P S T D C R 1 1 8 0 F - Power Thyristor

5200V_{DRM}; 1180 A rms

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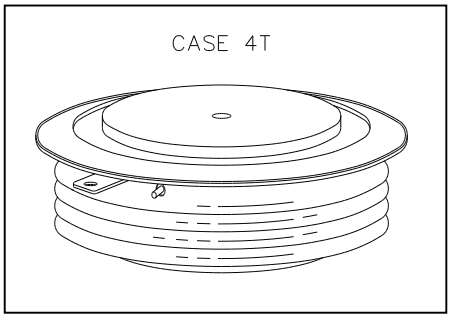
HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

Features:

- **. All Diffused Structure**
- **. Center Amplifying Gate Configuration**
- **. Blocking capabilty up to5200 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)
DCR1180F4800	4800	4800	4900
DCR1180F5000	5000	5000	5100
DCR1180F5200	5200	5200	5300

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}	50 mA 150 mA (3)
Critical rate of voltage rise	dV/dt (4)	1500 V/μsec

Conducting - on state

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, Secti5-2-2-6. The value defined would be in addi-tion to that obtained from a snubber circuit,comprising a 0.2 μF capacitor and 20 ohms resistance in parallel with the thristor undertest.

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	$I_{T(AV)}$		1180		A	Sinewave,180° conduction,T_c=65°C
RMS value of on-state current	I_{TRMS}		1854		A	Nominal value
Peak one cycle surge (non repetitive) current	I_{TSM}		15900		A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T_j = 125 °C
I square t	I^2t		$1.26x10^6$		A^2s	10.0 msec
Latching current	I_L		800		mA	V_D = 24 V; R_L= 12 ohms
Holding current	I_H		400		mA	V_D = 24 V; I = 2.5 A
Peak on-state voltage	V_{TM}		2.5		V	I_{TM} =3000A; Duty cycle ≤ 0.01%
Threshold voitage	V_{TO}		1.2		V	T_j = 125 °C
Slope resistance	r_T		0.57		mΩ	T_j = 125 °C
Critical rate of rise of on-state current (5, 6)	di/dt		300		A/μs	Switching from V_{DRM} ≤ 1000 V,non-rep
Critical rate of rise of on-state current (6)	di/dt		150		A/μs	Switching from V_{DRM} ≤ 1000 V

ELECTRICAL CHARACTERISTICS AND RATINGS (cont'd) DCR1180F- 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}		10		A	
Gate current required to trigger all units	I_{GT}		300		mA	V_D = 6 V;R_L = 3 ohms;T_j = +25 °C j
Gate voltage required to trigger all units	V_{GT}		3		V	V_D = 6 V;R_L = 3 ohms;T_j = 25°C
Peak negative voltage	V_{GRM}		5		V	

Dynamic

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		1.5	0.7	µs	I_{TM} = 50 A; V_D = Rated V_{DRM} 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	150	µs	I_{TM} = 1000 A; di/dt = 25 A/µs; V_R ≥ -50 V; Re-applied dV/dt = 20 V/µs linear to 80% V_{DRM}; V_G = 0; T_j = 125 °C; Duty cycle ≥ 0.01%
Reverse recovery charge	Q_{rr}		*		µC	I_{TM} = 1000 A; di/dt = 25 A/µs; V_R ≥ -50 V

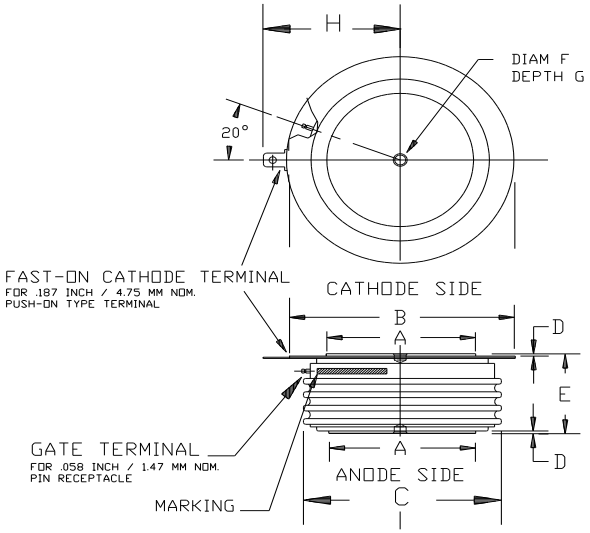
* For guaranteed max. value, contact factory.

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	+150		°C	
Thermal resistance - junction to case	$R_{\theta(j-c)}$		0.025		°C/W	Double sided cooled
Thermal resistamce - case to sink	$R_{\theta(c-s)}$		0.010		°C/W	Double sided cooled *
Mounting force	P	5500 24.5	6000 26.7		lb. kN	
Weight	W			16 460	oz. g	

* Mounting surfaces smooth, flat and greased

CASE OUTLINE AND DIMENSIONS. DCR1180F- Power Thyristor



STRIKE DISTANCE = .58 INCH / 14.7 MM MIN.
CREEPAGE DISTANCE = 1.00 INCH / 25.4 MM MIN.

OUTLIINE DIMENSIONS - CASE 4T

DIMENSIONS	Min. mm	Max. mm	Min. In.	Max. In.
DIAM A	43.18	48.26	1.70	1.90
DIAM B	63.50	75.18	2.50	2.96
DIAM C	--	67.31	--	2.65
D	0.76	--	0.03	--
E	25.40	27.18	1.00	1.07
F	3.30	3.81	0.13	0.15
G	1.78	2.03	0.07	0.08
H	--	44.20	--	1.74