Ceramic Balun

RF Transformer

BLNK2-252R+

50Ω 2400 to 2500 MHz 1:2 Ratio



Generic photo used for illustration purposes only

CASE STYLE: NK0402C

+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**	2W 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 1W at 85°C.

Pad Connections

PRIMARY DOT (Unbalanced Port)	1
PRIMARY (GND) or DC Feed	2
SECONDARY DOT (Balanced)	3
SECONDARY (Balanced)	4

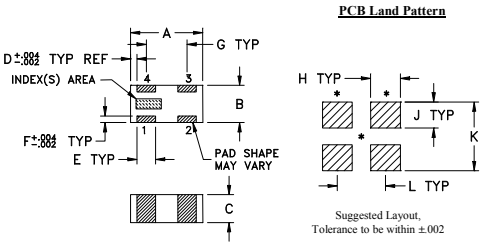
Features

- miniature size 0402 (0.039"[1.0mm] x 0.020"[0.5mm] x 0.015"[0.37mm])
- low phase unbalance, 1.2 deg.
- LTCC construction
- low cost
- aqueous washable

Applications

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

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H
.039	.020	.015	.004	.010	.004	.022	.016
1.0	0.51	0.38	0.10	0.25	0.10	0.56	0.41

J	K	L	wt
.014	.037	.026	grams
0.36	0.94	0.66	.0007

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio			2		
Frequency Range		2400	—	2500	MHz
Insertion Loss*	2400 - 2500	—	0.6	1.2	dB
Amplitude Unbalance	2400 - 2500	—	0.5	2	dB
Phase Unbalance†	2400 - 2500	—	1.2	10	Degree
Unbalance Return Loss	2400 - 2500	9	16	—	dB

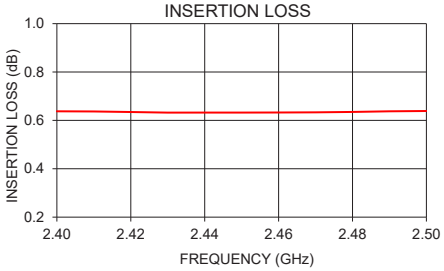
* Tested Evaluation Board TB-1012+
† Relative to 180°

Typical Performance Data at 25°C**

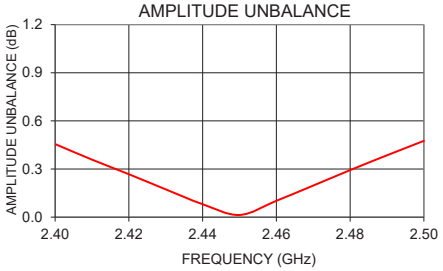
FREQUENCY (GHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
2.40	0.64	13.57	0.46	0.77
2.41	0.64	13.58	0.36	0.81
2.42	0.63	13.59	0.27	0.86
2.43	0.63	13.59	0.17	0.91
2.44	0.63	13.61	0.08	0.95
2.45	0.63	13.61	0.01	1.01
2.46	0.63	13.62	0.10	1.05
2.47	0.63	13.63	0.20	1.13
2.48	0.63	13.62	0.29	1.18
2.49	0.64	13.62	0.39	1.28
2.50	0.64	13.62	0.48	1.29

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

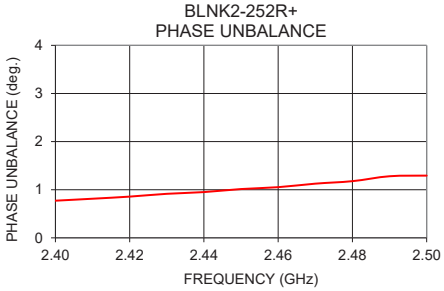
BLNK2-252R+
INSERTION LOSS



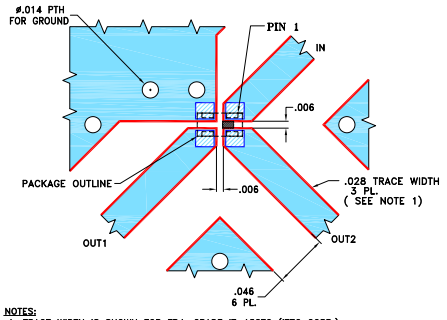
BLNK2-252R+
AMPLITUDE UNBALANCE



BLNK2-252R+
PHASE UNBALANCE



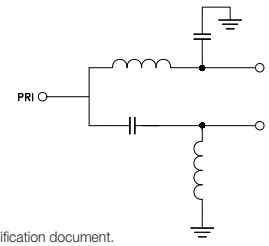
Evaluation Board MCL P/N: TB-1012+
Suggested PCB Layout (PL-549)



NOTES:
1. TRACE WIDTH IS SHOWN FOR FR4, GRADE IT-180TC (ITEQ CORP.) WITH DIELECTRIC THICKNESS .016±.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.

Configuration S



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. OR
M172548
BLNK2-252R+
AV/CP/AM
200924

LTCC Balun

RF Transformer BLNK2-252R+

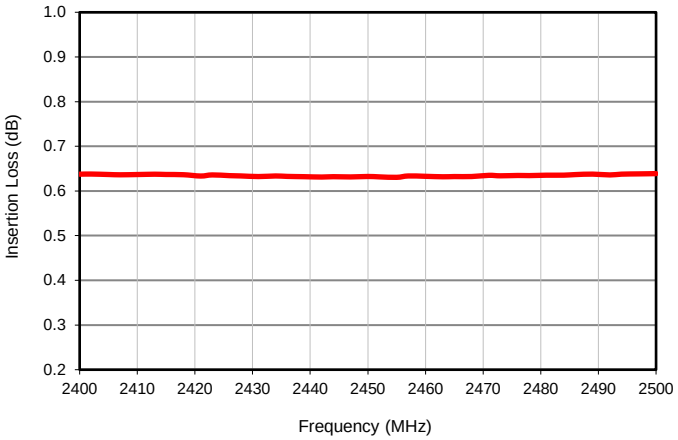
Typical Performance Data

FREQUENCY (MHz)	AVERAGE INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE[1] (deg.)
2400	0.64	13.57	0.46	0.77
2402	0.64	13.57	0.43	0.76
2405	0.64	13.56	0.41	0.78
2407	0.64	13.57	0.39	0.80
2410	0.64	13.58	0.36	0.81
2413	0.64	13.58	0.33	0.84
2415	0.64	13.58	0.31	0.85
2418	0.64	13.59	0.28	0.86
2421	0.63	13.59	0.26	0.88
2423	0.64	13.59	0.24	0.86
2426	0.63	13.58	0.21	0.91
2428	0.63	13.59	0.19	0.89
2431	0.63	13.59	0.16	0.92
2434	0.63	13.60	0.14	0.92
2436	0.63	13.60	0.12	0.94
2439	0.63	13.60	0.09	0.93
2442	0.63	13.61	0.06	0.98
2444	0.63	13.61	0.04	0.98
2447	0.63	13.61	0.02	0.99
2450	0.63	13.61	0.01	1.01
2452	0.63	13.61	0.03	1.03
2455	0.63	13.61	0.06	1.04
2457	0.63	13.62	0.07	1.05
2460	0.63	13.62	0.10	1.05
2463	0.63	13.63	0.13	1.07
2465	0.63	13.62	0.15	1.08
2468	0.63	13.62	0.18	1.11
2471	0.64	13.62	0.21	1.12
2473	0.63	13.63	0.23	1.14
2476	0.63	13.63	0.26	1.15
2478	0.63	13.63	0.27	1.18
2481	0.64	13.63	0.30	1.19
2484	0.64	13.63	0.33	1.22
2486	0.64	13.63	0.35	1.24
2489	0.64	13.62	0.38	1.25
2492	0.64	13.63	0.40	1.29
2494	0.64	13.62	0.42	1.27
2497	0.64	13.62	0.45	1.27
2500	0.64	13.62	0.48	1.29

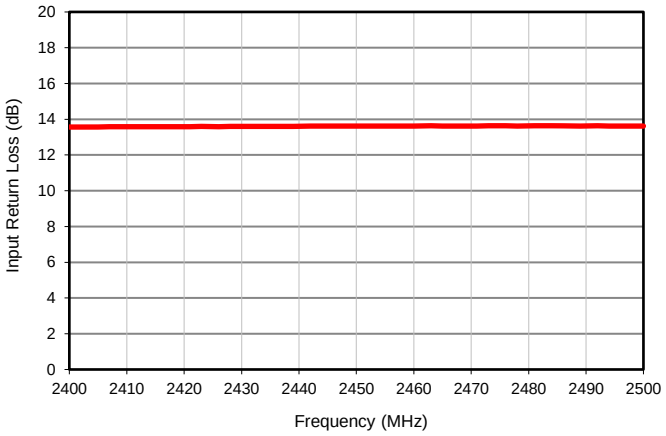
[1] Relative to 180°

Typical Performance Data

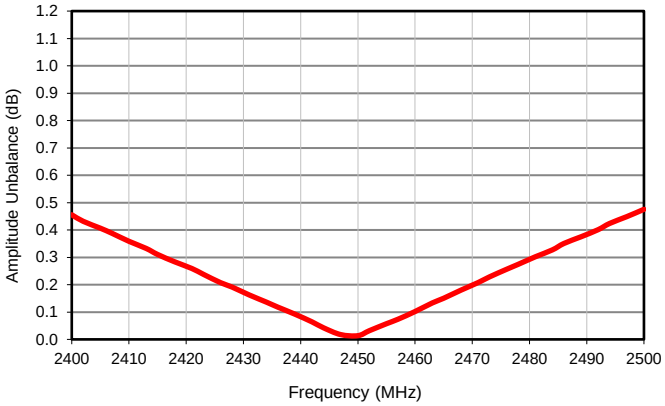
Average Insertion Loss



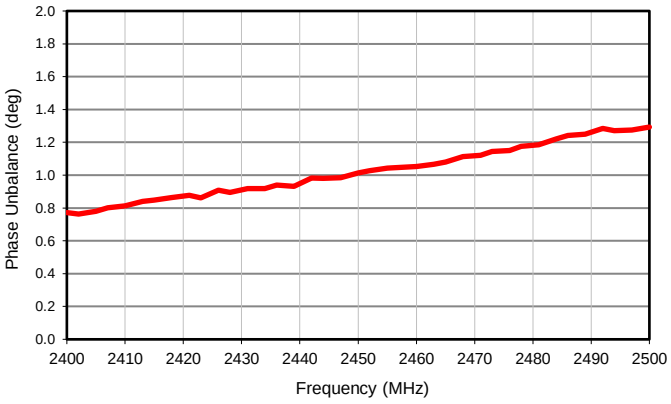
Input Return Loss



Amplitude Unbalance



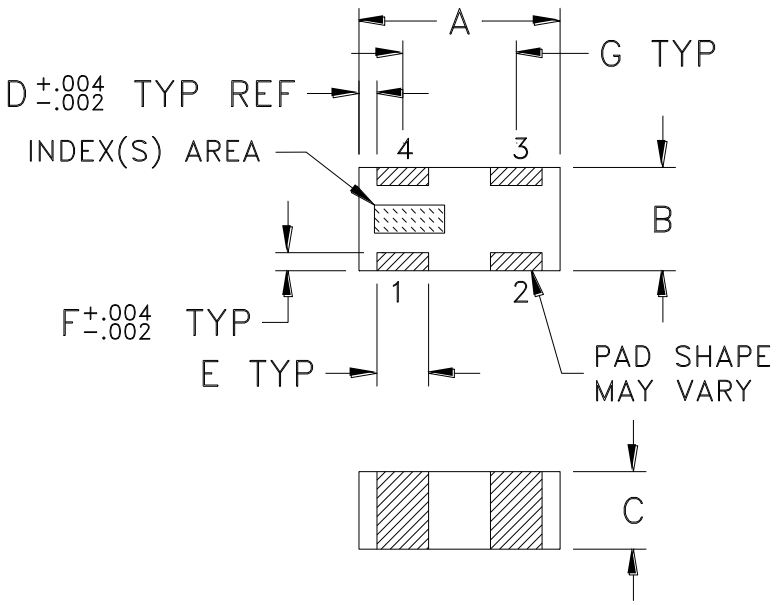
Phase Unbalance



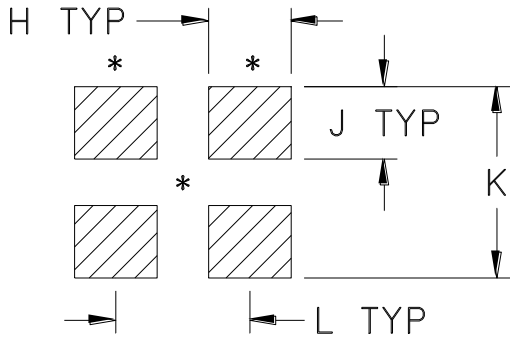
Case Style NK

NK0402C

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE#	A	B	C	D	E	F	G	H	J	K	L	WT.GRAMS
NK0402C	.039 (1.00)	.020 (.50)	.015 (0.37)	.004 (0.10)	.010 (0.25)	.004 (0.10)	.022 (0.55)	.016 (0.41)	.014 (0.36)	.037 (0.94)	.026 (0.65)	.0007

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

Notes:

1. Open style, ceramic base.
2. Termination finish:
   For RoHS Case Styles: Matte Tin over Nickel plating. Models with (+) suffix.
3. *Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

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Tape & Reel Packaging TR-F114-1

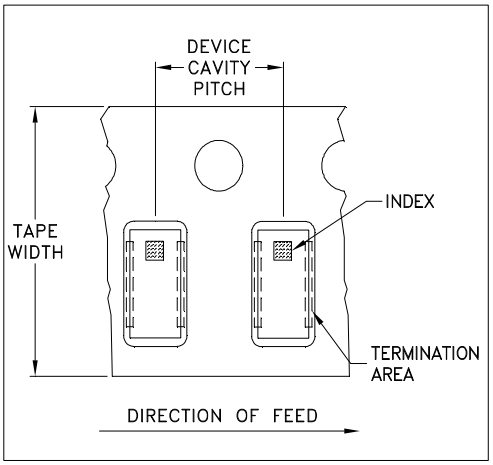


ILLUSTRATION 1

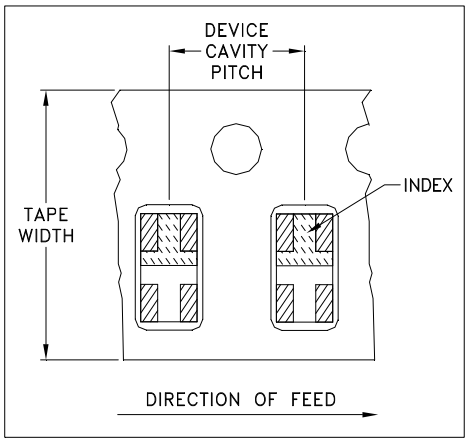


ILLUSTRATION 3

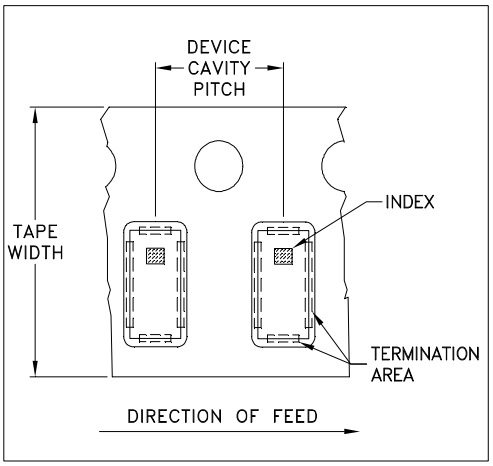


ILLUSTRATION 2

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
8	2	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.

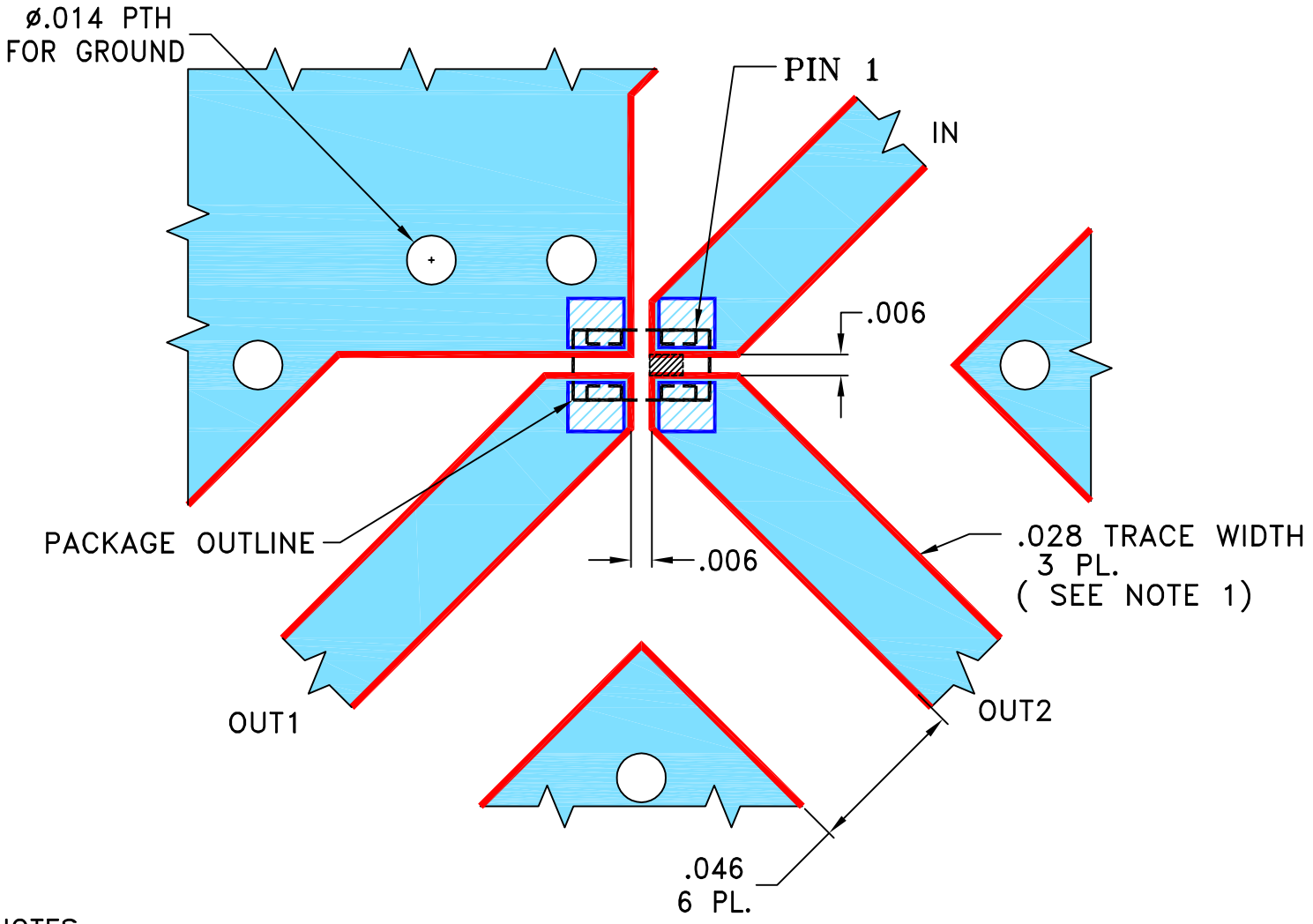
Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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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 NK0402C CASE STYLE, "04TJ01" PIN CODE



NOTES:

1. TRACE WIDTH IS SHOWN FOR FR4, GRADE IT-180TC (ITEQ CORP.) WITH DIELECTRIC THICKNESS .016±.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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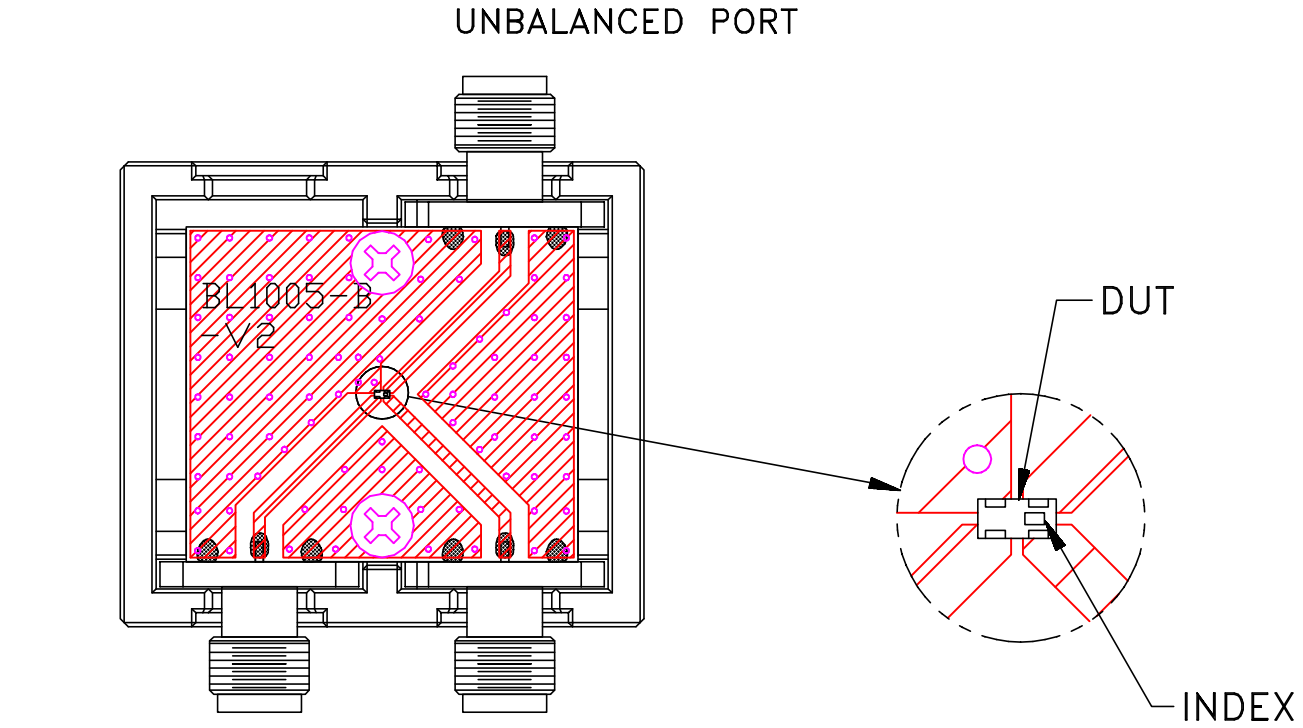
ASHEETA1.DWG REV:A DATE:01/12/95

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

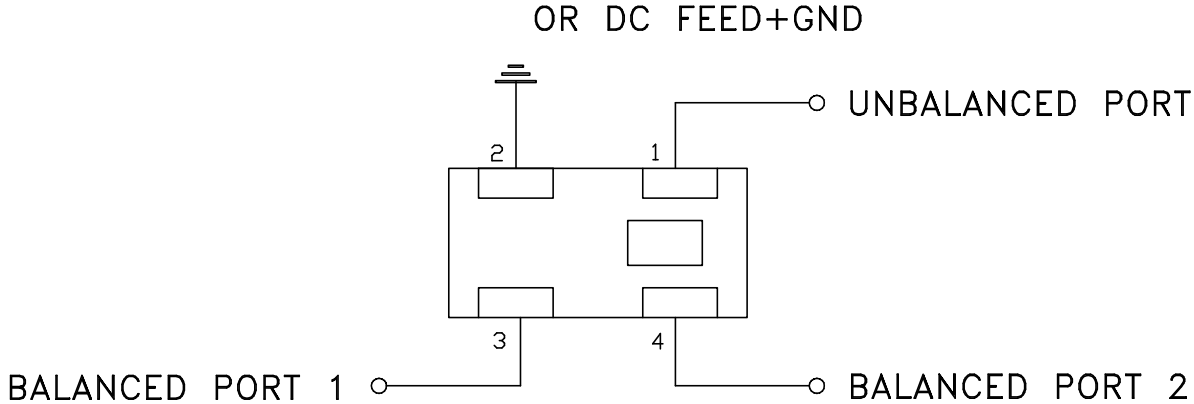
PL, 04TJ01, NK0402C, TB-1012+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-549	OR
FILE: 98PL549		SCALE: 15:1	SHEET: 1 OF 1

Evaluation Board and Circuit



TB-1012+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: FR4 or equivalent,
   Dielectric Constant=4.5, Thickness=.016 inch.

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Environmental Specifications **ENV107**

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
Thermal Shock	-40° to 125°C, 100 cycles	MIL-STD-202 Method 107, Condition A-3 except -40°C instead of -55° C and +125° C instead of -85° C
Solder Reflow Heat	Pb-Free Process 245° -250°C peak,	J-STD-020, 4-2 and 5-2,Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Shelf Life	Shelf life is 12 months when kept in sealed bags. Unused parts are to be resealed to preseve shelf life for proper solderability.	

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