DESCRIPTION

The MXN3060 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

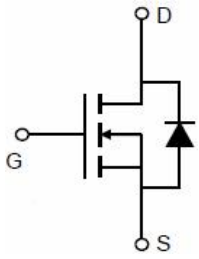
GENERAL FEATURES

- V_{DS}=30V, I_D=60A
  $R_{DS(ON)}$(Typ.)=6.0mΩ @ V_{GS}=4.5V
  $R_{DS(ON)}$(Typ.)=5.0mΩ @ V_{GS}=10V
- Low density cell design
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

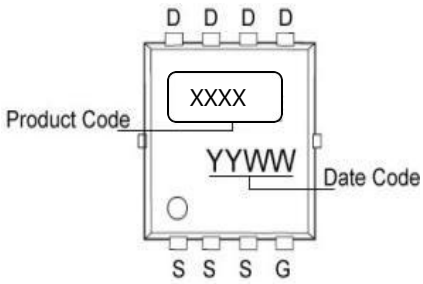
APPLICATION

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

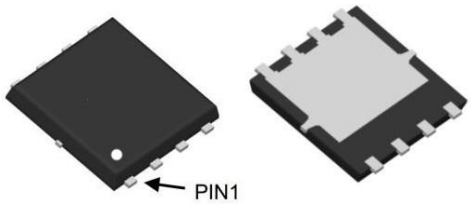
PINOUT



Schematic diagram



Marking and pin Assignment



DFN5X6-8L top&bottom view

ORDERING INFORMATION

Part Number	StorageTemperature	Package	Devices Per Reel
MXN3060	-55°C to 150°C	DFN5X6-8L	5000

ABSOLUTE MAXIMUM RATINGS(T_C=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	60	A
Pulsed Drain Current(Note1)	I_{DM}	150	A
Maximum Power Dissipation	P_D	42	W
Derating factor		0.5	W/°C
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL RESISTANCE

Thermal Resistance, Junction-to-Case(Note2)	$R_{\theta JC}$	3.0	°C/W

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
Note 2. Surface Mounted on FR4 Board, t ≤ 10 sec.

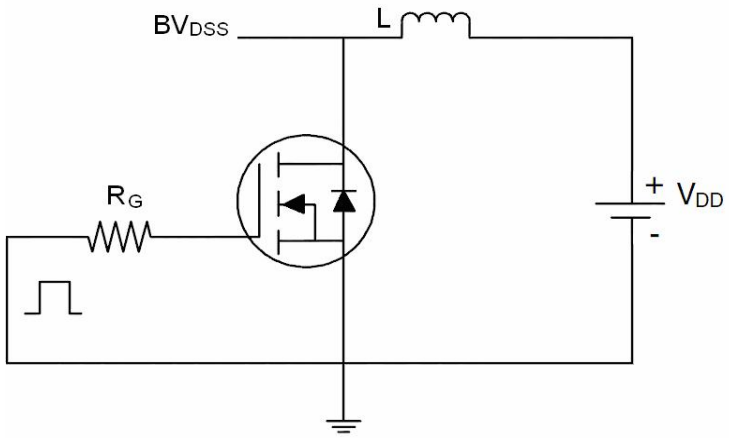
ELECTRICAL CHARACTERISTICS(T_C=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
On Characteristics(Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.0	1.4	2.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=20A	-	6.0	9.0	mΩ
		V_{GS}=10V, I_D=20A	-	5.0	6.5	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=20A	-	57	-	S
Dynamic Characteristics(Note4)						
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V, F=1.0MHz	-	1950	-	pF
Output Capacitance	C_{oss}		-	310	-	pF
Reverse Transfer Capacitance	C_{rss}		-	240	-	pF
Switching Characteristics(Note4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V, R_L=15Ω, V_{GS}=10V,R_G=2.5Ω	-	8.1	-	nS
Turn-on Rise Time	t_r		-	8.6	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	nS
Turn-Off Fall Time	t_f		-	9	-	nS
Total Gate Charge	Q_g	V_{DS}=15V, I_D=20A, V_{GS}=10V	-	37	-	nC
Gate-Source Charge	Q_{gs}		-	4.8	-	nC
Gate-Drain Charge	Q_{gd}		-	11	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage(Note 3)	V_{SD}	V_{GS}=0V, I_S=20A	-	-	1.2	V
Diode Forward Current(Note 2)	I_S		-	-	60	A
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F = 20A di/dt = 100A/μs(Note3)	-	26	-	nS
Reverse Recovery Charge	Q_{rr}		-	34	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

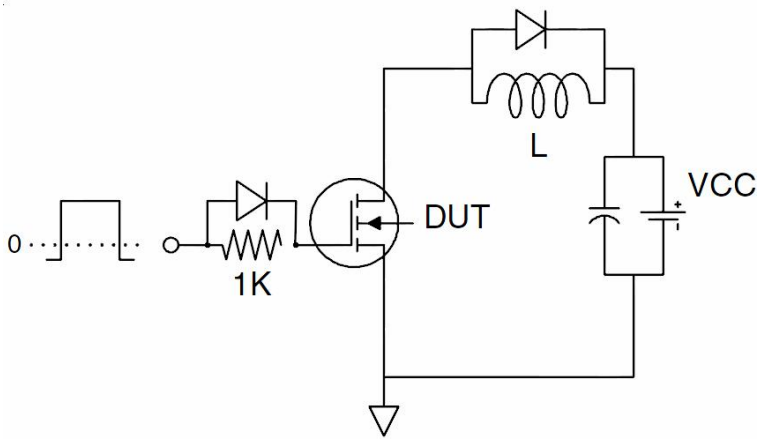
Note 2. Surface Mounted on FR4 Board, t ≤ 10 sec.
Note 3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
Note 4. Guaranteed by design, not subject to product.

TEST CIRCUIT

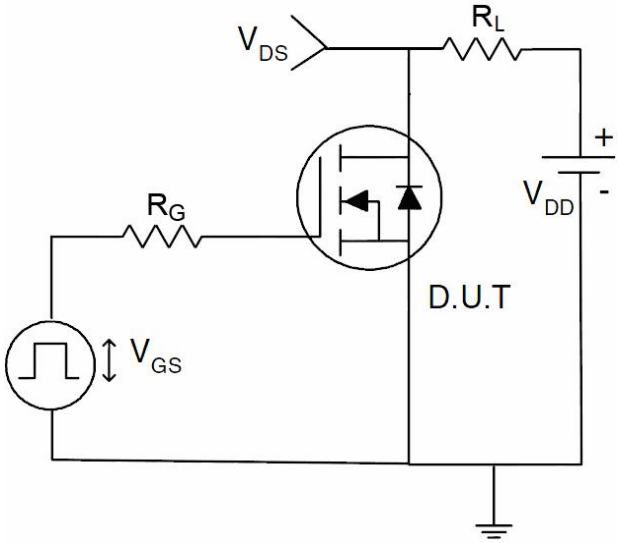
1. E_{AS} Test Circuit



2. Gate Charge Test Circuit



3. Switch Time Test Circuit



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1. Output Characteristics

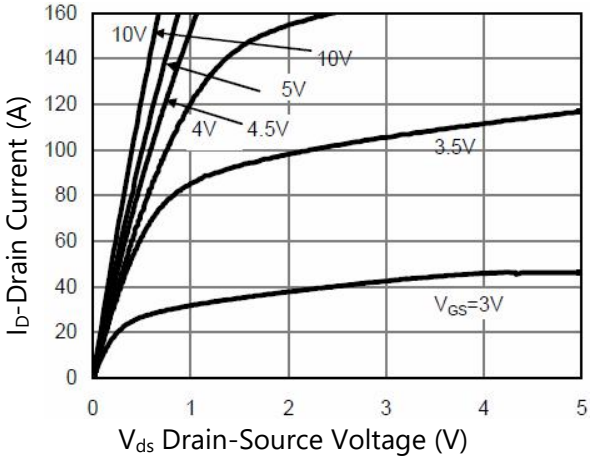


Figure 2. Transfer Characteristics

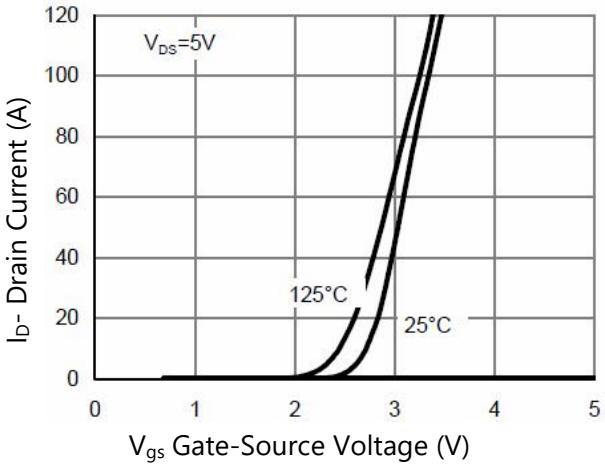


Figure 3. R_{dson} vs Drain Current

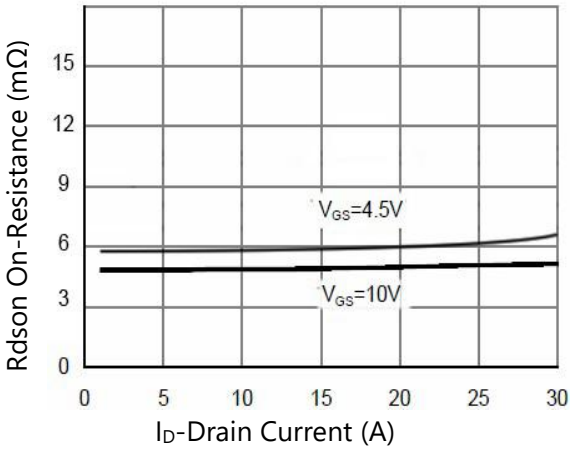


Figure 4. R_{dson} vs Junction Temperature

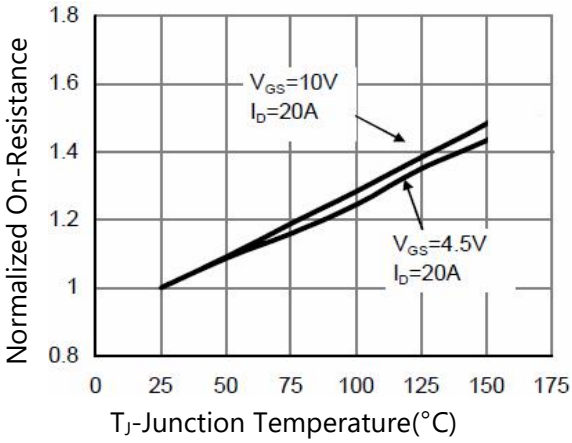


Figure 5. Gate Charge

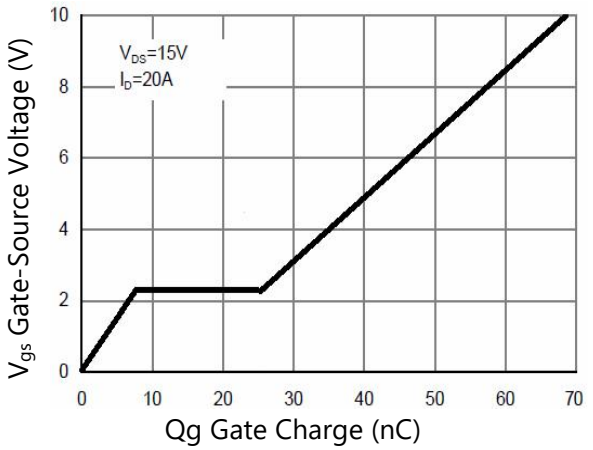
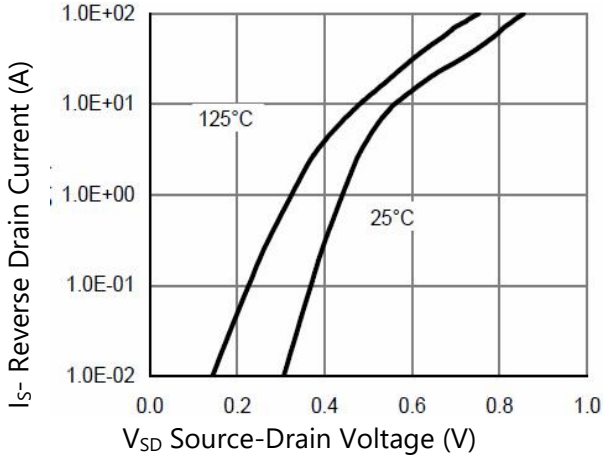


Figure 6. Source- Drain Diode Forward



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7. Capacitance vs V_{DS}

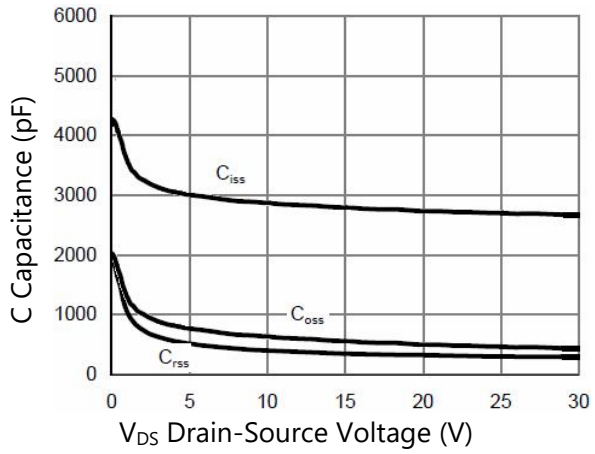


Figure 8. Rdson vs Gate-Source Voltage

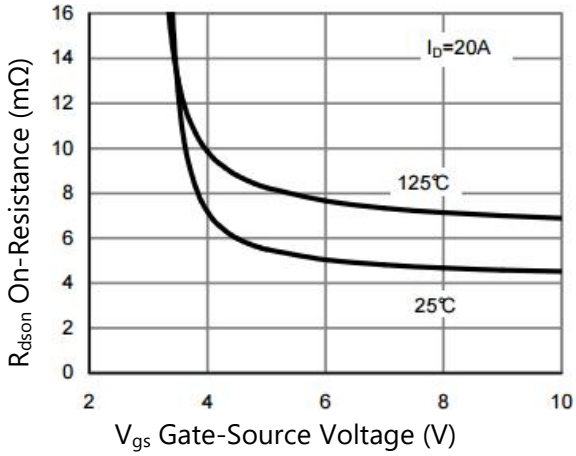


Figure 9. Current- Junction Temperature

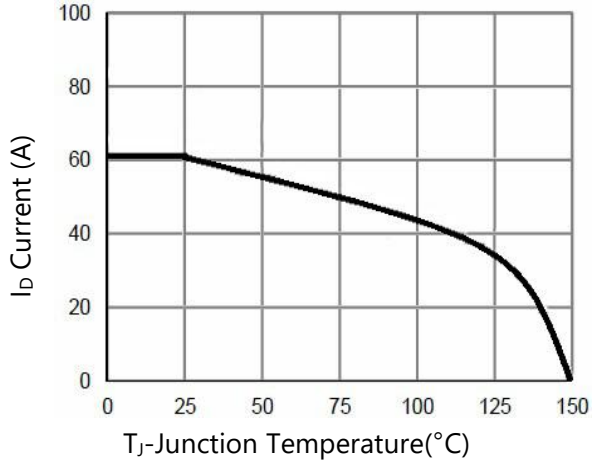


Figure 10. Safe Operation Area

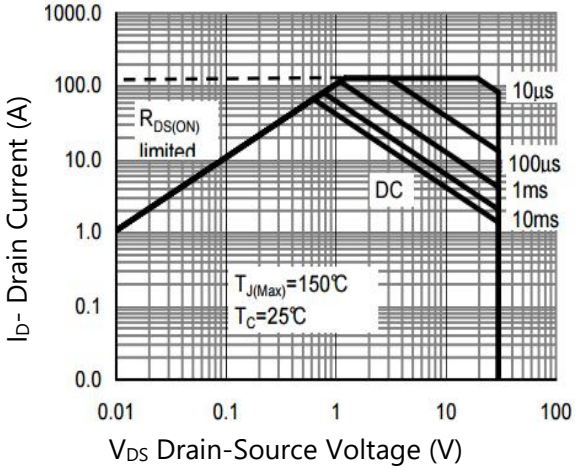
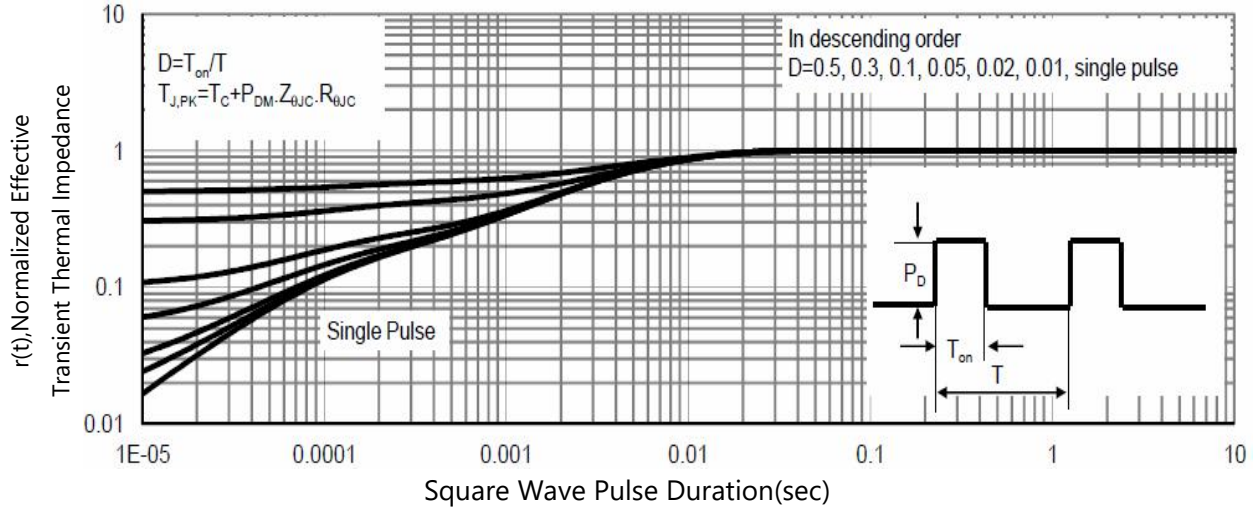
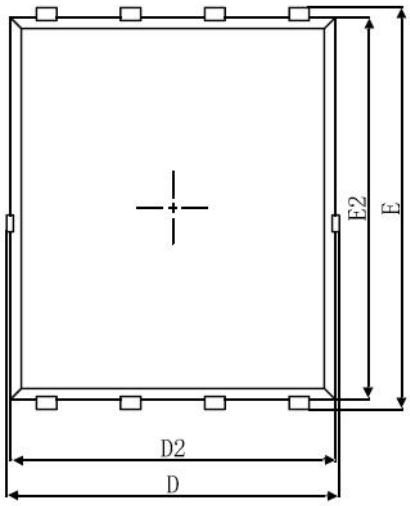


Figure 11. Normalized Maximum Transient Thermal Impedance

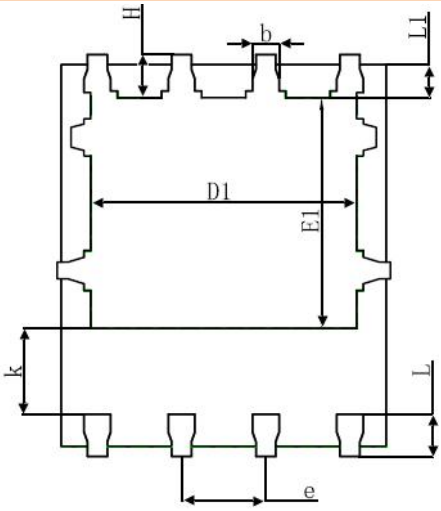


PACKAGE INFORMATION

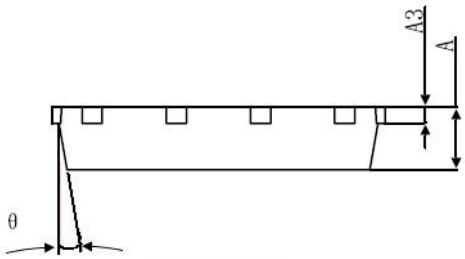
DFN5X6-8L



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	8°	12°	8°	12°