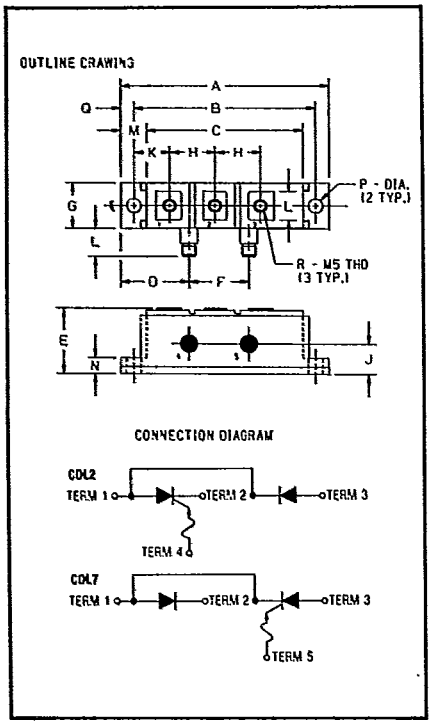
CDL2 __ __ 60
CDL7 __ __ 60 Tentative

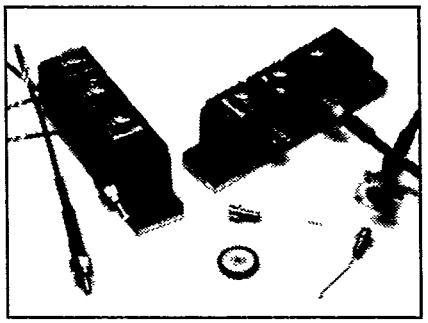
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272
Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 72.75.15

SCR/Diode Light-Triggered POW-R-BLOK™ Modules
60 Amperes/100-1400 Volts



100-1400 Volts
CDL2 __ __ 60, CDL7 __ __ 60
Outline Drawing

Dimension	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	3.602	3.640	91.49	92.45
B	3.146	3.154	79.91	80.11
C	2.705	2.735	68.71	69.47
D	1.180	1.200	29.97	30.48
E	1.125	1.165	28.58	29.59
F	1.025	1.055	26.04	26.80
G	.795	.805	20.19	20.45
H	.788	.798	19.76	20.27
J	.650	.670	16.51	17.02
K	.608	.628	15.44	15.95
L	.480	.520	12.19	13.21
M	.43	.47	10.92	11.94
N	.265	.285	6.73	7.24
PØ	.245	.255	6.22	6.48
Q	.227	.246	5.59	6.25
R	—	—	M5 x 0.8	



CDL2 __ __ 60, CDL7 __ __ 60
SCR/Diode Light-Triggered
POW-R-BLOK™ Modules
60 Amperes/100-1400 Volts

Description
Powerex SCR/Diode CDL2 and CDL7 are light-triggered isolated POW-R-BLOK™ modules. The directly light-triggered thyristor module is gated on with a Gallium Arsenide (GaAs) laser diode or a high-power Gallium Aluminum Arsenide (GaAlAs) light emitting diode (LED).

Features:
- ☐ Glass Passivated Chips
- ☐ Hybrid Construction
- ☐ Fiber Optic Receptacles
- ☐ Fiber Optic Pigtails

Applications:
- ☐ High Degree of Gate Isolation
- ☐ Remote Location of Thyristor From Gate Circuits
- ☐ High Immunity from Deleterious Effects of Electromagnetic Interference (EMI)

Ordering Information
Example: Select the complete eight digit rating module part number you desire from the table — i.e. CDL21260 is a 1200 Volt, 60 Ampere SCR/Diode Light-Triggered POW-R-BLOK™ Module.

Type	V_{RRM} Volts (x100)	Current Rating Amperes (60)
CDL2	01	60
CDL7	02	
	04	
	06	
	08	
	10	
	12	
	14	

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CDL2 __ __ 60, CDL7 __ __ 60
SCR/Diode
Light-Triggered POW-R-BLOK™ Modules
60 Amperes/100-1400 Volts

Absolute Maximum Ratings

Characteristics	Symbol	CDL20160 CDL70160	CDL20260 CDL70260	CDL20460 CDL70460	CDL20660 CDL70660	Units
Peak Forward Blocking Voltage	V_{DRM}	100	200	400	600	Volts
Peak Reverse Blocking Voltage	V_{RRM}	100	200	400	600	Volts
Transient Peak Reverse Blocking Voltage (Non-Repetitive) t<5 ms	V_{RSM}	200	300	500	700	Volts

		CDL20860 CDL70860	CDL21060 CDL71060	CDL21260 CDL71260	CDL21460 CDL71460	
Peak Forward Blocking Voltage	V_{DRM}	800	1000	1200	1400	Volts
Peak Reverse Blocking Voltage	V_{RRM}	800	1000	1200	1400	Volts
Transient Peak Reverse Blocking Voltage (Non-Repetitive) t<5 ms	V_{RSM}	950	1200	1450	1700	Volts

		CDL2 __ __ 60 CDL7 __ __ 60	
RMS On-State Current	$I_{T(RMS)}$, $I_{F(RMS)}$	125	Amperes
Average On-State Current	$I_{T(AV)}$, $I_{F(AV)}$	80	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz)	I_{TSM}, I_{FSM}	1800	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	I_{TSM}, I_{FSM}	1645	Amperes
I^2t (for Fusing), 8.3 milliseconds	I^2t	13500	A^2sec
Critical Rate-of-Rise of On-State Current ①(Non-Repetitive)	di/dt	100	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 125	°C
Operating Temperature	T_J	-40 to 125	°C
Maximum Mounting Torque M6 Mounting Screw	—	50	in.-lb.
Maximum Terminal Torque M5 Terminal Screw	—	35	in.-lb.
Module Weight (Typical)	—	142	Grams
V Isolation	V_{RMS}	2500	Volts

① Per JEDEC STD RS-397, 5.2.2.6.

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CDL2 __ __ 60, CDL7 __ __ 60
SCR/Diode
Light-Triggered POW-R-BLOK™ Modules
60 Amperes/100-1400 Volts

Electrical and Thermal Characteristics T_J=25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	CDL2 __ __ 60	CDL7 __ __ 60	Units
Blocking State Maximums					
Forward Leakage Current, Peak	I_{DRM}	T_J=125°C, V_{DRM}=rated		15	mA
Reverse Leakage Current, Peak	I_{RRM}	T_J=125°C, V_{RRM}=rated		15	mA
Conducting State Maximums					
Peak On-State Voltage	V_{TM}	I_{TM}=250A		1.75	Volts
Peak On-State Voltage	V_{FM}	I_{FM}=250A		1.3	Volts
Switching Minimums					
Critical Rate of Rise of Off-State Voltage	dv/dt	T_J=125°C, Exponential to V_{DRM}		300	Volts/μsec
Typical Turn-Off Time	t_q	I_{TM}=50A, T_J=125°C, di_R/dt=5A/μs reapplied dv/dt=20V/μs linear to 0.8 V_{DRM}		100	μsec
Typical Turn-On Time	t_{on}	I_{TM}=100A, V_D=100V		4	μsec
Thermal Maximums					
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Per Device		0.28	°C/Watt
Thermal Resistance, Case to Sink Lubricated	$R_{\theta CS}$	Per Device		0.2	°C/Watt
Gate Parameters Maximums					
Optical Energy to Trigger	E_{LT}	Trigger at V_D=40V, Wavelength = 094 nm tp=0.2 μs		0.500	μJ
Recommended Optical Gate Drive Energy	E_{LTrec}	—		0.750	μJ
Interconnecting Optical Fiber Diameter					
Fiber Optical Pigtail	—	—		600	μm
Integral Fiber Optic Connector	—	—		1000	μm
Interconnecting Optical Fiber Numerical Aperture	—	—		.37	NA

CAUTION:
The user should be careful not to overtighten the nut on the fiber optic plug when coupling it to the module.

After insertion of the fiber optic plug into the receptacle, the nut should be tightened finger tight. If additional tightening is required, the nut may be turned a *maximum of 1/16th of a turn or a maximum torque of 4 inch pounds applied.* Damage to the fiber optic receptacle, internal optical fiber and fiber optic plug may result if the nut is overtightened.

It is recommended that a high pressure air jet be used to remove any particles from the inside of the fiber optic receptacle prior to insertion of the fiber optic plug in order to prevent damage to the glass fibers.

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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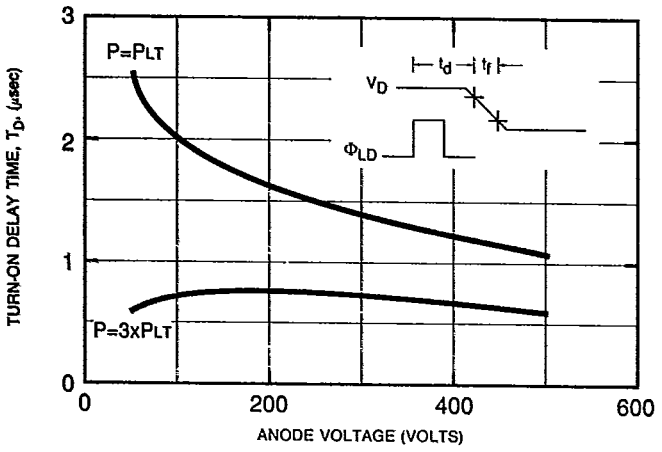
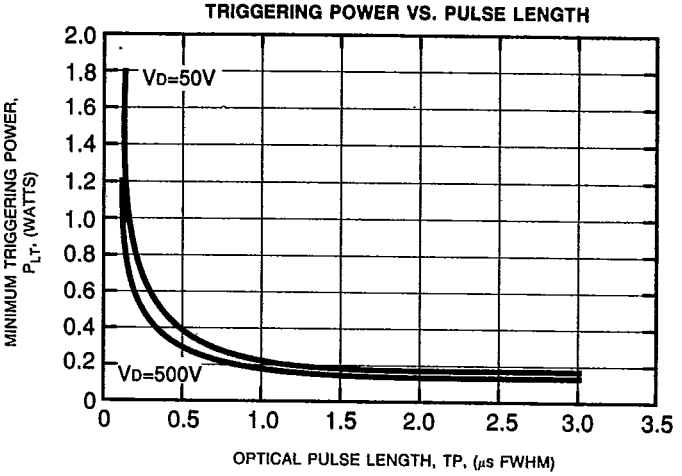
CDL2 __ __ 60, CDL7 __ __ 60
SCR/Diode
Light-Triggered POW-R-BLOK™ Modules
60 Amperes/100-1400 Volts

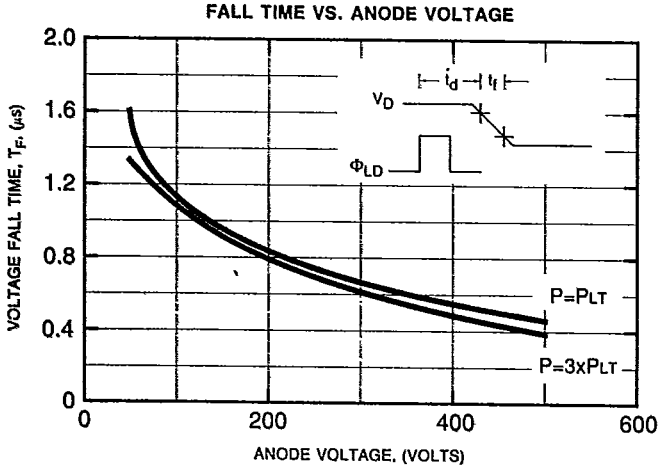
TURN-ON DELAY VS. ANODE VOLTAGE



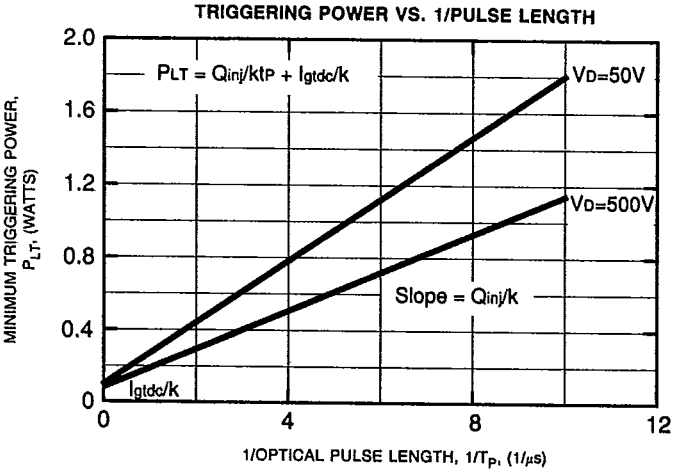
TRIGGERING POWER VS. PULSE LENGTH



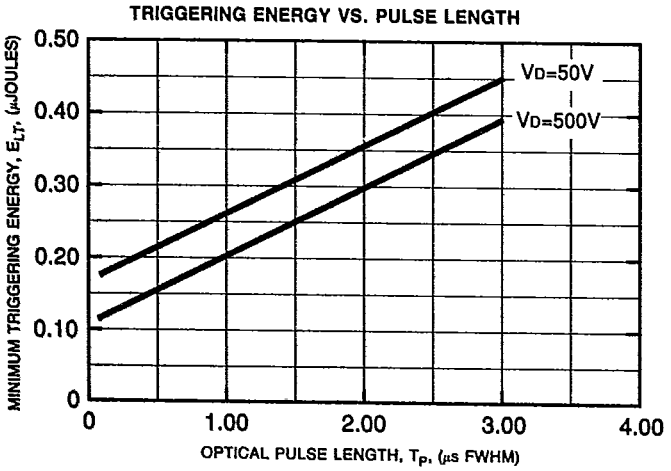
FALL TIME VS. ANODE VOLTAGE



TRIGGERING POWER VS. 1/PULSE LENGTH



TRIGGERING ENERGY VS. PULSE LENGTH



POWEREX

T-91-01

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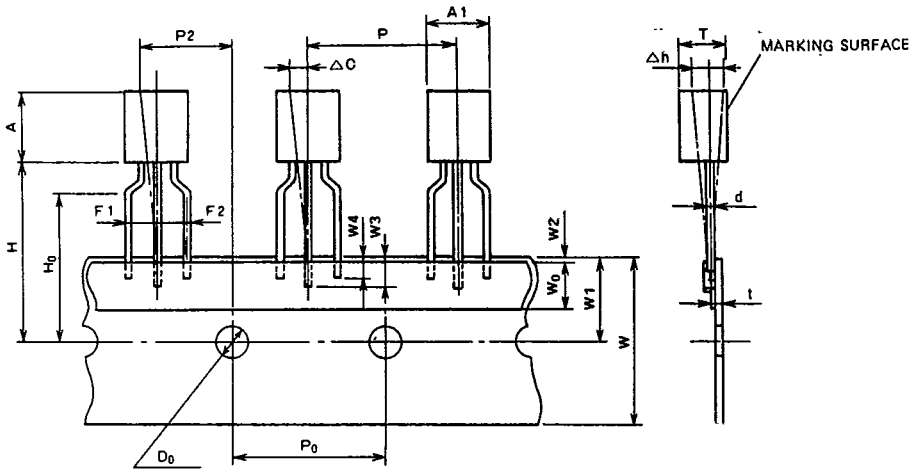
Taping

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	$18.0 \pm^{1.0}_{0.5}$	
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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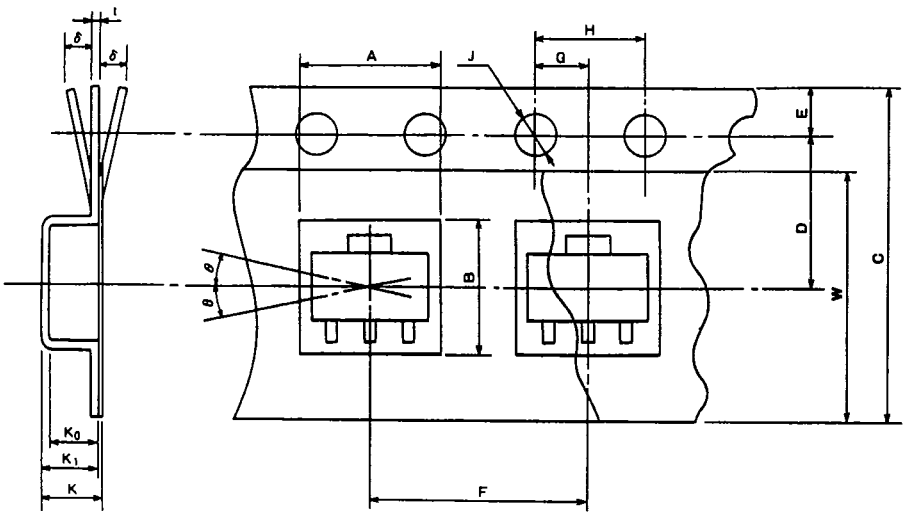
Powerex Semiconductor Data Book
Taping



SOT-89 Package

Thyristor
CR08AS

Taping dimensions

Description of symbol		Symbol	Dimensions/angles Unit:mm	Remark
Parts insertion Concave square hole	Height	A	$5.0 \pm^{0.1}_{0.1}$	Cross-section of the surface 0.5mm above the inner bottom
	Width	B	$4.6 \pm^{0.1}_{0.1}$	Cross-section of the surface 0.5mm above the inner bottom
	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	$\phi 1.5 \pm^{0.1}_{0.05}$	
	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 δ0.3 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