

DESCRIPTION

The MXN80N02 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

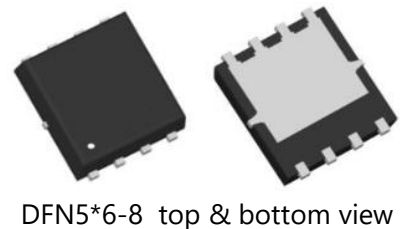
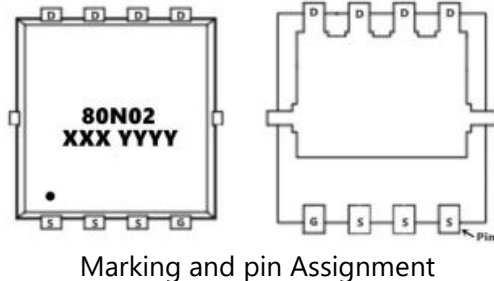
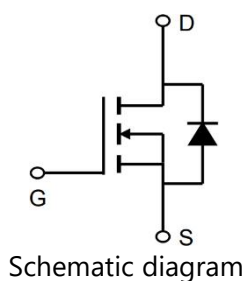
GENERAL FEATURES

- $V_{DS}=20V$, $I_D=80A$
 $R_{DS(ON)}(Typ.)=4.0m\Omega$ @ $V_{GS}=2.5V$
 $R_{DS(ON)}(Typ.)=2.8m\Omega$ @ $V_{GS}=4.5V$

APPLICATION

- Solar road lights
- Load switch
- Uninterruptible power supply

PINOUT



ORDERING INFORMATION

Part Number	StorageTemperature	Package	Devices Per Reel
MXN80N02	-55°C to 175°C	DFN5*6-8L	5000

ABSOLUTE MAXIMUM RATINGS($T_C=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous($V_{GS}=10V$, $T_C=25^\circ C$) ^(Note1)	I_D	80	A
Drain Current-Continuous($V_{GS}=10V$, $T_C=100^\circ C$) ^(Note1)	I_D	59	A
Pulsed Drain Current ^(Note2)	I_{DM}	360	A
Single Pulse Avalanche Energy ^(Note3)	E_{AS}	110	mJ
Avalanche Current	I_{AS}	12.7	A
Power Dissipation	P_D	81	W
Operating Junction and Storage Temperature Range	T_J , T_{STG}	-55 to 175	$^\circ C$
Thermal Resistance, Junction-to-Ambient ^(Note1)	$R_{\theta JA}$	65	$^\circ C/W$
Thermal Resistance, Junction-to-Case ^(Note1)	$R_{\theta JC}$	4	$^\circ C/W$

Note1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

Note2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

Note3. The E_{AS} data shows Max. rating . The test condition is $V_{DD}=25V$, $V_{GS}=10V$, $L=0.1mH$, $I_{AS}=12.7A$


ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
-----------	--------	------------	-----	-----	-----	------

Off Characteristics

Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20	24	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$	-	-	± 100	nA

On Characteristics

Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.65	1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=2.5V, I_D=20A$	-	4.0	6.0	m Ω
		$V_{GS}=4.5V, I_D=30A$	-	2.8	6.0	m Ω

Dynamic Characteristics

Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V,$ $F=1.0MHz$	-	3200	-	pF
Output Capacitance	C_{oss}		-	460	-	pF
Reverse Transfer Capacitance	C_{rss}		-	446	-	pF

Switching Characteristics

Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=10V, I_D=30A,$ $V_{GS}=4.5V, R_{GEN}=1.8\Omega$	-	9.7	-	nS
Turn-on Rise Time	t_r		-	37	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	63	-	nS
Turn-Off Fall Time	t_f		-	52	-	nS
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=30A,$ $V_{GS}=4.5V$	-	11.05	-	nC
Gate-Source Charge	Q_{gs}		-	1.73	-	nC
Gate-Drain Charge	Q_{gd}		-	3.1	-	nC

Drain-Source Diode Characteristics

Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=7.6A$	-	-	1.2	V
-----------------------	----------	-----------------------	---	---	-----	---



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1. Output Characteristics

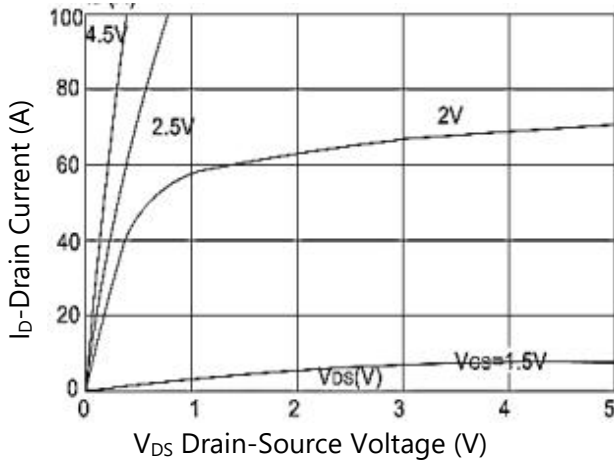


Figure 2. Transfer Characteristics

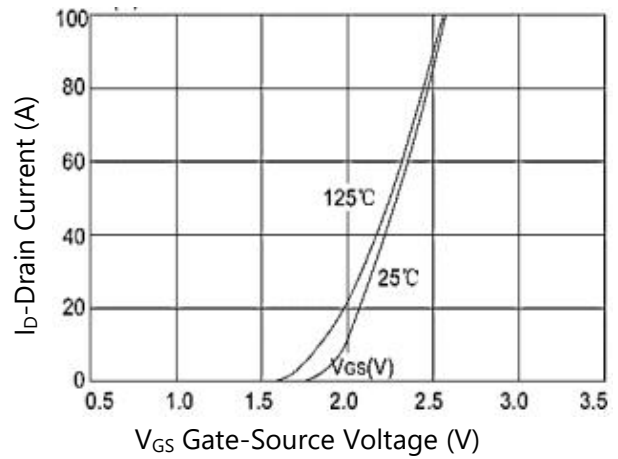


Figure 3. On-Resistance vs Drain Current

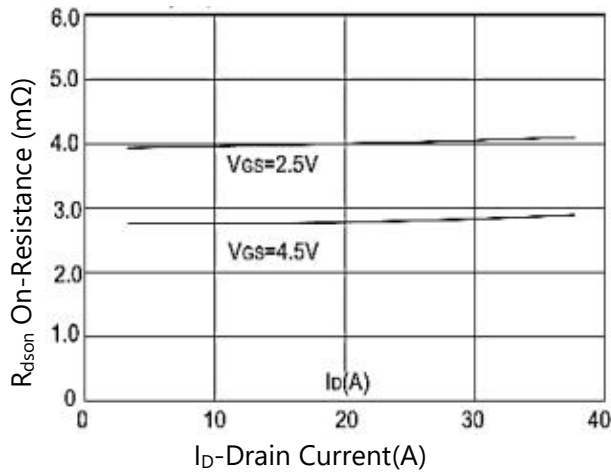


Figure 4. Body Diode Characteristics

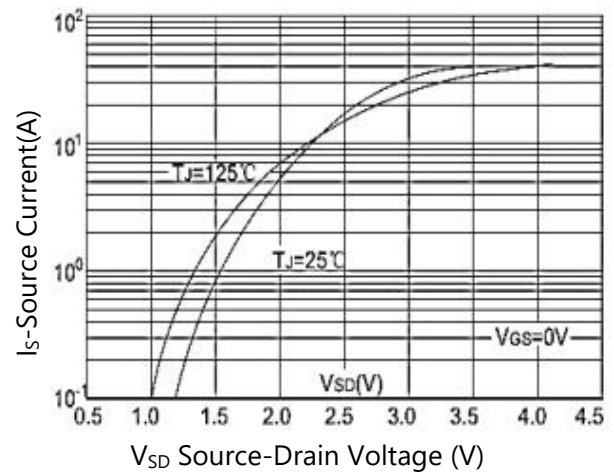


Figure 5. Gate Charge

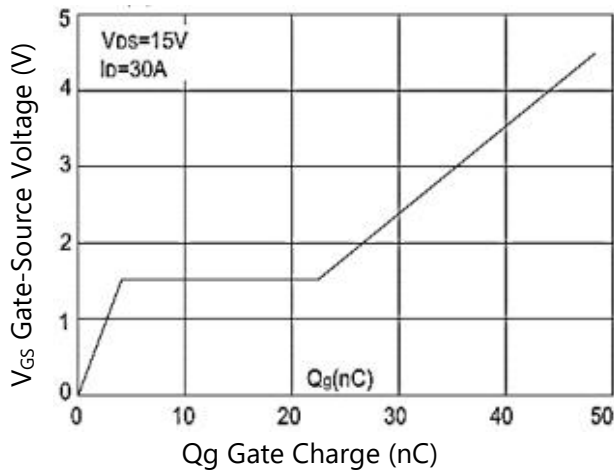
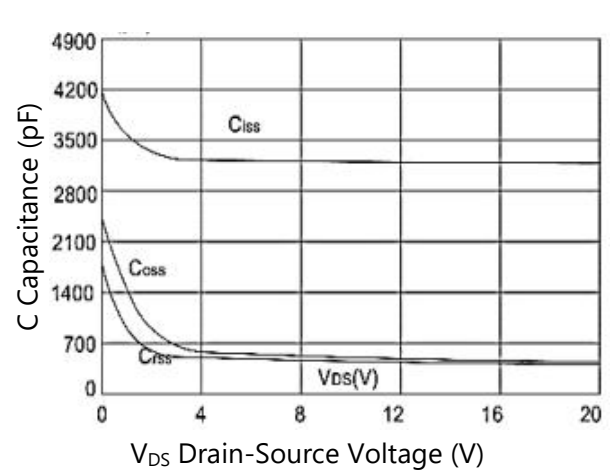


Figure 6. Capacitance vs V_{DS}





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7. $V_{BR(DSS)}$ vs Junction Temperature

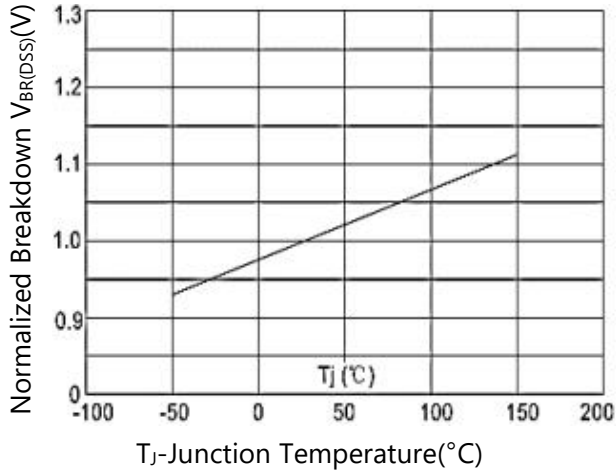


Figure 8. $R_{DS(on)}$ vs Junction Temperature

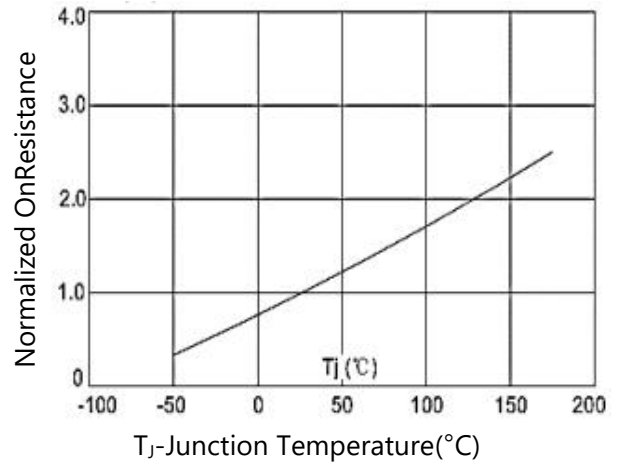


Figure 9. Drain Current vs Ambient Temperature

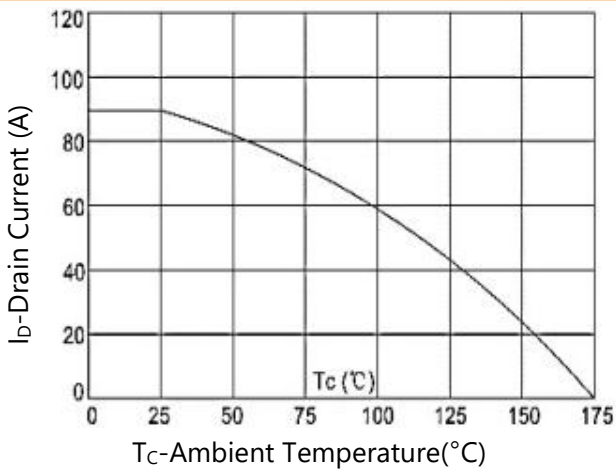


Figure 10. Safe Operation Area

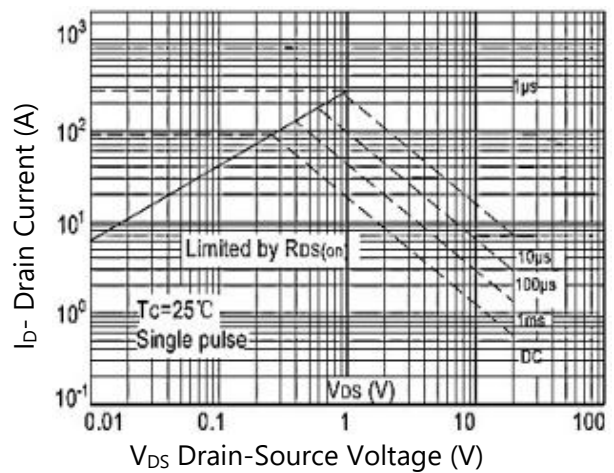
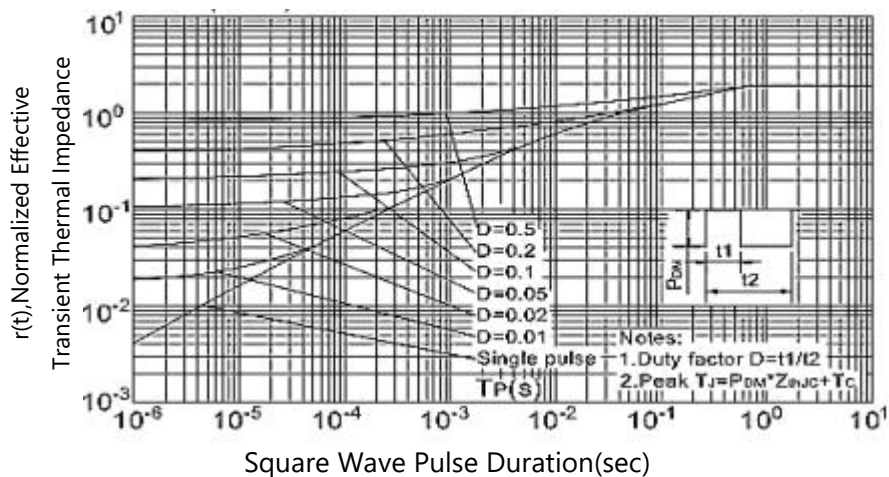


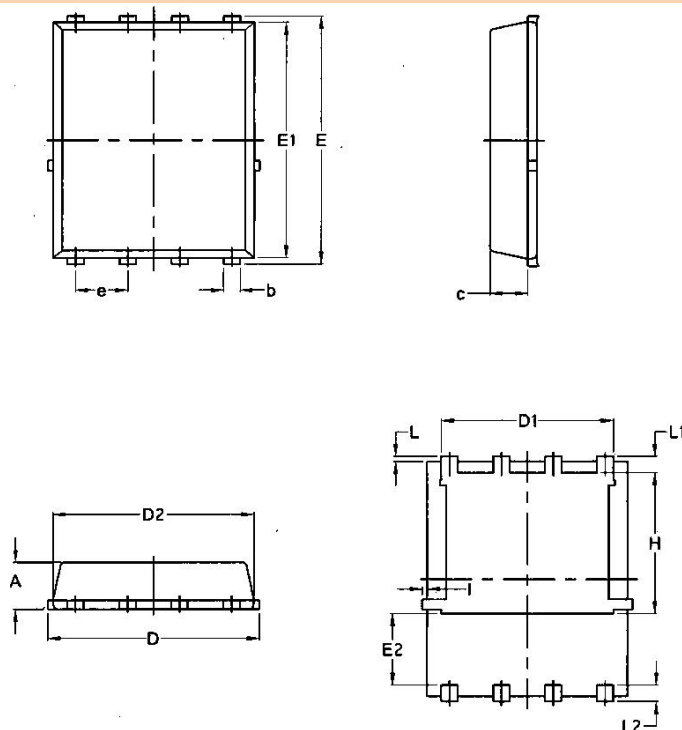
Figure 11. Normalized Maximum Transient Thermal Impedance





PACKAGE INFORMATION

DFN5*6-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	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