

# Surface Mount Monolithic Amplifiers

# MAR+ SERIES MAR SERIES

50Ω

DC to 2000 MHz



CASE STYLE: WW107

## Features

- wideband, DC to 2000 MHz
- high gain, up to 32.5 dB @ 100 MHz
- low noise
- cascadable
- protected by US Patent, 6,943,629 (except MAR-6SM and MAR-8SM)

## Applications

- cellular
- PCN instrumentation

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

See our web site for RoHS Compliance methodologies and qualifications.

## Electrical Specifications

MODEL NO.	FREQ. <sup>2</sup> (MHz)		GAIN (dB) Typical at MHz				MAXIMUM POWER (dBm)		DYNAMIC RANGE		VSWR (:1) Typ.		ABSOLUTE MAXIMUM RATING <sup>5</sup> (25°C)		DC OPERATING POWER <sup>7</sup> at Pin 3		THERMAL RESISTANCE <sup>5</sup>	PRICE \$
	f <sub>L</sub>	f <sub>u</sub>	100	1000	2000	Note 1 Min.	Output (1 dB Compr.) Typ.	Input (no damage)	NF (dB) Typ.	IP3 (dBm) Typ.	In	Out	I (mA)	P (mW)	Current (mA)	Device Volt Typ.	°C/W	Qty. (30)
MAR-1SM(+)	DC	1000	18.5	15.5	—	13.0	+1.5	+13	5.5	+14.0	1.3	1.2	40	200	17	5.0	115	1.04
MAR-2SM(+)	DC	2000	12.5	12.0	11.0	8.5	+4.5	+13	6.5	+17.0	1.5	1.4	60	325	25	5.0	105	1.17
MAR-3SM(+)	DC	2000	12.5	12.0	10.5	8.0	+10.0	+13	6.0	+23.0	1.5	1.7	70	400	35	5.0	115	1.24
MAR-4SM(+)	DC	1000	8.3	8.0	—	7.0	+12.5	+13	7.0	+25.5	1.5	1.9	85	500	50	5.25	100	1.34
MAR-6SM(+)	DC	2000	20.0	16.0	11.0	9.0	+2.0	+13	3.0	+14.5	1.7	1.7	50	200	16	3.50	120	1.21
MAR-7SM(+)	DC	2000	13.5	12.5	11.0	8.5	+5.5	+13	5.0	+19.0	1.7	1.7	60	275	22	4.0	120	1.36
MAR-8SM(+)	DC	1000	32.5	22.5	—	19.0	+12.5	+13	3.3	+27.0	#	#	65	500	36	7.8	140	1.32

### NOTES:

# MAR-8SM(+) model input and output impedances are not 50 ohms, see S-parameter data. Conditionally stable, source and load VSWR<3:1 required. MAR-6SM(+) conditionally stable, source and load VSWR<5:1 required.

- Minimum gain over the full frequency range and temperature range.
- Low frequency cutoff determined by external coupling capacitors.
- Frequency at which output power, NF and IP3 are specified: 500 MHz for MAR-1SM(+) and MAR-6SM(+), 1000 MHz for all other models.
- MAR-6SM(+) models potentially unstable with very high VSWR terminations.
- Thermal resistance t<sub>jc</sub> is from hottest junction in device to mounting surface of leads.
- 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 -20°C to 85°C

Storage Temperature -55°C to 100°C

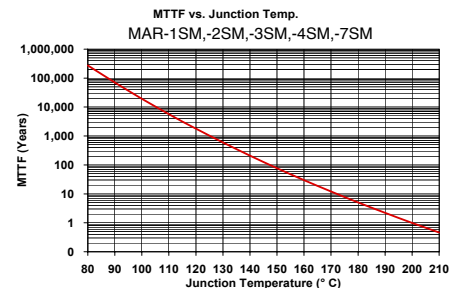
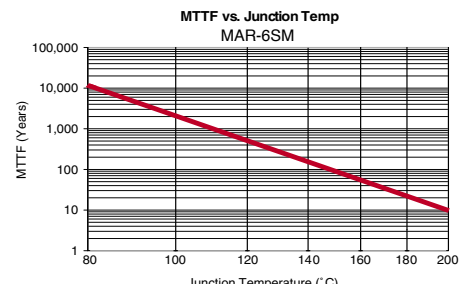
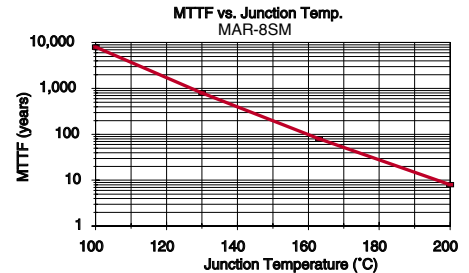
## Pin Connections

RF IN	1
RF OUT	3
DC	3
GROUND	2,4

## Model Identification

Model No.	Marking <sup>†</sup>
MAR-1SM(+)	01
MAR-2SM(+)	02
MAR-3SM(+)	03
MAR-4SM(+)	04
MAR-6SM(+)	06
MAR-7SM(+)	07
MAR-8SM(+)	08

<sup>†</sup>Prefix letter (optional) designates assembly location



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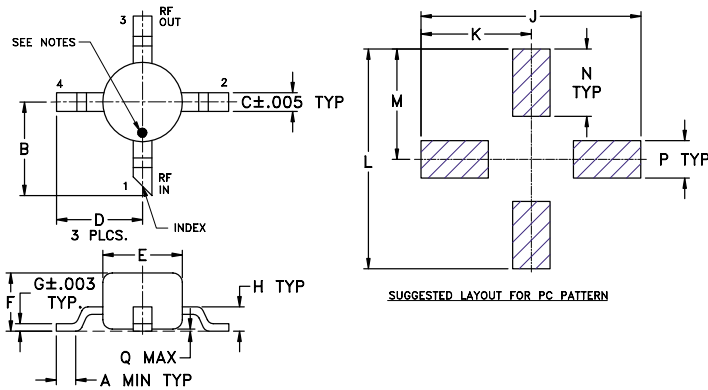
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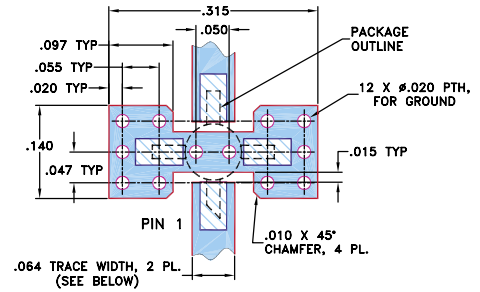


# MAR+ SERIES MAR SERIES

## Outline Drawing



Demo Board MCL PIN: MAR-TB  
Suggested PCB Layout (PL-075)



### NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B 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.
3. IF PCB DESIGN RULES ALLOW, PLACE GROUND VIAS UNDER THE LAND PATTERN FOR BETTER RF PERFORMANCE. OTHERWISE PLACE GROUND VIAS AS CLOSE TO LAND PATTERN AS POSSIBLE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	wt.
0.01	0.1	0.02	0.09	0.08	0.06	0.00	0.02	0.23	0.11	0.23	0.11	0.07	0.04	0.02	grams
0.30	2.54	0.51	2.34	2.16	1.52	0.18	0.66	5.97	3.00	5.97	3.00	1.83	1.02	0.51	0.15

## Typical Biasing Configuration

