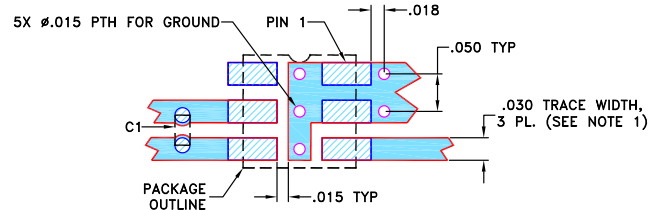
Outline Drawing



PCB Land Pattern



Demo Board MCL P/N: TB-742+
Suggested PCB Layout (PL-422)



COMPONENT	SIZE
C1	0402

Outline Dimensions (inch/mm)

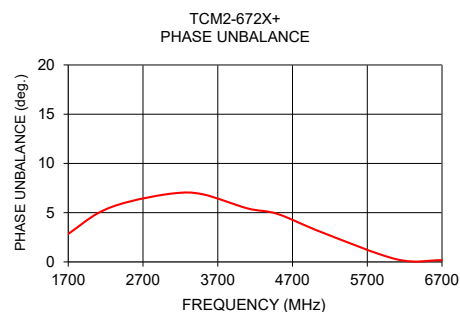
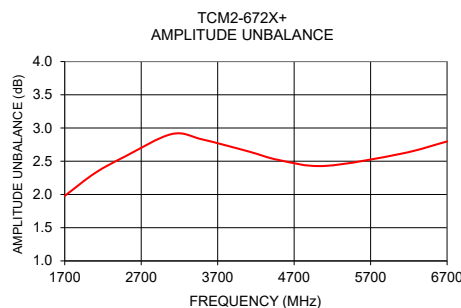
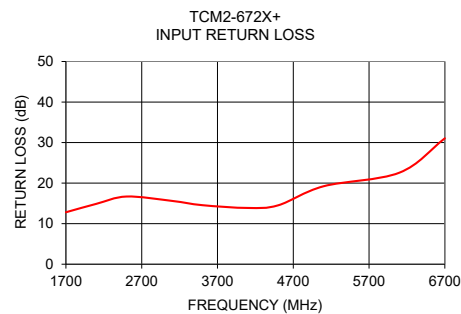
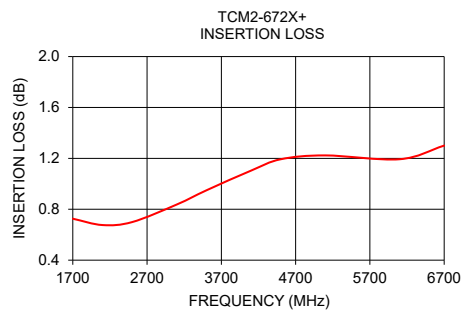
A	B	C	D	E	F
.160	.150	.160	.050	.040	.025
4.06	3.81	4.06	1.27	1.02	0.64
G	H	J	K		wt
.028	.065	.190	.030		grams
0.71	1.65	4.83	0.76		0.15

NOTES:

- TRACE WIDTH PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .0133"±.001". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 - CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-742+.
 - 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.

Typical Performance Data

Frequency (MHz)	Avg. Insertion Loss (dB)	Input R. Loss (dB)	Amplitude Unbalance (dB)	Phase Unbalance (Deg.)
1700	0.73	12.81	1.02	2.84
2100	0.68	14.88	0.67	4.96
2500	0.70	16.69	0.42	6.09
3100	0.84	15.62	0.09	6.95
3500	0.95	14.56	0.17	6.87
4100	1.10	13.88	0.35	5.43
4500	1.19	14.52	0.48	4.87
5100	1.22	19.23	0.57	2.98
6100	1.19	22.57	0.39	0.25
6700	1.30	31.04	0.20	0.17



Additional 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-Circuits' 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



RF Transformer

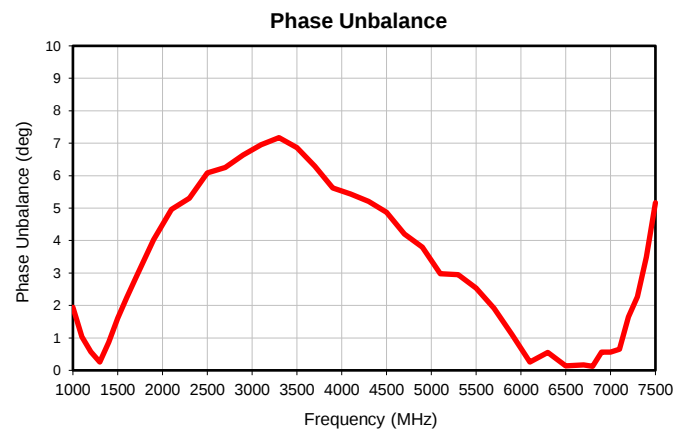
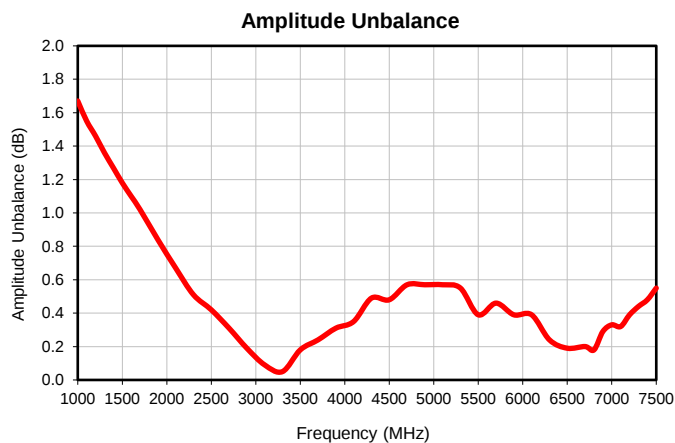
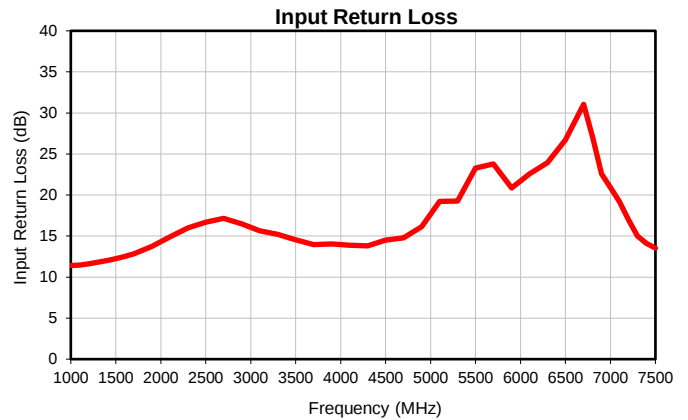
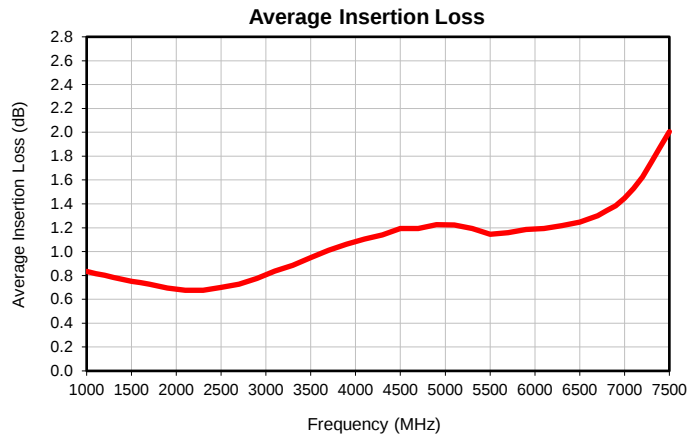
TCM2-672X-1+

Typical Performance Data

FREQUENCY MHz	AVERAGE INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (deg.)
1000	0.83	11.41	1.67	1.94
1100	0.81	11.47	1.55	1.04
1200	0.80	11.64	1.46	0.57
1300	0.78	11.81	1.36	0.26
1400	0.77	11.99	1.27	0.86
1500	0.75	12.26	1.18	1.60
1600	0.74	12.51	1.10	2.24
1700	0.73	12.81	1.02	2.84
1900	0.69	13.73	0.84	4.03
2100	0.68	14.88	0.67	4.96
2300	0.68	16.00	0.51	5.30
2500	0.70	16.69	0.42	6.09
2700	0.73	17.14	0.31	6.25
2900	0.78	16.49	0.19	6.64
3100	0.84	15.62	0.09	6.95
3300	0.88	15.22	0.05	7.17
3500	0.95	14.56	0.18	6.87
3700	1.01	13.97	0.24	6.29
3900	1.06	14.02	0.31	5.62
4100	1.10	13.88	0.35	5.43
4300	1.14	13.82	0.49	5.21
4500	1.19	14.52	0.48	4.87
4700	1.19	14.77	0.57	4.20
4900	1.22	16.16	0.57	3.79
5100	1.22	19.23	0.57	2.98
5300	1.19	19.25	0.55	2.95
5500	1.14	23.27	0.39	2.53
5700	1.16	23.80	0.46	1.92
5900	1.19	20.86	0.39	1.11
6100	1.19	22.57	0.39	0.25
6300	1.22	23.94	0.24	0.55
6500	1.25	26.69	0.19	0.13
6700	1.30	31.04	0.20	0.17
6800	1.34	27.06	0.18	0.12
6900	1.38	22.57	0.29	0.56
7000	1.45	20.90	0.33	0.56
7100	1.53	19.18	0.32	0.65
7200	1.63	16.99	0.39	1.64
7300	1.75	15.00	0.44	2.27
7400	1.88	14.10	0.48	3.49
7500	2.01	13.52	0.55	5.17

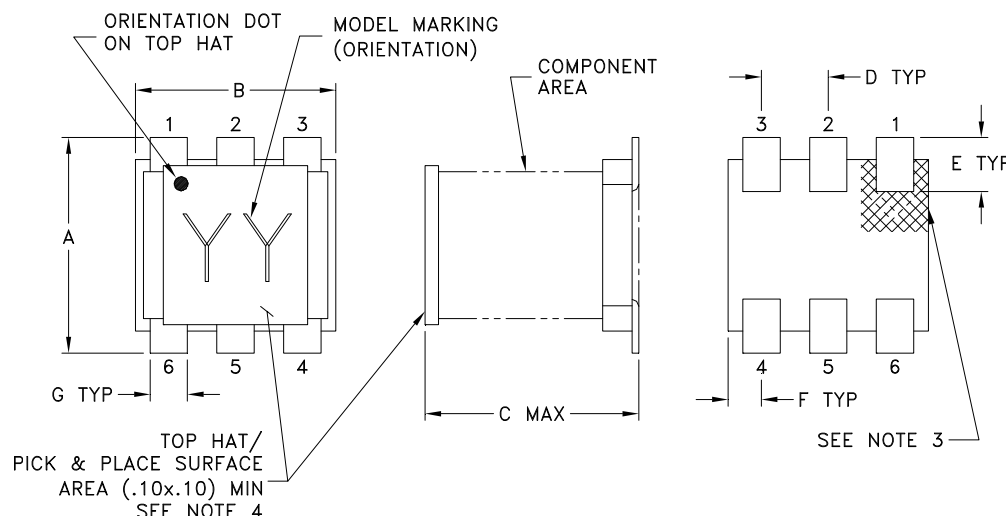


Typical Performance Data

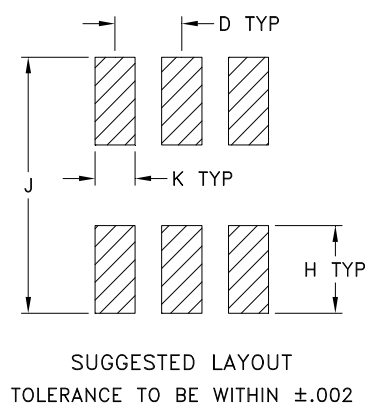


Outline Dimensions

DB1627



PCB Land Pattern



CASE #	A	B	C	D	E	F	G	H	J	K	WT. GRAM
DB1627	.160 (4.06)	.150 (3.81)	.160 (4.06)	.050 (1.27)	.040 (1.02)	.025 (0.64)	.028 (0.71)	.065 (1.65)	.190 (4.83)	.030 (0.76)	.15

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

Notes:

- Case material: Plastic.
- Termination finish:
For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.
- Orientation dot on top hat & orientation feature on substrate correspondence to pin #1.
- Top-Hat total thickness: .013 inches MAX.



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



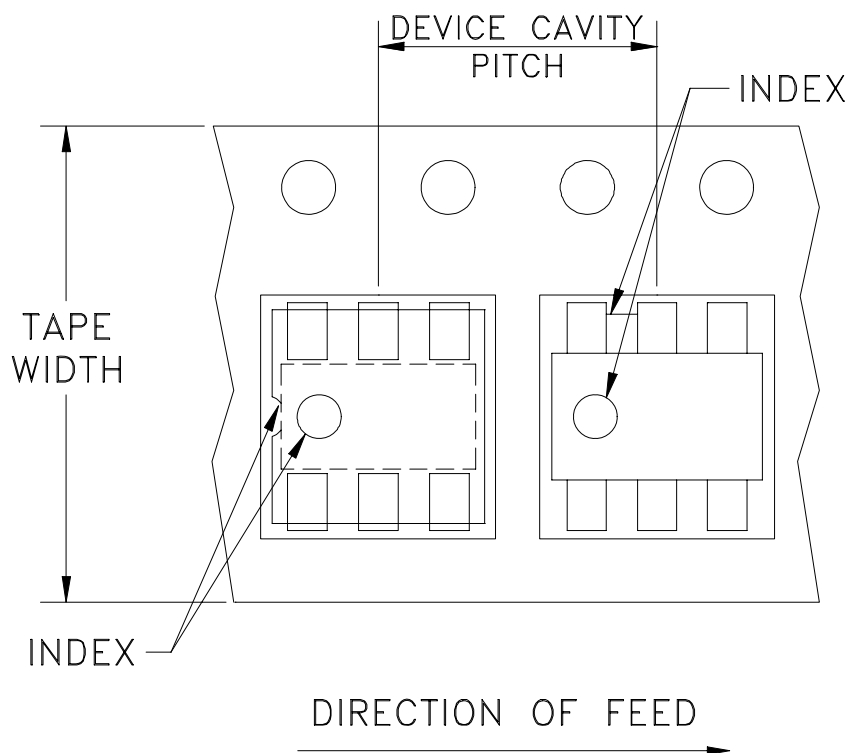
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS



Tape & Reel Packaging TR-F47

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note
12	8	13	1000, 2000
		7	20, 50, 100, 200, 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

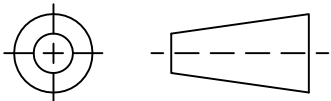


INTERNET <http://www.minicircuits.com>

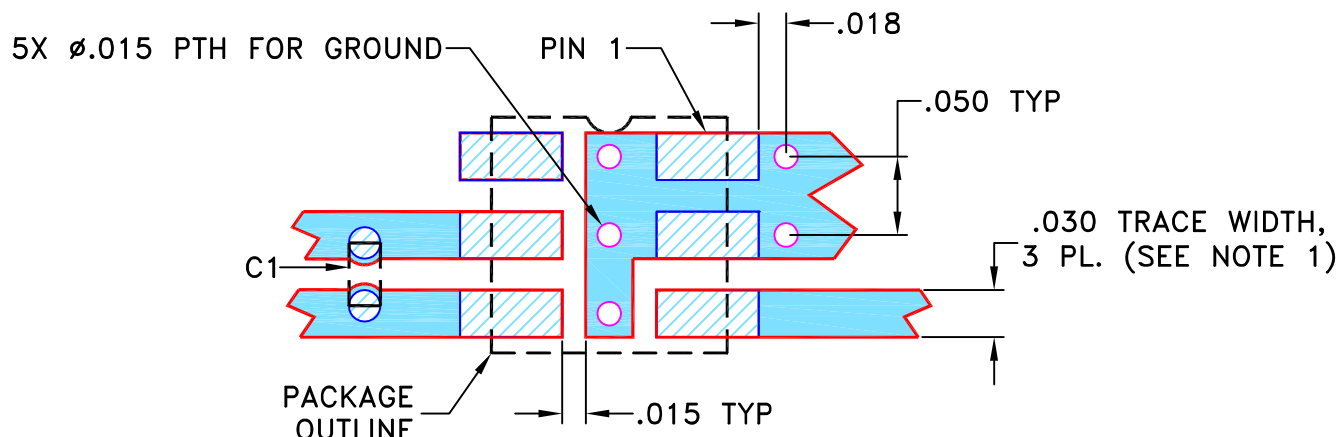
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THIRD ANGLE PROJECTION		REVISIONS				
	REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
	OR	M147897	NEW RELEASE	08/20/14	ITG	DJ

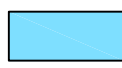
**SUGGESTED MOUNTING CONFIGURATION
FOR DB714 CASE STYLE, "06TG04" PIN CODE**

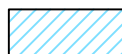


COMPONENT	SIZE
C1	0402

NOTES:

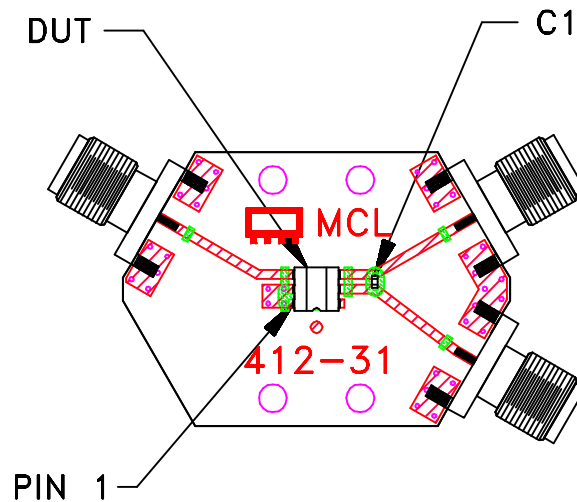
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- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).

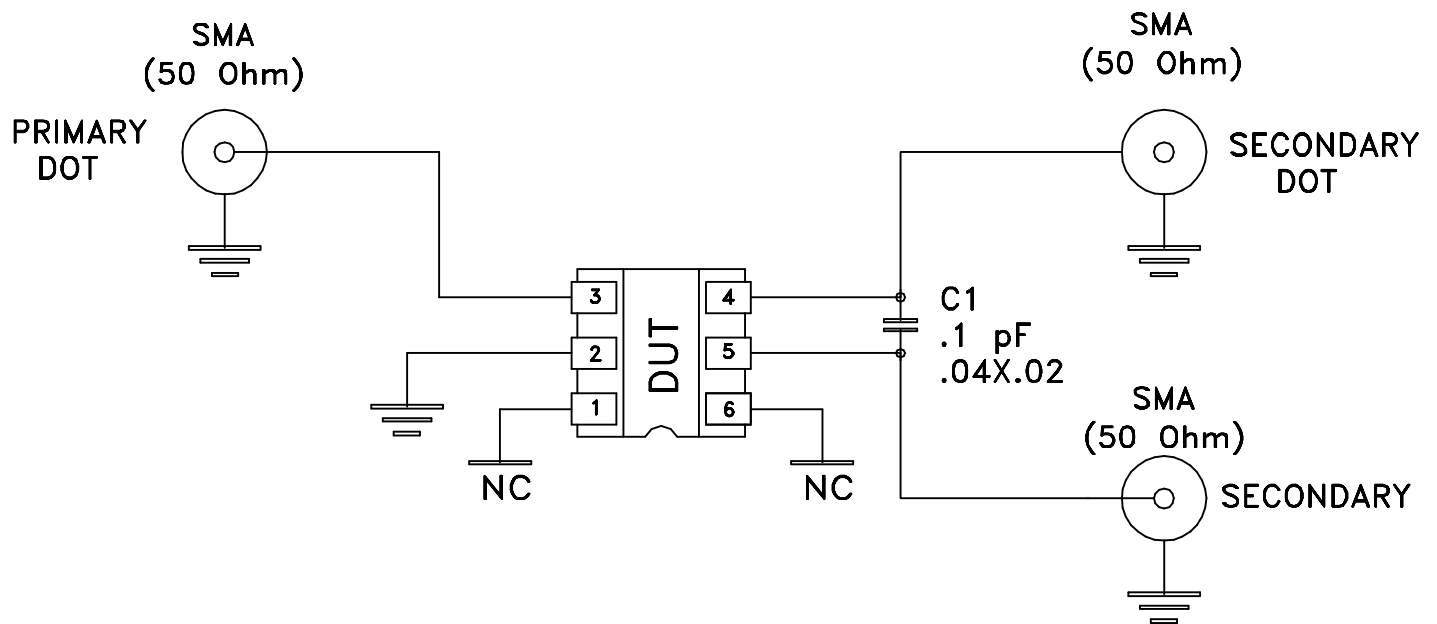
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

UNLESS OTHERWISE SPECIFIED		INITIALS		DATE	Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235		
DIMENSIONS ARE IN INCHES		DRAWN	ITG	08/20/14		PL, 06TG04, DB714, TB-742+	
TOLERANCES ON:		CHECKED	GF	08/20/14			
2 PL DECIMALS ±		APPROVED	DJ	08/20/14			
3 PL DECIMALS ± .005							
ANGLES ±						SIZE A CODE IDENT 15542 DRAWING NO: 98-PL-422 REV: OR	
FRACTIONS ±							
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ASHEETA1.DWG REV:A DATE:01/12/95				FILE: 98PL422		SCALE: 8:1 SHEET: 1 OF 1	

Evaluation Board and Circuit



TB-742+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.0133 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