



ELECTRONICS, INC.  
 44 FARRAND STREET  
 BLOOMFIELD, NJ 07003  
 (973) 748-5089  
<http://www.nteinc.com>

## NTE6238 Powerblock Module

### **Description:**

The NTE6238 uses 2 high voltage power diodes in series and the semiconductors are electrically isolated from the metal base, allowing common heatsinks and compact assemblies to be built. This device is intended for general purpose applications such as battery chargers, welders and plating equipment and where high voltage and high current are required.

### **Features:**

- High Voltage
- Electrically Isolated Base Plate
- 3000V<sub>RMS</sub> Isolating Voltage
- High Surge Capability
- Large Creepage Distances

### **Ratings and Characteristics:**

Average Forward Current ( $T_C = +100^\circ\text{C}$ , 180° Conduction, Half Sine Wave),  $I_{F(AV)}$  ..... 320A  
 Maximum RMS Forward Current (As AC Switch),  $I_{T(RMS)}$  ..... 502A  
 Maximum Repetitive Peak Reverse Voltage,  $V_{RRM}$  ..... 1600V  
 Maximum Non-Repetitive Peak Reverse Voltage,  $V_{RSM}$  ..... 1700V  
 Maximum Peak Reverse Current ( $T_J = +150^\circ\text{C}$ ),  $I_{RRM}$  ..... 50mA  
 RMS Isolation Voltage (50Hz, Circuit to Base, All Terminals Shorted,  $t = 1\text{s}$ ),  $V_{ISO}$  ..... 3000V  
 Operating Junction Temperature Range,  $T_J$  .....  $-40^\circ$  to  $+150^\circ\text{C}$   
 Storage Temperature Range,  $T_{stg}$  .....  $-40^\circ$  to  $+150^\circ\text{C}$   
 Thermal Resistance, Junction-to-Case (Per Module, DC Operation),  $R_{thJC}$  .....  $0.125^\circ\text{C/W}$   
 Thermal Resistance, Case-to-Sink (Per Module, Note 1),  $R_{thCS}$  .....  $0.02^\circ\text{C/W}$

Note 1. Mounting surface flat, smooth and greased.

### **Electrical Specifications:**

Parameter	Symbol	Test Conditions		Rating	Unit
Maximum Peak One-Cycle Non-Repetitive Surge Current	$I_{FSM}$	$t = 10\text{ms}$	Sinusoidal Half Wave, 100% $V_{RRM}$ Reapplied, Initial $T_J = +150^\circ\text{C}$	8500	A
		$t = 8.3\text{ms}$		8900	A
		$t = 10\text{ms}$	Sinusoidal Half Wave, No Voltage Reapplied, Initial $T_J = +150^\circ\text{C}$	10110	A
		$t = 8.3\text{ms}$		10580	A

### Electrical Specifications (Cont'd):

Parameter	Symbol	Test Conditions	Rating	Unit	
Maximum $I^2t$ for Fusing	$I^2t$	t = 10ms	Sinusoidal Half Wave, 100% $V_{RRM}$ Reapplied, Initial $T_J = +150^\circ\text{C}$	361	$\text{kA}^2\text{s}$
		t = 8.3ms		330	$\text{kA}^2\text{s}$
		t = 10ms	Sinusoidal Half Wave, No Voltage Reapplied, Initial $T_J = +150^\circ\text{C}$	511	$\text{kA}^2\text{s}$
		t = 8.3ms		466	$\text{kA}^2\text{s}$
Maximum $I^2\sqrt{t}$	$I^2\sqrt{t}$	t = 0.1 to 10ms, no voltage reapplied	5110	$\text{kA}^2\sqrt{t}$	
Threshold Voltage, Low level	$V_{F(TO)1}$	$T_J = +150^\circ\text{C}$ , $(16.7\% \times \pi \times I_{T(AV)} < I < \pi \times I_{T(AV)})$	0.69	V	
Threshold Voltage, High level	$V_{F(TO)2}$	$T_J = +150^\circ\text{C}$ , $(\pi \times I_{T(AV)} < I < 20 \times \pi \times I_{T(AV)})$	0.86	V	
Forward Slope Resistance, Low Level	$r_{f1}$	$T_J = +150^\circ\text{C}$ , $(16.7\% \times \pi \times I_{T(AV)} < I < \pi \times I_{T(AV)})$	0.59	$\text{m}\Omega$	
Forward Slope Resistance, High Level	$r_{f2}$	$T_J = +150^\circ\text{C}$ , $(\pi \times I_{T(AV)} < I < 20 \times \pi \times I_{T(AV)})$	0.44	$\text{m}\Omega$	
Maximum Forward Voltage Drop	$V_{FM}$	$T_J = +25^\circ\text{C}$ , $I_{FM} = \pi \times I_{F(AV)}$ , Av. Power = $V_{F(TO)} \times I_{T(AV)} + r_f \times (I_{F(RMS)})^2$	1.28	V	

### Circuit Diagram

