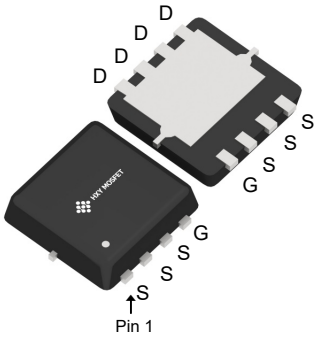
NVTFS5C658NLWFTAG

N-SGT Enhancement Mode MOSFET

Description

The NVTFS5C658NLWFTAG use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics.This device is specially designed to get better ruggedness and suitable.

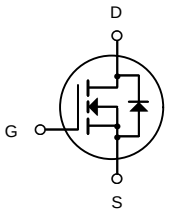


DFN3X3-8L

General Features

V_{DS} =60V I_D =100A

$R_{DS(ON)}$ < 4.8mΩ@ V_{GS}=10V



N-Channel MOSFET

Applications

Consumer electronic power supply Motor control

Synchronous-rectification Isolated DC

Synchronous-rectification applications

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
NVTFS5C658NLWFTAG	DFN3X3-8L	HXY MOSFET	5000

Absolute Maximum Ratings at T_j=25°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°C	I_D	100	A
Continuous drain current	T_C=100°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		Tstg,Tj	-55 to 150	℃
Thermal resistance, junction-case		$R_{\theta JC}$	1.7	°C/W
Thermal resistance, junction-ambient[4)]		$R_{\theta JA}$	51	°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

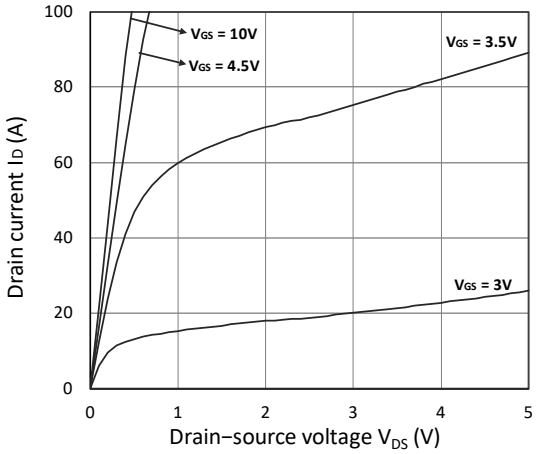


Figure 1. Output Characteristics

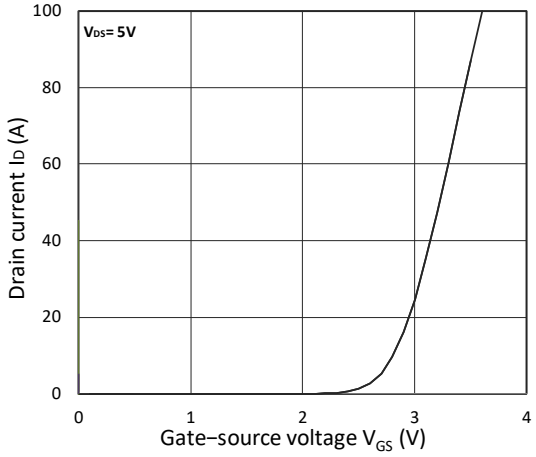


Figure 2. Transfer Characteristics

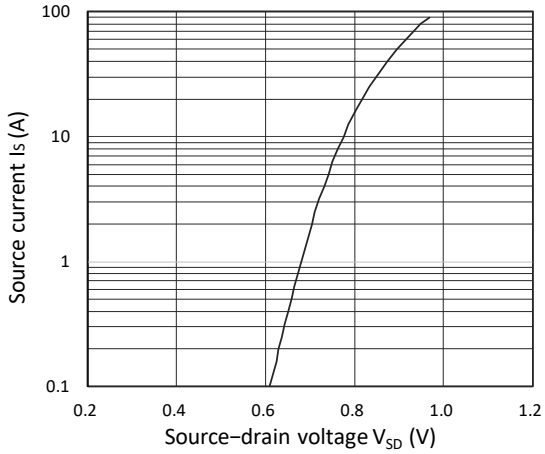


Figure 3. Forward Characteristics of Reverse

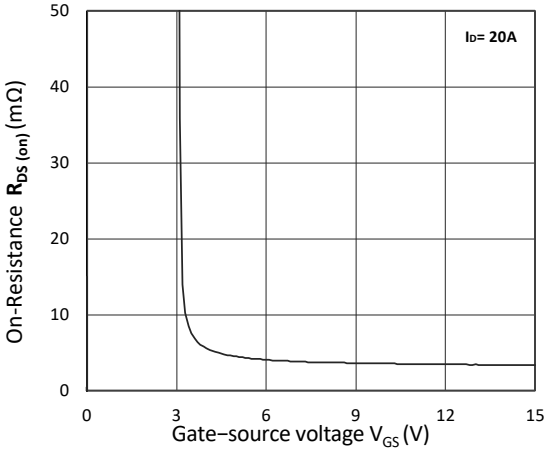


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

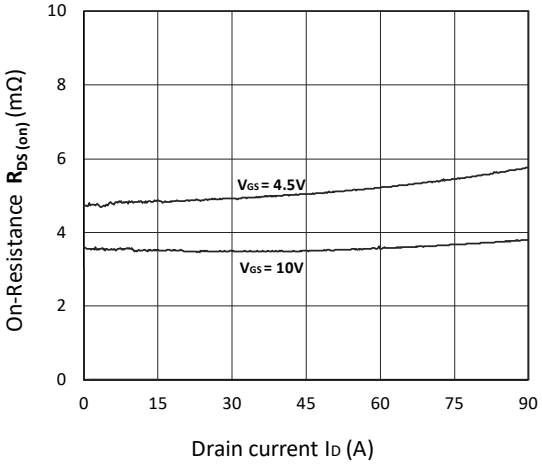


Figure 5. $R_{DS(ON)}$ vs. I_D

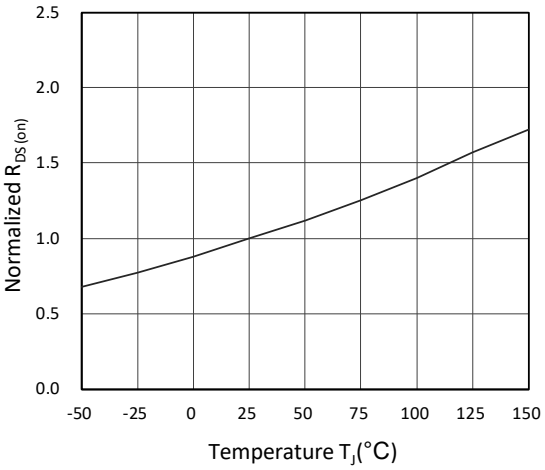


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

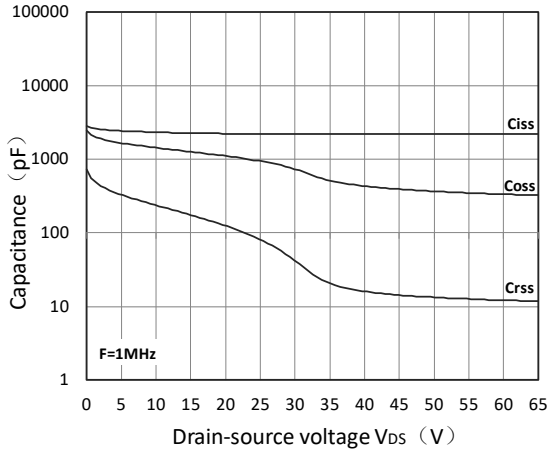


Figure 7. Capacitance Characteristics

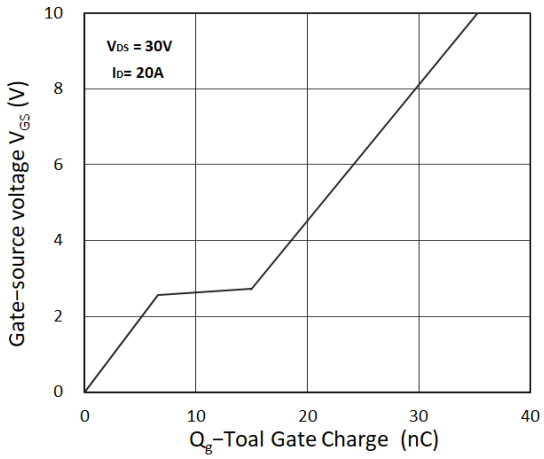


Figure 8. Gate Charge Characteristics

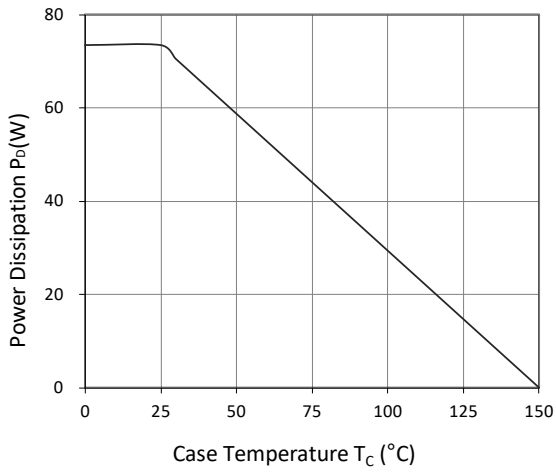


Figure 9. Power Dissipation

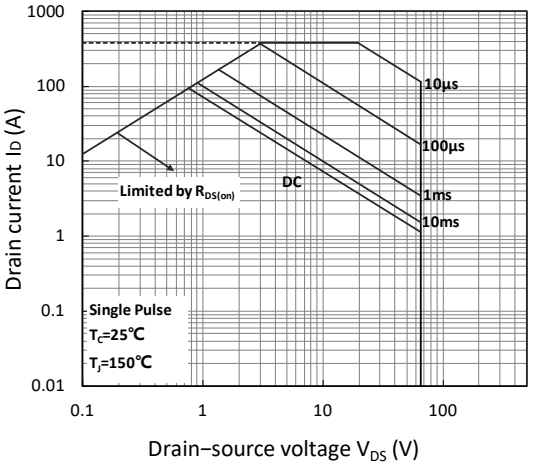


Figure10. Safe Operating Area

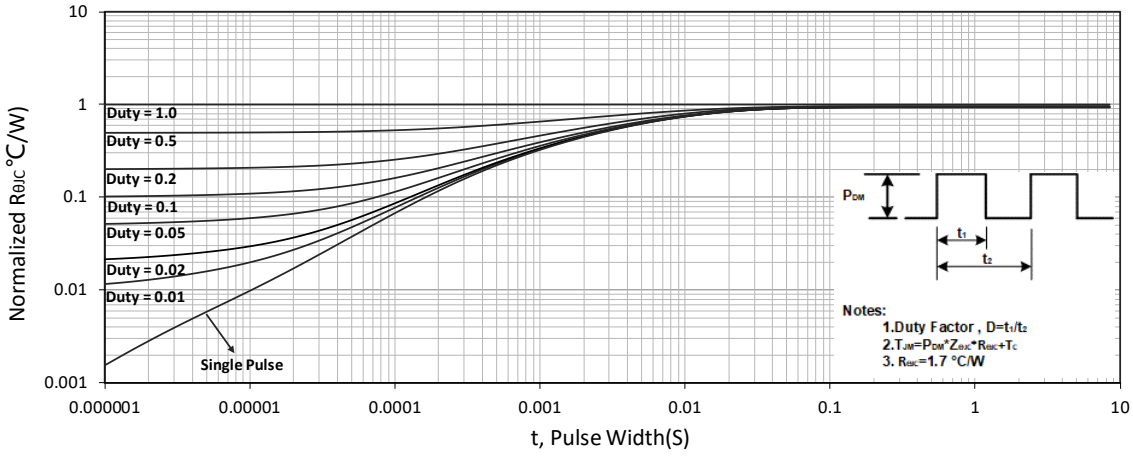


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

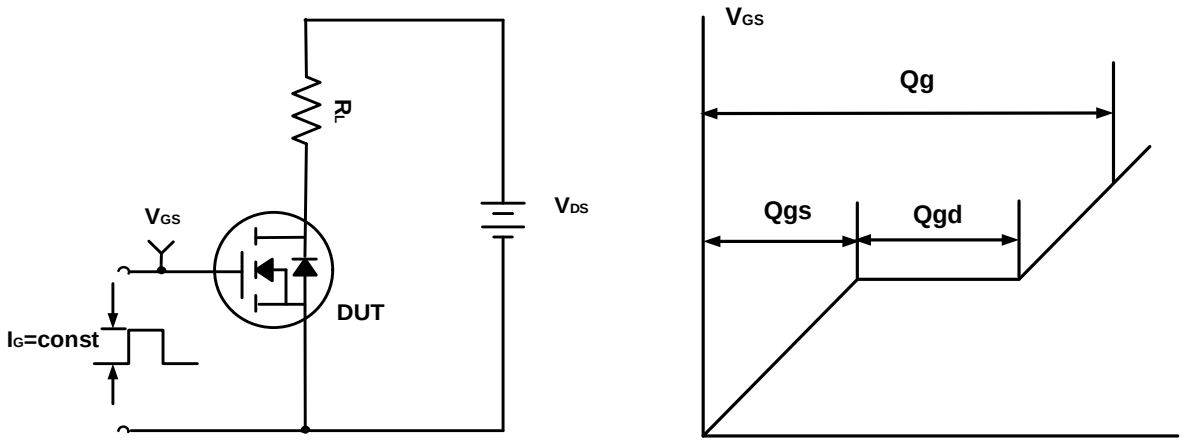


Figure A. Gate Charge Test Circuit & Waveforms

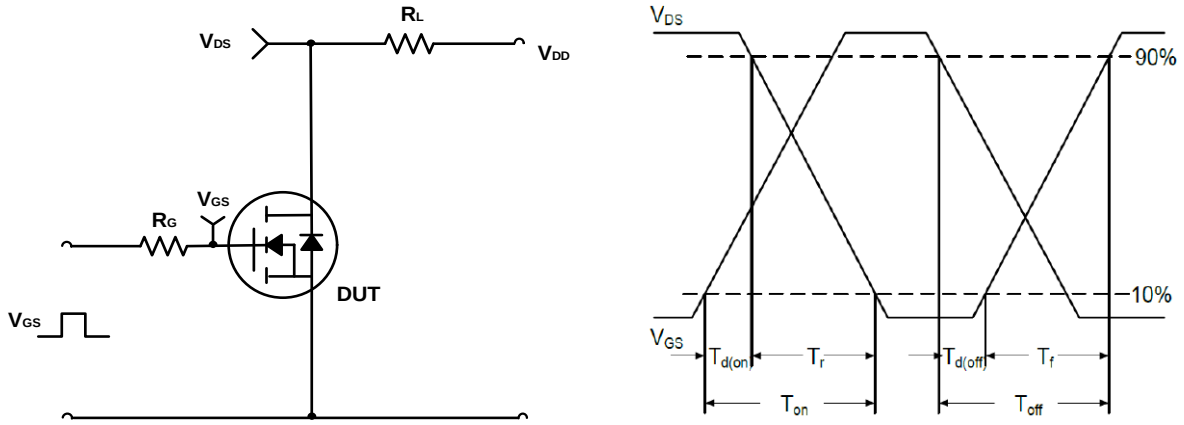


Figure B. Switching Test Circuit & Waveforms

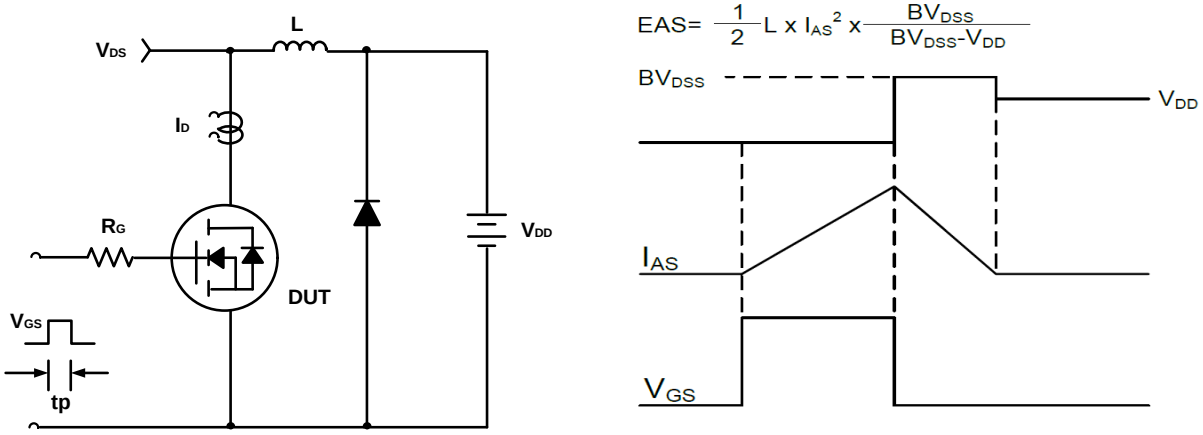
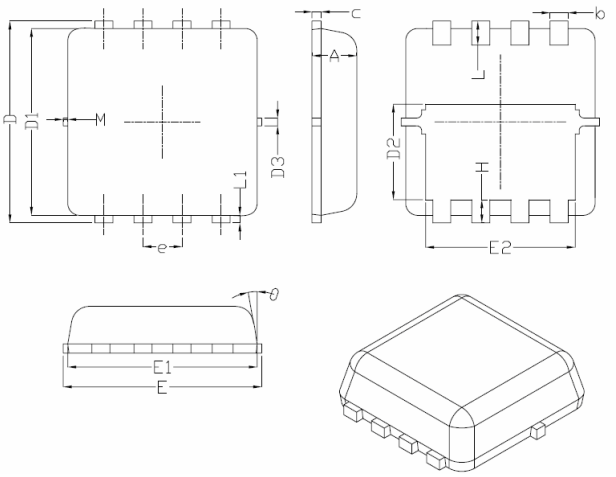


Figure C. Unclamped Inductive Switching Circuit & Waveforms

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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