SURFACE MOUNT top hat®

RF Transformer

TTCM4-4X+

50Ω 0.5 to 400 MHz

FEATURES

- Wideband, 0.5 to 400 MHz
- Excellent amplitude (0.1 dB typ.) and phase unbalance (1° typ.)
- Plastic base with solder plated leads
- Aqueous washable



Generic photo used for illustration purposes only

CASE STYLE: DB1627

+RoHS Compliant
The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

APPLICATIONS

- Impedance matching

ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Impedance Ratio (secondary/primary)			4		Ohm
Frequency Range		0.5		400	**MHz**
Insertion Loss	0.5 - 400 1.3 - 160 5 - 100	— — —	3 2 1	— — —	dB
Amplitude Unbalance	5 - 100 1.3 - 160	— —	0.1 0.1	— —	dB
Phase Unbalance	5 - 100 1.3 - 160	— —	1 1	— —	Degree

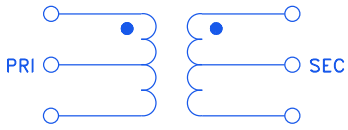
* Insertion Loss is referenced to mid-band loss, 0.65 dB typ.

MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-20°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	250 mA
DC Curret	30 mA

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

CONFIGURATION B



REV. B
ECO-025163
TTCM4-4X+
MCL NY
250408

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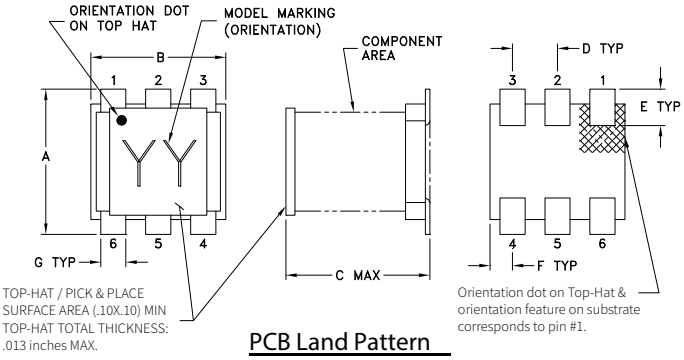
PIN CONNECTIONS

PRIMARY DOT	4
PRIMARY	6
PRIMARY CT	5**
SECONDARY DOT	3
SECONDARY	1
SECONDARY CT	2

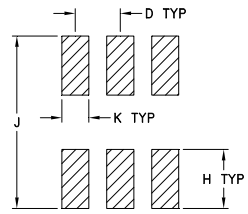
** Used only in balanced to balanced configuration.

PRODUCT MARKING: GA

OUTLINE DRAWING



PCB Land Pattern



SUGGESTED LAYOUT
TOLERANCE TO BE WITHIN ±.002

OUTLINE DIMENSIONS (Inches / 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

TAPE & REEL INFORMATION: F47

SURFACE MOUNT top hat®

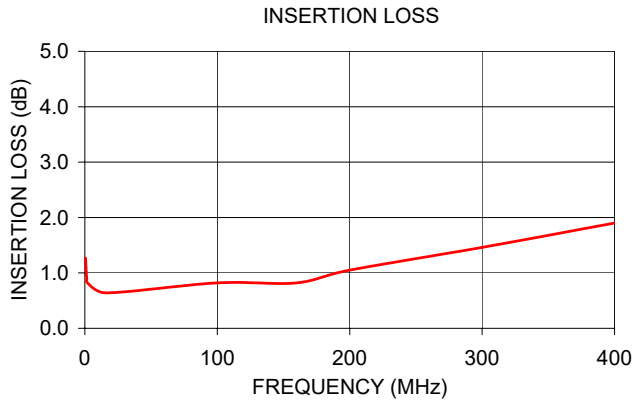
RF Transformer

TTCM4-4X+

50Ω 0.5 to 400 MHz

TYPICAL PERFORMANCE DATA

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	Amplitude Unbalance (dB)	Phase Unbalance (deg)
0.50	1.27	15.05	0.02	0.21
1.00	1.02	16.86	0.02	0.16
1.50	0.90	17.24	0.02	0.11
2.00	0.82	17.30	0.03	0.04
16.00	0.64	16.47	0.04	0.12
100.00	0.82	16.33	0.01	0.43
160.00	0.82	16.19	0.10	0.50
200.00	1.05	14.91	0.16	0.34
300.00	1.46	12.61	0.38	0.93
400.00	1.90	10.01	0.61	4.56





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 atwww.minicircuits.com/terms/viewterm.html

RF Transformer TTCM4-4X+

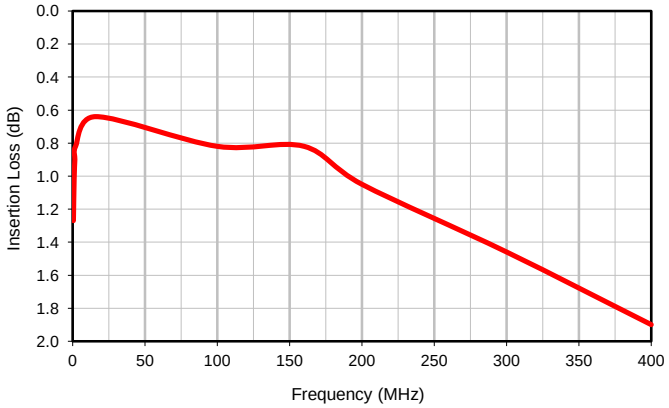
Typical Performance Data

FREQUENCY (MHz)	AVERAGE INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (deg.)
0.5	1.27	15.05	0.02	0.21
1.0	1.02	16.86	0.02	0.16
1.5	0.90	17.24	0.02	0.11
2.0	0.82	17.30	0.03	0.04
16.0	0.64	16.47	0.04	0.12
100.0	0.82	16.33	0.01	0.43
160.0	0.82	16.19	0.10	0.50
200.0	1.05	14.91	0.16	0.34
300.0	1.46	12.61	0.38	0.93
400.0	1.90	10.01	0.61	4.56

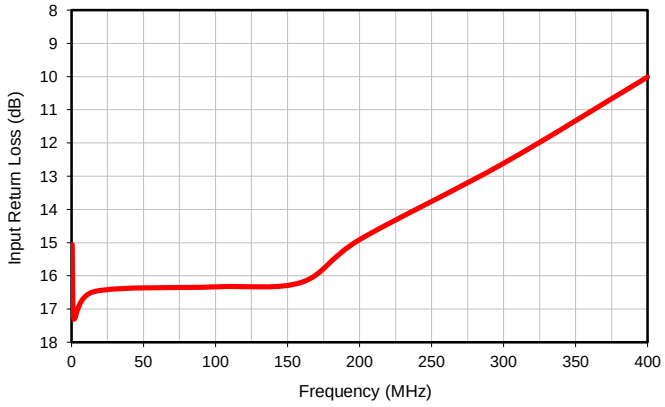
RF Transformer TTCM4-4X+

Typical Performance Data

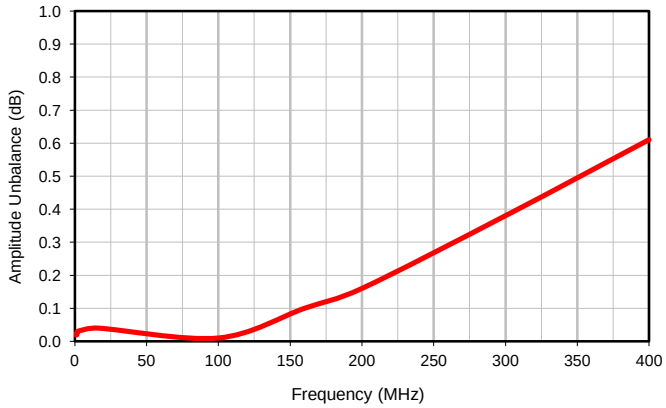
Insertion Loss Average



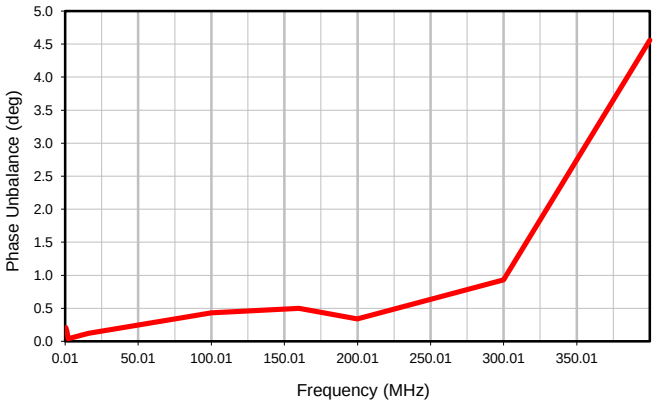
Input Return Loss



Amplitude Unbalance



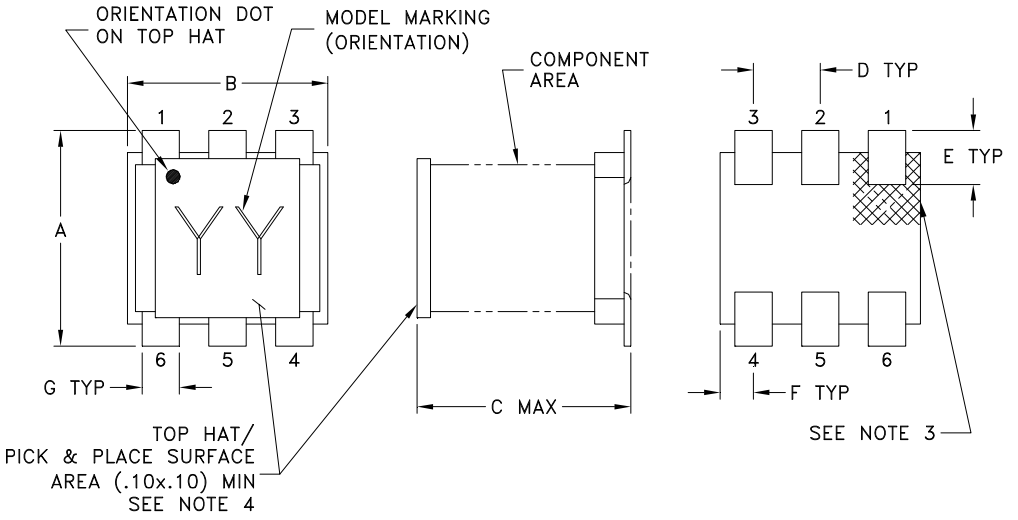
Phase Unbalance



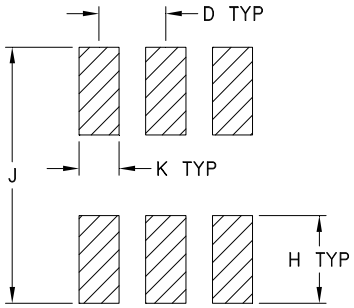
Case Style DB

DB1627

Outline Dimensions



PCB Land Pattern



SUGGESTED LAYOUT
TOLERANCE TO BE WITHIN ±.002

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. ± .01; 3Pl. ± .005

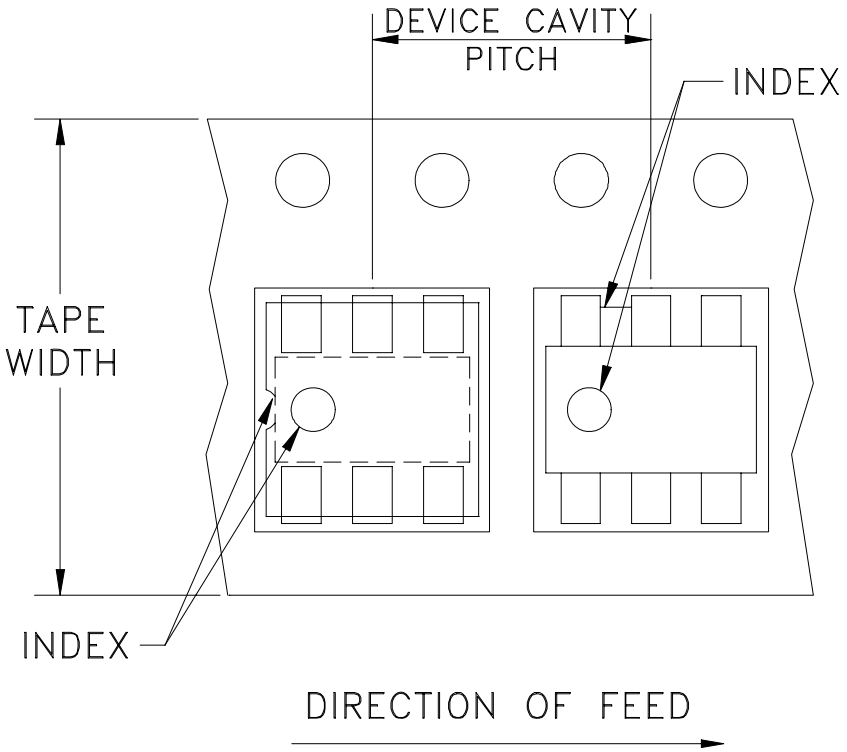
Notes:

1. Case material: Plastic.
2. 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.
3 Orientation dot on top hat & orientation feature on substrate correspondence to pin #1.
4 Top-Hat total thickness: .013 inches MAX.

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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

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Mini-Circuits

Environmental Specifications ENV02

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	-20° 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

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