

Prospective Data

Medium Voltage Thyristor

Type K1000M#600 to K1000M#650

Development Type No. KX283M#600-650

Absolute Maximum Ratings

	VOLTAGE RATINGS	MAXIMUM LIMITS	UNITS
V_{DRM}	Repetitive peak off-state voltage, (note 1)	6000-6500	V
V_{DSM}	Non-repetitive peak off-state voltage, (note 1)	6000-6500	V
V_{RRM}	Repetitive peak reverse voltage, (note 1)	6000-6500	V
V_{RSM}	Non-repetitive peak reverse voltage, (note 1)	6100-6600	V

	OTHER RATINGS	MAXIMUM LIMITS	UNITS
$I_{T(AV)M}$	Maximum average on-state current, $T_{sink}=55^{\circ}C$, (note 2)	1000	A
$I_{T(AV)M}$	Maximum average on-state current, $T_{sink}=85^{\circ}C$, (note 2)	695	A
$I_{T(AV)M}$	Maximum average on-state current, $T_{sink}=85^{\circ}C$, (note 3)	410	A
$I_{T(RMS)}$	Nominal RMS on-state current, $T_{sink}=25^{\circ}C$, (note 2)	1950	A
$I_{T(D.C.)}$	D.C. on-state current, $T_{sink}=25^{\circ}C$, (note 4)	1735	A
I_{TSM}	Peak non-repetitive surge $t_p=10ms$, $V_{rm}=60\%V_{RRM}$, (note 5)	12.5	kA
I_{TSM2}	Peak non-repetitive surge $t_p=10ms$, $V_{rm}\leq 10V$, (note 5)	13.7	kA
I^2t	I^2t capacity for fusing $t_p=10ms$, $V_{rm}=60\%V_{RRM}$, (note 5)	781×10^3	A^2s
I^2t	I^2t capacity for fusing $t_p=10ms$, $V_{rm}\leq 10V$, (note 5)	938×10^3	A^2s
$(di/dt)_{cr}$	Critical rate of rise of on-state current, (Note 6)	continuous, 50Hz	100
		repetitive, 50Hz, 60s	200
		non-repetitive	700
V_{RGM}	Peak reverse gate voltage	5	V
$P_{G(AV)}$	Mean forward gate power	2	W
P_{GM}	Peak forward gate power	30	W
$T_{j op}$	Operating temperature range	-40 to +125	$^{\circ}C$
T_{stg}	Storage temperature range	-40 to +150	$^{\circ}C$

Notes:-

- De-rating factor of 0.13% per $^{\circ}C$ is applicable for T_j below $25^{\circ}C$.
- Double side cooled, single phase; 50Hz, 180° half-sinewave.
- Cathode side cooled, single phase; 50Hz, 180° half-sinewave.
- Double side cooled.
- Half-sinewave, $125^{\circ}C$ T_j initial.
- $V_D=67\% V_{DRM}$, $I_{FG}=2A$, $t_r\leq 0.5\mu s$, $T_{case}=125^{\circ}C$.

Characteristics

	PARAMETER	MIN.	TYP.	MAX.	TEST CONDITIONS (Note 1)	UNITS
V_{TM}	Maximum peak on-state voltage	2.05	-	2.25	$I_{TM}=1000A$	V
V_{TM}	Maximum peak on-state voltage	-	-	3.97	$I_{TM}=3000A$	V
V_{T0}	Threshold voltage	-	-	1.39		V
r_T	Slope resistance	-	-	0.86		m Ω
$(dv/dt)_{cr}$	Critical rate of rise of off-state voltage	1000	-	-	$V_D=80\% V_{DRM}$, linear ramp, gate o/c	V/ μs
I_{DRM}	Peak off-state current	-	-	100	Rated V_{DRM}	mA
I_{RRM}	Peak reverse current	-	-	100	Rated V_{RRM}	mA
V_{GT}	Gate trigger voltage	-	-	1.80	$T_J=25^\circ C$, $V_D=10V$, $I_T=3A$	V
I_{GT}	Gate trigger current	-	-	300		mA
V_{GD}	Gate non-trigger voltage	-	-	0.25	Rated V_{DRM}	V
I_H	Holding current	-	-	1000	$T_J=25^\circ C$	mA
t_{gd}	Gate-controlled turn-on delay time	-	0.5	1.5	$V_D=67\% V_{DRM}$, $I_T=2000A$, $di/dt=10A/\mu s$, $I_{FG}=2A$, $t_r=0.5\mu s$, $T_J=25^\circ C$	μs
t_{gt}	Turn-on time	-	2.0	5.0		μs
Q_{rr}	Recovered charge	6000	-	7000		μC
Q_{ra}	Recovered charge, 50% chord	-	3250	-	$I_{TM}=2000A$, $t_p=1000\mu s$, $di/dt=10A/\mu s$, $V_r=100V$	μC
I_{rm}	Reverse recovery current	160	-	180		A
t_{rr}	Reverse recovery time, 50% chord	-	40	-		μs
t_q	Turn-off time	700	-	-	$I_{TM}=2000A$, $t_p=1000\mu s$, $di/dt=10A/\mu s$, $V_r=100V$, $V_{dr}=27\% V_{DRM}$, $dV_{dr}/dt=20V/\mu s$	μs
		1000	-	-	$I_{TM}=2000A$, $t_p=1000\mu s$, $di/dt=10A/\mu s$, $V_r=100V$, $V_{dr}=67\% V_{DRM}$, $dV_{dr}/dt=200V/\mu s$	
R_{thJK}	Thermal resistance, junction to heatsink	-	-	0.020	Double side cooled	K/W
		-	-	0.038	Anode side cooled	K/W
		-	-	0.043	Cathode side cooled	K/W
F	Mounting force	25	-	31		kN
W_t	Weight	-	550	-	Housing option MA	g
		-	730	-	Housing option ME	g

Notes:-

- 1) Unless otherwise indicated $T_J=125^\circ C$.
- 2) For other clamp forces consult factory.

Curves

Figure 1 – On-state characteristics of Limit device

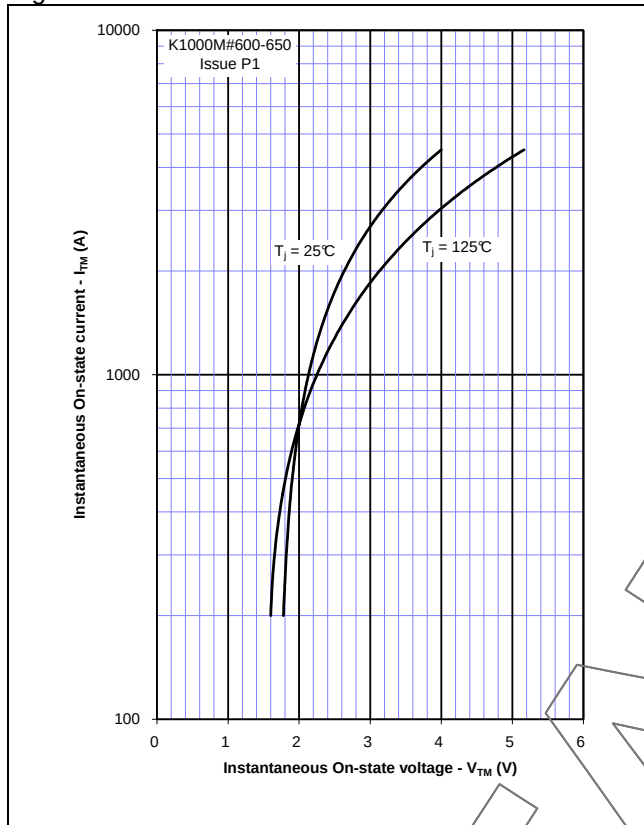
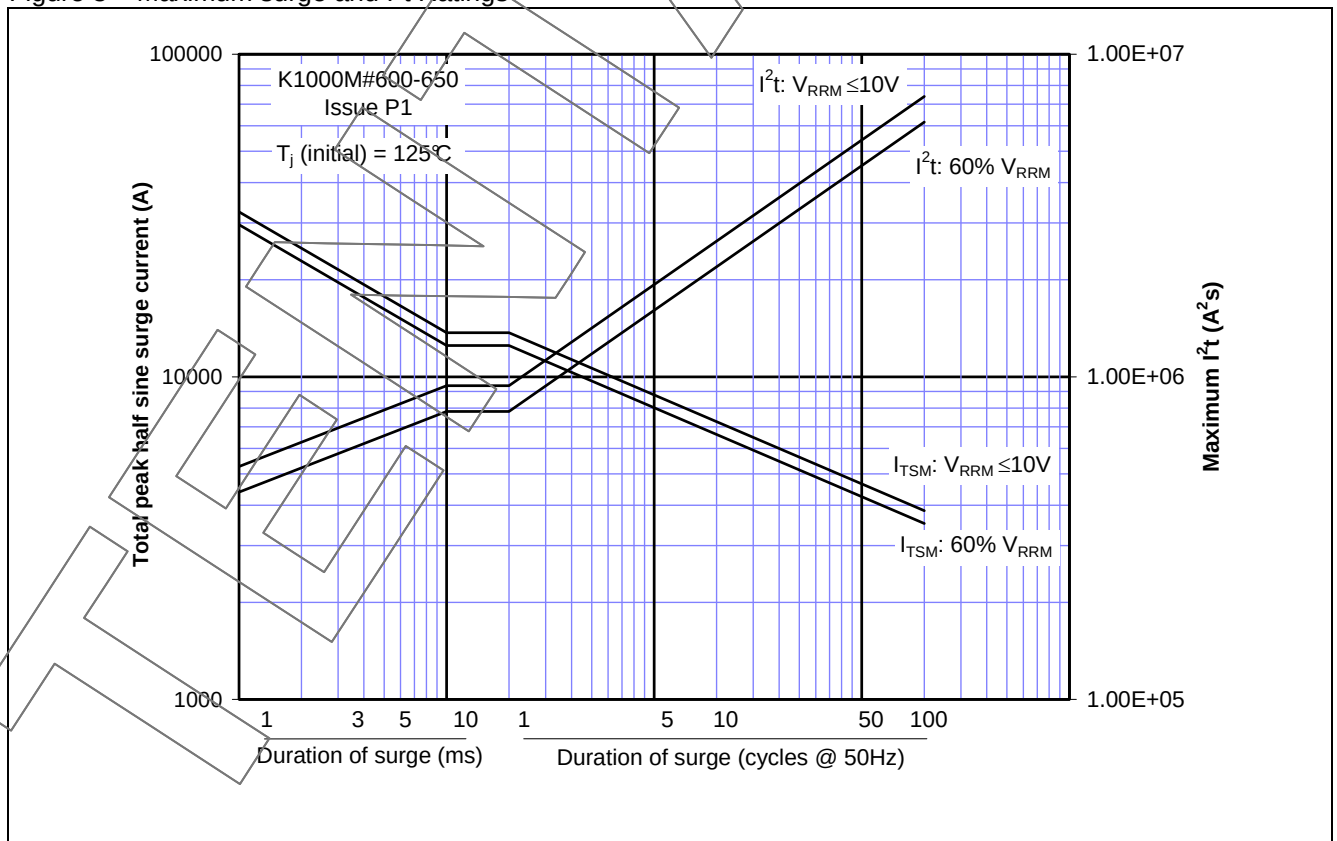


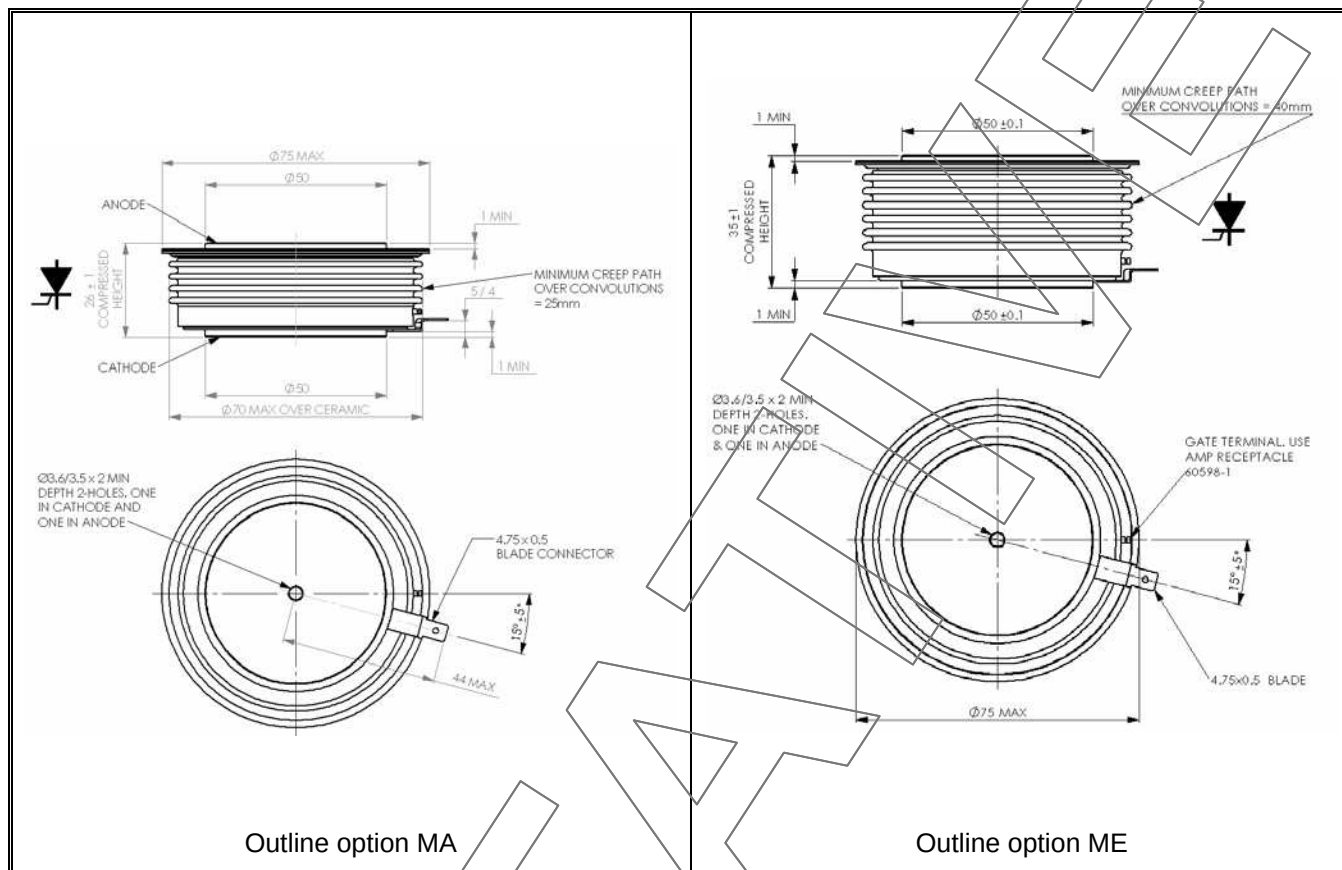
Figure 2 – Transient thermal impedance



Figure 3 – Maximum surge and I^2t Ratings



Outline Drawing & Ordering Information



ORDERING INFORMATION

(Please quote 10 digit code as below)

K1000	Q#	◆◆	0
Fixed Type Code	Outline Code MA=26mm ME=35mm	Voltage code $V_{RRM}/100$ 60-65	Fixed code

Typical order code: K1000MA650 – 6500V V_{DRM} , V_{RRM} , 26mm clamp height capsule.

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