

2 Way-90° Power Splitter

QCV-211+

50Ω 130 to 210 MHz



CASE STYLE: JV1210C-1

The Big Deal

- High Power handling (10W)
- Low Unbalance, 0.6 dB & 4 deg. typ.
- Industry leading combination of size/bandwidth

Product Overview

Mini-Circuits new 90° Power Splitter, model QCV-211+, offers an industry leading combination of operating bandwidth and size; supporting nearly an octave band in a miniature EIA-1210 form factor. The outstanding phase and amplitude unbalance make this component a versatile building block for use in a variety of systems and sub-system designs.

Key Features

Feature	Advantages
Small Size	Offered in the EIA-1210 package size, the QCV-211+ offers an industry leading combination of size, bandwidth and frequency. The small footprint (3.2mm x 2.0mm) allows for reduced parasitics in systems with improved performance and simplified layout.
Low Phase and Amplitude Unbalance	Supporting 4 deg. and 0.6 dB unbalance make this 90° hybrid applicable for use in higher level integrated components such as image reject mixers, single sideband modulators, phase shifters, variable attenuators, and balance amplifiers.
High Power Handling	Capable of operating up to 10W, the LTCC construction of the QCV-211+ makes this 90° hybrid a robust, rugged product that can be used effectively in either the transmit or receive paths.

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



Power Splitter/Combiner

2 Way-90° 50Ω 130 to 210 MHz

QCV-211+



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Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	10W* max.

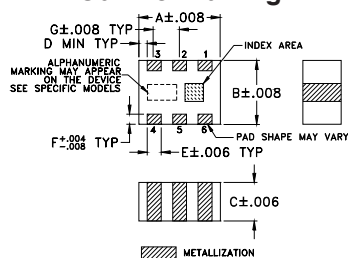
* Derate linearly to 3W at 100°C ambient.
Permanent damage may occur if any of these limits are exceeded.

Pin Connections

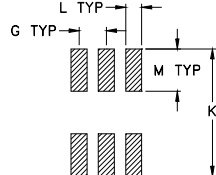
SUM PORT	1
PORT 1 (0°)	4
PORT 2 (+90°)	6
GROUND	2,5
50 OHM TERM EXTERNAL	3

Product Marking: CC

Outline Drawing



PCB Land Pattern

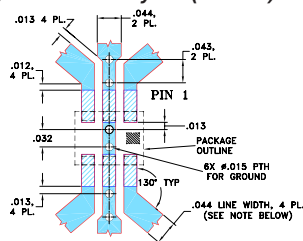


Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.126	.098	.059	.004	.022	.016	.039
3.2	2.5	1.50	0.1	0.56	0.4	1.0
H	J	K	L	M	wt	
-	-	.177	.024	.059	grams	
-	-	4.5	0.6	1.5	0.03	

Demo Board MCL P/N: TB-610+ Suggested PCB Layout (PL-340)



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

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Features

- low insertion loss, 0.4 dB typ.
- high isolation, 20 dB typ.
- ultra small size, 0.12x0.10x0.059"
- wrap-around terminal for excellent solderability

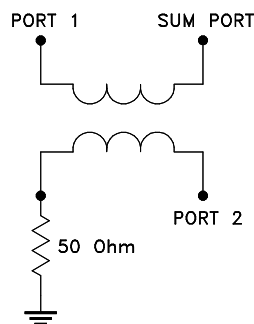
Applications

- I&Q modulators
- image reject mixers
- balanced amplifiers
- marine radio

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		130		210	MHz
Insertion Loss (avg of coupled outputs above 3 dB)	130-155	—	0.5	0.6	dB
	155-180	—	0.6	0.7	
	180-210	—	0.8	1.0	
Isolation	130-155	18	20	—	dB
	155-180	16	18	—	
	180-210	13	15	—	
Phase Unbalance	130-155	—	2.3	6	Degree
	155-180	—	2.8	5	
	180-210	—	1.6	5	
Amplitude Unbalance	130-155	—	1.0	1.4	dB
	155-180	—	0.4	0.6	
	180-210	—	1.0	1.6	
VSWR (Port S)	130-155	—	1.15	1.3	:1
	155-180	—	1.20	1.4	
	180-210	—	1.35	1.5	
VSWR (Port 1-2)	130-155	—	1.15	1.3	:1
	155-180	—	1.22	1.4	
	180-210	—	1.41	1.6	

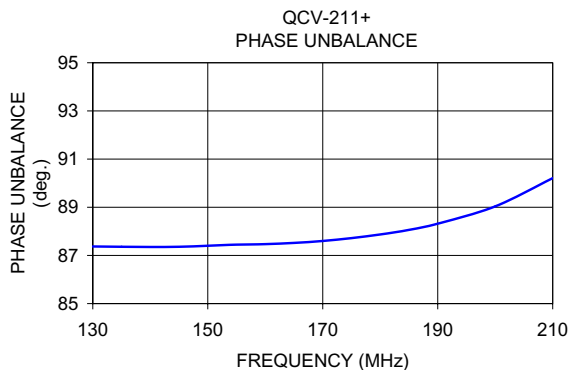
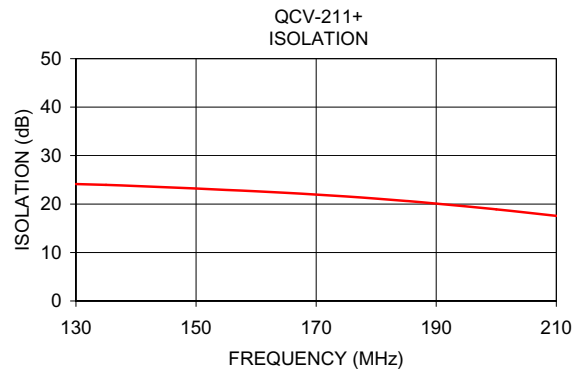
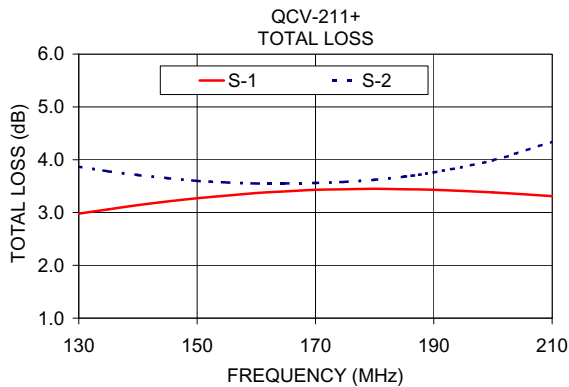
Electrical Schematic



Typical Performance Data

Frequency (MHz)	Total Loss ¹ (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR S	VSWR 1	VSWR 2
	S-1	S-2						
130.00	2.98	3.87	0.89	24.13	87.37	1.11	1.12	1.16
135.00	3.06	3.78	0.72	23.95	87.36	1.11	1.12	1.17
140.00	3.14	3.71	0.57	23.72	87.35	1.12	1.13	1.17
145.00	3.21	3.65	0.44	23.46	87.36	1.12	1.13	1.18
150.00	3.27	3.60	0.34	23.20	87.40	1.13	1.14	1.19
155.00	3.32	3.57	0.25	22.91	87.45	1.14	1.14	1.20
160.00	3.37	3.55	0.18	22.63	87.47	1.15	1.15	1.21
165.00	3.40	3.55	0.14	22.31	87.52	1.16	1.16	1.23
170.00	3.43	3.56	0.13	21.96	87.60	1.17	1.16	1.24
175.00	3.44	3.58	0.14	21.56	87.72	1.19	1.17	1.26
180.00	3.45	3.62	0.17	21.12	87.87	1.21	1.19	1.28
185.00	3.44	3.68	0.24	20.63	88.06	1.23	1.20	1.30
190.00	3.43	3.76	0.33	20.10	88.32	1.26	1.22	1.33
200.00	3.38	3.99	0.61	18.90	89.04	1.32	1.26	1.40
210.00	3.31	4.34	1.04	17.57	90.21	1.40	1.32	1.48

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



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