

Asymmetric thyristors

A158 S

Features:

- . All Diffused Structure
- . Center Amplifying Gate Configuration
- . Blocking capability up to 2000 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)
15	1000	15

- 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}	5 mA 40 mA (3)
Critical rate of voltage rise (4)	dV/dt	1000 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 a snubber circuit, comprising a 0.2 μF 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	$I_{T(AV)}$		158		A	Sinewave, 180° conduction, $T_c = 85^\circ\text{C}$
RMS value of on-state current	I_{TRMS}		400		A	Nominal value
Peak one cycle surge (non repetitive) current	I_{TSM}		-		A	8.3 msec (60Hz), sinusoidal waveshape, 180° conduction, $T_j = 125^\circ\text{C}$
			2300		A	10.0 msec (50Hz), sinusoidal waveshape, 180° conduction, $T_j = 125^\circ\text{C}$
I square t	I^2t		7000		A^2s	8.3 msec and 10.0 msec
Latching current	I_L		-		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}		2.6		V	$I_{TM} = 600\text{ A}$; Duty cycle $\leq 0.01\%$
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 $V_{DRM} \leq 1000\text{ V}$



ELECTRICAL CHARACTERISTICS AND RATINGS
Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P_{GM}		30		W	$t_p = 40 \mu s$
Average gate power dissipation	$P_{G(AV)}$		10		W	
Peak gate current	I_{GM}		-		A	
Gate current required to trigger all units	I_{GT}		300		mA mA mA	$V_D = 6 V; R_L = 3 \text{ ohms}; T_j = -40 \text{ }^\circ\text{C}$ $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = +25 \text{ }^\circ\text{C}$ $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = +125 \text{ }^\circ\text{C}$
Gate voltage required to trigger all units	V_{GT}		- 2.7		V V V	$V_D = 6 V; R_L = 3 \text{ ohms}; T_j = -40 \text{ }^\circ\text{C}$ $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = 0-125 \text{ }^\circ\text{C}$ $V_D = \text{Rated } V_{DRM}; R_L = 1000 \text{ ohms}; T_j = +125 \text{ }^\circ\text{C}$
Peak negative voltage	V_{GRM}		-		V	

Dynamic

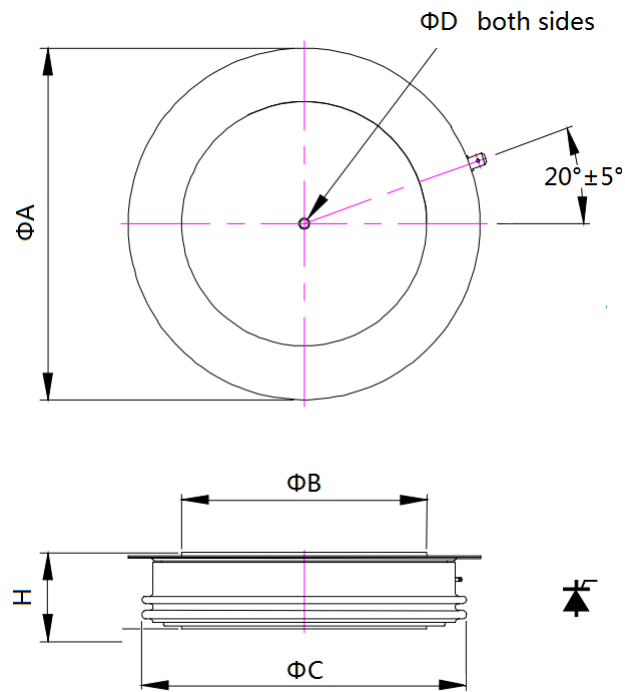
Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d			1	μs	$I_{TM} = 50 \text{ A}; V_D = \text{Rated } V_{DRM}$ Gate pulse: $V_G = 20 \text{ V}; R_G = 20 \text{ ohms}; t_r = 0.1 \mu s; t_p = 20 \mu s$
Turn-off time (with $V_R = -50 \text{ V}$)	t_q	-	-	15	μs	$I_{TM} = 500 \text{ A}; di/dt = 25 \text{ A}/\mu s;$ $V_R \geq -50 \text{ V};$ Re-applied $dV/dt = 20 \text{ V}/\mu s$ linear to 80% $V_{DRM}; V_G = 0;$ $T_j = 125 \text{ }^\circ\text{C};$ Duty cPSTCle $\geq 0.01\%$
Reverse recovery charge	Q_{rr}		*		μC	$I_{TM} = 500 \text{ A}; di/dt = 25 \text{ A}/\mu s;$ $V_R \geq -50 \text{ V}$

* 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	$R_{\theta(j-c)}$			117 -	K/KW	Double sided cooled * Single sided cooled *
Thermal resistance - case to sink	$R_{\theta(c-s)}$			- -	K/KW	Double sided cooled * Single sided cooled *
Thermal resistance - junction to sink	$R_{\theta(j-s)}$			- -	K/KW	Double sided cooled * Single sided cooled *
Mounting force	P	5	9	-	kN	
Weight	W			-	g	

OUTLINE



Sym	A	B	C	D	H
mm	41	25	40	3.5x1.8	14±1