STRIPLINE SURFACE MOUNT

Power Splitter/Combiner

QCH-123+

50Ω 2-Way 90° 8000 to 12000 MHz 50 W

KEY FEATURES

- High Power Handling, up to 50 W
- Wide Bandwidth
- Good Amplitude Unbalance, ±0.35 dB
- Good Phase Unbalance, ±5 deg

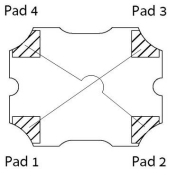


Generic photo used for illustration purposes only

APPLICATIONS

- Balanced Amplifiers
- I & Q Modulators
- Defense and Military

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' QCH-123+ is a 2-way 90° power splitter, capable of handling up to 50 W with amplitude unbalance of ±0.35 dB typ and phase unbalance of ±5 deg. typ. Operating over a frequency range of 8000 to 12000 MHz, the good 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 (0.2 × 0.25 × 0.069") and includes wrap-around terminations for good solderability and easy visual inspection.

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

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Frequency Range	-	8000	-	12000	MHz
Insersion Loss[3]	8000-12000	-	0.25	0.4	dB
Isolation	8000-12000	18	23	-	dB
Phase Unbalance	8000-12000	-	±5	-	deg
Amplitude Unbalance	8000-12000	-	±0.35	±0.5	dB
Return Loss	8000-12000	16.5	23	-	dB
Thermal Resistance[4]	8000-12000	-	1.1	-	°C/W

1. Tested in Evaluation Board TB-QCH-123+. De-embedded to the device reference plane.
2. Model is symmetrical and all ports are interchangeable, see Pad 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, example (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	50 W
	+95 °C case	35 W
	+105 °C case	25 W

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

REV. C
ECO-031644
EDR-12104
QCH-123+
MCIL
261020

Power Splitter/Combiner

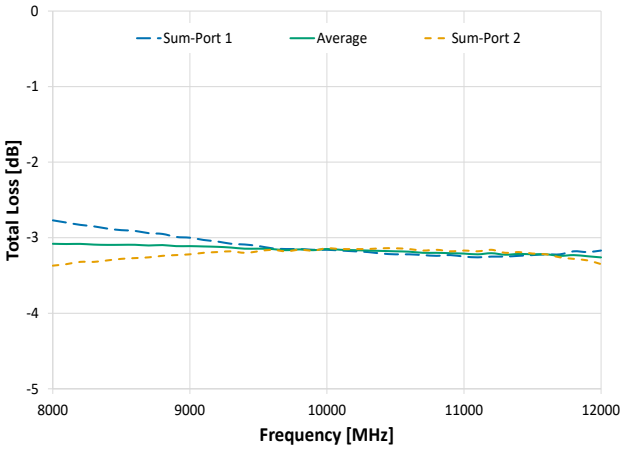
QCH-123+

50Ω 2-Way 90° 8000 to 12000 MHz 50 W

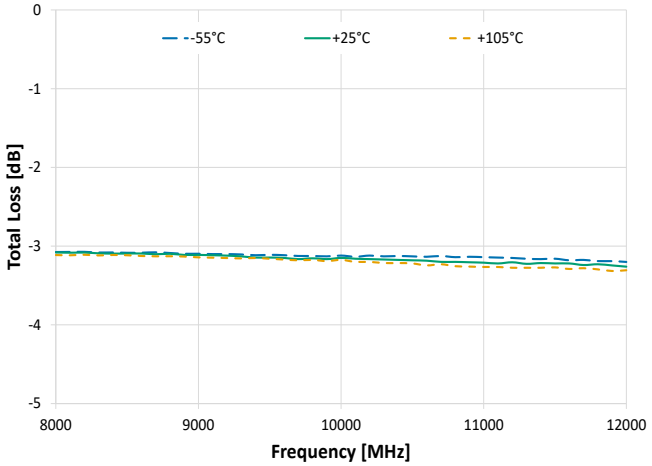
TYPICAL PERFORMANCE GRAPHS

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

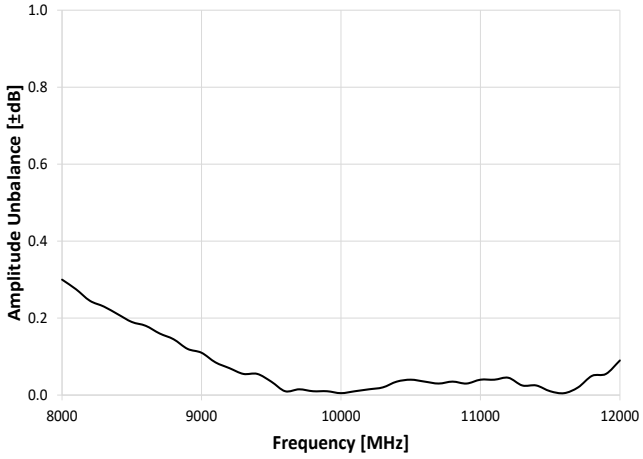
Total Loss vs. Frequency



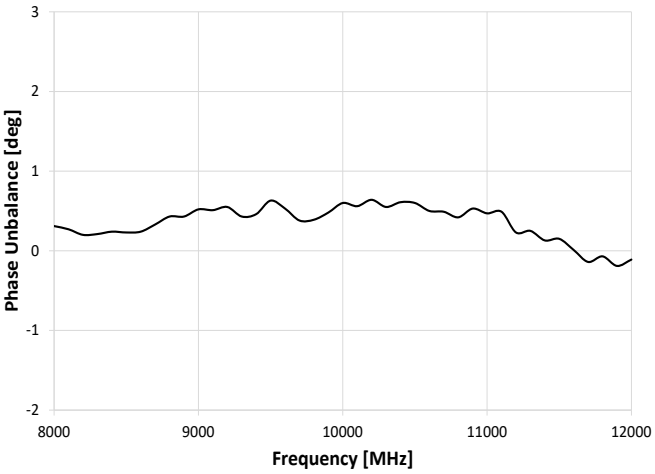
Average Loss vs. Frequency



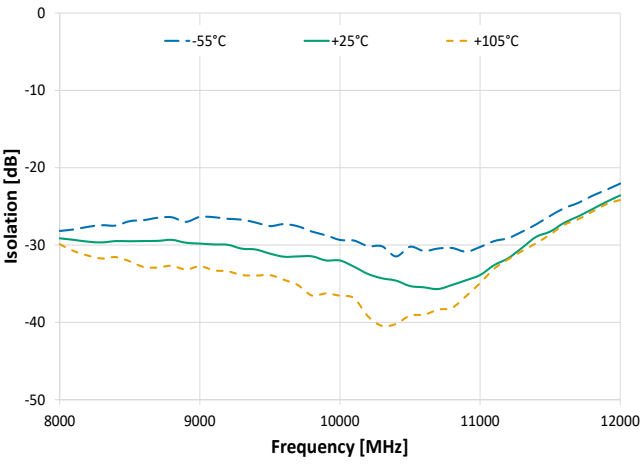
Amplitude Unbalance (half peak-to-peak) vs. Frequency



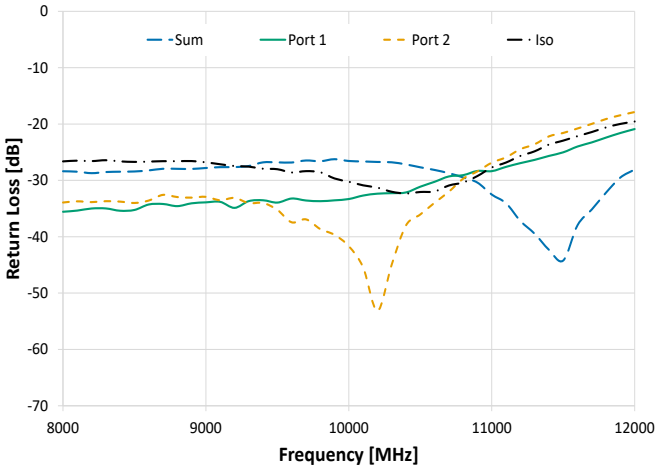
Phase Unbalance (relative to 90°) vs. Frequency



Isolation vs. Frequency



Return Loss vs. Frequency



Power Splitter/Combiner QCH-123+

50Ω 2-Way 90° 8000 to 12000 MHz 50 W

FUNCTIONAL DIAGRAM

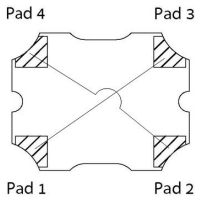


Figure 1. QCH-123+ Functional Diagram

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-526)

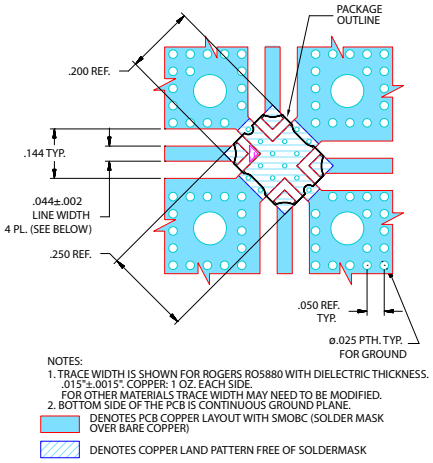
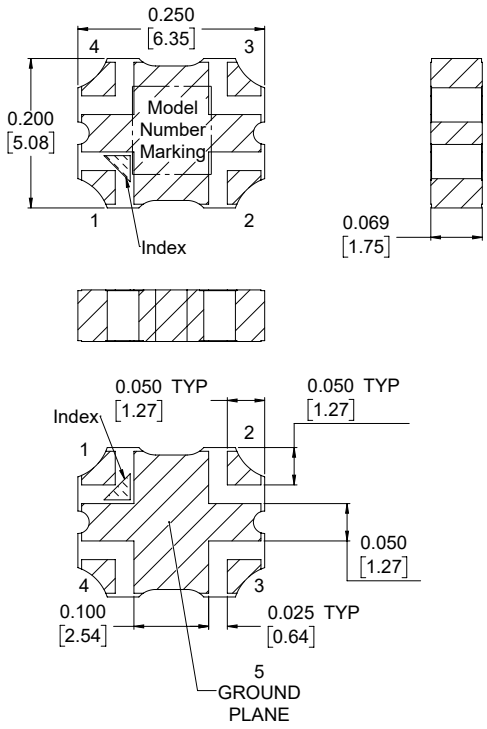
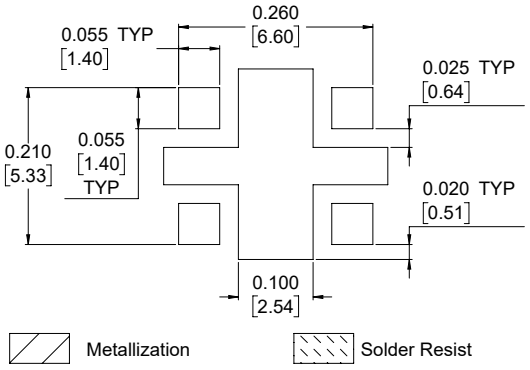


Figure 2. Suggested PCB Layout PL-526

CASE STYLE DRAWING (PQ2482)



Suggested PCB Layout



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: 0.5 grams
5. Marking may contain other features or characters for internal lot control.

PRODUCT MARKING*: QCH-123+

*Marking may contain other features or characters for internal lot control.

Power Splitter/Combiner QCH-123+

50Ω 2-Way 90° 8000 to 12000 MHz 50 W

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	PQ2482 Lead Finish: 2-5 µinch (0.05-0.13 microns) Immersion Gold.
RoHS Status	Compliant
Tape and Reel	F030
Suggested Layout for PCB Design	PL-526
Evaluation Board	TB-QCH-123+
	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-Circuits' 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/terms/viewterm.html

2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =+5 dBm @Temperature = -55°C, Sum port at pad 1

FREQ. (MHz)	TOTAL LOSS (dB)			Amp. Unbal. (±dB)	Phase Unbal. (deg)	ISOLATION (dB)	VSWR (:1)			
	Sum-Port 1	Sum-Port 2	Avg	See Note	See Note	Port 1 - Port 2	Sum	Port 1	Port 2	Iso
7000	2.83	3.39	3.10	0.29	0.32	24.53	1.17	1.16	1.10	1.10
7200	2.88	3.33	3.10	0.24	0.08	24.34	1.12	1.12	1.16	1.16
7400	2.93	3.26	3.09	0.17	0.31	24.41	1.09	1.08	1.17	1.19
7600	3.02	3.19	3.10	0.08	0.33	26.59	1.14	1.10	1.05	1.09
7700	3.06	3.16	3.11	0.05	0.26	28.50	1.15	1.11	1.05	1.04
7800	3.09	3.12	3.10	0.02	0.19	28.04	1.15	1.12	1.07	1.04
7900	3.13	3.10	3.11	0.02	0.09	26.13	1.15	1.12	1.09	1.09
8000	3.15	3.09	3.12	0.03	-0.08	24.73	1.14	1.10	1.11	1.14
8100	3.16	3.07	3.11	0.05	0.11	24.44	1.12	1.08	1.13	1.17
8200	3.19	3.05	3.12	0.07	0.16	24.97	1.13	1.07	1.10	1.15
8300	3.22	3.02	3.12	0.10	0.13	25.93	1.15	1.09	1.08	1.10
8400	3.25	3.01	3.13	0.12	0.16	27.06	1.15	1.10	1.09	1.07
8500	3.29	2.99	3.14	0.15	0.01	27.41	1.14	1.11	1.13	1.06
8600	3.30	2.97	3.13	0.17	-0.05	25.75	1.13	1.13	1.14	1.11
8700	3.32	2.96	3.14	0.18	-0.18	24.23	1.11	1.13	1.17	1.19
8800	3.32	2.96	3.14	0.18	-0.18	23.68	1.07	1.11	1.22	1.25
8900	3.31	2.95	3.13	0.18	-0.03	23.74	1.06	1.09	1.23	1.27
9000	3.34	2.93	3.13	0.21	0.18	24.73	1.06	1.06	1.20	1.23
9100	3.37	2.91	3.13	0.23	0.20	26.61	1.06	1.06	1.17	1.16
9200	3.40	2.92	3.15	0.24	0.10	27.79	1.07	1.09	1.16	1.12
9300	3.44	2.90	3.16	0.27	0.13	27.28	1.07	1.11	1.16	1.13
9400	3.46	2.90	3.17	0.28	-0.10	25.46	1.08	1.12	1.21	1.19
9500	3.45	2.93	3.18	0.26	-0.33	24.19	1.10	1.10	1.29	1.26
9600	3.43	2.93	3.17	0.25	-0.01	24.12	1.11	1.08	1.34	1.29
9700	3.44	2.94	3.18	0.25	0.22	25.28	1.10	1.06	1.33	1.29
9800	3.46	2.95	3.20	0.25	0.68	26.97	1.10	1.05	1.31	1.22
9900	3.47	2.92	3.19	0.27	0.61	27.89	1.09	1.05	1.27	1.18
10000	3.50	2.91	3.19	0.29	0.68	27.51	1.09	1.08	1.23	1.16
10100	3.52	2.89	3.19	0.31	0.73	25.93	1.10	1.09	1.22	1.18
10200	3.56	2.91	3.22	0.32	0.87	24.80	1.12	1.08	1.25	1.23
10300	3.54	2.93	3.22	0.31	0.61	24.66	1.14	1.05	1.27	1.25
10400	3.53	2.92	3.21	0.30	0.79	26.08	1.15	1.01	1.26	1.20
10500	3.57	2.92	3.23	0.32	0.81	27.67	1.16	1.04	1.25	1.13
10600	3.58	2.93	3.24	0.32	0.89	27.49	1.17	1.07	1.23	1.08
10700	3.58	2.92	3.24	0.33	0.94	26.12	1.16	1.09	1.24	1.09
10800	3.61	2.92	3.25	0.34	0.91	24.95	1.17	1.09	1.23	1.11
10900	3.58	2.94	3.25	0.32	1.00	23.80	1.18	1.09	1.21	1.12
11000	3.60	2.94	3.26	0.33	1.13	24.20	1.18	1.10	1.15	1.11
11100	3.60	2.95	3.26	0.32	1.12	25.68	1.21	1.14	1.09	1.08
11200	3.62	2.94	3.27	0.33	1.37	28.24	1.25	1.20	1.15	1.09
11300	3.64	2.96	3.29	0.34	1.35	29.49	1.27	1.25	1.21	1.13
11400	3.67	2.96	3.30	0.35	0.97	28.70	1.27	1.26	1.21	1.10
11500	3.64	3.00	3.31	0.32	0.96	26.88	1.23	1.24	1.17	1.02
11600	3.58	2.98	3.27	0.30	0.94	25.62	1.18	1.20	1.14	1.05
11700	3.56	2.96	3.25	0.30	1.28	25.88	1.16	1.19	1.10	1.09
11800	3.59	2.98	3.27	0.30	1.50	27.68	1.20	1.23	1.01	1.13
11900	3.57	2.97	3.26	0.30	1.37	30.66	1.23	1.29	1.13	1.23
12000	3.58	2.99	3.27	0.29	1.19	33.96	1.24	1.33	1.24	1.34
12100	3.53	3.00	3.26	0.26	1.20	32.85	1.23	1.33	1.29	1.37
12200	3.54	3.00	3.26	0.26	1.17	31.46	1.18	1.28	1.22	1.28
12400	3.48	3.01	3.24	0.23	0.75	41.20	1.05	1.20	1.10	1.10
12600	3.49	3.05	3.26	0.21	0.25	27.29	1.05	1.30	1.19	1.19
12800	3.38	3.21	3.29	0.08	-0.34	21.37	1.02	1.30	1.37	1.41
13000	3.33	3.28	3.30	0.02	0.95	20.72	1.15	1.25	1.24	1.25

Note: Phase Unbalance shown relative to 90°; Amplitude Unbalance 1/2 of peak-to-peak difference

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-Circuits 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

2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =+5 dBm @Temperature = -55°C, Sum port at pad 2

FREQ. (MHz)	TOTAL LOSS (dB)			Amp. Unbal. (±dB)	Phase Unbal. (deg)	ISOLATION (dB)	VSWR (:1)			
	Sum-Port 1	Sum-Port 2	Avg	See Note	See Note	Port 1 - Port 2	Sum	Port 1	Port 2	Iso
7000	2.89	3.43	3.15	0.26	-0.57	24.49	1.10	1.10	1.16	1.17
7200	2.99	3.36	3.17	0.18	-0.62	24.32	1.16	1.16	1.12	1.12
7400	3.08	3.29	3.18	0.11	-0.67	24.40	1.19	1.17	1.08	1.09
7600	3.12	3.20	3.16	0.05	-0.56	26.58	1.09	1.05	1.10	1.14
7700	3.14	3.17	3.15	0.02	-0.54	28.49	1.04	1.05	1.11	1.15
7800	3.18	3.13	3.15	0.03	-0.53	28.03	1.04	1.07	1.12	1.15
7900	3.22	3.12	3.17	0.05	-0.52	26.12	1.09	1.09	1.12	1.15
8000	3.26	3.11	3.18	0.08	-0.64	24.73	1.14	1.11	1.10	1.14
8100	3.29	3.09	3.19	0.10	-0.64	24.45	1.17	1.13	1.08	1.12
8200	3.31	3.07	3.19	0.12	-0.62	24.97	1.15	1.10	1.07	1.13
8300	3.32	3.04	3.18	0.14	-0.56	25.93	1.10	1.08	1.09	1.15
8400	3.35	3.02	3.18	0.17	-0.48	27.05	1.07	1.09	1.10	1.15
8500	3.38	2.98	3.18	0.20	-0.53	27.38	1.06	1.13	1.11	1.14
8600	3.41	2.99	3.19	0.22	-0.59	25.74	1.11	1.14	1.13	1.13
8700	3.45	2.99	3.21	0.23	-0.63	24.24	1.19	1.17	1.13	1.11
8800	3.50	3.01	3.25	0.25	-0.70	23.68	1.25	1.22	1.11	1.07
8900	3.51	3.01	3.25	0.26	-0.66	23.74	1.27	1.23	1.09	1.06
9000	3.52	2.98	3.24	0.27	-0.64	24.73	1.23	1.20	1.06	1.06
9100	3.53	2.95	3.23	0.29	-0.61	26.60	1.16	1.17	1.06	1.06
9200	3.53	2.92	3.21	0.31	-0.55	27.77	1.12	1.16	1.09	1.07
9300	3.56	2.91	3.22	0.33	-0.40	27.26	1.13	1.16	1.11	1.07
9400	3.60	2.94	3.26	0.33	-0.54	25.44	1.19	1.21	1.12	1.08
9500	3.66	2.94	3.29	0.36	-0.39	24.19	1.26	1.29	1.10	1.10
9600	3.69	2.94	3.30	0.38	-0.63	24.12	1.29	1.34	1.08	1.11
9700	3.72	2.97	3.33	0.38	-0.85	25.27	1.29	1.33	1.06	1.10
9800	3.70	2.95	3.31	0.37	-0.65	26.95	1.22	1.31	1.05	1.10
9900	3.69	2.93	3.29	0.38	-0.65	27.88	1.18	1.27	1.05	1.09
10000	3.69	2.91	3.28	0.40	-0.72	27.50	1.16	1.23	1.08	1.09
10100	3.69	2.93	3.29	0.39	-0.60	25.92	1.18	1.22	1.09	1.10
10200	3.73	2.94	3.32	0.40	-0.53	24.80	1.23	1.25	1.08	1.12
10300	3.75	2.92	3.32	0.42	-0.52	24.66	1.25	1.27	1.05	1.14
10400	3.75	2.92	3.32	0.42	-0.84	26.07	1.20	1.26	1.01	1.15
10500	3.74	2.92	3.31	0.42	-0.76	27.64	1.13	1.25	1.04	1.16
10600	3.74	2.88	3.29	0.43	-0.74	27.47	1.08	1.23	1.07	1.17
10700	3.72	2.91	3.30	0.41	-1.01	26.10	1.09	1.24	1.09	1.16
10800	3.76	2.91	3.31	0.43	-0.94	24.95	1.11	1.23	1.09	1.17
10900	3.70	2.95	3.31	0.39	-1.30	23.79	1.12	1.21	1.09	1.18
11000	3.70	2.96	3.31	0.38	-0.94	24.20	1.11	1.15	1.10	1.18
11100	3.69	2.97	3.32	0.37	-0.56	25.68	1.08	1.09	1.14	1.21
11200	3.70	2.96	3.31	0.38	-0.57	28.22	1.09	1.15	1.20	1.25
11300	3.70	2.97	3.32	0.37	-0.64	29.43	1.13	1.21	1.25	1.27
11400	3.69	2.96	3.31	0.37	-0.41	28.68	1.10	1.21	1.26	1.27
11500	3.70	2.98	3.33	0.36	-0.52	26.87	1.02	1.17	1.24	1.23
11600	3.67	2.98	3.31	0.35	-0.55	25.63	1.05	1.14	1.20	1.18
11700	3.66	3.01	3.32	0.33	-0.41	25.90	1.09	1.10	1.19	1.16
11800	3.64	3.00	3.31	0.33	-0.07	27.69	1.13	1.01	1.23	1.20
11900	3.67	3.03	3.34	0.32	-0.30	30.69	1.23	1.13	1.29	1.23
12000	3.69	3.08	3.37	0.32	-0.17	33.96	1.34	1.24	1.33	1.24
12100	3.70	3.10	3.39	0.31	-0.25	32.88	1.37	1.29	1.33	1.23
12200	3.66	3.10	3.37	0.29	-0.05	31.48	1.28	1.22	1.28	1.18
12400	3.56	3.06	3.30	0.26	0.13	41.06	1.10	1.10	1.20	1.05
12600	3.61	3.15	3.37	0.24	-0.01	27.28	1.19	1.19	1.30	1.05
12800	3.64	3.34	3.49	0.16	-0.76	21.37	1.41	1.37	1.30	1.02
13000	3.47	3.34	3.40	0.07	-1.28	20.71	1.25	1.24	1.25	1.15

Note: Phase Unbalance shown relative to 90°; Amplitude Unbalance 1/2 of peak-to-peak difference

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-Circuits 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

2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =+5 dBm @Temperature = -55°C, Sum port at pad 3

FREQ. (MHz)	TOTAL LOSS (dB)			Amp. Unbal. (±dB)	Phase Unbal. (deg)	ISOLATION (dB)	VSWR (:1)			
	Sum-Port 1	Sum-Port 2	Avg	See Note	See Note	Port 1 - Port 2	Sum	Port 1	Port 2	Iso
7000	2.83	3.43	3.12	0.30	-0.23	25.00	1.16	1.17	1.10	1.10
7200	2.87	3.36	3.11	0.24	-0.47	24.34	1.12	1.12	1.16	1.16
7400	2.93	3.30	3.11	0.18	-0.28	25.42	1.08	1.09	1.19	1.17
7600	3.02	3.21	3.11	0.10	-0.15	30.05	1.10	1.14	1.09	1.05
7700	3.06	3.17	3.11	0.06	-0.32	30.83	1.11	1.15	1.04	1.05
7800	3.09	3.13	3.11	0.02	-0.46	29.14	1.12	1.15	1.04	1.07
7900	3.12	3.12	3.12	0.00	-0.54	27.91	1.12	1.15	1.09	1.09
8000	3.14	3.11	3.12	0.02	-0.65	27.07	1.10	1.14	1.14	1.11
8100	3.16	3.09	3.12	0.04	-0.54	27.23	1.08	1.12	1.17	1.13
8200	3.19	3.07	3.13	0.07	-0.41	28.62	1.07	1.13	1.15	1.10
8300	3.21	3.04	3.12	0.09	-0.40	29.15	1.09	1.15	1.10	1.08
8400	3.25	3.02	3.13	0.12	-0.43	28.26	1.10	1.15	1.07	1.09
8500	3.28	2.98	3.13	0.15	-0.65	26.39	1.11	1.14	1.06	1.13
8600	3.30	2.99	3.14	0.16	-0.90	24.87	1.13	1.13	1.11	1.14
8700	3.31	2.99	3.15	0.17	-1.05	24.23	1.13	1.11	1.19	1.17
8800	3.31	3.02	3.16	0.15	-1.01	24.05	1.11	1.07	1.25	1.22
8900	3.30	3.01	3.15	0.16	-0.67	24.76	1.09	1.06	1.27	1.23
9000	3.33	2.98	3.15	0.18	-0.42	25.94	1.06	1.06	1.23	1.20
9100	3.36	2.96	3.16	0.21	-0.34	26.13	1.06	1.06	1.16	1.17
9200	3.40	2.93	3.16	0.24	-0.40	25.16	1.09	1.07	1.12	1.16
9300	3.43	2.92	3.17	0.26	-0.56	24.66	1.11	1.07	1.13	1.16
9400	3.45	2.95	3.19	0.26	-0.82	23.61	1.12	1.08	1.19	1.21
9500	3.44	2.95	3.19	0.26	-0.78	22.82	1.10	1.10	1.26	1.29
9600	3.42	2.94	3.17	0.25	-0.74	22.64	1.08	1.11	1.29	1.34
9700	3.43	2.97	3.19	0.24	-0.46	23.11	1.06	1.10	1.29	1.33
9800	3.46	2.96	3.20	0.26	-0.05	23.51	1.05	1.10	1.22	1.31
9900	3.46	2.94	3.19	0.27	-0.01	23.82	1.05	1.09	1.18	1.27
10000	3.49	2.92	3.20	0.29	0.06	24.15	1.08	1.09	1.16	1.23
10100	3.51	2.94	3.22	0.30	0.10	24.32	1.09	1.10	1.18	1.22
10200	3.56	2.95	3.24	0.31	0.08	24.62	1.08	1.12	1.23	1.25
10300	3.54	2.92	3.22	0.32	0.00	24.34	1.05	1.14	1.25	1.27
10400	3.52	2.93	3.21	0.30	-0.04	23.96	1.01	1.15	1.20	1.26
10500	3.56	2.93	3.23	0.33	0.10	23.82	1.04	1.16	1.13	1.25
10600	3.57	2.89	3.22	0.35	0.19	23.45	1.07	1.17	1.08	1.23
10700	3.57	2.92	3.23	0.34	-0.06	23.00	1.09	1.16	1.09	1.24
10800	3.60	2.92	3.25	0.35	0.01	23.17	1.09	1.17	1.11	1.23
10900	3.58	2.95	3.25	0.32	-0.08	23.25	1.09	1.18	1.12	1.21
11000	3.59	2.97	3.27	0.33	0.25	25.09	1.10	1.18	1.11	1.15
11100	3.59	2.98	3.27	0.32	0.51	27.39	1.14	1.21	1.08	1.09
11200	3.61	2.97	3.28	0.33	0.55	27.79	1.20	1.25	1.09	1.15
11300	3.64	2.97	3.29	0.34	0.52	26.41	1.25	1.27	1.13	1.21
11400	3.66	2.97	3.30	0.36	0.29	24.61	1.26	1.27	1.10	1.21
11500	3.63	2.99	3.30	0.33	0.00	23.66	1.24	1.23	1.02	1.17
11600	3.57	2.99	3.27	0.30	-0.11	23.71	1.20	1.18	1.05	1.14
11700	3.56	3.02	3.28	0.28	0.21	25.12	1.19	1.16	1.09	1.10
11800	3.58	3.01	3.29	0.30	0.43	27.60	1.23	1.20	1.13	1.01
11900	3.56	3.04	3.29	0.27	0.18	31.91	1.29	1.23	1.23	1.13
12000	3.57	3.08	3.32	0.25	0.35	37.56	1.33	1.24	1.34	1.24
12100	3.52	3.10	3.30	0.22	0.49	44.85	1.33	1.23	1.37	1.29
12200	3.53	3.11	3.31	0.22	0.85	40.17	1.28	1.18	1.28	1.22
12400	3.47	3.06	3.26	0.21	0.22	28.09	1.20	1.05	1.10	1.10
12600	3.47	3.15	3.31	0.17	-0.18	21.74	1.30	1.05	1.19	1.19
12800	3.37	3.35	3.36	0.03	-0.31	19.50	1.30	1.02	1.41	1.37
13000	3.32	3.35	3.33	0.01	1.01	19.86	1.25	1.15	1.25	1.24

Note: Phase Unbalance shown relative to 90°; Amplitude Unbalance 1/2 of peak-to-peak difference

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-Circuits 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

2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =+5 dBm @Temperature = -55°C, Sum port at pad 4

FREQ. (MHz)	TOTAL LOSS (dB)			Amp. Unbal. (±dB)	Phase Unbal. (deg)	ISOLATION (dB)	VSWR (:1)			
	Sum-Port 1	Sum-Port 2	Avg	See Note	See Note	Port 1 - Port 2	Sum	Port 1	Port 2	Iso
7000	2.91	3.41	3.15	0.25	-0.19	24.99	1.10	1.10	1.17	1.16
7200	3.01	3.34	3.17	0.17	-0.26	24.31	1.16	1.16	1.12	1.12
7400	3.09	3.26	3.17	0.09	-0.27	25.41	1.17	1.19	1.09	1.08
7600	3.12	3.18	3.15	0.04	-0.27	30.02	1.05	1.09	1.14	1.10
7700	3.14	3.15	3.14	0.01	-0.15	30.83	1.05	1.04	1.15	1.11
7800	3.17	3.12	3.14	0.03	-0.07	29.13	1.07	1.04	1.15	1.12
7900	3.22	3.09	3.15	0.06	-0.09	27.90	1.09	1.09	1.15	1.12
8000	3.26	3.08	3.17	0.09	-0.28	27.06	1.11	1.14	1.14	1.10
8100	3.29	3.07	3.18	0.11	-0.20	27.22	1.13	1.17	1.12	1.08
8200	3.31	3.04	3.17	0.14	-0.25	28.60	1.10	1.15	1.13	1.07
8300	3.33	3.02	3.17	0.16	-0.25	29.15	1.08	1.10	1.15	1.09
8400	3.35	3.00	3.17	0.17	-0.11	28.27	1.09	1.07	1.15	1.10
8500	3.39	2.99	3.19	0.20	-0.08	26.38	1.13	1.06	1.14	1.11
8600	3.41	2.96	3.18	0.22	0.05	24.86	1.14	1.11	1.13	1.13
8700	3.45	2.96	3.20	0.25	0.03	24.23	1.17	1.19	1.11	1.13
8800	3.51	2.95	3.22	0.28	-0.10	24.04	1.22	1.25	1.07	1.11
8900	3.52	2.95	3.23	0.28	-0.26	24.75	1.23	1.27	1.06	1.09
9000	3.52	2.93	3.21	0.30	-0.26	25.94	1.20	1.23	1.06	1.06
9100	3.54	2.90	3.21	0.32	-0.29	26.12	1.17	1.16	1.06	1.06
9200	3.54	2.92	3.22	0.31	-0.30	25.15	1.16	1.12	1.07	1.09
9300	3.57	2.90	3.22	0.33	0.07	24.64	1.16	1.13	1.07	1.11
9400	3.61	2.90	3.24	0.35	-0.05	23.59	1.21	1.19	1.08	1.12
9500	3.67	2.93	3.28	0.37	-0.19	22.80	1.29	1.26	1.10	1.10
9600	3.69	2.93	3.29	0.38	-0.13	22.63	1.34	1.29	1.11	1.08
9700	3.73	2.95	3.32	0.39	-0.43	23.10	1.33	1.29	1.10	1.06
9800	3.70	2.95	3.31	0.38	-0.18	23.49	1.31	1.22	1.10	1.05
9900	3.70	2.92	3.29	0.38	-0.29	23.81	1.27	1.18	1.09	1.05
10000	3.71	2.91	3.29	0.39	-0.37	24.14	1.23	1.16	1.09	1.08
10100	3.71	2.90	3.29	0.40	-0.22	24.29	1.22	1.18	1.10	1.09
10200	3.75	2.92	3.32	0.41	0.00	24.61	1.25	1.23	1.12	1.08
10300	3.76	2.93	3.33	0.41	-0.17	24.32	1.27	1.25	1.14	1.05
10400	3.76	2.92	3.32	0.42	-0.29	23.93	1.26	1.20	1.15	1.01
10500	3.76	2.92	3.32	0.41	-0.33	23.79	1.25	1.13	1.16	1.04
10600	3.76	2.93	3.33	0.41	-0.34	23.43	1.23	1.08	1.17	1.07
10700	3.73	2.92	3.31	0.40	-0.29	22.98	1.24	1.09	1.16	1.09
10800	3.77	2.92	3.32	0.42	-0.34	23.14	1.23	1.11	1.17	1.09
10900	3.72	2.95	3.32	0.38	-0.52	23.24	1.21	1.12	1.18	1.09
11000	3.72	2.94	3.31	0.38	-0.37	25.07	1.15	1.11	1.18	1.10
11100	3.71	2.95	3.31	0.38	-0.23	27.36	1.09	1.08	1.21	1.14
11200	3.71	2.95	3.31	0.38	-0.05	27.74	1.15	1.09	1.25	1.20
11300	3.71	2.96	3.32	0.37	-0.10	26.38	1.21	1.13	1.27	1.25
11400	3.70	2.97	3.32	0.36	-0.03	24.59	1.21	1.10	1.27	1.26
11500	3.71	3.00	3.34	0.35	0.14	23.65	1.17	1.02	1.23	1.24
11600	3.68	2.99	3.32	0.35	0.20	23.70	1.14	1.05	1.18	1.20
11700	3.67	2.96	3.30	0.35	0.38	25.11	1.10	1.09	1.16	1.19
11800	3.66	2.99	3.31	0.33	0.67	27.58	1.01	1.13	1.20	1.23
11900	3.69	2.97	3.32	0.36	0.57	31.90	1.13	1.23	1.23	1.29
12000	3.70	3.00	3.34	0.35	0.35	37.53	1.24	1.34	1.24	1.33
12100	3.71	3.01	3.35	0.35	0.13	44.91	1.29	1.37	1.23	1.33
12200	3.68	3.01	3.33	0.33	-0.07	40.08	1.22	1.28	1.18	1.28
12400	3.58	3.02	3.29	0.28	0.36	28.09	1.10	1.10	1.05	1.20
12600	3.63	3.05	3.33	0.28	0.07	21.71	1.19	1.19	1.05	1.30
12800	3.66	3.21	3.43	0.22	-1.13	19.48	1.37	1.41	1.02	1.30
13000	3.49	3.29	3.39	0.10	-1.69	19.84	1.24	1.25	1.15	1.25

Note: Phase Unbalance shown relative to 90°; Amplitude Unbalance 1/2 of peak-to-peak difference

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-Circuits 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

2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =+5 dBm @Temperature = +25°C, Sum port at pad 1

FREQ. (MHz)	TOTAL LOSS (dB)			Amp. Unbal. (±dB)	Phase Unbal. (deg)	ISOLATION (dB)	VSWR (:1)			
	Sum-Port 1	Sum-Port 2	Avg	See Note	See Note	Port 1 - Port 2	Sum	Port 1	Port 2	Iso
7000	2.77	3.40	3.07	0.32	0.81	23.47	1.16	1.14	1.14	1.17
7200	2.83	3.31	3.06	0.24	0.72	24.72	1.14	1.12	1.12	1.15
7400	2.90	3.23	3.06	0.17	0.64	26.53	1.11	1.10	1.11	1.13
7600	2.96	3.16	3.06	0.10	0.63	28.33	1.09	1.08	1.10	1.10
7700	2.99	3.15	3.07	0.08	0.58	28.96	1.09	1.07	1.09	1.09
7800	3.02	3.11	3.06	0.05	0.66	29.54	1.08	1.07	1.07	1.08
7900	3.05	3.08	3.06	0.02	0.61	30.04	1.08	1.06	1.06	1.08
8000	3.08	3.06	3.07	0.02	0.58	30.31	1.08	1.06	1.06	1.08
8100	3.11	3.03	3.07	0.04	0.53	30.20	1.07	1.06	1.07	1.08
8200	3.13	3.01	3.07	0.06	0.54	29.87	1.06	1.06	1.09	1.10
8300	3.16	2.99	3.07	0.08	0.49	28.99	1.06	1.06	1.11	1.11
8400	3.18	2.98	3.08	0.10	0.53	28.38	1.06	1.06	1.12	1.13
8500	3.20	2.97	3.08	0.12	0.52	27.79	1.05	1.07	1.13	1.15
8600	3.23	2.95	3.09	0.14	0.58	27.48	1.06	1.07	1.13	1.15
8700	3.25	2.95	3.10	0.15	0.64	27.22	1.06	1.07	1.13	1.15
8800	3.28	2.92	3.10	0.18	0.58	26.76	1.07	1.07	1.14	1.14
8900	3.29	2.92	3.10	0.19	0.50	26.26	1.08	1.08	1.15	1.14
9000	3.33	2.91	3.11	0.21	0.49	25.71	1.09	1.09	1.17	1.15
9100	3.34	2.91	3.12	0.21	0.32	24.90	1.09	1.10	1.19	1.16
9200	3.36	2.92	3.13	0.22	0.40	24.49	1.10	1.10	1.20	1.18
9300	3.37	2.92	3.14	0.23	0.43	23.92	1.10	1.10	1.22	1.20
9400	3.39	2.92	3.15	0.23	0.48	23.71	1.10	1.10	1.21	1.21
9500	3.41	2.91	3.15	0.25	0.61	23.68	1.10	1.09	1.22	1.21
9600	3.43	2.90	3.16	0.26	0.64	23.57	1.11	1.09	1.21	1.21
9700	3.43	2.91	3.16	0.26	0.63	23.52	1.11	1.09	1.21	1.20
9800	3.45	2.91	3.17	0.27	0.74	23.53	1.12	1.09	1.21	1.20
9900	3.46	2.90	3.17	0.28	0.75	23.57	1.12	1.09	1.21	1.19
10000	3.48	2.92	3.19	0.28	0.93	23.90	1.13	1.08	1.21	1.18
10100	3.48	2.91	3.19	0.29	0.95	23.98	1.13	1.08	1.20	1.16
10200	3.51	2.91	3.20	0.30	1.12	24.54	1.14	1.09	1.20	1.14
10300	3.51	2.92	3.20	0.30	1.11	24.72	1.14	1.09	1.20	1.13
10400	3.52	2.92	3.21	0.30	1.06	24.81	1.15	1.10	1.19	1.12
10500	3.53	2.92	3.21	0.31	1.29	25.15	1.15	1.10	1.19	1.12
10600	3.52	2.93	3.21	0.30	1.34	25.49	1.15	1.11	1.18	1.12
10700	3.56	2.91	3.22	0.32	1.50	26.40	1.14	1.11	1.17	1.11
10800	3.53	2.92	3.21	0.31	1.39	27.18	1.14	1.12	1.15	1.10
10900	3.55	2.93	3.23	0.31	1.61	28.19	1.14	1.13	1.15	1.09
11000	3.54	2.91	3.21	0.32	1.63	29.17	1.13	1.13	1.13	1.08
11100	3.54	2.92	3.22	0.32	1.68	30.01	1.13	1.14	1.12	1.07
11200	3.54	2.92	3.22	0.31	1.80	30.99	1.12	1.14	1.11	1.08
11300	3.55	2.91	3.22	0.32	1.89	32.85	1.11	1.14	1.10	1.08
11400	3.55	2.91	3.22	0.32	1.91	35.09	1.10	1.14	1.08	1.08
11500	3.54	2.91	3.21	0.32	1.88	39.18	1.09	1.15	1.05	1.09
11600	3.53	2.92	3.21	0.31	1.94	44.74	1.09	1.16	1.02	1.10
11700	3.52	2.91	3.20	0.31	1.83	43.12	1.08	1.16	1.02	1.11
11800	3.52	2.93	3.21	0.30	1.77	38.70	1.07	1.16	1.03	1.12
11900	3.50	2.92	3.20	0.29	1.65	36.32	1.06	1.15	1.02	1.11
12000	3.49	2.94	3.21	0.28	1.53	34.22	1.04	1.15	1.03	1.11
12100	3.48	2.97	3.22	0.26	1.55	32.23	1.03	1.15	1.05	1.11
12200	3.47	2.99	3.22	0.24	1.46	30.27	1.01	1.16	1.08	1.12
12400	3.43	3.05	3.24	0.19	1.33	26.74	1.01	1.17	1.16	1.18
12600	3.37	3.12	3.24	0.13	1.31	24.29	1.06	1.18	1.21	1.23
12800	3.36	3.21	3.28	0.09	1.49	22.63	1.13	1.21	1.18	1.23
13000	3.34	3.27	3.30	0.04	1.29	21.31	1.19	1.25	1.16	1.23

Note: Phase Unbalance shown relative to 90°; Amplitude Unbalance 1/2 of peak-to-peak difference

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

2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =+5 dBm @Temperature = +25°C, Sum port at pad 2

FREQ. (MHz)	TOTAL LOSS (dB)			Amp. Unbal. (±dB)	Phase Unbal. (deg)	ISOLATION (dB)	VSWR (:1)			
	Sum-Port 1	Sum-Port 2	Avg	See Note	See Note	Port 1 - Port 2	Sum	Port 1	Port 2	Iso
7000	2.78	3.40	3.08	0.31	-0.46	23.47	1.17	1.14	1.14	1.16
7200	2.84	3.31	3.07	0.24	-0.49	24.72	1.15	1.12	1.12	1.14
7400	2.91	3.23	3.07	0.16	-0.58	26.52	1.13	1.11	1.10	1.11
7600	2.96	3.16	3.06	0.10	-0.67	28.33	1.10	1.10	1.08	1.09
7700	2.99	3.13	3.06	0.07	-0.60	28.96	1.09	1.09	1.07	1.09
7800	3.02	3.10	3.06	0.04	-0.63	29.55	1.08	1.07	1.07	1.08
7900	3.04	3.08	3.06	0.02	-0.64	30.03	1.08	1.06	1.06	1.08
8000	3.08	3.05	3.06	0.02	-0.65	30.31	1.08	1.06	1.06	1.08
8100	3.10	3.03	3.06	0.04	-0.65	30.19	1.08	1.07	1.06	1.07
8200	3.14	3.01	3.07	0.06	-0.69	29.86	1.10	1.09	1.06	1.06
8300	3.17	2.99	3.08	0.09	-0.69	28.99	1.11	1.11	1.06	1.06
8400	3.20	2.98	3.09	0.11	-0.75	28.38	1.13	1.12	1.06	1.06
8500	3.23	2.97	3.10	0.13	-0.81	27.79	1.15	1.13	1.07	1.05
8600	3.25	2.95	3.10	0.15	-0.81	27.48	1.15	1.13	1.07	1.06
8700	3.27	2.94	3.10	0.17	-0.83	27.21	1.15	1.13	1.07	1.06
8800	3.30	2.93	3.11	0.19	-0.83	26.75	1.14	1.14	1.07	1.07
8900	3.32	2.92	3.12	0.20	-0.87	26.25	1.14	1.15	1.08	1.08
9000	3.36	2.92	3.13	0.22	-0.91	25.70	1.15	1.17	1.09	1.09
9100	3.38	2.90	3.13	0.24	-0.98	24.90	1.16	1.19	1.10	1.09
9200	3.40	2.92	3.15	0.25	-0.96	24.48	1.18	1.20	1.10	1.10
9300	3.44	2.92	3.17	0.26	-1.03	23.92	1.20	1.22	1.10	1.10
9400	3.45	2.92	3.18	0.27	-1.08	23.69	1.21	1.21	1.10	1.10
9500	3.46	2.92	3.18	0.28	-1.09	23.68	1.21	1.22	1.09	1.10
9600	3.49	2.92	3.20	0.29	-1.04	23.56	1.21	1.21	1.09	1.11
9700	3.49	2.91	3.19	0.30	-1.11	23.51	1.20	1.21	1.09	1.11
9800	3.52	2.92	3.21	0.30	-1.06	23.53	1.20	1.21	1.09	1.12
9900	3.51	2.90	3.19	0.31	-1.04	23.57	1.19	1.21	1.09	1.12
10000	3.53	2.90	3.20	0.32	-1.03	23.90	1.18	1.21	1.08	1.13
10100	3.52	2.90	3.20	0.32	-1.07	23.97	1.16	1.20	1.08	1.13
10200	3.53	2.89	3.20	0.32	-1.02	24.53	1.14	1.20	1.09	1.14
10300	3.54	2.88	3.20	0.33	-1.10	24.72	1.13	1.20	1.09	1.14
10400	3.54	2.88	3.20	0.33	-0.94	24.81	1.12	1.19	1.10	1.15
10500	3.55	2.89	3.21	0.33	-1.05	25.14	1.12	1.19	1.10	1.15
10600	3.53	2.88	3.19	0.33	-1.03	25.48	1.12	1.18	1.11	1.15
10700	3.53	2.90	3.20	0.33	-0.87	26.39	1.11	1.17	1.11	1.14
10800	3.55	2.88	3.20	0.33	-0.96	27.18	1.10	1.15	1.12	1.14
10900	3.52	2.90	3.20	0.31	-0.89	28.17	1.09	1.15	1.13	1.14
11000	3.54	2.91	3.21	0.31	-0.75	29.17	1.08	1.13	1.13	1.13
11100	3.53	2.91	3.21	0.31	-0.68	30.00	1.07	1.12	1.14	1.13
11200	3.53	2.93	3.22	0.31	-0.67	30.98	1.08	1.11	1.14	1.12
11300	3.54	2.93	3.22	0.31	-0.62	32.86	1.08	1.10	1.14	1.11
11400	3.51	2.93	3.21	0.30	-0.59	35.11	1.08	1.08	1.14	1.10
11500	3.52	2.93	3.21	0.30	-0.49	39.21	1.09	1.05	1.15	1.09
11600	3.51	2.94	3.22	0.29	-0.50	44.86	1.10	1.02	1.16	1.09
11700	3.51	2.93	3.21	0.29	-0.51	43.15	1.11	1.02	1.16	1.08
11800	3.51	2.97	3.23	0.28	-0.54	38.79	1.12	1.03	1.16	1.07
11900	3.50	2.97	3.23	0.27	-0.50	36.33	1.11	1.02	1.15	1.06
12000	3.50	2.99	3.24	0.26	-0.51	34.20	1.11	1.03	1.15	1.04
12100	3.48	2.99	3.23	0.24	-0.62	32.22	1.11	1.05	1.15	1.03
12200	3.46	3.02	3.23	0.22	-0.65	30.27	1.12	1.08	1.16	1.01
12400	3.46	3.10	3.28	0.18	-0.80	26.74	1.18	1.16	1.17	1.01
12600	3.46	3.18	3.32	0.14	-0.78	24.30	1.23	1.21	1.18	1.06
12800	3.40	3.23	3.31	0.09	-0.95	22.64	1.23	1.18	1.21	1.13
13000	3.33	3.30	3.31	0.02	-0.98	21.32	1.23	1.16	1.25	1.19

Note: Phase Unbalance shown relative to 90°; Amplitude Unbalance 1/2 of peak-to-peak difference

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

2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =+5 dBm @Temperature = +25°C, Sum port at pad 3

FREQ. (MHz)	TOTAL LOSS (dB)			Amp. Unbal. (±dB)	Phase Unbal. (deg)	ISOLATION (dB)	VSWR (:1)			
	Sum-Port 1	Sum-Port 2	Avg	See Note	See Note	Port 1 - Port 2	Sum	Port 1	Port 2	Iso
7000	2.76	3.40	3.07	0.32	-0.67	24.99	1.14	1.16	1.17	1.14
7200	2.82	3.31	3.06	0.24	-0.77	26.75	1.12	1.14	1.15	1.12
7400	2.89	3.24	3.06	0.17	-0.86	27.87	1.10	1.11	1.13	1.11
7600	2.95	3.17	3.06	0.10	-0.93	29.15	1.08	1.09	1.10	1.10
7700	2.98	3.14	3.06	0.07	-0.95	30.35	1.07	1.09	1.09	1.09
7800	3.01	3.11	3.06	0.04	-0.96	31.81	1.07	1.08	1.08	1.07
7900	3.03	3.08	3.05	0.02	-1.00	33.01	1.06	1.08	1.08	1.06
8000	3.07	3.06	3.06	0.02	-1.06	32.67	1.06	1.08	1.08	1.06
8100	3.09	3.04	3.06	0.04	-1.08	31.27	1.06	1.07	1.08	1.07
8200	3.12	3.02	3.07	0.06	-1.12	29.98	1.06	1.06	1.10	1.09
8300	3.14	3.00	3.07	0.08	-1.18	28.96	1.06	1.06	1.11	1.11
8400	3.16	2.98	3.07	0.10	-1.21	28.35	1.06	1.06	1.13	1.12
8500	3.19	2.97	3.08	0.12	-1.19	27.96	1.07	1.05	1.15	1.13
8600	3.21	2.96	3.08	0.14	-1.16	27.78	1.07	1.06	1.15	1.13
8700	3.24	2.95	3.09	0.16	-1.17	27.34	1.07	1.06	1.15	1.13
8800	3.26	2.94	3.10	0.18	-1.19	26.76	1.07	1.07	1.14	1.14
8900	3.28	2.92	3.10	0.19	-1.26	25.84	1.08	1.08	1.14	1.15
9000	3.31	2.92	3.11	0.21	-1.34	25.01	1.09	1.09	1.15	1.17
9100	3.32	2.91	3.11	0.22	-1.42	24.17	1.10	1.09	1.16	1.19
9200	3.34	2.92	3.12	0.23	-1.45	23.77	1.10	1.10	1.18	1.20
9300	3.35	2.93	3.13	0.23	-1.48	23.57	1.10	1.10	1.20	1.22
9400	3.37	2.92	3.14	0.24	-1.36	23.51	1.10	1.10	1.21	1.21
9500	3.38	2.92	3.14	0.25	-1.42	23.46	1.09	1.10	1.21	1.22
9600	3.41	2.92	3.16	0.26	-1.32	23.55	1.09	1.11	1.21	1.21
9700	3.42	2.91	3.16	0.26	-1.30	23.38	1.09	1.11	1.20	1.21
9800	3.44	2.92	3.17	0.27	-1.18	23.35	1.09	1.12	1.20	1.21
9900	3.45	2.91	3.17	0.28	-1.15	23.26	1.09	1.12	1.19	1.21
10000	3.47	2.90	3.18	0.29	-1.07	23.33	1.08	1.13	1.18	1.21
10100	3.47	2.91	3.18	0.30	-1.06	23.37	1.08	1.13	1.16	1.20
10200	3.50	2.90	3.19	0.31	-0.98	23.51	1.09	1.14	1.14	1.20
10300	3.50	2.89	3.18	0.32	-1.01	23.43	1.09	1.14	1.13	1.20
10400	3.51	2.89	3.19	0.32	-0.97	23.50	1.10	1.15	1.12	1.19
10500	3.52	2.90	3.20	0.32	-0.93	23.70	1.10	1.15	1.12	1.19
10600	3.51	2.89	3.19	0.32	-0.81	24.01	1.11	1.15	1.12	1.18
10700	3.54	2.90	3.21	0.33	-0.92	24.55	1.11	1.14	1.11	1.17
10800	3.52	2.89	3.19	0.32	-0.91	24.95	1.12	1.14	1.10	1.15
10900	3.53	2.91	3.21	0.32	-0.81	25.33	1.13	1.14	1.09	1.15
11000	3.53	2.93	3.22	0.32	-0.82	26.03	1.13	1.13	1.08	1.13
11100	3.52	2.92	3.21	0.32	-0.73	26.73	1.14	1.13	1.07	1.12
11200	3.52	2.92	3.21	0.31	-0.60	27.41	1.14	1.12	1.08	1.11
11300	3.53	2.93	3.22	0.31	-0.55	28.32	1.14	1.11	1.08	1.10
11400	3.53	2.94	3.22	0.31	-0.50	29.77	1.14	1.10	1.08	1.08
11500	3.52	2.94	3.22	0.31	-0.52	31.35	1.15	1.09	1.09	1.05
11600	3.51	2.94	3.22	0.30	-0.44	33.05	1.16	1.09	1.10	1.02
11700	3.51	2.93	3.21	0.30	-0.54	34.34	1.16	1.08	1.11	1.02
11800	3.50	2.96	3.22	0.28	-0.64	34.10	1.16	1.07	1.12	1.03
11900	3.47	2.97	3.21	0.27	-0.65	32.96	1.15	1.06	1.11	1.02
12000	3.47	2.98	3.22	0.25	-0.68	31.35	1.15	1.04	1.11	1.03
12100	3.46	2.99	3.22	0.25	-0.76	28.76	1.15	1.03	1.11	1.05
12200	3.45	3.02	3.23	0.23	-0.84	26.75	1.16	1.01	1.12	1.08
12400	3.40	3.10	3.25	0.16	-0.99	23.91	1.17	1.01	1.18	1.16
12600	3.34	3.17	3.25	0.10	-0.75	22.60	1.18	1.06	1.23	1.21
12800	3.34	3.23	3.28	0.07	-0.58	22.47	1.21	1.13	1.23	1.18
13000	3.31	3.30	3.30	0.02	-0.84	21.42	1.25	1.19	1.23	1.16

Note: Phase Unbalance shown relative to 90°; Amplitude Unbalance 1/2 of peak-to-peak difference

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

2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =+5 dBm @Temperature = +25°C, Sum port at pad 4

FREQ. (MHz)	TOTAL LOSS (dB)			Amp. Unbal. (±dB)	Phase Unbal. (deg)	ISOLATION (dB)	VSWR (:1)			
	Sum-Port 1	Sum-Port 2	Avg	See Note	See Note	Port 1 - Port 2	Sum	Port 1	Port 2	Iso
7000	2.78	3.40	3.08	0.32	1.02	24.97	1.14	1.17	1.16	1.14
7200	2.85	3.30	3.07	0.24	1.02	26.75	1.12	1.15	1.14	1.12
7400	2.91	3.22	3.06	0.16	0.94	27.85	1.11	1.13	1.11	1.10
7600	2.97	3.15	3.06	0.10	0.90	29.14	1.10	1.10	1.09	1.08
7700	2.99	3.13	3.06	0.08	0.93	30.34	1.09	1.09	1.09	1.07
7800	3.02	3.10	3.06	0.05	1.01	31.79	1.07	1.08	1.08	1.07
7900	3.05	3.07	3.06	0.02	0.99	32.99	1.06	1.08	1.08	1.06
8000	3.08	3.04	3.06	0.02	0.99	32.65	1.06	1.08	1.08	1.06
8100	3.11	3.02	3.06	0.04	0.97	31.26	1.07	1.08	1.07	1.06
8200	3.14	3.00	3.07	0.06	0.97	29.97	1.09	1.10	1.06	1.06
8300	3.18	2.98	3.08	0.09	0.98	28.94	1.11	1.11	1.06	1.06
8400	3.20	2.97	3.08	0.11	0.98	28.32	1.12	1.13	1.06	1.06
8500	3.23	2.95	3.09	0.13	0.92	27.94	1.13	1.15	1.05	1.07
8600	3.26	2.94	3.10	0.15	0.93	27.74	1.13	1.15	1.06	1.07
8700	3.28	2.94	3.11	0.16	0.98	27.32	1.13	1.15	1.06	1.07
8800	3.30	2.91	3.10	0.19	0.95	26.73	1.14	1.14	1.07	1.07
8900	3.32	2.90	3.10	0.20	0.88	25.82	1.15	1.14	1.08	1.08
9000	3.36	2.89	3.12	0.23	0.91	24.99	1.17	1.15	1.09	1.09
9100	3.38	2.90	3.13	0.23	0.75	24.14	1.19	1.16	1.09	1.10
9200	3.41	2.91	3.15	0.24	0.90	23.74	1.20	1.18	1.10	1.10
9300	3.44	2.90	3.16	0.26	0.89	23.54	1.22	1.20	1.10	1.10
9400	3.45	2.91	3.17	0.27	0.77	23.48	1.21	1.21	1.10	1.10
9500	3.46	2.89	3.17	0.28	0.94	23.43	1.22	1.21	1.10	1.09
9600	3.49	2.88	3.17	0.30	0.92	23.53	1.21	1.21	1.11	1.09
9700	3.50	2.90	3.19	0.29	0.82	23.36	1.21	1.20	1.11	1.09
9800	3.53	2.90	3.20	0.31	0.89	23.33	1.21	1.20	1.12	1.09
9900	3.52	2.90	3.20	0.31	0.87	23.23	1.21	1.19	1.12	1.09
10000	3.53	2.90	3.20	0.31	0.97	23.32	1.21	1.18	1.13	1.08
10100	3.54	2.91	3.21	0.31	0.93	23.35	1.20	1.16	1.13	1.08
10200	3.54	2.91	3.21	0.31	1.10	23.47	1.20	1.14	1.14	1.09
10300	3.54	2.90	3.21	0.31	1.01	23.41	1.20	1.13	1.14	1.09
10400	3.54	2.91	3.21	0.31	1.09	23.47	1.19	1.12	1.15	1.10
10500	3.56	2.91	3.22	0.32	1.18	23.67	1.19	1.12	1.15	1.10
10600	3.54	2.92	3.22	0.30	1.14	23.98	1.18	1.12	1.15	1.11
10700	3.54	2.90	3.21	0.31	1.57	24.53	1.17	1.11	1.14	1.11
10800	3.54	2.90	3.21	0.32	1.36	24.93	1.15	1.10	1.14	1.12
10900	3.53	2.92	3.21	0.30	1.56	25.30	1.15	1.09	1.14	1.13
11000	3.55	2.89	3.21	0.32	1.71	26.00	1.13	1.08	1.13	1.13
11100	3.54	2.90	3.21	0.31	1.75	26.69	1.12	1.07	1.13	1.14
11200	3.53	2.90	3.20	0.31	1.76	27.39	1.11	1.08	1.12	1.14
11300	3.53	2.89	3.20	0.32	1.85	28.29	1.10	1.08	1.11	1.14
11400	3.52	2.90	3.20	0.30	1.83	29.73	1.08	1.08	1.10	1.14
11500	3.53	2.89	3.20	0.31	1.94	31.32	1.05	1.09	1.09	1.15
11600	3.51	2.90	3.19	0.30	1.89	33.04	1.02	1.10	1.09	1.16
11700	3.51	2.90	3.19	0.30	1.88	34.31	1.02	1.11	1.08	1.16
11800	3.51	2.90	3.19	0.29	1.89	34.06	1.03	1.12	1.07	1.16
11900	3.50	2.89	3.18	0.29	1.82	32.91	1.02	1.11	1.06	1.15
12000	3.48	2.91	3.19	0.28	1.71	31.33	1.03	1.11	1.04	1.15
12100	3.46	2.95	3.20	0.25	1.72	28.74	1.05	1.11	1.03	1.15
12200	3.46	2.97	3.21	0.24	1.67	26.72	1.08	1.12	1.01	1.16
12400	3.46	3.02	3.23	0.21	1.55	23.89	1.16	1.18	1.01	1.17
12600	3.45	3.09	3.27	0.17	1.32	22.57	1.21	1.23	1.06	1.18
12800	3.40	3.17	3.28	0.10	1.15	22.43	1.18	1.23	1.13	1.21
13000	3.32	3.24	3.28	0.03	1.16	21.39	1.16	1.23	1.19	1.25

Note: Phase Unbalance shown relative to 90°; Amplitude Unbalance 1/2 of peak-to-peak difference

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

2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =+5 dBm @Temperature = +105°C, Sum port at pad 1

FREQ. (MHz)	TOTAL LOSS (dB)			Amp. Unbal. (±dB)	Phase Unbal. (deg)	ISOLATION (dB)	VSWR (:1)			
	Sum-Port 1	Sum-Port 2	Avg	See Note	See Note	Port 1 - Port 2	Sum	Port 1	Port 2	Iso
7000	2.79	3.51	3.14	0.37	0.35	21.66	1.20	1.19	1.25	1.24
7200	2.87	3.39	3.12	0.27	0.29	23.27	1.20	1.17	1.15	1.15
7400	2.94	3.30	3.12	0.19	-0.04	25.22	1.17	1.14	1.07	1.11
7600	2.98	3.26	3.12	0.14	-0.20	26.20	1.12	1.09	1.14	1.14
7700	3.00	3.24	3.12	0.12	-0.10	26.14	1.10	1.07	1.18	1.17
7800	3.03	3.20	3.11	0.09	0.02	26.02	1.10	1.06	1.18	1.18
7900	3.08	3.16	3.12	0.05	0.04	26.86	1.10	1.06	1.14	1.15
8000	3.11	3.14	3.12	0.03	-0.11	28.68	1.10	1.06	1.08	1.11
8100	3.13	3.10	3.11	0.02	-0.13	31.97	1.08	1.05	1.02	1.07
8200	3.16	3.09	3.12	0.04	-0.22	36.94	1.05	1.03	1.03	1.04
8300	3.16	3.07	3.11	0.05	-0.32	34.91	1.01	1.01	1.07	1.07
8400	3.19	3.07	3.13	0.06	-0.28	31.20	1.02	1.04	1.15	1.15
8500	3.21	3.06	3.13	0.08	-0.32	29.42	1.04	1.06	1.20	1.22
8600	3.23	3.04	3.13	0.09	-0.14	29.66	1.05	1.08	1.19	1.22
8700	3.25	3.03	3.14	0.11	-0.07	31.99	1.04	1.07	1.14	1.17
8800	3.29	2.99	3.14	0.15	-0.08	38.08	1.02	1.05	1.07	1.09
8900	3.31	2.98	3.14	0.16	-0.14	36.11	1.03	1.04	1.05	1.02
9000	3.36	2.97	3.16	0.20	-0.14	30.01	1.05	1.07	1.08	1.06
9100	3.39	2.97	3.17	0.21	-0.47	26.91	1.07	1.10	1.12	1.14
9200	3.39	2.99	3.19	0.20	-0.57	25.42	1.09	1.13	1.19	1.22
9300	3.40	3.00	3.20	0.20	-0.42	25.55	1.10	1.13	1.25	1.27
9400	3.40	3.00	3.20	0.20	-0.20	26.52	1.09	1.11	1.25	1.27
9500	3.42	3.00	3.20	0.21	-0.08	28.91	1.07	1.07	1.20	1.19
9600	3.44	2.95	3.19	0.24	-0.01	31.66	1.06	1.05	1.13	1.09
9700	3.47	2.97	3.21	0.25	-0.03	29.83	1.07	1.07	1.12	1.03
9800	3.53	2.97	3.24	0.28	0.21	27.12	1.11	1.11	1.14	1.08
9900	3.53	2.97	3.24	0.28	-0.21	25.05	1.12	1.12	1.16	1.12
10000	3.55	2.99	3.26	0.28	-0.19	24.27	1.14	1.12	1.21	1.17
10100	3.54	3.00	3.26	0.27	-0.18	24.22	1.14	1.09	1.24	1.19
10200	3.58	3.00	3.28	0.29	0.01	25.42	1.14	1.07	1.24	1.16
10300	3.55	3.00	3.27	0.27	0.06	26.68	1.14	1.08	1.22	1.11
10400	3.56	2.96	3.25	0.30	0.34	28.27	1.14	1.13	1.19	1.05
10500	3.59	2.98	3.27	0.30	0.33	28.22	1.14	1.16	1.16	1.01
10600	3.59	2.99	3.28	0.30	0.35	27.59	1.15	1.17	1.15	1.03
10700	3.61	3.00	3.29	0.30	0.38	26.85	1.16	1.15	1.15	1.06
10800	3.59	2.99	3.28	0.30	0.17	26.44	1.16	1.14	1.15	1.07
10900	3.60	3.02	3.30	0.29	0.47	27.55	1.17	1.15	1.16	1.09
11000	3.60	3.00	3.29	0.30	0.42	29.18	1.16	1.16	1.16	1.10
11100	3.59	3.02	3.30	0.28	0.34	31.20	1.16	1.18	1.17	1.10
11200	3.58	3.01	3.29	0.28	0.72	33.78	1.14	1.20	1.18	1.10
11300	3.60	3.02	3.30	0.29	0.67	36.27	1.12	1.20	1.16	1.08
11400	3.58	3.02	3.29	0.27	0.57	38.04	1.10	1.19	1.14	1.07
11500	3.58	3.02	3.29	0.28	1.06	38.60	1.10	1.20	1.09	1.07
11600	3.57	2.98	3.26	0.29	0.83	38.95	1.10	1.20	1.04	1.10
11700	3.58	3.01	3.29	0.29	0.46	37.66	1.10	1.21	1.03	1.13
11800	3.57	3.02	3.29	0.27	0.60	36.68	1.11	1.20	1.04	1.14
11900	3.58	3.02	3.29	0.28	0.50	34.97	1.09	1.19	1.04	1.12
12000	3.55	3.01	3.27	0.26	0.36	35.05	1.07	1.18	1.06	1.13
12100	3.54	3.03	3.28	0.25	0.58	30.79	1.06	1.19	1.09	1.16
12200	3.56	3.08	3.31	0.24	0.30	27.88	1.03	1.21	1.09	1.18
12400	3.51	3.11	3.31	0.20	-0.36	23.54	1.02	1.24	1.20	1.28
12600	3.41	3.22	3.31	0.09	-0.11	22.28	1.06	1.18	1.28	1.32
12800	3.43	3.26	3.34	0.08	0.40	23.58	1.18	1.22	1.09	1.10
13000	3.45	3.32	3.38	0.06	-0.46	22.94	1.24	1.32	1.04	1.13

Note: Phase Unbalance shown relative to 90°; Amplitude Unbalance 1/2 of peak-to-peak difference

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-Circuits 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

2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =+5 dBm @Temperature = +105°C, Sum port at pad 2

FREQ. (MHz)	TOTAL LOSS (dB)			Amp. Unbal. (±dB)	Phase Unbal. (deg)	ISOLATION (dB)	VSWR (:1)			
	Sum-Port 1	Sum-Port 2	Avg	See Note	See Note	Port 1 - Port 2	Sum	Port 1	Port 2	Iso
7000	2.80	3.52	3.15	0.35	0.64	21.66	1.24	1.25	1.19	1.20
7200	2.85	3.39	3.11	0.27	0.49	23.27	1.15	1.15	1.17	1.20
7400	2.91	3.31	3.11	0.20	0.35	25.20	1.11	1.07	1.14	1.17
7600	2.99	3.25	3.12	0.13	0.47	26.25	1.14	1.14	1.09	1.12
7700	3.03	3.24	3.13	0.10	0.38	26.19	1.17	1.18	1.07	1.10
7800	3.07	3.19	3.13	0.06	0.38	26.04	1.18	1.18	1.06	1.10
7900	3.10	3.17	3.13	0.04	0.36	26.87	1.15	1.14	1.06	1.10
8000	3.11	3.14	3.12	0.02	0.25	28.71	1.11	1.08	1.06	1.10
8100	3.13	3.10	3.11	0.02	0.20	32.03	1.07	1.02	1.05	1.08
8200	3.15	3.09	3.12	0.04	0.26	36.80	1.04	1.03	1.03	1.05
8300	3.18	3.08	3.13	0.05	0.29	34.74	1.07	1.07	1.01	1.01
8400	3.23	3.07	3.15	0.08	0.34	31.17	1.15	1.15	1.04	1.02
8500	3.27	3.07	3.17	0.11	0.23	29.37	1.22	1.20	1.06	1.04
8600	3.30	3.06	3.18	0.13	0.17	29.51	1.22	1.19	1.08	1.05
8700	3.31	3.04	3.17	0.14	0.29	31.80	1.17	1.14	1.07	1.04
8800	3.32	3.01	3.16	0.16	0.35	37.84	1.09	1.07	1.05	1.02
8900	3.32	2.98	3.15	0.18	0.31	35.78	1.02	1.05	1.04	1.03
9000	3.37	2.98	3.17	0.20	0.39	29.89	1.06	1.08	1.07	1.05
9100	3.41	2.99	3.19	0.22	0.36	26.89	1.14	1.12	1.10	1.07
9200	3.46	2.99	3.22	0.24	0.31	25.41	1.22	1.19	1.13	1.09
9300	3.50	3.00	3.24	0.26	0.17	25.48	1.27	1.25	1.13	1.10
9400	3.51	3.02	3.26	0.25	0.14	26.40	1.27	1.25	1.11	1.09
9500	3.51	2.99	3.24	0.27	0.08	28.79	1.19	1.20	1.07	1.07
9600	3.49	2.97	3.22	0.27	0.08	31.56	1.09	1.13	1.05	1.06
9700	3.49	2.98	3.23	0.26	0.30	29.71	1.03	1.12	1.07	1.07
9800	3.54	2.96	3.24	0.30	0.50	27.06	1.08	1.14	1.11	1.11
9900	3.58	2.96	3.26	0.32	0.41	25.05	1.12	1.16	1.12	1.12
10000	3.60	2.97	3.27	0.32	0.35	24.29	1.17	1.21	1.12	1.14
10100	3.60	2.98	3.28	0.32	0.33	24.20	1.19	1.24	1.09	1.14
10200	3.63	2.97	3.29	0.34	0.11	25.38	1.16	1.24	1.07	1.14
10300	3.60	2.95	3.26	0.33	0.02	26.64	1.11	1.22	1.08	1.14
10400	3.58	3.00	3.28	0.30	0.12	28.27	1.05	1.19	1.13	1.14
10500	3.58	3.00	3.28	0.30	0.01	28.17	1.01	1.16	1.16	1.14
10600	3.57	3.00	3.28	0.29	0.16	27.52	1.03	1.15	1.17	1.15
10700	3.58	2.98	3.27	0.31	0.41	26.84	1.06	1.15	1.15	1.16
10800	3.57	3.00	3.28	0.30	0.10	26.48	1.07	1.15	1.14	1.16
10900	3.57	3.02	3.29	0.28	0.58	27.55	1.09	1.16	1.15	1.17
11000	3.59	3.00	3.28	0.30	0.73	29.18	1.10	1.16	1.16	1.16
11100	3.61	3.03	3.31	0.30	0.85	31.24	1.10	1.17	1.18	1.16
11200	3.57	3.04	3.30	0.28	0.71	33.87	1.10	1.18	1.20	1.14
11300	3.58	3.03	3.30	0.29	0.79	36.35	1.08	1.16	1.20	1.12
11400	3.59	3.01	3.29	0.30	0.79	38.04	1.07	1.14	1.19	1.10
11500	3.57	3.04	3.30	0.28	0.65	38.48	1.07	1.09	1.20	1.10
11600	3.57	3.05	3.30	0.27	0.70	38.91	1.10	1.04	1.20	1.10
11700	3.56	3.07	3.31	0.26	0.84	37.60	1.13	1.03	1.21	1.10
11800	3.57	3.09	3.32	0.25	0.74	36.58	1.14	1.04	1.20	1.11
11900	3.56	3.08	3.31	0.25	0.93	34.83	1.12	1.04	1.19	1.09
12000	3.54	3.09	3.31	0.23	0.77	34.95	1.13	1.06	1.18	1.07
12100	3.53	3.11	3.31	0.22	0.78	30.81	1.16	1.09	1.19	1.06
12200	3.57	3.12	3.34	0.23	0.84	27.91	1.18	1.09	1.21	1.03
12400	3.57	3.21	3.39	0.19	0.29	23.53	1.28	1.20	1.24	1.02
12600	3.55	3.34	3.44	0.12	0.07	22.25	1.32	1.28	1.18	1.06
12800	3.39	3.31	3.35	0.05	0.46	23.50	1.10	1.09	1.22	1.18
13000	3.33	3.42	3.37	0.04	0.80	22.93	1.13	1.04	1.32	1.24

Note: Phase Unbalance shown relative to 90°; Amplitude Unbalance 1/2 of peak-to-peak difference

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-Circuits 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

2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =+5 dBm @Temperature = +105°C, Sum port at pad 3

FREQ. (MHz)	TOTAL LOSS (dB)			Amp. Unbal. (±dB)	Phase Unbal. (deg)	ISOLATION (dB)	VSWR (:1)			
	Sum-Port 1	Sum-Port 2	Avg	See Note	See Note	Port 1 - Port 2	Sum	Port 1	Port 2	Iso
7000	2.79	3.52	3.14	0.37	0.16	22.30	1.19	1.20	1.24	1.25
7200	2.87	3.40	3.13	0.26	0.08	24.71	1.17	1.20	1.15	1.15
7400	2.93	3.32	3.12	0.19	-0.26	28.17	1.14	1.17	1.11	1.07
7600	2.98	3.26	3.12	0.14	-0.31	27.86	1.09	1.12	1.14	1.14
7700	3.00	3.24	3.12	0.12	-0.30	27.53	1.07	1.10	1.17	1.18
7800	3.03	3.20	3.11	0.08	-0.22	28.23	1.06	1.10	1.18	1.18
7900	3.07	3.18	3.12	0.05	-0.16	30.20	1.06	1.10	1.15	1.14
8000	3.10	3.15	3.12	0.02	-0.28	34.07	1.06	1.10	1.11	1.08
8100	3.13	3.11	3.12	0.02	-0.42	39.67	1.05	1.08	1.07	1.02
8200	3.15	3.10	3.12	0.03	-0.47	37.10	1.03	1.05	1.04	1.03
8300	3.16	3.09	3.12	0.05	-0.52	32.64	1.01	1.01	1.07	1.07
8400	3.19	3.08	3.13	0.06	-0.46	30.96	1.04	1.02	1.15	1.15
8500	3.20	3.08	3.14	0.07	-0.44	30.10	1.06	1.04	1.22	1.20
8600	3.22	3.07	3.14	0.09	-0.34	30.97	1.08	1.05	1.22	1.19
8700	3.24	3.05	3.14	0.11	-0.12	32.95	1.07	1.04	1.17	1.14
8800	3.29	3.02	3.15	0.14	-0.11	33.60	1.05	1.02	1.09	1.07
8900	3.30	2.99	3.14	0.17	-0.30	30.58	1.04	1.03	1.02	1.05
9000	3.35	2.99	3.17	0.19	-0.35	27.73	1.07	1.05	1.06	1.08
9100	3.37	3.00	3.18	0.20	-0.55	25.93	1.10	1.07	1.14	1.12
9200	3.38	3.00	3.19	0.21	-0.61	24.98	1.13	1.09	1.22	1.19
9300	3.39	3.01	3.20	0.20	-0.63	24.80	1.13	1.10	1.27	1.25
9400	3.38	3.03	3.20	0.19	-0.27	25.07	1.11	1.09	1.27	1.25
9500	3.41	3.00	3.20	0.22	-0.13	25.53	1.07	1.07	1.19	1.20
9600	3.43	2.97	3.19	0.24	-0.16	25.61	1.05	1.06	1.09	1.13
9700	3.46	2.99	3.22	0.25	0.01	24.99	1.07	1.07	1.03	1.12
9800	3.52	2.96	3.23	0.29	-0.03	24.00	1.11	1.11	1.08	1.14
9900	3.52	2.97	3.24	0.29	-0.26	23.24	1.12	1.12	1.12	1.16
10000	3.54	2.98	3.25	0.29	-0.30	22.83	1.12	1.14	1.17	1.21
10100	3.53	2.99	3.25	0.28	-0.30	22.73	1.09	1.14	1.19	1.24
10200	3.58	2.98	3.27	0.31	-0.26	22.88	1.07	1.14	1.16	1.24
10300	3.54	2.96	3.24	0.30	-0.33	22.87	1.08	1.14	1.11	1.22
10400	3.55	3.01	3.27	0.28	-0.04	23.25	1.13	1.14	1.05	1.19
10500	3.57	3.01	3.28	0.30	-0.04	23.30	1.16	1.14	1.01	1.16
10600	3.58	3.01	3.29	0.30	-0.06	23.52	1.17	1.15	1.03	1.15
10700	3.59	2.99	3.28	0.31	-0.05	24.21	1.15	1.16	1.06	1.15
10800	3.59	3.00	3.28	0.30	-0.25	24.46	1.14	1.16	1.07	1.15
10900	3.59	3.03	3.30	0.29	0.04	25.58	1.15	1.17	1.09	1.16
11000	3.59	3.02	3.30	0.31	0.05	26.11	1.16	1.16	1.10	1.16
11100	3.58	3.04	3.30	0.29	0.24	26.05	1.18	1.16	1.10	1.17
11200	3.57	3.05	3.30	0.27	0.36	25.38	1.20	1.14	1.10	1.18
11300	3.59	3.04	3.31	0.29	0.49	25.46	1.20	1.12	1.08	1.16
11400	3.56	3.02	3.28	0.29	0.13	25.51	1.19	1.10	1.07	1.14
11500	3.57	3.05	3.30	0.28	0.33	25.92	1.20	1.10	1.07	1.09
11600	3.56	3.06	3.30	0.26	0.28	26.89	1.20	1.10	1.10	1.04
11700	3.57	3.08	3.32	0.26	0.25	27.91	1.21	1.10	1.13	1.03
11800	3.56	3.10	3.32	0.25	0.14	29.30	1.20	1.11	1.14	1.04
11900	3.57	3.09	3.32	0.25	0.35	30.67	1.19	1.09	1.12	1.04
12000	3.54	3.10	3.31	0.23	0.11	29.79	1.18	1.07	1.13	1.06
12100	3.53	3.12	3.32	0.22	0.26	26.95	1.19	1.06	1.16	1.09
12200	3.55	3.13	3.33	0.22	0.11	24.62	1.21	1.03	1.18	1.09
12400	3.50	3.22	3.36	0.15	-0.71	21.26	1.24	1.02	1.28	1.20
12600	3.39	3.35	3.37	0.04	-0.10	21.09	1.18	1.06	1.32	1.28
12800	3.42	3.32	3.37	0.06	0.35	22.56	1.22	1.18	1.10	1.09
13000	3.43	3.43	3.43	0.02	-0.30	21.52	1.32	1.24	1.13	1.04

Note: Phase Unbalance shown relative to 90°; Amplitude Unbalance 1/2 of peak-to-peak difference

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-Circuits 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

2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =+5 dBm @Temperature = +105°C, Sum port at pad 4

FREQ. (MHz)	TOTAL LOSS (dB)			Amp. Unbal. (±dB)	Phase Unbal. (deg)	ISOLATION (dB)	VSWR (:1)			
	Sum-Port 1	Sum-Port 2	Avg	See Note	See Note	Port 1 - Port 2	Sum	Port 1	Port 2	Iso
7000	2.83	3.52	3.16	0.35	0.88	22.46	1.25	1.24	1.20	1.19
7200	2.87	3.40	3.13	0.27	0.71	24.89	1.15	1.15	1.20	1.17
7400	2.93	3.30	3.11	0.20	0.61	28.17	1.07	1.11	1.17	1.14
7600	3.01	3.25	3.13	0.14	0.61	27.84	1.14	1.14	1.12	1.09
7700	3.04	3.24	3.14	0.11	0.62	27.57	1.18	1.17	1.10	1.07
7800	3.08	3.20	3.14	0.07	0.65	28.29	1.18	1.18	1.10	1.06
7900	3.11	3.16	3.13	0.03	0.59	30.24	1.14	1.15	1.10	1.06
8000	3.13	3.14	3.13	0.02	0.44	33.84	1.08	1.11	1.10	1.06
8100	3.15	3.10	3.12	0.02	0.54	37.84	1.02	1.07	1.08	1.05
8200	3.17	3.09	3.13	0.04	0.53	35.48	1.03	1.04	1.05	1.03
8300	3.19	3.06	3.12	0.06	0.50	31.72	1.07	1.07	1.01	1.01
8400	3.25	3.07	3.16	0.08	0.54	30.26	1.15	1.15	1.02	1.04
8500	3.29	3.06	3.17	0.11	0.38	29.44	1.20	1.22	1.04	1.06
8600	3.32	3.03	3.17	0.13	0.40	30.19	1.19	1.22	1.05	1.08
8700	3.32	3.02	3.17	0.14	0.35	31.88	1.14	1.17	1.04	1.07
8800	3.34	2.98	3.16	0.17	0.40	32.66	1.07	1.09	1.02	1.05
8900	3.34	2.98	3.16	0.17	0.49	30.25	1.05	1.02	1.03	1.04
9000	3.38	2.96	3.16	0.20	0.61	27.66	1.08	1.06	1.05	1.07
9100	3.43	2.96	3.19	0.23	0.46	25.88	1.12	1.14	1.07	1.10
9200	3.47	2.98	3.22	0.24	0.37	24.91	1.19	1.22	1.09	1.13
9300	3.52	3.00	3.25	0.25	0.39	24.65	1.25	1.27	1.10	1.13
9400	3.52	2.99	3.25	0.26	0.21	24.88	1.25	1.27	1.09	1.11
9500	3.53	2.99	3.25	0.26	0.12	25.30	1.20	1.19	1.07	1.07
9600	3.51	2.95	3.22	0.27	0.24	25.43	1.13	1.09	1.06	1.05
9700	3.51	2.97	3.23	0.27	0.26	24.94	1.12	1.03	1.07	1.07
9800	3.56	2.97	3.25	0.29	0.76	24.01	1.14	1.08	1.11	1.11
9900	3.60	2.96	3.27	0.31	0.48	23.35	1.16	1.12	1.12	1.12
10000	3.62	2.99	3.29	0.31	0.46	22.94	1.21	1.17	1.14	1.12
10100	3.62	2.99	3.29	0.30	0.47	22.85	1.24	1.19	1.14	1.09
10200	3.65	3.00	3.31	0.31	0.42	22.94	1.24	1.16	1.14	1.07
10300	3.61	3.00	3.29	0.30	0.41	22.87	1.22	1.11	1.14	1.08
10400	3.60	2.96	3.27	0.31	0.51	23.23	1.19	1.05	1.14	1.13
10500	3.60	2.98	3.28	0.30	0.37	23.26	1.16	1.01	1.14	1.16
10600	3.59	2.98	3.27	0.29	0.56	23.48	1.15	1.03	1.15	1.17
10700	3.60	3.00	3.29	0.29	0.82	24.26	1.15	1.06	1.16	1.15
10800	3.60	2.99	3.28	0.30	0.51	24.63	1.15	1.07	1.16	1.14
10900	3.59	3.02	3.30	0.28	1.00	25.82	1.16	1.09	1.17	1.15
11000	3.61	3.00	3.29	0.29	1.06	26.42	1.16	1.10	1.16	1.16
11100	3.64	3.02	3.32	0.30	0.93	26.31	1.17	1.10	1.16	1.18
11200	3.60	3.01	3.29	0.29	1.07	25.50	1.18	1.10	1.14	1.20
11300	3.60	3.02	3.30	0.28	0.97	25.53	1.16	1.08	1.12	1.20
11400	3.62	3.02	3.31	0.29	1.23	25.53	1.14	1.07	1.10	1.19
11500	3.60	3.02	3.30	0.28	1.35	25.92	1.09	1.07	1.10	1.20
11600	3.59	2.99	3.28	0.30	1.24	26.95	1.04	1.10	1.10	1.20
11700	3.58	3.01	3.29	0.28	1.08	28.05	1.03	1.13	1.10	1.21
11800	3.60	3.02	3.30	0.28	1.20	29.49	1.04	1.14	1.11	1.20
11900	3.58	3.02	3.29	0.27	1.11	31.08	1.04	1.12	1.09	1.19
12000	3.56	3.02	3.28	0.26	1.01	30.41	1.06	1.13	1.07	1.18
12100	3.55	3.03	3.28	0.25	1.12	27.41	1.09	1.16	1.06	1.19
12200	3.59	3.08	3.33	0.25	1.03	24.90	1.09	1.18	1.03	1.21
12400	3.60	3.11	3.35	0.23	0.63	21.34	1.20	1.28	1.02	1.24
12600	3.57	3.22	3.39	0.17	0.06	21.07	1.28	1.32	1.06	1.18
12800	3.42	3.26	3.34	0.07	0.51	22.57	1.09	1.10	1.18	1.22
13000	3.35	3.31	3.33	0.01	0.64	21.62	1.04	1.13	1.24	1.32

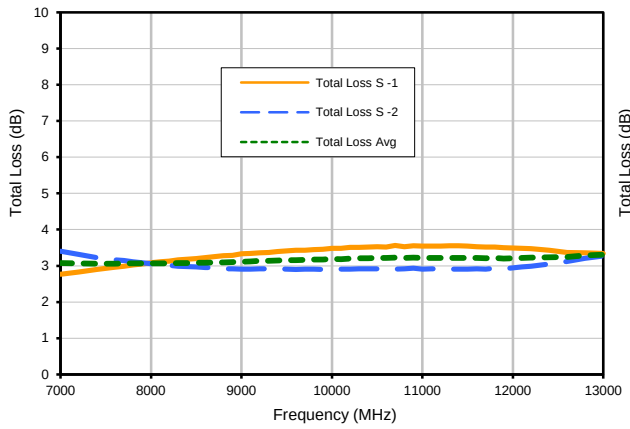
Note: Phase Unbalance shown relative to 90°; Amplitude Unbalance 1/2 of peak-to-peak difference

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-Circuits 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

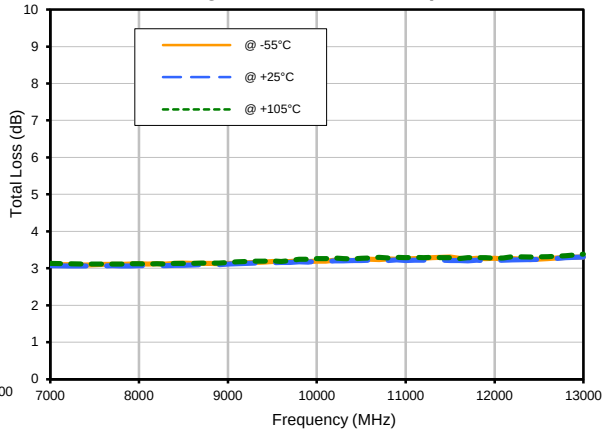
2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Curves (Sum port at pad 1)

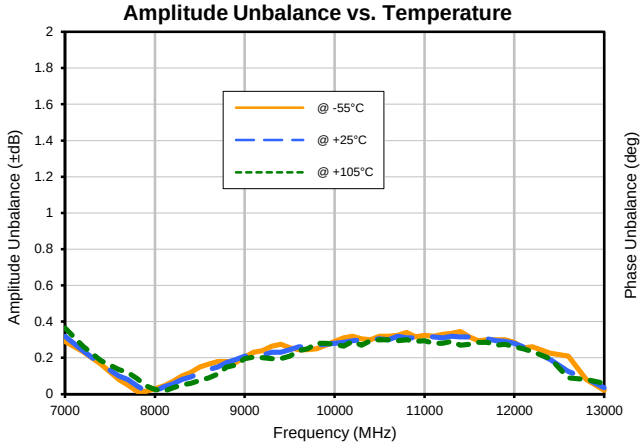
Total Loss



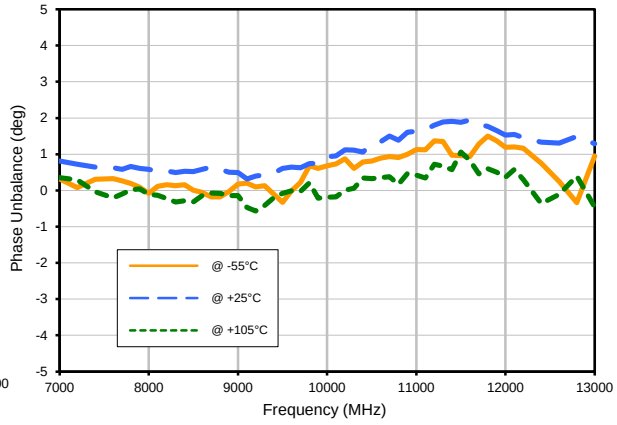
Average Total Loss vs. Temperature



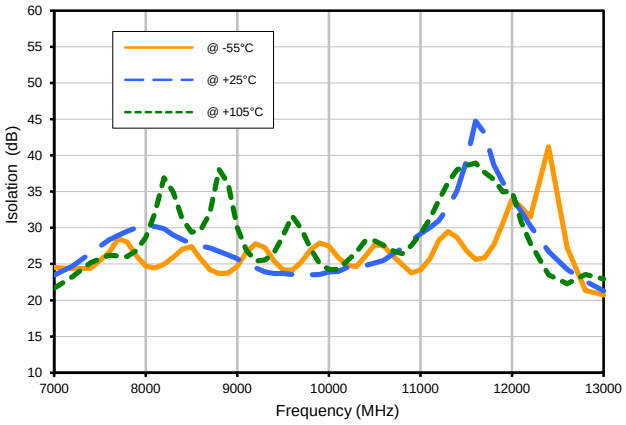
Amplitude Unbalance vs. Temperature



Phase Unbalance (relative to 90°) vs. Temp.



Isolation 1-2 vs. Temperature

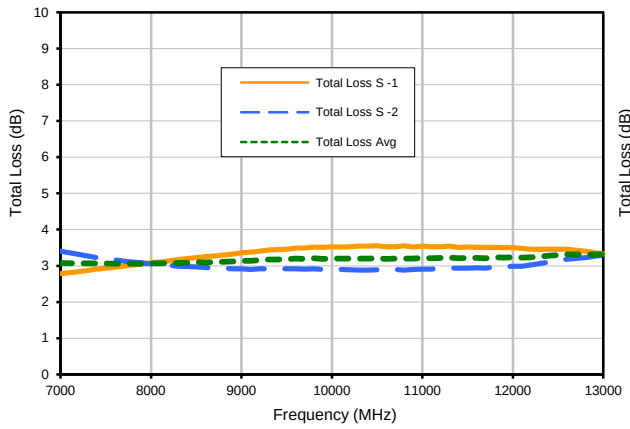


Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

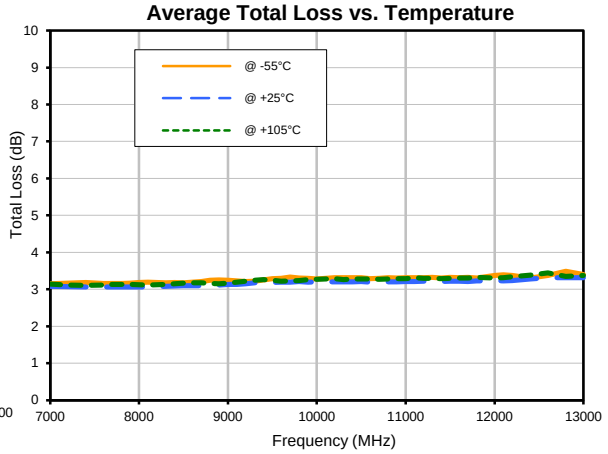
2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Curves (Sum port at pad 2)

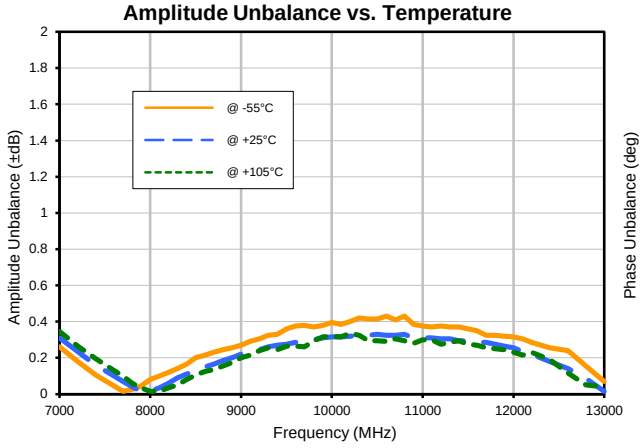
Total Loss



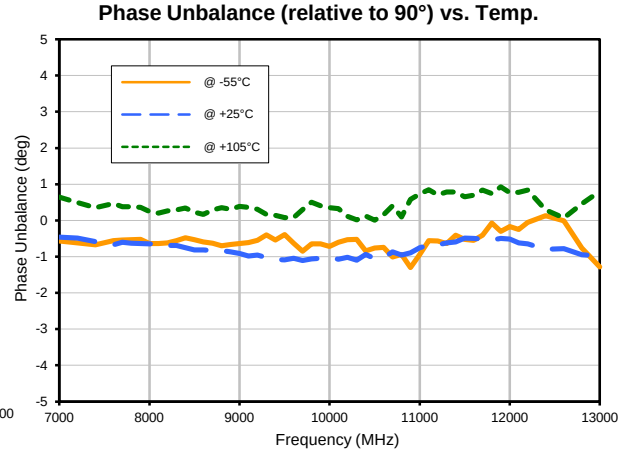
Average Total Loss vs. Temperature



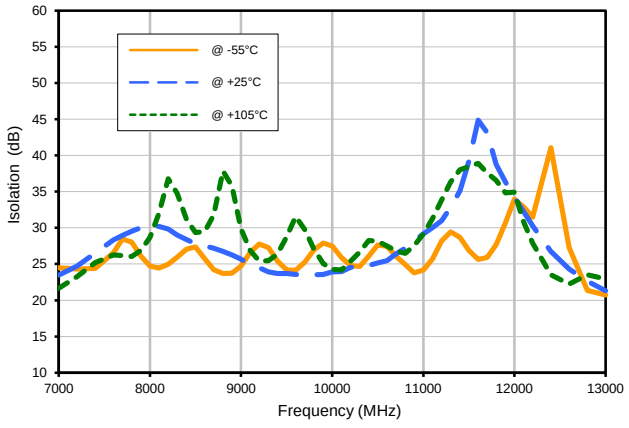
Amplitude Unbalance vs. Temperature



Phase Unbalance (relative to 90°) vs. Temp.



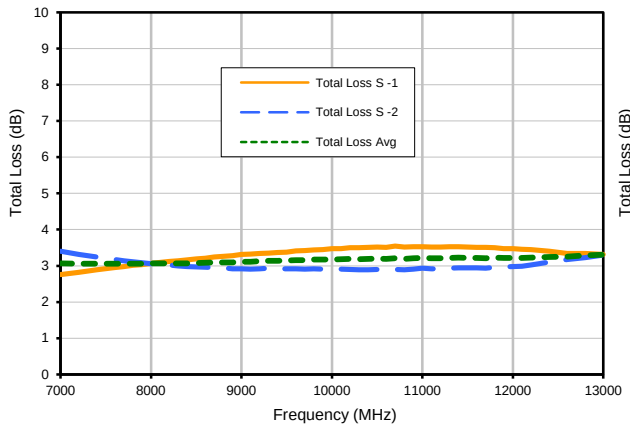
Isolation 1-2 vs. Temperature



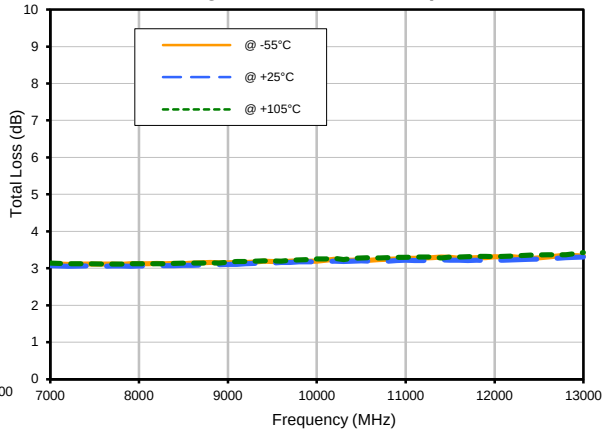
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

Typical Performance Curves (Sum port at pad 3)

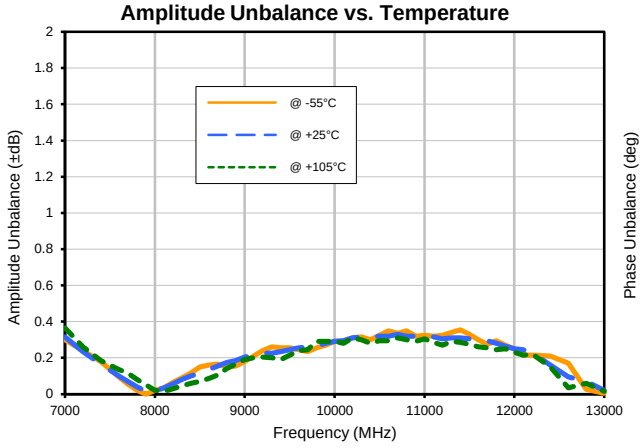
Total Loss



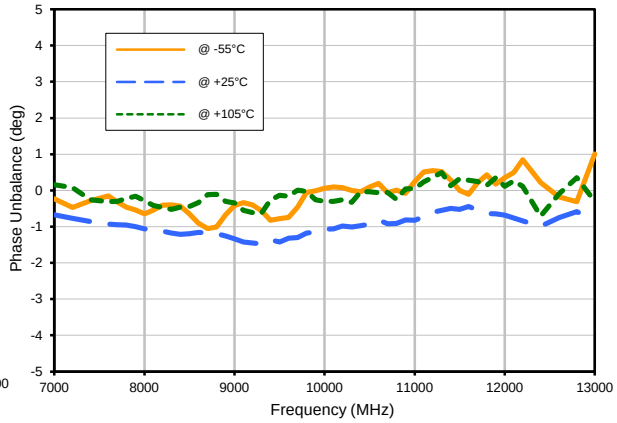
Average Total Loss vs. Temperature



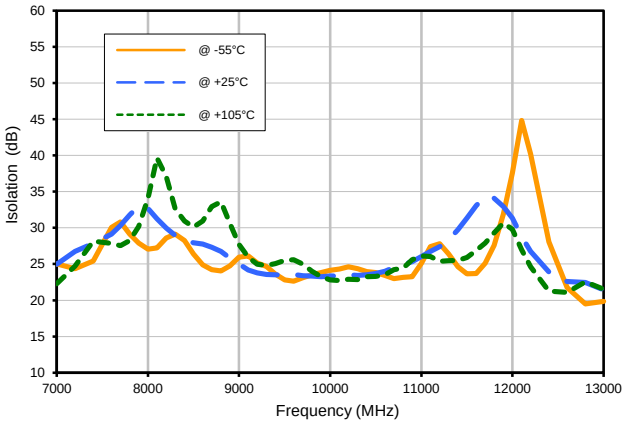
Amplitude Unbalance vs. Temperature



Phase Unbalance (relative to 90°) vs. Temp.



Isolation 1-2 vs. Temperature

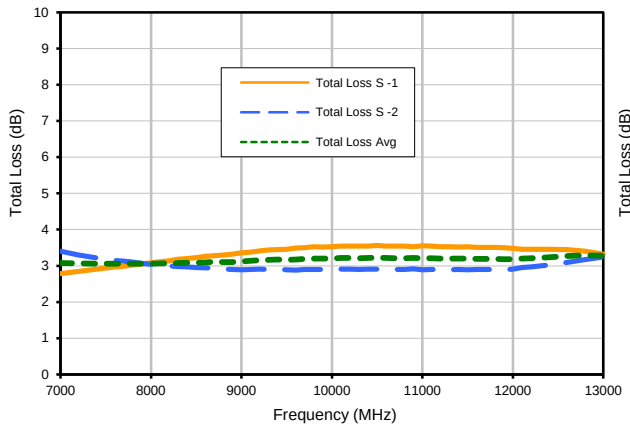


Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

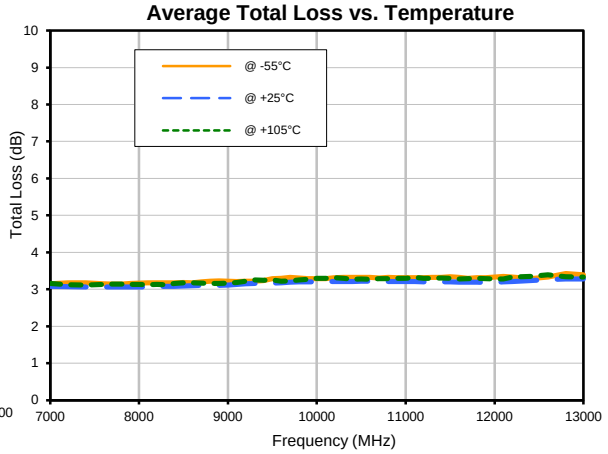
2 Way 90° Power Splitter/Combiner QCH-123+

Typical Performance Curves (Sum port at pad 4)

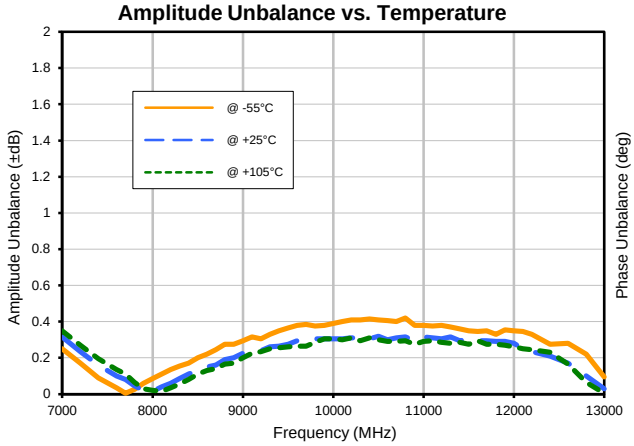
Total Loss



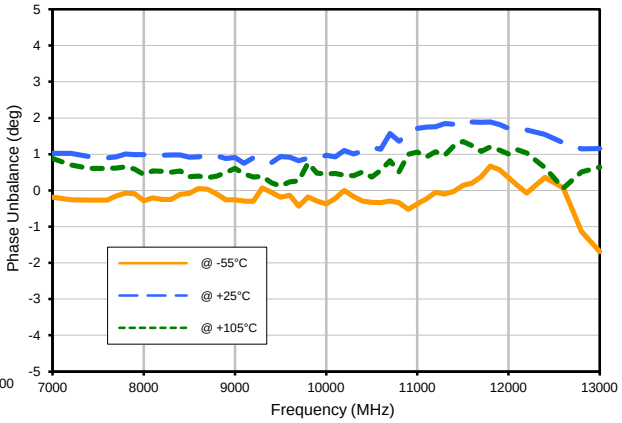
Average Total Loss vs. Temperature



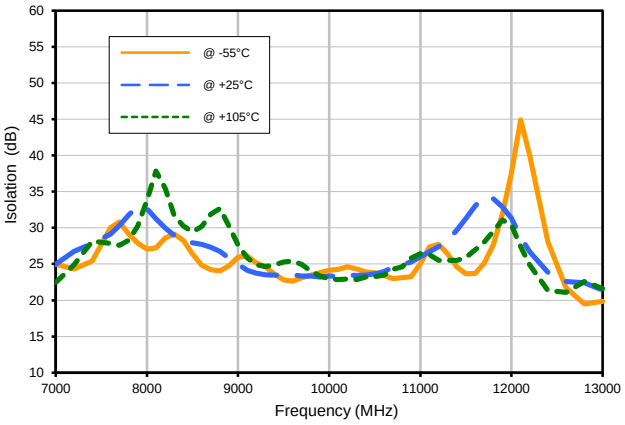
Amplitude Unbalance vs. Temperature



Phase Unbalance (relative to 90°) vs. Temp.



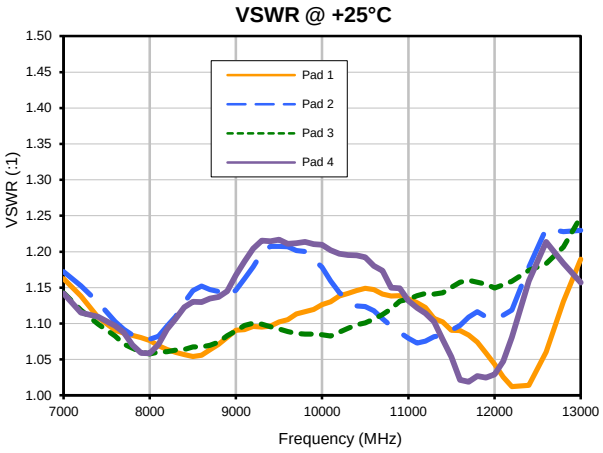
Isolation 1-2 vs. Temperature

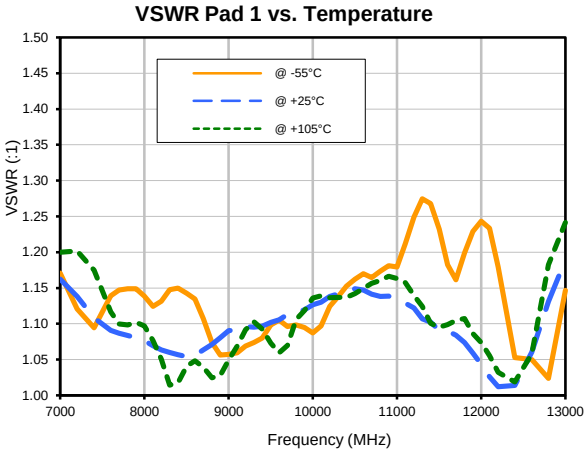


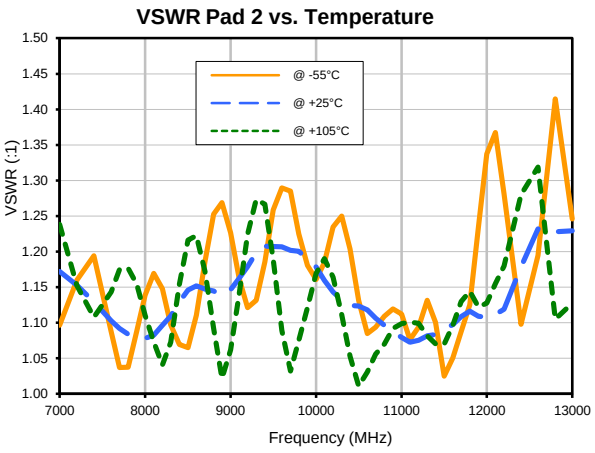
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

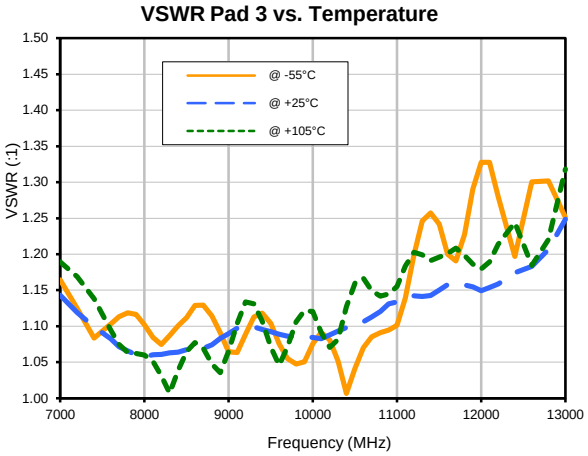
2 Way 90° Power Splitter/Combiner QCH-123+

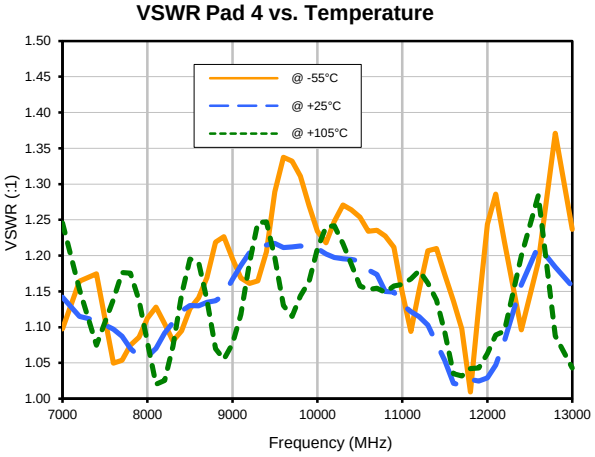
Typical Performance Curves (VSWR)











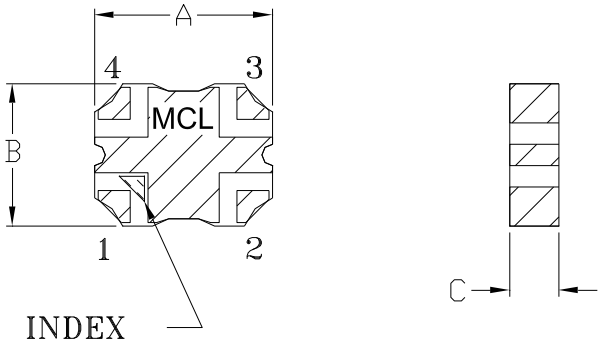
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits 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

Case Style PQ

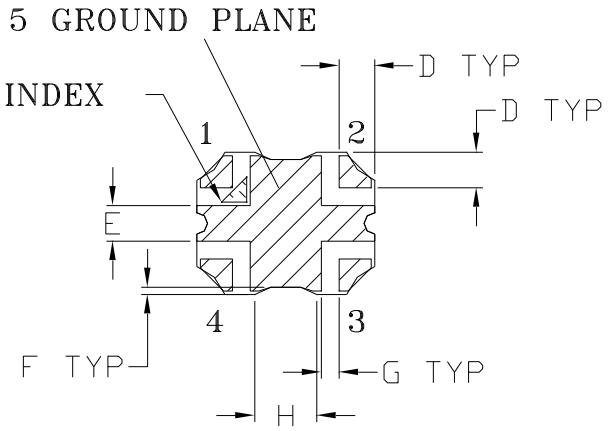
Outline Dimensions

PQ2482

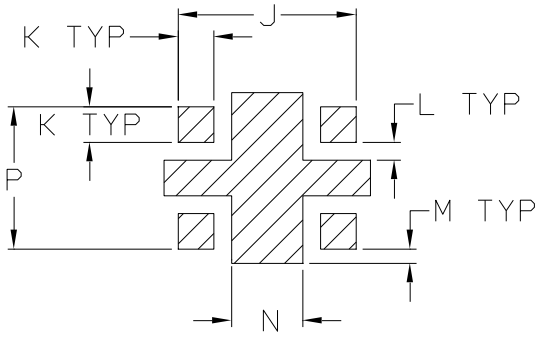
TOP SIDE



BOTTOM SIDE



PCB LAND PATTERN





CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	P	WT. GRAMS
PQ2482	.250 (6.35)	.200 (5.08)	.069 (1.75)	.050 (1.27)	.050 (1.27)	.010 (0.25)	.025 (0.63)	.087 (2.21)	.260 (6.35)	.055 (1.40)	.025 (0.63)	.020 (0.51)	.100 (2.54)	.210 (5.33)	0.5

Dimensions are in inches (mm). Tolerances: 2PL. +/- .03; 3PL. +/- .010

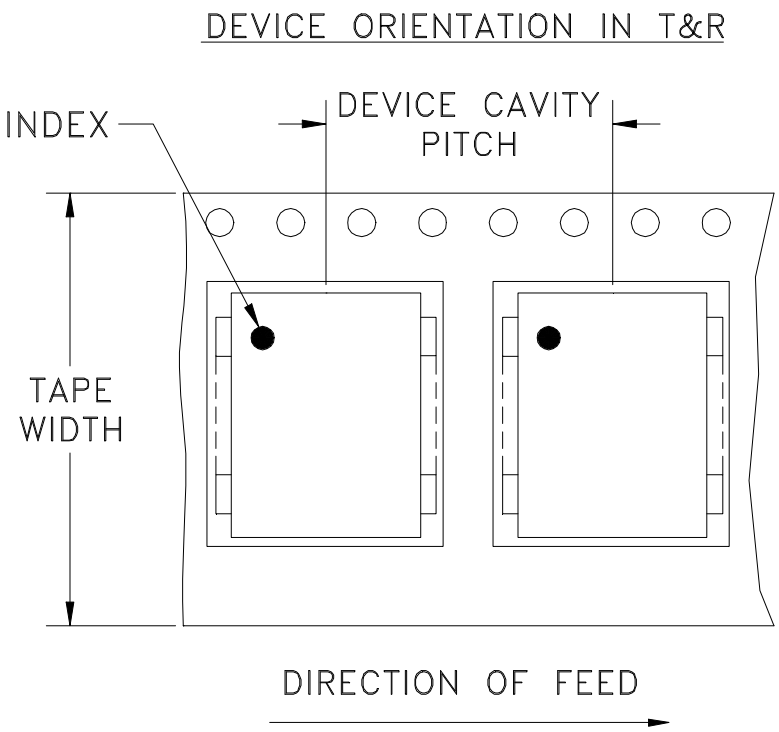
Notes:

1. Base material: Printed wiring laminate.
2. Termination finish:
   For RoHS Cases, all models (+) suffix: 2-5 µinch (.05-.13 microns) Immersion Gold.
   For RoHS-5 Cases, all models no (+) suffix: Tin-Lead plate.

Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

This document and its contents are the property of Mini-Circuits

Tape & Reel Packaging TR-F43



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
16	8	7	Small Quantity Standards (See Note)	20 50 100 200
			Standard	500

Note: Please consult individual model data sheet to determine device per reel.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

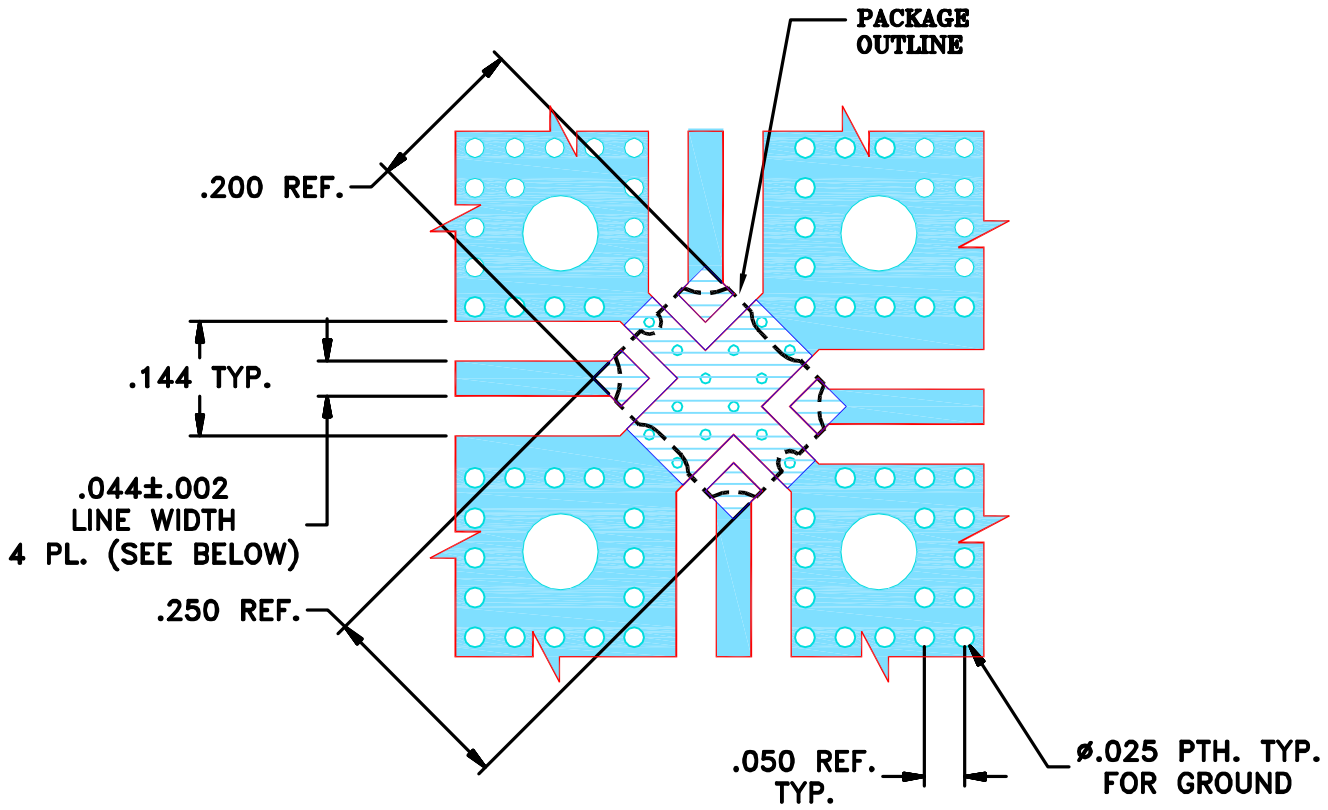
This document and its contents are the property of Mini-Circuits.

THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M163111	NEW RELEASE	02/18	DK	YB
OR	R92246	NEW RELEASE	02/18	DK	YB

SUGGESTED MOUNTING CONFIGURATION

FOR PQ2482 CASE STYLE 04DC01 PIN CONNECTION, 50 OHM



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO5880 WITH DIELECTRIC THICKNESS. .015"±.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

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	DK	19 FEB 18
TOLERANCES ON:	CHECKED	RM	19 FEB 18
2 PL DECIMALS ± .01	APPROVED	YB	19 FEB 18
3 PL DECIMALS ± .005			
ANGLES ± 1°			
FRACTIONS ±			

Mini-Circuits®

THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE , MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

ASHEETA1.DWG REV:A DATE:01/12/95

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL FOR QCH PQ2482
TB-977+ (50 Ω)

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-526	OR

FILE:	SCALE:	SHEET:
98-PL-526(OR)	1:1	1 OF 1

Mini-Circuits

Environmental Specifications **ENV02T8**

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 105° C Case Environment	Individual Model Data Sheet
Storage Temperature	-55° to 105°C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutectic Process 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020C, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Vibration (high Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-883, Method 2007.3, Condition A
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215

This document and its contents are the property of Mini-Circuits.