



Mini-Circuits

MMIC SURFACE MOUNT

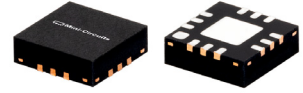
Power Splitter/Combiner

WP4N+

4 Way-0° 50Ω 1215 to 1900 MHz

FEATURES

- Excellent Isolation, Typ. 23 dB
- Excellent Phase Unbalance, Max. 5 deg.
- Excellent Amplitude Unbalance, Max. 0.5 dB
- Small Size, 3x3 mm
- High ESD Level
- Aqueous Washable



Generic photo used for illustration purposes only

CASE STYLE: DQ1225

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

APPLICATIONS

- GPS
- WCDMA
- PCS

ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Frequency Range		1215		1900	MHz
Insertion Loss* (Above 6.0 dB)	1215-1900		0.7	1.9	dB
Isolation	1215-1900	14	23		dB
Amplitude Unbalance	1215-1900			0.5	dB
Phase Unbalance	1215-1900			5	deg.
VSWR (Port S)	1215-1900		1.5		:1
VSWR (Ports 1,2,3,4)	1215-1900		1.4		:1

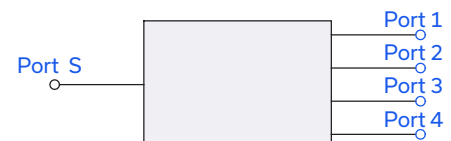
* Includes fixture loss, 0.15 dB typ. Max value increases to 2.5 dB below 1315 MHz.

ABSOLUTE MAXIMUM RATINGS

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

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

ELECTRICAL SCHEMATIC



Mini-Circuits

www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

REV. F
ECO-026468
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250806

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Power Splitter/Combiner

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4 Way-0° 50Ω 1215 to 1900 MHz

OUTLINE DRAWING

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

Figure 1: Dimensions of the package outline. The drawing shows a top-down view of a square package with a central square pad and four rectangular pads. Dimensions are given in inches. The overall width and height are .255 inches. The central pad has a width of .035 inches and a gap of .008 inches between pads. The package outline is defined by a blue shaded area. Labels include: .236, .148, .085, .105, 64°, 4 PL., .255, .224, .015, .007, .003, TYP, PIN 1, PACKAGE OUTLINE, 11X Ø.020 PTH FOR GROUND, COPLANAR WAVEGUIDE, .035 TRACE WIDTH, .008 GAP, 5 PL. (SEE NOTE 1), and SEE NOTE 3.

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.

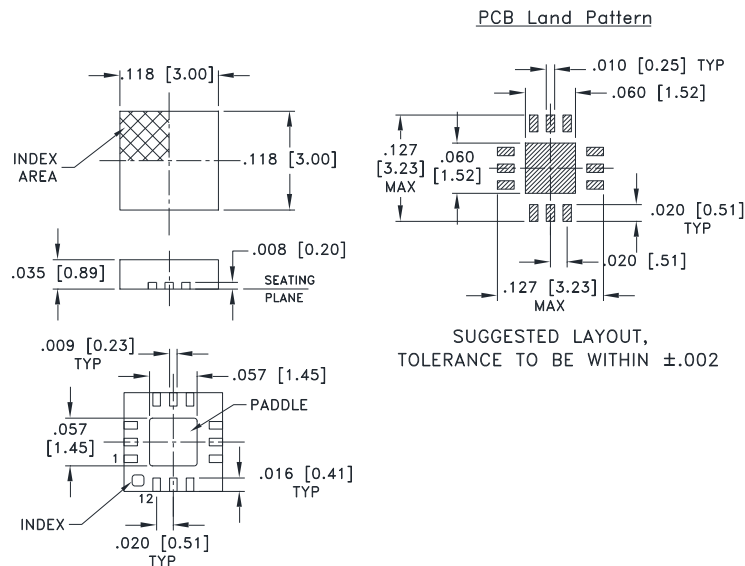
-  DENOTES PCB COPPER LAYOUT WITH SMOBC
 (SOLDER MASK OVER BARE COPPER)
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

The diagram shows a black rectangular label with white text. The text is arranged in four lines: a small white circle, the letters 'MCL', 'WP4N', and 'XXXX'. Annotations with arrows point to specific parts of the label:

- An arrow points from the word 'Index' to the small white circle.
- An arrow points from the text 'Black Body' to the 'MCL' line.
- An arrow points from the text 'Model Family Designation' to the 'XXXX' line.

Marking may contain other features or characters for internal lot control.

OUTLINE DRAWING



Weight: .02 Grams
Dimensions are in inches [mm]. Tolerances in inches: 2 Pl. $\pm .01$; 3 Pl. $\pm .004$ inches

TAPE & REEL INFORMATION: F66



Mini-Circuits

MMIC SURFACE MOUNT

Power Splitter/Combiner

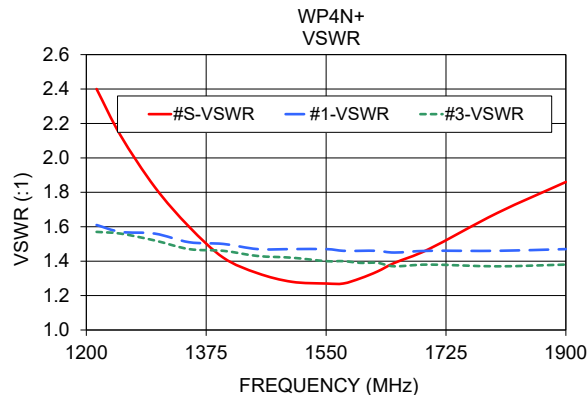
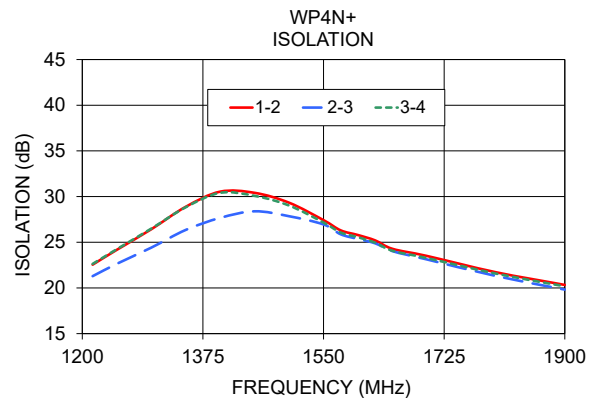
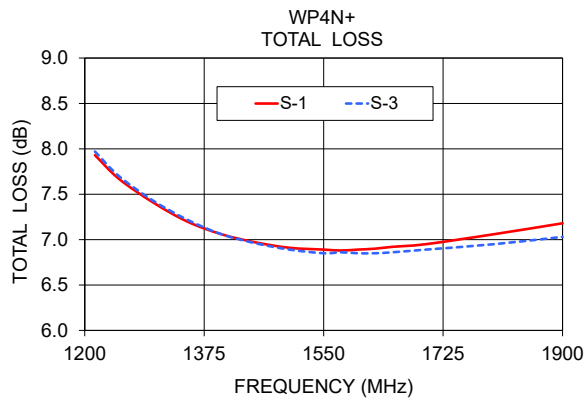
WP4N+

4 Way-0° 50Ω 1215 to 1900 MHz

TYPICAL PERFORMANCE DATA AND CHARTS

Frequency (MHz)	Total Loss ¹ (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						
1215.0	7.93	7.96	7.97	7.89	0.07	22.55	21.29	22.63	0.99	2.40	1.61	1.57	1.57	1.54
1250.0	7.67	7.69	7.70	7.64	0.06	24.17	22.64	24.24	0.77	2.13	1.57	1.57	1.56	1.52
1300.0	7.41	7.43	7.43	7.37	0.06	26.42	24.41	26.49	0.54	1.83	1.56	1.54	1.52	1.48
1350.0	7.20	7.21	7.22	7.17	0.05	28.88	26.35	28.83	0.28	1.60	1.51	1.50	1.47	1.45
1400.0	7.06	7.05	7.06	7.02	0.04	30.54	27.67	30.41	0.30	1.42	1.50	1.49	1.46	1.43
1450.0	6.97	6.95	6.96	6.94	0.03	30.41	28.39	30.08	0.45	1.33	1.47	1.47	1.43	1.41
1500.0	6.91	6.88	6.89	6.87	0.04	29.33	27.85	29.02	0.63	1.28	1.47	1.42	1.42	1.40
1550.0	6.89	6.84	6.85	6.85	0.04	27.42	26.95	27.16	0.98	1.27	1.47	1.44	1.40	1.39
1575.0	6.88	6.84	6.86	6.85	0.04	26.30	25.87	26.06	1.09	1.27	1.46	1.40	1.40	1.39
1600.0	6.89	6.84	6.85	6.87	0.05	25.79	25.36	25.55	1.07	1.30	1.46	1.39	1.39	1.38
1625.0	6.90	6.84	6.85	6.87	0.06	25.20	24.88	24.95	1.20	1.34	1.46	1.37	1.39	1.38
1650.0	6.92	6.84	6.86	6.87	0.08	24.28	24.03	24.07	1.27	1.39	1.45	1.39	1.37	1.38
1700.0	6.95	6.87	6.89	6.92	0.08	23.50	23.12	23.27	1.65	1.47	1.46	1.39	1.38	1.39
1800.0	7.06	6.95	6.95	7.02	0.12	21.72	21.31	21.57	2.01	1.68	1.46	1.36	1.37	1.42
1900.0	7.18	7.03	7.03	7.11	0.15	20.33	19.82	20.18	2.53	1.86	1.47	1.35	1.38	1.43

1. Total Loss = Insertion Loss + 6 dB 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



4 Way-0° Power Splitter/Combiner

WP4N+

Typical Performance Data

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

FREQ. (MHz)	TOTAL LOSS ¹ (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
900	10.88	11.05	11.00	10.81	0.24	3.12	15.46	14.66	15.81	6.07	1.76	1.72	1.73	1.75
1000	9.10	9.28	9.23	9.04	0.24	2.45	17.45	16.44	17.90	4.02	1.70	1.68	1.69	1.70
1100	8.08	8.28	8.22	8.04	0.24	2.05	20.47	19.03	21.10	2.75	1.62	1.62	1.63	1.63
1150	7.40	7.58	7.52	7.35	0.22	1.61	22.51	20.75	23.32	2.29	1.60	1.59	1.58	1.58
1200	7.30	7.46	7.42	7.26	0.21	1.60	24.99	22.78	26.21	1.95	1.54	1.55	1.55	1.55
1215	7.14	7.30	7.24	7.11	0.19	1.52	25.86	23.46	27.23	1.86	1.54	1.54	1.54	1.53
1230	7.03	7.18	7.13	6.99	0.19	1.42	26.77	24.16	28.33	1.78	1.53	1.53	1.52	1.52
1250	6.94	7.10	7.04	6.90	0.20	1.37	28.05	25.14	29.96	1.67	1.52	1.51	1.50	1.50
1280	6.79	6.95	6.89	6.75	0.21	1.18	29.91	26.58	32.51	1.54	1.50	1.49	1.49	1.48
1300	6.76	6.92	6.85	6.71	0.20	1.14	30.93	27.51	33.81	1.46	1.48	1.48	1.48	1.48
1325	6.78	6.92	6.86	6.73	0.19	1.17	31.62	28.43	34.31	1.37	1.47	1.47	1.46	1.46
1350	6.64	6.76	6.71	6.59	0.18	0.92	31.42	28.97	33.15	1.29	1.46	1.45	1.44	1.44
1375	6.55	6.68	6.62	6.50	0.18	0.81	30.44	28.95	31.39	1.22	1.45	1.44	1.42	1.43
1400	6.59	6.72	6.66	6.54	0.18	0.85	29.18	28.45	29.64	1.17	1.44	1.43	1.42	1.42
1425	6.61	6.71	6.66	6.55	0.16	0.75	27.90	27.64	28.11	1.13	1.42	1.41	1.41	1.41
1450	6.55	6.65	6.59	6.49	0.16	0.63	26.79	26.72	26.79	1.11	1.41	1.40	1.39	1.40
1475	6.52	6.61	6.55	6.46	0.15	0.65	25.76	25.83	25.67	1.12	1.42	1.39	1.38	1.39
1500	6.53	6.62	6.56	6.46	0.16	0.60	24.80	24.93	24.70	1.16	1.41	1.38	1.37	1.39
1525	6.55	6.64	6.58	6.49	0.15	0.68	23.99	24.07	23.86	1.20	1.39	1.38	1.37	1.39
1550	6.58	6.66	6.59	6.51	0.15	0.70	23.29	23.37	23.12	1.25	1.39	1.37	1.36	1.38
1575	6.63	6.68	6.62	6.55	0.13	0.68	22.70	22.73	22.48	1.29	1.39	1.36	1.35	1.37
1600	6.56	6.60	6.54	6.48	0.12	0.79	22.10	22.10	21.92	1.34	1.40	1.36	1.34	1.37
1650	6.75	6.79	6.73	6.67	0.12	0.74	21.13	21.01	20.92	1.44	1.38	1.35	1.35	1.37
1700	6.57	6.61	6.54	6.48	0.13	1.28	20.33	20.11	20.14	1.54	1.39	1.34	1.33	1.37
1750	6.86	6.83	6.77	6.76	0.10	1.21	19.66	19.34	19.46	1.64	1.39	1.34	1.34	1.37
1800	6.89	6.89	6.82	6.79	0.10	1.26	19.10	18.69	18.91	1.75	1.40	1.34	1.34	1.38
1825	6.93	6.88	6.82	6.84	0.12	1.58	18.83	18.36	18.66	1.80	1.40	1.34	1.33	1.37
1850	6.73	6.72	6.66	6.64	0.10	1.93	18.63	18.10	18.43	1.84	1.40	1.34	1.34	1.38
1875	6.96	6.94	6.88	6.84	0.11	1.58	18.43	17.86	18.21	1.89	1.40	1.34	1.34	1.39
1900	7.09	7.00	6.94	6.97	0.14	1.76	18.21	17.60	18.01	1.94	1.40	1.34	1.34	1.39
1950	6.99	6.95	6.88	6.88	0.11	2.03	17.85	17.14	17.64	2.03	1.42	1.35	1.34	1.39
2000	7.09	7.03	6.96	6.98	0.13	2.15	17.53	16.75	17.34	2.12	1.42	1.35	1.35	1.41
2050	7.11	7.03	6.96	7.00	0.15	2.52	17.25	16.37	17.06	2.21	1.44	1.36	1.35	1.41
2100	7.24	7.14	7.08	7.12	0.16	2.66	17.01	16.04	16.83	2.30	1.43	1.37	1.36	1.42
2200	7.12	7.05	7.00	7.02	0.12	3.15	16.63	15.45	16.41	2.45	1.46	1.38	1.37	1.43
2300	7.37	7.27	7.21	7.27	0.16	3.22	16.34	14.95	16.09	2.60	1.48	1.39	1.38	1.45
2400	7.38	7.25	7.18	7.29	0.20	3.96	16.11	14.47	15.82	2.75	1.50	1.40	1.39	1.46
2500	7.42	7.30	7.24	7.35	0.18	4.19	15.92	14.05	15.60	2.87	1.52	1.41	1.40	1.47
2600	7.67	7.50	7.44	7.59	0.23	4.58	15.75	13.67	15.42	2.98	1.53	1.41	1.41	1.49
2700	7.63	7.48	7.41	7.58	0.21	4.75	15.63	13.31	15.28	3.08	1.53	1.42	1.42	1.49
2800	7.94	7.74	7.69	7.88	0.24	4.57	15.52	12.97	15.16	3.17	1.54	1.42	1.43	1.50
2900	7.86	7.70	7.65	7.83	0.21	4.82	15.44	12.64	15.03	3.26	1.55	1.43	1.43	1.50
3000	8.12	7.92	7.89	8.06	0.23	4.33	15.36	12.31	14.92	3.35	1.56	1.43	1.42	1.50
3100	8.11	7.89	7.85	8.08	0.26	5.05	15.24	11.99	14.80	3.43	1.56	1.42	1.43	1.49
3200	7.80	7.67	7.65	7.81	0.16	5.49	15.09	11.66	14.66	3.52	1.56	1.42	1.43	1.49
3300	8.13	7.93	7.91	8.11	0.22	5.52	14.92	11.36	14.51	3.58	1.57	1.41	1.43	1.49
3400	8.09	7.89	7.86	8.08	0.23	6.09	14.78	11.09	14.35	3.65	1.57	1.41	1.43	1.48
3500	8.53	8.21	8.20	8.45	0.33	5.79	14.60	10.82	14.16	3.70	1.57	1.41	1.43	1.48
3600	8.54	8.14	8.11	8.43	0.44	6.44	14.39	10.57	13.94	3.76	1.57	1.41	1.44	1.47
3700	8.72	8.31	8.30	8.56	0.42	6.36	14.12	10.33	13.65	3.82	1.56	1.42	1.45	1.47
3800	8.95	8.42	8.39	8.71	0.55	6.51	13.77	10.11	13.35	3.89	1.54	1.43	1.46	1.46
3900	8.79	8.35	8.31	8.55	0.48	7.24	13.38	9.91	12.98	3.96	1.53	1.45	1.47	1.45
4000	9.17	8.66	8.62	8.82	0.55	6.79	12.96	9.73	12.60	4.01	1.53	1.47	1.50	1.45
4100	9.09	8.47	8.41	8.64	0.67	7.63	12.50	9.58	12.15	4.01	1.53	1.50	1.52	1.46

¹ Total Loss = Insertion Loss+ 6dB Splitter Loss

REV. X2

WP4N+

100627

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Mini-Circuits®

RF/MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant

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4 Way-0° Power Splitter/Combiner

WP4N+

Typical Performance Data

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

FREQ. (MHz)	TOTAL LOSS ¹ (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
900	10.84	11.03	11.00	10.77	0.26	3.07	15.27	14.49	15.63	6.56	1.76	1.72	1.74	1.76
1000	9.05	9.26	9.21	9.01	0.25	2.37	17.20	16.21	17.67	4.32	1.71	1.69	1.70	1.70
1100	8.03	8.25	8.20	8.01	0.24	1.98	20.17	18.78	20.80	2.89	1.62	1.63	1.64	1.64
1150	7.34	7.53	7.49	7.31	0.22	1.47	22.21	20.50	22.98	2.40	1.59	1.60	1.58	1.58
1200	7.24	7.41	7.37	7.20	0.20	1.48	24.72	22.53	25.80	2.03	1.54	1.56	1.56	1.55
1215	7.08	7.24	7.20	7.04	0.19	1.38	25.59	23.22	26.82	1.93	1.54	1.55	1.54	1.54
1230	6.95	7.12	7.08	6.92	0.20	1.24	26.51	23.93	27.89	1.84	1.53	1.54	1.52	1.52
1250	6.86	7.04	7.00	6.83	0.21	1.17	27.83	24.94	29.50	1.73	1.52	1.52	1.50	1.50
1280	6.71	6.88	6.85	6.69	0.19	1.13	29.87	26.48	32.15	1.59	1.50	1.49	1.49	1.48
1300	6.68	6.85	6.82	6.66	0.20	1.10	31.10	27.52	33.71	1.50	1.48	1.48	1.48	1.48
1325	6.68	6.84	6.81	6.67	0.18	1.09	32.08	28.64	34.53	1.40	1.46	1.46	1.46	1.46
1350	6.53	6.68	6.65	6.52	0.16	1.13	31.87	29.28	33.63	1.31	1.45	1.44	1.44	1.44
1375	6.44	6.60	6.57	6.43	0.17	1.13	30.68	29.26	31.82	1.23	1.44	1.43	1.42	1.43
1400	6.49	6.65	6.62	6.47	0.18	1.14	29.20	28.60	29.97	1.17	1.42	1.42	1.41	1.42
1425	6.49	6.62	6.60	6.47	0.16	1.13	27.83	27.67	28.34	1.14	1.40	1.40	1.40	1.41
1450	6.42	6.56	6.54	6.41	0.14	1.18	26.65	26.70	26.95	1.12	1.40	1.39	1.39	1.40
1475	6.38	6.52	6.50	6.37	0.15	1.35	25.63	25.77	25.79	1.13	1.40	1.38	1.37	1.39
1500	6.39	6.54	6.51	6.39	0.15	1.35	24.71	24.88	24.79	1.16	1.40	1.38	1.37	1.38
1525	6.42	6.55	6.52	6.41	0.14	1.47	23.95	24.06	23.93	1.20	1.38	1.37	1.37	1.38
1550	6.43	6.56	6.54	6.43	0.14	1.49	23.28	23.39	23.17	1.24	1.38	1.36	1.36	1.38
1575	6.48	6.58	6.56	6.46	0.12	1.58	22.70	22.78	22.51	1.28	1.39	1.35	1.35	1.37
1600	6.40	6.50	6.48	6.39	0.11	1.85	22.09	22.14	21.93	1.33	1.39	1.35	1.34	1.36
1650	6.60	6.71	6.68	6.59	0.12	1.76	21.11	21.03	20.91	1.43	1.38	1.34	1.34	1.37
1700	6.41	6.51	6.49	6.40	0.12	2.21	20.28	20.11	20.10	1.53	1.38	1.33	1.32	1.36
1750	6.67	6.71	6.69	6.64	0.06	2.20	19.62	19.34	19.41	1.63	1.37	1.33	1.33	1.37
1800	6.74	6.81	6.79	6.72	0.09	2.29	19.05	18.69	18.85	1.73	1.38	1.33	1.32	1.36
1825	6.74	6.76	6.75	6.72	0.04	2.52	18.79	18.36	18.59	1.78	1.39	1.33	1.31	1.36
1850	6.57	6.64	6.63	6.55	0.09	2.75	18.56	18.09	18.35	1.83	1.39	1.33	1.32	1.37
1875	6.81	6.87	6.85	6.79	0.08	2.54	18.35	17.82	18.13	1.88	1.39	1.33	1.32	1.37
1900	6.89	6.90	6.89	6.87	0.03	2.73	18.09	17.53	17.94	1.94	1.39	1.33	1.32	1.37
1950	6.84	6.88	6.85	6.81	0.07	2.90	17.70	17.04	17.56	2.04	1.40	1.33	1.31	1.37
2000	6.93	6.94	6.92	6.90	0.04	3.04	17.36	16.63	17.25	2.14	1.39	1.34	1.32	1.38
2050	6.94	6.93	6.91	6.91	0.03	3.33	17.09	16.27	16.96	2.23	1.41	1.35	1.32	1.38
2100	7.07	7.06	7.03	7.04	0.04	3.37	16.84	15.92	16.71	2.32	1.40	1.36	1.33	1.39
2200	6.99	6.99	6.96	6.95	0.04	3.78	16.46	15.33	16.29	2.48	1.43	1.38	1.34	1.40
2300	7.24	7.20	7.18	7.21	0.06	3.96	16.18	14.84	15.96	2.63	1.46	1.39	1.36	1.42
2400	7.22	7.15	7.12	7.20	0.10	4.52	15.95	14.37	15.68	2.78	1.49	1.41	1.38	1.44
2500	7.31	7.23	7.20	7.27	0.12	4.82	15.77	13.96	15.46	2.92	1.53	1.42	1.40	1.47
2600	7.54	7.39	7.35	7.49	0.19	5.37	15.63	13.59	15.29	3.03	1.55	1.42	1.42	1.49
2700	7.53	7.39	7.35	7.49	0.18	5.59	15.50	13.25	15.15	3.14	1.56	1.43	1.43	1.50
2800	7.88	7.67	7.62	7.79	0.26	5.75	15.43	12.91	15.04	3.25	1.57	1.43	1.44	1.51
2900	7.83	7.62	7.58	7.76	0.25	6.11	15.38	12.62	14.93	3.32	1.58	1.43	1.44	1.51
3000	8.15	7.88	7.84	8.04	0.31	6.01	15.31	12.29	14.81	3.40	1.57	1.43	1.43	1.50
3100	8.09	7.79	7.74	7.97	0.35	6.85	15.16	11.93	14.69	3.51	1.56	1.42	1.43	1.50
3200	7.86	7.65	7.60	7.77	0.26	7.17	14.99	11.58	14.54	3.61	1.57	1.41	1.42	1.49
3300	8.18	7.89	7.84	8.05	0.33	7.57	14.78	11.28	14.39	3.68	1.55	1.41	1.42	1.48
3400	8.13	7.85	7.80	8.00	0.33	8.30	14.58	10.97	14.22	3.79	1.54	1.40	1.43	1.47
3500	8.52	8.15	8.10	8.35	0.43	8.57	14.41	10.69	14.04	3.86	1.56	1.41	1.44	1.48
3600	8.43	8.02	7.98	8.26	0.45	9.82	14.23	10.46	13.82	3.90	1.55	1.42	1.45	1.48
3700	8.65	8.26	8.24	8.49	0.41	9.64	13.97	10.21	13.56	3.97	1.56	1.42	1.46	1.48
3800	8.75	8.27	8.29	8.57	0.48	10.25	13.65	9.99	13.27	4.05	1.55	1.44	1.47	1.48
3900	8.60	8.31	8.31	8.50	0.29	10.66	13.29	9.78	12.91	4.09	1.55	1.46	1.48	1.46
4000	8.92	8.56	8.63	8.79	0.37	10.46	12.86	9.58	12.53	4.17	1.54	1.48	1.49	1.45
4100	8.68	8.35	8.44	8.60	0.33	11.68	12.41	9.41	12.10	4.19	1.56	1.51	1.52	1.47

¹ Total Loss = Insertion Loss+ 6dB Splitter Loss

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4 Way-0° Power Splitter/Combiner

WP4N+

Typical Performance Data

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

FREQ. (MHz)	TOTAL LOSS ¹ (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
900	10.88	11.07	11.04	10.83	0.25	2.82	15.67	14.86	16.00	5.70	1.78	1.73	1.75	1.77
1000	9.12	9.31	9.26	9.06	0.25	2.18	17.70	16.66	18.12	3.82	1.72	1.69	1.70	1.71
1100	8.13	8.33	8.28	8.08	0.25	1.76	20.70	19.25	21.37	2.63	1.64	1.63	1.64	1.64
1150	7.47	7.64	7.58	7.41	0.23	1.29	22.72	20.95	23.63	2.22	1.61	1.59	1.59	1.59
1200	7.39	7.53	7.49	7.33	0.20	1.26	25.13	22.89	26.51	1.90	1.56	1.55	1.56	1.56
1215	7.24	7.37	7.33	7.18	0.20	1.26	25.94	23.55	27.53	1.81	1.55	1.54	1.55	1.55
1230	7.12	7.26	7.21	7.05	0.21	1.02	26.81	24.21	28.60	1.73	1.54	1.53	1.53	1.53
1250	7.03	7.17	7.12	6.96	0.21	1.00	27.95	25.13	30.21	1.64	1.54	1.51	1.51	1.51
1280	6.87	7.02	6.97	6.82	0.20	0.80	29.60	26.44	32.56	1.51	1.52	1.49	1.50	1.49
1300	6.84	6.99	6.94	6.77	0.21	0.81	30.47	27.26	33.68	1.44	1.50	1.48	1.49	1.49
1325	6.86	6.99	6.95	6.79	0.20	0.80	31.02	28.05	33.86	1.36	1.48	1.47	1.47	1.47
1350	6.73	6.84	6.79	6.67	0.18	0.58	30.88	28.53	32.68	1.28	1.47	1.45	1.45	1.45
1375	6.62	6.75	6.70	6.56	0.19	0.62	30.06	28.51	30.97	1.22	1.47	1.44	1.43	1.44
1400	6.66	6.79	6.74	6.60	0.19	0.63	28.98	28.11	29.36	1.17	1.45	1.43	1.42	1.43
1425	6.68	6.79	6.74	6.62	0.17	0.59	27.83	27.39	27.92	1.14	1.43	1.41	1.41	1.42
1450	6.62	6.72	6.68	6.56	0.16	0.85	26.83	26.61	26.65	1.13	1.43	1.40	1.40	1.41
1475	6.58	6.68	6.64	6.53	0.16	0.97	25.87	25.80	25.57	1.14	1.43	1.39	1.39	1.40
1500	6.58	6.68	6.64	6.52	0.16	1.04	24.94	24.95	24.64	1.17	1.42	1.38	1.38	1.39
1525	6.61	6.70	6.65	6.54	0.16	1.11	24.16	24.15	23.84	1.22	1.41	1.38	1.38	1.39
1550	6.63	6.72	6.67	6.57	0.15	1.13	23.46	23.44	23.11	1.26	1.40	1.37	1.37	1.39
1575	6.68	6.75	6.69	6.61	0.14	1.23	22.88	22.84	22.49	1.30	1.40	1.36	1.36	1.38
1600	6.61	6.67	6.62	6.53	0.14	1.59	22.29	22.22	21.93	1.35	1.41	1.36	1.35	1.38
1650	6.78	6.85	6.80	6.71	0.14	1.44	21.32	21.15	20.96	1.45	1.39	1.35	1.35	1.38
1700	6.59	6.66	6.61	6.53	0.13	2.04	20.52	20.27	20.18	1.55	1.40	1.34	1.34	1.37
1750	6.88	6.89	6.84	6.81	0.08	1.99	19.86	19.49	19.52	1.64	1.39	1.34	1.34	1.38
1800	6.90	6.94	6.89	6.83	0.11	1.99	19.29	18.84	18.97	1.74	1.40	1.34	1.34	1.38
1825	6.96	6.95	6.90	6.88	0.08	2.32	19.01	18.52	18.71	1.79	1.40	1.34	1.33	1.38
1850	6.76	6.79	6.73	6.69	0.10	2.60	18.81	18.24	18.48	1.83	1.40	1.34	1.33	1.38
1875	6.96	6.99	6.94	6.89	0.10	2.30	18.61	17.99	18.27	1.87	1.40	1.34	1.34	1.39
1900	7.10	7.06	7.02	7.02	0.08	2.48	18.37	17.73	18.09	1.92	1.40	1.34	1.34	1.39
1950	7.00	7.00	6.95	6.92	0.08	2.70	17.99	17.25	17.71	2.02	1.42	1.34	1.34	1.39
2000	7.11	7.08	7.03	7.02	0.08	2.91	17.66	16.86	17.41	2.10	1.41	1.35	1.35	1.40
2050	7.12	7.09	7.04	7.06	0.08	3.21	17.36	16.47	17.13	2.19	1.43	1.35	1.34	1.41
2100	7.25	7.20	7.15	7.17	0.10	3.20	17.13	16.13	16.89	2.27	1.42	1.36	1.35	1.42
2200	7.15	7.11	7.06	7.08	0.09	3.72	16.71	15.51	16.47	2.42	1.44	1.37	1.36	1.43
2300	7.40	7.32	7.28	7.33	0.11	3.82	16.39	14.98	16.14	2.57	1.46	1.38	1.37	1.44
2400	7.44	7.33	7.28	7.37	0.16	4.60	16.13	14.49	15.87	2.72	1.48	1.39	1.38	1.45
2500	7.51	7.38	7.34	7.42	0.17	4.87	15.92	14.06	15.64	2.83	1.49	1.40	1.38	1.46
2600	7.79	7.59	7.54	7.70	0.25	5.22	15.74	13.66	15.46	2.93	1.50	1.40	1.39	1.48
2700	7.78	7.58	7.53	7.69	0.24	5.53	15.60	13.30	15.31	3.03	1.50	1.41	1.40	1.48
2800	8.10	7.85	7.81	7.99	0.29	5.51	15.49	12.95	15.18	3.12	1.52	1.41	1.41	1.49
2900	8.06	7.82	7.78	7.96	0.28	5.92	15.39	12.62	15.07	3.21	1.53	1.42	1.41	1.50
3000	8.29	8.02	8.00	8.18	0.29	5.73	15.31	12.28	14.96	3.29	1.55	1.42	1.42	1.50
3100	8.36	8.03	7.99	8.23	0.37	6.60	15.19	11.97	14.84	3.37	1.56	1.42	1.42	1.50
3200	8.03	7.80	7.76	7.95	0.27	7.27	15.05	11.66	14.70	3.45	1.57	1.42	1.43	1.50
3300	8.35	8.06	8.03	8.24	0.32	7.32	14.91	11.38	14.56	3.50	1.57	1.42	1.43	1.50
3400	8.33	8.02	7.98	8.21	0.34	8.13	14.81	11.11	14.40	3.56	1.58	1.42	1.43	1.50
3500	8.73	8.36	8.32	8.59	0.41	7.93	14.66	10.86	14.22	3.62	1.59	1.41	1.44	1.49
3600	8.75	8.31	8.26	8.60	0.49	8.93	14.46	10.62	14.00	3.67	1.58	1.41	1.44	1.48
3700	8.81	8.44	8.41	8.69	0.40	8.88	14.19	10.39	13.71	3.72	1.58	1.42	1.44	1.47
3800	9.01	8.55	8.53	8.84	0.47	9.19	13.85	10.17	13.41	3.79	1.56	1.42	1.46	1.46
3900	8.72	8.42	8.43	8.62	0.30	10.09	13.46	9.97	13.04	3.83	1.55	1.43	1.47	1.44
4000	8.98	8.70	8.74	8.90	0.27	9.68	13.03	9.80	12.64	3.86	1.54	1.45	1.49	1.44
4100	8.79	8.50	8.54	8.73	0.29	10.80	12.57	9.68	12.19	3.86	1.53	1.48	1.52	1.43

¹ Total Loss = Insertion Loss+ 6dB Splitter Loss

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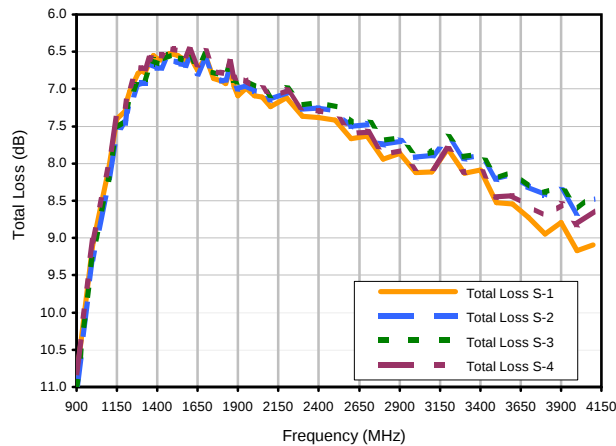


4 Way-0° Power Splitter/Combiner

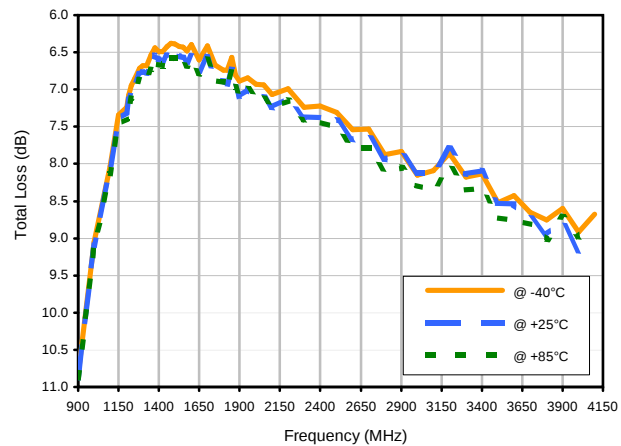
WP4N+

Typical Performance Curves

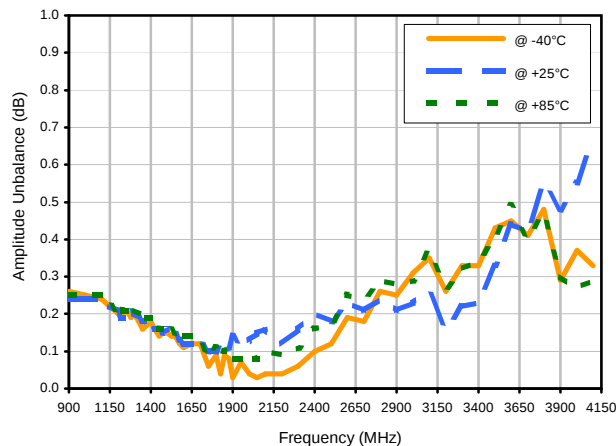
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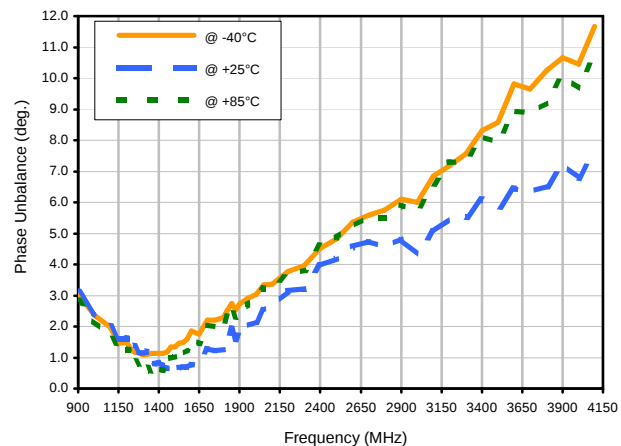
Total Loss S-1 vs. TEMPERATURE



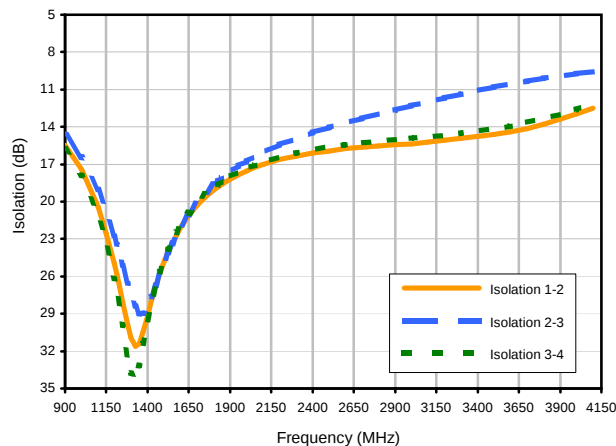
Amplitude Unbalance vs. TEMPERATURE



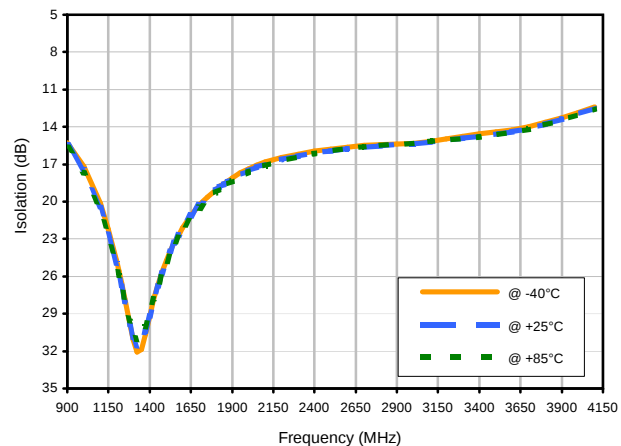
Phase Unbalance vs. TEMPERATURE



Isolation



Isolation 1-2 vs. TEMPERATURE

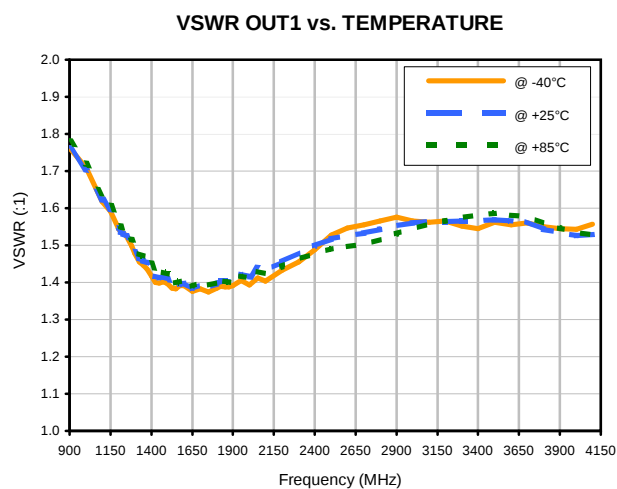
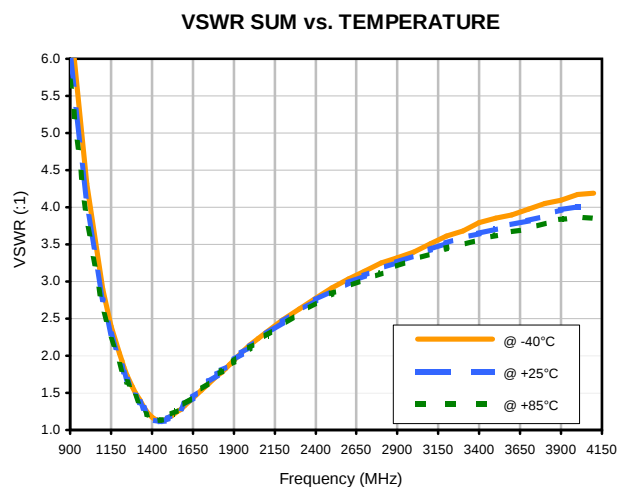
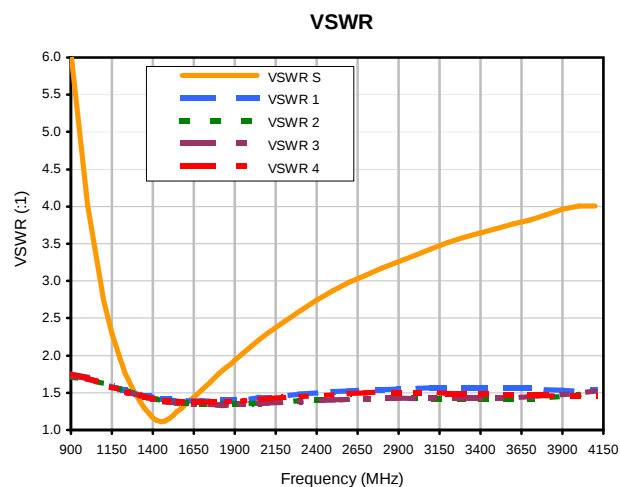


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4 Way-0° Power Splitter/Combiner

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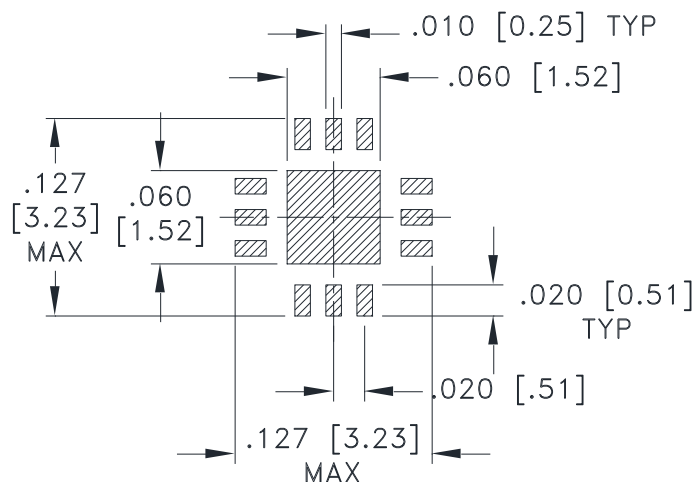
Typical Performance Curves



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Figure 1 shows the dimensions of the test specimen. The top view indicates a square specimen with a central square hole. The side view shows the specimen's profile with a central rectangular hole. The bottom view shows the specimen's base with a central square hole and four rectangular holes. Dimensions are given in inches and millimeters.

- Top View Dimensions:
 - Overall width: .118 [3.00]
 - Overall height: .118 [3.00]
 - Central square hole side length: .035 [0.89]
 - Index area (hatched square) side length: .008 [0.20]
- Side View Dimensions:
 - Overall height: .035 [0.89]
 - Central rectangular hole height: .008 [0.20]
 - Seating plane (indicated by a horizontal line)
- Bottom View Dimensions:
 - Overall width: .057 [1.45]
 - Overall height: .057 [1.45]
 - Central square hole side length: .009 [0.23] TYP
 - Four rectangular holes (top and bottom): .016 [0.41] TYP
 - Four rectangular holes (left and right): .020 [0.51] TYP
 - Index area (hatched square) side length: .008 [0.20]
 - Seating plane (indicated by a horizontal line)



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

Weight: .02 Grams

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

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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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.

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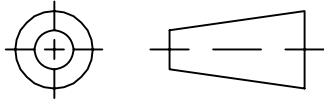
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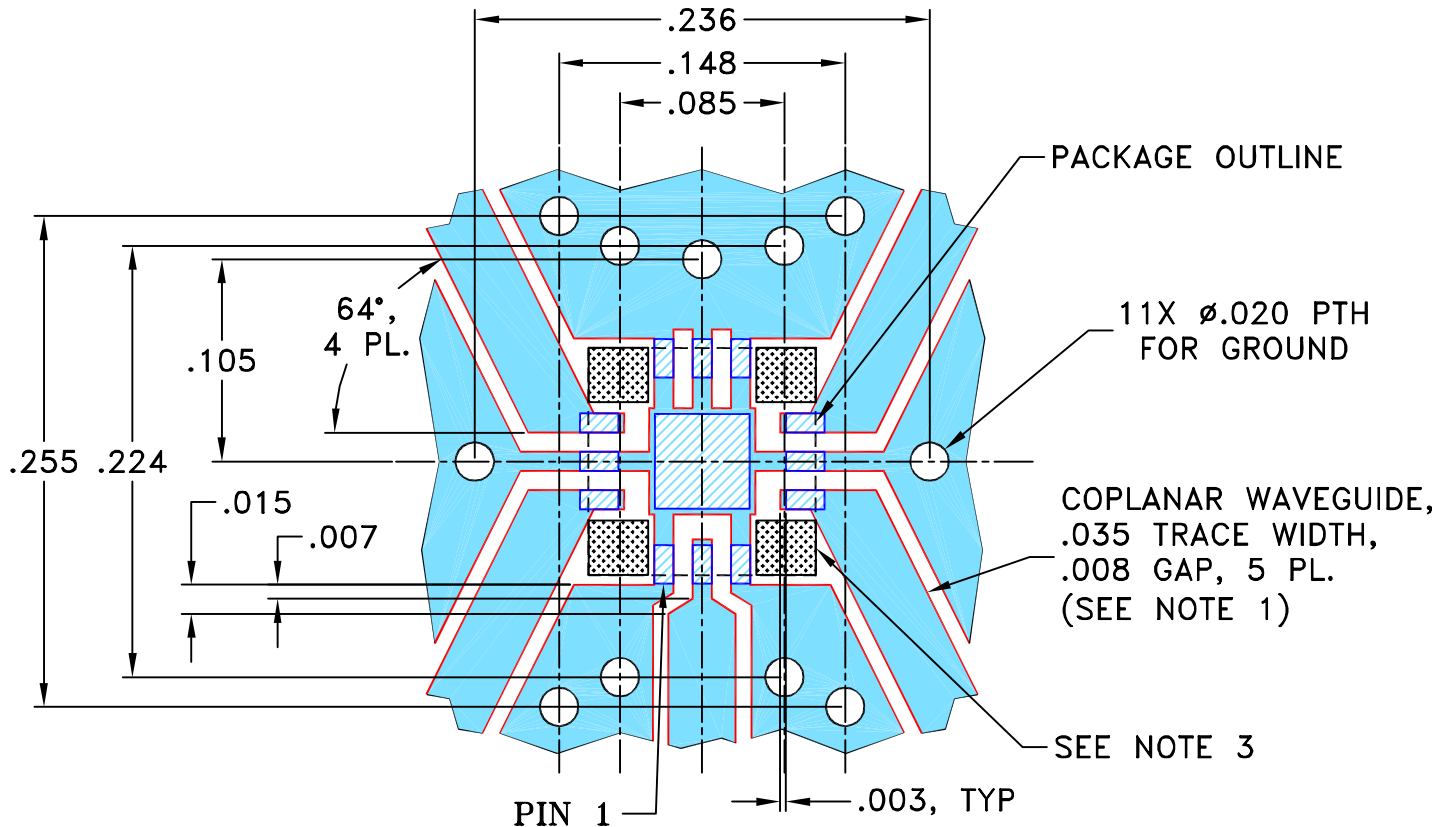
THIRD ANGLE PROJECTION



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 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

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON:
2 PL DECIMALS $\pm$
3 PL DECIMALS $\pm$.005
ANGLES $\pm$ 1°
FRACTIONS $\pm$

INITIALS

DATE

DRAWN

PW

01/10/07

CHECKED

IL

01/11/07

APPROVED

WP

01/11/07



Mini-Circuits®

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Brooklyn NY 11235

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

SIZE
A

CODE IDENT
15542

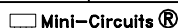
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98-PL-259

REV:
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FILE: 98PL259

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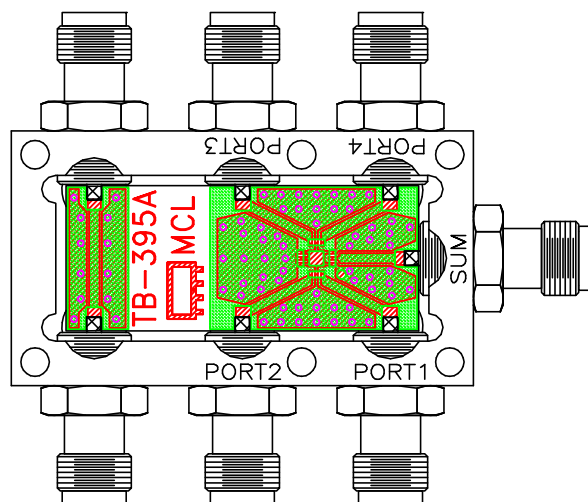
SHEET: 1 OF 1



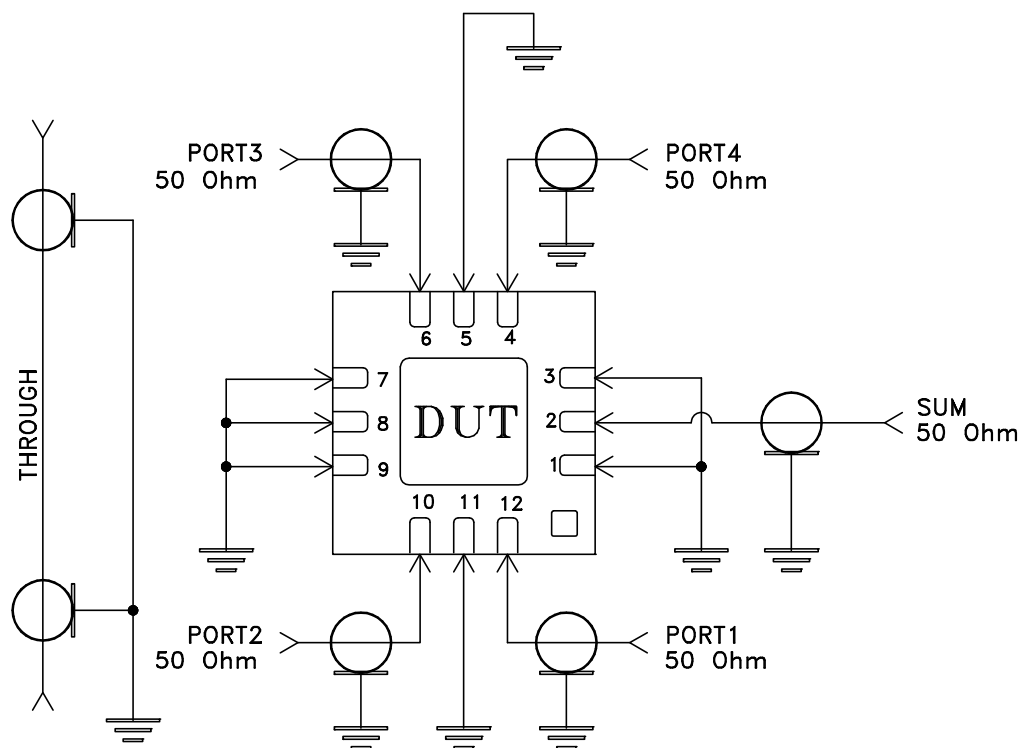
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Evaluation Board and Circuit



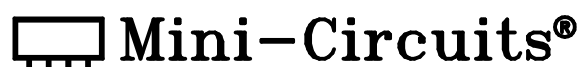
TB-395+



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.020 inch.





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