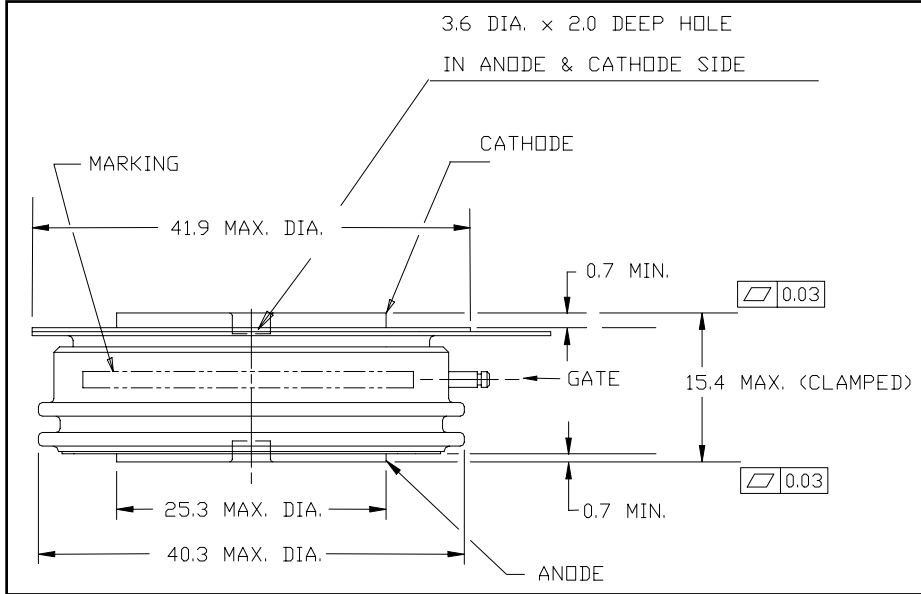


Phase Control SCR
650 Amperes Average
1600 Volts



T7H8 650A (Outline Drawing)



T7H8 650A Phase Control SCR
650 Amperes Average, 1600 Volts

Description:

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

Features:

- ☐ Low On-State Voltage
- ☐ High di/dt Capability
- ☐ High dv/dt Capability
- ☐ Hermetic Packaging
- ☐ Excellent Surge and I^2t Ratings

Applications:

- ☐ Power Supplies
- ☐ Motor Control

Ordering Information:

Select the complete 12 digit module part number from the table below.
Example: T7H8166504DN is a 1600V 650A Phase Control SCR.

Type	Voltage V_{RRM} (Volts)	Current $I_{T(av)}$ (A)	Turn-off Time t_q (μ sec)	Gate Current I_{GT} (mA)	Lead Code
T7H8	02 through 16 200V through 1600V	65 650A	0 150 μ sec typical	4 150 mA	DN 8"

Absolute Maximum Ratings

Characteristics	Symbol	Units
Non-Repetitive Transient Peak Reverse Blocking Voltage	V_{RSM} $V_{RRM} + 100V$	Volts
RMS On-State Current, $T_C = 65^\circ C$	$I_{T(RMS)}$ 1020	Amperes
Average Current 180° Sine Wave, $T_C = 65^\circ C$	$I_{T(AV)}$ 650	Amperes
RMS On-State Current, $T_C = 55^\circ C$	$I_{T(RMS)}$ 1125	Amperes
Average Current 180° Sine Wave, $T_C = 55^\circ C$	$I_{T(AV)}$ 715	Amperes
Peak One Cycle Surge On-State Current (Non-Repetitive) 60 Hz	I_{TSM} 9000	Amperes
Peak One Cycle Surge On-State Current (Non-Repetitive) 50 Hz	I_{TSM} 8200	Amperes
Critical Rate-of-rise of On-State Current (Non-Repetitive)	di/dt 600	A/ μ sec
Critical Rate-of-rise of On-State Current (Repetitive)	di/dt 150	A/ μ sec
I^2t (for Fusing) for One Cycle, 60 Hz	I^2t 338,000	A ² sec
Peak Gate Power Dissipation	P_{GM} 16	Watts
Average Gate Power Dissipation	$P_{G(av)}$ 3	Watts
Operating Temperature	T_J -40 to +125	$^\circ C$
Storage Temperature	T_{stg} -40 to +150	$^\circ C$
Approximate Weight	4	oz.
	113	g
Mounting Force	2000 to 2400	lb.
	900 to 1090	kg.

Information presented is based upon manufacturers testing and projected capabilities.
This information is subject to change without notice.
The manufacturer makes no claim as to the suitability of use, reliability, capability,
or future availability of this product.

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

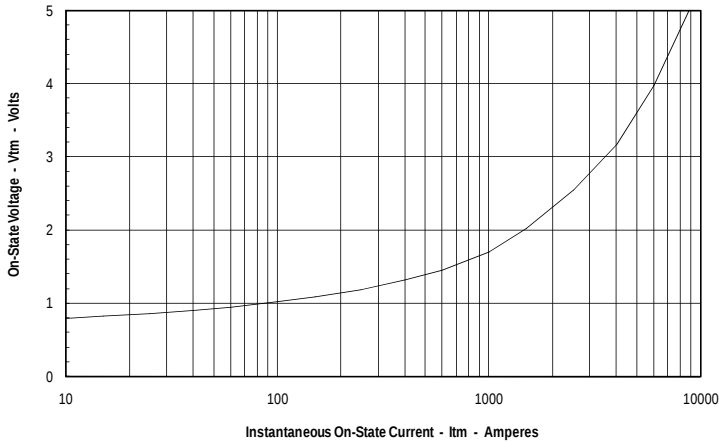
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Repetitive Peak Reverse Leakage Current	I_{RRM}	$T_J=125^\circ\text{C}$, $V_R = V_{RRM}$			30	mA
Repetitive Peak Forward Leakage Current	I_{DRM}	$T_J=125^\circ\text{C}$, $V_D = V_{DRM}$			30	mA
Peak On-State Voltage	V_{TM}	$I_{FM}=625\text{A}$ peak, Duty Cycle < 0.1 %			1.50	V
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_J = 125^\circ\text{C}$, $I = 15\%I_{T(AV)}$ to $\pi I_{T(AV)}$			1.0336	V
Slope Resistance, Low-level	r_{T1}				0.62862	$\text{m}\Omega$
Threshold Voltage, High-level	$V_{(TO)2}$	$T_J = 125^\circ\text{C}$, $I = \pi I_{T(AV)}$ to I_{TSM}			1.68191	V
Slope Resistance, High-level	r_{T2}				0.36847	$\text{m}\Omega$
V_{TM} Coefficients, Low-level		$T_J = 125^\circ\text{C}$, $I = 15\%I_{T(AV)}$ to $\pi I_{T(AV)}$ $V_{TM} = A + B \ln(I) + C(I) + D \text{ Sqrt}(I)$		A = B = C = D =	1.41917 -0.1663 1.243 E-04 0.04196	
Typical Turn-On Time	t_{on}	$I_T = 100\text{A}$, $V_D = 100\text{V}$		7		μs
Typical Turn-Off Time	t_q	$T_J = 125^\circ\text{C}$, $I_T = 250\text{A}$, $di_R/dt = 25\text{A}/\mu\text{s}$ Reapplied $dv/dt = 20\text{V}/\mu\text{s}$ Linear to 80% V_{DRM}		150		μs
Minimum Critical dv/dt – Exponential to V_{DRM}	dv/dt	$T_J = 125^\circ\text{C}$	300			$\text{V}/\mu\text{s}$
Gate Trigger Current	I_{GT}	$T_J = 25^\circ\text{C}$, $V_D = 12\text{V}$			150	mA
Gate Trigger Voltage	V_{GT}	$T_J = 25^\circ\text{C}$, $V_D = 12\text{V}$			3.0	V
Non-Triggering Gate Voltage	V_{GDM}	$T_J = 125^\circ\text{C}$, $V_D = V_{DRM}$			0.15	V
Peak Forward Gate Current	I_{GTM}				4	A
Peak Reverse Gate Voltage	V_{GRM}				5	V

Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling		Max.	Units
Junction-to-Case	$R_{\theta(J-C)}$	0.04	$^\circ\text{C}/\text{W}$
Case-to-Sink	$R_{\theta(C-S)}$	0.02	$^\circ\text{C}/\text{W}$

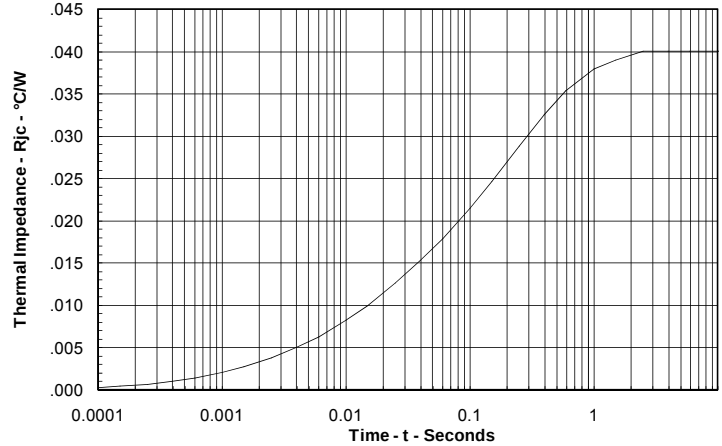
Maximum On-State Forward Voltage Drop

(T_J = 125 °C)



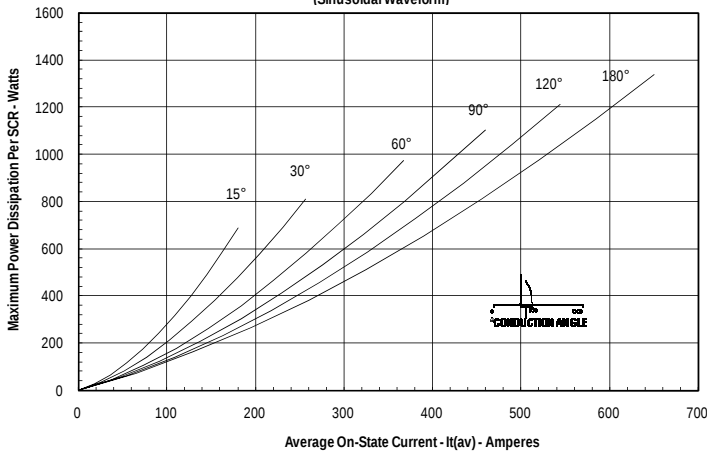
Maximum Transient Thermal Impedance

(Junction to Case)



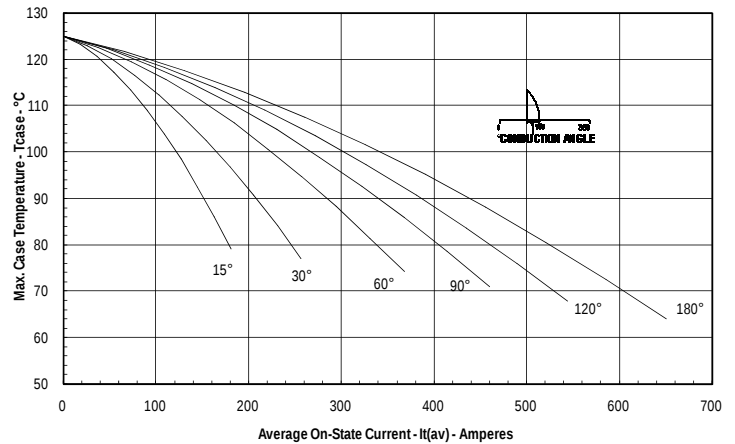
Maximum On-State Power Dissipation

(Sinusoidal Waveform)



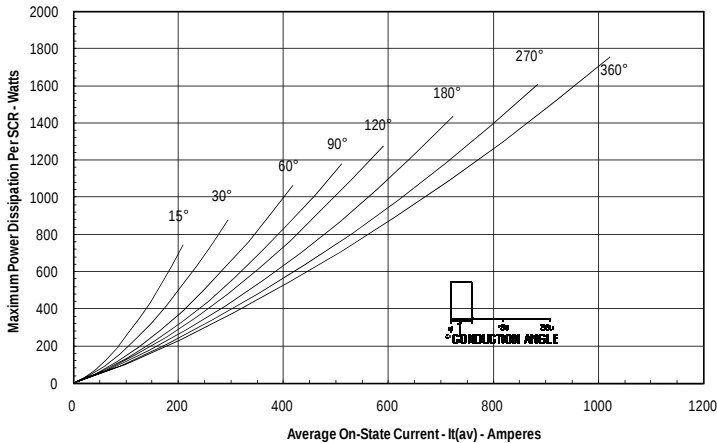
Maximum Allowable Case Temperature

(Sinusoidal Waveform)



Maximum On-State Power Dissipation

(Rectangular Waveform)



Maximum Allowable Case Temperature

(Rectangular Waveform)

