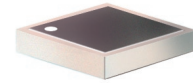


# Surface Mount Power Splitter/Combiner

## QCC-20+

2 Way-90° 50Ω 1200 to 2200 MHz



### Maximum Ratings

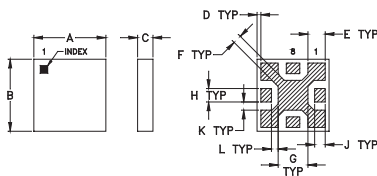
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	17.5W* max.

\* Derate linearly to 3.5W at 100°C ambient.

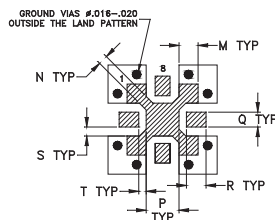
### Pin Connections

SUM PORT	2
PORT 1 (0°)	8
PORT 2 (+90°)	4
GROUND	1,3,5,7
50 OHM TERM EXTERNAL	6

### Outline Drawing



### PCB Land Pattern

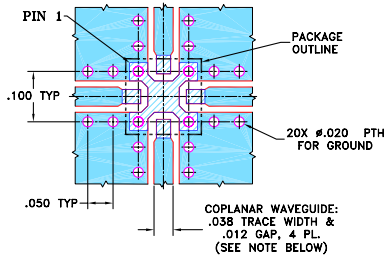


Suggested Layout,  
Tolerance to be within ±0.02

### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J
.150	.150	.032	.008	.036	.018	.062	.028	.022
3.81	3.81	0.81	0.20	0.91	0.46	1.57	0.71	0.56
K	L	M	N	P	Q	R	S	T
.017	.014	.036	.018	.062	.028	.037	.017	.014
0.43	0.36	0.91	0.46	1.57	0.71	0.94	0.43	0.36
								wt
								0.05

### Demo Board MCL P/N: TB-302+ Suggested PCB Layout (PL-128)



- NOTES: 1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015". COPPER: 1/2 OZ. EACH SIDE FOR OTHER MATERIALS TRACE WIDTH & GAP 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

### Features

- low insertion loss, 0.4 dB typ.
- high isolation, 25 dB typ.
- LTCC construction
- excellent temperature stability
- small size, 0.15" X 0.15"
- aqueous washable
- protected by U.S. Patent 7,030,713

### Applications

- WCDMA • defense
- PCS
- DECT
- PHS
- radar

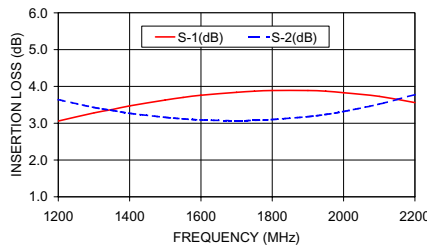
### Electrical Specifications

FREQ. RANGE (MHz)	ISOLATION (dB)		INSERTION LOSS (dB) Avg. of Coupled Outputs less 3 dB		PHASE UNBALANCE (Degrees)		AMPLITUDE UNBALANCE (dB)	
	Typ.	Min.	Typ.	Max.	Typ.	Max.	Typ.	Max.
1200-2200								
1200-1400	32	24	0.4	0.6	1	3	0.4	1.0
1400-1800	35	20	0.4	0.7	1	3	0.5	0.85
1800-2200	23	16	0.6	0.9	1	5	0.5	0.9

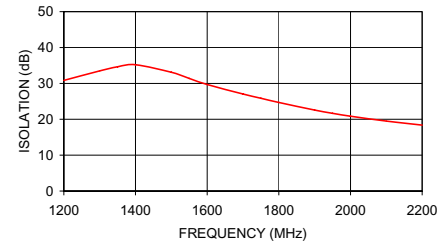
### Typical Performance Data

Frequency (MHz)	Insertion Loss (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR S	VSWR 1	VSWR 2
	S-1	S-2						
1200.00	3.06	3.64	0.58	30.83	90.74	1.03	1.16	1.19
1300.00	3.28	3.43	0.16	33.49	91.05	1.01	1.18	1.20
1350.00	3.37	3.35	0.03	34.64	91.20	1.02	1.19	1.20
1400.00	3.47	3.27	0.20	35.21	91.33	1.04	1.19	1.20
1500.00	3.63	3.16	0.47	33.11	91.51	1.08	1.21	1.21
1550.00	3.70	3.12	0.58	31.38	91.57	1.10	1.22	1.21
1600.00	3.76	3.09	0.67	29.70	91.60	1.12	1.24	1.22
1700.00	3.84	3.07	0.77	27.04	91.58	1.15	1.27	1.23
1750.00	3.87	3.08	0.79	25.86	91.55	1.17	1.28	1.24
1800.00	3.89	3.10	0.79	24.69	91.48	1.18	1.29	1.25
1900.00	3.89	3.18	0.71	22.58	91.25	1.23	1.31	1.28
1950.00	3.87	3.24	0.63	21.66	91.11	1.25	1.32	1.30
2000.00	3.83	3.32	0.52	20.85	90.94	1.27	1.33	1.32
2100.00	3.73	3.52	0.21	19.49	90.53	1.31	1.35	1.35
2200.00	3.56	3.78	0.22	18.38	90.13	1.33	1.37	1.40

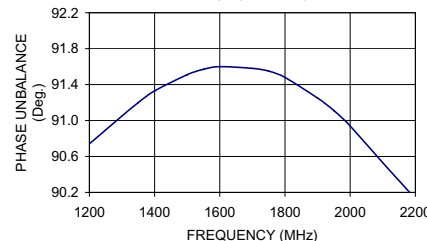
QCC-20+  
INSERTION LOSS



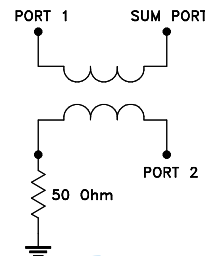
QCC-20+  
ISOLATION



QCC-20+  
PHASE UNBALANCE



### electrical schematic



**Mini-Circuits®**  
ISO 9001 ISO 14001 AS 9100 CERTIFIED

minicircuits.com

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

IF/RF MICROWAVE COMPONENTS

REV. E  
M108294  
QCC-20+  
EDB-030107  
LR/RS/CP  
070522