MMIC REFLECTIONLESS

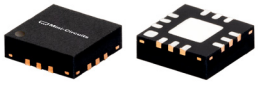
Band Pass Filter

XBF-282+

50Ω 2350 to 3150 MHz

THE BIG DEAL

- Match to 50Ω in the stop band, eliminates undesired reflections
- Cascadable
- Excellent Power handling
- Temperature stable, up to 105°C
- Small size, 3 x 3 mm
- Protected by US Patent No. 8,392,495



Generic photo used for illustration purposes only

CASE STYLE: DQ1225

+RoHS Compliant
The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

APPLICATIONS

- Wi-Fi
- WiMax
- Bluetooth
- Satellite

GENERAL DESCRIPTION

Mini-Circuits' XBF-282+ reflectionless filter employs a novel filter topology which absorbs and terminates stop band signals internally rather than reflecting them back to the source. This new capability enables unique applications for filter circuits beyond those suited to traditional approaches. Traditional filters are reflective in the stop band, sending signals back to the source at 100% of the power level. These reflections interact with neighboring components and often result in inter-modulation and other interferences. Reflectionless filters eliminate stop band reflections, allowing them to be paired with sensitive devices and used in applications that otherwise require circuits such as isolation amplifiers or attenuators.

KEY FEATURES

Features	Advantages
Easy integration with sensitive reflective components, e.g. mixers, multipliers	Reflectionless filters absorb unwanted signals, preventing reflections back to the source. This reduces generation of additional unwanted signals without the need for extra components like attenuators, improving system dynamic range and saving board space.
Enables stable integration of wideband amplifiers	Because reflectionless filters maintain good impedance in the stop band; they can be integrated with high gain, wideband amplifiers without the risk of creating instabilities in these out of band regions.
Cascadable	Reflectionless filters can be cascaded in multiple sections to provide sharper and higher attenuation, while also preventing any standing waves that could affect pass band signals.
Excellent power handling in a tiny surface mount	High power handling extends the usability of these filters to the transmit path for inter-stage filtering.
Small size, 3x3mm QFN	Allows replacement of filter/attenuator pairs with a single reflectionless filter, saving board space. Tiny footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.
Excellent repeatability of RF performance	Through semiconductor IPD process, X-series filters are inherently repeatable for large volume production.
Operating temperature up to 105 ˚C	Suitable for operation close to high power components.

*IPD – Integrated Passive Device, is a GaAs semiconductor process

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ELECTRICAL SPECIFICATIONS[1] AT +25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	F2-F3	2350 - 3150	—	3.2	3.6	dB
	VSWR	F2-F3	2350 - 3150	—	1.2	—	:1
Stop Band, Lower	Rejection	DC-F1	DC - 1810	12	15	—	dB
	VSWR	DC-F1	DC - 1810	—	1.2	—	:1
Stop Band, Upper	Rejection	F4-F5	3800 - 9500	12	15	—	dB
		F5-F6	9500 - 20000	—	20	—	
	VSWR	F4-F5	3800 - 9500	—	1.2	—	:1
		F5-F6	9500 - 20000	—	1.5	—	

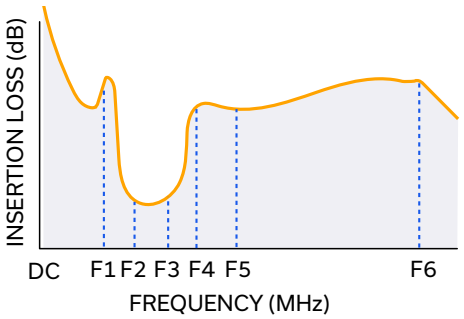
1. Measured on Mini-Circuits Characterization Test Board TB-968-163+

ABSOLUTE MAXIMUM RATINGS[2]

Parameter	Ratings
Operating Temperature	-55°C to +105°C
Storage Temperature	-65°C to +150°C
RF Power Input, Passband (F2-F3)[3]	2W at 25°C
RF Power Input, Stopband (DC-F2, F3-F6)[4]	0.5W at 25°C

2. Permanent damage may occur if any of these limits are exceeded.
3. Passband rating derates linearly to 0.25W at 105°C ambient
4. Stopband rating derates linearly to 0.08W at 105°C ambient

SPECIFICATION DEFINITION



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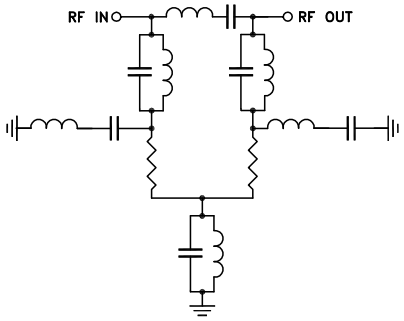
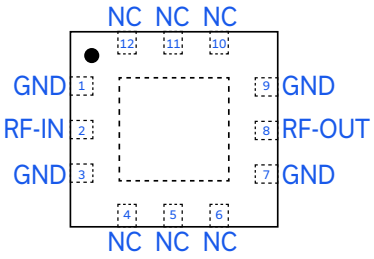
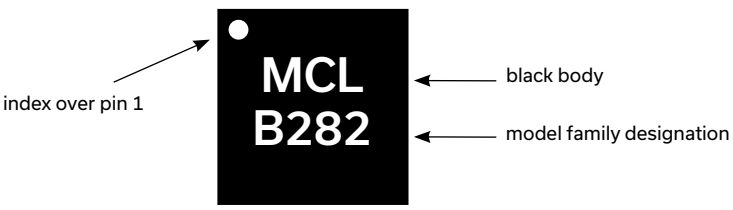
SIMPLIFIED SCHEMATIC AND PAD DESCRIPTION





Function	Pad Number	Description
RF-IN	2	RF Input Pad
RF-OUT	8	RF Output Pad
GND	1,3,7,9, Paddle	Connected to ground
NC (GND Externally)	4,5,6,10,11,12	No internal connection

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

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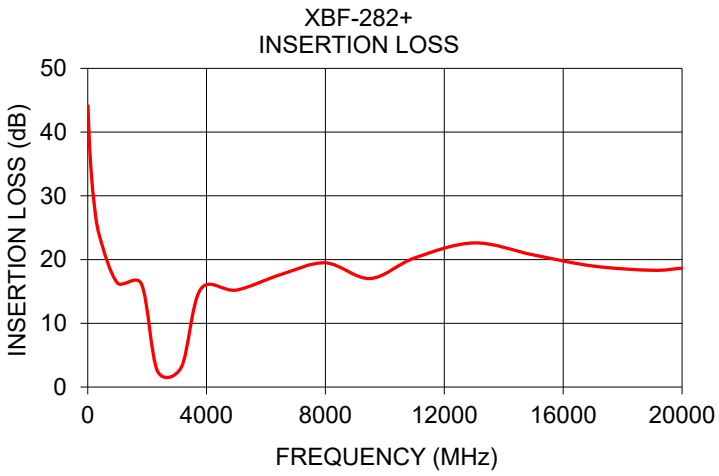
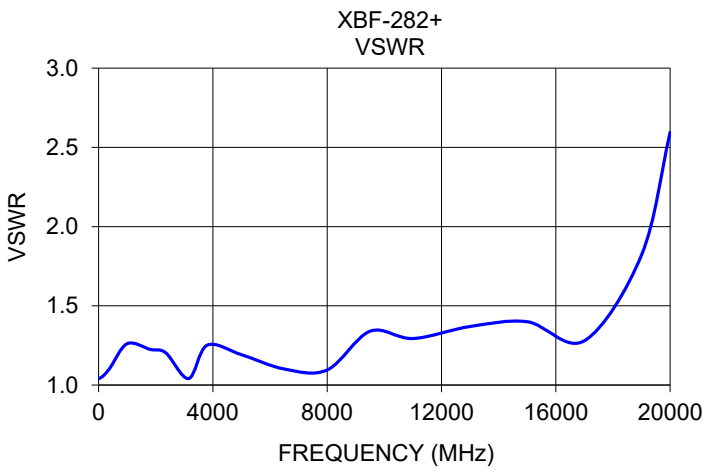
TYPICAL PERFORMANCE DATA AT +25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
10	44.12	1.04
50	39.26	1.04
100	35.00	1.05
200	29.51	1.07
400	23.66	1.11
1000	16.34	1.26
1810	16.16	1.23
2350	2.50	1.20
3150	3.10	1.04
3800	15.35	1.25
5000	15.22	1.19
6500	17.66	1.10
8000	19.49	1.10
9500	17.03	1.34
11000	20.26	1.29
13000	22.61	1.37
15000	20.73	1.40
17000	18.99	1.28
19000	18.32	1.82
20000	18.66	2.59





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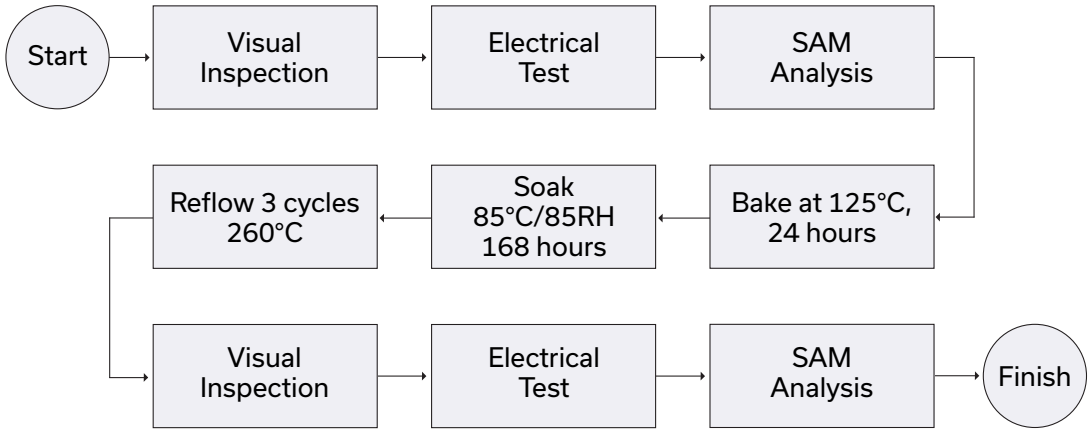
ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD. TO ACCESS CLICK HERE

Performance Data and Graphs	Data Graphs S-Parameter (S3P Files) Data Set (.zip file)
Case Style	DQ1225 Plastic package, exposed paddle lead finish: matte-tin
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-451
Evaluation Board	TB-844-282B+ (without connectors) TB-844-282BC+ (with connectors) B20-118-F1+ Connector sold separately
Environmental Ratings	ENV82

ESD RATING

Human Body Model (HBM): Class 2 (2000 to <4000 V) in accordance with ANSI/ESD STM 5.1 - 2001

MSL TEST FLOW CHART



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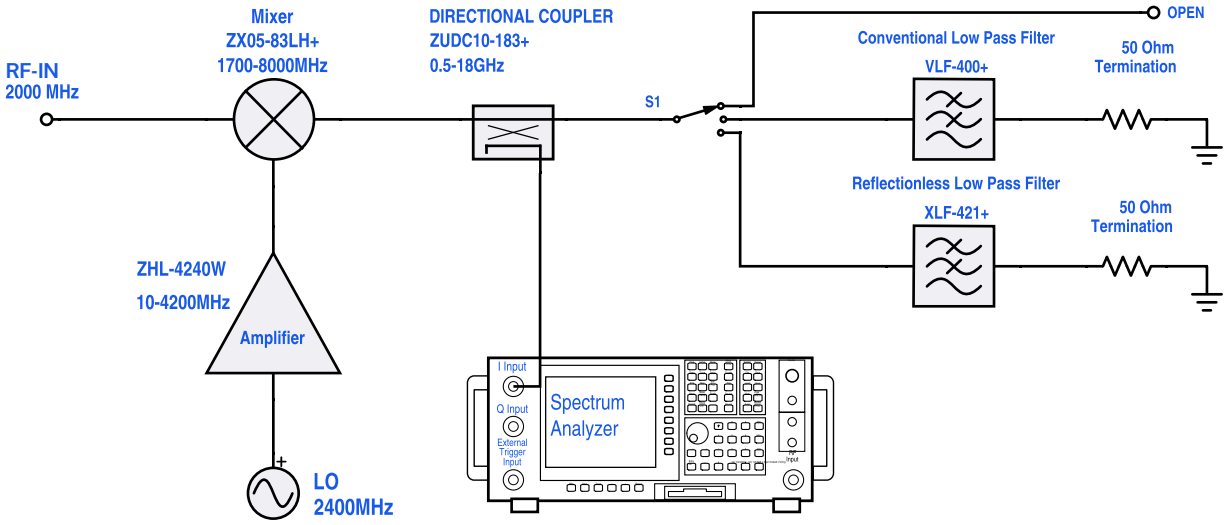
REFLECTIONLESS FILTER APPLICATION NOTE

Application Circuit Example: Pairing mixers with reflectionless filters to improve system dynamic range



Test block diagram: IF output reflection spectrum with single input frequency

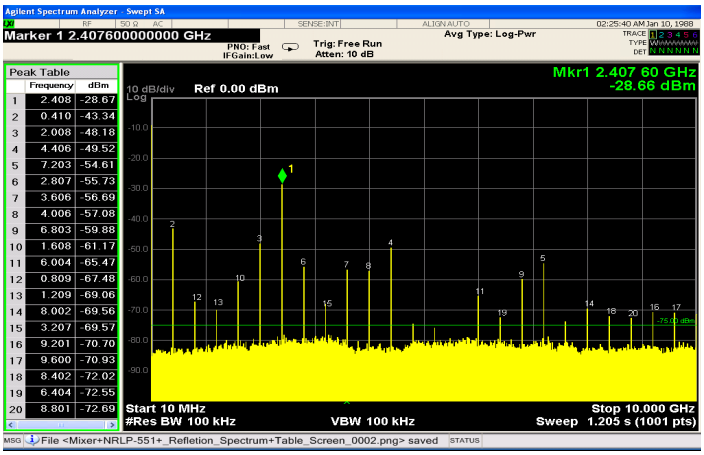


Figure 1. IF output reflection spectrum without filter

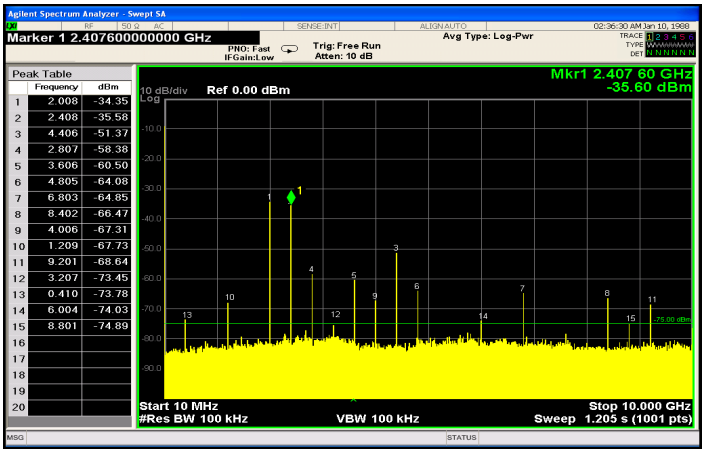


Figure 2. IF output reflection spectrum with conventional filter

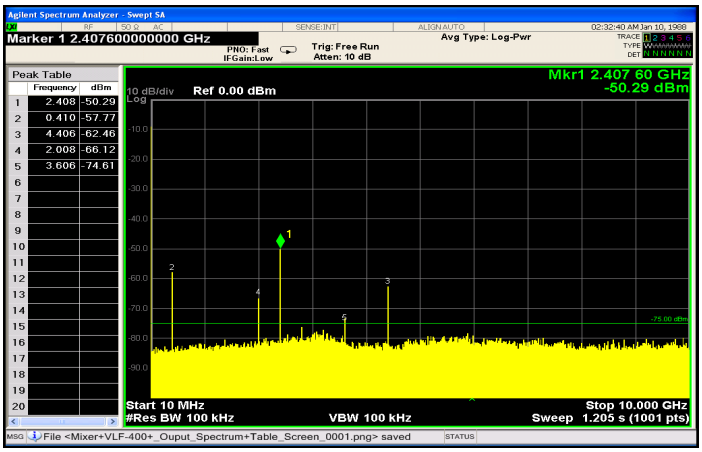


Figure 3. IF output reflection spectrum with reflectionless filter

An application circuit was assembled to measure the IF reflection spectrum at the output of a mixer when the mixer was paired with a conventional filter versus a reflectionless filter.

While the conventional filter reduces the reflections present when the mixer is used alone (no filter), the reflectionless filter virtually eliminates those reflections altogether.

The reflected signal at marker 1 in the figures above exhibits a reduction of more than 20 dB from -28.7 dBm to -50.3 dBm when the reflectionless filter is used as compared to the conventional filter, thus eliminating unwanted spurious mixing products and improvingsystem dynamic range.

For more information, refer to application note AN-75-007

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

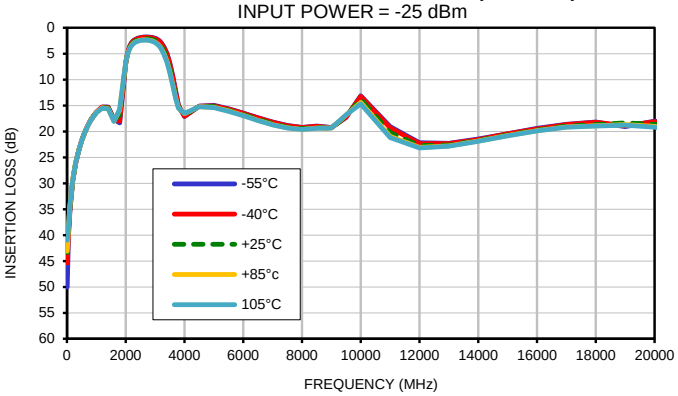
FREQ.	INSERTION LOSS					GROUP DELAY				
(MHz)	(dB)					(nsec)				
	@-55°C	@-40°C	@+25°C	@+85°C	@+105°C	@-55°C	@-40°C	@+25°C	@+85°C	@+105°C
10	50.03	45.37	43.37	43.11	40.99	-3.44	-5.06	-0.85	-3.19	-2.63
50	40.28	39.67	38.91	38.70	38.50	-2.00	-2.69	-1.06	-1.96	-1.80
100	35.45	35.07	34.82	34.39	34.31	-0.50	-0.46	-0.62	-0.69	-0.63
200	29.50	29.49	29.37	29.26	29.35	-0.04	0.01	-0.06	-0.08	-0.10
300	26.12	26.16	26.09	26.00	26.05	0.06	0.06	0.03	0.02	0.03
400	23.65	23.70	23.62	23.63	23.68	0.08	0.07	0.07	0.06	0.07
500	21.77	21.79	21.79	21.80	21.80	0.10	0.10	0.09	0.09	0.08
600	20.26	20.28	20.28	20.31	20.30	0.11	0.11	0.10	0.10	0.09
700	19.00	19.00	19.05	19.05	19.07	0.11	0.11	0.11	0.10	0.10
800	17.93	17.96	17.98	17.98	18.01	0.11	0.11	0.11	0.11	0.12
900	17.03	17.04	17.09	17.12	17.11	0.12	0.12	0.12	0.12	0.12
1000	16.28	16.30	16.33	16.37	16.38	0.13	0.13	0.13	0.13	0.13
1200	15.30	15.31	15.41	15.46	15.49	0.14	0.14	0.13	0.14	0.14
1400	15.29	15.33	15.48	15.60	15.65	0.13	0.13	0.11	0.11	0.10
1600	17.64	17.68	17.92	18.05	18.06	-0.13	-0.14	-0.22	-0.28	-0.30
1800	18.33	18.01	16.81	15.92	15.67	-0.91	-0.85	-0.64	-0.48	-0.44
1810	17.66	17.35	16.20	15.36	15.12	-0.80	-0.74	-0.53	-0.39	-0.35
2000	6.83	6.80	6.72	6.66	6.66	0.52	0.51	0.50	0.48	0.48
2050	5.28	5.29	5.35	5.41	5.44	0.57	0.56	0.53	0.51	0.51
2100	4.18	4.22	4.38	4.51	4.55	0.57	0.56	0.53	0.50	0.50
2150	3.43	3.49	3.70	3.87	3.92	0.54	0.53	0.50	0.48	0.47
2200	2.93	2.99	3.23	3.42	3.48	0.49	0.49	0.46	0.45	0.44
2250	2.57	2.64	2.90	3.09	3.16	0.45	0.45	0.43	0.41	0.41
2300	2.34	2.41	2.66	2.87	2.93	0.41	0.41	0.39	0.39	0.38
2350	2.16	2.23	2.49	2.69	2.76	0.38	0.38	0.37	0.36	0.36
2400	2.04	2.11	2.37	2.57	2.64	0.36	0.36	0.35	0.34	0.34
2450	1.95	2.01	2.27	2.47	2.54	0.34	0.34	0.33	0.33	0.33
2500	1.88	1.94	2.21	2.40	2.47	0.32	0.32	0.32	0.32	0.32
2550	1.83	1.90	2.16	2.36	2.43	0.31	0.31	0.31	0.31	0.31
2600	1.79	1.86	2.13	2.33	2.40	0.30	0.30	0.30	0.30	0.30
2650	1.78	1.84	2.11	2.32	2.39	0.30	0.30	0.29	0.30	0.30
2700	1.77	1.84	2.12	2.33	2.39	0.29	0.29	0.29	0.29	0.29
2750	1.78	1.85	2.13	2.35	2.42	0.29	0.29	0.29	0.29	0.29
2800	1.80	1.87	2.17	2.39	2.47	0.29	0.29	0.29	0.29	0.29
2850	1.83	1.91	2.21	2.45	2.52	0.29	0.29	0.29	0.30	0.30
2900	1.87	1.96	2.27	2.52	2.61	0.30	0.30	0.30	0.30	0.30
2950	1.94	2.03	2.36	2.63	2.72	0.30	0.30	0.30	0.31	0.31
3000	2.04	2.13	2.49	2.77	2.87	0.31	0.31	0.31	0.31	0.31
3050	2.15	2.25	2.63	2.95	3.05	0.32	0.32	0.32	0.32	0.32
3100	2.31	2.41	2.83	3.17	3.29	0.33	0.33	0.33	0.33	0.33
3150	2.52	2.63	3.09	3.47	3.60	0.34	0.34	0.34	0.34	0.34
3200	2.79	2.92	3.43	3.84	3.99	0.35	0.35	0.35	0.34	0.34
3300	3.61	3.76	4.38	4.89	5.06	0.37	0.36	0.35	0.34	0.33
3400	4.90	5.08	5.82	6.42	6.61	0.36	0.35	0.32	0.30	0.29
3500	6.78	6.99	7.82	8.46	8.66	0.29	0.28	0.24	0.21	0.20
3600	9.27	9.48	10.31	10.90	11.09	0.17	0.16	0.10	0.06	0.05
3700	12.15	12.34	13.01	13.44	13.56	-0.03	-0.04	-0.09	-0.12	-0.13
3800	14.95	15.03	15.33	15.46	15.50	-0.26	-0.26	-0.27	-0.26	-0.26
4000	17.13	17.06	16.79	16.57	16.50	-0.30	-0.29	-0.24	-0.20	-0.18
4500	15.11	15.13	15.18	15.23	15.26	0.04	0.04	0.04	0.04	0.04
5000	14.99	15.05	15.21	15.33	15.39	0.06	0.06	0.05	0.06	0.05
5500	15.63	15.68	15.89	16.04	16.11	0.05	0.05	0.05	0.05	0.05
6000	16.47	16.49	16.75	16.90	16.98	0.04	0.05	0.04	0.05	0.04
6500	17.34	17.42	17.66	17.85	17.88	0.05	0.04	0.04	0.04	0.05
7000	18.21	18.26	18.50	18.66	18.73	0.04	0.04	0.04	0.04	0.04
7500	18.87	18.92	19.17	19.31	19.36	0.04	0.04	0.04	0.04	0.04
8000	19.22	19.26	19.48	19.61	19.64	0.05	0.04	0.05	0.05	0.05
8500	18.96	19.00	19.22	19.36	19.41	0.08	0.07	0.08	0.08	0.09
9000	19.27	19.31	19.40	19.35	19.37	0.03	0.03	0.03	0.05	0.06
9500	17.28	17.25	17.04	16.84	16.80	0.12	0.12	0.15	0.18	0.20
10000	13.15	13.24	13.80	14.42	14.66	0.37	0.38	0.39	0.39	0.39
11000	19.06	19.31	20.24	20.97	21.19	0.14	0.15	0.13	0.13	0.14
12000	22.21	22.34	22.75	23.08	23.21	0.08	0.08	0.08	0.07	0.08
13000	22.29	22.37	22.61	22.81	22.86	0.06	0.05	0.05	0.05	0.05
14000	21.49	21.55	21.75	21.86	21.92	0.05	0.04	0.04	0.04	0.05
15000	20.44	20.48	20.70	20.81	20.86	0.05	0.05	0.04	0.04	0.05
16000	19.43	19.50	19.73	19.86	19.88	0.05	0.05	0.05	0.05	0.05
17000	18.62	18.68	18.94	19.13	19.18	0.05	0.05	0.04	0.05	0.05
18000	18.19	18.24	18.71	18.89	18.99	0.05	0.05	0.05	0.04	0.05
19000	19.10	18.91	18.36	18.69	18.82	-0.06	-0.03	0.07	0.06	0.07
20000	18.04	18.15	18.62	19.04	19.19	0.05	0.05	0.05	0.04	0.04
21000	18.88	18.98	19.43	19.81	19.94	0.04	0.04	0.03	0.04	0.04
22000	19.53	19.63	20.09	20.38	20.45	0.04	0.04	0.04	0.03	0.04
23000	20.15	20.25	20.71	20.91	21.00	0.04	0.04	0.04	0.04	0.04
24000	21.03	21.16	21.57	21.78	21.78	0.03	0.04	0.04	0.03	0.04
25000	21.69	21.82	22.32	22.56	22.65	0.03	0.03	0.03	0.03	0.03

Typical Performance Data

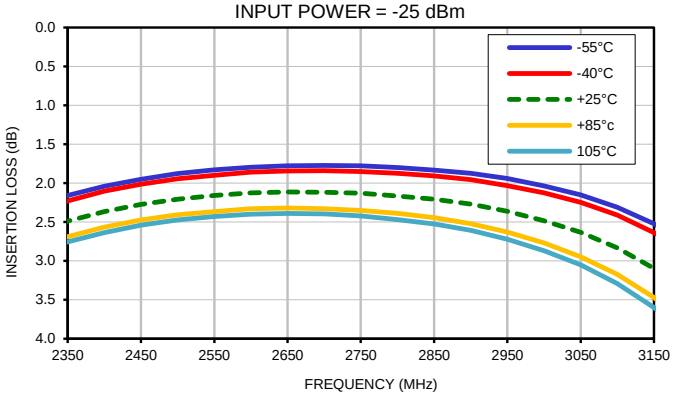
FREQ.	INPUT RETURN LOSS					OUTPUT RETURN LOSS				
(MHz)	(dB)					(dB)				
	@-55°C	@-40°C	@+25°C	@+85°C	@+105°C	@-55°C	@-40°C	@+25°C	@+85°C	@+105°C
10	34.90	34.72	33.61	33.05	32.92	34.62	34.36	33.20	33.12	32.80
50	33.63	33.51	33.35	32.74	32.68	33.49	33.51	33.45	32.80	32.61
100	31.85	31.93	32.31	32.06	32.07	31.97	31.95	32.20	31.93	31.77
200	29.83	29.75	30.01	29.87	29.97	29.74	29.78	30.07	30.09	29.96
300	27.86	27.83	27.64	27.55	27.49	28.09	28.08	27.86	27.84	27.82
400	25.82	25.86	25.85	25.77	25.75	25.66	25.77	25.64	25.64	25.60
500	24.25	24.17	24.13	24.17	24.11	23.67	23.62	23.63	23.69	23.71
600	22.73	22.77	22.62	22.71	22.71	22.35	22.36	22.21	22.31	22.30
700	21.47	21.42	21.42	21.46	21.48	21.29	21.30	21.12	21.20	21.21
800	20.54	20.54	20.51	20.56	20.59	20.24	20.24	20.13	20.20	20.20
900	19.62	19.65	19.65	19.72	19.77	19.27	19.28	19.23	19.29	19.31
1000	18.70	18.70	18.77	18.87	18.89	18.41	18.44	18.44	18.50	18.53
1200	17.24	17.26	17.47	17.52	17.54	17.17	17.22	17.24	17.29	17.32
1400	16.44	16.51	16.64	16.74	16.78	16.09	16.17	16.38	16.51	16.55
1600	15.96	16.11	16.71	17.04	17.12	15.91	16.02	16.50	16.82	16.92
1800	18.00	18.28	19.54	20.77	21.10	17.87	18.20	19.70	20.88	21.22
1810	18.24	18.55	19.86	21.18	21.55	18.16	18.51	20.10	21.40	21.76
2000	26.49	27.22	29.52	29.77	29.67	27.97	28.48	29.09	28.17	27.88
2050	26.69	26.88	26.38	25.65	25.43	25.80	25.76	25.11	24.26	24.09
2100	25.32	25.16	24.20	23.44	23.29	23.91	23.78	23.08	22.43	22.31
2150	24.01	23.78	22.92	22.19	22.03	22.88	22.73	22.02	21.42	21.34
2200	22.92	22.69	21.95	21.35	21.19	22.21	22.03	21.37	20.85	20.74
2250	22.24	22.03	21.40	20.87	20.74	21.77	21.59	21.00	20.51	20.42
2300	21.52	21.39	20.93	20.49	20.38	21.17	21.04	20.55	20.13	20.05
2350	21.08	20.99	20.74	20.35	20.28	20.90	20.78	20.42	20.09	20.02
2400	20.87	20.81	20.72	20.40	20.30	20.69	20.60	20.34	20.08	20.04
2450	20.82	20.78	20.74	20.51	20.44	20.73	20.63	20.45	20.26	20.20
2500	20.91	20.88	20.86	20.67	20.60	20.89	20.81	20.65	20.52	20.46
2550	20.88	20.87	20.84	20.73	20.66	21.03	21.01	20.84	20.73	20.67
2600	21.04	21.00	20.92	20.89	20.81	21.26	21.26	21.09	21.04	20.99
2650	21.21	21.20	21.10	21.13	21.09	21.45	21.42	21.25	21.28	21.26
2700	21.79	21.79	21.67	21.76	21.69	21.89	21.83	21.67	21.78	21.75
2750	22.12	22.09	21.99	22.22	22.17	22.15	22.11	21.96	22.16	22.09
2800	22.77	22.75	22.70	22.99	22.93	22.72	22.67	22.51	22.78	22.75
2850	23.54	23.54	23.48	23.87	23.80	23.61	23.55	23.36	23.68	23.62
2900	24.33	24.34	24.30	24.72	24.68	24.35	24.37	24.08	24.49	24.38
2950	25.34	25.33	25.28	25.81	25.76	25.45	25.34	25.12	25.48	25.45
3000	26.43	26.41	26.40	26.91	26.83	26.37	26.37	26.10	26.50	26.40
3050	28.14	28.19	28.00	28.53	28.50	27.75	27.73	27.43	27.70	27.60
3100	30.37	30.39	30.16	30.70	30.69	29.39	29.39	28.91	29.18	29.11
3150	33.92	34.12	33.70	34.43	34.31	31.96	31.92	31.18	31.13	30.96
3200	38.54	39.51	40.40	40.76	39.89	35.05	34.93	33.51	32.91	32.39
3300	37.00	37.52	37.50	35.77	35.07	35.37	34.50	31.90	30.63	30.13
3400	29.00	28.82	27.82	27.43	27.17	27.62	27.33	26.15	25.63	25.45
3500	23.76	23.69	23.17	23.12	23.00	22.92	22.82	22.29	22.16	22.09
3600	20.98	20.95	20.73	20.80	20.76	20.36	20.34	20.15	20.18	20.15
3700	19.67	19.67	19.50	19.68	19.68	19.19	19.20	19.11	19.20	19.20
3800	19.00	19.01	19.04	19.18	19.16	18.89	18.92	18.80	18.91	18.92
4000	18.98	19.06	19.09	19.01	19.02	19.02	18.99	18.86	18.81	18.77
4500	20.38	20.37	20.20	19.82	19.75	19.51	19.51	19.63	19.08	18.98
5000	21.28	21.29	21.17	20.68	20.61	20.80	20.77	20.71	20.04	19.93
5500	23.30	23.29	23.03	22.52	22.43	22.68	22.62	22.27	21.67	21.56
6000	25.76	25.69	24.92	24.33	24.33	24.28	24.16	23.46	22.85	22.81
6500	27.47	27.14	26.26	26.04	26.04	24.48	24.33	23.46	23.17	23.29
7000	27.97	27.60	26.56	26.16	26.23	25.36	25.20	24.19	24.42	24.71
7500	26.98	26.79	25.94	26.01	26.23	25.68	25.65	25.23	25.82	26.30
8000	27.85	27.66	27.08	27.15	27.33	27.82	27.63	27.02	27.29	27.40
8500	29.13	28.86	28.38	27.12	26.62	27.73	27.53	27.25	25.86	25.27
9000	23.21	23.24	23.20	22.03	21.57	21.23	21.23	21.43	20.34	19.81
9500	17.24	17.18	16.76	16.09	15.83	16.48	16.42	16.18	15.70	15.47
10000	11.16	11.18	11.27	11.62	11.79	11.83	11.89	11.97	12.66	12.95
11000	17.42	17.45	17.83	17.85	17.80	20.58	20.68	21.22	21.29	21.25
12000	18.36	18.19	17.72	16.98	16.67	19.94	19.81	19.99	18.50	17.99
13000	16.25	16.22	16.17	15.55	15.37	15.60	15.56	15.98	15.00	14.67
14000	15.05	15.12	15.25	15.13	15.23	14.33	14.35	14.48	14.14	14.16
15000	15.36	15.44	15.58	16.13	16.50	16.30	16.35	15.97	16.69	17.31
16000	17.08	17.19	17.96	18.46	18.64	20.39	20.50	21.08	22.22	22.48
17000	17.38	17.48	18.20	18.17	17.96	19.53	19.66	21.06	20.49	19.97
18000	12.97	12.90	12.60	12.31	12.21	16.28	16.28	15.38	15.39	15.49
19000	8.72	9.27	10.66	10.04	9.90	10.90	10.87	10.49	10.20	10.12
20000	7.07	7.07	7.07	6.85	6.83	6.88	6.91	7.07	6.80	6.68
21000	4.86	4.92	5.14	5.21	5.24	4.95	5.00	5.24	5.22	5.20
22000	3.78	3.85	4.14	4.36	4.44	4.20	4.27	4.42	4.68	4.80
23000	3.06	3.15	3.48	3.77	3.89	3.55	3.62	3.89	4.18	4.30
24000	2.54	2.63	3.03	3.39	3.56	2.64	2.73	3.12	3.35	3.45
25000	2.15	2.25	2.72	3.10	3.26	2.32	2.42	2.81	3.15	3.32

Typical Performance Curves

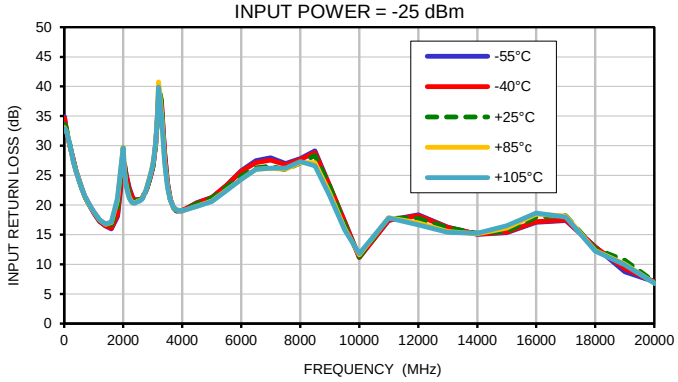
INSERTION LOSS vs. TEMPERATURE (Full Band)
INPUT POWER = -25 dBm



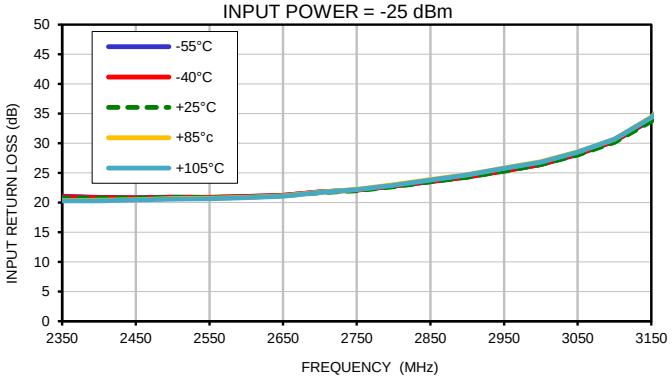
INSERTION LOSS vs. TEMPERATURE (Pass band)
INPUT POWER = -25 dBm



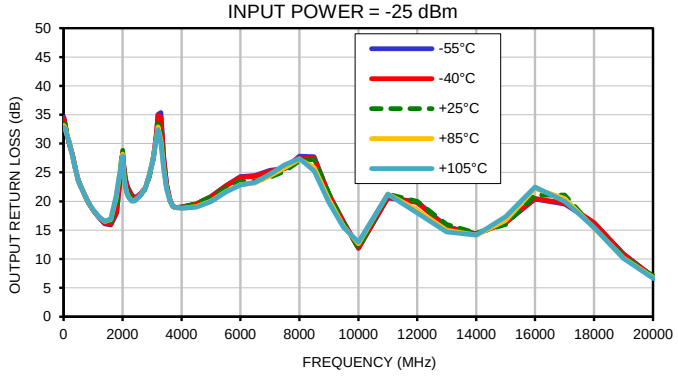
INPUT RETURN LOSS vs. TEMPERATURE (Full band)
INPUT POWER = -25 dBm



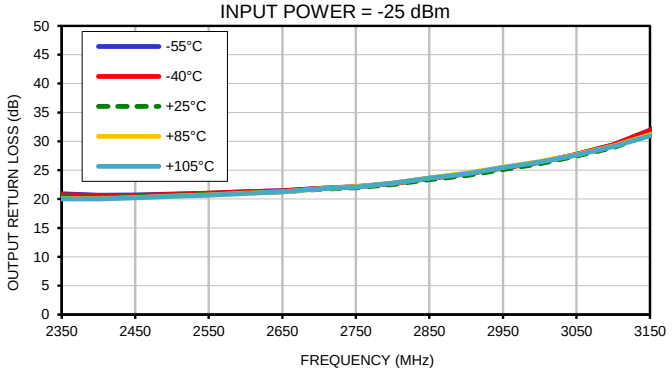
INPUT RETURN LOSS vs. TEMPERATURE (Pass band)
INPUT POWER = -25 dBm



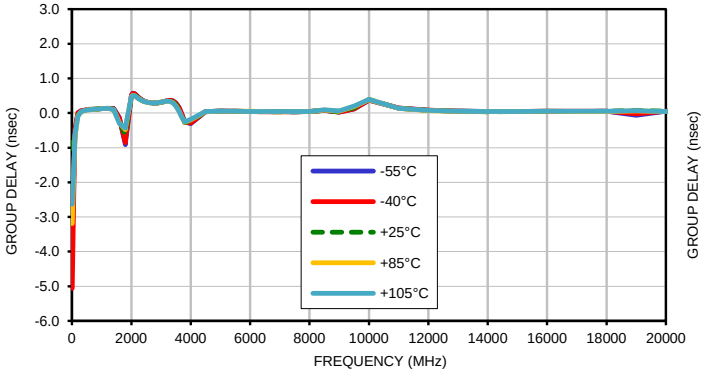
OUTPUT RETURN LOSS vs. TEMPERATURE (Full band)
INPUT POWER = -25 dBm



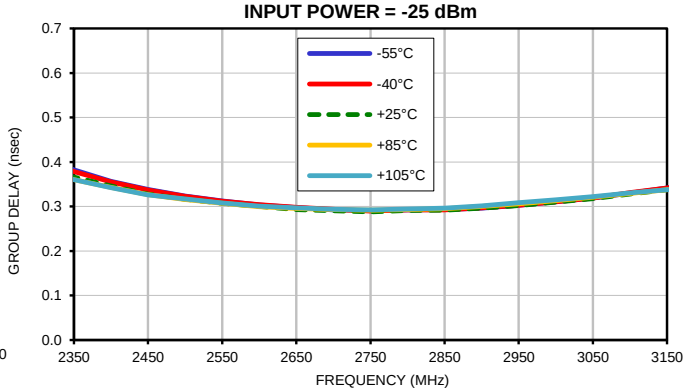
OUTPUT RETURN LOSS vs. TEMPERATURE (Pass band)
INPUT POWER = -25 dBm



GROUP DELAY vs. TEMPERATURE (Full band)
INPUT POWER = -25 dBm



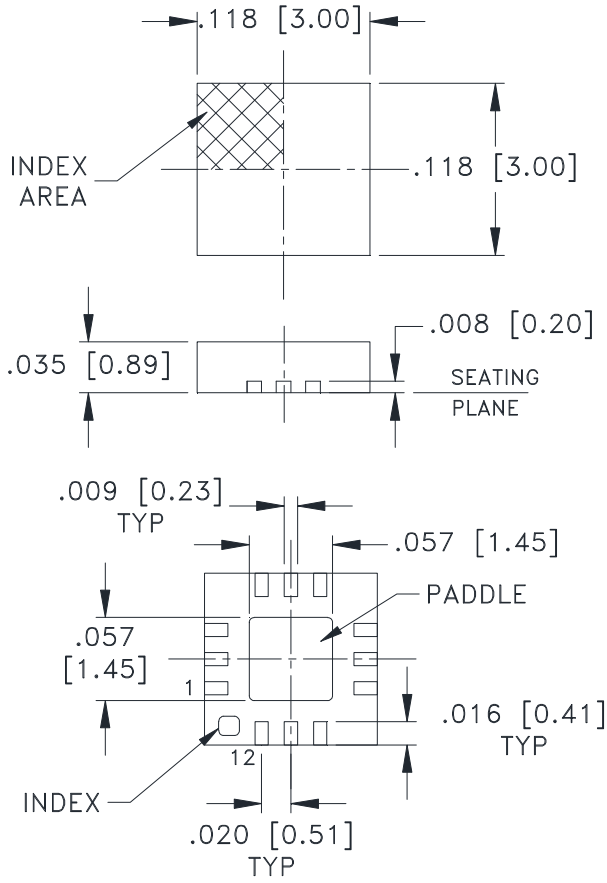
GROUP DELAY vs. TEMPERATURE (Pass band)
INPUT POWER = -25 dBm

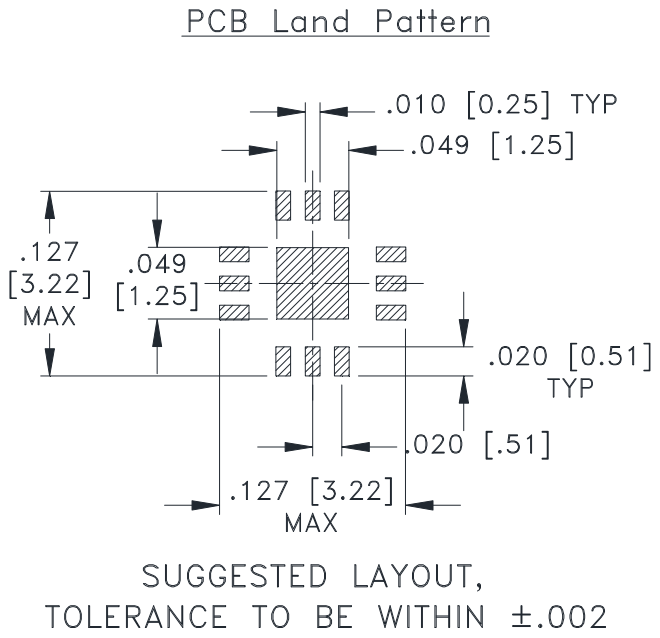


Case Style DQ

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.

Mini-Circuits®
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P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
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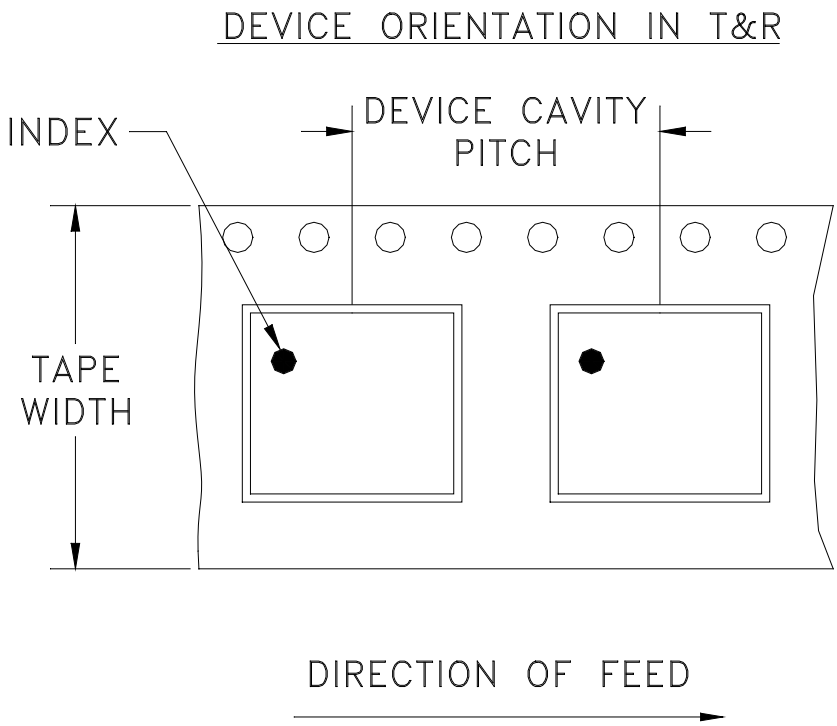
Tape & Reel Packaging TR-F66



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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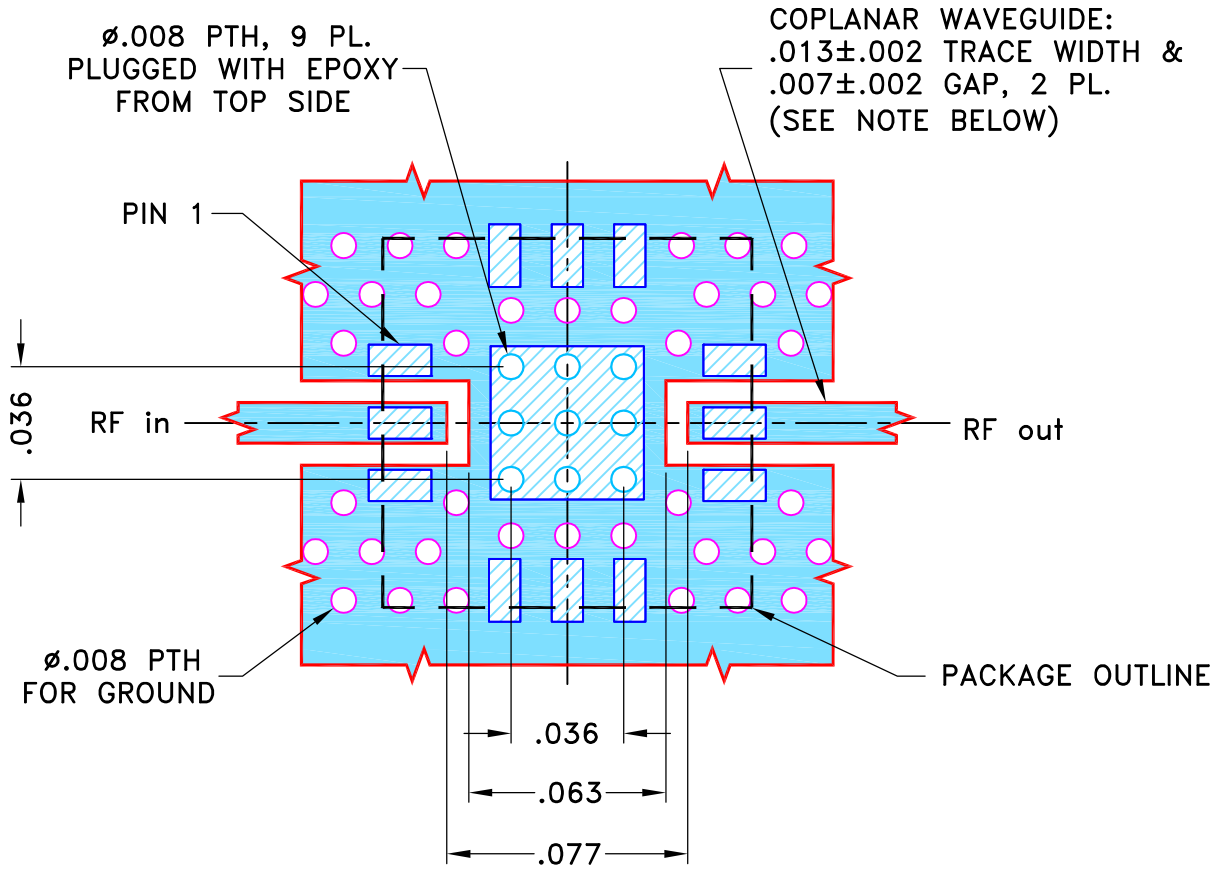
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M152656	NEW RELEASE	09/11/15	ITG	MY

SUGGESTED MOUNTING CONFIGURATION
FOR DQ1225 CASE STYLE, "12FL02" PIN CODE



NOTES:

1. TRACE WIDTH PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .0066"±.0007". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP 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 SOLDER MASK.

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	ITG	09/10/15
TOLERANCES ON:	CHECKED	GF	09/11/15
2 PL DECIMALS ±	APPROVED	MY	09/11/15
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

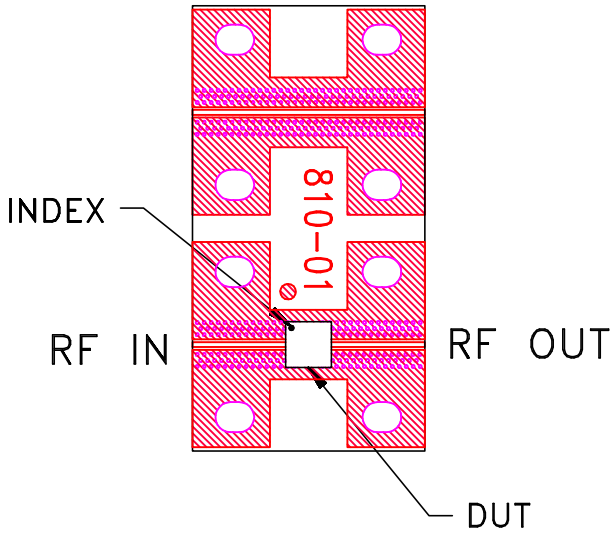
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 12FL02, DQ1225, TB-844+

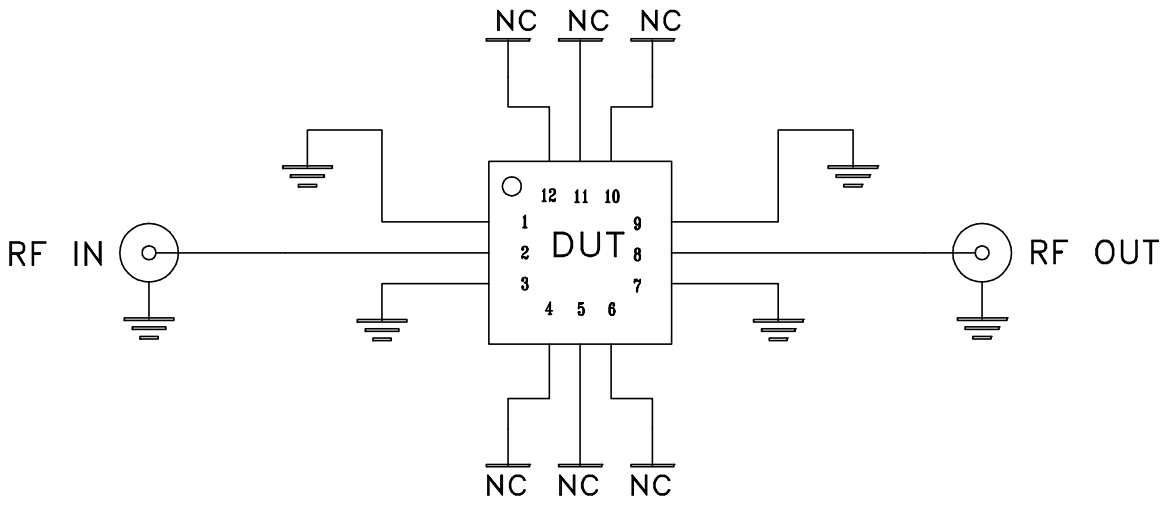
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-451	OR
FILE: 98PL451	SCALE: 16:1	SHEET: 1 OF 1	

Evaluation Board and Circuit

To be used with Mini-Circuits 50 Ohm 2.92 connectors B20-118-F1+.
Connectors are sold separately.



TB-844-282B+



Schematic Diagram

Note:

PCB Material: RO4350 or equivalent,
Dielectric Constant=3.5, Thickness=.0066 inch.

Mini-Circuits®

Mini-Circuits

Environmental Specifications ENV82

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 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-020C
Solderability	10X magnification, 95% coverage	JESD22-B102, Method 1: Dip and Look Test
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