



Mini-Circuits

ULTRA-SMALL CERAMIC

Power Splitter/Combiner

QCN-13D+

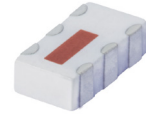
2 Way-90° 50Ω 675 to 1300 MHz

FEATURES

- Low insertion loss, 0.4 dB typ.
- High isolation, 19 dB typ.
- Wrap-around terminal for excellent solderability
- Ultra small, 0.12"X0.06"X0.035"

APPLICATIONS

- Balanced amplifiers
- Modulators
- GSM
- Defense communication
- WiMax 700
- GPS civilian



Generic photo used for illustration purposes only

CASE STYLE: FV1206-1

+RoHS Compliant

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

ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		675		1300	MHz
Insertion Loss, above 3.0 dB	675-1300		0.4	0.9	dB
	675-820		0.3	0.5	
	820-900		0.3	0.5	
	900-1000		0.4	0.6	
	1000-1200		0.4	0.6	
	1200-1300		0.5	0.8	
Isolation	675-1300	14	20		dB
	675-820	15	19		
	820-900	16	19		
	900-1000	16	19		
	1000-1200	14	17		
	1200-1300	13	15		
Phase Unbalance	675-1300		1.0	8.0	Degree
	675-820		1.0	4.0	
	820-900		0.5	3.0	
	900-1000		1.0	3.0	
	1000-1200		3.0	5.0	
	1200-1300		5.0	7.0	
Amplitude Unbalance	675-1300		1.0	1.3	dB
	675-820		0.7	1.0	
	820-900		0.6	1.0	
	900-1000		0.8	1.2	
	1000-1200		0.8	1.2	
	1200-1300		0.5	0.9	
VSWR	675-1300		1.2		(:1)
	675-820		1.25		
	820-900		1.2		
	900-1000		1.2		
	1000-1200		1.2		
	1200-1300		1.25		

1. For applications requiring DC voltage to be applied to the RF ports. DC resistance to ground is 100 Mohms min.

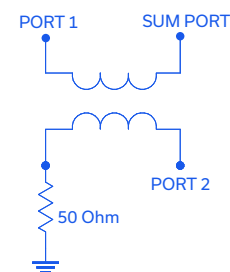
MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	15W* max.

* Derate linearly to 7W at 100°C ambient.

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

ELECTRICAL SCHEMATIC (NOTE 1)



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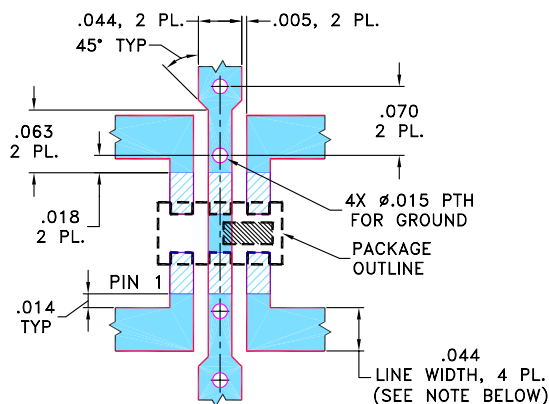
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PIN CONNECTIONS

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

PRODUCT MARKING: N/A

DEMO BOARD MCL P/N: TB-255
SUGGESTED PCB LAYOUT (PL-131)



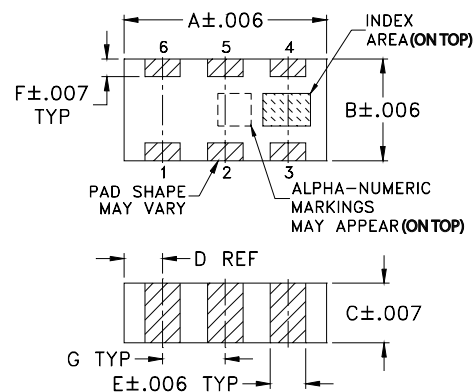
NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS $0.020" \pm 0.0015"$; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

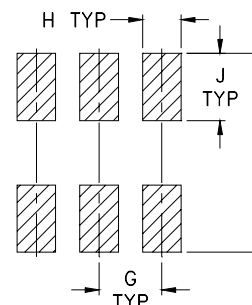
 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

OUTLINE DRAWING



PCB Land Pattern



Suggested Layout,
Tolerance to be within ± 0.002

OUTLINE DIMENSIONS (Inches/mm)

A	B	C	D	E	F
.126	.063	.035	.024	.022	.011
3.20	1.60	0.89	0.61	0.56	0.28
G	H	J	K		wt
.039	.024	.042	.123		grams
0.99	0.61	1.07	3.12		.020

TAPE & REEL INFORMATION: F75





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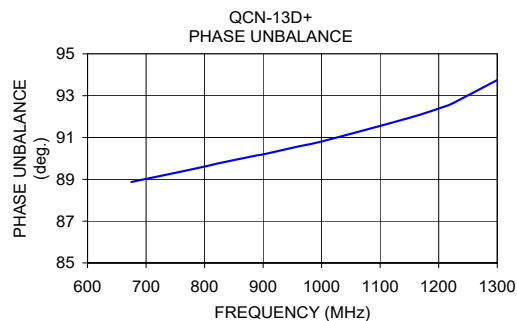
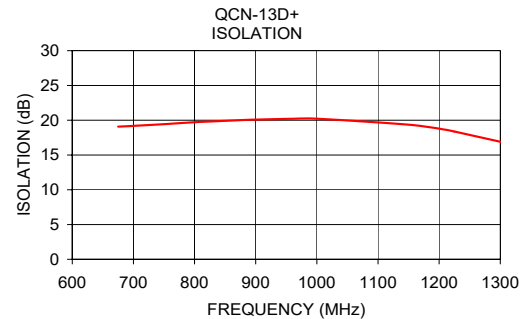
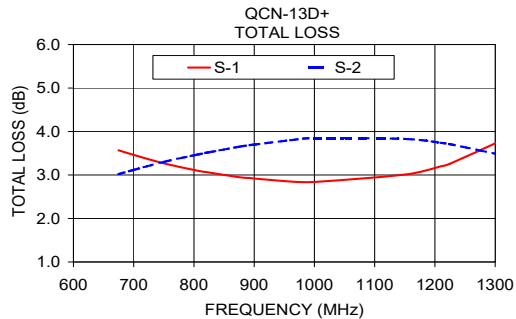
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TYPICAL PERFORMANCE DATA

Frequency (MHz)	Total Loss ¹ (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR (:1)		
	S-1	S-2				S	1	2
675.00	3.57	3.02	0.55	19.07	88.87	1.27	1.22	1.26
698.00	3.47	3.11	0.36	19.18	89.01	1.27	1.21	1.26
750.00	3.27	3.30	0.02	19.44	89.31	1.26	1.18	1.24
806.00	3.10	3.47	0.37	19.74	89.65	1.25	1.15	1.22
824.00	3.06	3.52	0.46	19.81	89.77	1.25	1.15	1.22
875.00	2.95	3.65	0.69	20.01	90.06	1.25	1.13	1.21
894.00	2.93	3.69	0.76	20.08	90.17	1.25	1.12	1.20
900.00	2.92	3.70	0.78	20.09	90.19	1.25	1.12	1.20
960.00	2.85	3.80	0.95	20.20	90.57	1.27	1.11	1.19
1000.00	2.84	3.85	1.01	20.22	90.81	1.28	1.11	1.18
1150.00	3.01	3.83	0.82	19.36	91.94	1.36	1.17	1.18
1210.00	3.20	3.74	0.54	18.64	92.48	1.42	1.21	1.19
1225.00	3.26	3.71	0.44	18.37	92.65	1.44	1.22	1.19
1310.00	3.79	3.46	0.32	16.71	93.90	1.56	1.30	1.23

1. Total Loss = Insertion Loss + 3 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/MCLStore/terms.jsp

