Surface Mount

Monolithic Amplifier

VAM-77+

50Ω, Broadband, DC to 6 GHz

CASE STYLE: MMM168
PRICE: Contact Sales Department

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

Features

- low device voltage, 3.3V typ.
- gain flatness, ±.55 dB typ. to 2 GHz
- equivalent to MSA-0711

Applications

- cellular
- PCN & instrumentation

Electrical Specifications

MODEL NO.	FREQ.* (GHz)	GAIN, dB Typical								MAXIMUM POWER, dBm at 2 GHz		DYNAMIC RANGE at 2 GHz		VSWR (:1) Typ.				MAXIMUM RATING**		DC‡ OPERATING POWER @ Pin 3		THERMAL RESISTANCE
		over frequency, GHz						Min. @ 2 GHz	Flatness DC-2 GHz	Output (1 dB Comp.) Typ.	Input (no dmg.)	NF dB Typ.	IP3 dBm Typ.	In DC-3 GHz	In 3-f_U GHz	Out DC-3 GHz	Out 3-f_U GHz	I (mA)	P (mW)	Current (mA)	Volt Typ.	θjc typ. °C/W
	f_L - f_U	0.1	1	2	3	4	6															
VAM-77+	DC-6	13.9	13.6	12.9	12.5	11.2	9.9	11	±0.55	4.0	13	3.8	18	1.3	1.2	1.5	1.9	50	175	22	3.3	194

* Low frequency cutoff determined by external coupling capacitors.
** Permanent damage may occur if any of these limits are exceeded. These ratings are not intended for continuous normal operation.
‡ Supply voltage must be connected to pin 3 through a bias resistor in order to prevent damage. See "Biasing MMIC Amplifiers" in minicircuits.com/application.html. Reliability predictions are applicable at specified current & normal operating conditions.

NON-CATALOG

Maximum Ratings

Operating Temperature	-45°C to 85°C
Storage Temperature	-55°C to 100°C
DC Voltage	2.8Vmin., 3.8V max.

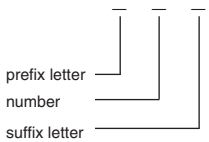
Pin Configuration

RF IN	1
RF OUT	3
DC	3
GND EXT.	2,4
NOT USED	—

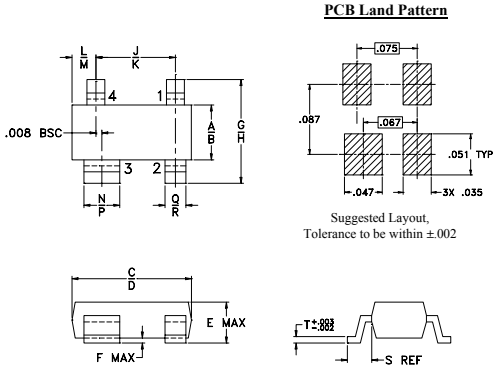
model identification

Model	marking
VAM-77+	7Z

Note: Prefix letter (optional) designates assembly location. Suffix letters (optional) are for wafer identification.



Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J	K
.045	.055	.105	.120	.047	.005	.083	.104	.070	.080
1.14	1.40	2.67	3.05	1.19	0.13	2.11	2.64	1.78	2.03

L	M	N	P	Q	R	S	T	wt.
.018	.024	.030	.036	.015	.021	.023	.004	grams
0.46	0.61	0.76	0.91	0.38	0.53	0.58	0.10	1.0

Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. **2.** Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. **3.** The parts covered by this specification sheet 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.

REV. A
M121747
EE-7974L/1
VAM-77+
RS/TD/CP/AM
090709

MMIC Amplifier VAM-77+

Typical Performance Data

FREQUENCY (MHz)	GAIN (dB) 22 mA	ISOLATION (dB) 22 mA	RETURN LOSS IN (dB) 22 mA	RETURN LOSS OUT (dB) 22 mA
100	14.03	18.24	16.71	14.33
200	13.98	17.50	16.60	15.39
400	13.91	17.63	16.48	15.15
600	13.85	17.70	16.42	14.88
800	13.73	17.60	16.11	14.63
1000	13.63	17.56	15.85	14.24
1200	13.51	17.61	15.54	13.80
1400	13.38	17.58	15.23	13.48
1600	13.25	17.60	15.04	13.33
1800	13.09	17.55	14.95	13.03
2000	12.96	17.52	14.94	12.85
2200	12.82	17.47	15.15	12.90
2500	12.62	17.33	15.95	13.30
2800	12.41	17.17	17.27	13.62
3000	12.30	17.10	18.75	14.00
3200	12.15	17.00	20.72	13.90
3400	12.00	16.89	23.52	13.66
3600	11.85	16.84	27.73	13.07
3800	11.67	16.78	34.00	12.41
4000	11.48	16.78	32.62	11.60
4200	11.28	16.75	27.69	10.90
4400	11.05	16.69	24.40	10.26
4600	10.84	16.77	22.43	9.85
4800	10.65	16.73	21.09	9.39
5000	10.48	16.82	20.65	9.12
5200	10.31	16.87	20.18	8.88
5400	10.25	16.76	20.11	8.68
5600	10.10	16.80	19.71	8.42
5800	10.06	16.70	18.88	8.24
6000	9.90	16.66	17.65	7.93
6200	9.76	16.67	16.29	7.51
6400	9.61	16.64	14.91	7.02
6600	9.39	16.73	13.36	6.53
6800	9.14	16.83	12.01	5.85
7000	8.91	17.00	10.77	5.45
7500	7.98	17.44	8.60	4.20
8000	7.07	17.91	7.70	3.78
8500	6.58	18.30	7.79	3.93
9000	6.58	18.04	8.13	4.05
9500	6.71	17.76	8.56	4.83
10000	7.05	17.24	8.81	5.04

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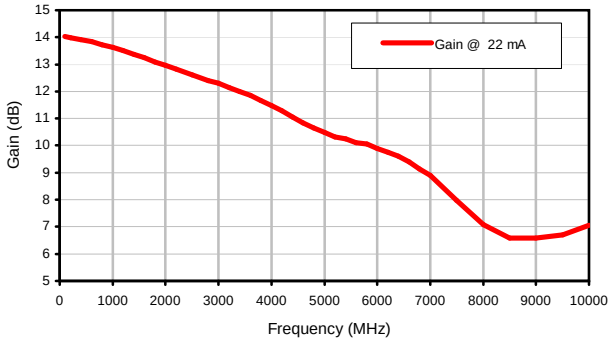
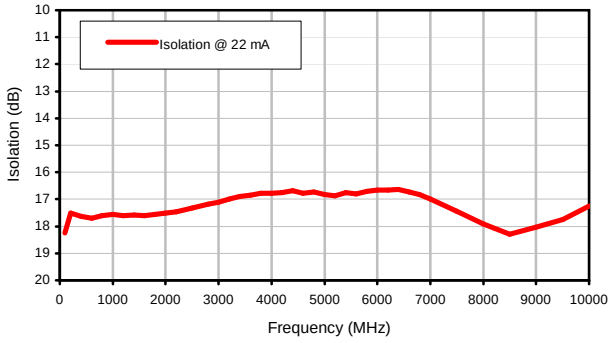
Typical Performance Curves

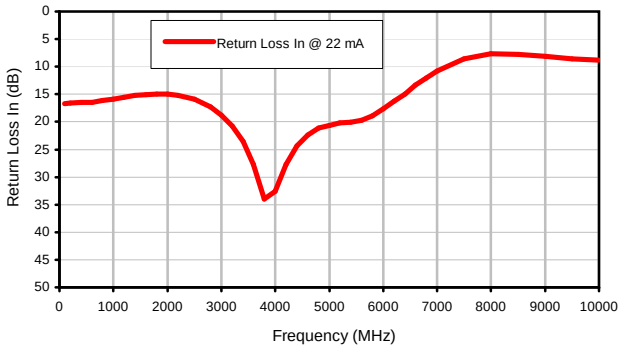
Gain



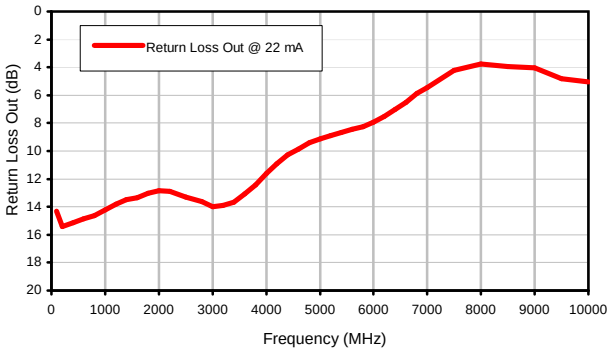
ISOLATION



Return Loss In



Return Loss Out



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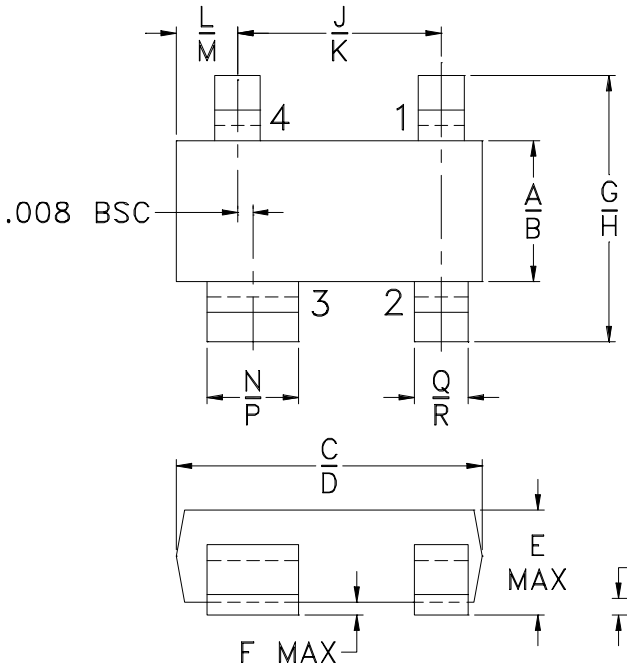
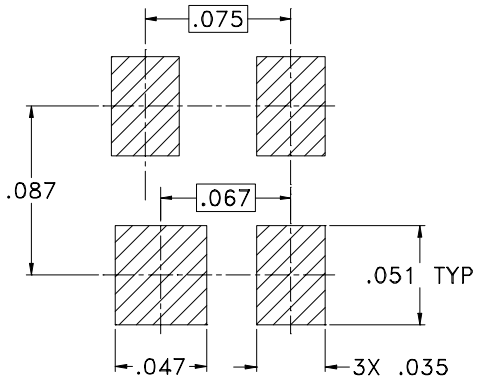
Case Style MMM

MMM168

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	N	P
MMM168	.045 (1.14)	.055 (1.40)	.105 (2.67)	.120 (3.05)	.047 (1.19)	.005 (0.13)	.083 (2.11)	.104 (2.64)	.070 (1.78)	.080 (2.03)	.018 (0.46)	.024 (0.61)	.030 (0.76)	.036 (0.91)

CASE #.	Q	R	S	T	WT, GRAM
MMM168	.015 (0.38)	.021 (0.53)	.023 (0.58)	.005 (0.13)	.01

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005

Notes:

1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Tin-Silver alloy plate over Nickel barrier.
   For RoHS-5 Case Styles: Tin-Lead plate.

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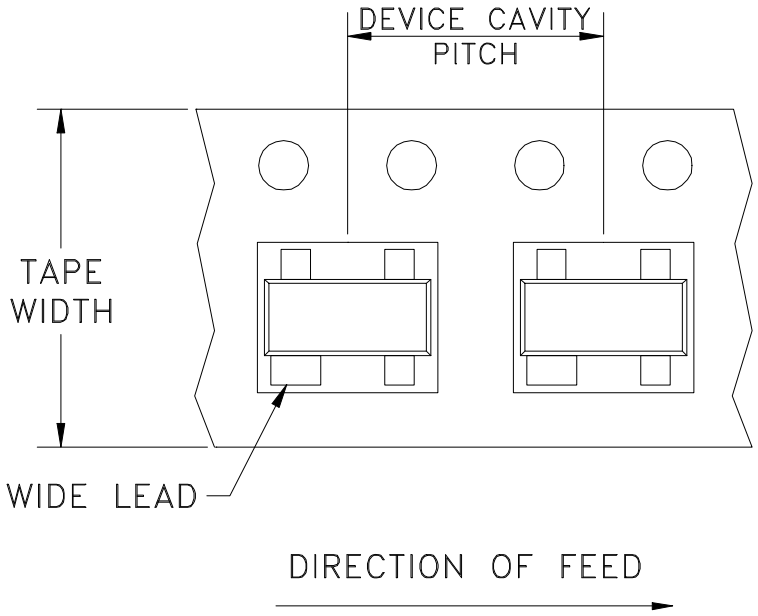
Tape & Reel Packaging TR-F8

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
8	4	7	3000

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

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

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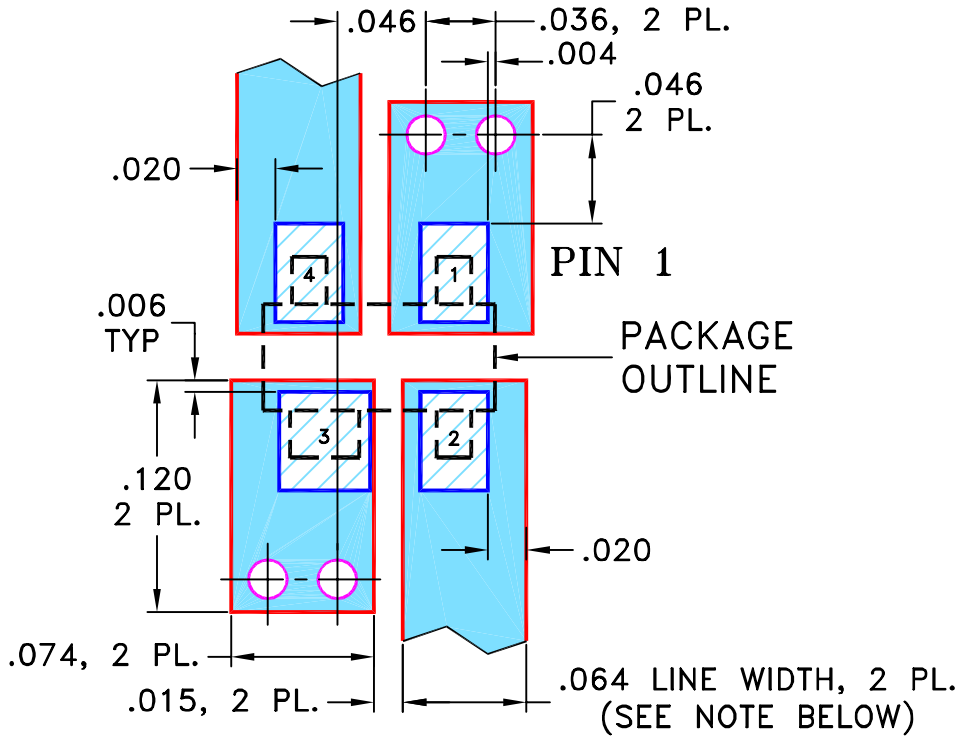
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M101091	NEW RELEASE	02/03/06	MMG	MM

SUGGESTED MOUNTING CONFIGURATION FOR MMM168 CASE STYLE, "jk" PIN CONNECTION



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

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	MMG	12/12/05
TOLERANCES ON:	CHECKED	AV	01/03/06
2 PL DECIMALS ±	APPROVED	MM	02/03/06
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

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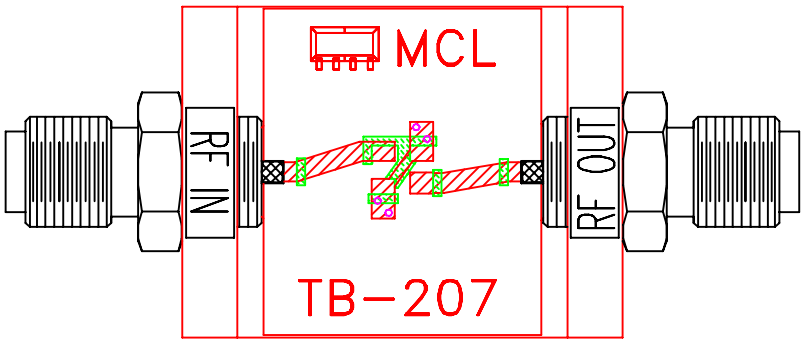
PL, jk, MMM168, LAT, TB-39

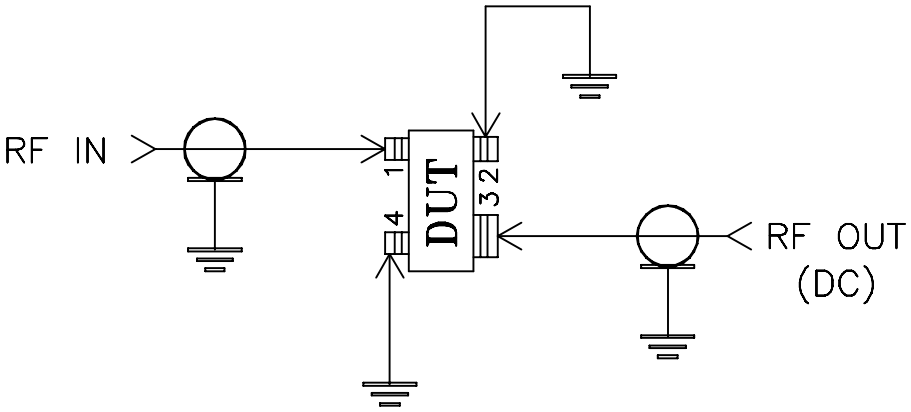
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-225	OR

FILE:	SCALE:	SHEET:
98PL225	10:1	1 OF 1

Evaluation Board and Circuit



TB-207



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.020 inch.

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