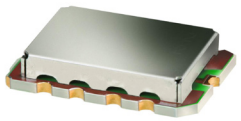
Low Noise Amplifier TAMP-272LN+

50Ω 2300 to 2700 MHz

The Big Deal

- Ultra Low Noise Figure, 0.85 dB typ.
- High Output Power, +19.5 dBm typ.
- High Output IP3, 30 dBm typ.
- Integrated Bias Matching and Stabilization Circuits



CASE STYLE: JQ1382

Product Overview

The TAMP-272LN+ (RoHS compliant) utilizes advanced E-PHEMT technology in a single stage low noise amplifier design built into a shielded case (size: .591”x.394”x.118”). The drop-in module offers ultra low noise figure and high output IP3 with good input and output return loss over the entire frequency range and without the need of external matching components.

Key Features

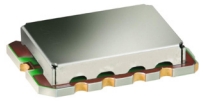
Feature	Advantages
Ultra Low NF	With only 0.85 dB NF, the TAMP-272LN+ enables greater sensitivity for receiver applications. It includes all matching and stability circuits making this Drop-in LNA module a turn-key solution for ensuring low system sensitivity in demanding applications.
High Output IP3	At +30 dBm IP3, in combination with its low noise performance, the TAMP-272LN+ can improve a systems’ spur-free dynamic range which is often the critical driver in many receiver applications.
High P1dB: 19.5dBm typ.	High P1dB enables the amplifier to operate in linear region in the presence of strong interfering signals.
Well Matched input/ output ports	With typical input VSWR of 1.3:1 and output VSWR of 1.45:1, the TAMP-272LN+ can be used in cascade with many 50 Ohm components and maintain minimal interaction or reflections.
Max Input Power, +17dBm	Ruggedized design operates up to input powers of +17dBm without the need of an external limiter.
Drop-in Module	Eliminates the need for designers to optimize low noise transistor bias and matching circuitry. The TAMP-272LN+ provides the outstanding combined performance and does not require any external elements. The case PCB area is smaller than most LNA transistor designs with external circuitry.
Metal Case	Provides a protective enclosure improving handling robustness in addition to shielding the sensitive high gain devices from close by circuitry.
Unconditionally stable	No adverse effects due to reactive loads at the input and output ports avoiding potential instability which can be a critical requirement when integrating high gain, high frequency devices on an open PCB assembly.

Surface Mount

Low Noise Amplifier

TAMP-272LN+

50Ω 2300 to 2700 MHz



CASE STYLE: JQ1382

Features

- Ultra low noise figure, 0.85 dB typ.
- Output power, up to +19.5 dBm typ.
- Good output IP3, 30 dBm typ.
- Good VSWR, 1.4:1 typ.
- Unconditionally stable

Applications

- WiMAX 2.5GHz
- Base station transceiver, tower mounted amplifier, repeater
- General purpose low noise amplifier

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		2300		2700	MHz
Noise Figure	2300 - 2700		0.85	1.15	dB
Gain	2300 - 2700	11.5	14.0		dB
Gain Flatness	2300 - 2700		± 0.5	± 1.0	dB
Output Power at 1dB compression	2300 - 2700	17.5	19.5		dBm
Output third order intercept point (OIP3)	2300 - 2700		30		dBm
Input VSWR	2300 - 2700		1.30		:1
Output VSWR	2300 - 2700		1.45		:1
DC Supply Voltage			5.0		V
DC Supply Current			55	70	mA

Pin Connections

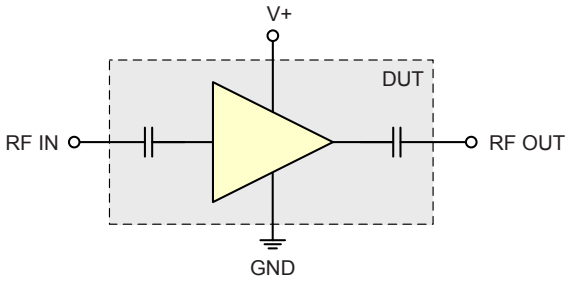
RF IN	10
RF OUT	5
V+	7
GROUND	1,2,3,4,6,8,9,11

Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Operating Voltage	5.5 V
Input RF Power (no damage)	+17 dBm
Power Consumption	385 mW

Permanent damage may occur if any of these limits are exceeded.

Simplified Schematic



ESD Rating

Human Body Model (HBM): Class 1A (250 V to < 500 V) in accordance with ANSI/ESD STM 5.1 - 2001
Machine Model (MM): Class M1 (40 V) in accordance with ANSI/ESD STM 5.2 - 1999

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.
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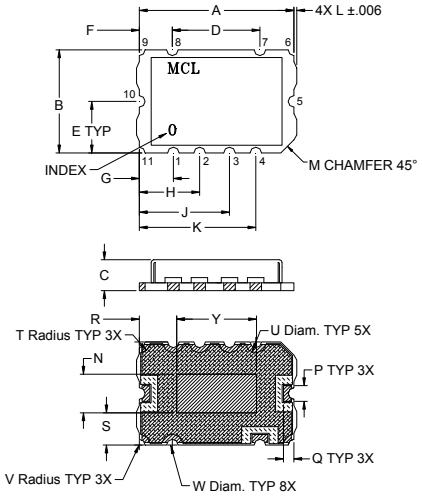
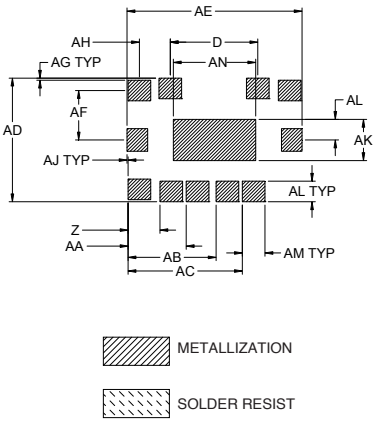
Outline Drawing



PCB Land Pattern

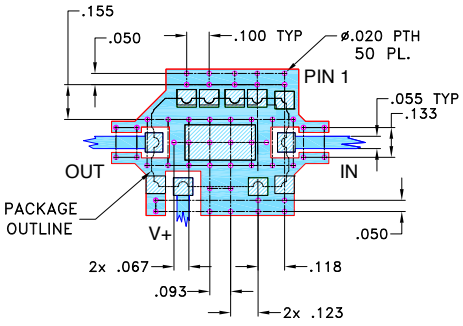


Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U
.591	.394	.118	.335	.197	.126	.130	.230	.344	.445	.011	.050	.148	.060	.040	.143	.123	.042	.084
15.0	10.0	3.0	8.5	5.0	3.2	3.3	5.85	8.75	11.3	.28	1.27	3.75	1.52	1.02	3.63	3.13	1.07	2.13

V	W	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	AN	wt.
.022	.044	.305	.122	.222	.337	.437	.472	.669	.189	.008	.118	.004	.158	.079	.087	.315	grams
.56	1.12	7.75	3.1	5.65	8.55	11.1	12.0	17.0	4.8	.20	3.0	.10	4.0	2.0	2.2	8.0	0.8

Demo Board MCL P/N: TB-468+
Suggested PCB Layout (PL-293)

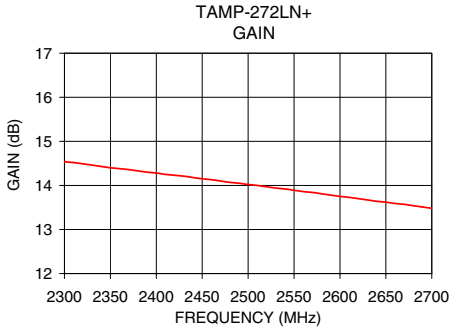


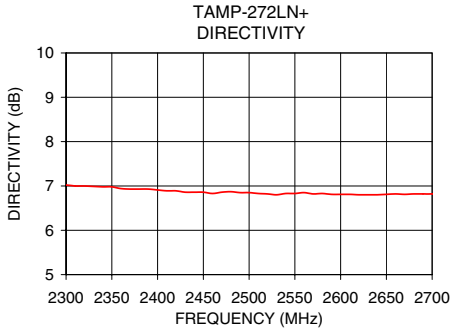
NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002; COPPER 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

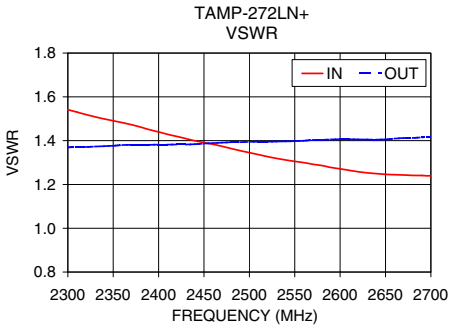
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

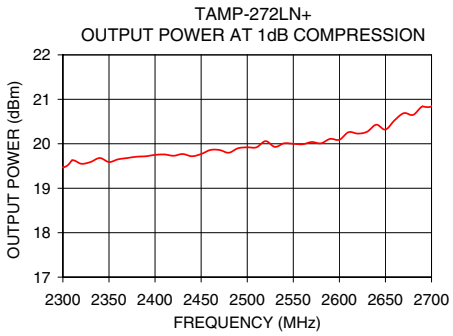
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

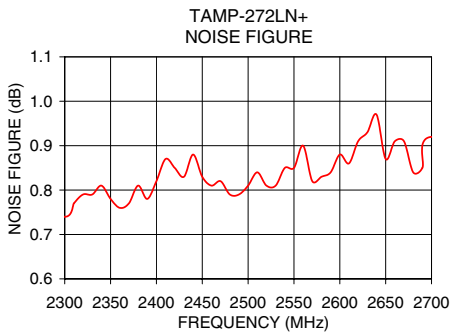
FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR IN (:1)	VSWR OUT (:1)	NOISE FIGURE (dB)	P. OUT @ 1dB COMPR. (dBm)	OUTPUT IP3 (dBm)
2300.00	14.54	7.02	1.54	1.37	0.74	19.47	30.86
2320.00	14.49	7.00	1.52	1.37	0.79	19.55	30.00
2340.00	14.43	6.98	1.50	1.37	0.81	19.68	30.36
2360.00	14.38	6.94	1.48	1.38	0.76	19.65	30.92
2380.00	14.33	6.93	1.46	1.38	0.81	19.71	29.98
2400.00	14.28	6.91	1.44	1.38	0.82	19.75	29.78
2420.00	14.23	6.89	1.42	1.38	0.85	19.73	31.83
2440.00	14.18	6.86	1.40	1.38	0.88	19.72	29.71
2460.00	14.13	6.83	1.38	1.39	0.81	19.86	29.33
2480.00	14.07	6.87	1.36	1.39	0.79	19.80	31.14
2500.00	14.02	6.85	1.35	1.39	0.81	19.92	30.11
2520.00	13.97	6.82	1.33	1.40	0.81	20.06	29.57
2540.00	13.92	6.83	1.31	1.40	0.85	20.01	30.35
2560.00	13.86	6.85	1.30	1.40	0.90	19.99	30.04
2580.00	13.81	6.83	1.29	1.40	0.83	20.01	30.06
2600.00	13.75	6.81	1.27	1.41	0.88	20.09	30.19
2620.00	13.70	6.80	1.26	1.41	0.91	20.23	30.05
2640.00	13.64	6.80	1.25	1.40	0.97	20.43	30.13
2680.00	13.54	6.82	1.24	1.41	0.84	20.65	29.77
2700.00	13.48	6.82	1.24	1.42	0.92	20.84	30.42

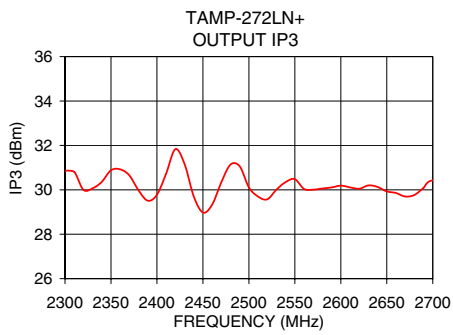












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Amplifier TAMP-272LN+

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions or to view GRAPHS.

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

TEST CONDITIONS: Supply Current = 50mA, DC Supply Voltage= 5V @Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)
1800	16.20	24.11	10.10	13.99	1.22	0.34	18.31
1850	16.02	23.88	10.55	13.67	1.22	0.35	18.34
1900	15.85	23.60	10.95	13.43	1.22	0.35	18.32
1950	15.68	23.38	11.43	13.17	1.23	0.36	18.34
2000	15.52	23.17	11.90	12.97	1.23	0.37	18.29
2020	15.46	23.10	12.08	12.92	1.23	0.37	18.32
2050	15.37	22.95	12.40	12.80	1.23	0.38	18.30
2100	15.22	22.75	12.94	12.63	1.24	0.38	18.30
2150	15.08	22.55	13.55	12.54	1.24	0.39	18.36
2200	14.93	22.35	14.20	12.45	1.25	0.40	18.35
2250	14.80	22.14	14.91	12.43	1.25	0.40	18.50
2300	14.66	21.94	15.74	12.38	1.25	0.41	18.45
2320	14.60	21.85	16.10	12.39	1.25	0.41	18.49
2350	14.53	21.75	16.72	12.43	1.26	0.42	18.45
2400	14.39	21.57	17.83	12.49	1.26	0.42	18.51
2420	14.34	21.48	18.31	12.52	1.26	0.42	18.55
2450	14.26	21.40	19.11	12.61	1.26	0.42	18.56
2500	14.14	21.22	20.63	12.76	1.27	0.43	18.60
2520	14.08	21.16	21.20	12.79	1.27	0.43	18.61
2550	14.00	21.05	22.15	12.94	1.27	0.43	18.64
2600	13.87	20.89	23.44	13.17	1.27	0.43	18.64
2620	13.81	20.84	23.78	13.29	1.27	0.43	18.62
2650	13.73	20.75	23.74	13.47	1.28	0.43	18.61
2700	13.58	20.60	22.72	13.86	1.28	0.43	18.63
2720	13.52	20.56	21.95	14.01	1.28	0.43	18.61
2750	13.43	20.47	20.82	14.29	1.28	0.43	18.67
2800	13.28	20.35	18.86	14.76	1.29	0.43	18.68
2850	13.11	20.25	17.03	15.31	1.29	0.43	18.61
2900	12.93	20.16	15.36	15.91	1.29	0.43	18.62
2950	12.74	20.08	13.91	16.62	1.30	0.42	18.56
3000	12.54	20.03	12.62	17.29	1.31	0.42	18.65
3050	12.33	19.98	11.44	18.00	1.31	0.42	18.41
3100	12.09	19.96	10.41	18.50	1.32	0.41	18.65
3150	11.85	19.92	9.47	18.99	1.32	0.41	18.42
3200	11.59	19.96	8.61	18.97	1.33	0.40	18.60
3250	11.31	19.98	7.85	18.76	1.34	0.40	18.16
3300	11.00	20.04	7.17	18.14	1.35	0.40	18.53

FREQ	IP3 Output	Noise Figure
(MHz)	(dBm)	(dB)
1800	32.37	0.67
1850	32.32	0.64
1900	32.38	0.62
1950	32.62	0.64
2000	32.72	0.73
2050	32.72	0.74
2100	32.67	0.69
2150	32.75	0.72
2200	32.23	0.70
2250	32.27	0.70
2300	32.23	0.77
2320	32.12	0.74
2340	32.07	0.72
2350	31.92	0.74
2360	32.04	0.71
2380	32.22	0.70
2400	32.05	0.74
2450	31.93	0.70
2500	31.94	0.75
2550	31.8	0.77
2600	31.81	0.77
2650	31.83	0.73
2700	31.68	0.75
2750	31.47	0.78
2800	31.48	0.80
2850	31.34	0.81
2900	31.28	0.81
2950	31.31	0.87
3000	31.24	0.86
3050	31.3	0.98
3100	30.93	0.93
3150	30.93	1.05
3200	30.86	1.08
3250	30.69	1.09
3300	30.72	1.33

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: Supply Current= 49mA, DC Supply Voltage = 5V @Temperature = -40degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)
1800	16.58	23.96	9.85	14.85	1.17	0.37	18.35
1850	16.39	23.69	10.20	14.55	1.17	0.38	18.34
1900	16.23	23.45	10.63	14.20	1.17	0.38	18.27
1950	16.07	23.19	11.25	13.81	1.18	0.39	18.31
2000	15.91	23.00	11.72	13.55	1.18	0.40	18.24
2020	15.84	22.91	11.84	13.48	1.18	0.40	18.26
2050	15.74	22.77	12.09	13.35	1.19	0.40	18.26
2100	15.59	22.55	12.65	13.04	1.19	0.41	18.25
2150	15.46	22.34	13.40	12.84	1.19	0.42	18.30
2200	15.31	22.14	14.07	12.73	1.20	0.43	18.27
2250	15.17	21.94	14.58	12.70	1.20	0.43	18.45
2300	15.04	21.73	15.48	12.53	1.20	0.44	18.39
2320	14.98	21.66	15.93	12.49	1.20	0.44	18.44
2350	14.91	21.56	16.58	12.51	1.20	0.45	18.39
2400	14.77	21.38	17.54	12.53	1.21	0.45	18.50
2420	14.71	21.27	17.91	12.51	1.21	0.45	18.48
2450	14.64	21.18	18.75	12.50	1.21	0.46	18.53
2500	14.51	21.01	20.84	12.46	1.21	0.46	18.55
2520	14.46	20.93	21.85	12.46	1.21	0.46	18.59
2550	14.38	20.83	23.32	12.51	1.21	0.46	18.60
2600	14.24	20.68	25.68	12.68	1.22	0.47	18.64
2620	14.18	20.63	26.76	12.72	1.22	0.47	18.62
2650	14.10	20.52	27.64	12.80	1.22	0.47	18.64
2700	13.95	20.38	25.77	13.11	1.22	0.47	18.65
2720	13.90	20.34	24.43	13.24	1.23	0.47	18.66
2750	13.80	20.25	22.70	13.45	1.23	0.47	18.70
2800	13.65	20.14	20.17	13.88	1.23	0.47	18.71
2850	13.49	20.03	17.90	14.34	1.23	0.46	18.70
2900	13.32	19.94	15.81	14.98	1.24	0.46	18.70
2950	13.13	19.86	14.07	15.73	1.24	0.46	18.66
3000	12.94	19.80	12.68	16.47	1.24	0.45	18.74
3050	12.72	19.76	11.33	17.37	1.25	0.45	18.57
3100	12.50	19.71	10.32	18.18	1.25	0.44	18.76
3150	12.27	19.70	9.44	18.79	1.25	0.44	18.54
3200	12.01	19.71	8.50	18.87	1.26	0.44	18.72
3250	11.72	19.71	7.69	18.77	1.26	0.43	18.29
3300	11.43	19.78	6.97	18.14	1.27	0.43	18.64

FREQ	IP3 Output	Noise Figure
(MHz)	(dBm)	(dB)
1800	33.33	0.45
1850	33.33	0.35
1900	33.33	0.38
1950	33.41	0.41
2000	33.46	0.45
2050	33.44	0.44
2100	33.38	0.43
2150	33.24	0.47
2200	33.15	0.49
2250	33.13	0.47
2300	33.11	0.49
2320	33.20	0.45
2340	33.10	0.47
2350	33.17	0.46
2360	33.28	0.40
2380	33.35	0.39
2400	33.09	0.38
2450	33.23	0.43
2500	33.10	0.45
2550	33.08	0.44
2600	33.14	0.47
2650	33.24	0.43
2700	33.15	0.44
2750	33.01	0.39
2800	33.09	0.45
2850	32.73	0.46
2900	32.96	0.45
2950	32.83	0.52
3000	32.56	0.48
3050	32.47	0.55
3100	32.62	0.47
3150	32.49	0.54
3200	32.48	0.48
3250	32.17	0.45
3300	32.27	0.75

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:Supply Current = 52mA, DC Supply Voltage = 5V @Temperature = +85degC

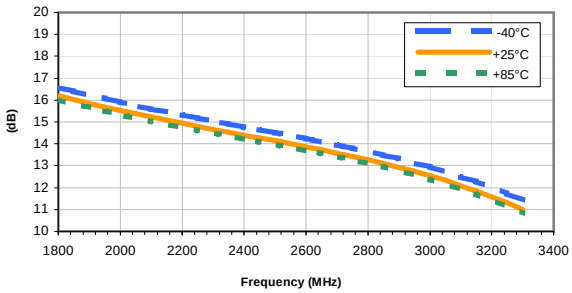
FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)
1800	16.01	24.21	10.02	13.73	1.24	0.33	18.34
1850	15.83	23.97	10.47	13.42	1.24	0.33	18.42
1900	15.67	23.71	10.91	13.18	1.25	0.34	18.45
1950	15.50	23.50	11.35	12.98	1.25	0.35	18.46
2000	15.34	23.29	11.75	12.81	1.26	0.35	18.45
2020	15.27	23.19	11.94	12.74	1.26	0.36	18.48
2050	15.18	23.05	12.29	12.63	1.26	0.36	18.45
2100	15.04	22.85	12.84	12.50	1.26	0.37	18.46
2150	14.89	22.65	13.37	12.44	1.27	0.37	18.51
2200	14.75	22.46	14.01	12.34	1.27	0.38	18.52
2250	14.61	22.23	14.76	12.33	1.27	0.39	18.59
2300	14.48	22.04	15.58	12.30	1.28	0.39	18.60
2320	14.43	21.99	15.89	12.31	1.28	0.40	18.59
2350	14.35	21.87	16.39	12.36	1.28	0.40	18.59
2400	14.22	21.66	17.56	12.41	1.28	0.40	18.57
2420	14.17	21.61	18.03	12.42	1.29	0.41	18.66
2450	14.09	21.49	18.75	12.53	1.29	0.41	18.65
2500	13.96	21.34	19.99	12.71	1.29	0.41	18.67
2520	13.91	21.27	20.53	12.78	1.29	0.41	18.67
2550	13.83	21.15	21.28	12.90	1.29	0.41	18.70
2600	13.69	21.01	22.33	13.20	1.30	0.41	18.68
2620	13.64	20.95	22.63	13.33	1.30	0.42	18.67
2650	13.56	20.86	22.52	13.49	1.30	0.42	18.62
2700	13.41	20.74	21.65	13.93	1.31	0.41	18.63
2720	13.35	20.67	21.17	14.09	1.31	0.42	18.58
2750	13.26	20.59	20.34	14.31	1.31	0.42	18.66
2800	13.11	20.48	18.54	14.82	1.31	0.41	18.63
2850	12.94	20.38	16.80	15.38	1.32	0.41	18.51
2900	12.77	20.29	15.28	16.02	1.32	0.41	18.53
2950	12.58	20.20	13.84	16.72	1.33	0.41	18.44
3000	12.38	20.13	12.57	17.36	1.33	0.40	18.51
3050	12.17	20.08	11.43	18.14	1.34	0.40	18.19
3100	11.93	20.06	10.38	18.68	1.34	0.40	18.50
3150	11.69	20.06	9.47	19.21	1.35	0.39	18.21
3200	11.42	20.07	8.60	19.20	1.36	0.39	18.40
3250	11.14	20.10	7.86	19.06	1.36	0.39	17.92
3300	10.83	20.17	7.17	18.44	1.38	0.38	18.33

FREQ	IP3 Output	Noise Figure
(MHz)	(dBm)	(dB)
1800	32.95	0.86
1850	32.71	0.75
1900	32.89	0.81
1950	32.88	0.86
2000	32.90	0.92
2050	32.99	0.94
2100	32.97	0.88
2150	33.02	0.94
2200	32.79	0.98
2250	32.70	0.94
2300	32.46	0.99
2320	32.30	0.96
2340	32.48	0.97
2350	32.44	1.00
2360	32.46	0.93
2380	32.65	0.92
2400	32.35	0.89
2450	32.21	0.94
2500	32.16	1.01
2550	31.98	0.98
2600	32.15	1.03
2650	31.90	0.97
2700	32.06	1.00
2750	31.74	0.99
2800	31.68	1.05
2850	31.35	1.09
2900	31.32	1.06
2950	31.18	1.16
3000	31.18	1.13
3050	31.11	1.21
3100	30.94	1.17
3150	30.73	1.32
3200	30.77	1.27
3250	30.56	1.24
3300	30.41	1.61

Typical Performance Curves

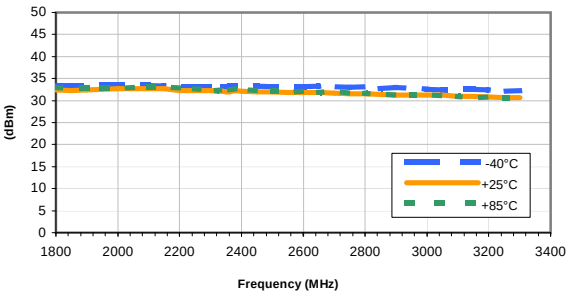
GAIN vs. FREQUENCY & TEMPERATURE

INPUT POWER = -20dBm, VOLTAGE = 5V



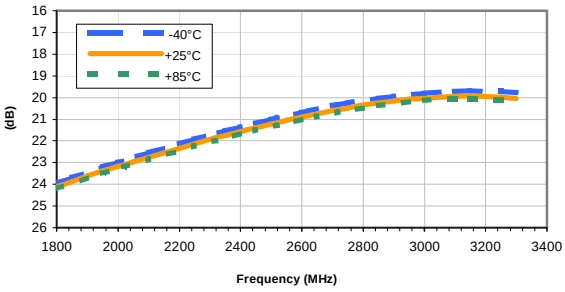
OUTPUT IP3 vs. FREQUENCY & TEMPERATURE

INPUT POWER = -20dBm, VOLTAGE = 5V



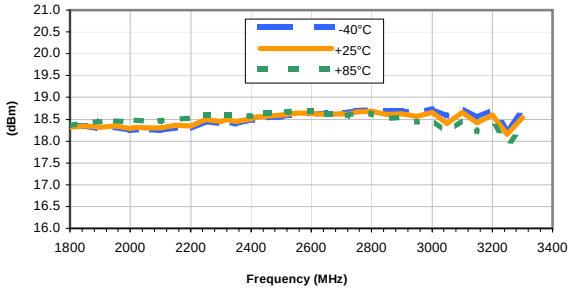
ISOLATION vs. FREQUENCY & TEMPERATURE

INPUT POWER = -20dBm, VOLTAGE = 5V



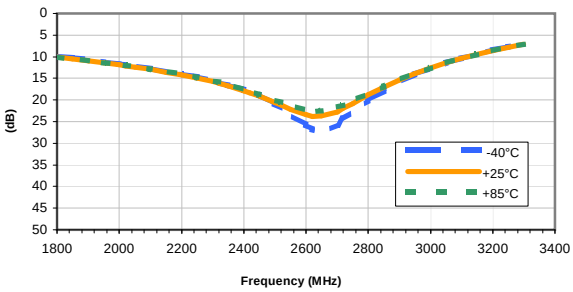
OUTPUT POWER at 1dB COMPRESSION vs. FREQUENCY & TEMPERATURE

VOLTAGE = 5V



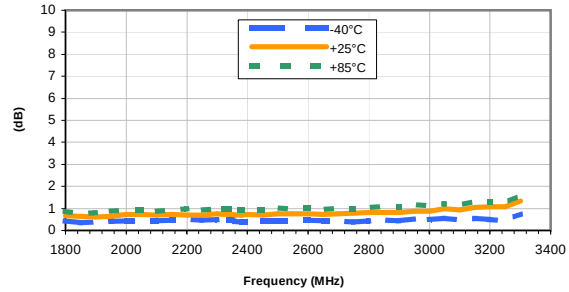
INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE

INPUT POWER = -20dBm, VOLTAGE = 5V



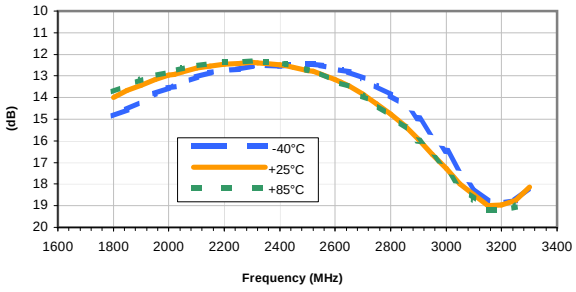
NOISE FIGURE vs. FREQUENCY & TEMPERATURE

VOLTAGE = 5V



OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE

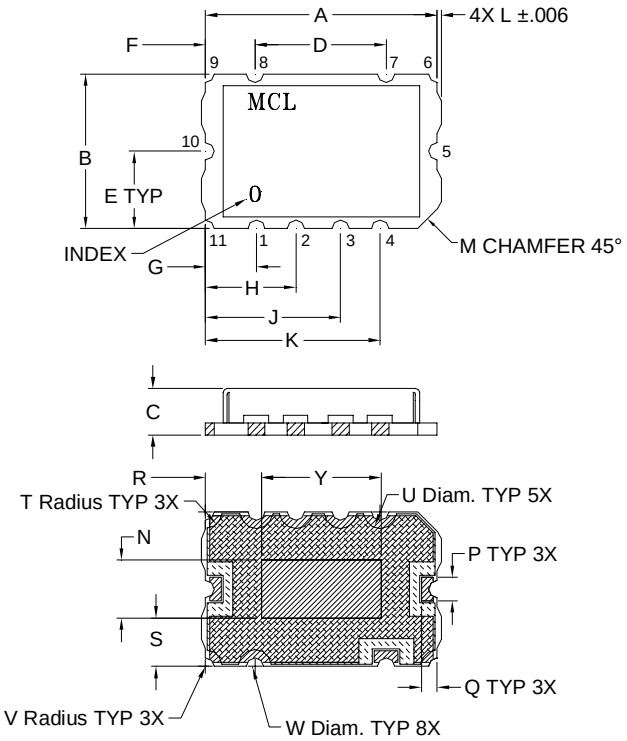
INPUT POWER = -20dBm, VOLTAGE = 5V



Case Style JQ

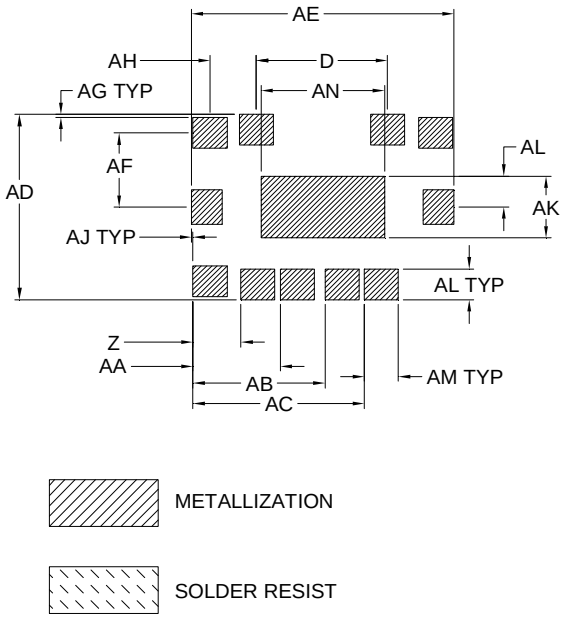
JQ1382

Outline Dimensions



PCB Land Pattern

Suggested Layout



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	P
JQ1382	.591 (15.0)	.394 (10.0)	.118 (3.0)	.335 (8.5)	.197 (5.0)	.126 (3.2)	.130 (3.3)	.230 (5.85)	.344 (8.75)	.445 (11.3)	.011 (.28)	.050 (1.27)	.148 (3.75)	.060 (1.52)

CASE#	Q	R	S	T	U	V	W	Y	Z	AA	AB	AC	AD	AE
JQ1382	.040 (1.02)	.143 (3.63)	.123 (3.13)	.042 (1.07)	.084 (2.13)	.022 (.56)	.044 (1.12)	.305 (7.75)	.122 (3.1)	.222 (5.65)	.337 (8.55)	.437 (11.1)	.472 (12.0)	.669 (17.0)

CASE#	AF	AG	AH	AJ	AK	AL	AM	AN	WT. GRAMS
JQ1382	.189 (4.8)	.008 (.20)	.118 (3.0)	.004 (.10)	.158 (4.0)	.079 (2.0)	.087 (2.2)	.315 (8.0)	.8

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .03; 3 Pl. ± .015

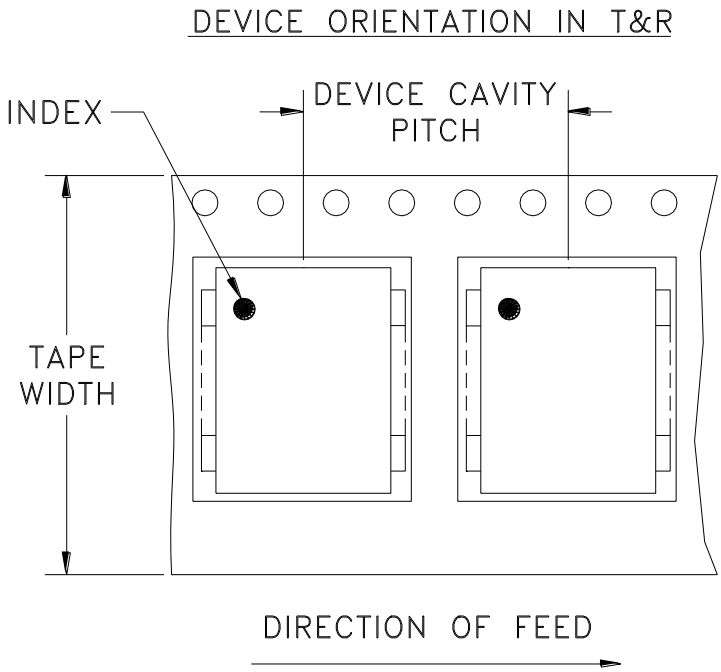
Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:

   For RoHS Case Styles: 3-5 µ inch (.08-.13 microns) Gold over 120-240 µ inch (3.05-6.10 microns) Nickel plate

   For RoHS-5 Case Styles: Tin-Lead plate.

Tape & Reel Packaging TR-F10



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
24	16	7	10,20,50,100,200
		13	500

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

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

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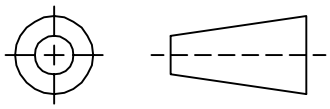
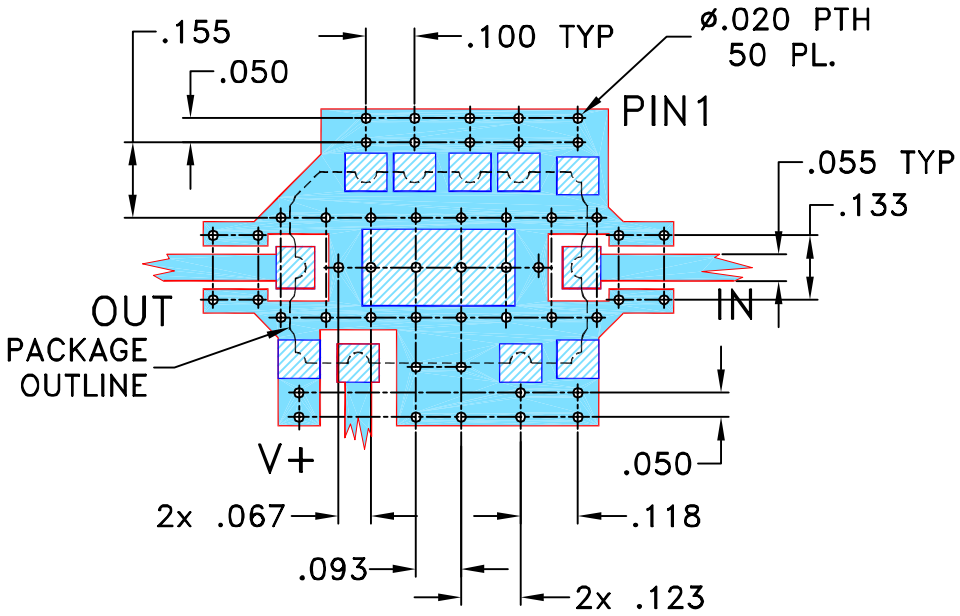
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M119697	NEW RELEASE	10/08	HB	HH
A	M120556	UPDATE GROUND PLANE DIM.	12/08	HB	HH
A	R75063	UPDATE GROUND PLANE DIM.	12/08	HB	HH

SUGGESTED MOUNTING CONFIGURATION FOR JQ1382 CASE STYLE, "11AM01" PIN CODE



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002; COPPER 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINOUS 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	HB	05.10.08
TOLERANCES ON:	CHECKED	DH	28.10.08
2 PL DECIMALS ±	APPROVED	HH	29.10.08
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

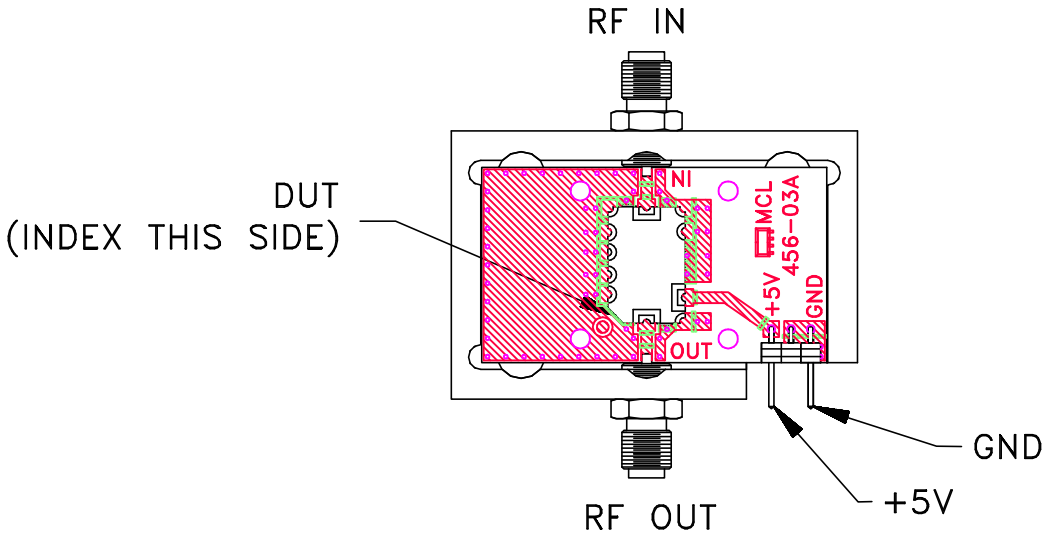
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 11AM01, JQ1382, TAMP, TB-468

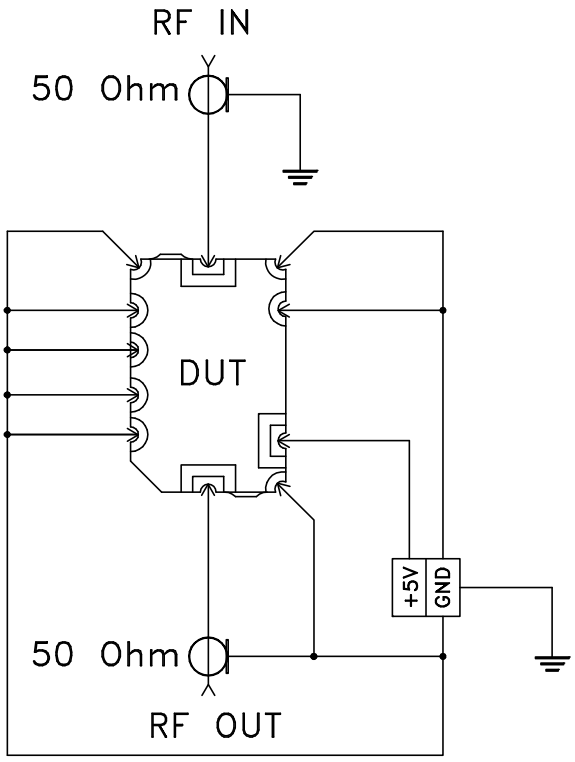
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-293	A

FILE:	SCALE:	SHEET:
98PL293	2.5:1	1 OF 1

Evaluation Board and Circuit



TB-468+



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.030 inch.

Mini-Circuits®

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Environmental Specifications ENV44

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	-55° to 100° C Ambient Environment	Individual Model Data Sheet
HAST	130°C, 85% RH, 96 hours	JESD22-A110
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutectic Process: 225°C peak Pb-Free Process, 245°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Vibration (High Frequency)	20g peak, 20-2000 Hz, 4 times in each of three axes (total 12)	MIL-STD-883, Method 2007.3, Condition A
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215