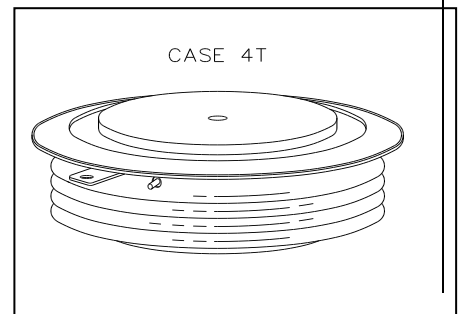


## HIGH POWER THYRISTOR FOR INVERTER AND CHOPPER APPLICATIONS

### Features:

- . All Diffused Structure
- . Center Amplifying Gate Configuration
- . Guaranteed Maximum Turn-Off Time
- . High dV/dt Capability
- . Pressure Assembled Device

## YZPST-R3708FC45V



## ELECTRICAL CHARACTERISTICS AND RATINGS

### Blocking - Off State

$V_{RRM}$ (1)	$V_{DRM}$ (1)	$V_{RSM}$ (1)
4500	4500	4600

$V_{RRM}$  = 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	$I_{RRM} / I_{DRM}$	20 mA 200mA (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 thyristor under test.

### Conducting - on state

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	$I_{T(AV)M}$		3708		A	Sine. 180° conduction $T_c = 55^\circ\text{C}$
RMS value of on-state current	$I_{TRMS}$		7364		A	Nominal value
Peak one cpstcle surge (non repetitive) current	$I_{TSM}$		50		kA	10.0 msec (50Hz), sinusoidal wave- shape, 180° conduction, $T_j = 125^\circ\text{C}$
I square t	$I^2t$		$12.5 \times 10^3$		$\text{kA}^2\text{s}$	
Latching current	$I_L$		1500		mA	$V_D = 24\text{ V}$ ; $R_L = 12\text{ ohms}$
Holding current	$I_H$		1000		mA	$V_D = 24\text{ V}$ ; $I = 2.5\text{ A}$
Peak on-state voltage	$V_{TM}$		2,10		V	$I_{TM} = 4000\text{ A}$ ; $T_{vj}=125^\circ\text{C}$
Threshold voltage	$V_{T(T0)}$		1.473		V	$T_j = 125^\circ\text{C}$
On-state slope resistance	$r_T$		0.156		$\Omega$	$T_j = 125^\circ\text{C}$
Critical rate of rise of on-state current (5, 6)	di/dt		1000		A/ $\mu\text{s}$	Switching from 75% $V_{DRM}$ , non-repetitive
Critical rate of rise of on-state current (6)	di/dt		500		A/ $\mu\text{s}$	Switching from 75% $V_{DRM}$

**ELECTRICAL CHARACTERISTICS AND RATINGS (cont'd)**
**Gating**

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	$P_{GM}$		50		W	$t_p = 100 \mu s$
Average gate power dissipation	$P_{G(AV)}$		4		W	
Peak gate current	$I_{GM}$		-		A	
Gate current required to trigger all units	$I_{GT}$		- 600 -		mA mA mA	$V_D = 5 V; R_L = 3 \text{ ohms}; T_j = -40 \text{ }^\circ\text{C}$ $V_D = 5 V; R_L = 3 \text{ ohms}; T_j = +25 \text{ }^\circ\text{C}$ $V_D = 5 V; R_L = 3 \text{ ohms}; T_j = +125 \text{ }^\circ\text{C}$
Gate voltage required to trigger all units	$V_{GT}$		- 3.0 -		V V V	$V_D = 5 V; R_L = 3 \text{ ohms}; T_j = -40 \text{ }^\circ\text{C}$ $V_D = 5 V; R_L = 3 \text{ ohms}; T_j = 0-125 \text{ }^\circ\text{C}$ $V_D = \text{Rated } V_{DRM}; R_L = 1000 \text{ ohms}; T_j = +125 \text{ }^\circ\text{C}$
Peak negative voltage	$V_{GRM}$		5		V	

**Dynamic**

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	$t_d$			-	$\mu s$	$I_{TM} = 50 \text{ A}; V_D = \text{Rated } V_{DRM}$ Gate pulse: $V_G = 20 \text{ V}; R_G = 20 \text{ ohms}; t_r = 0.1 \mu s; t_p = 20 \mu s$
Turn-off time (with $V_R = -50 \text{ V}$ )	$t_q$		150	-	$\mu s$	$I_{TM} = 4000 \text{ A}; di/dt = 60 \text{ A}/\mu s;$ $V_R \geq 100 \text{ V}; \text{Re-applied } dV/dt = 20 \text{ V}/\mu s \text{ linear to } 67\% V_{DRM}; V_G = 0;$ $T_j = 125 \text{ }^\circ\text{C}; \text{Duty cpstcle} \geq 0.01\%$
Reverse recovery charge	$Q_{rr}$		8800		$\mu As$	$I_{TM} = 4000 \text{ A}; di/dt = 60 \text{ A}/\mu s;$ $V_R \geq 100 \text{ V}$

\* For guaranteed max. value, contact factory.

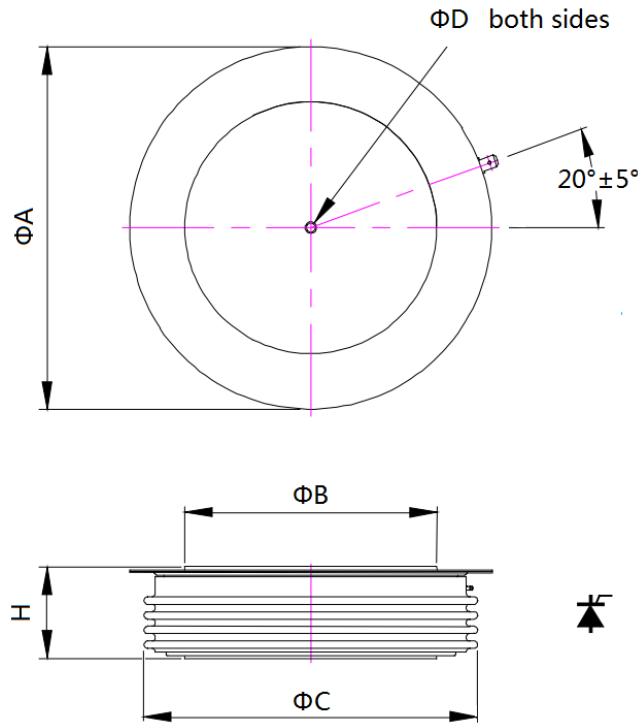
**THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS**

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	$T_j$	-40	+125		$^\circ\text{C}$	
Storage temperature	$T_{stg}$	-40	+150		$^\circ\text{C}$	
Thermal resistance - junction to case	$R_{\Theta(j-c)}$		0.0065 -		$\text{K}/\text{W}$	Double sided cooled Single sided cooled
Thermal resistance - case to heatsink	$R_{\Theta(c-s)}$		0.0130 -		$\text{K}/\text{W}$	Double sided cooled * Single sided cooled *
Thermal resistance - junction to heatsink	$R_{\Theta(j-s)}$		- -		$\text{K}/\text{kW}$	Double sided cooled Single sided cooled
Mounting force	P	81	99	-	kN	
Weight	W	-	-	2800	g	About

\* Mounting surfaces smooth, flat and greased

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

CASE OUTLINE AND DIMENSIONS.



Sym	A	B	C	D	H
mm	142	100	110	3.5x3	36±1

