

General Description

The MY20P80NE5 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.

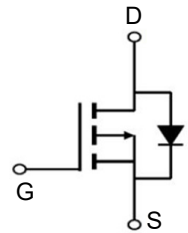
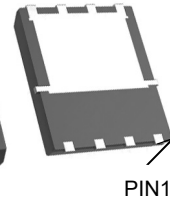


Features

V_{DSS}	-18	V
I_D	-80	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	2.3	m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	3.3	m Ω

Application

- Battery protection
- Load switch
- Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY20P80NE5	PDFN5*6-8L	20P80G	5000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-18	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current – Continuous ($T_C=25^{\circ}\text{C}$)	-80	A
	Drain Current – Continuous ($T_C=100^{\circ}\text{C}$)	-54	A
I_{DM}	Drain Current – Pulsed ¹	-360	A
P_D	Power Dissipation ($T_C=25^{\circ}\text{C}$)	41.67	W
	Power Dissipation – Derate above 25°C	0.33	W/ $^{\circ}\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction to ambient	62	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	3	$^{\circ}\text{C}/\text{W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-20	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=-1\text{mA}$	---	-0.008	---	V/ $^{\circ}\text{C}$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-0.4	-0.6	-1.0	V
ΔV_{GS}	$V_{GS(th)}$ Temperature Coefficient		---	-3.44	---	mV/ $^{\circ}\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-4.5V$, $I_D=-20A$	---	2.3	3.0	m Ω
		$V_{GS}=-2.5V$, $I_D=-20A$	---	3.3	4.5	m Ω
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-20V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	-1	μA
		$V_{DS}=-16V$, $V_{GS}=0V$, $T_J=125^{\circ}\text{C}$	---	---	-30	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V$, $V_{DS}=0V$	---	---	± 500	nA
g_{fs}	Forward Transconductance	$V_{DS}=-10V$, $I_S=-3A$	---	30	---	S
Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=-16V$, $V_{GS}=-4.5V$, $I_D=-5A$	---	149	225	
Q_{gs}	Gate-Source Charge ^{2, 3}		---	14.4	22	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	42.8	65	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DD}=-15V$, $V_{GS}=-4.5V$, $R_G=25\Omega$ $I_D=-1A$	---	21.2	42	nS
T_r	Rise Time ^{2, 3}		---	20.6	40	
$T_{d(off)}$	Turn-Off Delay Time ^{2, 3}		---	26	52	
T_f	Fall Time ^{2, 3}		---	400	600	
C_{iss}	Input Capacitance	$V_{DS}=-15V$, $V_{GS}=0V$, $F=1\text{MHz}$	---	12000	16000	pF
C_{oss}	Output Capacitance		---	1670	2500	
C_{rss}	Reverse Transfer Capacitance		---	730	1100	
R_g	Gate resistance	$V_{GS}=0V$, $V_{DS}=0V$, $F=1\text{MHz}$	---	2.6	---	Ω
I_S	Continuous Source Current	$V_g=V_d=0V$, Force Current			-90	A
I_{SM}	Pulsed Source Current				-180	A
V_{SD}	Diode Forward Voltage	$V_{gs}=0V$ $I_s=1A$ $T_J=25^{\circ}\text{C}$			-1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Characteristics

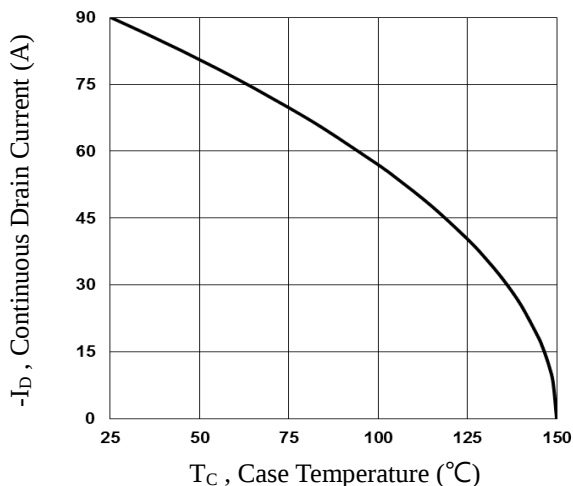


Fig.1 Continuous Drain Current

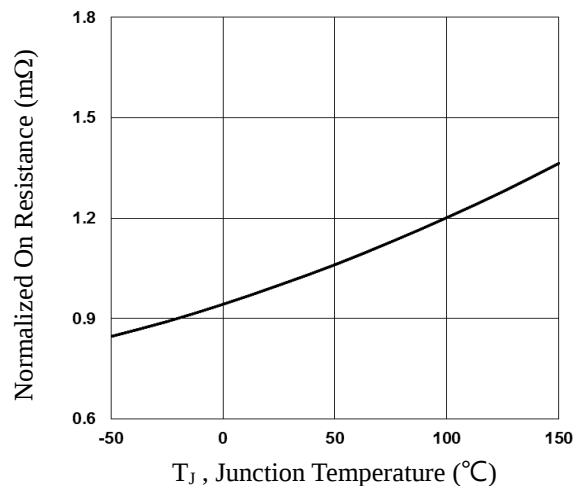


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

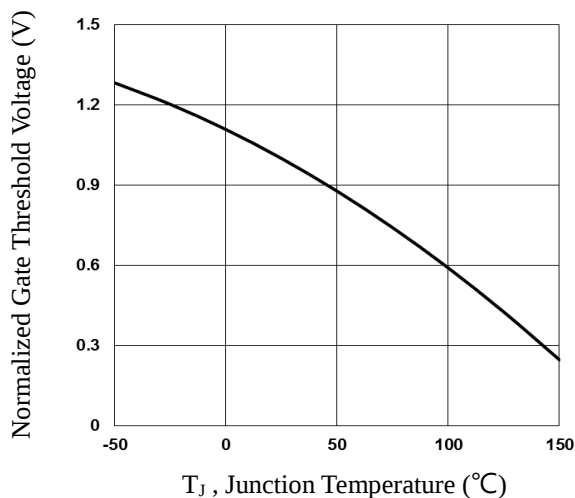


Fig.3 Normalized V_{th} vs. T_J

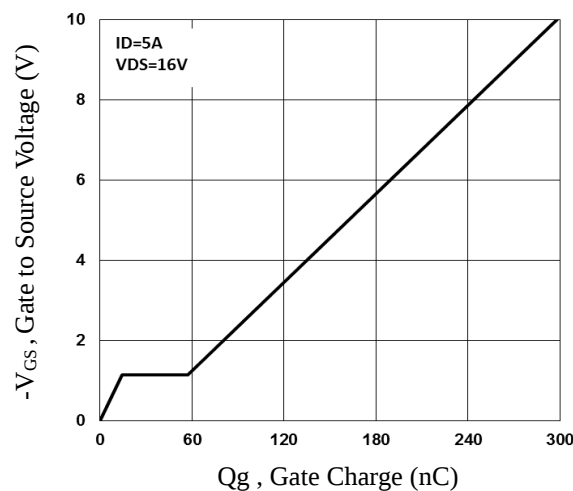


Fig.4 Gate Charge Waveform

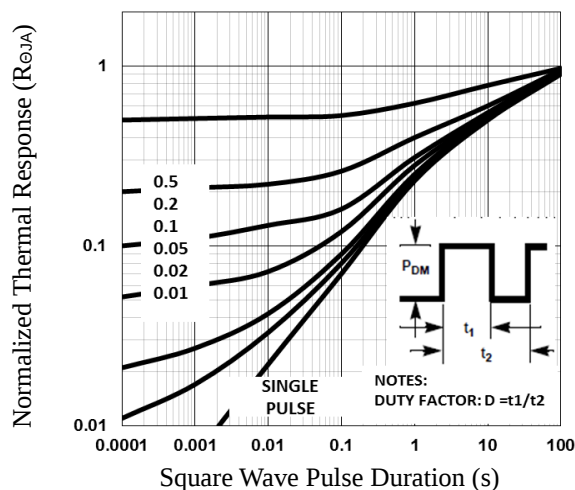


Fig.5 Normalized Transient Response

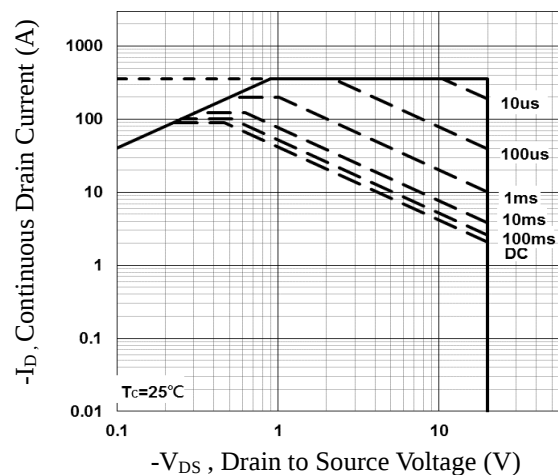


Fig.6 Maximum Safe Operation Area

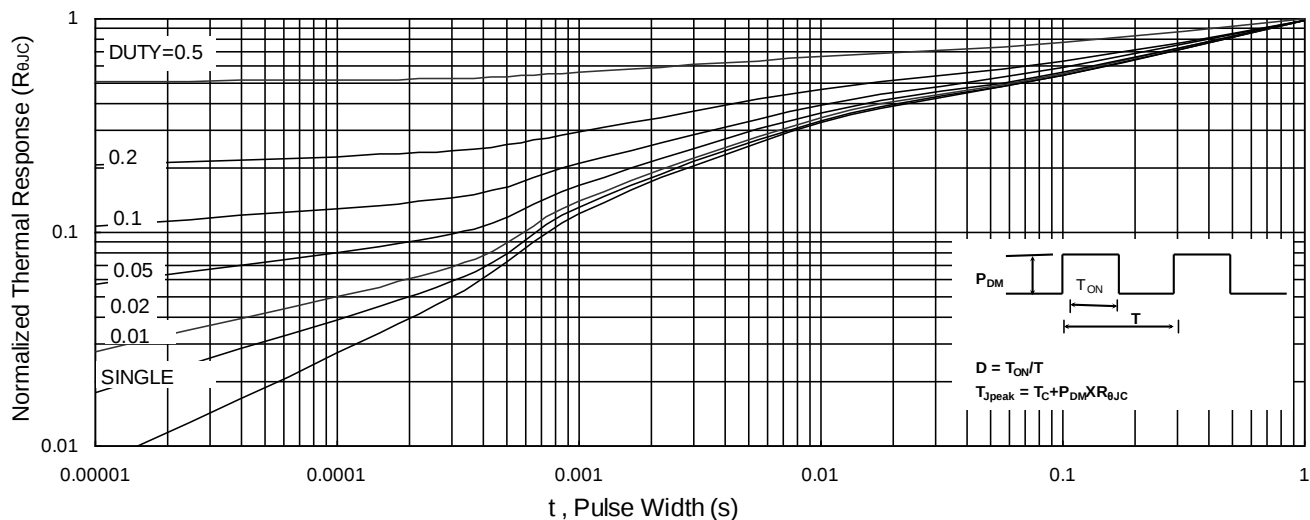


Fig.9 Normalized Maximum Transient Thermal Impedance

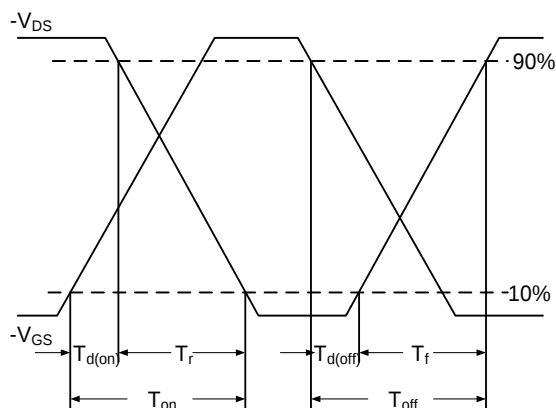


Fig.10 Switching Time Waveform

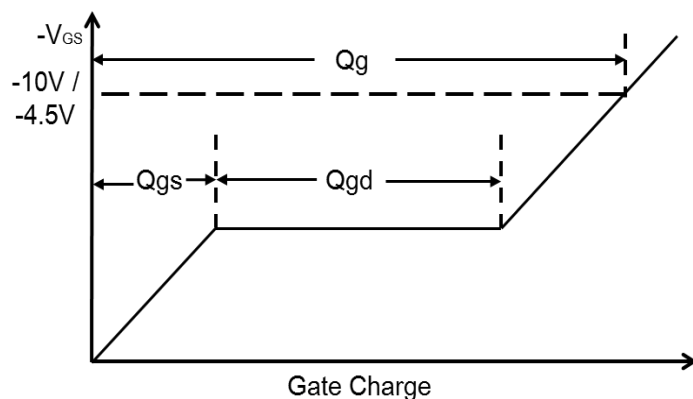
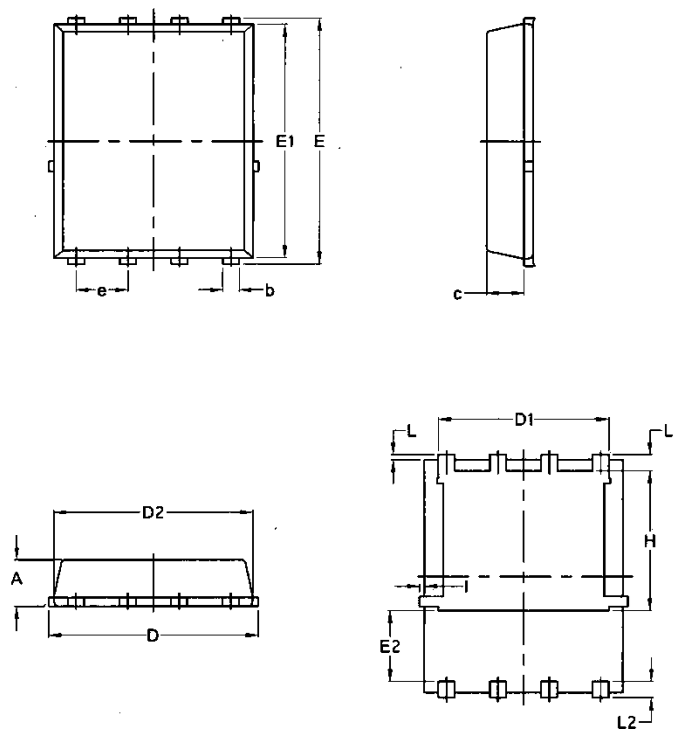


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data-DFN5*6-8L-JQ Single



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