

2 Way-0° 50Ω 10 to 3000 MHz



+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	0.5W max.
Internal Dissipation	0.125W max.
Permanent damage may occur if any of these limits are exceeded.	

SUM PORT	6
PORT 1	4
PORT 2	3
GROUND	1,2,5

TOP VIEW

B±.030

1 2 3

MCL

A

SIDE VIEW

C MAX

PCB Land Pattern

K TYP

D TYP

J

H TYP

BOTTOM VIEW

D TYP

E TYP

F±.015 TYP

1 2 3

G TYP

INDEX MARK

NOTES:

1. [Blue hatched box] DENOTES METALIZATION

Suggested Layout, Tolerance to be within ±.002

A	B	C	D	E	F	G	H	J	K	wt.
.250	.310	.20	.100	.050	.055	.040	.070	.270	.050	grams
6.35	7.87	5.08	2.54	1.27	1.40	1.02	1.78	6.86	1.27	0.5

[illegible]

NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030", 0.002"; COPPER: 1/2 OZ. EACH SIDE. 2. FOR OTHER MATERIALS, DIMENSIONS MAY NEED TO BE MODIFIED. 3. 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

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/MCStore/terms.htm.

- wideband, 10 to 3000 MHz
- good isolation, 22 dB typ.
- small size

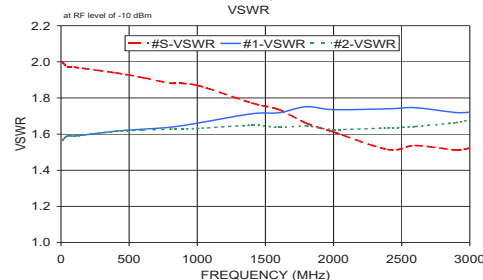
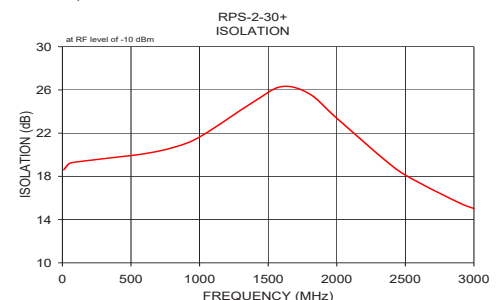
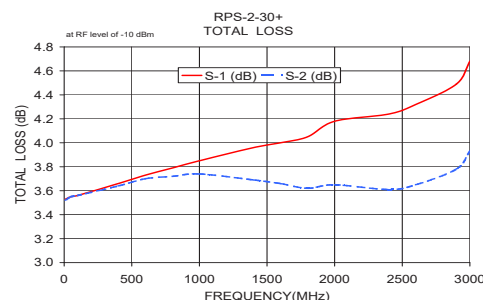
- instrumentation
- catv
- cellular
- PCS
- GSM

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	L	M	U
f_L - f_U	Typ.	Min	Typ.	Min	Typ.	Min	Typ.		Typ.		Typ.	Max.	Max.	Max.	Max.	Max.	Max.	
10-3000	19	12	22	15	15	9	0.6	1.0	0.9	1.5	1.2	2.5	2.0	4.0	8.0	0.3	0.6	1.2

L = low range [f_l to $10 f_l$] M = mid range [$10 f_l$ to $f_u/2$] U= upper range

Frequency (MHz)	Total Loss ¹ (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR S	VSWR 1	VSWR 2
	S-1	S-2						
10.00	3.53	3.52	0.01	18.61	0.01	2.00	1.57	1.57
50.00	3.55	3.55	0.01	19.19	0.04	1.97	1.59	1.59
100.00	3.56	3.56	0.00	19.33	0.06	1.97	1.59	1.59
400.00	3.66	3.64	0.02	19.78	0.09	1.94	1.62	1.62
600.00	3.73	3.70	0.03	20.10	0.14	1.91	1.63	1.62
800.00	3.79	3.72	0.07	20.65	0.09	1.88	1.64	1.63
1000.00	3.85	3.74	0.11	21.64	0.02	1.87	1.66	1.63
1400.00	3.96	3.69	0.27	24.95	0.59	1.77	1.71	1.65
1600.00	4.00	3.66	0.34	26.31	0.88	1.74	1.72	1.64
1800.00	4.05	3.62	0.43	25.64	1.27	1.66	1.75	1.64
2000.00	4.18	3.65	0.52	23.38	1.59	1.61	1.74	1.63
2400.00	4.24	3.61	0.63	19.00	2.43	1.51	1.74	1.63
2600.00	4.32	3.65	0.67	17.42	2.83	1.54	1.75	1.64
2900.00	4.49	3.78	0.71	15.51	3.65	1.51	1.72	1.66
3000.00	4.68	3.93	0.75	15.02	4.13	1.52	1.72	1.68

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



2 Way-0° Power Splitter/Combiner

RPS-2-30+

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
10	3.55	3.54	0.01	0.03	18.84	1.99	1.57	1.57
25	3.56	3.56	0.00	0.01	18.99	1.98	1.57	1.58
50	3.57	3.57	0.00	0.05	19.01	1.97	1.58	1.58
75	3.59	3.58	0.01	0.11	19.07	1.97	1.58	1.58
100	3.59	3.59	0.00	0.11	19.13	1.96	1.59	1.59
150	3.60	3.61	0.01	0.14	19.22	1.95	1.59	1.59
200	3.62	3.62	0.00	0.18	19.33	1.94	1.60	1.60
250	3.63	3.63	0.00	0.23	19.44	1.94	1.60	1.60
300	3.64	3.64	0.00	0.24	19.56	1.93	1.60	1.61
400	3.66	3.65	0.01	0.31	19.82	1.92	1.61	1.61
500	3.68	3.67	0.01	0.43	20.09	1.91	1.61	1.61
600	3.70	3.68	0.02	0.45	20.38	1.90	1.61	1.62
700	3.71	3.69	0.02	0.52	20.72	1.88	1.62	1.62
800	3.73	3.70	0.03	0.58	21.15	1.87	1.62	1.63
900	3.75	3.71	0.04	0.61	21.67	1.86	1.63	1.63
1000	3.77	3.72	0.05	0.65	22.21	1.84	1.63	1.64
1100	3.79	3.73	0.06	0.65	22.82	1.82	1.64	1.65
1200	3.80	3.73	0.07	0.71	23.52	1.81	1.64	1.66
1300	3.83	3.74	0.09	0.69	24.15	1.79	1.65	1.66
1400	3.86	3.74	0.12	0.70	24.84	1.77	1.66	1.67
1450	3.86	3.74	0.12	0.68	25.15	1.75	1.66	1.67
1500	3.88	3.74	0.14	0.69	25.45	1.74	1.66	1.67
1550	3.90	3.75	0.15	0.68	25.66	1.73	1.66	1.67
1600	3.90	3.73	0.17	0.72	25.84	1.71	1.66	1.67
1650	3.91	3.74	0.17	0.68	25.99	1.70	1.66	1.67
1700	3.93	3.74	0.19	0.67	25.93	1.68	1.66	1.67
1800	3.96	3.74	0.22	0.70	25.77	1.65	1.67	1.67
1900	3.98	3.73	0.25	0.67	25.37	1.63	1.66	1.67
2000	4.01	3.73	0.28	0.63	24.76	1.60	1.66	1.66
2100	4.04	3.73	0.31	0.60	24.00	1.57	1.66	1.66
2200	4.07	3.74	0.33	0.52	23.15	1.53	1.65	1.65
2300	4.09	3.74	0.35	0.48	22.37	1.50	1.64	1.64
2400	4.13	3.74	0.39	0.41	21.41	1.47	1.63	1.62
2500	4.15	3.74	0.41	0.30	20.60	1.44	1.62	1.61
2600	4.20	3.75	0.45	0.22	19.73	1.41	1.60	1.60
2700	4.23	3.76	0.47	0.06	18.86	1.38	1.58	1.58
2800	4.27	3.78	0.49	0.09	18.06	1.35	1.57	1.56
2850	4.29	3.80	0.49	0.18	17.69	1.34	1.56	1.55
2900	4.30	3.82	0.48	0.36	17.31	1.32	1.55	1.53
2950	4.32	3.82	0.50	0.47	16.88	1.31	1.54	1.53
3000	4.35	3.82	0.53	0.56	16.50	1.29	1.53	1.52
3050	4.38	3.86	0.52	0.66	16.15	1.29	1.52	1.51
3100	4.40	3.87	0.53	0.88	15.75	1.28	1.51	1.50
3200	4.45	3.90	0.55	1.28	14.95	1.27	1.50	1.48
3400	4.60	4.05	0.55	2.23	13.39	1.31	1.47	1.44
3500	4.70	4.14	0.56	2.78	12.78	1.34	1.47	1.43
3600	4.78	4.23	0.55	3.47	12.05	1.41	1.46	1.42
3800	5.02	4.47	0.55	5.21	10.70	1.57	1.47	1.39
4000	5.32	4.73	0.58	7.59	9.45	1.79	1.46	1.36

¹ Total Loss = Insertion Loss+ 3dB Splitter Loss

REV. X2
RPS-2-30+
100627
Page 1 of 3

2 Way-0° Power Splitter/Combiner

RPS-2-30+

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
10	3.54	3.54	0.00	0.01	17.64	1.99	1.61	1.62
25	3.56	3.55	0.01	0.00	20.48	1.99	1.66	1.66
50	3.57	3.57	0.00	0.02	21.30	1.99	1.68	1.68
75	3.58	3.57	0.01	0.04	21.57	1.98	1.69	1.69
100	3.58	3.58	0.00	0.05	21.67	1.96	1.69	1.69
150	3.58	3.58	0.00	0.05	21.74	1.95	1.68	1.69
200	3.60	3.59	0.01	0.07	21.74	1.95	1.69	1.70
250	3.60	3.59	0.01	0.09	21.71	1.94	1.69	1.69
300	3.61	3.60	0.01	0.09	21.75	1.94	1.69	1.70
400	3.62	3.60	0.02	0.15	21.94	1.93	1.69	1.70
500	3.63	3.61	0.02	0.19	22.14	1.92	1.70	1.70
600	3.64	3.61	0.03	0.18	22.41	1.91	1.70	1.70
700	3.65	3.62	0.03	0.27	22.75	1.90	1.71	1.71
800	3.66	3.61	0.05	0.26	23.20	1.89	1.71	1.71
900	3.67	3.61	0.06	0.26	23.74	1.87	1.71	1.72
1000	3.68	3.61	0.07	0.28	24.28	1.86	1.72	1.72
1100	3.70	3.61	0.09	0.26	24.87	1.84	1.72	1.73
1200	3.70	3.60	0.10	0.34	25.48	1.82	1.72	1.73
1300	3.73	3.61	0.12	0.26	25.91	1.80	1.73	1.74
1400	3.75	3.61	0.14	0.24	26.22	1.79	1.74	1.76
1450	3.75	3.60	0.15	0.23	26.23	1.78	1.74	1.74
1500	3.76	3.60	0.16	0.24	26.32	1.77	1.75	1.75
1550	3.77	3.60	0.17	0.18	26.32	1.76	1.75	1.76
1600	3.78	3.59	0.19	0.21	26.08	1.74	1.75	1.74
1650	3.78	3.58	0.20	0.17	25.79	1.72	1.75	1.74
1700	3.80	3.59	0.21	0.12	25.38	1.71	1.76	1.75
1800	3.83	3.58	0.25	0.14	24.61	1.69	1.76	1.74
1900	3.85	3.57	0.28	0.13	23.90	1.67	1.76	1.74
2000	3.86	3.57	0.29	0.11	23.01	1.64	1.76	1.76
2100	3.89	3.56	0.33	0.02	22.13	1.61	1.76	1.73
2200	3.91	3.56	0.35	0.03	21.43	1.57	1.75	1.72
2300	3.91	3.54	0.37	0.16	20.52	1.52	1.73	1.71
2400	3.95	3.53	0.42	0.18	19.51	1.49	1.73	1.68
2500	3.95	3.53	0.42	0.23	18.65	1.45	1.70	1.67
2600	3.98	3.54	0.44	0.40	17.79	1.43	1.69	1.68
2700	4.02	3.57	0.45	0.75	17.13	1.42	1.68	1.68
2800	4.04	3.55	0.49	0.80	16.42	1.37	1.66	1.63
2850	4.05	3.57	0.47	0.91	16.09	1.35	1.65	1.65
2900	4.06	3.58	0.48	1.21	15.74	1.34	1.65	1.64
2950	4.08	3.58	0.50	1.28	15.31	1.32	1.63	1.61
3000	4.09	3.59	0.50	1.43	14.92	1.31	1.62	1.61
3050	4.11	3.61	0.50	1.63	14.57	1.30	1.61	1.61
3100	4.13	3.64	0.49	1.93	14.19	1.30	1.60	1.61
3200	4.21	3.66	0.55	2.54	13.49	1.31	1.59	1.56
3400	4.33	3.80	0.53	3.50	12.02	1.34	1.56	1.52
3500	4.40	3.86	0.54	4.44	11.47	1.36	1.58	1.55
3600	4.49	3.92	0.57	5.18	10.84	1.41	1.57	1.51
3800	4.78	4.14	0.64	7.24	9.52	1.60	1.57	1.44
4000	5.07	4.38	0.70	9.35	8.47	1.79	1.55	1.39

¹ Total Loss = Insertion Loss+ 3dB Splitter Loss

2 Way-0° Power Splitter/Combiner

RPS-2-30+

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) 1-2	VSWR (:1)		
	S-1	S-2				S	1	2
10	3.55	3.55	0.00	0.03	16.41	1.99	1.45	1.45
25	3.57	3.56	0.01	0.03	16.49	1.98	1.46	1.46
50	3.58	3.58	0.00	0.09	16.50	1.96	1.46	1.46
75	3.59	3.59	0.00	0.14	16.56	1.96	1.46	1.46
100	3.61	3.61	0.00	0.17	16.63	1.96	1.47	1.47
150	3.63	3.63	0.00	0.23	16.77	1.95	1.48	1.48
200	3.64	3.64	0.00	0.32	16.92	1.94	1.48	1.49
250	3.65	3.65	0.00	0.37	17.07	1.93	1.49	1.49
300	3.67	3.67	0.00	0.43	17.20	1.93	1.49	1.50
400	3.69	3.69	0.00	0.58	17.44	1.91	1.50	1.50
500	3.71	3.71	0.00	0.72	17.70	1.90	1.50	1.51
600	3.73	3.73	0.00	0.79	18.00	1.89	1.51	1.52
700	3.75	3.74	0.01	0.91	18.37	1.88	1.51	1.52
800	3.77	3.76	0.01	0.98	18.82	1.86	1.52	1.53
900	3.80	3.77	0.03	1.05	19.31	1.85	1.53	1.54
1000	3.82	3.79	0.03	1.13	19.86	1.83	1.54	1.55
1100	3.85	3.80	0.05	1.16	20.42	1.81	1.54	1.56
1200	3.87	3.81	0.06	1.24	21.07	1.79	1.55	1.56
1300	3.91	3.83	0.08	1.28	21.72	1.77	1.55	1.57
1400	3.94	3.83	0.11	1.37	22.44	1.75	1.56	1.57
1450	3.95	3.83	0.12	1.37	22.81	1.73	1.56	1.57
1500	3.96	3.83	0.13	1.40	23.23	1.72	1.56	1.57
1550	3.98	3.83	0.15	1.41	23.59	1.71	1.56	1.57
1600	3.99	3.84	0.15	1.49	23.96	1.69	1.56	1.57
1650	4.01	3.84	0.17	1.47	24.40	1.68	1.56	1.57
1700	4.02	3.85	0.17	1.49	24.73	1.66	1.56	1.58
1800	4.06	3.85	0.21	1.56	25.46	1.63	1.56	1.58
1900	4.09	3.86	0.23	1.60	26.05	1.60	1.56	1.58
2000	4.12	3.86	0.26	1.60	26.53	1.57	1.56	1.57
2100	4.15	3.87	0.28	1.67	26.86	1.53	1.55	1.56
2200	4.18	3.88	0.30	1.63	26.76	1.50	1.54	1.56
2300	4.21	3.88	0.33	1.64	26.48	1.47	1.53	1.55
2400	4.25	3.89	0.36	1.61	25.84	1.44	1.52	1.54
2500	4.28	3.91	0.38	1.57	25.06	1.41	1.51	1.53
2600	4.32	3.91	0.41	1.54	24.21	1.38	1.50	1.51
2700	4.35	3.92	0.43	1.47	22.99	1.34	1.48	1.49
2800	4.39	3.95	0.44	1.39	21.83	1.31	1.47	1.48
2850	4.41	3.96	0.45	1.34	21.34	1.30	1.46	1.48
2900	4.43	3.98	0.45	1.24	20.79	1.28	1.45	1.47
2950	4.45	3.99	0.46	1.13	20.17	1.27	1.45	1.46
3000	4.47	4.00	0.48	1.08	19.69	1.26	1.44	1.45
3050	4.51	4.04	0.47	1.05	19.25	1.24	1.44	1.45
3100	4.52	4.04	0.48	0.89	18.61	1.23	1.43	1.43
3200	4.58	4.10	0.48	0.61	17.59	1.22	1.42	1.43
3400	4.69	4.21	0.48	0.11	15.52	1.24	1.39	1.40
3500	4.76	4.32	0.44	0.31	14.58	1.29	1.38	1.39
3600	4.85	4.40	0.44	1.14	13.70	1.35	1.38	1.39
3800	5.01	4.62	0.39	2.70	11.99	1.50	1.39	1.38
4000	5.29	4.94	0.35	4.85	10.45	1.74	1.40	1.39

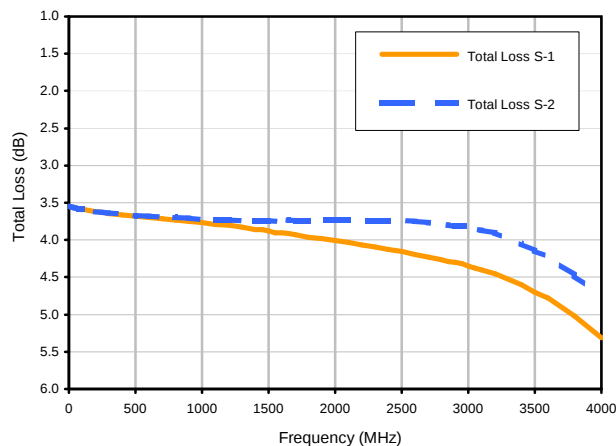
¹ Total Loss = Insertion Loss+ 3dB Splitter Loss

2 Way-0° Power Splitter/Combiner

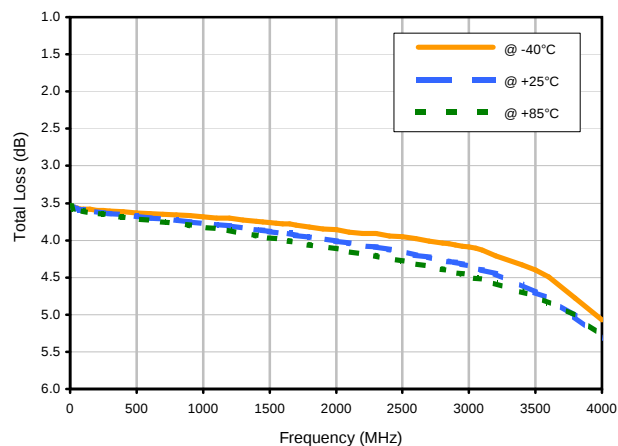
RPS-2-30+

Typical Performance Curves

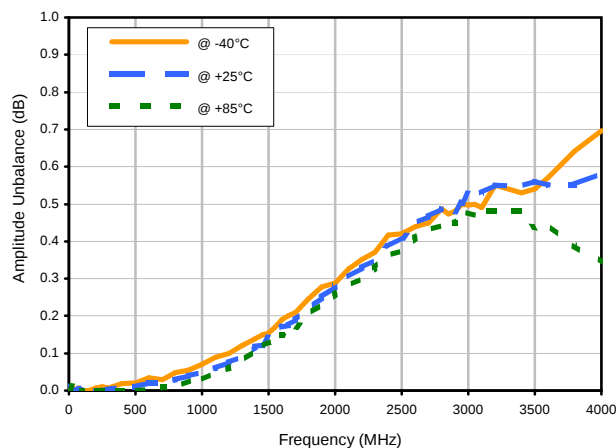
Total Loss



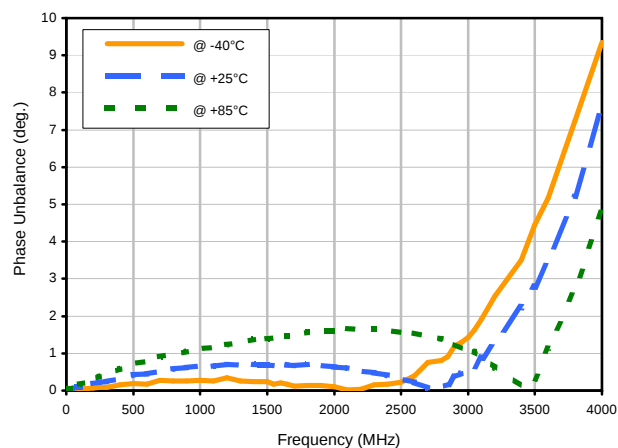
Total Loss S-1 vs. TEMPERATURE



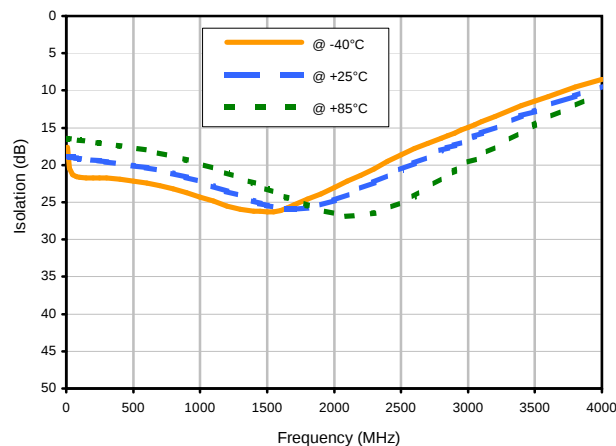
Amplitude Unbalance vs. TEMPERATURE



Phase Unbalance vs. TEMPERATURE



Isolation 1-2 vs. TEMPERATURE



REV. X2
RPS-2-30+
100627
Page 1 of 2



Mini-Circuits®

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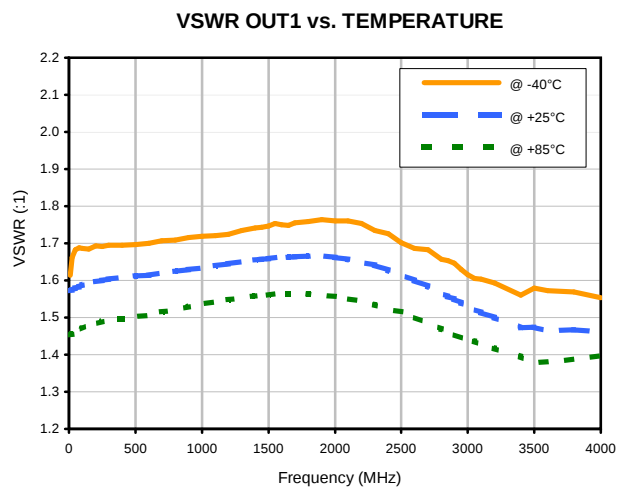
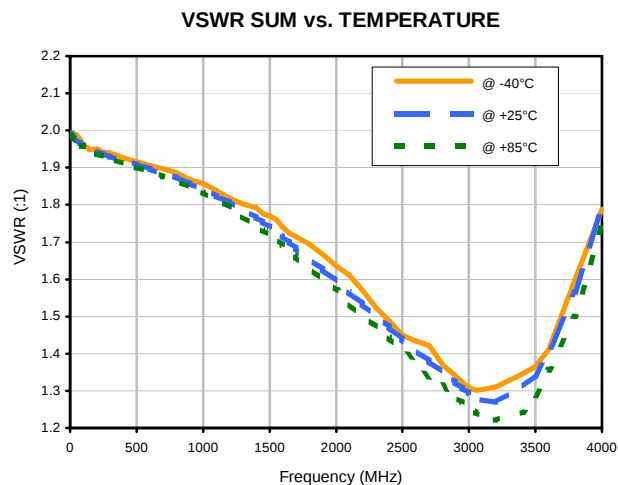
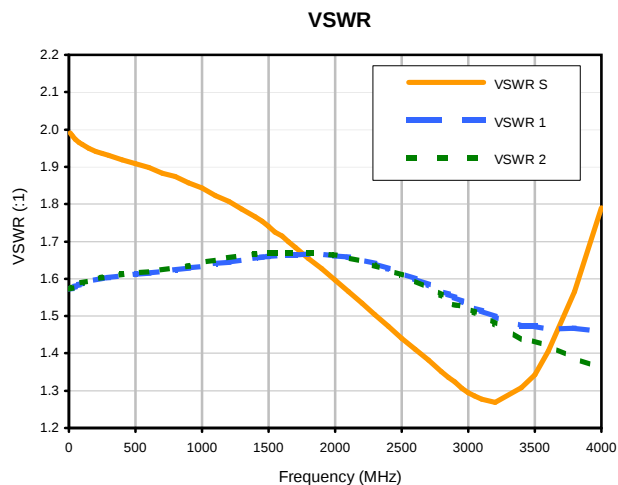
The Design Engineers Search Engine finds the model you need, instantly • For detailed performance specs & shopping online see



2 Way-0° Power Splitter/Combiner

RPS-2-30+

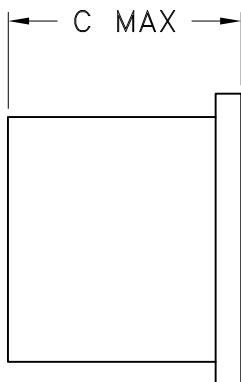
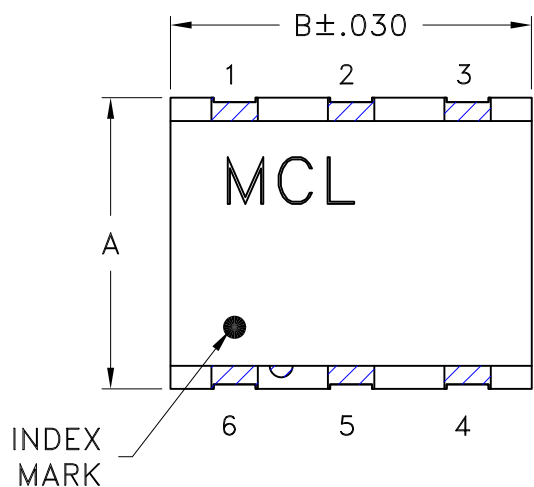
Typical Performance Curves



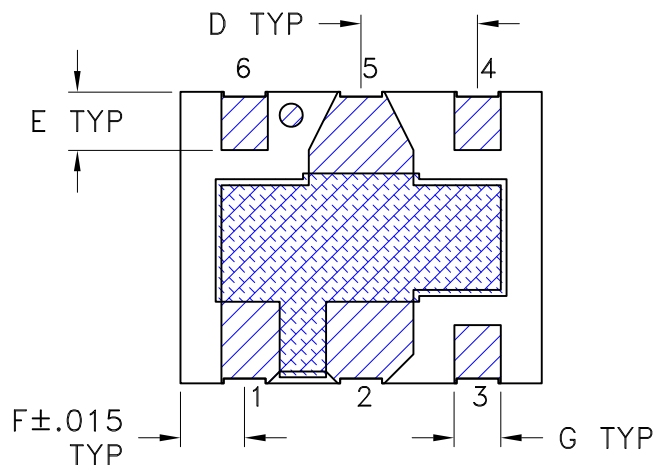
REV. X2
RPS-2-30+
100627
Page 2 of 2

TOP VIEW

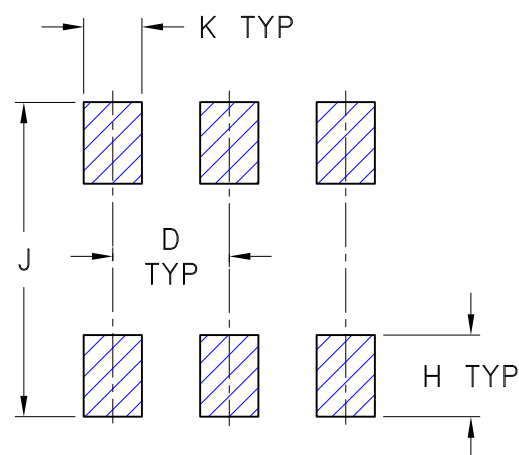
SIDE VIEW



BOTTOM VIEW



PCB Land Pattern



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

NOTES:

1.  DENOTES METALLIZATION

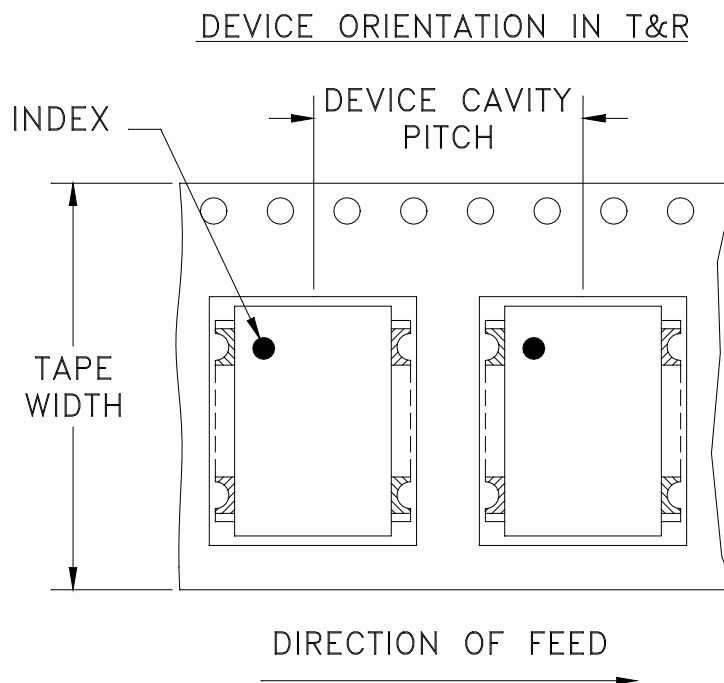
CASE#	A	B	C	D	E	F	G	H	J	K	WT, GRAM
TT1413	.250 (6.35)	.310 (7.87)	.20 (5.08)	.100 (2.54)	.050 (1.27)	.055 (1.40)	.040 (1.02)	.070 (1.78)	.270 (6.86)	.050 (1.27)	.50

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

Notes:

1. Case material: Ceramic.
2. Termination finish: Gold Plating.

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.

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



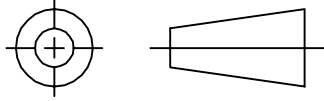
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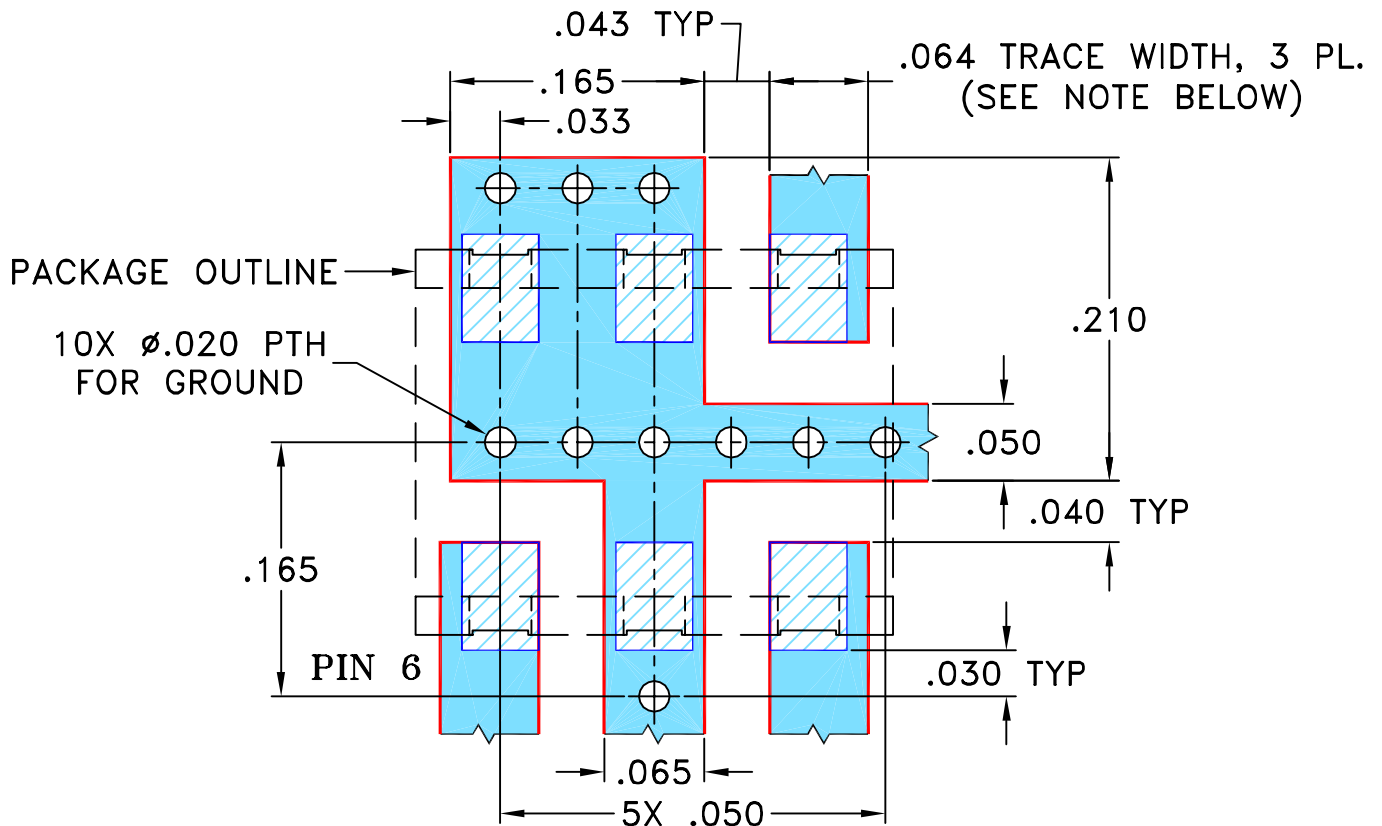
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M82456	NEW RELEASE	12/02/02	MMG	HY
A	M102713	ADDED "...WITH SMOBC"	01/14/06	GF	IL
B	M121379	TT1413 WAS TT240, "06SP05" WAS "gn"	02/17/09	MMG	IL

SUGGESTED MOUNTING CONFIGURATION FOR
TT1413 CASE STYLE, "06SP05" PIN CODE



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" $\pm$ 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.



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

11/15/02

TOLERANCES ON:
2 PL DECIMALS $\pm$
3 PL DECIMALS $\pm$.005
ANGLES $\pm$
FRACTIONS $\pm$

CHECKED

AV

11/29/02

APPROVED

HY

12/02/02



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

PL, 06SP05, TT1413, RPS, TB-155

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SIZE

CODE IDENT

DRAWING NO:

REV:

A

15542

98-PL-110

B

FILE: 98PL110

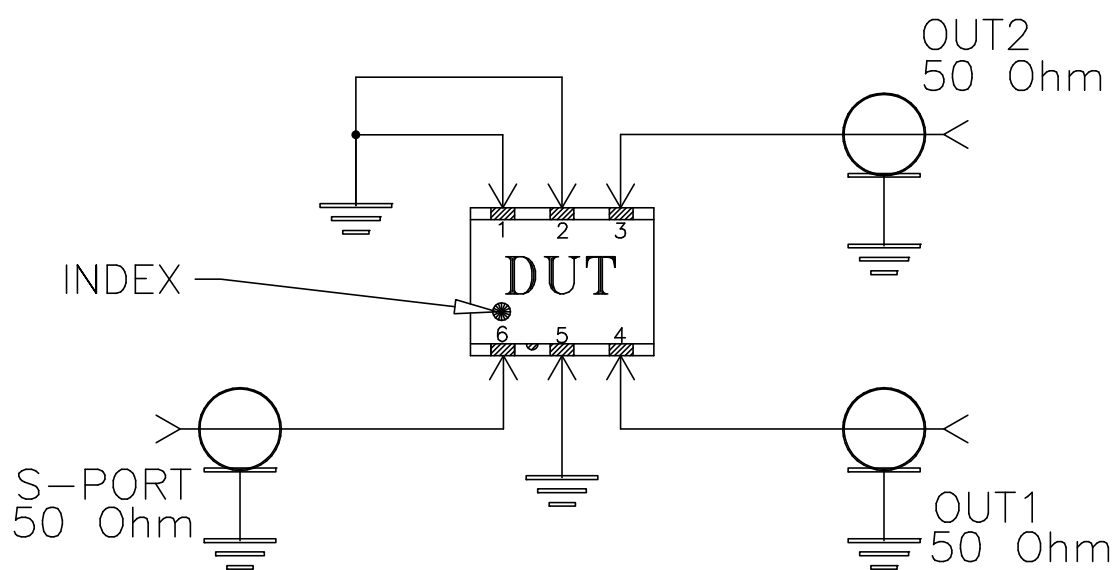
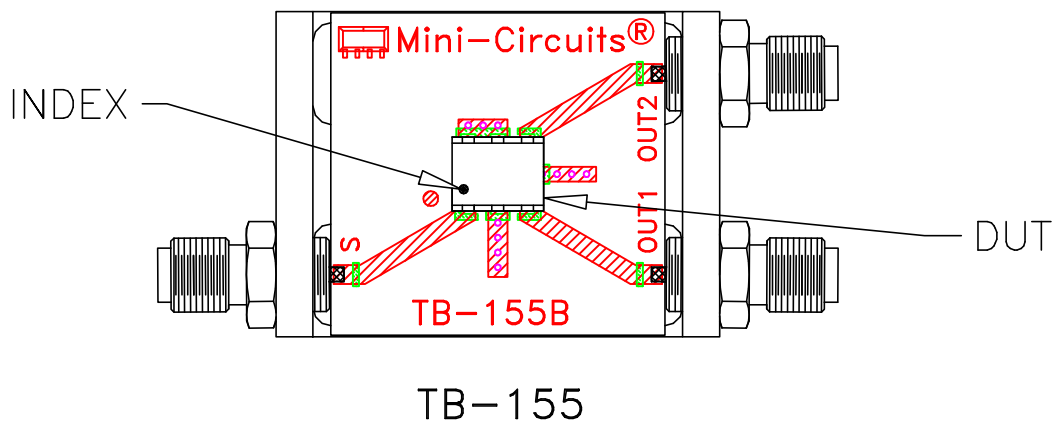
SCALE: 8:1

SHEET:

1 OF 1

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

Evaluation Board and Circuit



Schematic Diagram

Notes:

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

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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