Surface Mount Schottky Power Rectifier

SMB Power Surface Mount Package

... employing the Schottky Barrier principle in a metal-to-silicon power rectifier. Features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency switching power supplies; free wheeling diodes and polarity protection diodes.

- Compact Package with J-Bend Leads Ideal for Automated Handling
- Highly Stable Oxide Passivated Junction
- Guardring for Over-Voltage Protection
- Low Forward Voltage Drop

Mechanical Characteristics:

- Case: Molded Epoxy
- Epoxy Meets UL94, VO at 1/8"
- Weight: 95 mg (approximately)
- Cathode Polarity Band
- Maximum Temperature of 260°C/10 Seconds for Soldering
- Available in 12 mm Tape, 2500 Units per 13" Reel, Add "T3" Suffix to Part Number
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Marking: 2BL4

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|--|-------------|------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V _{RRM} V _{RWM} V _R | 40 | V |
| Average Rectified Forward Current (At Rated V_R , $T_C = 100$ °C) | I _O | 2.0 | Α |
| Peak Repetitive Forward Current (At Rated V _R , Square Wave, 20 kHz, T _C = 105°C) | I _{FRM} | 4.0 | А |
| Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | I _{FSM} | 25 | Α |
| Storage/Operating Case Temperature | T _{stg} , T _C | -55 to +150 | °C |
| Operating Junction Temperature | TJ | -55 to +125 | °C |
| Voltage Rate of Change (Rated V _R , T _J = 25°C) | dv/dt | 10,000 | V/µs |



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SCHOTTKY BARRIER RECTIFIER 2.0 AMPERES 40 VOLTS



SMB CASE 403A PLASTIC

MARKING DIAGRAM



2BL4 = Device Code

ORDERING INFORMATION

| Device | Package | Shipping |
|------------|---------|------------------|
| MBRS240LT3 | SMB | 2500/Tape & Reel |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Value | Unit |
|--|-----------------|-------|------|
| Thermal Resistance — Junction–to–Lead (Note 1.) | $R_{\theta JL}$ | 18 | °C/W |
| Thermal Resistance — Junction–to–Ambient (Note 3.) | $R_{\theta JA}$ | 78 | |

ELECTRICAL CHARACTERISTICS

| Maximum Instantaneous Forward Voltage (Note 2.) | | V _F | T _J = 25°C | T _J = 125°C | Volts |
|---|--|----------------|-----------------------|------------------------|-------|
| see Figure 2 | $(I_F = 2.0 \text{ A})$ $(I_F = 4.0 \text{ A})$ | | 0.43 0.54 | 0.375 0.55 | |
| Maximum Instantaneous Reverse Current (Note 2.) | | I _R | T _J = 25°C | T _J = 100°C | mA |
| see Figure 4 | $(V_R = 40 \text{ V})$ $(V_R = 20 \text{ V})$ | | 2.0 0.5 | 60 40 | |

- Mounted with minimum recommended pad size, PC Board FR4.
- Pulse Test: Pulse Width ≤ 250 µs, Duty Cycle ≤ 2.0%.
 1 inch square pad size (1 x 0.5 inch for each lead) on FR4 board.

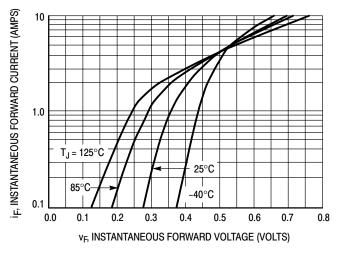


Figure 1. Typical Forward Voltage

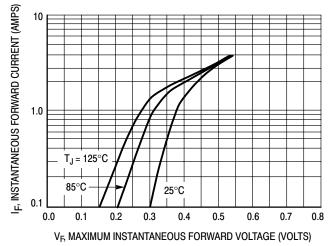


Figure 2. Maximum Forward Voltage

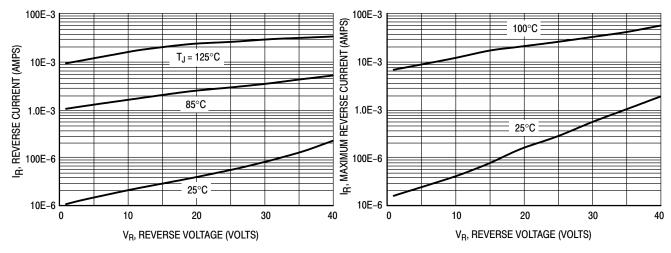
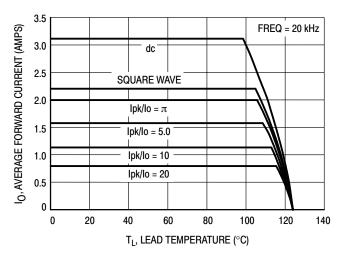


Figure 3. Typical Reverse Current

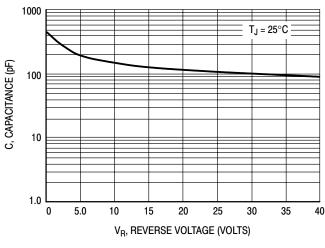
Figure 4. Maximum Reverse Current



P_{FO}, AVERAGE POWER DISSIPATION (WATTS) 1.6 dc 1.4 SQUARE WAVE $\text{lpk/lo} = \pi$ 1.2 lpk/lo = 5.0 1.0 lpk/lo = 108.0 Ipk/Io = 20 0.6 0.4 0.2 1.5 2.5 3.5 0 0.5 1.0 2.0 3.0 IO, AVERAGE FORWARD CURRENT (AMPS)

Figure 5. Current Derating

Figure 6. Forward Power Dissipation



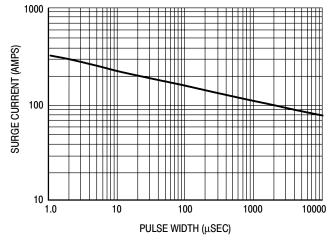


Figure 7. Capacitance

Figure 8. Maximum Non-Repetitive Forward Surge Current

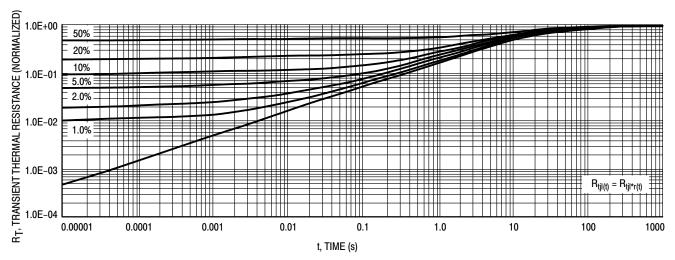
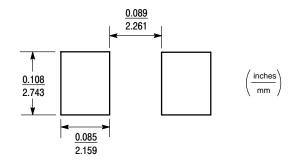
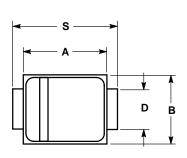


Figure 9. Thermal Response

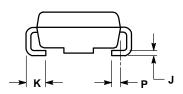
MINIMUM SOLDER PAD SIZES

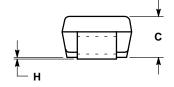


PACKAGE DIMENSIONS



SMB PLASTIC PACKAGE CASE 403A-03 ISSUE D





NOTES

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982. CONTROLLING DIMENSION: INCH.
- D DIMENSION SHALL BE MEASURED WITHIN
- DIMENSION P.

| | INCHES | | MILLIMETERS | | |
|-----|-----------|--------|-------------|-------|--|
| DIM | MIN | MAX | MIN | MAX | |
| Α | 0.160 | 0.180 | 4.06 | 4.57 | |
| В | 0.130 | 0.150 | 3.30 | 3.81 | |
| С | 0.075 | 0.095 | 1.90 | 2.41 | |
| D | 0.077 | 0.083 | 1.96 | 2.11 | |
| Н | 0.0020 | 0.0060 | 0.051 | 0.152 | |
| J | 0.006 | 0.012 | 0.15 | 0.30 | |
| K | 0.030 | 0.050 | 0.76 | 1.27 | |
| Р | 0.020 REF | | 0.51 REF | | |
| S | 0.205 | 0.220 | 5.21 | 5.59 | |

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