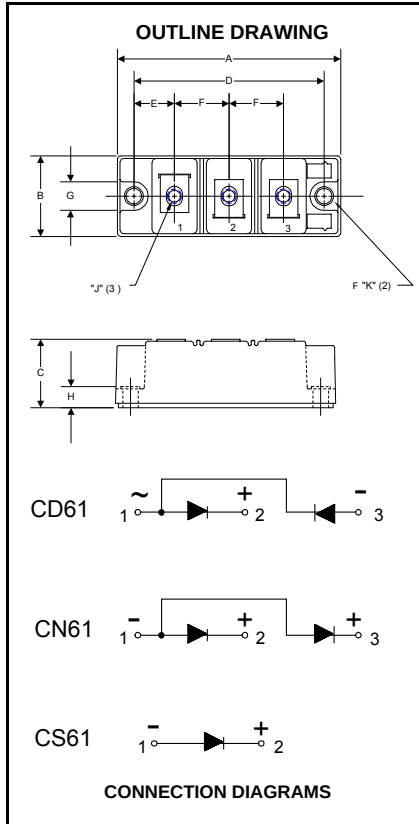


## POW-R-BLOK™

**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

### 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.

| 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



**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, $T_J=150^{\circ}\text{C}$    | $I_{FSM}$    | 3,500           | A                        |
|                                                                 | 60 Hz, 100% No $V_{RRM}$ reapplied, $T_J=150^{\circ}\text{C}$ | $I_{FSM}$    | 4,200           | A                        |
|                                                                 | 50 Hz, 100% $V_{RRM}$ reapplied, $T_J=150^{\circ}\text{C}$    | $I_{FSM}$    | 3,350           | A                        |
|                                                                 | 50 Hz, 100% No $V_{RRM}$ reapplied, $T_J=150^{\circ}\text{C}$ | $I_{FSM}$    | 4,000           | A                        |
| Peak Three Cycle Surge Current, Non-Repetitive                  | 60 Hz, 100% $V_{RRM}$ reapplied, $T_J=150^{\circ}\text{C}$    | $I_{FSM}$    | 2,600           | A                        |
|                                                                 | 50 Hz, 100% $V_{RRM}$ reapplied, $T_J=150^{\circ}\text{C}$    | $I_{FSM}$    | 2,480           | A                        |
| Peak Ten Cycle Surge Current, Non-Repetitive                    | 60 Hz, 100% $V_{RRM}$ reapplied, $T_J=150^{\circ}\text{C}$    | $I_{FSM}$    | 1,750           | A                        |
|                                                                 | 50 Hz, 100% $V_{RRM}$ reapplied, $T_J=150^{\circ}\text{C}$    | $I_{FSM}$    | 1,820           | A                        |
| $I^2t$ for Fusing for One Cycle                                 | 8.3ms, 100% $V_{RRM}$ reapplied, $T_J=150^{\circ}\text{C}$    | $I^2t$       | 52,000          | $\text{A}^2 \text{ sec}$ |
|                                                                 | 8.3ms, 100% No $V_{RRM}$ reapplied, $T_J=150^{\circ}\text{C}$ | $I^2t$       | 73,000          | $\text{A}^2 \text{ sec}$ |
|                                                                 | 10ms, 100% $V_{RRM}$ reapplied, $T_J=150^{\circ}\text{C}$     | $I^2t$       | 56,000          | $\text{A}^2 \text{ sec}$ |
|                                                                 | 10ms, 100% No $V_{RRM}$ reapplied, $T_J=150^{\circ}\text{C}$  | $I^2t$       | 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                        |

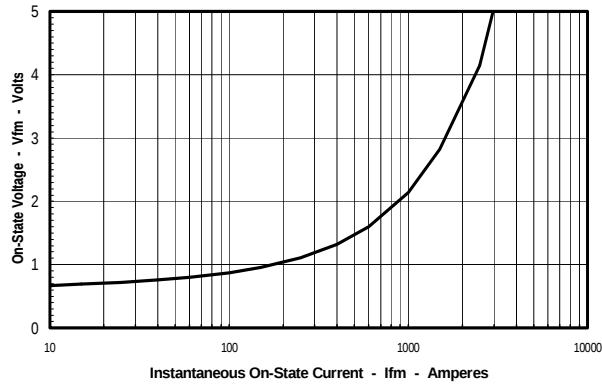
**Electrical Characteristics, T<sub>J</sub>=25°C unless otherwise specified**

| 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 |       |

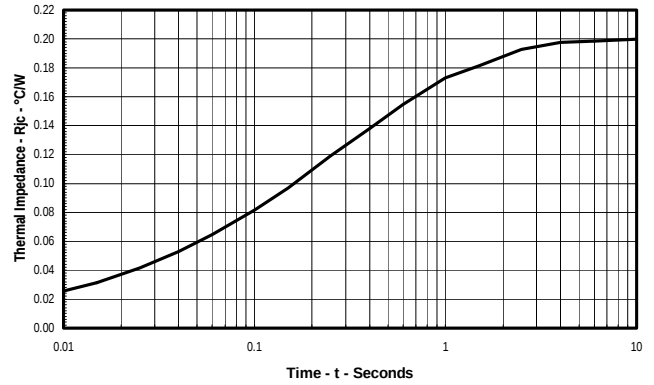
**Thermal Characteristics**

| Characteristics                             | Symbol            |                                                                                                                                                                                                                | Max.                                                                                                         | Units                                                                                                     |
|---------------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Thermal Resistance, Junction to Case        | R <sub>ΘJ-C</sub> | Per Module, both conducting<br>Per Junction both conducting                                                                                                                                                    | 0.1<br>0.2                                                                                                   | °C/W<br>°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                                                                                                      |

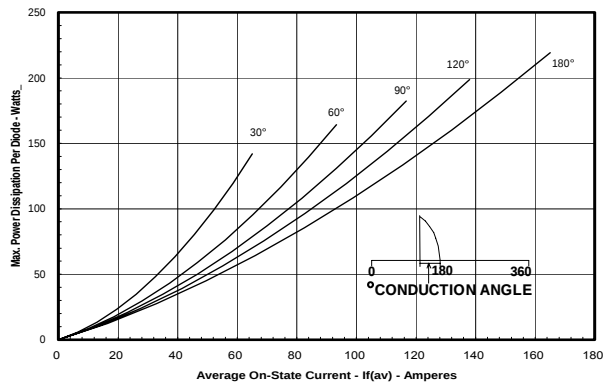
**Maximum On-State Forward Voltage Drop**  
 (T<sub>J</sub> = 150 °C)



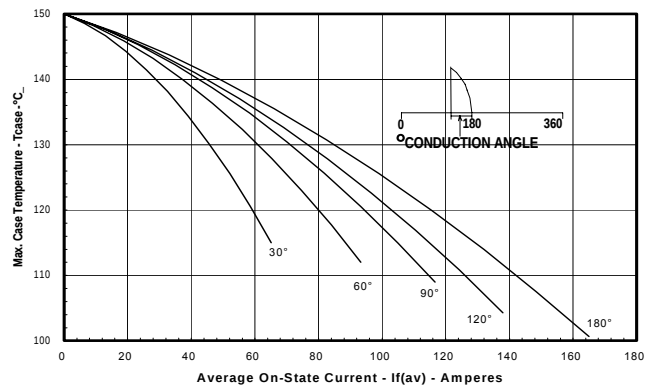
**Maximum Transient Thermal Impedance**  
 (Junction to Case, Per Diode)



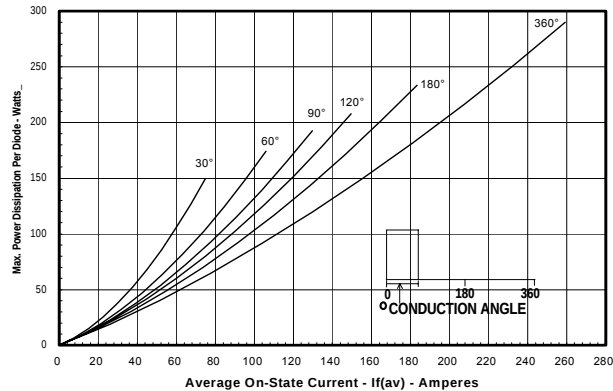
**Maximum On-State Power Dissipation**  
 (Sinusoidal Waveform)



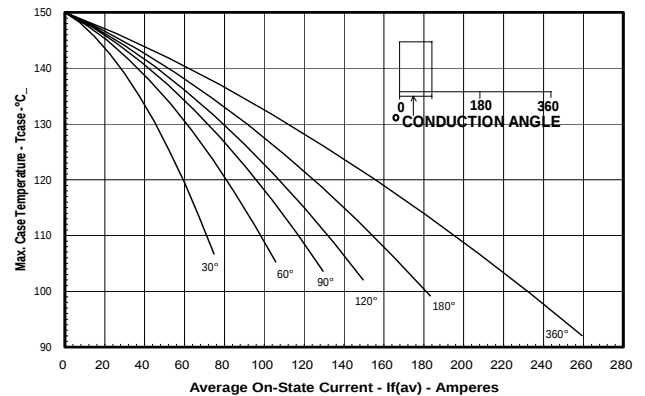
**Maximum Allowable Case Temperature**  
 (Sinusoidal Waveform)



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



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

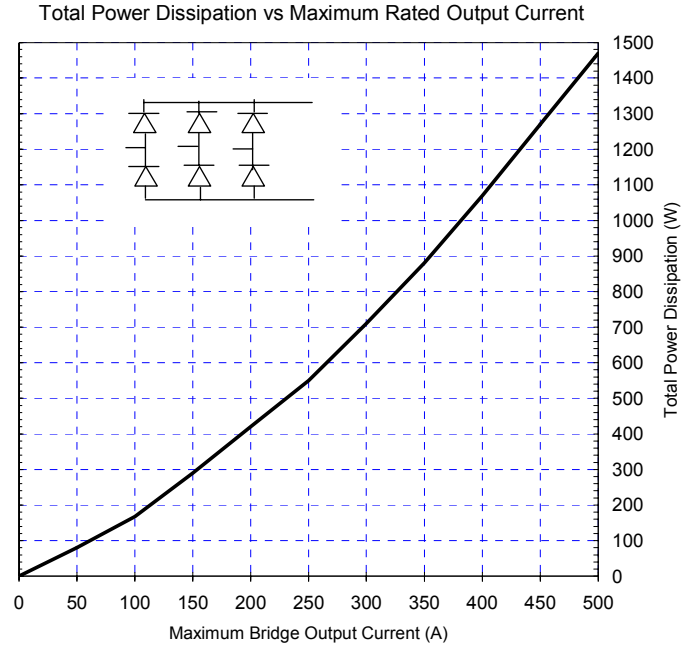
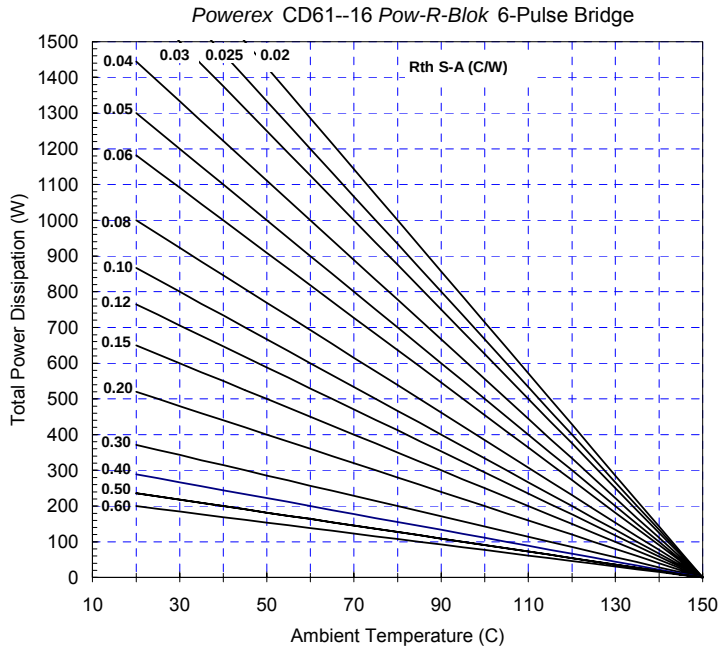




**CD61 16A, CS61 16A  
CN61 16A, CC61 16A**

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

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



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