

Power Splitter/Combiner

2 Way-0°

50Ω

20 to 2000 MHz

LRPS-2-11A+



Generic photo used for illustration purposes only

CASE STYLE: QQQ1358

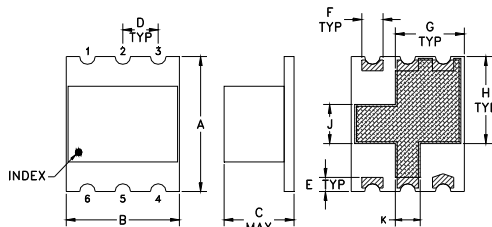
Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	1W max.
Internal Dissipation	0.125W max.
Permanent damage may occur if any of these limits are exceeded.	

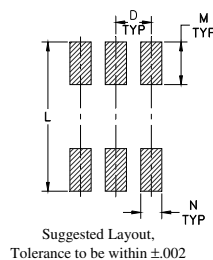
Pin Connections

SUM PORT	6
PORT 1	4
PORT 2	3
GROUND	1,2,5

Outline Drawing



PCB Land Pattern

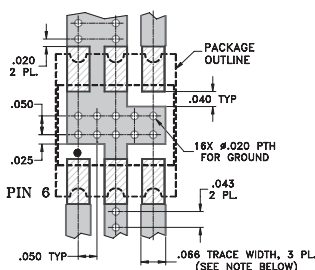
Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch)

A	B	C	D	E	F	G
.380	.32	.215	.100	.040	.060	.195
9.65	8.13	5.46	2.54	1.02	1.52	4.95

H	J	K	L	M	N	wt
0.25	.110	.070	.420	.120	.060	grams
6.35	2.79	1.78	10.67	3.05	1.52	0.43

Demo Board MCL P/N: TB-480+ Suggested PCB Layout (PL-290)



- 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

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

Features

- very wideband, 20 to 2000 MHz
- low insertion loss, 0.7 dB typ.
- good isolation, 21 dB typ.

Applications

- cellular
- GPS
- communications systems

Electrical Specifications

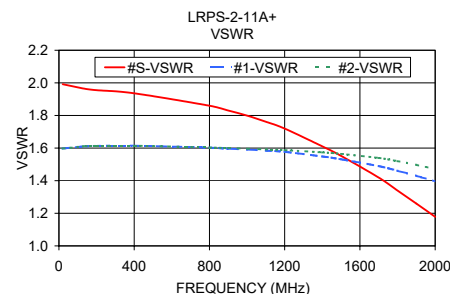
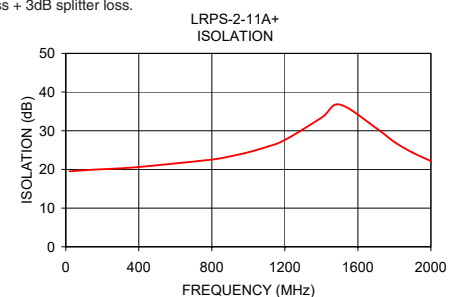
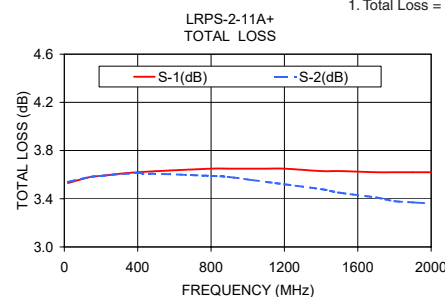
FREQ. RANGE (MHz)	ISOLATION (dB)						INSERTION LOSS (dB) ABOVE 3.0 dB						PHASE UNBALANCE (Degrees)			AMPLITUDE UNBALANCE (dB)		
	L		M		U		L		M		U		L		M		U	
f _L -f _U	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
20-2000	19	15	21	15	30	15	0.6	0.8	0.7	1.0	0.8	1.5	2.0	3.0	5.0	0.2	0.3	0.7

L = 20-200 MHz M = 200-1000 MHz U = 1000-2000 MHz

Typical Performance Data

Frequency (MHz)	Total Loss ¹ (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR S	VSWR 1	VSWR 2
	S-1	S-2						
20.00	3.54	3.54	0.00	19.18	0.01	1.99	1.58	1.58
140.00	3.58	3.58	0.01	19.39	0.23	1.96	1.59	1.59
200.00	3.59	3.59	0.01	19.49	0.35	1.95	1.59	1.59
400.00	3.62	3.60	0.02	19.96	0.62	1.92	1.58	1.58
800.00	3.63	3.56	0.07	21.25	1.00	1.81	1.54	1.53
900.00	3.63	3.54	0.09	21.81	1.29	1.76	1.52	1.51
1000.00	3.60	3.51	0.09	22.43	1.52	1.72	1.50	1.50
1100.00	3.60	3.49	0.10	23.16	1.30	1.67	1.49	1.48
1200.00	3.61	3.48	0.12	23.85	1.28	1.62	1.47	1.46
1400.00	3.63	3.46	0.17	24.72	1.01	1.51	1.43	1.43
1500.00	3.64	3.45	0.19	24.59	1.10	1.46	1.41	1.41
1700.00	3.68	3.44	0.24	22.76	0.92	1.38	1.36	1.39
1800.00	3.71	3.46	0.25	21.43	0.76	1.36	1.34	1.38
1900.00	3.76	3.49	0.27	20.06	0.54	1.37	1.32	1.37
2000.00	3.84	3.53	0.30	18.74	0.23	1.41	1.31	1.37

1. Total Loss = Insertion Loss + 3dB splitter loss.



electrical schematic



2 Way-0° Power Splitter/Combiner

LRPS-2-11A+

Typical Performance Data

FREQUENCY (MHz)	TOTAL LOSS ¹ (dB)		AMPLITUDE UNBALANCE (dB)	ISOLATION (dB)	PHASE UNBALANCE (deg.)	FREQUENCY (MHz)	VSWR (:1)		
	S-1	S-2					S	1	2
20.0	3.54	3.54	0.00	19.18	0.01	20.0	1.99	1.58	1.58
40.0	3.55	3.55	0.00	19.19	0.05	40.0	1.99	1.58	1.58
60.0	3.56	3.56	0.00	19.23	0.09	60.0	1.98	1.59	1.58
80.0	3.57	3.56	0.00	19.28	0.14	80.0	1.97	1.59	1.59
100.0	3.57	3.57	0.00	19.32	0.17	100.0	1.97	1.59	1.59
120.0	3.58	3.57	0.00	19.36	0.19	120.0	1.97	1.59	1.59
140.0	3.58	3.58	0.01	19.39	0.23	140.0	1.96	1.59	1.59
160.0	3.59	3.58	0.01	19.42	0.28	160.0	1.96	1.59	1.59
180.0	3.59	3.59	0.01	19.45	0.30	180.0	1.96	1.59	1.59
200.0	3.59	3.59	0.01	19.49	0.35	200.0	1.95	1.59	1.59
400.0	3.62	3.60	0.02	19.96	0.62	400.0	1.92	1.58	1.58
600.0	3.62	3.59	0.03	20.49	0.94	600.0	1.87	1.57	1.56
800.0	3.63	3.56	0.07	21.25	1.00	800.0	1.81	1.54	1.53
900.0	3.63	3.54	0.09	21.81	1.29	900.0	1.76	1.52	1.51
1000.0	3.60	3.51	0.09	22.43	1.52	1000.0	1.72	1.50	1.50
1100.0	3.60	3.49	0.10	23.16	1.30	1100.0	1.67	1.49	1.48
1200.0	3.61	3.48	0.12	23.85	1.28	1200.0	1.62	1.47	1.46
1300.0	3.61	3.46	0.15	24.44	1.29	1300.0	1.57	1.45	1.44
1400.0	3.63	3.46	0.17	24.72	1.01	1400.0	1.51	1.43	1.43
1500.0	3.64	3.45	0.19	24.59	1.10	1500.0	1.46	1.41	1.41
1600.0	3.65	3.44	0.21	23.88	1.04	1600.0	1.42	1.38	1.40
1700.0	3.68	3.44	0.24	22.76	0.92	1700.0	1.38	1.36	1.39
1800.0	3.71	3.46	0.25	21.43	0.76	1800.0	1.36	1.34	1.38
1900.0	3.76	3.49	0.27	20.06	0.54	1900.0	1.37	1.32	1.37
2000.0	3.84	3.53	0.30	18.74	0.23	2000.0	1.41	1.31	1.37

¹Total Loss = Insertion Loss + 3dB Splitter Loss



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

IF/RF MICROWAVE COMPONENTS

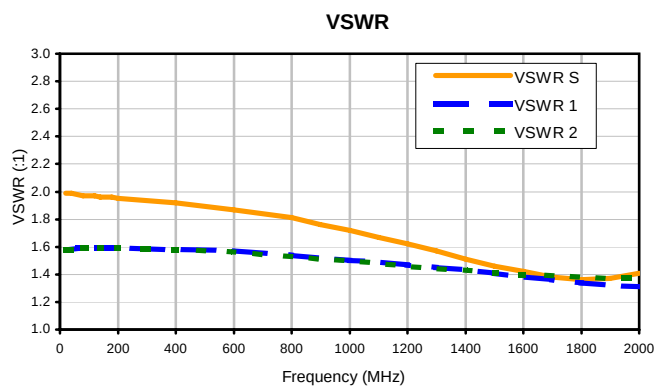
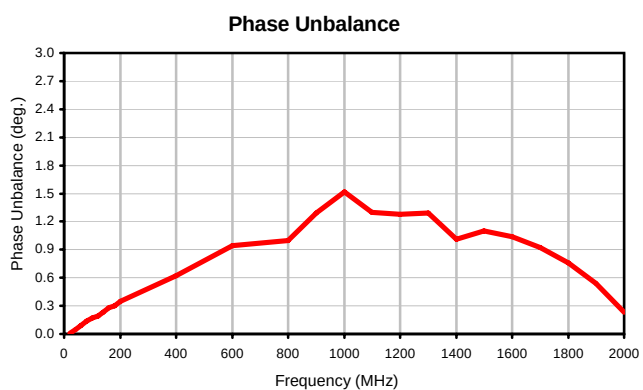
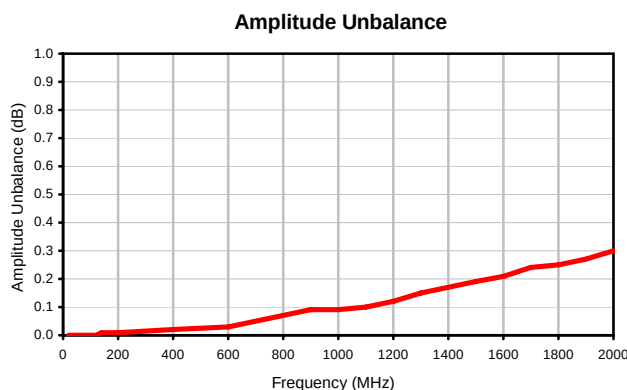
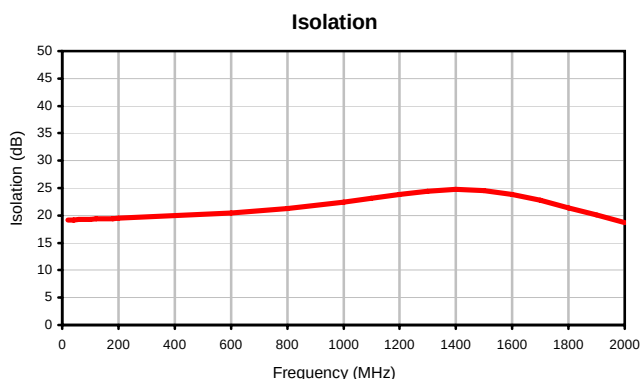
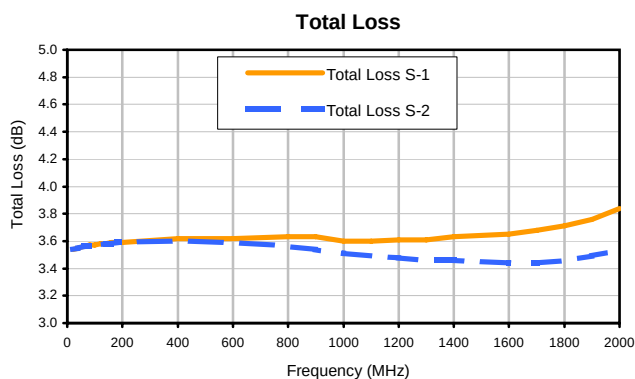


REV. X2
 LRPS-2-11A+
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2 Way-0° Power Splitter/Combiner

LRPS-2-11A+

Typical Performance Curves



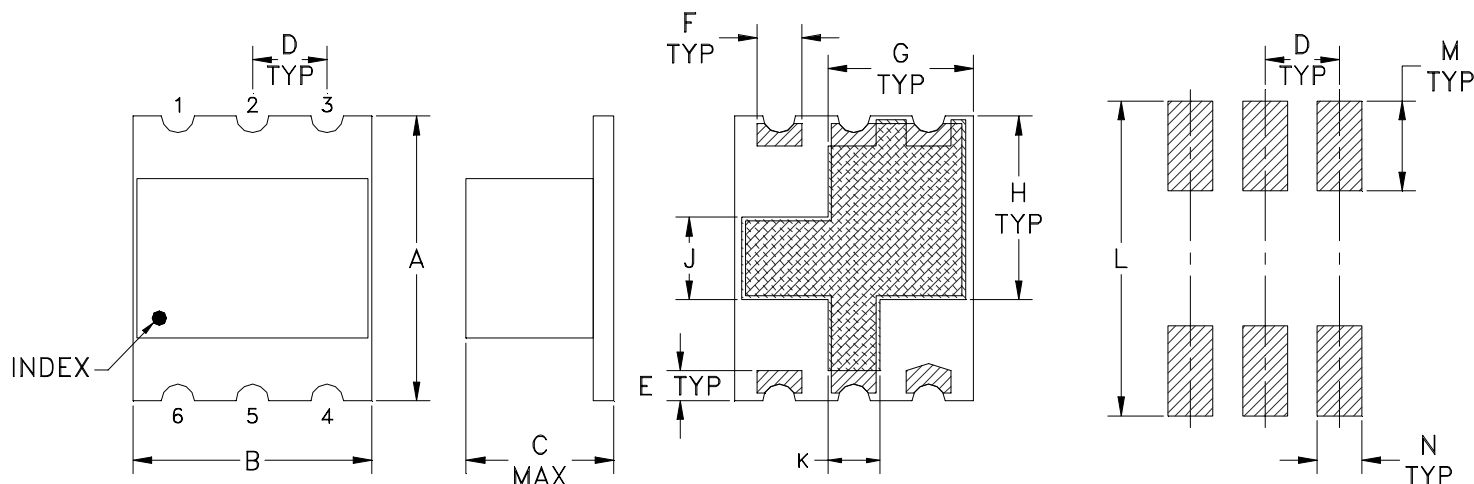
Case Style

QQQ

Outline Dimensions

QQQ1358 (non-waterproof)

PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	WT, GRAM
QQQ1358	.380 (9.65)	.32 (8.13)	.215 (5.46)	.100 (2.54)	.040 (1.02)	.060 (1.52)	.195 (4.95)	.25 (6.35)	.110 (2.79)	.070 (1.78)	.420 (10.67)	.120 (3.05)	.060 (1.52)	.43

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

Notes:

- Case material: Plastic.
- Base: Printed Wiring Laminate
- Termination finish:
For RoHS Case Styles: 3-5 μ inch (.08-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.
All Models (+) suffix

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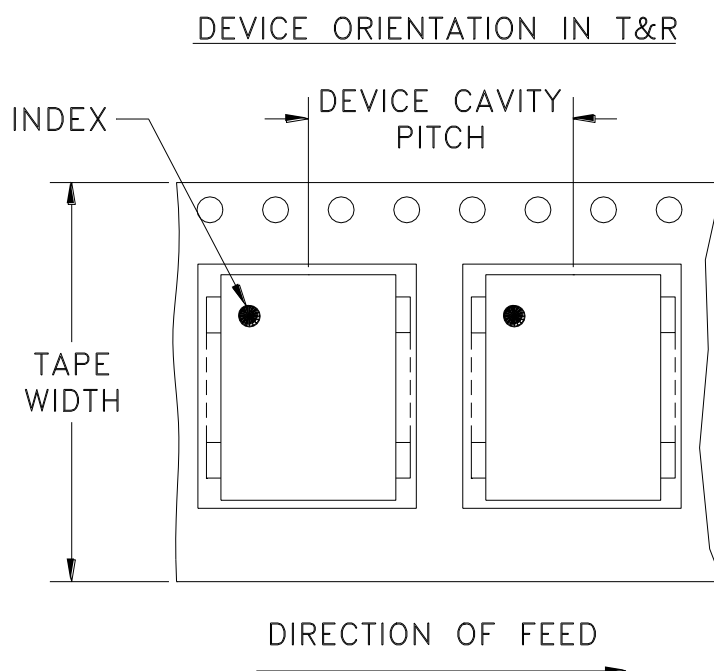
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Tape & Reel Packaging TR-F10



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
24	16	7	10,20,50,100,200
		13	500

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

Note: Please consult individual model data sheet to determine device per reel availability.



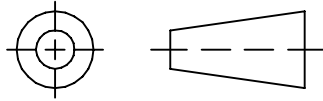
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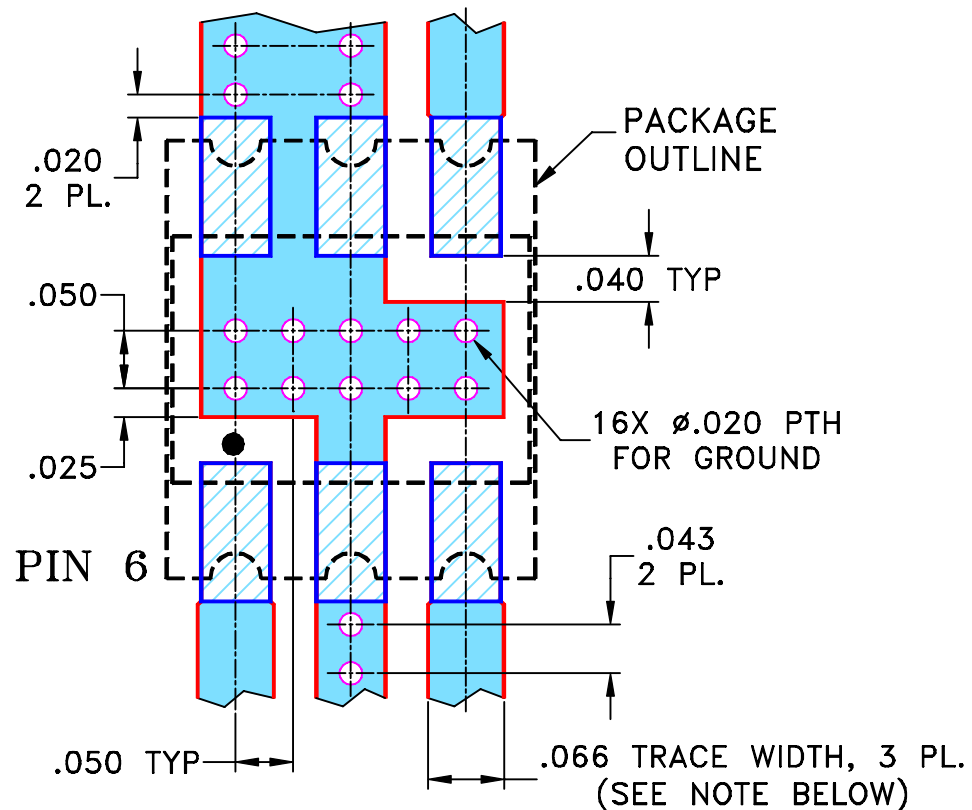
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M119204	NEW RELEASE	08/21/08	AV	HY

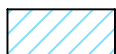
SUGGESTED MOUNTING CONFIGURATION FOR QQQ1358 CASE STYLE, "06SP05" PIN CODE



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030" $\pm$.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

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08/14/08

TOLERANCES ON:

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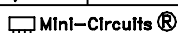
08/21/08

2 PL DECIMALS $\pm$.005

APPROVED

HY

08/21/08

3 PL DECIMALS $\pm$ ANGLES $\pm$ FRACTIONS $\pm$ 

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



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Brooklyn NY 11235

PL, 06SP05, QQQ1358, LRPS-2-11A+, TB-480+

SIZE

CODE IDENT

DRAWING NO:

REV:

A

15542

98-PL-290

OR

FILE: 98PL290

SCALE:

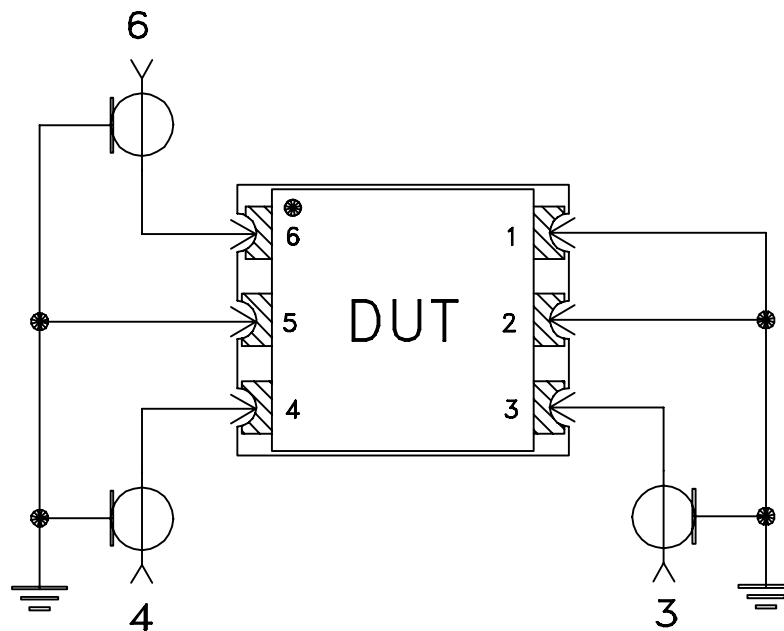
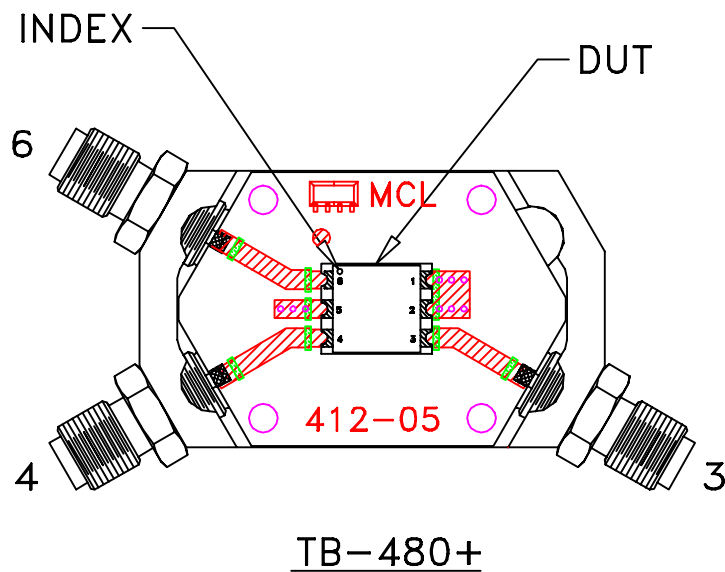
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SHEET:

1 OF 1

Evaluation Board and Circuit

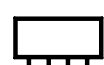
For Pin Connections refer to Data Sheet of the DUT



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.030 inch.

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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