

General Description

The MY70N04NE5 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance.

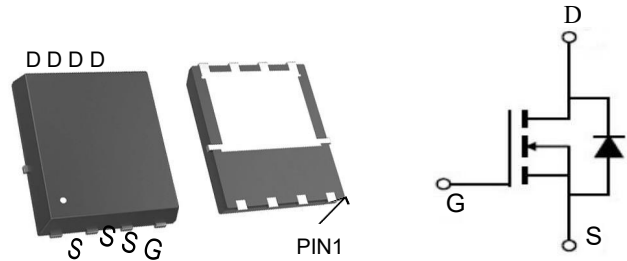


Features

V_{DSS}	40	V
I_D	70	A
$R_{DS(ON)}(at V_{GS}=10V)$	<7	m Ω
$R_{DS(ON)}(at V_{GS}=4.5V)$	<10	m Ω

Application

- Battery protection
- Load switch
- Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY70N04NE5	PDFN5*6-8L	MY70N04NE5	5000

Absolute Maximum Ratings ($T_c=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_c=25^{\circ}\text{C}$	Continuous Drain Current, V_{GS} @ 10V	70	A
$I_D@T_c=100^{\circ}\text{C}$	Continuous Drain Current, V_{GS} @ 10V	50	A
EAS	Single Pulse Avalanche Energy ³	31	mJ
I_{AS}	Avalanche Current	25	A
$P_D@T_c=25^{\circ}\text{C}$	Total Power Dissipation ⁴	34.7	W
$P_D@T_A=25^{\circ}\text{C}$	Total Power Dissipation ⁴	2	W
T_s m	Storage Temperature Range Operating	-55 to 150	$^{\circ}\text{C}$
T_J	Junction Temperature Range	-55to 150	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State) ¹	62	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	3.6	$^{\circ}\text{C/W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
$\Delta BV_{DS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C , $I_D=1\text{mA}$	---	0.034	---	$V/^{\circ}\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=20A$	---	---	7	m Ω
		$V_{GS}=4.5V, I_D=10A$	---	---	10	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.5	2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5.64	---	mV/ $^{\circ}\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=32V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=32V, V_{GS}=0V, T_J=55^{\circ}\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=20A$	---	36	---	S
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	2.1	4.2	Ω
Q_g	Total Gate Charge (4.5V)	$V_{DS}=20V, V_{GS}=4.5V, I_D=12A$	---	10.7	---	nC
Q_{gs}	Gate-Source Charge		---	3.3	---	
Q_{gd}	Gate-Drain Charge		---	4.2	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=12V, V_{GS}=10V, R_G=3.3, I_D=6A$	---	8.6	---	ns
T_r	Rise Time		---	3.4	---	
$T_{d(off)}$	Turn-Off Delay Time		---	25	---	
T_f	Fall Time		---	2.2	---	
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	1314	---	pF
C_{oss}	Output Capacitance		---	120	---	
C_{rss}	Reverse Transfer Capacitance		---	88	---	
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	42	A
I_{SM}	Pulsed Source Current ^{2,5}		---	---	100	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	---	---	1.2	V

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z 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 $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=25A$
- 4.The power dissipation is limited by 150°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

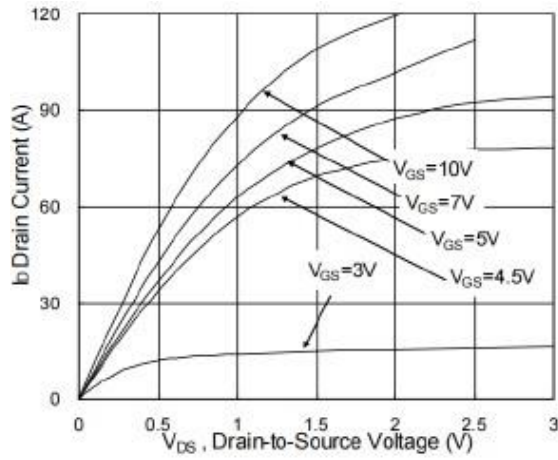


Fig.1 Typical Output Characteristics

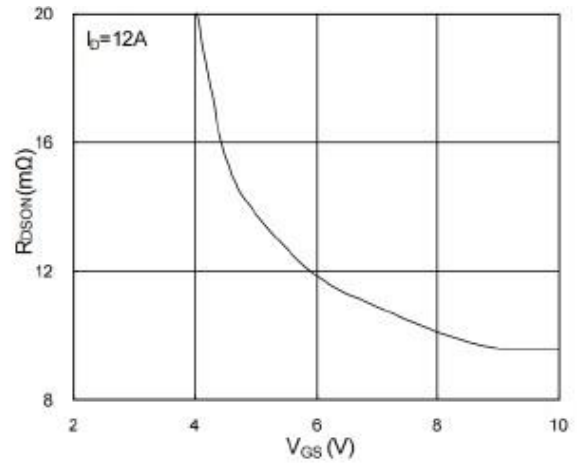


Fig.2 On-Resistance vs. G-S Voltage

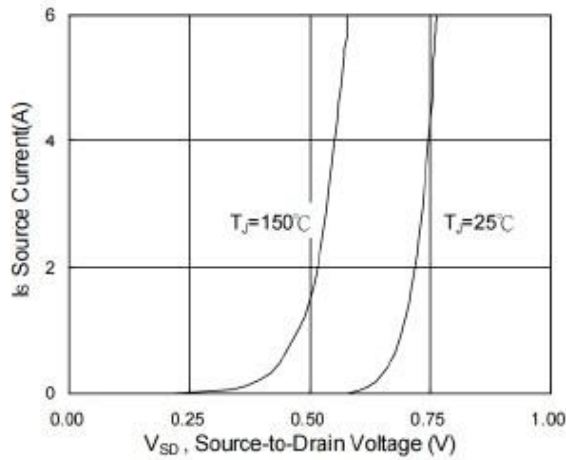


Fig.3 Forward Characteristics of Reverse

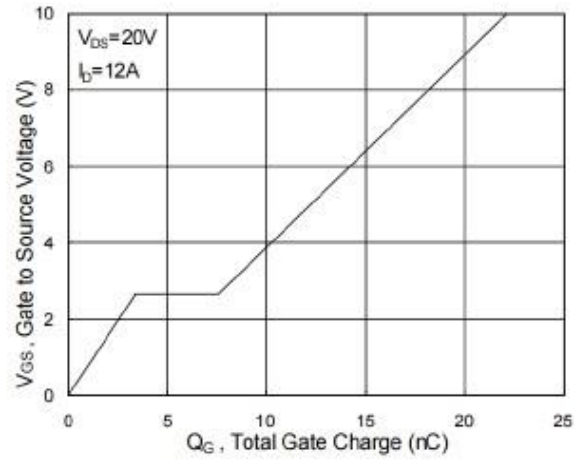


Fig.4 Gate-Charge Characteristics

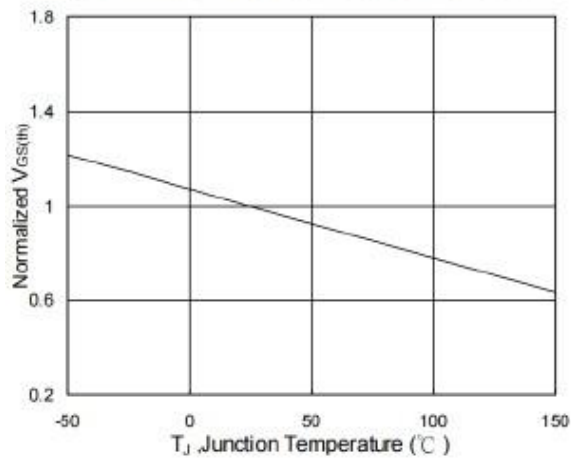


Fig.5 $V_{GS(th)}$ vs. T_J

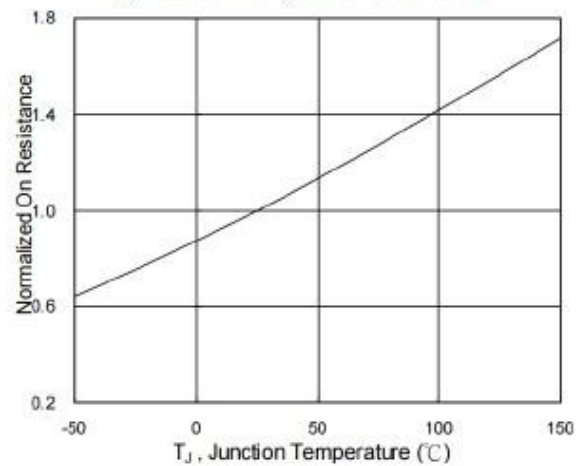


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

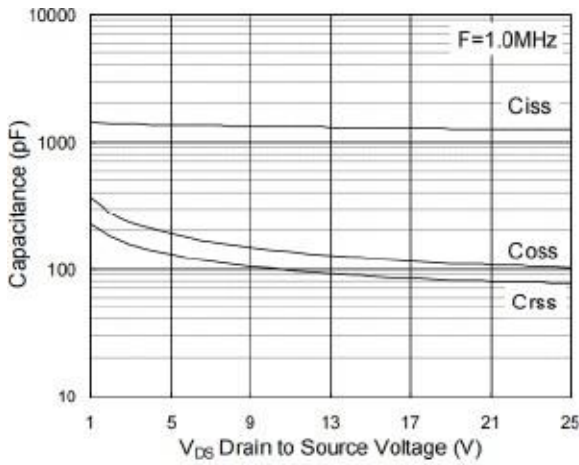


Fig.7 Capacitance

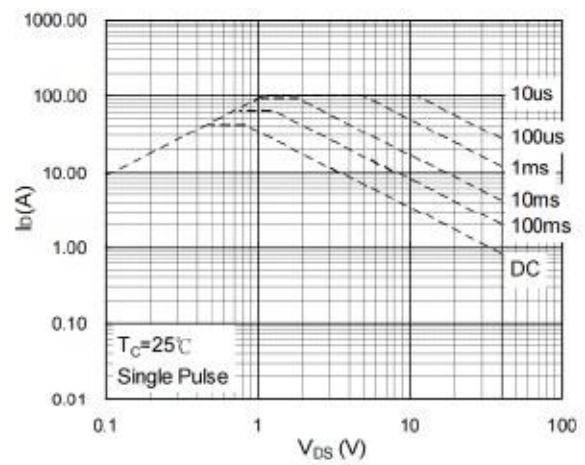


Fig.8 Safe Operating Area

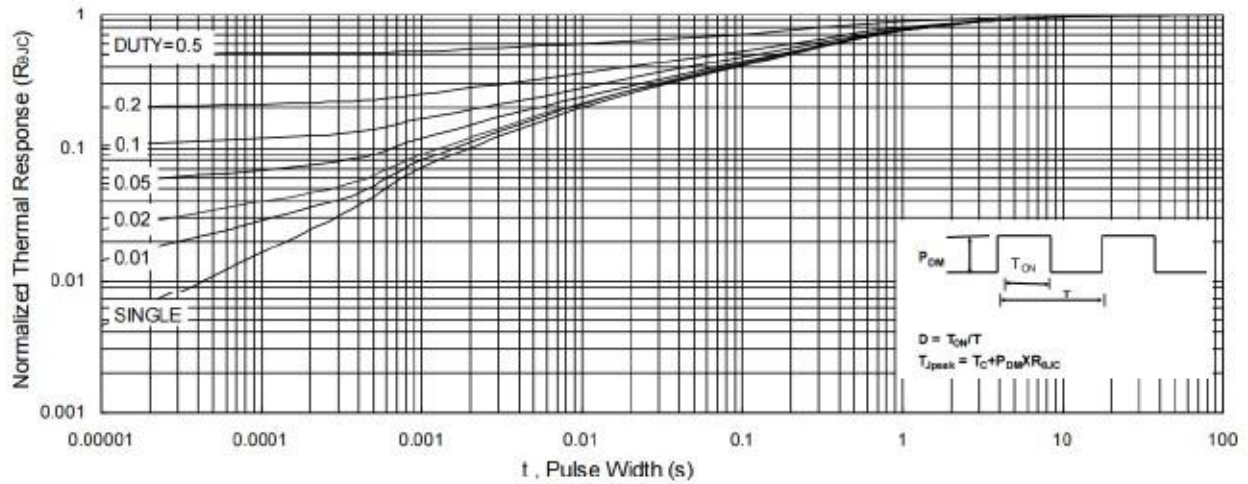


Fig.9 Normalized Maximum Transient Thermal Impedance

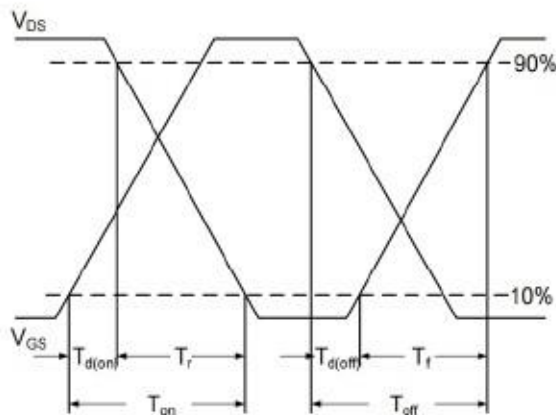


Fig.10 Switching Time Waveform

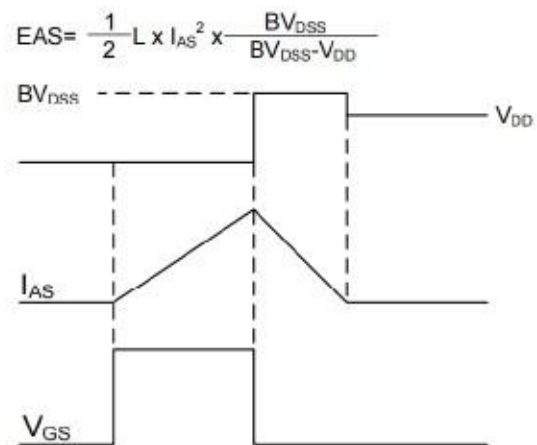
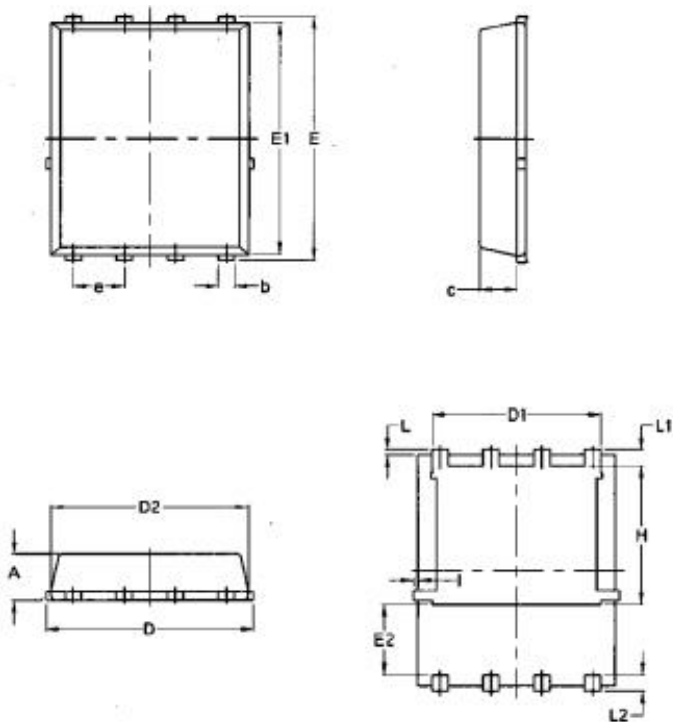


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data-DFN5*6-8L



Symbol	Common			
	mm		Inch	
	Mim	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