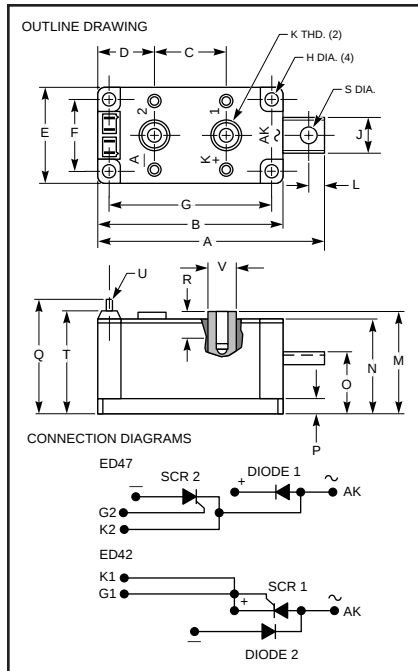
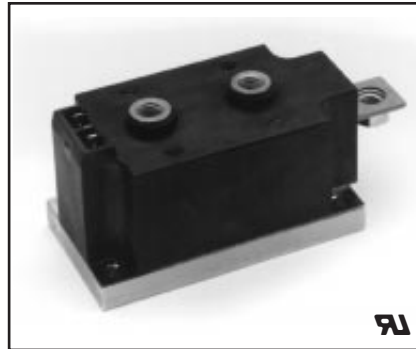


SCR/Diode Isolated POW-R-BLOK™ Module 210 Amperes/600-2000 Volts



Outline Drawing

Dimension	Inches	Millimeters
A	4.57	116
B	3.66	93
C	1.38	35
D	1.12	28.5
E	1.97	50
F	1.50	38
G	3.15	80
H	0.22	5.5
J	0.71	18
K	—	M8
L	0.35	9
M	2.05	52
N	1.93	49
O	1.34	34
P	0.394	10
Q	2.16	55
R	0.55	14
S	—	M8
T	2.09	53.1
U	0.110 x 0.032	2.8 x 0.8
V	0.54	14



ED42_ _21, ED47_ _21
SCR/Diode Isolated
POW-R-BLOK™ Module
210 Amperes/600-2000 Volts

Ordering Information:

Select the complete eight digit module part number you desire from the table below.
Example: ED422021 is a 2000 Volt, 210 Ampere SCR/Diode Isolated POW-R-BLOK™ Module.

Type	Voltage Volts (x100)	Current Rating Amperes (x10)
ED42	06	21
ED47	08	
	12	
	14	
	16	
	18	
	20	

Description:

The POW-R-BLOK™ combines multiple power semiconductor devices in a single, electrically isolated module. POW-R-BLOK™ can serve as the essential circuit element in many industrial applications, such as motor speed control and battery chargers. These SCR and diode combinations are available for use in 120, 240, 480 or 575 volt power line applications. POW-R-BLOK™ features a self contained electrical isolation system. By using high thermal conductivity BeO ceramic isolators, excellent circuit-to-baseplate isolation (≥ 2500 volts RMS) has been achieved, while maintaining efficient cooling of the semiconductors. All ED Series SCRs use the "di/Namic" gate structure for ease of triggering and high di/dt capability.

Features:

- ☐ Compression Bonded Elements
- ☐ Isolated Baseplate
- ☐ Insulated Package
- ☐ Metal Baseplate
- ☐ Low Thermal Impedance
- ☐ UL Recognized 

Benefits:

- ☐ No Additional Insulating Components Required
- ☐ Easy Installation
- ☐ Reduce Engineering Time
- ☐ Improved Heat Transfer
- ☐ Voltage Stability



Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

ED42_ _21, ED47_ _21
SCR/Diode Isolated
POW-R-BLOK™ Module
210 Amperes/600-2000 Volts

Absolute Maximum Ratings

Characteristics	Symbol	ED42_ _21/ED47_ _21	Units
Repetitive Peak Forward Blocking Voltage	V_{DRM}	2000	Volts
Repetitive Peak Reverse Blocking Voltage	V_{RRM}	2000	Volts
Transient Peak Reverse Blocking Voltage (Non-Repetitive), $t < 5ms$	V_{RSM}	2200	Volts
DC Reverse Blocking Voltage	$V_{R(DC)}$	1600	Volts
RMS On-State Current	$I_{T(RMS)}, I_{F(RMS)}$	330	Amperes
Average On-State Current	$I_{T(AV)}, I_{F(AV)}$	210	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz)	I_{TSM}, I_{FSM}	6000	Amperes
Peak Three-Cycle Surge (Non-Repetitive) On-State Current (60Hz)	I_{TSM}, I_{FSM}	4325	Amperes
Peak Ten-Cycle Surge (Non-Repetitive) On-State Current (60Hz)	I_{TSM}, I_{FSM}	3730	Amperes
I^2t (for Fusing) for One-Cycle	I^2t	149,000	A^2sec
Critical Rate-of-Rise of On-State Current (Non-Repetitive)*	di/dt	800	Amperes/ μs
Peak Gate Power Dissipation	P_{GM}	16	Watts
Average Gate Power Dissipation	$P_{G(AV)}$	3.0	Watts
Peak Forward Gate Voltage	V_{GFM}	10	Volts
Peak Reverse Gate Voltage	V_{GRM}	5.0	Volts
Peak Forward Gate Current	I_{GFM}	4.0	Amperes
Storage Temperature	T_{STG}	-40 to 150	°C
Operating Temperature	T_j	-40 to 130	°C
Maximum Mounting Torque M6 Mounting Screw	—	50	lb.-in.
Maximum Mounting Torque M8 Terminal Screw	—	130	lb.-in.
V Isolation	V_{RMS}	2500	Volts

*Per JEDEC STD RS-397, 5.2.2.6.
With recommended gate drive.

ED42 _ _21, ED47 _ _21
 SCR/Diode Isolated
 POW-R-BLOK™ Module
 210 Amperes/600-2000 Volts

Electrical and Thermal Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

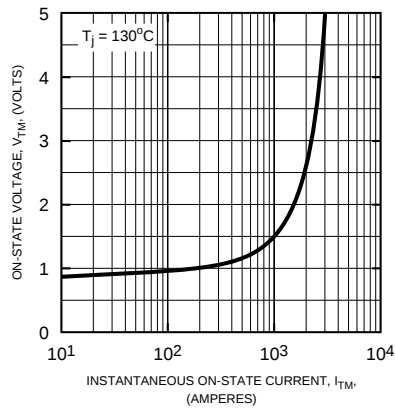
Characteristics	Symbol	Test Conditions	ED42 _ _21/ED47 _ _21	Units
Blocking State Maximums				
Forward Leakage Current, Peak	I_{DRM}	$T_j = 130^\circ\text{C}$, $V_{\text{DRM}} = \text{Rated}$	50	mA
Reverse Leakage Current, Peak	I_{RRM}	$T_j = 130^\circ\text{C}$, $V_{\text{RRM}} = \text{Rated}$	50	mA
Conducting State Maximums				
Peak On-State Voltage	V_{FM}	$I_{\text{FM}} = 1500\text{A}$	1.60	Volts
	V_{TM}	$I_{\text{TM}} = 625\text{A}$	1.40	Volts
Switching Minimums				
Critical Rate-of-Rise of Off-State Voltage	dv/dt	$T_j = 130^\circ\text{C}$, $V_D = 2/3 V_{\text{DRM}}$	500	Volts/ μs
Turn-Off Time (Typical)	t_q	$T_j = 130^\circ\text{C}$, $I_T = 250\text{A}$ Reapplied $dv/dt = 20\text{V}/\mu\text{s}$ Linear to $0.8 V_{\text{DRM}}$	150	μs
Turn-On Time (Typical)	t_{on}	$I_{\text{TM}} = 100\text{A}$, $V_D = 100\text{V}$	7	μs
Diode Reverse Recovery Time (Typical)	t_{rr}	$I_{\text{FM}} = 1500\text{A}$, $T_P = 190\mu\text{s}$ $di/dt = -25\text{A}/\mu\text{s}$	10	μs
Thermal Maximums				
Thermal Resistance, Junction-to-Case	$R_{\theta(\text{J-C})}$	Per Module	0.09	$^\circ\text{C}/\text{Watt}$
Thermal Resistance, Case-to-Sink (Lubricated)	$R_{\theta(\text{C-S})}$	Per Module	0.03	$^\circ\text{C}/\text{Watt}$
Gate Parameters Maximums				
Gate Current-to-Trigger	I_{GT}	$V_D = 12\text{V}$	150	mA
Gate Voltage-to-Trigger	V_{GT}	$V_D = 12\text{V}$	3	Volts
Non-Triggering Gate Voltage	V_{GDM}	$T_j = 130^\circ\text{C}$, $V_D = 1/2 V_{\text{DRM}}$	0.15	Volts

WARNING:

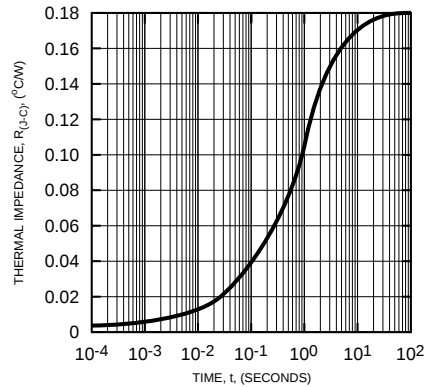
Internal insulation used is Beryllium Oxide.
 User should avoid grinding, crushing, or abrading these portions.
 Care must be exercised in properly disposing of unwanted devices.

ED42_21, ED47_21
SCR/Diode Isolated
POW-R-BLOK™ Module
210 Amperes/600-2000 Volts

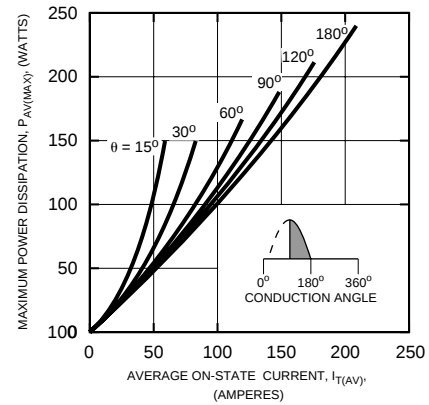
MAXIMUM ON-STATE FORWARD
VOLTAGE DROP



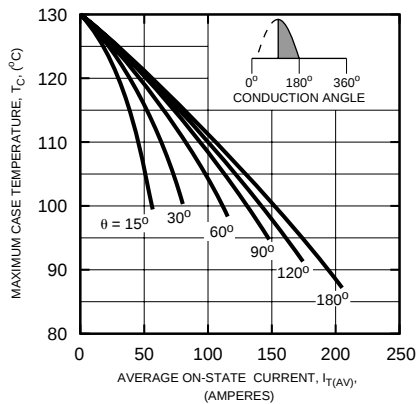
MAXIMUM TRANSIENT THERMAL
IMPEDANCE (JUNCTION-TO-CASE)
(PER ELEMENT)



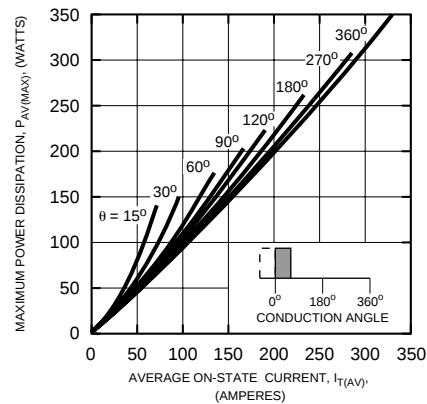
MAXIMUM ON-STATE POWER DISSIPATION
(SINUSOIDAL WAVEFORM)
(PER ELEMENT)



MAXIMUM ALLOWABLE CASE TEMPERATURE
(SINUSOIDAL WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION
(RECTANGULAR WAVEFORM)
(PER ELEMENT)



MAXIMUM ALLOWABLE CASE TEMPERATURE
(RECTANGULAR WAVEFORM)

