

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 | $V_D=67\% V_{DRM}$, $I_T=2000A$, $di/dt=10A/\mu s$, $I_{FG}=2A$, $t_r=0.5\mu s$, $T_j=25^\circ C$ | μs |
| t_{gt} | Turn-on time | - | 2.0 | 4.0 | | μs |
| Q_{rr} | Recovered charge | - | 7000 | 7700 | | μC |
| Q_{ra} | Recovered charge, 50% Chord | - | 4500 | - | $I_{TM}=4000A$, $t_p=2000\mu s$, $di/dt=10A/\mu s$, $V_r=100V$ | μC |
| I_{rr} | Reverse recovery current | - | 210 | - | | A |
| t_{rr} | Reverse recovery time | - | 43 | - | | μs |
| t_q | Turn-off time | - | 250 | - | $I_{TM}=4000A$, $t_p=2000\mu s$, $di/dt=10A/\mu s$, $V_r=100V$, $V_{dr}=80\%V_{DRM}$, $dV_{dr}/dt=20V/\mu s$ | μs |
| | | - | 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

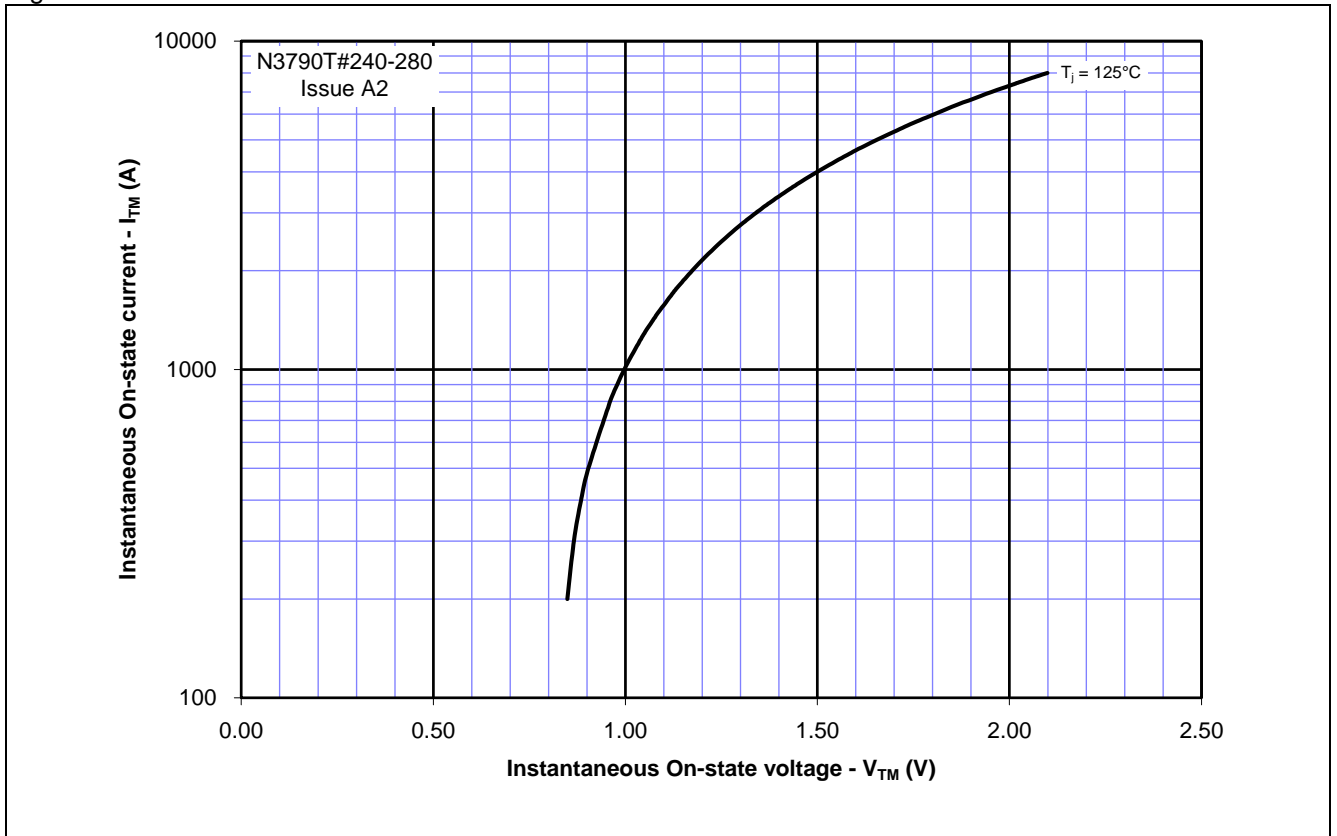


Figure 2 – Transient thermal impedance

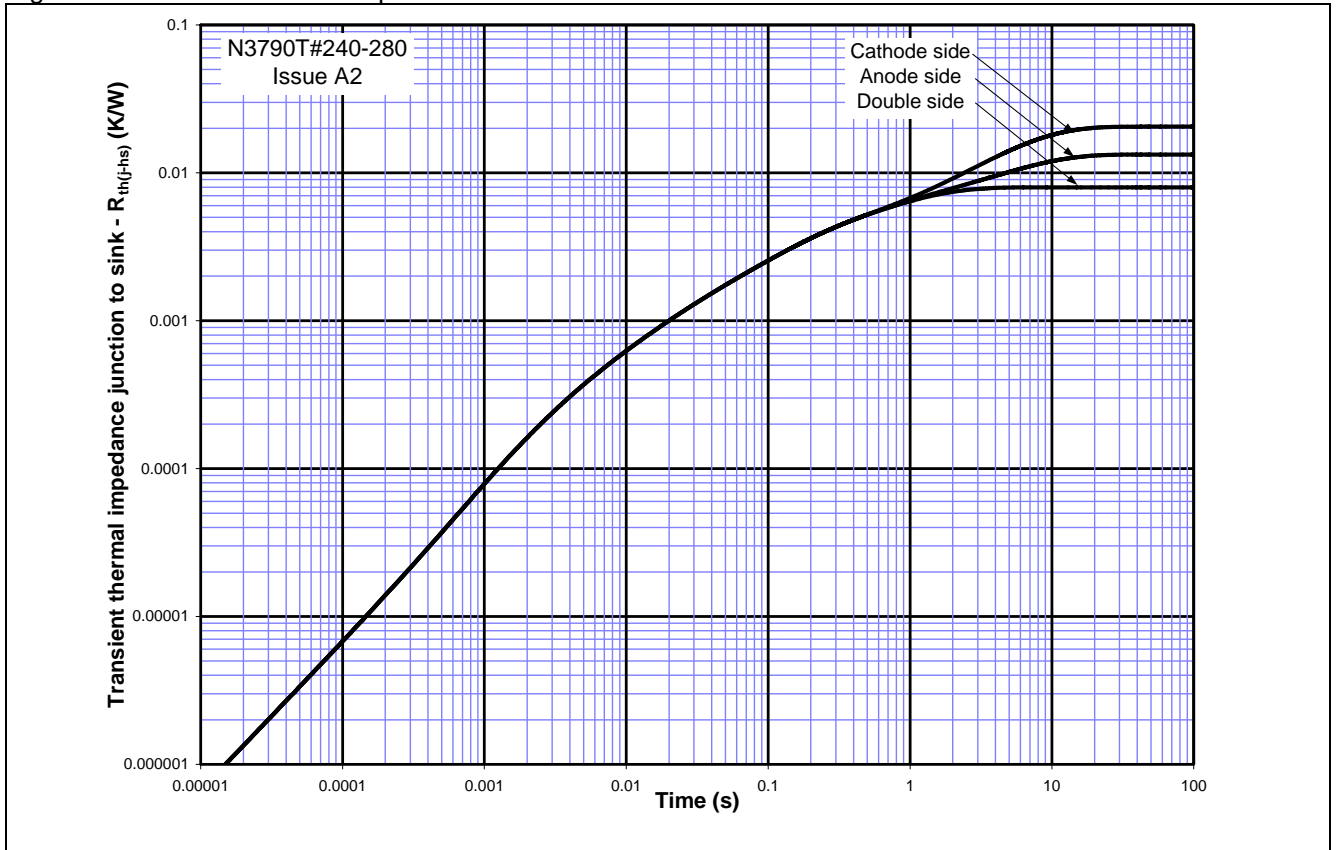
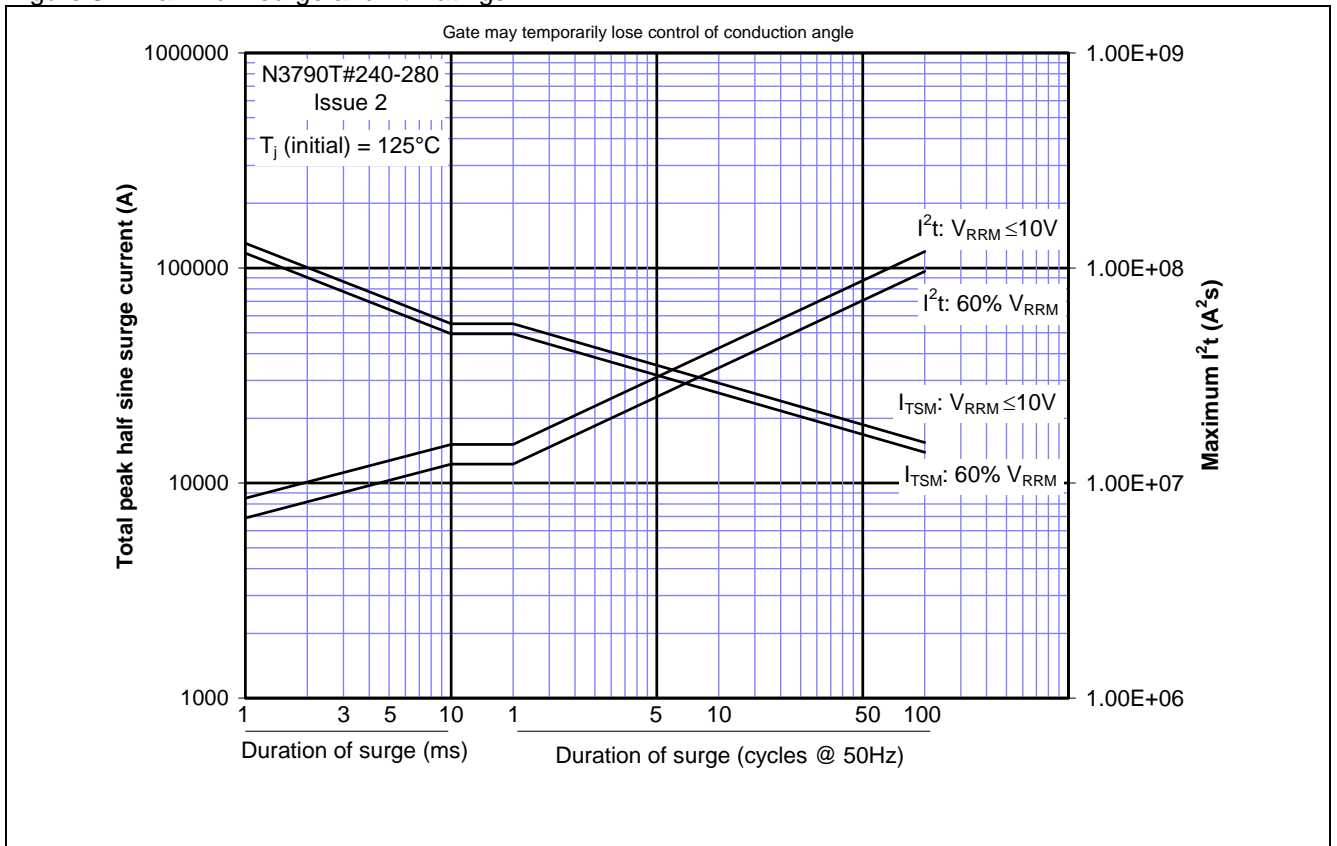
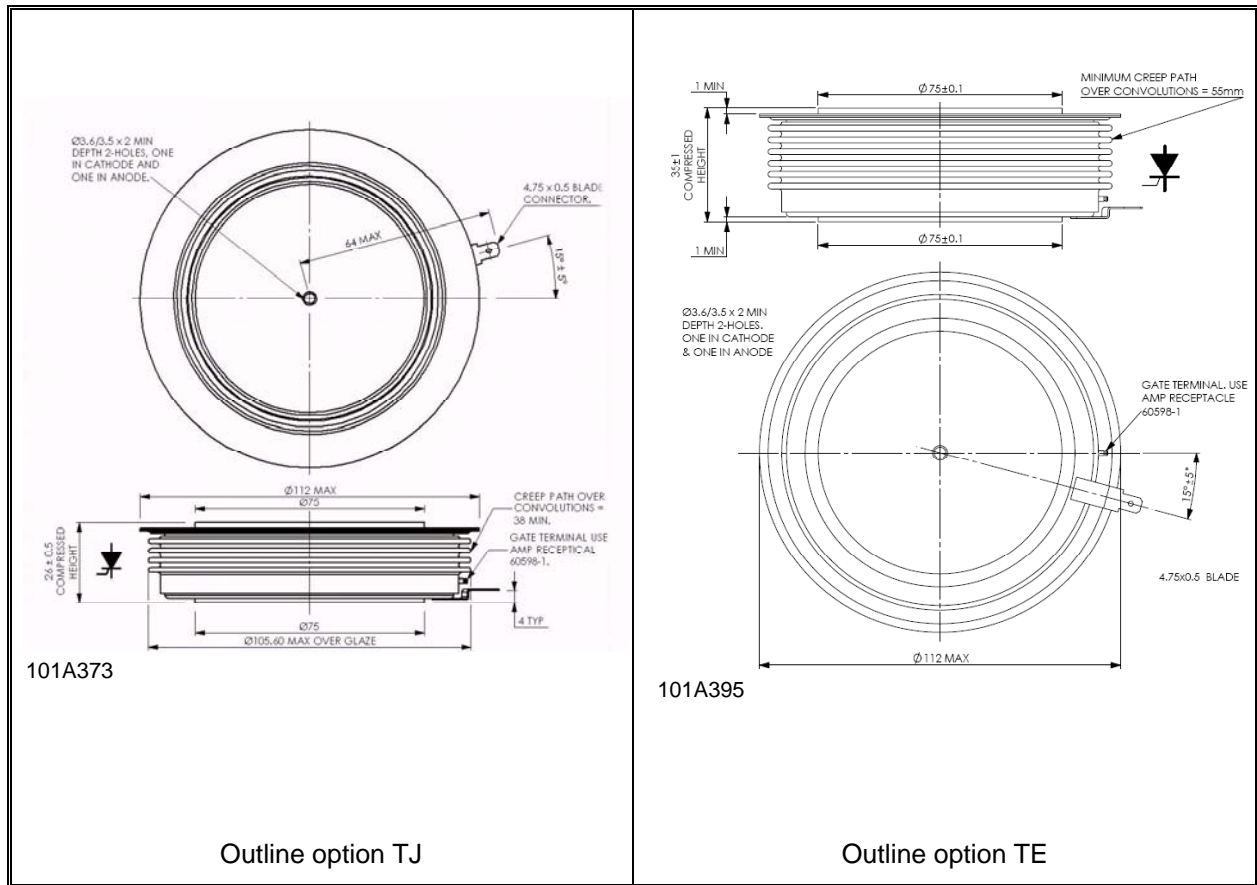


Figure 3 – Maximum surge and I^2t Ratings



Outline Drawing & Ordering Information



ORDERING INFORMATION

(Please quote 10 digit code as below)

| | | | |
|-----------------|---|--|--------------------------|
| 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.

IXYS Semiconductor GmbH
Edisonstraße 15
D-68623 Lampertheim
Tel: +49 6206 503-0
Fax: +49 6206 503-627
E-mail: marcom@ixys.de



IXYS UK Westcode Ltd
Langley Park Way, Langley Park,
Chippenham, Wiltshire, SN15 1GE.
Tel: +44 (0)1249 444524
Fax: +44 (0)1249 659448
E-mail: sales@ixysuk.com

IXYS Corporation
1590 Buckeye Drive
Milpitas CA 95035-7418
Tel: +1 (408) 457 9000
Fax: +1 (408) 496 0670
E-mail: sales@ixys.net

www.ixysuk.com

www.ixys.com

IXYS Long Beach
IXYS Long Beach, Inc
2500 Mira Mar Ave, Long Beach
CA 90815
Tel: +1 (562) 296 6584
Fax: +1 (562) 296 6585
E-mail: service@ixyslongbeach.com

The information contained herein is confidential and is protected by Copyright. The information may not be used or disclosed except with the written permission of and in the manner permitted by the proprietors IXYS UK Westcode Ltd.

© IXYS UK Westcode Ltd.

In the interest of product improvement, IXYS UK Westcode Ltd reserves the right to change specifications at any time without prior notice.

Devices with a suffix code (2-letter, 3-letter or letter/digit/letter combination) added to their generic code are not necessarily subject to the conditions and limits contained in this report.