

MBRD1035CTL, NRVBD1035VCTL, SBRD81035CTL Series

Switch-mode Schottky Power Rectifier

DPAK Power Surface Mount Package

The MBRD1035CTL employs the Schottky Barrier principle in a large area metal-to-silicon power diode. State of the art geometry features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency switching power supplies, free wheeling diode and polarity protection diodes.

Features

- Highly Stable Oxide Passivated Junction
- Guardring for Stress Protection
- Matched Dual Die Construction –
May be Paralleled for High Current Output
- High dv/dt Capability
- Short Heat Sink Tap Manufactured – Not Sheared
- Very Low Forward Voltage Drop
- Epoxy Meets UL 94 V-0 @ 0.125 in
- SBRD8 and NRVBD Prefix for Automotive and Other Applications
Requiring Unique Site and Control Change Requirements;
AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS
Compliant

Mechanical Characteristics:

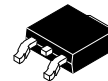
- Case: Epoxy, Molded
- Weight: 0.4 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal
Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes:
260°C Max. for 10 Seconds
- ESD Rating:
 - ◆ Human Body Model = 3B (> 8 kV)
 - ◆ Machine Model = C (> 400 V)



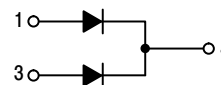
ON Semiconductor®

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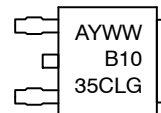
**SCHOTTKY BARRIER
RECTIFIER
10 AMPERES
35 VOLTS**



DPAK
CASE 369C



MARKING DIAGRAM



A = Assembly Location*
Y = Year
WW = Work Week
B1035CL = Device Code
G = Pb-Free Package

* The Assembly Location Code (A) is front side optional. In cases where the Assembly Location is stamped in the package bottom (molding ejector pin), the front side assembly code may be blank.

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

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MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_R | 35 | V |
| Average Rectified Forward Current (At Rated V_R , $T_C = 115^\circ\text{C}$) Per Leg Per Package | I_O | 5.0 10 | A |
| Peak Repetitive Forward Current (At Rated V_R , Square Wave, 20 kHz, $T_C = 115^\circ\text{C}$) Per Leg | I_{FRM} | 10 | A |
| Non-Repetitive Peak Surge Current (Surge applied at rated load conditions, halfwave, single phase, 60 Hz) Per Package | I_{FSM} | 50 | A |
| Storage / Operating Case Temperature | T_{stg}, T_C | -55 to +150 | $^\circ\text{C}$ |
| Operating Junction Temperature (Note 1) | T_J | -55 to +150 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated V_R , $T_J = 25^\circ\text{C}$) | dv/dt | 10,000 | V/ μs |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. The heat generated must be less than the thermal conductivity from Junction-to-Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.

THERMAL CHARACTERISTICS

| Rating | Symbol | Value | Unit |
|---|-----------------|-------|---------------------------|
| Thermal Resistance, Junction-to-Case Per Leg | $R_{\theta JC}$ | 3.0 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Ambient (Note 2) Per Leg | $R_{\theta JA}$ | 137 | $^\circ\text{C}/\text{W}$ |

2. Rating applies when using minimum pad size, FR4 PC Board

ELECTRICAL CHARACTERISTICS

| Rating | Symbol | Value | Unit |
|--|--------|------------------------------|------|
| Maximum Instantaneous Forward Voltage (Note 3) (See Figure 2) Per Leg ($I_F = 5$ Amps, $T_J = 25^\circ\text{C}$) ($I_F = 5$ Amps, $T_J = 100^\circ\text{C}$) ($I_F = 10$ Amps, $T_J = 25^\circ\text{C}$) ($I_F = 10$ Amps, $T_J = 100^\circ\text{C}$) | V_F | 0.47 0.41 0.56 0.55 | V |
| Maximum Instantaneous Reverse Current (Note 3) (See Figure 4) Per Leg ($V_R = 35$ V, $T_J = 25^\circ\text{C}$) ($V_R = 35$ V, $T_J = 100^\circ\text{C}$) ($V_R = 17.5$ V, $T_J = 25^\circ\text{C}$) ($V_R = 17.5$ V, $T_J = 100^\circ\text{C}$) | I_R | 2.0 30 0.20 5.0 | mA |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse Test: Pulse Width $\leq 250 \mu\text{s}$, Duty Cycle $\leq 2.0\%$

MBRD1035CTL, NRVBD1035VCTL, SBRD81035CTL Series

ORDERING INFORMATION

| Device | Package | Shipping† |
|---------------------|-------------------|---------------------------|
| MBRD1035CTLG | DPAK (Pb-Free) | 75 Units / Rail |
| SBRD81035CTLG* | | 75 Units / Rail |
| SBRD81035CTLG-VF01* | | 75 Units / Rail |
| MBRD1035CTLT4G | | 2,500 Units / Tape & Reel |
| NRVBD1035VCTLT4G* | | 2,500 Units / Tape & Reel |
| SBRD81035CTLT4G* | | 2,500 Units / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

*SBRD8 and NRVBD Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

TYPICAL CHARACTERISTICS

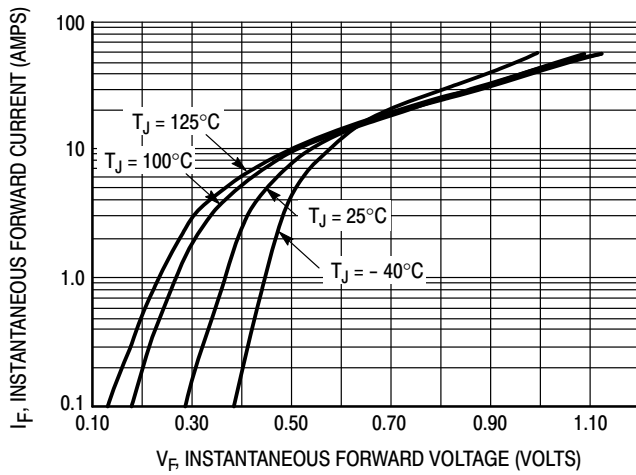


Figure 1. Typical Forward Voltage Per Leg

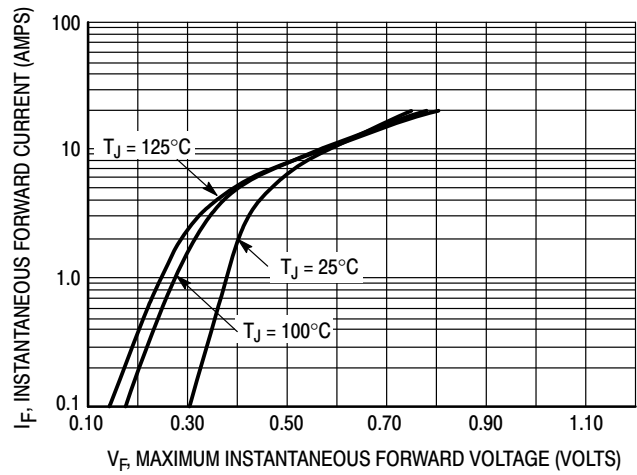


Figure 2. Maximum Forward Voltage Per Leg

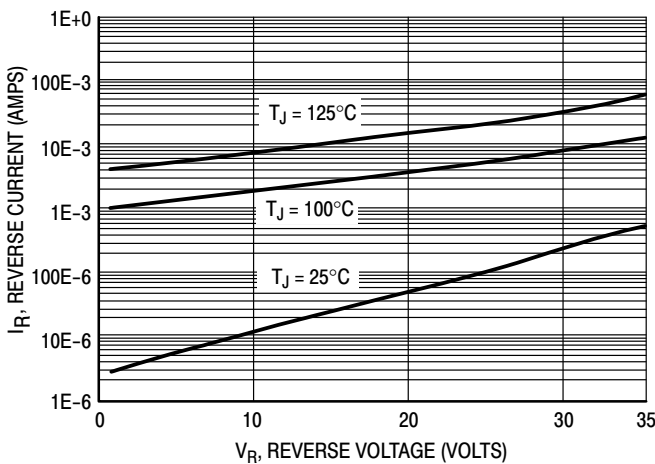


Figure 3. Typical Reverse Current Per Leg

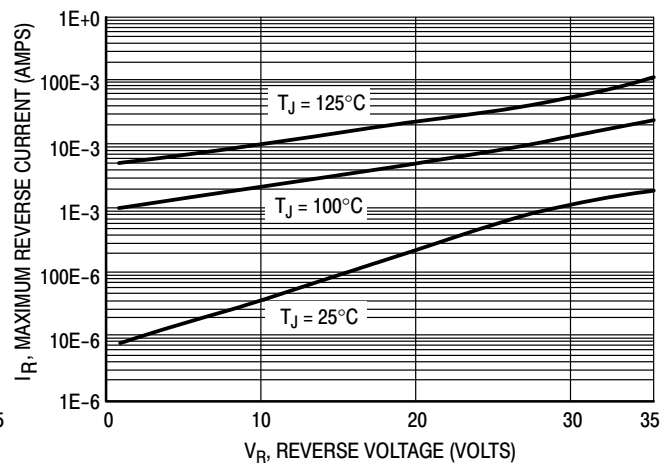


Figure 4. Maximum Reverse Current Per Leg

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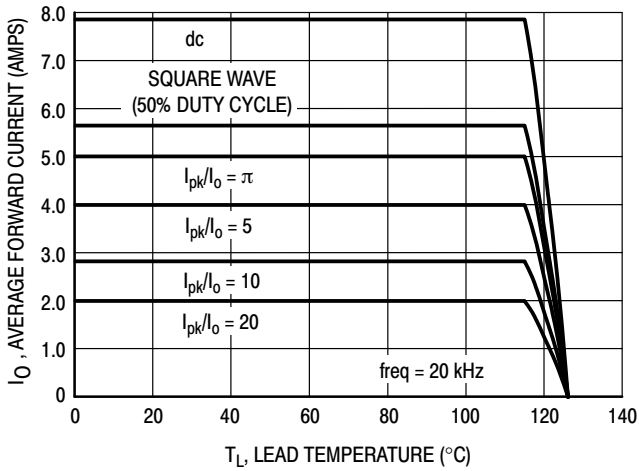


Figure 5. Current Derating Per Leg

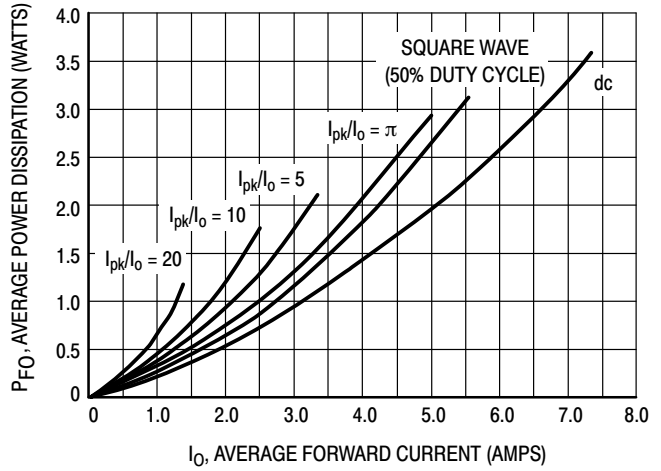


Figure 6. Forward Power Dissipation Per Leg

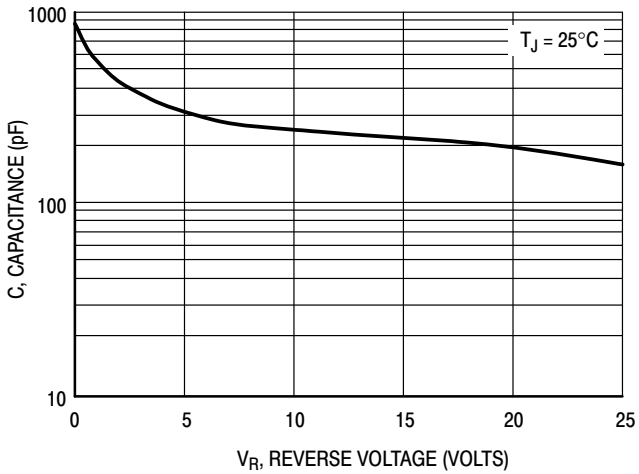


Figure 7. Capacitance Per Leg

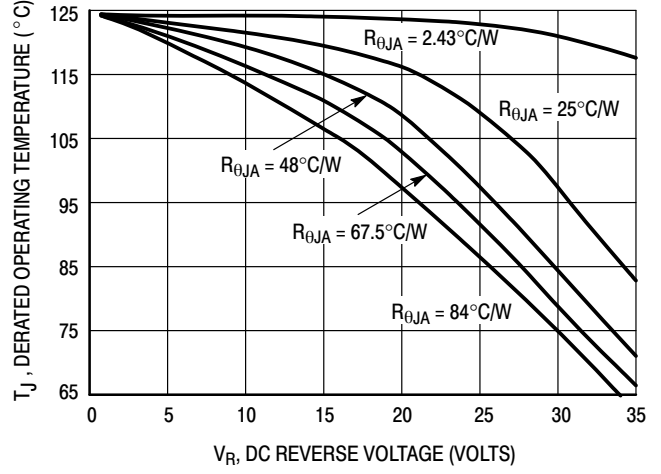


Figure 8. Typical Operating Temperature Derating Per Leg *

* Reverse power dissipation and the possibility of thermal runaway must be considered when operating this device under any reverse voltage conditions. Calculations of T_J therefore must include forward and reverse power effects. The allowable operating T_J may be calculated from the equation:

$$T_J = T_{Jmax} - r(t)(P_f + P_r) \text{ where}$$

$r(t)$ = thermal impedance under given conditions,
 P_f = forward power dissipation, and
 P_r = reverse power dissipation

This graph displays the derated allowable T_J due to reverse bias under DC conditions only and is calculated as $T_J = T_{Jmax} - r(t)P_r$, where $r(t) = R_{thja}$. For other power applications further calculations must be performed.

MBRD1035CTL, NRVD1035VCTL, SBRD81035CTL Series

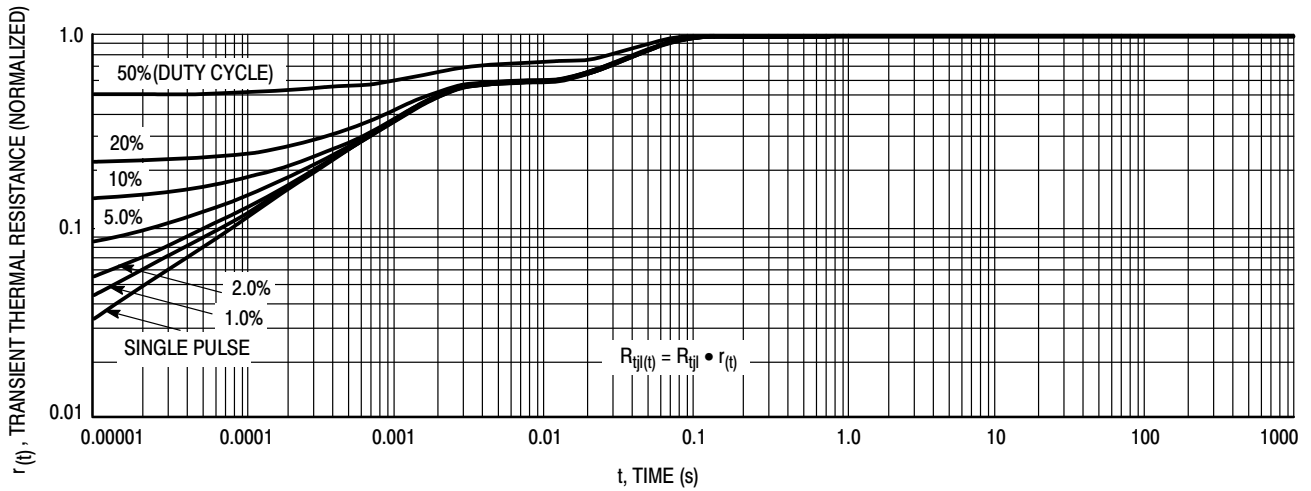


Figure 9. Thermal Response Junction to Case (Per Leg)

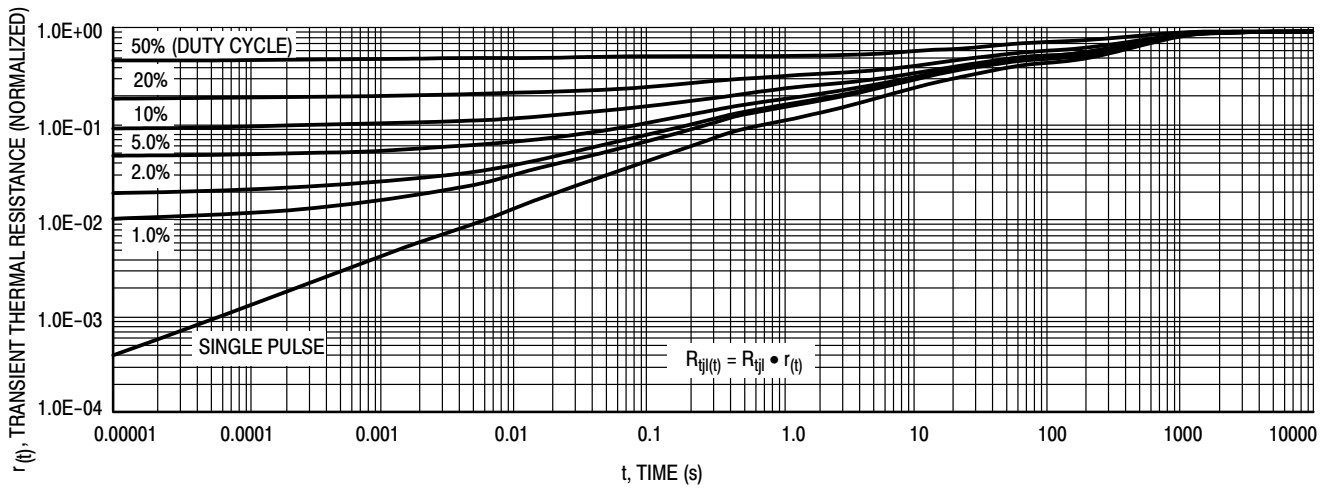
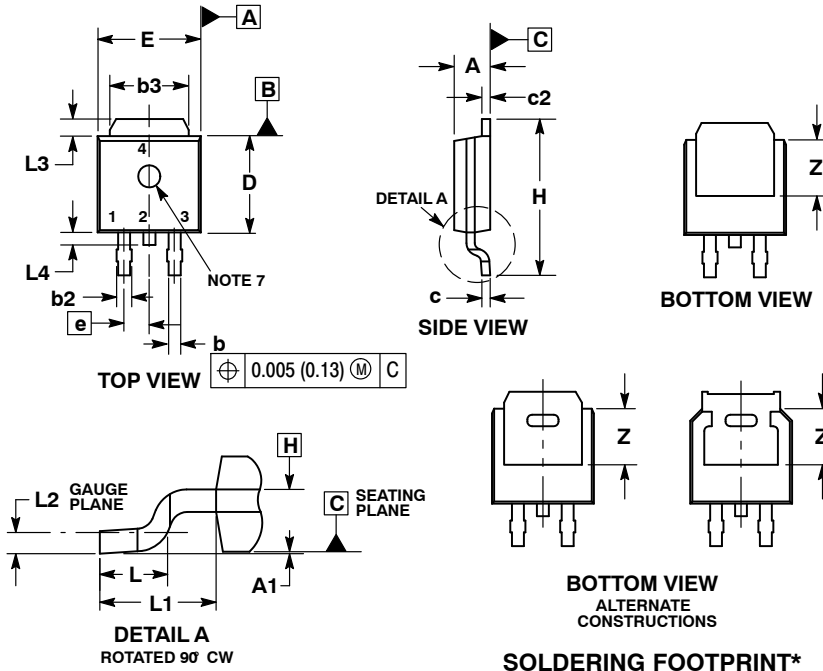


Figure 10. Thermal Response Junction to Ambient (Per Leg)

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PACKAGE DIMENSIONS

DPAK (SINGLE GAUGE) CASE 369C ISSUE F

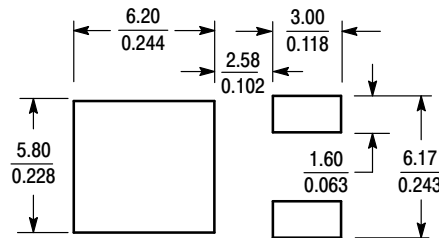


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS b3, L3 and Z.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
5. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
6. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.
7. OPTIONAL MOLD FEATURE.

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.086 | 0.094 | 2.18 | 2.38 |
| A1 | 0.000 | 0.005 | 0.00 | 0.13 |
| b | 0.025 | 0.035 | 0.63 | 0.89 |
| b2 | 0.028 | 0.045 | 0.72 | 1.14 |
| b3 | 0.180 | 0.215 | 4.57 | 5.46 |
| c | 0.018 | 0.024 | 0.46 | 0.61 |
| c2 | 0.018 | 0.024 | 0.46 | 0.61 |
| D | 0.235 | 0.245 | 5.97 | 6.22 |
| E | 0.250 | 0.265 | 6.35 | 6.73 |
| e | 0.090 BSC | | 2.29 BSC | |
| H | 0.370 | 0.410 | 9.40 | 10.41 |
| L | 0.055 | 0.070 | 1.40 | 1.78 |
| L1 | 0.114 REF | | 2.90 REF | |
| L2 | 0.020 BSC | | 0.51 BSC | |
| L3 | 0.035 | 0.050 | 0.89 | 1.27 |
| L4 | --- | 0.040 | --- | 1.01 |
| Z | 0.155 | --- | 3.93 | --- |

SOLDERING FOOTPRINT*



SCALE 3:1 (mm/inches)

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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