MMIC REFLECTIONLESS

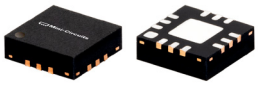
Low Pass Filter

XLF-63+

50Ω DC to 6000 MHz

THE BIG DEAL

- Match to 50Ω in the stop band, eliminates undesired reflections
- Cascadable
- Excellent Power handling
- Temperature sData, 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

- Harmonics Rejection
- Satellite
- Radar
- Military & Space

GENERAL DESCRIPTION

Mini-Circuits' XLF-63+ 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
Reflectionless Technology	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.
50Ω Match in Stopband	Reflectionless filters maintain good impedance matching in the stopband, allowing for integration with high gain, wideband amplifiers without the risk of creating out-of-band instabilities.
Excellent RF Performance Repeatability	Fabricated on a GaAs process, X-series filters are inherently repeaData for large-volume production.
Excellent Stability over temperature	With ±0.3 dB variation over temperature, is ideal for use in wide temperature range applications without the need for additional temperature compensation.
Excellent Power Handling in a Compact Package	High power handling extends the usability of these filters to the transmit path for inter-stage filtering.

REV. B
ECO-020994
XLF-63+
MCL NY
240226

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50Ω DC to 6000 MHz

ELECTRICAL SPECIFICATIONS[1] AT +25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	DC - F1	DC - 6000	—	1.3	1.6	dB
	Frequency Cut-off	F2	8100	—	3.0	—	dB
	VSWR	DC - F1	DC - 6000	—	1.3	—	:1
Stop Band	Rejection	F3 - F5	9600 - 17800	12	15	—	dB
	VSWR	F3 - F5	9600 - 17800	—	1.5	—	:1

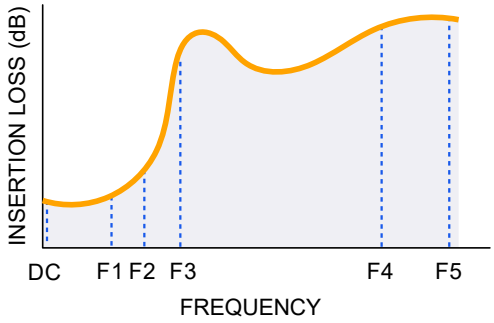
1. Measured on Mini-Circuits Characterization Test Board TB-844-63+

ABSOLUTE MAXIMUM RATINGS[2]

Parameter	Ratings
Operating Temperature	-55°C to +105°C
Storage Temperature	-65°C to +150°C
RF Power Input, Passband (DC-F1)[3]	2 W at +25°C
RF Power Input, Stopband (F2-F5)[4]	150 mW at +25°C

2. Permanent damage may occur if any of these limits are exceeded.
3. Passband rating derates linearly to 1 W at 105°C ambient
4. Stopband rating derates linearly to 75 mW at 105°C ambient

SPECIFICATION DEFINITION



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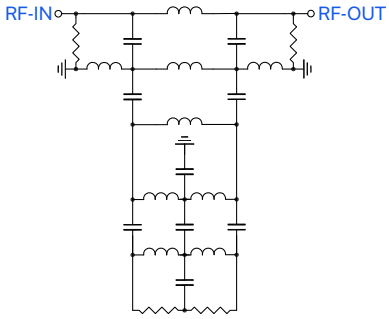
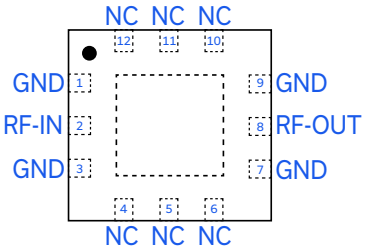
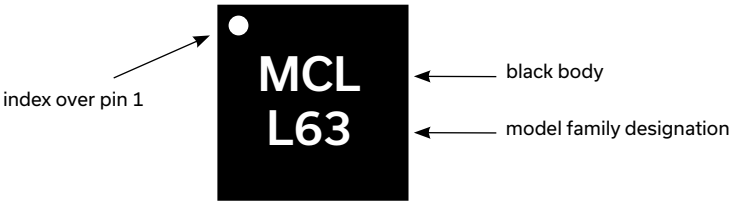
SIMPLIFIED SCHEMATIC AND PAD DESCRIPTION





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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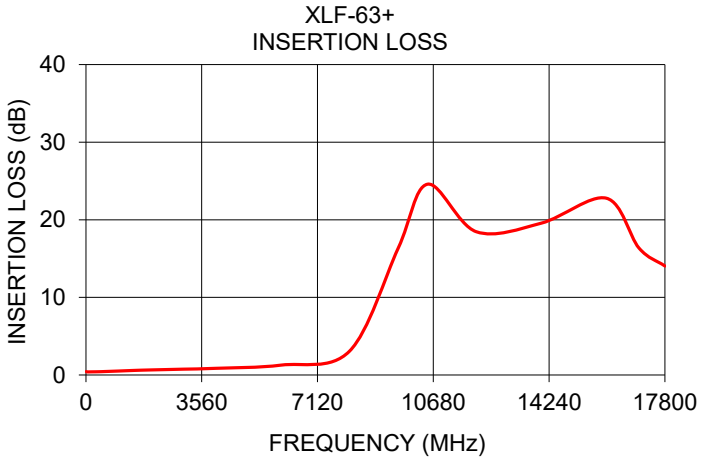
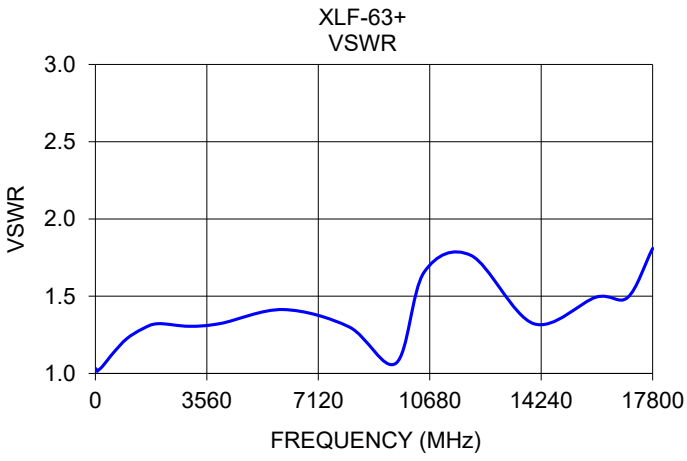
TYPICAL PERFORMANCE DATA AT +25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
10	0.44	1.03
50	0.41	1.01
100	0.41	1.02
200	0.41	1.04
400	0.43	1.09
600	0.46	1.14
1000	0.52	1.22
1500	0.60	1.29
2000	0.66	1.32
3000	0.76	1.31
4000	0.87	1.32
6000	1.28	1.41
8100	3.06	1.30
9600	16.34	1.07
10500	24.58	1.66
12000	18.46	1.76
14000	19.57	1.32
16000	22.78	1.49
17000	16.37	1.49
17800	14.04	1.81





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

Performance Data & Graphs	Data Graphs S-Parameter (S2P 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, 3000 devices
Suggested Layout for PCB Design	PL-451
Evaluation Board	TB-844-63+ (without connectors) TB-844-63C+ (with connectors) B20-118-F1+ Connector sold separately
Environmental Ratings	ENV82

ESD RATING

Human body model (HBM): Class 1A (250 to <500V) in accordance with ANSI/ESD 5.1-2001

MSL RATING

Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-STD-020D

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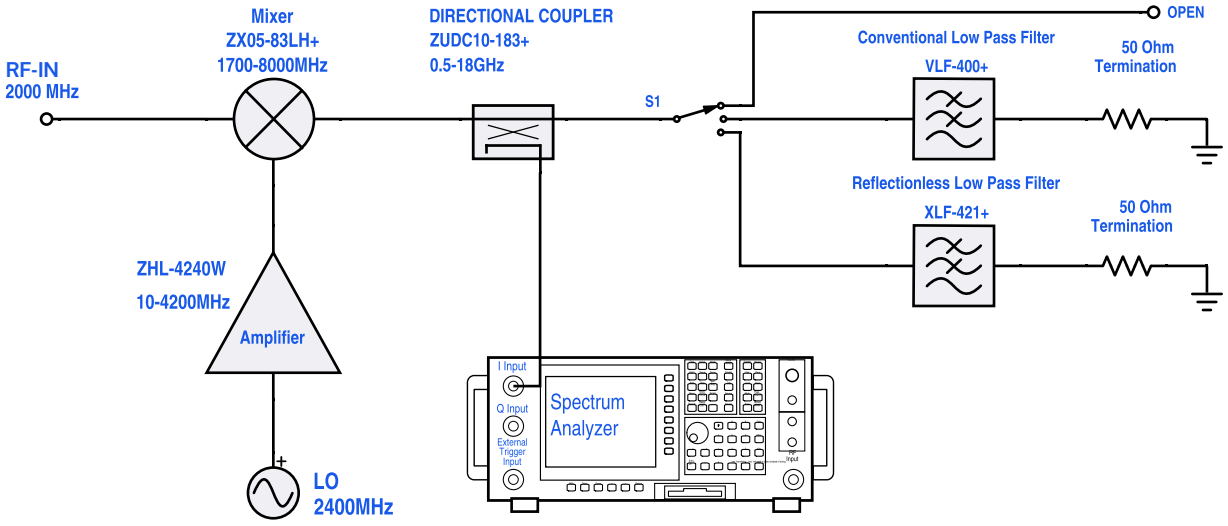
REFLECTIONLESS FILTER APPLICATION NOTE

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



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

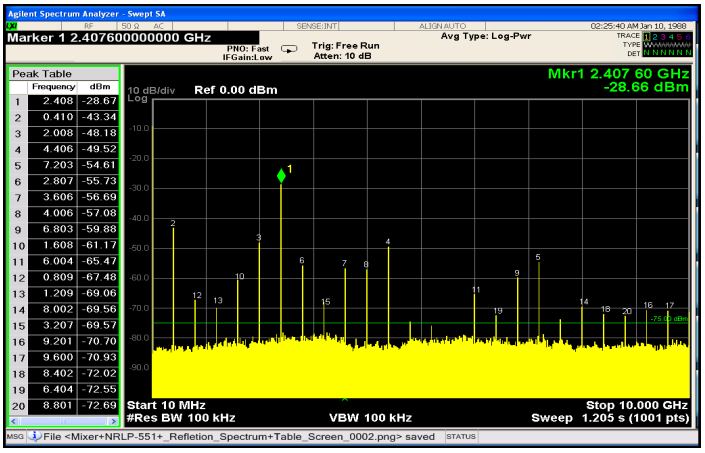


Figure 1. IF output reflection spectrum without filter

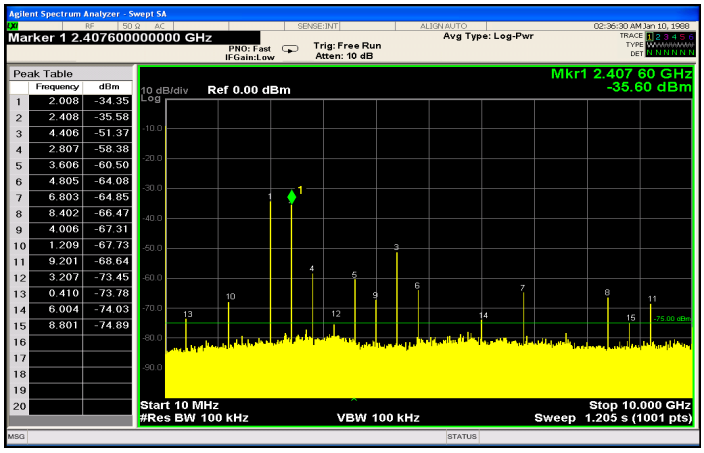
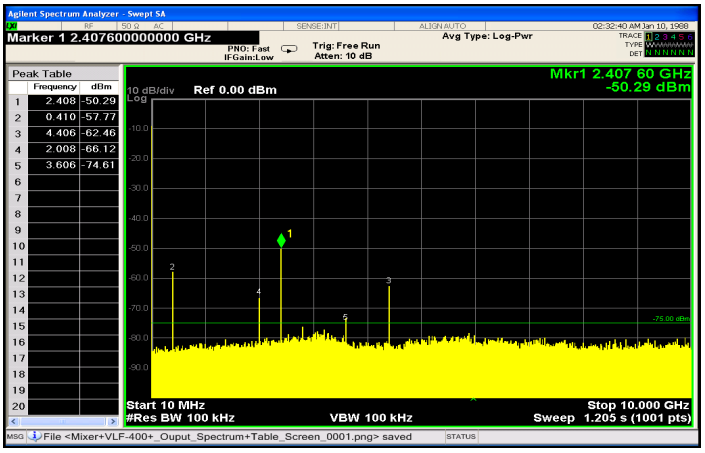


Figure 2. IF output reflection spectrum with conventional filter



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/MCLStore/terms.jsp

Typical Performance Data

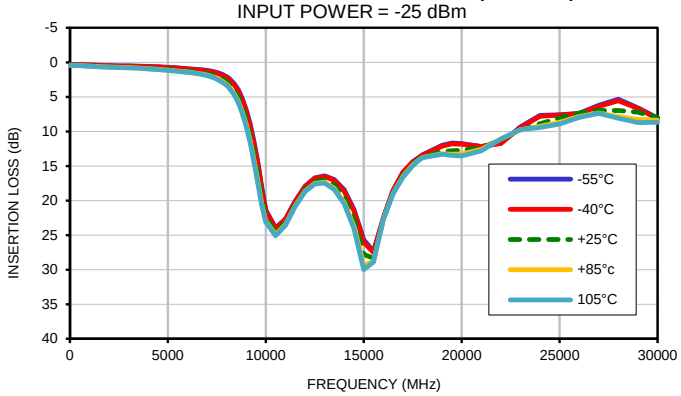
FREQ.	INSERTION LOSS					GROUP DELAY				
(MHz)	(dB)					(nsec)				
	@-55°C	@-40°C	@+25°C	@+85°C	@+105°C	@-55°C	@-40°C	@+25°C	@+85°C	@+105°C
10	0.39	0.41	0.42	0.45	0.46	0.10	0.16	0.12	0.14	0.12
50	0.35	0.35	0.40	0.42	0.43	0.08	0.10	0.08	0.09	0.08
100	0.35	0.35	0.41	0.43	0.44	0.06	0.06	0.06	0.06	0.06
200	0.34	0.35	0.41	0.44	0.45	0.06	0.06	0.05	0.06	0.06
300	0.34	0.36	0.43	0.44	0.46	0.06	0.06	0.06	0.05	0.06
400	0.33	0.35	0.41	0.46	0.46	0.06	0.06	0.05	0.05	0.05
500	0.34	0.36	0.44	0.47	0.48	0.06	0.06	0.05	0.05	0.05
600	0.34	0.36	0.45	0.48	0.50	0.06	0.06	0.05	0.05	0.05
700	0.36	0.38	0.47	0.51	0.52	0.06	0.06	0.05	0.05	0.05
800	0.36	0.38	0.48	0.51	0.54	0.06	0.06	0.05	0.05	0.05
900	0.37	0.39	0.50	0.53	0.55	0.06	0.05	0.05	0.05	0.05
1000	0.37	0.39	0.51	0.54	0.56	0.06	0.06	0.05	0.05	0.05
1200	0.40	0.42	0.54	0.58	0.60	0.05	0.05	0.05	0.05	0.05
1400	0.42	0.45	0.57	0.61	0.63	0.05	0.05	0.05	0.05	0.05
1600	0.44	0.47	0.60	0.64	0.66	0.05	0.05	0.05	0.05	0.05
1800	0.45	0.48	0.62	0.67	0.68	0.06	0.06	0.05	0.05	0.05
2000	0.47	0.50	0.64	0.68	0.70	0.05	0.05	0.05	0.05	0.05
2500	0.51	0.54	0.70	0.73	0.76	0.06	0.06	0.05	0.05	0.05
3000	0.52	0.56	0.73	0.77	0.80	0.06	0.06	0.05	0.05	0.05
3500	0.55	0.58	0.78	0.83	0.87	0.06	0.06	0.05	0.05	0.05
4000	0.58	0.63	0.84	0.92	0.96	0.06	0.06	0.06	0.06	0.06
4500	0.64	0.68	0.94	1.02	1.07	0.06	0.06	0.06	0.06	0.06
5000	0.72	0.77	1.03	1.14	1.20	0.07	0.07	0.06	0.06	0.06
5500	0.81	0.86	1.14	1.26	1.32	0.07	0.07	0.07	0.07	0.07
6000	0.91	0.97	1.26	1.40	1.45	0.08	0.08	0.08	0.08	0.07
6200	0.96	1.03	1.32	1.46	1.52	0.08	0.08	0.08	0.08	0.08
6400	1.01	1.08	1.39	1.54	1.60	0.09	0.09	0.08	0.08	0.08
6600	1.08	1.15	1.47	1.63	1.69	0.09	0.09	0.09	0.09	0.09
6800	1.11	1.19	1.54	1.73	1.80	0.10	0.10	0.09	0.09	0.09
7000	1.18	1.26	1.65	1.86	1.95	0.10	0.10	0.10	0.10	0.10
7200	1.27	1.36	1.77	2.01	2.11	0.11	0.11	0.11	0.11	0.11
7400	1.39	1.49	1.94	2.21	2.32	0.12	0.12	0.12	0.12	0.12
7600	1.55	1.66	2.16	2.46	2.58	0.13	0.13	0.13	0.13	0.13
7800	1.78	1.89	2.43	2.78	2.92	0.14	0.14	0.14	0.14	0.14
8000	2.08	2.20	2.80	3.21	3.37	0.16	0.16	0.15	0.15	0.15
8100	2.28	2.41	3.05	3.47	3.64	0.16	0.16	0.16	0.16	0.16
8200	2.51	2.65	3.32	3.79	3.96	0.17	0.17	0.17	0.17	0.17
8400	3.13	3.29	4.04	4.58	4.78	0.19	0.19	0.18	0.18	0.18
8600	4.00	4.19	5.04	5.68	5.90	0.20	0.20	0.20	0.19	0.19
8800	5.24	5.45	6.41	7.14	7.40	0.21	0.21	0.20	0.20	0.19
9000	6.88	7.12	8.19	9.02	9.32	0.21	0.21	0.20	0.19	0.19
9200	8.95	9.23	10.42	11.36	11.69	0.21	0.20	0.19	0.18	0.17
9400	11.53	11.83	13.14	14.16	14.52	0.19	0.19	0.17	0.15	0.14
9600	14.63	14.94	16.32	17.36	17.69	0.15	0.14	0.11	0.09	0.09
9800	18.13	18.40	19.63	20.55	20.77	0.06	0.06	0.04	0.02	0.02
10000	21.38	21.58	22.43	22.95	23.15	-0.01	-0.02	0.00	0.02	0.03
10500	23.96	24.06	24.55	24.94	25.10	0.16	0.16	0.20	0.21	0.22
11000	22.69	22.78	23.23	23.49	23.58	0.25	0.26	0.25	0.25	0.24
11500	20.11	20.16	20.59	20.78	20.84	0.20	0.20	0.18	0.18	0.17
12000	17.93	17.99	18.42	18.65	18.71	0.17	0.16	0.14	0.14	0.14
12500	16.74	16.79	17.25	17.50	17.58	0.14	0.14	0.13	0.12	0.12
13000	16.43	16.52	17.01	17.34	17.48	0.12	0.13	0.12	0.12	0.12
13500	16.97	17.12	17.78	18.26	18.42	0.14	0.13	0.12	0.11	0.12
14000	18.43	18.63	19.54	20.25	20.48	0.14	0.14	0.13	0.13	0.12
14500	21.29	21.49	22.72	23.74	24.06	0.18	0.17	0.17	0.16	0.17
15000	25.67	26.06	27.81	29.35	30.01	0.31	0.31	0.35	0.42	0.42
15500	27.37	27.52	28.33	28.80	28.91	0.43	0.43	0.41	0.37	0.39
16000	22.50	22.56	22.76	22.73	22.74	0.20	0.20	0.17	0.15	0.15
16500	18.50	18.54	18.89	18.98	19.01	0.13	0.13	0.12	0.11	0.11
17000	15.93	15.95	16.37	16.51	16.64	0.12	0.11	0.09	0.09	0.09
17500	14.39	14.44	14.71	14.85	14.97	0.09	0.09	0.08	0.08	0.08
17800	13.79	13.86	14.01	14.17	14.21	0.08	0.08	0.08	0.08	0.08
18000	13.38	13.45	13.66	13.78	13.82	0.07	0.07	0.08	0.08	0.08
19000	12.03	12.16	12.90	13.22	13.32	0.07	0.06	0.05	0.05	0.05
19500	11.68	11.81	12.82	13.29	13.49	0.06	0.06	0.04	0.03	0.03
20000	11.75	11.83	12.71	13.28	13.55	0.05	0.05	0.04	0.02	0.02
21000	12.19	12.16	12.36	12.58	12.80	0.03	0.03	0.01	0.02	0.01
22000	11.73	11.72	11.22	11.11	11.10	0.02	0.01	0.02	0.04	0.05
23000	9.33	9.45	9.83	9.78	9.72	0.06	0.05	0.04	0.05	0.06
24000	7.69	7.82	8.87	9.28	9.44	0.05	0.05	0.04	0.04	0.03
25000	7.60	7.63	8.04	8.68	8.94	0.05	0.05	0.04	0.04	0.04
26000	7.41	7.45	7.34	7.84	7.96	0.03	0.03	0.05	0.05	0.05
27000	6.23	6.39	6.99	7.33	7.39	0.06	0.06	0.05	0.06	0.07
28000	5.34	5.54	6.99	7.85	8.09	0.09	0.09	0.05	0.05	0.05
29000	6.61	6.69	7.24	8.24	8.74	0.05	0.05	0.05	0.04	0.03
30000	8.08	8.19	8.01	8.40	8.69	0.03	0.03	0.05	0.05	0.05

Typical Performance Data

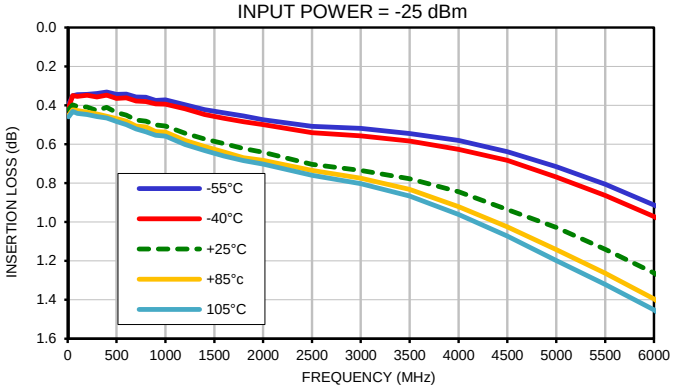
FREQ.	INPUT RETURN LOSS					OUTPUT RETURN LOSS				
(MHz)	(dB)					(dB)				
	@-55°C	@-40°C	@+25°C	@+85°C	@+105°C	@-55°C	@-40°C	@+25°C	@+85°C	@+105°C
10	33.75	33.74	35.42	37.12	37.00	38.59	39.01	42.70	48.03	47.18
50	37.05	37.85	42.75	47.46	52.69	36.13	36.87	40.06	42.05	41.74
100	35.37	35.70	38.89	41.10	42.07	36.44	36.70	38.74	38.84	38.78
200	35.25	34.96	34.15	33.62	33.46	34.06	34.03	33.49	32.36	31.82
300	30.54	30.38	30.06	30.18	30.12	30.88	30.66	30.55	30.15	29.99
400	27.92	27.87	27.13	27.29	27.16	28.02	27.72	27.34	26.93	26.85
500	26.00	25.87	25.25	25.15	25.01	26.27	26.09	25.66	25.21	25.03
600	24.60	24.54	23.72	23.81	23.78	24.81	24.72	24.02	23.77	23.71
700	23.37	23.21	22.43	22.44	22.35	23.42	23.29	22.60	22.31	22.27
800	22.11	22.04	21.38	21.27	21.18	22.16	22.05	21.44	21.18	21.05
900	21.23	21.17	20.64	20.57	20.57	21.21	21.16	20.62	20.47	20.45
1000	20.52	20.44	19.95	19.83	19.82	20.38	20.30	19.74	19.64	19.61
1200	19.29	19.22	18.94	18.75	18.74	19.12	19.08	18.62	18.58	18.60
1400	18.19	18.18	18.14	17.89	17.87	18.10	18.10	17.87	17.83	17.79
1600	17.67	17.71	17.80	17.61	17.59	17.50	17.53	17.50	17.48	17.48
1800	17.11	17.14	17.41	17.27	17.28	16.98	17.05	17.26	17.21	17.22
2000	16.75	16.81	17.13	17.16	17.18	16.71	16.77	17.22	17.19	17.20
2500	16.76	16.84	17.06	17.44	17.51	16.65	16.73	17.33	17.41	17.49
3000	17.19	17.26	17.57	17.80	17.86	17.02	17.10	17.51	17.79	17.91
3500	17.44	17.50	17.84	17.68	17.66	17.26	17.34	17.59	17.72	17.72
4000	17.24	17.29	17.11	16.79	16.66	17.06	17.11	17.16	16.76	16.63
4500	16.42	16.42	16.06	15.70	15.56	16.17	16.22	16.24	15.65	15.50
5000	15.46	15.48	15.37	15.10	14.97	15.12	15.20	15.39	15.06	14.90
5500	14.70	14.77	15.09	15.16	15.16	14.28	14.41	14.99	15.12	15.05
6000	14.48	14.57	15.33	15.86	16.05	14.02	14.19	15.39	15.95	16.13
6200	14.59	14.71	15.55	16.20	16.46	14.11	14.25	15.62	16.32	16.63
6400	14.86	14.98	15.87	16.56	16.83	14.44	14.60	15.99	16.80	17.13
6600	15.31	15.41	16.32	16.91	17.14	14.94	15.10	16.51	17.25	17.59
6800	16.15	16.19	16.75	17.14	17.30	15.48	15.56	16.71	17.29	17.49
7000	16.78	16.84	17.08	17.26	17.30	16.32	16.35	17.00	17.40	17.52
7200	17.33	17.33	17.30	17.35	17.31	16.85	16.82	17.00	17.21	17.17
7400	17.79	17.78	17.47	17.44	17.35	17.34	17.26	16.90	16.89	16.76
7600	17.65	17.67	17.54	17.47	17.36	17.71	17.62	16.93	16.74	16.58
7800	17.36	17.47	17.59	17.61	17.53	17.46	17.35	16.60	16.35	16.16
8000	16.96	17.13	17.61	17.78	17.76	17.42	17.34	16.56	16.26	16.02
8100	16.69	16.88	17.59	17.90	17.98	17.17	17.20	16.62	16.38	16.23
8200	16.56	16.76	17.66	18.08	18.22	16.75	16.80	16.49	16.32	16.20
8400	16.46	16.65	17.71	18.35	18.57	16.04	16.15	16.30	16.33	16.33
8600	16.35	16.55	17.56	18.29	18.56	15.66	15.83	16.44	16.59	16.59
8800	16.22	16.43	17.35	18.15	18.45	14.71	14.96	16.40	17.14	17.43
9000	16.42	16.63	17.42	18.40	18.79	14.48	14.79	17.01	18.37	19.02
9200	17.27	17.54	18.54	19.93	20.44	15.26	15.76	19.04	21.59	22.87
9400	19.54	19.97	21.72	23.70	24.51	17.72	18.41	23.38	28.76	32.10
9600	24.66	25.44	29.77	35.40	38.31	25.62	27.20	40.12	32.27	29.45
9800	27.22	27.31	26.82	25.45	24.93	28.54	27.43	23.90	21.81	21.13
10000	19.55	19.48	19.16	18.75	18.57	17.85	17.73	17.81	17.32	17.28
10500	12.08	12.10	12.16	12.20	12.22	10.59	10.71	11.87	12.48	12.81
11000	9.65	9.72	10.00	10.14	10.19	9.31	9.41	10.21	10.71	10.95
11500	9.29	9.40	9.89	10.15	10.24	10.03	10.16	10.32	10.48	10.51
12000	10.17	10.35	11.15	11.67	11.84	10.77	11.09	11.73	11.92	11.88
12500	12.13	12.41	13.65	14.81	15.25	11.17	11.67	13.93	14.95	15.11
13000	15.29	15.64	17.40	19.71	20.63	12.03	12.56	16.41	19.56	21.14
13500	17.96	18.24	19.50	20.48	20.69	14.92	15.23	17.42	18.76	19.18
14000	17.15	17.19	17.16	16.92	16.87	20.86	20.19	16.64	15.55	15.04
14500	15.02	15.05	14.99	14.72	14.63	16.73	16.92	15.89	14.75	14.16
15000	13.67	13.75	13.96	13.89	13.88	12.96	13.42	16.26	16.65	16.49
15500	13.06	13.18	13.59	13.74	13.82	12.18	12.62	16.56	19.54	21.22
16000	13.27	13.42	14.05	14.52	14.70	14.25	14.57	15.95	16.87	17.18
16500	13.57	13.73	14.49	15.33	15.62	17.25	17.22	14.41	13.21	12.66
17000	13.08	13.20	14.10	14.70	14.88	11.89	12.11	12.48	11.67	11.16
17500	11.58	11.65	12.21	12.50	12.54	8.16	8.37	10.48	10.93	10.90
17800	10.49	10.54	10.80	10.92	10.96	6.74	6.91	9.20	10.42	10.87
18000	9.70	9.72	9.87	9.86	9.88	6.59	6.72	8.68	9.94	10.58
19000	6.41	6.45	6.51	6.40	6.41	6.36	6.23	5.72	5.89	6.03
19500	5.36	5.44	5.60	5.64	5.69	5.92	5.84	4.82	4.62	4.56
20000	4.63	4.73	5.11	5.18	5.23	4.44	4.56	4.28	4.06	3.92
21000	4.12	4.21	5.18	4.90	4.99	2.55	2.82	4.39	4.61	4.47
22000	4.51	4.56	5.00	5.14	5.24	2.68	2.89	5.12	6.88	7.59
23000	5.10	5.19	5.64	6.06	6.25	5.35	5.40	6.15	7.55	8.55
24000	5.50	5.60	6.30	7.30	7.56	8.25	8.45	6.45	5.78	5.62
25000	6.57	6.64	6.74	7.33	7.20	4.54	4.99	7.01	6.40	5.88
26000	6.43	6.57	7.23	7.24	6.81	3.47	3.79	7.78	9.44	9.28
27000	6.77	6.87	7.63	7.81	7.95	6.12	6.15	7.78	9.94	11.44
28000	8.82	8.65	7.50	7.59	7.81	12.06	11.60	6.56	5.39	5.13
29000	6.37	6.41	6.38	6.05	5.80	3.78	4.01	5.42	4.49	4.00
30000	3.88	3.96	4.71	4.78	4.72	1.94	2.02	4.37	5.56	5.42

Typical Performance Curves

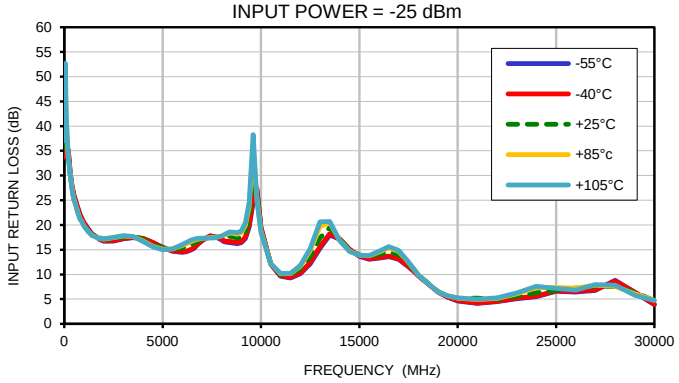
INSERTION LOSS vs. TEMPERATURE (Full band)
INPUT POWER = -25 dBm



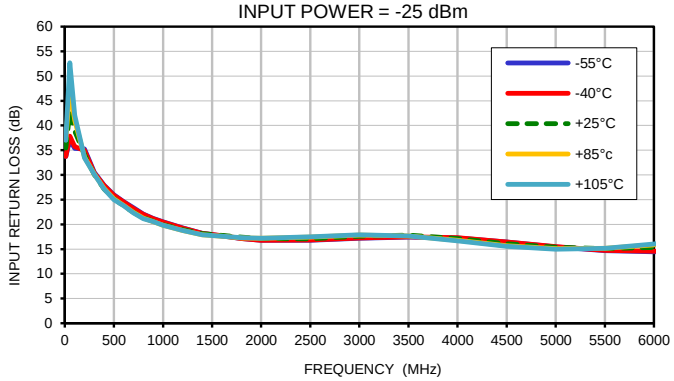
INSERTION LOSS vs. TEMPERATURE (Pass band)
INPUT POWER = -25 dBm



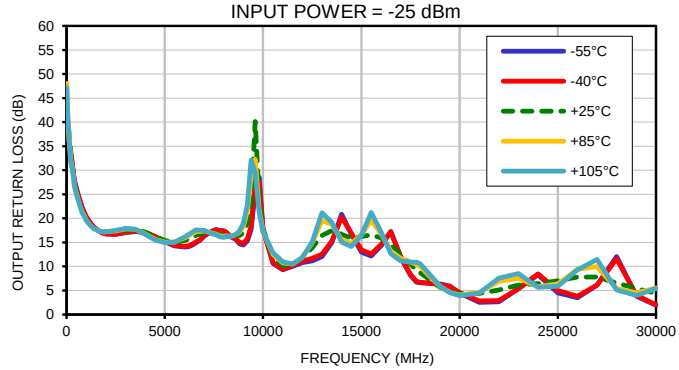
INPUT RETURN LOSS vs. TEMPERATURE (Full band)
INPUT POWER = -25 dBm



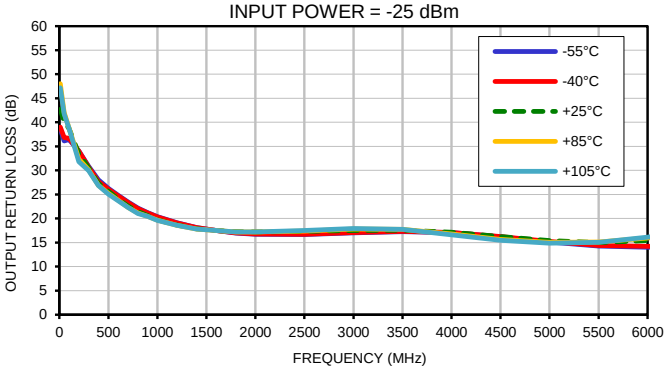
INPUT RETURN LOSS vs. TEMPERATURE (Pass band)
INPUT POWER = -25 dBm



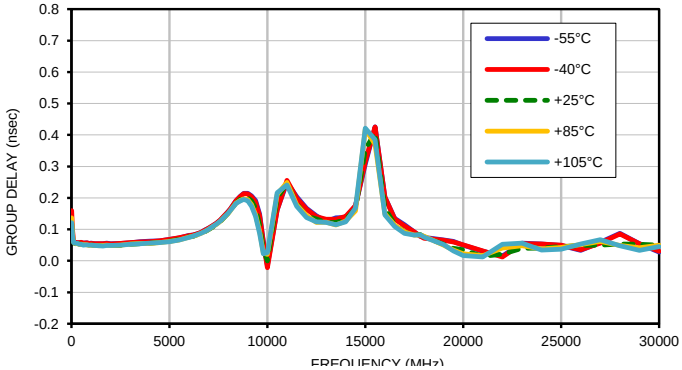
OUTPUT RETURN LOSS vs. TEMPERATURE (Full band)
INPUT POWER = -25 dBm



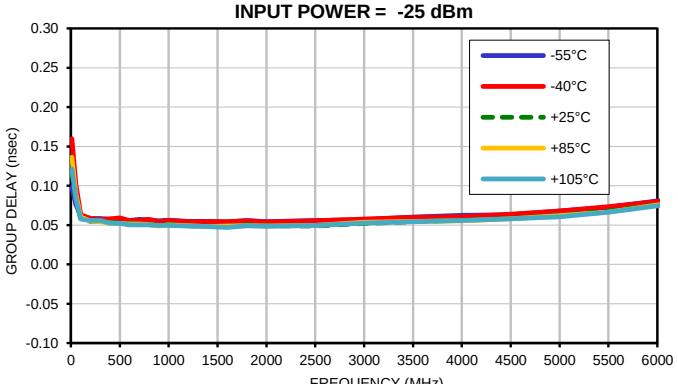
OUTPUT RETURN LOSS vs. TEMPERATURE (Pass band)
INPUT POWER = -25 dBm



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



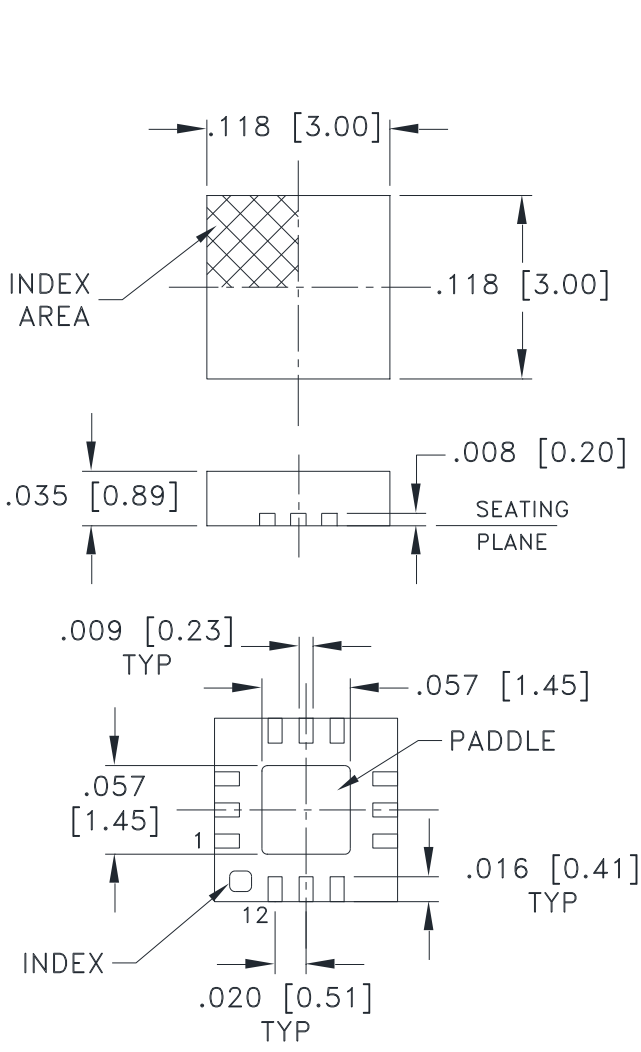
GROUP DELAY vs. TEMPERATURE (Passband)
INPUT POWER = -25 dBm



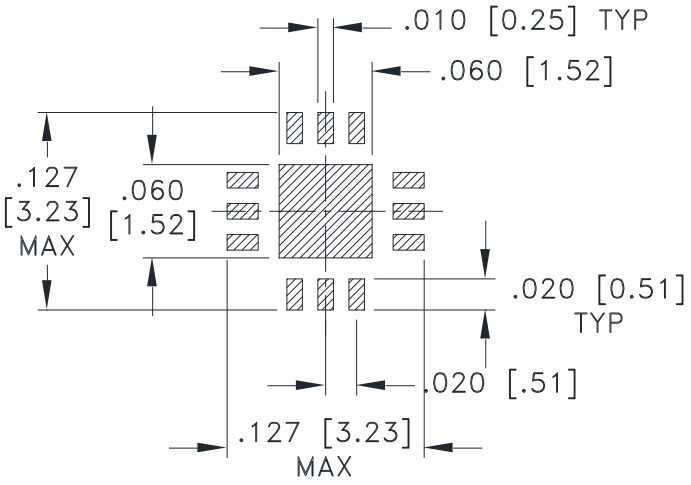
Case Style DQ

DQ1225

Outline Dimensions



PCB Land Pattern



SUGGESTED LAYOUT,
TOLERANCE TO BE WITHIN ±.002

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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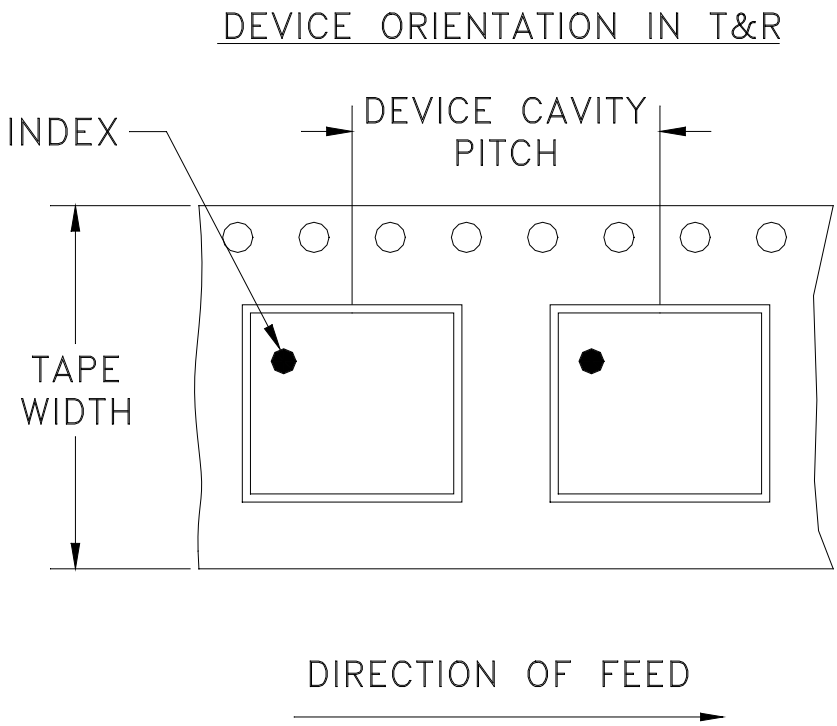
Tape & Reel Packaging TR-F66



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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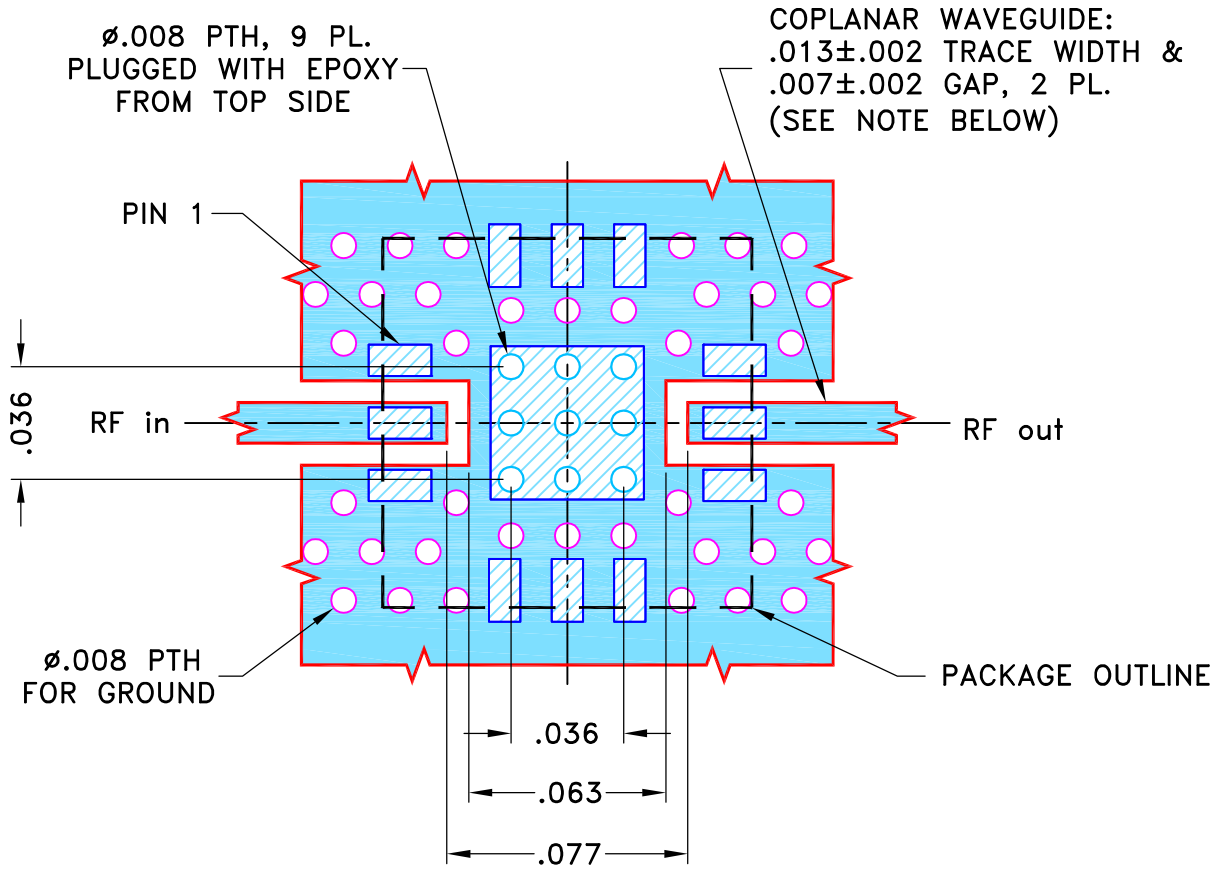
THIRD ANGLE PROJECTION

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

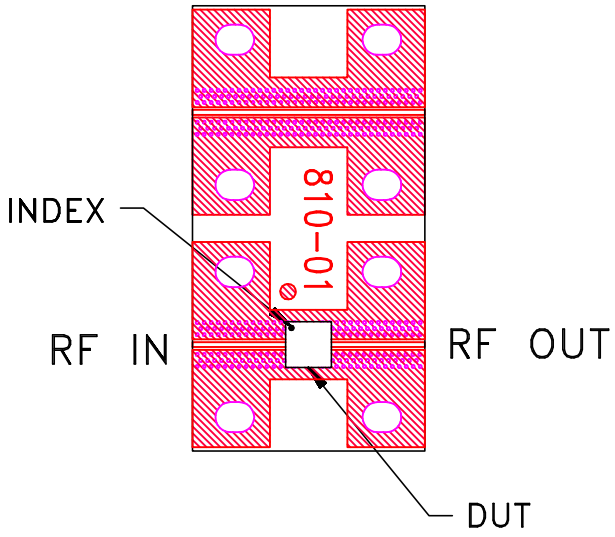
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 12FL02, DQ1225, TB-844+

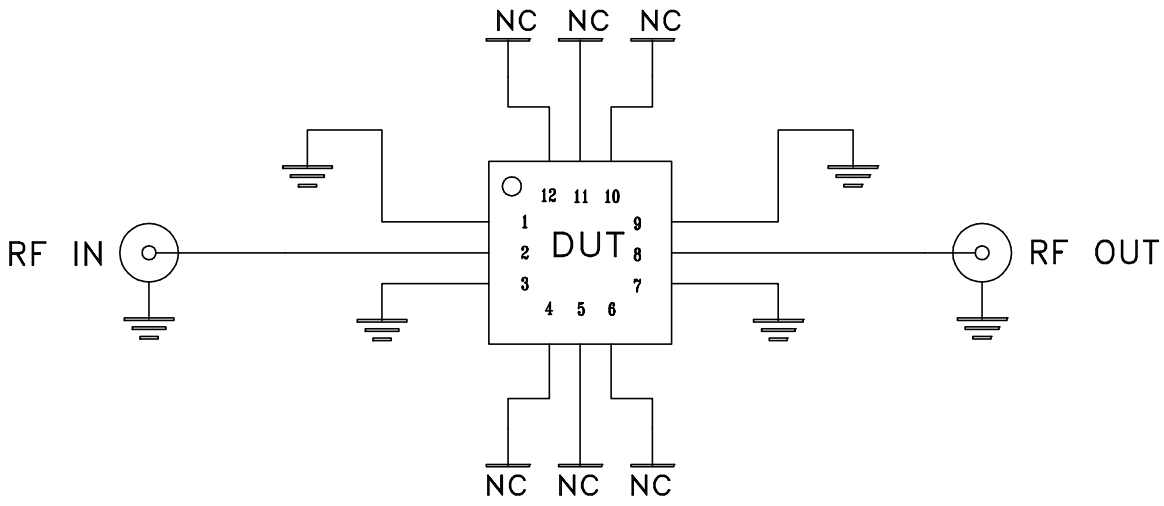
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-451	OR
FILE: 98PL451	SCALE: 16:1	SHEET: 1 OF 1	

Evaluation Board and Circuit

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



TB-844-63+



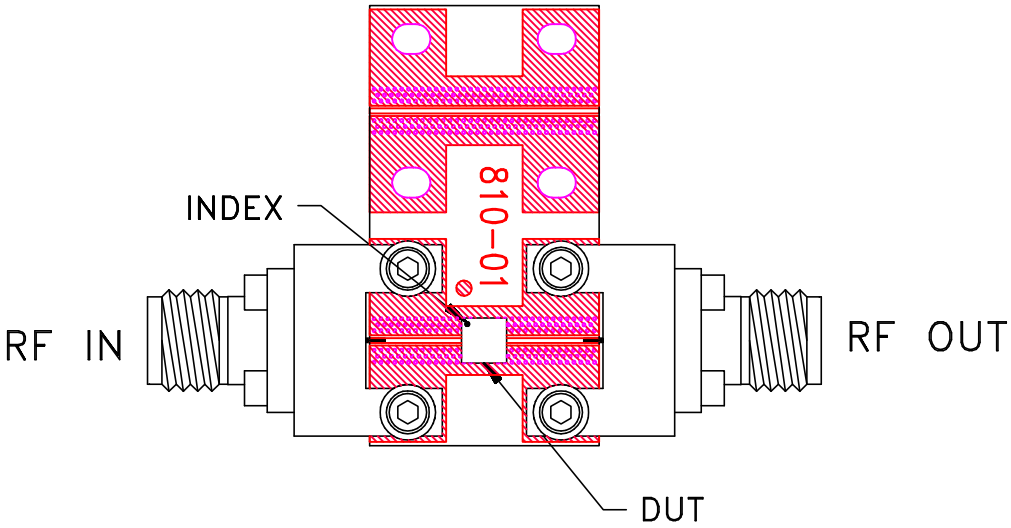
Schematic Diagram

Note:

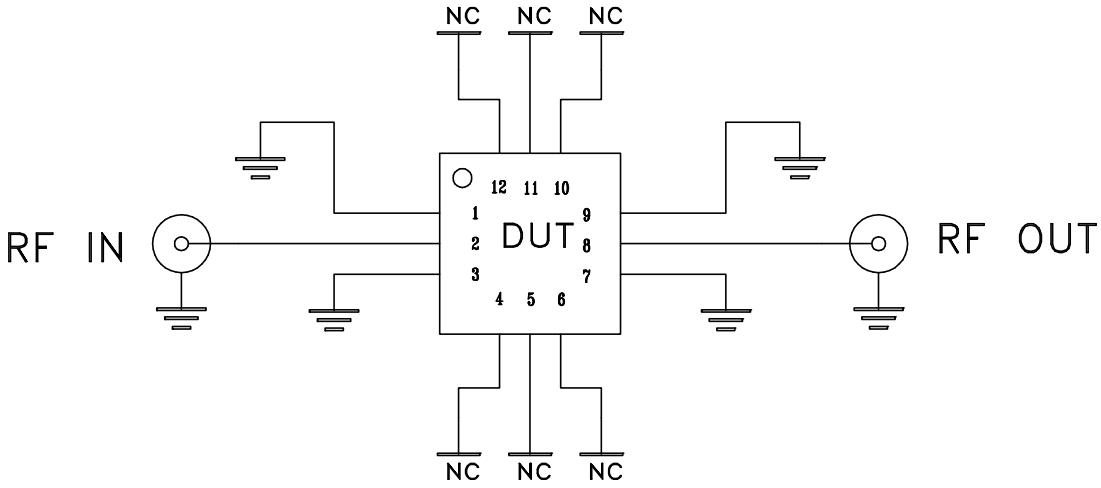
PCB Material: RO4350 or equivalent,
Dielectric Constant=3.5, Thickness=.0066 inch.

Mini-Circuits®

Evaluation Board and Circuit



TB-844-63C+



Schematic Diagram

Notes:

1. 50 Ohm 2.92 mm Female connectors.
2. 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