

# 20 dB, Surface Mount Power Signal Tap

## RBDC-20-63+

50Ω DC to 6000 MHz



Generic photo used for illustration purposes only

CASE STYLE: TT1224-2

### Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C

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

### Pad Connections

INPUT	3
OUTPUT	4
COUPLED	1
GROUND	2,5,6

### Features

- Wideband, DC-6000 MHz
- Low insertion loss, 1.1 dB typ.
- Excellent return loss for input/output ports ideal for signal-tap
- Temperature stable

### Applications

- ISM
- UMTS
- WiMAX
- PCS
- Wi-Fi
- LTE

**+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

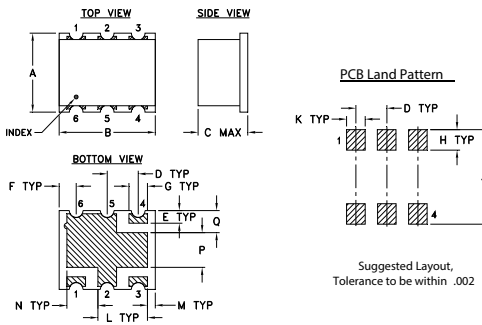
Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500, 1000, 4000

### Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
<b>Frequency Range</b>	DC	—	—	6000	MHz
<b>Mainline Loss<sup>1</sup></b>	DC-2000	—	0.98	1.3	dB
	2000-6000	—	1.35	1.6	
<b>Nominal Coupling<sup>2</sup> (IN-CPL, OUT-CPL)</b>	DC-6000	—	20	—	dB
<b>Coupling Flatness(±)</b>	DC-2000	—	0.7	1.0	dB
	2000-6000	—	1.3	1.8	
<b>Return Loss (Input)</b>	DC-2000	16	20	—	dB
	2000-6000	15	18	—	
<b>Return Loss (Output)</b>	DC-2000	16	20	—	dB
	2000-6000	15	20	—	
<b>Return Loss (Coupling)</b>	DC-2000	15	19	—	dB
	2000-6000	12	17	—	
<b>Input Power</b>	DC-6000	—	—	0.25	W

1. Mainline loss includes theoretical power loss at coupled port.  
2. Coupling can be used for both forward and reversed direction.

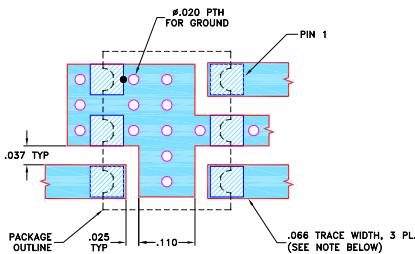
### Outline Drawing



### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H
.25	.31	.16	.100	.040	.055	.060	.065
6.35	7.87	4.06	2.54	1.02	1.40	1.52	1.65
J	K	L	M	N	P	Q	wt.
.300	.060	.160	.025	.100	.110	.070	grams
7.62	1.52	4.06	0.64	2.54	2.79	1.78	0.16

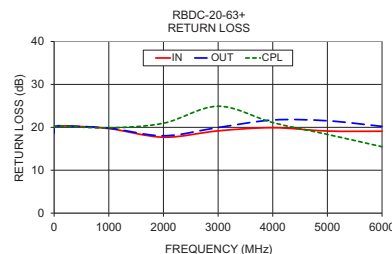
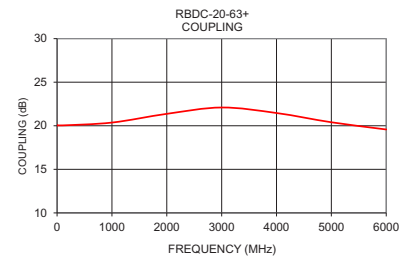
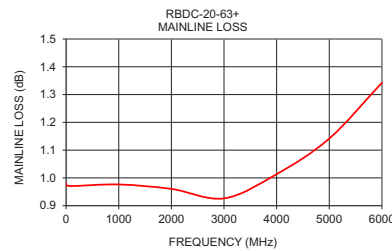
### Demo Board MCL P/N: TB-907+ Suggested PCB Layout (PL-511)



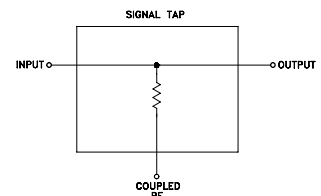
- NOTES:  
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030"±.002". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.  
3. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).  
4. DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

### Typical Performance Data

Frequency (MHz)	Mainline Loss (dB) In-Out	Coupling (dB) In-Cpl	In	Out	Cpl
0.01	0.98	20.01	18.75	18.67	19.96
0.10	0.98	20.10	19.73	19.73	20.10
10.00	0.97	20.06	20.12	20.18	20.13
100.00	0.97	20.04	20.37	20.35	20.32
1000.00	0.98	20.37	19.71	19.82	19.88
2000.00	0.96	21.37	17.70	18.03	20.95
3000.00	0.93	22.10	19.18	19.95	24.92
4000.00	1.01	21.46	19.91	21.70	21.10
5000.00	1.14	20.40	19.13	21.52	18.35
6000.00	1.34	19.57	19.08	20.22	15.47



### Electrical Schematic



### Notes

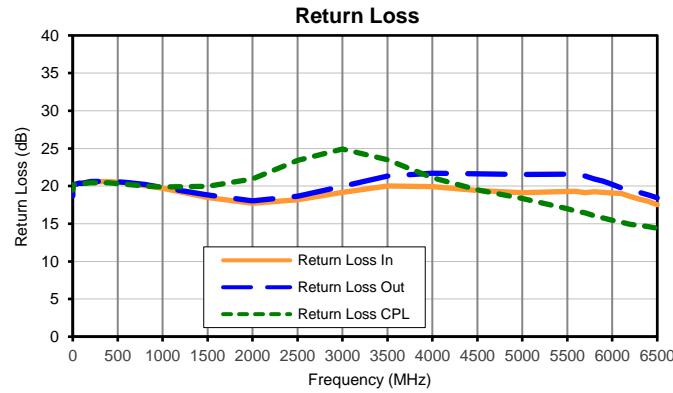
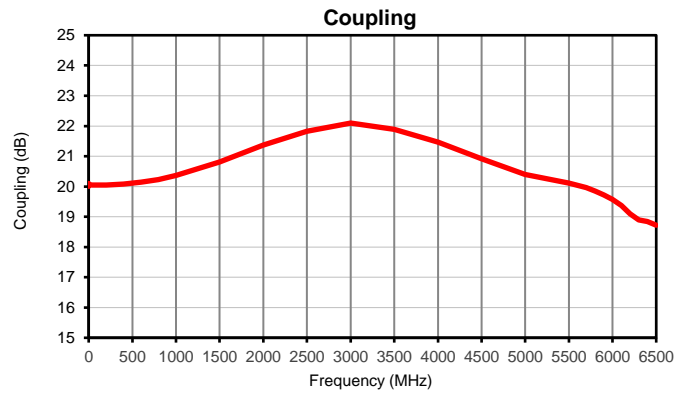
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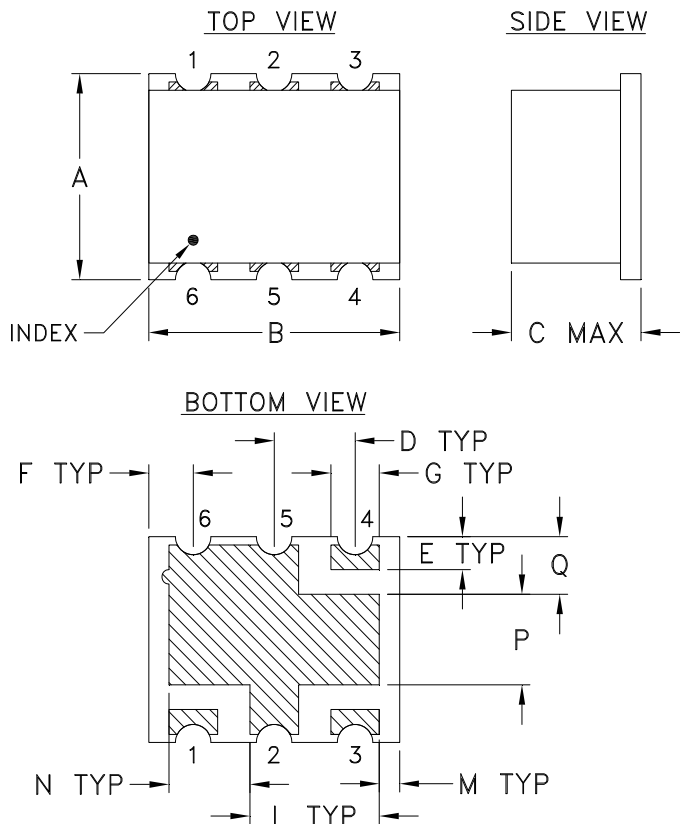
## Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	COUPLING (dB)	RETURN LOSS		
			IN	OUT	CPL
0.01	0.98	20.01	18.75	18.67	19.96
0.04	0.98	20.10	19.63	19.81	19.44
0.07	0.98	20.10	19.68	19.76	20.04
0.10	0.98	20.10	19.73	19.73	20.10
0.40	0.98	20.10	19.74	19.75	20.13
0.70	0.98	20.09	19.95	19.98	20.12
1.0	0.98	20.07	20.03	20.01	20.12
4.0	0.98	20.07	20.08	20.10	20.13
7.0	0.97	20.06	20.06	20.14	20.13
10	0.97	20.06	20.12	20.18	20.13
40	0.97	20.05	20.28	20.28	20.21
70	0.97	20.05	20.33	20.39	20.30
100	0.97	20.04	20.37	20.35	20.32
200	0.97	20.05	20.54	20.61	20.45
400	0.97	20.08	20.60	20.63	20.42
600	0.98	20.14	20.42	20.47	20.22
800	0.97	20.23	20.07	20.20	20.02
1000	0.98	20.37	19.71	19.82	19.88
1500	0.98	20.81	18.50	18.81	19.95
2000	0.96	21.37	17.70	18.03	20.95
2500	0.97	21.82	18.18	18.65	23.40
3000	0.93	22.10	19.18	19.95	24.92
3500	0.95	21.89	20.01	21.32	23.48
4000	1.01	21.46	19.91	21.70	21.10
4500	1.07	20.92	19.40	21.61	19.50
5000	1.14	20.40	19.13	21.52	18.35
5500	1.22	20.12	19.29	21.59	17.00
5600	1.24	20.04	19.27	21.48	16.65
5700	1.25	19.96	19.12	21.33	16.45
5800	1.28	19.85	19.23	20.96	16.07
5900	1.30	19.72	19.14	20.65	15.75
6000	1.34	19.57	19.08	20.22	15.47
6100	1.39	19.38	19.02	19.76	15.20
6200	1.47	19.09	18.59	19.33	14.89
6300	1.51	18.89	18.27	19.18	14.77
6400	1.55	18.84	17.95	18.83	14.59
6500	1.62	18.72	17.53	18.44	14.40

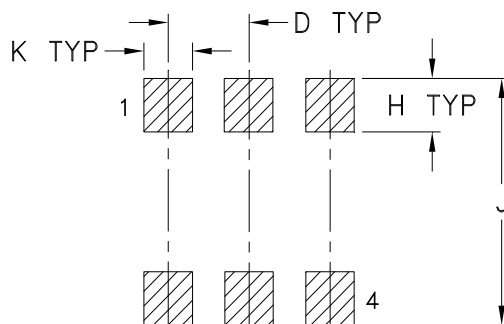
## Typical Performance Curves



### Outline Dimensions



### PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm 0.002$

CASE #	A	B	C	D	E	F	G	H	J	K	L
TT1224-2	.25 (6.35)	.31 (7.87)	.16 (4.06)	.100 (2.54)	.040 (1.02)	.055 (1.40)	.060 (1.52)	.065 (1.65)	.300 (7.62)	.060 (1.52)	.160 (4.06)

CASE #	M	N	P	Q	WT. GRAM
TT1224-2	.025 (.64)	.100 (2.54)	.110 (2.79)	.070 (1.78)	.16

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

### Notes:

- Case material: Plastic.
- Termination: 2-10  $\mu$  inch (.05-.25 microns) Gold over 100-300  $\mu$  inch (2.54-7.62 microns) Nickel plate



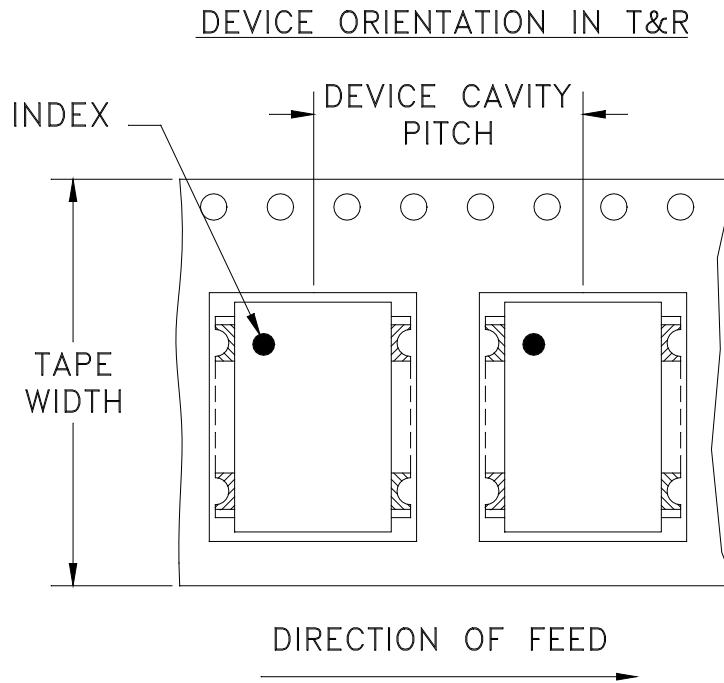
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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F2



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel See note
16	12	7	10
			20
			50
			100
			200
		13	500
			1000

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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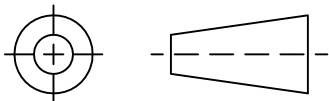
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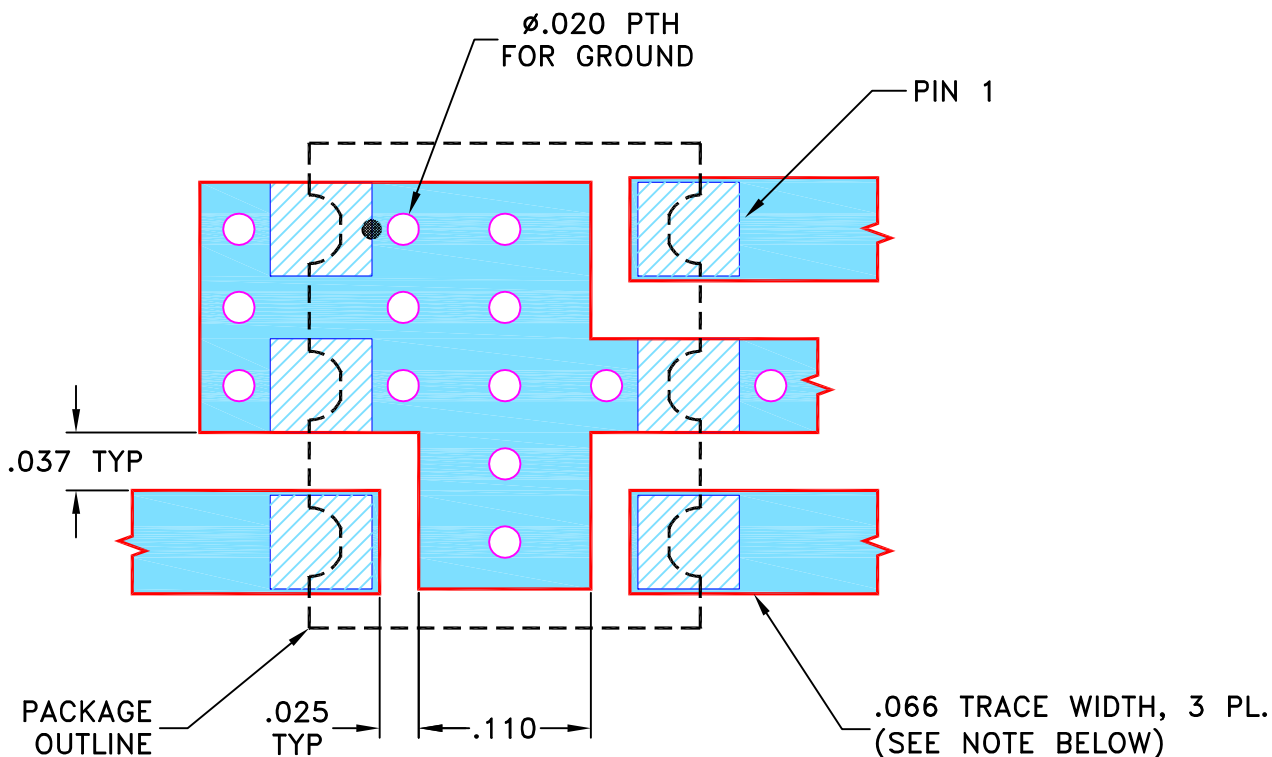
THIRD ANGLE PROJECTION



REVISIONS

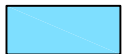
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M161289	NEW RELEASE	04/12/17	ITG	YL

SUGGESTED MOUNTING CONFIGURATION  
FOR TT1224-2 CASE STYLE, "06BT02" PIN CODE

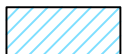


NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030"±.002".  
COPPER: 1/2 OZ. EACH SIDE.  
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- 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	ITG	04/07/17
TOLERANCES ON:	CHECKED	IL	04/12/17
2 PL DECIMALS ±	APPROVED	YL	04/12/17
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			



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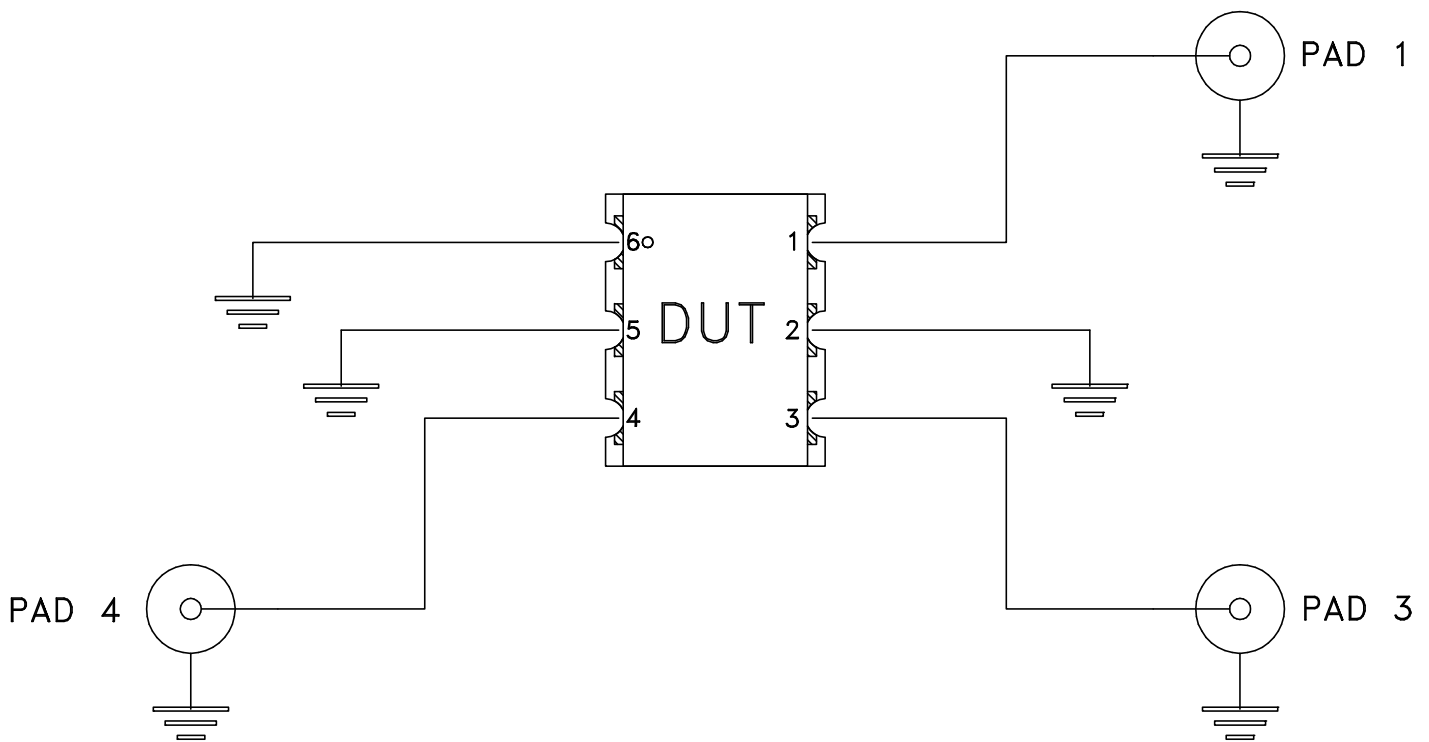
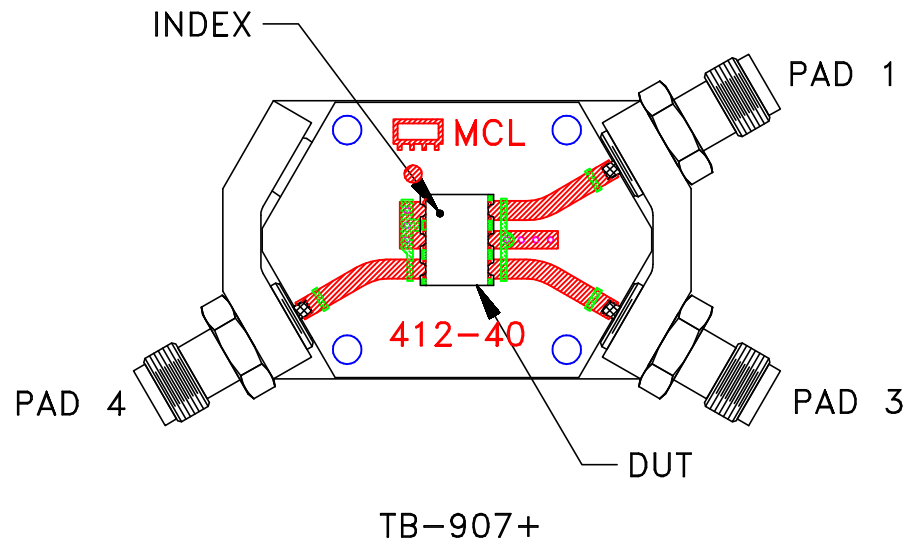
PL, 06BT02, TT1224-2, TB-907+

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SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-511	OR
FILE:	98PL511	SCALE:	8:1
		SHEET:	1 OF 1

# Evaluation Board and Circuit


For Pad connection refer to Data Sheet of the DUT



Schematic Diagram

## Notes:

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

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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