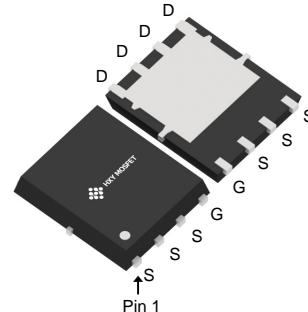




Description

The NVMFS5C450NT1G uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



DFN5X6-8L

General Features

$V_{DS} = 40V$ $I_D = 130A$

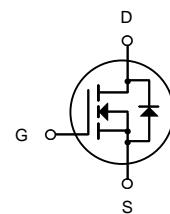
$R_{DS(ON)} < 3.5m\Omega$ $V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
NVMFS5C450NT1G	DFN5X6-8L	HXY MOSFET	5000

Absolute Maximum Ratings ($T_c=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_c=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	130	A
$I_D @ T_c=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	65	A
I_{DM}	Pulsed Drain Current	400	A
EAS	Single Pulse Avalanche Energy	150	mJ
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C



Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max	Unit
Static Characteristics						
BV _{DSS}	Drain Source breakdown voltage	V _{GS} =0V, I _D =250uA, T _J =25°C	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V	-	-	1	uA
I _{GSS}	Gate-to-Source Forward Leakage	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1.0	1.6	2.5	V
R _{DSON}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =30A	-	2.8	3.5	mΩ
g _{FS}	Forward Transconductance	V _{GS} =5V, I _D =20A	50	-	-	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} = 0V V _{DS} = 25V f = 1mHz	-	5584	-	pF
C _{oss}	Output Capacitance		-	410	-	pF
C _{rss}	Reverse Transfer Capacitance		-	338	-	pF
Switching Characteristics						
T _{D(on)}	Turn-on Delay Time	V _{DD} = 20V V _{GS} = 10V R _G = 1Ω I _D = 20A	-	11	-	ns
T _r	Turn-on Rise Time		-	15	-	ns
T _{D(off)}	Turn-off Delay Time		-	38	-	ns
T _f	Turn-off Fall Time		-	14	-	ns
Q _g	Total Gate Charge	V _{DD} = 20V V _{GS} = 4.5V I _D = 20A	-	64	-	nC
Q _{gs}	Gate Source Charge		-	12.4	-	nC
Q _{gd}	Gate Drain Charge		-	14	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
V _{SD}	Drain-Source Diode Forward Voltage	I _S = 30A, V _{GS} = 0V	-	-	1.2	V
T _{rr}	Reverse Recovery Time	I _S = 30A, V _{GS} = 0V di/dt = 100A/μs	-	22	-	ns
Q _{rr}	Reverse Recovery Charge		-	11	-	nC

Notes:

1. Rated according to R_{θJC}
2. Rated according to R_{θJA}
3. Surface mounted on 1 inch² FR4 board, 2 oz Cu
4. Limited by maximum T_J
5. Starting T_J = 25°C, V_{DD} = 30V, V_{GS} = 10V, L = 0.5mH
6. Pulse width limited by maximum T_J



Typical Characteristics

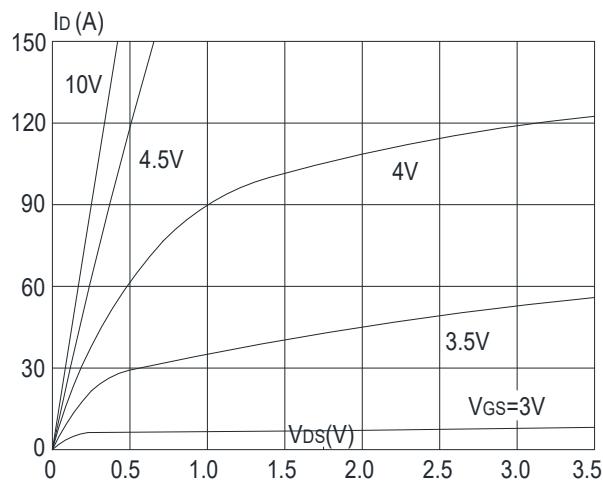


Figure 1: Output Characteristics

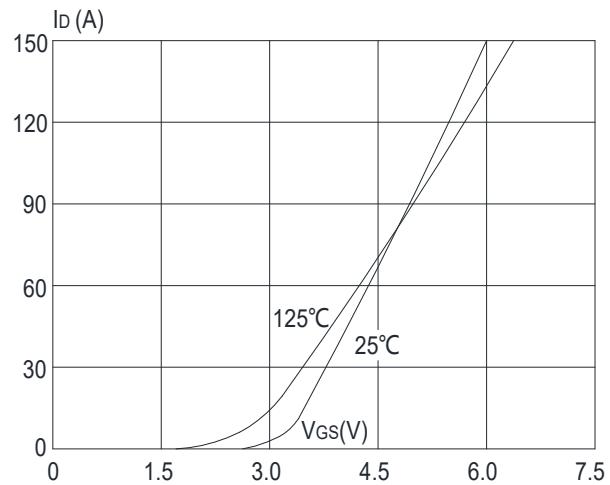


Figure 2: Typical Transfer Characteristics

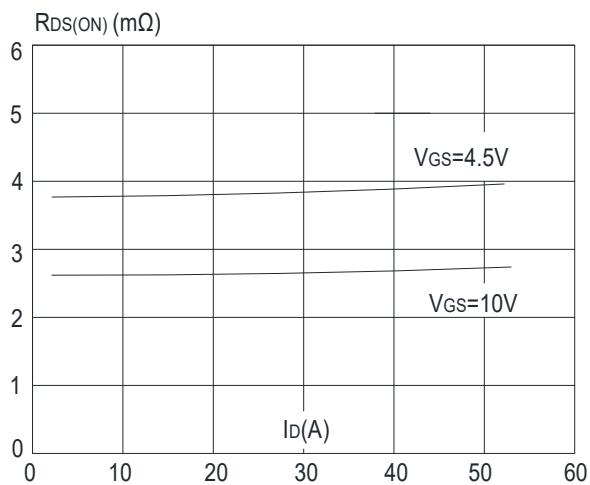


Figure 3: On-resistance vs. Drain Current

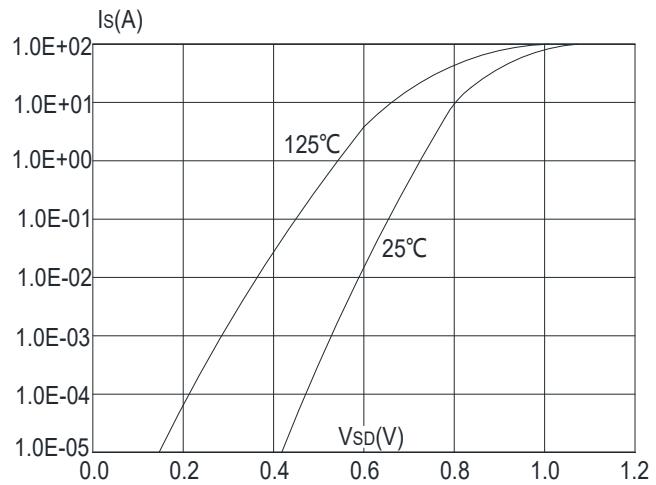


Figure 4: Body Diode Characteristics

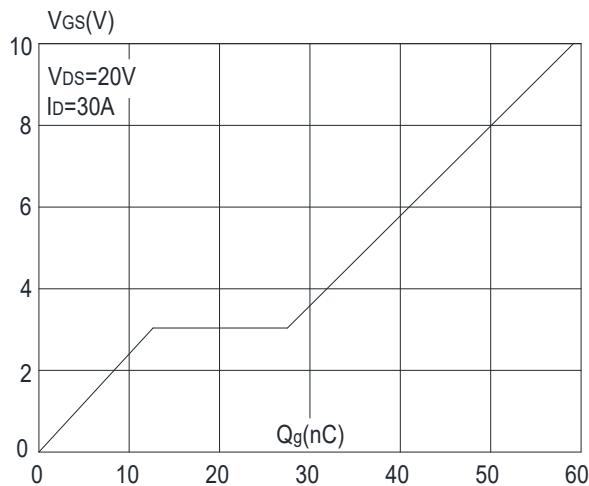


Figure 5: Gate Charge Characteristics

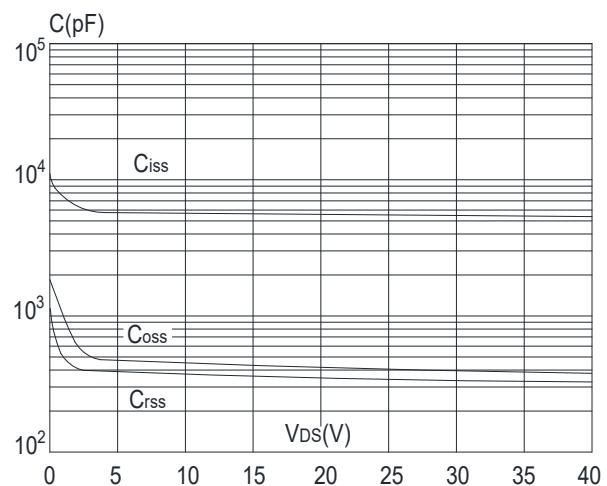


Figure 6: Capacitance Characteristics

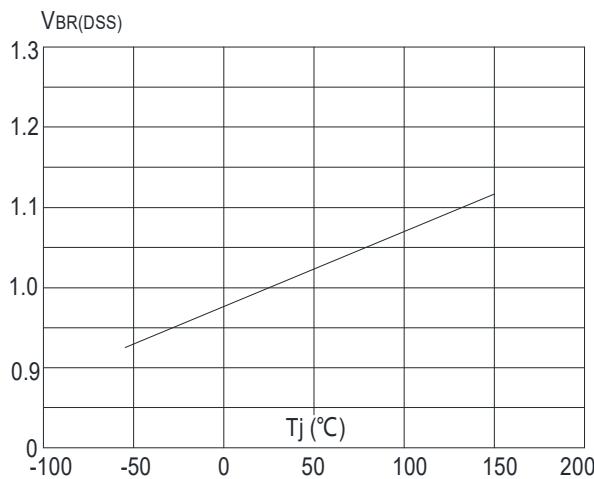


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

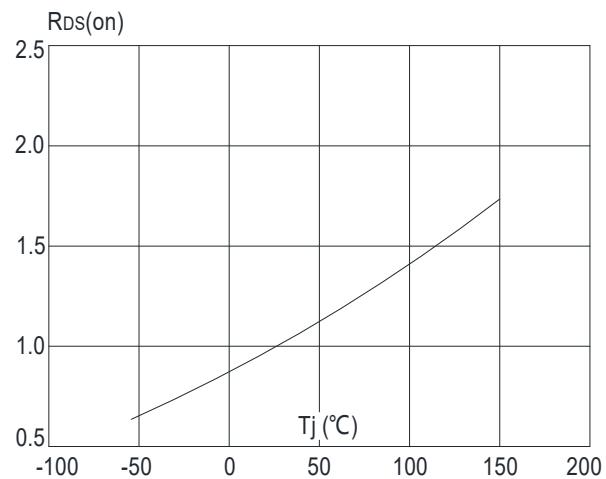


Figure 8: Normalized on Resistance vs. Junction Temperature

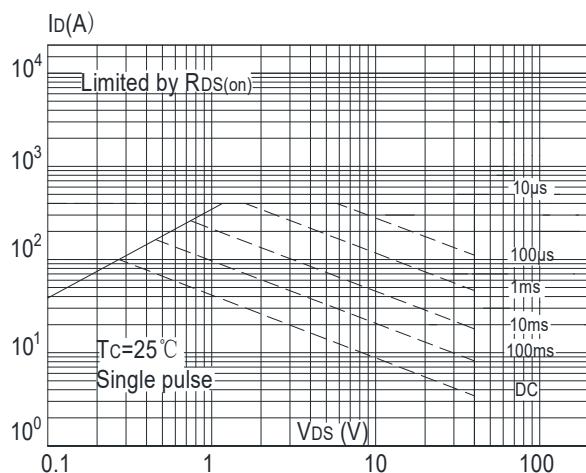


Figure 9: Maximum Safe Operating Area

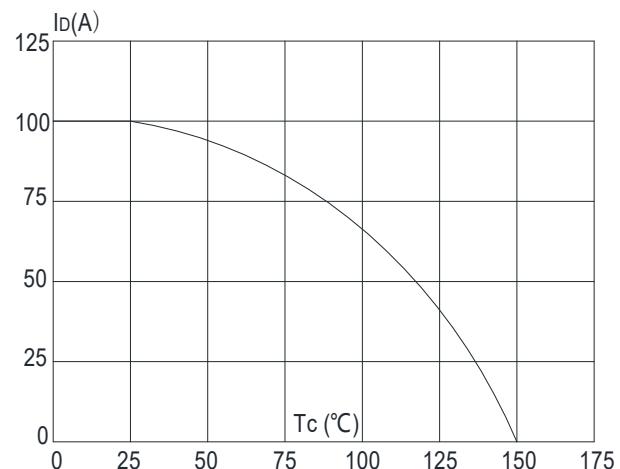


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

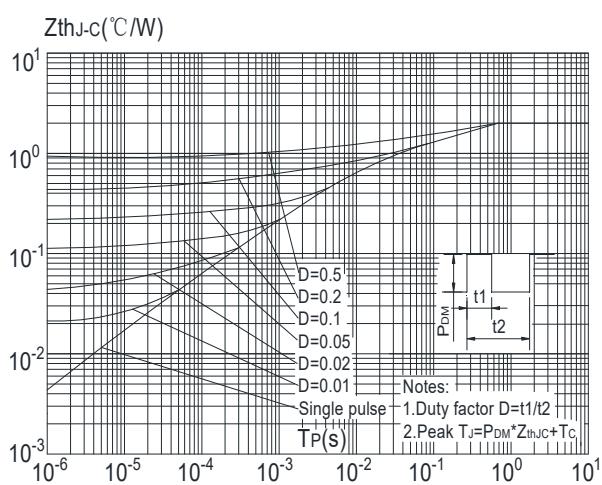
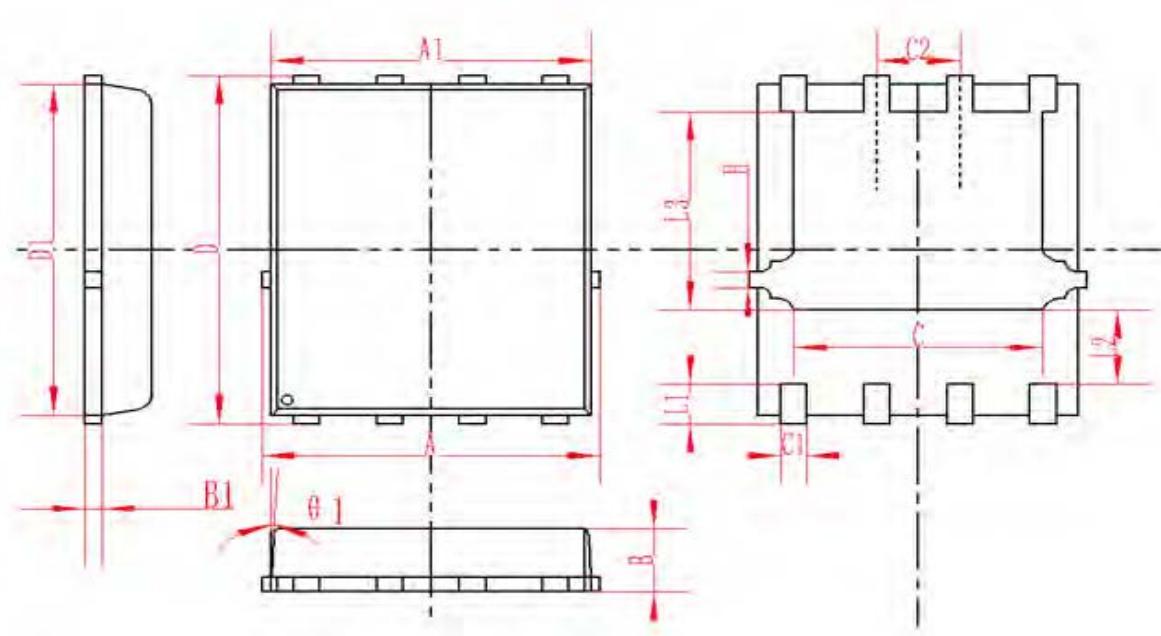


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



DFN5X6-8L Package Information



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.95	5	5.05	0.195	0.197	0.199
A1	4.82	4.9	4.98	0.190	0.193	0.196
D	5.98	6	6.02	0.235	0.236	0.237
D1	5.67	5.75	5.83	0.223	0.226	0.230
B	0.9	0.95	1	0.035	0.037	0.039
B1	0.254REF			0.010REF		
C	3.95	4	4.05	0.156	0.157	0.159
C1	0.35	0.4	0.45	0.014	0.016	0.018
C2	1.27TYP			0.5TYP		
θ1	8°	10°	12°	8°	10°	12°
L1	0.63	0.64	0.65	0.025	0.025	0.026
L2	1.2	1.3	1.4	0.047	0.051	0.055
L3	3.415	3.42	3.425	0.134	0.135	0.135
H	0.24	0.25	0.26	0.009	0.010	0.010



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