

Low Noise Amplifier

TAMP-362GLN+

50Ω 3300 to 3600 MHz

The Big Deal

- Ultra Low Noise Figure, 0.9 dB typ.
- High Output IP3, 29 dBm typ.
- Integrated Bias Matching and Stabilization Circuits



CASE STYLE: JQ1382

Product Overview

The TAMP-362GLN+ (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 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 typ. 0.9 dB NF, the TAMP-362GLN+ 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 +29 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.
Well Matched input/ output ports	With typical input & output VSWR of 1.3:1, the TAMP-362GLN+ can be used in cascade with many 50 Ohm components and maintain minimal interaction or reflections.
Max Input Power, +15dBm	Ruggedized design operates up to input powers of +15dBm 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-362GLN+ 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.

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



Surface Mount

Low Noise Amplifier

TAMP-362GLN+

50Ω

3300 to 3600 MHz

Features

- Ultra low noise figure, 0.9 dB typ.
- Output power, up to +16 dBm typ.
- Good output IP3, 29 dBm typ.
- Good VSWR, 1.3:1 typ.
- Unconditionally stable

Applications

- WiMAX
- Defence system radar
- Base station transceiver, tower mounted amplifier, repeater
- General purpose low noise amplifier



CASE STYLE: JQ1382

+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		3300		3600	MHz
Noise Figure	3300 - 3600		0.9	1.2	dB
Gain	3300 - 3600	18	20		dB
Gain Flatness	3300 - 3600		± 0.3	± 0.6	dB
Output Power at 1dB compression	3300 - 3600	13	16		dBm
Output third order intercept point (OIP3)	3300 - 3600		29		dBm
Input VSWR	3300 - 3600		1.3		:1
Output VSWR	3300 - 3600		1.3		:1
DC Supply Voltage			5.0		V
DC Supply Current			100	140	mA

Pin Connections

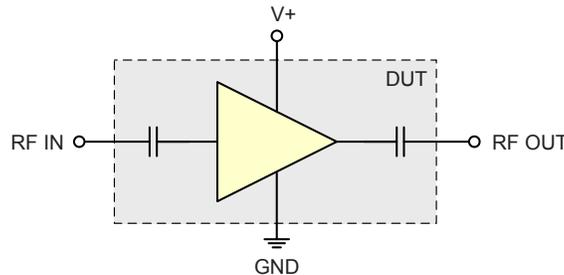
RF IN	10
RF OUT	5
V+	7
GROUND	1,2,3,4,6,8,9,11

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)	+15 dBm
Power Consumption	800 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

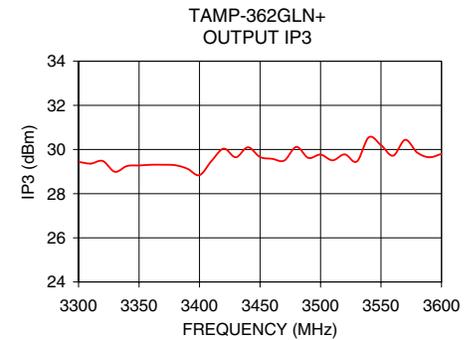
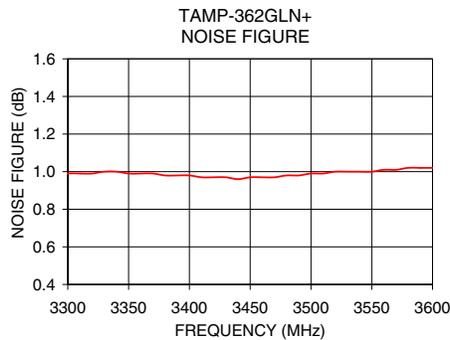
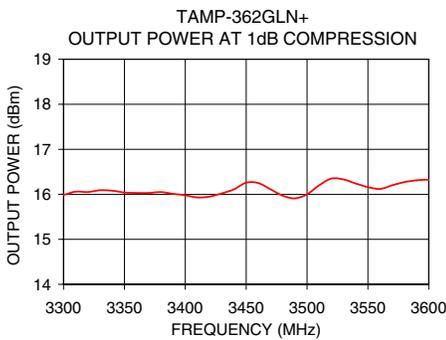
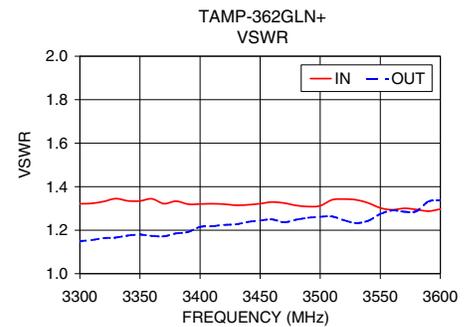
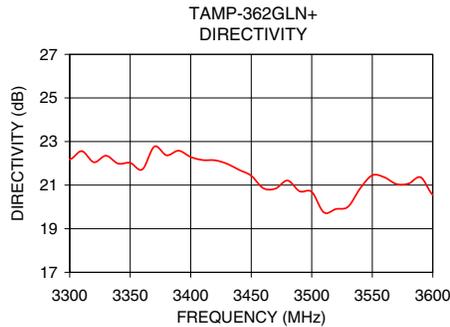
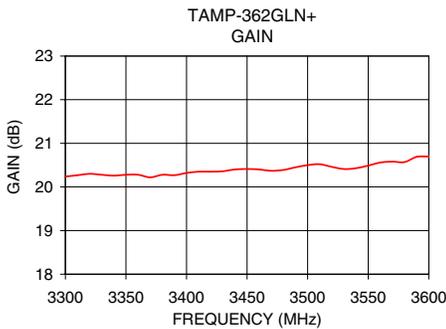
Machine Model (MM): Class M1 (40 V) in accordance with ANSI/ESD STM 5.2 - 1999

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FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR IN (:1)	VSWR OUT (:1)	NOISE FIGURE (dB)	P. OUT @ 1dB COMPR. (dBm)	OUTPUT IP3 (dBm)
3300.00	20.24	22.19	1.32	1.15	0.99	15.99	29.43
3320.00	20.30	22.05	1.33	1.16	0.99	16.05	29.48
3330.00	20.28	22.35	1.35	1.17	1.00	16.09	28.99
3350.00	20.28	22.02	1.33	1.18	0.99	16.04	29.28
3360.00	20.28	21.72	1.34	1.17	0.99	16.03	29.31
3380.00	20.28	22.37	1.33	1.19	0.98	16.05	29.29
3400.00	20.32	22.29	1.32	1.21	0.98	15.98	28.84
3410.00	20.35	22.15	1.32	1.22	0.97	15.93	29.49
3430.00	20.36	21.98	1.31	1.23	0.97	16.02	29.65
3450.00	20.41	21.43	1.32	1.24	0.97	16.26	29.66
3470.00	20.37	20.84	1.32	1.24	0.97	16.11	29.50
3480.00	20.39	21.21	1.31	1.25	0.98	15.97	30.12
3500.00	20.50	20.69	1.31	1.26	0.99	16.00	29.77
3520.00	20.46	19.90	1.34	1.25	1.00	16.35	29.78
3530.00	20.41	20.01	1.34	1.23	1.00	16.33	29.46
3550.00	20.49	21.45	1.30	1.27	1.00	16.16	30.20
3560.00	20.56	21.36	1.29	1.29	1.01	16.12	29.72
3580.00	20.57	21.07	1.30	1.29	1.02	16.27	29.86
3590.00	20.69	21.36	1.29	1.33	1.02	16.31	29.65
3600.00	20.70	20.55	1.30	1.34	1.02	16.32	29.80



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Amplifier

TAMP-362GLN+

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 = 100mA, Vd = 5V @Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Noise Figure	FREQ	IP3 Output
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dB)	(MHz)	(dBm)
3300	20.24	42.43	17.17	23.09	5.93	0.07	15.99	0.99	3305	30.13
3310	20.27	42.83	17.13	22.88	5.98	0.06	16.06	0.99	3315	29.85
3320	20.30	42.35	16.93	22.42	6.03	0.07	16.05	0.99	3325	29.20
3330	20.28	42.63	16.64	22.30	5.90	0.07	16.09	1.00	3334	28.61
3340	20.26	42.25	16.87	21.87	5.76	0.07	16.08	1.00	3344	28.93
3350	20.28	42.30	16.88	21.68	5.80	0.07	16.04	0.99	3349	29.53
3360	20.28	42.00	16.66	21.94	5.64	0.07	16.03	0.99	3359	29.22
3370	20.22	42.99	17.16	22.04	5.43	0.06	16.03	0.99	3364	29.48
3380	20.28	42.65	16.90	21.44	5.21	0.06	16.05	0.98	3374	28.93
3390	20.27	42.85	17.21	21.16	5.20	0.06	16.01	0.98	3384	29.19
3400	20.32	42.61	17.20	20.26	5.18	0.06	15.98	0.98	3389	28.74
3410	20.35	42.50	17.17	20.14	5.27	0.06	15.93	0.97	3399	28.92
3415	20.35	42.32	17.16	20.10	5.29	0.07	15.94	0.97	3409	29.51
3420	20.35	42.49	17.21	19.92	5.35	0.06	15.95	0.97	3414	29.47
3425	20.35	41.97	17.22	19.86	5.32	0.07	16.01	0.97	3424	30.16
3430	20.36	42.34	17.33	19.83	5.30	0.07	16.02	0.97	3429	29.85
3435	20.38	42.25	17.38	19.61	5.27	0.07	16.07	0.97	3434	29.35
3440	20.40	42.10	17.28	19.46	5.24	0.07	16.11	0.96	3439	30.56
3445	20.40	41.97	17.21	19.45	5.16	0.07	16.20	0.96	3444	29.45
3450	20.41	41.84	17.16	19.25	5.08	0.07	16.26	0.97	3449	29.10
3455	20.41	41.28	17.04	19.00	5.08	0.08	16.28	0.97	3454	30.41
3460	20.40	41.26	16.99	19.10	5.09	0.08	16.25	0.97	3459	29.11
3465	20.39	41.00	17.02	19.31	5.17	0.08	16.17	0.97	3469	29.55
3470	20.37	41.21	17.10	19.52	5.26	0.08	16.11	0.97	3474	29.42
3475	20.37	41.31	17.18	19.46	5.34	0.08	16.02	0.98	3484	30.05
3480	20.39	41.60	17.35	19.14	5.42	0.07	15.97	0.98	3494	29.87
3485	20.42	41.21	17.47	18.85	5.41	0.08	15.92	0.97	3499	29.99
3490	20.45	41.17	17.48	18.87	5.40	0.08	15.91	0.98	3504	29.52
3500	20.50	41.19	17.39	18.74	5.39	0.08	16.00	0.99	3514	29.87
3510	20.52	40.27	16.76	18.70	5.45	0.09	16.20	0.99	3523	30.21
3520	20.46	40.36	16.69	19.22	5.50	0.09	16.35	1.00	3533	29.54
3530	20.41	40.42	16.77	19.64	5.30	0.08	16.33	1.00	3543	30.78
3540	20.43	41.28	17.09	19.29	5.41	0.08	16.24	1.00	3548	29.81
3550	20.49	41.94	17.63	18.37	5.46	0.07	16.16	1.00	3558	30.01
3560	20.56	41.92	17.85	17.92	5.34	0.07	16.12	1.01	3568	29.54
3570	20.58	41.63	17.68	18.09	5.11	0.07	16.20	1.01	3578	29.96
3580	20.57	41.64	17.81	18.03	4.87	0.07	16.27	1.02	3588	30.17
3590	20.69	42.05	18.02	16.94	4.91	0.07	16.31	1.02	3593	29.26
3600	20.70	41.25	17.79	16.79	4.95	0.08	16.32	1.02	3603	29.81

REV. X1

TAMP-362GLN+

090720

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Amplifier

TAMP-362GLN+

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 = 102mA, Vd = 5V @Temperature = -40degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Noise Figure	FREQ	IP3 Output
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dB)	(MHz)	(dBm)
3300	20.66	42.64	15.45	25.94	5.00	0.07	15.88	0.80	3305	29.26
3310	20.67	42.95	15.51	24.89	4.91	0.07	15.93	0.80	3315	27.48
3320	20.67	42.42	15.76	23.72	4.82	0.07	15.91	0.79	3325	28.16
3330	20.71	41.66	15.49	22.96	4.82	0.08	15.94	0.79	3334	28.62
3340	20.71	41.36	15.24	23.14	4.83	0.08	15.94	0.79	3344	28.26
3350	20.65	41.79	15.49	23.46	4.64	0.08	15.91	0.79	3349	32.60
3360	20.70	42.52	15.62	22.84	4.63	0.07	15.90	0.79	3359	28.62
3370	20.75	41.81	15.32	21.95	4.78	0.07	15.87	0.78	3364	30.08
3380	20.71	41.27	14.95	21.93	4.84	0.08	15.89	0.78	3374	28.26
3390	20.65	41.34	15.05	22.60	4.77	0.08	15.86	0.78	3384	29.84
3400	20.62	41.25	15.16	22.24	4.69	0.08	15.84	0.78	3389	28.59
3410	20.58	41.73	15.42	22.78	4.56	0.08	15.82	0.78	3399	30.51
3415	20.58	42.58	15.62	22.33	4.43	0.07	15.82	0.77	3409	28.46
3420	20.64	42.28	15.76	21.00	4.29	0.07	15.82	0.77	3414	28.79
3425	20.65	41.85	15.63	20.93	4.36	0.07	15.89	0.77	3424	30.18
3430	20.62	41.53	15.60	21.20	4.44	0.08	15.91	0.78	3429	28.96
3435	20.59	42.38	16.07	21.08	4.51	0.07	15.96	0.77	3434	28.66
3440	20.70	43.13	16.60	19.74	4.58	0.06	15.97	0.77	3439	30.46
3445	20.79	41.98	16.56	18.85	4.74	0.07	16.05	0.77	3444	28.73
3450	20.87	40.49	15.91	18.84	4.89	0.09	16.09	0.77	3449	30.10
3455	20.85	40.58	15.41	19.60	5.14	0.09	16.10	0.77	3454	29.61
3460	20.80	40.80	15.16	19.68	5.39	0.08	16.09	0.78	3459	28.97
3465	20.74	40.73	15.17	19.62	5.55	0.08	16.01	0.78	3469	29.00
3470	20.71	40.63	15.31	19.75	5.70	0.08	15.95	0.79	3474	29.21
3475	20.69	40.57	15.39	19.93	5.86	0.08	15.87	0.79	3484	29.22
3480	20.68	40.96	15.73	20.22	6.01	0.08	15.81	0.79	3494	28.96
3485	20.73	41.69	16.08	19.51	6.33	0.07	15.77	0.79	3499	29.94
3490	20.78	41.10	15.87	18.91	6.66	0.08	15.76	0.79	3504	29.41
3500	20.72	40.06	15.75	19.17	6.98	0.09	15.89	0.80	3514	29.58
3510	20.73	40.14	16.23	19.69	6.19	0.09	16.09	0.80	3523	28.58
3520	20.75	40.90	16.39	20.01	5.40	0.08	16.23	0.80	3533	28.03
3530	20.84	41.47	16.48	18.89	5.71	0.08	16.19	0.81	3543	28.92
3540	20.87	41.06	16.49	18.66	6.01	0.08	16.10	0.80	3548	30.08
3550	20.87	41.08	16.36	18.16	5.55	0.08	16.02	0.80	3558	29.98
3560	20.88	40.88	16.49	18.19	5.24	0.08	15.96	0.80	3568	28.52
3570	20.90	40.77	16.51	18.11	4.95	0.08	16.05	0.80	3578	28.56
3580	20.91	40.99	16.68	17.86	4.66	0.08	16.15	0.80	3588	30.43
3590	20.97	41.13	16.93	17.47	4.28	0.08	16.15	0.79	3593	30.57
3600	21.01	41.08	16.88	16.82	3.90	0.08	16.16	0.79	3603	29.76



Amplifier

TAMP-362GLN+

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 = 99mA, Vd = 5V @Temperature = +85degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Noise Figure	FREQ	IP3 Output
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dB)	(MHz)	(dBm)
3300	19.68	42.09	14.64	23.40	6.06	0.07	16.05	1.25	3305	28.17
3310	19.75	41.76	14.78	21.71	6.11	0.07	16.12	1.25	3315	28.16
3320	19.77	41.24	14.28	21.33	6.16	0.07	16.18	1.24	3325	27.77
3330	19.72	41.11	14.46	21.49	5.79	0.07	16.23	1.25	3334	28.55
3340	19.74	40.90	14.55	20.80	5.41	0.07	16.20	1.25	3344	29.09
3350	19.75	40.03	14.24	20.73	5.48	0.08	16.13	1.26	3349	28.16
3360	19.73	40.29	14.28	21.29	5.64	0.08	16.13	1.26	3359	29.04
3370	19.70	41.16	14.47	21.76	5.70	0.07	16.14	1.25	3364	28.94
3380	19.72	41.50	14.50	21.29	5.76	0.07	16.18	1.25	3374	28.24
3390	19.71	41.55	14.49	20.98	5.68	0.07	16.17	1.25	3384	28.88
3400	19.76	41.47	14.76	20.12	5.60	0.07	16.14	1.25	3389	29.43
3410	19.77	40.88	14.59	20.19	5.61	0.07	16.09	1.24	3399	28.58
3415	19.75	41.18	14.64	20.33	5.62	0.07	16.10	1.24	3409	29.16
3420	19.75	41.10	14.79	20.40	5.63	0.07	16.08	1.24	3414	29.13
3425	19.75	41.38	14.84	20.41	5.53	0.07	16.13	1.23	3424	29.21
3430	19.77	41.67	14.97	20.27	5.43	0.06	16.14	1.23	3429	30.17
3435	19.80	41.66	14.91	19.83	5.33	0.06	16.19	1.23	3434	29.66
3440	19.79	40.80	14.72	19.57	5.23	0.07	16.22	1.23	3439	28.99
3445	19.74	40.89	14.59	19.76	5.27	0.07	16.33	1.22	3444	28.50
3450	19.70	40.90	14.70	20.05	5.30	0.07	16.37	1.22	3449	29.41
3455	19.70	41.39	15.05	20.02	5.60	0.07	16.39	1.22	3454	29.16
3460	19.75	41.89	15.34	19.68	5.89	0.06	16.38	1.23	3459	29.50
3465	19.80	41.79	15.52	19.47	5.93	0.06	16.30	1.23	3469	28.66
3470	19.82	42.12	15.52	19.49	5.97	0.06	16.26	1.23	3474	29.07
3475	19.85	42.48	15.55	19.02	6.00	0.06	16.18	1.23	3484	30.00
3480	19.88	42.09	15.49	18.43	6.04	0.06	16.11	1.23	3494	31.25
3485	19.88	41.49	15.36	18.31	5.88	0.06	16.08	1.24	3499	29.10
3490	19.86	41.28	15.20	18.36	5.72	0.07	16.08	1.24	3504	28.17
3500	19.84	41.07	15.31	18.66	5.57	0.07	16.14	1.25	3514	29.20
3510	19.89	41.96	15.70	18.58	5.76	0.06	16.29	1.26	3523	29.20
3520	19.94	42.43	15.69	17.52	5.95	0.05	16.41	1.26	3533	29.46
3530	19.93	40.96	15.51	17.17	5.79	0.07	16.41	1.27	3543	29.29
3540	19.93	41.09	15.78	17.25	5.63	0.07	16.34	1.27	3548	29.31
3550	20.09	41.35	16.50	16.39	5.60	0.06	16.26	1.27	3558	29.57
3560	20.17	41.35	16.16	16.11	5.61	0.06	16.26	1.28	3568	29.34
3570	20.12	41.03	15.72	16.10	5.27	0.07	16.35	1.28	3578	29.46
3580	20.12	41.16	16.11	15.96	4.93	0.07	16.41	1.27	3588	30.28
3590	20.18	40.48	15.94	15.43	4.71	0.07	16.43	1.27	3593	30.04
3600	20.14	39.31	15.40	15.89	4.49	0.09	16.47	1.27	3603	28.86

REV. X1

TAMP-362GLN+

090720

Page 3 of 3



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant

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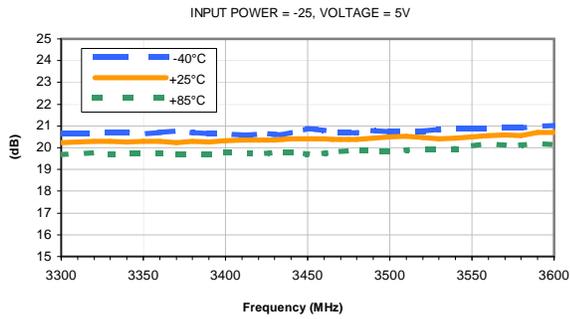


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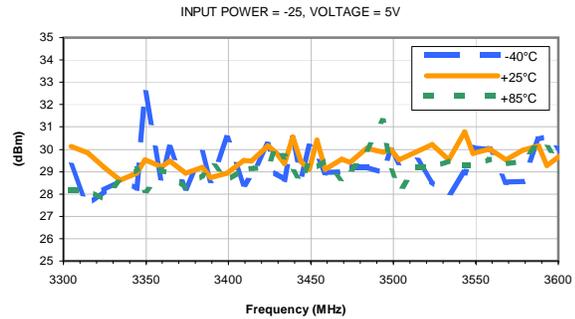


Typical Performance Curves

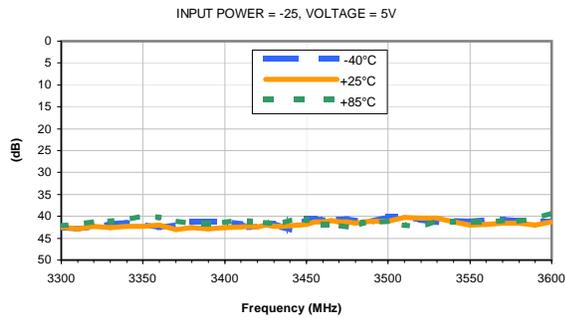
GAIN vs. FREQUENCY & TEMPERATURE



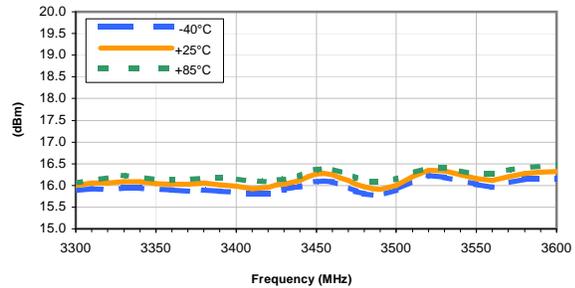
OUTPUT IP3 vs. FREQUENCY & TEMPERATURE



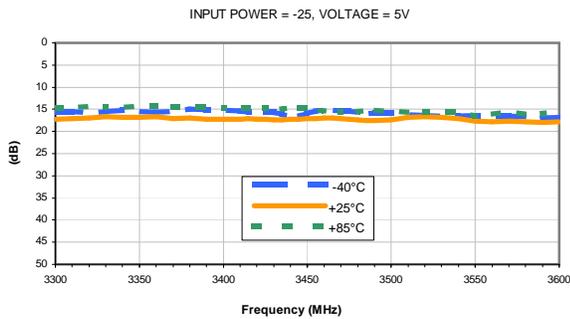
ISOLATION vs. FREQUENCY & TEMPERATURE



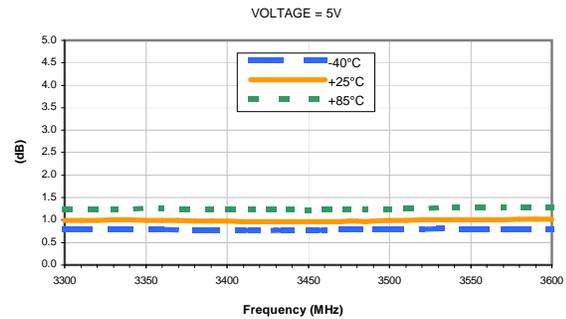
OUTPUT POWER at 1dB COMPRESSION vs. FREQUENCY & TEMPERATURE



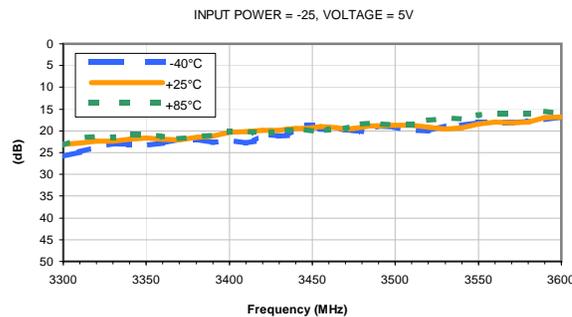
INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE



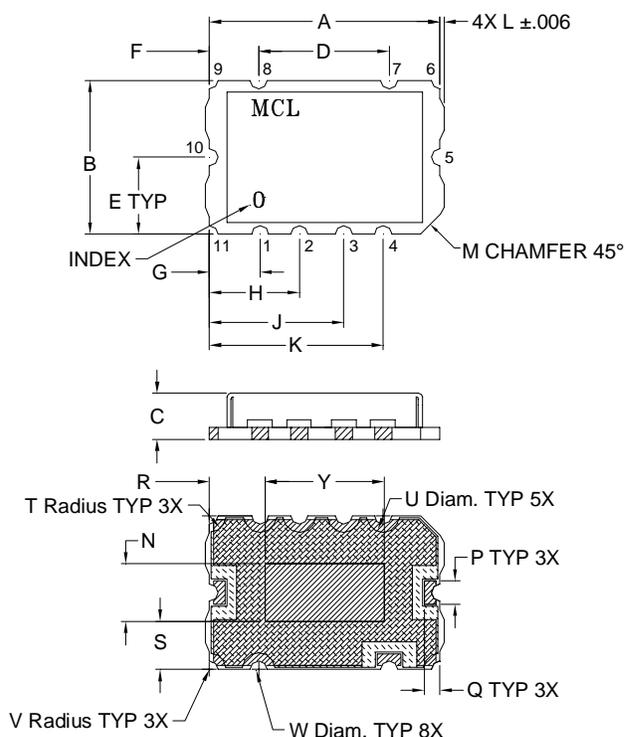
NOISE FIGURE vs. FREQUENCY & TEMPERATURE



OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE

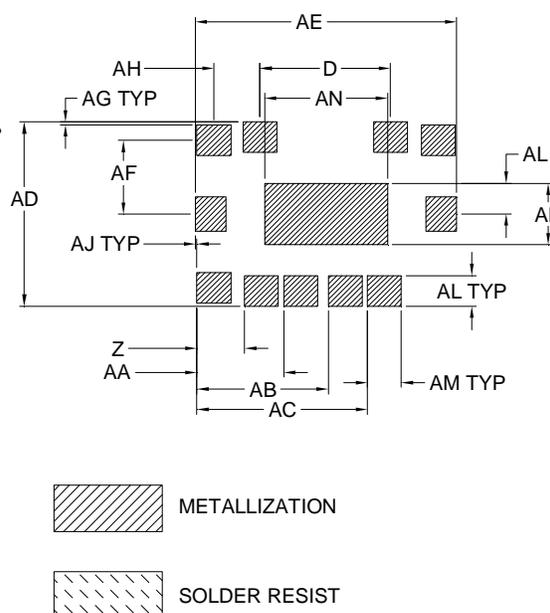


Outline Dimensions



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.



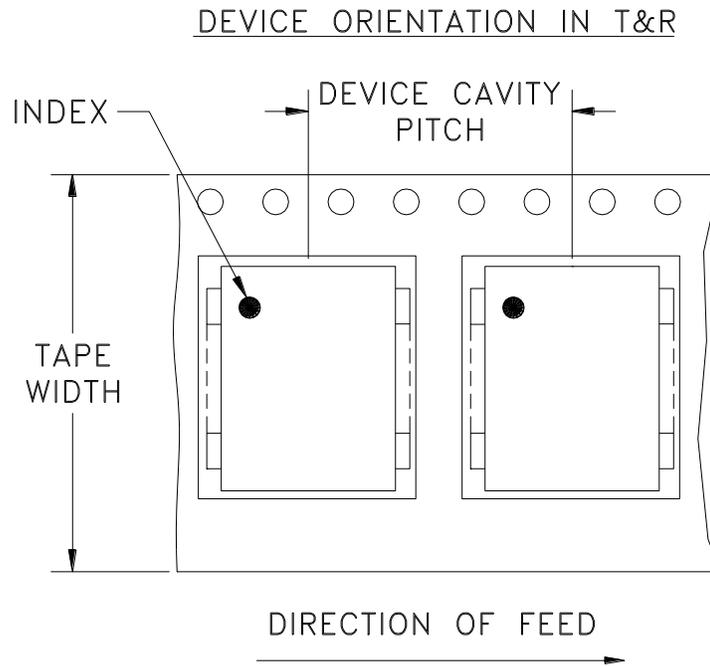
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RF/IF MICROWAVE COMPONENTS

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.

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



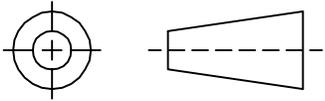
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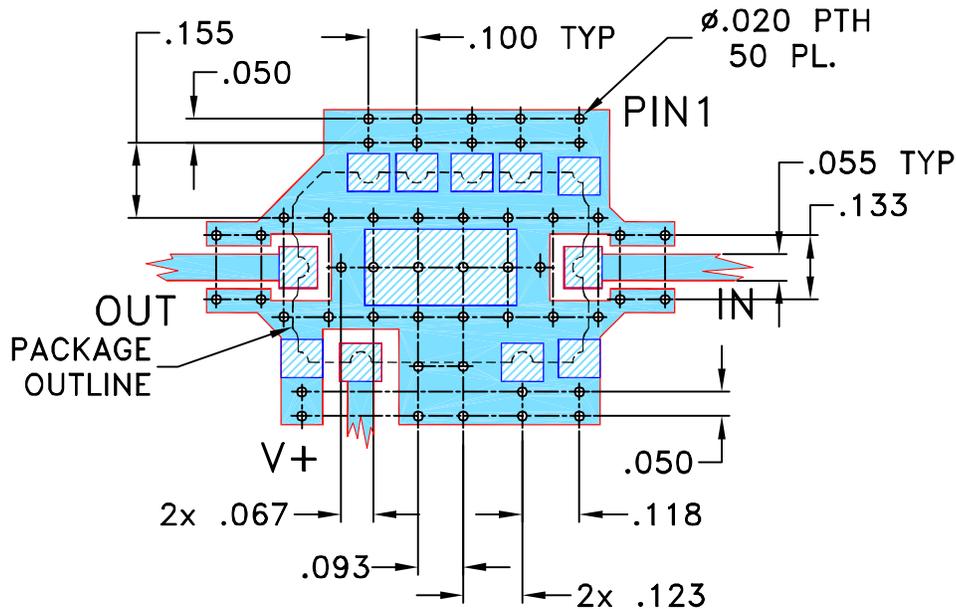
THIRD ANGLE PROJECTION



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 R04350B 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

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 ±		

Mini-Circuits® 13 Neptune Avenue
Brooklyn NY 11235

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

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SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-293	A
FILE:	98PL293	SCALE: 2.5:1	SHEET: 1 OF 1

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