

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)	100
		(repetitive, 50Hz, 60s)	200
		(non-repetitive)	400
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		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/ μ s
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	$T_j=25^\circ C$ $V_D=10V$, $I_T=3A$	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	-	0.6	1.5	$V_D=67\% V_{DRM}$, $I_T=2000A$, $di/dt=10A/\mu s$, $I_{FG}=2A$, $t_r=0.5\mu s$, $T_j=25^\circ C$	μ s
t_{gt}	Turn-on time	-	1.0	2.0		μ s
Q_{rr}	Recovered charge	-	1700	-	$I_{TM}=2000A$, $t_p=2000\mu s$, $di/dt=10A/\mu s$, $V_r=100V$	μ C
Q_{ra}	Recovered charge, 50% Chord	-	1000	1250		μ C
I_{rr}	Reverse recovery current	-	105	-		A
t_{rr}	Reverse recovery time, 50% Chord	-	19	-		μ s
t_q	Turn-off time	-	200	-	$I_{TM}=2000A$, $t_p=2000\mu s$, $di/dt=10A/\mu s$, $V_r=100V$, $V_{dr}=80\%V_{DRM}$, $dV_{dr}/dt=20V/\mu s$	μ s
		-	250	-	$I_{TM}=2000A$, $t_p=2000\mu s$, $di/dt=10A/\mu s$, $V_r=100V$, $V_{dr}=80\%V_{DRM}$, $dV_{dr}/dt=200V/\mu s$	
R_{thJK}	Thermal resistance, junction to heatsink	-	-	0.011	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 $T_j=140^\circ C$.
- 2) For other clamp forces, please consult factory.

Curves

Figure 1 – On-state characteristics of Limit device

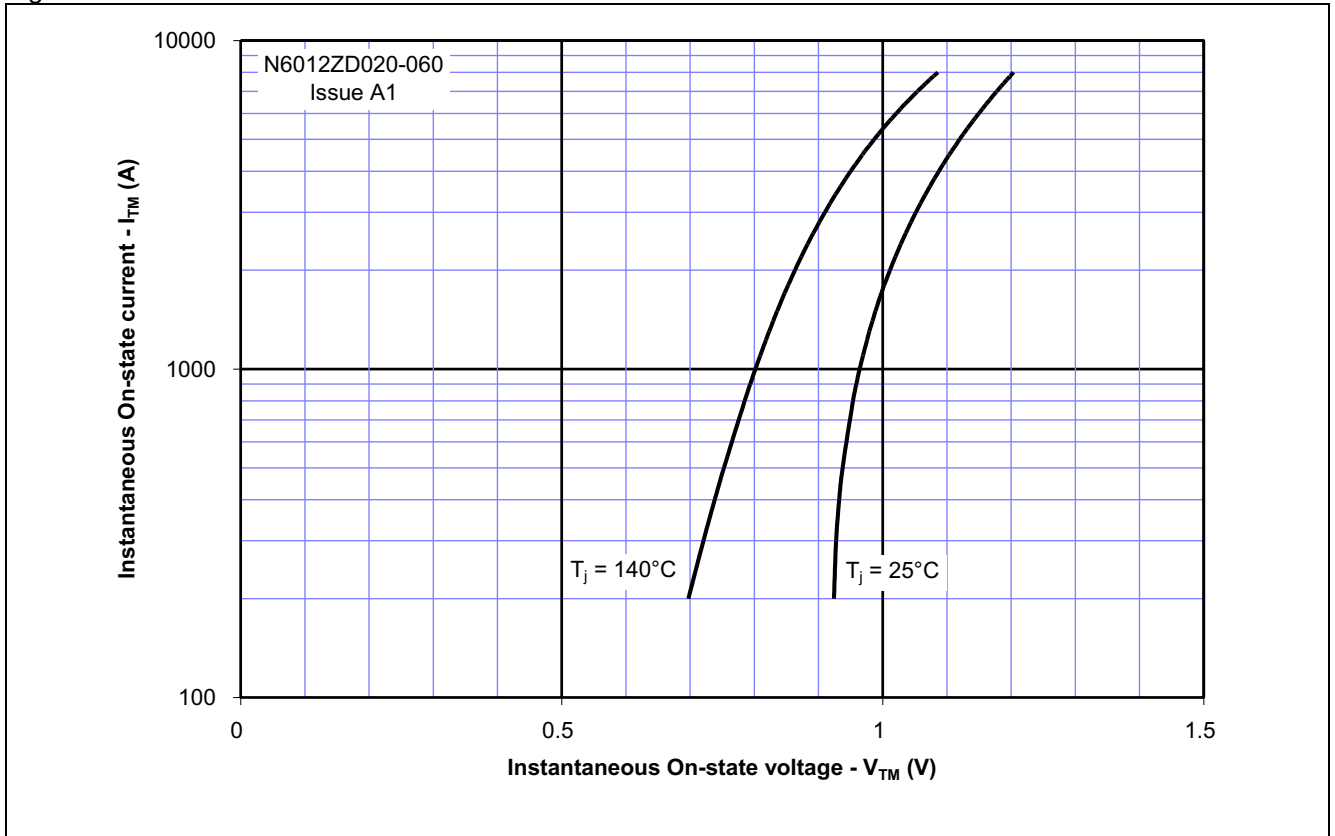


Figure 2 – Transient Thermal Impedance

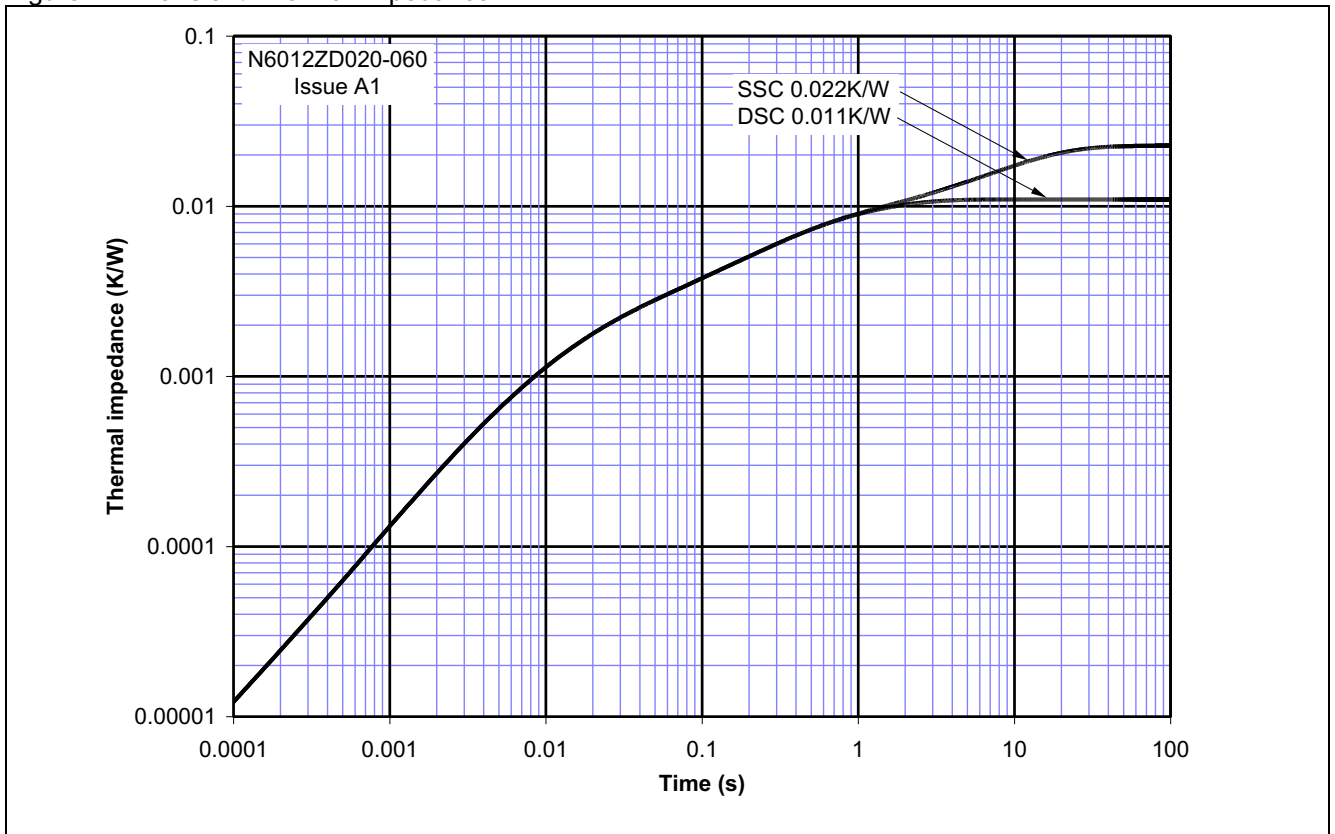
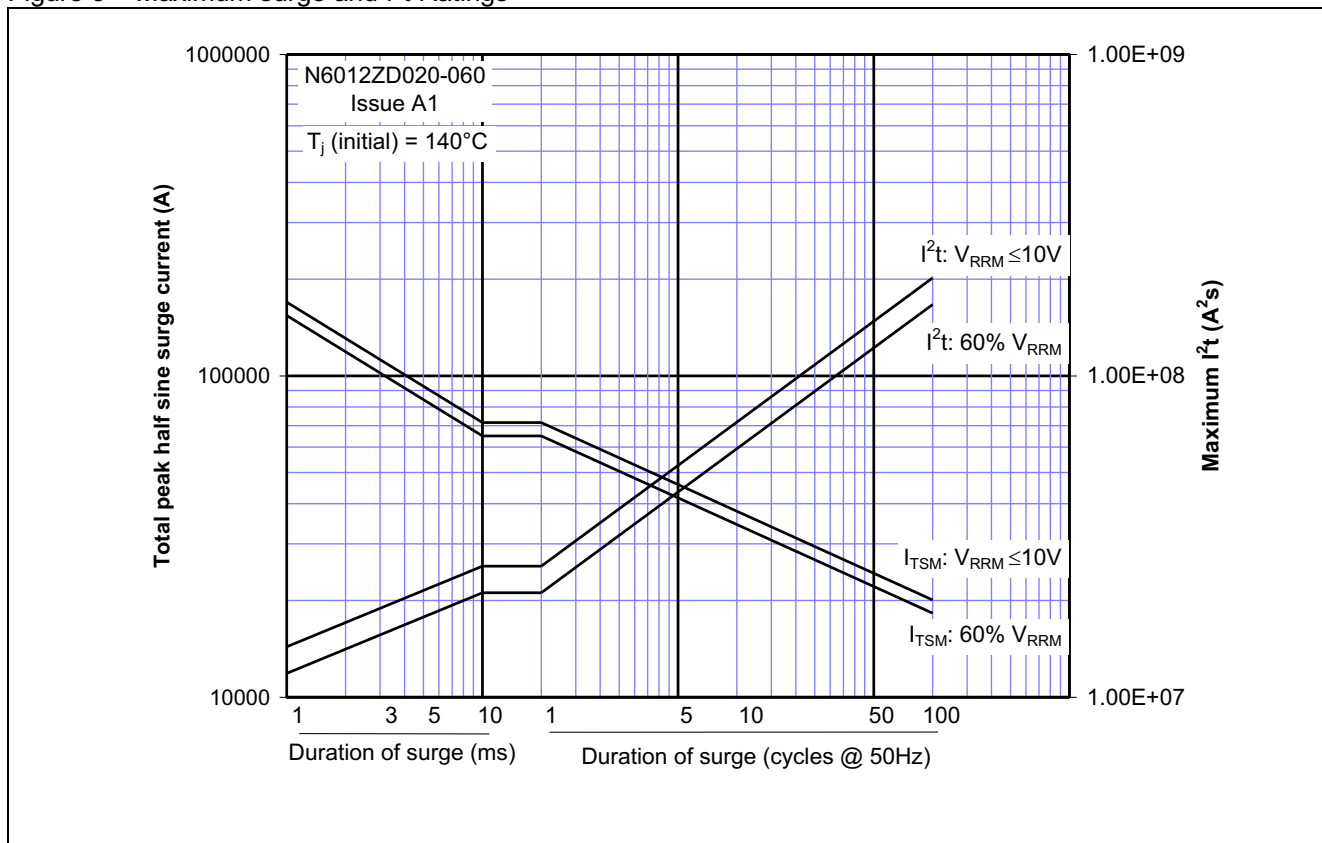
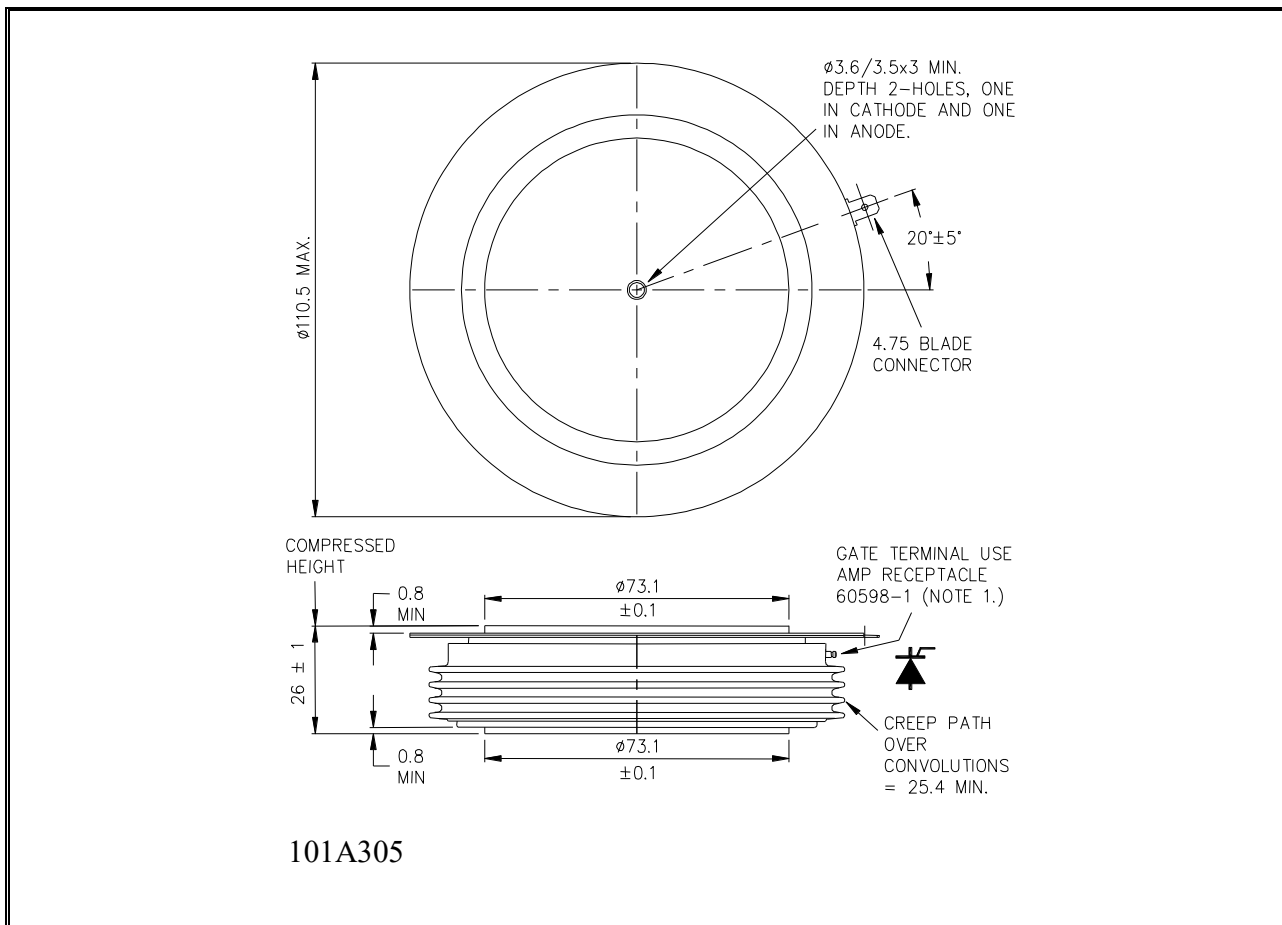


Figure 3 – Maximum surge and I²t Ratings



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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