NCE N-Channel Super Trench II Power MOSFET

Description

The series of devices uses **Super Trench II** technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Q_g. This device is ideal for high-frequency switching and synchronous rectification.

Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

General Features

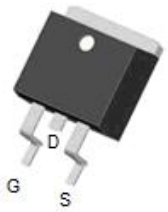
- V_{DS} =85V,I_D =240A
  $R_{DS(ON)}$=2.2mΩ , typical (TO-220)@ V_{GS}=10V
  $R_{DS(ON)}$=2.0mΩ , typical (TO-263)@ V_{GS}=10V
- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- 175 °C operating temperature
- Pb-free lead plating

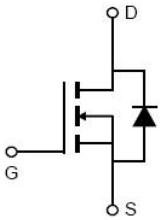
100% UIS TESTED!

100% ΔVds TESTED!

TO-220-3L

TO-263-2L





Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
NCEP026N85	NCEP026N85	TO-220-3L	-	-	-
NCEP026N85D	NCEP026N85D	TO-263-2L	-	-	-

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	240	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	170	A
Pulsed Drain Current	I_{DM}	960	A
Maximum Power Dissipation	P_D	270	W
Derating factor		1.8	W/℃
Single pulse avalanche energy (Note 1)	E_{AS}	2400	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 175	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.56	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Parameter	Symbol	Condition		Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA		85		-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=85V,V_{GS}=0V		-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V		-	-	±100	nA
On Characteristics							
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA		2.0	3.0	4.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	TO-220	-	2.2	2.6	mΩ
			TO-263		2.0	2.6	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=100A			145	-	S
Dynamic Characteristics							
Input Capacitance	C_{lss}	V_{DS}=40V,V_{GS}=0V, F=1.0MHz		-	13400	-	PF
Output Capacitance	C_{oss}			-	1850	-	PF
Reverse Transfer Capacitance	C_{rss}			-	35	-	PF
Switching Characteristics (Note 2)							
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=40V,I_D=20A V_{GS}=10V,R_G=1.6Ω		-	33	-	nS
Turn-on Rise Time	t_r			-	32	-	nS
Turn-Off Delay Time	$t_{d(off)}$			-	83	-	nS
Turn-Off Fall Time	t_f			-	28	-	nS
Total Gate Charge	Q_g	V_{DS}=40V,I_D=20A, V_{GS}=10V		-	172	-	nC
Gate-Source Charge	Q_{gs}			-	55.5		nC
Gate-Drain Charge	Q_{gd}			-	41.5		nC
Drain-Source Diode Characteristics							
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=20A		-		1.2	V
Diode Forward Current	I_S			-	-	240	A
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F = 20A di/dt = 100A/μs		-	95	-	nS
Reverse Recovery Charge	Qrr			-	250	-	nC

Notes:

1. EAS condition : Tj=25℃,V_{DD}=40V,V_G=10V,L=0.5mH,Rg=25Ω
2. Guaranteed by design, not subject to production
3. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=175°C. The SOA curve provides a single pulse rating.

Typical Electrical and Thermal Characteristics

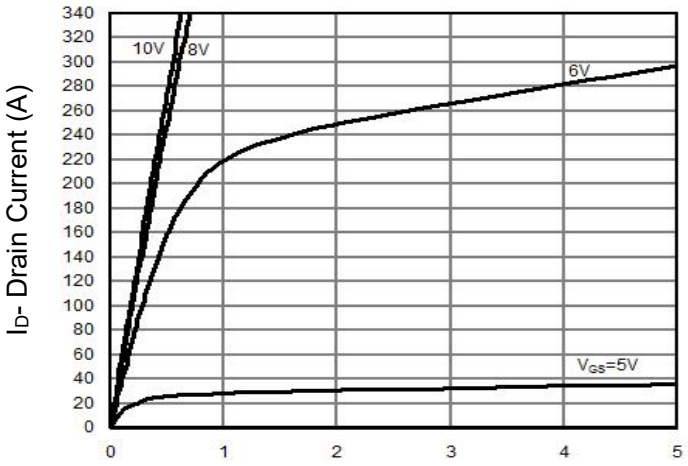


Figure 1 Output Characteristics

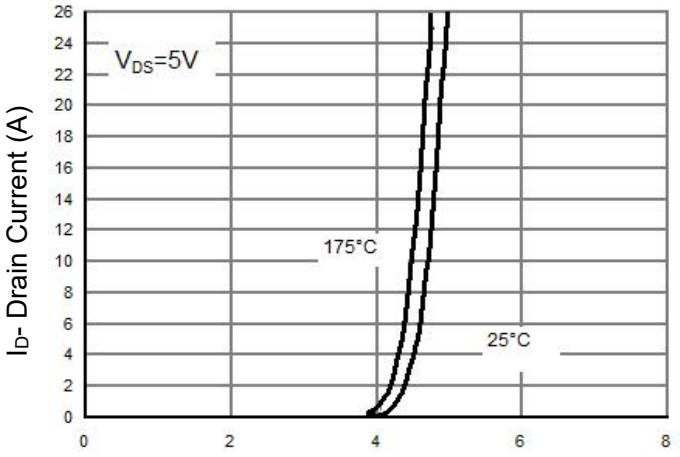


Figure 2 Transfer Characteristics

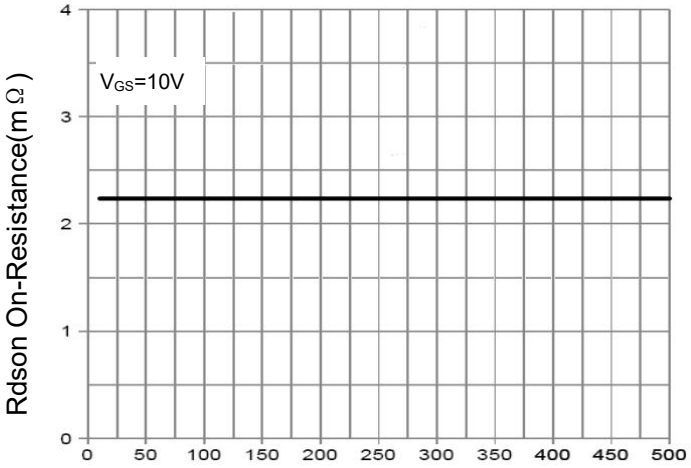


Figure 3 Rdson- Drain Current

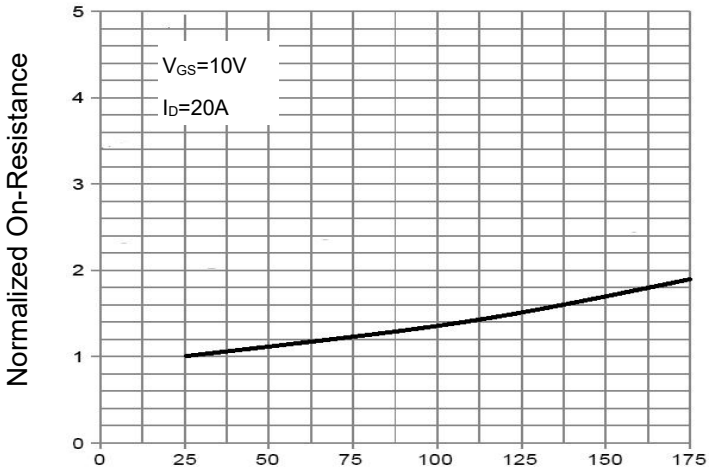


Figure 4 Rdson-Junction Temperature

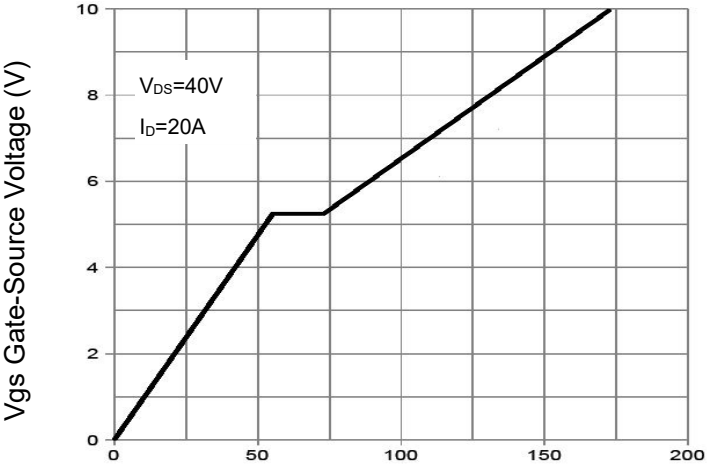


Figure 5 Gate Charge

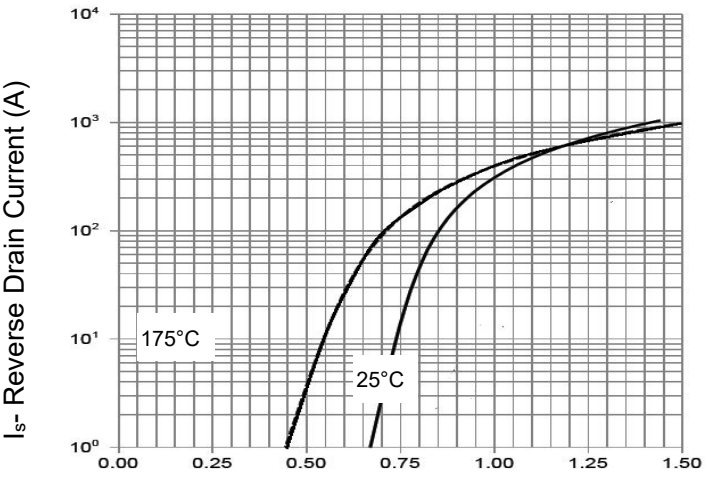


Figure 6 Source- Drain Diode Forward

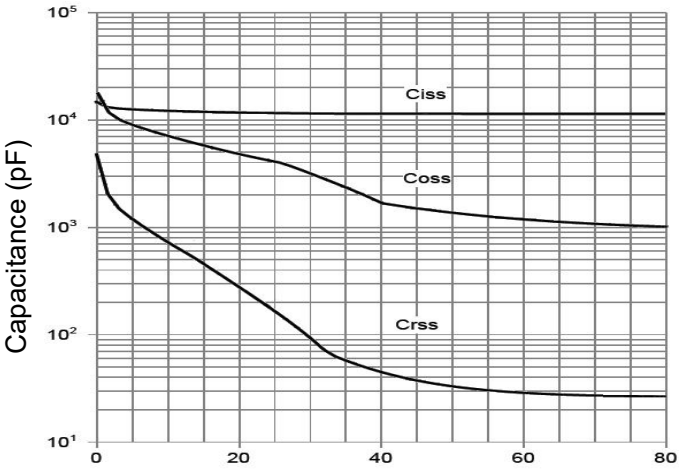


Figure 7 Capacitance vs Vds

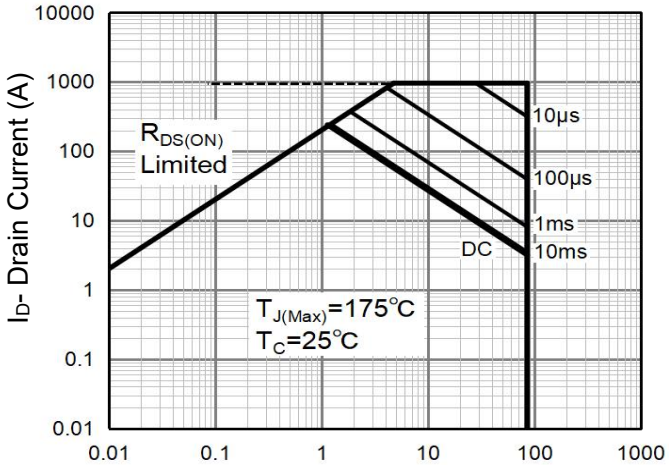


Figure 8 Safe Operation Area(Note 3)

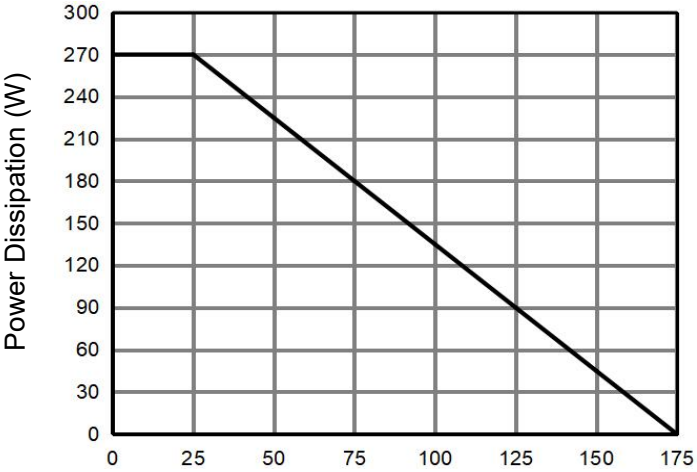


Figure 9 Power De-rating

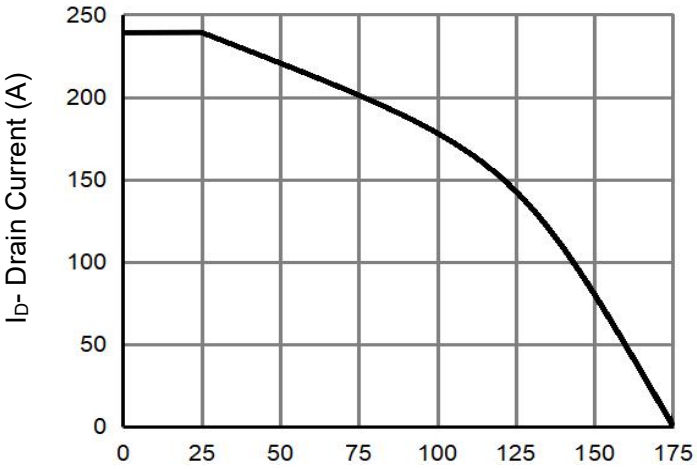


Figure 10 Current De-rating

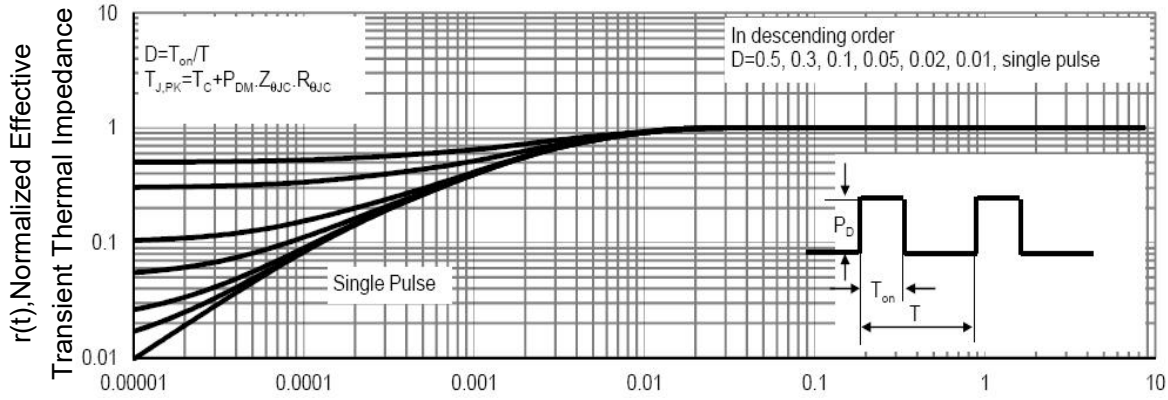
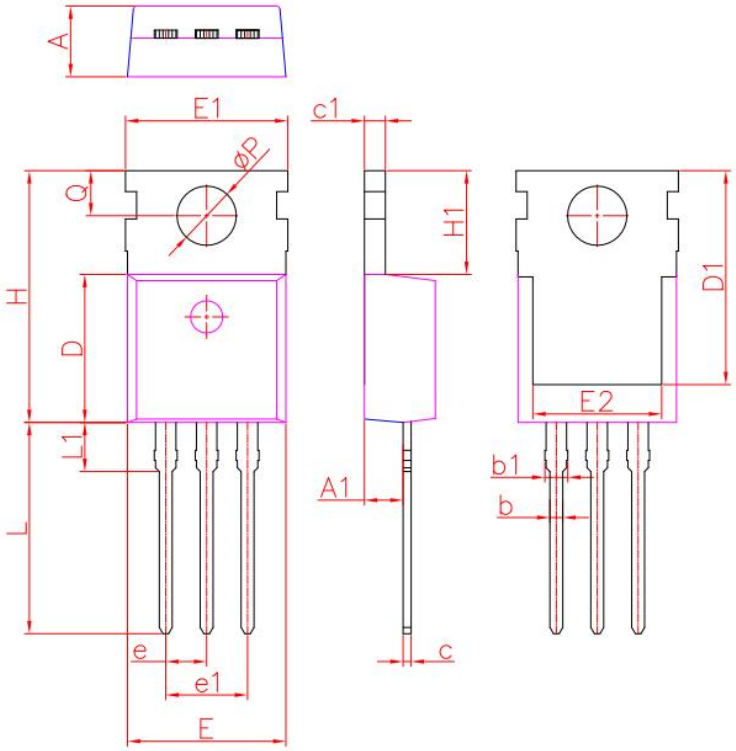


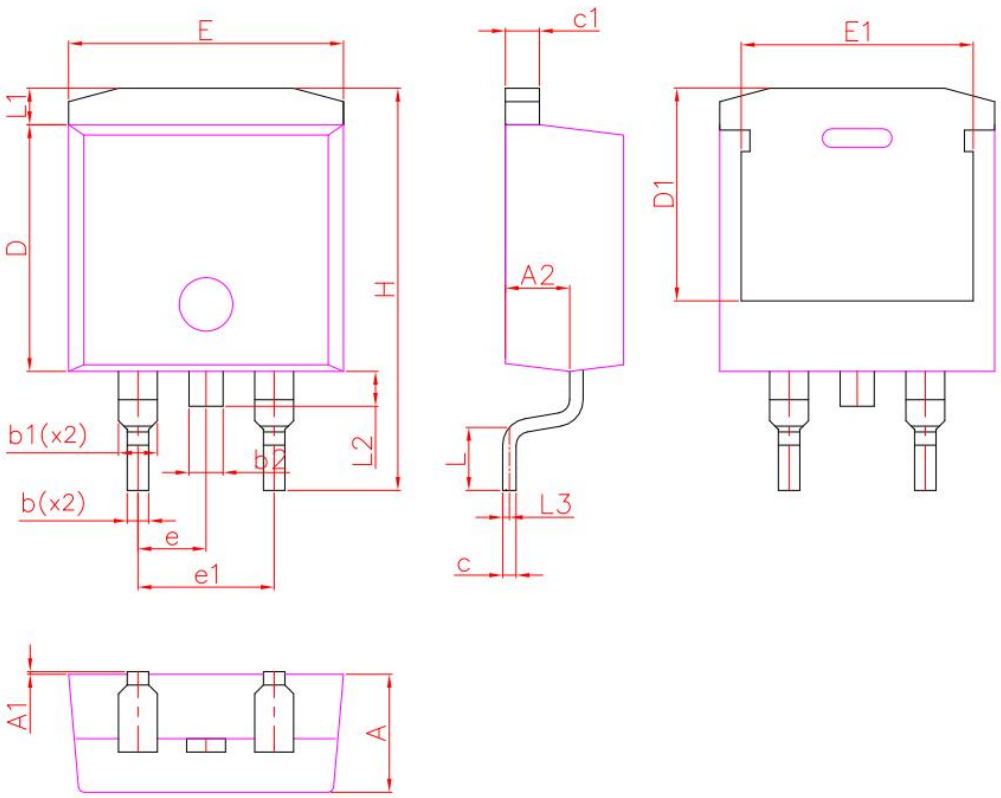
Figure 11 Normalized Maximum Transient Thermal Impedance

TO-220-3L Package Information



TO220			
DIM.	MIN.	NOM.	MAX.
A	4.20	4.40	4.60
A1	2.25	2.40	2.55
b	0.70	0.80	0.90
b1	1.17	1.27	1.37
c	0.33	0.50	0.65
c1	1.20	1.30	1.40
D	8.95	9.20	9.75
D1	13.10	13.30	13.50
E	9.74	9.84	10.04
E1	9.91	10.08	10.25
E2	7.90	8.00	8.10
e	2.54BSC		
e1	5.08BSC		
H	15.45	15.65	15.85
H1	6.30	6.45	6.60
L	12.90	13.13	13.40
L1	2.85	3.05	3.25
Q	2.65	2.80	2.95
øP	3.40	3.68	3.80
All dimensions in millimeters			

TO-263-2L Package Information



TO263			
DIM.	MIN.	NOM.	MAX.
A	4.20	4.40	4.60
A1	0.00	0.10	0.25
A2	2.20	2.40	2.60
b	0.70	0.80	0.90
b1	1.20	1.45	1.75
b2	1.17	1.27	1.37
c	0.40	0.50	0.60
c1	1.15	1.27	1.40
D	9.10	9.20	9.30
D1	7.63	7.93	8.23
E	10.05	10.25	10.45
E1	8.35	8.65	8.95
e	2.54BSC		
e1	5.08BSC		
H	14.61	15.00	15.88
L	1.78	2.35	2.79
L1	1.36REF		
L2	1.3REF		
L3	0.25REF		
All dimensions in millimeters			

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