WESTCODE

Date:- 6 Feb, 2001

Data Sheet Issue:- 1

Phase Control Thyristor

Types N0734YS120 to N0734YS160

Absolute Maximum Ratings

	VOLTAGE RATINGS	MAXIMUM LIMITS	UNITS
V_{DRM}	Repetitive peak off-state voltage, (note 1)	1200-1600	V
V_{DSM}	Non-repetitive peak off-state voltage, (note 1)	1200-1600	V
V_{RRM}	Repetitive peak reverse voltage, (note 1)	1200-1600	V
V_{RSM}	Non-repetitive peak reverse voltage, (note 1)	1300-1700	V

	OTHER RATINGS	MAXIMUM LIMITS	UNITS
$I_{T(AV)}$	Mean on-state current, T_{sink}=55°C, (note 2)	734	A
$I_{T(AV)}$	Mean on-state current. T_{sink}=85°C, (note 2)	494	A
$I_{T(AV)}$	Mean on-state current. T_{sink}=85°C, (note 3)	290	A
$I_{T(RMS)}$	Nominal RMS on-state current, 25°C, (note 2)	1465	A
$I_{T(d.c.)}$	D.C. on-state current, 25°C, (note 4)	1231	A
I_{TSM}	Peak non-repetitive surge t_p=10ms, V_{RM}=0.6V_{RRM}, (note 5)	8400	A
I_{TSM2}	Peak non-repetitive surge t_p=10ms, V_{RM}≤10V, (note 5)	9240	A
I^2t	I^2t capacity for fusing t_p=10ms, V_{RM}=0.6V_{RRM}, (note 5)	353×10^3	A^2s
I^2t	I^2t capacity for fusing t_p=10ms, V_{RM}≤10V, (note 5)	427×10^3	A^2s
di_T/dt	Maximum rate of rise of on-state current (repetitive), (Note 6)	500	A/µs
	Maximum rate of rise of on-state current (non-repetitive), (Note 6)	1000	A/µs
V_{RGM}	Peak reverse gate voltage	5	V
$P_{G(AV)}$	Mean forward gate power	2	W
P_{GM}	Peak forward gate power	30	W
V_{GD}	Non-trigger gate voltage, (Note 7)	0.25	V
T_{HS}	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) Single 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}=1500A, I_{FG}=2A, t_r≤0.5µs, T_{case}=125°C.
7) Rated V_{DRM}.

Characteristics

	PARAMETER	MIN.	TYP.	MAX.	TEST CONDITIONS (Note 1)	UNITS
V_{TM}	Maximum peak on-state voltage	-	-	1.78	I_{TM}=1550A	V
V_0	Threshold voltage	-	-	1.03		V
r_S	Slope resistance	-	-	0.483		mΩ
dv/dt	Critical rate of rise of off-state voltage	1000	-	-	V_D=80% V_{DRM}	V/µs
I_{DRM}	Peak off-state current	-	-	40	Rated V_{DRM}	mA
I_{RRM}	Peak reverse current	-	-	40	Rated V_{RRM}	mA
V_{GT}	Gate trigger voltage	-	-	3.0	T_j=25°C	V
I_{GT}	Gate trigger current	-	-	150	T_j=25°C. V_D=10V, I_T=3A	mA
I_H	Holding current	-	-	500	T_j=25°C	mA
R_θ	Thermal resistance, junction to heatsink	-	-	0.05	Double side cooled	K/W
		-	-	0.1	Single side cooled	K/W
F	Mounting force	5.3	-	10		kN
W_t	Weight	-	90	-		g

Notes:-
1) Unless otherwise indicated T_j=125°C.

Notes on Ratings and Characteristics

1.0 Voltage Grade Table

Voltage Grade 'H'	V_{DRM} V_{DSM} V_{RRM} V	V_{RSM} V	V_D V_R DC V
12	1200	1300	810
14	1400	1500	930
16	1600	1700	1040

2.0 Extension of Voltage Grades

This report is applicable to other and higher voltage grades when supply has been agreed by Sales/Production.

3.0 De-rating Factor

A blocking voltage de-rating factor of 0.13%/°C is applicable to this device for T_j below 25°C.

4.0 Repetitive dv/dt

Standard dv/dt is 1000V/µs.

5.0 Computer Modelling Parameters

5.1 Device Dissipation Calculations

$$I_{AV} = \frac{-V_0 + \sqrt{V_0^{\,2} + 4 \cdot ff^2 \cdot r_s \cdot W_{AV}}}{2 \cdot ff^2 \cdot r_s}$$

and:

$$W_{AV} = \frac{\Delta T}{R_{th}}$$

$$\Delta T = T_{j\max} - T_{Hs}$$

Where V_0=1.03V,r_s=0.483mΩ,

R_{th} = Supplementary thermal impedance, see table below.

ff = Form factor, see table below.

Supplementary Thermal Impedance							
Conduction Angle	30°	60°	90°	120°	180°	270°	d.c.
Square wave Double Side Cooled	0.071	0.069	0.065	0.061	0.057	0.053	0.05
Square wave Single Side Cooled	0.12	0.119	0.115	0.111	0.107	0.103	0.1
Sine wave Double Side Cooled	0.053	0.052	0.0516	0.0513	0.0505		
Sine wave Single Side Cooled	0.103	0.102	0.1017	0.1013	0.1005		

Form Factors							
Conduction Angle	30°	60°	90°	120°	180°	270°	d.c.
Square wave	3.46	2.45	2	1.73	1.41	1.15	1
Sine wave	3.98	2.78	2.22	1.88	1.57		

5.2 Calculating V_T using ABCD Coefficients

The on-state characteristic I_T vs. V_T, on page 7 is represented in two ways;
(i) the well established V_o and r_s tangent used for rating purposes and
(ii) a set of constants A, B, C, D, forming the coefficients of the representative equation for V_T in terms of I_T given below:

$$V_T = A + B \cdot \ln(I_T) + C \cdot I_T + D \cdot \sqrt{I_T}$$

The constants, derived by curve fitting software, are given below for both hot and cold characteristics. The resulting values for V_T agree with the true device characteristic over a current range, which is limited to that plotted.

25°C Coefficients		125°C Coefficients	
A	0.608472	A	0.255645
B	0.1136108	B	0.1512629
C	4.010517×10^{-4}	C	5.081796×10^{-4}
D	-8.037156×10^{-3}	D	-9.373878×10^{-3}

5.3 D.C. Thermal Impedance Calculation

$$r_t = \sum_{p=1}^{p=n} r_p \cdot \left(1 - e^{\frac{-t}{\tau_p}}\right)$$

Where *p = 1* to *n, n* is the number of terms in the series and:

t = Duration of heating pulse in seconds.
r_t = Thermal resistance at time t.
r_p = Amplitude of p_{th} term.
τ_p = Time Constant of r_{th} term.

D.C. Double Side Cooled				
Term	1	2	3	4
r_p	0.12000552	0.01609235	8.812673×10^{-3}	3.659765×10^{-3}
τ_p	0.3391689	0.09405764	0.12195269	2.196197×10^{-3}

D.C. Single Side Cooled					
Term	1	2	3	4	5
r_p	0.06157697	8.431182×10^{-3}	0.01031315	0.01613806	5.181088×10^{-3}
τ_p	2.136132	1.212898	0.1512408	0.04244	2.889595×10^{-3}

Curves

Figure 1 - On-state current vs. Power dissipation - Double Side Cooled (Sine wave)

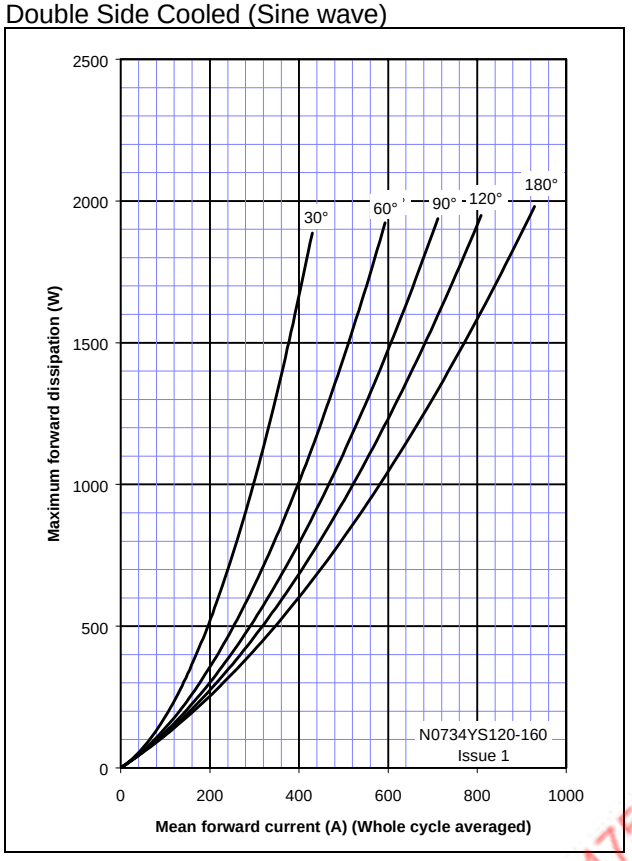


Figure 2 - On-state current vs. Heatsink temperature - Double Side Cooled (Sine wave)

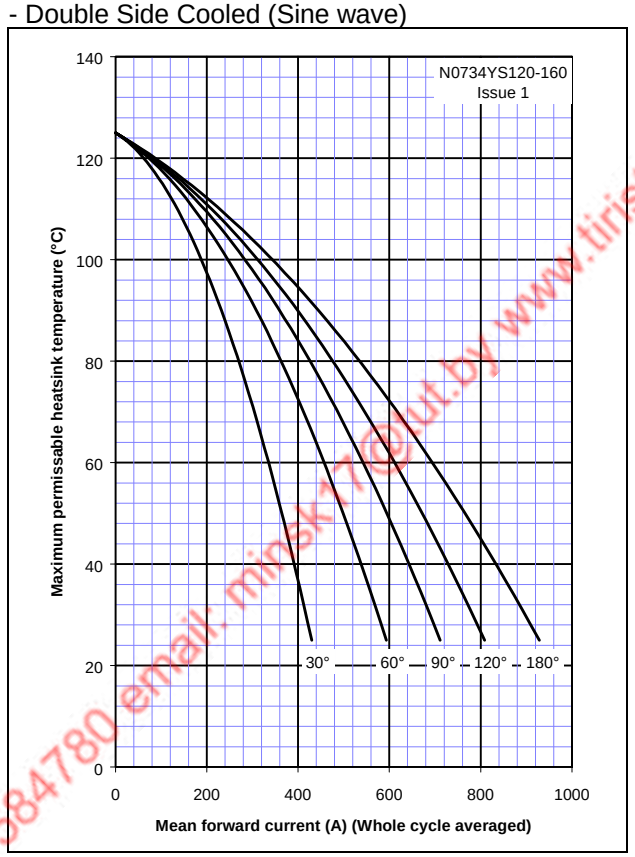


Figure 3 - On-state current vs. Power dissipation - Double Side Cooled (Square wave)

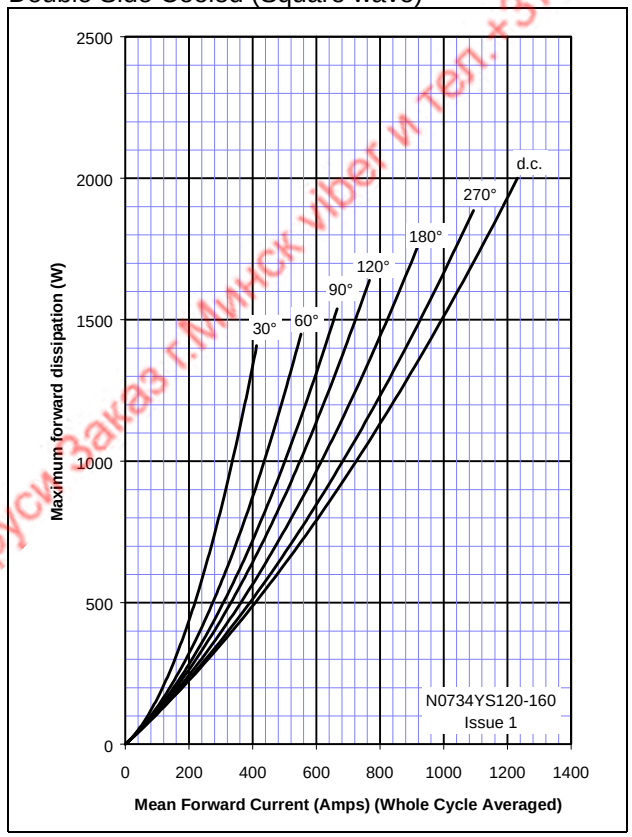


Figure 4 - On-state current vs. Heatsink temperature - Double Side Cooled (Square wave)

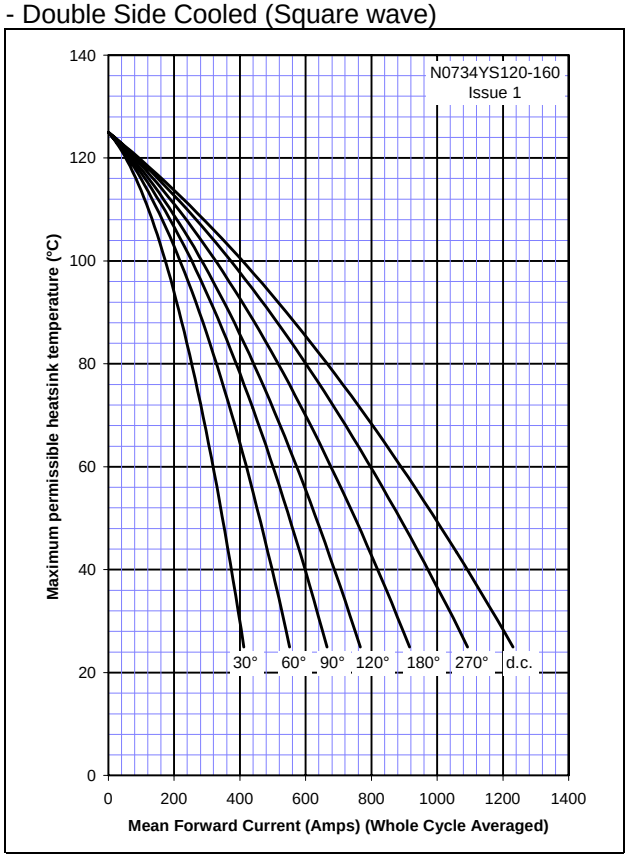


Figure 5 - On-state current vs. Power dissipation - Single Side Cooled (Sine wave)

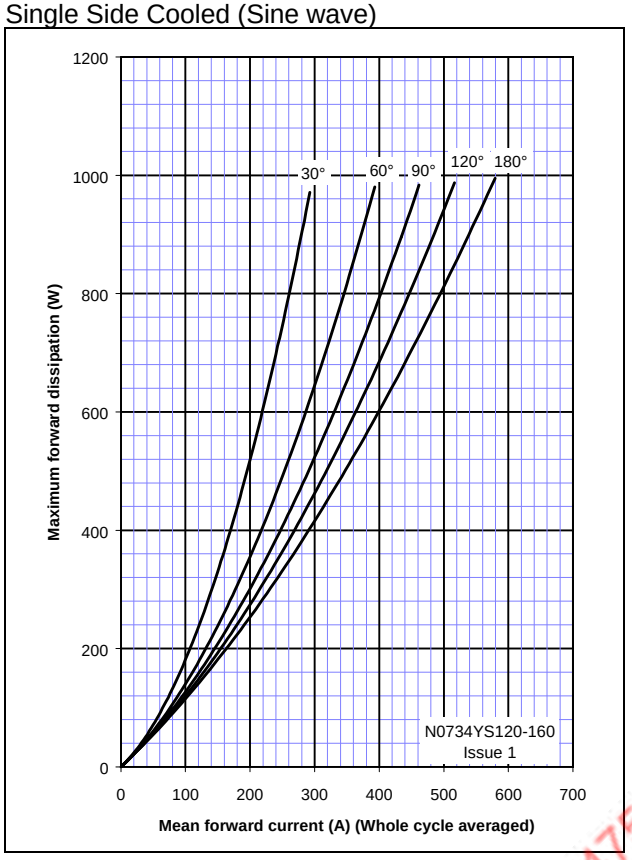


Figure 6 - On-state current vs. Heatsink temperature - Single Side Cooled (Sine wave)

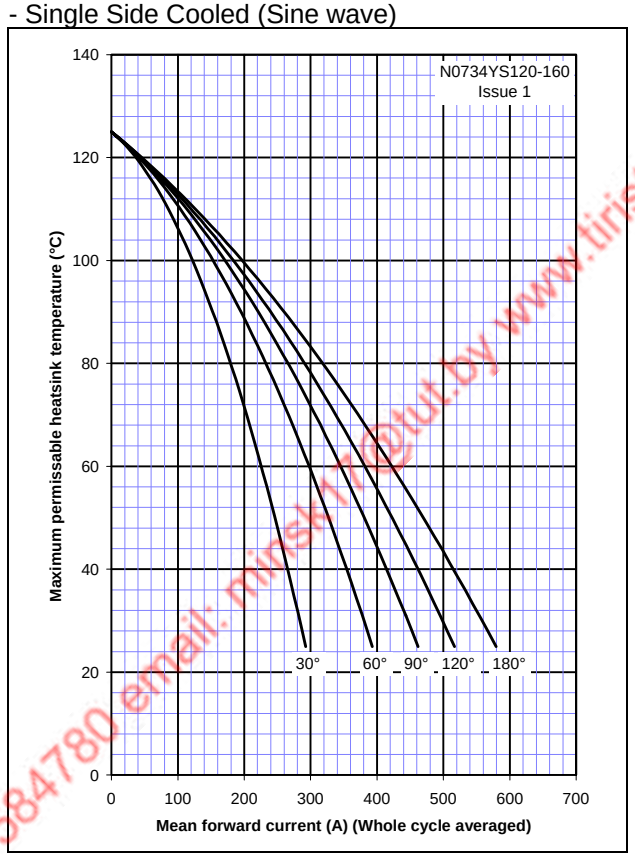


Figure 7 - On-state current vs. Power dissipation - Single Side Cooled (Square wave)

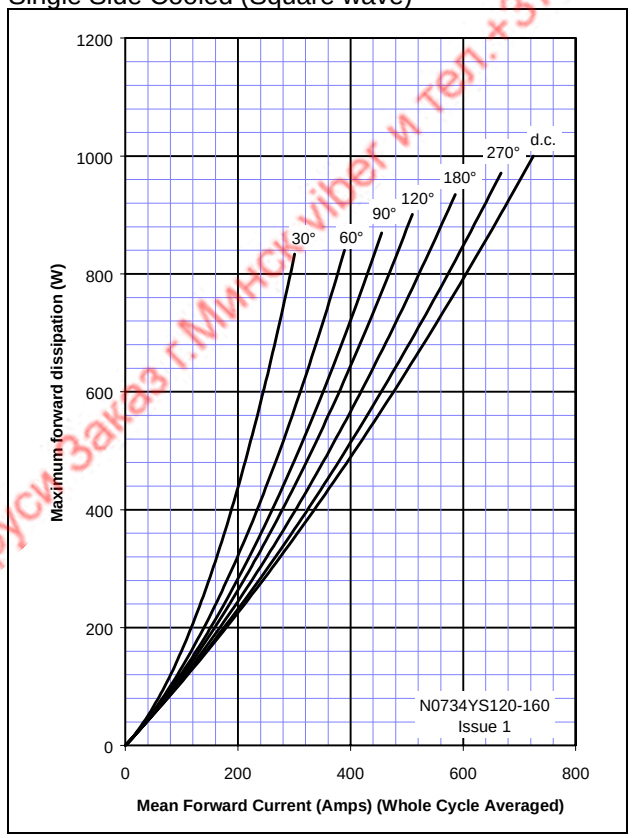


Figure 8 - On-state current vs. Heatsink temperature - Single Side Cooled (Square wave)

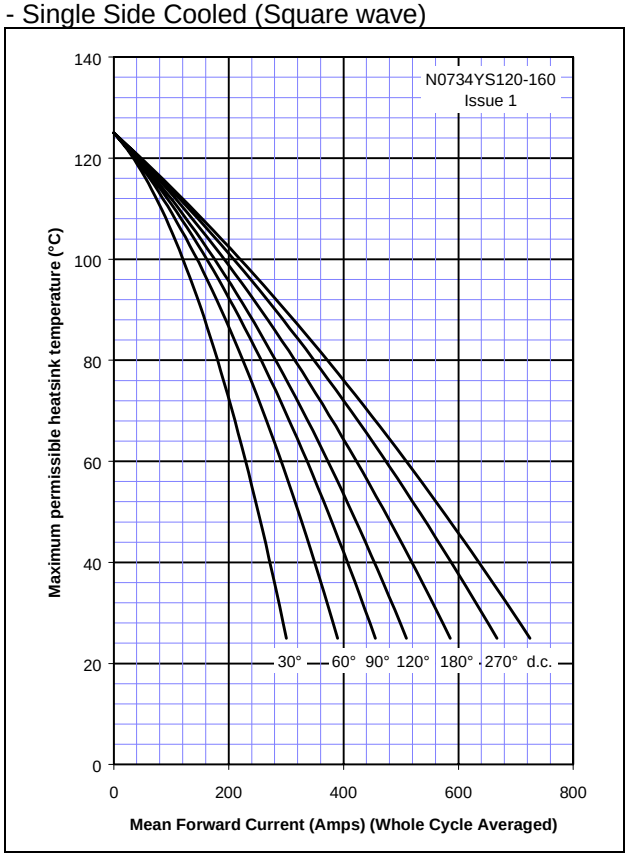


Figure 9 - On-state characteristics of Limit device

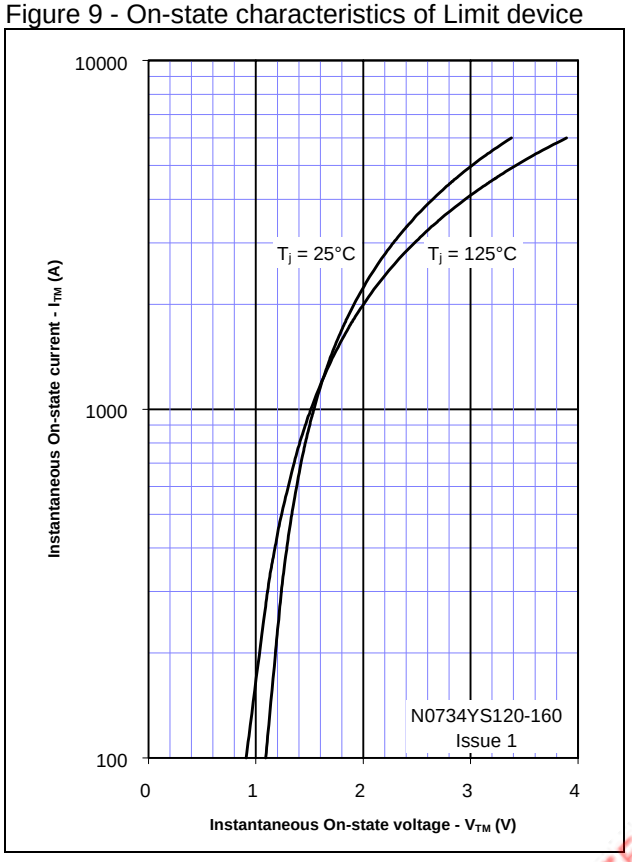


Figure 10 - Transient Thermal Impedance

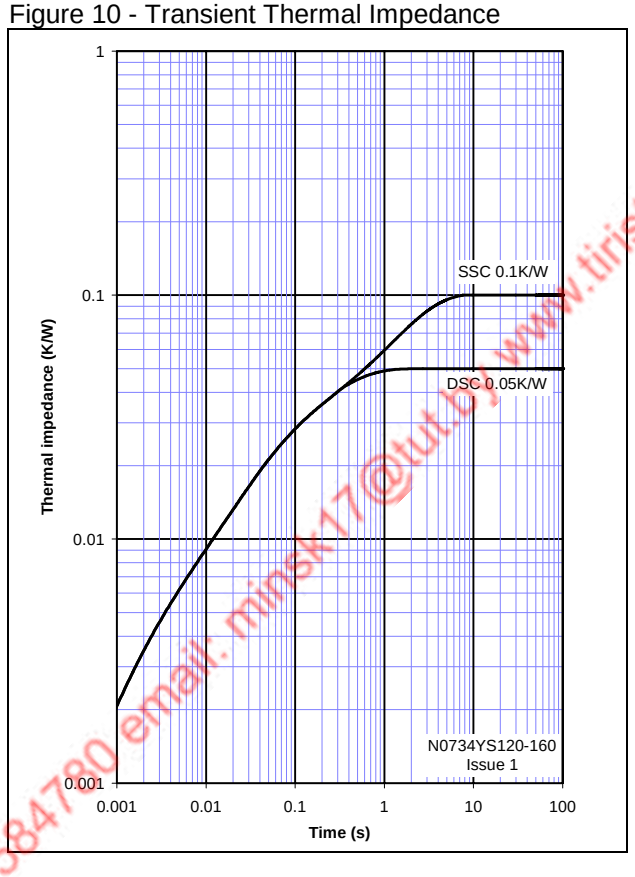


Figure 11 - Gate Characteristics - Trigger Limits

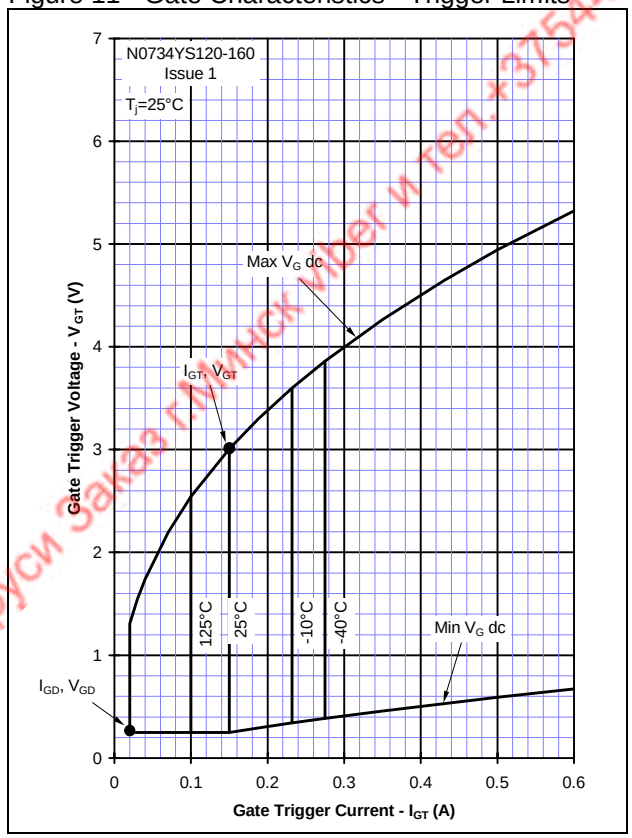


Figure 12 - Gate Characteristics - Power Curves

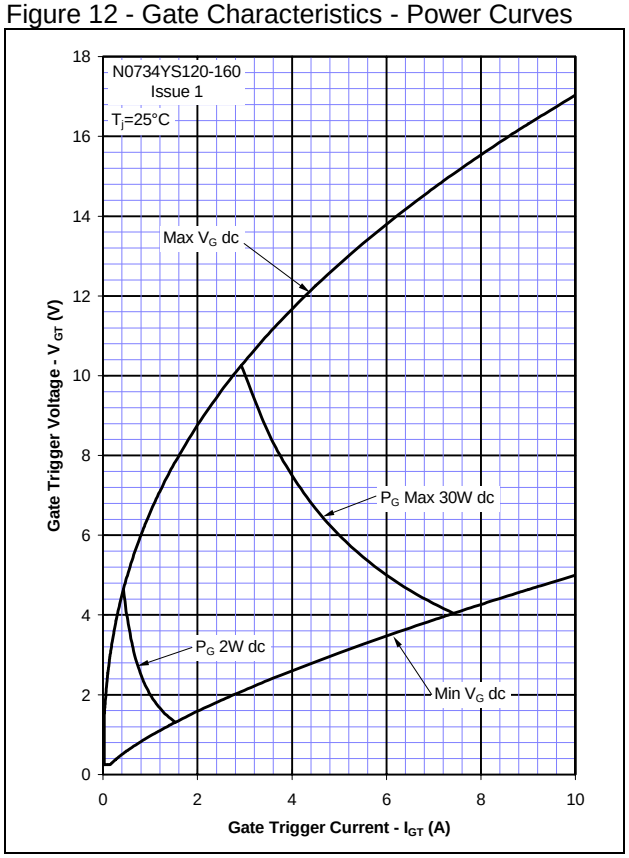
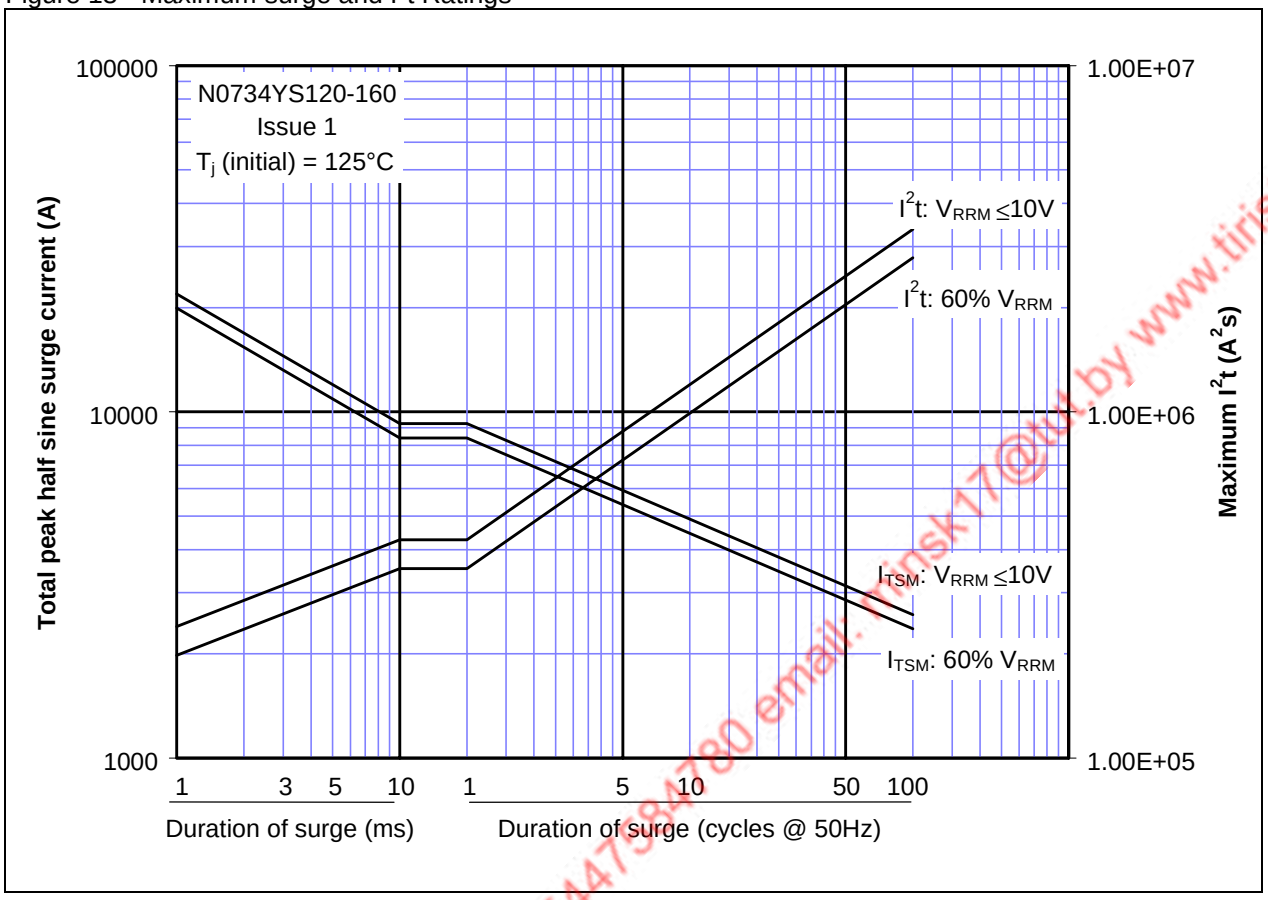
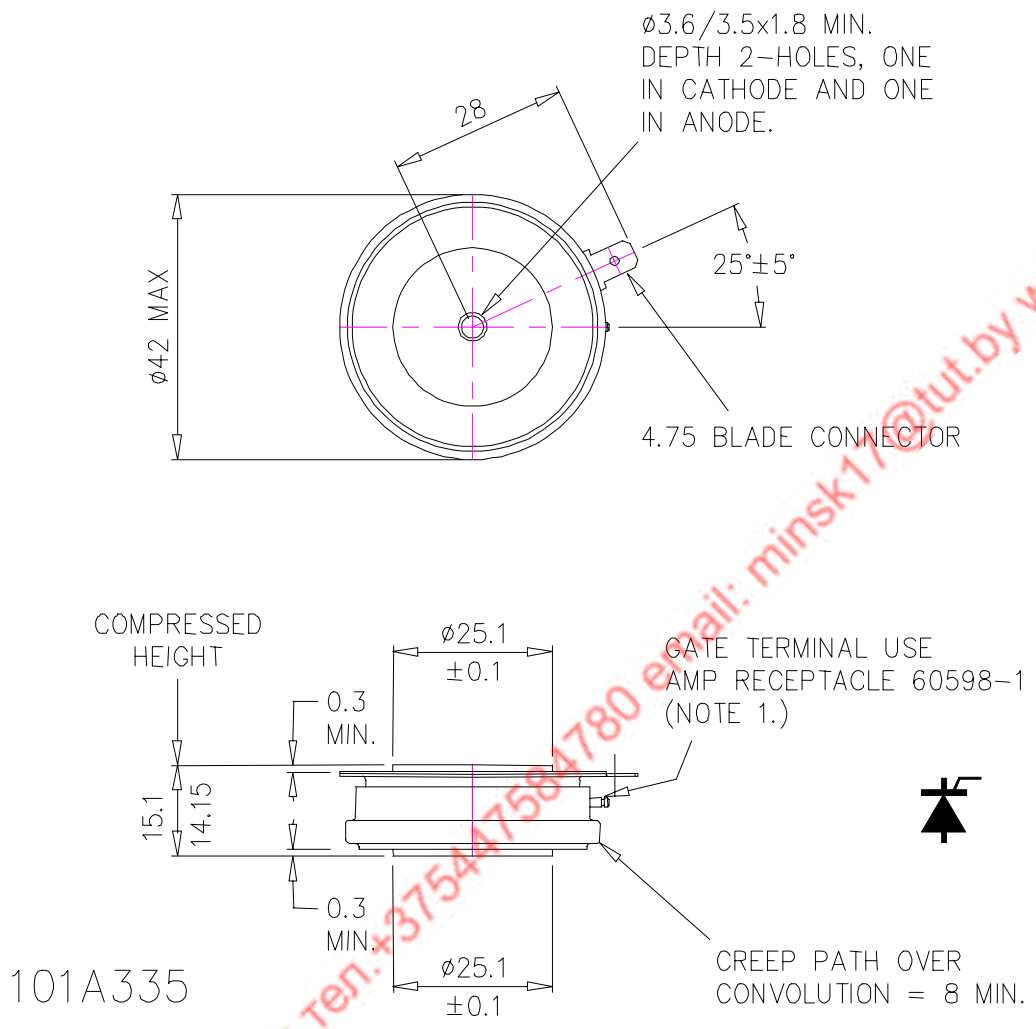


Figure 13 - Maximum surge and I^2t Ratings



Outline Drawing & Ordering Information



ORDERING INFORMATION (Please quote 10 digit code as below)

N0734	YS	♦ ♦	0
Fixed Type Code	Fixed Outline Code	Voltage Code 120-160	Fixed turn-off time code

Typical order code: N0734YS120 – 1200V V_{DRM}, V_{RRM}, 1000V/µs dv/dt, 15.1mm clamp height capsule.

WESTCODE

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Internet: http://www.westcode.com

Phase Control Thyristors - Capsule Types

We provide one of the most comprehensive ranges of standard phase control thyristors in the industry.
Device with voltage ranges from 600V to 4500V are available, making them suitable for applications with line voltages from 230V to over 1000V (higher voltage applications are now served by our range of Medium Voltage Thyristors). Westcode is a leading supplier of phase control products into demanding markets such as industrial DC drives, induction melting, marine/rail propulsion systems, wind power converters, electrochemical power supplies and soft starters. These devices are optimised to give low conduction losses and are primarily intended for applications with line frequencies up to 400Hz.

Type		V_{DRM} V_{RRM}	I_{TAV} T_K=55°C	I_{TSM} 10ms ½ sine, V_R ≤60% V_{RRM}	I^2t	V_{T0} @T_{JM}	r_T @T_{JM}	T_{JM}	R_{thJK} 180° Sine	R_{thJK} 120° Rect.	Fig. No.
Part No.	Old Part No.	V	A	A	A^2s	V	mΩ	°C	K/W	K/W	
N0194WC120	N086CH12	1200	194	1700	14.5×10^3	1.570	2.290	125	0.135	0.190	W8
N0194WC160	N086CH16	1600	194	1700	14.5×10^3	1.570	2.290	125	0.135	0.190	W8
N0255WC120	N105CH12	1200	255	2450	30.0×10^3	0.900	1.790	125	0.135	0.190	W8
N0255WC160	N105CH16	1600	255	2450	30.0×10^3	0.900	1.790	125	0.135	0.190	W8
N0339WC120	N170CH12	1200	339	4200	88.2×10^3	1.080	1.300	125	0.095	0.110	W8
N0339WC160	N170CH16	1600	339	4200	88.2×10^3	1.080	1.300	125	0.095	0.110	W8
N0392WC120	N195CH12	1200	392	4650	108×10^3	0.920	0.990	125	0.095	0.110	W8
N0392WC160	N195CH16	1600	392	4650	108×10^3	0.920	0.990	125	0.095	0.110	W8
N0491WC020	N275CH02	200	491	6000	180×10^3	0.850	0.535	125	0.095	0.110	W8
N0491WC080	N275CH08	800	491	6000	180×10^3	0.850	0.535	125	0.095	0.110	W8
N0606YS200	N282SH20	2000	606	7100	252×10^3	1.103	0.804	125	0.050	0.058	W9
N0606YS250	N/A	2500	606	7100	252×10^3	1.103	0.804	125	0.050	0.058	W9
N0616LC400	N255CH40	4000	616	5250	138×10^3	1.220	1.530	125	0.032	0.040	W10
N0616LC450	N255CH45	4500	616	5250	138×10^3	1.220	1.530	125	0.032	0.040	W10
N0634LC380	N257CH38	3800	634	7000	245×10^3	1.100	1.500	125	0.032	0.040	W10
N0634LC420	N257CH42	4200	634	7000	245×10^3	1.100	1.500	125	0.032	0.040	W10
N0646LC300	N260CH30	3000	646	5700	162×10^3	1.210	1.360	125	0.032	0.040	W10
N0646LC360	N260CH36	3600	646	5700	162×10^3	1.210	1.360	125	0.032	0.040	W10
N0676YS120	N281SH12	1200	676	7500	281×10^3	1.090	0.587	125	0.050	0.058	W9
N0676YS180	N281SH18	1800	676	7500	281×10^3	1.090	0.587	125	0.050	0.058	W9
N0734YS120	N280SH12	1200	734	8400	353×10^3	1.030	0.483	125	0.050	0.058	W9
N0734YS160	N280SH16	1600	734	8400	353×10^3	1.030	0.483	125	0.050	0.058	W9
N0782YS120	N283SH12	1200	782	9420	444×10^3	0.920	0.450	125	0.050	0.058	W9
N0782YS140	N283SH14	1600	782	9420	444×10^3	0.920	0.450	125	0.050	0.058	W9
N0882NC400	N320CH40	4000	882	7700	296×10^3	1.300	0.920	125	0.024	0.030	W11
N0882NC450	N320CH45	5000	882	7700	296×10^3	1.300	0.920	125	0.024	0.030	W11
N0910LS200	N330SH20	2000	910	9200	423×10^3	1.040	0.606	125	0.032	0.040	W10a
N0910LS260	N330SH26	2600	910	9200	423×10^3	1.040	0.606	125	0.032	0.040	W10a
N0992YS020	N310SH02	200	992	11000	605×10^3	0.820	0.240	125	0.050	0.058	W9
N0992YS060	N310SH06	600	992	11000	605×10^3	0.820	0.240	125	0.050	0.058	W9
N1010NC300	N360CH30	3000	1010	12100	732×10^3	1.170	0.687	125	0.024	0.030	W11
N1010NC380	N360CH38	3800	1010	12100	732×10^3	1.170	0.687	125	0.024	0.030	W11
N1042LS120	N350SH12	1200	1042	11500	661×10^3	1.080	0.395	125	0.032	0.040	W10a
N1042LS180	N350SH18	1800	1042	11500	661×10^3	1.080	0.395	125	0.032	0.040	W10a

Figure W8 - 19mm - 70g

Figure W9 - 25mm - 90g

Figure W10 - 34mm - 340g

Figure W10a - 34mm - 340g

Figure W11 - 47mm - 510g

Type		V_{DRM} / V_{RRM}	I_{TAV} T_K=55°C	I_{TSM} 10ms ½ sine V_R ≤60% V_{RRM}	I^2t V_R ≤60% V_{RRM}	V_{T0} @T_{JM}	r_T @T_{JM}	T_{JM}	R_{thJK} 180° Sine	R_{thJK} 120° Rect.	Fig. No.
Part No.	Old Part No.	V	A	A	A^2s	V	mΩ	°C	K/W	K/W	
N1114LS120	N370SH12	1200	1114	12700	806×10^3	1.000	0.349	125	0.032	0.040	W10a
N1114LS180	N370SH18	1800	1114	12700	806×10^3	1.000	0.349	125	0.032	0.040	W10a
N1132NC300	N390CH30	3000	1132	14300	1.02×10^6	1.150	0.510	125	0.024	0.030	W11
N1132NC320	N390CH32	3200	1132	14300	1.02×10^6	1.150	0.510	125	0.024	0.030	W11
N1159NC380	N500CH38	3800	1159	14500	1.05×10^6	1.100	0.574	125	0.022	0.027	W11
N1159NC420	N500CH42	4200	1159	14500	1.05×10^6	1.100	0.574	125	0.022	0.027	W11
N1265LS120	N520SH12	1200	1226	15000	1.13×10^6	0.883	0.297	125	0.032	0.040	W10a
N1265LS160	N520SH16	1600	1226	15000	1.13×10^6	0.883	0.297	125	0.032	0.040	W10a
N1297NS200	N450SH20	2000	1297	17600	1.55×10^6	1.030	0.380	125	0.024	0.030	W11a
N1297NS260	N450SH26	2600	1297	17600	1.55×10^6	1.030	0.380	125	0.024	0.030	W11a
N1314NC300	N570CH30	3000	1314	16600	1.38×10^6	1.000	0.437	125	0.024	0.030	W11
N1314NC360	N570CH36	3600	1314	16600	1.38×10^6	1.000	0.437	125	0.024	0.030	W11
N1351VC400	N560CH40	4000	1351	17500	1.53×10^6	1.200	0.553	125	0.017	0.020	W12
N1351VC450	N560CH45	4500	1351	17500	1.53×10^6	1.200	0.553	125	0.017	0.020	W12
N1351VD400	N/A	4000	1351	17500	1.53×10^6	1.200	0.553	125	0.017	0.020	W50
N1351VD450	N/A	4500	1351	17500	1.53×10^6	1.200	0.553	125	0.017	0.020	W50
N1467NS200	N490SH20	2000	1467	21500	2.31×10^6	1.000	0.272	125	0.024	0.030	W11a
N1467NS260	N490SH26	2600	1467	21500	2.31×10^6	1.000	0.272	125	0.024	0.030	W11a
N1479NS240	N620SH24	2400	1436	21000	2.21×10^6	1.000	0.342	125	0.022	0.026	W11a
N1479NS300	N620SH30	3000	1436	21000	2.21×10^6	1.000	0.342	125	0.022	0.026	W11a
N1547NS160	N510SH16	1600	1547	23300	2.71×10^6	0.920	0.252	125	0.024	0.030	W11a
N1547NS200	N510SH20	2000	1547	23300	2.71×10^6	0.920	0.252	125	0.024	0.030	W11a
N1588NS200	N680SH20	2000	1588	22500	2.53×10^6	0.951	0.268	125	0.022	0.027	W11a
N1588NS260	N680SH26	2600	1588	22500	2.53×10^6	0.951	0.268	125	0.022	0.027	W11a
N1661VC300	N630CH30	3000	1661	23000	2.65×10^6	1.040	0.350	125	0.017	0.020	W12
N1661VC360	N630CH36	3600	1661	23000	2.65×10^6	1.040	0.350	125	0.017	0.020	W12
N1661VD300	N/A	3000	1661	23000	2.65×10^6	1.040	0.350	125	0.017	0.020	W50
N1661VD360	N/A	3600	1661	23000	2.65×10^6	1.040	0.350	125	0.017	0.020	W50
N1712VC240	N640CH24	2400	1712	24500	3.00×10^6	1.050	0.320	125	0.017	0.020	W12
N1712VC300	N640CH30	3000	1712	24500	3.00×10^6	1.050	0.320	125	0.017	0.020	W12
N1712VD240	N/A	2400	1712	24500	3.00×10^6	1.050	0.320	125	0.017	0.020	W50
N1712VD300	N/A	3000	1712	24500	3.00×10^6	1.050	0.320	125	0.017	0.020	W50
N1718NS120	N540SH12	1200	1718	27200	3.70×10^6	0.979	0.169	125	0.024	0.030	W11a
N1718NS180	N540SH18	1800	1718	27200	3.70×10^6	0.979	0.169	125	0.024	0.030	W11a
N1802NS120	N600SH12	1200	1802	29600	4.38×10^6	0.855	0.171	125	0.024	0.030	W11a
N1802NS160	N600SH16	1600	1802	29600	4.38×10^6	0.855	0.171	125	0.024	0.030	W11a
N2046NS120	N740SH12	1200	2046	29200	4.26×10^6	0.980	0.114	125	0.022	0.026	W11a
N2046NS160	N740SH16	1600	2046	29200	4.26×10^6	0.980	0.114	125	0.022	0.026	W11a

Figure W10a - 34mm - 340g

Figure W11 - 47mm - 510g

Figure W11a - 47mm - 510g

Figure W12 - 63mm - 1000g

Figure W50 - 63mm - 750g

Type		V_{DRM} / V_{RRM}	I_{TAV} T_K=55°C	I_{TSM} 10ms ½ sine V_R ≤60% V_{RRM}	I^2t V_R ≤60% V_{RRM}	V_{T0} @T_{JM}	r_T @T_{JM}	T_{JM}	R_{thJK} 180° Sine	R_{thJK} 120° Rect.	Fig. No.
Part No.	Old Part No.	V	A	A	A^2s	V	mΩ	°C	K/W	K/W	
N2086NS060	N610SH06	600	2086	35000	6.13×10^6	0.840	0.108	125	0.024	0.030	W11a
N2086NS100	N610SH10	1000	2086	35000	6.13×10^6	0.840	0.108	125	0.024	0.030	W11a
N2172ZC400	N750CH40	4000	2172	28000	3.92×10^6	1.350	0.294	125	0.011	0.012	W13
N2172ZC450	N750CH45	4500	2172	28000	3.92×10^6	1.350	0.294	125	0.011	0.012	W13
N2172ZD400	N750DH40	4000	2172	28000	3.92×10^6	1.350	0.294	125	0.011	0.012	W46
N2172ZD450	N750DH45	4500	2172	28000	3.92×10^6	1.350	0.294	125	0.011	0.012	W46
N2293VC180	N760CH18	1800	2293	33800	5.71×10^6	0.956	0.148	125	0.017	0.020	W12
N2293VC220	N760CH22	2200	2293	33800	5.71×10^6	0.956	0.148	125	0.017	0.020	W12
N2293VD180	N/A	1800	2293	33800	5.71×10^6	0.956	0.148	125	0.017	0.020	W50
N2293VD220	N/A	2200	2293	33800	5.71×10^6	0.956	0.148	125	0.017	0.020	W50
N2418ZC300	N850CH30	3000	2418	30000	4.50×10^6	1.160	0.246	125	0.011	0.012	W13
N2418ZC360	N850CH36	3600	2418	30000	4.50×10^6	1.160	0.246	125	0.011	0.012	W13
N2418ZD300	N/A	3000	2418	30000	4.50×10^6	1.160	0.246	125	0.011	0.012	W46
N2418ZD360	N/A	3600	2418	30000	4.50×10^6	1.160	0.246	125	0.011	0.012	W46
N2500VC120	N990CH12	1200	2500	37000	6.85×10^6	0.880	0.124	125	0.017	0.020	W12
N2500VC160	N990CH16	1600	2500	37000	6.85×10^6	0.880	0.124	125	0.017	0.020	W12
N2500VD120	N/A	1200	2500	37000	6.85×10^6	0.880	0.124	125	0.017	0.020	W50
N2500VD160	N/A	1600	2500	37000	6.85×10^6	0.880	0.124	125	0.017	0.020	W50
N2543ZC240	N880CH24	2400	2543	32000	5.12×10^6	0.780	0.274	125	0.011	0.012	W13
N2543ZC300	N880CH30	3000	2543	32000	5.12×10^6	0.780	0.274	125	0.011	0.012	W13
N2543ZD240	N/A	2400	2543	32000	5.12×10^6	0.780	0.274	125	0.011	0.012	W46
N2543ZD300	N/A	3000	2543	32000	5.12×10^6	0.780	0.274	125	0.011	0.012	W46
N3012ZC200	N900CH20	2000	3012	45100	10.2×10^6	0.920	0.160	125	0.011	0.012	W13
N3012ZC260	N900CH26	2600	3012	45100	10.2×10^6	0.920	0.160	125	0.011	0.012	W13
N3012ZD200	N/A	2000	3012	45100	10.2×10^6	0.920	0.160	125	0.011	0.012	W46
N3012ZD260	N/A	2600	3012	45100	10.2×10^6	0.920	0.160	125	0.011	0.012	W46
N3476TC360	N1463CH36	3600	3476	46800	10.95×10^6	0.970	0.180	125	0.008	0.009	W14
N3476TC420	N1463CH42	4200	3476	46800	10.95×10^6	0.970	0.180	125	0.008	0.009	W14
N3476TD360	N1463DH36	3600	3476	46800	10.95×10^6	0.970	0.180	125	0.008	0.009	W19
N3476TD420	N1463DH42	4200	3476	46800	10.95×10^6	0.970	0.180	125	0.008	0.009	W19

Figure W11a
47mm - 510g

Figure W12
63mm - 1000g

Figure W50
63mm - 750g

Figure W13 - 73mm - 1700g

Figure W46 - 73mm - 1200g

Figure W14 - 75mm - 1300g

Figure W19 - 75mm - 1700g

Type		V_{DRM} / V_{RRM}	I_{TAV} T_K=55°C	I_{TSM} 10ms ½ sine, V_R ≤60% V_{RRM}	I^2t	V_{T0} @T_{JM}	r_T @T_{JM}	T_{JM}	R_{thJK} 180° sin	R_{thJK} 120° rec	Fig. No.
Part No.	Old Part No.	V	A	A	A^2s	V	mΩ	°C	K/W	K/W	
N3533ZC140	N1400CH14	1400	3533	50000	12.50×10^6	0.970	0.095	125	0.011	0.012	W13
N3533ZC220	N1400CH22	2200	3533	50000	12.50×10^6	0.970	0.095	125	0.011	0.012	W13
N3533ZD140	N/A	1400	3533	50000	12.50×10^6	0.970	0.095	125	0.011	0.012	W46
N3533ZD220	N/A	2200	3533	50000	12.50×10^6	0.970	0.095	125	0.011	0.012	W46
N3839TC300	N1663CH30	3000	3839	49500	12.25×10^6	0.950	0.140	125	0.008	0.012	W14
N3839TC350	N1663CH35	3500	3839	49500	12.25×10^6	0.950	0.140	125	0.008	0.012	W14
N3839TD300	N1663DH30	3000	3839	49500	12.25×10^6	0.950	0.140	125	0.008	0.012	W19
N3839TD350	N1663DH35	3500	3839	49500	12.25×10^6	0.950	0.140	125	0.008	0.012	W19
N4085ZC080	N1600CH08	800	4085	64000	20.5×10^6	0.850	0.070	125	0.011	0.012	W13
N4085ZC120	N1600CH12	1200	4085	64000	20.5×10^6	0.850	0.070	125	0.011	0.012	W13
N4085ZD080	N/A	800	4085	64000	20.5×10^6	0.850	0.070	125	0.011	0.012	W46
N4085ZD120	N/A	1200	4085	64000	20.5×10^6	0.850	0.070	125	0.011	0.012	W46
N4151FC360	N1483CH36	3600	4151	54000	14.6×10^6	0.850	0.170	125	0.0065	0.0068	W15
N4151FC420	N1483CH42	4200	4151	54000	14.6×10^6	0.850	0.170	125	0.0065	0.0068	W15
N4151FD360	N1483DH36	3600	4151	54000	14.6×10^6	0.850	0.170	125	TBC	TBC	W48
N4151FD420	N1483DH42	4200	4151	54000	14.6×10^6	0.850	0.170	125	TBC	TBC	W48
N4400TC120	N1863CH12	1200	4400	54000	14.6×10^6	0.900	0.100	125	0.008	0.0085	W14
N4400TC280	N1863CH28	2800	4400	54000	14.6×10^6	0.900	0.100	125	0.008	0.0085	W14
N4400TD120	N1863DH12	1200	4400	54000	14.6×10^6	0.900	0.100	125	0.008	0.0085	W19
N4400TD280	N1863DH28	2800	4400	54000	14.6×10^6	0.900	0.100	125	0.008	0.0085	W19
N4803FC300	N1683CH30	3000	4803	60000	18.0×10^6	0.920	0.110	125	0.0065	0.0068	W15
N4803FC350	N1683CH35	3500	4803	60000	18.0×10^6	0.920	0.110	125	0.0065	0.0068	W15
N4803FD300	N/A	3000	4803	60000	18.0×10^6	0.920	0.110	125	TBC	TBC	W48
N4803FD350	N/A	3500	4803	60000	18.0×10^6	0.920	0.110	125	TBC	TBC	W48
N5177FC200	N1883CH20	2000	5177	67500	22.8×10^6	0.800	0.100	125	0.0065	0.0068	W15
N5177FC280	N1883CH28	2800	5177	67500	22.8×10^6	0.800	0.100	125	0.0065	0.0068	W15
N5177FD200	N/A	2000	5177	67500	22.8×10^6	0.800	0.100	125	TBC	TBC	W48
N5177FD280	N/A	2800	5177	67500	22.8×10^6	0.800	0.100	125	TBC	TBC	W48
N5946FC180	N1983CH18	1800	5946	72000	25.9×10^6	0.855	0.065	125	0.0065	0.0068	W15
N5946FC220	N1983CH22	2200	5946	72000	25.9×10^6	0.855	0.065	125	0.0065	0.0068	W15
N5946FD180	N/A	1800	5946	72000	25.9×10^6	0.855	0.065	125	TBC	TBC	W48
N5946FD220	N/A	2200	5946	72000	25.9×10^6	0.855	0.065	125	TBC	TBC	W48

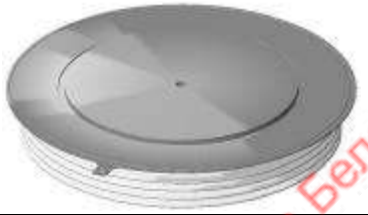

Figure W46
75mm - 1200g

Figure W48
99mm - 1200g

Figure W13 - 73mm - 1700g

Figure W14 - 75mm - 1300g

Figure W19 - 75mm - 1700g

Figure W15 - 99mm - 2800g

RECTIFIER DEVICE - Phase Control Thyristors - Capsule Types

Old Part Number	PDF Data Sheet Available	New Part Number	V_{DRM} V_{RRM} Range (Note 5) (V)	$I_{T(AV)}$ @ T_{sink} 55°C (A)	$I_{T(RMS)}$ @ T_{sink} 25°C (A)	$I_{TSM(1)}$ 10ms V_R £60% V_{RRM} (A)	$I_{TSM(2)}$ 10ms V_R £10V (A)	$I^2t_{(2)}$ 10ms V_R £10V (Note 1) (A^2s)	di/dt Non Rep/Rep (Note 4) (A / ms)	I_{GT}/V_{GT} @ 25°C (mA) (V)	I_{DRM} I_{RRM} at 125°C (mA)	I_H @25°C (mA)	Rth j-hs dc 180°sine (K/W)	Rth j-hs 120° Rect. (K/W)	V_o r @ Tj 125°C (Note 2) (V)	V_o r @ Tj 125°C (Note 2) (mW)	V_{TM} at I_{TM} @ Tj 125°C (V) / (A)	Wt (Typ) (g)	Mounting Force (kN)	Outline No. (Note 3)
N086CH12-16	N	N0194WC120-160	1200-1600	194	392	1700	1950	1.90×10^4	- /500	150/3	20	600	0.135		1.570	2.290	2.5 / 405	70	3.3 - 5.5	101A212
N105CH12-16	N	N0255WC120-160	1200-1600	255	500	2450	1950	0.363×10^5	- /500	150/3	20	600	0.135		0.900	1.790	1.9 / 556	70	3.3 - 5.5	
N170CH12-16	N	N0339WC120-160	1200-1600	339	674	4200	4620	1.07×10^5	- /500	150/3	20	600	0.095		1.080	1.300	2.0 / 720	70	3.3 - 5.5	
N195CH12-16	N	N0392WC120-160	1200-1600	392	780	4650	5120	131×10^3	1000/500	150/3	20	600	0.095		0.920	0.990	1.68 / 770	70	3.3 - 5.5	
N275CH02-08	N	N0491WC020-080	1200-1600	491	986	6000	6600	218×10^3	-/500	150/3	20	400	0.095		0.850	0.535	1.39 / 1000	70	3.3 - 5.5	
N282SH20-24*	Y	N0606YS200-240	2000-2400	606	1201	7100	7810	305×10^3	600/300	200/3	40	500	0.050		1.140	0.781	2.35 / 1550	90	5.3 - 10.0	101A335
N281SH12-18*	Y	N0676YS120-180	1200-1800	676	1346	7500	8300	345×10^3	1000/500	150/3	40	500	0.050		1.090	0.587	2.0 / 1550	90	5.3 - 10.0	
N280SH12-16*	Y	N0734YS120-160	1200-1600	734	1465	8400	9240	427×10^3	1000/500	150/3	40	500	0.050		1.030	0.483	1.78 / 1550	90	5.3 - 10.0	
N283SH12-16*	Y	N0782YS120-160	1200-1600	782	1554	9420	10400	541×10^3	1000/500	150/3	40	500	0.050		0.920	0.450	1.62 / 1550	90	5.3 - 10.0	
N310SH02-06*	Y	N0992YS020-060	200-600	992	1995	11000	12100	732×10^3	1000/500	150/3	40	500	0.050		0.820	0.240	1.19 / 1550	90	5.3 - 10.0	
N200CH58-65	N	N0485LC580-650	5800-6500	485	970	4000	4400	96.8×10^3	- / -	300/4	60	1000	0.032	0.0388	1.350	2.100	2.40 / 500	340	10.0 - 20.0	101A216
N255CH40-45	N	N0616LC400-450	4000-4500	616	1150	5250	5780	167×10^3	-/150	300/3	60	1000	0.032	0.0388	1.220	1.530	2.9 / 1100	340	10.0 - 20.0	
N257CH38-42	N	N0634LC380-420	3800-4200	634	1180	7000	7700	0.296×10^6	- / -	300/3	100	1000	0.032	0.0388	1.100	1.500	2.80 / 1100	340	10.0 - 20.0	
N260CH30-36	N	N0646LC300-360	3000-3600	646	1210	5700	6270	196×10^3	- / 200	300/3	60	1000	0.032	0.0388	1.210	1.360	2.71 / 1100	340	10.0 - 20.0	
N330SH20-26*	Y	N0910LS200-260	2000-2600	910	1788	9200	10100	510×10^3	600/300	300/3	60	1000	0.032	0.0388	1.040	0.606	2.07 / 1700	340	10.0 - 20.0	101A336
N350SH12-18*	Y	N1042LS120-180	1200-1800	1042	2072	11500	12650	800×10^3	1000/500	300/3	60	1000	0.032	0.0388	1.080	0.395	1.75 / 1700	340	10.0 - 20.0	
N370SH12-18*	Y	N1114LS120-180	1200-1800	1114	2214	12700	14000	980×10^3	1000/500	300/3	60	1000	0.032	0.0388	1.000	0.349	1.59 / 1700	340	10.0 - 20.0	
N520SH12-15*	Y	N1265LS120-150	1200-1800	1265	2517	15000	16000	1.280×10^6	1000/500	300/3	60	1000	0.032	0.0388	0.900	0.265	1.35 / 1700	340	10.0 - 20.0	
N320CH40-45	N	N0882NC400-450	4000-4500	882	1725	7700	8470	359×10^3	300/150	300/3	100	1000	0.024	0.029	1.300	0.920	2.77 / 1600	510	19.0 - 26.0	101A223
N360CH30-38	N	N1010NC300-380	3000-3800	1010	1975	12100	13300	884×10^3	400/200	300/3	100	1000	0.024		1.170	0.687	2.43 / 1830	510	19.0 - 26.0	
N390CH30-36	N	N1132NC300-360	3000-3600	1132	2220	14300	15700	1.23×10^6	400/200	300/3	100	1000	0.024		1.150	0.510	2.08 / 1830	510	19.0 - 26.0	
N450SH20-26*	Y	N1297NS200-260	2000-2600	1297	2557	17600	19400	1.88×10^6	600/300	300/3	100	1000	0.024		1.030	0.380	2.0 / 2550	510	19.0 - 26.0	101A337
N490SH20-26*	Y	N1467NS200-260	2000-2600	1467	2912	21500	23600	2.78×10^6	1000/500	300/3	100	1000	0.024		1.000	0.272	1.69 / 2550	510	19.0 - 26.0	
N510SH16-20*	Y	N1547NS160-200	1600-2000	1547	3064	23300	25600	3.28×10^6	1000/500	300/3	100	1000	0.024		0.920	0.252	1.56 / 2550	510	19.0 - 26.0	
N540SH12-18*	Y	N1718NS120-180	1200-2000	1718	3450	27200	29900	4.47×10^6	1000/500	300/3	100	1000	0.024		0.979	0.169	1.41 / 2550	510	19.0 - 26.0	
N600SH12-16*	Y	N1802NS120-160	1200-1500	1802	3592	29600	32500	5.28×10^6	1000/500	300/3	100	1000	0.024		0.855	0.171	1.29 / 2550	510	19.0 - 26.0	
N610SH06-10*	Y	N2086NS060-100	600-1000	2086	4207	35000	38000	7.22×10^6	1000/500	300/3	100	1000	0.024		0.840	0.108	1.12 / 2550	510	19.0 - 26.0	
N410CH58-65	N	N0633NC580-650	5800-6500	633	1270	6650	7300	0.266×10^6	100/50	300/4	150	1000	0.024	0.029	1.380	1.640	3.02 / 1000	510	19.0 - 26.0	101A223
N500CH38-42	N	N1159NC380-420	3800-4200	1159	2270	14500	16100	1.30×10^6	300/150	300/3	100	1000	0.022	0.027	1.100	0.574	2.15 / 1830	510	19.0 - 26.0	
N570CH30-36	N	N1314NC300-360	2000-3600	1314	2580	16630	18290	1.67×10^6	300/150	300/3	100	1000	0.022	0.027	1.000	0.437	2.11 / 2550	510	19.0 - 26.0	
N620SH24-30*	Y	N1479NS240-300	2400-3000	1479	2901	21000	23000	2.65×10^6	400/200	300/3	100	1000	0.022	0.027	0.920	0.342	1.80 / 2550	510	19.0 - 26.0	101A337
N680SH20-26*	Y	N1588NS200-260	2000-2600	1588	3138	22500	24750	3.06×10^6	300/150	300/3	100	1000	0.022		0.951	0.268	1.65 / 2550	510	19.0 - 26.0	
N740SH12-16*	Y	N2046NS120-160	1200-1600	2046	4141	29200	32200	5.18×10^6	300/150	300/3	100	1000	0.022		0.980	0.114	1.27 / 2550	510	19.0 - 26.0	
N560CH40-45	N	N1351VC400-450	4000-4500	1351	2645	17500	20000	2.00×10^6	300/150	300/3	150	1000	0.017	0.020	1.200	0.553	3.00 / 3220	1000	27.0 - 34.0	101A232
N630CH30-36	N	N1661VC300-360	3000-3600	1661	3261	23000	25000	3.13×10^6	300/150	300/3	150	1000	0.017	0.020	1.040	0.350	2.17 / 3220	1000	27.0 / 34.0	
N640CH24-30	N	N1712VC240-300	2400-300	1712	3370	24500	30000	4.50×10^6	300/150	300/3	150	1000	0.017	0.020	1.050	0.320	2.08 / 3220	1000	27.0 - 34.0	
N760CH18-22	N	N2293VC180-220	1800-2200	2293	4575	33800	40000	8.00×10^6	300/150	300/3	150	1000	0.017	0.020	0.956	0.148	1.43 / 3220	1000	27.0 - 34.0	
N990CH12-16	N	N2500VC120-160	1200-1600	2500	5000	3700	45000	10.1×10^6	300/150	300/3	150	1000	0.017	0.020	0.880	0.124	1.28 / 3220	1000	27.0 - .34.0	
N635CH58-65	N	N1555ZC580-650	5800-6500	1555	3110	20000	22000	2.42×10^6	100/50	350/4	200	1000	0.011	0.012	1.200	0.600	1.80 / 1000	1700	27.0 - 47.0	101A281
N750CH40-45	N	N2172ZC400-450	4000-4500	2172	4290	28000	33500	5.61×10^6	300/150	350/4	200	1000	0.011	0.012	1.350	0.294	2.23 / 3000	1700	27.0 - 47.0	
N850CH30-36	N	N2418ZC300-360	3000-3600	2418	4880	30000	36000	6.48×10^6	300/150	300/3	200	1000	0.011	0.012	1.160	0.246	1.90 / 3000	1700	27.0 - 47.0	
N880CH24-30	N	N2543ZC240-300	2400-3000	2543	4930	32000	39000	7.61×10^6	300/150	300/3	200	1000	0.011	0.012	0.780	0.274	1.60 / 3000	1700	27.0 - 47.0	
N900CH20-26	N	N3012ZC200-260	2000-2600	3012	5925	45100	49700	12.40×10^6	300/150	300/3	200	1000	0.011	0.012	0.920	0.160	1.40 / 3000	1700	27.0 - 47.0	
N980CH16-22	N	N3022ZC160-220	1600-2200	3022	5900	45600	55000	15.1×10^6	300/150	300/3	200	1000	0.011	0.012	0.880	0.164	1.37 / 3000	1700	27.0 - 47.0	
N1400CH14-20	N	N3533ZC140-200	1400-2000	3533	7060	50000	60000	18.0×10^6	300/150	300/3	200	1000	0.011	0.012	0.970	0.095	1.25 / 3000	1700	27.0 - 47.0	
N1600CH08-12	N	N4085ZC080-120	800-1200	4085	8165	64000	70000	24.5×10^6	300/150	300/3	200	1000	0.011	0.012	0.850	0.070	1.06 / 3000	1700	27.0 - 47.0	

N1063DH58-65	Y	N1847TD580-650	5300-6500	2010	3930	25200	28000	2.6×10^6	300/150	300/2	200	1000	0.011		1.200	0.385	2.00 / 2000	1230	63.0 - 77.0	101A325
N1263CH45-52	Y	N2503TC450-520	4500-5200	2500	4880	37800	42000	5.1×10^6	300/150	300/4	300	1000	0.011		1.00	0.250	2.0 / 4000	1230	63.0 - 77.0	
N1263DH45-52	N	N2503TC450-520	4500-5200	2500	4880	37800	42000	5.1×10^6	300/150	300/4	300	1000	0.011		1.00	0.250	2.0 / 4000	1230	63.0 - 77.0	
N1463CH36-42	Y	N2849TC360-420	3600-4200	2850	5590	46800	52000	8.2×10^6	300/150	300/3	250	1000	0.011		0.180	0.970	1.87 / 5000	1230	63.0 - 77.0	
N1463DH36-42	N	N2849TC360-420	3600-4200	2850	5590	46800	52000	8.2×10^6	300/150	300/3	250	1000	0.011		0.180	0.970	1.87 / 5000	1230	63.0 - 77.0	
N1663CH30-35	Y	N3184TC300-350	3600-4200	3180	5460	49500	55000	9.8×10^6	300/150	300/3	250	1000	0.011		0.95	0.14	1.74 / 6000	1230	63.0 - 77.0	
N1663DH30-35	N	N3184TC300-350	3600-4200	3180	5460	49500	55000	9.8×10^6	300/150	300/3	250	1000	0.011		0.95	0.14	1.74 / 6000	1230	63.0 - 77.0	
N1863CH20-28	Y	N3573TC200-280	2000-2800	3560	6040	54000	64000	10.1×10^6	300/150	300/3	250	1000	0.011		0.9	0.1	1.5 / 6000	1230	63.0 - 77.0	
N1863DH20-28	N	N3573TC200-280	2000-2800	3560	6040	54000	64000	10.1×10^6	300/150	300/3	250	1000	0.011		0.9	0.1	1.5 / 6000	1230	63.0 - 77.0	

N1083CH58-65	Y	N2840FC580-650	5800-6500	2310	4130	40000	45000	6.0×10^6	300/150	300/3	300	1000	0.009		0.29	1.23	2.10 / 3000	2800	81.0 - 98.0	101A322
N1283CH45-52	Y	N3764FC450-520	4500-5200	3764	6620	49500	55000	15.13×10^6	300/150	300/3	300	1000	0.0065		1.0	0.2	2.0 / 5000	2800	81.0 - 98.0	
N1483CH36-42	Y	N4156FC360-420	3600-4200	3400	5950	54000	60000	10.1×10^6	300/150	300/3	250	1000	0.009		0.85	0.17	1.87 / 6000	2800	81.0 - 98.0	
N1683CH30-35	Y	N4803FC300-350	3000-3500	3890	6650	60000	67000	10.2×10^6	300/150	300/3	250	1000	0.009		0.94	0.11	1.60 / 6000	2800	81.0 - 98.0	
N1883CH20-28	Y	N5107FC200-280	2000-2800	4145	7115	67500	75000	10.8×10^6	300/150	300/3	300	1000	0.009		0.8	0.1	1.40 / 6000	2800	81.0 - 98.0	
N1983CH18-22	Y	N5946FC180-220	1800-2200	5946	10155	72000	80000	32.0×10^6	300/150	300/3	200	1000	0.0065		0.855	0.065	1.25 / 6000	2800	81.0 - 98.0	

Note 1 I_{TSM} (8.3ms) = I^2t (10ms) x 0.943 at initial temperature Tj 125°C

Note 2 V_o Threshold Voltage
r Slope resistance) for conduction loss and heatsink calculations (Tj = 125°C)

Note 3 Capsule outlines available with compressed heights:
Outline 101A281 25.6 / 26.9 = ordering code NxxxDHxx, e.g. N980DH12

Note 4 di/dt ratings refer to the sum of snubber discharge an

Note 5 A blocking derating factor of 0.13 per degree Centigrage for Tj below 25°C