

The TDK4 is a high voltage, high current disc pack SCR employing a high di/dt gate structure. This gate design allows the SCR to be reliably operated at high di/dt and dv/dt conditions in various phase control applications.

FEATURES:

- Low On-State Voltage
- High di/dt Capability
- High dv/dt Capability
- Hermetic Ceramic Package
- Excellent Surge and I²t Ratings

APPLICATIONS:

- DC Power Supplies
- Motor Controls

ORDERING INFORMATION

Select the complete 12 digit Part Number using the table below.
EXAMPLE: TDK4443302DH is a 4400V-3300A SCR with 300ma IGT and 12 inch gate and cathode potential leads.

PART	Voltage Rating V _{DRM} -V _{RSM}	Voltage Code	Current Rating I _{tavg}	Current Code	Turn-Off I _q	Gate I _{GT}	Leads
TDK4	4500	45	3300	33	0	2	
	4400	44					
	4200	42			400us	300ma	12"
	4000	40			(typ.)	(max)	
	3600	36					

Absolute Maximum Ratings[†]

Characteristic	Symbol	Rating	Units
Repetitive Peak Voltage	$V_{DRM}-V_{RRM}$	4400	Volts
Average On-State Current, $T_C=72^\circ\text{C}$	$I_{T(Avg.)}$	3300	A
RMS On-State Current, $T_C=70^\circ\text{C}$	$I_{T(RMS)}$	5184	A
Average On-State Current, $T_C=55^\circ\text{C}$	$I_{T(Avg.)}$	3900	A
RMS On-State Current, $T_C=55^\circ\text{C}$	$I_{T(RMS)}$	6126	A
Peak One Cycle Surge Current, 60Hz, $V_R=0\text{V}$	I_{TSM}	50,000	A
Peak One Cycle Surge Current, 50Hz, $V_R=0\text{V}$	I_{TSM}	47,140	A
Fuse Coordination I^2t , 60Hz	I^2t	1.04E+07	A ² s
Fuse Coordination I^2t , 50Hz	I^2t	1.11E+07	A ² s
Critical Rate-of-Rise of On-State Current	di/dt	150	A/us
Repetitive from .67•VDRM			
Critical Rate-of-Rise of On-State Current	di/dt	300	A/us
Non-Repetitive from .67•VDRM			
Peak Gate Power, 100us	P_{GM}	16	Watts
Average Gate Power	$P_{G(avg)}$	5	Watts
Operating Temperature	T_j	-40 to+125	°C
Storage Temperature	$T_{Stg.}$	-40 to+150	°C
Approximate Weight		7	lb
		3.18	Kg
Mounting Force		18,000 - 25,000	lbs
		80 - 110	KNewtons

[†] Ratings apply for operation at rated load force.

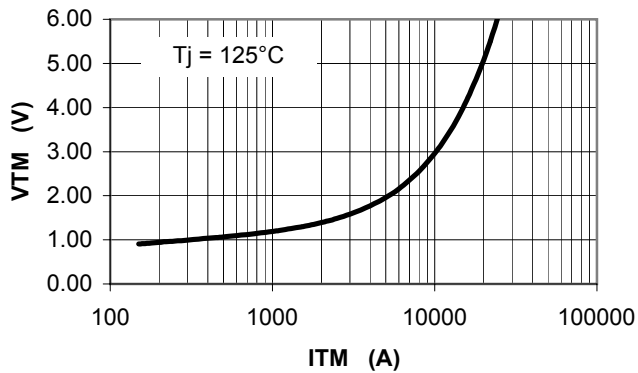
Electrical Characteristics, T_j=25°C unless otherwise specified

Characteristic	Symbol	Test Conditions	Rating			Units
			min	typ	max	
Repetitive Peak Forward Leakage Current	I _{DRM}	T _j =125°C, V _{DRM} =Rated			300	ma
Repetitive Peak Reverse Leakage Current	I _{RPM}	T _j =125°C, V _{RPM} =Rated			300	ma
Peak On-State Voltage	V _{TM}	T _j =125°C, I _{TM} =3000A			1.60	V
V _{TM} Model, Low Level	V ₀	T _j =125°C			0.991269	V
V _{TM} = V ₀ + r•I _{TM}	r	15% I _{TM} - π•I _{TM}			1.96E-04	Ω
V _{TM} Model, High Level	V ₀	T _j =125°C			0.772002	V
V _{TM} = V ₀ + r•I _{TM}	r	π•I _{TM} - I _{TSM}			2.18E-04	Ω
V _{TM} Model, 4-Term	A	T _j =125°C			0.132	
V _{TM} = A + B•Ln(I _{TM}) +	B	15%I _{TM} - I _{TSM}			0.181	
C•(I _{TM}) + D•(I _{TM}) ^{1/2}	C				2.57E-04	
	D				-1.41E-02	
Turn-On Delay Time	t _d	V _D = 0.5•V _{DRM} Gate Drive: 40V - 20Ω			3	us
Turn-Off Time (typ)	t _q	T _j =125°C dv/dt = 20V/us to 80% V _{DRM}			400	us
dv/dt _(crit)	dv/dt	T _j =125°C Exp. Waveform V _D =67% Rated	2000			V/us
Gate Trigger Current	I _{GT}	T _j =25°C V _D = 12V	40	100	300	ma
Gate Trigger Voltage	V _{GT}		0.8	2.0	4.0	V
Peak Reverse Gate Voltage	V _{GRM}				5	V

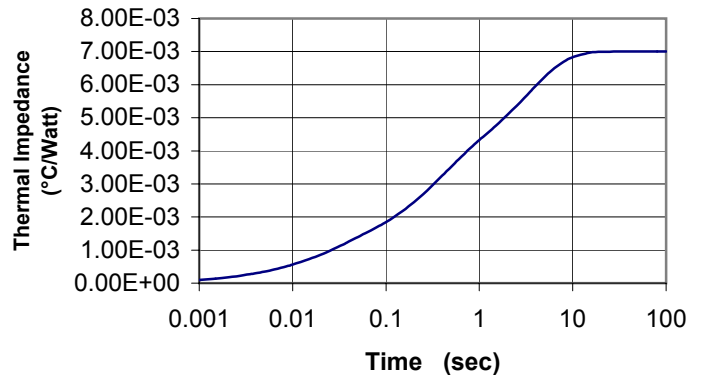
Thermal Characteristics

Characteristic	Symbol	Test Conditions	Rating			Units	
			min	typ	max		
Thermal Resistance							
Junction to Case	Rθ _{jc}	Double side cooled		0.0055	0.007	°C/Watt	
Case to Sink	Rθ _{cs}	Double side cooled		0.0015	0.002	°C/Watt	
Thermal Impedance Model							
Zθ _{jc} (t) = Σ(A(N)•(1-exp(-t/Tau(N))))		where:	N =	1	2	3	4
			A(N) =	1.43E-04	9.38E-04	2.42E-03	3.50E-03
			Tau(N) =	2.62E-03	2.31E-02	3.05E-01	3.30E+00

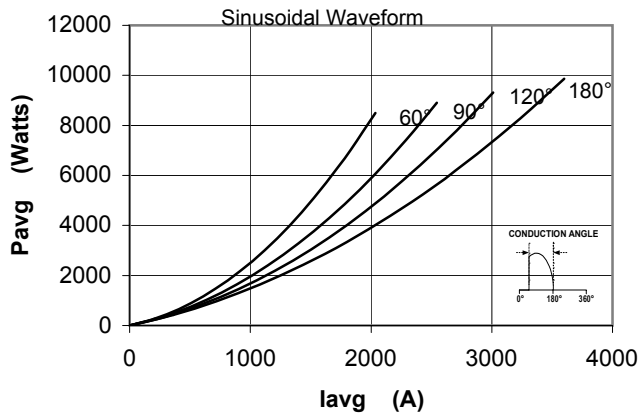
Maximum On-State Voltage Drop



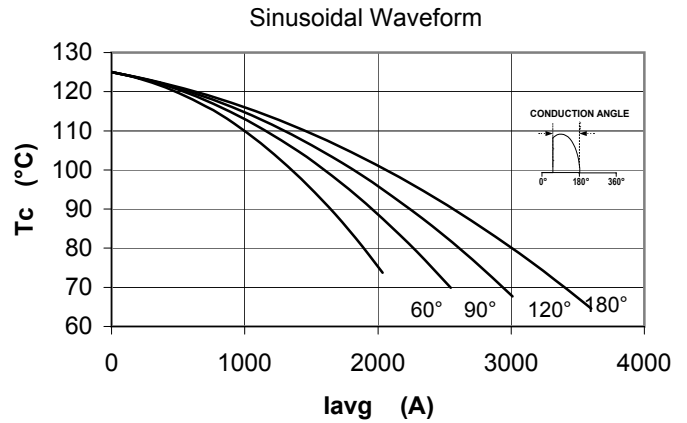
MAXIMUM TRANSIENT THERMAL IMPEDANCE



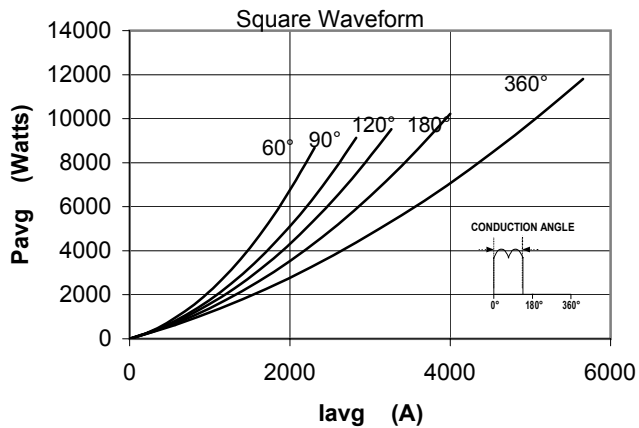
Maximum On-State Power Dissipation



Maximum Allowable Case Temperature



Maximum On-State Power Dissipation



Maximum Allowable Case Temperature

