



## General Description

The NTMFD5C466NT1G 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.

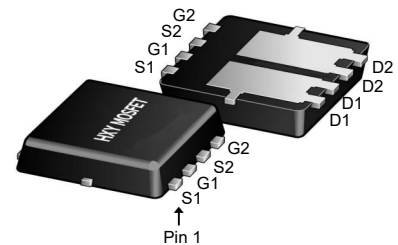
## General Features

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

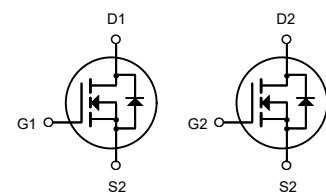
$R_{DS(ON)} < 8.5m\Omega @ V_{GS} = 10V$

## Applications

Consumer electronic power supply Motor control  
Synchronous-rectification Isolated DC  
Synchronous-rectification applications



DFN5X6-8L



Dual N-Channel MOSFET

## Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
NTMFD5C466NT1G	DFN5X6-8L	HXY MOSFET	5000

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

Symbol	Parameter		Max.	Units
$V_{DSS}$	Drain-Source Voltage		40	V
$V_{GSS}$	Gate-Source Voltage		$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ C$	40	A
		$T_C = 100^\circ C$	25	A
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>		100	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>note2</sup>		28	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ C$	29	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		3.2	$^\circ C/W$
$T_J, T_{STG}$	Operating and Storage Temperature Range		-55 to +175	$^\circ C$



### Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V$ , $I_D=250\mu A$	40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V$ , $I_D=12A$	---	6.9	8.5	$m\Omega$
		$V_{GS}=4.5V$ , $I_D=10A$	---	10.0	15	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$ , $I_D=250\mu A$	1.35	---	3	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=32V$ , $V_{GS}=0V$ , $T_J=25^{\circ}\text{C}$	---	---	1	$\mu A$
		$V_{DS}=32V$ , $V_{GS}=0V$ , $T_J=55^{\circ}\text{C}$	---	---	5	
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V$ , $V_{DS}=0V$	---	---	$\pm 100$	nA
$R_g$	Gate Resistance	$V_{DS}=0V$ , $V_{GS}=0V$ , $f=1\text{MHz}$	---	1.7	---	$\Omega$
$Q_g$	Total Gate Charge (4.5V)	$V_{DS}=20V$ , $V_{GS}=4.5V$ , $I_D=12A$	---	5.8	---	nC
$Q_{gs}$	Gate-Source Charge		---	3	---	
$Q_{gd}$	Gate-Drain Charge		---	1.2	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V$ , $V_{GS}=10V$ , $R_G=3.3\Omega$ $I_D=1A$	---	14.3	---	ns
$T_r$	Rise Time		---	5.6	---	
$T_{d(off)}$	Turn-Off Delay Time		---	20	---	
$T_f$	Fall Time		---	11	---	
$C_{iss}$	Input Capacitance	$V_{DS}=15V$ , $V_{GS}=0V$ , $f=1\text{MHz}$	---	690	---	pF
$C_{oss}$	Output Capacitance		---	193	---	
$C_{rss}$	Reverse Transfer Capacitance		---	38	---	

### Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current <sup>1,5</sup>	$V_G=V_D=0V$ , Force Current	---	---	40	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V$ , $I_S=1A$ , $T_J=25^{\circ}\text{C}$	---	---	1	V

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is  $V_{DD}=25V$ ,  $V_{GS}=10V$ ,  $L=0.1mH$ ,  $I_{AS}=31A$
- 4.The power dissipation is limited by 150 $^{\circ}\text{C}$  junction temperature
- 5.The data is theoretically the same as  $I_D$  and  $I_{DM}$  , in real applications , should be limited by total power dissipation.



## Typical Characteristics

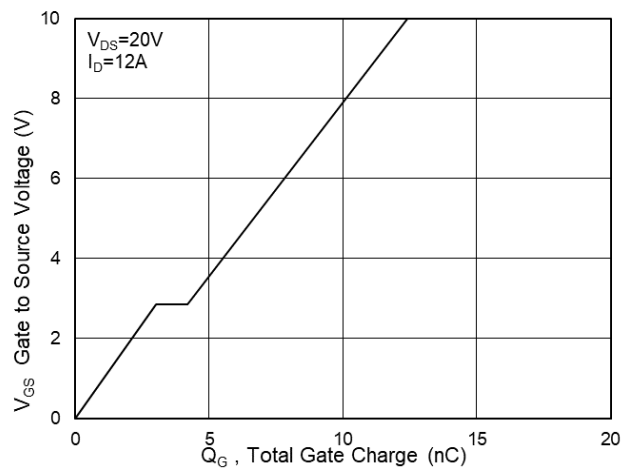
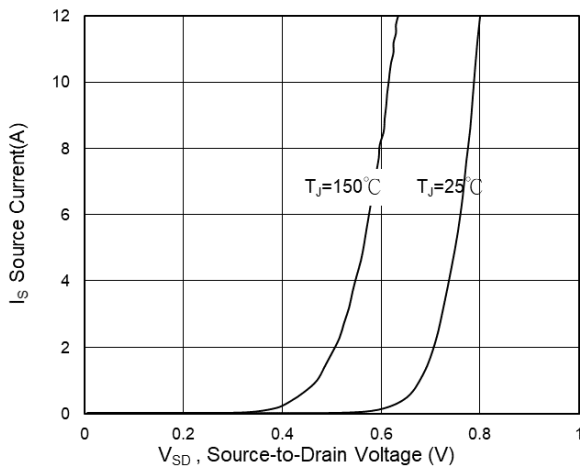
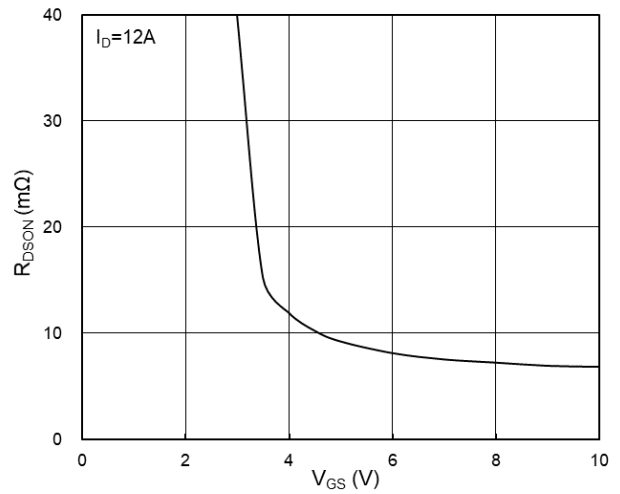
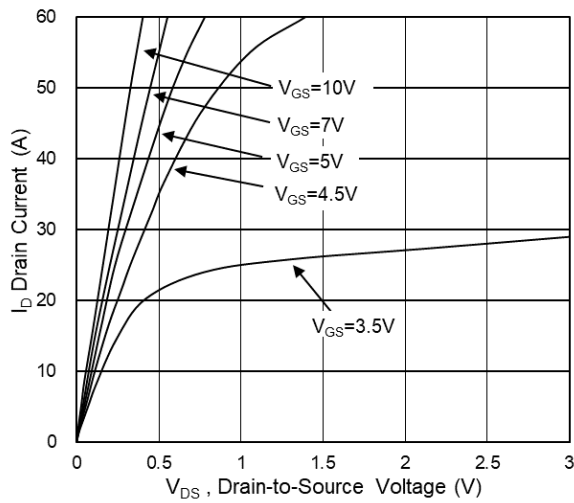
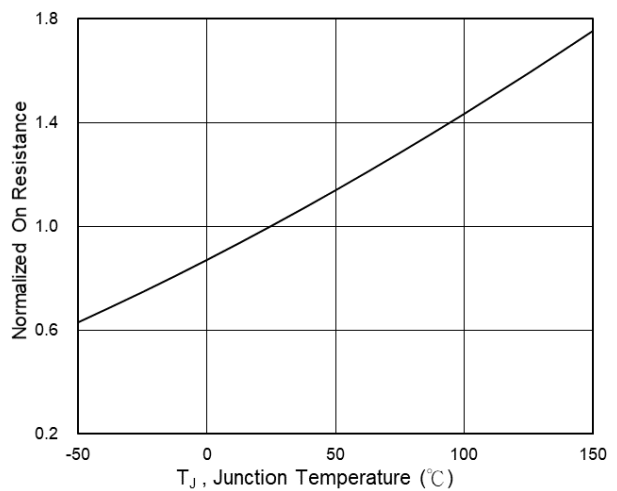
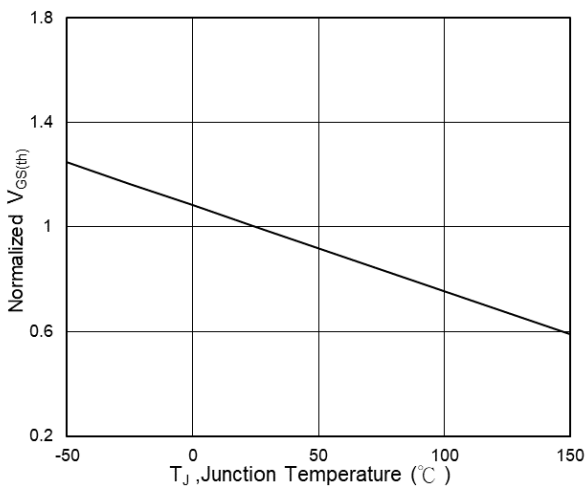


Fig.3 Source Drain Forward Characteristics

Fig.4 Gate-Charge Characteristics



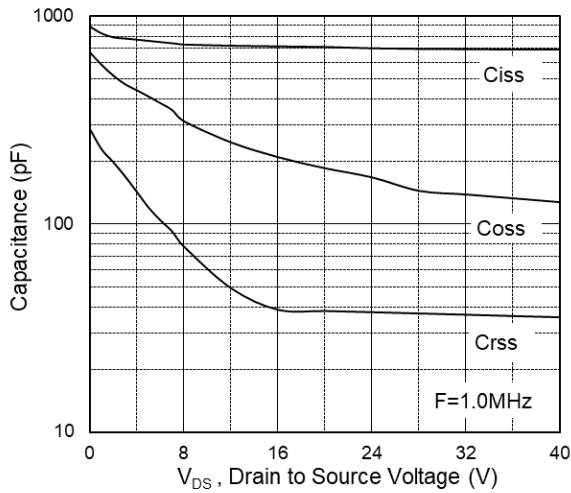


Fig.7 Capacitance

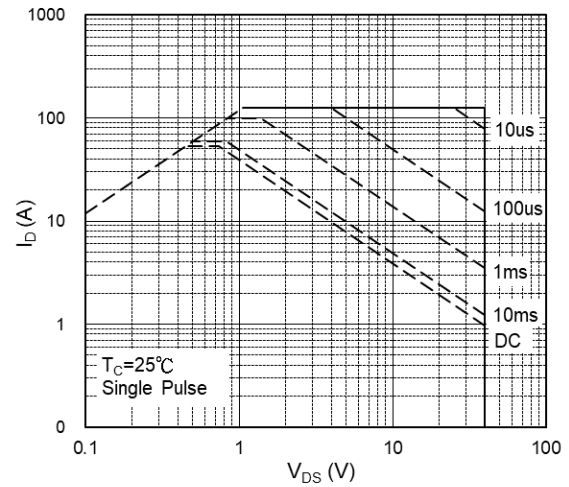


Fig.8 Safe Operating Area

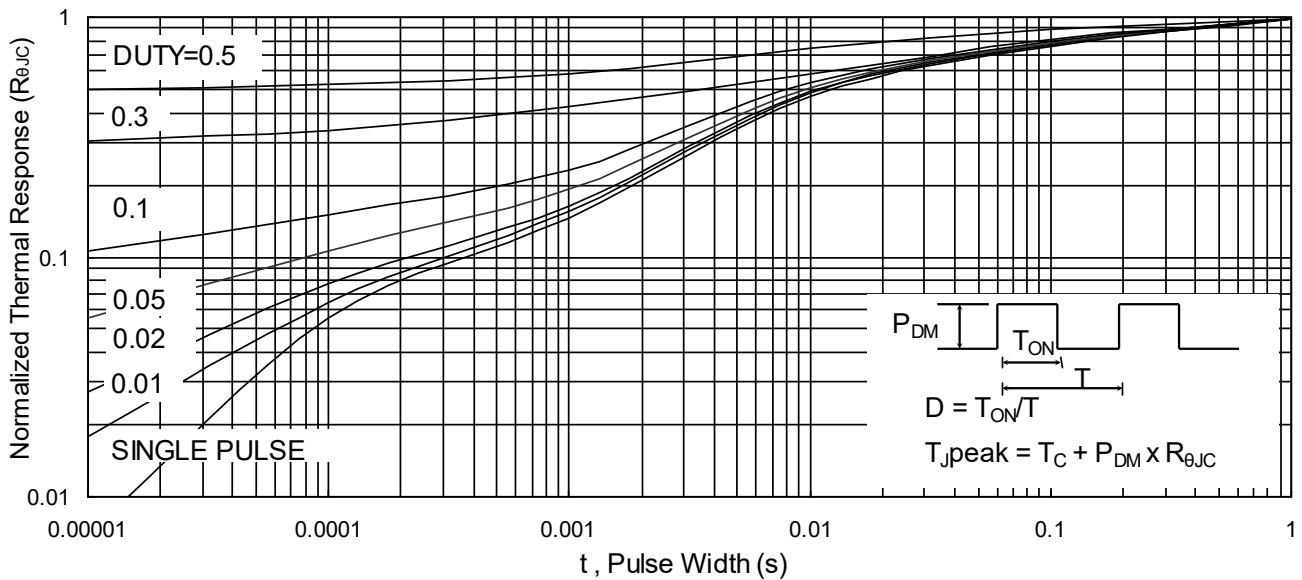


Fig.9 Normalized Maximum Transient Thermal Impedance

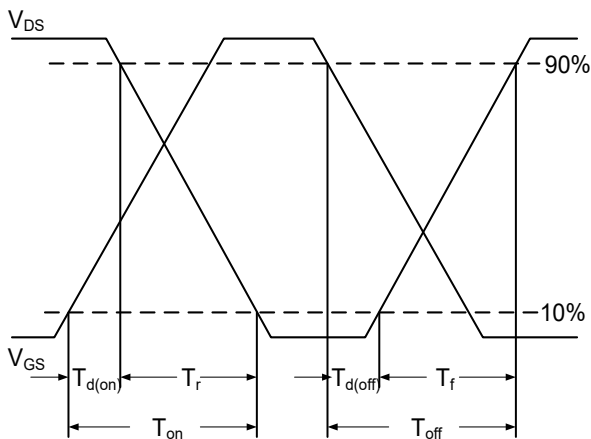


Fig.10 Switching Time Waveform

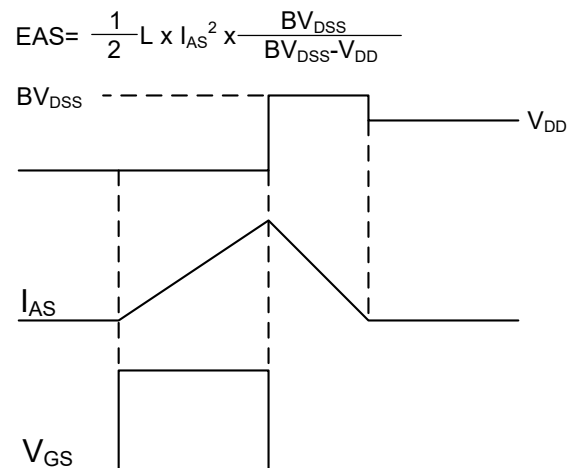
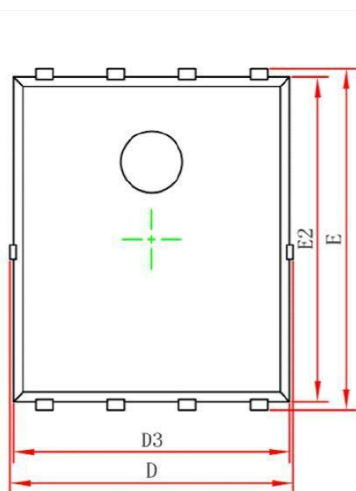


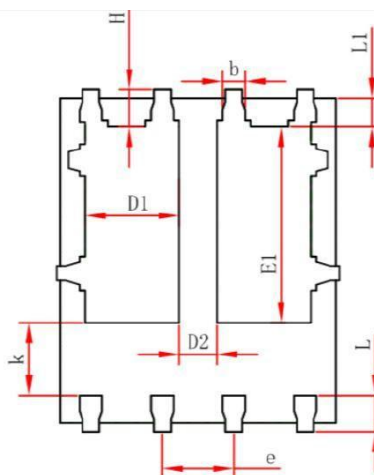
Fig.11 Unclamped Inductive Waveform



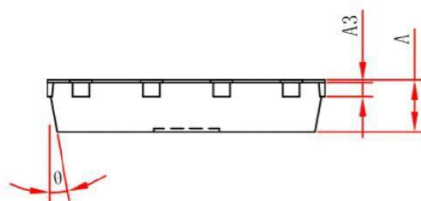
## Package Mechanical Data- PDFN5X6-8L



**Top View**



**Bottom View**



**Side View**

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.154REF.		0.006REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	1.470	1.870	0.058	0.074
D2	0.470	0.870	0.019	0.034
E1	3.375	3.575	0.133	0.141
D3	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°



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