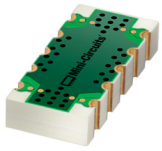
DC Pass, High Power

Bi-Directional Coupler SCBD-25-122HP+

50Ω Up to 100W 800 to 1220 MHz

The Big Deal

- High power handling, up to 100W
- Low mainline loss, 0.1 dB
- High directivity, 24 dB
- Good return loss, 30 dB (input/output/coupling)



CASE STYLE: JB1233-1

Product Overview

Mini-Circuits' SCBD-25-122HP+ bi-directional coupler provides high-power handling up to 100W, low mainline loss, excellent return loss, and high directivity. Covering frequencies from 800 to 1220 MHz, this model supports a wide variety of applications from cellular and ISM to defense communications and more. The coupler is designed into an open printed laminate (0.70 x 0.32 x 0.20") with wrap-around terminations for good solderability and easy visual inspection.

Key Features

Feature	Advantages
Wideband, 800 to 1220 MHz	SCBD-25-122HP+ supports a wide range of system and lab applications.
Low mainline loss, 0.1 dB	Provides excellent through-path signal power transmission.
High directivity, 24 dB	High directivity allows accurate signal sampling through the coupled port with minimal measurement error.
Excellent return loss, 28 - 35 dB (input/output/coupling)	Provides excellent matching for 50Ω systems with minimal signal reflection.
High power handling, 100W	Usable in systems with a wide range of power requirements.
DC current passing up to 2A	Suitable for use in systems where DC power is needed through the RF line.

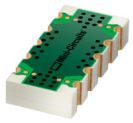
Notes
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DC Pass, High Power

Bi-Directional Coupler

SCBD-25-122HP+

50Ω Up to 100W 800 to 1220 MHz



Generic photo used for illustration purposes only

CASE STYLE: JB1233-1

+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
13"	500

Maximum Ratings

Operating Temperature, case	-55°C to 85°C
Storage Temperature	-55°C to 100°C
DC Current	2A

*Case temperature is defined as temperature on ground leads. Permanent damage may occur if any of these limits are exceeded.

Pad Connections

INPUT	1,2,3,4
OUTPUT	2,1,4,3
COUPLED IN	4,3,2,1
COUPLED OUT	3,4,1,2
GROUND	5

Product Marking: SCBD-01+

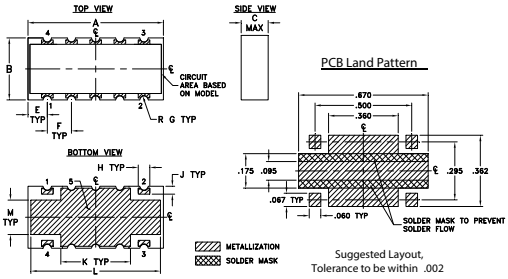
Features

- wide frequency range, 800 to 1220 MHz
- high directivity, 24 dB typ.
- good return loss
- high power, up to 100W
- DC current pass through input to output

Applications

- cellular
- ISM
- defense communication
- GPS
- PCS

Outline Drawing



Outline Dimensions (inch / mm)

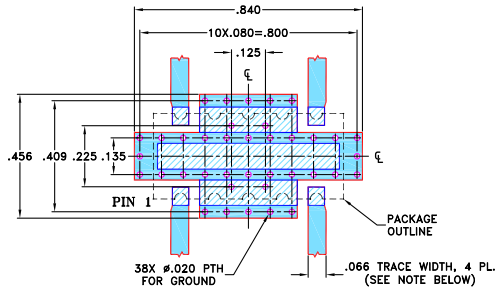
A	B	C	E	F	G
.70	.32	.14	.100	.125	.022
17.78	8.13	3.56	2.54	3.18	0.56

H	J	K	L	M	wt
.060	.040	.360	.670	.175	grams
1.52	1.02	9.14	17.02	4.45	0.80

Demo Board MCL P/N: TB-774+

Suggested PCB Layout (PL-423)**

*** Wraparound solder on ground pins may not be shown*



NOTE: 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)

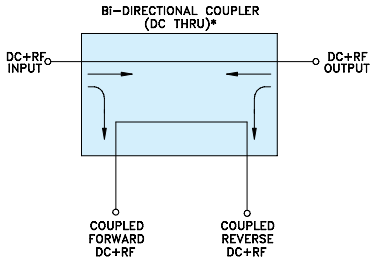
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		800		1220	MHz
Mainline Loss[1]	800-1220	—	0.1	0.2	dB
Coupling	800-1000 1000-1220	— —	25.8±0.9 24.1±0.8	— —	dB
Coupling Flatness (±)	800-1000 1000-1220	— —	0.9 0.8	1.2 1.0	dB
Directivity	800-1220	20	23	—	dB
Return Loss (Input)	800-1220	20	30	—	dB
Return Loss (Output)	800-1220	20	30	—	dB
Return Loss (Coupling)	800-1220	20	30	—	dB
Input Power[2] **(up to +65°C case temp.)**	800-1220	—	—	100	W
Input Power (up to +85°C case temp.)	800-1220	—	—	64	W

1. Include coupling loss.
2. At 65°C with no DC. Derate linearly to 50W at 65°C with 2A DC current.

Electrical Schematic



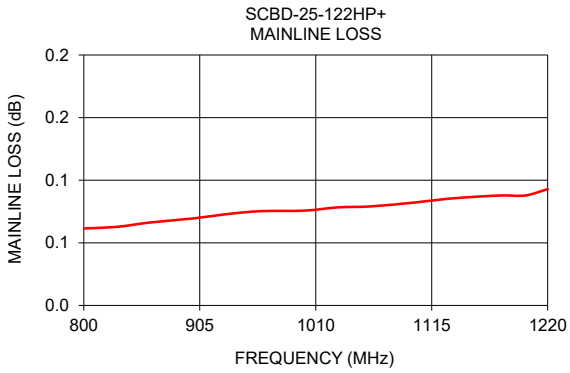
* ELECTRICAL SCHEMATIC IS FOR BI-DIRECTIONAL COUPLER WITHOUT INTERNAL TRANSFORMERS AND RESISTORS.

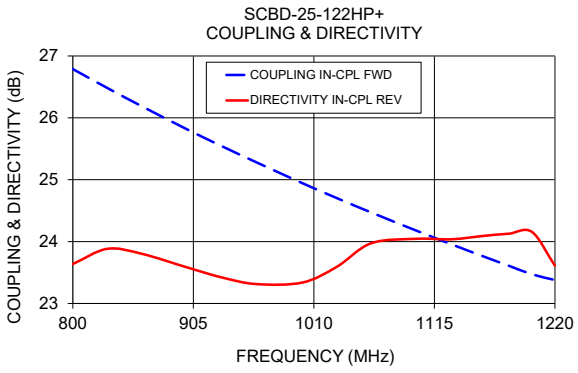
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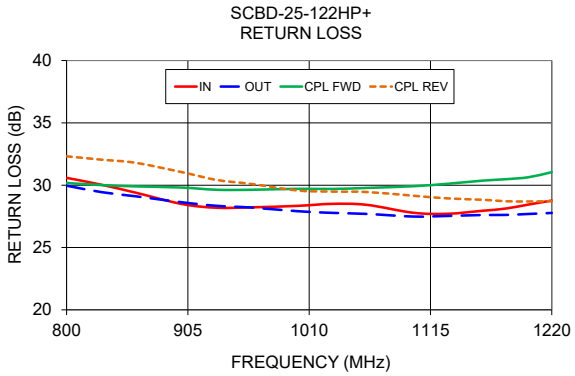
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Typical Performance Data

Frequency (MHz)	Mainline Loss (dB)	Coupling (dB)		Directivity (dB)		Return Loss (dB)			
	In-Out	In-Cpl Fwd	Out-Cpl Rev	Out-Cpl Fwd	In-Cpl Rev	In	Out	Cpl Fwd	Cpl Rev
800	0.06	26.79	26.76	23.60	23.64	30.59	29.96	30.18	32.32
830	0.06	26.48	26.46	23.65	23.88	30.04	29.45	30.01	32.05
860	0.07	26.19	26.16	23.64	23.80	29.39	29.11	29.90	31.79
900	0.07	25.81	25.78	23.47	23.58	28.49	28.63	29.81	31.04
930	0.07	25.54	25.51	23.50	23.42	28.19	28.34	29.63	30.42
960	0.08	25.28	25.25	23.60	23.31	28.22	28.21	29.63	30.10
1000	0.08	24.94	24.92	23.67	23.34	28.34	27.91	29.71	29.57
1030	0.08	24.70	24.68	23.75	23.59	28.50	27.78	29.70	29.49
1060	0.08	24.47	24.44	23.80	23.97	28.42	27.70	29.78	29.45
1100	0.08	24.17	24.14	23.82	24.05	27.79	27.49	29.92	29.16
1130	0.09	23.96	23.92	23.97	24.04	27.71	27.53	30.12	28.94
1160	0.09	23.74	23.71	24.12	24.10	27.95	27.61	30.36	28.83
1180	0.09	23.61	23.57	24.20	24.13	28.12	27.61	30.48	28.71
1200	0.09	23.47	23.43	24.21	24.16	28.45	27.69	30.64	28.69
1220	0.09	23.38	23.26	23.50	23.61	28.77	27.77	31.05	28.71







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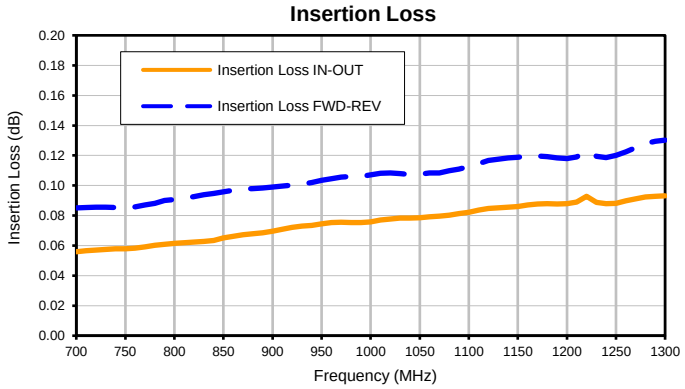
DC PASS

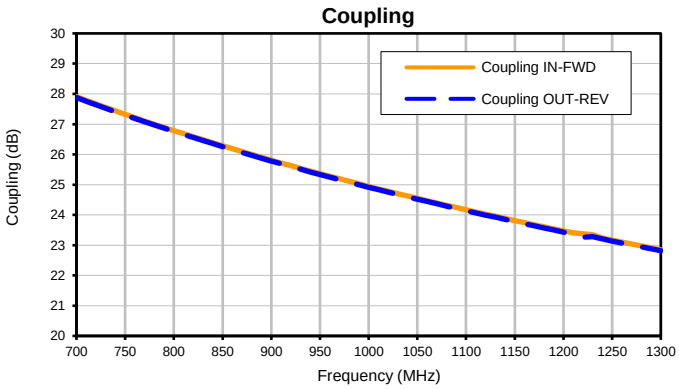
Bi-Directional Coupler SCBD-25-122HP+

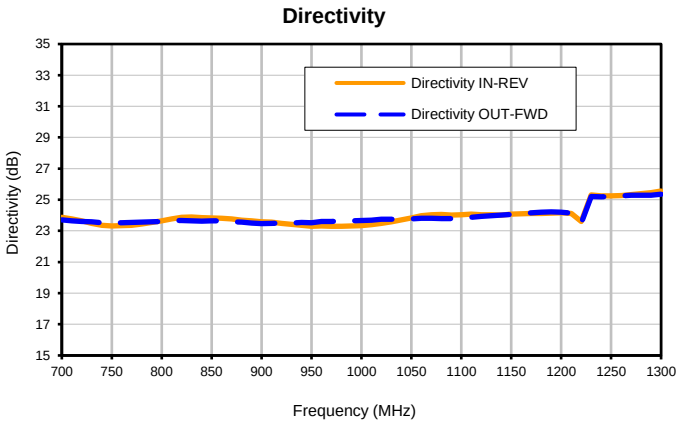
Typical Performance Data

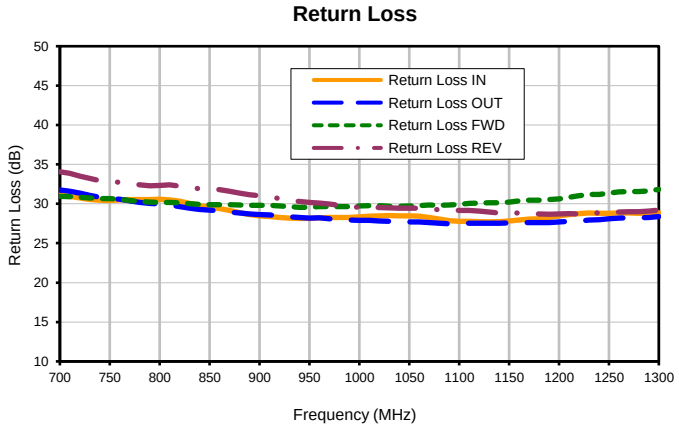
FREQ. (MHz)	INSERTION LOSS (dB)		COUPLING (dB)		DIRECTIVITY (dB)		RETURN LOSS (dB)			
	IN-OUT	FWD-REV	IN-FWD	OUT-REV	IN-REV	OUT-FWD	IN	OUT	FWD	REV
700	0.06	0.09	27.91	27.88	23.88	23.70	31.10	31.76	30.95	34.06
710	0.06	0.09	27.79	27.76	23.77	23.65	30.94	31.60	30.90	33.86
720	0.06	0.09	27.67	27.64	23.64	23.61	30.75	31.35	30.84	33.52
730	0.06	0.09	27.55	27.53	23.47	23.59	30.56	31.08	30.75	33.21
740	0.06	0.09	27.44	27.41	23.36	23.52	30.45	30.82	30.68	32.94
750	0.06	0.09	27.32	27.30	23.31	23.52	30.43	30.68	30.67	32.82
760	0.06	0.09	27.21	27.18	23.33	23.52	30.48	30.58	30.57	32.74
770	0.06	0.09	27.11	27.08	23.36	23.53	30.54	30.37	30.43	32.57
780	0.06	0.09	27.00	26.97	23.43	23.56	30.54	30.19	30.28	32.40
790	0.06	0.09	26.89	26.87	23.54	23.58	30.55	30.05	30.20	32.31
800	0.06	0.09	26.79	26.76	23.64	23.60	30.59	29.96	30.18	32.32
810	0.06	0.09	26.68	26.66	23.76	23.66	30.49	29.84	30.18	32.40
820	0.06	0.09	26.58	26.56	23.86	23.66	30.34	29.66	30.12	32.24
830	0.06	0.09	26.48	26.46	23.88	23.65	30.04	29.45	30.01	32.05
840	0.06	0.09	26.38	26.36	23.85	23.63	29.75	29.28	29.91	31.90
850	0.07	0.10	26.28	26.26	23.83	23.64	29.56	29.20	29.90	31.83
860	0.07	0.10	26.19	26.16	23.80	23.64	29.39	29.11	29.90	31.79
870	0.07	0.10	26.09	26.06	23.76	23.59	29.15	28.96	29.89	31.60
880	0.07	0.10	26.00	25.97	23.68	23.56	28.88	28.82	29.86	31.35
890	0.07	0.10	25.90	25.87	23.65	23.51	28.64	28.70	29.80	31.17
900	0.07	0.10	25.81	25.78	23.58	23.47	28.49	28.63	29.81	31.04
910	0.07	0.10	25.72	25.69	23.55	23.48	28.40	28.59	29.79	30.92
920	0.07	0.10	25.63	25.60	23.48	23.50	28.27	28.48	29.73	30.68
930	0.07	0.10	25.54	25.51	23.42	23.50	28.19	28.34	29.63	30.42
940	0.07	0.10	25.45	25.42	23.36	23.53	28.14	28.26	29.55	30.28
950	0.07	0.10	25.37	25.34	23.31	23.52	28.15	28.20	29.57	30.18
960	0.08	0.10	25.28	25.25	23.31	23.60	28.22	28.21	29.63	30.10
970	0.08	0.11	25.20	25.17	23.29	23.61	28.25	28.12	29.65	29.96
980	0.08	0.11	25.11	25.08	23.30	23.65	28.26	28.03	29.66	29.79
990	0.08	0.11	25.03	25.00	23.32	23.65	28.28	27.93	29.64	29.62
1000	0.08	0.11	24.94	24.92	23.34	23.67	28.34	27.91	29.71	29.57
1010	0.08	0.11	24.86	24.83	23.40	23.69	28.44	27.88	29.77	29.57
1020	0.08	0.11	24.78	24.76	23.48	23.74	28.47	27.84	29.75	29.54
1030	0.08	0.11	24.70	24.68	23.59	23.75	28.50	27.78	29.70	29.49
1040	0.08	0.11	24.62	24.60	23.71	23.77	28.48	27.73	29.68	29.45
1050	0.08	0.11	24.55	24.52	23.83	23.77	28.48	27.71	29.72	29.44
1060	0.08	0.11	24.47	24.44	23.97	23.80	28.42	27.70	29.78	29.45
1070	0.08	0.11	24.39	24.37	24.04	23.81	28.27	27.60	29.86	29.35
1080	0.08	0.11	24.32	24.29	24.06	23.79	28.05	27.52	29.81	29.26
1090	0.08	0.11	24.25	24.22	24.02	23.79	27.85	27.46	29.86	29.18
1100	0.08	0.11	24.17	24.14	24.05	23.82	27.79	27.49	29.92	29.16
1110	0.08	0.11	24.10	24.07	24.08	23.87	27.77	27.53	30.05	29.16
1120	0.08	0.12	24.03	24.00	24.04	23.93	27.73	27.54	30.08	29.07
1130	0.09	0.12	23.96	23.92	24.04	23.97	27.71	27.53	30.12	28.94
1140	0.09	0.12	23.88	23.85	24.02	24.01	27.72	27.52	30.12	28.85
1150	0.09	0.12	23.81	23.78	24.07	24.06	27.83	27.57	30.23	28.83
1160	0.09	0.12	23.74	23.71	24.10	24.12	27.95	27.61	30.36	28.83
1170	0.09	0.12	23.68	23.64	24.11	24.16	28.04	27.63	30.44	28.78
1180	0.09	0.12	23.61	23.57	24.13	24.20	28.12	27.61	30.48	28.71
1190	0.09	0.12	23.54	23.50	24.14	24.22	28.27	27.63	30.52	28.67
1200	0.09	0.12	23.47	23.43	24.16	24.21	28.45	27.69	30.64	28.69
1210	0.09	0.12	23.41	23.36	24.11	24.13	28.61	27.78	30.82	28.75
1220	0.09	0.12	23.38	23.26	23.61	23.50	28.77	27.77	31.05	28.71
1230	0.09	0.12	23.34	23.28	25.30	25.20	28.83	27.96	31.18	28.88
1240	0.09	0.12	23.24	23.21	25.24	25.19	28.78	27.99	31.20	28.85
1250	0.09	0.12	23.17	23.14	25.24	25.20	28.81	28.09	31.36	28.91
1260	0.09	0.12	23.10	23.07	25.27	25.25	28.83	28.20	31.52	28.95
1270	0.09	0.13	23.04	23.01	25.33	25.28	28.84	28.21	31.55	28.99
1280	0.09	0.13	22.97	22.94	25.39	25.28	28.81	28.25	31.55	29.00
1290	0.09	0.13	22.91	22.88	25.46	25.29	28.81	28.28	31.65	29.07
1300	0.09	0.13	22.85	22.82	25.56	25.36	28.87	28.40	31.83	29.18

Typical Performance Curves





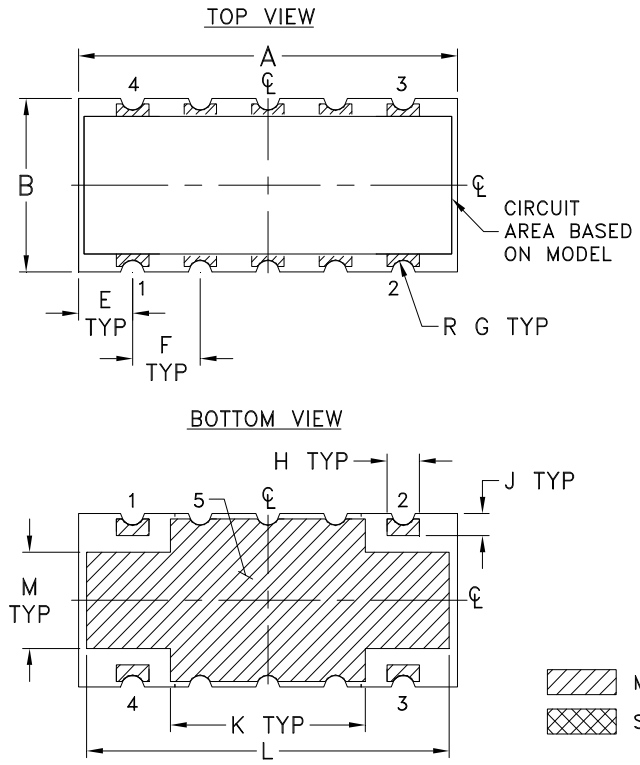




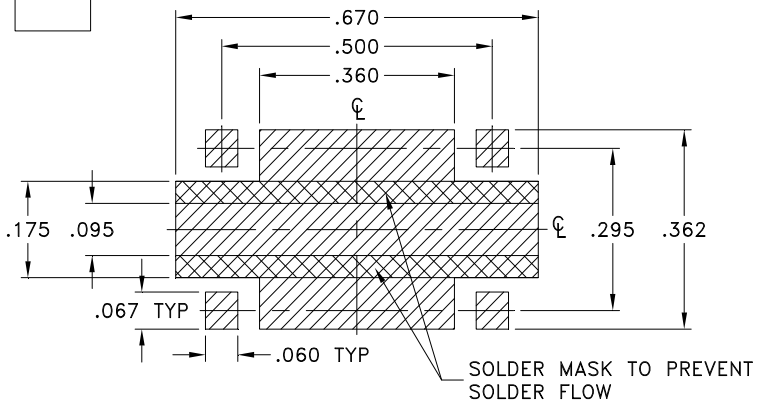
Case Style JB

JB1233-1

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	WT, GRAM
JB1233-1	.70 (17.78)	.32 (8.13)	.14 (3.56)	-- --	.100 (2.54)	.125 (3.17)	.022 (0.56)	.060 (1.52)	.040 (1.02)	.360 (9.14)	.670 (17.02)	.175 (4.45)	0.8

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

Notes:

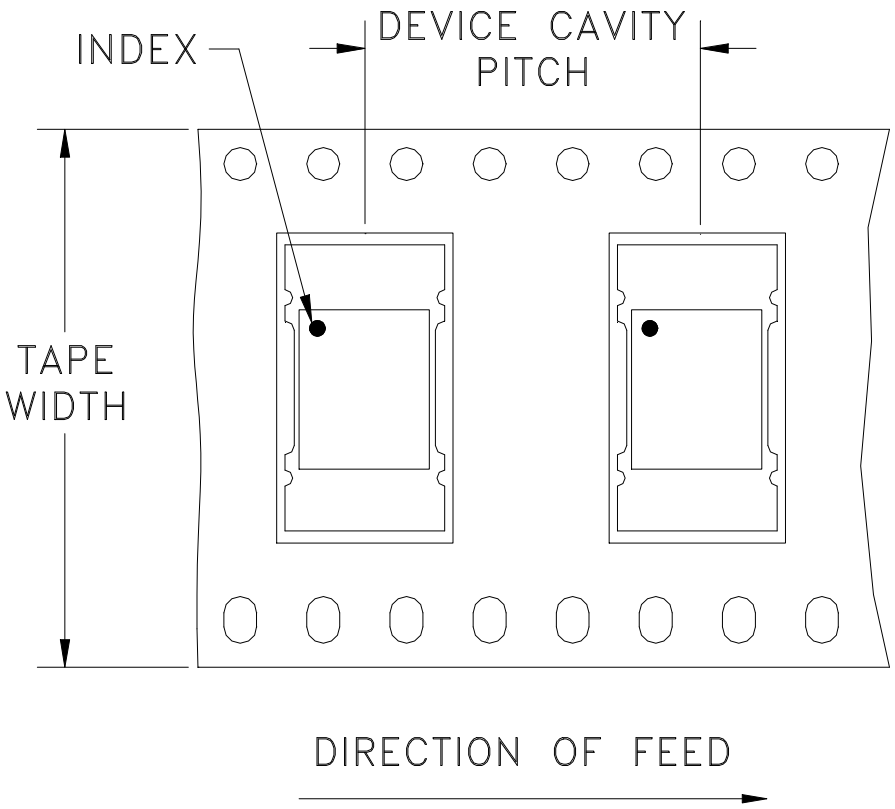
1. Open style, Base material: Printed wiring laminate.
2. Termination finish: 3-5 µ inch (.08-.13 microns) Gold over 120-240 µ inch (3.05-6.10 microns) Nickel plate.
   All models, (+) suffix.

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Tape & Reel Packaging TR-F84

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
32	12	13	500

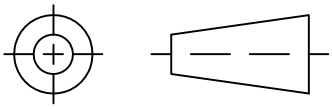
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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

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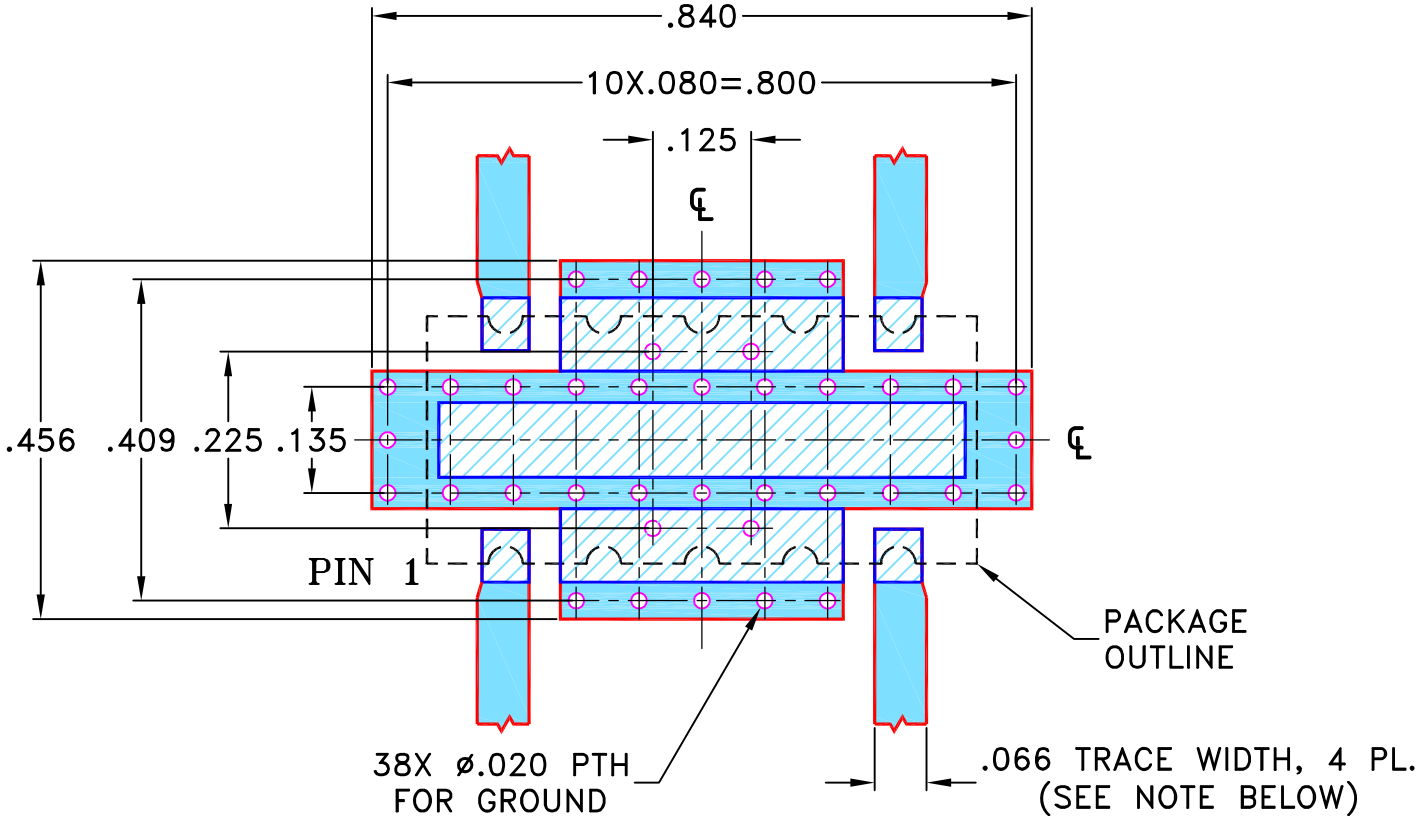
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THIRD ANGLE PROJECTION



REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M147676	NEW RELEASE	07/31/14	ITG	CH

SUGGESTED MOUNTING CONFIGURATION FOR JB1233-1 CASE STYLE, "05DC02" PIN CODE



NOTE: 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

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	ITG	07/30/14
TOLERANCES ON:	CHECKED	GF	07/31/14
2 PL DECIMALS ±	APPROVED	CH	07/31/14
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

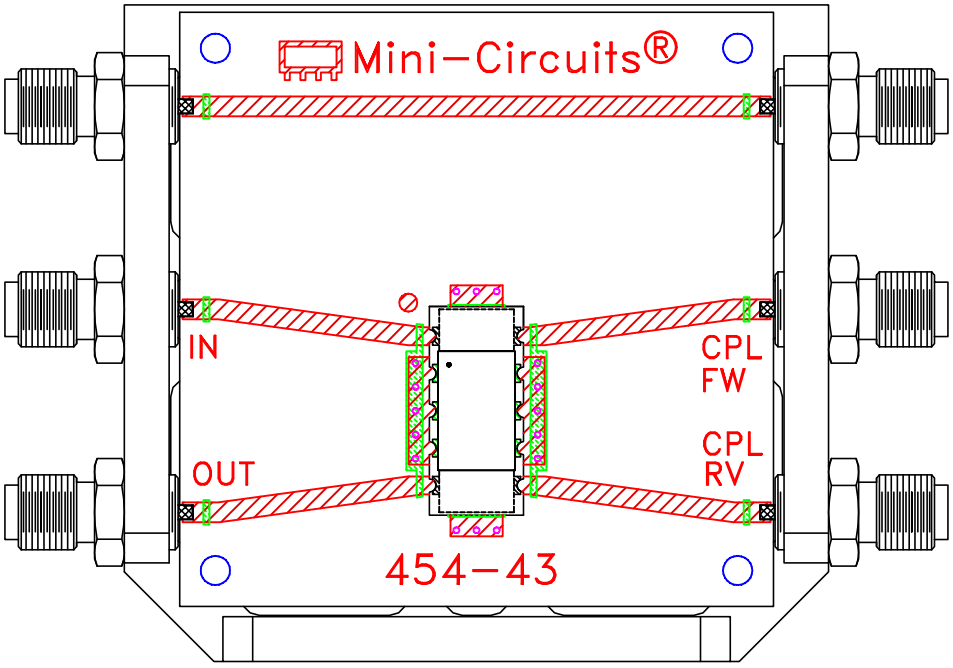
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Brooklyn NY 11235

PL, 05DC02, JB1233-1, TB-774+

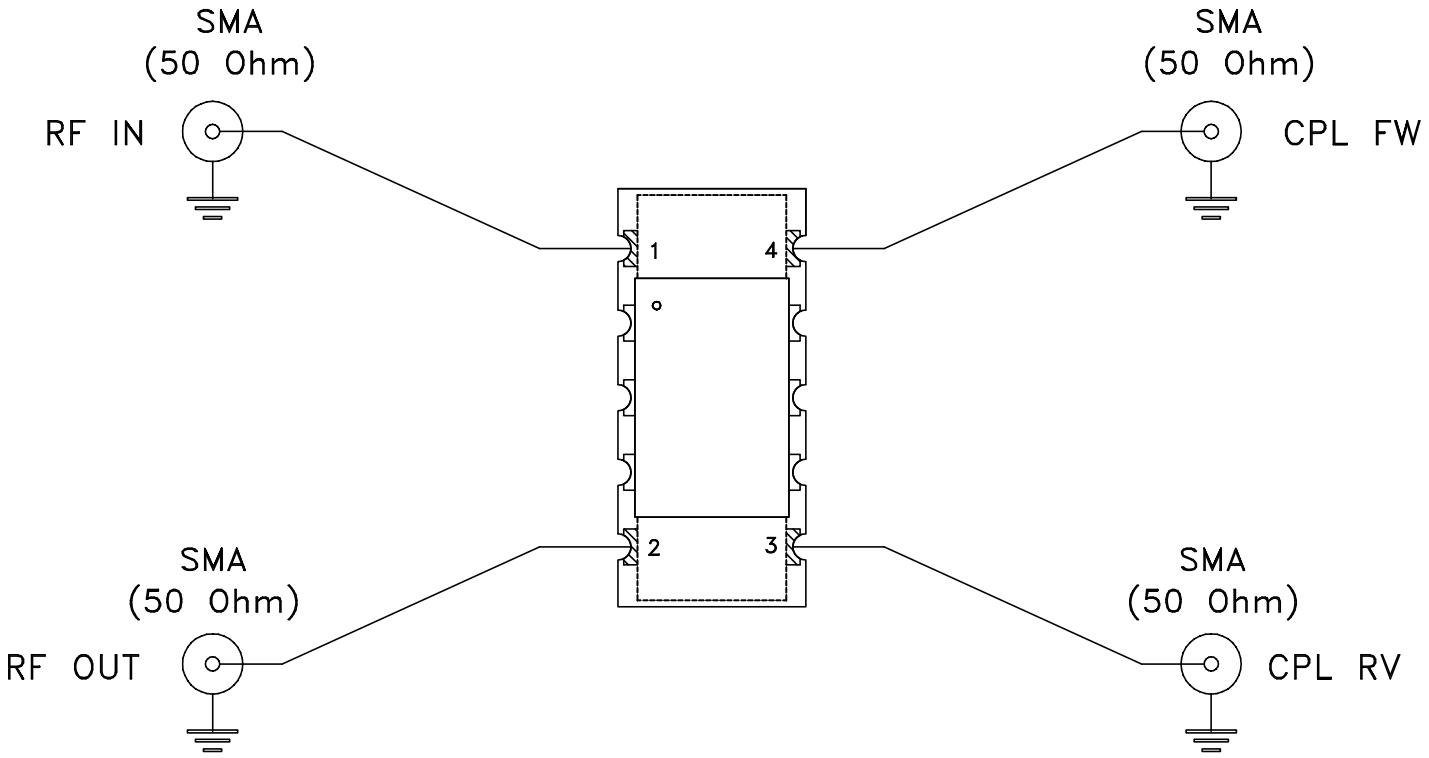
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-423	OR

FILE:	SCALE:	SHEET:
98PL423	4:1	1 OF 1

Evaluation Board and Circuit



TB-774+



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: RO4350 or equivalent.
   Dielectric Constant=3.5, Thickness=.030 inch.

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Environmental Specifications **ENV02T7**

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	-55° to 65° C Case 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, Para 4.2.5, Test S, 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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