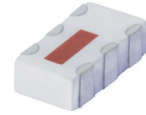**ULTRA-SMALL CERAMIC**

Power Splitter/Combiner

QCN-3+

2 Way-90°   50Ω   220 to 470 MHz

FEATURES

- Low insertion loss, 0.4 dB typ.
- High isolation, 25 dB typ.
- Wrap-around terminal for excellent solderability
- Ultra small, 0.12"X0.06"X0.035"

Generic photo used for illustration purposes only

CASE STYLE: FV1206-1

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

APPLICATIONS

- Balanced amplifiers
- Modulators
- VHF
- Defense communication

ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		220		470	MHz
Insertion Loss, above 3.0 dB	220-470		0.6	0.8	dB
	270-350		0.4	0.7	
	350-450		0.6	0.8	
Isolation	220-470	18	24		dB
	270-350	18	25		
	350-450	20	30		
Phase Unbalance	220-470		1	8	Degree
	270-350		3	5	
	350-450		5	8	
Amplitude Unbalance	220-470		0.5	1.7	dB
	270-350		0.7	1.0	
	350-450		0.5	1.0	
VSWR	220-470		1.2		(:1)
	270-350		1.2		
	350-450		1.2		

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
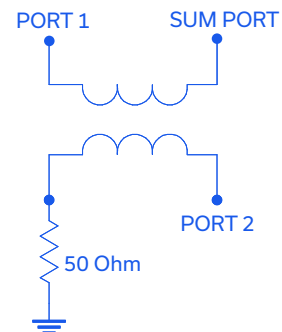
PORT 1   SUM PORT

PORT 2

50 Ohm

Power Splitter/Combiner   QCN-3+

PIN CONNECTIONS

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

PRODUCT MARKING: SB

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

.044, 2 PL.
.005, 2 PL.
45° TYP
.063 2 PL.
.070 2 PL.
.018 2 PL.
4X ⌀.015 PTH FOR GROUND
PACKAGE OUTLINE
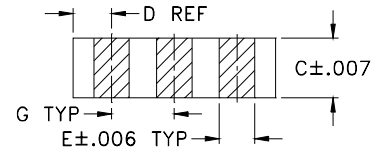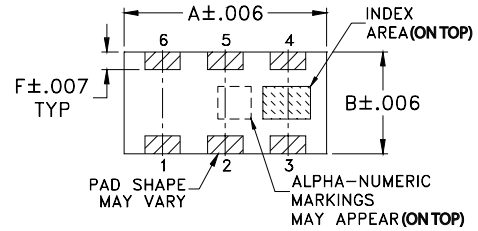PIN 1
.014 TYP
.044 LINE WIDTH, 4 PL. (SEE NOTE BELOW)
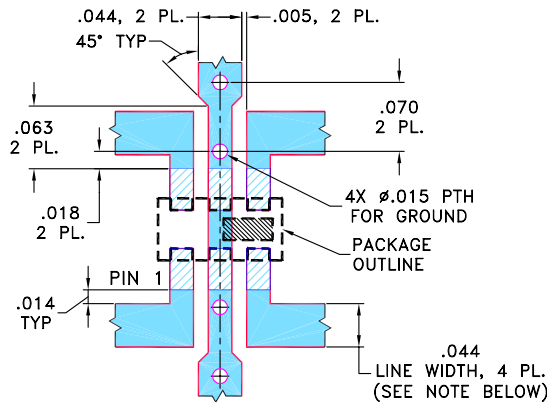
NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
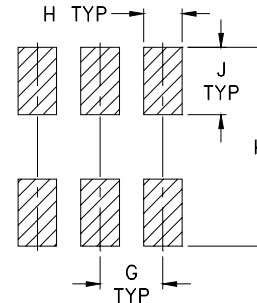2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

OUTLINE DRAWING

A±.006
INDEX AREA (ON TOP)
F±.007 TYP
B±.006
PAD SHAPE MAY VARY
ALPHA-NUMERIC MARKINGS MAY APPEAR (ON TOP)
D REF
C±.007
G TYP
E±.006 TYP

PCB Land Pattern

H TYP
J TYP
K
G TYP

Suggested Layout,
Tolerance to be within ±.002

OUTLINE DIMENSIONS $\left(\frac{Inches}{mm}\right)$

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

# ULTRA-SMALL CERAMIC
Power Splitter/Combiner QCN-3+

2 Way-90°   50Ω   220 to 470 MHz

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
220.00	3.91	3.00	0.91	23.23	90.40	1.07	1.12	1.07
230.00	3.77	3.11	0.67	23.41	90.55	1.06	1.12	1.06
250.00	3.55	3.31	0.23	23.85	90.86	1.05	1.11	1.06
260.00	3.45	3.41	0.05	24.11	91.02	1.05	1.11	1.05
270.00	3.37	3.49	0.12	24.37	91.18	1.04	1.10	1.05
290.00	3.24	3.64	0.39	24.96	91.53	1.04	1.10	1.04
310.00	3.16	3.76	0.60	25.67	91.88	1.03	1.09	1.03
330.00	3.12	3.83	0.72	26.46	92.26	1.03	1.08	1.03
350.00	3.11	3.88	0.77	27.38	92.67	1.04	1.08	1.02
370.00	3.14	3.88	0.74	28.47	93.12	1.05	1.07	1.02
390.00	3.22	3.85	0.63	29.82	93.63	1.07	1.07	1.02
410.00	3.35	3.78	0.42	31.55	94.16	1.09	1.07	1.01
430.00	3.55	3.66	0.11	33.99	94.80	1.11	1.07	1.01
450.00	3.82	3.50	0.32	37.16	95.56	1.14	1.07	1.02
470.00	4.19	3.29	0.90	38.74	96.48	1.17	1.08	1.02

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

QCN-3+ TOTAL LOSS

QCN-3+ ISOLATION

QCN-3+ PHASE UNBALANCE
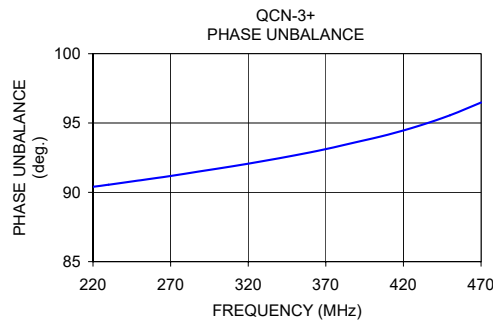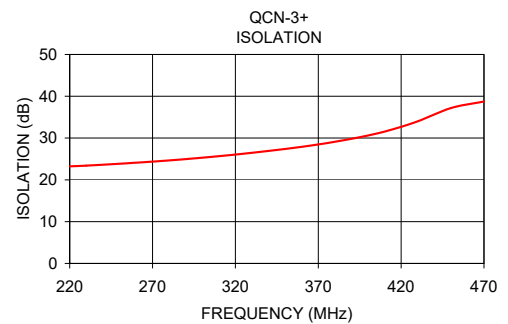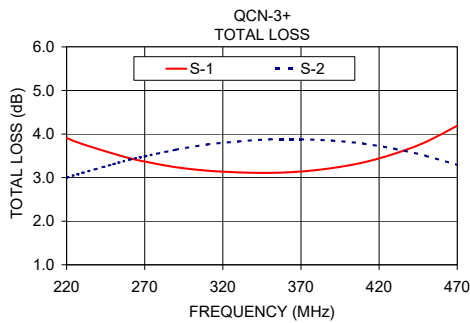
NOTES

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