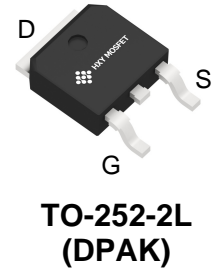




### Description

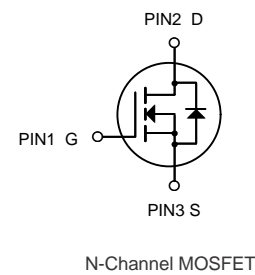
The NVD4C05NT4G uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



### General Features

$V_{DS} = 30V$   $I_D = 120A$

$R_{DS(ON)} < 3.8m\Omega @ V_{GS}=10V$



### Application

Battery protection

Load switch

Uninterruptible power supply

### Ordering Information

Product ID	Pack	Brand	Qty(PCS)
NVD4C05NT4G	TO-252-2L(DPAK)	HXY MOSFET	2500

### Absolute Maximum Ratings ( $T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	120	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	75	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	384	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	196	mJ
$I_{AS}$	Avalanche Current	53.8	A
$P_D@T_C=25^\circ C$	Total Power Dissipation <sup>4</sup>	62.5	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup>	62	$^\circ C/W$



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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	30	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C	-	-	1 30	μA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	1.4	1.7	2.5	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
R <sub>DS(ON)</sub> <sup>d</sup>	Drain-Source On-state Resistance	V <sub>GS</sub> =10V, I <sub>DS</sub> =20A T <sub>J</sub> =125°C	-	3 4.4	3.8 -	mΩ
		V <sub>GS</sub> =4.5V, I <sub>DS</sub> =15A	-	4.0	5.5	
Gfs	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>DS</sub> =10A	-	24.6	-	S
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>d</sup>	Diode Forward Voltage	I <sub>SD</sub> =20A, V <sub>GS</sub> =0V	-	0.8	1.1	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>DS</sub> =20A, di <sub>SD</sub> /dt=100A/μs	-	35.6	-	ns
t <sub>a</sub>	Charge Time		-	19.3	-	
t <sub>b</sub>	Discharge Time		-	16.3	-	
Q <sub>rr</sub>	Reverse Recovery Charge		-	26	-	
<b>Dynamic Characteristics<sup>e</sup></b>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	-	1	2	Ω
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, Frequency=1.0MHz	-	2485	2971	pF
C <sub>oss</sub>	Output Capacitance		-	850	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	85	-	
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> =15V, R <sub>L</sub> =15Ω, I <sub>DS</sub> =1A, V <sub>GEN</sub> =10V, R <sub>G</sub> =6Ω	-	12.4	23	ns
t <sub>r</sub>	Turn-on Rise Time		-	9.5	18	
t <sub>d(OFF)</sub>	Turn-off Delay Time		-	27.2	49	
t <sub>f</sub>	Turn-off Fall Time		-	35.2	64	
<b>Gate Charge Characteristics<sup>e</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>DS</sub> =20A	-	20.6	28.8	nC
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>DS</sub> =20A	-	9.8	-	
Q <sub>gth</sub>	Threshold Gate Charge		-	1.8	-	
Q <sub>gs</sub>	Gate-Source Charge		-	3.8	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	3.7	-	

Note d : Pulse test ; pulse width≤300μs, duty cycle≤2%.

Note e : Guaranteed by design, not subject to production testing.



### Typical Operating Characteristics

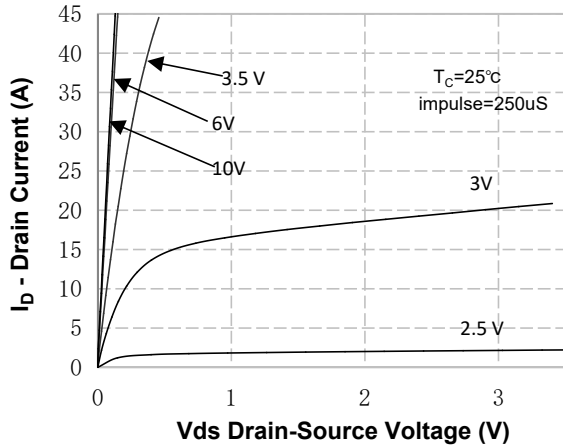


Figure 1. On-Region Characteristics

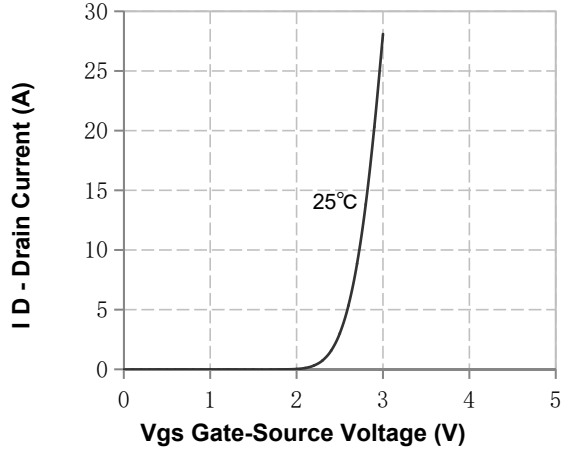


Figure 2. Transfer Characteristics

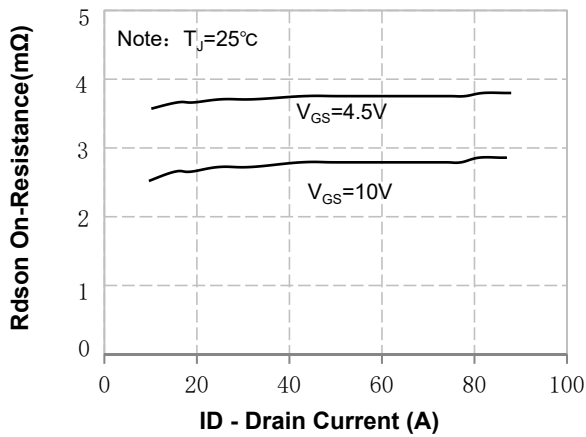


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

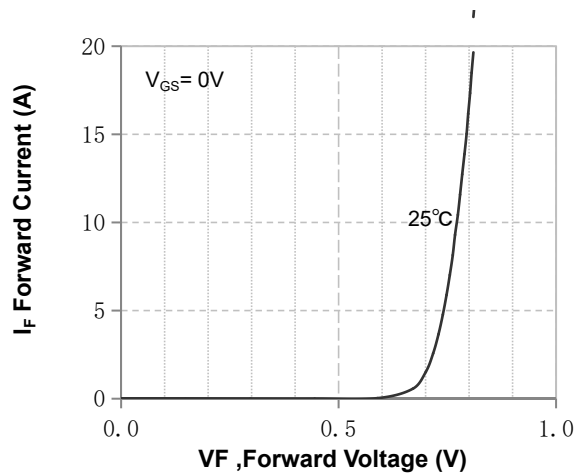


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

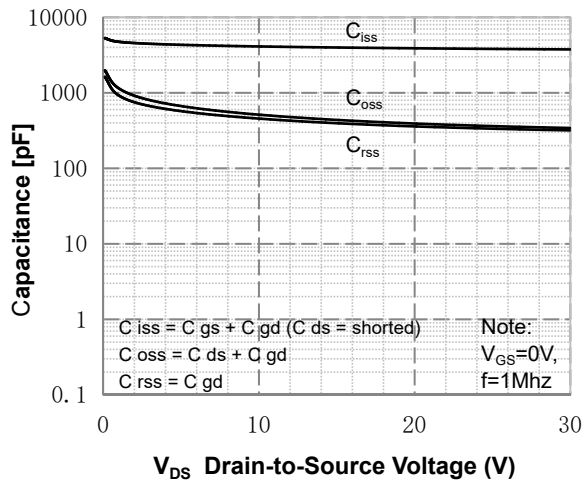


Figure 5. Capacitance Characteristics

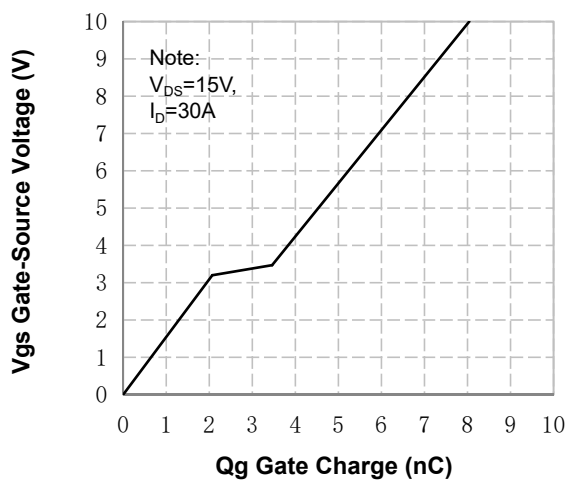


Figure 6. Gate Charge Characteristics

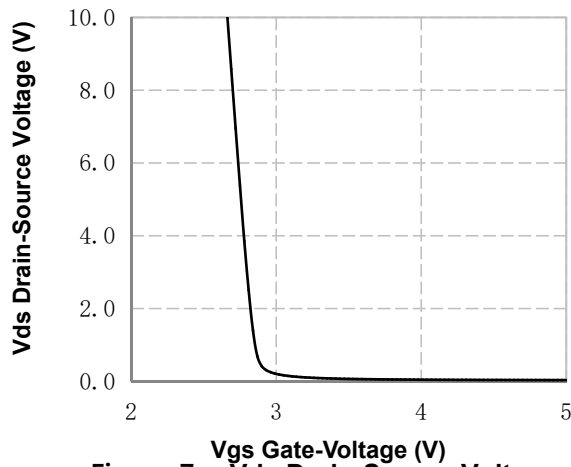


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

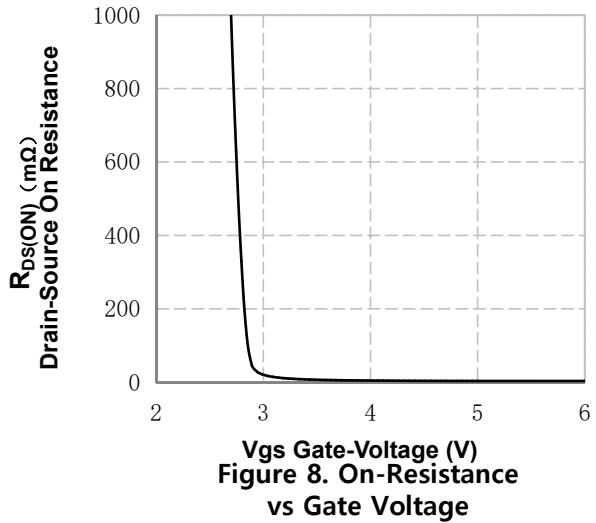


Figure 8. On-Resistance vs Gate Voltage

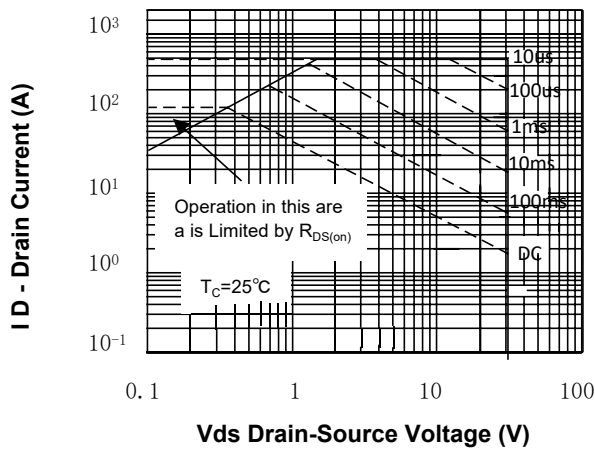


Figure 9. Maximum Safe Operating Area

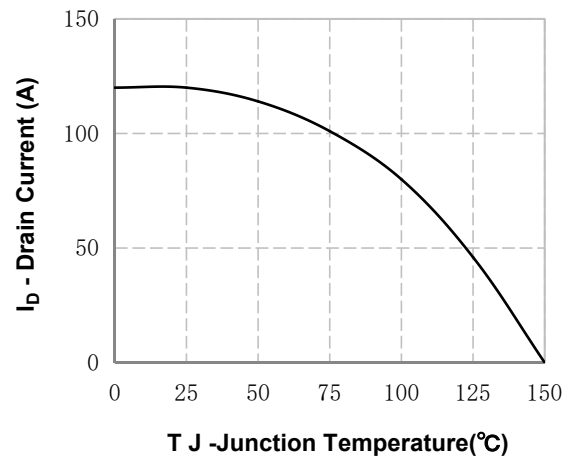


Figure 10. Maximum Continuous Drain Current vs Temperature

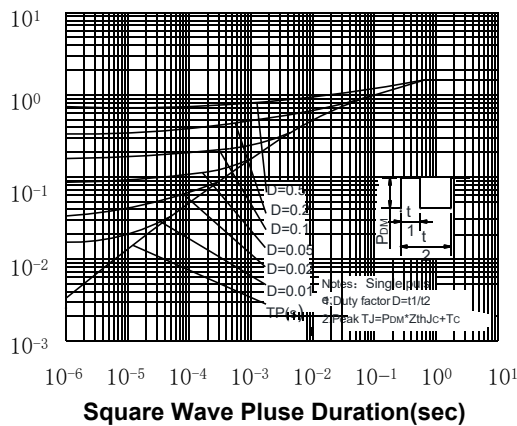


Figure 11. Transient Thermal Response Curve





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