

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, ± 0.55 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 RESIS- TANCE
		over frequency, GHz								Output (1 dB Comp.) Typ.	Input (no dmg.)	NF dB Typ.	IP3 dBm Typ.	In DC-3 GHz	3-f _l GHz	DC-3 GHz	3-f _u GHz	I (mA)	P (mW)	Current (mA)	Volt Typ.	
		f _L - f _U	0.1	1	2	3	4	6	Min. @ 2 GHz	Flatness DC-2 GHz												
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.

Maximum Ratings

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

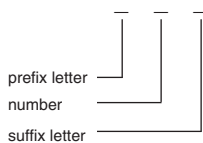
Pin Configuration

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

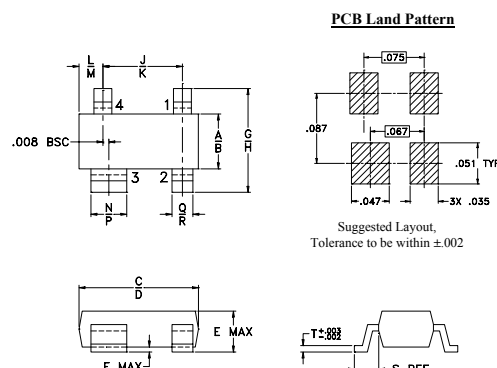
model identification

Model	marking
VAM-77+	77

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	

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ISO 9001 ISO 14001 AS 9100 CERTIFIED
The Design Engineers Search Engine Provides ACTUAL Data Instantly at minicircuits.com
I/RF MICROWAVE COMPONENTS

For detailed performance specs
& shopping online see web site

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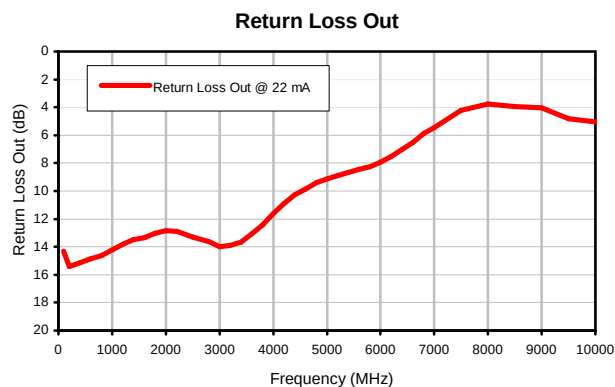
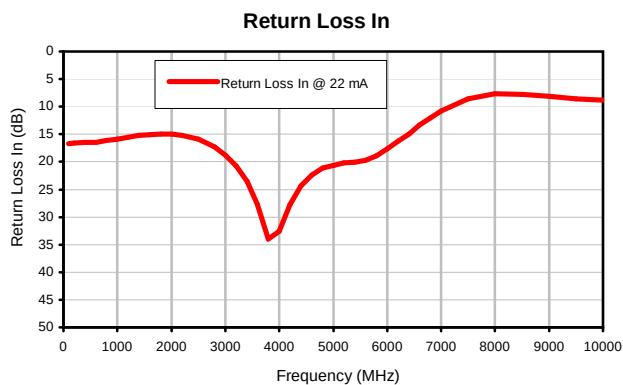
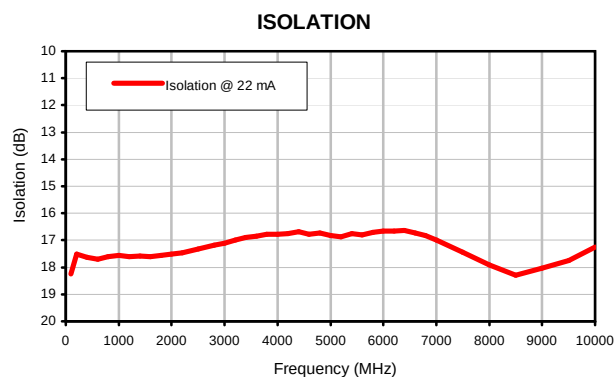
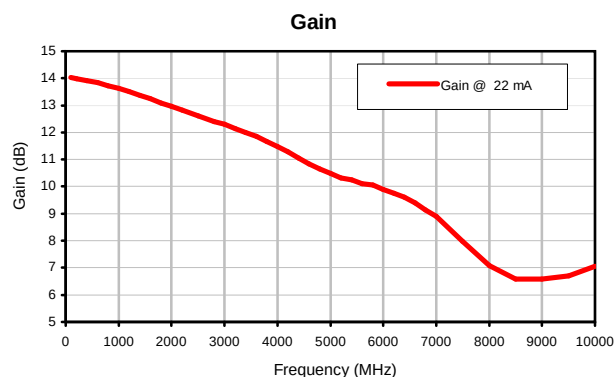
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REV. A
M121747
EE-7974L/1
VAM-77+
RS/TD/CP/AM
090709
page 1 of 2

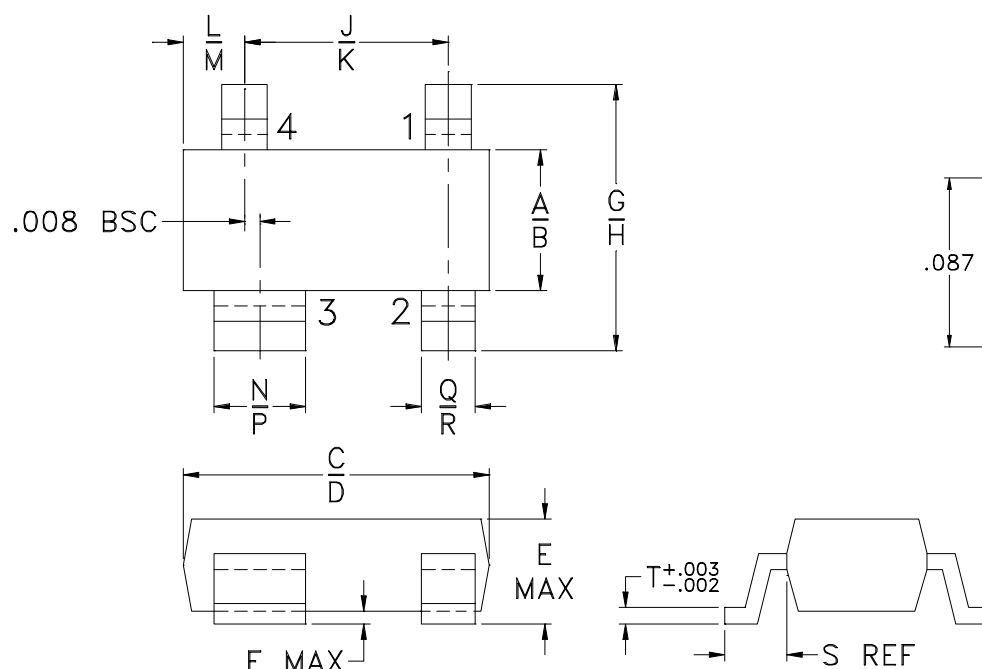
Typical Performance Data

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

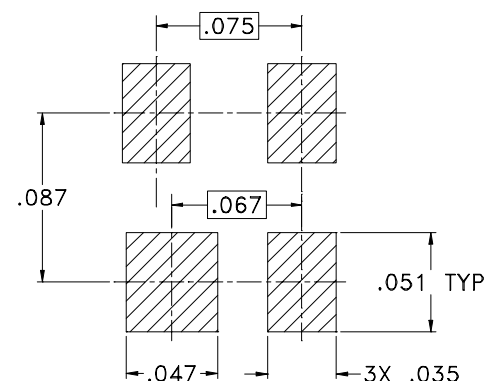
Typical Performance Curves



Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

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. $\pm .01$; 3 Pl. $\pm .005$

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.



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

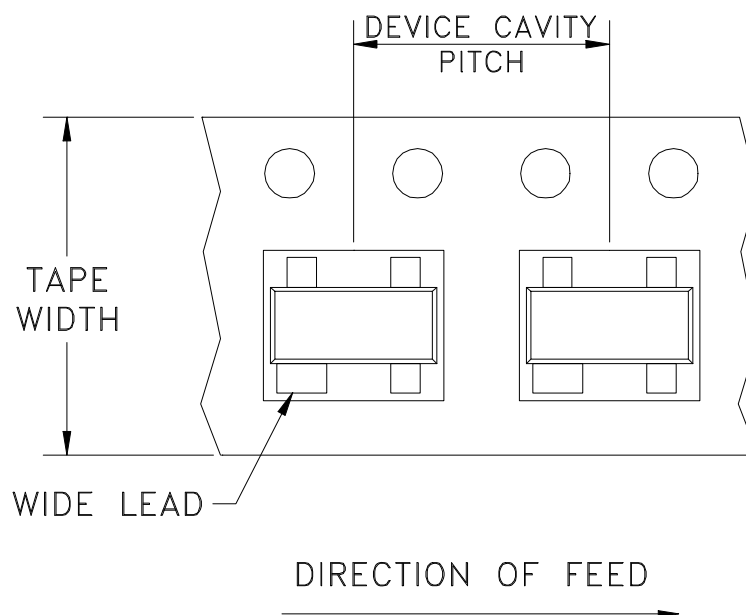
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Tape & Reel Packaging TR-F8

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



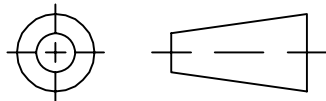
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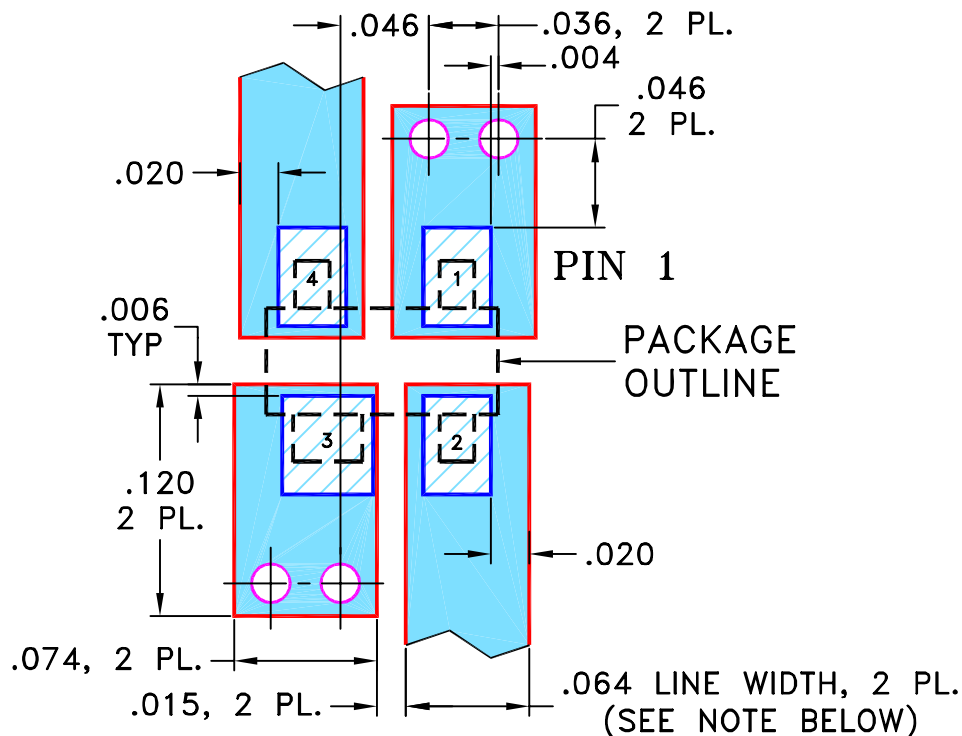
THIRD ANGLE PROJECTION



REVISIONS

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

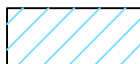
SUGGESTED MOUNTING CONFIGURATION FOR MMM168 CASE STYLE, "jk" PIN CONNECTION



- NOTES:** 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" $\pm$.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

DIMENSIONS ARE IN INCHES

TOLERANCES ON:
2 PL DECIMALS $\pm$
3 PL DECIMALS $\pm$.005
ANGLES $\pm$
FRACTIONS $\pm$



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

INITIALS

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MMG

12/12/05

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01/03/06

APPROVED

MM

02/03/06



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PL, jk, MMM168, LAT, TB-39

SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-225

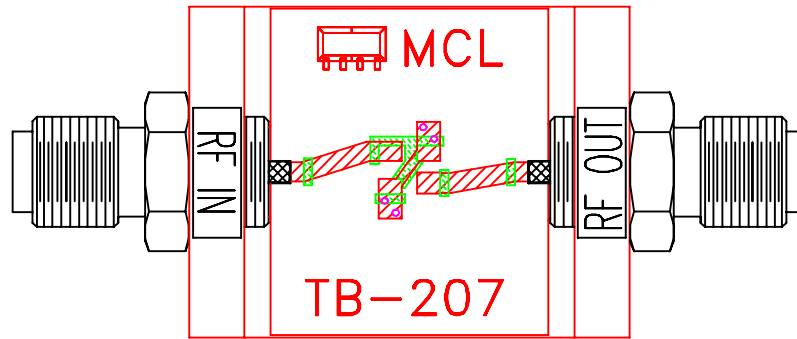
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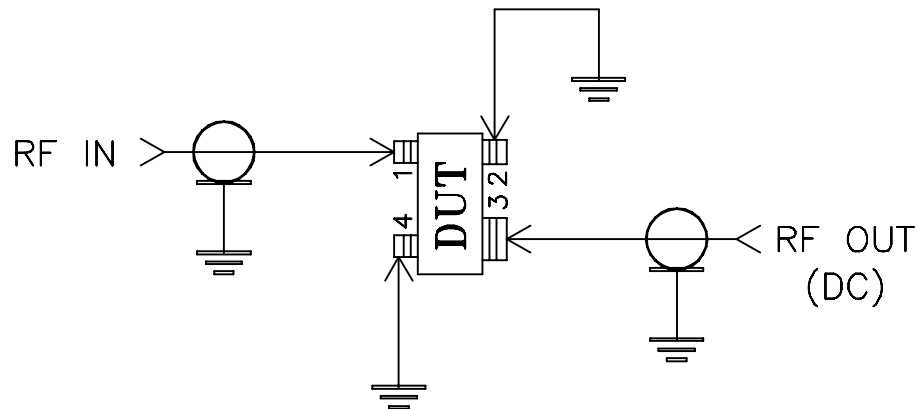
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SHEET: 1 OF 1

Evaluation Board and Circuit



TB-207



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.020 inch.

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