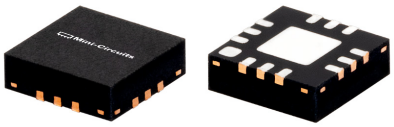
MMIC SURFACE MOUNT

Power Splitter/Combiner GP2S1A+

50Ω 500 to 2500 MHz DC PASSING

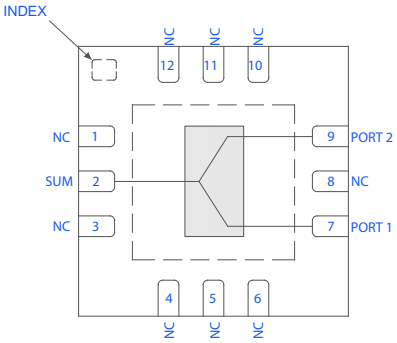
THE BIG DEAL

- Wide Bandwidth, 500 to 2500 MHz
- Excellent Insertion Loss, Typ. 1.0 dB
- Excellent Amplitude Unbalance, Typ. 0.02 dB
- Good Phase Unbalance, Typ. 0.4 Deg
- Power Handling as a Splitter, Max 10 W
- 3x3 mm 12-Lead QFN-Style Package
- DC Passing up to 370 mA



Generic photo used for illustration purposes only

FUNCTIONAL DIAGRAM



APPLICATIONS

- Back Haul Radio Systems
- Radar, EW, and ECM Defense Systems
- Satellite Communications

PRODUCT OVERVIEW

Mini-Circuits' GP2S1A+ is a 50Ω GaAs MMIC 2-way splitter/combiner that operates from 500 to 2500 MHz. The GP2S1A+ provides typical performance of 1.0 dB insertion loss, 22 dB isolation, 0.02 dB amplitude unbalance, and 0.4 deg phase unbalance. In conjunction, it has excellent power handling capabilities of 10 W max, with the ability to pass DC current up to 370 mA. This combination of characteristics makes it the perfect device for maintaining signal integrity and low signal distortion during signal splits, while also handling high power RF signals in tandem with DC current on a singular signal path.

KEY FEATURES

Features	Advantages
Low Insertion Loss, Typ. 1.0 dB (Above 3.0 dB Splitter Loss)	Low insertion loss ensures minimized signal power loss through the device, limiting the need for compensating power requirements at the respective outputs.
Excellent Unbalance • Amplitude Unbalance, Typ. 0.02 dB • Phase Unbalance, Typ. 0.4 deg.	Strong unbalance characteristics allow for low signal distortion and maintaining signal integrity when splitting RF signals between respective outputs.
DC Passing	DC current passing capabilities are helpful in applications where both RF & DC need to pass on a singular path through the DUT.
3x3 mm 12-Lead QFN-Style Package	Small footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB. Industry standard packaging allows for ease of assembly in high volume manufacturing processes.

REV. OR
ECO-024881
GP2S1A+
MCL NY
250317

Power Splitter/Combiner GP2S1A+

50Ω 500 to 2500 MHz DC PASSING

ELECTRICAL SPECIFICATIONS[1] AT +25°C & P_{IN} = -10 dBm, UNLESS NOTED OTHERWISE

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		500		2500	MHz
Insertion Loss (Above 3.0 dB Splitter Loss)	500		0.9	1.3	dB
	1500		1.0	1.4	
	2500		1.5	1.8	
Isolation	500	8	12		dB
	1500	17	22		
	2500	15	19		
Amplitude Unbalance	500		0.01	0.2	dB
	1500		0.02	0.2	
	2500		0.02	0.2	
Phase Unbalance	500		0.1	2.0	Degrees
	1500		0.4	3.0	
	2500		0.6	4.0	
Return Loss (Sum Port)	500		15		dB
	1500		22		
	2500		17		
Return Loss (Ports 1, 2)[2]	500		20		dB
	1500		26		
	2500		19		

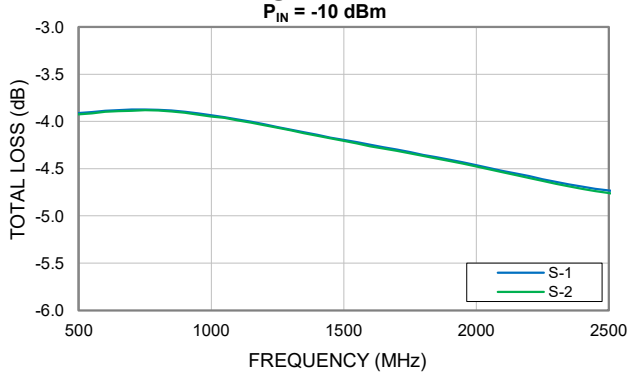
1. Tested on Mini-Circuits Characterization Test Board TB-GP2S1AC+. See Figure 2. Board loss de-embedded to the device.
2. Typical values displayed are the worst case among Port 1 and Port 2.

Power Splitter/Combiner GP2S1A+

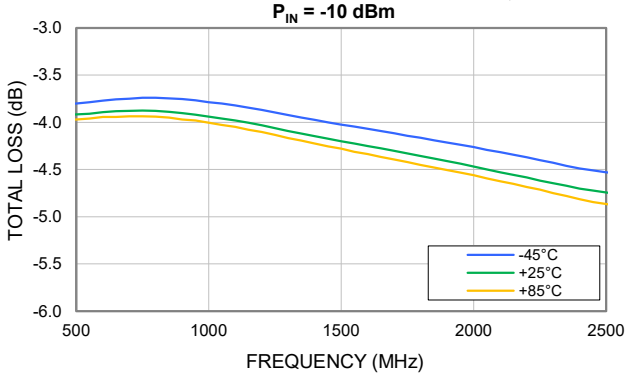
50Ω 500 to 2500 MHz DC PASSING

TYPICAL PERFORMANCE GRAPHS

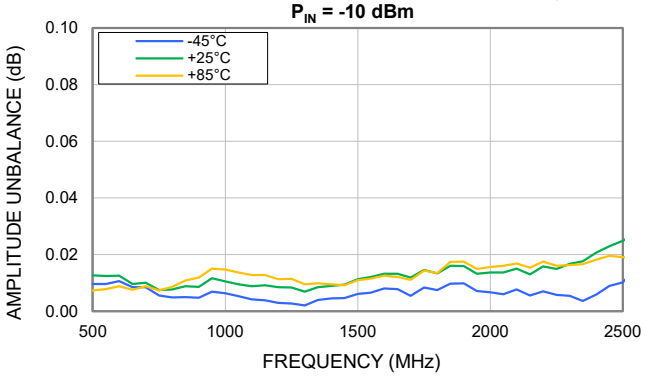
TOTAL LOSS[3] @ TEMPERATURE = +25°C
P_{IN} = -10 dBm



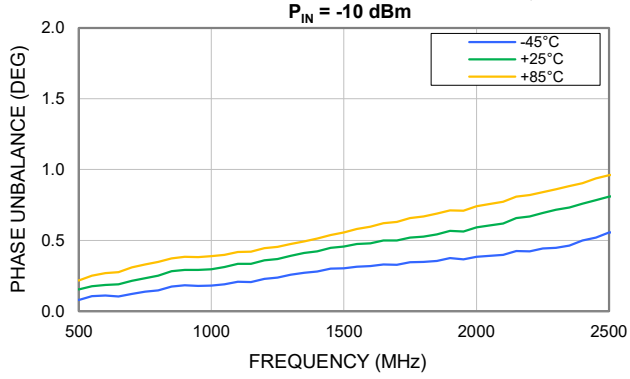
AVG. TOTAL LOSS[4] vs TEMPERATURE,
P_{IN} = -10 dBm



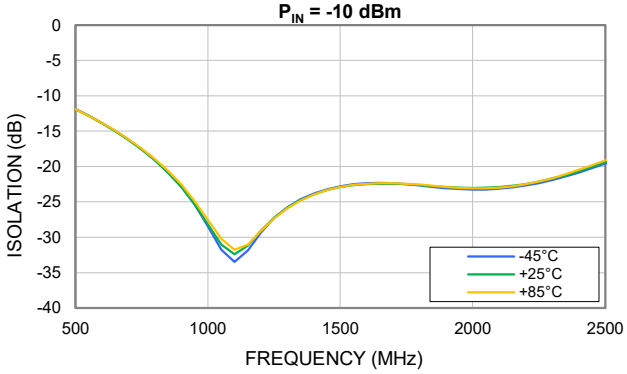
AMPLITUDE UNBALANCE vs TEMPERATURE,
P_{IN} = -10 dBm



PHASE UNBALANCE vs TEMPERATURE,
P_{IN} = -10 dBm



ISOLATION 1-2 vs TEMPERATURE,
P_{IN} = -10 dBm



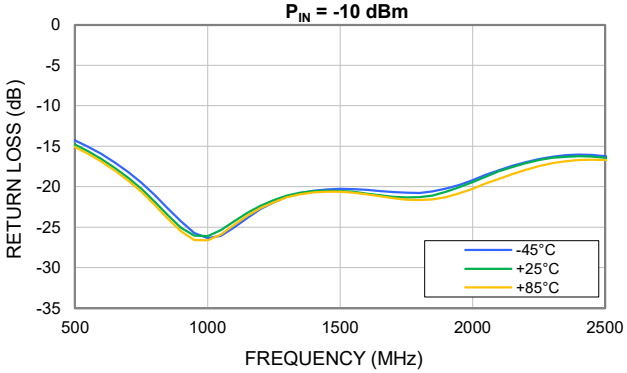
3. Total Loss = Single Path (S-1 or S-2) Insertion Loss + 3 dB Splitter Loss
4. Average of both paths' Total Loss

Power Splitter/Combiner GP2S1A+

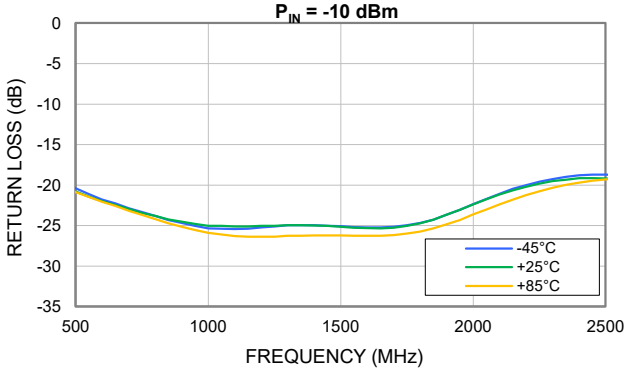
50Ω 500 to 2500 MHz DC PASSING

TYPICAL PERFORMANCE GRAPHS

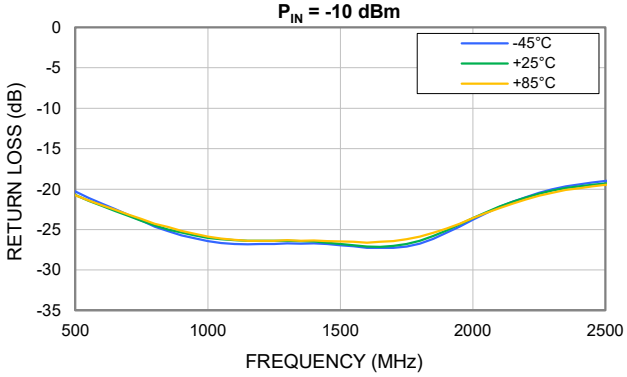
RETURN LOSS PORT S vs TEMPERATURE,
P_{IN} = -10 dBm



RETURN LOSS PORT 1 vs TEMPERATURE,
P_{IN} = -10 dBm



RETURN LOSS PORT 2 vs TEMPERATURE,
P_{IN} = -10 dBm



Power Splitter/Combiner GP2S1A+

50Ω 500 to 2500 MHz DC PASSING

ABSOLUTE MAXIMUM RATINGS[5]

Parameter	Ratings
Operating Temperature	-45°C to +85°C
Storage Temperature	-65°C to +150°C
Junction Temperature[6]	+150°C
Power Input (CW) • As a Splitter[7,8] • As a Combiner[9,10]	 +40 dBm +35 dBm
DC Current	370 mA

5. Permanent damage may occur if any of these limits are exceeded. Maximum ratings are not intended for continuous normal operation.
6. Peak temperature on top of Die.
7. Tested by applying input power to Port S, measuring output power at Port 1, and presenting both an Open and 50Ω load at Port 2 to determine worst case conditions.
8. Max power rating at +25°C and +85°C; no derating required over temperature.
9. Tested by applying input power to Port 2, measuring output power at Port 1, and presenting both an Open and 50Ω load at Port S to determine worst case conditions.
10. Derates linearly to +32 dBm at +85°C.

ESD RATING

	Class	Voltage Range	Reference Standard
HBM	1B	500 V to < 1000 V	ANSI/ESDA/JEDEC JS-001-2023
CDM	C3	≥ 1000 V	ANSI/ESDA/JEDEC JS-002-2022

ESD HANDLING PRECAUTION: This device is designed to be Class 1B for HBM. Static charges may easily produce potentials higher than this with improper handling and can discharge into DUT and damage it. As a preventive measure Industry standard ESD handling precautions should be used at all times to protect the device from ESD damage.

MSL RATING

Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-STD-020E/JEDEC J-STD-033C

Power Splitter/Combiner GP2S1A+

50Ω 500 to 2500 MHz DC PASSING

FUNCTIONAL DIAGRAM

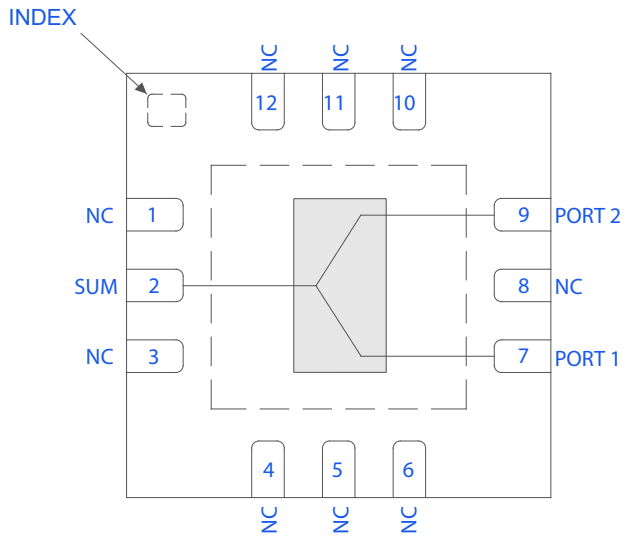


Figure 1. GP2S1A+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description (Refer to Figure 2)
SUM	2	SUM Pad connects to Input Sum Port.
PORT 1	7	PORT 1 Pad connects to Output Port 1.
PORT 2	9	PORT 2 Pad connects to Output Port 2.
NC	1, 3-6, 8, 10-12	Connects to ground on the test board.
GND	PADDLE & INDEX	Connects to ground.

CHARACTERIZATION TEST BOARD

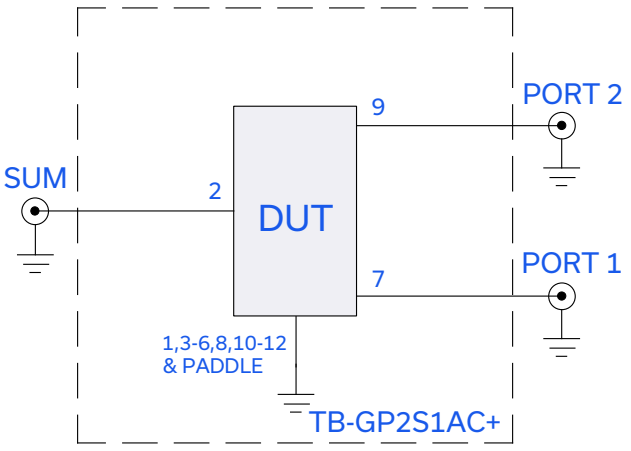


Figure 2. GP2S1A+ Characterization and Application Circuit.

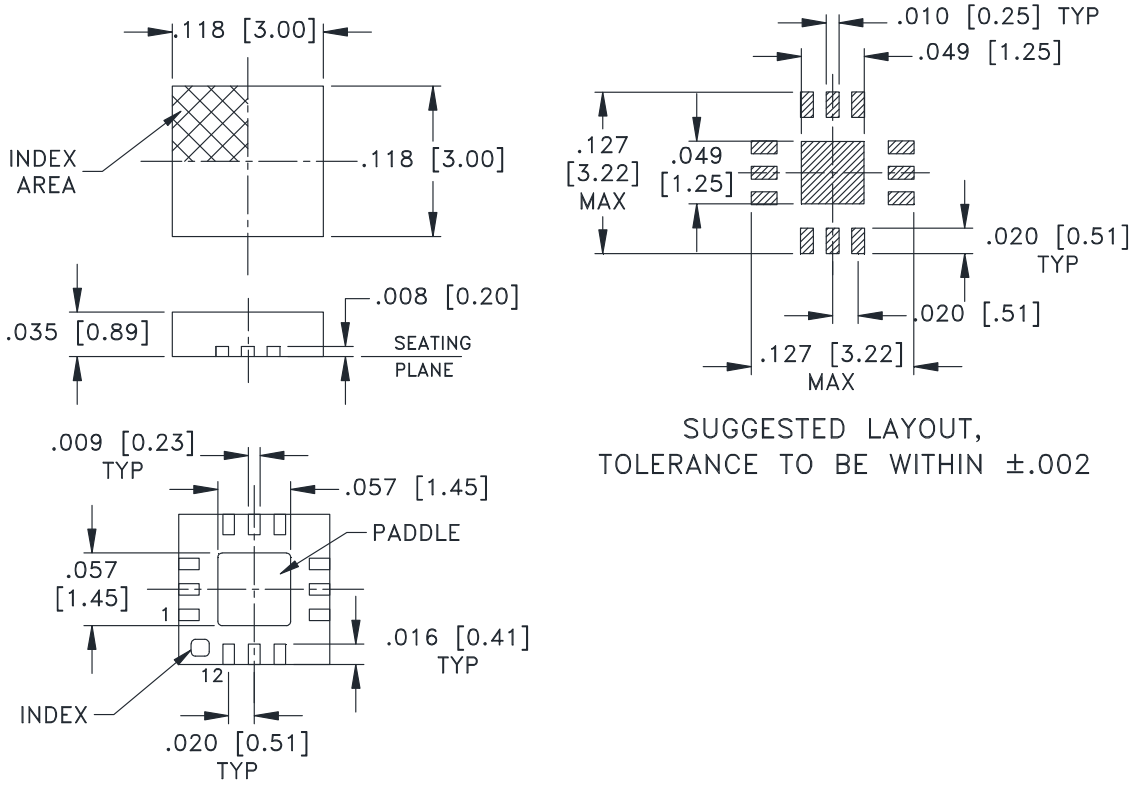
Electrical Parameters and Conditions
Insertion Loss, Isolation, Return Loss, Phase Unbalance, and Amplitude Unbalance measured using N5242A PNA-X microwave network analyzer.

Condition:
1) Insertion Loss and Return Loss: P_{IN} = -10 dBm

Power Splitter/Combiner GP2S1A+

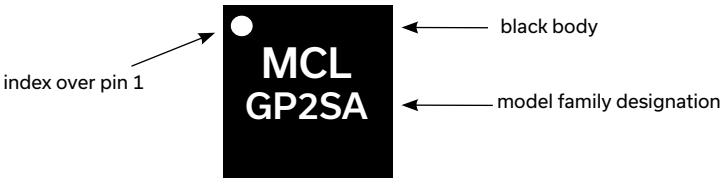
50Ω 500 to 2500 MHz DC PASSING

CASE STYLE DRAWING



Weight: .02 Grams
Dimensions are in inches [mm]. Tolerances in inches: 2 Pl. ±.01; 3 Pl.±.004 inches

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

Power Splitter/Combiner GP2S1A+

50Ω 500 to 2500 MHz DC PASSING

ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD CLICK HERE

Performance Data & Graphs	Data Graphs S-Parameter (S3P Files) Data Set (.zip file)
Case Style	DQ1225 Plastic package, exposed paddle, Lead Finish: Matte-Tin
RoHS Status	Compliant
Tape & Reel **Standard quantities available on reel**	F66 7" reels with 20, 50, 100, 200, 500, 1000, 2000, or 3000 devices
Suggested Layout for PCB Design	PL-817
Evaluation Board	TB-GP2S1AC+ Gerber File
Environmental Ratings	ENV12

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/terms/viewterm.html

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: P_{IN} = -10 dBm @ Temperature = +25°C

FREQ	Total Loss[1]		Amp. Unbal.	Phase Unbal.	Isolation	Return Loss		
	S-1	S-2			1-2	S	1	2
(MHz)	(dB)	(dB)	(dB)	(Deg.)	(dB)	(dB)	(dB)	(dB)
400	3.93	3.94	0.01	0.16	10.1	13.5	19.4	19.2
450	3.92	3.93	0.01	0.18	11.0	14.1	20.2	20.0
500	3.91	3.92	0.01	0.15	11.9	14.8	20.8	20.7
550	3.90	3.91	0.01	0.18	12.9	15.6	21.4	21.4
600	3.89	3.90	0.01	0.18	13.9	16.6	22.0	22.1
650	3.88	3.89	0.01	0.19	15.0	17.7	22.5	22.7
700	3.87	3.88	0.01	0.21	16.3	18.9	23.0	23.3
750	3.87	3.88	0.01	0.23	17.6	20.3	23.5	24.0
800	3.88	3.88	0.01	0.25	19.1	21.9	23.8	24.5
850	3.88	3.89	0.01	0.28	20.9	23.5	24.3	25.0
900	3.90	3.91	0.01	0.29	23.0	25.1	24.5	25.4
950	3.91	3.93	0.01	0.29	25.4	26.0	24.8	25.7
1000	3.94	3.95	0.01	0.30	28.2	26.1	25.0	26.0
1050	3.95	3.96	0.01	0.31	31.1	25.4	25.1	26.2
1100	3.98	3.99	0.01	0.34	32.4	24.3	25.1	26.3
1150	4.00	4.01	0.01	0.33	31.2	23.2	25.1	26.4
1200	4.03	4.04	0.01	0.36	29.1	22.3	25.1	26.4
1250	4.06	4.07	0.01	0.37	27.2	21.6	25.0	26.4
1300	4.09	4.09	0.01	0.39	25.8	21.1	25.0	26.4
1350	4.11	4.12	0.01	0.41	24.7	20.7	25.0	26.4
1400	4.14	4.15	0.01	0.42	23.9	20.5	25.0	26.5
1450	4.17	4.18	0.01	0.45	23.3	20.5	25.0	26.6
1500	4.19	4.21	0.01	0.46	22.9	20.5	25.2	26.8
1550	4.22	4.23	0.01	0.48	22.6	20.6	25.3	27.0
1600	4.25	4.26	0.01	0.48	22.5	20.8	25.3	27.1
1650	4.27	4.29	0.01	0.50	22.4	21.1	25.4	27.1
1700	4.30	4.31	0.01	0.50	22.4	21.2	25.3	27.0
1750	4.32	4.34	0.01	0.52	22.5	21.3	25.1	26.8
1800	4.35	4.36	0.01	0.53	22.6	21.3	24.7	26.4
1850	4.38	4.39	0.02	0.54	22.8	21.1	24.3	25.8
1900	4.40	4.42	0.02	0.57	22.9	20.6	23.7	25.1
1950	4.43	4.44	0.01	0.56	23.0	20.1	23.1	24.4
2000	4.46	4.48	0.01	0.59	23.0	19.4	22.4	23.6
2050	4.49	4.51	0.01	0.60	23.0	18.7	21.8	22.9
2100	4.52	4.54	0.02	0.62	22.9	18.1	21.2	22.2
2150	4.55	4.56	0.01	0.66	22.7	17.6	20.6	21.6
2200	4.58	4.59	0.02	0.67	22.5	17.1	20.2	21.0
2250	4.61	4.63	0.01	0.69	22.1	16.7	19.8	20.6
2300	4.64	4.66	0.02	0.71	21.7	16.4	19.5	20.2
2350	4.67	4.68	0.02	0.73	21.2	16.3	19.3	19.9
2400	4.69	4.71	0.02	0.76	20.7	16.2	19.2	19.6
2450	4.71	4.74	0.02	0.78	20.1	16.3	19.2	19.5
2500	4.73	4.76	0.02	0.81	19.4	16.4	19.2	19.3
2550	4.75	4.78	0.03	0.82	18.7	16.8	19.3	19.2
2600	4.77	4.80	0.03	0.83	18.0	17.3	19.4	19.1

1. Total Loss = Single Path (S-1 or S-2) Insertion Loss + 3 dB Splitter Loss

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: P_{IN} = -10 dBm @ Temperature = -45°C

FREQ	Total Loss[1]		Amp. Unbal.	Phase Unbal.	Isolation	Return Loss		
	S-1	S-2			1-2	S	1	2
(MHz)	(dB)	(dB)	(dB)	(Deg.)	(dB)	(dB)	(dB)	(dB)
400	3.82	3.83	0.01	0.08	10.1	13.1	18.7	18.6
450	3.81	3.82	0.01	0.10	10.9	13.6	19.6	19.5
500	3.80	3.81	0.01	0.08	11.9	14.3	20.4	20.3
550	3.78	3.79	0.01	0.10	12.8	15.1	21.1	21.1
600	3.77	3.78	0.01	0.11	13.8	16.0	21.8	21.8
650	3.75	3.76	0.01	0.10	15.0	17.0	22.3	22.5
700	3.75	3.75	0.01	0.12	16.2	18.2	22.9	23.2
750	3.74	3.74	0.01	0.14	17.5	19.5	23.4	23.9
800	3.74	3.74	0.00	0.14	19.1	21.0	23.8	24.6
850	3.74	3.75	0.00	0.17	20.8	22.7	24.3	25.2
900	3.75	3.76	0.00	0.18	22.9	24.3	24.7	25.7
950	3.77	3.77	0.01	0.18	25.4	25.7	25.1	26.1
1000	3.78	3.79	0.01	0.18	28.4	26.4	25.4	26.5
1050	3.80	3.80	0.01	0.19	31.8	26.1	25.4	26.7
1100	3.82	3.83	0.00	0.21	33.5	25.0	25.5	26.8
1150	3.84	3.85	0.00	0.20	31.8	23.9	25.4	26.9
1200	3.87	3.87	0.00	0.23	29.3	22.8	25.2	26.8
1250	3.90	3.90	0.00	0.24	27.2	21.9	25.1	26.8
1300	3.92	3.92	0.00	0.26	25.7	21.2	25.0	26.7
1350	3.95	3.95	0.00	0.27	24.6	20.8	25.0	26.7
1400	3.97	3.98	0.00	0.28	23.8	20.5	25.0	26.7
1450	4.00	4.00	0.00	0.30	23.2	20.4	25.0	26.8
1500	4.02	4.03	0.01	0.30	22.8	20.3	25.1	26.9
1550	4.04	4.05	0.01	0.32	22.5	20.3	25.2	27.1
1600	4.07	4.07	0.01	0.32	22.4	20.4	25.2	27.3
1650	4.09	4.10	0.01	0.33	22.3	20.5	25.2	27.3
1700	4.11	4.12	0.01	0.33	22.4	20.7	25.2	27.3
1750	4.14	4.15	0.01	0.35	22.5	20.7	24.9	27.1
1800	4.16	4.17	0.01	0.35	22.7	20.8	24.7	26.7
1850	4.19	4.20	0.01	0.36	22.9	20.6	24.3	26.2
1900	4.21	4.22	0.01	0.38	23.1	20.3	23.7	25.4
1950	4.23	4.24	0.01	0.37	23.2	19.8	23.1	24.7
2000	4.26	4.27	0.01	0.38	23.2	19.2	22.4	23.8
2050	4.29	4.30	0.01	0.39	23.2	18.5	21.7	23.0
2100	4.31	4.32	0.01	0.40	23.1	18.0	21.1	22.2
2150	4.34	4.35	0.01	0.42	22.9	17.4	20.5	21.6
2200	4.37	4.37	0.01	0.42	22.7	17.0	20.0	21.0
2250	4.40	4.41	0.01	0.44	22.3	16.6	19.6	20.5
2300	4.43	4.43	0.01	0.45	21.9	16.3	19.2	20.1
2350	4.46	4.46	0.00	0.46	21.4	16.1	19.0	19.7
2400	4.49	4.49	0.01	0.50	20.8	16.0	18.8	19.4
2450	4.51	4.51	0.01	0.52	20.2	16.1	18.7	19.2
2500	4.53	4.54	0.01	0.55	19.6	16.2	18.7	19.0
2550	4.54	4.55	0.02	0.56	18.9	16.5	18.8	18.9
2600	4.55	4.57	0.02	0.56	18.2	17.0	19.0	18.8

1. Total Loss = Single Path (S-1 or S-2) Insertion Loss + 3 dB Splitter Loss

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

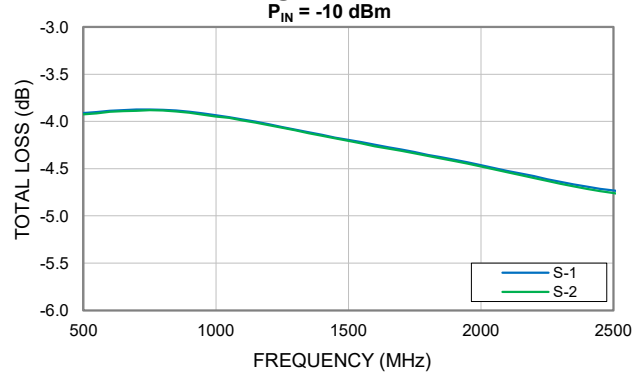
TEST CONDITIONS: P_{IN} = -10 dBm @ Temperature = +85°C

FREQ	Total Loss[1]		Amp. Unbal.	Phase Unbal.	Isolation	Return Loss		
	S-1	S-2			1-2	S	1	2
(MHz)	(dB)	(dB)	(dB)	(Deg.)	(dB)	(dB)	(dB)	(dB)
400	3.99	3.99	0.01	0.20	10.1	13.8	19.5	19.4
450	3.97	3.98	0.01	0.23	11.0	14.4	20.3	20.1
500	3.97	3.97	0.01	0.22	11.9	15.1	20.9	20.8
550	3.96	3.96	0.01	0.25	12.9	16.0	21.5	21.4
600	3.94	3.95	0.01	0.27	13.9	16.9	22.1	22.0
650	3.94	3.95	0.01	0.28	15.0	18.0	22.6	22.6
700	3.93	3.94	0.01	0.31	16.1	19.2	23.2	23.2
750	3.93	3.94	0.01	0.33	17.5	20.6	23.7	23.7
800	3.94	3.95	0.01	0.35	19.0	22.2	24.2	24.3
850	3.94	3.96	0.01	0.37	20.7	24.0	24.7	24.7
900	3.96	3.97	0.01	0.38	22.6	25.5	25.2	25.2
950	3.98	3.99	0.02	0.38	24.9	26.6	25.6	25.5
1000	4.00	4.01	0.01	0.39	27.6	26.6	25.9	25.9
1050	4.02	4.03	0.01	0.40	30.2	25.9	26.1	26.1
1100	4.04	4.05	0.01	0.42	31.8	24.7	26.3	26.3
1150	4.07	4.09	0.01	0.42	31.0	23.6	26.4	26.4
1200	4.10	4.11	0.01	0.44	29.1	22.6	26.4	26.4
1250	4.13	4.14	0.01	0.45	27.3	21.9	26.4	26.4
1300	4.16	4.17	0.01	0.47	25.9	21.3	26.3	26.3
1350	4.19	4.20	0.01	0.49	24.8	20.9	26.3	26.4
1400	4.22	4.23	0.01	0.51	24.0	20.7	26.2	26.4
1450	4.25	4.26	0.01	0.54	23.3	20.6	26.2	26.4
1500	4.28	4.29	0.01	0.56	22.9	20.6	26.2	26.5
1550	4.31	4.32	0.01	0.58	22.6	20.7	26.3	26.5
1600	4.33	4.35	0.01	0.60	22.4	20.9	26.3	26.6
1650	4.36	4.37	0.01	0.62	22.3	21.2	26.3	26.5
1700	4.39	4.40	0.01	0.63	22.3	21.4	26.2	26.4
1750	4.41	4.43	0.01	0.66	22.4	21.6	26.0	26.2
1800	4.45	4.46	0.01	0.67	22.6	21.7	25.8	25.9
1850	4.47	4.49	0.02	0.69	22.7	21.6	25.4	25.4
1900	4.50	4.52	0.02	0.71	22.9	21.3	24.9	24.9
1950	4.53	4.54	0.01	0.71	23.0	20.8	24.3	24.3
2000	4.55	4.57	0.02	0.74	23.1	20.3	23.6	23.6
2050	4.59	4.60	0.02	0.76	23.1	19.6	23.0	23.0
2100	4.62	4.63	0.02	0.77	23.0	19.0	22.4	22.3
2150	4.64	4.66	0.02	0.81	22.8	18.4	21.8	21.8
2200	4.68	4.69	0.02	0.82	22.5	17.9	21.3	21.3
2250	4.71	4.72	0.02	0.84	22.1	17.5	20.8	20.8
2300	4.74	4.76	0.02	0.86	21.7	17.1	20.3	20.5
2350	4.77	4.79	0.02	0.88	21.1	16.9	20.0	20.1
2400	4.80	4.82	0.02	0.90	20.5	16.7	19.7	19.9
2450	4.83	4.85	0.02	0.94	19.8	16.7	19.5	19.6
2500	4.86	4.88	0.02	0.96	19.1	16.7	19.3	19.5
2550	4.88	4.90	0.02	0.97	18.4	16.9	19.2	19.3
2600	4.91	4.92	0.02	0.99	17.7	17.2	19.1	19.2

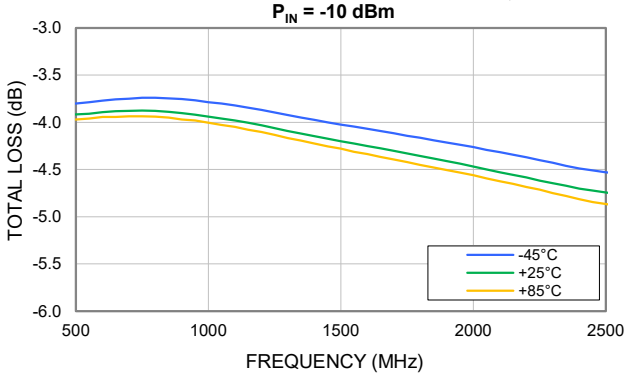
1. Total Loss = Single Path (S-1 or S-2) Insertion Loss + 3 dB Splitter Loss

Typical Performance Curves

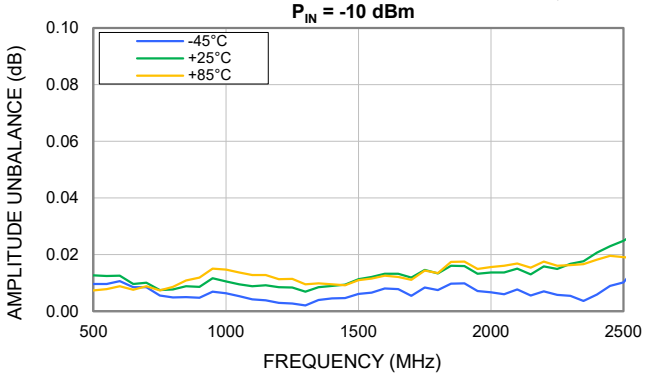
TOTAL LOSS[3] @ TEMPERATURE = +25°C
P_{IN} = -10 dBm



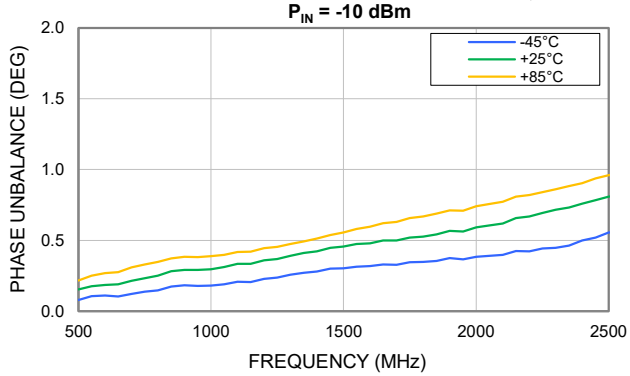
AVG. TOTAL LOSS[4] vs TEMPERATURE,
P_{IN} = -10 dBm



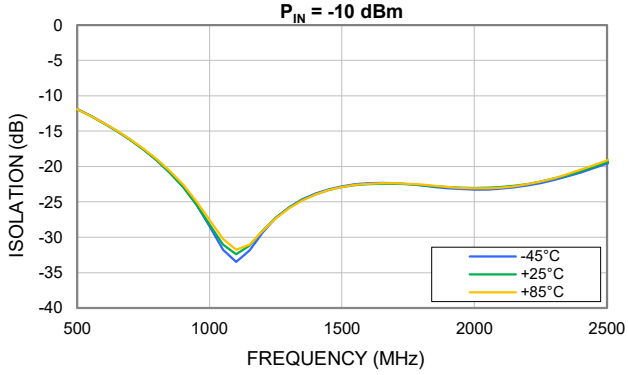
AMPLITUDE UNBALANCE vs TEMPERATURE,
P_{IN} = -10 dBm



PHASE UNBALANCE vs TEMPERATURE,
P_{IN} = -10 dBm



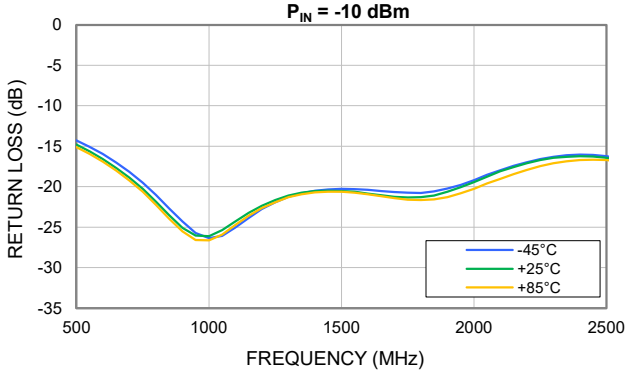
ISOLATION 1-2 vs TEMPERATURE,
P_{IN} = -10 dBm



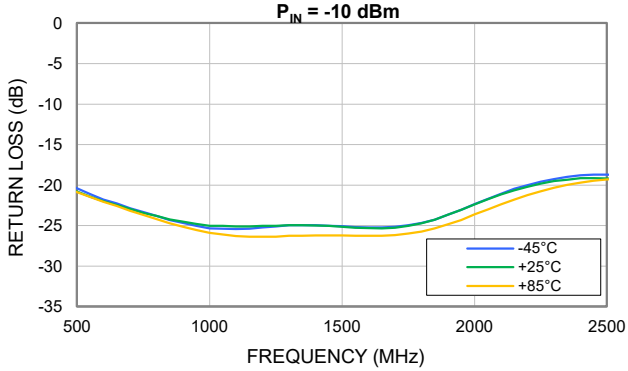
3. Total Loss = Single Path (S-1 or S-2) Insertion Loss + 3 dB Splitter Loss
4. Average of both paths' Total Loss

Typical Performance Curves

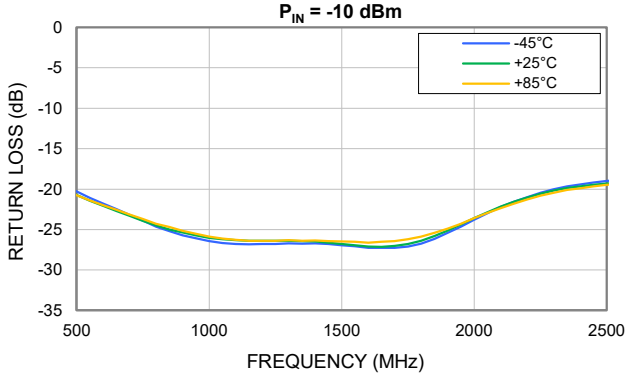
RETURN LOSS PORT S vs TEMPERATURE,
P_{IN} = -10 dBm



RETURN LOSS PORT 1 vs TEMPERATURE,
P_{IN} = -10 dBm



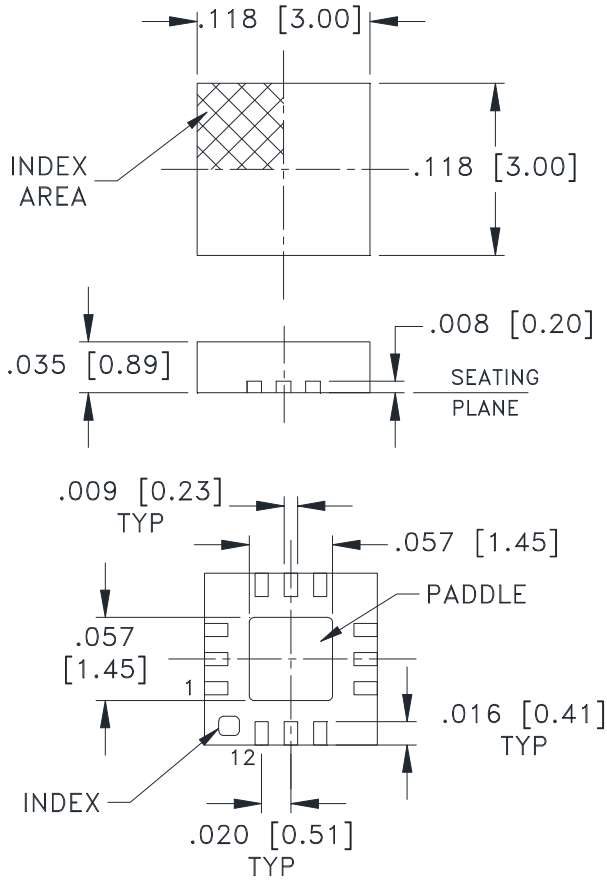
RETURN LOSS PORT 2 vs TEMPERATURE,
P_{IN} = -10 dBm

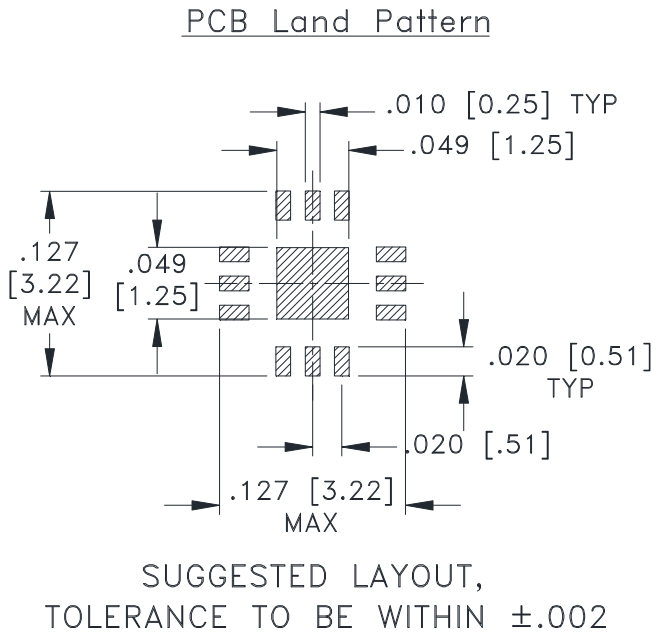


Case Style DQ

DQ1225

Outline Dimensions





Weight: .02 Grams

Dimensions are in inches (mm). Tolerances: 2Pl. ± .01; 3 Pl. ± .004

Notes:

1. Case material: Plastic.
2. Termination finish:
   - For RoHS Case Styles: Tin-Silver alloy plate over Nickel barrier or Matte-Tin. All models, (+) suffix. See Data sheet.
   - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

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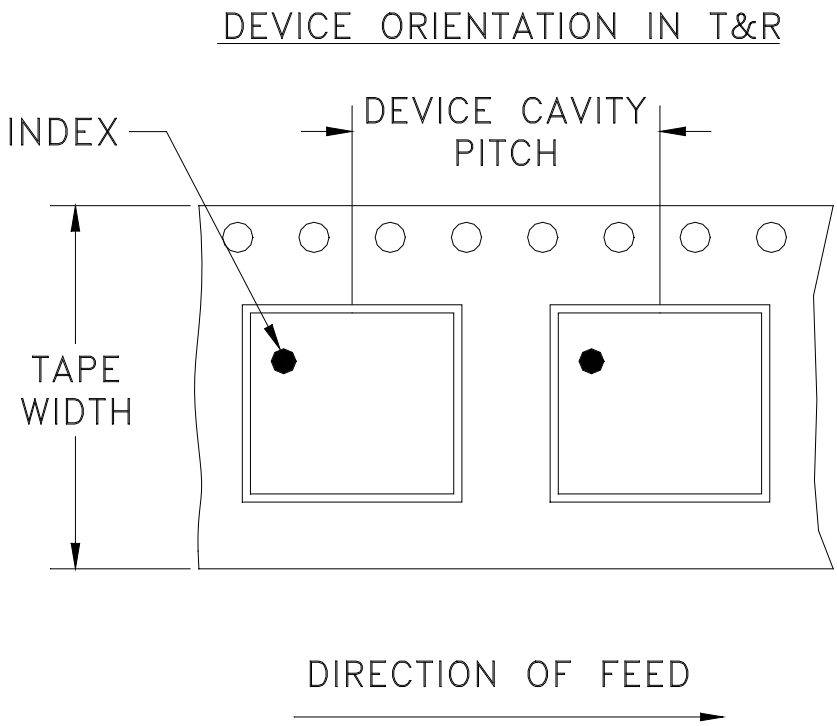

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
8	4	7	Small quantity standard	20
				50
				100
				200
				500
		7	Standard	1000, 2000, 3000

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

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

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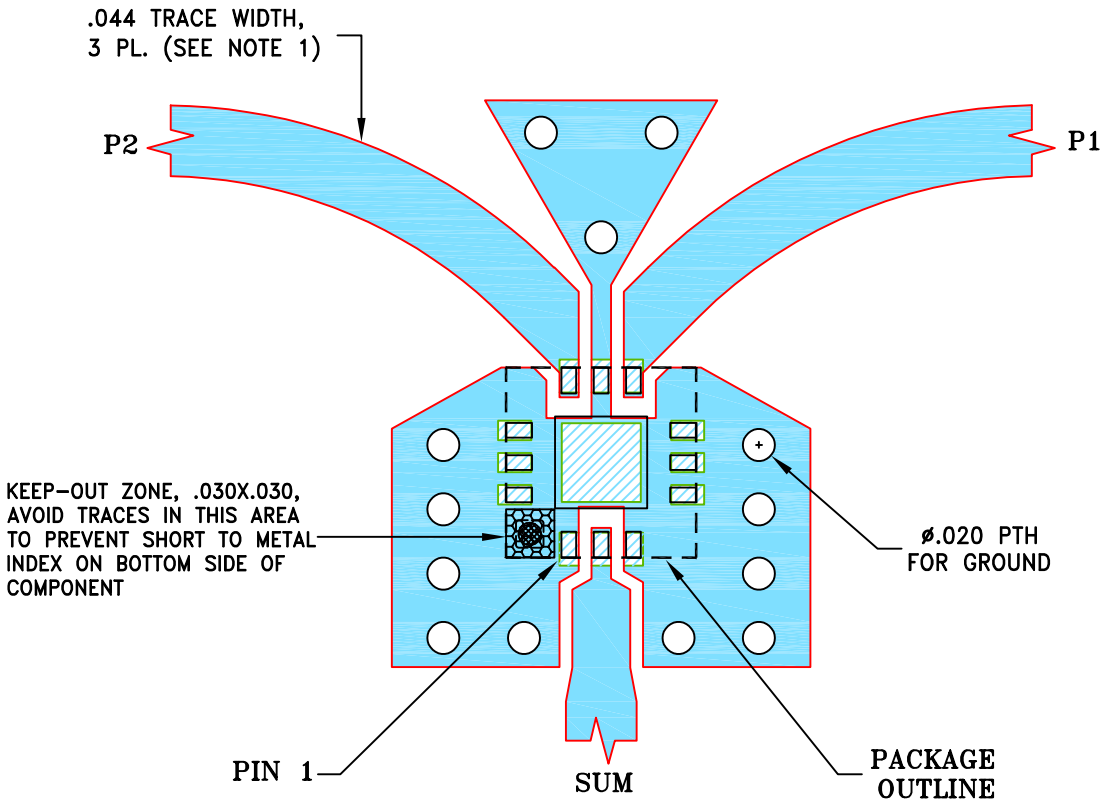
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-024737	NEW RELEASE	03/12/25	ITG	QT

SUGGESTED MOUNTING CONFIGURATION FOR DQ1225 CASE STYLE



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B, DIELECTRIC THICKNESS: .020"; COPPER: 1/2 Oz EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
3. 98-PL-817 IS APPLICABLE FOR CATALOG MODELS GP2SA+, GP2S1A+, GP2YA+ & GP2Y1A+.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	ITG	03/12/25
TOLERANCES ON:	CHECKED	GF	03/12/25
2 PL DECIMALS ±	APPROVED	IL	03/12/25
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

Mini-Circuits®

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

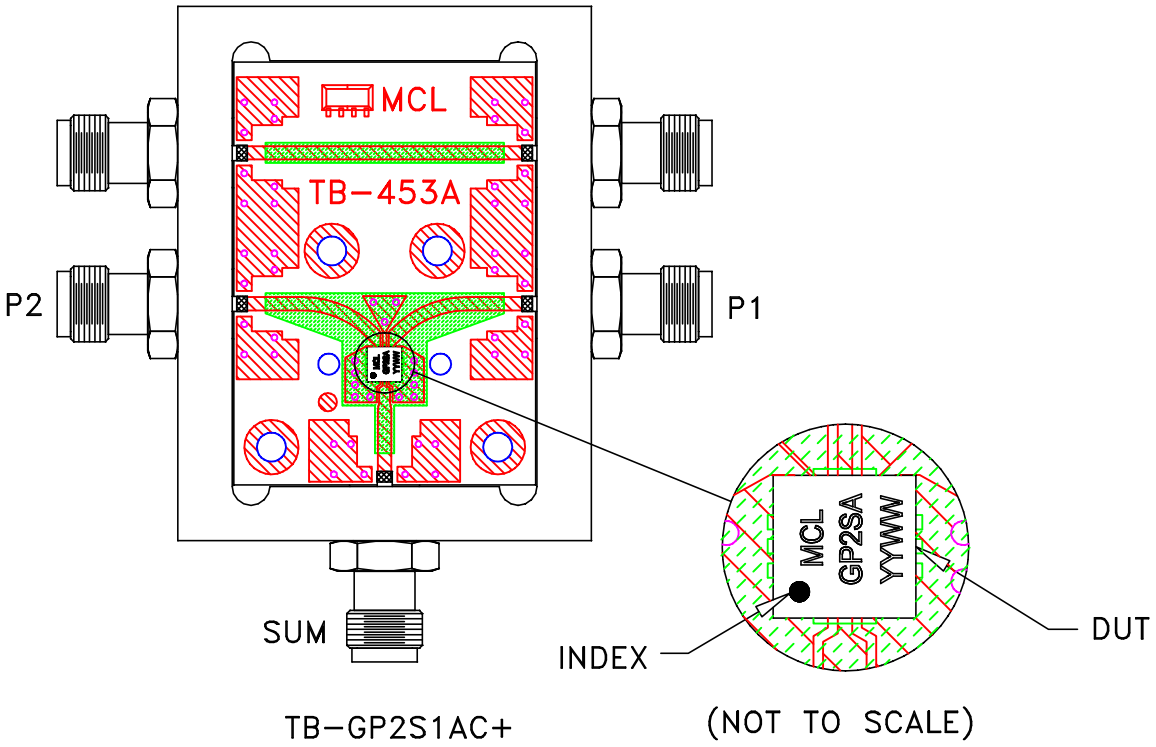
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, DQ1225, TB-453+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-817	OR

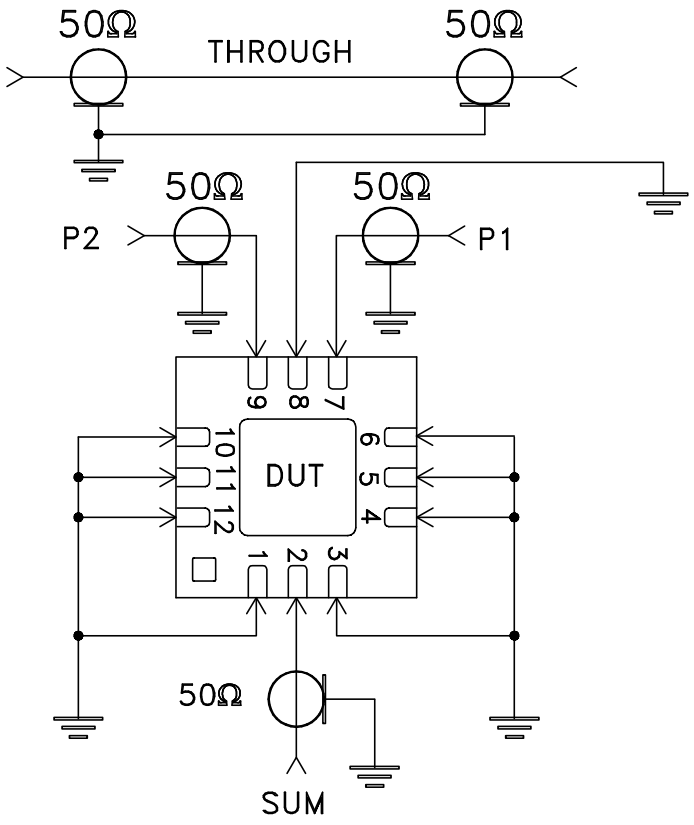
FILE:	SCALE:	SHEET:
98PL817	8:1	1 OF 1

Evaluation Board and Circuit



TB-GP2S1AC+

(NOT TO SCALE)



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.020 inch.

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Environmental Specifications ENV12

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	-40° to 85° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-65° to 150° C Ambient Environment	Individual Model Data Sheet
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102-C, Condition C
Temperature Cycling	-65° to 150°C, 100 cycles	JESD22-A104
Temperature Humidity	85°C/ 85% RH, 168 hours	JESD22-113
Solder Reflow Heat	Sn-Pb Eutetic Process: 240°C peak Pb-Free Process: 260°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Moisture Sensitivity: Level 1	Bake at 125°C for 24 hours Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 240°C peak (Non-RoHS) or 260°C (RoHS)	J-STD-020
Solderability	10X magnification, 95% coverage	JESD22-B102, Method 1: Dip and Look Test
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D