



FREE FLOATING TYPE THYRISTOR FOR PHASE CONTROL APPLICATIONS**Features:**

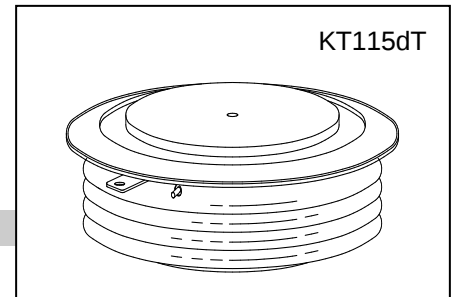
- . Free-floating silicon technology
- . Low on-state and switching losses
- . Optimum power handling capability
- . Blocking capability up to 4200 volts
- . Distributed amplifying gate

ELECTRICAL CHARACTERISTICS AND RATINGS**Blocking - Off State**

Device Type	V _{RRM} (1)	V _{DRM} (1)	V _{RSM} (1)
KP4310/34	3400	3400	3500
KP4310/36	3600	3600	3700
KP4310/38	3800	3800	3900
KP4310/40	4000	4000	4100
KP4310/42	4200	4200	4300

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)	1000 V/μsec



Notes:

(1) All voltage ratings are specified for an applied 50Hz/60Hz sinusoidal waveform over the temperature range 0 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 67% rated V_{DRM}. Gate open. T_j = 125 °C.

(5). The value of di/dt is established in accordance with EIA/NIMA Standard JB/T 8950.2-2013

Conducting - On State

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	I _{T(AV)}		4310		A	Sinewave, 180° conduction, T _c = 70°C
RMS value of on-state current	I _{TRMS}		6780		A	Nominal value
Peak one cycle surge (non repetitive) current	I _{TSM}		60000		A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T _j = 125 °C
I square t	I ² t		1.8x10 ⁷		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}		1.30		V	I _{TM} = 3000A; T _j = 25°C
Threshold voltage, low-level	V _{TO}		0.97		V	T _j = 125°C
Slope resistance, low-level	r _T		0.11		mΩ	3000A to 6000A
Critical rate of rise of on-state current	di/dt		200		A/μs	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		mA	$V_D = 12\text{ V}; R_L = 3\text{ ohms}; T_j = +25\text{ }^{\circ}\text{C}$
Gate- trigger voltage	V_{GT}	0.70	2.5		V	$V_D = 12\text{ V}; R_L = 3\text{ ohms}; T_j = +25\text{ }^{\circ}\text{C}$
Peak negative voltage	V_{GRM}		5		V	

Dynamic

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		3.0	2.5	μs	$I_{TM} = 100\text{ A}; V_D = 67\% V_{DRM}$ 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			600	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 charge	Q_{rr}			5000	μC	$I_{TM} = 2000\text{ A}; di/dt = -10\text{ A}/\text{s};$ $V_R = 50\text{ V}; T_j = 125^{\circ}\text{C}$

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	+125		$^{\circ}\text{C}$	
Thermal resistance - junction to case	$R_{\theta(j-c)}$		0.0057		$^{\circ}\text{C}/\text{W}$	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			90	kN	
Weight	W			2.90	kg	

* Mounting surfaces smooth, flat and greased

