MBRD1035CTL

SWITCHMODE™ 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
- Pb−Free Packages are Available

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

ON Semiconductor®

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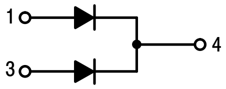
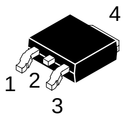
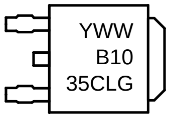
SCHOTTKY BARRIER RECTIFIER
10 AMPERES
35 VOLTS





DPAK
CASE 369C

MARKING DIAGRAM



Y = Year
WW = Work Week
B1035CL = Device Code
G = Pb−Free Package

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

January, 2006 − Rev. 6

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, $T_C = 115°C$)	Per Leg Per Package	I_O	5.0 10	A
Peak Repetitive Forward Current (At Rated V_R, Square Wave, 20 kHz, $T_C = 115°C$)	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	°C
Operating Junction Temperature (Note 1)		T_J	−55 to +150	°C
Voltage Rate of Change (Rated V_R, $T_J = 25°C$)		dv/dt	10,000	V/μs

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, 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

Thermal Resistance, Junction−to−Case	Per Leg	$R_{\theta JC}$	3.0	°C/W
Thermal Resistance, Junction−to−Ambient (Note 2)	Per Leg	$R_{\theta JA}$	137	°C/W

ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (Note 3) (See Figure 2) $I_F = 5$ Amps, $T_J = 25°C$ $I_F = 5$ Amps, $T_J = 100°C$ $I_F = 10$ Amps, $T_J = 25°C$ $I_F = 10$ Amps, $T_J = 100°C$	Per Leg	V_F	0.47 0.41 0.56 0.55	V
Maximum Instantaneous Reverse Current (Note 3) (See Figure 4) ($V_R = 35$ V, $T_J = 25°C$) ($V_R = 35$ V, $T_J = 100°C$) ($V_R = 17.5$ V, $T_J = 25°C$) ($V_R = 17.5$ V, $T_J = 100°C$)	Per Leg	I_R	2.0 30 0.20 5.0	mA

2. Rating applies when using minimum pad size, FR4 PC Board
3. Pulse Test: Pulse Width ≤ 250 μs, Duty Cycle ≤ 2.0%

ORDERING INFORMATION

Device	Package	Shipping†
MBRD1035CTL	DPAK	75 Units / Rail
MBRD1035CTLG	DPAK (Pb−Free)	75 Units / Rail
MBRD1035CTLT4	DPAK	2500 Units / Tape & Reel
MBRD1035CTLT4G	DPAK (Pb−Free)	2500 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.

TYPICAL CHARACTERISTICS

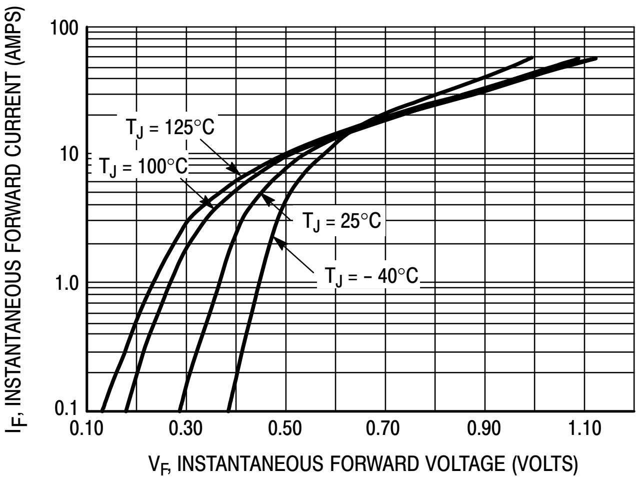


Figure 1. Typical Forward Voltage Per Leg

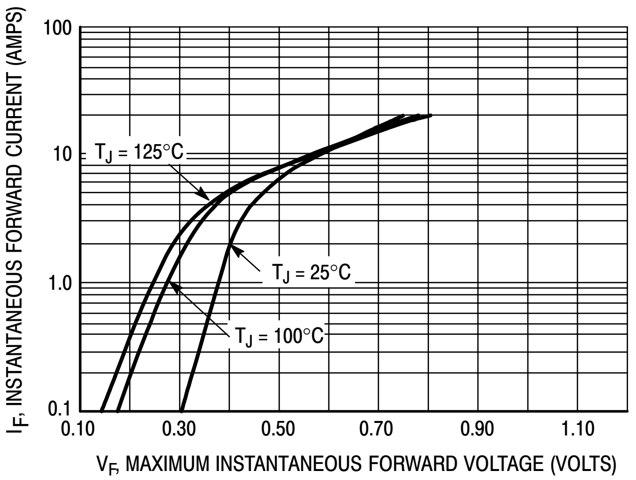


Figure 2. Maximum Forward Voltage Per Leg

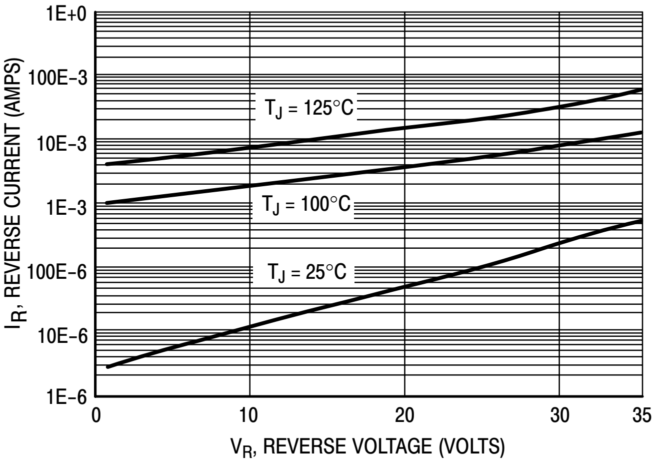


Figure 3. Typical Reverse Current Per Leg

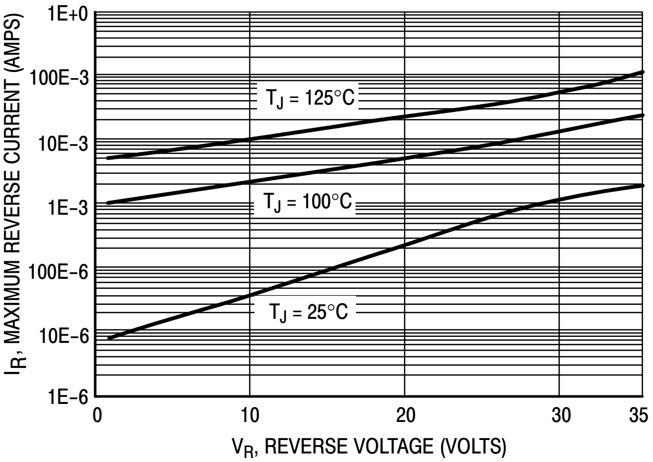


Figure 4. Maximum Reverse Current Per Leg

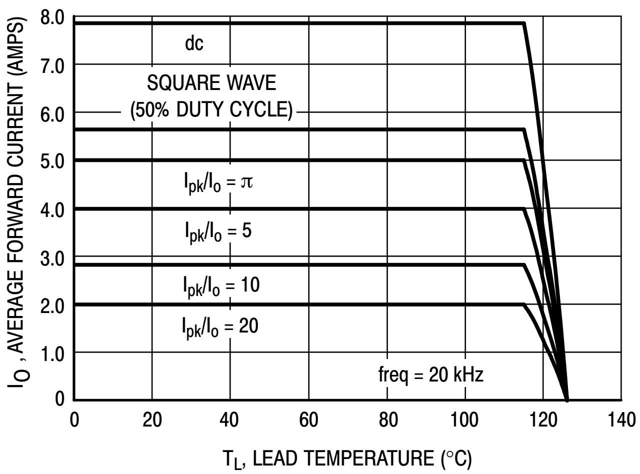


Figure 5. Current Derating Per Leg

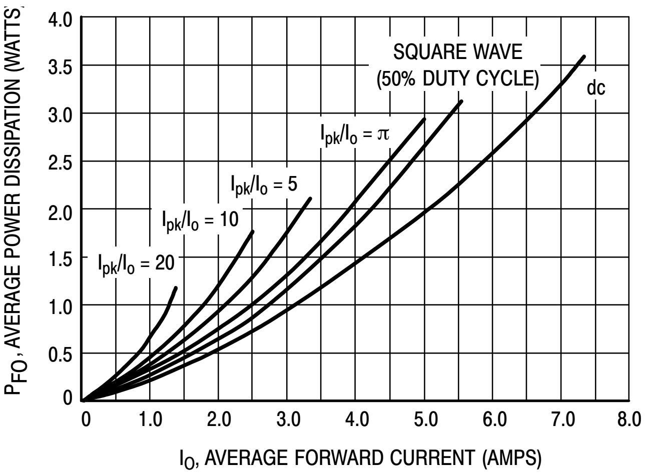


Figure 6. Forward Power Dissipation Per Leg

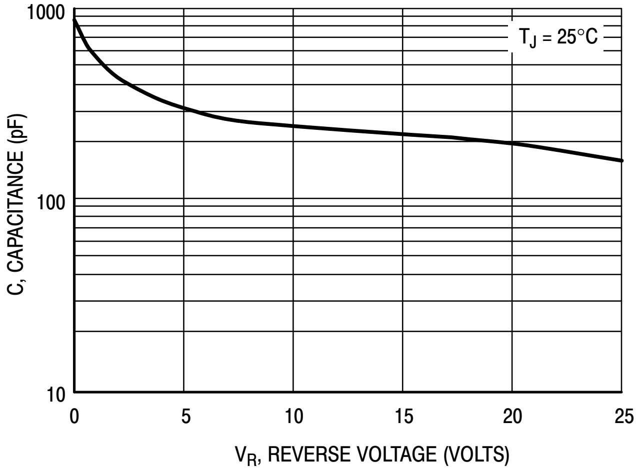


Figure 7. Capacitance Per Leg

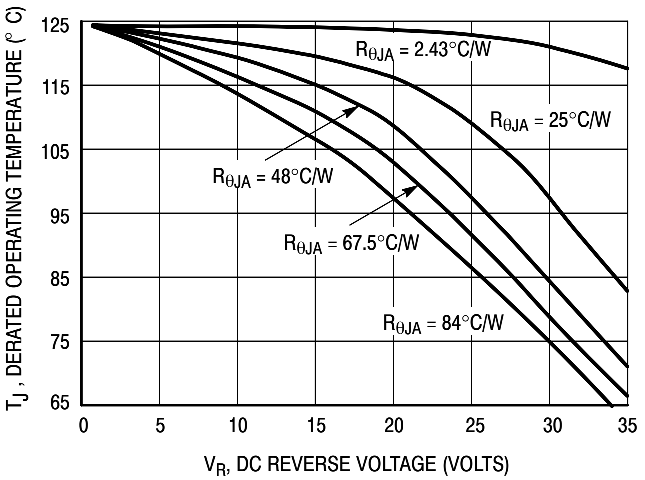


Figure 8. Typical Operating Temperature Derating Per Leg *

* 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: $T_J = T_{Jmax} - r(t)(Pf + Pr)$ where

r(t) = thermal impedance under given conditions,
Pf = forward power dissipation, and
Pr = reverse power dissipation

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

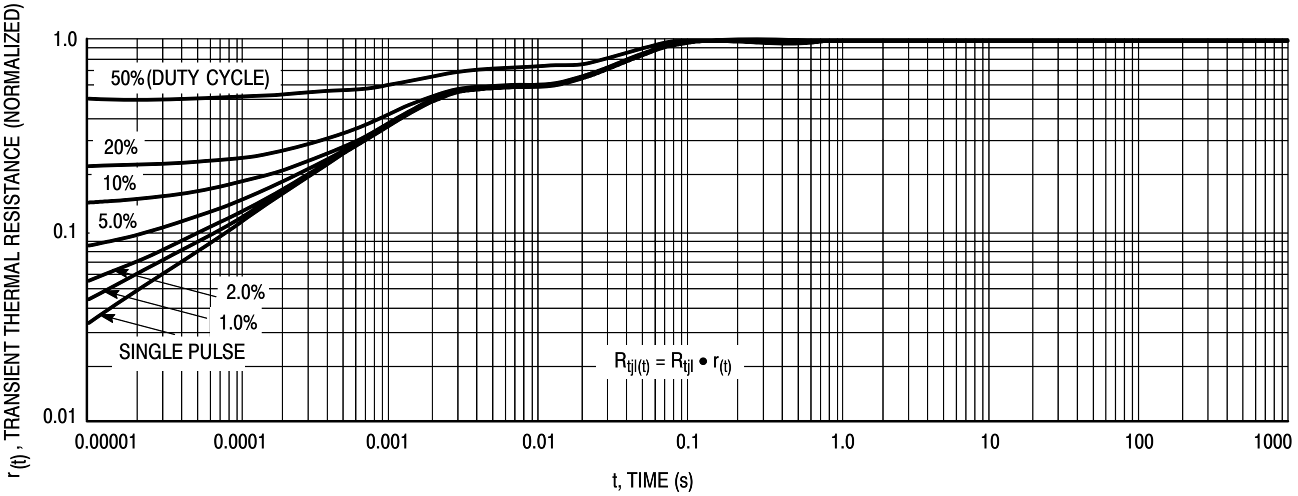


Figure 9. Thermal Response Junction to Case (Per Leg)

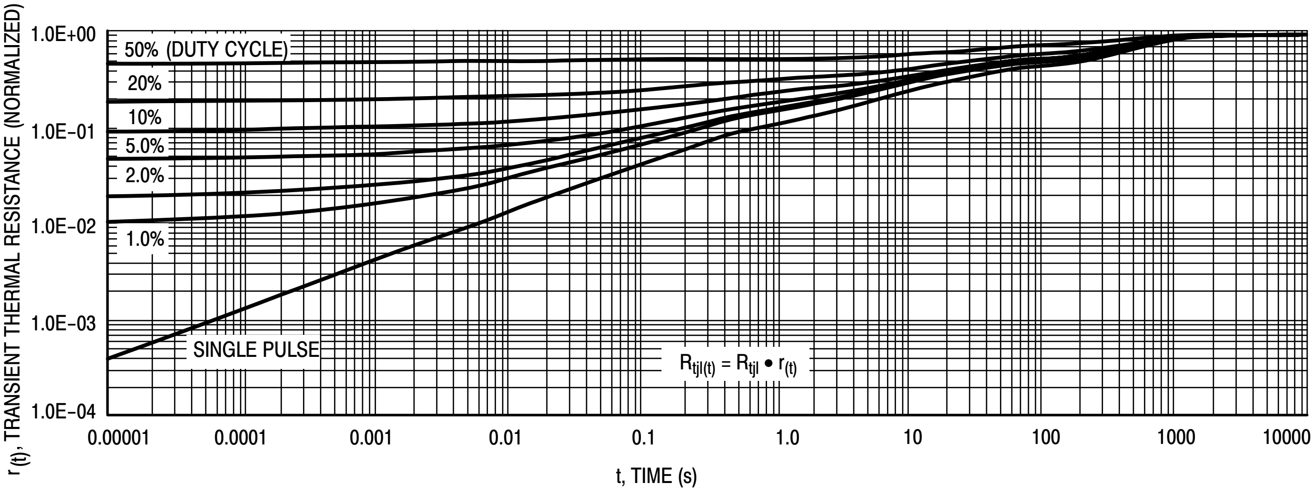
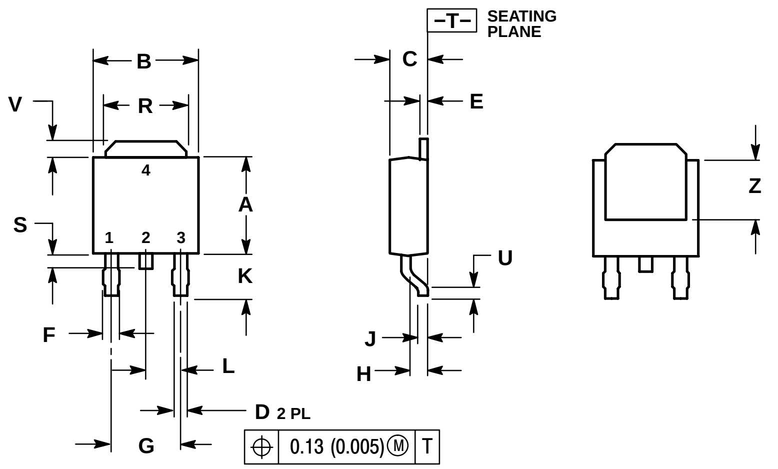


Figure 10. Thermal Response Junction to Ambient (Per Leg)

PACKAGE DIMENSIONS

DPAK (SINGLE GUAGE)

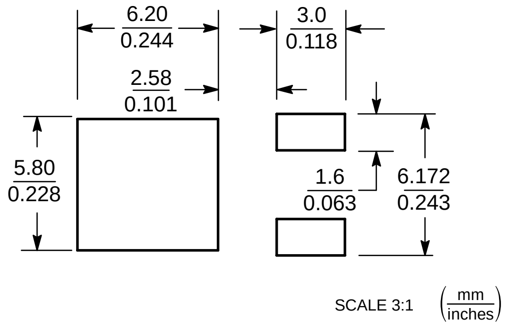
CASE 369C
ISSUE O



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	0.235	0.245	5.97	6.22
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.018	0.023	0.46	0.58
F	0.037	0.045	0.94	1.14
G	0.180 BSC		4.58 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.102	0.114	2.60	2.89
L	0.090 BSC		2.29 BSC	
R	0.180	0.215	4.57	5.45
S	0.025	0.040	0.63	1.01
U	0.020	−−−	0.51	−−−
V	0.035	0.050	0.89	1.27
Z	0.155	−−−	3.93	−−−

SOLDERING FOOTPRINT*



*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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