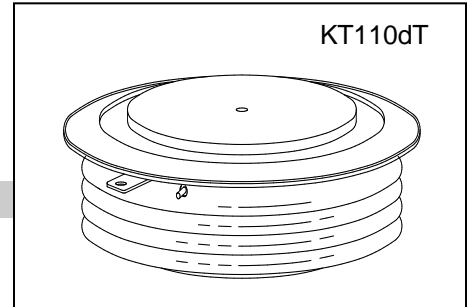




HIGH POWER THYRISTOR FOR INVERTER APPLICATION

Features:

- . All Diffused Structure
- . Amplifying Gate Configuration
- . Blocking capability up to 4500 volts
- . High d_v/d_t Capability
- . Pressure Assembled Device



ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking-Off State

Device Type	V_{RRM} (1)	V_{DRM} (1)	V_{RSM} (1)
KK3708/45	4500	4500	4500

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 180 mA (3)
Critical rate of voltage rise	d_v/d_t (4)	1000 V/sec (min)

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 0 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 67% rated V_{DRM} . Gate open, $T_j=125^\circ\text{C}$

(5) The value of d_i/d_t is established in accordance with JB/T4193-2013.

Conducting-On State

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	$I_{T(AV)}$		3708		A	Sinewave, 180° conduction, $T_c=55^\circ\text{C}$
RMS value of on-state current	$I_{T(RMS)}$		5825		A	Nominal value
Peak one cycle surge (non repetitive) current	I_{TSM}		50000		A	10 msec (50Hz), sinusoidal wave-shape, 180° conduction, $T_j = 125^\circ\text{C}$
I square t	I^2t		13×10^6		A^2s	10 msec
Latching current	I_L		1000		mA	$V_D=12\text{V}$; $R_L=12\text{ohms}$
Holding current	I_H		200		mA	$V_D=12\text{V}$; $I=2.5\text{A}$
Peak on-state voltage	V_{TM}		1.8		V	$I_{TM}=3000\text{A}$; $T_j = 25^\circ\text{C}$
Threshold voltage, low level	V_{TO}		1.2		V	$T_j=125^\circ\text{C}$
Slope resistance, low-level	r_T		0.2		$\text{m}\Omega$	3000A to 5500A
Critical rate of rise of on-state current(5)	d_i/d_t		200		$\text{A}/\mu\text{s}$	Repetition

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 trigger current	I_{GT}		200	150	mA	$V_D=12V; R_L=30\text{ohms}; T_j=+25^\circ\text{C}$
Gate trigger voltage	V_{GT}	0.70	3.0	2.5	V	$V_D=12V; R_L=30\text{ohms}; T_j=+25^\circ\text{C}$
Peak negative voltage	V_{GRM}		5		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: $V_G=30\text{V}; R_G=10\text{ohms};$ $t_r=0.1\mu\text{s}; t_p=20\mu\text{s}$
Turn-off time ($V_R=-5\text{V}$)	t_q		250		μs	$I_{TM}=2000\text{A}; di/dt = -10\text{A}/\mu\text{s};$ $V_R = 50\text{V}; dV/dt=30\text{V}/\mu\text{s};$ $V_D= 67\%V_{DRM}; T_j=125^\circ\text{C}$
Reverse recovery current	Q_{rr}				μC	$I_{TM}=2000\text{A}; di/dt=-10\text{A}/\mu\text{s};$ $V_R=50\text{V}; T_j=125^\circ\text{C}$

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	$R_{\Theta(j-c)}$		0.006		$^\circ\text{C}/\text{W}$	Double sided cooled
Thermal resistance - case to heatsink	$R_{\Theta(c-s)}$		0.0015		$^\circ\text{C}/\text{W}$	Double sided cooled
Mounting force	P	65	85	80	kN	
Weight	W			1.9	kg.	

* Mounting surfaces smooth, flat and greased

