

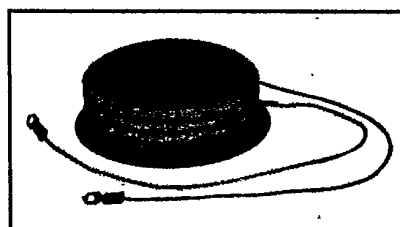
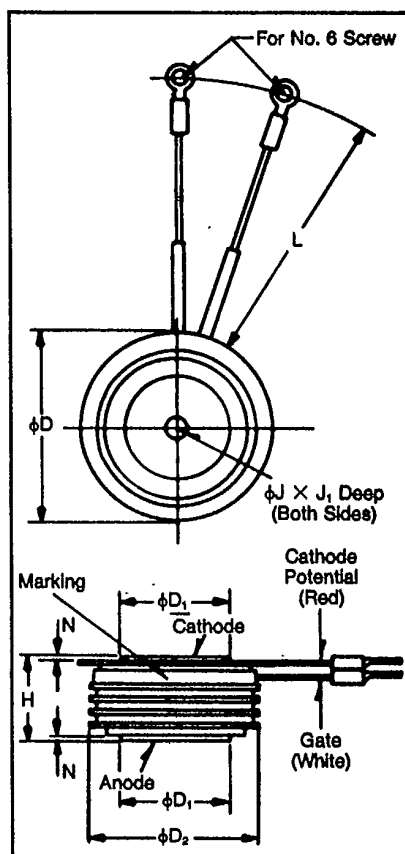
POWEREX

TA20

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

Powerex Europe, S.A., 428 Ave. G. Durand, BP107, 72003 LeMans, France (49) 72.75.15

Phase Control SCR
1200-1400 Amperes Avg
2400-4000 Volts



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Description

Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-diffused, Press-Pak (Pow-R-Disc) devices employing the field-proven amplifying (di/dt) gate.

Features:

- ☐ Low On-State Voltage
- ☐ High di/dt
- ☐ High dv/dt
- ☐ Hermetic Packaging
- ☐ Excellent Surge and I²t Ratings

Applications:

- ☐ Power Supplies
- ☐ Battery Chargers
- ☐ Motor Control
- ☐ Light Dimmers
- ☐ VAR Generators

Ordering Information

Example: Select the complete eight digit part number you desire from the table - i.e. TA202412 is a 2400 Volt, 1200 Ampere Phase Control SCR.

TA2
Outline Drawing

Dimensions	Inches		Millimeters	
	Min.	Max.	Min.	Max.
φD	3.910	3.950	99.31	100.33
φD ₁	2.470	2.480	62.74	63.00
φD ₂	3.440	3.560	87.38	90.42
H	1.260	1.300	32.00	33.02
φJ	.135	.145	3.43	3.68
J ₁	.075	.090	1.91	2.29
L	11.50	12.50	292.10	317.50
N	.050	—	1.27	—

Creep Distance—1.40 in. min. (35.56 mm)

Strike Distance—.98 in. min. (24.89 mm).

(In accordance with NEMA standards.)

Finish—Nickel Plate.

Approx. Weight—2.1 lb. (950 g).

1. Dimension "H" is a clamped dimension.

Type	Voltage		Current	
	V _{ONM} V _{RRM}	Code	I _T (avg)	Code
TA20	2400	24	1200	12
	2600	26	1400	14
	2800	28		
	3000	30		
	3200	32		
	3400	34		
	3600	36		
	3800	38		
	4000	40		



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Absolute Maximum Ratings

	Symbol	TA20 _ _ 12	TA20 _ _ 14	Units
RMS On-State Current	$I_{T(RMS)}$	1800	2200	Amperes
Average On-State Current	$I_{T(av)}$	1200	1400	Amperes
Peak One-Cycle Surge (Non Repetitive) On-State Current (60Hz) ^①	I_{TSM}	23,500	25,000	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz) ^①	I_{TSM}	21,450	22,800	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive) ^② ^③	di/dt	400	400	Amperes/ μ s
Critical Rate-of-Rise of On-State Current (Repetitive)	di/dt	150	150	Amperes/ μ s
I^2t (for Fusing), One Cycle at 60Hz	I^2t	1.67×10^6	2.6×10^6	A ² sec
Peak Gate Power Dissipation	P_{GM}	16	16	Watts
Average Gate Power Dissipation	$P_{G(av)}$	3	3	Watts
Storage Temperature	T_{STG}	-40 to 150	-40 to 150	°C
Operating Temperature	T_J	-40 to 125	-40 to 125	°C
Mounting Force ^④		9000 to 11,000	9000 to 11,000	lb.
Mounting Force ^④		4100 to 5000	4100 to 5000	kg

Electrical and Thermal Characteristics

	Symbol	Test Conditions	TA20 _ _ 12	TA20 _ _ 14	Units
Current—Conducting State Maximums					
Peak On-State Voltage	V_{TM}	$I_{TM} = 3000A, T_J = 25^\circ C$	3.15	2.50	Volts
Voltage—Blocking State Maximums^①					
Forward Leakage, Peak	I_{DRM}	$T_J = 125^\circ C, V_{DRM} = \text{rated}$	250		mA
Reverse Leakage, Peak	I_{RRM}	$T_J = 125^\circ C, V_{RRM} = \text{rated}$	250		mA
Switching					
Typical Turn-Off Time	t_t	$I_T = 250A, T_J = 125^\circ C,$ $di/dt = 50A/\mu\text{sec}, \text{reapplied}$ $dv/dt = 20V/\mu\text{sec linear to } 0.8V_{DRM}$	400		μsec
Typical Turn-On Time ^②	t_{on}	$I_{TM} = 1000A, V_D = 1500V$	8.0		μsec
Min. Critical dv/dt exponential to V_{DRM} ^③	dv/dt	$T_J = 125^\circ C$	300		V/ μsec
Thermal					
Maximum Thermal Resistance, ^④ double sided cooling					
Junction to Case	$R_{\theta JC}$		.015		°C/Watt
Case to Sink, Lubricated	$R_{\theta CS}$		.007		°C/Watt
Gate—Maximum Parameters					
Gate Current to Trigger	I_{GT}	$T_J = 25^\circ C, V_D = 12V$	200		mA
Gate Voltage to Trigger	V_{GT}	$T_J = 25^\circ C, V_D = 12V$	3.0		Volts
Non-Triggering Gate Voltage	V_{GDM}	$T_J = 125^\circ C, \text{rated } V_{DRM}$	.15		Volts
Peak Forward Gate Current	I_{GTM}		4		Amperes
Peak Reverse Gate Voltage	V_{GRM}		5		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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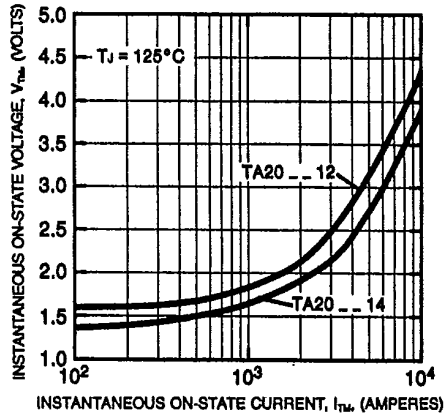
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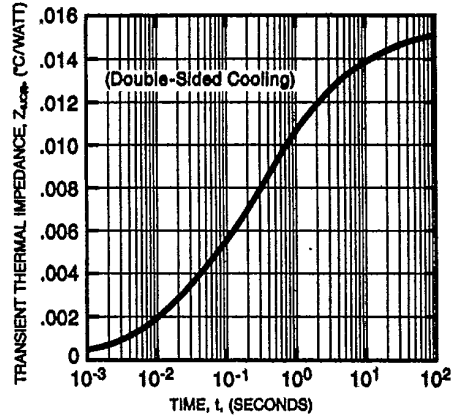
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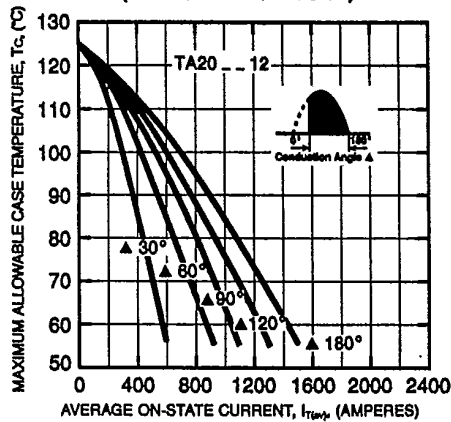
MAXIMUM ON-STATE CHARACTERISTICS



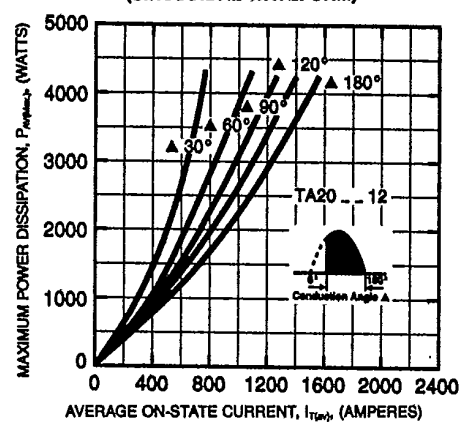
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



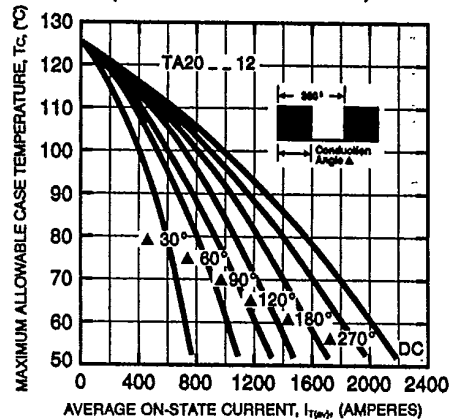
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



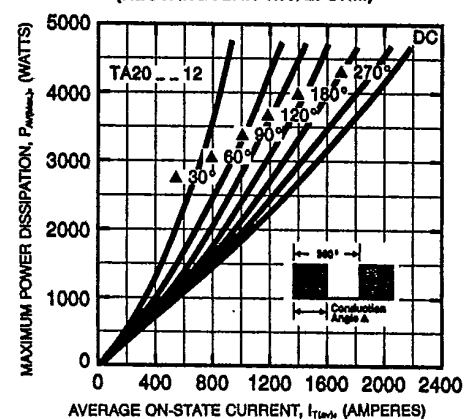
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)





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