R 3 7 0 8 F D 4 5 - Power Thyristor

4500 V_{DRM};

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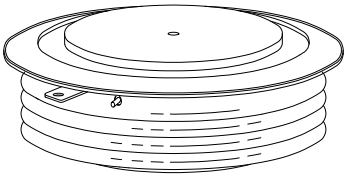
HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

Features:

- **All Diffused Structure**
- **Linear Amplifying Gate Configuration**
- **Blocking capabilty up to 4500 volts**
- **Guaranteed Maximum Turn-Off Time**
- **High dV/dt Capability**
- **Pressure Assembled Device**



ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

Device Type	V_{RRM} (1)	V_{DRM} (1)	V_{RSM} (1)
R3708FD45	4500	4500	4600

V_{RRM} = Repetitive peak reverse voltage
V_{DRM} = Repetitive peak off state voltage
V_{RSM} = Non repetitive peak reverse voltage (2)

Repetitive peak reverse leakage and off state leakage	I_{RRM} / I_{DRM}	200 mA (3)
Critical rate of voltage rise	dV/dt (4)	200 V/µsec

Notes:
All ratings are specified for Tj=25 °C unless otherwise stated.
(1) All voltage ratings are specified for an applied 50Hz/60zHz sinusoidal waveform over the temperature range -40 to +125 °C.
(2) 10 msec. max. pulse width
(3) Maximum value for Tj = 125 °C.
(4) Minimum value for linear and exponential waveshape to 80% rated V_{DRM}. Gate open. Tj = 125 °C.
(5) Non-repetitive value.
(6) The value of di/dt is established in accordance with EIA/NIMA Standard RS-397, Section 5-2-2-6. The value defined would be in addition to that obtained from a snubber circuit, comprising a 0.2 µF capacitor and 20 ohms resistance in parallel with the thristor under test.

Conducting - on state

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	$I_{T(AV)}$		3708		A	Sinewave,180° conduction,T_S=55°C
RMS value of on-state current	I_{TRMS}		7364		A	T_S=25°C
Peak one cpstcle surge (non repetitive) current	I_{TSM}		50000		A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T_j = 125 °C
I square t	I^2t		$12.5x10^6$		A^2s	10.0 msec
Latching current	I_L		1000		mA	V_D = 12 V; R_L= 12 ohms
Holding current	I_H		450		mA	$V_{D=}$ 12 V; I = 2.5 A
Peak on-state voltage	V_{TM}		2.1		V	I_{TM} = 4000 A; Duty cpstcle ≤ 0.01% T_j = 125 °C
Critical rate of rise of on-state current (5, 6)	di/dt		250		A/µs	Switching from V_{DRM} ≤ 1000 V, non-repetitive
Critical rate of rise of on-state current (6)	di/dt		100		A/µs	Switching from V_{DRM} ≤ 1000 V

ELECTRICAL CHARACTERISTICS AND RATINGS R3708FC45 - Power Thyristor

Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P_{GM}		200		W	t_p = 40 us
Average gate power dissipation	$P_{G(AV)}$		5		W	
Peak gate current	I_{GM}		15		A	
Gate current required to trigger all units	I_{GT}	 30	300 200 125		mA mA mA	V_D = 12V;R_L = 6 ohms;T_j = -40 °C V_D = 12V;R_L = 6 ohms;T_j = +25 °C V_D = 12V;R_L = 6 ohms;T_j = +125°C
Gate voltage required to trigger all units	V_{GT}	 0.30	5 3		V V V	V_D = 12 V;R_L = 6 ohms;T_j = -40 °C V_D = 12V;R_L = 6 ohms;T_j = 0-125°C V_D = Rated V_{DRM}; R_L = 1000 ohms; T_j = + 125 °C
Peak negative voltage	V_{GRM}		15		V	

Dynamic

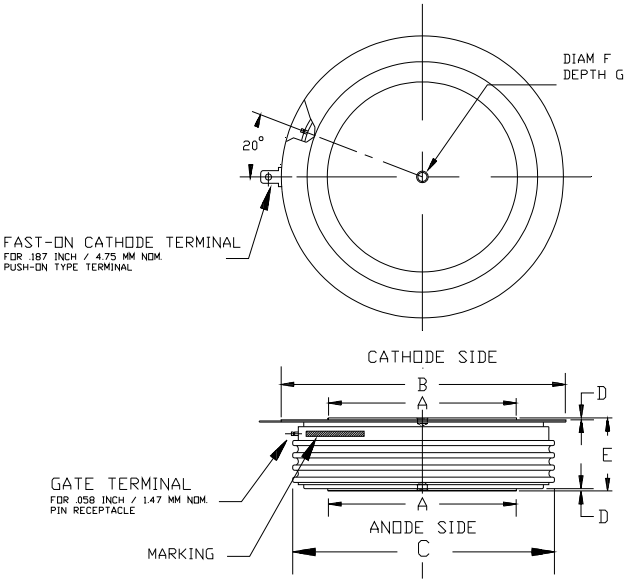
Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d			2.5	µs	I_{TM} = 50 A; V_D = 1500 V Gate pulse: V_G = 20 V; R_G = 20 ohms; t_r = 0.1 µs; t_p = 20 µs
Turn-off time (with V_R = -50 V)	t_q			250	µs	I_{TM} =4000 A; di/dt = 60 A/µs; V_R =100 V; Re-applied dV/dt = 20 V/µs linear to 67% V_{DRM}; V_G = 0; T_j = 125 °C; Tp=2000us
Reverse recovery current	I_{rr}				A	I_{TM} =4000 A; di/dt = 60 A/µs; V_R =100 V

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-40	+125		°C	
Storage temperature	T_{stg}	-40	+140		°C	
Thermal resistance - junction to sink	$R_{\Theta (j-s)}$		0.0075 0.0150		°C/W	Double sided cooled Single sided cooled
Mounting force	P	98	113		kN	
Weight	W			2.7	Kg.	

* Mounting surfaces smooth, flat and greased

Note : for case outline and dimensions, see case outline drawing in page 4 of this Technical Data



Sym	A	B	C	E
Inches	3.9 3	5.90	5.15	1.37
mm	100	150	131	26±1.0