
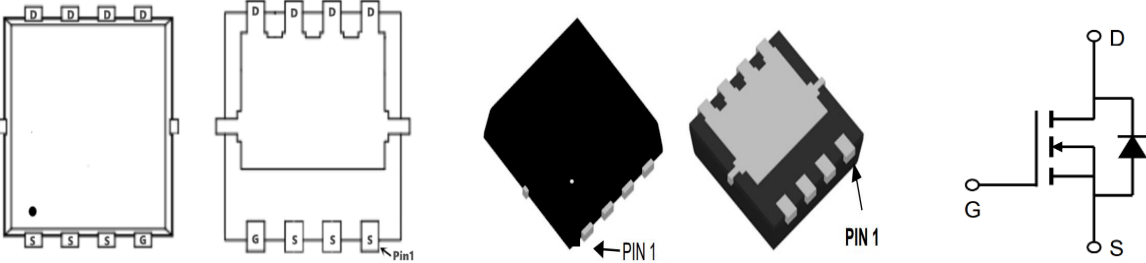


**TM0052N06NF**

**N-Channel Enhancement Mosfet**

<p><b>General Description</b></p> <ul style="list-style-type: none"> <li>• Low <math>R_{DS(ON)}</math></li> <li>• RoHS and Halogen-Free Compliant</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• Load switch</li> <li>• PWM</li> </ul>	<p><b>General Features</b></p> <p><math>V_{DS} = 60V</math> <math>I_D = 80A</math></p> <p><math>R_{DS(ON)} = 5.2 m\Omega (typ.) @ V_{GS} = 10V</math></p> <p>100% UIS Tested              100% <math>R_g</math> Tested</p> 
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NF:DFN5x6-8L



Marking:80N06F

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

Symbol	Parameter	Max.	Units
$V_{DSS}$	Drain-Source Voltage	60	V
$V_{GSS}$	Gate-Source Voltage	$\pm 25$	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ C$	80
		$T_C = 100^\circ C$	52
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>	320	A
EAS	Single Pulsed Avalanche Energy <sup>note2</sup>	169	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ C$	108
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.4	$^\circ C/W$
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +175	$^\circ C$



## TM0052N06NF

## N-Channel Enhancement Mosfet

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V,$	-	-	1.0	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	$V_{GS}=10V, I_D=30A$	-	7.2	8.6	m $\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=30V, V_{GS}=0V,$ $f=1.0MHz$	-	4136	-	pF
$C_{oss}$	Output Capacitance		-	286	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	257	-	pF
$Q_g$	Total Gate Charge	$V_{DS}=30V, I_D=30A,$ $V_{GS}=10V$	-	90	-	nC
$Q_{gs}$	Gate-Source Charge		-	9	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	18	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=30V, I_D=30A,$ $R_G=1.8\Omega, V_{GS}=10V$	-	9	-	ns
$t_r$	Turn-on Rise Time		-	7	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	40	-	ns
$t_f$	Turn-off Fall Time		-	15	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	80	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	320	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=30A$	-	-	1.2	V
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F=30A, dI/dt=100A/\mu s$	-	33	-	ns
$Q_{rr}$	Body Diode Reverse Recovery Charge		-	46	-	nC

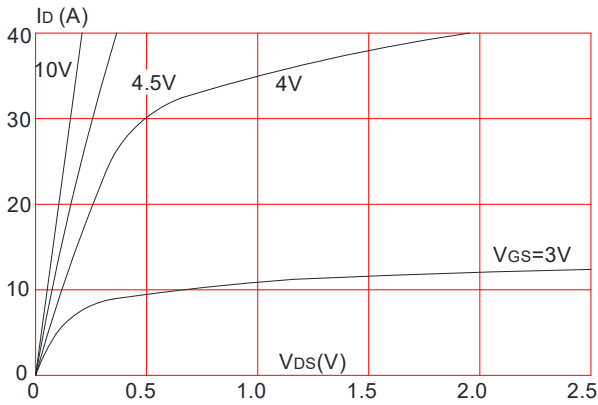
Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition :  $T_J=25^{\circ}\text{C}$ ,  $V_{DD}=30V$ ,  $V_G=10V$ ,  $L=0.5mH$ ,  $R_g=25\Omega$ ,  $I_{AS}=26A$

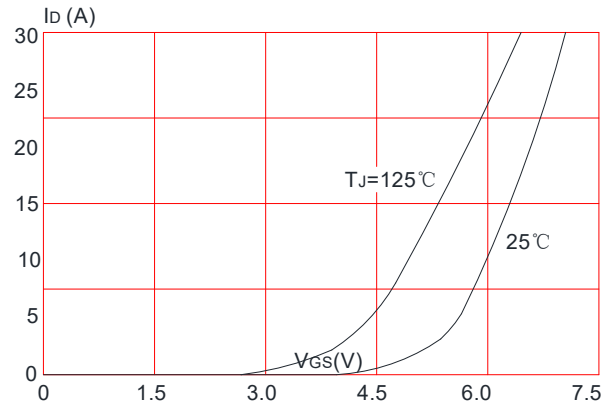
3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$

## Typical Performance Characteristics

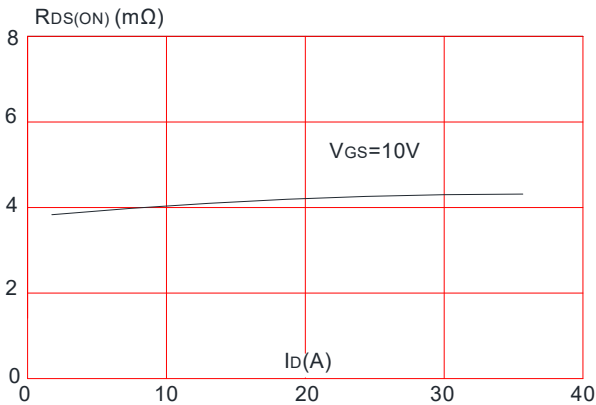
**Figure 1: Output Characteristics**



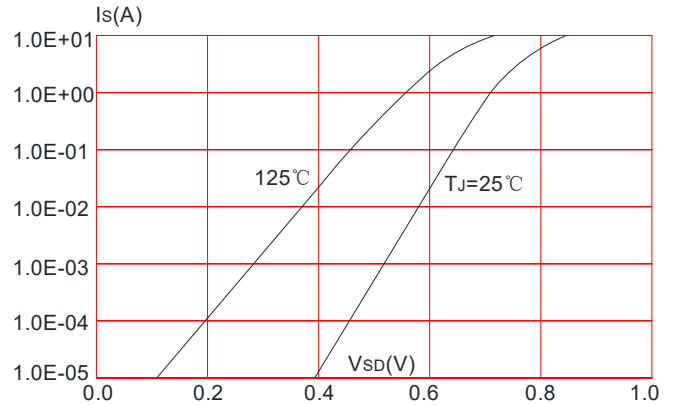
**Figure 2: Typical Transfer Characteristics**



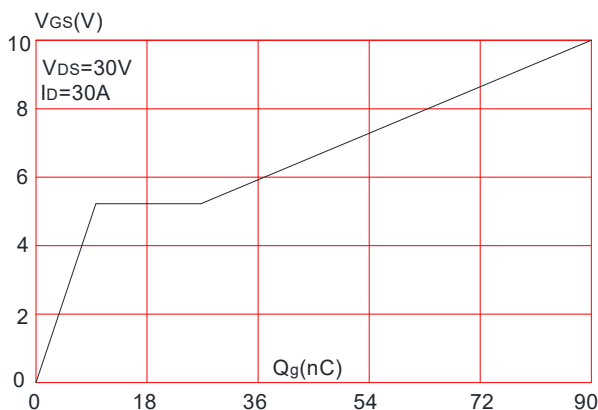
**Figure 3: On-resistance vs. Drain Current**



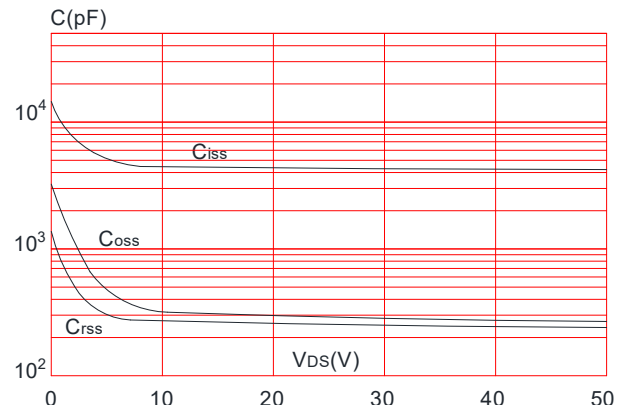
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**



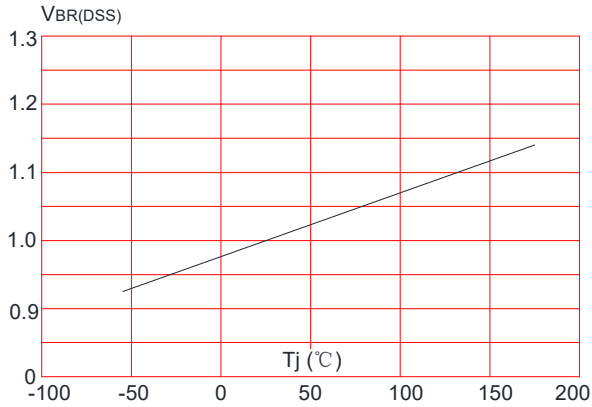
**Figure 6: Capacitance Characteristics**



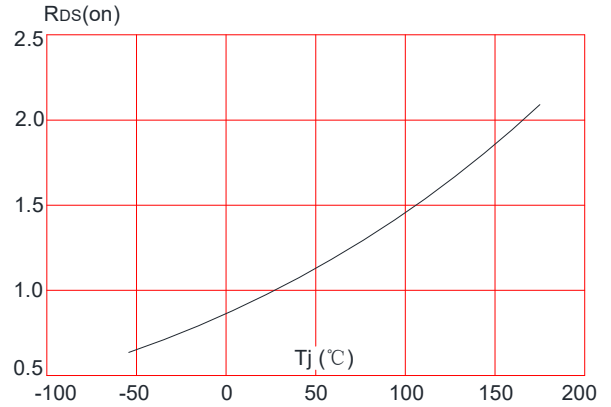
**TM0052N06NF**

**N-Channel Enhancement Mosfet**

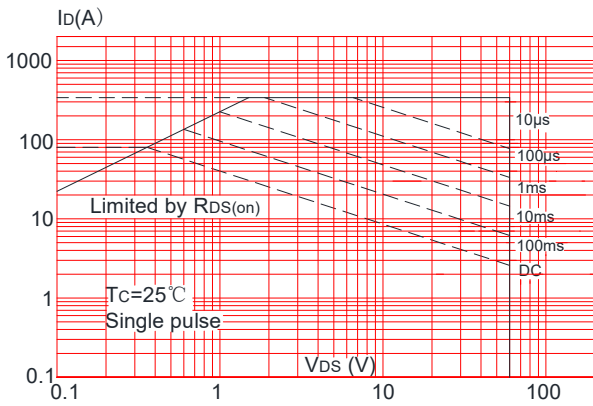
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



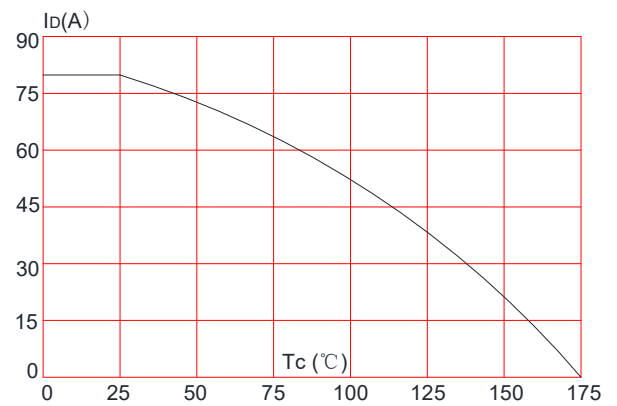
**Figure 8: Normalized on Resistance vs. Junction Temperature**



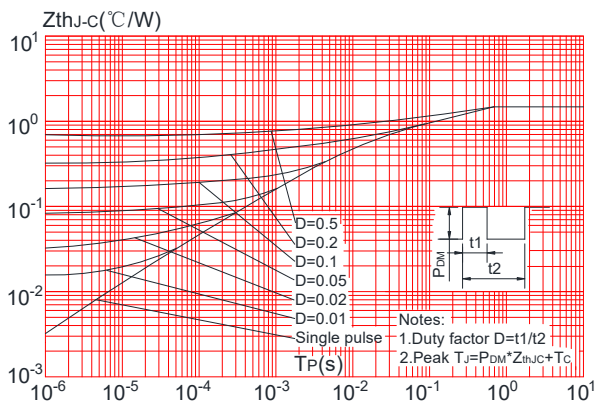
**Figure 9: Maximum Safe Operating Area**



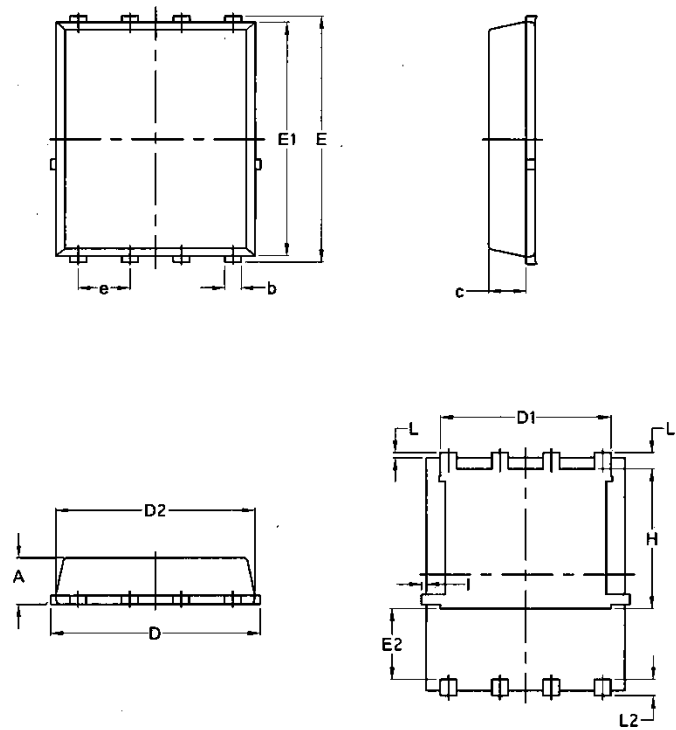
**Figure 10: Maximum Continuous Drain Current vs. Case Temperature**



**Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case**



## Package Mechanical Data:DFN5x6-8L



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

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