

Provisional Data
Phase Control Thyristor
 Types N3790T#240 to N3790T#280
 Development Type No.: NX223TJ280

Absolute Maximum Ratings

	VOLTAGE RATINGS	MAXIMUM LIMITS	UNITS
V _{DRM}	Repetitive peak off-state voltage, (note 1)	2400-2800	V
V _{DSM}	Non-repetitive peak off-state voltage, (note 1)	2400-2800	V
V _{RRM}	Repetitive peak reverse voltage, (note 1)	2400-2800	V
V _{RSM}	Non-repetitive peak reverse voltage, (note 1)	2500-2900	V

	OTHER RATINGS	MAXIMUM LIMITS	UNITS
I _{T(AV)M}	Maximum average on-state current, T _{sink} =55°C, (note 2)	3790	A
I _{T(AV)M}	Maximum average on-state current. T _{sink} =85°C, (note 2)	2655	A
I _{T(AV)M}	Maximum average on-state current. T _{sink} =85°C, (note 3)	1405	A
I _{T(RMS)M}	Nominal RMS on-state current, T _{sink} =25°C, (note 2)	7410	A
I _{T(d.c.)}	D.C. on-state current, T _{sink} =25°C, (note 4)	6610	A
I _{TSM}	Peak non-repetitive surge t _p =10ms, V _m =60%V _{RRM} , (note 5)	49.5	kA
I _{TSM2}	Peak non-repetitive surge t _p =10ms, V _m ≤10V, (note 5)	55.0	kA
I ² t	I ² t capacity for fusing t _p =10ms, V _m =60%V _{RRM} , (note 5)	12.3×10 ⁶	A ² s
I ² t	I ² t capacity for fusing t _p =10ms, V _m ≤10V, (note 5)	15.1×10 ⁶	A ² s
(di/dt) _{cr}	Critical rate of rise of on-state current (note 6)	(continuous, 50Hz) (repetitive, 50Hz, 60s) (non-repetitive)	100 200 400 A/μs
V _{RGM}	Peak reverse gate voltage	5	V
P _{G(AV)}	Mean forward gate power	5	W
P _{GM}	Peak forward gate power	40	W
T _{j op}	Operating temperature range	-40 to +125	°C
T _{stg}	Storage temperature range	-40 to +150	°C

Notes:-

- 1) De-rating factor of 0.13% per °C is applicable for T_j below 25°C.
- 2) Double side cooled, single phase; 50Hz, 180° half-sinewave.
- 3) Cathode side cooled, single phase; 50Hz, 180° half-sinewave.
- 4) Double side cooled.
- 5) Half-sinewave, 125°C T_j initial.
- 6) V_D=67% V_{DRM}, I_{TM}=2000A, I_{FG}=2A, t_r≤0.5μs, T_{case}=125°C.

Characteristics

	PARAMETER	MIN.	TYP.	MAX.	TEST CONDITIONS (Note 1)	UNITS
V_{TM}	Maximum peak on-state voltage	-	-	1.50	$I_{TM}=4000A$	V
V_{TM}	Maximum peak on-state voltage	-	-	2.10	$I_{TM}=8000A$	V
V_{T0}	Threshold voltage	-	-	0.90		V
r_T	Slope resistance	-	-	0.15		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	-	-	250	Rated V_{DRM}	mA
I_{RRM}	Peak reverse current	-	-	250	Rated V_{RRM}	mA
V_{GT}	Gate trigger voltage	-	-	3.0	$T_j=25^\circ C$ $V_D=10V$, $I_T=3A$	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	-	0.7	1.5	$V_D=67\% V_{DRM}$, $I_T=2000A$, $di/dt=10A/\mu s$,	μs
t_{gt}	Turn-on time	-	2.0	4.0	$I_{FG}=2A$, $t_r=0.5\mu s$, $T_j=25^\circ C$	μs
Q_{rr}	Recovered charge	-	7000	7700		μC
Q_{ra}	Recovered charge, 50% Chord	-	4500	-	$I_{TM}=4000A$, $t_p=2000\mu s$, $di/dt=10A/\mu s$,	μC
I_{rr}	Reverse recovery current	-	210	-	$V_r=100V$	A
t_{rr}	Reverse recovery time	-	43	-		μs
t_q	Turn-off time	-	250	-	$I_{TM}=4000A$, $t_p=2000\mu s$, $di/dt=10A/\mu s$,	μs
		-	400	-	$V_r=100V$, $V_{dr}=80\%V_{DRM}$, $dV_{dr}/dt=20V/\mu s$	
R_{thJK}	Thermal resistance, junction to heatsink	-	-	0.008	Double side cooled	K/W
		-	-	0.013	Anode side cooled	K/W
		-	-	0.020	Cathode side cooled	K/W
F	Mounting force	60	-	70	Note 2.	kN
W_t	Weight	-	1.15	-		kg

Notes:-

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

Curves

Figure 1 – On-state characteristics of Limit device

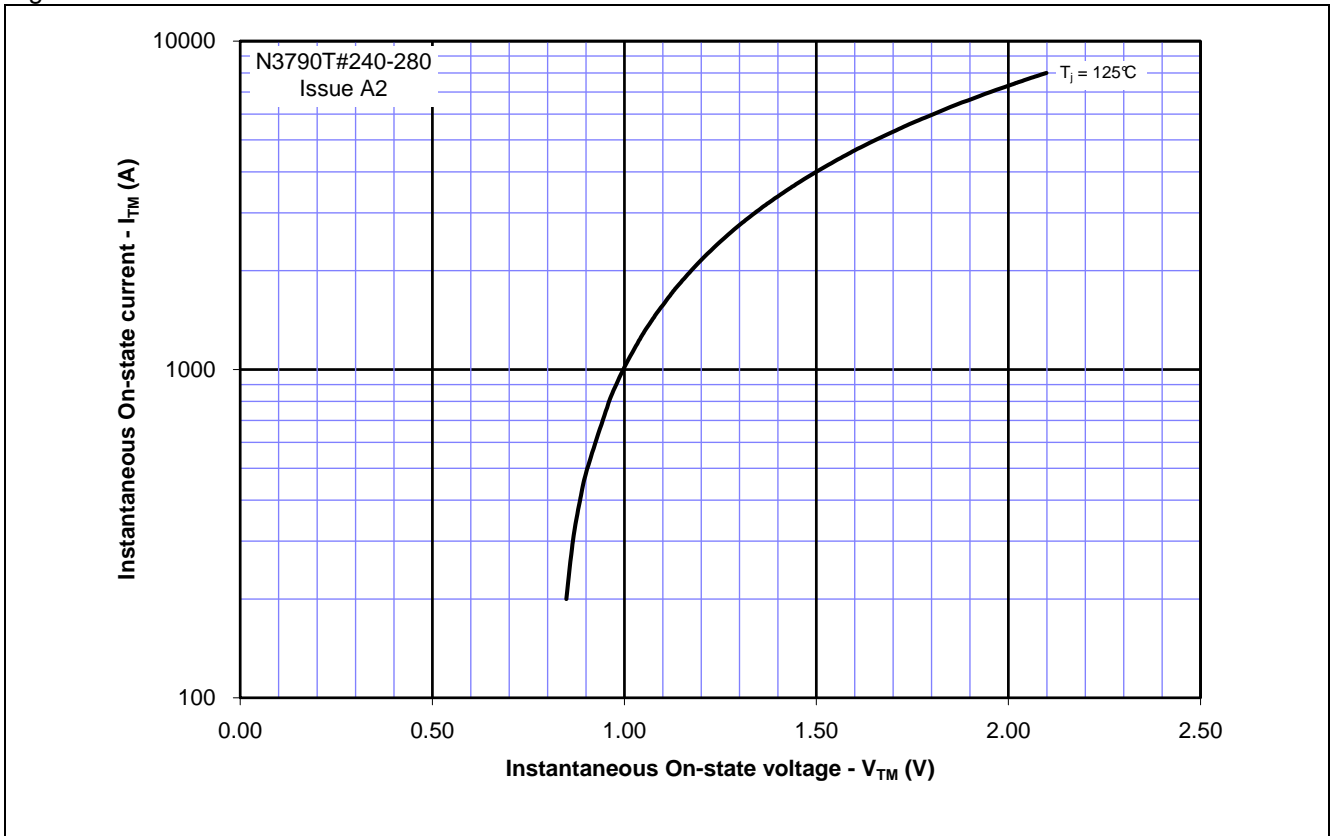


Figure 2 – Transient thermal impedance

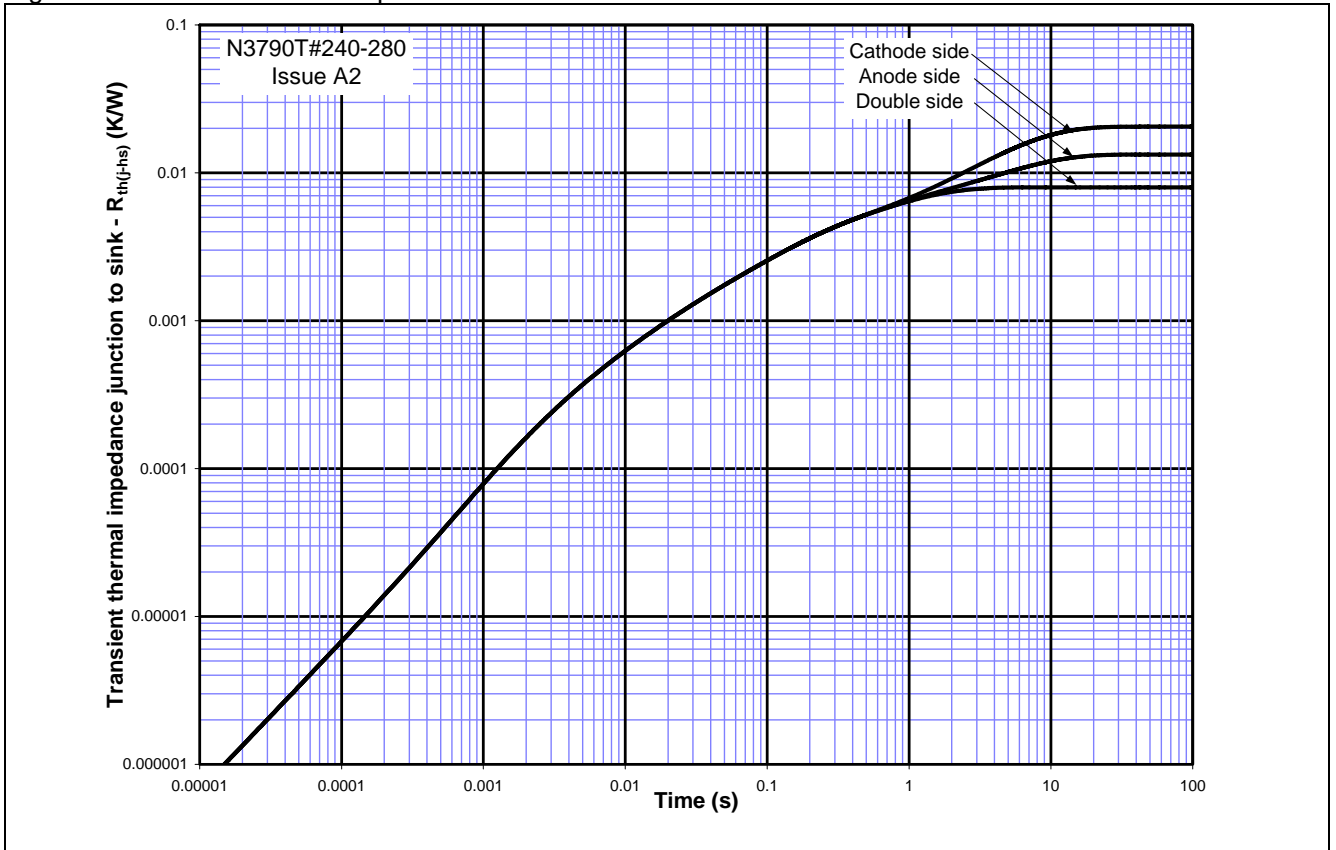
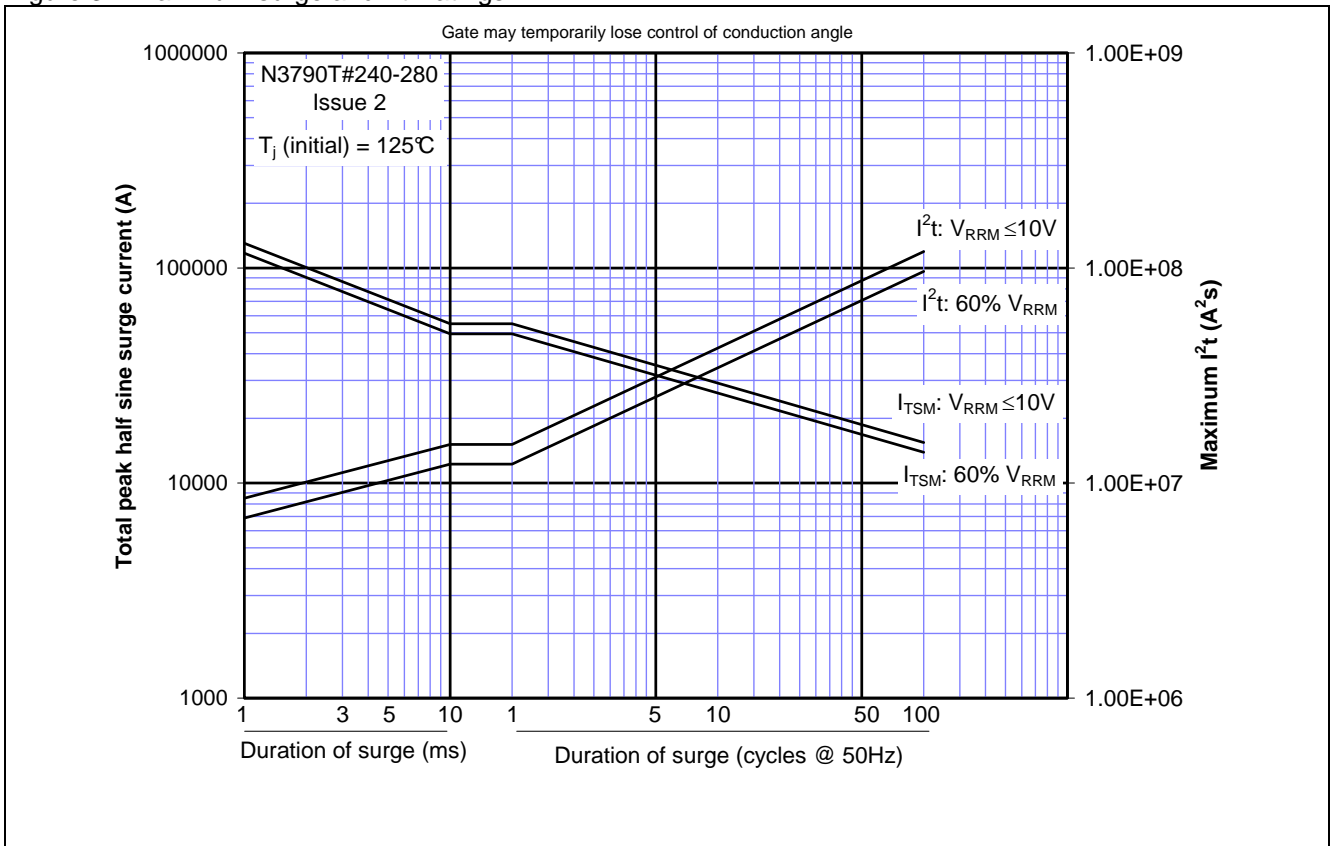
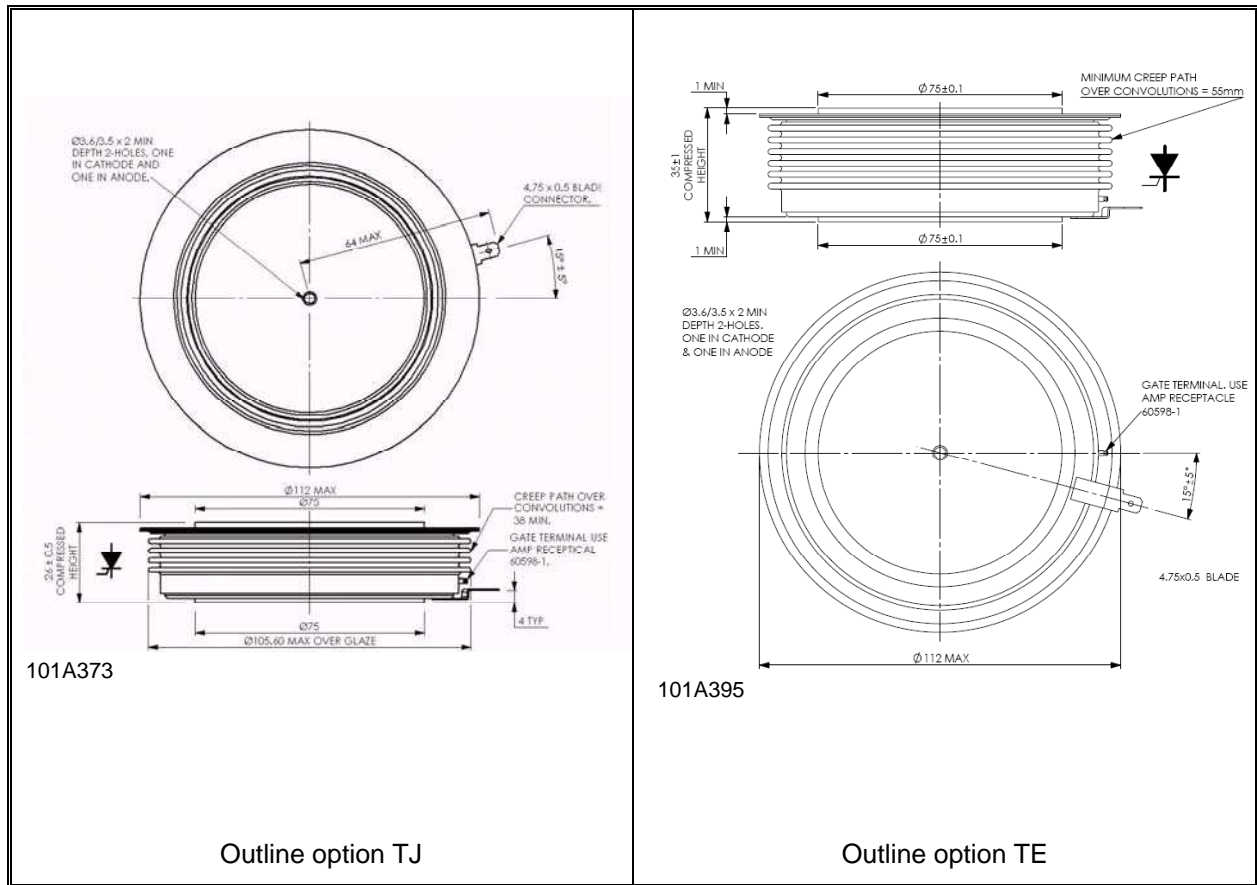


Figure 3 – Maximum surge and I^2t Ratings



Outline Drawing & Ordering Information



ORDERING INFORMATION

(Please quote 10 digit code as below)

N3790	T#	◆◆	0
Fixed Type Code	Fixed TJ = 26mm clamp height TE = 35mm clamp height	Voltage code V _{DRM} /100 24-28	Fixed turn-off time code

Order code: N3790TJ280 – 2800V V_{DRM}, V_{RRM}, 26mm clamp height capsule.

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