STRIPLINE SURFACE MOUNT

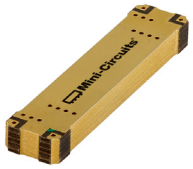
Power Splitter/Combiner

QCH-382+

50Ω 800 to 3800 MHz 2-Way 90° 150W

KEY FEATURES

- High power handling, up to 150W
- Ultra wide bandwidth, over two octaves
- Excellent amplitude unbalance, ±0.35 dB
- Excellent phase unbalance, ±1.60 deg

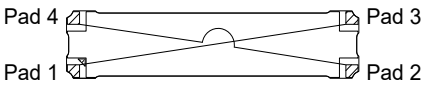


Generic photo used for illustration purposes only

APPLICATIONS

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

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' QCH-382+ is a 2-way 90° power splitter, capable of handling up to 150W with amplitude unbalance of ±0.35 dB typ and phase unbalance of ±1.6 deg. typ. Operating over a frequency range of 800 to 3800 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 (1.80 x 0.40 x 0.19") and includes wrap-around terminations for good solderability and easy visual inspection.

ELECTRICAL SPECIFICATIONS [1, 2] AT +25°C

Parameter	Conditions (MHz)	Min.	Typ.	Max.	Unit
Frequency Range	–	800	–	3800	MHz
Insertion Loss [3]	800 - 3800	–	0.25	0.5	dB
Isolation	800 - 3800	18	28	–	dB
Phase Unbalance	800 - 3800	–	±1.6	±7.5	deg
Amplitude Unbalance	800 - 3800	–	±0.35	±0.65	dB
Return Loss	800 - 3800	17.5	23	–	dB
Thermal Resistance [4]	800 - 3800	–	0.6	–	°C/W

1. Tested in Evaluation Board TB-QCH-382+. De-embbeded to the device reference plane.
2. Model is symmetrical and all ports are interchangeable, see Port Function Description/Configuration table for details and S-Parameters for actual performance.
3. Does not include theoretical loss due to coupling. Nominal theoretical loss is 3 dB.
4. Thermal Resistance is defined as Θjc= (Hot Spot Temperature on DUT - Base Plate Temperature)/Input Power.

ABSOLUTE MAXIMUM RATINGS [5]

Operating Case Temperature [6]		-55°C to +105°C
Storage Temperature		-55°C to +105°C
Power Input	**+85°C case**	150 W
	+95°C case	125 W
	+105°C case	100 W

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

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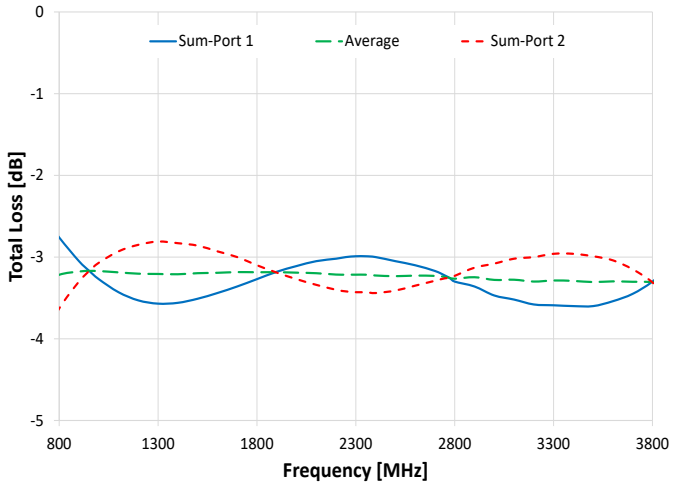
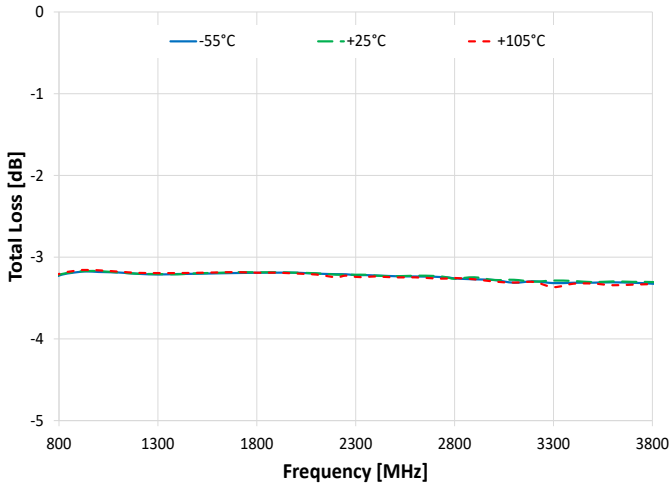
TYPICAL PERFORMANCE GRAPHS*

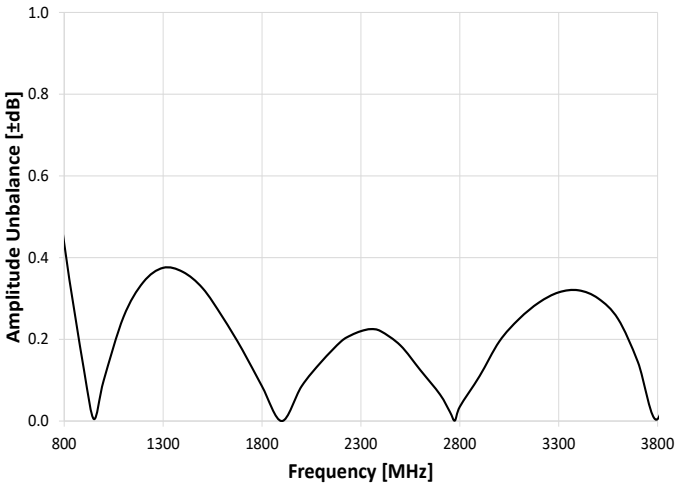
Total Loss vs. Frequency



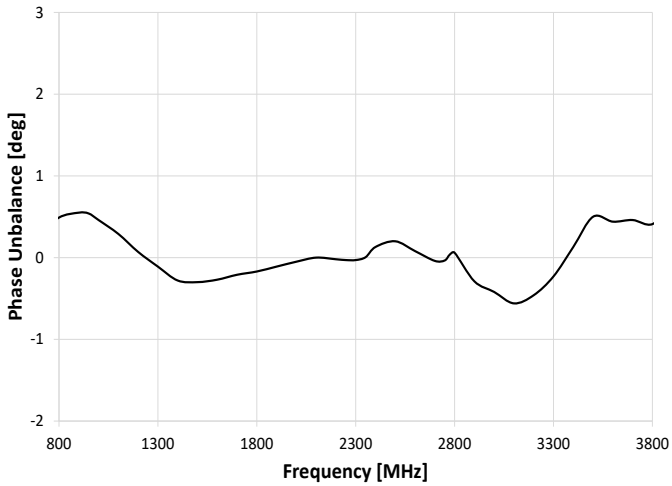
Average Loss vs. Frequency



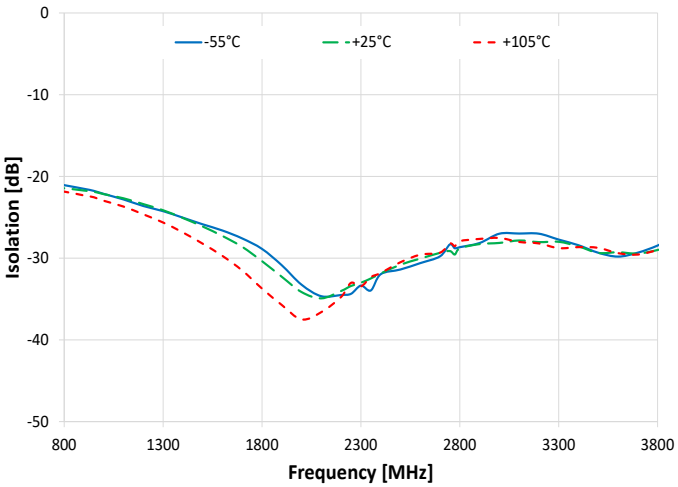
Amplitude Unbalance (half peak-to-peak) vs. Frequency



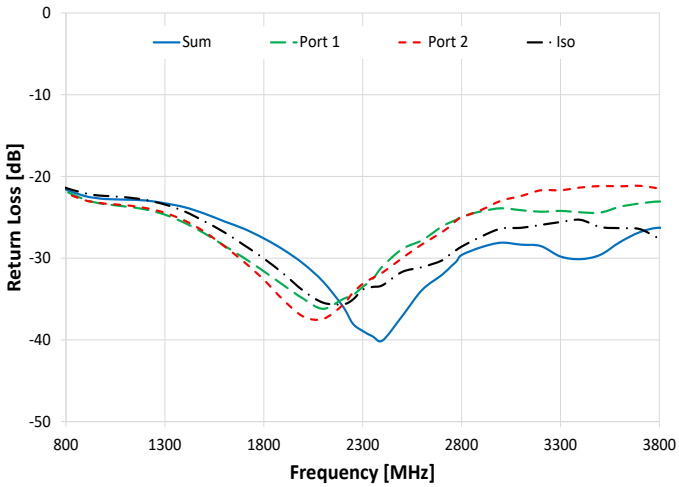
Phase Unbalance (relative to 90°) vs. Frequency



Isolation vs. Frequency



Return Loss vs. Frequency



* Data corresponds to Configuration A at +25°C unless otherwise specified.

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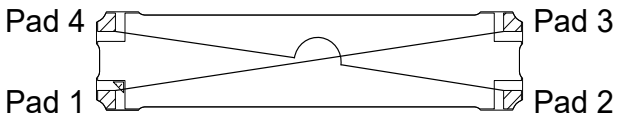
FUNCTIONAL DIAGRAM



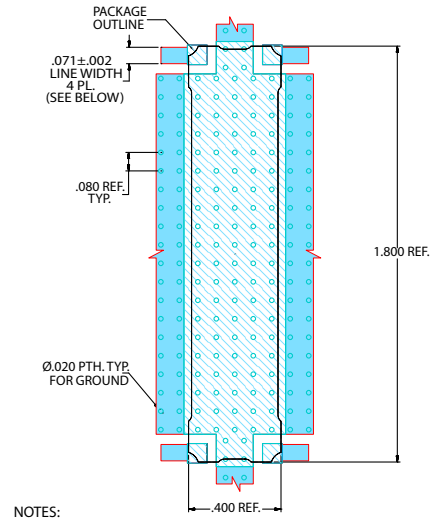
PAD DESCRIPTION/CONFIGURATION [7]

Function	Pad	Description
Sum	1	Sum port
Isolation	2	Isolation port
Port 1 (0°)	3	0° port
Port 2 (90°)	4	90° port
Ground	5	Ground

Configuration	Sum	Isolation	Port 1 (0°)	Port 2 (90°)
A	1	2	3	4
B	2	1	4	3
C	3	4	1	2
D	4	3	2	1

7. Model is symmetrical and all ports are interchangeable, see Port Function Configurations table and s-parameters for actual performance.

SUGGESTED PCB LAYOUT (PL-539)

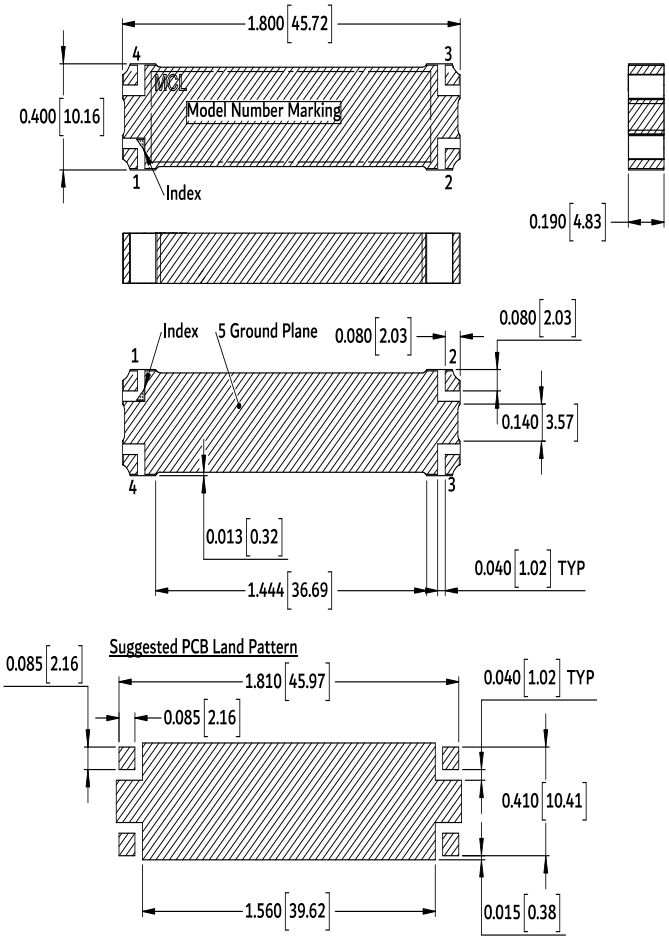


NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4003C WITH DIELECTRIC THICKNESS. 0.032"±.0015". COPPER: 1 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

CASE STYLE DRAWING (PQ2181)



NOTES:
1. Base material: Printed wiring laminate.
2. Termination finish: 2-5 µinch (.05-.13 microns) Immersion Gold.
3. Dimensions: Inches [mm]. Tolerances 2 Pl. ±.03 inch; 3 Pl. ±.010 inch.
4. Weight: 1.0 grams
5. Marking may contain other features or characters for internal lot control.

Metallization

Solder Resist

PRODUCT MARKING*: QCH-382+

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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASH BOARD

CLICK HERE

Performance Data & Graphs	Data Graphs S-Parameter (S4P files) data set (.zip file) de-embedded to device pads
Case Style	PQ2181 Lead finish: 2-5 µ inch (0.05-0.13 microns) immersion gold
RoHS Status	Compliant
Tape and Reel	F120
Suggested Layout for PCB Design	PL-539
Evaluation Board	TB-QCH-382+ Gerber file
Environmental Rating	ENV02T8

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 https://www.minicircuits.com/terms/viewterm.html