



# KS1440-Bidirectional thyristor

5800-6500 V<sub>DRM</sub>

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## HIGH POWER BIDIRECTIONAL THYRISTOR

TS17D

### Features:

- . Amplifying Gate Configuration
- . Two thyristors integrated into one wafer
- . Blocking capability up to 6500 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)
KS1440/58	5800	5900
KS1440/60	6000	6100
KS1440/62	6200	6300
KS1440/65	6500	6600

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>	10 mA 300 mA (3)
Off - state voltage rise rating	dv/dt(4)	2000 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/60Hz sinusoidal waveform over the temperature range -40 °C to +125 °C

(2) 10 msec. Max. Pulse width

(3) Maximum value for T<sub>j</sub>=125 °C; 5Hz.

(4) Minimum value for linear and exponential waveshape to 67% rated V<sub>DRM</sub>. Gate open, T<sub>j</sub>=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 <sub>T(AV)</sub>		1440		A	Sinewave, 180° conduction, T <sub>c</sub> =70°C
RMS value of on-state current	I <sub>TRMS</sub>		2260		A	Nominal value
Peak one cycle surge (non repetitive) current	I <sub>TSM</sub>		23000		A	10.0 msec (50Hz), sinusoidal waveshape, 180° conduction, T <sub>j</sub> = 125 °C
I square t	I <sup>2</sup> t		2.65x10 <sup>6</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>		2.95		V	I <sub>TM</sub> =3000A; T <sub>j</sub> =25°C
Threshold Voltage	V <sub>TO</sub>		1.2		V	T <sub>j</sub> =125°C
Slope resistance	r <sub>T</sub>		0.6		mΩ	2000A to 5000A
Critical rate of rise of on-state current(5)	di/dt		200		A/μs	T <sub>j</sub> =125°C; V <sub>D</sub> = 0.67 V <sub>DRM</sub> ; f=50Hz; I <sub>TM</sub> =5000A
Critical rate of rise of commutating voltage	dv/dt <sub>com</sub>			500	V/μs	T <sub>j</sub> =125°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	250		mA	$V_D=12V; R_L=3ohms; T_j=+25^{\circ}C$
Gate trigger voltage	$V_{GT}$	1.0	2.6		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 ( $V_R=-5V$ )	$t_q$			800	$\mu s$	$I_{TM}=2000A; di/dt=-1.5 A/s;$ $V_R=100 V; dV/dt=30V/\mu s;$ $V_D= 67\%V_{DRM}; T_j=125^{\circ}C$
Reverse recovery charge	$Q_{rr}$		3800		$\mu C$	$I_{TM}=2000A; di/dt=-1.5 A/s;$ $V_R=100 V; T_j=125^{\circ}C$

**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	$R_{\Theta(j-c)}$		0.0114		$^{\circ}C/W$	Double sided cooled
Thermal resistance - case to heatsink	$R_{\Theta(c-s)}$		0.002		$^{\circ}C/W$	Double sided cooled
Mounting force	F	81	108	90	kN	
Weight	m			2.9	kg	

\* Mounting surfaces smooth, flat and greased



