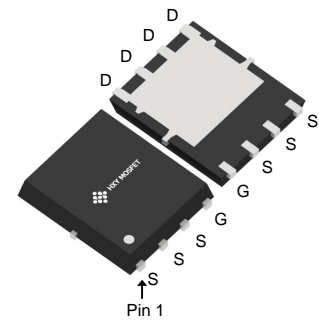




## Description

The NVMFS5C430NLWFAFT1G 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.



DFN5X6-8L

## General Features

$V_{DS} = 40V$   $I_D = 219A$

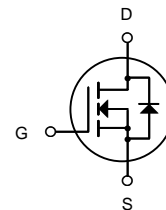
$R_{DS(ON)} < 1.5m\Omega$   $V_{GS}=10V$

## Applications

Consumer electronic power supply Motor control

Synchronous-rectification Isolated DC

Synchronous-rectification applications



N-Channel MOSFET

## Ordering Information

Product ID	Pack	Brand	Qty(PCS)
NVMFS5C430NLWFAFT1G	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	$\pm 20$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	219	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	138	A
$I_{DM}$	Pulsed Drain Current <sup>4</sup>	345	A
EAS	Single Pulse Avalanche Energy <sup>5</sup>	69	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	114	W
$T_{STG}$	Storage Temperature Range	-50 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-50 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>3</sup>	43.2	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case	1.1	$^\circ C/W$



**Electrical Characteristics (T<sub>J</sub>=25°C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max	Unit
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain Source breakdown voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA, T <sub>J</sub> =25°C	40	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =40V, V <sub>GS</sub> =0V	-	-	1	uA
I <sub>GSS</sub>	Gate-to-Source Forward Leakage	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.4	-	2.3	V
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	1.2	1.5	mΩ
		V <sub>GS</sub> =5V, I <sub>D</sub> =20A	-	1.7	2.2	mΩ
R <sub>G</sub>	Gate Resistance	f = 1 MHz	-	1.5	-	Ω
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0V V <sub>DS</sub> = 20V f = 150KHz	-	6461	-	pF
C <sub>oss</sub>	Output Capacitance		-	3257	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	196	-	pF
<b>Switching Characteristics</b>						
T <sub>D(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> = 20V V <sub>GS</sub> = 4.5V R <sub>G</sub> = 3Ω I <sub>D</sub> = 20A	-	24	-	ns
T <sub>r</sub>	Turn-on Rise Time		-	84	-	ns
T <sub>D(off)</sub>	Turn-off Delay Time		-	62	-	ns
T <sub>f</sub>	Turn-off Fall Time		-	20	-	ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DD</sub> = 20V V <sub>GS</sub> = 4.5V I <sub>D</sub> = 20A	-	55	-	nC
Q <sub>gs</sub>	Gate Source Charge		-	15	-	nC
Q <sub>gd</sub>	Gate Drain Charge		-	19	-	nC
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
V <sub>SD</sub>	Drain-Source Diode Forward Voltage	I <sub>S</sub> = 50A, V <sub>GS</sub> = 0V	-	0.8	1.2	V
T <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> = 20A, V <sub>GS</sub> = 0V di/dt = 100A/μs	-	171	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	381	-	nC

**Notes:**

1. Rated according to R<sub>θJC</sub>
2. Rated according to R<sub>θJA</sub>
3. Surface mounted on 1 inch<sup>2</sup> FR4 board, 2 oz Cu
4. Limited by maximum T<sub>J</sub>
5. Starting T<sub>J</sub> = 25°C, V<sub>DD</sub> = 30V, V<sub>GS</sub> = 10V, L = 0.5mH
6. Pulse width limited by maximum T<sub>J</sub>



### Typical Characteristics

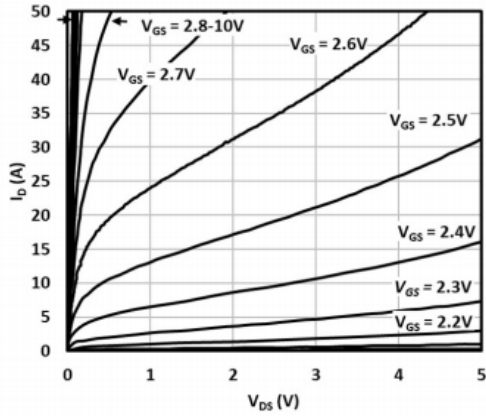


Fig. 1 Output characteristics

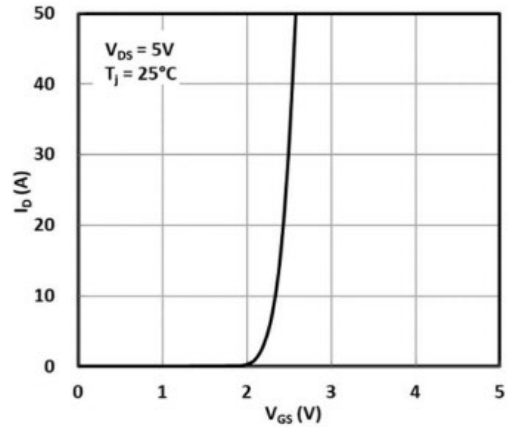


Fig. 2 Transfer characteristics

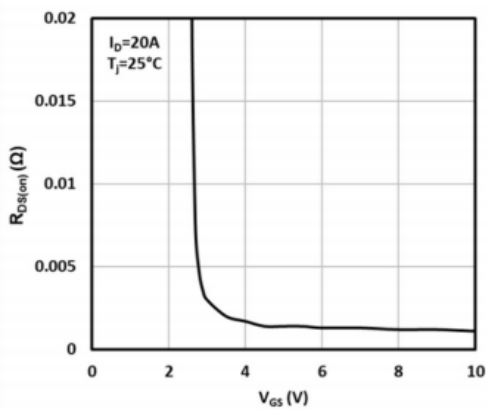


Fig.3 On-resistance vs. gate voltage

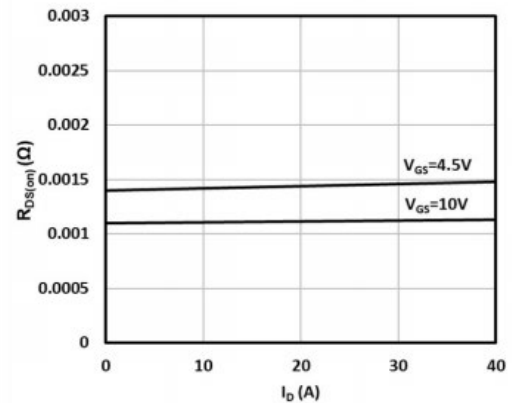


Fig.4 On-resistance vs. drain current

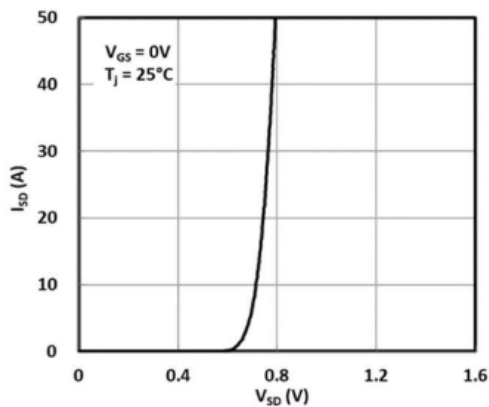


Fig.5 Source-to-drain diode forward characteristics

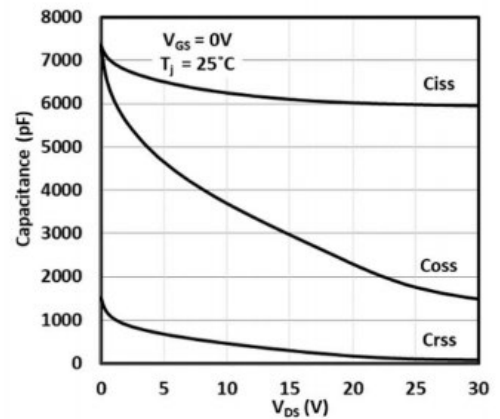


Fig.6 Capacitance vs. drain-to-source voltage

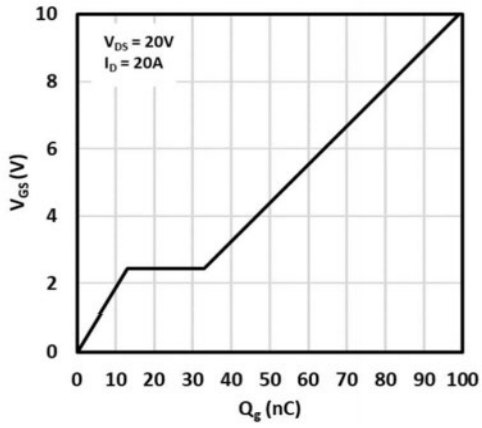


Fig.7 Gate-to-source voltage vs. gate charge

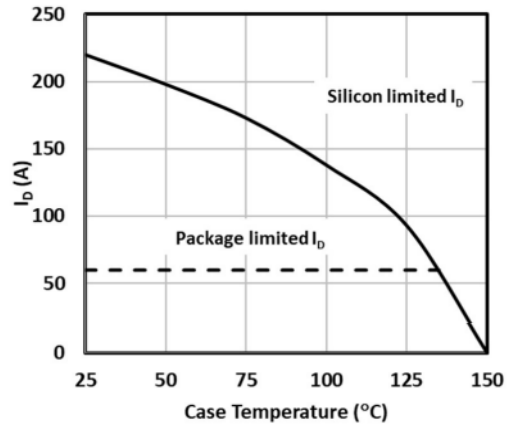


Fig.8 Maximum drain current vs. case temperature

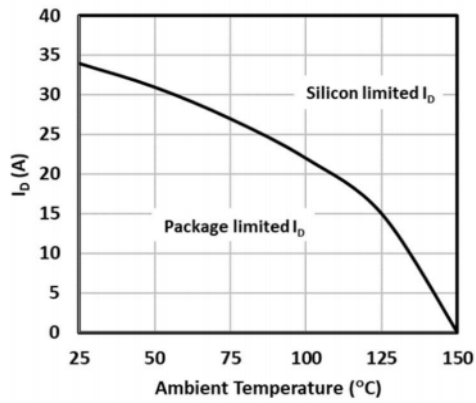
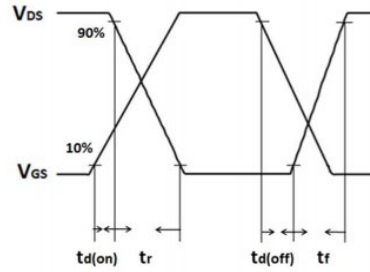
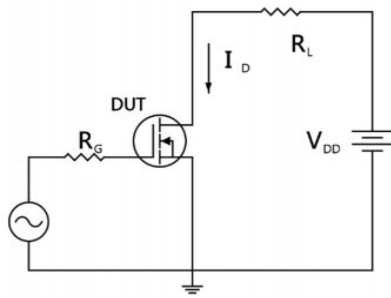


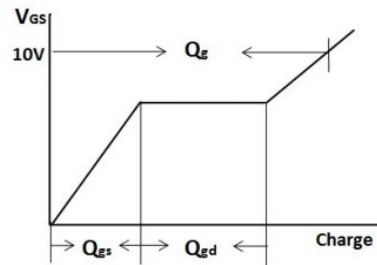
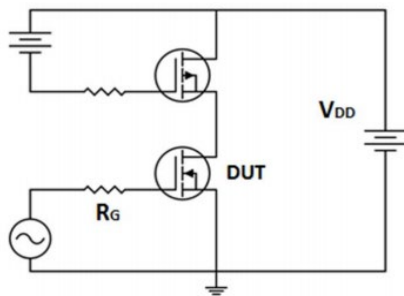
Fig. 9 Maximum drain current vs. ambient temperature



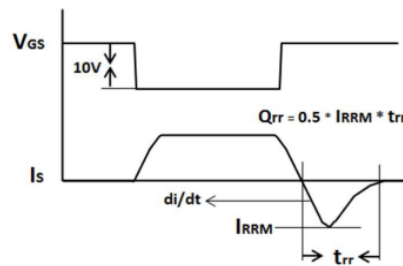
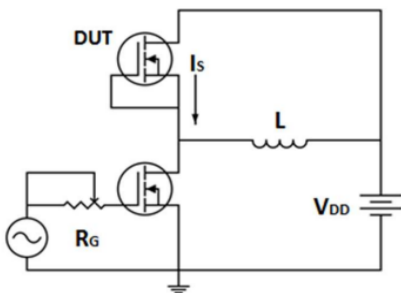
## Test Circuits and Waveforms



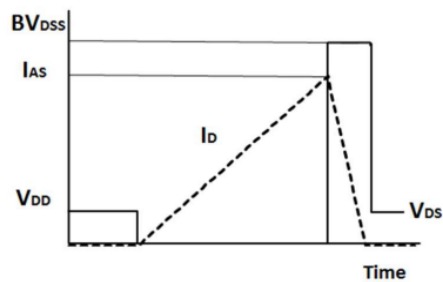
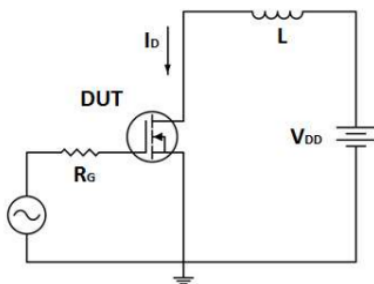
Resistive switching time test circuit & waveforms



Gate charge test circuit & waveform



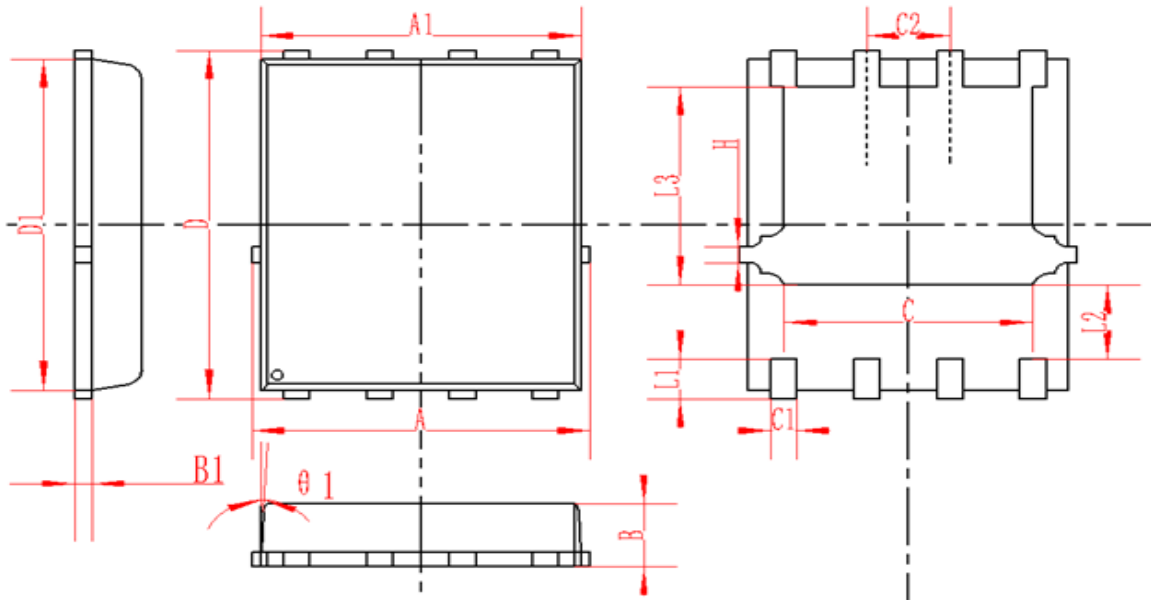
Peak diode recovery dv/dt test circuit & waveforms



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		
theta 1	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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