

HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

YZPST-ST280CH04

Features:

- all diffused design
- high current capabilities
- high surge current capabilities
- high rates voltages
- high dv/dt
- low gate current
- dynamic gate
- low thermal impedance
- compact size and small weight

APPLICATION

- High Power Drives
- DC Motor Control
- High Voltage Power Supplies

ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

V_{RRM} (1)	V_{DRM} (1)	V_{RSM} (1)
400	400	500

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}	8mA 75 mA (3)
Critical rate of voltage rise	dV/dt (4)	500 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 $0.2\ \mu\text{F}$ capacitor and 20 ohms resistance in parallel with the thristor under test.

Conducting - on state

Parameter	Symbol	Min.	Max.	Typ	Units	Conditions
Max. average value of on-state current	$I_{T(AV)}$		185		A	Sinewave, 180° conduction, $T_c=110^\circ\text{C}$
RMS value of on-state current	I_{TRMS}		1130		A	Nominal value
Peak one cPSTCle surge (non repetitive) current	I_{TSM}		-		kA	8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, $T_j = 125^\circ\text{C}$
			6		kA	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, $T_j = 125^\circ\text{C}$
I square t	I^2t		180×10^3		A^2s	8.3 msec
Treshold voltage	$V_{T(T0)}$		0.84		V	
Slope resistance	r_T		0.50		m Ω	
Latching current	I_L		1000		mA	$V_D = 12\ \text{V}$; $R_L = 12\ \text{ohms}$
Holding current	I_H		600		mA	$V_D = 12\ \text{V}$; $I = 2.5\ \text{A}$
Peak on-state voltage	V_{TM}		1.35		V	$I_{TM} = 1000\ \text{A}$; $T_j = 150^\circ\text{C}$
Critical rate of rise of on-state current (5, 6)	di/dt		1000		A/ μ s	Switching from $V_{DRM} \leq 1000\ \text{V}$, non-repetitive
Critical rate of rise of on-state current (6)	di/dt		-		A/ μ s	Switching from $V_{DRM} \leq 1000\ \text{V}$

Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P_{GM}		10		W	
Average gate power dissipation	$P_{G(AV)}$		2		W	
Peak gate current	I_{GM}		3		A	
Gate current required to trigger all units	I_{GT}		150		mA	$V_D = 10\text{ V}; I_T = 3\text{ A}; T_j = +25\text{ }^\circ\text{C}$
Gate voltage required to trigger all units	V_{GT}		3.		V	$V_D = 10\text{ V}; I_T = 3\text{ A}; T_j = +25\text{ }^\circ\text{C}$
Peak negative voltage	V_{RGM}		-		V	

Dynamic

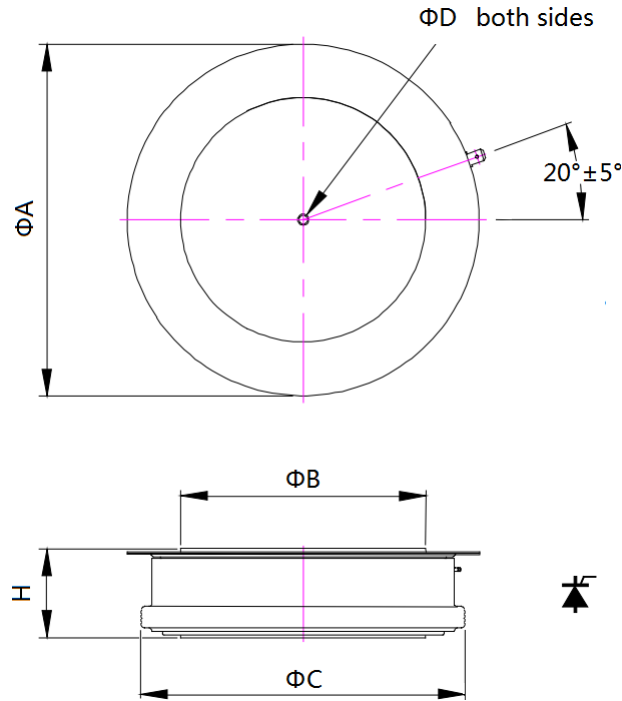
Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_{gd}			-	μs	$V_D = 67\% V_{DRM}, I_T = 2000\text{ A},$ $di/dt = 60\text{ A}/\mu\text{s}, I_{FG} = 2\text{ A}, t_r = 0.5\mu\text{s},$ $T_j = 25\text{ }^\circ\text{C}$
Turn-on time	t_{gt}		-	-		
Turn-off time (with $V_R = -5\text{ V}$)	t_q	-	100	-	μs	$I_{TM} = 300\text{ A}, t_p = 500\mu\text{s},$ $di/dt = 20\text{ A}/\mu\text{s}, V_r = 50\text{ V},$ $V_{dr} = 67\% V_{DRM}, dV_{dr}/dt = 20\text{ V}/\mu\text{s}$
Reverse recovery current	I_{rm}		-		A	$I_{TM} = 4000\text{ A}, t_p = 2000\mu\text{s},$ $di/dt = 60\text{ A}/\mu\text{s}$

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-40	+150		$^\circ\text{C}$	
Storage temperature	T_{stg}	-40	+150		$^\circ\text{C}$	
Thermal resistance - junction to case	$R_{\theta(j-c)}$		0.17 -		K/W	Double sided cooled Single sided cooled
Thermal resistance - case to sink	$R_{\theta(c-s)}$		0.033 -		K/W	Double sided cooled * Single sided cooled *
Thermal resistance - junction to case	$R_{\theta(j-s)}$		- -		$^\circ\text{C}/\text{W}$	Double sided cooled Single sided cooled
Mounting force	F	-	-	4.9	kN	
Weight	W			50	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	41	19	36	3.5x1.8	14±1