

HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

KK820S22W

Features:

- . All Diffused Structure
- . Interdigitated Amplifying Gate Configuration
- . 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 leakage	I_{RRM} / I_{DRM}	10 mA 100 mA (3)
Critical rate of voltage rise	dV/dt (4)	600 V/ μ 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 aubber 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
Max. average value of on-state current	$I_{T(AV)M}$		725		A	Sinewave, 180° conduction, $T_c=55^\circ\text{C}$
RMS value of on-state current	$I_{T(RMS)M}$		-		A	Nominal value
Peak one cycle surge (non repetitive) current	I_{TSM}		-		kA	8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, $T_j = 125^\circ\text{C}$
			9		kA	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, $T_j = 125^\circ\text{C}$
I square t	I^2t		405×10^3		A^2s	8.3 msec
Latching current	I_L		280		mA	$V_D = 5\text{ V}$; $R_L = 12\text{ ohms}$
Holding current	I_H		500		mA	$V_D = 5\text{ V}$; $I = 2.5\text{ A}$
Peak on-state voltage	V_{TM}		2.4		V	$I_{TM} = 1400\text{ A}$; $T_j = 25^\circ\text{C}$
Critical rate of rise of on-state current (5, 6)	di/dt		-		A/ μs	Switching from $V_{DRM} \leq 1000\text{ V}$, non-repetitive
Critical rate of rise of on-state current (6)	di/dt		400		A/ μs	Switching from $V_{DRM} \leq 1000\text{ V}$



Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P_{GM}		150		W	
Average gate power dissipation	$P_{G(AV)}$		3		W	
Peak gate current	I_{GM}		-		A	
Gate current required to trigger all units	I_{GT}		350		mA	$V_D = 10 V; I_T = 3A; T_j = +25^\circ C$
Gate voltage required to trigger all units	V_{GT}		3.5		V	$V_D = 10 V; I_T = 3A; T_j = +25^\circ C$
Peak negative voltage	V_{RGM}		5		V	

Dynamic

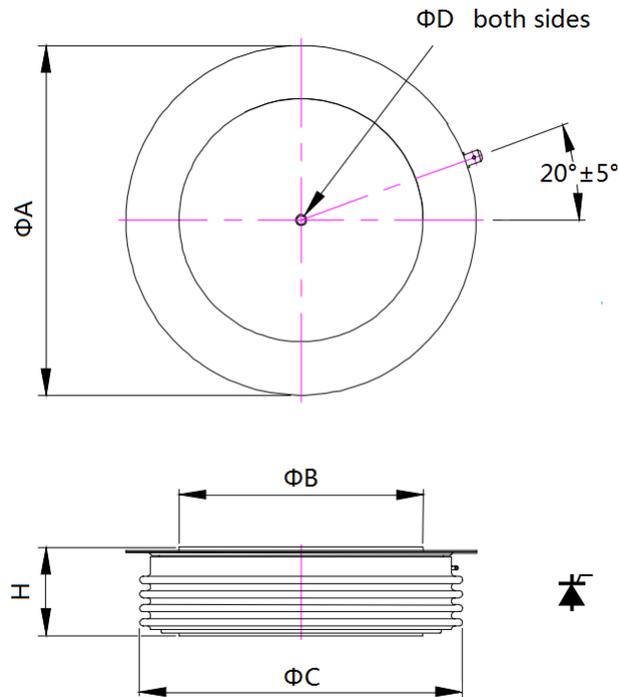
Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_{gd}		-	0.6-	μs	$V_D = 67\% V_{DRM}, I_T = 2000A,$ $di/dt = 60A/\mu s, I_{FG} = 2A, t_r = 0.5\mu s,$ $T_j = 25C$
Turn-on time	t_{gt}		-	-		
Turn-off time (with $V_R = -5 V$)	t_q	-	-	80	μs	$I_{TM} = 1000A, t_p = 1000\mu s,$ $di/dt = 60A/\mu s, V_r = 50V,$ $V_{dr} = 33\% V_{DRM}, dV_{dr}/dt = 200V/\mu s$
Reverse recovery current	I_{rm}		-		A	$I_{TM} = 4000A, t_p = 2000\mu s,$ $di/dt = 60A/\mu s$

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-30	+125		$^\circ C$	
Storage temperature	T_{stg}	-30	+125		$^\circ C$	
Thermal resistance - junction to case	$R_{\Theta(j-c)}$		-		$^\circ C/kW$	Double sided cooled Single sided cooled
Thermal resistance - case to sink	$R_{\Theta(c-s)}$		-		$^\circ C/kW$	Double sided cooled * Single sided cooled *
Thermal resistance - junction to case	$R_{\Theta(j-s)}$		37		$^\circ C/kW$	Double sided cooled Single sided cooled
Mounting force	F	11	13	-	kN	
Weight	W			-	g	about

* Mounting surfaces smooth, flat and greased

Note : for case outline and dimensions, see case outline drawing in page 3 of this Technical Data



Sym	A	B	C	D	H
mm	59	34	53	3.5x3	26±1