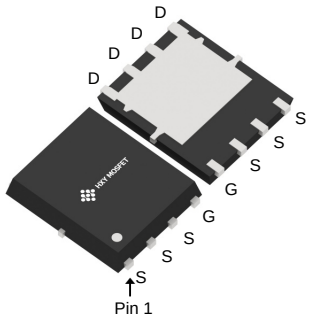
NVMFS5C450NWFT3G

N-Channel Enhancement Mode MOSFET

Description

The NVMFS5C450NWFT3G 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.

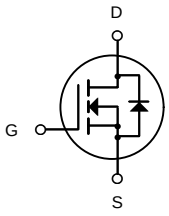


DFN5X6-8L

General Features

V_{DS} = 40V I_D = 130A

$R_{DS(ON)}$ < 3.5mΩ V_{GS}=10V



N-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
NVMFS5C450NWFT3G	DFN5X6-8L	HXY MOSFET	5000

Absolute Maximum Ratings (T_C=25°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℃	Continuous Drain Current, V_{GS} @ 10V	130	A
I_D@T_C=100℃	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	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

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
$R_{DS(ON)}$	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						
Ciss	Input Capacitance	VGS = 0V VDS = 25V f = 1mHz	-	5584	-	pF
Coss	Output Capacitance		-	410	-	pF
Crss	Reverse Transfer Capacitance		-	338	-	pF
Switching Characteristics						
$T_{D(on)}$	Turn-on Delay Time	VDD = 20V VGS = 10V RG = 1Ω ID = 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, VGS = 0V	-	-	1.2	V
T_{rr}	Reverse Recovery Time	I_S = 30A, VGS = 0V di/dt = 100A/μs	-	22	-	ns
Q_{rr}	Reverse Recovery Charge		-	11	-	nC

Notes:

1.Rated according to $R_{\theta JC}$
2.Rated according to $R_{\theta JA}$
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 TJ

Typical Characteristics

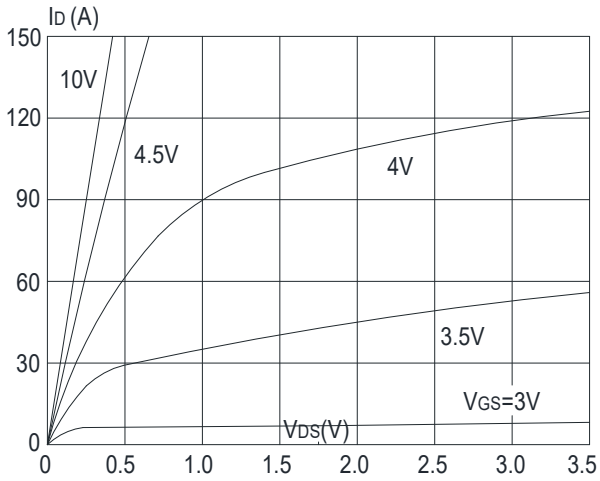


Figure1: Output Characteristics

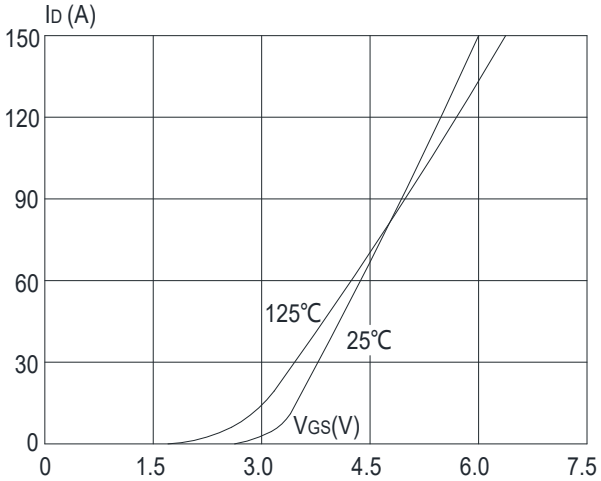


Figure 2: Typical Transfer Characteristics

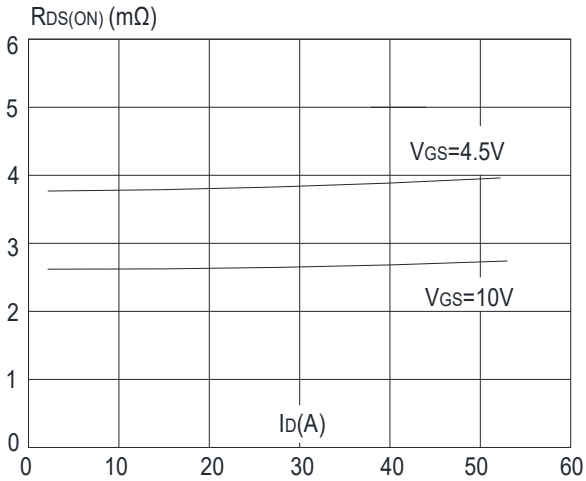


Figure 3: On-resistance vs. Drain Current

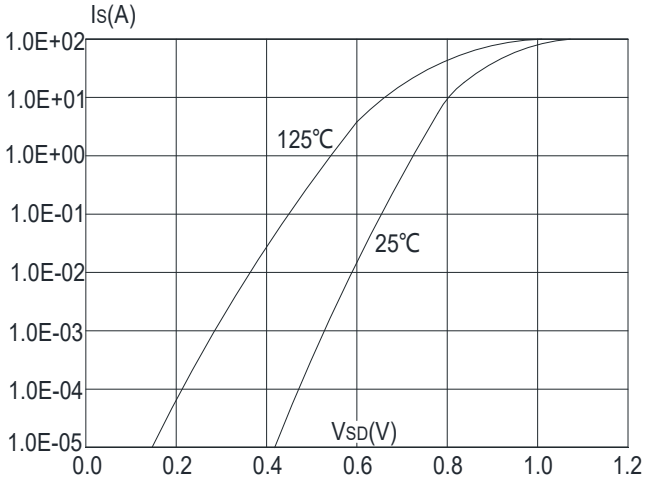


Figure 4: Body Diode Characteristics

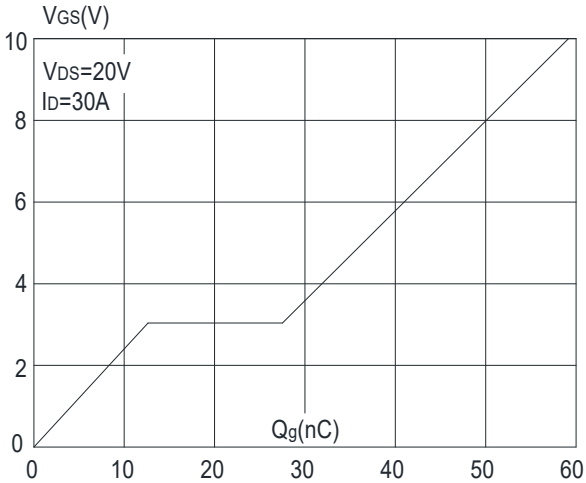


Figure 5: Gate Charge Characteristics

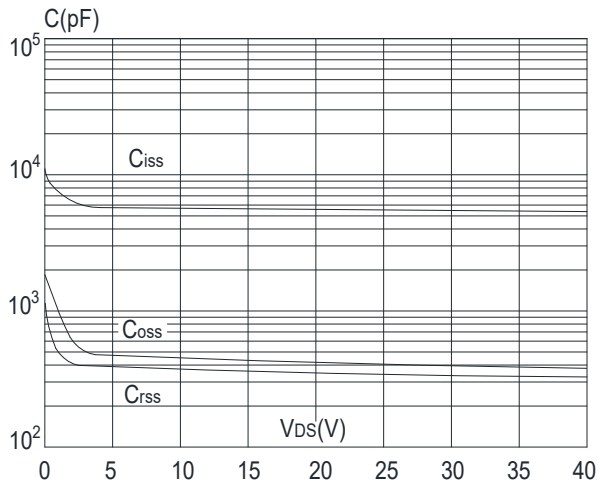


Figure 6: Capacitance Characteristics

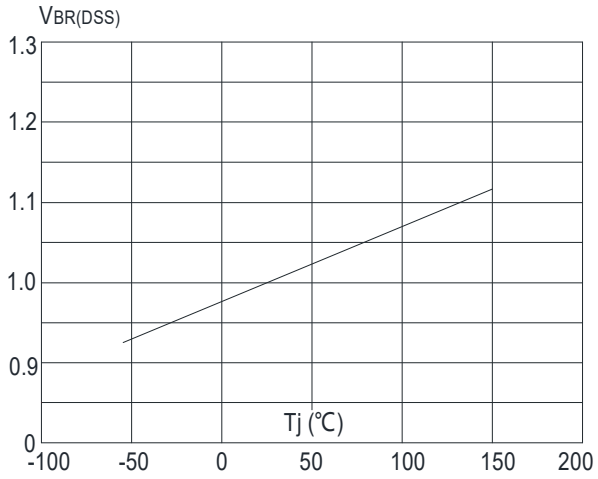


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

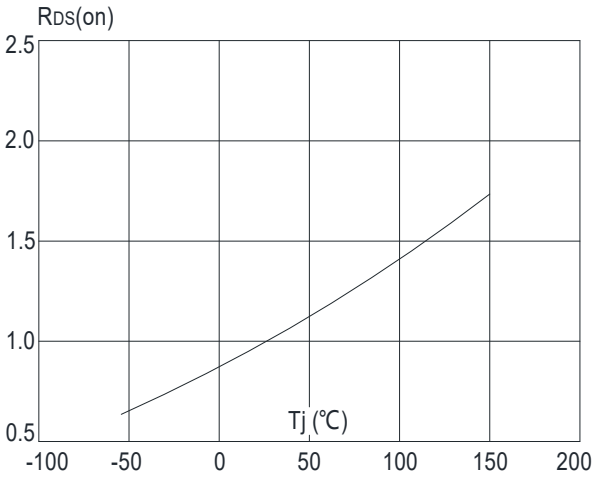


Figure 8: Normalized on Resistance vs. Junction Temperature

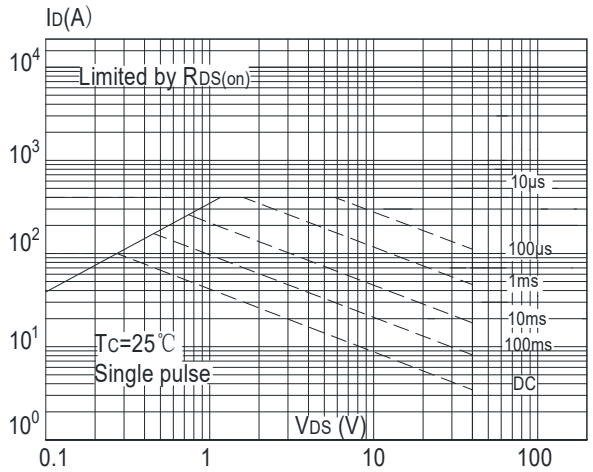


Figure 9: Maximum Safe Operating Area

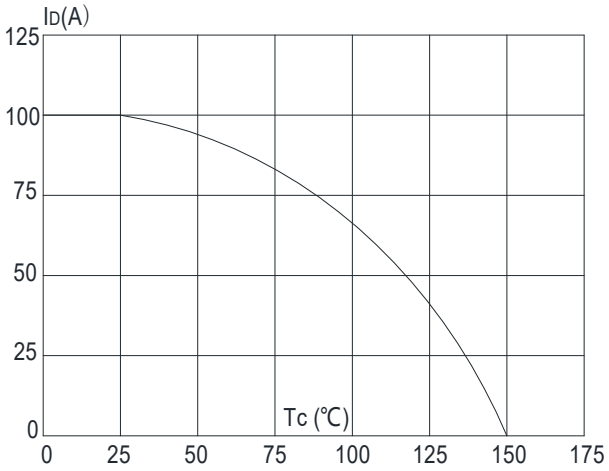


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

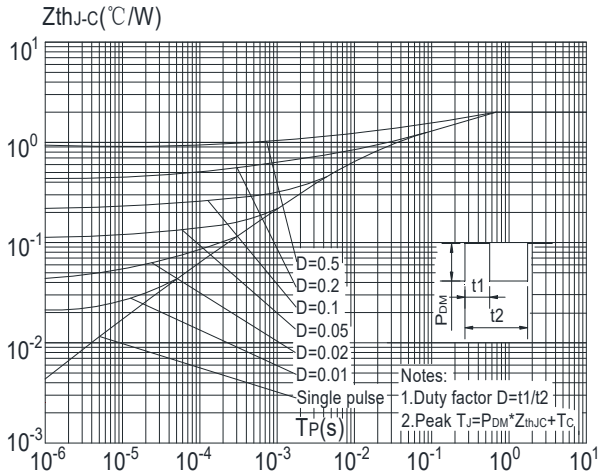
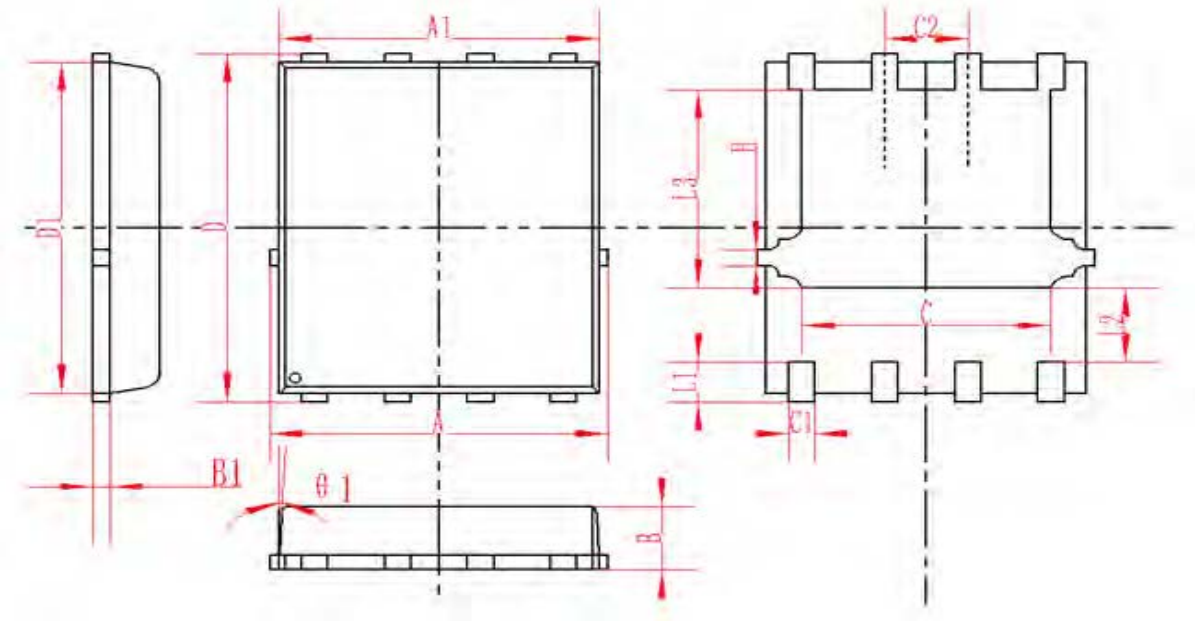


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

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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