

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

**Absolute Maximum Ratings**

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

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

Notes:-

- 1) De-rating factor of 0.13% per °C is applicable for T<sub>j</sub> 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<sub>j</sub> initial.
- 6) V<sub>D</sub>=67% V<sub>DRM</sub>, I<sub>TM</sub>=2000A, I<sub>FG</sub>=2A, t<sub>r</sub>≤0.5μs, T<sub>case</sub>=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 $\Omega$
$(dv/dt)_{cr}$	Critical rate of rise of off-state voltage	1000	-	-	$V_D=80\% V_{DRM}$ , linear ramp, gate o/c	V/ $\mu s$
$I_{DRM}$	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 $V_{DRM}$
$I_H$	Holding current	-	-	1000	$T_j=25^\circ C$	mA
$t_{gd}$	Gate-controlled turn-on delay time	-	0.7	1.5	$V_D=67\% V_{DRM}$ , $I_T=2000A$ , $di/dt=10A/\mu s$ , $I_{FG}=2A$ , $t_r=0.5\mu s$ , $T_j=25^\circ C$	$\mu s$
$t_{gt}$	Turn-on time	-	2.0	4.0		$\mu s$
$Q_{rr}$	Recovered charge	-	7000	7700	$I_{TM}=4000A$ , $t_p=2000\mu s$ , $di/dt=10A/\mu s$ , $V_r=100V$	$\mu C$
$Q_{ra}$	Recovered charge, 50% Chord	-	4500	-		$\mu C$
$I_{rr}$	Reverse recovery current	-	210	-		A
$t_{rr}$	Reverse recovery time	-	43	-		$\mu s$
$t_q$	Turn-off time	-	250	-	$I_{TM}=4000A$ , $t_p=2000\mu s$ , $di/dt=10A/\mu s$ , $V_r=100V$ , $V_{dr}=80\%V_{DRM}$ , $dV_{dr}/dt=20V/\mu s$	$\mu s$
		-	400	-	$I_{TM}=4000A$ , $t_p=2000\mu s$ , $di/dt=10A/\mu s$ , $V_r=100V$ , $V_{dr}=80\%V_{DRM}$ , $dV_{dr}/dt=200V/\mu s$	
$R_{thJK}$	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

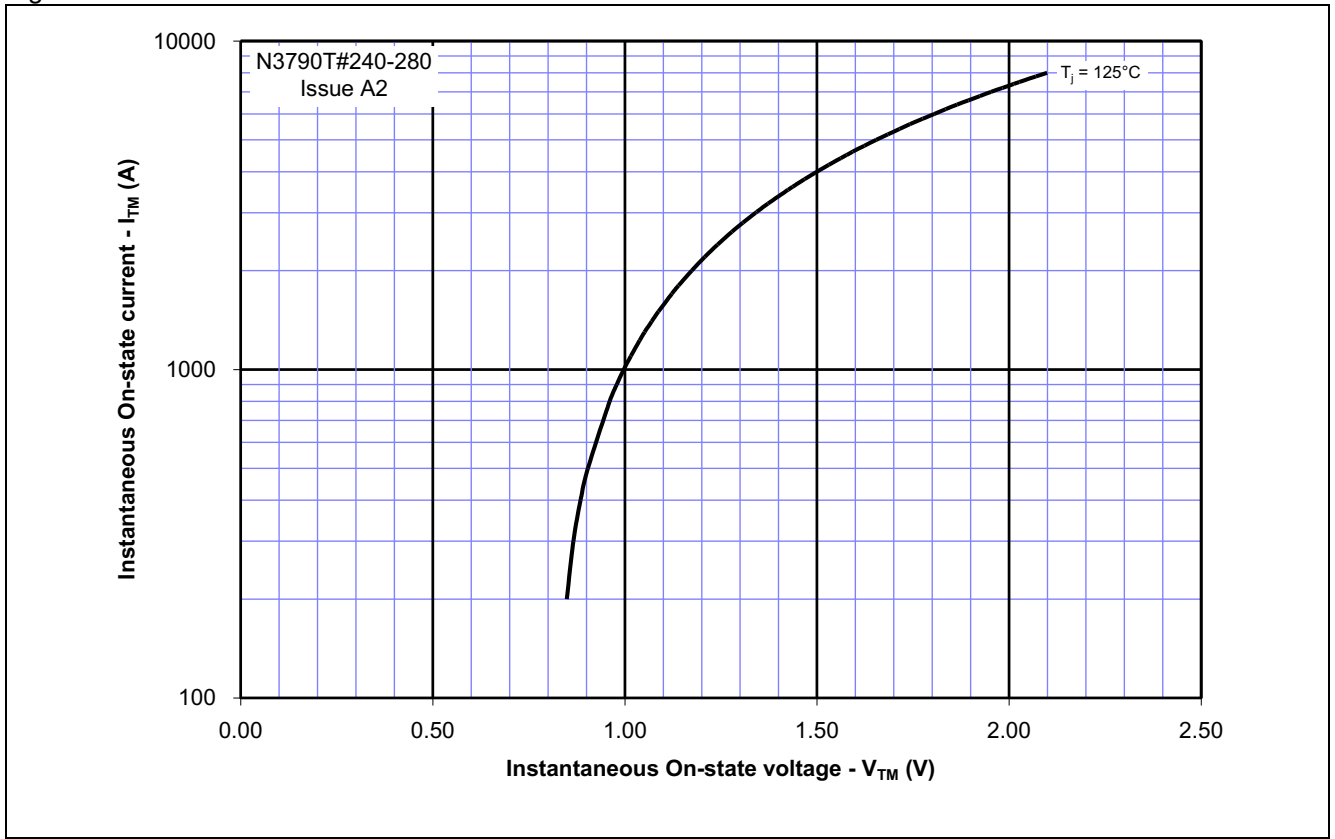


Figure 2 – Transient thermal impedance

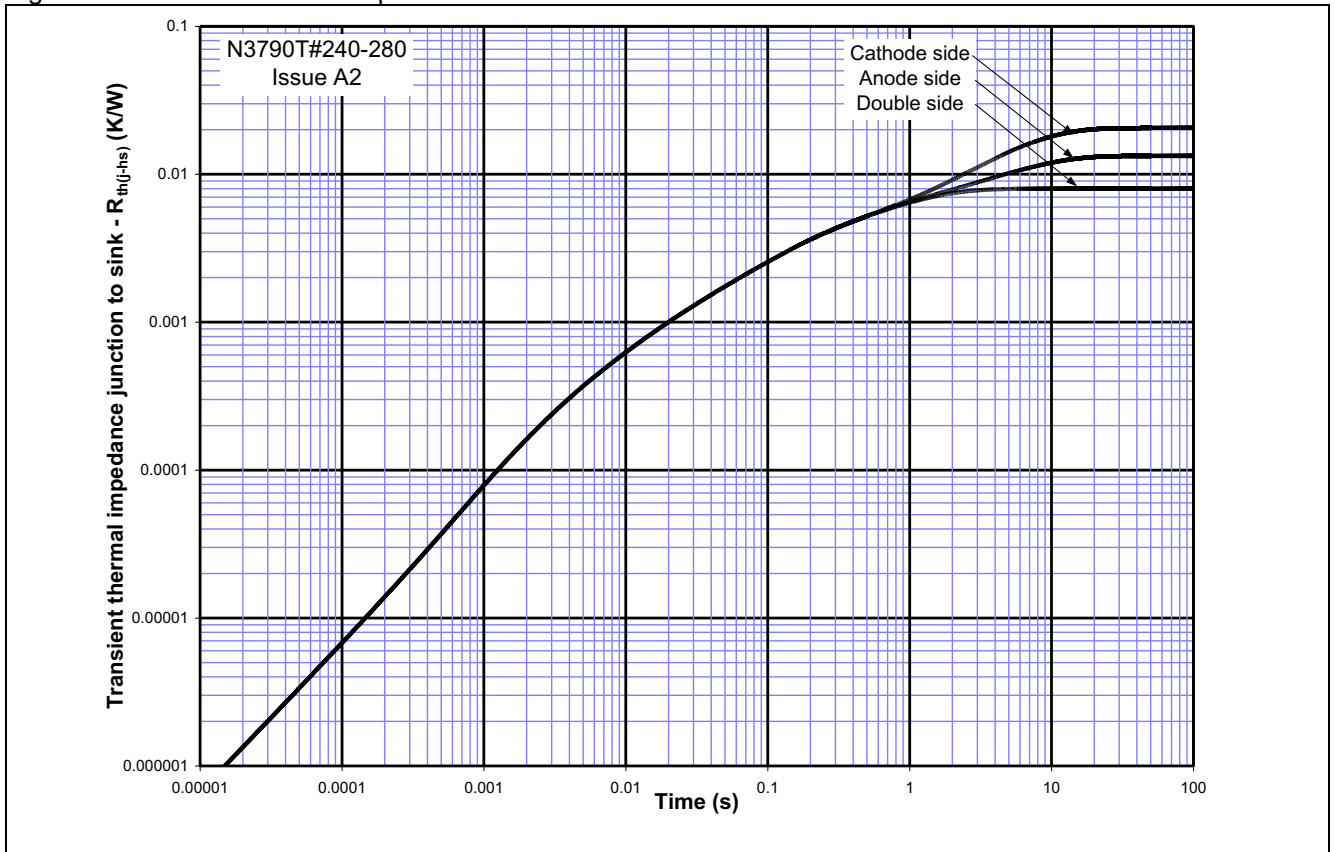
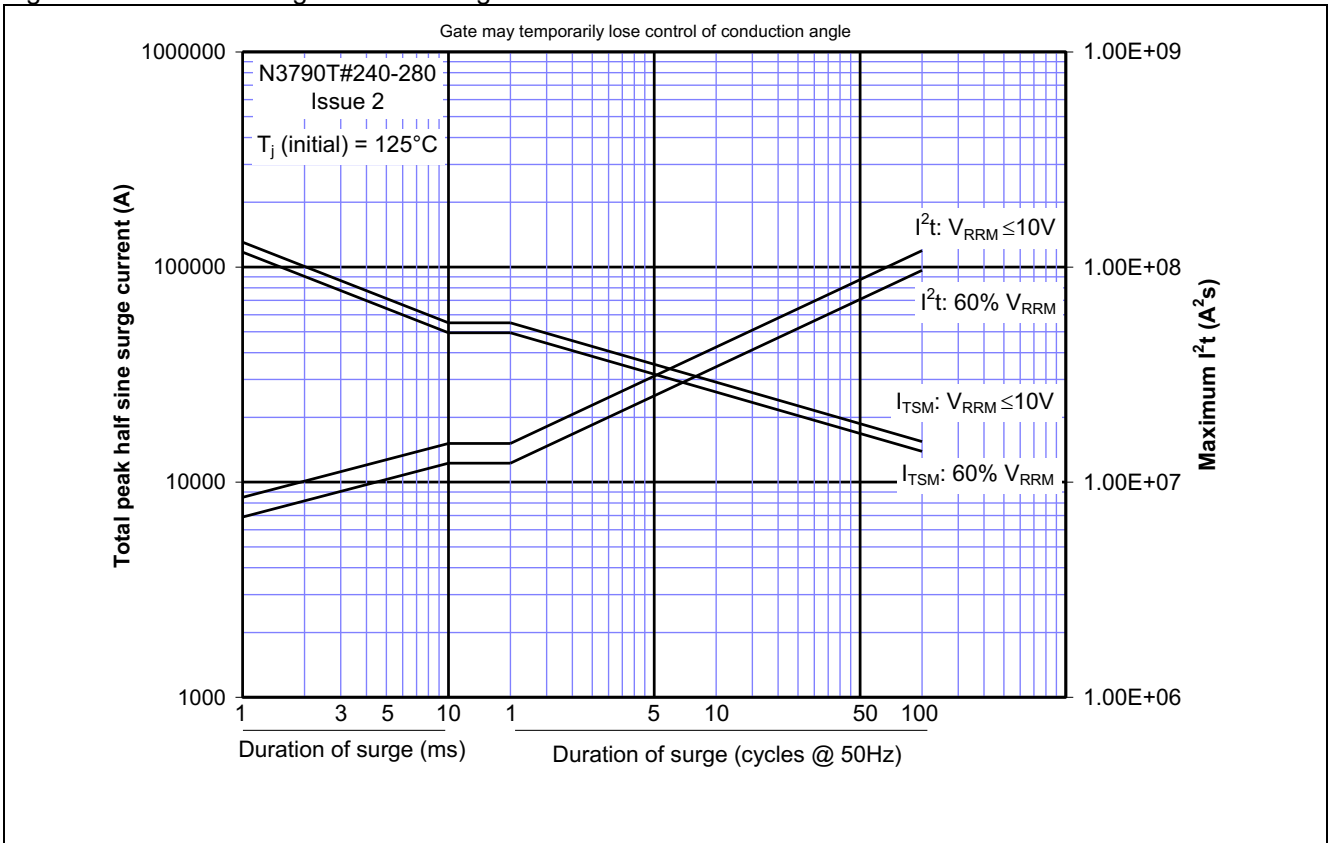
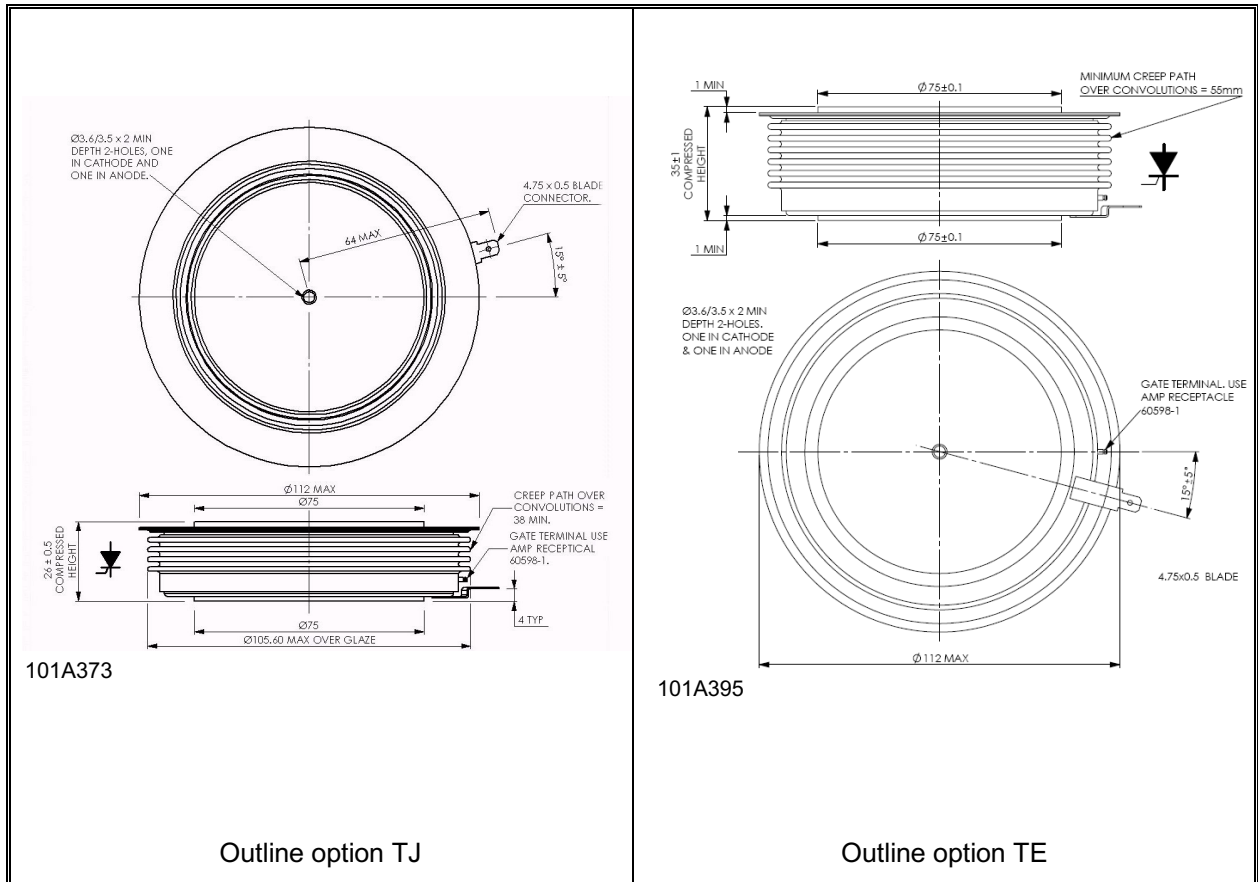


Figure 3 – Maximum surge and  $I^2t$  Ratings



**Outline Drawing & Ordering Information**



**ORDERING INFORMATION** (Please quote 10 digit code as below)

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

Order code: N3790TJ280 – 2800V V<sub>DRM</sub>, V<sub>RRM</sub>, 26mm clamp height capsule.

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