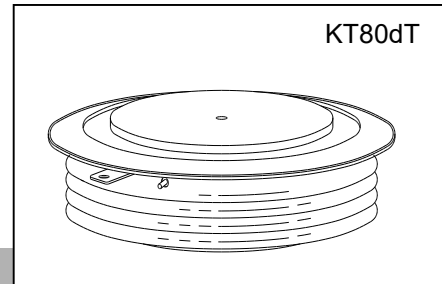




HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

Features:

- . All Diffused Structure
- . Interdigitated 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

Device Type	V _{RRM} (1)	V _{DRM} (1)	V _{RSM} (1)
YC781PB	1200	1200	1300
YC781PD	1400	1400	1500
YC781PE	1500	1500	1600
YC781PM	1600	1600	1700
YC781PS	1700	1700	1800
YC781PN	1800	1800	1900
YC781L	2000	2000	2100
YC781LA	2100	2100	2200

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 150 mA (3)
Critical rate of voltage rise	dV/dt (4)	500 V/μsec

Notes:

All ratings are specified for T_j=25 °C unless otherwise stated.

- (1) All voltage ratings are specified for an applied 50Hz/60Hz sinusoidal waveform over the temperature range -40 to +125 °C.
- (2) 10 msec. max. pulse width
- (3) Maximum value for T_j = 125 °C.
- (4) Minimum value for linear and exponential waveshape to 80% rated V_{DRM}. Gate open. T_j = 125 °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)}		2500		A	Sinewave, 180° conduction, T _c =72°C
RMS value of on-state current	I _{TRMS}		3925		A	Nominal value
Peak one cycle surge (non repetitive) current	I _{TSM}		45000		A	8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, T _j = 125 °C
			41500		A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T _j = 125 °C
I square t	I ² t		8.5x10 ⁶		A ² s	8.3 msec
Latching current	I _L		400		mA	V _D = 24 V; R _L = 12 ohms
Holding current	I _H		100		mA	V _D = 24 V; I = 2.5 A
Peak on-state voltage	V _{TM}		1.2		V	I _{TM} = 2000 A; T _j = 25 °C
Critical rate of rise of on-state current (5, 6)	di/dt		300		A/μs	Switching from V _{DRM} ≤ 1500 V, non-repetitive
Critical rate of rise of on-state current (6)	di/dt		100		A/μs	Switching from V _{DRM} ≤ 1500 V

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}		15		A	
Gate current required to trigger all units	I_{GT}		300 200 125		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}	0.30	5 4		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}		15		V	

Dynamic

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		3.0	2.5	μs	$I_{TM} = 50 \text{ A}; V_D = 67\% V_{DRM}$ Gate pulse: $V_G = 30 \text{ V}; R_G = 10 \text{ ohms}; t_r = 0.1 \mu s; t_p = 20 \mu s$
Turn-off time (with $V_R = -5 \text{ V}$)	t_q		400	250	μs	$I_{TM} > 2000 \text{ A}; di/dt = 25 \text{ A}/\mu s;$ $V_R \geq -5 \text{ V};$ Re-applied $dV/dt = 400 \text{ V}/\mu s$ linear to $67\% V_{DRM}$; $T_j = 125 \text{ }^\circ\text{C};$ Duty cycle $\geq 0.01\%$
Reverse recovery current	I_{rr}		200		A	$I_{TM} > 2000 \text{ A}; di/dt = 25 \text{ A}/\mu s;$ $V_R \geq -50 \text{ V}; T_j = 125 \text{ }^\circ\text{C}$

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	$R_{\Theta(j-c)}$		0.012		$^\circ\text{C}/\text{W}$	Double sided cooled
Thermal resistance - case to sink	$R_{\Theta(c-s)}$		0.001		$^\circ\text{C}/\text{W}$	Double sided cooled *
Mounting force	P	8000 35.5	10000 44.4		lb. kN	
Weight	W			3.5 1.60	Lb. Kg.	

* Mounting surfaces smooth, flat and greased

