

High Power

2 Way-90° Power Splitter

QCH-392+

50Ω 600 to 3900 MHz

The Big Deal

- Wide bandwidth (over two octaves)
- High power handling up to 90W



CASE STYLE: PQ2098-1

Product Overview

Mini-Circuits new 2-way 90° power splitter, QCH-392+ capable of handling up to 90W with amplitude unbalance of 0.8 dB typ and phase unbalance of 5 deg. typ. Operating over a frequency range of 600 to 3900 MHz, the outstanding phase and amplitude unbalance make this component a versatile building block for use in a variety of systems and sub-system designs from balanced amplifiers and antenna feeds to military applications and more. The splitter is fabricated using laminated PCB process (1.0 x 0.5 x 0.2") and includes wrap-around terminations for good solderability and easy visual inspection.

Key Features

Feature	Advantages
Wide bandwidth	The QCH-392+ wide band width (600 - 3900 MHz) of a full decade makes it suitable for a wide range of applications.
High power handling, up to 90W	Usable in many systems with high-power requirements such as antenna feeds, power amplifiers, and others that require balanced high power outputs.
Low Phase and Amplitude Unbalance(at 600-3900 MHz): • 0.8 dB Amplitude Unbalance • 5° Phase Unbalance	QCH-392+ produces nearly equal signals with 90° phase shift - ideal for I/Q systems, balanced amplifiers, antenna feeds, phase shifters, and many more applications.



High Power Power Splitter/Combiner

50Ω 2 Way-90° Up to 90W 600 to 3900 MHz

QCH-392+



CASE STYLE: PQ2098-1

Maximum Ratings

Operating Temperature, case* -55°C to 105°C

Storage Temperature -55°C to 105°C

Power Input (as a splitter) 90W

*Case temperature is defined as temperature on base plate. Permanent damage may occur if any of these limits are exceeded.

Pad Connections

SUM	1
ISOLATION	2
PORT 1 (0°)	3
PORT 2 (+90°)	4
GROUND	5

Features

- wide bandwidth, over two octaves
- high power, up to 90W
- low amplitude unbalance, 0.8 dB Typ
- low phase unbalance, 5 deg Typ

Applications

- Balanced amplifiers
- I&Q Modulators
- Defense and military

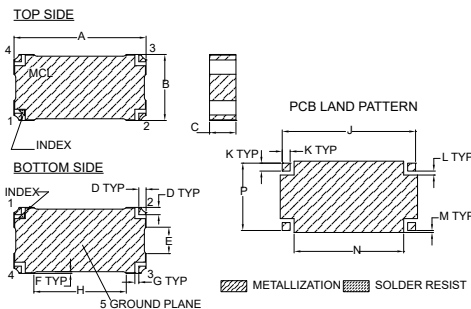
+RoHS Compliant

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

Electrical Specifications @ +25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		600		3900	MHz
Insertion Loss (Avg. of Coupled outputs less 3 dB)	600 - 3900	—	0.6	1.4	dB
Isolation	600 - 3900	11.5	14	—	dB
Phase Unbalance	600 - 3900	—	5	12	deg
Amplitude Unbalance	600 - 3900	—	0.8	2.5	dB
VSWR	600 - 3900	—	1.45	2.0	:1
Input RF Power	600 - 3900	—	—	90	W

Outline Drawing



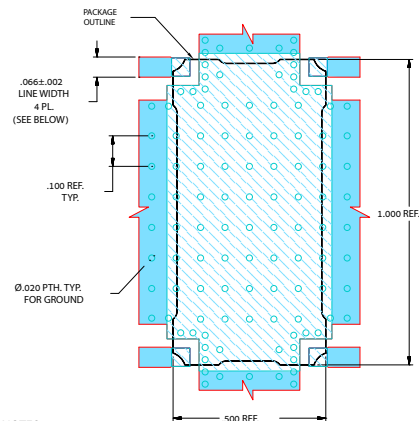
Base material: Printed wiring laminate.
Termination Finish: 2-5 µinch (0.05-0.13 microns) Gold over 120-240 µinch (3.05-6.10 microns) Nickel

Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
1.000	.500	.200	.055	.200	.013	.030
25.40	12.70	5.08	1.40	5.08	0.33	0.76
H	J	K	L	M	N	P
.700	1.010	.060	.030	.015	.830	.510
17.78	25.65	1.52	0.76	0.38	21.08	12.95
						wt. grams
						4.0

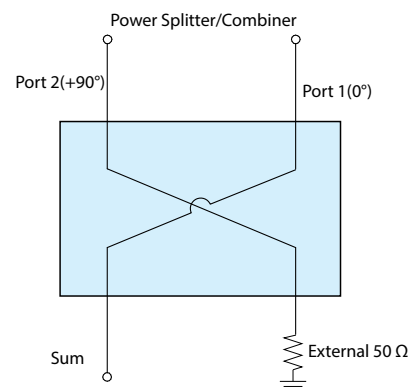
Demo Board MCL P/N: TB-863

Suggested PCB Layout (PL-469)



- NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4003C WITH DIELECTRIC THICKNESS, 0.032"±.0015". COPPER: 1 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 SOLDERMASK

Electrical Schematic



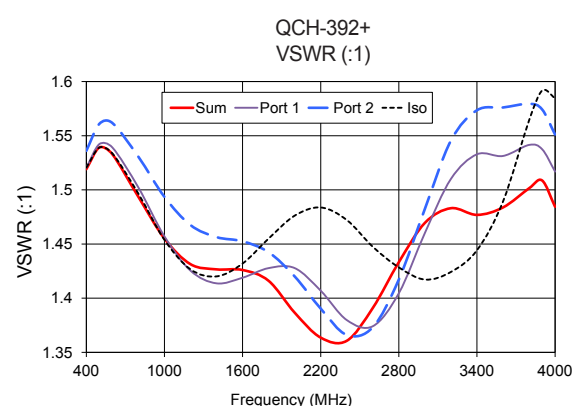
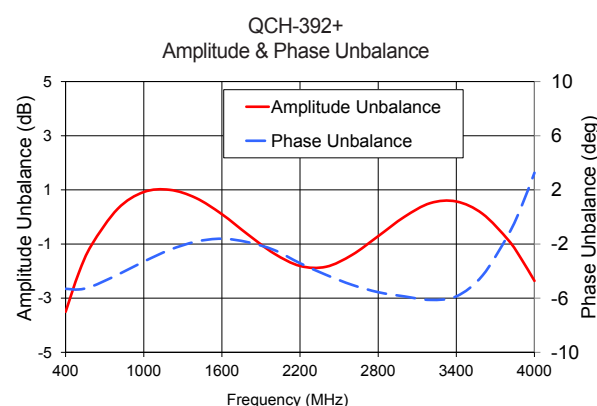
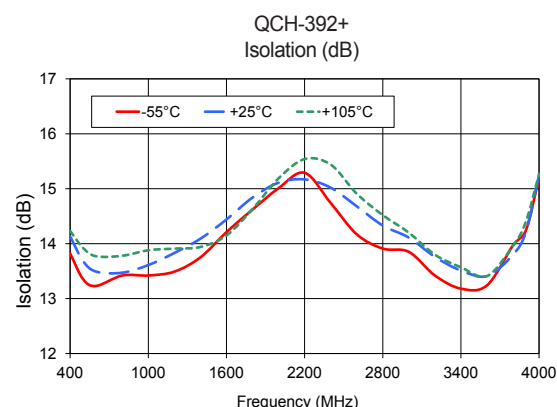
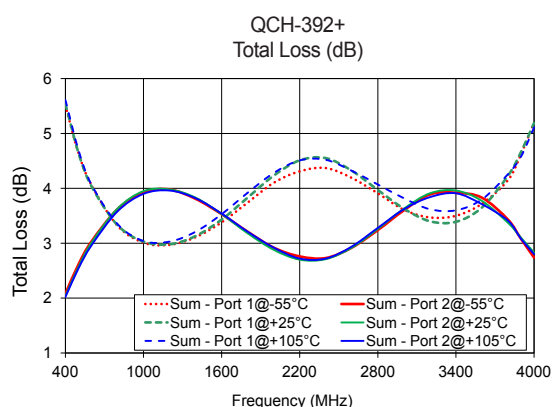
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QCH-392+
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Typical Performance Data @ 25°C

FREQUENCY (MHz)	Total Loss ¹ (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg)	VSWR (:1)		
	S - 1	S - 2				S	1	2
400.0	5.54	2.04	-3.50	14.18	84.69	1.52	1.54	1.52
500.0	4.65	2.57	-2.08	13.75	84.64	1.54	1.56	1.54
600.0	4.04	3.01	-1.03	13.64	84.86	1.53	1.56	1.53
800.0	3.33	3.63	0.30	13.74	85.73	1.49	1.53	1.50
1000.0	3.03	3.95	0.92	13.96	86.70	1.46	1.49	1.45
1200.0	2.98	3.98	1.00	14.18	87.57	1.43	1.47	1.43
1400.0	3.13	3.83	0.70	14.42	88.17	1.43	1.46	1.42
1600.0	3.43	3.53	0.10	14.72	88.39	1.43	1.45	1.43
1800.0	3.83	3.18	-0.65	15.21	88.13	1.42	1.44	1.46
2000.0	4.23	2.88	-1.35	15.76	87.56	1.39	1.42	1.48
2200.0	4.51	2.70	-1.81	16.16	86.58	1.36	1.39	1.48
2400.0	4.55	2.71	-1.84	16.03	85.72	1.36	1.37	1.47
2600.0	4.32	2.92	-1.40	15.41	84.98	1.39	1.37	1.45
2800.0	3.97	3.26	-0.71	14.62	84.44	1.43	1.42	1.43
3000.0	3.63	3.63	0.00	14.09	84.13	1.47	1.48	1.42
3200.0	3.40	3.91	0.51	13.74	83.87	1.48	1.55	1.42
3400.0	3.39	3.96	0.57	13.64	84.13	1.48	1.57	1.44
3600.0	3.65	3.77	0.12	13.73	85.66	1.48	1.58	1.49
3800.0	4.23	3.37	-0.86	14.36	88.71	1.50	1.58	1.56
3900.0	4.66	3.10	-1.56	14.99	90.77	1.51	1.57	1.59
4000.0	5.19	2.83	-2.36	16.16	93.26	1.48	1.55	1.58

1. Total loss is the loss from Sum to each coupled port including the 3dB theoretical split.



Additional Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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

