



KS500-Bidirectional thyristor

4000-4500 V_{DRM}

HIGH POWER BIDIRECTIONAL THYRISTOR

TS8D

Features:

- . Amplifying Gate Configuration
- . Two thyristors integrated into one wafer
- . Blocking capability up to 4500 volts
- . High power capability
- . Full cold pressing encapsulation



ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking-Off State

Device No.	V _{DRM} (1)	V _{DSM} (1)
KS500/40	4000	4100
KS500/42	4200	4300
KS500/45	4500	4600

V_{DRM} = Repetitive peak off state voltage

V_{DSM} = Non Repetitive peak reverse voltage(2)

Repetitive peak reverse leakage and off state leakage	I _{DRM}	5 mA 100 mA (3)
Off - state voltage rise rating	dv/dt(4)	1000 V/μs

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 °C to +125 °C

(2) 10 msec. Max. Pulse width

(3) Maximum value for T_j=125 °C; 5Hz.

(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)}		500		A	Sinewave, 180° conduction, T _c =70°C
RMS value of on-state current	I _{TRMS}		785		A	Nominal value
Peak one cycle surge (non repetitive) current	I _{TSM}		6000		A	10.0 msec (50Hz), sinusoidal waveshape, 180° conduction, T _j = 125 °C
I square t	I ² t		1.8x10 ⁵		A ² s	10 msec
Latching current	I _L		700		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}		2.2		V	I _{TM} =1000A; T _j =25°C
Threshold Voltage	V _{TO}		1.1		V	T _j =125°C
Slope resistance	r _T		1.1		mΩ	785A to 2355A
Critical rate of rise of on-state current(5)	di/dt		100		A/μs	V _D =0.67V _{DRM} , f=50Hz, I _{TM} =2I _{T(AV)} , T _j =125°C
Critical rate of rise of commutating voltage	dv/dt _{com}			500	V/μs	T _j =125°C; V _R ≤0.67V _{DRM}

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}	50	150		mA	$V_D=12V; R_L=3ohms; T_j=+25^{\circ}C$
Gate trigger voltage	V_{GT}	0.5	2.5		V	$V_D=12V; R_L=3ohms; T_j=+25^{\circ}C$
Peak negative voltage	V_{GRM}		5		V	

Dynamic

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		3.0		μs	$I_{FG}=2.0A; V_D=0.4V_{DRM}; t_r=0.5\mu s$
Turn-off time ($V_R=-5V$)	t_q			400	μs	$I_{TM}=1000A; di/dt=-1.5 A/s;$ $V_R=100 V; dV/dt=30V/\mu s;$ $V_D= 67\%V_{DRM}; T_j=125^{\circ}C$
Reverse recovery charge	Q_{rr}		1500		μC	$I_{TM}=1000A; di/dt=-1.5 A/s;$ $V_R=100 V; T_j=125^{\circ}C$

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-40	+125		$^{\circ}C$	
Storage temperature	T_{stg}	-40	+140		$^{\circ}C$	
Thermal resistance- junction to case	$R_{\Theta(j-c)}$		0.045		$^{\circ}C/W$	Double sided cooled
Thermal resistance - case to heatsink	$R_{\Theta(c-s)}$		0.008		$^{\circ}C/W$	Double sided cooled
Mounting force	F	20	25	22	kN	
Weight	m			0.6	kg.	

* Mounting surfaces smooth, flat and greased



