MY80N02NE3

20V N-Channel Enhancement Mode MOSFET

MAOYUANWEI semiconductor

General Description

The MY80N02NE3 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.

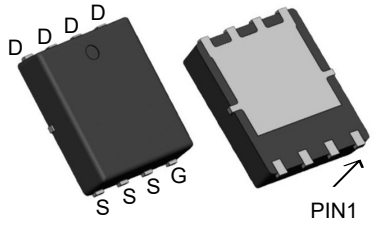
RoHS Compliant

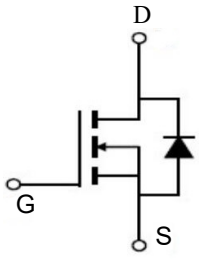
Features

V_{DSS}	20	V
I_D	80	A
$R_{DS(ON)}$(atV_{GS}=10V)	3.1	mΩ
$R_{DS(ON)}$(atV_{GS}=4.5V)	4.2	mΩ

Application

- Battery protection
- Load switch
- Uninterruptible power supply





Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY80N02NE3	PDFN3*3-8	MY80N02NE3	5000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate- Source Voltage	±12	V
I_D@ T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	80	A
I_D@ T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	42	A
I_{DM}	Pulsed Drain Current[2]	210	A
EAS	Single Pulse Avalanche Energy[3]	200	mJ
P_D@ T_C=25℃	Total Power Dissipation[4]	60	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]		
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	2.1	℃/ W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	20	22	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =19.5V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±10V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS},I_D=250μA	0.4	0.7	1.1	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=20 A	-	3.1	5	mΩ
		V_{GS}=2.5V, I_D=20A		4.2	9	mΩ
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=20A	15	-	-	S
Input Capacitance	C_{lss}	V_{DS}=10V,V_{GS}=0V, F=1.0MHz	-	2000	-	PF
Output Capacitance	C_{oss}		-	500	-	PF
Reverse Transfer Capacitance	C_{rss}		-	200	-	PF
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10V,I_D=2A,R_L=1Ω V_{GS}=4.5V,R_G=3Ω	-	6.4	-	nS
Turn-on Rise Time	t_r		-	17.2	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	29.6	-	nS
Turn-Off Fall Time	t_f		-	16.8	-	nS
Total Gate Charge	Q_g	V_{DS}=10V,I_D=20A, V_{GS}=10V	-	27		nC
Gate-Source Charge	Q_{gs}		-	6.5		nC
Gate-Drain Charge	Q_{gd}		-	6.4		nC
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=10A	-		1.2	V
Diode Forward Current (Note 2)	I_S		-	-	60	A
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF = 20A di/dt = 100A/μs (Note3)	-	25	-	nS
Reverse Recovery Charge	Qrr		-	24	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board, t ≤ 10 sec.

3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

4. Guaranteed by design, not subject to production

5. E_{AS} condition : Tj=25℃,V_{DD}=10V,V_G=10V,L=0.5mH,Rg=25Ω,

Typical Characteristics

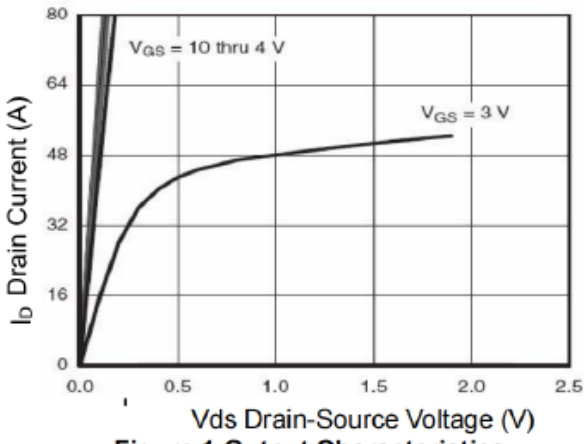


Figure 1 Output Characteristics

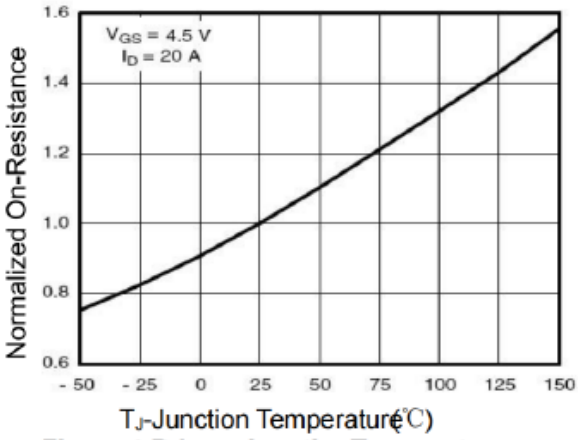


Figure 4 Rdson-JunctionTemperature

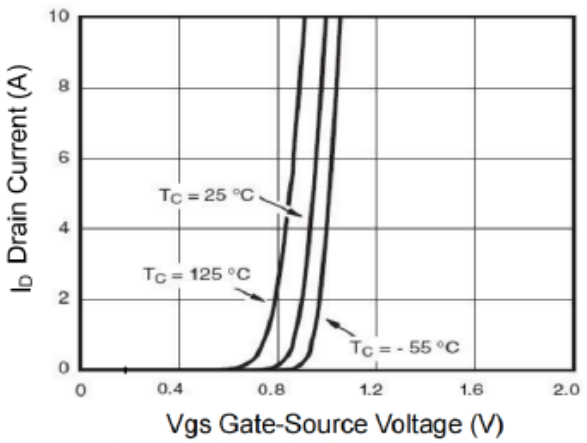


Figure 2 Transfer Characteristics

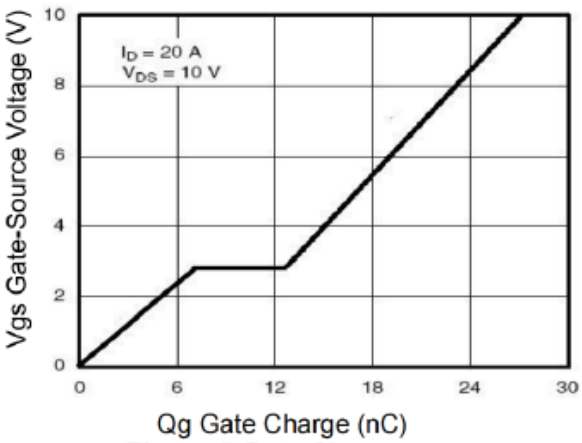


Figure 5 Gate Charge

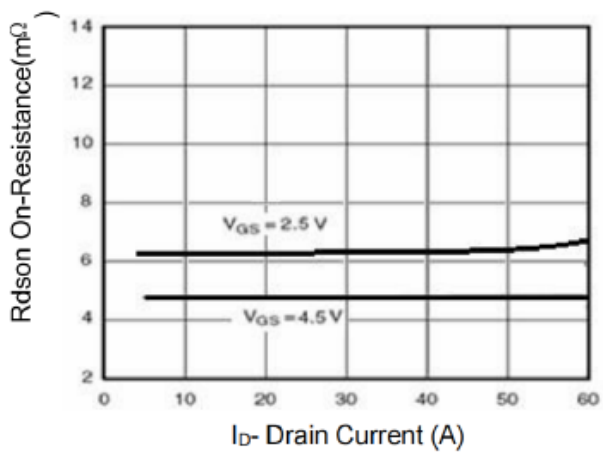


Figure 3 Rdson- Drain Current

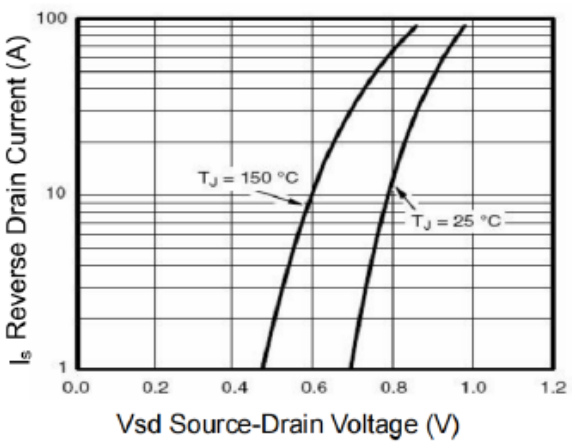


Figure 6 Source- Drain Diode Forward

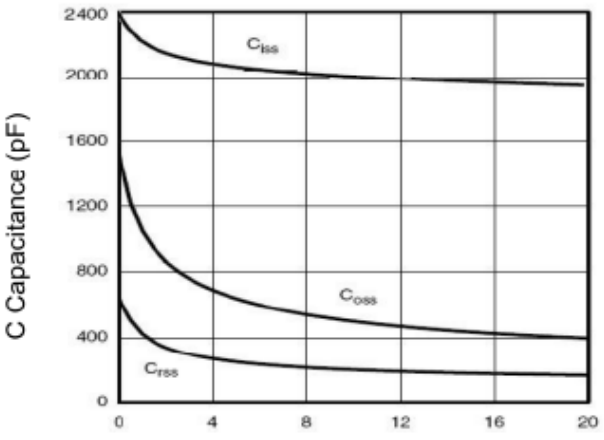


Figure 7 Capacitance vs Vds

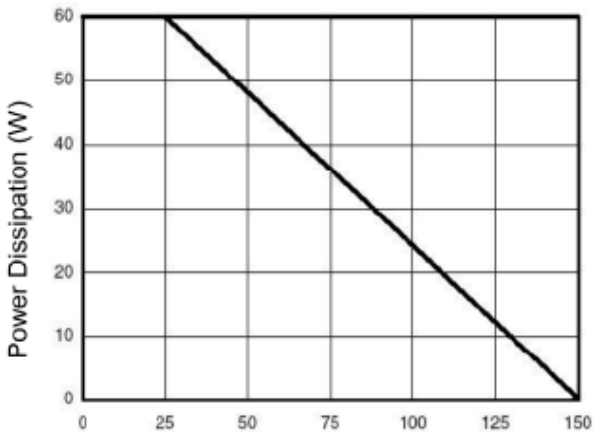


Figure 9 Power De-rating

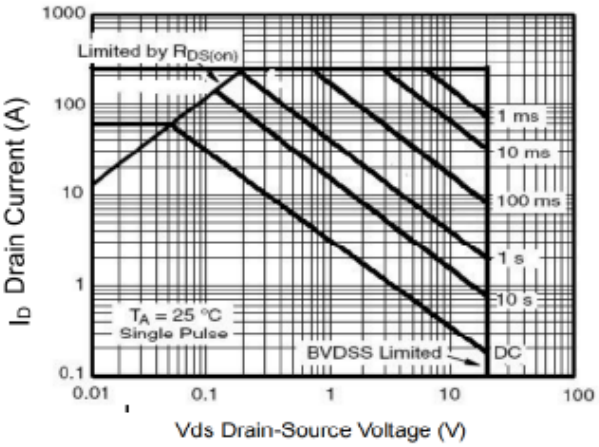


Figure 8 Safe Operation Area

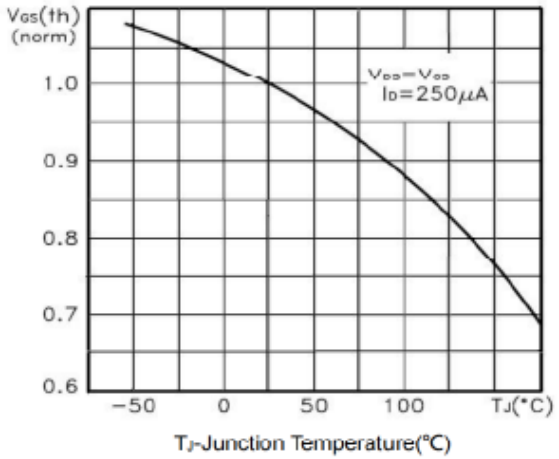


Figure 10 $V_{GS(th)}$ vs Junction Temperature

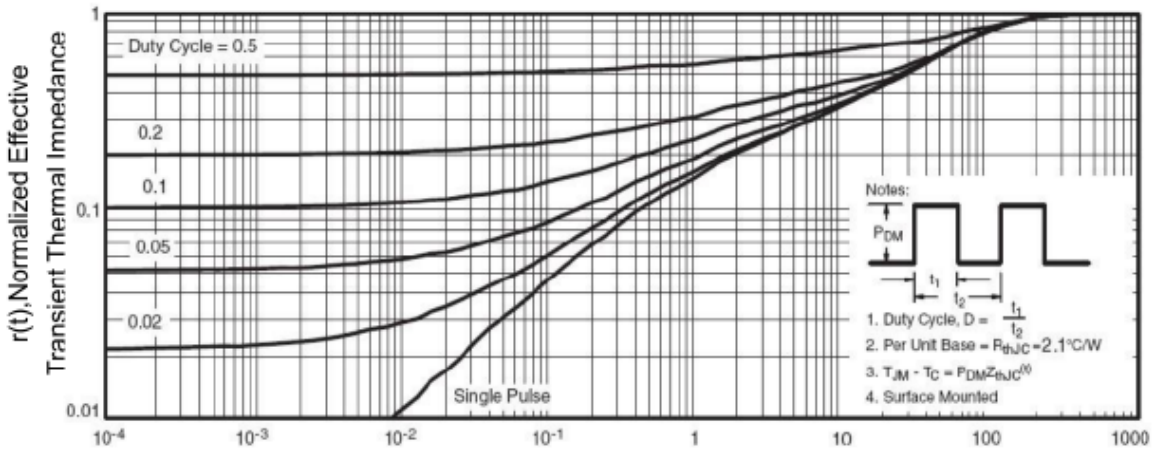
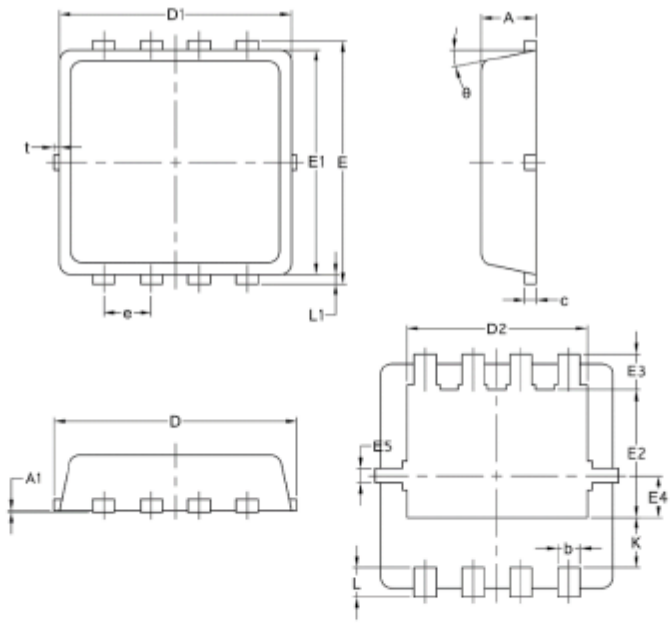


Figure 11 Normalized Maximum Transient Thermal Impedance

Package Mechanical Data PDFN3*3-8



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14