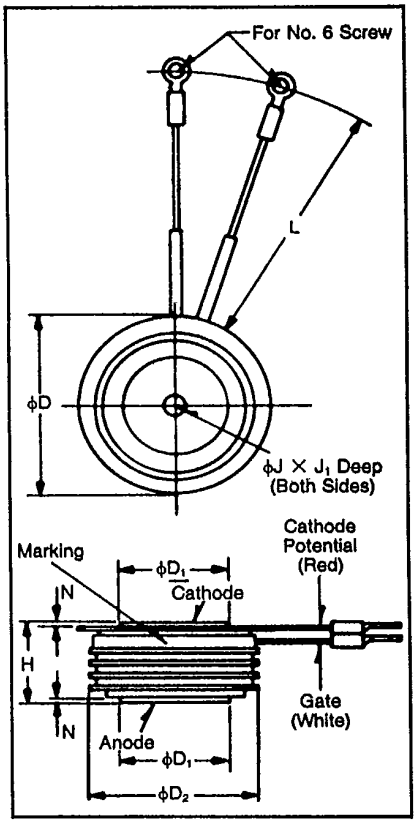
POWEREX

TA20

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

Phase Control SCR

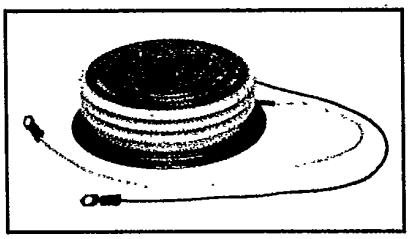
1600-1800 Amperes Avg
100-2200 Volts



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.



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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/namic) gate.

Features:
- ☐ Low On-State Voltage
- ☐ High di/dt
- ☐ High dv/dt
- ☐ Hermetic Packaging
- ☐ Excellent Surge and I^2t 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. TA200816 is a 800 Volt, 1600 Ampere Phase Control SCR.

Type	Voltage*		Current	
	V_{DRM} V_{RRM}	Code	I_T (avg)	Code
TA20	100	01	1600	16
	200	02	1800	18
	400	04		
	600	06		
	800	08		
	1000	10		
	1200	12		
	1400	14		
	1600	16		
	1800	18		
	2000	20		
	2200	22		

*All voltages not available in all current ratings.

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Absolute Maximum Ratings

	Symbol	TA20 _ _ 16	TA20 _ _ 18	Units
Maximum Blocking Voltage	V_{DRM}, V_{RRM}	2200	1800	Volts
RMS On-State Current	$I_{T(RMS)}$	2500	2820	Amperes
Average On-State Current	$I_{T(av)}$	1600	1800	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz)③	I_{TSM}	29,500	40,000	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)③	I_{TSM}	26,900	36,500	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive)①②④	di/dt	400	400	Amperes/µs
Critical Rate-of-Rise of On-State Current (Repetitive)	di/dt	150	150	Amperes/µs
I^2t (for Fusing), One Cycle at 60 Hz	I^2t	3.63×10^6	6.67×10^6	A^2sec
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 Force①		9000 to 11,000	9000 to 11,000	lb.
Mounting Force①		4100 to 5000	4100 to 5000	kg

Electrical and Thermal Characteristics

	Symbol	Test Conditions	TA20 _ _ 16	TA20 _ _ 18	Units
Current—Conducting State Maximums					
Peak On-State Voltage	V_{TM}	I_{TM} = 3000A, T_J = 25°C	1.75	1.45	Volts
			TA20		
Voltage—Blocking State Maximums②					
Forward Leakage, Peak	I_{DRM}	T_J = 125°C, V_{DRM} = rated	100		mA
Reverse Leakage, Peak	I_{RRM}	T_J = 125°C, V_{RRM} = rated	100		mA
Switching					
Typical Turn-Off Time	t_q	I_T = 250A, T_J = 125°C, di_R/dt = 50A/µsec, reapplied dv/dt = 20V/µsec linear to 0.8V_{DRM}	250		µsec
Typical Turn-On Time④	t_{on}	I_{TM} = 1000A, V_D = 1500V	4.0		µsec
Min. Critical dv/dt exponential to V_{DRM}②⑤	dv/dt	T_J = 125°C	300		V/µsec
Thermal					
Maximum Thermal Resistance,① 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°C, V_D = 12V	200		mA
Gate Voltage to Trigger	V_{GT}	T_J = 25°C, V_D = 12V	3.0		Volts
Non-Triggering Gate Voltage	V_{GDM}	T_J = 125°C, 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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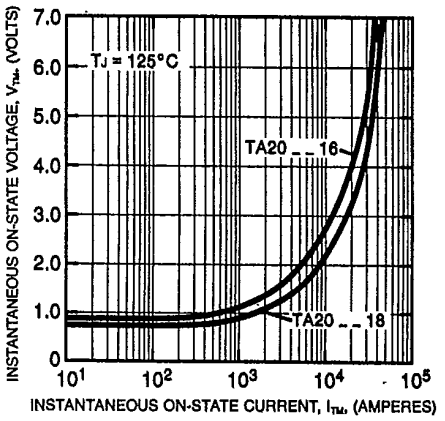
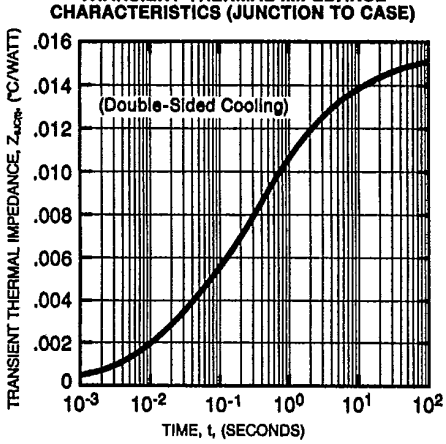
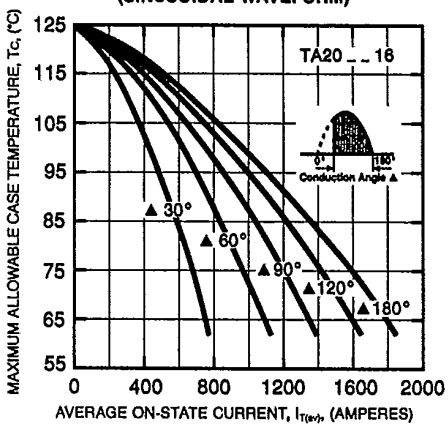
MAXIMUM ON-STATE CHARACTERISTICS



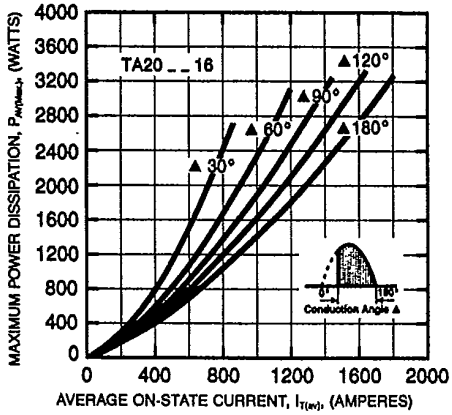
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



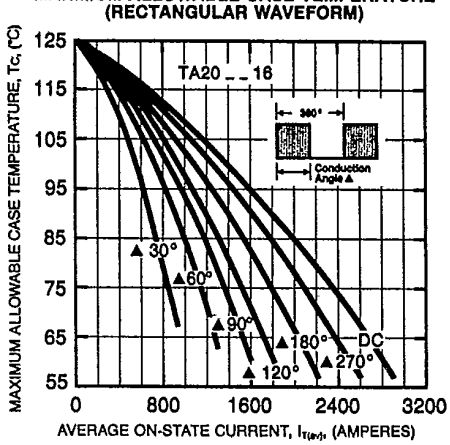
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



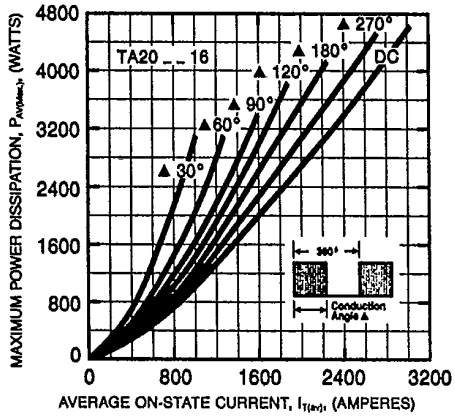
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)



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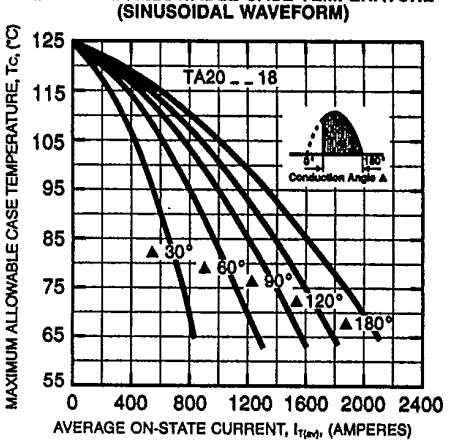

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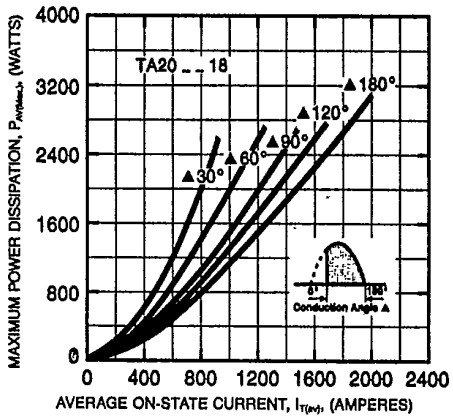

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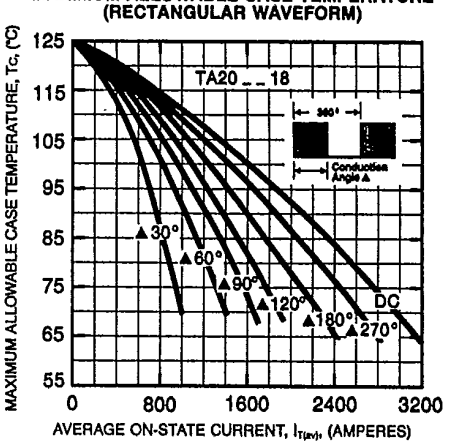

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