

DCR1059/21

HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

Features:

- . All Diffused Structure
- . Center Amplifying Gate Configuration
- . Blocking capability up to 2100 volts
- . Guaranteed Maximum Turn-Off Time
- . High dV/dt Capability
- . Pressure Assembled Device

ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

V_{RRM} (1)	V_{DRM} (1)	V_{RSM} (1)
2100	2100	2200

V_{RRM} = Repetitive peak reverse voltage

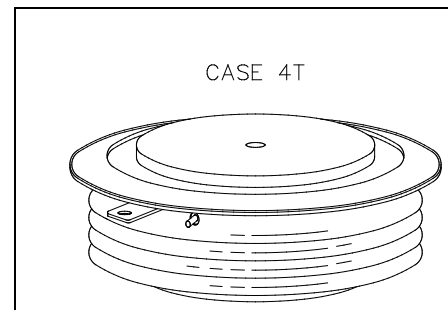
V_{DRM} = Repetitive peak off state voltage

V_{RSM} = Non repetitive peak reverse voltage (2)

Repetitive peak reverse leakage and off state	I_{RRM} / I_{DRM}	10 mA 60 mA (3)
Critical rate of voltage rise	dV/dt (4)	200 V/μsec

Conducting - on state

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	$I_{T(AV)}$		1080		A	Sinewave, 180° conduction, $T_c = 80^\circ C$
RMS value of on-state current	I_{TRMS}		1700		A	Nominal value
Peak one cPSTCLe surge (non repetitive) current	I_{TSM}		18000		A	8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, $T_j = 125^\circ C$
					A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, $T_j = 125^\circ C$
I square t	$I^2 t$		1.6×10^6		A ² s	8.3 msec and 10.0 msec
Latching current	I_L		-		mA	$V_D = 24 V$; $R_L = 12 \text{ ohms}$
Holding current	I_H		-		mA	$V_D = 24 V$; $I = 2.5 A$
Peak on-state voltage	V_{TM}		1.45		V	$I_{TM} = 1000 A$; Duty cPSTCLe $\leq 0.01\%$; $T_j = 25^\circ C$
Critical rate of rise of on-state current (5, 6)	di/dt		800		A/μs	Switching from $V_{DRM} \leq 1000 V$, non-repetitive
Critical rate of rise of on-state current (6)	di/dt		200		A/μs	Switching from $V_{DRM} \leq 1000 V$



Notes:

All ratings are specified for $T_j = 25^\circ C$ unless otherwise stated.

(1) All voltage ratings are specified for an applied 50Hz/60Hz sinusoidal waveform over the temperature range -40 to $+125^\circ C$.

(2) 10 msec. max. pulse width

(3) Maximum value for $T_j = 125^\circ C$.

(4) Minimum value for linear and exponential waveshape to 80% rated V_{DRM} . Gate open. $T_j = 125^\circ C$.

(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.

ELECTRICAL CHARACTERISTICS AND RATINGS

Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P_{GM}		-		W	$t_p = 40 \mu s$
Average gate power dissipation	$P_{G(AV)}$		-		W	
Peak gate current	I_{GM}		-		A	
Gate current required to trigger all units	I_{GT}		- 350 -		mA mA mA	$V_D = 6 V; R_L = 3 \text{ ohms}; T_j = -40^\circ C$ $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = +25^\circ C$ $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = +125^\circ C$
Gate voltage required to trigger all units	V_{GT}		- 3.0 -		V V V	$V_D = 6 V; R_L = 3 \text{ ohms}; T_j = -40^\circ C$ $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = 0-125^\circ C$ $V_D = \text{Rated } V_{DRM}; R_L = 1000 \text{ ohms}; T_j = +125^\circ C$
Peak negative voltage	V_{GRM}		-		V	

Dynamic

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		-	0.7	μs	$I_{TM} = 50 A; V_D = \text{Rated } V_{DRM}$ Gate pulse: $V_G = 20 V; R_G = 20 \text{ ohms}; t_r = 0.1 \mu s; t_p = 20 \mu s$
Turn-off time (with $V_R = -50 V$)	t_q		-	50	μs	$I_{TM} = 1000 A; di/dt = 25 A/\mu s;$ $V_R \geq -50 V; \text{Re-applied } dV/dt = 20 V/\mu s \text{ linear to } 80\% V_{DRM}; V_G = 0;$ $T_j = 125^\circ C; \text{Duty cPSTCle} \geq 0.01\%$
Reverse recovery charge	Q_{rr}		*		μC	$I_{TM} = 1000 A; di/dt = 25 A/\mu s;$ $V_R \geq -50 V$

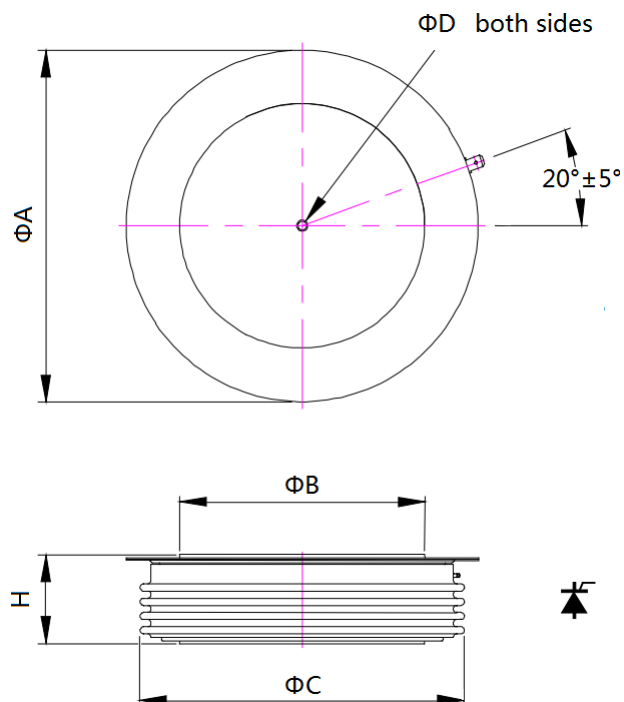
* For guaranteed max. value, contact factory.

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-40	+125		$^\circ C$	
Storage temperature	T_{stg}	-40	+150		$^\circ C$	
Thermal resistance - junction to case	$R_{\theta(j-c)}$		0.025 0.050		$^\circ C/W$	Double sided cooled Single sided cooled
Thermal resistance - case to sink	$R_{\theta(c-s)}$		0.010 0.020		$^\circ C/W$	Double sided cooled * Single sided cooled *
Mounting force	P	24.5	26.7		kN	
Weight	W			480	g	About

* Mounting surfaces smooth, flat and greased

CASE OUTLINE AND DIMENSIONS



Sym	A	B	C	D	H
mm	75	47	66	3.5×3	26±1