

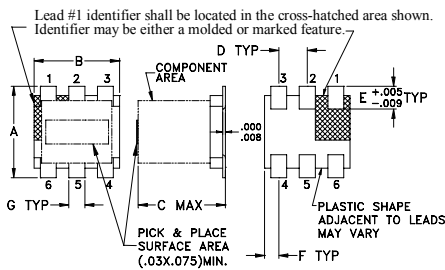
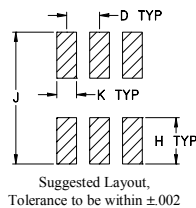
2 Way-0° 50Ω 5 to 1000 MHz

**Maximum Ratings**

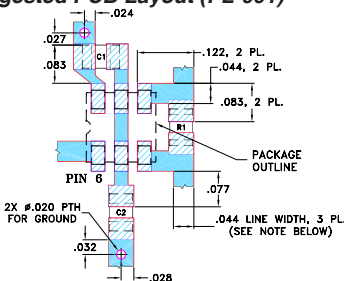
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	0.5W max.
Permanent damage may occur if any of these limits are exceeded.	

Pin Connections

SUMPORT	6
PORT 1	3
PORT 2	4
GROUND	1
CONNECT	2,5
EXT. RESISTOR 100Ω	3,4
EXT. CAPACITOR 1.5pF	2 TO GND 5 TO GND

Outline Drawing**PCB Land Pattern****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

**Demo Board MCL P/N: TB-232
Suggested PCB Layout (PL-001)****Features**

- low insertion, 0.5 dB typ.
- excellent amplitude unbalance, 0.1 dB typ.
- very good phase unbalance, 1.0 deg. typ.
- external resistor & capacitor required
- aqueous washable
- leads for excellent solderability
- low cost

Applications

- cellular
- VHF/UHF
- communications systems

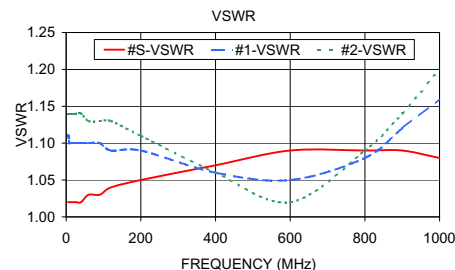
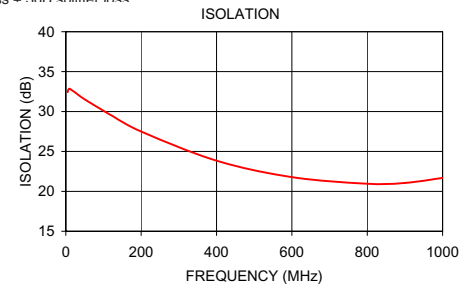
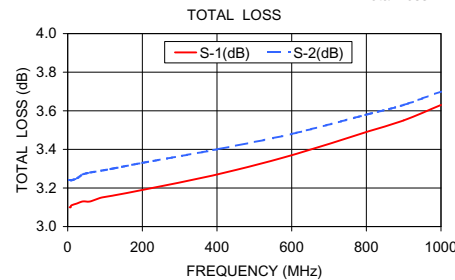
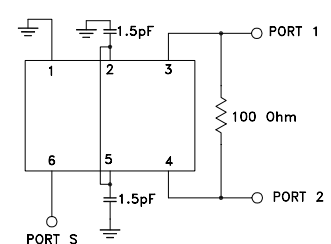
Electrical Specifications

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.
5-1000	25	17	25	16	21	16	0.3	0.9	0.5	0.9	0.5	1.4	4.0	4.0	6.0	0.6	0.6	0.3

L = low range [f_L to $10 f_L$] M = mid range [$10 f_L$ to $f_U/2$] U = upper range [$f_U/2$ to f_U]**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						
5.00	3.10	3.24	0.14	32.43	0.15	1.02	1.11	1.14
6.00	3.10	3.24	0.14	32.64	0.15	1.02	1.11	1.14
8.00	3.10	3.24	0.14	32.81	0.09	1.02	1.10	1.14
10.00	3.11	3.24	0.13	32.85	0.09	1.02	1.10	1.14
25.00	3.12	3.25	0.14	32.38	0.01	1.02	1.10	1.14
40.00	3.13	3.27	0.14	31.84	0.06	1.02	1.10	1.14
60.00	3.13	3.28	0.14	31.23	0.09	1.03	1.10	1.13
90.00	3.15	3.29	0.14	30.38	0.10	1.03	1.10	1.13
120.00	3.16	3.30	0.14	29.54	0.11	1.04	1.09	1.13
200.00	3.19	3.33	0.14	27.50	0.24	1.05	1.09	1.11
400.00	3.27	3.40	0.13	23.84	0.45	1.07	1.06	1.06
600.00	3.37	3.48	0.11	21.78	0.71	1.09	1.05	1.02
800.00	3.49	3.58	0.09	20.95	0.98	1.09	1.08	1.09
900.00	3.55	3.63	0.08	21.06	1.15	1.09	1.12	1.14
1000.00	3.63	3.70	0.07	21.68	1.29	1.08	1.16	1.20

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

**electrical schematic**For detailed performance specs
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2 Way-0° Power Splitter/Combiner

TCP-2-10

Typical Performance Data

TEST CONDITIONS: INPUT POWER = 0dBm @Temperature = +25°C

FREQ. (MHz)	TOTAL LOSS ¹ (dB)		AMP. UNBAL. (dB)	PHASE UNBAL. (deg.)	ISOLATION (dB) 1-2	VSWR (:1)		
	S-1	S-2				S	1	2
5	3.26	3.11	0.15	0.37	30.06	1.03	1.17	1.14
6	3.26	3.11	0.14	0.32	30.60	1.03	1.17	1.13
7	3.26	3.11	0.14	0.27	31.14	1.03	1.16	1.13
8	3.26	3.12	0.14	0.22	31.69	1.02	1.15	1.12
9	3.26	3.12	0.14	0.17	32.23	1.02	1.15	1.12
10	3.26	3.12	0.14	0.14	32.49	1.02	1.14	1.12
20	3.26	3.12	0.14	0.01	33.17	1.02	1.13	1.11
30	3.26	3.12	0.14	0.01	32.77	1.02	1.13	1.11
40	3.27	3.13	0.14	0.01	32.17	1.03	1.13	1.11
50	3.28	3.14	0.14	0.05	31.71	1.03	1.13	1.11
60	3.29	3.15	0.14	0.07	31.24	1.03	1.13	1.11
70	3.29	3.15	0.14	0.08	30.82	1.03	1.13	1.11
80	3.30	3.16	0.15	0.08	30.43	1.03	1.13	1.10
90	3.31	3.16	0.15	0.06	30.07	1.03	1.13	1.10
100	3.31	3.17	0.14	0.08	29.74	1.04	1.13	1.10
150	3.34	3.20	0.13	0.17	28.20	1.04	1.12	1.10
200	3.36	3.22	0.13	0.24	26.90	1.05	1.11	1.09
250	3.38	3.24	0.13	0.29	25.86	1.05	1.10	1.08
300	3.39	3.26	0.13	0.38	24.89	1.05	1.09	1.08
350	3.41	3.27	0.14	0.42	24.11	1.06	1.08	1.07
400	3.43	3.29	0.14	0.46	23.38	1.06	1.07	1.07
450	3.45	3.31	0.14	0.52	22.76	1.06	1.05	1.07
500	3.47	3.33	0.14	0.56	22.24	1.07	1.04	1.07
550	3.49	3.35	0.14	0.64	21.82	1.07	1.04	1.07
600	3.51	3.37	0.14	0.71	21.44	1.07	1.04	1.08
650	3.54	3.40	0.14	0.75	21.14	1.07	1.05	1.09
700	3.56	3.43	0.13	0.86	20.95	1.07	1.07	1.10
750	3.59	3.45	0.14	0.92	20.79	1.07	1.08	1.11
800	3.62	3.48	0.14	0.98	20.68	1.07	1.10	1.12
850	3.65	3.51	0.14	1.05	20.63	1.07	1.12	1.14
900	3.68	3.55	0.14	1.16	20.64	1.07	1.14	1.15
950	3.72	3.58	0.14	1.29	20.64	1.07	1.16	1.17
1000	3.76	3.63	0.13	1.38	20.64	1.07	1.19	1.18

¹ Total Loss = Insertion Loss+ 3dB Splitter Loss

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2 Way-0° Power Splitter/Combiner

TCP-2-10

Typical Performance Data

TEST CONDITIONS: INPUT POWER = 0dBm @Temperature = -40°C

FREQ. (MHz)	TOTAL LOSS ¹ (dB)		AMP. UNBAL. (dB)	PHASE UNBAL. (deg.)	ISOLATION (dB) 1-2	VSWR (:1)		
	S-1	S-2				S	1	2
5	3.30	3.13	0.17	1.43	25.32	1.05	1.26	1.20
6	3.28	3.13	0.15	1.30	26.23	1.05	1.24	1.18
7	3.27	3.12	0.14	1.16	27.13	1.04	1.22	1.17
8	3.25	3.12	0.13	1.03	28.04	1.04	1.20	1.16
9	3.23	3.12	0.11	0.89	28.95	1.03	1.18	1.15
10	3.23	3.12	0.11	0.80	29.65	1.03	1.17	1.14
20	3.20	3.10	0.09	0.35	34.69	1.02	1.12	1.11
30	3.19	3.10	0.09	0.24	37.26	1.03	1.11	1.10
40	3.19	3.10	0.09	0.19	38.23	1.03	1.10	1.09
50	3.19	3.11	0.09	0.14	38.00	1.03	1.10	1.09
60	3.20	3.11	0.08	0.12	36.78	1.04	1.09	1.08
70	3.20	3.12	0.08	0.08	35.28	1.04	1.09	1.08
80	3.21	3.12	0.09	0.07	33.92	1.05	1.08	1.08
90	3.21	3.13	0.09	0.08	32.77	1.05	1.08	1.07
100	3.21	3.13	0.08	0.08	31.89	1.06	1.08	1.07
150	3.23	3.15	0.08	0.01	30.11	1.06	1.08	1.08
200	3.25	3.17	0.08	0.09	28.13	1.07	1.10	1.07
250	3.26	3.18	0.08	0.07	26.22	1.08	1.08	1.05
300	3.28	3.19	0.08	0.10	25.26	1.08	1.07	1.06
350	3.29	3.21	0.08	0.13	24.09	1.09	1.06	1.06
400	3.30	3.22	0.09	0.13	23.38	1.09	1.05	1.04
450	3.32	3.23	0.09	0.11	22.69	1.10	1.04	1.04
500	3.33	3.24	0.09	0.12	22.16	1.10	1.03	1.05
550	3.34	3.26	0.08	0.14	21.83	1.09	1.03	1.06
600	3.36	3.28	0.08	0.18	21.42	1.09	1.04	1.07
650	3.37	3.29	0.08	0.19	21.22	1.08	1.05	1.09
700	3.39	3.32	0.07	0.30	20.82	1.09	1.06	1.10
750	3.41	3.34	0.08	0.28	20.63	1.08	1.09	1.11
800	3.44	3.36	0.07	0.32	20.58	1.07	1.11	1.13
850	3.46	3.39	0.07	0.33	20.43	1.08	1.13	1.14
900	3.49	3.42	0.07	0.42	20.46	1.07	1.15	1.15
950	3.52	3.45	0.07	0.47	20.28	1.08	1.16	1.17
1000	3.56	3.49	0.07	0.55	20.30	1.07	1.19	1.18

¹ Total Loss = Insertion Loss+ 3dB Splitter Loss

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2 Way-0° Power Splitter/Combiner

TCP-2-10

Typical Performance Data

TEST CONDITIONS: INPUT POWER = 0dBm @Temperature = +85°C

FREQ. (MHz)	TOTAL LOSS ¹ (dB)		AMP. UNBAL. (dB)	PHASE UNBAL. (deg.)	ISOLATION (dB)	VSWR		
	S-1	S-2				S	(:1) 1	2
5	3.33	3.14	0.19	0.34	28.68	1.03	1.20	1.15
6	3.33	3.14	0.19	0.29	28.89	1.03	1.20	1.15
7	3.33	3.14	0.19	0.24	29.11	1.03	1.19	1.15
8	3.34	3.15	0.19	0.20	29.32	1.02	1.19	1.15
9	3.34	3.15	0.19	0.15	29.54	1.02	1.19	1.15
10	3.34	3.15	0.19	0.12	29.60	1.02	1.18	1.14
20	3.35	3.16	0.19	0.00	29.37	1.03	1.18	1.14
30	3.35	3.16	0.19	0.02	28.79	1.03	1.18	1.15
40	3.36	3.17	0.19	0.05	28.19	1.04	1.18	1.15
50	3.37	3.18	0.19	0.08	27.78	1.04	1.18	1.15
60	3.37	3.19	0.19	0.09	27.49	1.03	1.18	1.15
70	3.38	3.20	0.19	0.12	27.36	1.02	1.18	1.15
80	3.39	3.20	0.19	0.16	27.34	1.02	1.18	1.15
90	3.40	3.21	0.19	0.16	27.40	1.01	1.18	1.15
100	3.40	3.21	0.19	0.17	27.48	1.02	1.18	1.15
150	3.42	3.24	0.18	0.26	26.66	1.03	1.17	1.13
200	3.45	3.27	0.17	0.35	25.39	1.02	1.14	1.11
250	3.46	3.30	0.16	0.51	25.22	1.02	1.13	1.12
300	3.48	3.31	0.17	0.67	24.21	1.03	1.13	1.11
350	3.50	3.33	0.18	0.75	23.58	1.02	1.11	1.10
400	3.52	3.35	0.17	0.83	23.15	1.03	1.09	1.10
450	3.54	3.38	0.16	0.97	22.51	1.03	1.07	1.09
500	3.57	3.40	0.17	1.07	22.15	1.04	1.06	1.09
550	3.59	3.42	0.17	1.20	21.80	1.04	1.05	1.09
600	3.62	3.45	0.16	1.32	21.46	1.04	1.05	1.09
650	3.64	3.48	0.16	1.41	21.20	1.05	1.06	1.10
700	3.67	3.51	0.16	1.56	21.04	1.05	1.07	1.10
750	3.70	3.54	0.16	1.67	20.92	1.05	1.09	1.11
800	3.74	3.59	0.15	1.82	20.76	1.06	1.10	1.12
850	3.77	3.62	0.15	1.93	20.72	1.06	1.12	1.13
900	3.81	3.67	0.15	2.13	20.68	1.06	1.14	1.15
950	3.85	3.71	0.15	2.29	20.62	1.07	1.16	1.16
1000	3.91	3.76	0.14	2.47	20.62	1.07	1.18	1.17

¹ Total Loss = Insertion Loss+ 3dB Splitter Loss

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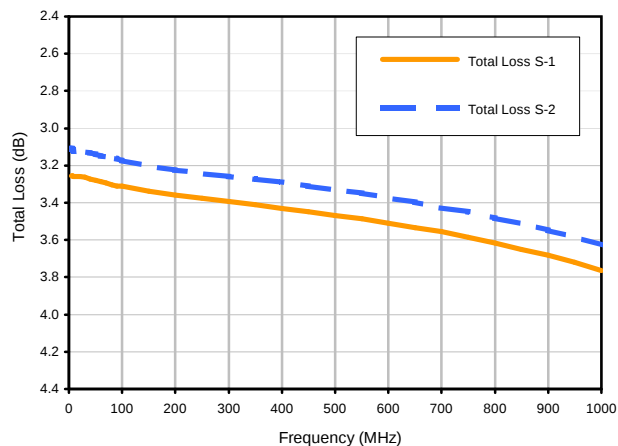


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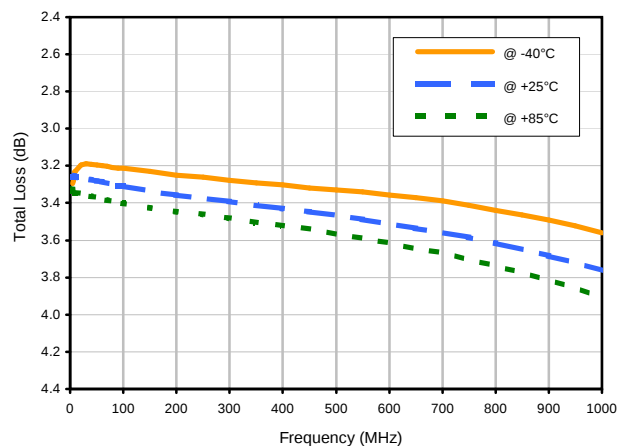
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Typical Performance Curves

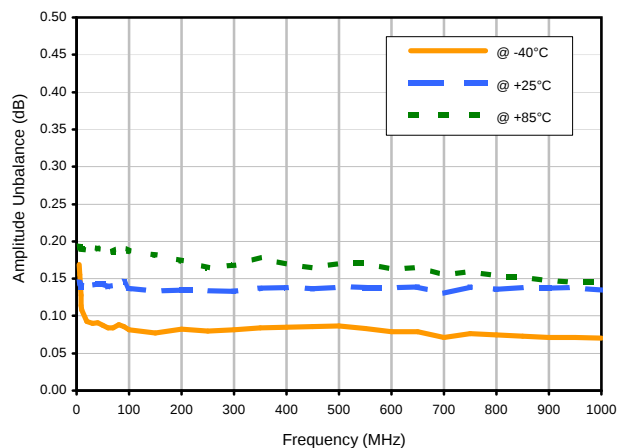
Total Loss



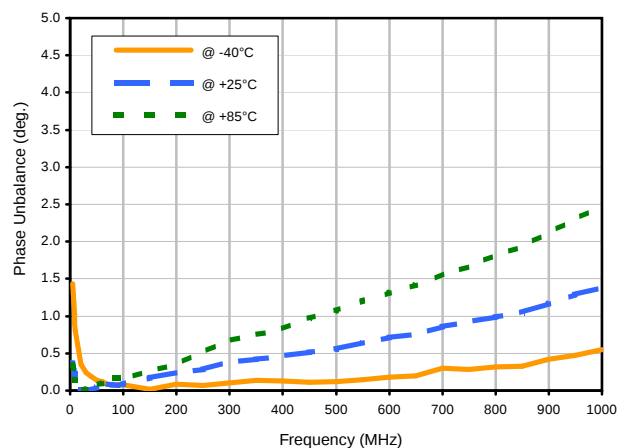
Total Loss S-1 vs. TEMPERATURE



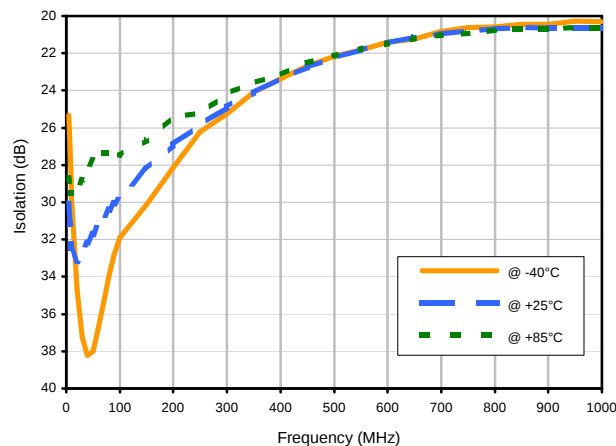
Amplitude Unbalance vs. TEMPERATURE



Phase Unbalance vs. TEMPERATURE



Isolation 1-2 vs. TEMPERATURE



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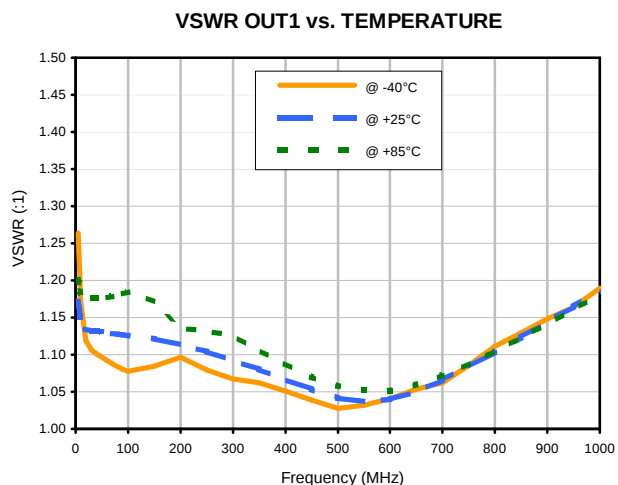
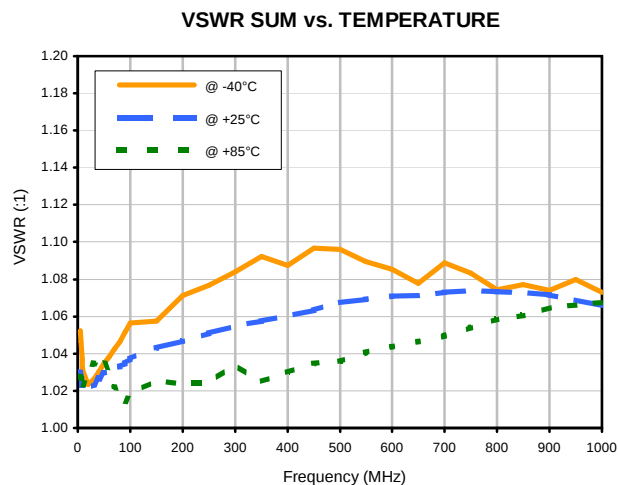
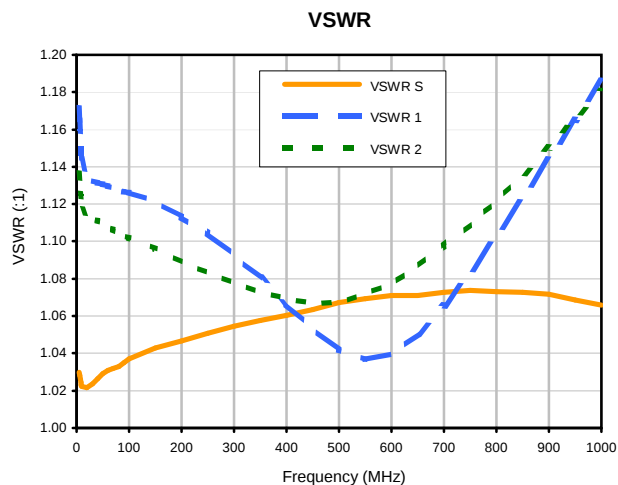
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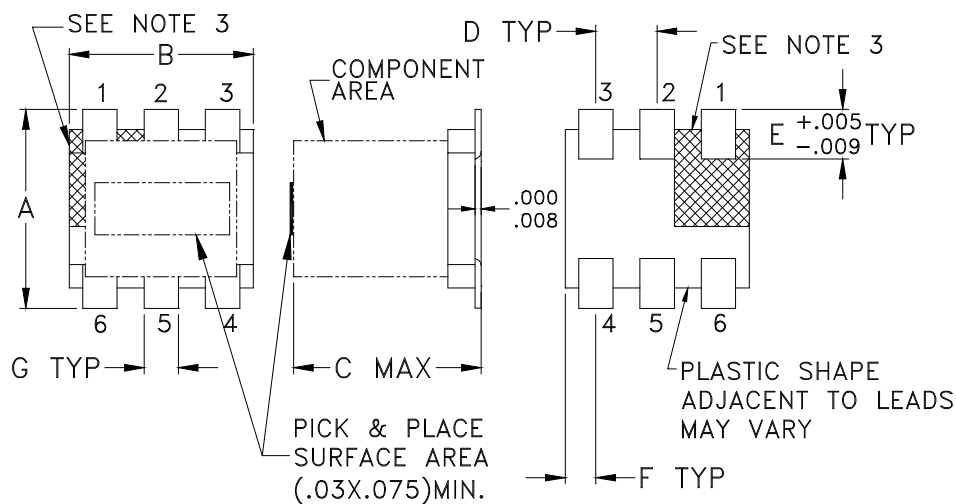
Typical Performance Curves



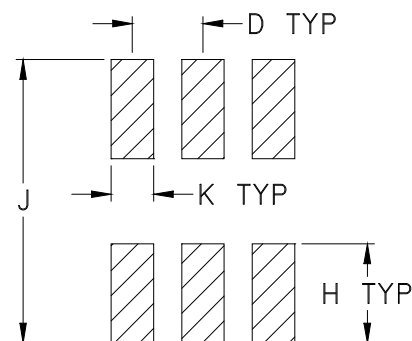
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Outline Dimensions

DB714



PCB Land Pattern



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

CASE #	A	B	C	D	E	F	G	H	J	K	WT. GRAM
DB714	.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.
- Lead #1 identifier shall be located in the cross-hatched area shown.
Identifier may be either a molded or marked feature.



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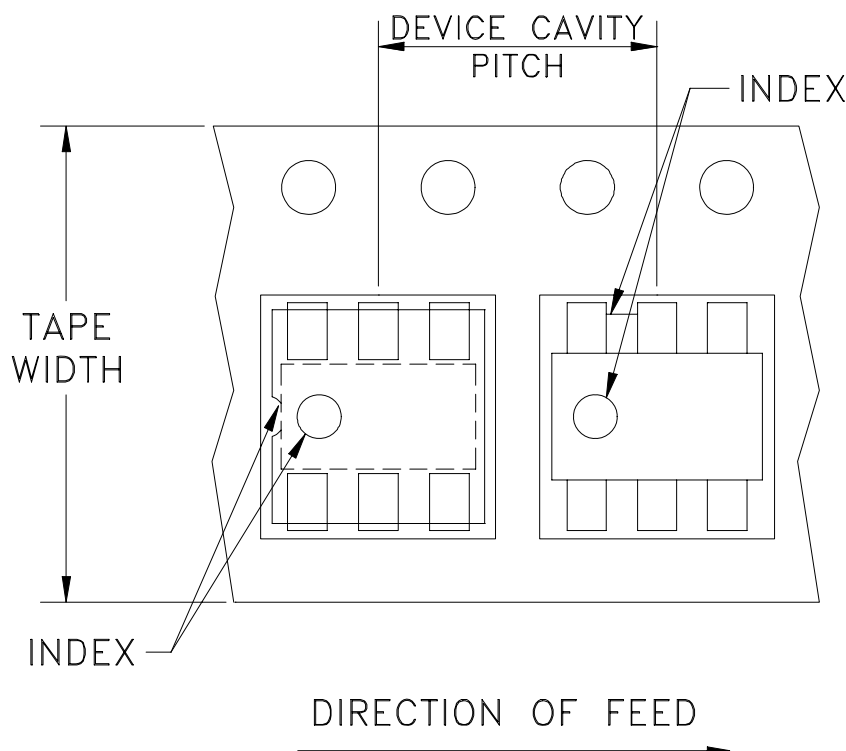


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RF/IF MICROWAVE COMPONENTS

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.

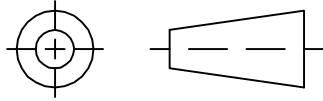
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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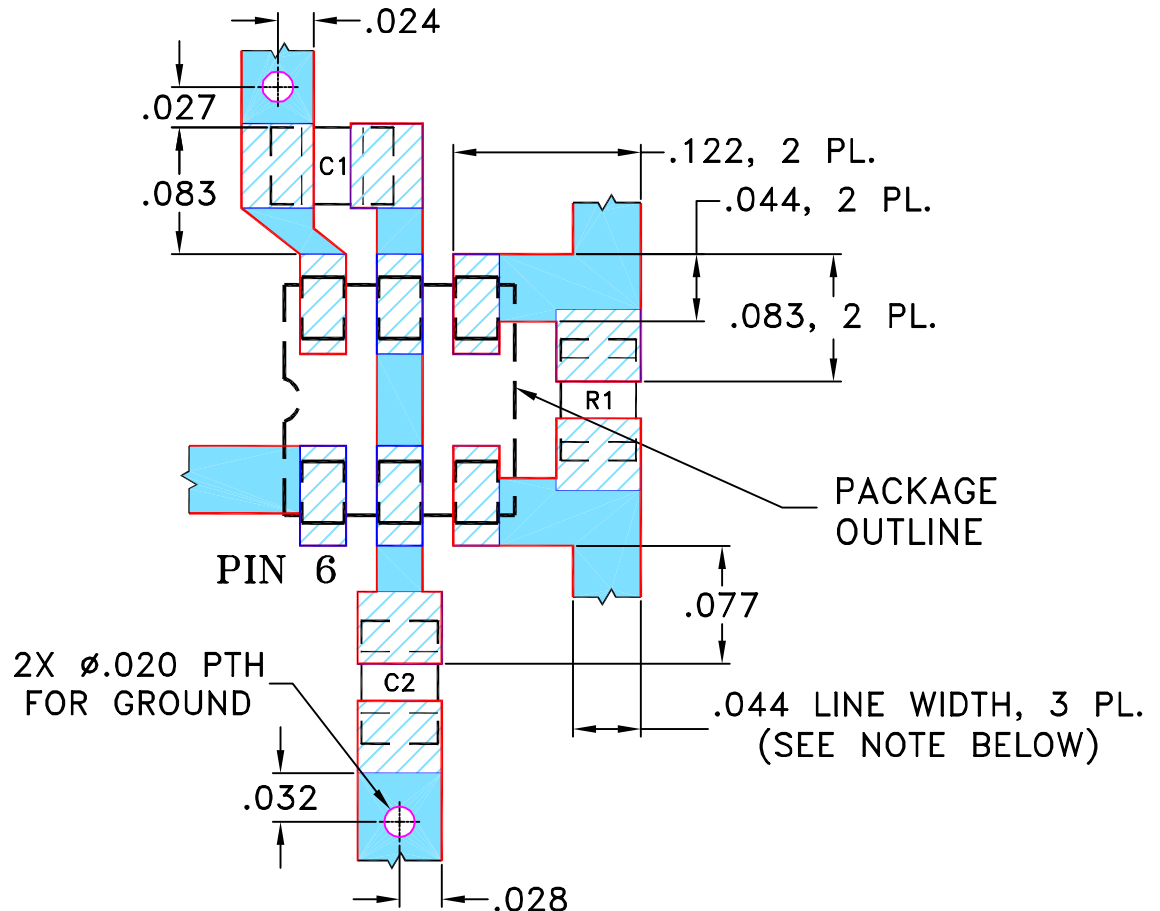
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
A	M71500	ADDED SOLDER MASK & LEGEND	04/00	IL	DB
B	M82377	UPDATED DRAWING	08/06/02	GF	HY
C	M83081	UPDATED DRAWING	06/24/03	MMG	DY
D	M102713	ADDED "...WITH SMOBC", CRCTD MATL	01/12/06	GF	IL

SUGGESTED MOUNTING CONFIGURATION FOR
DB714 CASE STYLE, "mt" PIN CONNECTION

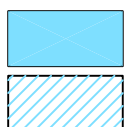


RESISTOR R1: 100 Ohm, 0805 SIZE

CAPACITORS C1 & C2: 1.5 pF, 0805 SIZE

NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS $0.020" \pm 0.0015"$; 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	DRAWN IL	02/24/00
TOLERANCES ON:	CHECKED DY	02/29/00
2 PL DECIMALS $\pm$	APPROVED DB	02/29/00
3 PL DECIMALS $\pm$.005		
ANGLES $\pm$		
FRACTIONS $\pm$		

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



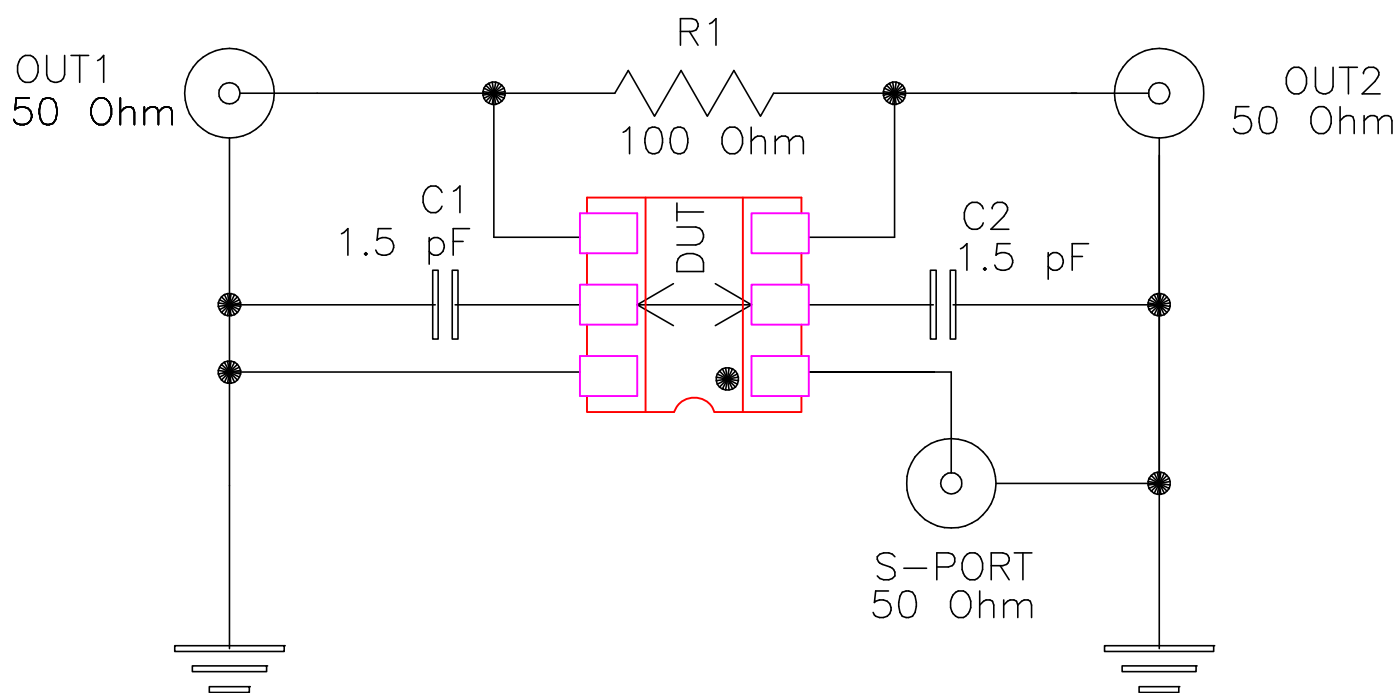
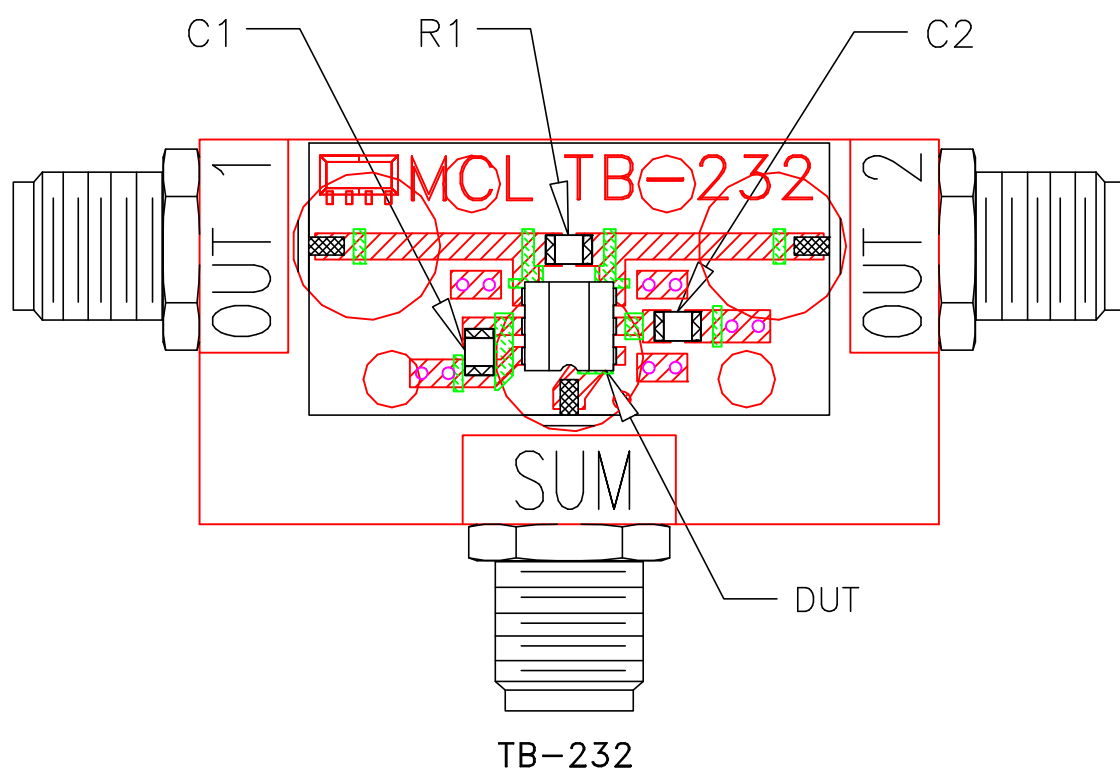
Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

PL, mt, DB714, TCP, TB-232

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-001	D
FILE:	98PL001	SCALE:	8:1
		SHEET:	1 OF 1

Evaluation Board and Circuit



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.020 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