

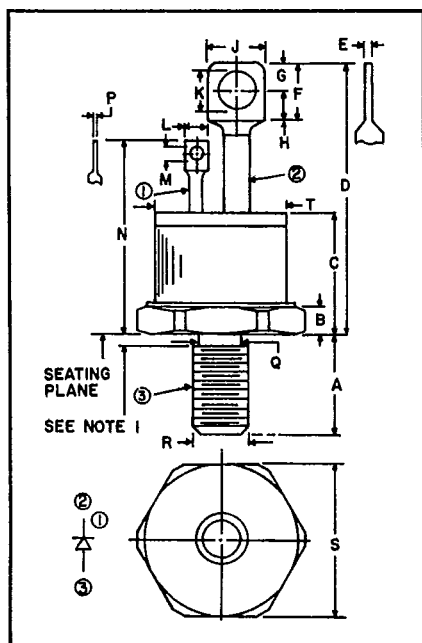


T-25-17

C148

Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

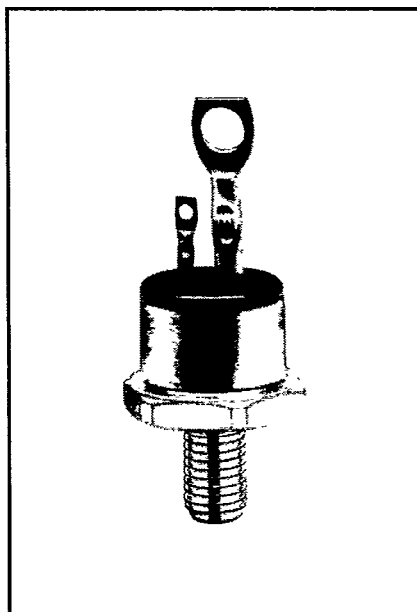
Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Inverter Grade SCR**63 Amperes RMS****600-1200 Volts/30-40 μ sec****600-1200 Volts, C148 Outline Drawing
Modified TO-65**

Dimensions	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	.422	.452	10.72	11.47
B	.120	.135	3.05	3.42
C	.534	.565	13.57	14.34
D	1.230	1.290	31.25	32.78
E	.029	0.62	.74	1.56
F	.258	Ref.	6.55	Ref.
G	.138	Ref.	3.50	Ref.
H	.115	—	2.83	—
J	.240	.300	6.10	7.62
K	.169	.182	4.30	4.62
L	.090	.115	2.29	2.91
M	.055	.066	1.40	1.67
N	.831	.901	21.11	22.88
P	.012	—	.31	—
Q	.220	—	5.59	—
R	1/4-28		UNF-2A	
S	.676	.684	17.18	17.36
T	—	.597	—	15.15

Note:

- 1 Complete threads to within 2 1/2 thd. of seating plane.
- 2 One steel, cadmium plated nut and one steel, cadmium plated lockwasher supplied with each device.

**C148
Inverter Grade SCR
63 Amperes/600-1200 Volts/
30-40 μ sec****Description**

Powerex Inverter Grade Silicon Controlled Rectifiers (SCR) are designed for applications. These are all-diffused, compression bonded encapsulated (CBE) devices employing the field-proven amplifying (di/namic) gate.

Features:

- ☐ Center fired Di/Namic Gate
- ☐ High dv/dt With Soft Gate Control
- ☐ High Frequency Operation
- ☐ Sinusoidal Waveform Operation To 20kHz
- ☐ Rectangular Waveform Operation To 20kHz
- ☐ Low Dynamic Forward Voltage Drop
- ☐ Low Switching Losses At High Frequency

Applications:

- ☐ UPS Inverters
- ☐ Induction Heating Inverters
- ☐ High Frequency Lighting
- ☐ Cycloconverters
- ☐ Choppers
- ☐ DC To DC Conversion

Ordering Information

Example: Select the complete 7 or 8 digit part number you desire from the table — i.e. C148N40 is an 800 Volt, 63 Ampere Inverter Grade SCR, 40 μ s T_q .

Type	Voltage V_{DRM}/V_{RRM}	Code	Turn-Off	
			t_q (μ sec)	Code
C148	600	M	30	30
	800	N	40	40
	1000	P		
	1200	PB		

Note: All voltages not available in all current ratings.



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C148**Inverter Grade SCR**63 Amperes RMS/600-1200 Volts/30-40 μ sec**Absolute Maximum Ratings**

Ratings	Symbol	C148M	C148N	Units
Repetitive Peak Off-State Voltage	V_{DRM}	600	800	Volts
Repetitive Peak Reverse Voltage	V_{RRM}	600	800	Volts
Non-repetitive Peak Reverse Voltage	V_{RSM}	720	960	Volts

Ratings	Symbol	C148P	C148PB	Units
Repetitive Peak Off-State Voltage	V_{DRM}	1000	1200	Volts
Repetitive Peak Reverse Voltage	V_{RRM}	1000	1200	Volts
Non-repetitive Peak Reverse Voltage	V_{RSM}	1200	1440	Volts

C148

RMS On-State Current	$I_T(RMS)$	63	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (60 Hz) ③	I_{TSM}	700	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50 Hz) ③	I_{TSM}	670	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive) ①④⑤	di/dt	100	Amperes/ μ s
Critical Rate-of-Rise of On-State Current (Repetitive)	di/dt	75	Amperes/ μ s
I^2t (for Fusing), 8.3 ms	I^2t	2000	A ² sec
Average Gate Power Dissipation	$P_{G(AV)}$	2	Watts
Storage Temperature	T_{stg}	-40 to 150	°C
Operating Temperature	T_j	-40 to 125	°C
Mounting Torque ①		30	in.-lb.
Mounting Torque ①		3.4	N-m

① Consult recommended mounting procedures.

② Applies for zero or negative gate bias.

③ Per JEDEC RS-397, 5.2.2.1.

④ With recommended gate drive.

⑤ Higher di/dt ratings available, consult factory.

⑥ Per JEDEC standard RS-397, 5.2.2.6.



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C148**Inverter Grade SCR**63 Amperes RMS/600-1200 Volts/30-40 μ sec**Electrical Characteristics**

Characteristics	Symbol	Test Conditions	Min.	C148 Typ.	Max.	Units
Current—Conducting State Maximums						
Peak On-State Voltage	V _{TM}	T _c = 25 °C, I _T = 500A	—	—	4.0	Volts
Voltage—Blocking State Maximums						
Forward Leakage, Peak	I _{DRM}	T _j = 125 °C, V _D = V _{DRM}	—	7	12	mA
Reverse Leakage, Peak	I _{RRM}	T _j = 125 °C, V _R = V _{RRM}	—	7	12	mA
Typical Critical dv/dt exponential to V _{DRM} ②⑤	dv/dt	T _j = 125 °C, V _D = V _{DRM}	200	—	—	V/μsec
Thermal						
Maximum Thermal Resistance ① Junction to Case	R _{th(j-c)}		200	—	—	°C/Watt
Gate—Maximum Parameters						
Gate Current to Trigger	I _{GT}	T _c = 25 °C, V _D = 6V, R _L = 3Ω	—	—	150	mA
Gate Voltage to Trigger	V _{GT}	T _c = 25 °C, V _D = 6V, R _L = 3Ω	—	—	3.0	Volts
Non-Triggering Gate Voltage	V _{GD}	T _c = 125 °C, V _D = V _{DRM} , R _L = 1kΩ	0,25	—	—	Volts

① Consult recommended mounting procedures.

② Applies for zero or negative gate bias.

③ Per JEDEC RS-397, 5.2.2.1.

④ With recommended gate drive.

⑤ Higher dv/dt ratings available, consult factory.

⑥ Per JEDEC standard RS-397, 5.2.2.6.



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C148**Inverter Grade SCR**63 Amperes RMS/600-1200 Volts/30-40 μ sec**Electrical Characteristics**

Characteristics	Symbol	Test Conditions	C148-30			C148-40			Units
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Switching Circuit									
Turn-Off Time	t_q	$T_c = +125^\circ\text{C}$, $I_{TM} = 150\text{A}$, $V_R = 50\text{V/min.}$, $di/dt = 5\text{A}/\mu\text{s}$, reapplied $dv/dt = 20\text{V}/\mu\text{s}$ linear Repetition Rate = 1 pps Gate Bias During Turn-Off Interval $V_D = 0\text{V}$, $R_L = 100\Omega$	—	—	30	—	—	40	μsec
Turn-Off Time	t_q	$T_c = +125^\circ\text{C}$, $I_{TM} = 150\text{A}$, $V_R = 50\text{V/min.}$, $di/dt = 5\text{A}/\mu\text{s}$, reapplied $dv/dt = 200\text{V}/\mu\text{s}$ linear Repetition Rate = 1 pps Gate Bias During Turn-Off Interval $V_D = 0\text{V}$, $R_L = 100\Omega$	—	38	†	—	48	†	μsec
Turn-Off Time (with Feedback Diode)	t_q	$T_c = +125^\circ\text{C}$, $I_{TM} = 150\text{A}$, $V_R = 1\text{V}$, $di/dt = 5\text{A}/\mu\text{s}$, Repetition Rate = 1 pps Gate Bias During Turn-Off Interval $V_D = 0\text{V}$, $R_L = 100\Omega$	—	45	—	—	55	—	μsec

†Consult factory for a specified maximum turn-off time.



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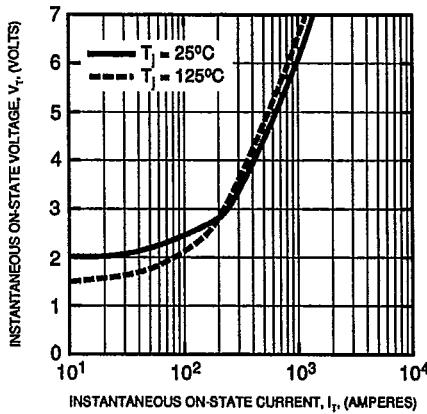
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C148

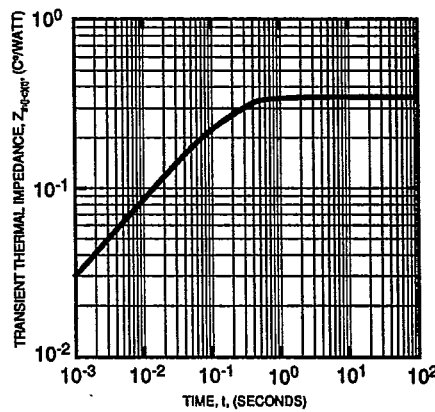
Inverter Grade SCR

63 Amperes RMS/600-1200 Volts/30-40 μ sec

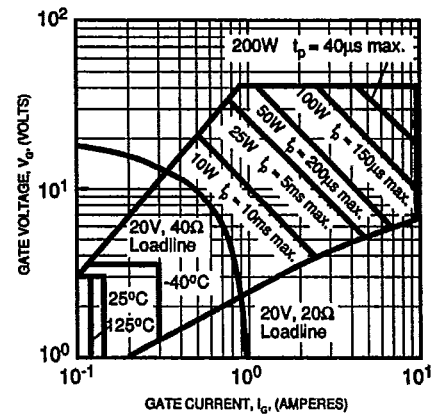
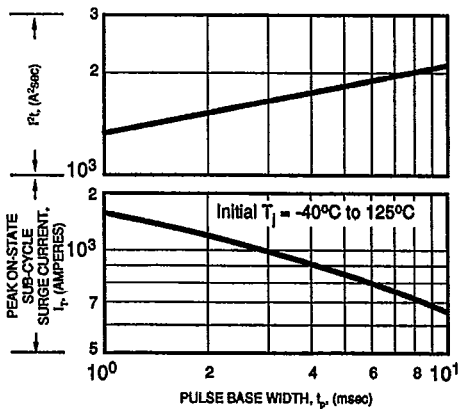
MAXIMUM ON-STATE CHARACTERISTICS



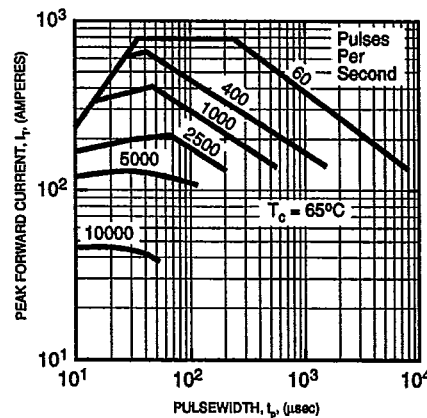
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



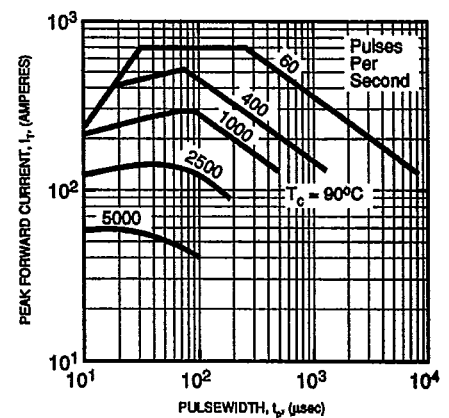
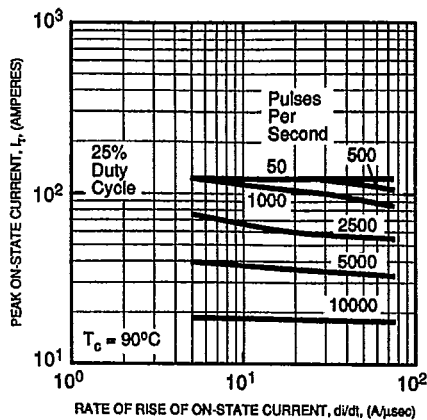
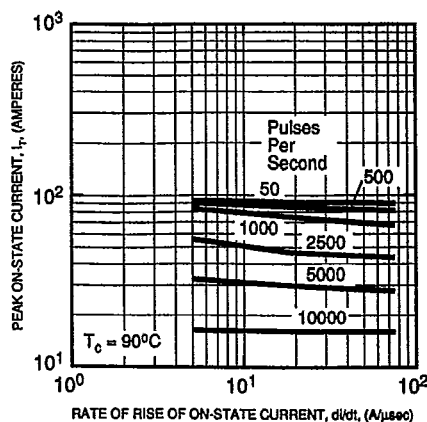
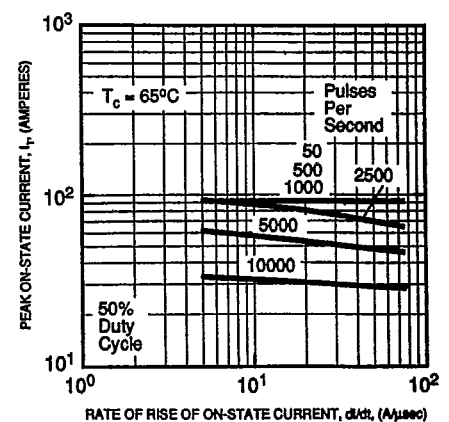
GATE CHARACTERISTICS AND POWER RATINGS

MAXIMUM ALLOWABLE NON-REPETITIVE SUB-CYCLE SURGE ON-STATE CURRENT AND I^2t RATINGS

MAXIMUM ALLOWABLE PEAK FORWARD CURRENT



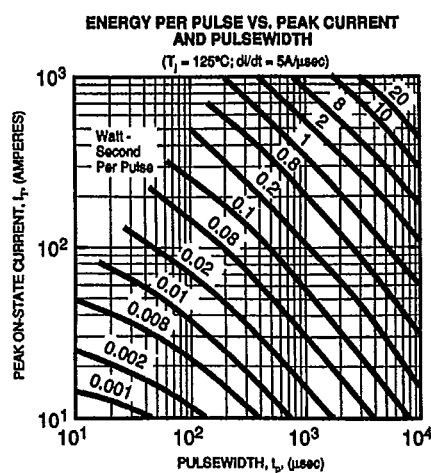
MAXIMUM ALLOWABLE PEAK FORWARD CURRENT

MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VS. di/dt MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VS. di/dt MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VS. di/dt 

POWEREX

7-25-17

C148
Inverter Grade SCR
63 Amperes RMS/600-1200 Volts/30-40 μ sec





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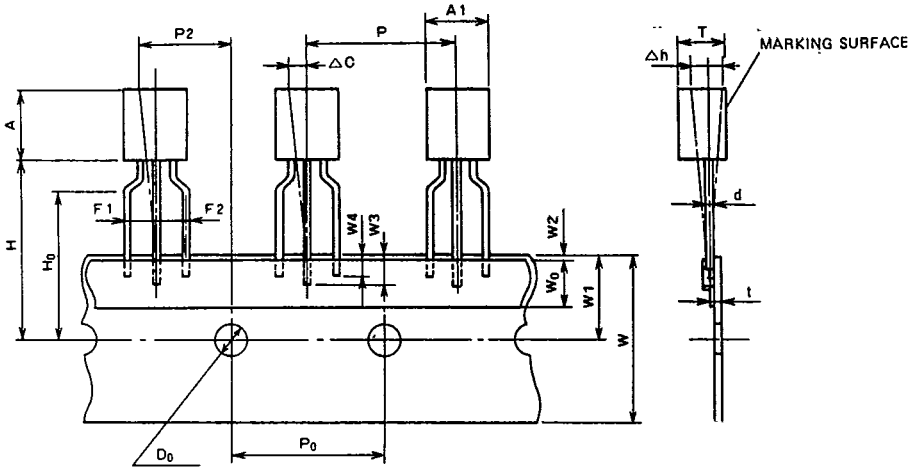
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Taping

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	P0	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	W0	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	H0	16.0 ± 0.5	
Feed hole diameter	D0	4.0 ± 0.2	
Tape thickness	t	0.7 ± 0.2	
Defective product (2)	ΔC	0 ± 1.0	

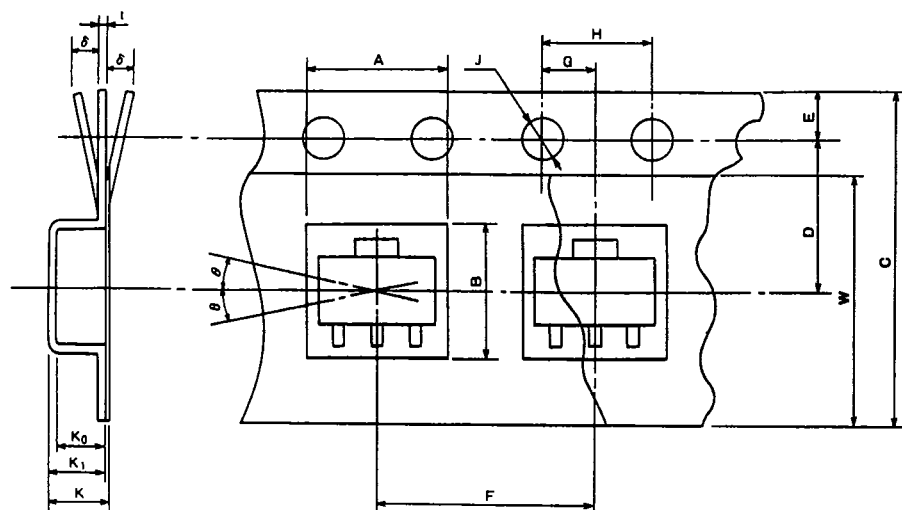


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Powerex Semiconductor Data Book

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