



MMIC SURFACE MOUNT

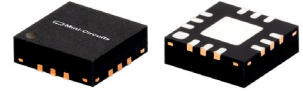
# Power Splitter/Combiner

## WP4W+

4 Way-0° 50Ω 3300 to 3800 MHz

### FEATURES

- Excellent isolation, 26 dB typ.
- Good phase unbalance, 2 deg. typ.
- Good amplitude unbalance, 0.15 dB typ.
- Small size, .118" x .118" x .035"
- High ESD level
- Aqueous washable



Generic photo used for illustration purposes only

CASE STYLE: DQ1225

**+RoHS Compliant**

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

### APPLICATIONS

- WIMAX

### ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Frequency Range		3300		3800	MHz
Insertion Loss* (above 6.0 dB)	3300-3800	—	0.8	1.4	dB
Isolation	3300-3800	18	26	—	dB
Amplitude Unbalance	3300-3800	—	—	0.4	dB
Phase Unbalance	3300-3800	—	—	8	deg.
VSWR (Port S)	3300-3800	—	1.5	—	:1
VSWR (Ports 1,2,3,4)	3300-3800	—	1.3	—	:1

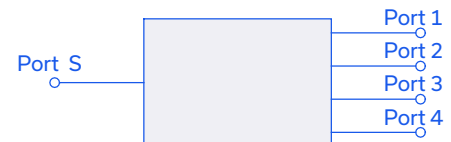
\*Includes test fixture loss, 0.27 dB typ.

### MAXIMUM RATINGS

Parameter	Ratings
Operating temperature	-40°C to 85°C
Storage temperature	-65°C to 150°C
Power Input (as a splitter)	1.5W max.
Internal Dissipation	0.375W max.

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

### ELECTRICAL SCHEMATIC





# MMIC SURFACE MOUNT

# Power Splitter/Combiner

# WP4W+

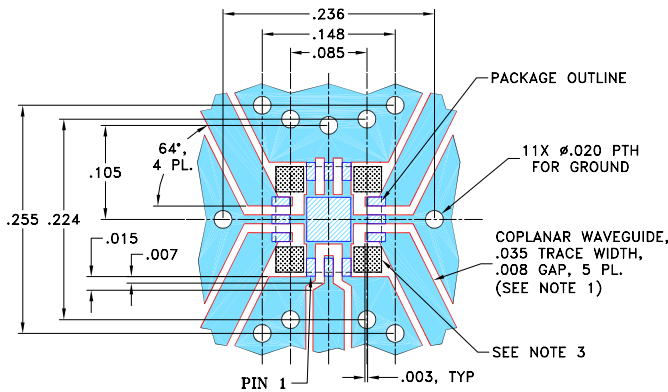
Mini-Circuits

4 Way-0° 50Ω 3300 to 3800 MHz

### PAD CONNECTIONS

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

### DEMO BOARD MCL P/N: TB-395+ SUGGESTED PCB LAYOUT (PL-259)

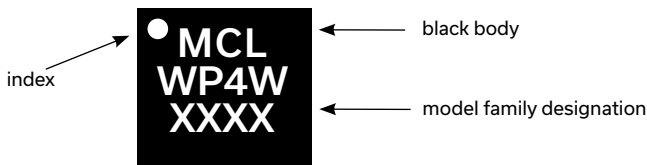


#### NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .020" ± .0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
3. SIGNAL TRACES ARE NOT ALLOWED INSIDE HATCHED AREAS (APPROX. .030 X .030) AT 4 PLACES AS SHOWN.

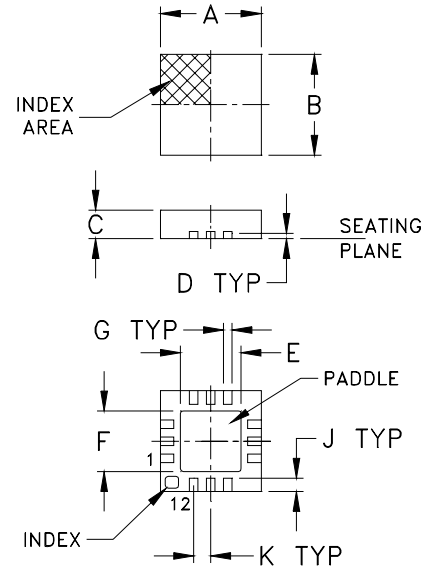
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### PRODUCT MARKING

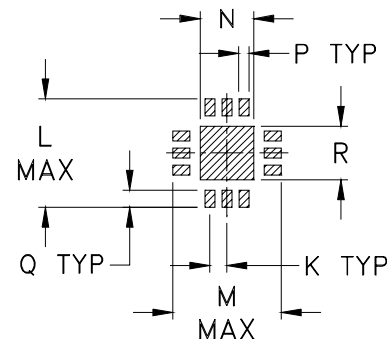


Marking may contain other features or characters for internal lot control

### 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
.118	.118	.035	.008	.057	.057	.009	---	.016
3.00	3.00	0.89	0.20	1.45	1.45	0.23	---	0.41
K	L	M	N	P	Q	R	wt	
.020	.127	.127	.049	.010	.020	.049	grams	
0.51	3.23	3.23	1.24	0.25	0.51	1.24	0.02	

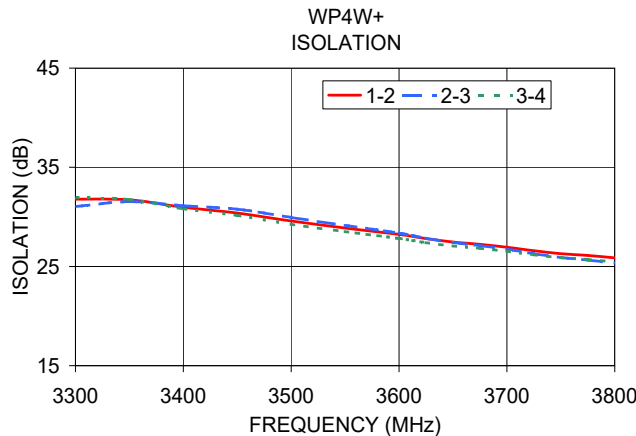
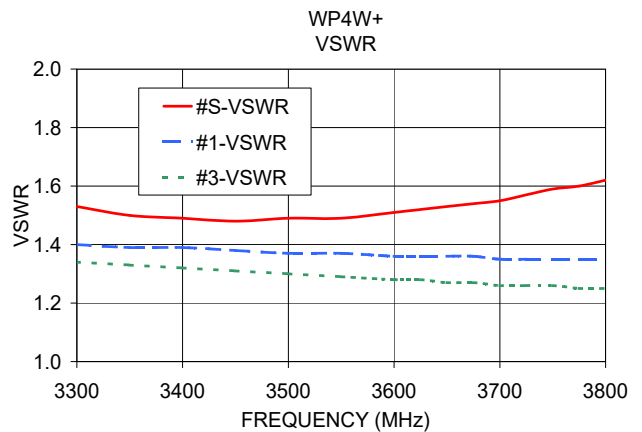
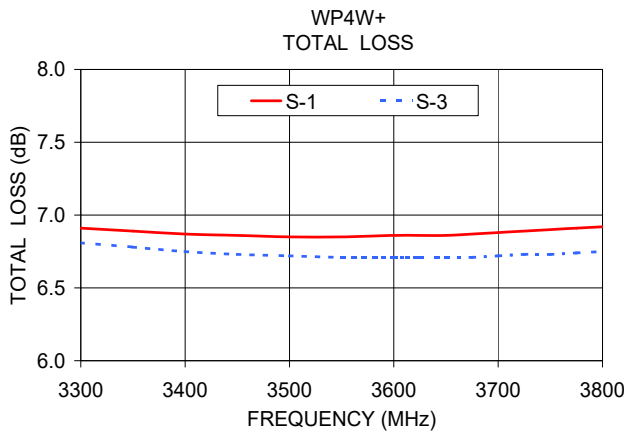
### TAPE & REEL INFORMATION: F66



### TYPICAL PERFORMANCE DATA AND CHARTS

Frequency (MHz)	Total Loss <sup>1</sup> (dB)				Amplitude Unbalance (dB)	Isolation (dB)			Phase Unbalance (deg.)	VSWR S	VSWR 1	VSWR 2	VSWR 3	VSWR 4
	S-1	S-2	S-3	S-4		1-2	2-3	3-4						
3300.00	6.91	6.88	6.81	6.88	0.10	31.79	31.04	31.98	0.99	1.53	1.40	1.32	1.34	1.41
3350.00	6.89	6.85	6.78	6.86	0.11	31.72	31.54	31.75	1.00	1.50	1.39	1.31	1.33	1.40
3400.00	6.87	6.82	6.75	6.84	0.12	30.97	31.12	30.82	1.02	1.49	1.39	1.30	1.32	1.40
3450.00	6.86	6.80	6.73	6.83	0.13	30.39	30.78	30.15	1.19	1.48	1.38	1.29	1.31	1.39
3500.00	6.85	6.79	6.72	6.83	0.13	29.59	29.95	29.26	1.36	1.49	1.37	1.28	1.30	1.38
3550.00	6.85	6.77	6.71	6.83	0.14	28.87	29.14	28.52	1.57	1.49	1.37	1.27	1.29	1.38
3600.00	6.86	6.77	6.71	6.83	0.15	28.23	28.36	27.83	1.74	1.51	1.36	1.26	1.28	1.38
3625.00	6.86	6.77	6.71	6.84	0.15	27.81	27.84	27.41	1.83	1.52	1.36	1.26	1.28	1.37
3650.00	6.86	6.77	6.71	6.84	0.16	27.47	27.42	27.07	1.94	1.53	1.36	1.25	1.27	1.37
3675.00	6.87	6.77	6.71	6.85	0.16	27.23	27.11	26.84	2.02	1.54	1.36	1.25	1.27	1.37
3700.00	6.88	6.78	6.72	6.86	0.16	26.94	26.74	26.53	2.09	1.55	1.35	1.24	1.26	1.37
3725.00	6.89	6.78	6.73	6.87	0.16	26.59	26.29	26.18	2.18	1.57	1.35	1.24	1.26	1.37
3750.00	6.90	6.79	6.73	6.87	0.17	26.29	25.90	25.89	2.28	1.59	1.35	1.24	1.26	1.36
3775.00	6.91	6.79	6.74	6.88	0.17	26.11	25.65	25.71	2.39	1.60	1.35	1.23	1.25	1.36
3800.00	6.92	6.80	6.75	6.89	0.17	25.87	25.35	25.47	2.47	1.62	1.35	1.23	1.25	1.36

1. Total Loss = Insertion Loss + 6dB splitter loss.



#### 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-Circuits 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-Circuits' website at [www.minicircuits.com/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



# 4 Way-0° Power Splitter/Combiner

# WP4W+

## Typical Performance Data

TEST CONDITIONS: INPUT POWER = -10dBm @Temperature = +25°C

FREQ. (MHz)	TOTAL LOSS <sup>1</sup> (dB)				AMP. UNBAL. (dB)	PHASE UNBAL. (deg.)	ISOLATION (dB)			VSWR (:1)				
	S-1	S-2	S-3	S-4			1-2	2-3	3-4	S	1	2	3	4
2200	10.20	10.43	10.36	10.13	0.30	6.22	16.64	15.73	16.66	5.23	1.68	1.71	1.71	1.66
2300	9.56	9.76	9.69	9.49	0.27	5.60	17.43	16.42	17.47	4.41	1.65	1.68	1.67	1.63
2400	9.01	9.19	9.12	8.93	0.26	5.08	18.33	17.19	18.41	3.76	1.62	1.63	1.63	1.59
2500	8.54	8.69	8.62	8.46	0.23	4.64	19.37	18.09	19.51	3.22	1.58	1.59	1.59	1.55
2600	8.14	8.26	8.19	8.05	0.21	4.17	20.58	19.14	20.77	2.78	1.55	1.55	1.55	1.52
2700	7.81	7.91	7.84	7.72	0.19	3.76	21.91	20.31	22.22	2.44	1.51	1.50	1.51	1.48
2800	7.56	7.63	7.56	7.46	0.17	3.39	23.37	21.59	23.85	2.18	1.48	1.46	1.46	1.45
2900	7.34	7.39	7.32	7.26	0.14	3.02	25.06	23.08	25.67	1.96	1.45	1.42	1.42	1.42
3000	7.19	7.21	7.14	7.10	0.11	2.63	26.82	24.71	27.57	1.79	1.42	1.39	1.39	1.40
3050	7.12	7.14	7.07	7.04	0.10	2.43	27.72	25.57	28.51	1.72	1.41	1.37	1.37	1.39
3100	7.07	7.08	7.01	6.99	0.09	2.26	28.55	26.44	29.36	1.67	1.41	1.35	1.35	1.38
3150	7.03	7.02	6.95	6.94	0.08	2.12	29.42	27.39	30.05	1.61	1.39	1.34	1.34	1.37
3200	6.99	6.97	6.90	6.90	0.09	1.96	30.16	28.34	30.50	1.57	1.39	1.32	1.32	1.36
3250	6.95	6.93	6.85	6.87	0.10	1.79	30.71	29.20	30.66	1.53	1.37	1.30	1.30	1.36
3300	6.93	6.89	6.82	6.85	0.11	1.60	30.89	29.92	30.56	1.50	1.37	1.29	1.29	1.35
3350	6.91	6.87	6.80	6.83	0.12	1.42	30.69	30.24	30.24	1.49	1.35	1.28	1.28	1.34
3400	6.90	6.85	6.78	6.82	0.13	1.25	30.37	30.31	29.75	1.48	1.35	1.26	1.26	1.34
3450	6.90	6.84	6.76	6.82	0.14	1.08	29.91	30.07	29.18	1.48	1.34	1.26	1.25	1.33
3500	6.90	6.82	6.75	6.82	0.15	0.90	29.42	29.73	28.57	1.48	1.33	1.24	1.24	1.33
3550	6.90	6.82	6.75	6.82	0.15	0.72	28.75	29.07	27.96	1.49	1.33	1.23	1.23	1.32
3600	6.91	6.82	6.75	6.83	0.16	0.59	28.12	28.34	27.37	1.50	1.32	1.23	1.22	1.32
3650	6.92	6.82	6.75	6.84	0.17	0.49	27.44	27.50	26.80	1.53	1.32	1.22	1.22	1.32
3700	6.93	6.83	6.76	6.86	0.18	0.62	26.88	26.81	26.27	1.56	1.32	1.21	1.21	1.31
3750	6.95	6.84	6.77	6.87	0.18	0.75	26.32	26.09	25.76	1.58	1.31	1.20	1.20	1.31
3800	6.97	6.85	6.78	6.89	0.19	0.90	25.83	25.48	25.28	1.61	1.31	1.20	1.20	1.30
3850	6.98	6.86	6.79	6.91	0.20	1.06	25.35	24.92	24.85	1.63	1.30	1.19	1.19	1.30
3900	7.01	6.88	6.81	6.93	0.20	1.22	24.87	24.31	24.43	1.66	1.30	1.19	1.19	1.30
3950	7.03	6.90	6.83	6.95	0.20	1.37	24.43	23.77	24.05	1.69	1.29	1.18	1.18	1.30
4000	7.06	6.92	6.85	6.98	0.21	1.50	23.96	23.23	23.70	1.74	1.30	1.18	1.18	1.30
4050	7.08	6.94	6.87	7.00	0.21	1.65	23.64	22.77	23.36	1.77	1.29	1.18	1.18	1.30
4100	7.12	6.97	6.90	7.03	0.22	1.79	23.27	22.28	23.03	1.81	1.29	1.18	1.18	1.29
4150	7.14	6.99	6.92	7.06	0.22	1.93	22.99	21.88	22.71	1.84	1.28	1.18	1.17	1.29
4200	7.17	7.02	6.95	7.09	0.23	2.07	22.68	21.46	22.43	1.87	1.27	1.17	1.17	1.29
4250	7.21	7.05	6.98	7.12	0.23	2.23	22.42	21.07	22.17	1.91	1.28	1.17	1.17	1.29
4300	7.24	7.08	7.01	7.15	0.23	2.35	22.16	20.69	21.90	1.95	1.26	1.17	1.17	1.29
4400	7.31	7.15	7.07	7.22	0.23	2.61	21.67	19.98	21.42	2.03	1.26	1.17	1.17	1.28
4500	7.37	7.21	7.14	7.29	0.23	2.88	21.31	19.38	21.00	2.11	1.25	1.17	1.17	1.28
4600	7.45	7.29	7.21	7.36	0.24	3.14	20.93	18.79	20.58	2.20	1.24	1.17	1.17	1.27
4800	7.60	7.44	7.36	7.50	0.24	3.69	20.27	17.72	19.90	2.38	1.22	1.18	1.18	1.26
5000	7.75	7.62	7.52	7.64	0.23	4.21	19.63	16.80	19.29	2.58	1.20	1.20	1.20	1.25
5200	7.89	7.78	7.68	7.77	0.21	4.67	19.09	16.03	18.78	2.76	1.19	1.22	1.22	1.24
5400	8.05	7.96	7.86	7.92	0.19	5.23	18.59	15.27	18.33	2.98	1.18	1.24	1.25	1.24
5600	8.18	8.12	8.03	8.05	0.15	5.70	18.22	14.63	17.93	3.17	1.18	1.28	1.29	1.25
5800	8.31	8.28	8.19	8.18	0.13	6.17	17.81	14.00	17.48	3.36	1.18	1.32	1.33	1.25
6000	8.39	8.41	8.32	8.28	0.14	6.79	17.41	13.49	17.02	3.48	1.19	1.37	1.38	1.27
6200	8.48	8.54	8.48	8.40	0.14	7.14	16.94	12.98	16.56	3.61	1.21	1.43	1.44	1.30
6400	8.54	8.66	8.60	8.48	0.18	7.66	16.49	12.60	16.09	3.71	1.24	1.51	1.52	1.34
6600	8.58	8.74	8.71	8.55	0.19	7.93	16.04	12.28	15.59	3.78	1.28	1.58	1.60	1.39
6800	8.62	8.82	8.81	8.61	0.20	8.21	15.54	12.00	15.13	3.80	1.33	1.67	1.69	1.45
7000	8.63	8.87	8.88	8.63	0.25	8.36	15.03	11.70	14.63	3.79	1.37	1.76	1.78	1.50
7200	8.67	8.96	8.96	8.66	0.30	8.35	14.43	11.48	14.09	3.82	1.44	1.88	1.88	1.56
7400	8.69	9.03	9.01	8.66	0.37	8.67	13.93	11.34	13.64	3.80	1.51	1.97	1.97	1.62
7600	8.76	9.14	9.08	8.69	0.45	9.08	13.38	11.14	13.13	3.82	1.59	2.08	2.07	1.67
8000	8.82	9.27	9.07	8.67	0.61	9.59	12.59	11.07	12.35	3.72	1.73	2.27	2.21	1.78

<sup>1</sup> Total Loss = Insertion Loss+ 6dB Splitter Loss

REV. X2  
WP4W+  
100627

Page 1 of 3



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# 4 Way-0° Power Splitter/Combiner

# WP4W+

## Typical Performance Data

TEST CONDITIONS: INPUT POWER = -10dBm @Temperature = -40°C

FREQ. (MHz)	TOTAL LOSS <sup>1</sup> (dB)				AMP. UNBAL. (dB)	PHASE UNBAL. (deg.)	ISOLATION (dB)			VSWR (:1)				
	S-1	S-2	S-3	S-4			1-2	2-3	3-4	S	1	2	3	4
2200	10.12	10.35	10.27	10.06	0.29	8.77	16.43	15.52	16.43	5.68	1.67	1.70	1.70	1.66
2300	9.46	9.67	9.59	9.40	0.27	8.21	17.21	16.20	17.23	4.72	1.64	1.67	1.67	1.62
2400	8.92	9.09	9.02	8.83	0.26	7.79	18.10	16.95	18.16	4.01	1.61	1.63	1.63	1.59
2500	8.43	8.58	8.50	8.34	0.24	7.54	19.15	17.87	19.24	3.40	1.58	1.59	1.59	1.56
2600	8.01	8.13	8.05	7.92	0.21	7.18	20.39	18.95	20.49	2.89	1.54	1.54	1.55	1.53
2700	7.69	7.79	7.71	7.60	0.19	6.82	21.66	20.08	21.92	2.54	1.51	1.50	1.52	1.49
2800	7.44	7.51	7.43	7.35	0.17	6.59	23.02	21.28	23.53	2.27	1.47	1.46	1.48	1.46
2900	7.21	7.27	7.19	7.14	0.13	6.31	24.72	22.77	25.34	2.02	1.44	1.42	1.44	1.44
3000	7.05	7.08	7.00	6.97	0.10	5.97	26.42	24.36	27.25	1.84	1.41	1.38	1.39	1.41
3050	6.98	7.00	6.92	6.91	0.10	5.82	27.27	25.16	28.20	1.77	1.40	1.36	1.37	1.39
3100	6.93	6.94	6.85	6.85	0.09	5.69	28.10	26.01	29.07	1.71	1.39	1.34	1.35	1.38
3150	6.87	6.87	6.79	6.80	0.09	5.59	29.08	26.99	29.80	1.64	1.38	1.32	1.33	1.37
3200	6.83	6.81	6.73	6.75	0.10	5.48	29.97	28.04	30.29	1.58	1.37	1.30	1.31	1.36
3250	6.79	6.77	6.68	6.71	0.11	5.35	30.69	29.07	30.50	1.54	1.36	1.28	1.29	1.35
3300	6.77	6.73	6.64	6.68	0.12	5.21	30.90	29.90	30.44	1.50	1.35	1.27	1.28	1.35
3350	6.75	6.71	6.62	6.67	0.13	5.09	30.68	30.26	30.13	1.49	1.34	1.26	1.27	1.34
3400	6.74	6.69	6.60	6.65	0.14	4.97	30.31	30.35	29.65	1.49	1.34	1.24	1.25	1.33
3450	6.74	6.67	6.58	6.65	0.15	4.86	29.83	30.12	29.08	1.49	1.33	1.24	1.24	1.32
3500	6.73	6.66	6.57	6.64	0.16	4.74	29.34	29.78	28.47	1.49	1.32	1.22	1.22	1.31
3550	6.73	6.65	6.56	6.65	0.17	4.63	28.66	29.14	27.86	1.50	1.32	1.22	1.21	1.30
3600	6.74	6.65	6.56	6.65	0.18	4.56	28.03	28.39	27.25	1.51	1.31	1.21	1.20	1.30
3650	6.75	6.66	6.57	6.66	0.19	4.48	27.35	27.51	26.67	1.54	1.31	1.20	1.19	1.30
3700	6.76	6.66	6.57	6.67	0.19	4.39	26.76	26.79	26.13	1.57	1.30	1.19	1.18	1.29
3750	6.78	6.67	6.58	6.69	0.20	4.51	26.16	26.06	25.62	1.60	1.30	1.19	1.18	1.29
3800	6.80	6.69	6.59	6.71	0.20	4.72	25.69	25.41	25.14	1.63	1.30	1.19	1.17	1.29
3850	6.81	6.70	6.61	6.73	0.21	4.92	25.22	24.84	24.69	1.65	1.30	1.18	1.17	1.29
3900	6.84	6.71	6.62	6.75	0.22	5.14	24.78	24.30	24.28	1.68	1.30	1.18	1.17	1.28
3950	6.85	6.73	6.64	6.77	0.22	5.34	24.36	23.78	23.91	1.70	1.29	1.17	1.16	1.29
4000	6.88	6.75	6.66	6.80	0.22	5.52	23.91	23.22	23.55	1.75	1.29	1.17	1.16	1.29
4050	6.91	6.77	6.68	6.82	0.23	5.72	23.54	22.75	23.22	1.78	1.29	1.17	1.16	1.29
4100	6.94	6.80	6.71	6.85	0.23	5.92	23.12	22.21	22.89	1.83	1.28	1.17	1.16	1.28
4150	6.97	6.83	6.74	6.87	0.23	6.11	22.80	21.78	22.57	1.86	1.28	1.17	1.16	1.28
4200	7.00	6.86	6.76	6.90	0.24	6.31	22.50	21.35	22.28	1.90	1.27	1.17	1.16	1.28
4250	7.03	6.88	6.79	6.93	0.24	6.52	22.26	21.01	22.02	1.94	1.27	1.17	1.15	1.27
4300	7.05	6.90	6.81	6.96	0.24	6.69	22.03	20.65	21.76	1.96	1.26	1.17	1.15	1.27
4400	7.12	6.97	6.87	7.03	0.25	7.05	21.51	19.93	21.29	2.05	1.25	1.17	1.15	1.27
4500	7.19	7.04	6.95	7.10	0.25	7.41	21.08	19.28	20.86	2.14	1.25	1.17	1.16	1.27
4600	7.27	7.12	7.02	7.16	0.25	7.78	20.75	18.69	20.45	2.23	1.25	1.17	1.16	1.26
4800	7.40	7.26	7.15	7.30	0.25	8.53	20.12	17.64	19.77	2.40	1.22	1.17	1.18	1.26
5000	7.57	7.44	7.33	7.45	0.24	9.26	19.41	16.66	19.14	2.63	1.20	1.20	1.19	1.25
5200	7.69	7.59	7.47	7.58	0.22	9.92	18.95	15.90	18.63	2.80	1.19	1.23	1.22	1.25
5400	7.85	7.76	7.64	7.71	0.21	10.64	18.42	15.13	18.15	3.04	1.19	1.26	1.24	1.23
5600	7.97	7.92	7.80	7.83	0.17	11.36	18.09	14.53	17.74	3.23	1.19	1.30	1.30	1.26
5800	8.12	8.10	7.99	7.99	0.14	11.97	17.63	13.83	17.29	3.50	1.19	1.34	1.33	1.26
6000	8.13	8.16	8.04	8.02	0.14	12.79	17.37	13.39	16.85	3.52	1.20	1.39	1.39	1.29
6200	8.23	8.30	8.19	8.14	0.16	13.27	16.91	12.85	16.40	3.70	1.22	1.46	1.44	1.31
6400	8.29	8.42	8.31	8.20	0.22	14.13	16.41	12.46	15.94	3.82	1.25	1.54	1.53	1.36
6600	8.37	8.55	8.46	8.31	0.24	14.72	15.90	12.07	15.45	4.01	1.30	1.62	1.62	1.41
6800	8.43	8.65	8.58	8.39	0.26	15.30	15.41	11.78	15.00	4.09	1.35	1.70	1.72	1.47
7000	8.41	8.68	8.62	8.40	0.27	15.80	14.95	11.51	14.54	4.04	1.40	1.81	1.85	1.54
7200	8.45	8.77	8.73	8.46	0.32	15.99	14.32	11.28	14.00	4.12	1.47	1.92	1.97	1.62
7400	8.43	8.79	8.78	8.46	0.35	16.13	13.80	11.09	13.57	4.06	1.54	2.01	2.08	1.68
7600	8.49	8.88	8.85	8.50	0.39	16.25	13.25	10.89	13.05	4.08	1.62	2.11	2.17	1.74
8000	8.54	8.97	8.81	8.59	0.44	17.26	12.50	10.68	12.23	3.94	1.74	2.27	2.28	1.82

<sup>1</sup> Total Loss = Insertion Loss+ 6dB Splitter Loss

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# 4 Way-0° Power Splitter/Combiner

# WP4W+

## Typical Performance Data

TEST CONDITIONS: INPUT POWER = -10dBm @Temperature = +85°C

FREQ. (MHz)	TOTAL LOSS <sup>1</sup> (dB)				AMP. UNBAL. (dB)	PHASE UNBAL. (deg.)	ISOLATION (dB)			VSWR (:1)				
	S-1	S-2	S-3	S-4			1-2	2-3	3-4	S	1	2	3	4
2200	10.26	10.48	10.41	10.19	0.29	7.90	16.75	15.84	16.80	4.98	1.68	1.71	1.70	1.66
2300	9.63	9.82	9.75	9.56	0.26	7.46	17.56	16.53	17.62	4.21	1.65	1.68	1.66	1.63
2400	9.08	9.24	9.17	9.00	0.24	7.05	18.50	17.33	18.58	3.58	1.62	1.64	1.62	1.59
2500	8.60	8.74	8.67	8.52	0.22	6.64	19.58	18.27	19.69	3.08	1.59	1.60	1.58	1.55
2600	8.21	8.32	8.24	8.12	0.19	6.28	20.81	19.34	20.98	2.67	1.55	1.55	1.53	1.51
2700	7.88	7.97	7.89	7.79	0.17	5.94	22.21	20.55	22.45	2.35	1.52	1.50	1.49	1.48
2800	7.63	7.69	7.61	7.54	0.15	5.57	23.74	21.89	24.11	2.10	1.48	1.46	1.45	1.44
2900	7.43	7.46	7.39	7.34	0.12	5.21	25.44	23.41	25.96	1.90	1.45	1.43	1.41	1.42
3000	7.28	7.29	7.22	7.19	0.10	4.94	27.23	25.06	27.91	1.74	1.43	1.39	1.37	1.39
3050	7.22	7.22	7.15	7.13	0.09	4.82	28.15	25.94	28.86	1.68	1.41	1.37	1.36	1.38
3100	7.17	7.16	7.09	7.09	0.08	4.67	28.96	26.84	29.71	1.63	1.41	1.35	1.34	1.37
3150	7.12	7.11	7.03	7.04	0.09	4.65	29.76	27.75	30.38	1.58	1.39	1.34	1.33	1.37
3200	7.09	7.06	6.99	7.01	0.10	4.69	30.39	28.63	30.78	1.54	1.39	1.32	1.31	1.36
3250	7.06	7.02	6.95	6.98	0.11	4.75	30.82	29.40	30.90	1.51	1.37	1.31	1.30	1.35
3300	7.04	6.99	6.92	6.96	0.12	4.84	30.94	30.06	30.74	1.48	1.37	1.29	1.29	1.35
3350	7.03	6.97	6.90	6.95	0.13	4.92	30.71	30.30	30.36	1.47	1.35	1.28	1.28	1.34
3400	7.02	6.95	6.88	6.94	0.14	5.00	30.37	30.30	29.83	1.46	1.35	1.26	1.27	1.34
3450	7.01	6.94	6.87	6.94	0.15	5.06	29.85	29.97	29.23	1.46	1.34	1.26	1.26	1.33
3500	7.01	6.92	6.86	6.94	0.15	5.16	29.32	29.54	28.61	1.46	1.33	1.24	1.25	1.33
3550	7.02	6.92	6.85	6.95	0.16	5.24	28.63	28.88	27.99	1.47	1.33	1.23	1.24	1.33
3600	7.02	6.92	6.86	6.96	0.17	5.40	28.02	28.16	27.39	1.48	1.32	1.23	1.23	1.32
3650	7.04	6.93	6.86	6.97	0.18	5.63	27.37	27.33	26.82	1.51	1.32	1.22	1.22	1.32
3700	7.05	6.93	6.87	6.99	0.18	5.92	26.81	26.65	26.28	1.53	1.31	1.21	1.22	1.32
3750	7.07	6.94	6.88	7.00	0.19	6.19	26.24	25.99	25.78	1.55	1.30	1.20	1.21	1.32
3800	7.09	6.95	6.89	7.02	0.20	6.41	25.75	25.34	25.31	1.58	1.30	1.20	1.21	1.31
3850	7.11	6.97	6.90	7.04	0.20	6.64	25.27	24.76	24.87	1.60	1.29	1.19	1.20	1.31
3900	7.13	6.99	6.92	7.06	0.21	6.83	24.79	24.19	24.46	1.64	1.30	1.19	1.20	1.31
3950	7.15	7.00	6.94	7.09	0.21	7.05	24.37	23.68	24.09	1.66	1.29	1.19	1.19	1.31
4000	7.18	7.03	6.97	7.12	0.22	7.34	23.93	23.12	23.73	1.70	1.29	1.18	1.19	1.31
4050	7.21	7.05	6.99	7.14	0.22	7.57	23.61	22.68	23.39	1.73	1.28	1.18	1.19	1.30
4100	7.24	7.07	7.01	7.17	0.23	7.80	23.24	22.19	23.06	1.77	1.28	1.18	1.18	1.30
4150	7.27	7.10	7.04	7.20	0.23	8.00	22.95	21.78	22.74	1.81	1.27	1.18	1.18	1.30
4200	7.30	7.13	7.07	7.23	0.24	8.19	22.66	21.36	22.46	1.84	1.27	1.17	1.18	1.30
4250	7.34	7.17	7.10	7.27	0.24	8.40	22.39	20.98	22.21	1.89	1.27	1.17	1.18	1.30
4300	7.37	7.20	7.13	7.30	0.24	8.63	22.16	20.62	21.94	1.92	1.26	1.17	1.18	1.30
4400	7.45	7.27	7.20	7.37	0.25	9.12	21.68	19.94	21.46	2.01	1.25	1.17	1.17	1.29
4500	7.52	7.34	7.27	7.44	0.25	9.51	21.32	19.33	21.04	2.09	1.25	1.17	1.17	1.28
4600	7.60	7.42	7.35	7.51	0.25	9.92	20.96	18.74	20.62	2.19	1.24	1.17	1.17	1.27
4800	7.75	7.57	7.49	7.65	0.25	10.81	20.32	17.71	19.96	2.37	1.22	1.18	1.18	1.26
5000	7.89	7.73	7.65	7.79	0.25	11.57	19.72	16.85	19.37	2.56	1.20	1.20	1.19	1.25
5200	8.03	7.89	7.80	7.92	0.23	12.31	19.18	16.07	18.88	2.73	1.18	1.22	1.21	1.24
5400	8.19	8.07	7.97	8.07	0.21	12.95	18.69	15.32	18.44	2.95	1.16	1.24	1.23	1.23
5600	8.32	8.24	8.14	8.21	0.18	13.60	18.32	14.69	18.05	3.14	1.15	1.27	1.27	1.23
5800	8.46	8.41	8.31	8.35	0.15	14.22	17.88	14.06	17.63	3.32	1.15	1.31	1.31	1.24
6000	8.56	8.56	8.46	8.46	0.10	14.71	17.46	13.52	17.17	3.45	1.17	1.35	1.36	1.26
6200	8.66	8.69	8.63	8.60	0.09	15.54	16.99	13.03	16.72	3.58	1.18	1.39	1.42	1.29
6400	8.72	8.80	8.77	8.69	0.11	16.31	16.57	12.68	16.26	3.65	1.20	1.46	1.49	1.33
6600	8.76	8.87	8.89	8.76	0.13	17.29	16.13	12.37	15.76	3.68	1.24	1.53	1.57	1.37
6800	8.78	8.93	8.98	8.80	0.20	18.30	15.66	12.11	15.28	3.65	1.29	1.60	1.66	1.41
7000	8.79	8.99	9.06	8.83	0.27	19.38	15.12	11.83	14.75	3.61	1.33	1.70	1.74	1.46
7200	8.82	9.07	9.12	8.83	0.30	20.52	14.57	11.66	14.19	3.58	1.40	1.82	1.81	1.50
7400	8.85	9.16	9.16	8.82	0.34	21.40	14.07	11.51	13.71	3.55	1.48	1.93	1.89	1.55
7600	8.92	9.29	9.21	8.83	0.46	22.23	13.52	11.43	13.19	3.52	1.56	2.05	1.98	1.61
8000	9.04	9.50	9.24	8.83	0.67	23.01	12.68	11.37	12.42	3.48	1.72	2.27	2.15	1.74

<sup>1</sup> Total Loss = Insertion Loss+ 6dB Splitter Loss

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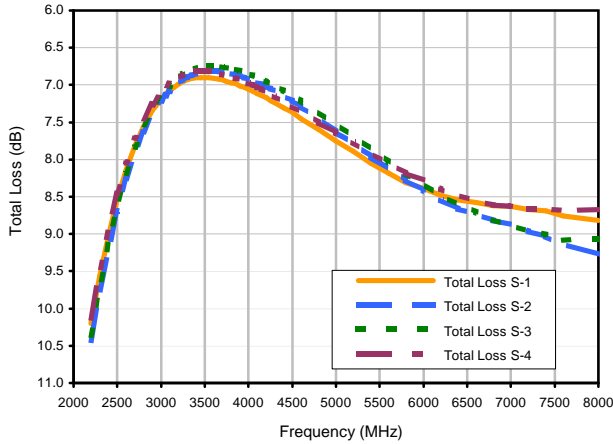


# 4 Way-0° Power Splitter/Combiner

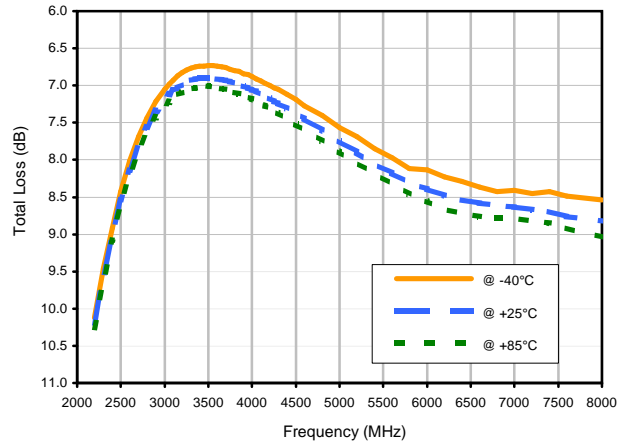
WP4W+

## Typical Performance Curves

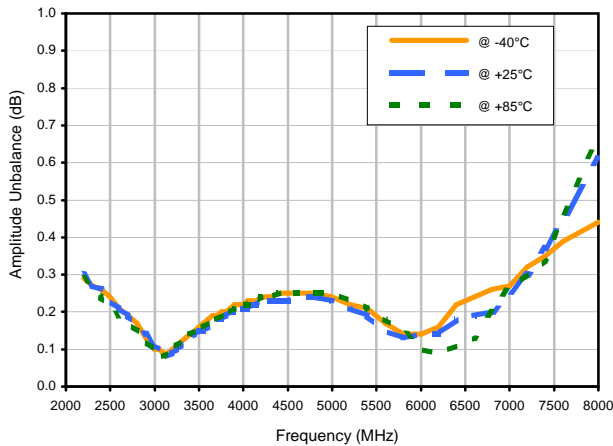
Total Loss



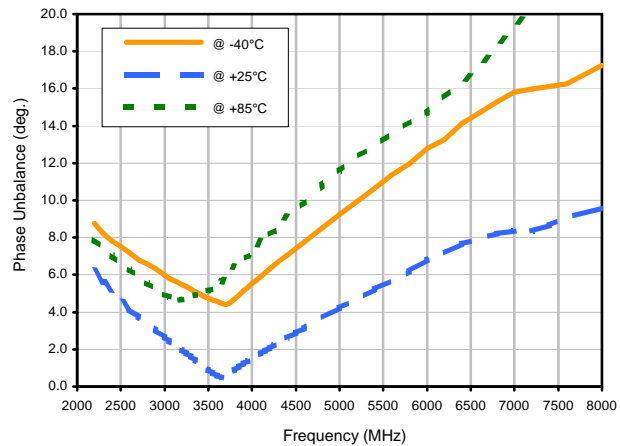
Total Loss S-1 vs. TEMPERATURE



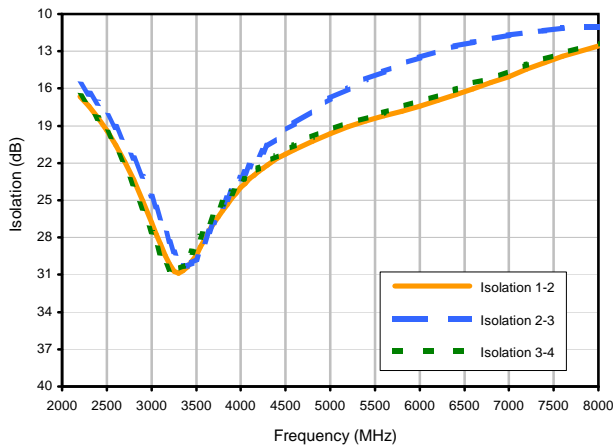
Amplitude Unbalance vs. TEMPERATURE



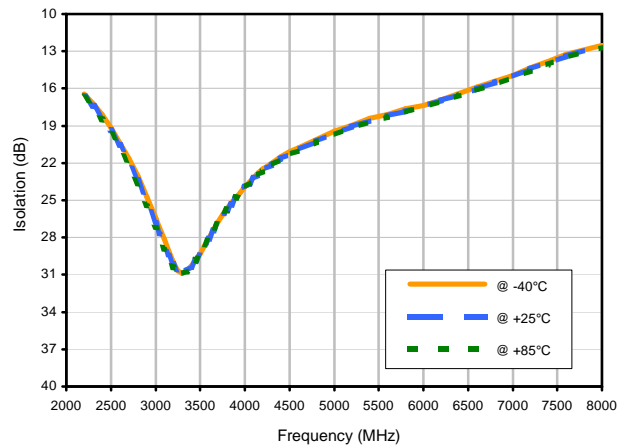
Phase Unbalance vs. TEMPERATURE



Isolation



Isolation 1-2 vs. TEMPERATURE



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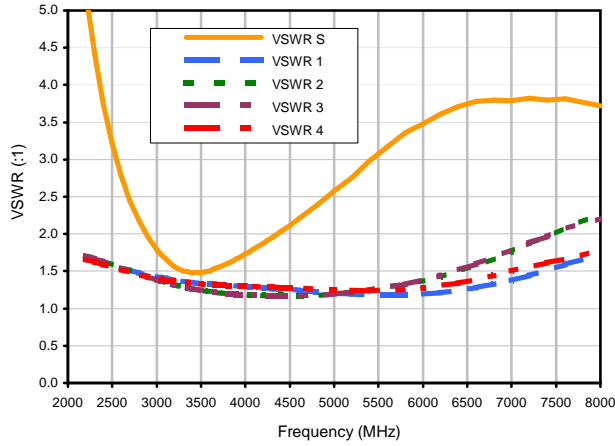


# 4 Way-0° Power Splitter/Combiner

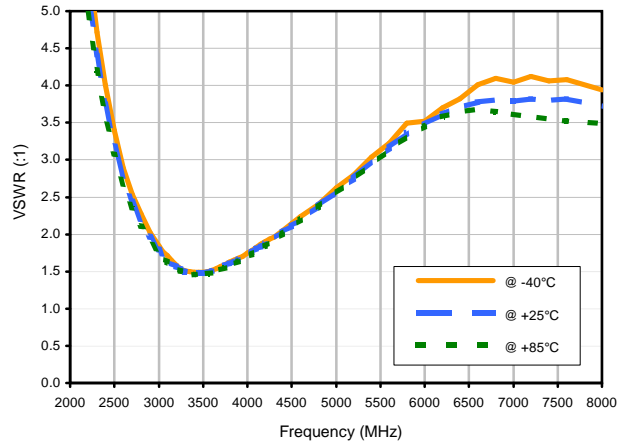
# WP4W+

## Typical Performance Curves

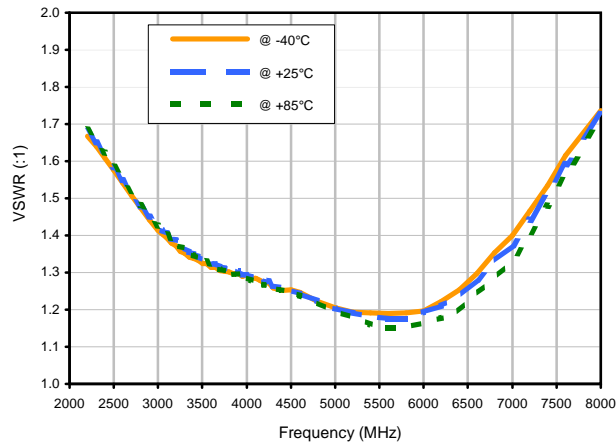
### VSWR



### VSWR SUM vs. TEMPERATURE



### VSWR OUT1 vs. TEMPERATURE



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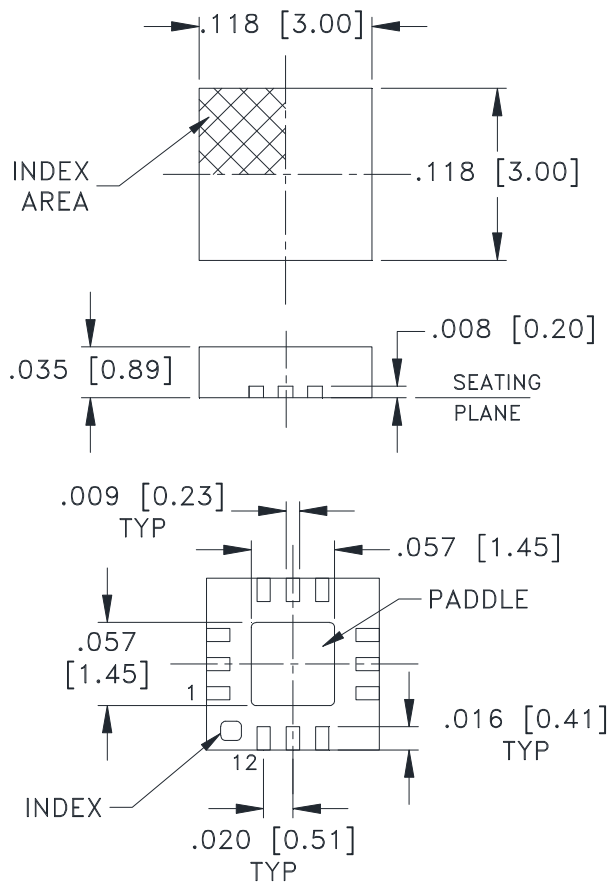


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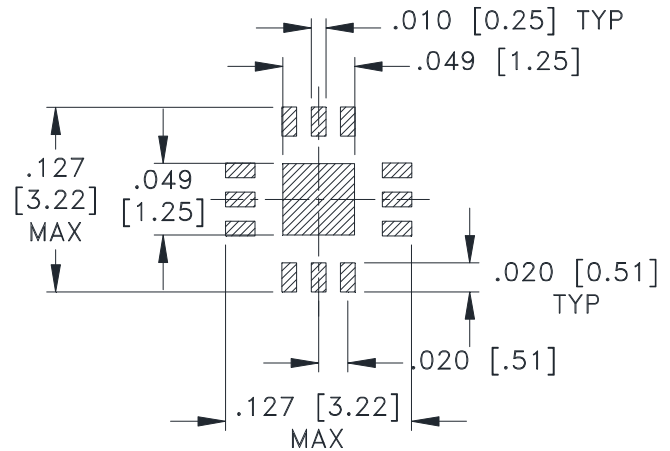




### Outline Dimensions



### PCB Land Pattern



SUGGESTED LAYOUT,  
TOLERANCE TO BE WITHIN  $\pm .002$

**Weight: .02 Grams**

**Dimensions are in inches (mm). Tolerances: 2Pl.  $\pm .01$ ; 3 Pl.  $\pm .004$**

### Notes:

1. Case material: Plastic.
2. Termination finish:
  - For RoHS Case Styles: Tin-Silver alloy plate over Nickel barrier or Matte-Tin. All models, (+) suffix. See Data sheet.
  - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

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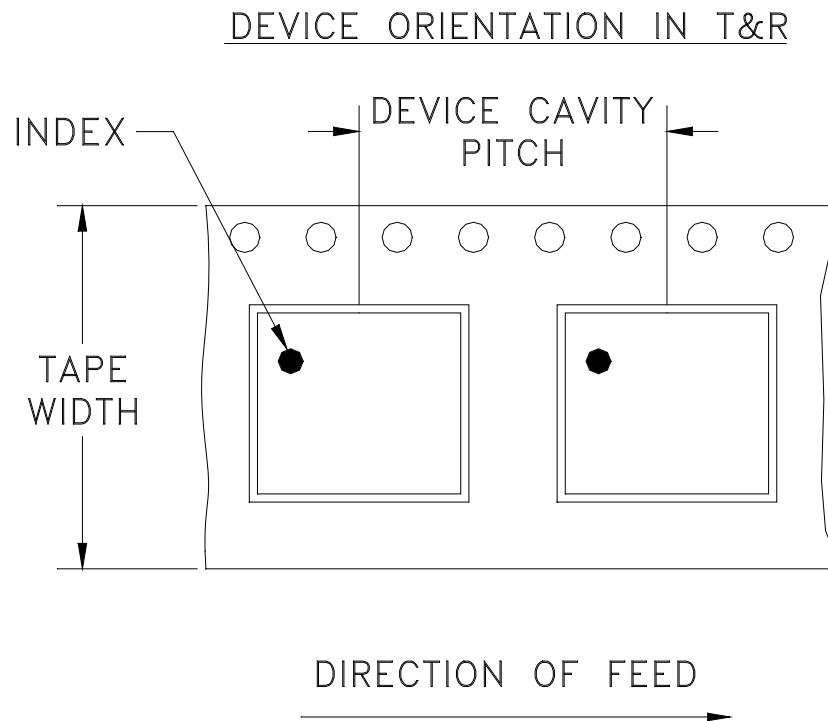
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# Tape & Reel Packaging TR-F66



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
8	4	7	Small quantity standard	20
				50
				100
				200
				500
		7	Standard	1000, 2000, 3000

Note: Please consult individual model data sheet to determine device per reel availability.

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](http://www.minicircuits.com/pages/pdfs/tape.pdf)

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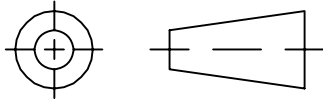
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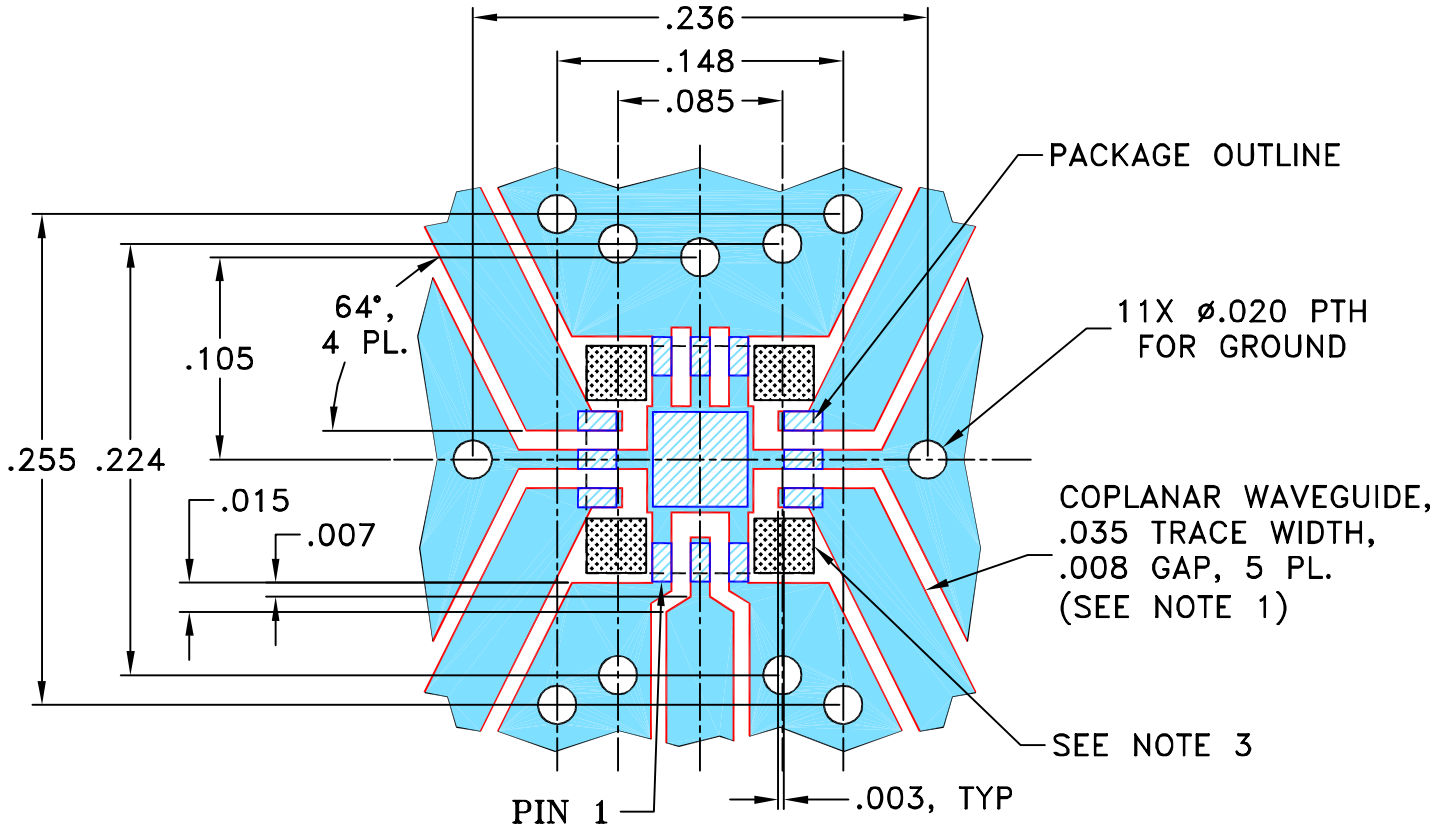
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M109251	NEW RELEASE	01/11/07	PW	WP
A	M112849	UPDATED NOTE 3	08/03/07	AV	WP

**SUGGESTED MOUNTING CONFIGURATION FOR  
DQ1225 CASE STYLE, "rx" PIN CONNECTION**



**NOTES:**

1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS  $.020'' \pm .0015''$ ; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
3. SIGNAL TRACES ARE NOT ALLOWED INSIDE HATCHED AREAS (APPROX.  $.030 \times .030$ ) AT 4 PLACES AS SHOWN.



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

PW

01/10/07

TOLERANCES ON:

CHECKED

IL

01/11/07

2 PL DECIMALS  $\pm .005$

APPROVED

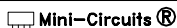
WP

01/11/07

3 PL DECIMALS  $\pm .005$

ANGLES  $\pm 1^\circ$

FRACTIONS  $\pm$



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



**Mini-Circuits®**

13 Neptune Avenue  
Brooklyn NY 11235

**PL, rx, DQ1225, WP4, TB-395+**

SIZE  
A

CODE IDENT  
15542

DRAWING NO:  
98-PL-259

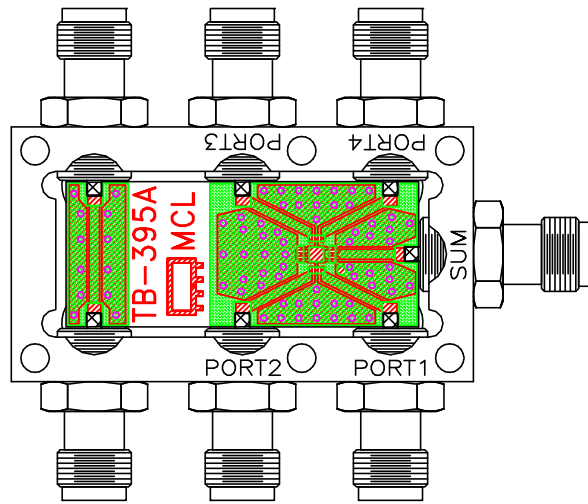
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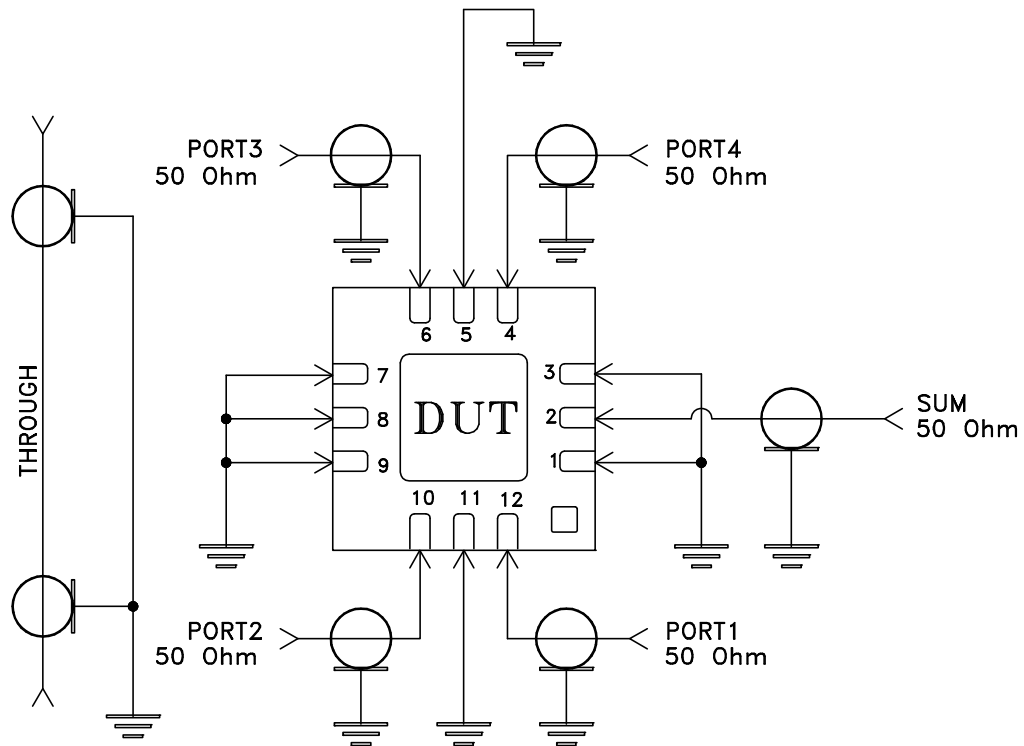
SCALE: 10:1

SHEET: 1 OF 1

# Evaluation Board and Circuit




TB-395+



Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent, Dielectric Constant=3.5, Thickness=.020 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	-65° to 150° C Ambient Environment	Individual Model Data Sheet
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102-C, Condition C
Temperature Cycling	-65° to 150°C, 100 cycles	JESD22-A104
Temperature Humidity	85°C/ 85% RH, 168 hours	JESD22-113
Solder Reflow Heat	Sn-Pb Eutetic Process: 240°C peak Pb-Free Process: 260°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Moisture Sensitivity: Level 1	Bake at 125°C for 24 hours Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 240°C peak (Non-RoHS) or 260°C (RoHS)	J-STD-020
Solderability	10X magnification, 95% coverage	JESD22-B102, Method 1: Dip and Look Test
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
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