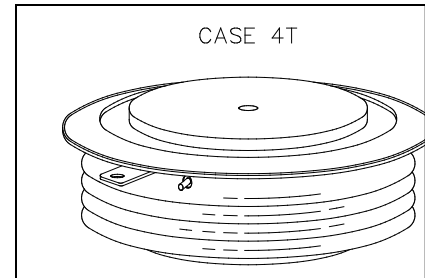


## DCR1004SD2323

### 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)
2200	2200	2300

- $V_{RRM}$  = 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	$I_{RRM} / I_{DRM}$	15 mA 65 mA (3)
Critical rate of voltage rise	dV/dt (4)	1000 V/ $\mu$ sec

#### Notes:

- All ratings are specified for  $T_j=25^\circ\text{C}$  unless otherwise stated.
- (1) All voltage ratings are specified for an applied 50Hz/60Hz sinusoidal waveform over the temperature range  $-40$  to  $+125^\circ\text{C}$ .
  - (2) 10 msec. max. pulse width
  - (3) Maximum value for  $T_j = 125^\circ\text{C}$ .
  - (4) Minimum value for linear and exponential waveshape to 80% rated  $V_{DRM}$ . Gate open.  $T_j = 125^\circ\text{C}$ .
  - (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  $\mu\text{F}$  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	$I_{T(AV)}$		1300		A	Sinewave, $180^\circ$ conduction, $T_c=65^\circ\text{C}$
RMS value of on-state current	$I_{TRMS}$		2000		A	Nominal value
Peak one cPSTCle surge (non repetitive) current	$I_{TSM}$		20000		A	8.3 msec (60Hz), sinusoidal wave-shape, $180^\circ$ conduction, $T_j = 125^\circ\text{C}$
			18000		A	10.0 msec (50Hz), sinusoidal wave-shape, $180^\circ$ conduction, $T_j = 125^\circ\text{C}$
I square t	$I^2t$		$1.7 \times 10^6$		$\text{A}^2\text{s}$	8.3 msec and 10.0 msec
Latching current	$I_L$		800		mA	$V_D = 24\text{ V}$ ; $R_L = 12\text{ ohms}$
Holding current	$I_H$		400		mA	$V_D = 24\text{ V}$ ; $I = 2.5\text{ A}$
Peak on-state voltage	$V_{TM}$		1.75		V	$I_{TM} = 3000\text{ A}$ ; Duty cPSTCle $\leq 0.01\%$
Critical rate of rise of on-state current (5, 6)	di/dt		600		A/ $\mu\text{s}$	Switching from $V_{DRM} \leq 1000\text{ V}$ , non-repetitive
Critical rate of rise of on-state current (6)	di/dt		200		A/ $\mu\text{s}$	Switching from $V_{DRM} \leq 1000\text{ V}$

## ELECTRICAL CHARACTERISTICS AND RATINGS

### Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	$P_{GM}$		200		W	$t_p = 40 \mu s$
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	$V_D = 6 V; R_L = 3 \text{ ohms}; T_j = -40^\circ C$
			150		mA	$V_D = 6 V; R_L = 3 \text{ ohms}; T_j = +25^\circ C$
			125		mA	$V_D = 6 V; R_L = 3 \text{ ohms}; T_j = +125^\circ C$
Gate voltage required to trigger all units	$V_{GT}$		5		V	$V_D = 6 V; R_L = 3 \text{ ohms}; T_j = -40^\circ C$
			3		V	$V_D = 6 V; R_L = 3 \text{ ohms}; T_j = 0-125^\circ C$
		0.30			V	$V_D = \text{Rated } V_{DRM}; R_L = 1000 \text{ ohms}; T_j = +125^\circ C$
Peak negative voltage	$V_{GRM}$		5		V	

### Dynamic

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	$t_d$		1.5	0.7	$\mu s$	$I_{TM} = 50 A; V_D = \text{Rated } V_{DRM}$ 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 $V_R = -50 V$ )	$t_q$		250	150	$\mu s$	$I_{TM} = 1000 A; di/dt = 25 A/\mu s;$ $V_R \geq -50 V; \text{Re-applied } dV/dt = 20 V/\mu s \text{ linear to } 80\% V_{DRM}; V_G = 0;$ $T_j = 125^\circ C; \text{Duty cPSTCle} \geq 0.01\%$
Reverse recovery charge	$Q_{rr}$		*		$\mu C$	$I_{TM} = 1000 A; di/dt = 25 A/\mu s;$ $V_R \geq -50 V$

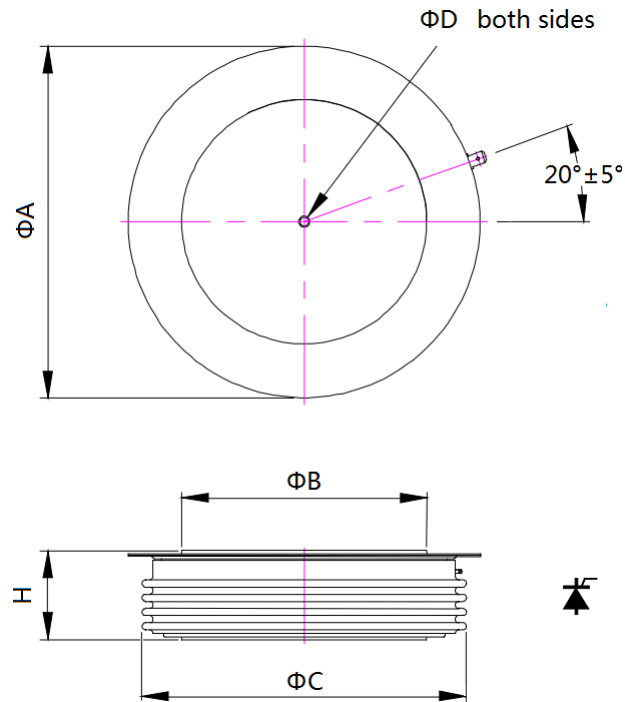
\* For guaranteed max. value, contact factory.

## 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		$^\circ C/W$	Double sided cooled
			0.050		$^\circ C/W$	Single sided cooled
Thermal resistance - case to sink	$R_{\Theta(c-s)}$		0.010		$^\circ C/W$	Double sided cooled *
			0.020		$^\circ C/W$	Single sided cooled *
Mounting force	P	24.5	26.7		kN	
Weight	W				g	

\* Mounting surfaces smooth, flat and greased

CASE OUTLINE AND DIMENSIONS



Sym	A	B	C	D	H
mm	75	47	66	3.5x3	26±1