

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. ² (MHz) | | GAIN (dB) Typical at MHz | | | | MAXIMUM POWER (dBm) | | DYNAMIC RANGE | | VSWR (:1) Typ. | | ABSOLUTE MAXIMUM RATING ⁵ (25°C) | | DC OPERATING POWER ⁷ at Pin 3 | | THERMAL RESISTANCE ⁵ | PRICE \$ |
|------------|--------------------------|----------------|-----------------------------|------|------|-------------|---------------------------|-------------------|---------------|----------------|-------------------|-----|---|--------|--|------------------|---------------------------------|-----------|
| | f _L | f _u | 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.

1. Minimum gain over the full frequency range and temperature range.
2. Low frequency cutoff determined by external coupling capacitors.
3. Frequency at which output power, NF and IP3 are specified: 500 MHz for MAR-1SM(+) and MAR-6SM(+), 1000 MHz for all other models.
4. MAR-6SM(+) models potentially unstable with very high VSWR terminations.
5. Thermal resistance t_{jc} is from hottest junction in device to mounting surface of leads.
6. Permanent damage may occur if any of these limits are exceeded. These ratings are not intended for continuous normal operation.
7. 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

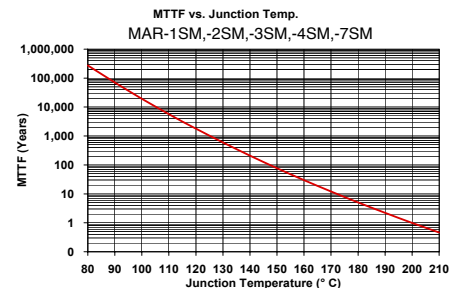
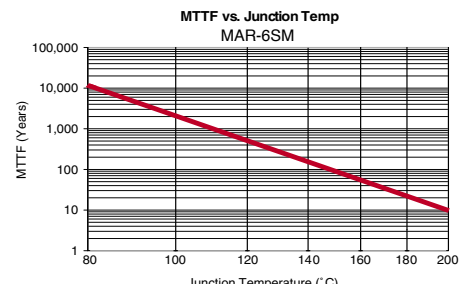
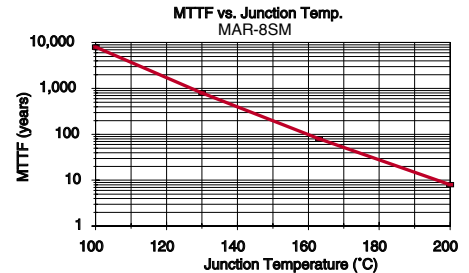
Pin Connections

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

Model Identification

| Model No. | Marking [†] |
|------------|----------------------|
| MAR-1SM(+) | 01 |
| MAR-2SM(+) | 02 |
| MAR-3SM(+) | 03 |
| MAR-4SM(+) | 04 |
| MAR-6SM(+) | 06 |
| MAR-7SM(+) | 07 |
| MAR-8SM(+) | 08 |

[†]Prefix letter (optional) designates assembly location



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

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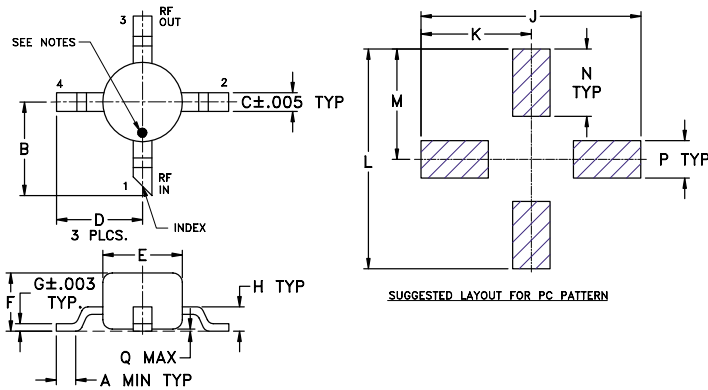
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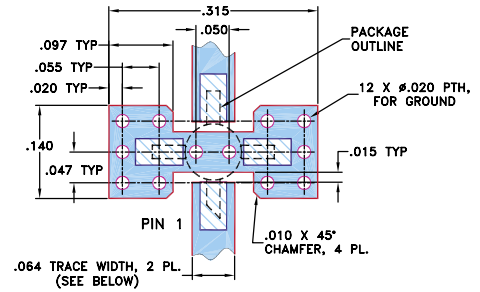


MAR+ SERIES MAR SERIES

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

