

High Power

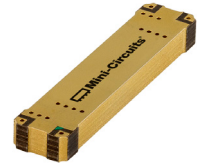
2 Way-90° Power Splitter

QCH-272+

50Ω 2 Way-90° Up to 200W 700 to 2700 MHz

The Big Deal

- High power handling up to 200W
- Wide bandwidth
- Excellent Amplitude Unbalance, ± 0.1 dB
- Excellent Phase Unbalance, ± 0.9 deg



CASE STYLE: PQ2181

Product Overview

Mini-Circuits new 2-way 90° power splitter, QCH-272+ capable of handling up to 200W with amplitude unbalance of ± 0.1 dB typ and phase unbalance of ± 0.9 deg. typ. Operating over a frequency range of 700 to 2700 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 (1.8 x 0.4 x 0.19") and includes wrap-around terminations for good solderability and easy visual inspection.

Key Features

Feature	Advantages
Wide bandwidth	The QCH-272+ wide band width (700 - 2700 MHz) makes it suitable for a wide range of applications.
High power handling: 200W @ +85°C 140W @ +105°C	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: • ± 0.1 dB Amplitude Unbalance • $\pm 0.9^\circ$ Phase Unbalance	QCH-272+ 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

QCH-272+

50Ω 2 Way-90° Up to 200W* 700 to 2700 MHz

Maximum Ratings

Operating Temperature, case**	-55°C to 105°C
Storage Temperature	-55°C to 105°C
Power Input*	200W @ +85°C, case

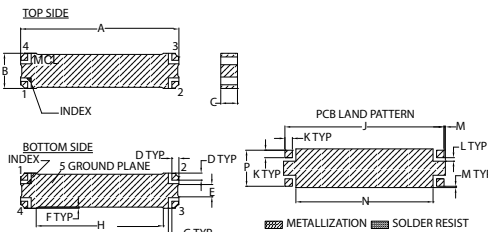
*Derate to 170W at +95°C and 140W at +105°C case temperature
 **Case temperature is defined as temperature on base plate.
 Permanent damage may occur if any of these limits are exceeded.

Pad Connections***

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

***Model is symmetrical and all ports are interchangeable, see port function table.

Outline Drawing

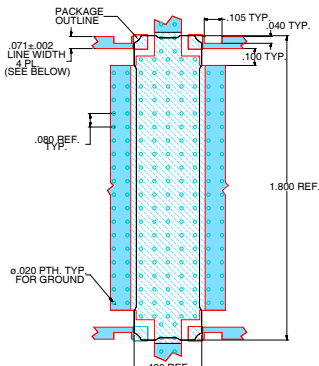


Base material: Printed wiring laminate.
 Termination Finish: 2-5 μinch (0.05-0.13 microns) Gold over 120-240 μinch (3.05-6.10 microns) Nickel

Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	
1.800	.400	.190	.080	.140	.013	.040	
45.72	10.16	4.83	2.03	3.56	0.33	1.02	
H	J	K	L	M	N	P	wt.
1.446	1.810	.085	.040	.015	1.560	.410	grams
36.73	45.97	2.16	1.02	0.38	39.62	10.41	1.0

Demo Board MCL P/N: TB-884+ Suggested PCB Layout (PL-480)



- NOTES:
- TRACE WIDTH IS SHOWN FOR ROGERS RO4003C WITH DIELECTRIC THICKNESS 0.032 ± 0.015". COPPER: 1 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
 - CUTOUTS IN RF LINES ARE REQUIRED TO ACHIEVE SPECIFIED ISOLATION.
 - DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
 - DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

Features

- high power, up to 200W
- wide bandwidth
- low amplitude unbalance, ±0.1 dB Typ
- low phase unbalance, ±0.9 deg Typ

Applications

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



CASE STYLE: PQ2181

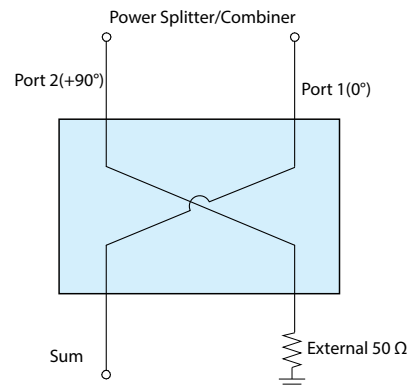
+RoHS Compliant

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		700		2700	MHz
Insertion Loss (Avg. of Coupled outputs less 3 dB)	700 - 2700	—	0.3	0.5	dB
Isolation	700 - 2700	17	22	—	dB
Phase Unbalance	700 - 2700	—	±0.9	±5	deg
Amplitude Unbalance	700 - 2700	—	±0.1	±1.0	dB
	800 - 2700	—	±0.1	±0.6	
VSWR	700 - 2700	—	1.15	1.35	:1
Input RF Power	@+85°C, case	700 - 2700	—	200	W
	@+95°C, case	700 - 2700	—	170	
	@+105°C, case	700 - 2700	—	140	

Electrical Schematic



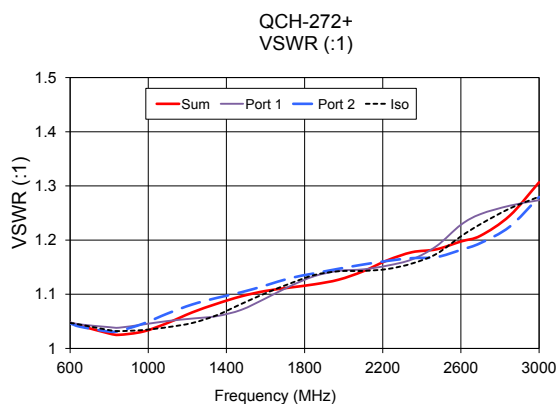
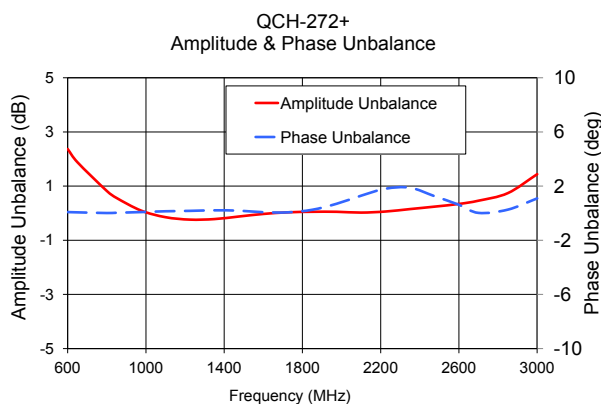
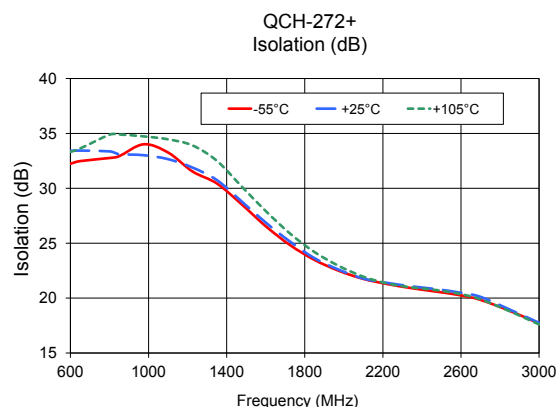
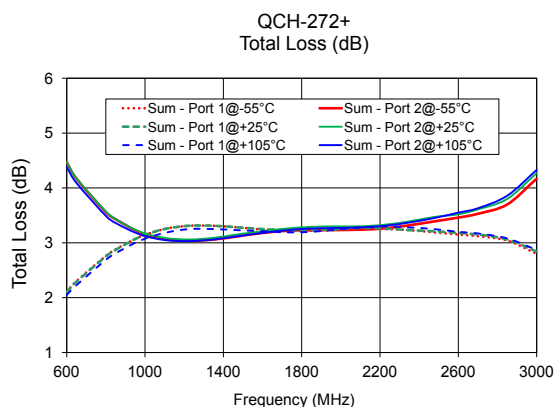
Port Function Configurations

Sum	Isolation	Port 1 (0°)	Port 2 (90°)
1	2	3	4
2	1	4	3
3	4	1	2
4	3	2	1

Typical Performance Data ¹

FREQUENCY (MHz)	Total Loss ² (dB)			Total Loss ² (dB)			Amplitude Unbalance (dB)	Isolation (dB)			Phase Unbalance (deg)	VSWR (:1)			
	Sum - Port 1			Sum - Port 2				-55°C	+25°C	+105°C		Sum	Port 1	Port 2	ISO
	-55°C	+25°C	+105°C	-55°C	+25°C	+105°C									
600.0	2.11	2.10	2.05	4.47	4.47	4.38	2.37	32.24	33.42	33.32	0.08	1.05	1.05	1.05	1.05
700.0	2.46	2.46	2.40	3.93	3.93	3.85	1.48	32.55	33.40	33.98	0.06	1.04	1.04	1.03	1.04
800.0	2.76	2.75	2.69	3.56	3.57	3.49	0.82	32.76	33.37	34.88	0.01	1.03	1.04	1.03	1.03
850.0	2.88	2.87	2.81	3.43	3.43	3.36	0.56	32.93	33.12	34.90	0.03	1.03	1.04	1.03	1.03
975.0	3.11	3.11	3.04	3.19	3.20	3.15	0.10	34.01	33.02	34.73	0.08	1.03	1.04	1.05	1.03
1100.0	3.25	3.25	3.18	3.07	3.09	3.05	-0.15	33.26	32.66	34.46	0.14	1.05	1.05	1.06	1.04
1225.0	3.31	3.31	3.25	3.04	3.06	3.03	-0.24	31.54	31.90	33.91	0.17	1.07	1.06	1.08	1.05
1350.0	3.31	3.31	3.25	3.06	3.09	3.06	-0.22	30.44	30.75	32.50	0.21	1.08	1.06	1.09	1.06
1475.0	3.28	3.28	3.23	3.12	3.16	3.12	-0.13	28.57	28.84	30.20	0.19	1.10	1.07	1.10	1.08
1600.0	3.24	3.25	3.21	3.18	3.21	3.18	-0.03	26.55	26.88	27.93	0.07	1.11	1.09	1.12	1.10
1725.0	3.23	3.23	3.19	3.22	3.26	3.23	0.03	24.83	25.14	25.87	0.06	1.11	1.11	1.13	1.12
1850.0	3.22	3.23	3.20	3.23	3.29	3.26	0.05	23.48	23.63	24.19	0.25	1.12	1.13	1.14	1.14
1975.0	3.23	3.25	3.24	3.24	3.30	3.27	0.05	22.49	22.58	22.93	0.70	1.13	1.14	1.15	1.14
2100.0	3.25	3.27	3.28	3.24	3.30	3.28	0.02	21.75	21.78	21.95	1.29	1.14	1.15	1.15	1.14
2225.0	3.25	3.26	3.30	3.27	3.33	3.31	0.06	21.28	21.38	21.33	1.81	1.16	1.15	1.16	1.15
2350.0	3.23	3.23	3.28	3.32	3.39	3.37	0.15	20.90	21.06	20.97	1.88	1.18	1.16	1.17	1.16
2475.0	3.19	3.21	3.25	3.39	3.47	3.45	0.24	20.59	20.81	20.73	1.26	1.18	1.19	1.17	1.17
2600.0	3.15	3.18	3.20	3.46	3.52	3.55	0.34	20.25	20.48	20.36	0.62	1.20	1.23	1.18	1.21
2700.0	3.12	3.15	3.17	3.53	3.61	3.63	0.46	19.84	20.11	19.89	0.02	1.21	1.25	1.19	1.23
2850.0	3.04	3.06	3.08	3.70	3.80	3.86	0.74	18.84	18.95	18.80	0.26	1.25	1.26	1.22	1.26
3000.0	2.80	2.84	2.87	4.17	4.27	4.33	1.44	17.69	17.74	17.60	1.09	1.31	1.27	1.28	1.28

1. Data at +25°C unless specified otherwise.
 2. Total loss is the loss from Sum to each coupled port including the 3dB theoretical split.



Additional 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