## Switch-mode Schottky Power Rectifier

## **DPAK Power Surface Mount Package**

The NRVBD1035CTL 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
- This is a Pb–Free Device

### Mechanical Characteristics:

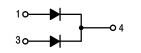
- Case: Epoxy, Molded
- Weight: 0.4 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds



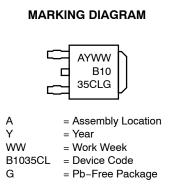
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### **ORDERING INFORMATION**

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

#### **MAXIMUM RATINGS**

Rating		Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage		V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	35	V
Average Rectified Forward Current (At Rated $V_R$ , $T_C$ = 115°C)	Per Leg Per Package	IO	5.0 10	A
Peak Repetitive Forward Current (At Rated V <sub>R</sub> , Square Wave, 20 kHz, T <sub>C</sub> = 115°C)	Per Leg	I <sub>FRM</sub>	10	A
Non-Repetitive Peak Surge Current (Surge applied at rated load conditions, halfwave, sin	Per Package ngle phase, 60 Hz)	I <sub>FSM</sub>	50	A
Storage / Operating Case Temperature		T <sub>stg,</sub> T <sub>c</sub>	–55 to +150	°C
Operating Junction Temperature (Note 1)		TJ	-55 to +150	°C
Voltage Rate of Change (Rated $V_R$ , $T_J = 25^{\circ}C$ )		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**

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

#### **ELECTRICAL CHARACTERISTICS**

$\label{eq:states} \begin{array}{l} \mbox{Maximum Instantaneous Forward Voltage (Note 3)} \\ \mbox{(See Figure 2)} \\ \mbox{I}_F = 5 \mbox{ Amps, } T_J = 25^\circ \mbox{C} \\ \mbox{I}_F = 5 \mbox{ Amps, } T_J = 100^\circ \mbox{C} \\ \mbox{I}_F = 10 \mbox{ Amps, } T_J = 25^\circ \mbox{C} \\ \mbox{I}_F = 10 \mbox{ Amps, } T_J = 100^\circ \mbox{C} \end{array}$	Per Leg	V <sub>F</sub>	0.47 0.41 0.56 0.55	V
$\label{eq:second} \begin{array}{l} \mbox{Maximum Instantaneous Reverse Current (Note 3)} \\ (See Figure 4) \\ (V_R = 35 V, T_J = 25^\circ C) \\ (V_R = 35 V, T_J = 100^\circ C) \\ (V_R = 17.5 V, T_J = 25^\circ C) \\ (V_R = 17.5 V, T_J = 100^\circ C) \end{array}$	Per Leg	I <sub>R</sub>	2.0 30 0.20 5.0	mA

2. Rating applies when using minimum pad size, FR4 PC Board 3. Pulse Test: Pulse Width  $\leq$  250  $\mu s,$  Duty Cycle  $\leq$  2.0%

#### **ORDERING INFORMATION**

Device	Package	Shipping <sup>†</sup>
NRVBD1035CTLT4G	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**

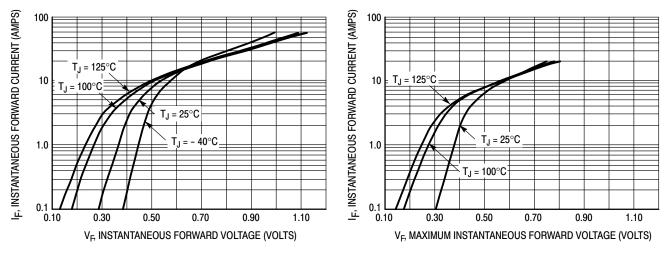


Figure 1. Typical Forward Voltage Per Leg



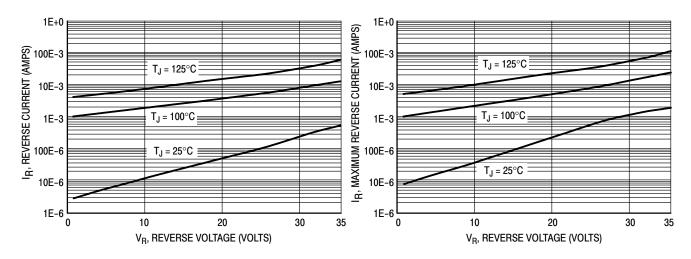
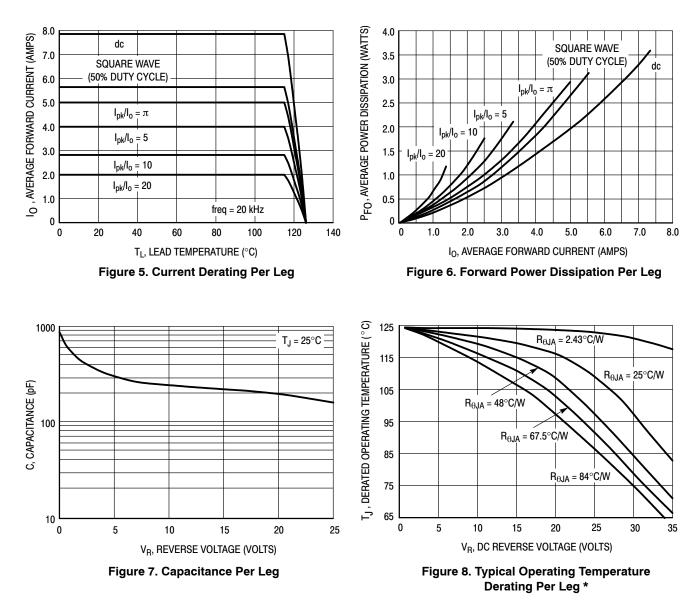


Figure 3. Typical Reverse Current Per Leg

Figure 4. Maximum Reverse Current 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.

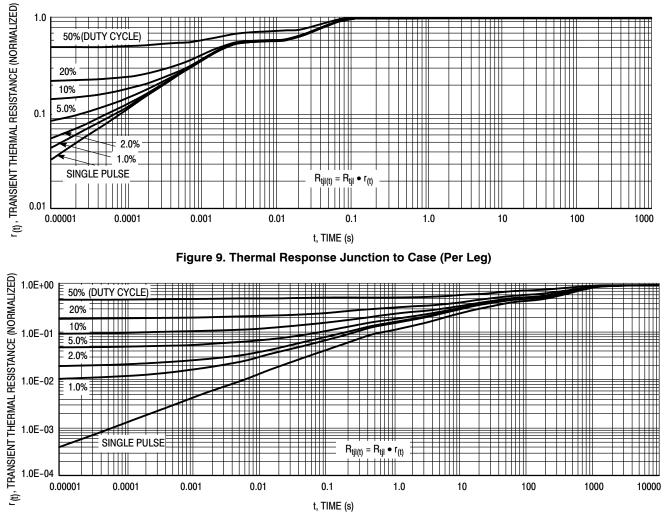
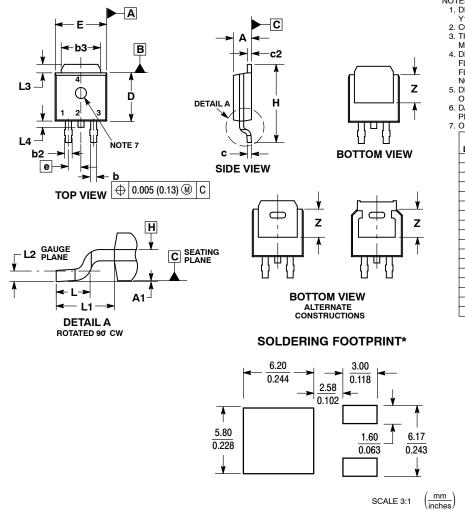


Figure 10. Thermal Response Junction to Ambient (Per Leg)

#### PACKAGE DIMENSIONS

#### **DPAK (SINGLE GAUGE)** CASE 369C

**ISSUE F** 



\*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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- 1. DIMENSIONING AND TOLERANCING PER ASME
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  CONTROLLING DIMENSION: INCHES.
  THERMAL PAD CONTOUR OPTIONAL WITHIN DI-MENSIONS b3, L3 and Z.
- A 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.
- DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
- DATUMS A AND B ARE DETERMINED AT DATUM
- PLANE H. 7. OPTIONAL MOLD FEATURE

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
Α	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
С	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
Е	0.250	0.265	6.35	6.73
е	0.090 BSC		2.29 BSC	
н	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
Ζ	0.155		3.93	

NRVBD1035CTL/D

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