



Description

The NVTF5C658NLWFTAG use advanced SGT MOSFET technology to provide low $R_{DS(ON)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is specially designed to get better ruggedness and suitable.

General Features

$V_{DS} = 60V$ $I_D = 100A$

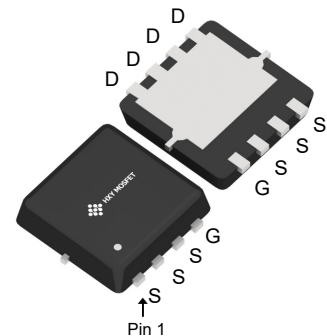
$R_{DS(ON)} < 4.8m\Omega @ V_{GS}=10V$

Applications

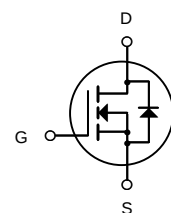
Consumer electronic power supply Motor control

Synchronous-rectification Isolated DC

Synchronous-rectification applications



DFN3X3-8L



N-Channel MOSFET

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
NVTF5C658NLWFTAG	DFN3X3-8L	HXY MOSFET	5000

Absolute Maximum Ratings at $T_j=25^\circ C$ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain source voltage	V_{DS}	60	V
Gate source voltage	V_{GS}	± 20	V
Continuous drain current $T_C=25^\circ C$	I_D	100	A
Continuous drain current $T_C=100^\circ C$	I_D	64	A
Pulsed drain current ¹	I_{DM}	385	A
Power dissipation	P_D	73.5	W
Single pulsed avalanche energy ²	EAS	80	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	$^\circ C$
Thermal resistance, junction-case	$R_{\theta JC}$	1.7	$^\circ C/W$
Thermal resistance, junction-ambient ⁴	$R_{\theta JA}$	51	$^\circ C/W$



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

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage		V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	60	-	-	V
Gate-body Leakage Current		I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	I _{DSS}	V _{DS} = 60V, V _{GS} = 0V	-	-	1	μA
	T _J =100°C			-	-		
Gate-Threshold Voltage		V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.2	1.7	2.5	V
Drain-Source On-Resistance ⁴		R _{DS(on)}	V _{GS} = 10V, I _D = 21A	-	4.0	4.8	mΩ
			V _{GS} = 4.5V, I _D = 10A	-	5.2	6.6	
Forward Transconductance ⁴		g _{fs}	V _{DS} = 10V, I _D = 21A	-	89	-	S
Input Capacitance		C _{iss}	V _{DS} = 30V, V _{GS} = 0V, f = 1MHz	-	2180	-	pF
Output Capacitance		C _{oss}		-	735	-	
Reverse Transfer Capacitance		C _{rss}		-	42	-	
Gate Resistance		R _g	f = 1MHz	-	1.8	-	Ω
Total Gate Charge		Q _g	V _{GS} = 10V, V _{DS} = 30V, I _D = 21A	-	35	-	nC
Gate-Source Charge		Q _{gs}		-	6.6	-	
Gate-Drain Charge		Q _{gd}		-	8.4	-	
Turn-On Delay Time		t _{d(on)}	V _{GS} = 10V, V _{DD} = 30V, R _G = 3Ω, I _D = 21A	-	9.4	-	ns
Rise Time		t _r		-	8.4	-	
Turn-Off Delay Time		t _{d(off)}		-	32.5	-	
Fall Time		t _f		-	12.5	-	
Body Diode Reverse Recovery Time		t _{rr}	I _F = 20A, dI/dt = 100A/μs	-	50	-	ns
Body Diode Reverse Recovery Charge		Q _{rr}		-	20	-	nC
Diode Forward Voltage ⁴		V _{SD}	I _S = 21A, V _{GS} = 0V	-	-	1.2	V
Continuous Source Current	T _C = 25°C	I _S	-	-	-	100	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)} = 150°C
2. The EAS data shows Max. rating . The test condition is V_{DD} = 25V, V_{GS} = 10V, L = 0.1mH, I_{AS} = 40A.
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.



Typical Characteristics

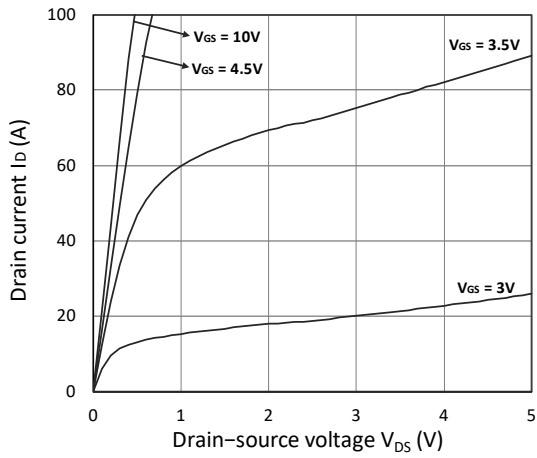


Figure 1. Output Characteristics

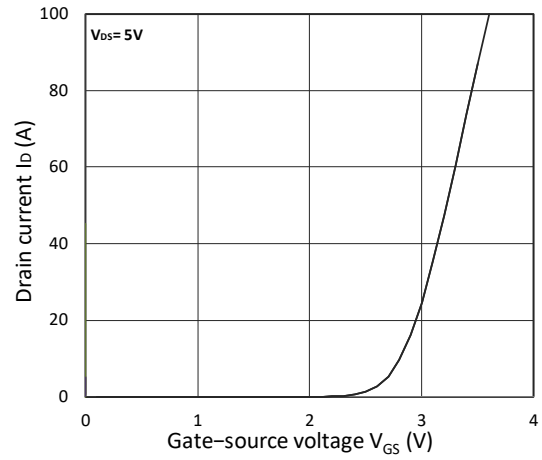


Figure 2. Transfer Characteristics

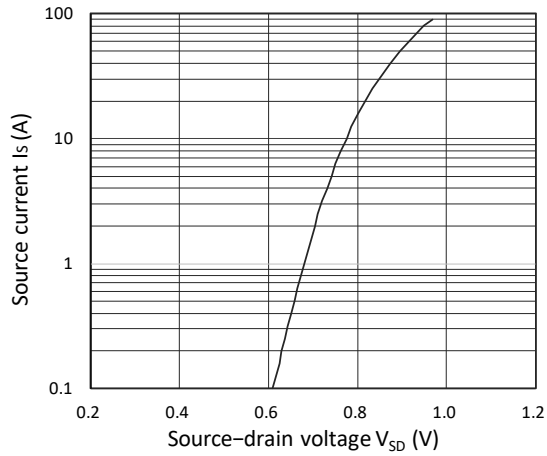


Figure 3. Forward Characteristics of Reverse

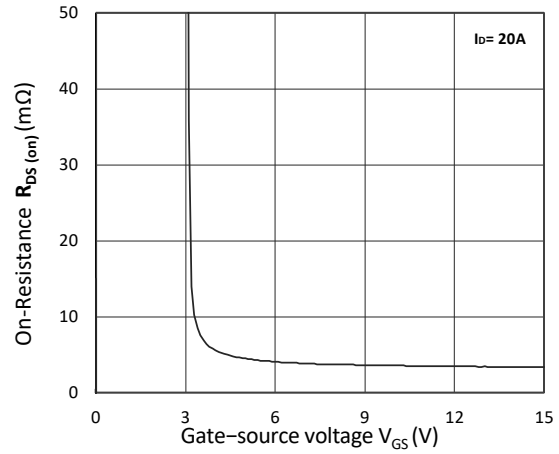


Figure 4. $R_{DS(on)}$ vs. V_{GS}

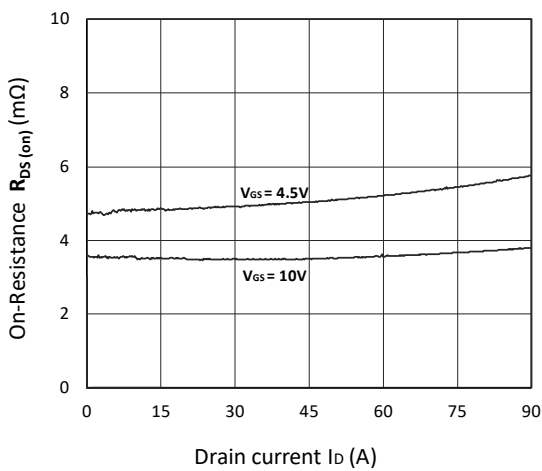


Figure 5. $R_{DS(on)}$ vs. I_D

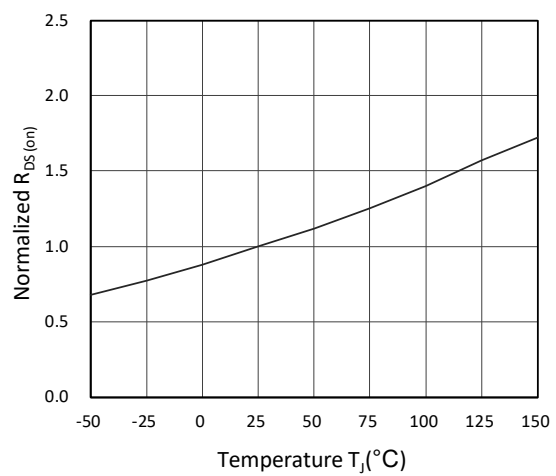


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

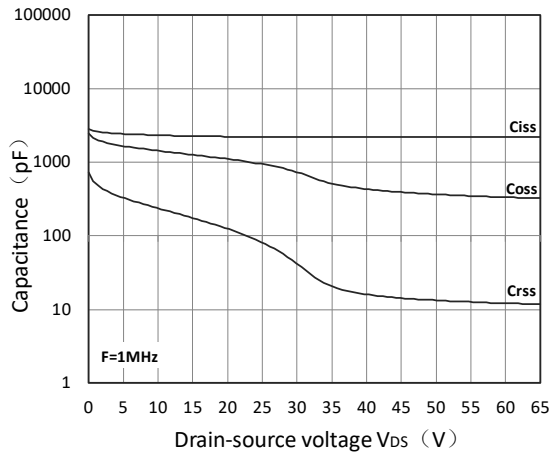


Figure 7. Capacitance Characteristics

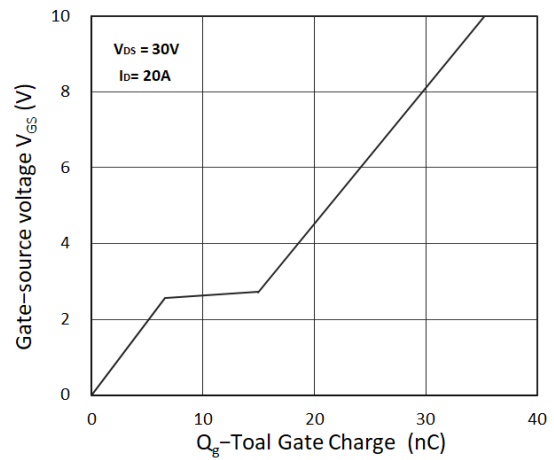


Figure 8. Gate Charge Characteristics

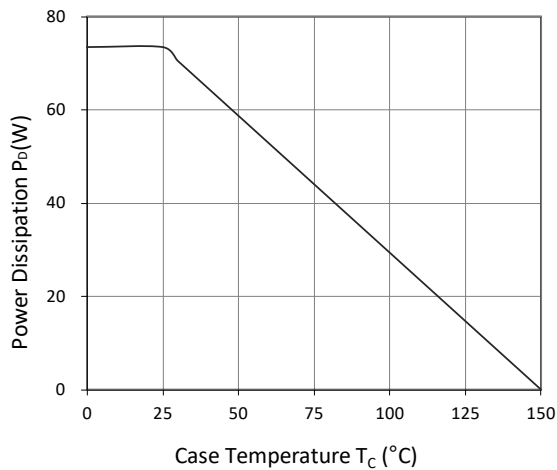


Figure 9. Power Dissipation

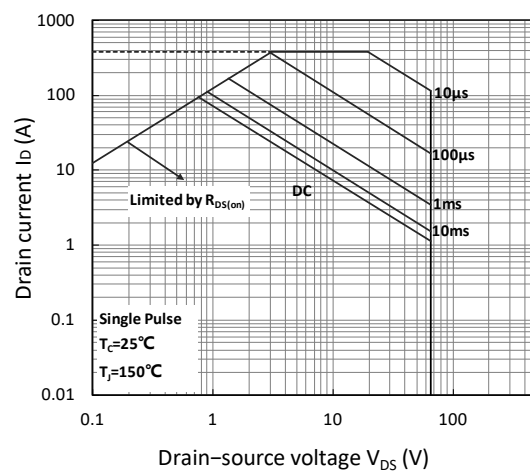


Figure 10. Safe Operating Area

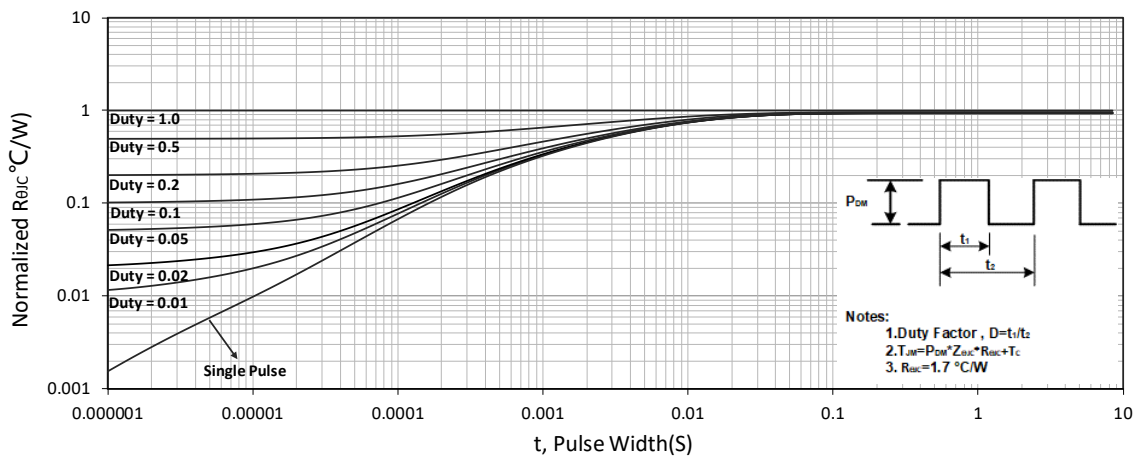


Figure 11. Normalized Maximum Transient Thermal Impedance



Test Circuit

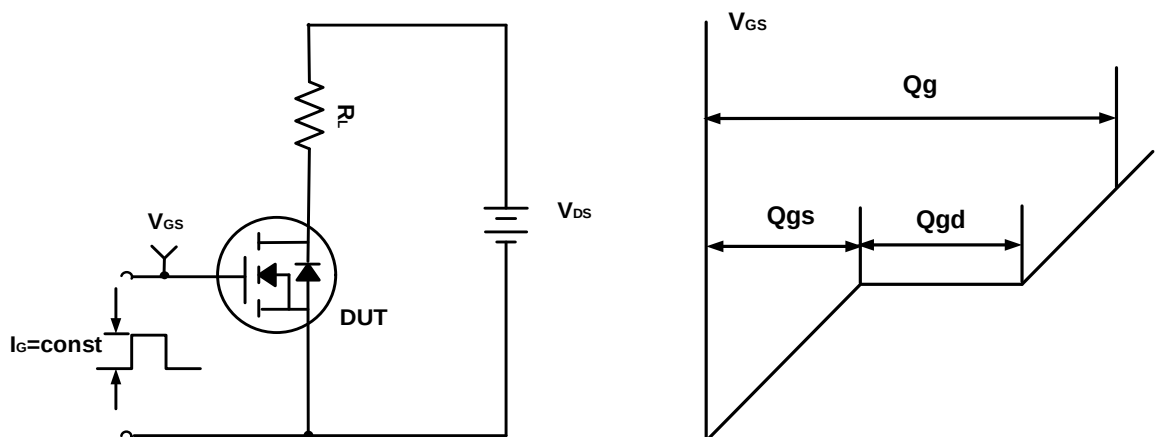


Figure A. Gate Charge Test Circuit & Waveforms

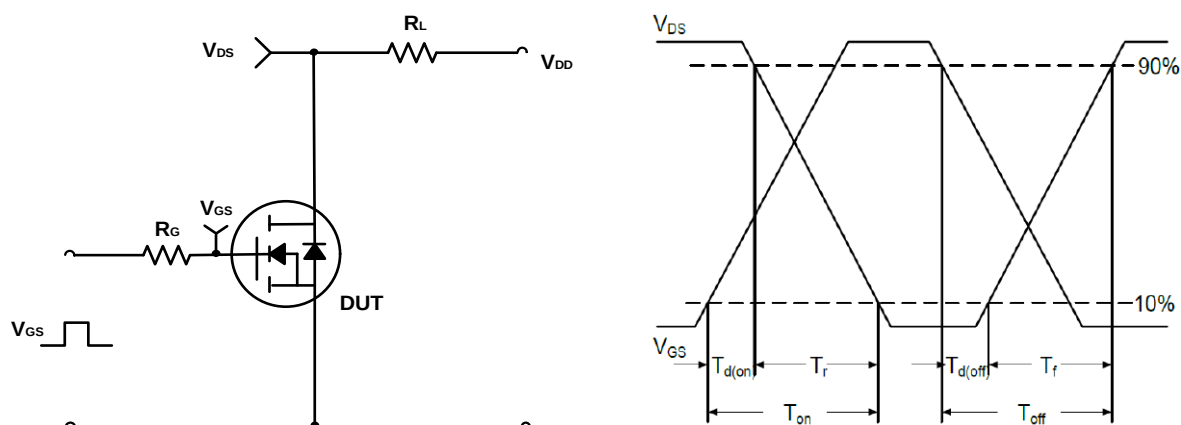


Figure B. Switching Test Circuit & Waveforms

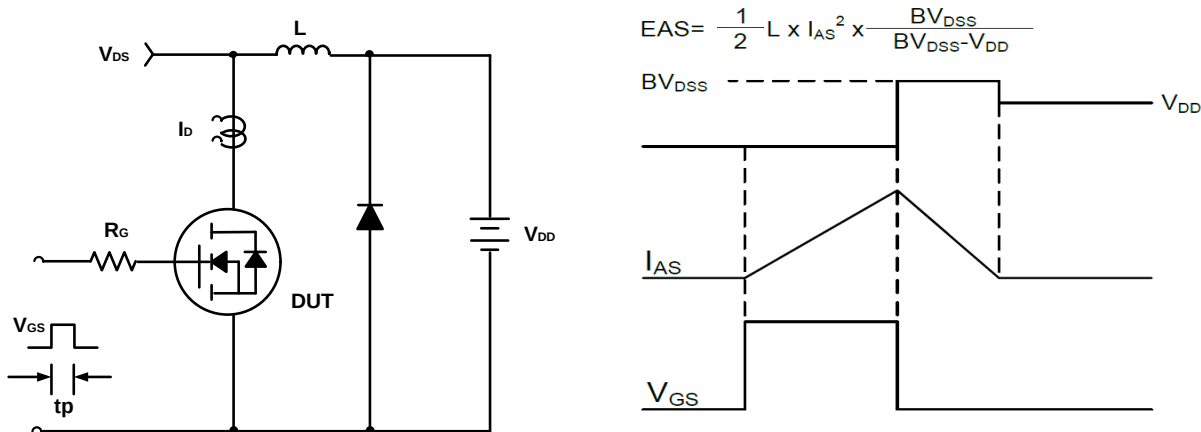
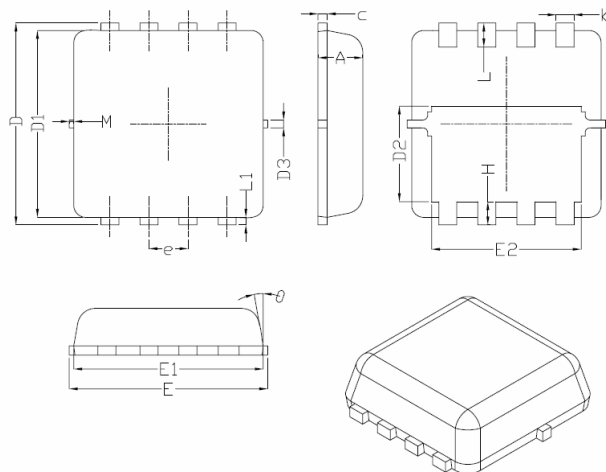


Figure C. Unclamped Inductive Switching Circuit & Waveforms



DFN3X3-8L Package Information



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.48	1.58	1.68
D3	-	0.13	-
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	-	0.13	-
M	*	*	0.15
θ		10°	12°



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