



HIGH POWER THYRISTOR FOR INVERTER APPLICATIONS

Features:

- . All Diffused Structure
- . Amplifying Gate Configuration
- . Blocking capability up to 2000 volts
- . High dV/dt Capability
- . Pressure Assembled Device

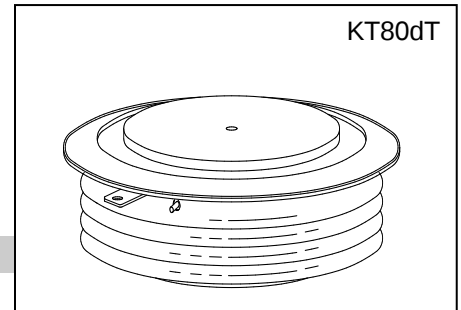
ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

Device Type	V _{RRM} (1)	V _{DRM} (1)	V _{RSM} (1)
C770PM	1600	1600	1700
C770PN	1800	1800	1900
C770L	2000	2000	2100

V_{RRM} = Repetitive peak reverse voltageV_{DRM} = Repetitive peak off state voltageV_{RSM} = Non repetitive peak reverse voltage (2)

Repetitive peak reverse leakage and off state leakage	I _{RRM} /I _{DRM}	5 mA 200 mA (3)
Critical rate of voltage rise	dV/dt (4)	500 V/sec (min)



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) The value of di/dt is established in accordance with EIA/NIMA Standard RS-397, Section 5-2-2-6.

Conducting - on state

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	I _{T(AV)}		2619		A	Sinewave, 180° conduction, T _c =55°C
RMS value of on-state current	I _{TRMS}		4110		A	Nominal value
Peak one cycle surge (non repetitive) current	I _{TSM}		31400		A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T _j = 125 °C
I square t	I ² t		4.9x10 ⁶		A ² s	10 msec
Latching current	I _L		1000		mA	V _D = 12 V; R _L = 12 ohms
Holding current	I _H		200		mA	V _D = 12 V; I = 2.5 A
Peak on-state voltage	V _{TM}		1.55		V	I _{TM} = 2000 A; T _j = 125 °C
Threshold voltage, Low-level	V _{TO}		1.05		V	T _j = 125°C
Slope Resistance, Low-level	r _T		0.12		mΩ	2000A...4000A
Critical rate of rise of on-state current (5)	di/dt		200		A/μs	Repetitive

Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P_{GM}		20		W	
Average gate power dissipation	$P_{G(AV)}$		4		W	
Gate current required to trigger all units	I_{GT}		250 150 5		mA mA mA	$V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = -40\text{ }^{\circ}\text{C}$ $V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = +25\text{ }^{\circ}\text{C}$ $V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = +125\text{ }^{\circ}\text{C}$
Gate voltage required to trigger all units	V_{GT}	0.30	5 3		V V V	$V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = -40\text{ }^{\circ}\text{C}$ $V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = 0\text{--}125\text{ }^{\circ}\text{C}$ $V_D = \text{Rated } V_{DRM}; R_L = 1000\text{ ohms}; T_j = +125\text{ }^{\circ}\text{C}$
Peak negative voltage	V_{GRM}		5		V	

Dynamic

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		3.0	1.5	μs	$I_{TM} = 50\text{ A}; V_D = 67\% V_{DRM}$ Gate pulse: $V_G = 30\text{ V}; R_G = 10\text{ ohms}; t_r = 0.1\mu\text{s}; t_p = 20\mu\text{s}$
Turn-off time (with $V_R = -5\text{ V}$)	t_q		70		μs	$I_{TM} = 2000\text{ A}; di/dt = -25\text{ A}/\mu\text{s}; V_R = 50\text{ V};$ Re-applied $dV/dt = 200\text{ V}/\mu\text{s}$ linear to $80\% V_{DRM}$; $T_j = 125\text{ }^{\circ}\text{C};$ Duty cycle $\geq 0.01\%$
Reverse recovery current	I_{rr}			250	A	$I_{TM} = 2000\text{ A}; di/dt = -25\text{ A}/\mu\text{s}; V_R = -50\text{ V}; T_j = 125\text{ }^{\circ}\text{C}$

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	+140		$^{\circ}\text{C}$	
Thermal resistance - junction to case	$R_{\theta(j-c)}$		0.01 0.02		$^{\circ}\text{C}/\text{W}$	Double sided cooled Single sided cooled
Thermal resistance - case to sink	$R_{\theta(c-s)}$		0.003 0.006		$^{\circ}\text{C}/\text{W}$	Double sided cooled * Single sided cooled
Mounting force	P	32	39	35	kN	
Weight	W			1.5	kg	

* Mounting surfaces smooth, flat and greased

