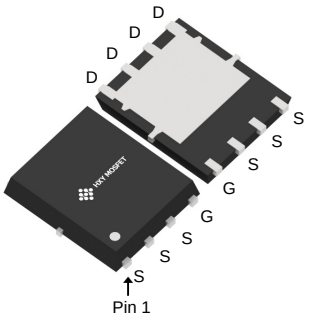
NVMFWS1D3N04XMT1G

N-SGT Enhancement Mode MOSFET

Description

The NVMFWS1D3N04XMT1G 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.



DFN5X6-8L

General Features

V_{DS} = 40V I_D = 219A

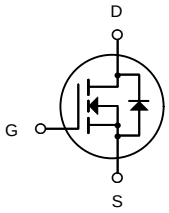
$R_{DS(ON)}$ < 1.5mΩ V_{GS}=10V

Applications

Consumer electronic power supply Motor control

Synchronous-rectification Isolated DC

Synchronous-rectification applications



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
NVMFWS1D3N04XMT1G	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[1]	219	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	138	A
I_{DM}	Pulsed Drain Current[4]	345	A
EAS	Single Pulse Avalanche Energy[5]	69	mJ
P_D@T_C=25℃	Total Power Dissipation	114	W
T_{STG}	Storage Temperature Range	-50 to 150	℃
T_J	Operating Junction Temperature Range	-50 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [3]	43.2	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	1.1	℃/W

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	1.4	-	2.3	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=20A	-	1.2	1.5	mΩ
		V_{GS}=5V, I_D=20A	-	1.7	2.2	mΩ
R_G	Gate Resistance	f = 1 MHz	-	1.5	-	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	VGS = 0V VDS = 20V f = 150KHz	-	6461	-	pF
Coss	Output Capacitance		-	3257	-	pF
Crss	Reverse Transfer Capacitance		-	196	-	pF
Switching Characteristics						
$T_{D(on)}$	Turn-on Delay Time	VDD = 20V VGS = 4.5V RG = 3Ω ID = 20A	-	24	-	ns
T_r	Turn-on Rise Time		-	84	-	ns
$T_{D(off)}$	Turn-off Delay Time		-	62	-	ns
T_f	Turn-off Fall Time		-	20	-	ns
Q_g	Total Gate Charge	V_{DD} = 20V V_{GS} = 4.5V I_D = 20A	-	55	-	nC
Q_{gs}	Gate Source Charge		-	15	-	nC
Q_{gd}	Gate Drain Charge		-	19	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
V_{SD}	Drain-Source Diode Forward Voltage	I_S = 50A, VGS = 0V	-	0.8	1.2	V
T_{rr}	Reverse Recovery Time	I_S = 20A, VGS = 0V di/dt = 100A/μs	-	171	-	ns
Q_{rr}	Reverse Recovery Charge		-	381	-	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

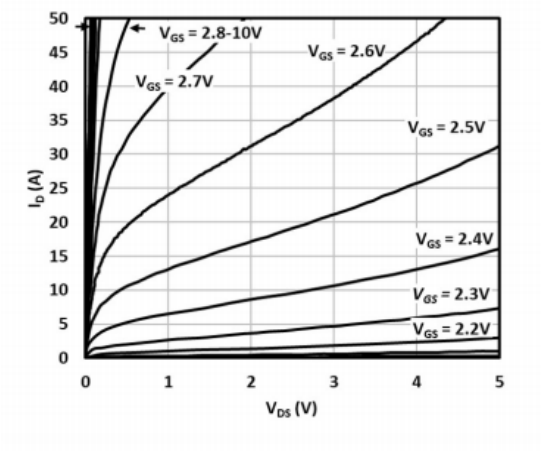


Fig. 1 Output characteristics

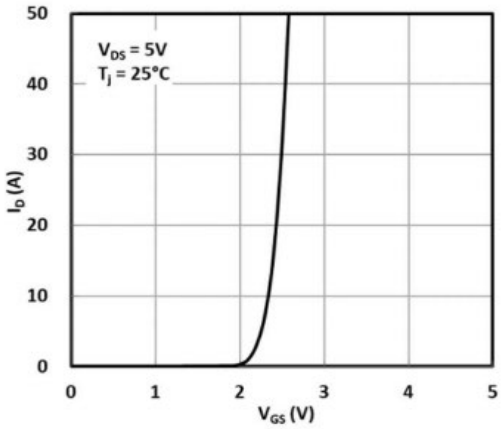


Fig. 2 Transfer characteristics

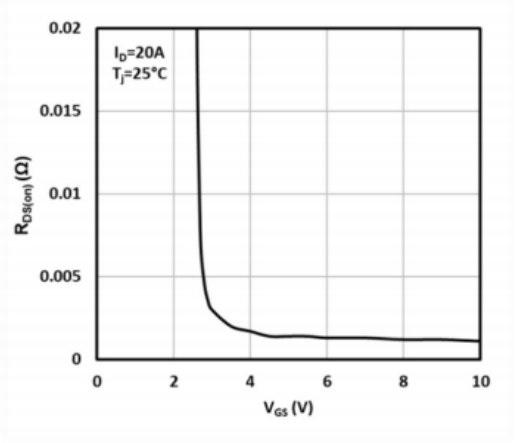


Fig.3 On-resistance vs. gate voltage

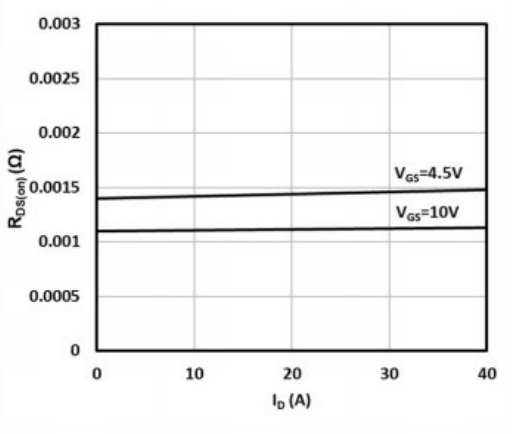


Fig.4 On-resistance vs. drain current

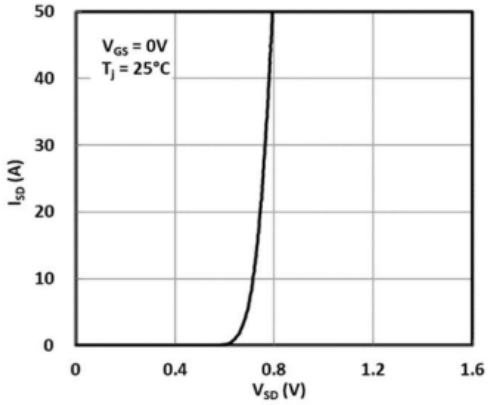


Fig.5 Source-to-drain diode forward characteristics

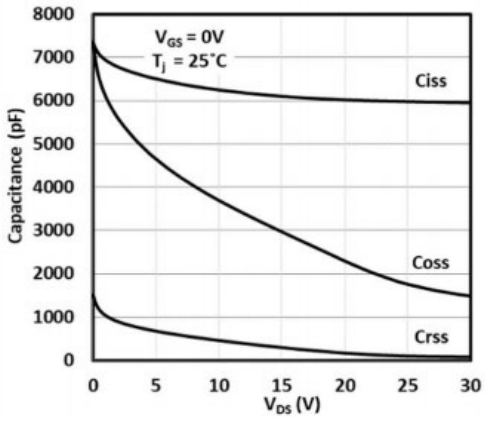


Fig.6 Capacitance vs. drain-to-source voltage

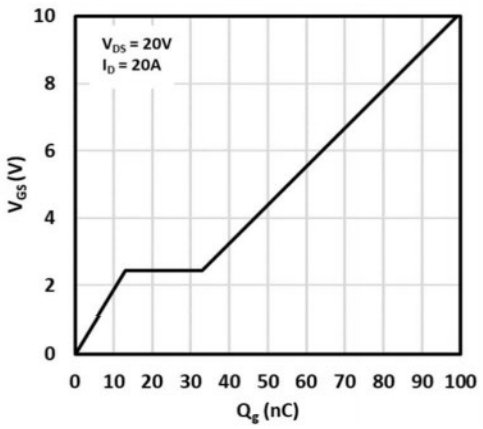


Fig.7 Gate-to-source voltage vs. gate charge

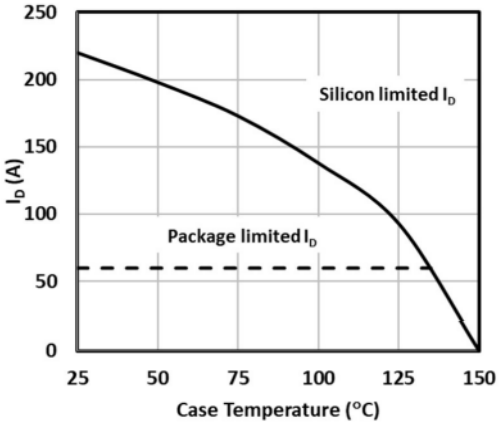


Fig.8 Maximum drain current vs. case temperature

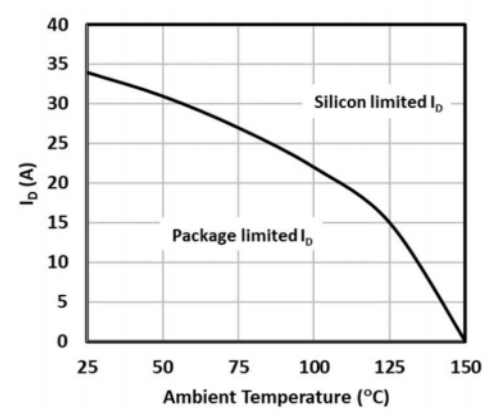
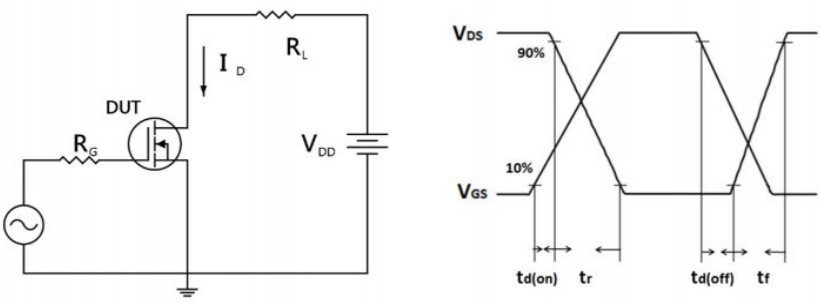
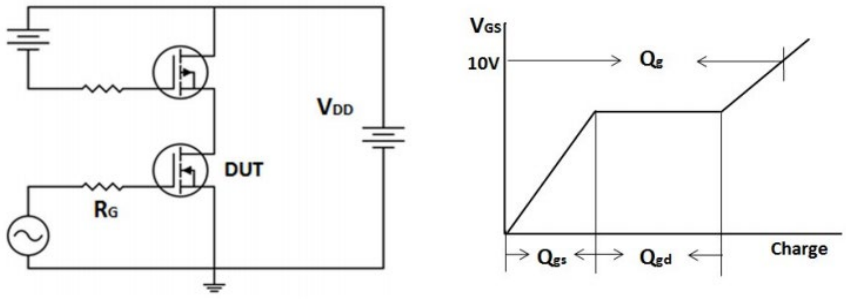


Fig. 9 Maximum drain current vs. ambient temperature

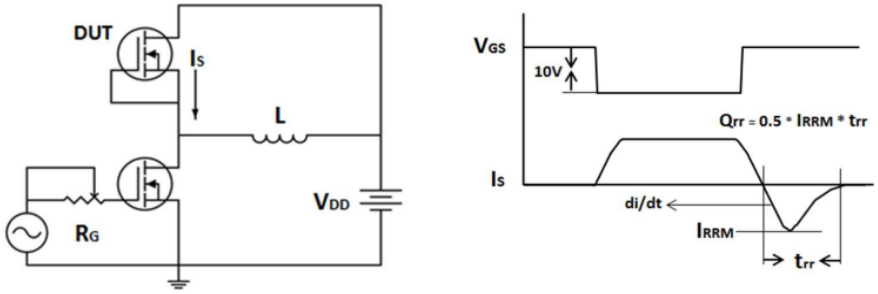
Test Circuits and Waveforms



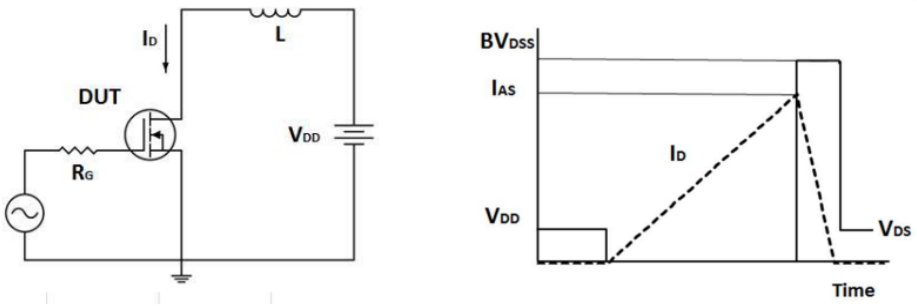
Resistive switching time test circuit & waveforms



Gate charge test circuit & waveform

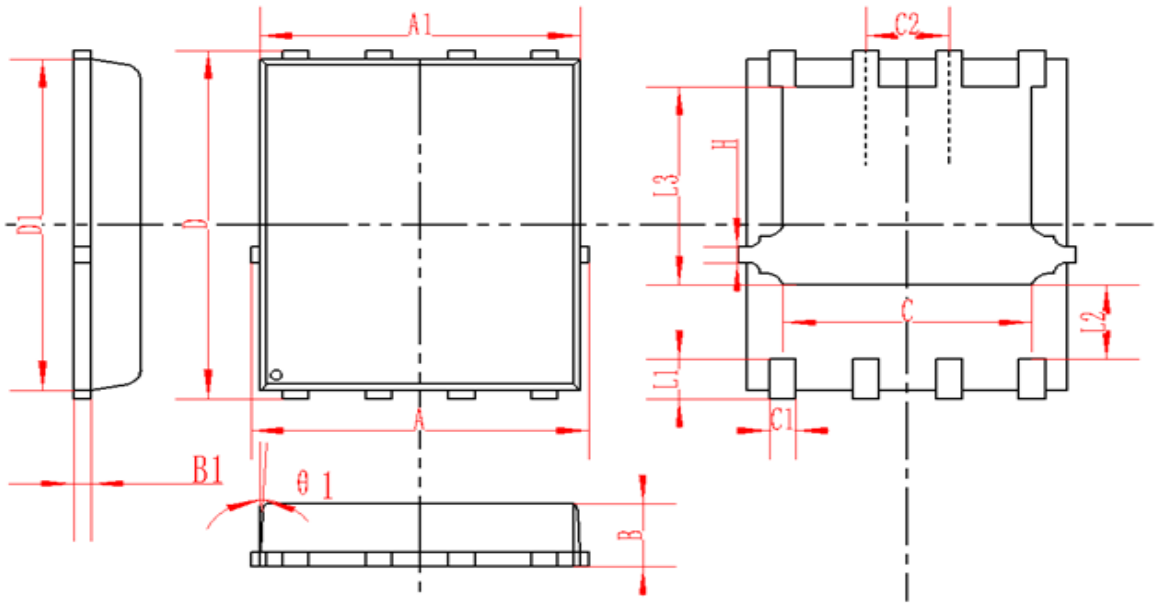


Peak diode recovery dv/dt test circuit & waveforms



Unclamped inductive switching test circuit & waveforms

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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