



## MMIC REFLECTIONLESS

# Low Pass Filter

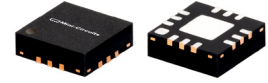
## XLF-982+

Mini-Circuits

50Ω DC to 9800 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
- Wideband Matching
- Transmitters / Receivers

### GENERAL DESCRIPTION

Mini-Circuits' XLF-982+ 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. C  
 ECO-021040  
 XLF-133+  
 MCL NY  
 240229





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

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	DC - F1	—	1.4	1.8	dB
	Frequency Cut-off	F2	—	3.0	—	dB
	VSWR	DC - F1	—	1.2	—	:1
Stop Band	Rejection	F3 - F4	12	15	—	dB
		F4 - F5	15	20	—	dB
	VSWR	F3 - F4	—	3.4	—	:1
		F4 - F5	—	3.0	—	:1

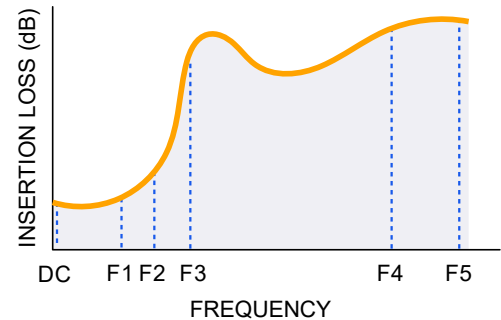
1. Measured on Mini-Circuits Characterization Test Board TB-844-982+

### ABSOLUTE MAXIMUM RATINGS<sup>2</sup>

Parameter	Ratings
Operating Temperature	-55°C to +105°C
Storage Temperature	-65°C to +150°C
RF Power Input, Passband (DC-F1) <sup>3</sup>	2 W at +25°C
RF Power Input, Stopband (F2-F5) <sup>4</sup>	0.2 W at +25°C

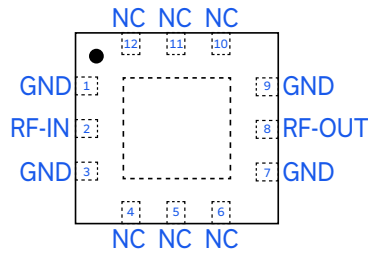
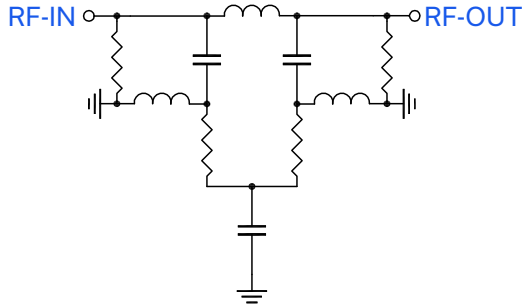
- 2. Permanent damage may occur if any of these limits are exceeded.
- 3. Passband rating derates linearly to 1 W at 105°C ambient
- 4. Stopband rating derates linearly to 0.1 W at 105°C ambient

### SPECIFICATION DEFINITION



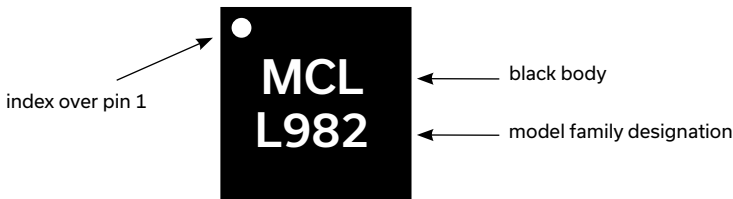


### SIMPLIFIED SCHEMATIC AND PAD DESCRIPTION



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

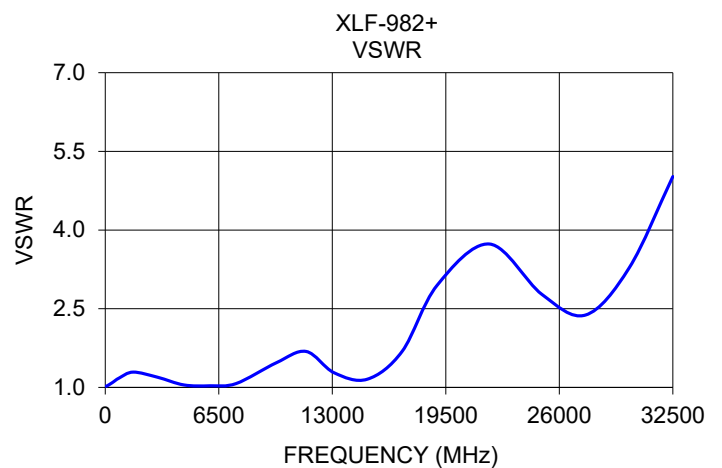
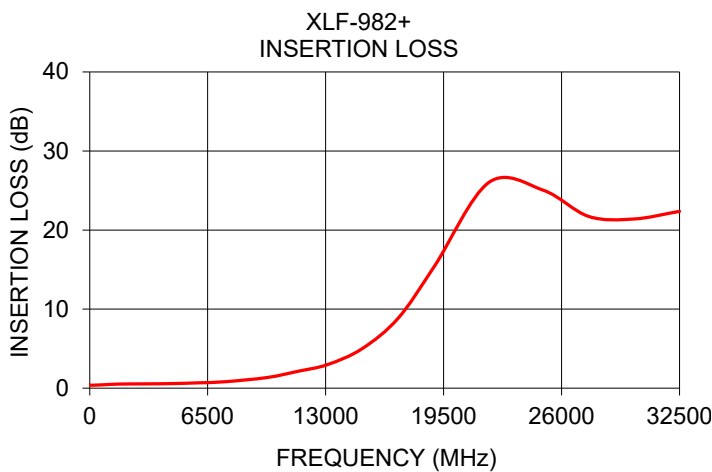


Marking may contain other features or characters for internal lot control



### TYPICAL PERFORMANCE DATA AT +25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
10	0.41	1.02
100	0.38	1.03
400	0.40	1.09
800	0.44	1.18
1600	0.52	1.29
3000	0.55	1.19
4500	0.58	1.05
6000	0.68	1.03
7500	0.83	1.08
9800	1.36	1.47
11500	2.15	1.69
13100	2.98	1.28
15000	4.98	1.16
17000	8.87	1.69
19000	15.45	2.95
22000	26.04	3.73
25000	25.03	2.77
27500	21.72	2.38
30000	21.40	3.28
32500	22.37	5.02





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# Low Pass Filter

## XLF-982+

Mini-Circuits

50Ω DC to 9800 MHz

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-844-982+ (without connectors) TB-844-982C+ (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

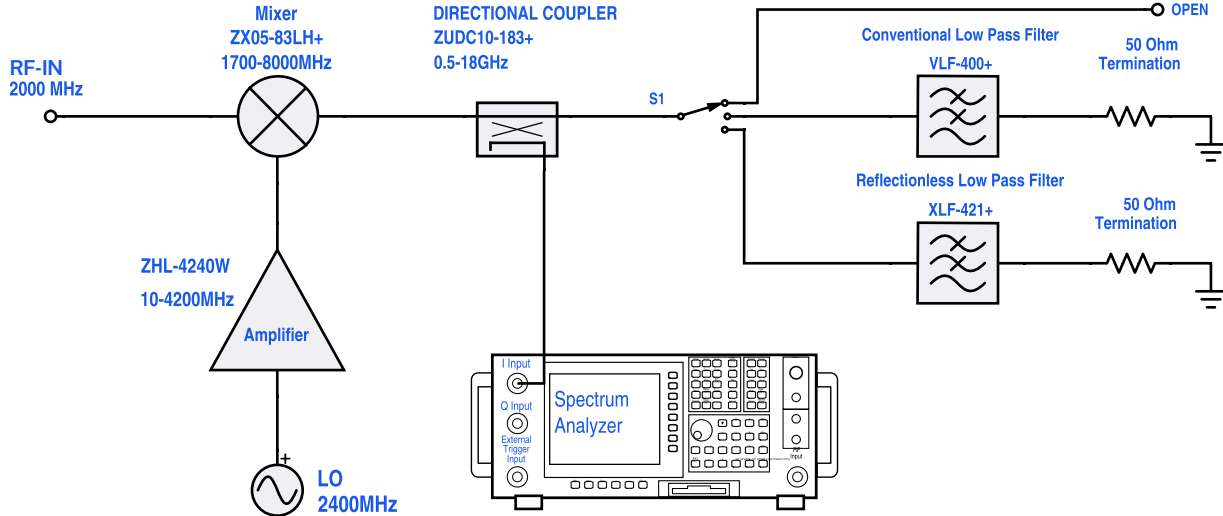
Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-STD-020D





### 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

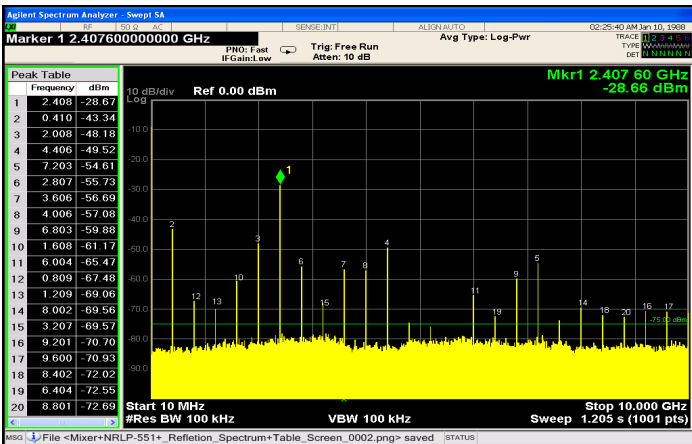


Figure 1. IF output reflection spectrum without filter

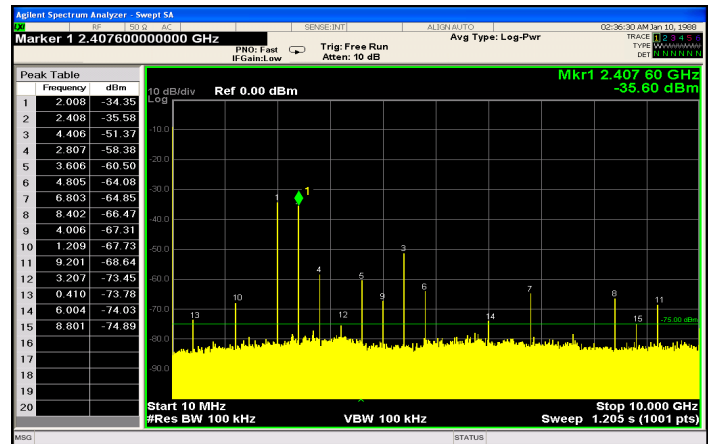
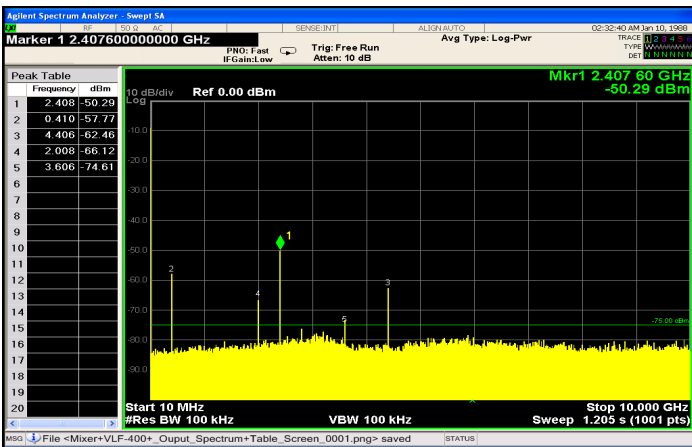


Figure 2. IF output reflection spectrum with conventional filter



#### 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](http://www.minicircuits.com/MCLStore/terms.jsp)



Typical Performance Data

FREQ.  (MHz)	INSERTION LOSS					GROUP DELAY				
	(dB)					(nsec)				
	@-55°C	@-40°C	@+25°C	@+85°C	@+105°C	@-55°C	@-40°C	@+25°C	@+85°C	@+105°C
10	0.38	0.38	0.42	0.42	0.42	0.10	0.09	0.09	0.08	0.07
50	0.33	0.35	0.37	0.39	0.40	0.07	0.07	0.07	0.07	0.06
100	0.33	0.35	0.38	0.40	0.42	0.05	0.05	0.05	0.05	0.06
200	0.33	0.35	0.38	0.41	0.42	0.05	0.04	0.04	0.05	0.05
300	0.34	0.35	0.40	0.43	0.44	0.04	0.04	0.04	0.05	0.05
400	0.34	0.35	0.40	0.44	0.45	0.04	0.04	0.04	0.05	0.05
500	0.34	0.35	0.41	0.45	0.46	0.04	0.04	0.04	0.05	0.05
600	0.34	0.36	0.42	0.46	0.47	0.04	0.04	0.04	0.05	0.05
700	0.34	0.35	0.42	0.46	0.48	0.04	0.04	0.04	0.04	0.05
800	0.35	0.36	0.43	0.47	0.49	0.04	0.04	0.04	0.04	0.05
900	0.35	0.37	0.43	0.48	0.49	0.04	0.04	0.04	0.05	0.05
1000	0.36	0.38	0.45	0.49	0.51	0.04	0.04	0.04	0.04	0.04
1200	0.37	0.39	0.46	0.51	0.53	0.04	0.04	0.04	0.04	0.04
1400	0.37	0.40	0.48	0.53	0.55	0.04	0.04	0.04	0.04	0.04
1600	0.39	0.42	0.50	0.55	0.57	0.04	0.04	0.04	0.04	0.04
1800	0.41	0.43	0.51	0.56	0.59	0.04	0.04	0.04	0.04	0.04
2000	0.41	0.44	0.52	0.57	0.59	0.04	0.04	0.04	0.04	0.04
2500	0.41	0.44	0.53	0.59	0.61	0.04	0.04	0.04	0.04	0.04
3000	0.42	0.45	0.55	0.61	0.63	0.04	0.04	0.04	0.04	0.04
3500	0.43	0.46	0.57	0.63	0.66	0.04	0.04	0.04	0.04	0.04
4000	0.44	0.48	0.59	0.67	0.71	0.04	0.04	0.04	0.04	0.05
4500	0.46	0.50	0.62	0.72	0.76	0.04	0.04	0.04	0.04	0.04
5000	0.49	0.53	0.67	0.77	0.81	0.04	0.04	0.04	0.04	0.04
5500	0.50	0.55	0.69	0.79	0.84	0.04	0.04	0.04	0.04	0.04
6000	0.51	0.56	0.72	0.82	0.87	0.04	0.04	0.04	0.04	0.05
6500	0.53	0.57	0.74	0.86	0.91	0.05	0.05	0.04	0.04	0.05
7000	0.54	0.59	0.77	0.90	0.95	0.05	0.05	0.04	0.05	0.05
7500	0.58	0.63	0.82	0.96	1.01	0.05	0.05	0.04	0.05	0.05
8000	0.62	0.68	0.88	1.02	1.08	0.05	0.05	0.04	0.05	0.05
9000	0.78	0.84	1.06	1.22	1.29	0.05	0.05	0.05	0.05	0.05
9800	1.00	1.07	1.33	1.51	1.58	0.05	0.05	0.05	0.05	0.05
10000	1.07	1.15	1.42	1.60	1.67	0.05	0.05	0.05	0.05	0.05
10200	1.15	1.22	1.50	1.69	1.76	0.05	0.05	0.05	0.05	0.05
10400	1.23	1.30	1.60	1.79	1.86	0.05	0.05	0.05	0.05	0.05
10600	1.31	1.39	1.69	1.89	1.97	0.05	0.05	0.05	0.05	0.05
10800	1.40	1.48	1.78	1.99	2.07	0.05	0.05	0.05	0.05	0.05
11000	1.48	1.57	1.87	2.09	2.17	0.05	0.05	0.05	0.05	0.05
11200	1.57	1.66	1.96	2.19	2.27	0.05	0.05	0.05	0.05	0.05
11400	1.67	1.75	2.05	2.28	2.37	0.05	0.05	0.05	0.05	0.05
11600	1.75	1.84	2.14	2.37	2.46	0.05	0.05	0.05	0.05	0.05
11800	1.84	1.92	2.22	2.47	2.55	0.05	0.05	0.05	0.05	0.06
12000	1.94	2.02	2.32	2.57	2.66	0.05	0.05	0.05	0.05	0.05
12200	2.04	2.13	2.42	2.67	2.76	0.05	0.05	0.05	0.05	0.06
12400	2.15	2.24	2.54	2.79	2.88	0.05	0.05	0.05	0.05	0.06
12600	2.27	2.35	2.65	2.91	3.00	0.05	0.05	0.05	0.06	0.06
12800	2.38	2.46	2.78	3.04	3.13	0.06	0.06	0.05	0.06	0.06
13000	2.50	2.59	2.92	3.18	3.27	0.06	0.06	0.05	0.06	0.06
13100	2.57	2.66	2.99	3.26	3.35	0.06	0.06	0.05	0.06	0.06
13500	2.87	2.96	3.33	3.60	3.69	0.06	0.06	0.06	0.06	0.06
14000	3.32	3.43	3.82	4.10	4.20	0.06	0.06	0.06	0.06	0.06
15000	4.47	4.59	5.03	5.35	5.47	0.06	0.06	0.06	0.06	0.06
16000	5.98	6.11	6.58	6.97	7.11	0.06	0.06	0.06	0.06	0.06
17000	7.96	8.09	8.64	9.07	9.23	0.06	0.06	0.06	0.06	0.06
18000	10.61	10.76	11.43	11.92	12.07	0.05	0.05	0.05	0.05	0.05
19000	14.09	14.26	14.94	15.47	15.64	0.04	0.04	0.03	0.03	0.03
20000	18.00	18.15	18.73	19.24	19.43	0.01	0.01	0.01	0.01	0.01
21000	21.78	21.91	22.54	22.93	23.01	0.00	-0.01	-0.01	-0.02	-0.01
22000	25.13	25.22	25.51	25.63	25.63	-0.03	-0.04	-0.04	-0.03	-0.02
23000	26.93	26.93	26.93	26.73	26.67	-0.04	-0.04	-0.03	-0.04	-0.03
24000	26.62	26.58	26.38	26.07	25.98	-0.04	-0.02	-0.02	-0.02	-0.02
25000	24.98	24.94	24.88	24.67	24.63	-0.01	0.00	0.00	0.00	0.01
26000	23.09	23.13	23.28	23.29	23.26	0.02	0.02	0.01	0.02	0.02
27000	21.54	21.64	21.89	22.11	22.16	0.03	0.03	0.03	0.04	0.04
28000	20.64	20.71	20.98	21.23	21.29	0.04	0.03	0.05	0.04	0.04
29000	20.21	20.33	20.73	20.91	20.96	0.04	0.04	0.04	0.04	0.05
30000	20.27	20.36	20.99	21.15	21.04	0.04	0.04	0.02	0.04	0.05
31000	20.60	20.74	21.38	21.48	21.43	0.05	0.04	0.04	0.03	0.05
32000	21.24	21.42	21.84	22.02	22.15	0.03	0.02	0.02	0.03	0.03
32500	21.66	21.73	22.10	22.43	22.51	0.03	0.02	0.03	0.03	0.02
33000	21.85	21.96	22.35	22.69	22.78	0.02	0.03	0.01	0.02	0.03
34000	21.95	22.08	22.47	22.79	22.80	0.02	0.02	0.01	0.02	0.01
35000	21.52	21.71	22.32	22.48	22.47	0.01	0.01	0.01	0.02	0.03
36000	21.03	21.13	21.91	21.83	21.71	0.05	0.05	0.02	0.04	0.06
37000	20.89	21.08	21.39	21.40	21.42	0.04	0.01	0.03	0.03	0.03
38000	19.69	19.76	20.01	20.00	20.01	0.04	0.04	0.03	0.06	0.05
39000	17.44	17.66	18.05	18.11	18.16	0.07	0.07	0.05	0.06	0.07
40000	16.63	16.87	17.32	17.63	17.76	0.09	0.06	0.05	0.07	0.01



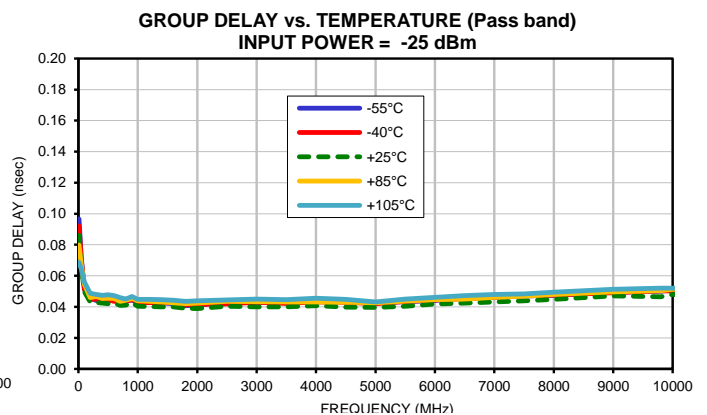
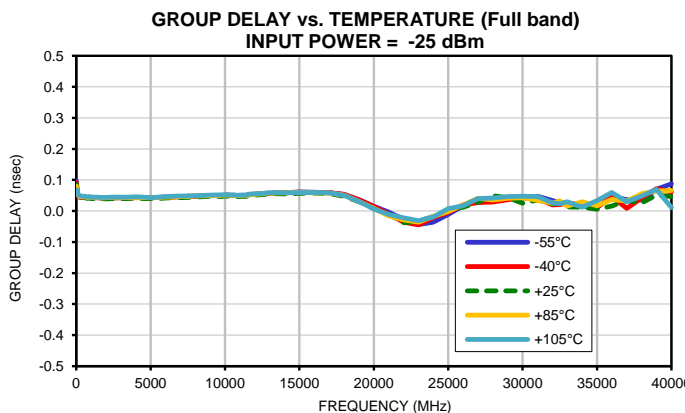
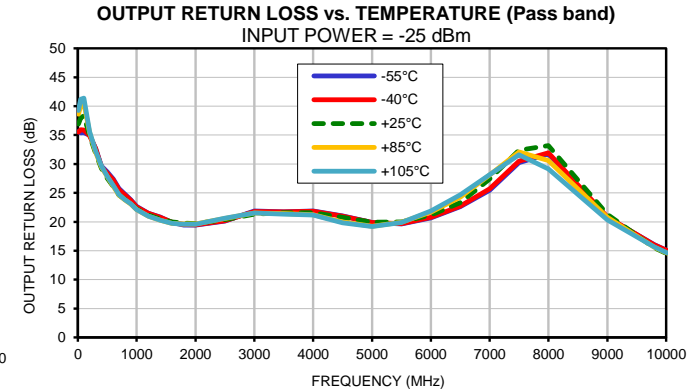
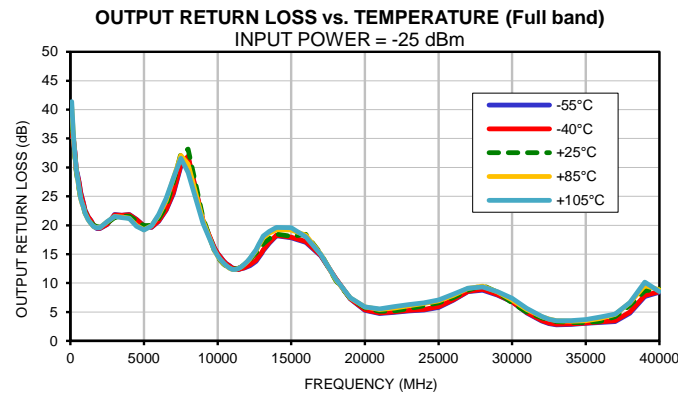
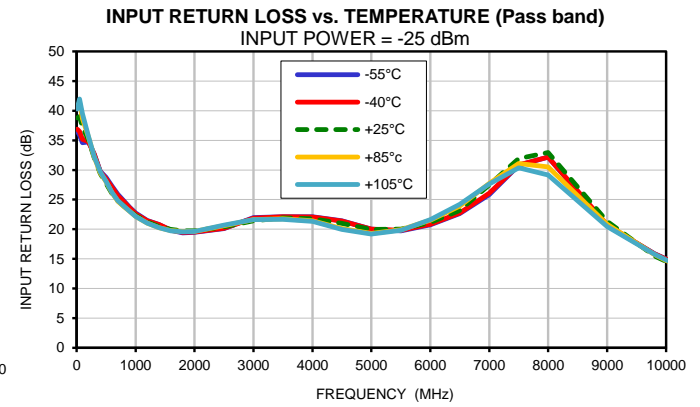
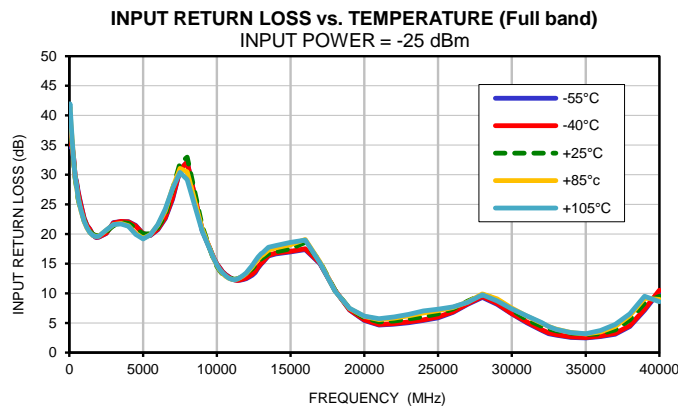
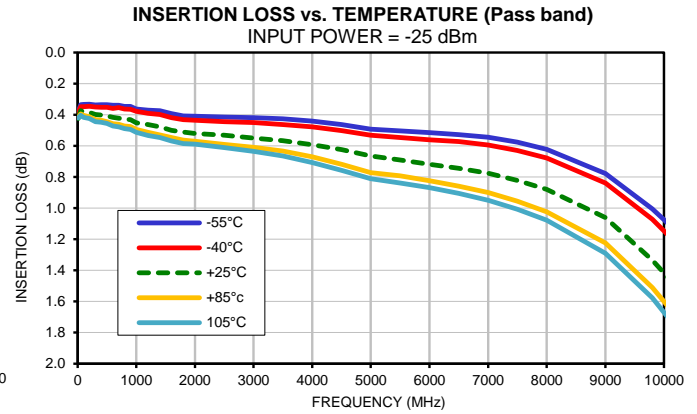
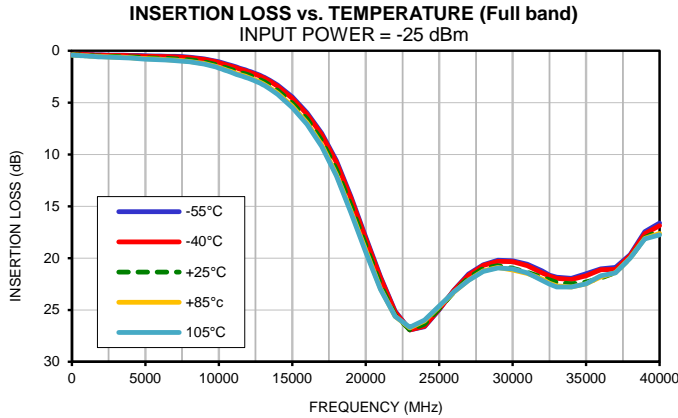
Typical Performance Data

FREQ.  (MHz)	INPUT RETURN LOSS					OUTPUT RETURN LOSS				
	(dB)					(dB)				
	@-55°C	@-40°C	@+25°C	@+85°C	@+105°C	@-55°C	@-40°C	@+25°C	@+85°C	@+105°C
10	36.59	36.89	38.76	40.54	40.30	35.61	35.50	36.94	38.63	39.25
50	35.88	36.50	39.01	41.44	41.97	35.36	35.93	37.97	40.03	41.19
100	34.60	35.19	37.24	38.68	39.52	35.41	35.86	38.33	40.50	41.38
200	34.72	34.79	35.06	35.57	35.64	34.98	34.87	34.86	35.42	35.56
300	32.69	32.67	32.08	32.21	32.24	32.68	32.65	31.83	32.02	32.24
400	29.76	29.70	29.39	29.52	29.68	29.65	29.49	29.22	29.51	29.63
500	28.77	28.53	27.72	28.02	28.09	28.62	28.40	27.55	27.85	27.89
600	27.27	27.08	25.99	26.15	26.21	27.42	27.25	26.09	26.18	26.29
700	25.89	25.66	24.78	24.75	24.84	25.77	25.54	24.63	24.63	24.72
800	24.79	24.63	23.91	23.79	23.89	24.77	24.61	23.84	23.75	23.83
900	23.72	23.63	23.12	23.02	23.02	23.79	23.70	23.19	23.08	23.09
1000	22.72	22.60	22.28	22.15	22.16	22.68	22.56	22.23	22.13	22.13
1200	21.47	21.44	21.22	21.04	21.05	21.46	21.45	21.18	20.99	20.99
1400	20.81	20.80	20.47	20.26	20.25	20.80	20.78	20.47	20.29	20.29
1600	19.82	19.85	19.97	19.76	19.73	19.88	19.92	19.95	19.74	19.73
1800	19.41	19.48	19.75	19.61	19.58	19.44	19.51	19.79	19.64	19.60
2000	19.46	19.52	19.72	19.65	19.62	19.44	19.50	19.66	19.61	19.60
2500	20.12	20.15	20.40	20.63	20.69	20.11	20.15	20.37	20.59	20.63
3000	21.95	21.87	21.41	21.62	21.63	21.85	21.78	21.32	21.52	21.51
3500	22.11	22.11	21.92	21.77	21.69	21.70	21.73	21.55	21.40	21.32
4000	22.09	22.06	21.77	21.41	21.33	21.87	21.81	21.57	21.25	21.15
4500	21.45	21.36	21.00	20.13	19.97	21.03	20.98	20.76	19.97	19.83
5000	20.03	20.04	20.00	19.29	19.18	19.88	19.90	19.92	19.24	19.16
5500	19.74	19.81	20.03	19.92	19.85	19.62	19.68	19.98	19.91	19.86
6000	20.75	20.84	21.13	21.52	21.63	20.68	20.78	21.18	21.69	21.86
6500	22.63	22.75	23.17	23.89	24.22	22.60	22.72	23.30	24.66	24.66
7000	25.83	26.08	27.49	27.74	27.64	25.46	25.70	27.40	28.10	28.13
7500	30.80	30.85	31.94	31.08	30.39	30.24	30.49	32.38	32.07	31.57
8000	32.16	32.14	32.96	30.51	29.16	31.74	31.93	33.18	30.58	29.15
9000	20.59	20.74	21.34	20.85	20.46	20.70	20.84	21.29	20.77	20.32
9800	15.87	15.86	15.50	15.72	15.77	16.04	16.00	15.48	15.61	15.66
10000	14.97	14.95	14.56	14.73	14.81	15.11	15.08	14.56	14.64	14.71
10200	14.29	14.28	13.84	13.95	14.04	14.49	14.43	13.87	13.93	14.03
10400	13.65	13.61	13.22	13.34	13.44	13.87	13.81	13.29	13.38	13.48
10600	13.15	13.11	12.86	12.87	12.95	13.36	13.31	12.91	12.93	13.00
10800	12.80	12.76	12.58	12.54	12.58	12.98	12.94	12.59	12.57	12.60
11000	12.45	12.44	12.48	12.37	12.38	12.60	12.58	12.44	12.36	12.38
11200	12.29	12.30	12.38	12.29	12.29	12.49	12.49	12.44	12.36	12.37
11400	12.16	12.18	12.48	12.41	12.44	12.32	12.35	12.54	12.50	12.53
11600	12.22	12.26	12.65	12.68	12.72	12.48	12.53	12.80	12.78	12.80
11800	12.34	12.41	12.95	12.98	13.06	12.60	12.68	13.16	13.19	13.23
12000	12.46	12.59	13.25	13.33	13.42	12.81	12.93	13.59	13.64	13.69
12200	12.77	12.95	13.77	13.94	14.12	13.00	13.18	14.07	14.20	14.28
12400	13.07	13.25	14.12	14.46	14.71	13.35	13.55	14.67	14.89	15.00
12600	13.51	13.71	14.68	15.12	15.44	13.75	13.97	15.18	15.61	15.75
12800	14.25	14.41	15.13	15.72	16.10	14.45	14.66	15.85	16.52	16.72
13000	14.93	15.10	15.84	16.32	16.69	15.13	15.30	16.43	17.62	17.62
13100	15.17	15.31	15.97	16.48	16.86	15.57	15.76	16.77	17.81	18.12
13500	16.28	16.40	16.64	17.29	17.76	16.90	17.03	17.70	18.65	18.91
14000	16.67	16.78	16.98	17.67	18.07	18.19	18.27	18.46	19.23	19.62
15000	17.01	17.08	17.54	18.18	18.58	17.84	17.92	18.07	19.16	19.57
16000	17.36	17.54	18.59	19.08	18.96	17.02	17.20	18.44	18.26	17.99
17000	14.97	15.09	15.33	15.31	15.16	14.70	14.79	15.07	14.97	14.94
18000	10.53	10.55	10.51	10.42	10.38	10.83	10.84	10.51	10.65	10.74
19000	7.15	7.21	7.43	7.43	7.45	7.28	7.33	7.36	7.44	7.48
20000	5.44	5.53	5.84	6.08	6.15	5.29	5.38	5.74	5.87	5.90
21000	4.65	4.75	5.18	5.57	5.70	4.72	4.81	5.13	5.44	5.55
22000	4.80	4.89	5.32	5.79	6.00	4.93	5.02	5.21	5.69	5.92
23000	5.05	5.17	5.66	6.19	6.46	5.19	5.28	5.60	6.08	6.28
24000	5.41	5.54	6.08	6.70	7.01	5.31	5.45	6.10	6.47	6.57
25000	5.88	6.01	6.52	7.09	7.34	5.78	5.91	6.58	6.94	7.07
26000	6.77	6.88	7.38	7.62	7.71	7.01	7.11	7.50	7.88	8.06
27000	8.14	8.26	8.68	8.56	8.48	8.50	8.59	8.79	9.04	9.11
28000	9.32	9.46	9.82	9.91	9.73	8.74	8.90	9.61	9.46	9.31
29000	8.14	8.30	9.02	9.05	8.72	7.94	8.02	8.44	8.49	8.54
30000	6.52	6.61	7.24	7.51	7.35	6.75	6.77	6.59	7.07	7.36
31000	5.05	5.16	5.58	6.17	6.21	4.84	4.91	4.98	5.43	5.61
32000	3.77	3.89	4.45	5.01	5.07	3.41	3.53	3.98	4.20	4.23
32500	3.19	3.33	4.01	4.39	4.39	2.99	3.11	3.66	3.78	3.76
33000	2.92	3.04	3.69	3.94	3.94	2.77	2.87	3.35	3.47	3.51
34000	2.55	2.65	3.28	3.39	3.37	2.86	2.92	3.18	3.40	3.50
35000	2.47	2.54	3.07	3.14	3.18	3.03	3.07	3.15	3.49	3.68
36000	2.70	2.79	3.17	3.50	3.17	3.19	3.29	3.38	3.89	4.13
37000	3.11	3.24	3.82	4.42	4.74	3.35	3.50	4.19	4.57	4.63
38000	4.39	4.57	5.54	6.27	6.52	4.77	4.97	6.11	6.57	6.63
39000	7.12	7.33	8.36	9.14	9.49	7.68	7.86	8.66	9.59	10.18
40000	10.31	10.53	9.49	8.95	8.58	8.44	8.54	8.97	8.81	8.53

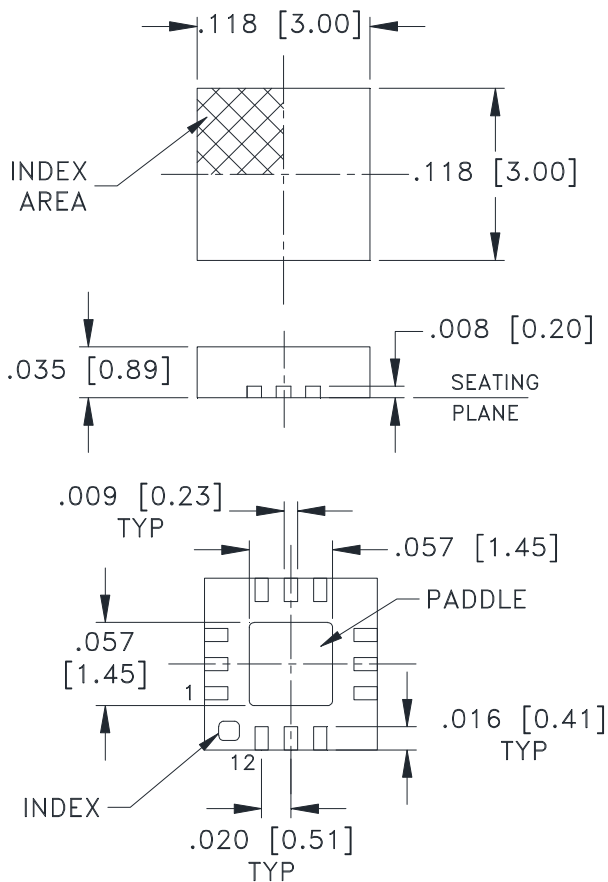




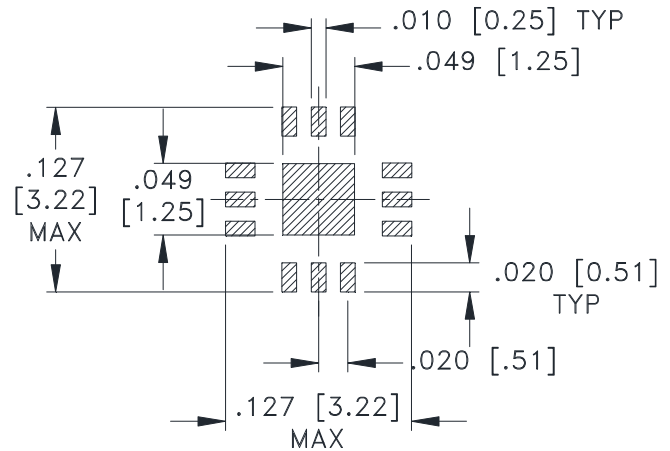
## Typical Performance Curves



### Outline Dimensions



### PCB Land Pattern



SUGGESTED LAYOUT,  
TOLERANCE TO BE WITHIN  $\pm .002$

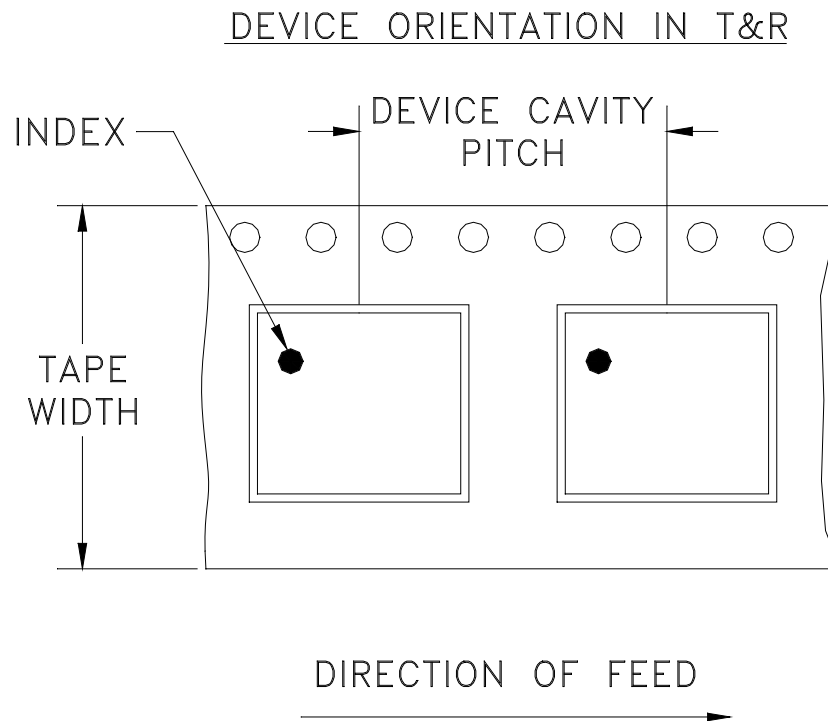
**Weight: .02 Grams**

**Dimensions are in inches (mm). Tolerances: 2Pl.  $\pm .01$ ; 3 Pl.  $\pm .004$**

### 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.

# 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](http://www.minicircuits.com/pages/pdfs/tape.pdf)

**Mini-Circuits®**

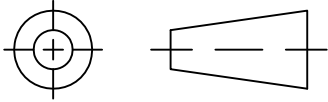
INTERNET <http://www.minicircuits.com>

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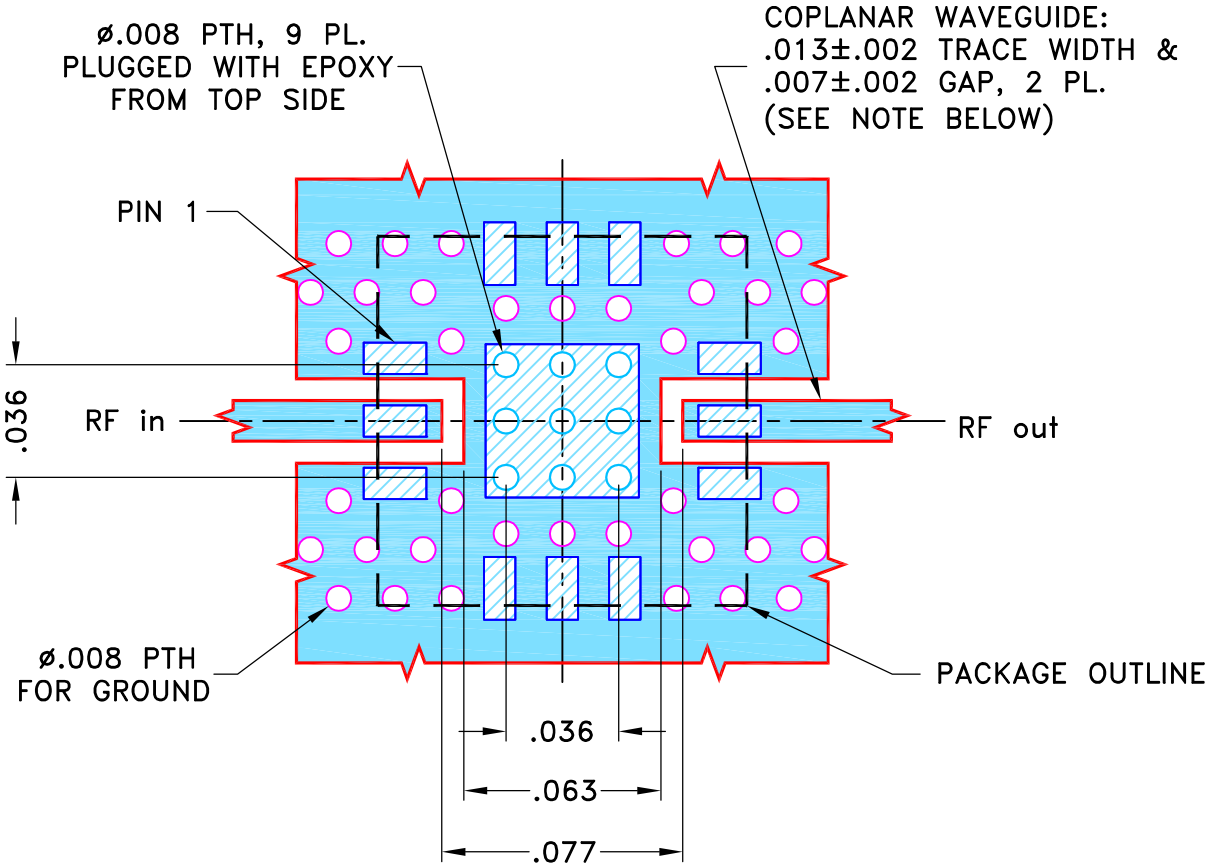
THIRD ANGLE PROJECTION



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:**

- TRACE WIDTH PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS  $.0066 \pm .0007$ ". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

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

**Mini-Circuits<sup>®</sup>** 13 Neptune Avenue  
 Brooklyn NY 11235

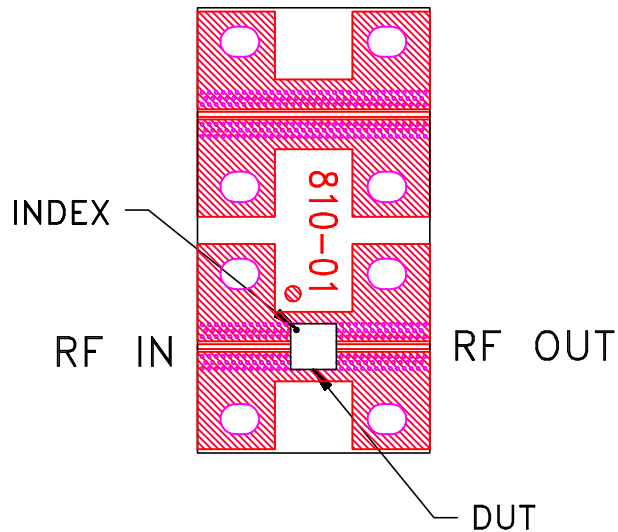
PL, 12FL02, DQ1225, TB-844+

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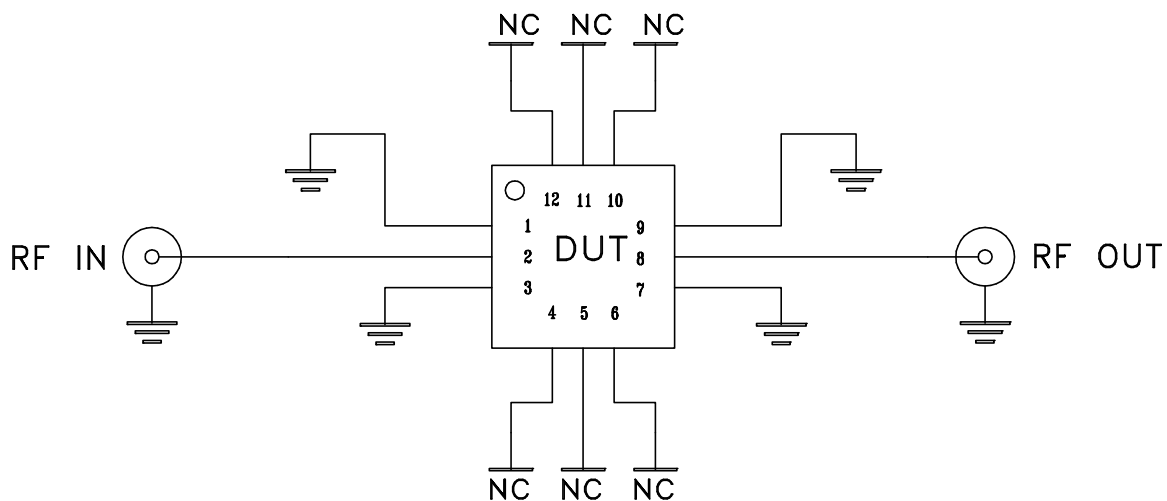
SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-451	REV: OR
FILE: 98PL451	SCALE: 16:1	SHEET: 1 OF 1	

# Evaluation Board and Circuit

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




TB-844-982+



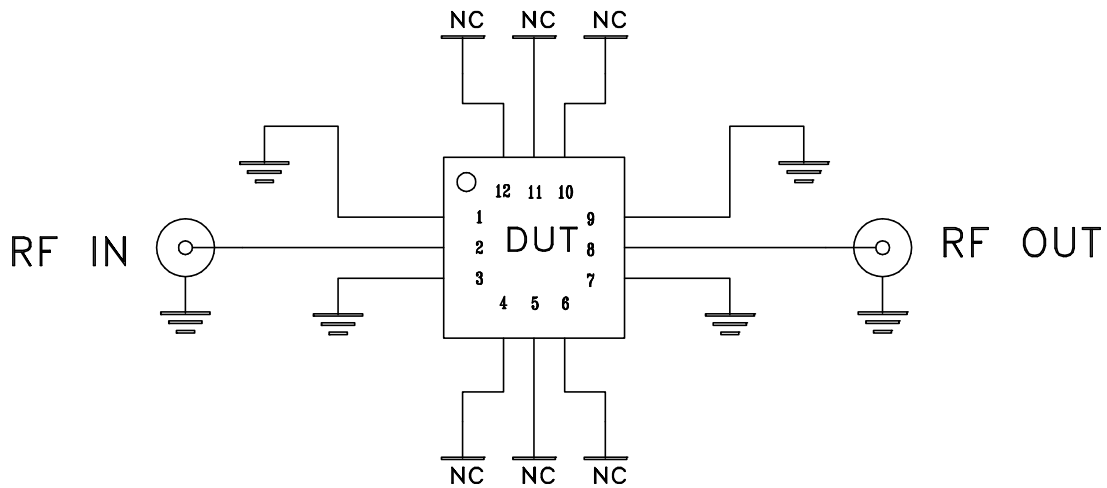
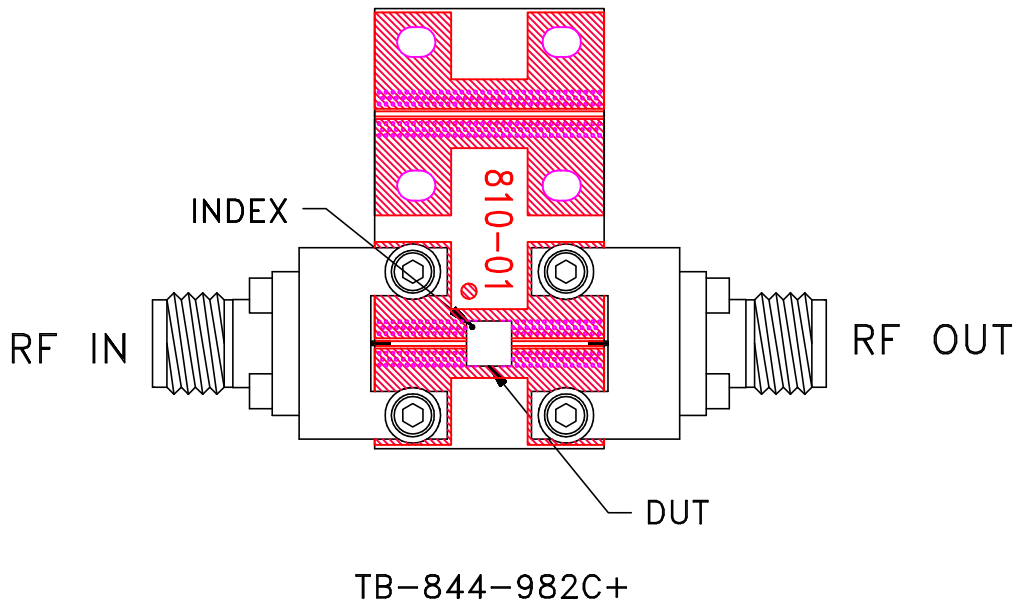
Schematic Diagram

## Note:

PCB Material: R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.0066 inch.

 **Mini-Circuits®**


# Evaluation Board and Circuit



Schematic Diagram

## Notes:

1. 50 Ohm 2.92 mm Female connectors.
2. PCB Material: R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.0066 inch.

 **Mini-Circuits®**



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