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**HIGH POWER BIDIRECTIONAL THYRISTOR**

TS5D

**Features:**

- . Amplifying Gate Configuration
- . Two thyristors integrated into one wafer
- . Blocking capability up to 8500 volts
- . High power capability
- . Full cold pressing encapsulation



**ELECTRICAL CHARACTERISTICS AND RATINGS**

**Blocking-Off State**

Device No.	V <sub>DRM</sub> (1)	V <sub>DSM</sub> (1)
KS135/74	6500	7400
KS135/78	6900	7800
KS135/82	7300	8200
KS135/85	7600	8500

V<sub>DRM</sub> = Repetitive peak off state voltage  
V<sub>DSM</sub> = Non Repetitive peak reverse voltage(2)

Repetitive peak reverse leakage and off state leakage	I <sub>DRM</sub>	2 mA 100 mA (3)
Off - state voltage rise rating	dv/dt(4)	1000 V/μs

Notes:

All ratings are specified for T<sub>j</sub>=25 °C unless otherwise stated.

- (1) All voltage ratings are specified for an applied 50Hz/60zHz sinusoidal waveform over the temperature range-40 °C to +110 °C
- (2) 10 msec. Max. Pulse width
- (3) Maximum value for T<sub>j</sub>=110 °C; 50Hz.
- (4) Minimum value for linear and exponential waveshape to 67% rated V<sub>DRM</sub>. Gate open, T<sub>j</sub>=110 °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 <sub>T(AV)</sub>		135		A	Sinewave, 180° conduction, T <sub>c</sub> =70°C
RMS value of on-state current	I <sub>TRMS</sub>		212		A	Nominal value
Peak one cycle surge (non repetitive) current	I <sub>TSM</sub>		1485		A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T <sub>j</sub> = 110 °C
I square t	I <sup>2</sup> t		11x10 <sup>3</sup>		A <sup>2</sup> s	10 msec
Latching current	I <sub>L</sub>		700		mA	V <sub>D</sub> = 12 V; R <sub>L</sub> = 12 ohms
Holding current	I <sub>H</sub>		200		mA	V <sub>D</sub> = 12 V; I = 2.5 A
Peak on-state voltage	V <sub>TM</sub>		3.5		V	I <sub>TM</sub> =300A; T <sub>j</sub> =25°C
Threshold Voltage	V <sub>TO</sub>		2.36		V	T <sub>j</sub> =110°C
Slope resistance	r <sub>T</sub>		3.8		mΩ	200A to 500A
Critical rate of rise of on-state current(5)	di/dt		100		A/μs	repetition
Critical rate of rise of commutating voltage	dv/dt <sub>com</sub>			500	A/μs	T <sub>j</sub> =110°C; VR≤0.67V <sub>DRM</sub>

### 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	$V_{GT}$	0.8	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		$\mu s$	$I_{FG}=2.0A; V_D=0.4V_{DRM}; t_r=0.5\mu s$
Turn-off time ( $V_R=-5V$ )	$t_q$			700	$\mu s$	$I_{TM}=1000A; di/dt=-1.5 A/s; V_R=100 V; dV/dt=30V/\mu s; V_D= 67\% V_{DRM}; T_j=110^{\circ}C$
Reverse recovery charge	$Q_{rr}$		1800		$\mu C$	$I_{TM}=1000A; di/dt=-1.5 A/s; V_R=100 V; T_j=110^{\circ}C$

### THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	$T_j$	-40	+110		$^{\circ}C$	
Storage temperature	$T_{stg}$	-40	+140		$^{\circ}C$	
Thermal resistance- junction to case	$R_{\theta(j-c)}$		0.08		$^{\circ}C/W$	Double sided cooled
Thermal resistance - case to heatsink	$R_{\theta(c-s)}$		0.015		$^{\circ}C/W$	Double sided cooled
Mounting force	F	10	14	12	kN	
Weight	m			0.4	kg.	

\* Mounting surfaces smooth, flat and greased

