Surface Mount

Power Splitter/Combiner

JCPS-6-3

6 Way-0° 50Ω 75 to 425 MHz

Generic photo used for illustration purposes only

CASE STYLE: BG291

Maximum Ratings

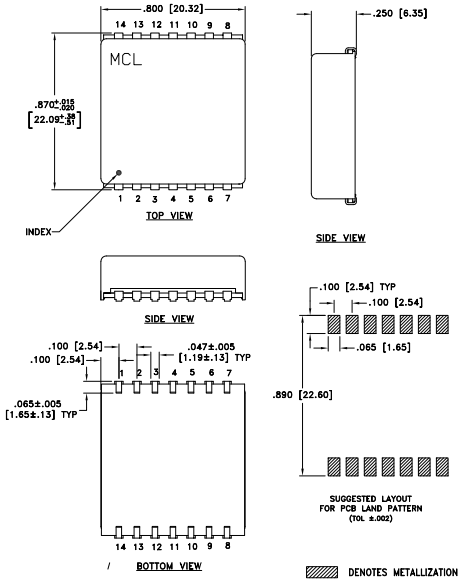
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	0.25W max.
Internal Dissipation	0.5W max.

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

Pin Connections

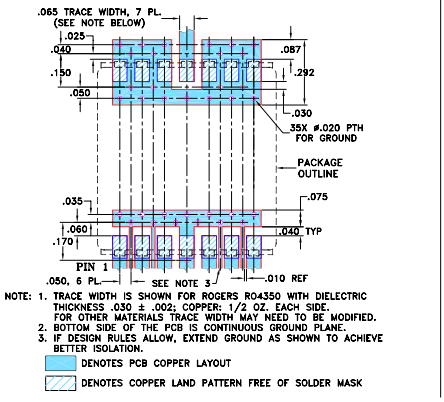
SUM PORT	11
PORT 1	1
PORT 2	2
PORT 3	3
PORT 4	5
PORT 5	6
PORT 6	7
GROUND	4,8,9,10,12,13,14

Outline Drawing



Weight: 4 grams
Dimensions are in inches [mm].
Tolerances: 2 Pl.±.03 [0.76]; 3Pl.±.015 [0.381] inches

Demo Board MCL P/N: TB-234
Suggested PCB Layout (PL-139)



Features

- wideband, 75 to 425 MHz
- good isolation, 23 dB typ.
- excellent amplitude unbalance, 0.1 dB typ.
- good phase unbalance, 2 deg. typ.
- excellent insertion loss flatness, 0.15 dB typ.
- aqueous washable, shielded metal case
- J-leads for good solderability & strain relief

Applications

- VHF receivers
- instrumentation

Electrical Specifications

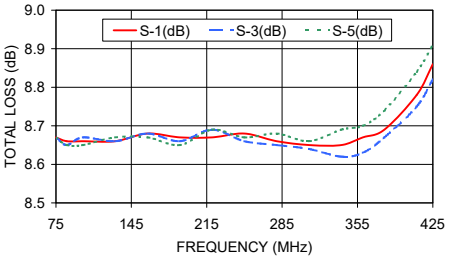
FREQ. RANGE (MHz)	ISOLATION (dB)		INSERTION LOSS (dB) ABOVE 7.8 dB		PHASE UNBALANCE (Degrees)	AMPLITUDE UNBALANCE (dB)
f_L-f_U	Typ.	Min.	Typ.	Max.	Max.	Max.
75-425	23	18	0.9	1.8	9	0.7

Typical Performance Data

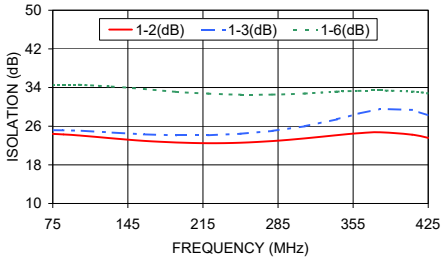
Frequency (MHz)	Total Loss[1] (dB)			Amplitude Unbalance (dB)	Isolation (dB)			Phase Unbal. (deg.)	VSWR S	VSWR 1	VSWR 3
	S-1	S-3	S-5		1-2	1-3	1-6				
75.00	8.67	8.67	8.67	0.01	24.41	25.17	34.51	0.37	1.34	1.27	1.25
85.00	8.66	8.65	8.65	0.02	24.29	25.15	34.60	0.29	1.33	1.25	1.24
100.00	8.66	8.67	8.65	0.02	24.08	25.07	34.55	0.59	1.31	1.23	1.21
130.00	8.66	8.66	8.67	0.01	23.50	24.70	34.21	0.59	1.29	1.20	1.18
160.00	8.68	8.68	8.67	0.02	22.96	24.31	33.71	0.70	1.28	1.17	1.14
190.00	8.67	8.66	8.65	0.03	22.62	24.11	33.11	0.66	1.26	1.15	1.11
220.00	8.67	8.69	8.69	0.02	22.48	24.13	32.74	0.89	1.23	1.12	1.08
250.00	8.68	8.66	8.67	0.05	22.58	24.42	32.52	1.02	1.19	1.10	1.05
280.00	8.66	8.65	8.68	0.05	22.92	25.03	32.54	1.11	1.14	1.07	1.03
310.00	8.65	8.64	8.66	0.07	23.48	26.00	32.75	1.22	1.07	1.05	1.00
340.00	8.65	8.62	8.69	0.09	24.14	27.44	33.15	1.34	1.02	1.04	1.02
360.00	8.67	8.63	8.70	0.11	24.54	28.59	33.30	1.47	1.09	1.04	1.04
380.00	8.69	8.67	8.74	0.11	24.74	29.57	33.39	1.45	1.17	1.05	1.05
410.00	8.78	8.75	8.84	0.11	24.24	29.38	33.18	1.58	1.33	1.07	1.08
425.00	8.86	8.82	8.91	0.12	23.57	28.23	32.80	1.63	1.43	1.09	1.09

1. Total Loss = Insertion Loss + 7.8dB splitter loss.

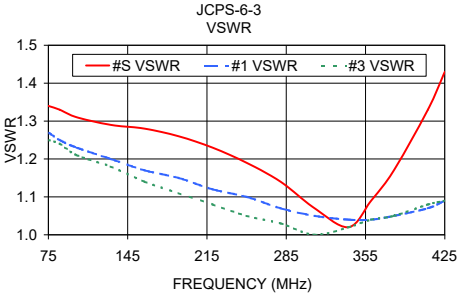
JCPS-6-3
TOTAL LOSS



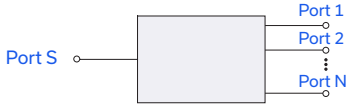
JCPS-6-3
ISOLATION



JCPS-6-3
VSWR



electrical schematic



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.
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M151107
JCPS-6-3
MCL NY
240401

6 Way-0° Power Splitter/Combiner JCPS-6-3

Typical Performance Data

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

FREQ. (MHz)	TOTAL LOSS[1] (dB)			AMP. UNBAL. (dB)	PHASE UNBAL. (deg.)	ISOLATION (dB)			VSWR (:1)		
	S-1	S-3	S-5			1-2	1-3	1-6	S	1	3
25	8.97	8.96	9.00	0.04	0.43	20.65	20.74	28.18	1.92	1.67	1.67
50	8.76	8.76	8.77	0.01	0.39	23.46	23.76	32.69	1.47	1.36	1.35
60	8.74	8.74	8.75	0.01	0.42	23.76	24.14	33.45	1.41	1.32	1.31
70	8.74	8.73	8.74	0.02	0.45	23.84	24.31	33.97	1.38	1.29	1.29
75	8.73	8.73	8.74	0.02	0.47	23.84	24.33	34.19	1.37	1.28	1.27
80	8.73	8.73	8.74	0.01	0.48	23.80	24.33	34.39	1.35	1.27	1.26
90	8.73	8.73	8.74	0.02	0.53	23.68	24.27	34.72	1.34	1.26	1.25
100	8.73	8.73	8.74	0.02	0.58	23.51	24.16	35.01	1.33	1.24	1.23
120	8.74	8.73	8.74	0.02	0.66	23.13	23.87	35.48	1.32	1.22	1.21
140	8.74	8.74	8.75	0.03	0.73	22.72	23.55	35.83	1.31	1.20	1.19
160	8.75	8.74	8.76	0.03	0.83	22.36	23.24	36.09	1.30	1.18	1.17
180	8.76	8.75	8.77	0.04	0.93	22.05	22.98	36.30	1.30	1.17	1.15
200	8.76	8.75	8.77	0.04	0.97	21.81	22.78	36.44	1.29	1.15	1.13
210	8.76	8.75	8.78	0.05	1.05	21.71	22.71	36.53	1.29	1.14	1.12
220	8.77	8.76	8.78	0.05	1.09	21.64	22.65	36.60	1.28	1.13	1.11
230	8.78	8.76	8.78	0.05	1.11	21.58	22.61	36.65	1.28	1.13	1.10
240	8.77	8.75	8.78	0.05	1.14	21.54	22.60	36.73	1.27	1.12	1.10
250	8.78	8.75	8.79	0.06	1.24	21.52	22.60	36.79	1.26	1.11	1.09
260	8.78	8.76	8.79	0.07	1.28	21.53	22.62	36.86	1.25	1.11	1.08
270	8.78	8.76	8.80	0.07	1.28	21.55	22.68	36.93	1.24	1.10	1.07
280	8.78	8.75	8.79	0.08	1.34	21.59	22.74	37.02	1.23	1.09	1.06
290	8.77	8.75	8.79	0.08	1.39	21.65	22.84	37.11	1.22	1.08	1.06
300	8.78	8.74	8.79	0.09	1.46	21.75	22.97	37.22	1.20	1.08	1.05
320	8.77	8.74	8.79	0.09	1.52	22.01	23.31	37.44	1.17	1.06	1.03
340	8.77	8.73	8.79	0.10	1.63	22.35	23.78	37.70	1.13	1.04	1.02
360	8.77	8.73	8.80	0.12	1.68	22.78	24.41	38.02	1.08	1.03	1.01
380	8.77	8.72	8.80	0.13	1.79	23.25	25.19	38.31	1.04	1.01	1.02
400	8.79	8.73	8.82	0.14	1.88	23.70	26.09	38.48	1.05	1.01	1.04
410	8.80	8.74	8.83	0.15	1.94	23.87	26.56	38.51	1.08	1.01	1.04
420	8.82	8.76	8.85	0.15	2.02	23.97	26.98	38.42	1.12	1.02	1.05
425	8.83	8.76	8.86	0.15	1.99	24.01	27.19	38.38	1.14	1.03	1.06
430	8.84	8.78	8.87	0.16	1.99	24.00	27.34	38.31	1.16	1.03	1.06
440	8.87	8.80	8.90	0.17	2.08	23.88	27.53	38.06	1.21	1.04	1.07
450	8.91	8.83	8.94	0.17	2.14	23.64	27.51	37.74	1.26	1.05	1.08
460	8.95	8.87	8.98	0.18	2.21	23.28	27.24	37.28	1.32	1.06	1.08
470	9.01	8.92	9.04	0.18	2.25	22.78	26.70	36.76	1.39	1.07	1.09
480	9.08	8.99	9.10	0.19	2.33	22.18	25.96	36.18	1.46	1.08	1.10
490	9.16	9.07	9.18	0.19	2.34	21.52	25.08	35.55	1.54	1.09	1.11
500	9.24	9.15	9.27	0.20	2.36	20.79	24.12	34.87	1.63	1.10	1.12

[1]Total Loss = Insertion Loss + 7.8dB Splitter Loss

6 Way-0° Power Splitter/Combiner JCPS-6-3

Typical Performance Data

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

FREQ. (MHz)	TOTAL LOSS[1] (dB)			AMP. UNBAL. (dB)	PHASE UNBAL. (deg.)	ISOLATION (dB)			VSWR (:1)		
	S-1	S-3	S-5			1-2	1-3	1-6	S	1	3
25	9.12	9.12	9.17	0.07	0.33	20.52	20.59	26.19	2.08	1.89	1.88
50	8.82	8.82	8.85	0.04	0.41	23.05	23.33	30.50	1.54	1.44	1.44
60	8.79	8.79	8.82	0.04	0.42	23.35	23.71	31.37	1.47	1.39	1.38
70	8.78	8.78	8.81	0.04	0.45	23.44	23.88	32.01	1.43	1.36	1.35
75	8.78	8.78	8.80	0.03	0.48	23.44	23.92	32.27	1.41	1.35	1.34
80	8.77	8.77	8.80	0.03	0.49	23.41	23.92	32.50	1.40	1.33	1.33
90	8.77	8.77	8.79	0.04	0.54	23.29	23.86	32.93	1.38	1.32	1.31
100	8.76	8.76	8.78	0.04	0.58	23.14	23.76	33.33	1.37	1.30	1.29
120	8.76	8.75	8.78	0.04	0.66	22.78	23.48	34.07	1.35	1.27	1.26
140	8.75	8.74	8.78	0.05	0.71	22.40	23.19	34.77	1.35	1.25	1.23
160	8.75	8.74	8.77	0.06	0.77	22.09	22.93	35.44	1.34	1.22	1.21
180	8.74	8.74	8.78	0.06	0.88	21.84	22.72	36.05	1.34	1.20	1.18
200	8.74	8.73	8.77	0.07	0.93	21.66	22.58	36.59	1.33	1.19	1.17
210	8.74	8.73	8.78	0.08	0.97	21.59	22.54	36.84	1.33	1.18	1.16
220	8.75	8.73	8.78	0.08	1.00	21.55	22.51	37.07	1.32	1.17	1.15
230	8.74	8.72	8.77	0.08	1.03	21.52	22.51	37.28	1.31	1.16	1.14
240	8.74	8.72	8.77	0.09	1.05	21.52	22.52	37.48	1.31	1.15	1.13
250	8.73	8.71	8.77	0.09	1.14	21.54	22.56	37.66	1.29	1.14	1.12
260	8.73	8.71	8.77	0.10	1.14	21.58	22.63	37.84	1.28	1.13	1.11
270	8.73	8.70	8.77	0.10	1.18	21.64	22.71	38.02	1.27	1.13	1.10
280	8.72	8.69	8.76	0.10	1.25	21.72	22.82	38.21	1.26	1.12	1.09
290	8.71	8.68	8.75	0.11	1.29	21.83	22.95	38.35	1.24	1.11	1.08
300	8.71	8.67	8.75	0.11	1.35	21.97	23.13	38.51	1.23	1.10	1.07
320	8.70	8.66	8.75	0.13	1.42	22.31	23.57	38.84	1.19	1.08	1.06
340	8.68	8.64	8.73	0.13	1.48	22.76	24.15	39.14	1.15	1.07	1.04
360	8.68	8.63	8.73	0.15	1.52	23.32	24.93	39.48	1.10	1.05	1.03
380	8.67	8.62	8.73	0.16	1.60	23.94	25.91	39.76	1.04	1.03	1.02
400	8.68	8.62	8.73	0.17	1.72	24.54	27.09	39.90	1.03	1.01	1.03
410	8.69	8.63	8.74	0.18	1.75	24.78	27.73	39.84	1.06	1.01	1.03
420	8.70	8.64	8.76	0.18	1.82	24.91	28.32	39.68	1.10	1.01	1.04
425	8.72	8.65	8.77	0.18	1.78	24.96	28.61	39.59	1.13	1.01	1.04
430	8.72	8.66	8.78	0.19	1.79	24.95	28.83	39.46	1.15	1.02	1.05
440	8.75	8.67	8.81	0.20	1.90	24.80	29.09	39.13	1.20	1.03	1.05
450	8.78	8.70	8.84	0.20	1.97	24.48	29.02	38.70	1.25	1.04	1.06
460	8.82	8.74	8.88	0.20	1.99	24.02	28.58	38.14	1.31	1.05	1.07
470	8.87	8.79	8.93	0.21	2.05	23.39	27.79	37.48	1.38	1.06	1.08
480	8.93	8.84	8.99	0.21	2.14	22.66	26.76	36.81	1.46	1.07	1.09
490	9.02	8.92	9.07	0.22	2.21	21.87	25.64	36.11	1.54	1.08	1.10
500	9.09	9.00	9.15	0.22	2.24	21.05	24.50	35.35	1.63	1.10	1.11

[1]Total Loss = Insertion Loss + 7.8dB Splitter Loss

6 Way-0° Power Splitter/Combiner JCPS-6-3

Typical Performance Data

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

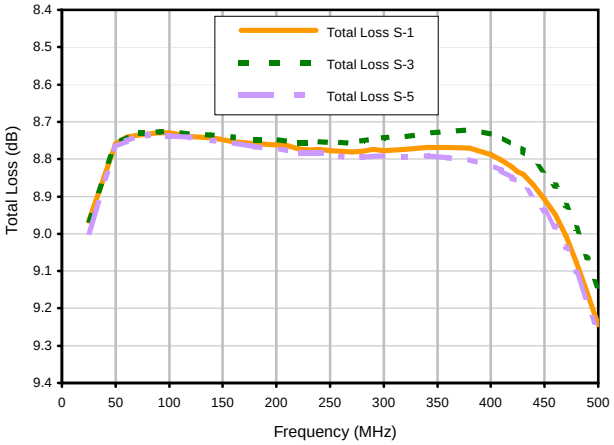
FREQ. (MHz)	TOTAL LOSS[1] (dB)			AMP. UNBAL. (dB)	PHASE UNBAL. (deg.)	ISOLATION (dB)			VSWR (:1)		
	S-1	S-3	S-5			1-2	1-3	1-6	S	1	3
25	8.98	8.98	9.01	0.04	0.46	21.12	21.22	28.70	1.85	1.63	1.62
50	8.81	8.81	8.82	0.02	0.46	23.71	24.02	32.28	1.44	1.37	1.36
60	8.79	8.80	8.81	0.01	0.49	23.92	24.33	32.88	1.39	1.33	1.33
70	8.79	8.78	8.80	0.01	0.51	23.96	24.43	33.32	1.36	1.31	1.30
75	8.78	8.78	8.80	0.02	0.50	23.93	24.44	33.51	1.35	1.29	1.29
80	8.78	8.78	8.79	0.02	0.54	23.87	24.43	33.68	1.34	1.28	1.28
90	8.78	8.78	8.79	0.02	0.61	23.73	24.33	34.00	1.32	1.27	1.26
100	8.78	8.78	8.80	0.03	0.64	23.54	24.20	34.27	1.31	1.25	1.24
120	8.79	8.79	8.80	0.02	0.75	23.14	23.88	34.75	1.30	1.22	1.22
140	8.80	8.79	8.81	0.03	0.84	22.73	23.55	35.15	1.29	1.21	1.19
160	8.81	8.80	8.82	0.03	0.90	22.36	23.24	35.47	1.28	1.19	1.18
180	8.81	8.81	8.83	0.04	1.05	22.05	22.98	35.73	1.28	1.17	1.16
200	8.82	8.81	8.83	0.04	1.09	21.81	22.77	35.94	1.27	1.15	1.14
210	8.82	8.81	8.83	0.05	1.16	21.71	22.70	36.05	1.26	1.14	1.13
220	8.83	8.82	8.84	0.05	1.21	21.63	22.64	36.14	1.25	1.13	1.11
230	8.83	8.82	8.84	0.05	1.25	21.58	22.59	36.23	1.25	1.13	1.11
240	8.83	8.81	8.84	0.05	1.32	21.54	22.57	36.32	1.24	1.12	1.10
250	8.84	8.82	8.85	0.06	1.34	21.52	22.58	36.41	1.23	1.11	1.09
260	8.84	8.82	8.85	0.06	1.42	21.53	22.60	36.52	1.22	1.10	1.08
270	8.84	8.82	8.86	0.07	1.42	21.54	22.65	36.61	1.21	1.09	1.07
280	8.84	8.82	8.86	0.07	1.51	21.59	22.71	36.71	1.20	1.09	1.06
290	8.84	8.82	8.86	0.08	1.54	21.66	22.81	36.82	1.19	1.08	1.05
300	8.84	8.81	8.86	0.08	1.65	21.75	22.94	36.93	1.18	1.07	1.05
320	8.85	8.82	8.87	0.09	1.72	22.00	23.27	37.20	1.14	1.06	1.03
340	8.85	8.81	8.87	0.10	1.80	22.34	23.74	37.47	1.11	1.04	1.01
360	8.85	8.81	8.88	0.12	1.88	22.79	24.37	37.76	1.07	1.02	1.01
380	8.86	8.81	8.89	0.12	1.98	23.27	25.15	37.98	1.04	1.01	1.02
400	8.88	8.83	8.91	0.14	2.10	23.73	26.06	38.07	1.07	1.01	1.04
410	8.90	8.84	8.92	0.14	2.14	23.93	26.55	38.04	1.10	1.02	1.05
420	8.92	8.87	8.95	0.14	2.20	24.05	27.00	37.90	1.14	1.03	1.06
425	8.93	8.87	8.96	0.15	2.20	24.09	27.23	37.82	1.16	1.03	1.06
430	8.95	8.89	8.97	0.15	2.21	24.08	27.39	37.70	1.18	1.04	1.06
440	8.98	8.91	9.01	0.16	2.34	23.98	27.62	37.42	1.23	1.05	1.07
450	9.02	8.95	9.04	0.16	2.38	23.76	27.64	37.09	1.28	1.06	1.08
460	9.07	8.99	9.09	0.17	2.40	23.41	27.42	36.59	1.34	1.06	1.09
470	9.13	9.05	9.15	0.18	2.48	22.91	26.92	36.08	1.40	1.07	1.10
480	9.20	9.11	9.22	0.18	2.54	22.32	26.18	35.50	1.47	1.08	1.11
490	9.28	9.19	9.30	0.18	2.57	21.66	25.32	34.87	1.55	1.09	1.11
500	9.37	9.28	9.39	0.19	2.61	20.94	24.35	34.25	1.64	1.11	1.12

[1]Total Loss = Insertion Loss + 7.8dB Splitter Loss

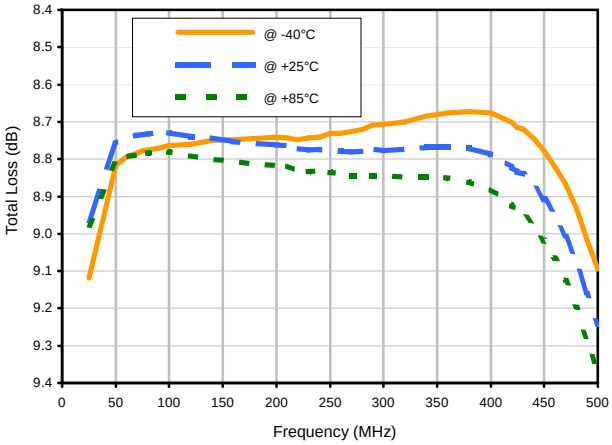
6 Way-0° Power Splitter/Combiner JCPS-6-3

Typical Performance Curves

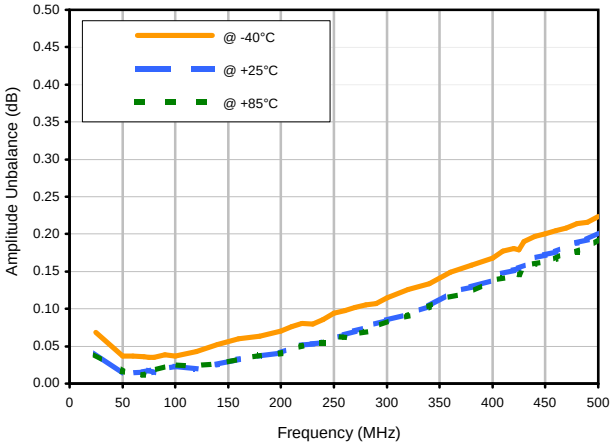
Total Loss



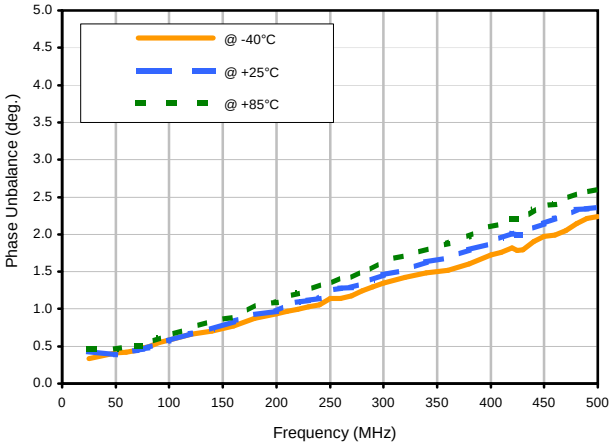
Total Loss S-1 vs. TEMPERATURE



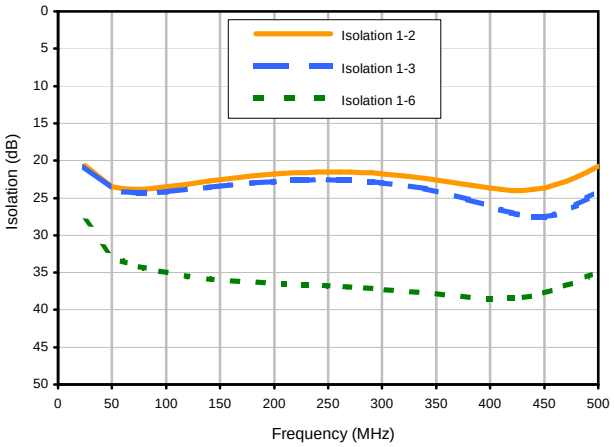
Amplitude Unbalance vs. TEMPERATURE



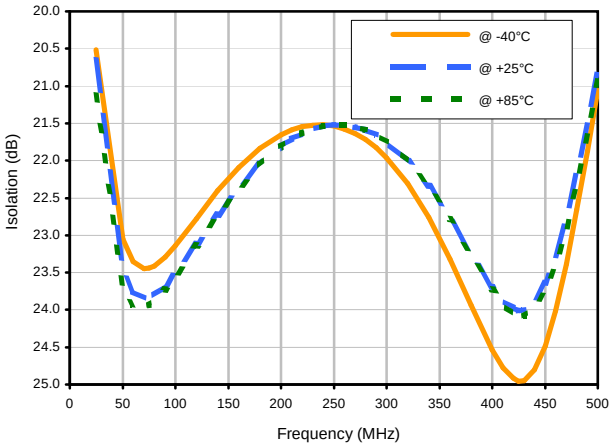
Phase Unbalance vs. TEMPERATURE



Isolation



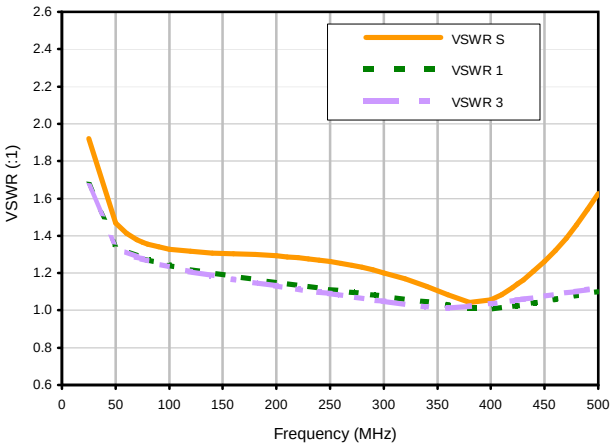
Isolation 1-2 vs. TEMPERATURE



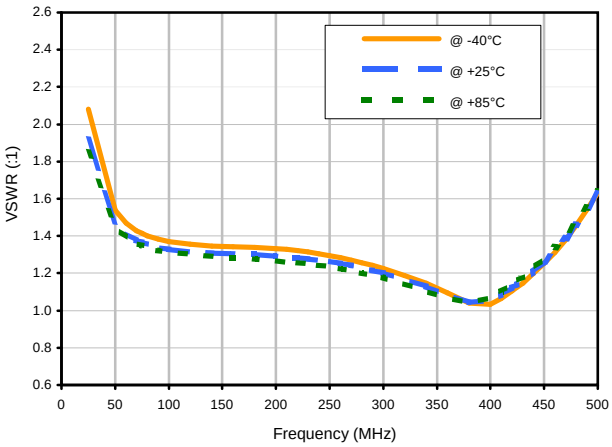
6 Way-0° Power Splitter/Combiner JCPS-6-3

Typical Performance Curves

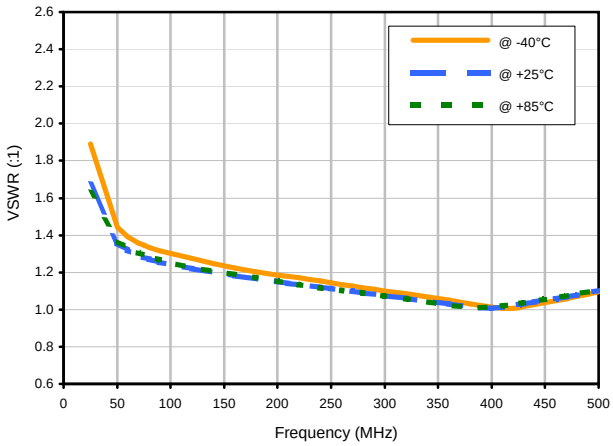
VSWR



VSWR SUM vs. TEMPERATURE

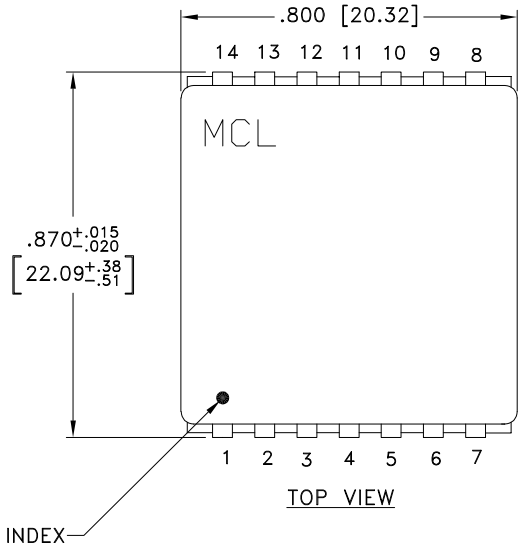


VSWR OUT2 vs. TEMPERATURE

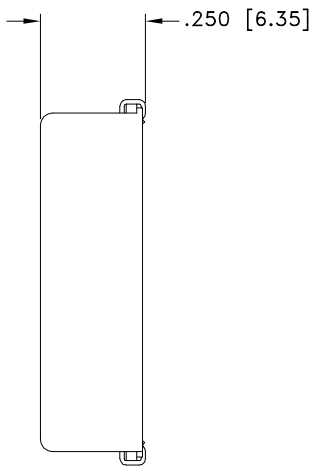


Case Style BG

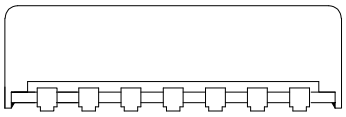
Outline Dimensions BG291



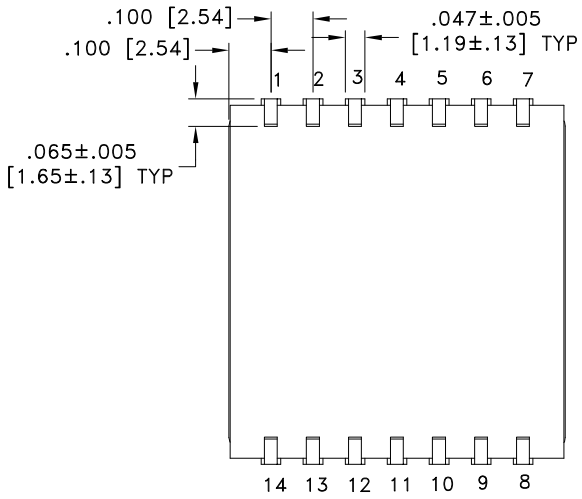
TOP VIEW



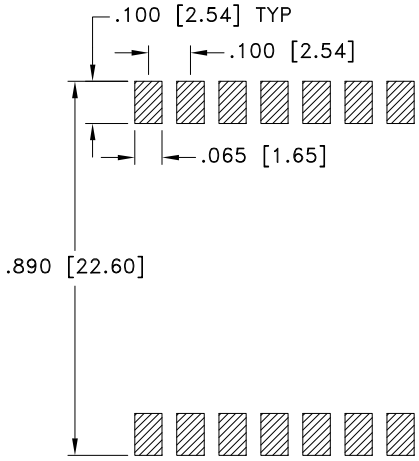
SIDE VIEW



SIDE VIEW



BOTTOM VIEW



SUGGESTED LAYOUT
FOR PCB LAND PATTERN
(TOL ±.002)

DENOTES METALLIZATION

Weight: 4 gram

Dimensions are in inches[mm]. Tolerances: 2PL.±0.03[0.76]; 3 Pl.± 0.015 [0.381] inches[mm], unless otherwise specified

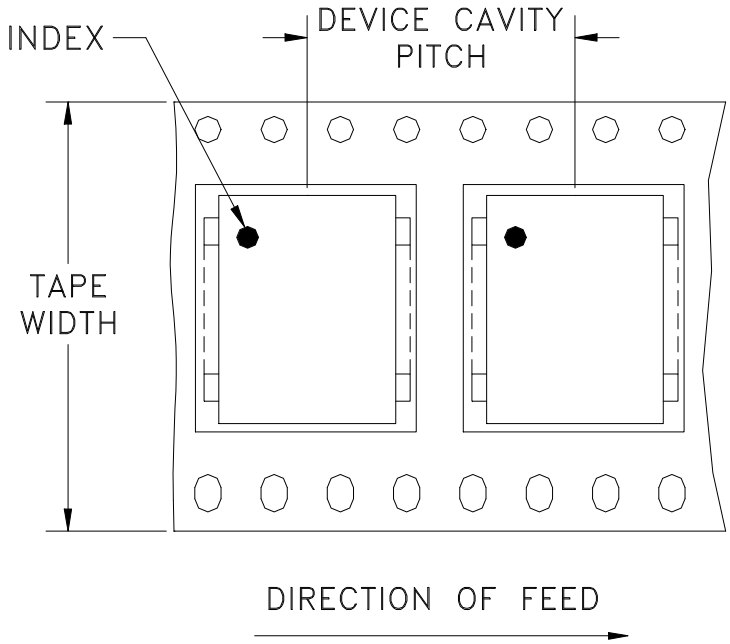
Notes:

1. Case material: Copper-Nickel alloy.
2. Base material: Printed wiring laminate.
3. 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.

Tape & Reel Packaging TR-F21

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
32	32	13	200

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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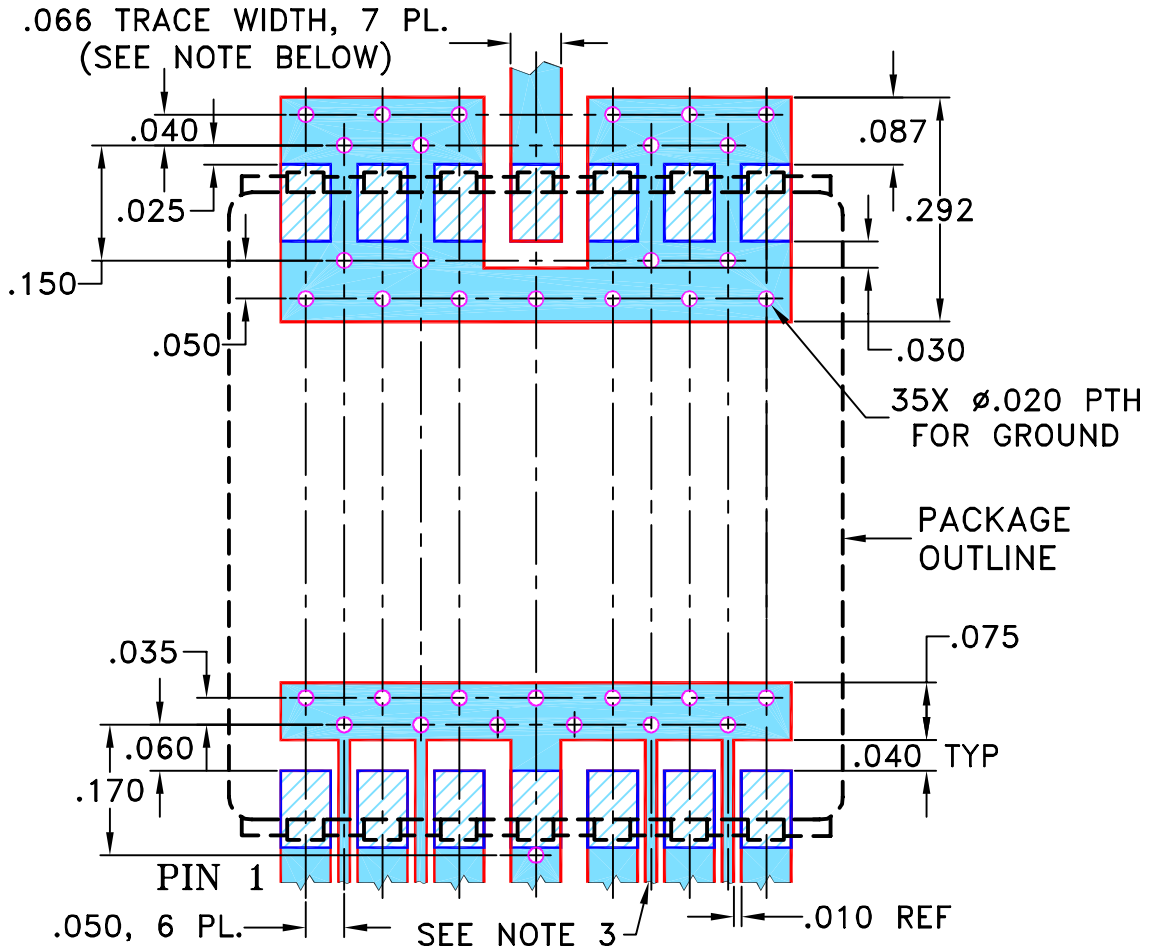
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M88786	NEW RELEASE	10/06/05	MMG	HY
A	M102713	ADDED"...WITH SMOBC"	01/16/06	GF	IL

SUGGESTED MOUNTING CONFIGURATION FOR BG291 CASE STYLE, "mf" PIN CONNECTION



NOTES: 1.TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; 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.IF DESIGN RULES ALLOW, EXTEND GROUND AS SHOWN TO ACHIEVE BETTER ISOLATION.

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	MMG	09/28/05
TOLERANCES ON:	CHECKED	AV	10/06/05
2 PL DECIMALS ±	APPROVED	HY	10/06/05
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

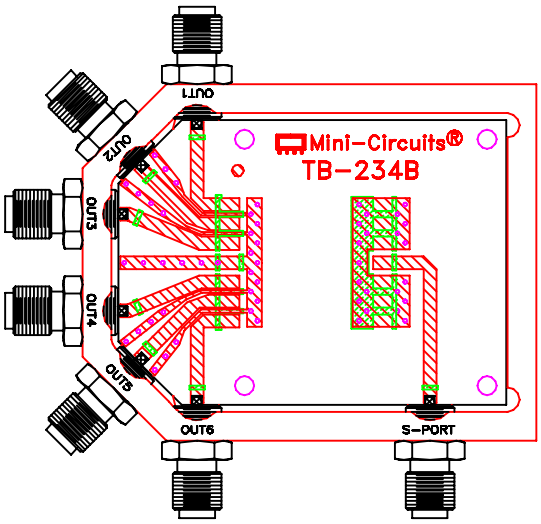
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, mf, BG291, JCPS-6-3, TB-234

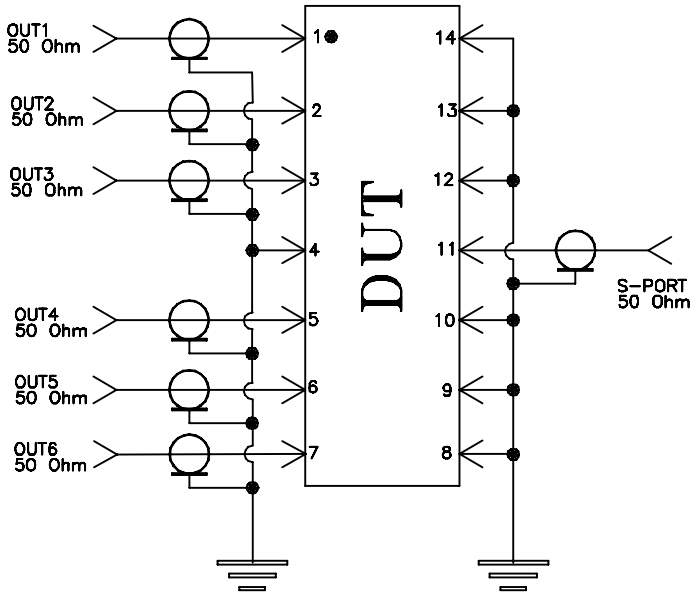
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-139	A

FILE:	SCALE:	SHEET:
98PL139	4:1	1 OF 1

Evaluation Board and Circuit



TB-234



Schematic Diagram

Notes:

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

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Environmental Specifications ENV02T1

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