

Provisional Data
Phase Control Thyristor
Types N6012ZD020 to N6012ZD060
Development Type No.: NX373ZD020-060

Absolute Maximum Ratings

| | VOLTAGE RATINGS | MAXIMUM LIMITS | UNITS |
|-----------|---|----------------|-------|
| V_{DRM} | Repetitive peak off-state voltage, (note 1) | 200-600 | V |
| V_{DSM} | Non-repetitive peak off-state voltage, (note 1) | 200-600 | V |
| V_{RRM} | Repetitive peak reverse voltage, (note 1) | 200-600 | V |
| V_{RSM} | Non-repetitive peak reverse voltage, (note 1) | 300-700 | V |

| | OTHER RATINGS | MAXIMUM LIMITS | UNITS |
|----------------|---|--|-------------|
| $I_{T(AV)M}$ | Maximum average on-state current, $T_{sink}=55^{\circ}C$, (note 2) | 6012 | A |
| $I_{T(AV)M}$ | Maximum average on-state current. $T_{sink}=85^{\circ}C$, (note 2) | 4300 | A |
| $I_{T(AV)M}$ | Maximum average on-state current. $T_{sink}=85^{\circ}C$, (note 3) | 2430 | A |
| $I_{T(RMS)M}$ | Nominal RMS on-state current, $T_{sink}=25^{\circ}C$, (note 2) | 11795 | A |
| $I_{T(d.c.)}$ | D.C. on-state current, $T_{sink}=25^{\circ}C$, (note 4) | 9310 | A |
| I_{TSM} | Peak non-repetitive surge $t_p=10ms$, $V_{rm}=60\%V_{RRM}$, (note 5) | 65.0 | kA |
| I_{TSM2} | Peak non-repetitive surge $t_p=10ms$, $V_{rm}\leq 10V$, (note 5) | 71.5 | kA |
| I^2t | I^2t capacity for fusing $t_p=10ms$, $V_{rm}=60\%V_{RRM}$, (note 5) | 21.13×10^6 | A^2s |
| I^2t | I^2t capacity for fusing $t_p=10ms$, $V_{rm}\leq 10V$, (note 5) | 25.56×10^6 | A^2s |
| $(di/dt)_{cr}$ | Critical rate of rise of on-state current (note 6) | (continuous, 50Hz) (repetitive, 50Hz, 60s) (non-repetitive) 100 200 400 | $A/\mu s$ |
| V_{RGM} | Peak reverse gate voltage | 5 | V |
| $P_{G(AV)}$ | Mean forward gate power | 4 | W |
| P_{GM} | Peak forward gate power | 30 | W |
| $T_{j op}$ | Operating temperature range | -40 to +140 | $^{\circ}C$ |
| T_{stg} | Storage temperature range | -40 to +150 | $^{\circ}C$ |

Notes:-

- 1) De-rating factor of 0.13% per $^{\circ}C$ is applicable for T_j below $25^{\circ}C$.
- 2) Double side cooled, single phase; 50Hz, 180° half-sinewave.
- 3) Single side cooled, single phase; 50Hz, 180° half-sinewave.
- 4) Double side cooled.
- 5) Half-sinewave, $140^{\circ}C$ T_j initial.
- 6) $V_D=67\% V_{DRM}$, $I_{TM}=2000A$, $I_{FG}=2A$, $t_r\leq 0.5\mu s$, $T_{case}=140^{\circ}C$.

Characteristics

| | PARAMETER | MIN. | TYP. | MAX. | TEST CONDITIONS (Note 1) | UNITS |
|-----------------------|--|------|------|-------|--|------------------------|
| V _{TM} | Maximum peak on-state voltage | - | - | 0.95 | I _{TM} =4000A | V |
| V _{TM} | Maximum peak on-state voltage | - | - | 1.45 | I _{TM} =20900A | V |
| V _{T0} | Threshold voltage | - | - | 0.853 | | V |
| r _T | Slope resistance | - | - | 0.029 | | mΩ |
| (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 | - | - | 3.0 | T _j =25°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°C | mA |
| t _{gd} | Gate-controlled turn-on delay time | - | 0.6 | 1.5 | V _D =67% V _{DRM} , I _T =2000A, di/dt=10A/μs, I _{FG} =2A, t _r =0.5μs, T _j =25°C | μs |
| t _{gt} | Turn-on time | - | 1.0 | 2.0 | | μs |
| Q _{rr} | Recovered charge | - | 1700 | - | I _{TM} =2000A, t _p =2000μs, di/dt=10A/μs, V _r =100V | μC |
| Q _{ra} | Recovered charge, 50% Chord | - | 1000 | 1250 | | μC |
| I _{rr} | Reverse recovery current | - | 105 | - | | A |
| t _{rr} | Reverse recovery time, 50% Chord | - | 19 | - | | μs |
| t _q | Turn-off time | - | 200 | - | I _{TM} =2000A, t _p =2000μs, di/dt=10A/μs, V _r =100V, V _{dr} =80%V _{DRM} , dV _{dr} /dt=20V/μs | μs |
| | | - | 250 | - | I _{TM} =2000A, t _p =2000μs, di/dt=10A/μs, V _r =100V, V _{dr} =80%V _{DRM} , dV _{dr} /dt=200V/μs | |
| R _{thJK} | Thermal resistance, junction to heatsink | - | - | 0.011 | Double side cooled | K/W |
| | | - | - | 0.022 | Single side cooled | K/W |
| F | Mounting force | 36 | - | 44 | Note 2. | kN |
| W _t | Weight | - | 1.2 | - | | kg |

Notes:-

- 1) Unless otherwise indicated T_j=140°C.
- 2) For other clamp forces, please consult factory.

Curves

Figure 1 – On-state characteristics of Limit device

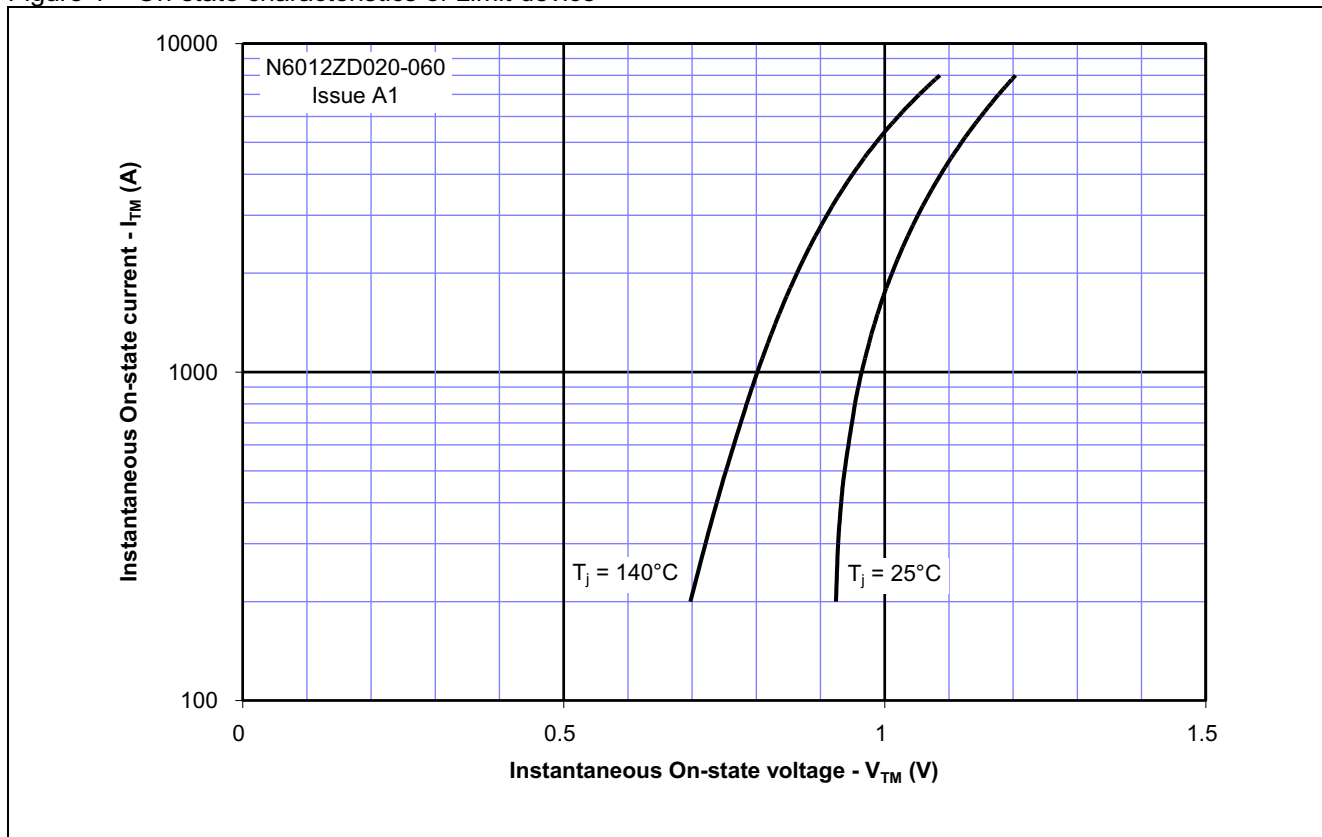


Figure 2 – Transient Thermal Impedance

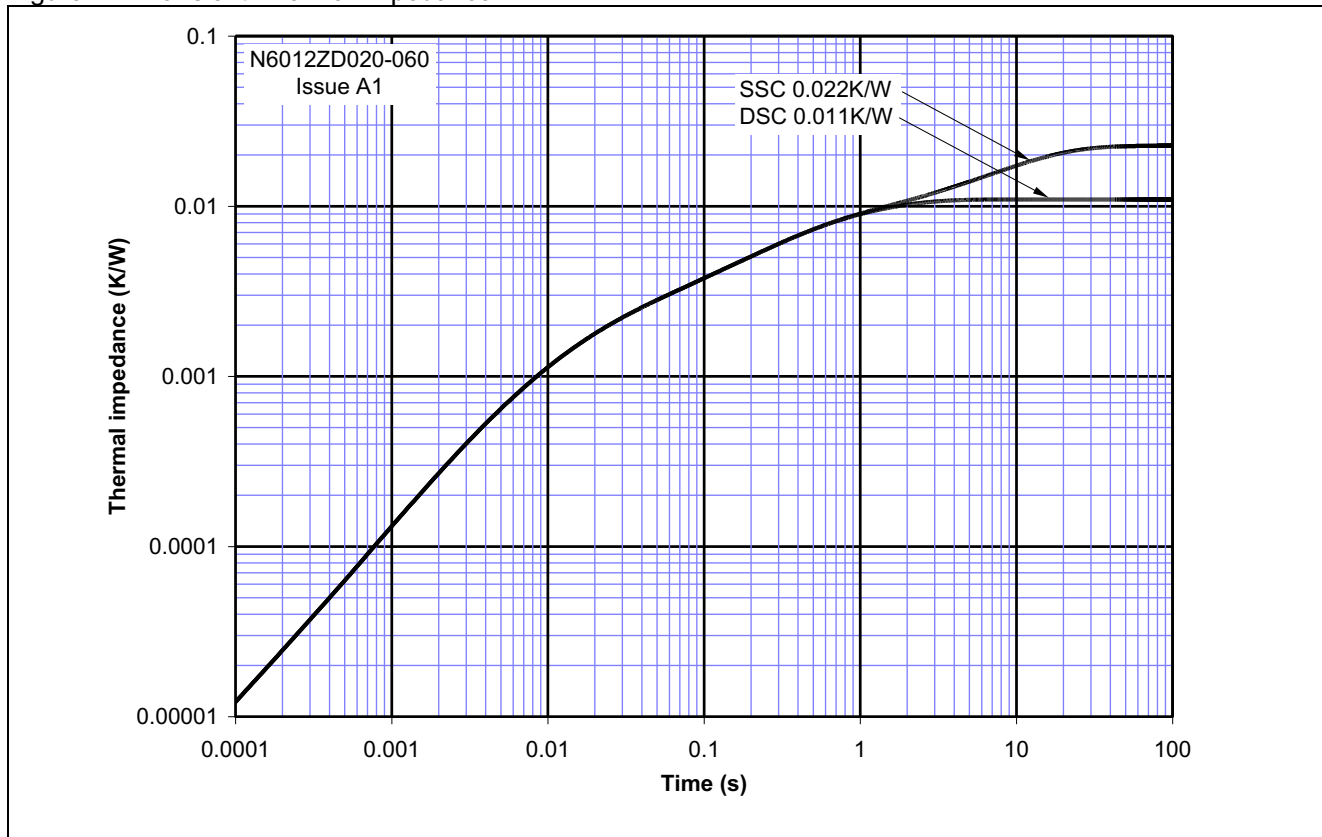
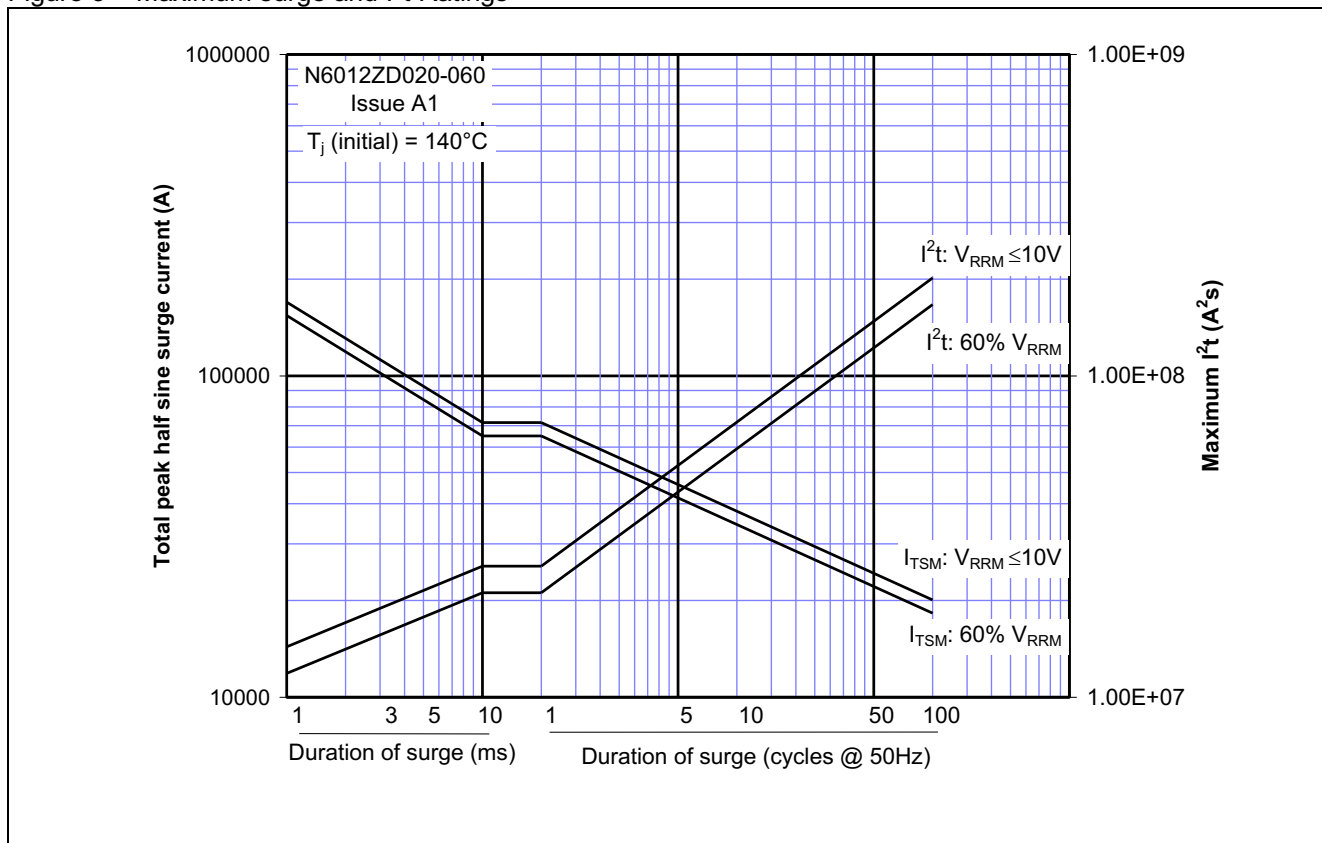
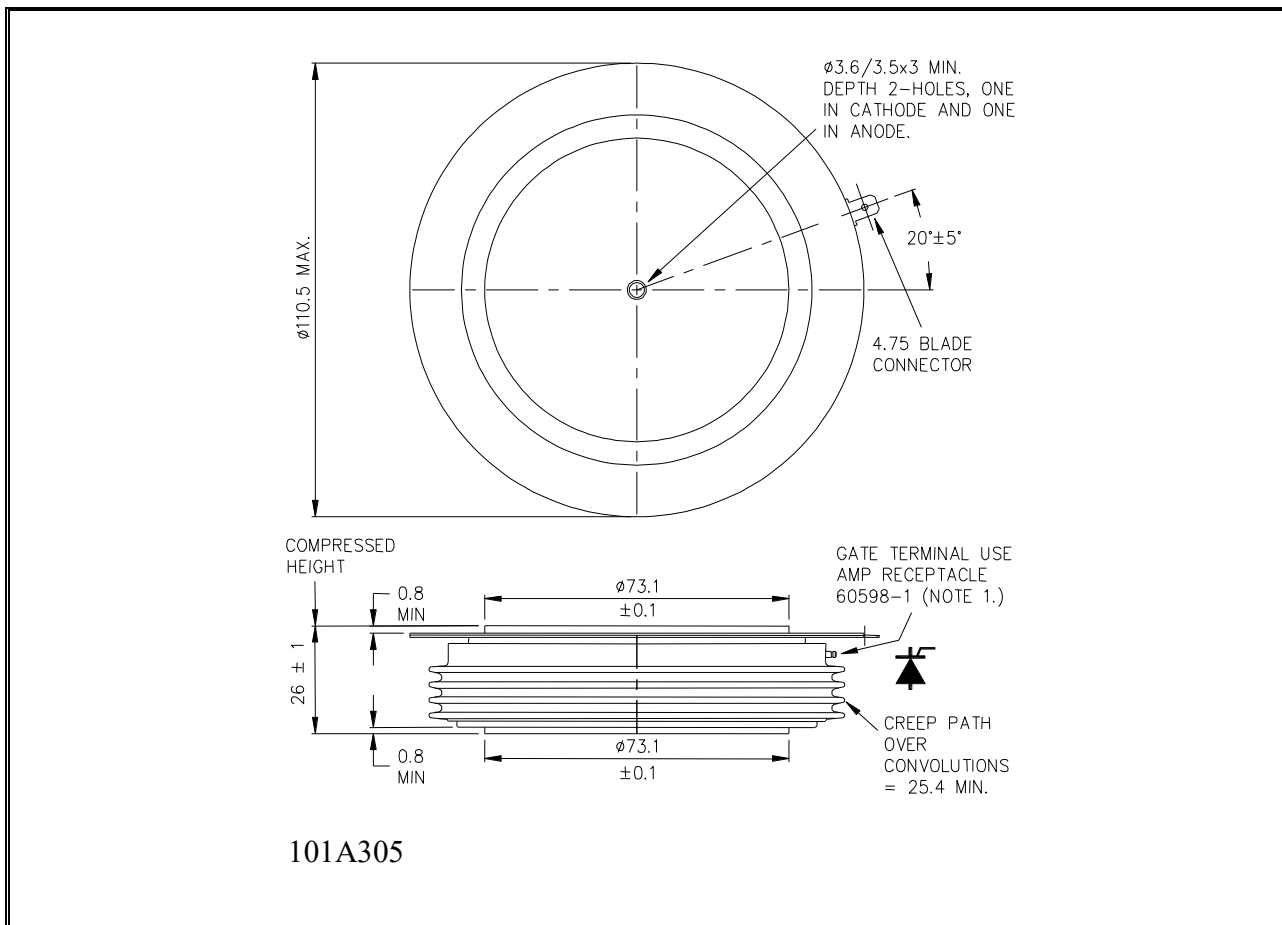


Figure 3 – Maximum surge and I²t Ratings



Outline Drawing & Ordering Information



| ORDERING INFORMATION | | | |
|---------------------------------------|--------------------|--|--------------------------|
| (Please quote 10 digit code as below) | | | |
| N6012 | ZD | ◆◆ | 0 |
| Fixed Type Code | Fixed outline code | Voltage code $V_{DRM}/100$ 02-06 | Fixed turn-off time code |

Order code: N6012ZD040 – 400V V_{DRM} , V_{RRM} , 26mm clamp height capsule.

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