LTCC Balun

RF Transformer

BLJC1-542R+

50Ω 4900 to 5950 MHz 1:1 Ratio



Generic photo used for illustration purposes only

CASE STYLE: JC0603C

+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, 500,1000, 4000

Maximum Ratings

Operating Temperature	-40 °C to +85 °C
Storage Temperature*	-40 °C to +85 °C
Input RF Power**	0.5 W at +25 °C

*Refer to product storage temperature after installation.
Suggestion for T&R unused product storage condition: +5 ~ +35 °C, Humidity 45 ~ 75% RH, 12 Month max.
Permanent damage may occur if any of these limits are exceeded.
**Derate linearly to 0.25 W at +85 °C

Pad Connections

PRIMARY DOT (Unbalanced Port)	1
GND or DC FEED	2
SECONDARY DOT (Balanced) (OUT1)	3
SECONDARY (Balanced) (OUT2)	4
NO CONNECTION	6
NOT USED (GND Externally)	5

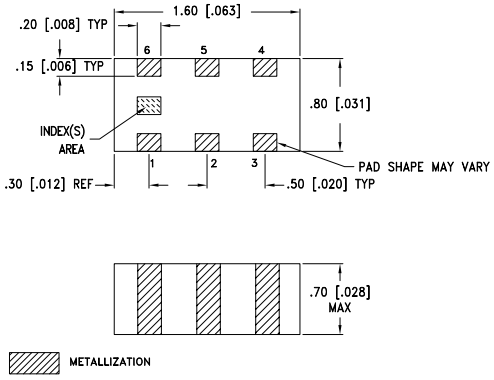
Features

- low phase unbalance, 2.4 deg. and amplitude unbalance, 0.6 dB typ.
- miniature size 0603
- low cost
- aqueous washable

Applications

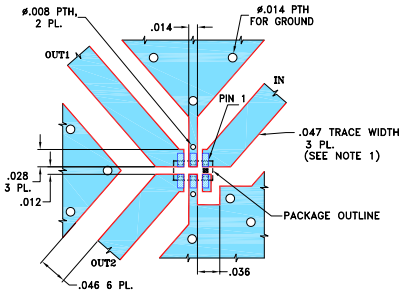
- ISM Band
- WLAN/Wi-Fi
- Bluetooth
- Zigbee

Outline Drawing



Weight: .005 grams
Dimensions are in mm [inch]. Tolerances: ±0.13 mm

Evaluation Board MCL P/N: TB-1051+
Suggested PCB Layout (PL-548)



NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4233 WITH DIELECTRIC THICKNESS .020±.0015. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP 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.

Electrical Specifications at +25 °C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio			1		
Frequency Range		4900	—	5950	MHz
Insertion Loss*	4900 - 5950	—	0.7	1.5	dB
Amplitude Unbalance	4900 - 5950	—	0.6	1.7	dB
Phase Unbalance†	4900 - 5950	—	2.4	14	Degree
Unbalance Return Loss	4900 - 5950	7	16	—	dB

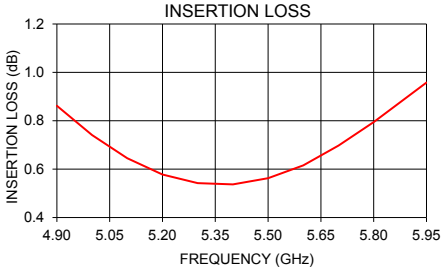
* Tested on Evaluation Board TB-1051+
† Relative to 180°

Typical Performance Data at +25 °C**

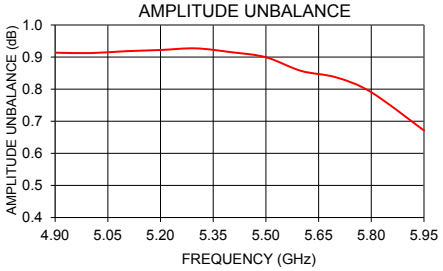
FREQUENCY (GHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
4.90	0.86	12.50	0.91	2.32
5.00	0.74	14.78	0.91	2.60
5.10	0.65	17.88	0.92	2.83
5.20	0.58	22.77	0.92	3.09
5.30	0.54	28.63	0.93	3.33
5.40	0.54	23.13	0.92	3.56
5.50	0.56	18.19	0.90	3.74
5.60	0.62	14.83	0.86	3.87
5.70	0.70	12.57	0.84	3.96
5.95	0.96	9.10	0.67	4.19

** Measured with Agilent E5071B network analyzer using impedance conversion and port extension.

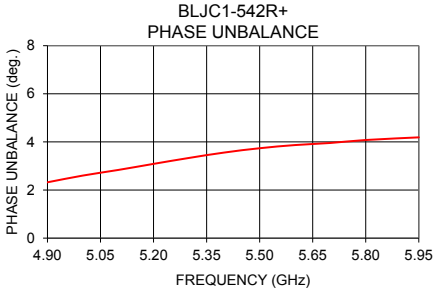
BLJC1-542R+
INSERTION LOSS



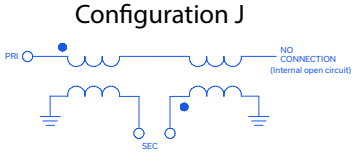
BLJC1-542R+
AMPLITUDE UNBALANCE



BLJC1-542R+
PHASE UNBALANCE



Configuration J



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

REV. A
ECO-030244
BLJC1-542R+
MCL NY
260626

LTCC Balun

RF Transformer BLJC1-542R+

Typical Performance Data

FREQUENCY (MHz)	AVERAGE INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE[1] (deg.)
4900	0.86	12.50	0.91	2.29
4926	0.83	13.00	0.91	2.37
4952	0.80	13.53	0.91	2.41
4978	0.77	14.17	0.91	2.49
5005	0.74	14.91	0.91	2.62
5031	0.71	15.59	0.91	2.67
5057	0.68	16.34	0.91	2.74
5084	0.66	17.26	0.91	2.79
5110	0.64	18.29	0.92	2.85
5136	0.62	19.37	0.92	2.94
5163	0.60	20.61	0.92	3.02
5189	0.58	22.07	0.92	3.07
5215	0.57	23.78	0.92	3.10
5242	0.56	25.72	0.92	3.18
5268	0.55	27.53	0.92	3.27
5294	0.54	28.57	0.92	3.31
5321	0.54	28.09	0.93	3.36
5347	0.53	26.60	0.92	3.41
5373	0.53	24.91	0.91	3.47
5400	0.54	23.13	0.91	3.54
5426	0.54	21.43	0.92	3.56
5452	0.55	20.01	0.91	3.62
5478	0.56	18.95	0.90	3.69
5505	0.56	18.02	0.90	3.71
5531	0.58	17.01	0.89	3.76
5557	0.59	16.03	0.88	3.80
5584	0.61	15.21	0.87	3.83
5610	0.62	14.60	0.85	3.89
5636	0.64	14.02	0.85	3.90
5663	0.67	13.35	0.85	3.91
5689	0.69	12.77	0.84	3.93
5715	0.71	12.30	0.83	4.00
5742	0.73	11.88	0.82	4.05
5768	0.76	11.45	0.81	4.05
5794	0.79	11.00	0.79	4.08
5821	0.82	10.59	0.77	4.12
5847	0.84	10.24	0.76	4.18
5873	0.87	9.94	0.74	4.19
5900	0.90	9.64	0.71	4.17
5950	0.96	9.10	0.67	4.19

[1]Relative to 180°

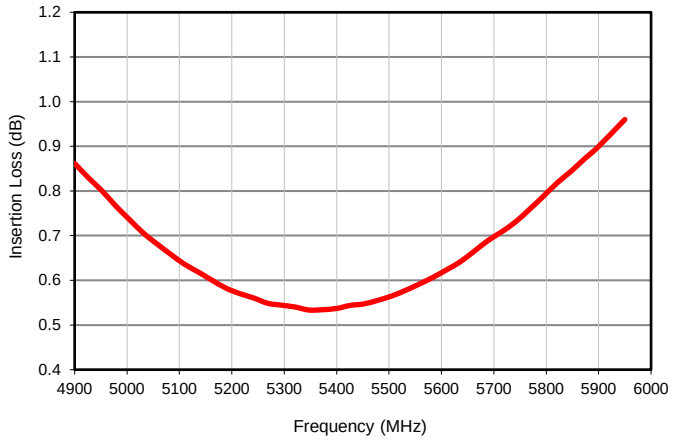
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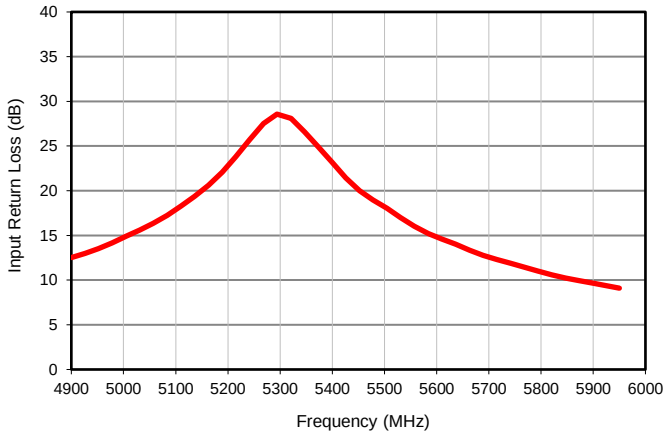
BLJC1-542R+

Typical Performance Data

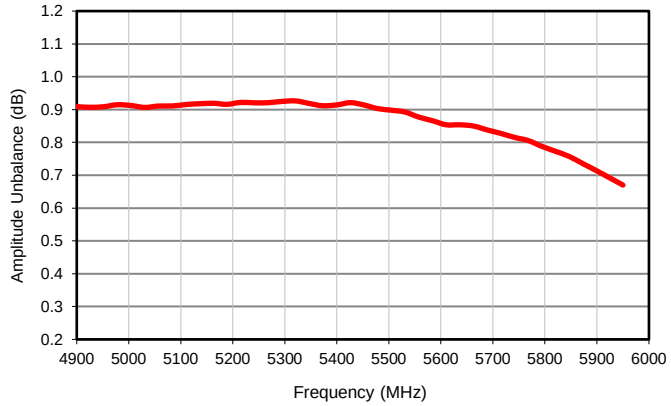
Average Insertion Loss



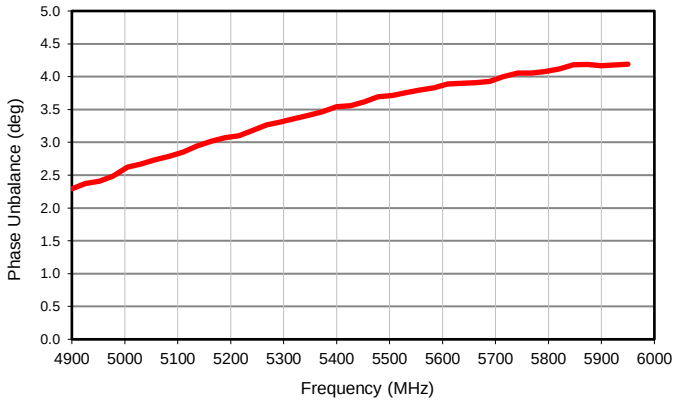
Input Return Loss



Amplitude Unbalance

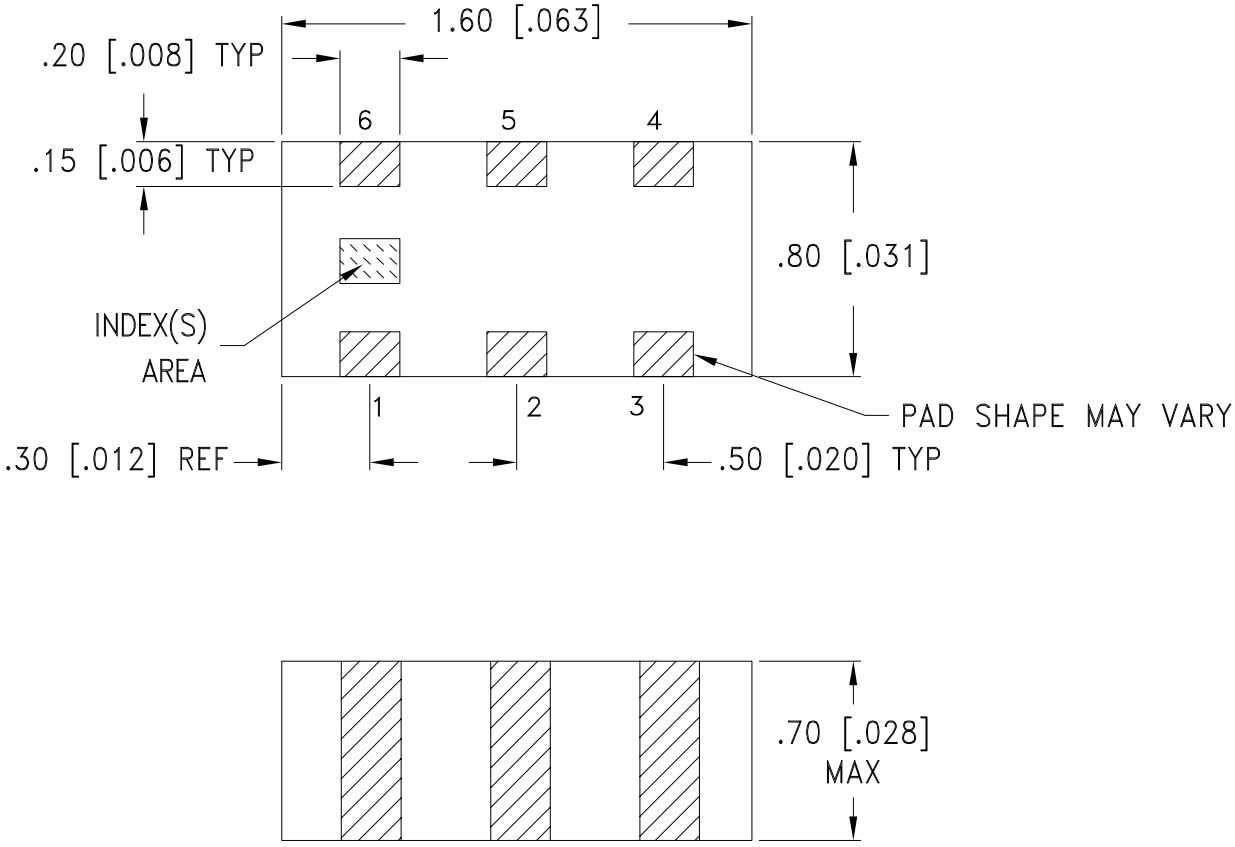


Phase Unbalance



Case Style JC

Outline Dimensions JC0603C



METALLIZATION

Weight: .005 grams

Dimensions are in mm [inch]. Tolerances: ±0.13 mm

Notes:

1. Open style, ceramic base.
2. Termination finish:
   For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.

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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F114

DEVICE ORIENTATION IN T&R

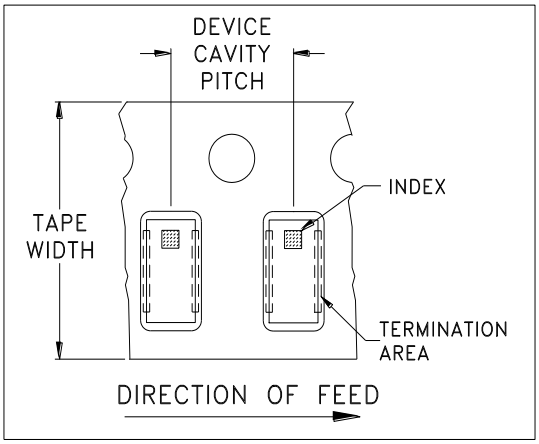


ILLUSTRATION 1

Applicable Case Styles	
GE0805C	JC0603C
GE0805C-1	JC0603C-4
GE0805C-1AP	JC0603C-6
GE0805C-7	
GE0805C-9	
GE0805C-10	
GE0805C-11	
GE0805C-12	

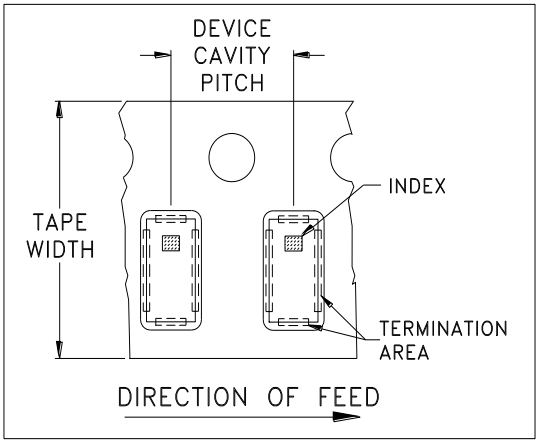


ILLUSTRATION 2

Applicable Case Styles	
GE0805C-2	JC0603C-1
GE0805C-3	JC0603C-2
GE0805C-4	JC0603C-3
GE0805C-5	JC0603C-5
GE0805C-6	JC0603C-7
GE0805C-8	
GE0805C-15	

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
8	4	7	Small quantity standards (see note)	20
				50
				100
				200
				500
				1000
			Standard	4000

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

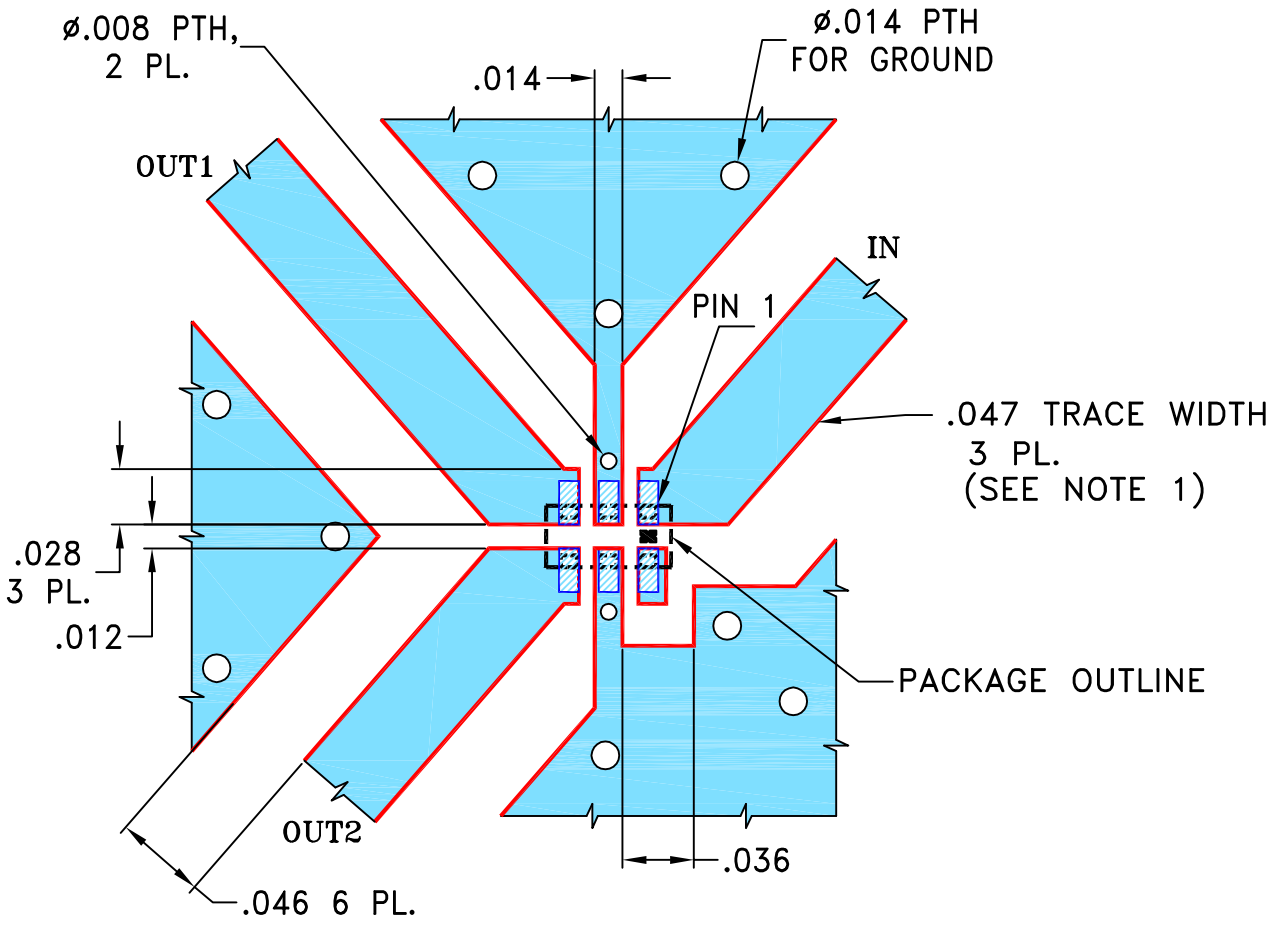
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THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M168200	NEW RELEASE	05/31/18	NP	SL

SUGGESTED MOUNTING CONFIGURATION FOR JC0603C CASE STYLE, "06TJ08" PIN CODE



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4233 WITH DIELECTRIC THICKNESS .020±.0015. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP 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	NP	05/30/18
TOLERANCES ON:	CHECKED	GF	05/30/18
2 PL DECIMALS ±	APPROVED	SL	05/31/18
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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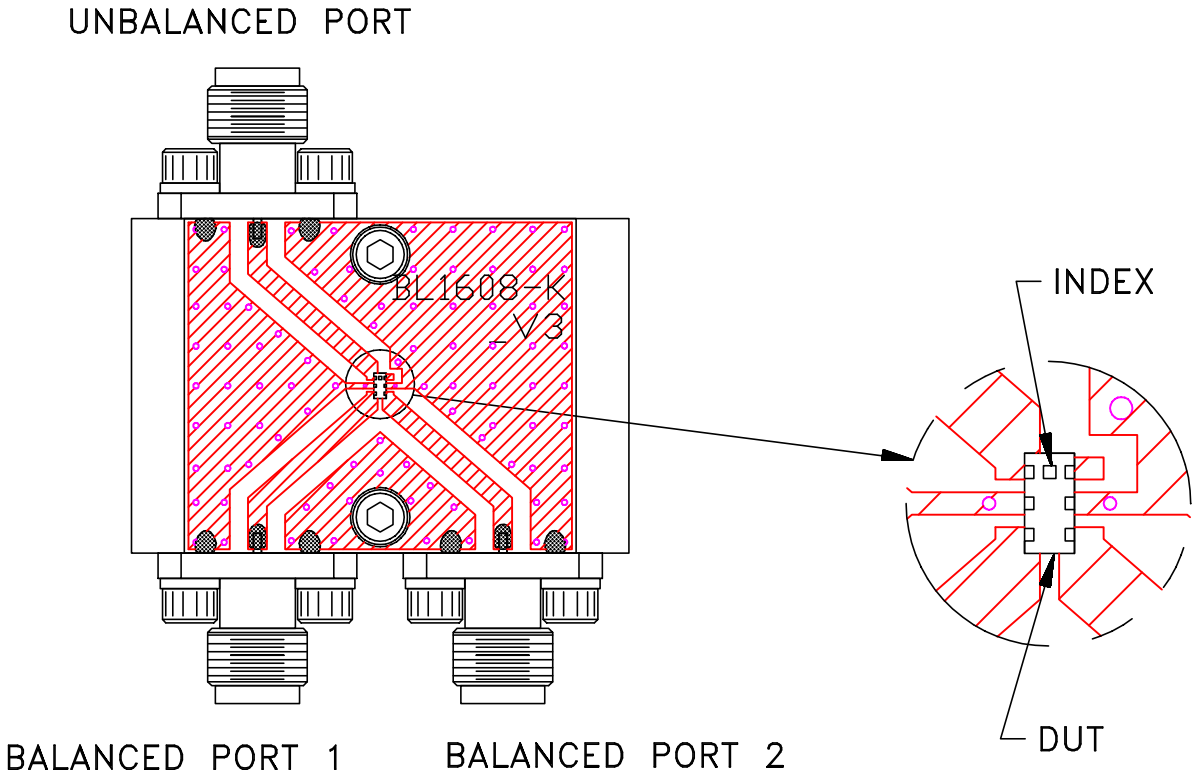
ASHEETA1.DWG REV:A DATE:01/12/95

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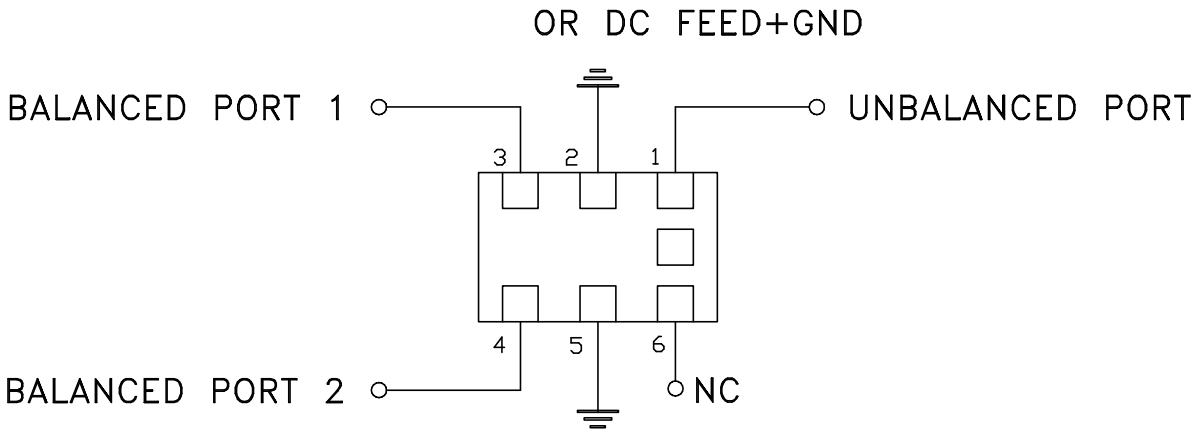
PL, 06TJ08, JC0603C, TB-1051+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-548	OR
FILE: 98PL548	SCALE: 10:1	SHEET: 1 OF 1	

Evaluation Board and Circuit



TB-1051+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: RO4233 or equivalent,
   Dielectric Constant=3.5, Thickness=.020 inch.

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Environmental Specifications **ENV06T4**

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	-40° to 85° 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 Eutectic Process: 225°C peak Pb-Free Process: 250°C peak	J-STD-020C, 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

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