

Surface Mount Power Splitter/Combiner

ADPQ-2-250+ ADPQ-2-250

2 Way-90° 50Ω 150 to 250 MHz

Maximum Ratings

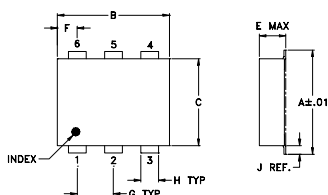
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	1W max.

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

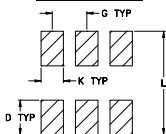
Pin Connections

SUM PORT	6
PORT 1 (0°)	4
PORT 2 (+90°)	1
GROUND	2,5
50 OHM TERM EXTERNAL	3

Outline Drawing



PCB Land Pattern

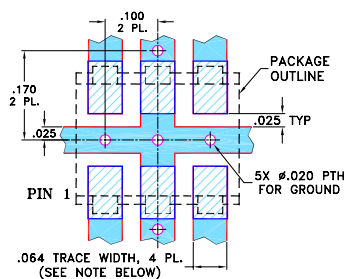


Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K	L	wt grams
.272	.310	.220	.100	.206	.055	.100	.076	.026	.065	.300	0.40
6.91	7.87	5.59	2.54	5.23	1.40	2.54	0.66	0.66	1.65	7.62	0.40

Demo Board MCL P/N: TB-211 Suggested PCB Layout (PL-097)



- NOTES: 1. 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.
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-Circuit's 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-Circuit's website at www.minicircuits.com/MCLStore/terms.jsp

Features

- excellent amplitude unbalance, 0.7 dB typ. and phase unbalance, 0.4 dB typ.
- very low insertion loss, 0.2 dB typ.
- excellent VSWR, 1.15 typ.
- excellent isolation, 24 dB typ.
- aqueous washable
- protected under U.S. Patent 6,133,525

Applications

- VHF TV



Generic photo used for illustration purposes only

CASE STYLE: CD637

+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"	900

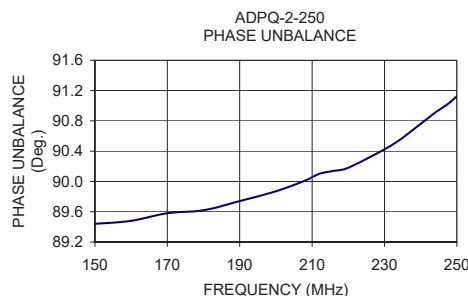
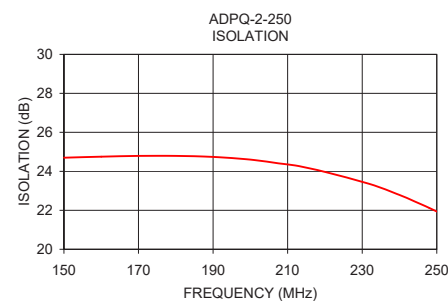
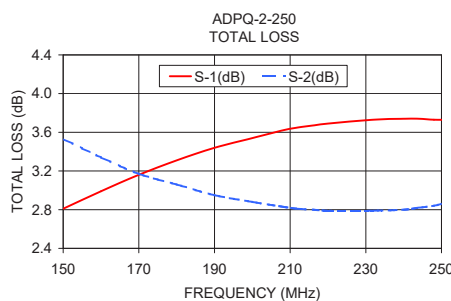
Electrical Specifications

FREQ. RANGE (MHz)	ISOLATION (dB)	INSERTION LOSS (dB) Avg. of Coupled Outputs ABOVE 3 dB	PHASE UNBALANCE (Degrees)	AMPLITUDE UNBALANCE (dB)
f_L - f_U	Typ. Min.	Typ. Max.	Max.	Max.
150-250	24 17	0.2 0.7	4	1.4

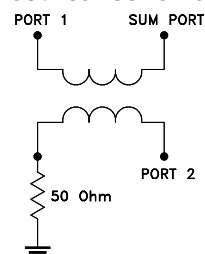
Typical Performance Data

Frequency (MHz)	Total Loss ¹ (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR S	VSWR 1	VSWR 2
	S-1	S-2						
150.00	2.81	3.53	0.72	24.70	89.44	1.13	1.13	1.14
160.00	2.99	3.34	0.34	24.75	89.48	1.14	1.14	1.14
170.00	3.16	3.17	0.01	24.79	89.58	1.14	1.14	1.15
180.00	3.31	3.06	0.25	24.79	89.62	1.14	1.14	1.15
190.00	3.44	2.95	0.49	24.74	89.74	1.15	1.15	1.16
200.00	3.54	2.88	0.67	24.60	89.87	1.15	1.15	1.17
208.00	3.62	2.83	0.78	24.40	90.01	1.16	1.15	1.17
212.00	3.65	2.81	0.83	24.30	90.10	1.16	1.16	1.18
216.00	3.67	2.80	0.87	24.15	90.14	1.16	1.16	1.18
220.00	3.69	2.79	0.90	23.97	90.18	1.16	1.16	1.18
232.00	3.73	2.79	0.94	23.35	90.48	1.17	1.17	1.20
240.00	3.74	2.80	0.94	22.79	90.76	1.18	1.18	1.21
244.00	3.74	2.82	0.92	22.46	90.91	1.19	1.18	1.22
248.00	3.73	2.84	0.89	22.12	91.04	1.19	1.19	1.22
252.00	3.73	2.88	0.85	21.75	91.22	1.20	1.19	1.23

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



electrical schematic



2 Way-90° Power Splitter/Combiner

ADPQ-2-250+

Typical Performance Data

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

FREQ. (MHz)	TOTAL LOSS ¹			AMP. UNBAL. (dB)	PHASE UNBAL. From 90° (deg.)	ISOLATION (dB) 1-2	VSWR		
	(dB)						(:1)		
	S-1	S-2	AVG.				S	1	2
80	1.26	6.42	3.84	5.16	0.63	26.20	1.12	1.11	1.11
85	1.38	6.06	3.72	4.68	0.67	26.02	1.12	1.11	1.11
90	1.50	5.74	3.62	4.23	0.69	25.87	1.12	1.11	1.12
95	1.63	5.44	3.54	3.82	0.71	25.74	1.12	1.11	1.12
100	1.75	5.18	3.46	3.43	0.73	25.65	1.13	1.12	1.12
105	1.87	4.93	3.40	3.06	0.72	25.57	1.13	1.12	1.12
110	1.99	4.71	3.35	2.72	0.73	25.54	1.13	1.12	1.12
115	2.11	4.51	3.31	2.40	0.70	25.52	1.13	1.12	1.13
120	2.23	4.32	3.27	2.10	0.71	25.52	1.13	1.12	1.13
125	2.34	4.15	3.25	1.81	0.69	25.55	1.13	1.12	1.13
130	2.45	4.00	3.23	1.55	0.71	25.60	1.13	1.12	1.13
135	2.56	3.86	3.21	1.30	0.69	25.66	1.13	1.12	1.13
140	2.67	3.73	3.20	1.06	0.66	25.75	1.13	1.12	1.13
145	2.77	3.61	3.19	0.84	0.65	25.83	1.13	1.12	1.13
150	2.87	3.50	3.18	0.64	0.61	25.92	1.13	1.12	1.13
155	2.96	3.40	3.18	0.44	0.60	26.01	1.13	1.12	1.13
160	3.05	3.31	3.18	0.27	0.58	26.13	1.13	1.12	1.13
165	3.13	3.23	3.18	0.10	0.53	26.20	1.13	1.12	1.13
170	3.21	3.16	3.18	0.06	0.54	26.27	1.13	1.13	1.13
175	3.28	3.09	3.19	0.20	0.50	26.33	1.13	1.13	1.13
180	3.36	3.03	3.19	0.33	0.43	26.38	1.13	1.13	1.13
185	3.43	2.98	3.20	0.45	0.41	26.40	1.13	1.13	1.13
190	3.49	2.94	3.21	0.55	0.35	26.41	1.13	1.13	1.13
195	3.54	2.89	3.22	0.65	0.31	26.39	1.13	1.13	1.13
200	3.59	2.86	3.22	0.73	0.22	26.32	1.14	1.13	1.14
205	3.63	2.83	3.23	0.81	0.18	26.24	1.14	1.13	1.14
210	3.67	2.81	3.24	0.86	0.11	26.11	1.14	1.14	1.14
215	3.70	2.79	3.25	0.91	0.04	25.93	1.15	1.14	1.15
220	3.73	2.79	3.26	0.95	0.03	25.69	1.15	1.14	1.15
225	3.76	2.78	3.27	0.97	0.15	25.39	1.15	1.15	1.15
230	3.77	2.79	3.28	0.98	0.26	25.04	1.16	1.15	1.16
235	3.77	2.80	3.28	0.98	0.41	24.61	1.16	1.16	1.17
240	3.77	2.81	3.29	0.96	0.53	24.15	1.17	1.16	1.17
245	3.77	2.84	3.30	0.93	0.73	23.65	1.18	1.17	1.18
250	3.76	2.87	3.31	0.89	0.92	23.11	1.18	1.18	1.19
255	3.74	2.91	3.33	0.82	1.12	22.51	1.19	1.19	1.20
260	3.72	2.97	3.34	0.75	1.38	21.87	1.20	1.20	1.21
265	3.69	3.04	3.36	0.65	1.67	21.21	1.22	1.21	1.22
270	3.65	3.12	3.38	0.53	2.00	20.52	1.23	1.23	1.24
275	3.61	3.21	3.41	0.40	2.43	19.81	1.24	1.25	1.25
280	3.56	3.31	3.44	0.25	2.88	19.08	1.26	1.26	1.27
285	3.51	3.43	3.47	0.07	3.46	18.33	1.28	1.28	1.29
290	3.45	3.58	3.52	0.13	4.12	17.58	1.30	1.31	1.31
295	3.39	3.75	3.57	0.36	4.92	16.82	1.33	1.33	1.34
300	3.34	3.95	3.64	0.62	5.84	16.07	1.36	1.36	1.37

¹Total Loss = Insertion Loss + 3dB Splitter Loss

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2 Way-90° Power Splitter/Combiner

ADPQ-2-250+

Typical Performance Data

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

FREQ. (MHz)	TOTAL LOSS ¹			AMP. UNBAL. (dB)	PHASE UNBAL. From 90° (deg.)	ISOLATION (dB) 1-2	VSWR		
	(dB)						S	1	2
	S-1	S-2	AVG.						
80	1.23	6.42	3.83	5.19	0.94	25.83	1.12	1.13	1.13
85	1.35	6.06	3.71	4.71	0.98	25.71	1.12	1.13	1.13
90	1.48	5.73	3.60	4.26	1.05	25.61	1.12	1.13	1.13
95	1.60	5.44	3.52	3.84	1.08	25.46	1.12	1.13	1.13
100	1.72	5.17	3.44	3.45	1.11	25.32	1.12	1.13	1.13
105	1.84	4.92	3.38	3.08	1.13	25.15	1.12	1.13	1.13
110	1.96	4.70	3.33	2.74	1.18	25.01	1.13	1.13	1.13
115	2.08	4.50	3.29	2.42	1.19	24.86	1.13	1.13	1.13
120	2.19	4.31	3.25	2.12	1.22	24.75	1.14	1.14	1.13
125	2.31	4.14	3.22	1.83	1.23	24.67	1.15	1.14	1.13
130	2.42	3.99	3.20	1.57	1.32	24.64	1.15	1.14	1.13
135	2.53	3.84	3.19	1.32	1.30	24.66	1.15	1.14	1.13
140	2.63	3.71	3.17	1.08	1.33	24.73	1.15	1.14	1.14
145	2.73	3.59	3.16	0.86	1.33	24.85	1.15	1.15	1.14
150	2.83	3.48	3.16	0.65	1.33	25.02	1.15	1.15	1.14
155	2.92	3.39	3.16	0.46	1.35	25.23	1.15	1.15	1.14
160	3.01	3.29	3.15	0.28	1.33	25.49	1.14	1.15	1.14
165	3.09	3.21	3.15	0.11	1.32	25.72	1.14	1.15	1.14
170	3.17	3.13	3.15	0.04	1.33	25.95	1.13	1.15	1.13
175	3.24	3.06	3.15	0.18	1.32	26.16	1.13	1.14	1.13
180	3.31	3.00	3.15	0.31	1.31	26.31	1.13	1.14	1.13
185	3.38	2.95	3.16	0.43	1.28	26.39	1.12	1.14	1.13
190	3.43	2.90	3.17	0.54	1.24	26.40	1.13	1.14	1.13
195	3.49	2.85	3.17	0.64	1.23	26.34	1.13	1.13	1.13
200	3.53	2.82	3.18	0.72	1.17	26.19	1.13	1.13	1.13
205	3.58	2.78	3.18	0.80	1.15	26.02	1.14	1.13	1.13
210	3.62	2.76	3.19	0.86	1.10	25.81	1.14	1.13	1.13
215	3.65	2.75	3.20	0.90	1.06	25.59	1.15	1.13	1.14
220	3.68	2.74	3.21	0.94	1.02	25.34	1.15	1.13	1.14
225	3.70	2.73	3.22	0.97	0.91	25.10	1.16	1.13	1.14
230	3.71	2.74	3.22	0.98	0.83	24.84	1.16	1.14	1.15
235	3.72	2.74	3.23	0.97	0.71	24.53	1.16	1.14	1.16
240	3.72	2.75	3.23	0.96	0.63	24.21	1.17	1.15	1.17
245	3.71	2.78	3.24	0.94	0.45	23.85	1.17	1.16	1.17
250	3.70	2.81	3.25	0.89	0.30	23.44	1.18	1.17	1.18
255	3.68	2.85	3.26	0.83	0.10	22.93	1.18	1.18	1.19
260	3.66	2.90	3.28	0.76	0.11	22.34	1.19	1.19	1.20
265	3.63	2.97	3.30	0.66	0.40	21.69	1.20	1.20	1.21
270	3.59	3.04	3.31	0.55	0.68	20.97	1.21	1.22	1.23
275	3.55	3.12	3.33	0.42	1.06	20.21	1.23	1.24	1.24
280	3.50	3.23	3.36	0.27	1.48	19.42	1.25	1.26	1.26
285	3.45	3.35	3.40	0.10	2.00	18.61	1.27	1.28	1.28
290	3.39	3.49	3.44	0.10	2.63	17.80	1.30	1.30	1.30
295	3.33	3.65	3.49	0.32	3.35	17.00	1.33	1.33	1.32
300	3.27	3.85	3.56	0.58	4.22	16.21	1.36	1.36	1.35

¹Total Loss = Insertion Loss + 3dB Splitter Loss

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2 Way-90° Power Splitter/Combiner

ADPQ-2-250+

Typical Performance Data

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

FREQ. (MHz)	TOTAL LOSS ¹ (dB)			AMP. UNBAL. (dB)	PHASE UNBAL. From 90° (deg.)	ISOLATION (dB) 1-2	VSWR (:1)		
	S-1	S-2	AVG.				S	1	2
80	1.27	6.42	3.85	5.15	0.31	26.56	1.11	1.09	1.09
85	1.40	6.07	3.73	4.67	0.33	26.28	1.12	1.09	1.10
90	1.52	5.74	3.63	4.22	0.33	26.08	1.13	1.10	1.10
95	1.65	5.45	3.55	3.81	0.33	25.91	1.13	1.10	1.11
100	1.76	5.19	3.48	3.42	0.30	25.82	1.14	1.10	1.11
105	1.89	4.95	3.42	3.06	0.26	25.78	1.14	1.10	1.12
110	2.01	4.73	3.37	2.71	0.25	25.82	1.13	1.11	1.12
115	2.13	4.52	3.32	2.40	0.20	25.89	1.13	1.11	1.12
120	2.24	4.34	3.29	2.10	0.18	26.00	1.13	1.11	1.12
125	2.35	4.17	3.26	1.81	0.15	26.15	1.12	1.11	1.12
130	2.46	4.01	3.24	1.55	0.15	26.31	1.12	1.11	1.12
135	2.57	3.87	3.22	1.30	0.07	26.46	1.11	1.11	1.12
140	2.68	3.74	3.21	1.06	0.03	26.59	1.11	1.11	1.12
145	2.78	3.62	3.20	0.84	0.02	26.68	1.11	1.11	1.12
150	2.88	3.51	3.19	0.64	0.09	26.72	1.11	1.11	1.12
155	2.98	3.42	3.20	0.44	0.13	26.73	1.11	1.11	1.12
160	3.07	3.33	3.20	0.26	0.17	26.72	1.11	1.11	1.12
165	3.15	3.25	3.20	0.09	0.25	26.65	1.12	1.11	1.12
170	3.23	3.17	3.20	0.06	0.26	26.57	1.12	1.11	1.12
175	3.30	3.10	3.20	0.20	0.32	26.49	1.13	1.11	1.12
180	3.38	3.05	3.21	0.33	0.40	26.41	1.13	1.11	1.13
185	3.45	3.00	3.22	0.45	0.47	26.35	1.14	1.12	1.13
190	3.51	2.96	3.23	0.55	0.55	26.31	1.14	1.12	1.13
195	3.56	2.92	3.24	0.65	0.60	26.27	1.14	1.12	1.14
200	3.61	2.88	3.25	0.73	0.71	26.22	1.14	1.13	1.14
205	3.66	2.85	3.26	0.81	0.78	26.17	1.15	1.13	1.15
210	3.70	2.83	3.26	0.87	0.87	26.06	1.15	1.14	1.15
215	3.73	2.82	3.27	0.91	0.97	25.91	1.15	1.14	1.16
220	3.76	2.81	3.29	0.95	1.08	25.68	1.15	1.15	1.16
225	3.78	2.81	3.30	0.97	1.22	25.37	1.16	1.16	1.17
230	3.79	2.82	3.31	0.97	1.36	24.99	1.16	1.16	1.17
235	3.80	2.83	3.31	0.97	1.55	24.50	1.17	1.17	1.18
240	3.80	2.84	3.32	0.96	1.70	23.97	1.17	1.18	1.18
245	3.80	2.87	3.33	0.93	1.92	23.39	1.18	1.19	1.19
250	3.78	2.91	3.35	0.88	2.13	22.80	1.19	1.20	1.20
255	3.77	2.95	3.36	0.82	2.36	22.15	1.21	1.21	1.21
260	3.75	3.01	3.38	0.74	2.64	21.48	1.22	1.22	1.22
265	3.72	3.08	3.40	0.64	2.97	20.81	1.23	1.23	1.23
270	3.69	3.16	3.42	0.52	3.35	20.13	1.25	1.24	1.24
275	3.65	3.25	3.45	0.39	3.81	19.44	1.26	1.26	1.26
280	3.60	3.36	3.48	0.23	4.32	18.74	1.28	1.28	1.28
285	3.54	3.49	3.51	0.06	4.91	18.03	1.30	1.30	1.30
290	3.49	3.64	3.56	0.15	5.62	17.32	1.32	1.32	1.33
295	3.43	3.81	3.62	0.38	6.46	16.60	1.34	1.35	1.35
300	3.37	4.01	3.69	0.64	7.44	15.89	1.36	1.38	1.38

¹Total Loss = Insertion Loss + 3dB Splitter Loss

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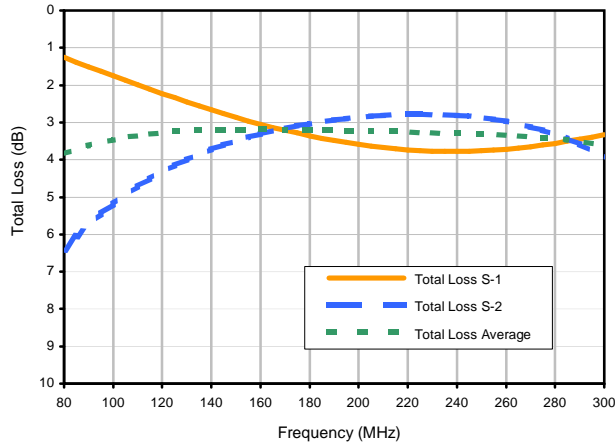


The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see

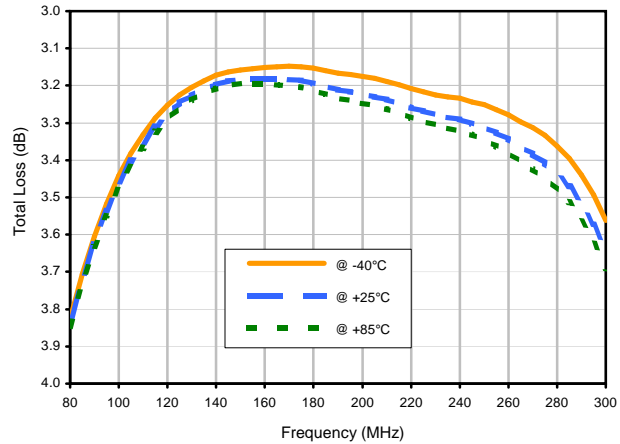


Typical Performance Curves

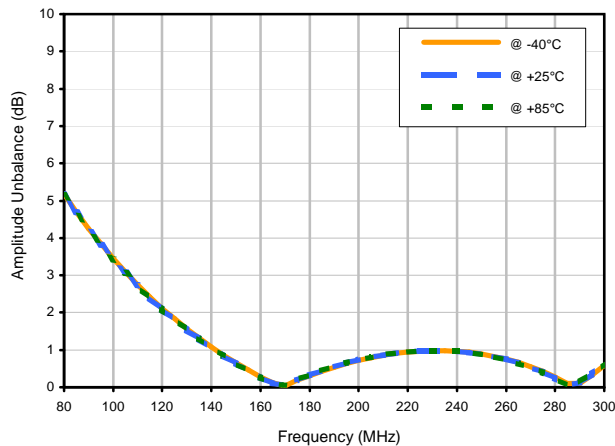
Total Loss



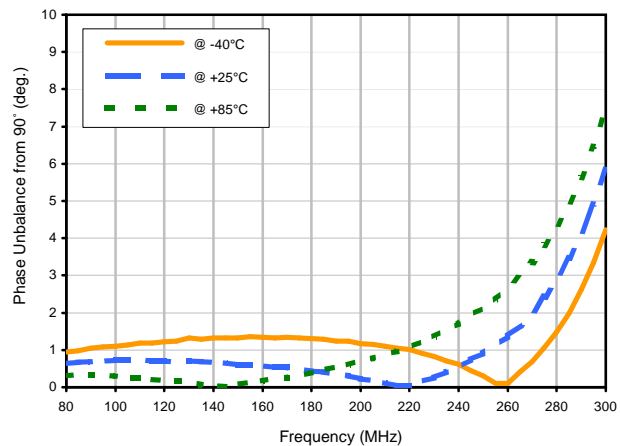
Average Total Loss vs. TEMPERATURE



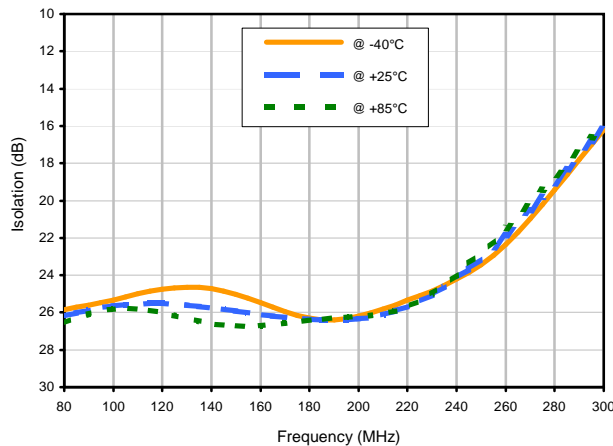
Amplitude Unbalance vs. TEMPERATURE



Phase Unbalance vs. TEMPERATURE

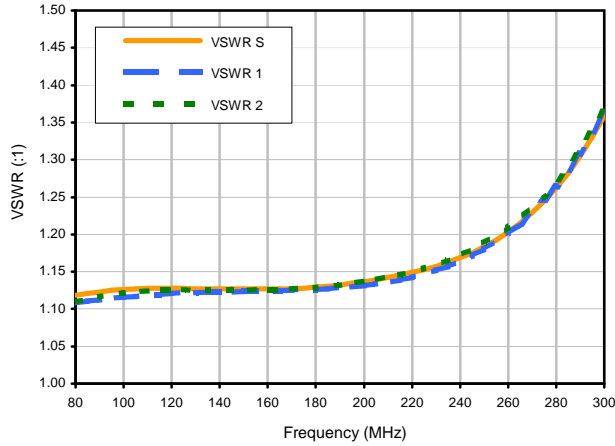


Isolation 1-2 vs. TEMPERATURE

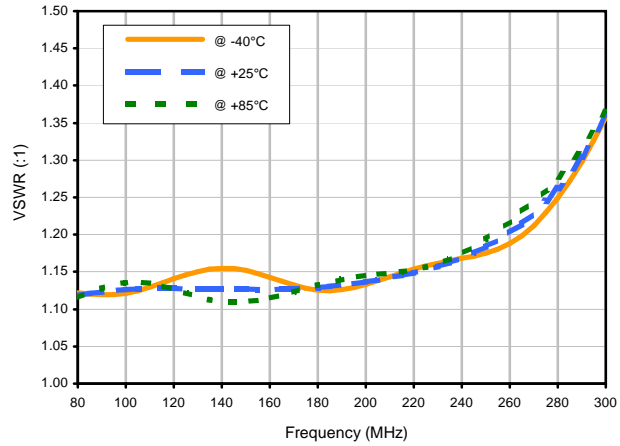


Typical Performance Curves

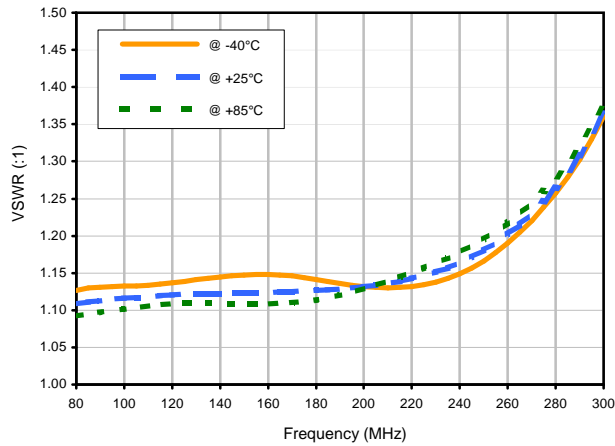
VSWR



VSWR SUM vs. TEMPERATURE



VSWR OUT1 vs. TEMPERATURE

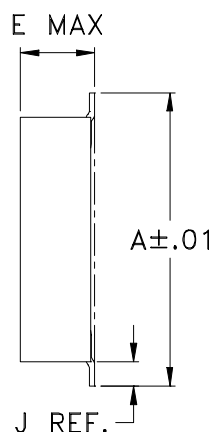


Case Style

CD

CD541
CD542
CD636
CD637

Outline Dimensions



PCB Land Pattern



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

CASE#	A	B	C	D	E	F	G	H	J	K	L	WT, GRAM
CD541					.082 (2.08)							.15
CD542	.272 (6.91)	.310 (7.87)	.220 (5.58)	.100 (2.54)	.112 (2.84)	.055 (1.40)	.100 (2.54)	.030 (0.76)	.026 (0.66)	.065 (1.65)	.300 (7.62)	.20
CD636					.162 (4.11)							.25
CD637					.206 (5.23)							.40

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

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.

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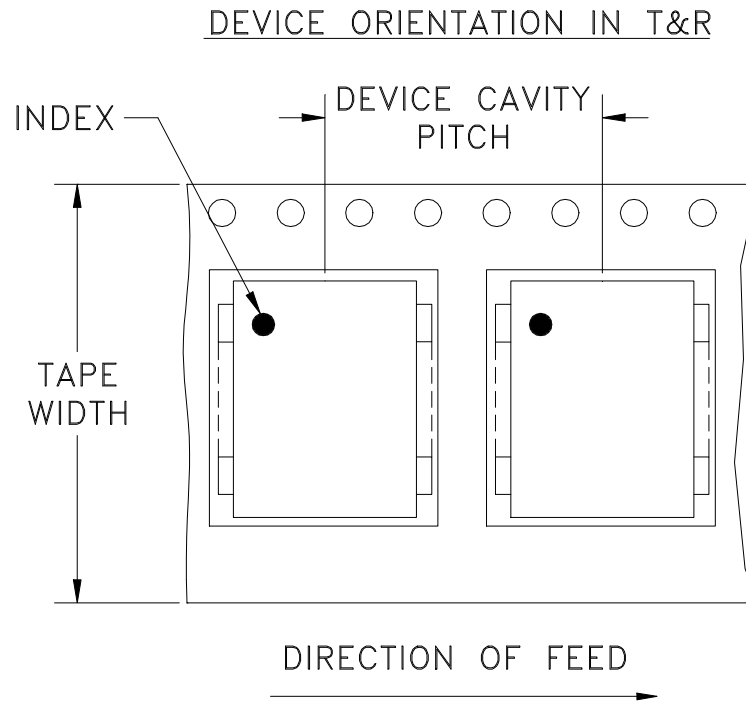
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Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
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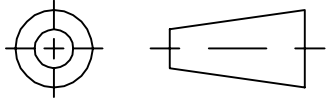
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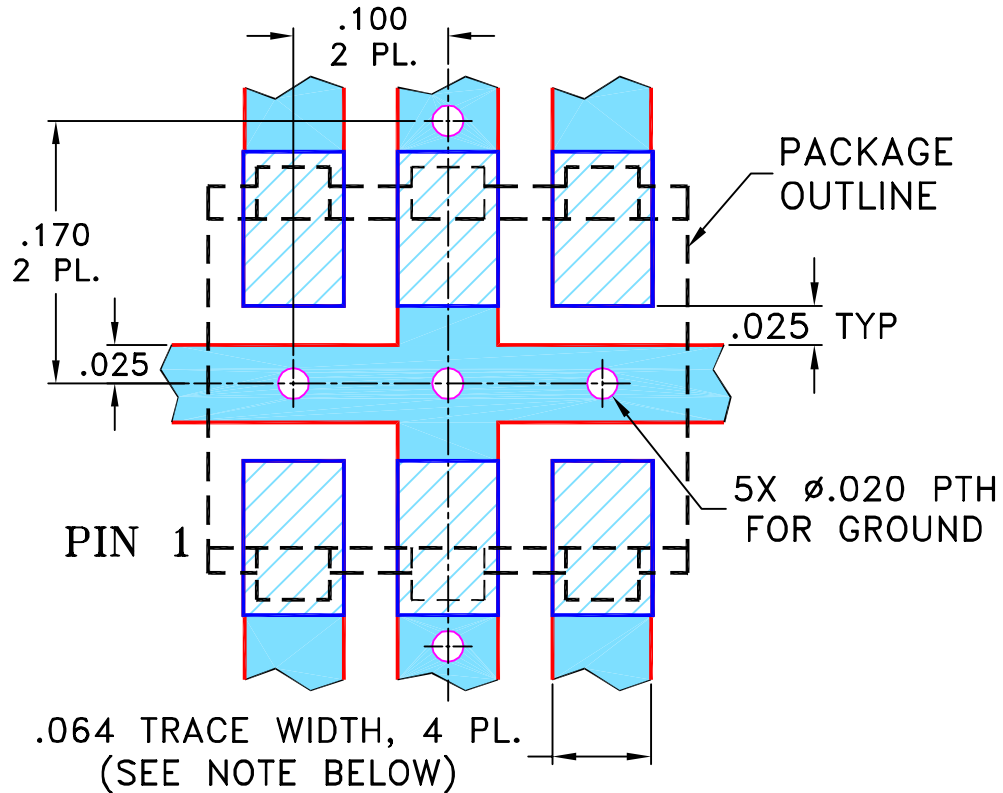
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M82476	NEW RELEASE	11/26/02	MMG	HY
A	M102713	ADDED "ay", "ls" PIN CONNECTIONS, CD636/637 CASE STYLES & "...WITH SMOBC"	01/17/06	MMG	IL

SUGGESTED MOUNTING CONFIGURATION
FOR BH292, CD636/CD637 CASE STYLES,
"ay", "jg", "ls" PIN CONNECTIONS



- NOTES: 1. 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.
 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

MMG

10/30/02

TOLERANCES ON:

CHECKED

AV

11/26/02

2 PL DECIMALS ±

APPROVED

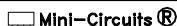
HY

11/26/02

3 PL DECIMALS ± .005

ANGLES ±

FRACTIONS ±



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



Mini-Circuits®

13 Neptune Avenue
 Brooklyn NY 11235

PL, ay/jg/lb, BH292, CD636/637,
 ADPQ/AMT/JPS, TB-211

SIZE
 A

CODE IDENT
 15542

DRAWING NO:
 98-PL-097

REV:
 A

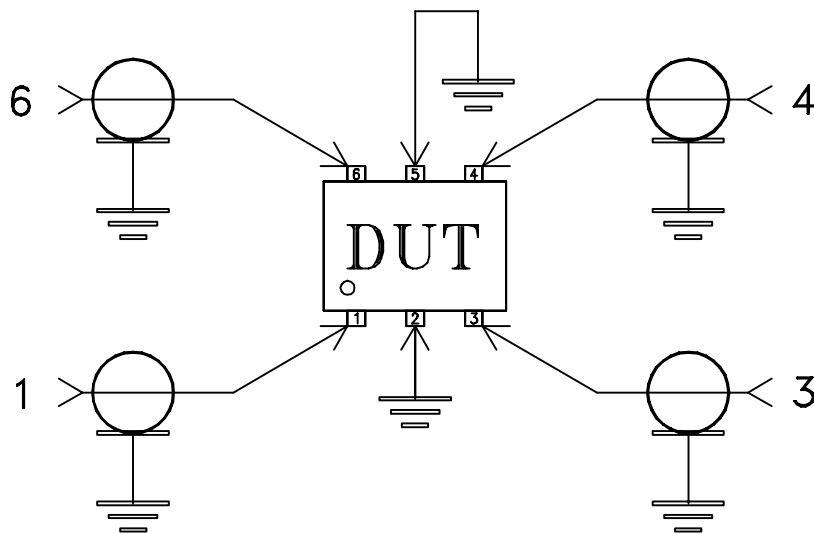
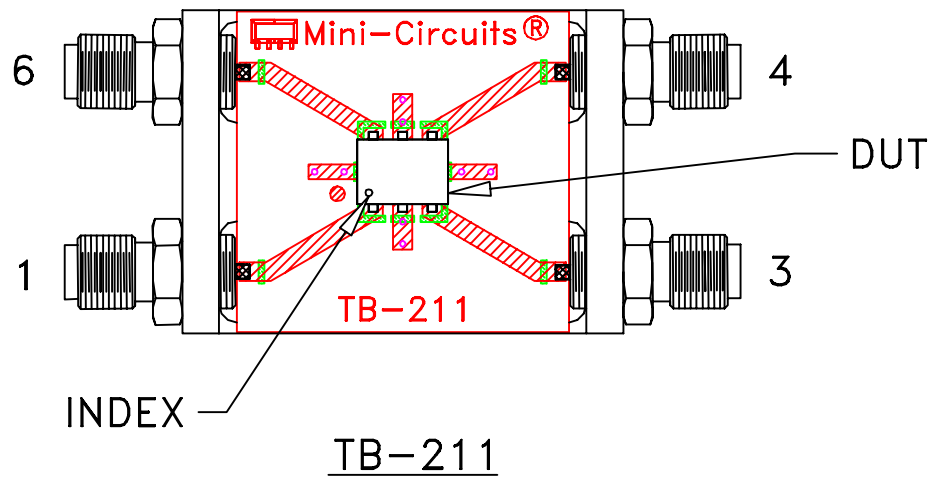
FILE: 98PL097

SCALE: 8:1

SHEET: 1 OF 1

Evaluation Board and Circuit


For Pin Connections refer to Data Sheet of the DUT



Schematic Diagram

Notes:

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