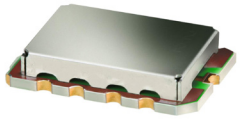
Low Noise Amplifier TAMP-242GLN+

50Ω 1710 to 2400 MHz

The Big Deal

- Ultra Low Noise Figure, 0.85 dB typ.
- High IP3, 36 dBm typ.
- High Gain, 30 dB typ.
- Integrated Bias Matching and Stabilization Circuits



CASE STYLE: JQ1382

Product Overview

The TAMP-242GLN+ (RoHS compliant) utilizes advanced E-PHEMT technology in a 2-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 gain with good input and output return loss over the entire frequency range and without the need of external matching components.

Key Features

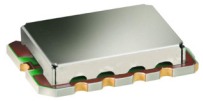
Feature	Advantages
Ultra Low NF	With only 0.85 dB NF, the TAMP-242GLN+ enables greater sensitivity for receiver applications. It includes all matching and stability circuits making this Drop-in LNA module a turn-key solution for ensuring low system sensitivity in demanding applications.
High Output IP3	At +36 dBm IP3, in combination with its low noise performance, the TAMP-242GLN+ can improve a systems’ spur-free dynamic range which is often the critical driver in many receiver applications.
High Gain	With a high gain of 30 dB, this amplifier can minimize receiver NF degradation due to components losses or NF of the 2nd stage device following the TAMP-242GLN+.
Power In at 1dB Comp.: -9dBm typ. Input no damage, +17dBm	Provides a good safety margin against damage or saturation from unwanted high power RF signals present at the input to a receiver.
Well Matched input/ output ports	With typical input VSWR of 1.25:1 and output VSWR of 1.40:1, the TAMP-242GLN+ can be used in cascade with many 50 Ohm components and maintain minimal interaction or reflections.
Drop-in Module	Eliminates the need for designers to optimize low noise transistor bias and matching circuitry. The TAMP-242GLN+ 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-242GLN+

50Ω 1710 to 2400 MHz



CASE STYLE: JQ1382

Features

- Ultra low noise figure, 0.85 dB typ.
- High gain, 30 dB typ.
- Output power, up to +20 dBm typ.
- Good output IP3, 36 dBm typ.
- Good VSWR, 1.3:1 typ.
- Unconditionally stable

Applications

- Base station transceiver, tower mounted amplifier, repeater
- WCDMA
- TD SCDMA
- PCS Rx / PCS Tx
- General purpose low noise amplifier

+RoHS Compliant

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

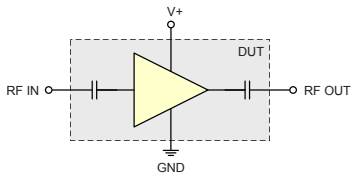
Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		1710		2400	MHz
Noise Figure	1710 - 1880		0.80	1.00	dB
	1850 - 1990		0.80	1.00	
	1990 - 2200		0.85	1.05	
	2200 - 2400		0.90	1.15	
Gain	1710 - 1880	28.0	31.0		dB
	1850 - 1990	28.0	30.5		
	1990 - 2200	27.0	30.0		
	2200 - 2400	26.0	28.5		
Gain Flatness	1710 - 1880		± 0.45	± 0.90	dB
	1850 - 1990		± 0.45	± 0.90	
	1990 - 2200		± 0.60	± 1.20	
	2200 - 2400		± 0.50	± 1.00	
Output Power at 1dB compression	1710 - 1880	17.5	19.5		dBm
	1850 - 1990	18.0	20.0		
	1990 - 2200	18.5	20.0		
	2200 - 2400	19.0	20.5		
Output third order intercept point (OIP3)	1710 - 1880		36		dBm
	1850 - 1990		36		
	1990 - 2200		36		
	2200 - 2400		36		
Input VSWR	1710 - 1880		1.5		:1
	1850 - 1990		1.3		
	1990 - 2200		1.2		
	2200 - 2400		1.2		
Output VSWR	1710 - 1880		1.5		:1
	1850 - 1990		1.4		
	1990 - 2200		1.4		
	2200 - 2400		1.4		
DC Supply Voltage			5.0		V
DC Supply Current			120	150	mA

Pin Connections

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

Simplified Schematic



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	825 mW

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

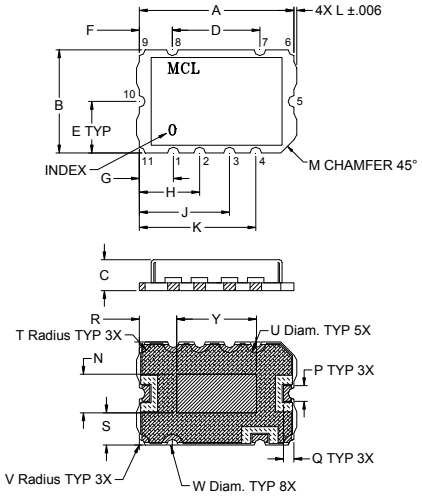
ESD Rating

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

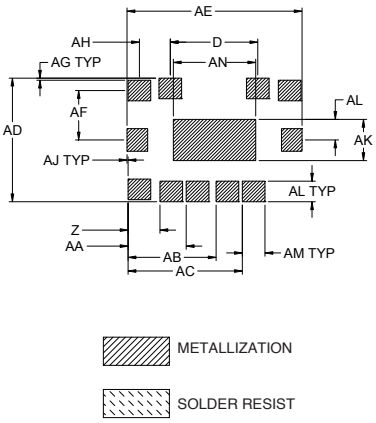
Notes

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.
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

Outline Drawing



PCB Land Pattern

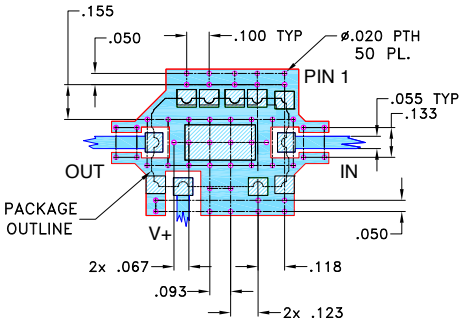


Outline Dimensions (inch / mm)

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)

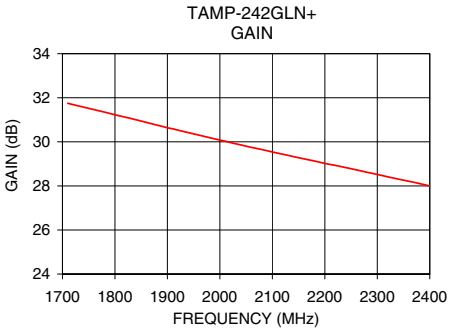


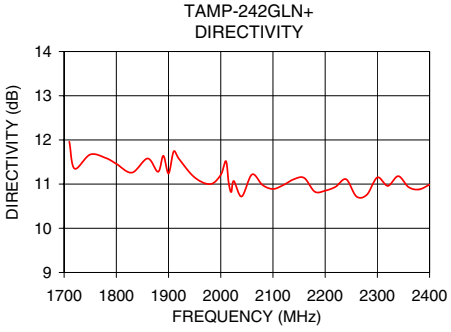
NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002; COPPER 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

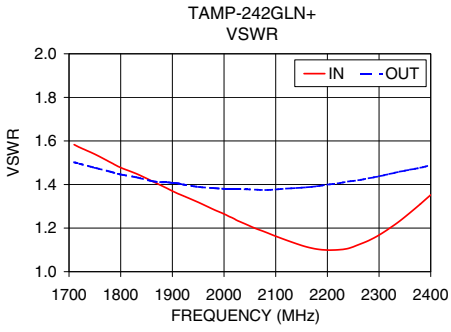
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

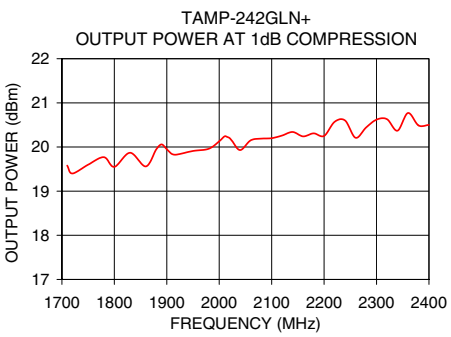
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

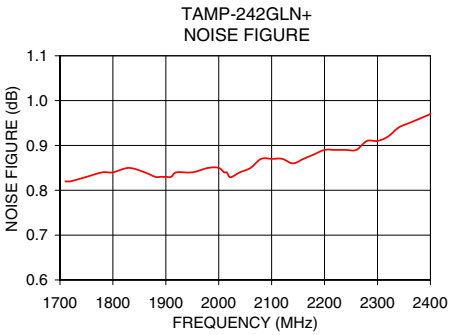
FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR IN (:1)	VSWR OUT (:1)	NOISE FIGURE (dB)	P. OUT @ 1dB COMPR. (dBm)	OUTPUT IP3 (dBm)
1710.00	31.75	11.96	1.58	1.50	0.82	19.58	36.53
1750.00	31.52	11.67	1.54	1.48	0.83	19.60	36.47
1800.00	31.23	11.46	1.48	1.45	0.84	19.55	36.54
1830.00	31.06	11.26	1.45	1.43	0.85	19.87	36.55
1860.00	30.88	11.58	1.42	1.42	0.84	19.56	36.60
1900.00	30.64	11.24	1.37	1.41	0.83	19.95	36.75
1950.00	30.36	11.15	1.32	1.39	0.84	19.91	36.98
2000.00	30.08	11.21	1.26	1.38	0.85	20.13	36.76
2040.00	29.86	10.72	1.22	1.38	0.84	19.93	37.36
2060.00	29.75	11.22	1.20	1.38	0.85	20.15	36.98
2100.00	29.54	10.89	1.16	1.38	0.87	20.20	37.10
2140.00	29.33	11.11	1.13	1.38	0.86	20.34	36.95
2180.00	29.13	10.83	1.10	1.39	0.88	20.31	37.08
2200.00	29.02	10.85	1.10	1.40	0.89	20.25	36.72
2260.00	28.73	10.72	1.12	1.42	0.89	20.21	36.88
2300.00	28.52	11.15	1.17	1.44	0.91	20.62	36.63
2320.00	28.41	10.96	1.20	1.45	0.92	20.63	36.69
2360.00	28.21	10.93	1.27	1.47	0.95	20.77	36.72
2380.00	28.11	10.88	1.31	1.48	0.96	20.49	36.50
2400.00	28.00	10.99	1.35	1.49	0.97	20.50	36.75

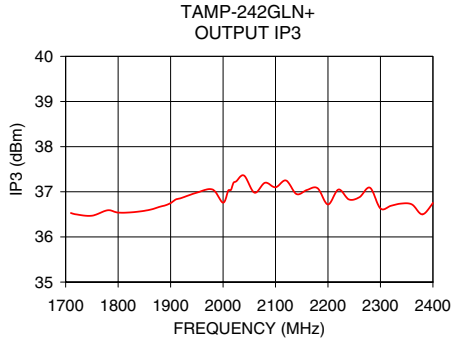












Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

Amplifier TAMP-242GLN+

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: I = 116mA, Vd = 5V @Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output	Noise* Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)	(dB)
1710	31.75	43.71	12.93	13.95	1.92	0.25	36.53	19.58	0.82
1720	31.69	43.04	13.07	14.04	1.81	0.27	36.50	19.40	0.82
1750	31.52	43.19	13.46	14.31	1.89	0.26	36.47	19.60	0.83
1760	31.46	42.91	13.65	14.38	1.85	0.27	36.46	19.70	0.84
1780	31.35	42.94	13.95	14.58	1.88	0.26	36.59	19.77	0.84
1800	31.23	42.69	14.30	14.78	1.87	0.26	36.54	19.55	0.84
1830	31.06	42.32	14.72	14.99	1.84	0.27	36.55	19.87	0.85
1840	31.00	42.33	14.88	15.07	1.86	0.27	36.61	19.89	0.85
1860	30.88	42.46	15.27	15.28	1.91	0.26	36.60	19.56	0.84
1880	30.76	42.04	15.68	15.38	1.87	0.27	36.67	19.95	0.83
1900	30.64	41.88	16.13	15.43	1.86	0.27	36.76	19.95	0.83
1930	30.47	41.67	16.80	15.61	1.87	0.28	36.79	19.89	0.84
1950	30.36	41.51	17.24	15.76	1.86	0.28	36.98	19.91	0.84
1960	30.30	41.56	17.56	15.80	1.88	0.27	37.10	19.94	0.85
1980	30.19	41.19	18.07	15.87	1.84	0.28	37.06	19.96	0.85
2000	30.08	41.29	18.64	15.93	1.88	0.28	36.76	20.13	0.85
2020	29.97	40.79	19.32	15.95	1.82	0.29	37.21	20.20	0.83
2040	29.86	40.58	20.07	15.97	1.80	0.29	37.36	19.93	0.84
2050	29.80	40.77	20.43	16.01	1.85	0.28	37.08	19.99	0.84
2060	29.75	40.97	20.85	16.00	1.90	0.28	36.98	20.15	0.85
2080	29.65	40.63	21.59	16.04	1.86	0.28	37.20	20.19	0.87
2100	29.54	40.43	22.46	15.99	1.84	0.29	37.10	20.20	0.87
2120	29.44	40.42	23.39	15.91	1.86	0.29	37.25	20.26	0.87
2140	29.33	40.44	24.39	15.86	1.89	0.28	36.95	20.34	0.86
2180	29.13	39.96	26.16	15.71	1.84	0.29	37.08	20.31	0.88
2190	29.07	40.10	26.29	15.68	1.87	0.29	36.85	20.31	0.88
2200	29.02	39.87	26.51	15.57	1.84	0.29	36.72	20.25	0.89
2220	28.93	39.87	26.43	15.47	1.86	0.29	37.05	20.57	0.89
2240	28.83	39.94	25.92	15.32	1.89	0.29	36.83	20.60	0.89
2260	28.73	39.45	24.70	15.22	1.82	0.30	36.89	20.21	0.89
2280	28.62	39.38	23.53	15.07	1.82	0.30	37.09	20.44	0.91
2300	28.52	39.67	22.22	14.92	1.89	0.29	36.63	20.62	0.91
2320	28.41	39.37	20.88	14.75	1.85	0.30	36.68	20.63	0.92
2340	28.31	39.49	19.65	14.58	1.88	0.29	36.74	20.37	0.94
2360	28.21	39.14	18.48	14.44	1.83	0.30	36.71	20.77	0.95
2370	28.16	38.93	17.94	14.36	1.80	0.31	36.68	20.73	0.95
2380	28.11	38.99	17.43	14.31	1.82	0.31	36.50	20.49	0.96
2390	28.05	38.97	16.93	14.21	1.82	0.31	36.53	20.37	0.96
2400	28.00	38.99	16.49	14.14	1.83	0.31	36.75	20.50	0.97

*The Noise Figure measurement preformed in shielded box.

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: I = 120mA, Vd = 5V @Temperature = -40degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)
1710	32.51	43.69	13.17	12.66	1.76	0.27	37.19	19.67
1720	32.39	44.18	13.46	12.67	1.88	0.25	37.16	19.48
1750	32.26	43.45	13.81	12.86	1.77	0.27	37.10	19.76
1760	32.20	43.13	13.73	12.98	1.73	0.28	37.11	19.85
1780	32.01	43.49	14.48	13.04	1.85	0.26	37.21	19.89
1800	31.89	43.06	14.73	12.87	1.79	0.27	37.08	19.66
1830	31.76	43.04	15.07	12.80	1.81	0.27	37.02	20.02
1840	31.67	42.82	15.32	12.97	1.79	0.27	37.05	20.01
1860	31.52	42.47	15.75	13.35	1.77	0.28	37.11	19.68
1880	31.42	42.52	16.24	13.50	1.81	0.28	37.14	20.13
1900	31.29	42.20	16.71	13.58	1.78	0.28	37.37	20.06
1930	31.13	41.72	17.48	13.69	1.74	0.30	37.21	20.02
1950	31.02	42.27	17.99	13.98	1.86	0.28	37.46	20.02
1960	30.95	41.70	18.16	14.00	1.78	0.29	37.48	20.06
1980	30.80	41.68	18.59	14.14	1.81	0.29	37.47	20.09
2000	30.70	41.67	18.95	14.19	1.82	0.29	37.37	20.28
2020	30.59	41.30	19.63	14.34	1.78	0.30	37.84	20.29
2040	30.43	41.25	20.01	14.51	1.81	0.29	37.79	20.04
2050	30.36	40.81	20.69	14.64	1.75	0.30	37.74	20.13
2060	30.29	41.03	21.00	14.64	1.80	0.30	37.77	20.29
2080	30.18	40.97	21.82	14.41	1.81	0.29	37.77	20.32
2100	30.11	40.70	22.55	14.63	1.78	0.30	37.94	20.32
2120	29.97	40.44	23.30	14.85	1.76	0.31	37.75	20.39
2140	29.87	40.32	23.98	14.77	1.76	0.31	37.50	20.45
2180	29.66	40.17	25.59	14.89	1.77	0.31	37.55	20.42
2190	29.61	39.91	25.77	14.99	1.74	0.31	37.51	20.41
2200	29.56	39.97	25.99	15.08	1.76	0.31	37.61	20.36
2220	29.47	39.73	26.04	15.14	1.74	0.32	37.57	20.71
2240	29.33	39.75	27.12	15.09	1.76	0.31	37.29	20.66
2260	29.23	39.79	25.94	15.00	1.79	0.31	37.49	20.30
2280	29.12	39.59	24.81	15.06	1.77	0.31	37.60	20.56
2300	29.00	39.52	23.69	15.22	1.78	0.31	37.42	20.74
2320	28.89	39.22	22.39	15.19	1.75	0.32	37.23	20.70
2340	28.80	38.95	21.08	15.21	1.72	0.32	37.54	20.48
2360	28.67	39.06	20.00	15.18	1.75	0.31	37.47	20.86
2370	28.64	38.84	19.36	15.22	1.72	0.32	37.01	20.79
2380	28.57	38.79	18.71	15.09	1.72	0.32	36.96	20.54
2390	28.54	38.64	18.29	15.19	1.70	0.33	37.17	20.45
2400	28.44	38.87	17.91	15.16	1.75	0.32	37.45	20.61

Typical Performance Data

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

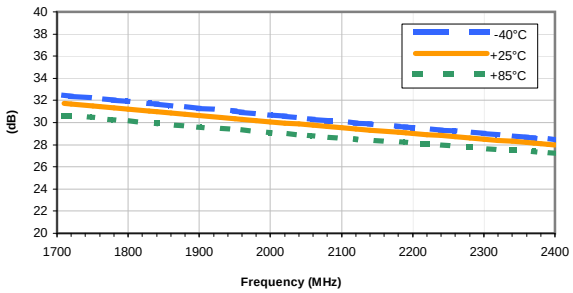
TEST CONDITIONS: I = 115mA, Vd = 5V @Temperature = +85degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)
1710	30.64	44.38	13.75	14.97	2.36	0.21	36.26	19.54
1720	30.61	44.10	13.91	14.90	2.30	0.21	36.09	19.40
1750	30.45	43.83	14.24	15.17	2.28	0.21	36.23	19.47
1760	30.42	43.51	14.35	15.46	2.22	0.22	36.19	19.58
1780	30.26	43.85	14.63	15.41	2.34	0.21	36.29	19.70
1800	30.17	43.41	14.80	15.49	2.26	0.22	36.35	19.52
1830	29.97	43.49	15.28	15.07	2.33	0.21	36.33	19.74
1840	29.92	43.06	15.56	15.33	2.25	0.22	36.31	19.82
1860	29.77	42.69	16.07	15.75	2.21	0.22	36.39	19.48
1880	29.70	42.70	16.51	15.80	2.24	0.22	36.62	19.78
1900	29.62	42.94	16.65	15.97	2.32	0.22	36.61	19.88
1930	29.47	42.71	17.25	15.99	2.30	0.22	36.72	19.79
1950	29.39	42.88	17.67	16.28	2.37	0.21	36.63	19.80
1960	29.34	42.41	17.96	16.34	2.27	0.22	36.62	19.83
1980	29.21	42.01	17.97	16.60	2.22	0.23	36.58	19.85
2000	29.09	41.87	18.54	16.56	2.21	0.23	36.37	20.00
2020	29.02	41.87	19.18	16.41	2.23	0.23	36.64	20.14
2040	28.88	41.29	19.82	16.67	2.14	0.24	36.74	19.86
2050	28.82	41.52	20.11	16.67	2.21	0.23	36.46	19.90
2060	28.78	41.39	20.49	16.58	2.18	0.23	36.42	20.06
2080	28.68	41.16	21.23	16.35	2.16	0.24	36.56	20.12
2100	28.59	41.41	22.67	16.38	2.24	0.23	36.37	20.14
2120	28.52	40.73	23.69	16.53	2.11	0.24	36.56	20.20
2140	28.41	40.74	24.77	16.38	2.13	0.24	36.19	20.31
2180	28.25	40.37	28.27	16.20	2.09	0.25	36.00	20.28
2190	28.21	40.48	29.56	16.24	2.12	0.24	35.96	20.28
2200	28.17	40.14	30.88	16.26	2.06	0.25	36.03	20.20
2220	28.08	40.55	34.97	16.24	2.17	0.24	36.06	20.53
2240	27.96	40.01	43.21	16.04	2.08	0.25	35.86	20.65
2260	27.87	40.02	41.04	15.92	2.10	0.25	35.72	20.22
2280	27.79	39.99	33.22	15.72	2.11	0.25	36.22	20.41
2300	27.71	39.96	29.40	15.67	2.11	0.25	35.83	20.62
2320	27.59	39.53	26.11	15.50	2.05	0.26	35.77	20.72
2340	27.52	39.54	23.76	15.41	2.06	0.25	35.80	20.37
2360	27.44	39.66	22.03	15.30	2.09	0.25	35.93	20.80
2370	27.41	39.37	21.48	15.34	2.04	0.26	35.69	20.79
2380	27.35	39.38	20.77	15.24	2.05	0.26	35.63	20.55
2390	27.28	39.22	19.98	15.25	2.03	0.26	35.69	20.39
2400	27.23	38.97	19.28	15.20	1.99	0.27	35.78	20.50

Typical Performance Curves

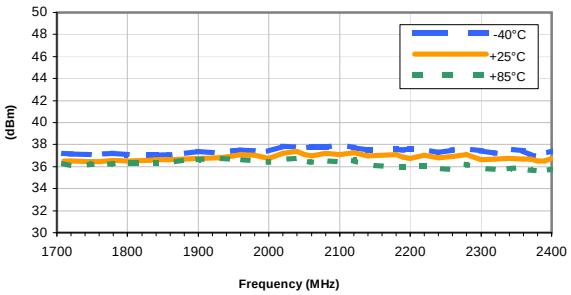
GAIN vs. FREQUENCY & TEMPERATURE

INPUT POWER = -25, VOLTAGE = 5V



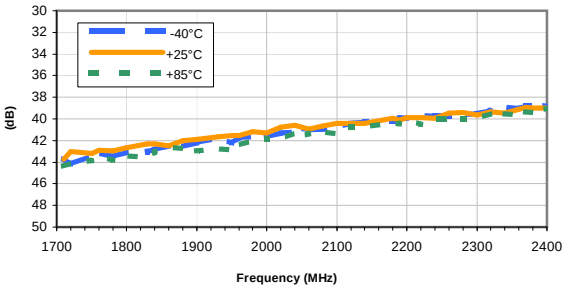
OUTPUT IP3 vs. FREQUENCY & TEMPERATURE

INPUT POWER = -25, VOLTAGE = 5V



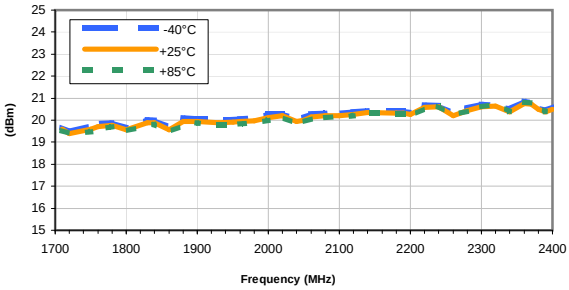
ISOLATION vs. FREQUENCY & TEMPERATURE

INPUT POWER = -25, VOLTAGE = 5V



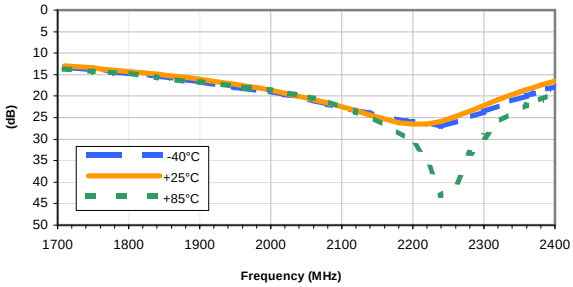
OUTPUT POWER at 1dB COMPRESSION vs. FREQUENCY & TEMPERATURE

VOLTAGE = 5V



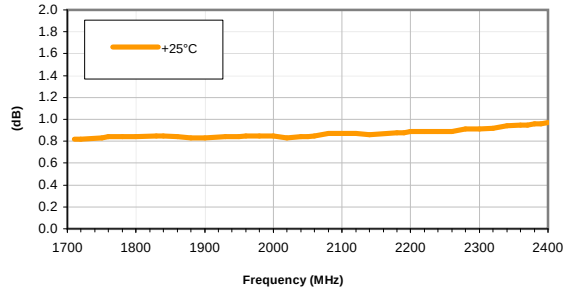
INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE

INPUT POWER = -25, VOLTAGE = 5V



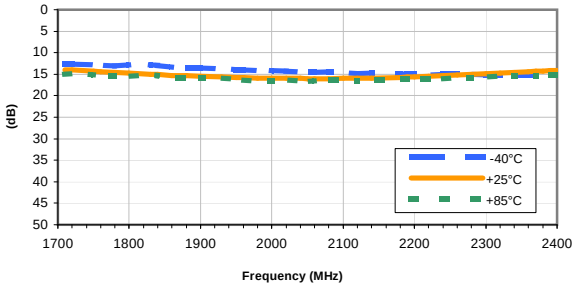
NOISE FIGURE vs. FREQUENCY

VOLTAGE = 5V



OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE

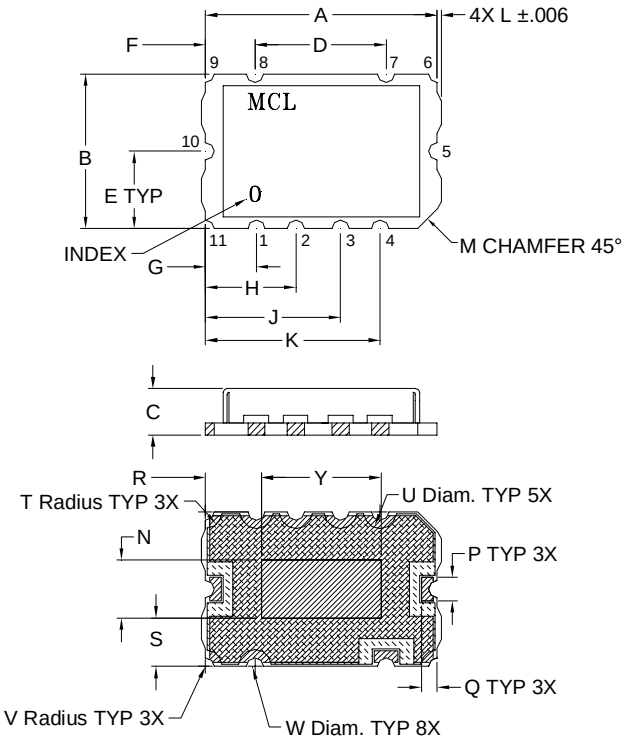
INPUT POWER = -25, VOLTAGE = 5V



Case Style JQ

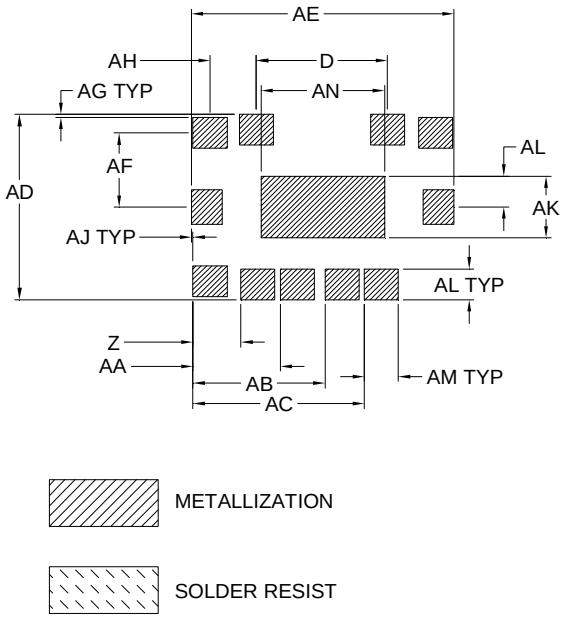
JQ1382

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

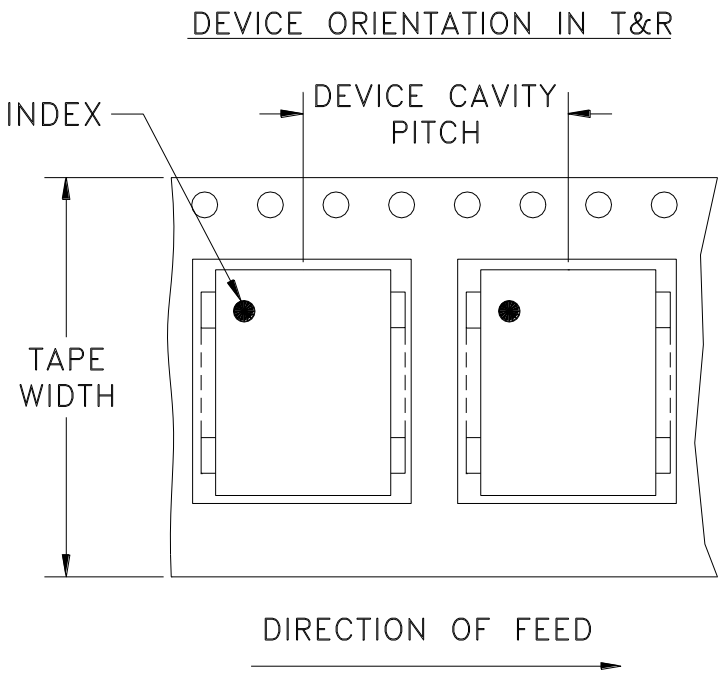
Notes:

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
		13	200,500

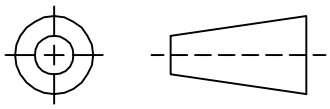
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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

Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

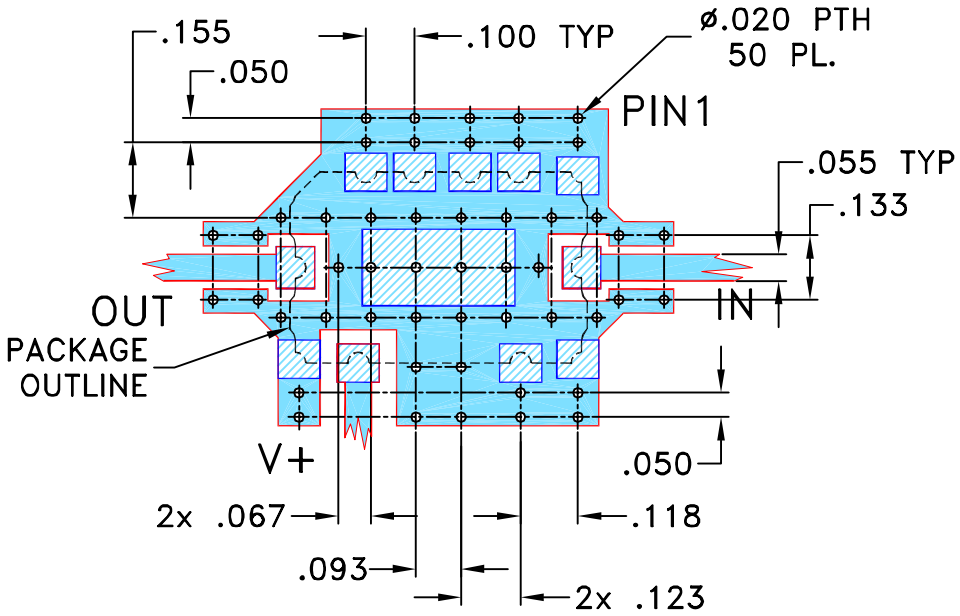
THIRD ANGLE PROJECTION



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

Mini-Circuits

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