



## STRIPLINE SURFACE MOUNT

# Power Splitter/Combiner

## QCH-83+

50Ω    4000 to 8000 MHz    2-Way 90°    75W

### KEY FEATURES

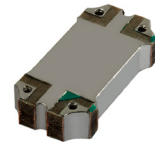
- High power handling, up to 75W
- Wide bandwidth
- Good phase unbalance,  $\pm 5$  deg
- Good amplitude unbalance,  $\pm 0.45$  deg

### APPLICATIONS

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

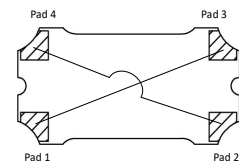
### PRODUCT OVERVIEW

Mini-Circuits' QCH-83+ is a 2-way 90° power splitter, capable of handling up to 75W with amplitude unbalance of  $\pm 0.45$  dB typ and phase unbalance of  $\pm 5$  deg. typ. Operating over a frequency range of 4000 to 8000 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 (0.4 x 0.2 x 0.083") and includes wrap-around terminations for good solderability and easy visual inspection.



Generic photo used for illustration purposes only

### FUNCTIONAL DIAGRAM



### ELECTRICAL SPECIFICATIONS <sup>1, 2</sup> AT +25°C

Parameter	Conditions (MHz)	Min.	Typ.	Max.	Unit
Frequency Range	–	4000	–	8000	MHz
Insertion Loss <sup>3</sup>	4000 - 8000	–	0.15	0.45	dB
Isolation	4000 - 8000	16.5	23	–	dB
Phase Unbalance	4000 - 8000	–	$\pm 5$	–	deg
Amplitude Unbalance	4000 - 8000	–	$\pm 0.45$	$\pm 0.65$	dB
Return Loss	4000 - 8000	16	25	–	dB
Thermal Resistance <sup>4</sup>	4000 - 8000	–	0.7	–	°C/W

1. Tested in Evaluation Board TB-QCH-83+. De-embedded 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  $\theta_{jc} = (\text{Hot Spot Temperature on DUT} - \text{Base Plate Temperature}) / \text{Input Power}$ .

### ABSOLUTE MAXIMUM RATINGS <sup>5</sup>

Operating Case Temperature <sup>6</sup>		-55°C to +105°C
Storage Temperature		-55°C to +105°C
Power Input	+85°C case	75 W
	+95°C case	55 W
	+105°C case	40 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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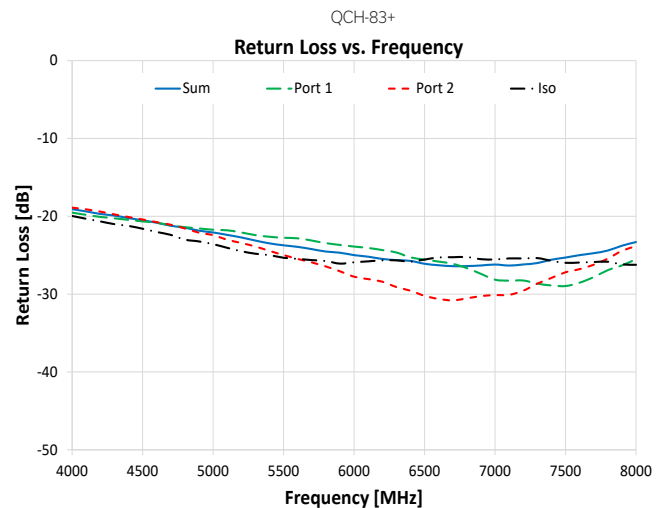
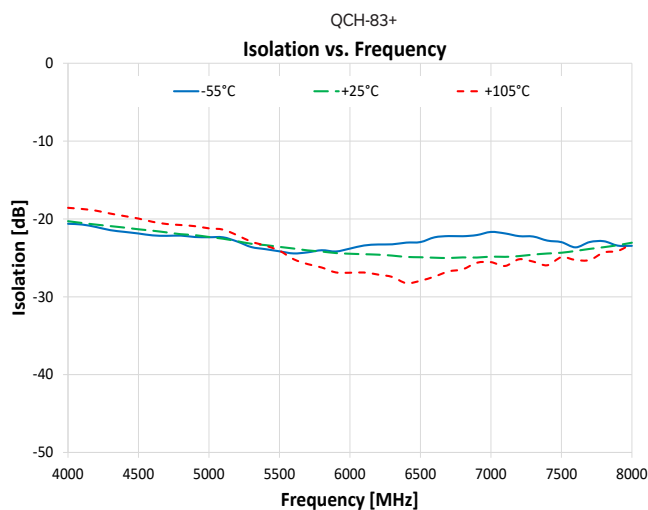
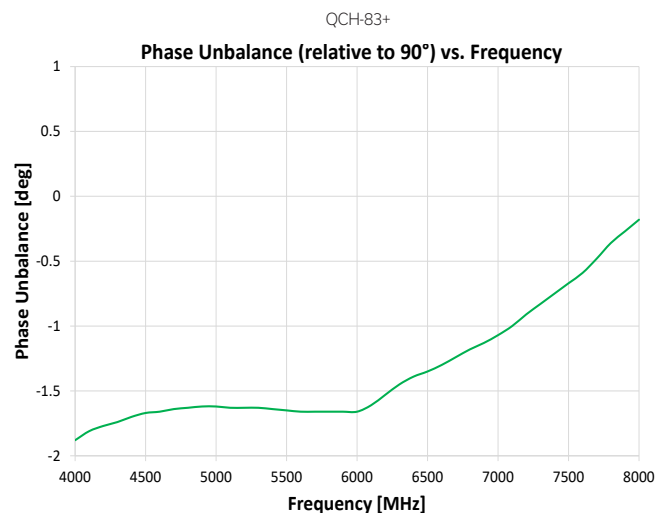
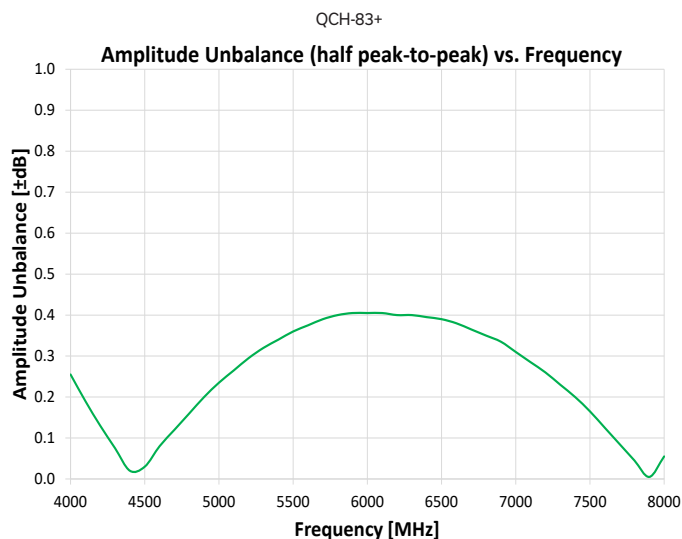
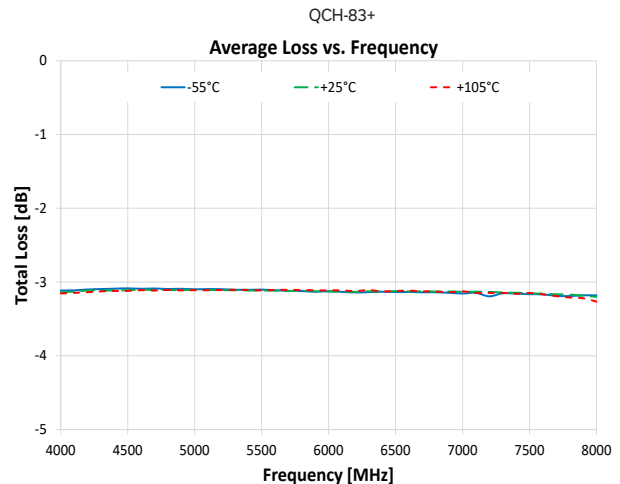
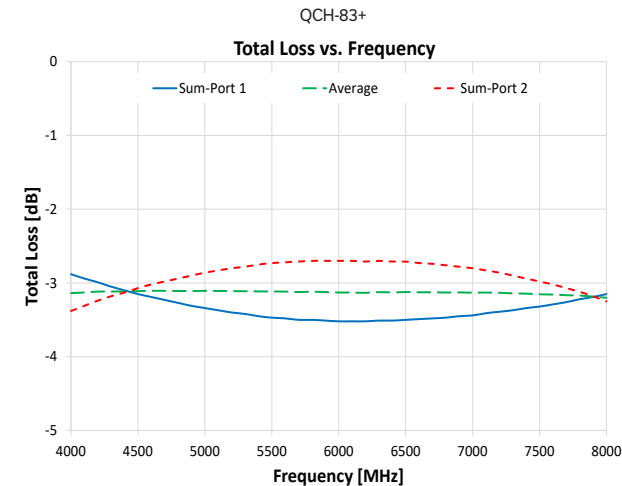
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### TYPICAL PERFORMANCE GRAPHS\*

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





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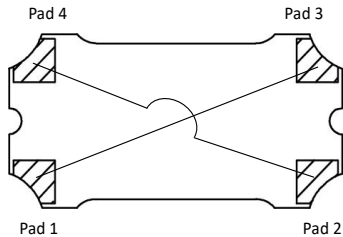
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**QCH-83+**

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### FUNCTIONAL DIAGRAM



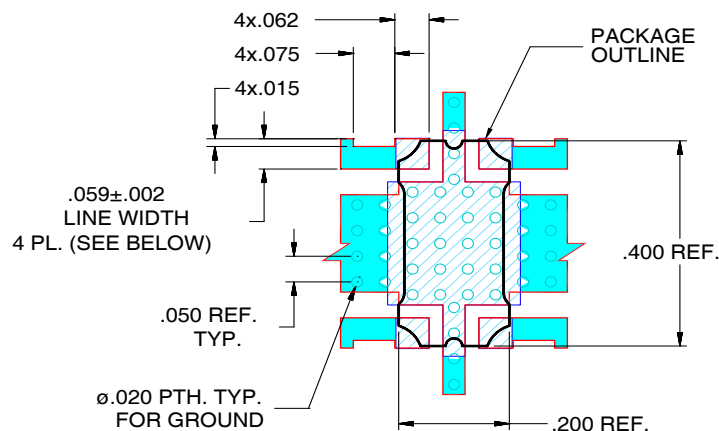
### PAD DESCRIPTION/CONFIGURATION <sup>7</sup>

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.

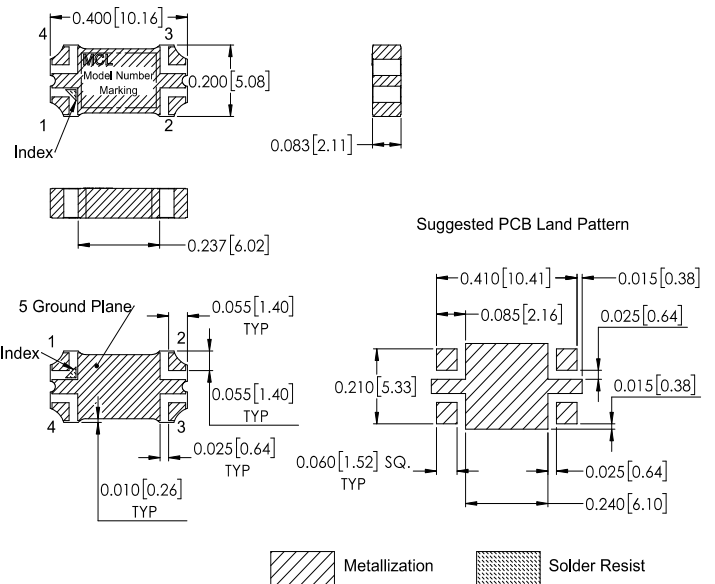
### SUGGESTED PCB LAYOUT (PL-525A)



#### NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS RT/DUROID5880 WITH DIELECTRIC THICKNESS  $0.02 \pm 0.0015$ ". COPPER: 1 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- 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 (PQ2481)



#### NOTES:

- Base material: Printed wiring laminate.
- Termination finish: 2-5 µinch (.05-.13 microns) Immersion Gold.
- Dimensions: Inches [mm]. Tolerances 2 PL.  $\pm 0.3$  inch; 3 PL.  $\pm 0.010$  inch.
- Weight: 1.0 grams
- Marking may contain other features or characters for internal lot control.

### PRODUCT MARKING\*: QCH-83+

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Mini-Circuits



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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	PQ2481    Lead finish: 2-5 inch (0.05-0.13 microns) immersion gold
RoHS Status	Compliant
Tape and Reel	F34
Suggested Layout for PCB Design	PL-525A
Evaluation Board	TB-QCH-83+ 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>

