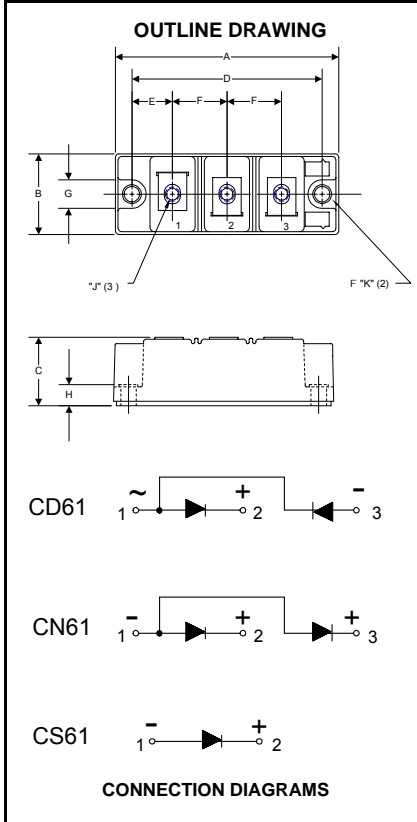


### POW-R-BLOK™ Dual & Single Diode Isolated Module 160 Amperes / Up to 1600 Volts



**CD61\_\_16A, CS61\_\_16A  
CN61\_\_16A, CC61\_\_16A  
Dual & Single Diode Isolated  
POW-R-BLOK™ Module  
160 Amperes / Up to 1600 Volts**

#### Ordering Information:

Select the complete nine digit module part number from the table below.  
Example: CD611616A is a 1600 Volt, 160 Ampere Dual Diode Isolated POW-R-BLOK™ Module

| Type | Voltage<br>Volts<br>(x100) | Current<br>Amperes<br>(x10) |
|------|----------------------------|-----------------------------|
| CD61 | 08                         | 16                          |
| CN61 | 12                         |                             |
| CC61 | 14                         |                             |
| CS61 | 16                         |                             |

#### Description:

Powerex Dual Diode & Single Diode Modules are designed for use in applications requiring rectification and isolated packaging. The modules are isolated for easy mounting with other components on a common heatsink. POW-R-BLOK™ has been tested and recognized by the Underwriters Laboratories.

#### Features:

- Electrically Isolated Heatsinking
- DBC Alumina Insulator
- Glass Passivated Chips
- Metal Baseplate
- Low Thermal Impedance for Improved Current Capability
- UL Recognized (E78240)

#### Benefits:

- No Additional Insulation Components Required
- Easy Installation
- No Clamping Components Required
- Reduce Engineering Time

#### Applications:

- Power Supplies
- Bridge Circuits
- AC & DC Motor Drives
- Battery Supplies
- Large IGBT Circuit Front Ends
- Welders

#### Outline Dimensions

| Dimension | Inches | Millimeters |
|-----------|--------|-------------|
| A         | 3.70   | 94          |
| B         | 1.38   | 35          |
| C         | 1.18   | 30          |
| D         | 3.15   | 80          |
| E         | 0.67   | 17          |
| F         | 0.91   | 23          |
| G         | 0.57   | 14.5        |
| H         | 0.35   | 9           |
| J         | M6     | M6          |
| K         | 0.26   | 6.5         |

Note: Dimensions are for reference only.



**CD61\_\_16A, CS61\_\_16A**  
**CN61\_\_16A, CC61\_\_16A**

Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (724) 925-7272

**POW-R-BLOK™**  
**Dual & Single Diode Isolated Module**  
**160 Amperes / Up to 1600 Volts**

### Absolute Maximum Ratings

| Characteristics   | Conditions  | Symbol       |                 | Units                    |
|---|---|--------------|-----------------|--------------------------|
| Repetitive Peak Reverse Blocking Voltage                        |   | $V_{RRM}$    | up to 1600      | V                        |
| Non-Repetitive Peak Reverse Blocking Voltage<br>( $t < 5$ msec) |   | $V_{RSM}$    | $V_{RRM} + 100$ | V                        |
| RMS Forward Current   | 180° Conduction, $T_C=100^\circ\text{C}$              | $I_{F(RMS)}$ | 260             | A                        |
| Average Forward Current   | 180° Conduction, $T_C=100^\circ\text{C}$              | $I_{F(AV)}$  | 165             | A                        |
| Peak One Cycle Surge Current, Non-Repetitive                    | 60 Hz, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$    | $I_{FSM}$    | 3,500           | A                        |
|   | 60 Hz, 100% No $V_{RRM}$ reapplied, $T_J=150\text{C}$ | $I_{FSM}$    | 4,200           | A                        |
|   | 50 Hz, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$    | $I_{FSM}$    | 3,350           | A                        |
|   | 50 Hz, 100% No $V_{RRM}$ reapplied, $T_J=150\text{C}$ | $I_{FSM}$    | 4,000           | A                        |
| Peak Three Cycle Surge Current, Non-Repetitive                  | 60 Hz, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$    | $I_{FSM}$    | 2,600           | A                        |
|   | 50 Hz, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$    | $I_{FSM}$    | 2,480           | A                        |
| Peak Ten Cycle Surge Current, Non-Repetitive                    | 60 Hz, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$    | $I_{FSM}$    | 1,750           | A                        |
|   | 50 Hz, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$    | $I_{FSM}$    | 1,820           | A                        |
| $I^2t$ for Fusing for One Cycle                                 | 8.3ms, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$    | $I^2t$       | 52,000          | $\text{A}^2 \text{ sec}$ |
|   | 8.3ms, 100% No $V_{RRM}$ reapplied, $T_J=150\text{C}$ | $I^2t$       | 73,000          | $\text{A}^2 \text{ sec}$ |
|   | 10ms, 100% $V_{RRM}$ reapplied, $T_J=150\text{C}$     | $I^2t$       | 56,000          | $\text{A}^2 \text{ sec}$ |
|   | 10ms, 100% No $V_{RRM}$ reapplied, $T_J=150\text{C}$  | $I^2t$       | 80,000          | $\text{A}^2 \text{ sec}$ |
| Operating Temperature   |   | $T_J$        | -40 to +150     | $^\circ\text{C}$         |
| Storage Temperature   |   | $T_{stg}$    | -40 to +150     | $^\circ\text{C}$         |
| Max. Mounting Torque, M6 Mounting Screw                         |   |              | 35 - 50         | in.-Lb.                  |
|   |   |              | 4 - 6           | Nm                       |
| Max. Mounting Torque, M8 Terminal Screw                         |   |              | 35 - 50         | in.-Lb.                  |
|   |   |              | 4 - 6           | Nm                       |
| Module Weight, Typical  |   |              | 200             | g                        |
|   |   |              | 7.1             | lb.                      |
| V Isolation @ 25C, $V_{rms}$ for 1 sec                          |   | $V_{rms}$    | 3500            | V                        |



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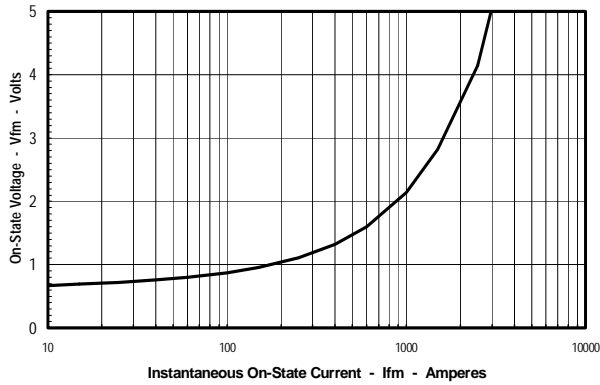
**Electrical Characteristics, T<sub>J</sub>=25°C unless otherwise specified**

| Characteristics                          | Symbol             | Test Conditions  | Min. | Max.      | Units |
|--|--------------------|--|------|-----------|-------|
| Repetitive Peak Reverse Leakage Current  | I <sub>RRM</sub>   | Up to 1600V, T <sub>J</sub> =150°C   |      | 20        | mA    |
| Peak On-State Voltage                    | V <sub>FM</sub>    | I <sub>FM</sub> =520A, 180 Deg Conduction                                  |      | 1.43      | V     |
| Threshold Voltage, Low-level             | V <sub>(TO)1</sub> | T <sub>J</sub> = 150°C, I = 16.7% I <sub>F(AV)</sub> to I <sub>F(AV)</sub> |      | 0.73      | V     |
| Slope Resistance, Low-level              | r <sub>T1</sub>    |  |      | 1.5       | mΩ    |
| Threshold Voltage, High-level            | V <sub>(TO)2</sub> | T <sub>J</sub> = 150°C, I = I <sub>F(AV)</sub> to I <sub>FSM</sub>         |      | 0.88      | V     |
| Slope Resistance, High-level             | r <sub>T2</sub>    |  |      | 1.26      | mΩ    |
| V <sub>TM</sub> Coefficients, Full Range |                    | T <sub>J</sub> = 150°C, I = 15% I <sub>F(AV)</sub> to I <sub>FSM</sub>     | A =  | 0.563     |       |
|  |                    |  | B =  | 0.0392    |       |
|  |                    | V <sub>FM</sub> = A + B Ln I + C I + D Sqrt I                              | C =  | 1.31 E-3  |       |
|  |                    |  | D =  | -8.25 E-5 |       |

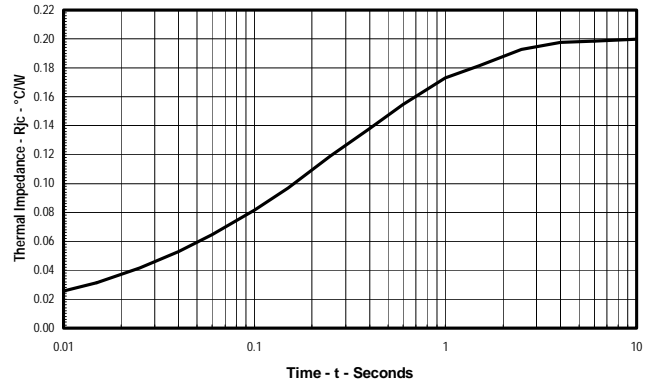
**Thermal Characteristics**

| Characteristics                             | Symbol            |  | Max.   | Units   |
|---|-------------------|--|--|---|
| Thermal Resistance, Junction to Case        | R <sub>ΘJ-C</sub> | Per Module, both conducting  | 0.1  | °C/W  |
|   |                   | Per Junction both conducting   | 0.2  | °C/W  |
| Thermal Impedance Coefficients              | Z <sub>ΘJ-C</sub> | Z <sub>ΘJ-C</sub> = K <sub>1</sub> (1-exp(-t/τ <sub>1</sub> ))<br>+ K <sub>2</sub> (1-exp(-t/τ <sub>2</sub> ))<br>+ K <sub>3</sub> (1-exp(-t/τ <sub>3</sub> ))<br>+ K <sub>4</sub> (1-exp(-t/τ <sub>4</sub> )) | K <sub>1</sub> = 1.84E-2<br>K <sub>2</sub> = 4.68E-2<br>K <sub>3</sub> = 8.25E-2<br>K <sub>4</sub> = 5.23E-2 | τ <sub>1</sub> = 2.53E-6<br>τ <sub>2</sub> = 6.44E-2<br>τ <sub>3</sub> = 3.11E-1<br>τ <sub>4</sub> = 1.32 |
| Thermal Resistance, Case to Sink Lubricated | R <sub>ΘC-S</sub> | Per Module   | 0.05   | °C/W  |

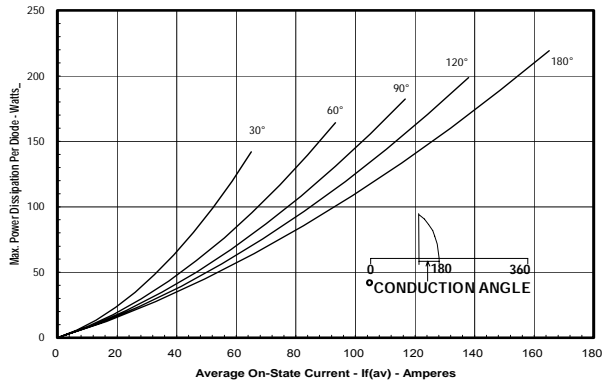
**Maximum On-State Forward Voltage Drop**  
( $T_J = 150^\circ\text{C}$ )



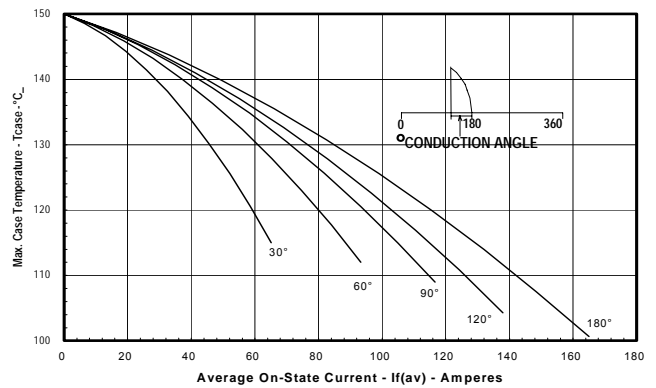
**Maximum Transient Thermal Impedance**  
(Junction to Case, Per Diode)



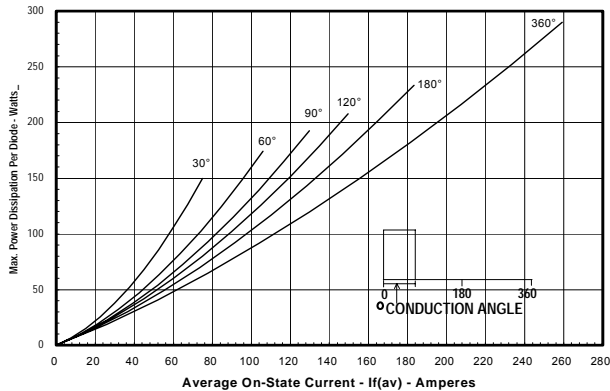
**Maximum On-State Power Dissipation**  
(Sinusoidal Waveform)



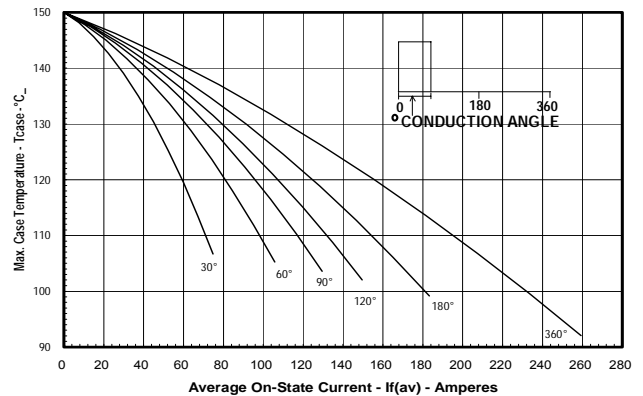
**Maximum Allowable Case Temperature**  
(Sinusoidal Waveform)

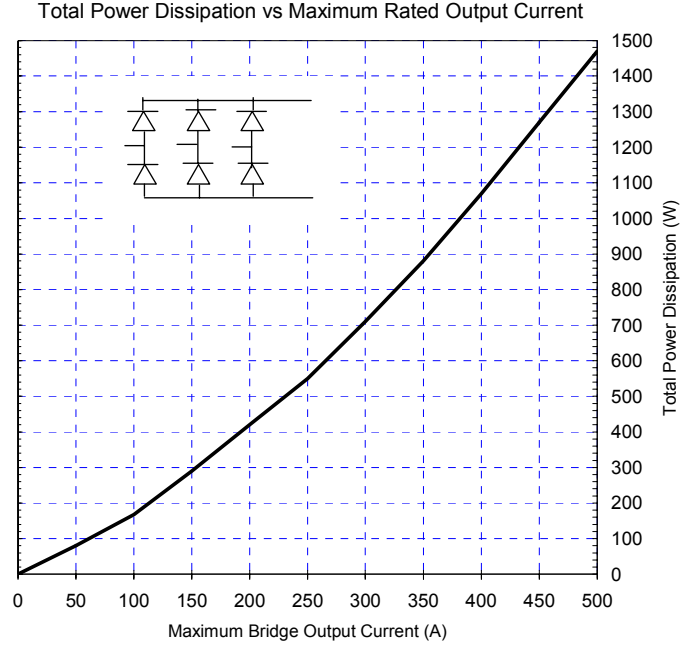
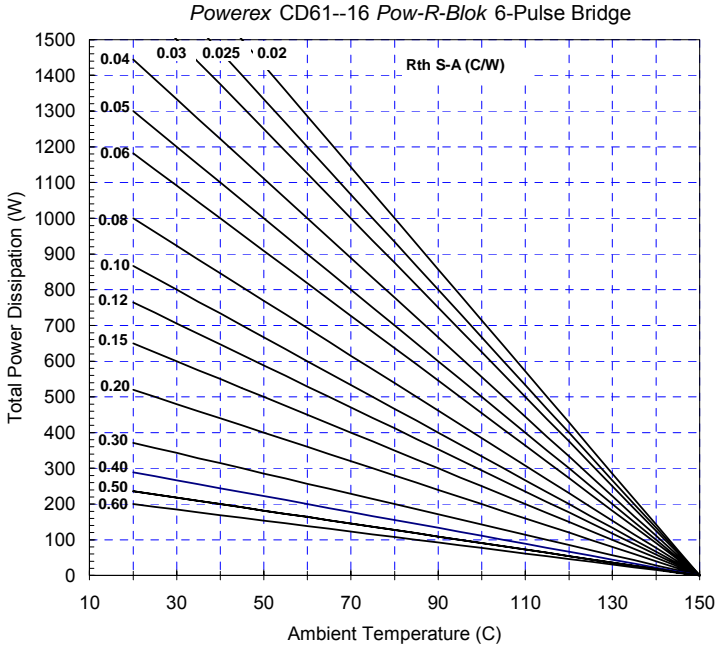


**Maximum On-State Power Dissipation**  
(Rectangular Waveform)



**Maximum Allowable Case Temperature**  
(Rectangular Waveform)





Six-Pulse Bridge Circuit Total Power Dissipation & Maximum Rated Output Current With Sink to Ambient Resistance of Heatsink as a Parameter.