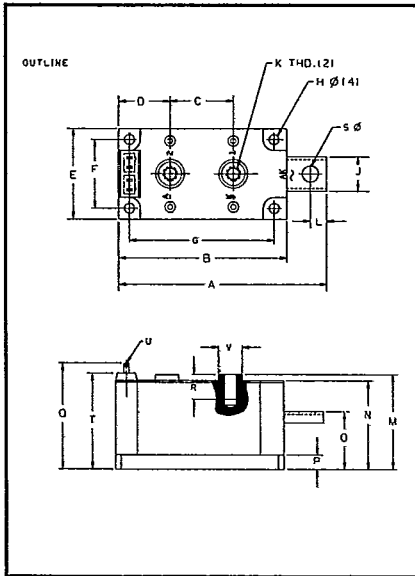




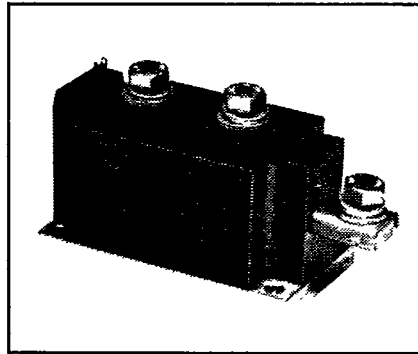
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**Dual SCR, SCR/Diode
Isolated Modules**
210-250-260 Amperes
100-2000 Volts



**Dual SCR, SCR/Diode
Isolated Modules
Outline Drawing**

Dimension	Inches	Millimeters
A	4.52	115
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	.22	5.5
J	.74	18.5
K	---	M8
L	.35	9
M	2.05	52
N	1.93	49
O	1.34	34
P	.31	8
Q	2.16	55
R	.55	14
S	---	M8
T	2.09	53.1
U	.110 X .032	2.8 X 0.8
V	.52	13



**Dual SCR, SCR/Diode
Isolated Modules**
210-250-260 Amperes/100-2000 Volts

Ordering Information

Example: Select the complete eight digit rating module part number you desire from the table — i.e. ED430825 is an 800 Volt, 250 Ampere Dual SCR Phase Control Module.

Type	V _{ORM} Volts (x100)	Current Rating Amperes (x10)
ED41	01	21
ED42	02	25
ED43	04	26*
ED45**	06	
ED46**	08	
ED47	10	
ED48**	12	
ED72	14	
ED77	16	
	18	
	20	

Note: All voltages are not available in every type. Insert code in digits 5 and 6 of part number to specify voltage (example: ED430625 is a 600 Volt, 250 Ampere dual SCR module). Diode voltage is same as SCR except for ED72, ED77, where suffix OY or OZ is added to denote 1.7 times SCR or 2.0 times SCR (example: ED721221OZ provides 1200 Volts SCR, 2400 Volt Diode).

*260A rating available in ED41 type only.

**Consult factory for available rating.

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, battery chargers, tap changers, transfer switches, and lighting controls. A variety of dual diode and SCR and diode combinations are available for use in 120, 240, 480 or 575 volt power line applications.

Semiconductor elements are secured by CBE (Compression Bonded Encapsulation) for excellent cycling performance.

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 SCR's use the "di/Namic" gate structure for ease of triggering and high di/dt capability.

Features:

- Compression Bonded Encapsulation
- Isolated Base Plate
- Insulated Package
- Low Thermal Impedance
- Metal Base Plate

Benefits:

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



T-2523
Tentative

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ED _____ 21, ED _____ 25, ED41 _____ 26

Dual SCR, SCR/Diode Isolated Modules

210-250-260 Amperes/100-2000 Volts

Absolute Maximum Ratings

Characteristics	Symbol	ED _____ 21	ED _____ 25	ED41 _____ 26	Units
Peak Forward Blocking Voltage	V_{DRM}	SCR to 2000			Volts
Peak Reverse Blocking Voltage	V_{RRM}	SCR to 2000, Diode to 2000			Volts
Transient Peak Reverse Blocking Voltage (Non-Repetitive) $t < 5$ ms	V_{RSM}	SCR to 2200, Diode to 2200			Volts
DC Reverse Blocking Voltage	$V_{R(DC)}$	SCR to 1600, Diode to 1600			Volts
RMS On-State Current	$I_{T(RMS)}, I_{F(RMS)}$	330	393	408	Amperes
Average On-State Current	$I_{T(AV)}, I_{F(AV)}$	210	250	260	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz)	I_{TSM}, I_{FSM}	6000	6500	8000	Amperes
Peak Three-Cycle Surge (Non-Repetitive) On-State Current (60Hz)	I_{TSM}, I_{FSM}	4325	4685	5750	Amperes
Peak Ten-Cycle Surge (Non-Repetitive) On-State Current (60 Hz)	I_{TSM}, I_{FSM}	3730	4040	4975	Amperes
I^2t (for Fusing), 8.3 milliseconds	I^2t	149,000	175,000	266,000	A ² sec
Critical Rate-of-Rise of On-State Current (Non-Repetitive) ① ②	di/dt	800	800	800	Amperes/ μ s
Peak Gate Power Dissipation	P_{GM}	16	16	16	Watts
Average Gate Power Dissipation	$P_{G(AV)}$	3.0	3.0	3.0	Watts
Peak Forward Gate Voltage	V_{GFM}	10	10	10	Volts
Peak Reverse Gate Voltage	V_{GRM}	5.0	5.0	5.0	Volts
Peak Forward Gate Current	I_{GFM}	4.0	4.0	4.0	Amperes
Storage Temperature	T_{STG}	-40 to 150	-40 to 150	-40 to 150	°C
Operating Temperature	T_J	-40 to 130	-40 to 130	-40 to 130	°C
Maximum Mounting Torque M6 Mounting Screw	—	50	50	50	in.-lb.
Maximum Terminal Torque M8 Terminal Screw	—	130	130	130	in.-lb.
V Isolation	V_{RMS}	2500	2500	2500	Volts

① Per JEDEC STD RS-397, 5.2.2.6.

② With recommended gate drive.



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ED _____ 21, ED _____ 25, ED41 _____ 26

Dual SCR, SCR/Diode Isolated Modules

210-250-260 Amperes/100-2000 Volts

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

Characteristics	Symbol	Test Conditions	ED _____ 21	ED _____ 25	ED41 _____ 26	Units
Blocking State Maximums						
Forward Leakage Current, Peak	I_{DRM}	$T_J = 130^\circ\text{C}$, $V_{DRM} = \text{rated}$	50	50	50	mA
Reverse Leakage Current, Peak	I_{RRM}	$T_J = 130^\circ\text{C}$, $V_{RRM} = \text{rated}$	50	50	50	mA
Conducting State Maximums						
Peak On-State Voltage	V_{TM}	$I_{TM} = 625\text{A}$	1.40	1.30	—	Volts
Peak On-State Voltage	V_{FM}	$I_{FM} = 1500\text{A}$	1.60	1.60	1.60	Volts
Switching Minimums						
Critical Rate of Rise of Off-State Voltage	dv/dt	$T_J = 130^\circ\text{C}$, $V_D = 2/3 V_{DRM}$	500	500	—	Volts/ μsec
Turn-Off Time (Typical)	t_q	$I_T = 250\text{A}$, $T_J = 130^\circ\text{C}$ Reapplied $dv/dt = 20\text{V}/\mu\text{sec}$ linear to $0.8 V_{DRM}$	150	150	—	μsec
Turn-On Time (Typical)	t_{on}	$I_{TM} = 100\text{A}$, $V_D = 100\text{V}$	7	7	—	μsec
Diode Reverse Recovery Time (Typical)	t_{rr}	$I_{FM} = 1500\text{A}$, $T_P = 190\mu\text{sec}$ $di/dt = -25 \text{A}/\mu\text{sec}$	10	10	10	μsec
Thermal Maximums						
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Per Module	0.09	0.09	0.09	$^\circ\text{C}/\text{Watt}$
Thermal Resistance, Case to Sink Lubricated	$R_{\theta CS}$	Per Module	0.03	0.03	0.03	$^\circ\text{C}/\text{Watt}$
Gate Parameters Maximums						
Gate Current to Trigger	I_{GT}	$V_D = 12\text{V}$	150	150	—	mA
Gate Voltage to Trigger	V_{GT}	$V_D = 12\text{V}$	3	3	—	Volts
Non-Triggering Gate Voltage	V_{GDM}	$T_J = 130^\circ\text{C}$, $V_D = 1/2 V_{DRM}$	0.15	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 modules.



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ED _____ 21, ED _____ 25, ED41 _____ 26
Dual SCR, SCR/Diode Isolated Modules
210-250-260 Amperes/100-2000 Volts

Connection Diagrams

ED43	Dual SCR Phase Control	
ED46	Dual SCR Fast Switch*	
ED42	SCR/Diode Phase Control	
ED45	SCR/Diode Fast Switch*	
ED72	SCR/Diode Current Source**	
ED47	Diode/SCR Phase Control	
ED48	Diode/SCR Fast Switch*	
ED77	Diode/SCR Current Source**	
ED41	Diode/Diode Standard Recovery	
ED44	Diode/Diode Fast Recovery*	

*Consult factory for available ratings
**Ratings identical to ED42/ED47

This specification is tentative; therefore, performance curves are not included. Please contact the Powerex sales representative nearest you for further information.



T-91-01

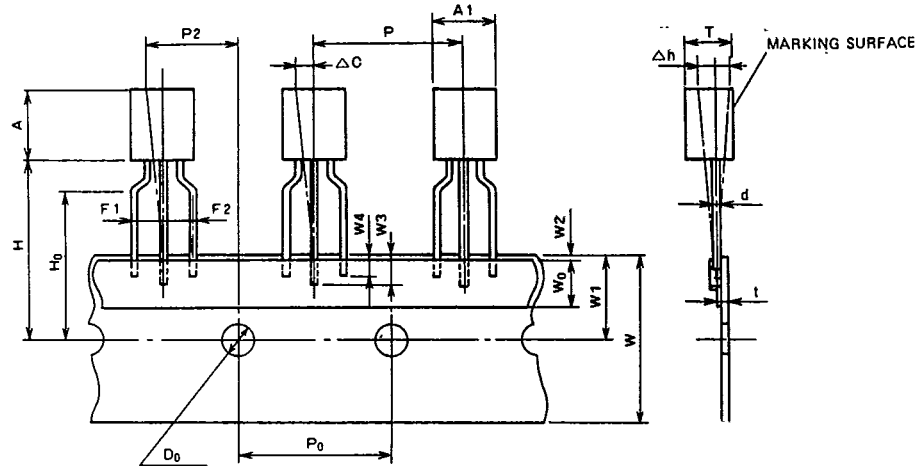
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Taping

STANDARD SPECIFICATIONS FOR TAPING OF MOLDED PACKAGE THYRISTORS AND TRIACS

TO-92 Package

Thyristor
CR02AM, CR03AM, CR04AM
Triac
BCR1AM



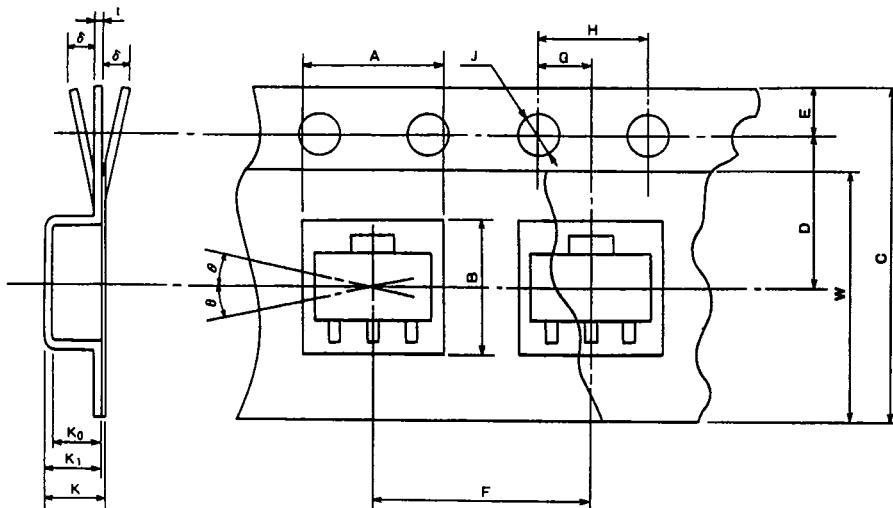
Taping dimensions

Description of symbol	Symbol	Dimensions (Unit:mm)	Remark
Product width	A1	5.0 MAX	
Product height	A	5.0 MAX	
Product thickness	T	3.7 MAX	
Lead wire diameter	d	0.6 MAX	
Sticker lead wire length (1)	W3	2.5 MIN	
Sticker lead wire length (2)	W4	2.0 MIN	
Pitch between products	P	12.7 ± 1.0	
Feed hole pitch	P ₀	12.7 ± 0.3	The cumulative pitch error is ± 1mm per 20 pitches.
Feed hole deviation (1)	P2	6.35 ± 1.3	
Distance between lead wires	F1, F2	2.5 ± 0.4	
Defective product (1)	Δh	0 ± 2.0	
Tape width	W	18.0 ± ^{1.0} / _{0.5}	
Sticker tape width	W ₀	6.0 ± 0.5	
Feed hole deviation (2)	W1	9.0 ± 0.5	
Sticker tape deviation	W2	0.5 MAX	
Position of product bottom surface	H	17.5 MIN	
Lynch height of lead wire	H ₀	16.0 ± 0.5	
Feed hole diameter	D ₀	4.0 ± 0.2	
Tape thickness	t	0.7 ± 0.2	
Defective product (2)	ΔC	0 ± 1.0	



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Powerex Semiconductor Data Book
 Taping



SOT-89 Package

Thyristor
 CR08AS

Taping dimensions

Description of symbol		Symbol	Dimensions/angles Unit:mm	Remark
Parts insertion	Height	A	5.0 ± 0.1	Cross-section of the surface 0.5mm above the inner bottom
	Width	B	4.6 ± 0.1	Cross-section of the surface 0.5mm above the inner bottom
Concave square hole	Depth	K ₀	1.8 ± 0.1	Inner space
	Pitch	F	8.0 ± 0.1	Cumulative error +0.1/-0.3 MAX/10 pitches
Round feed hole	Diameter	J	$\phi 1.5 \pm 0.05$	
	Pitch	H	4.0 ± 0.1	Cumulative error +0.1/-0.3 MAX/10 pitches
	Position	E	1.5 ± 0.1	Distance between the tape edge and the hole center
Distance between center lines	Vertical	G	2.0 ± 0.5	Center line of concave square hole and round feed hole
	Horizontal	D	5.65 ± 0.05	Center line of concave square hole and round feed hole
Cover tape	Width	W	$9.5 + 0.3/-0$	Thickness: 0.1 MAX
Carrier tape	Width	C	12 ± 0.2	Warp ± 0.3 MAX
	Thickness	t	0.3 ± 0.05	
	Package hole depth	K ₁	2.1 ± 0.1	
Device	Package dimensions	—	—	As shown in (e)
	Inclination	θ	30° MAX.	
Total Thickness		K	2.3 ± 0.1	Total thickness including cover and carrier tapes