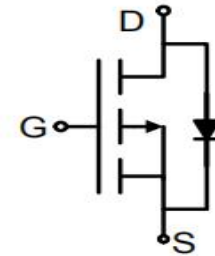




### P-Channel Enhancement Mode Power MOSFET

#### Description

The MXN6545 uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be Used in a wide variety of applications.

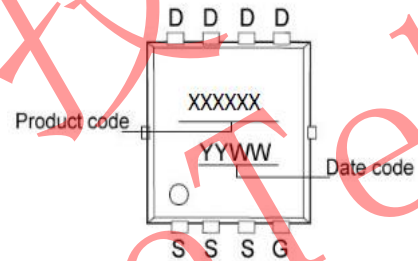


#### General Features

- ◆  $V_{DS} = -30V$ ,  $I_D = -50A$
- ◆  $R_{DS(ON)}$  (Typ.)=  $4.4m\ \Omega$  @  $V_{GS} = -10V$

High density cell design for ultra low Rdson  
 Fully characterized avalanche voltage and current  
 Good stability and uniformity with high EAS  
 Excellent package for good heat dissipation  
 Special process technology for high ESD capability

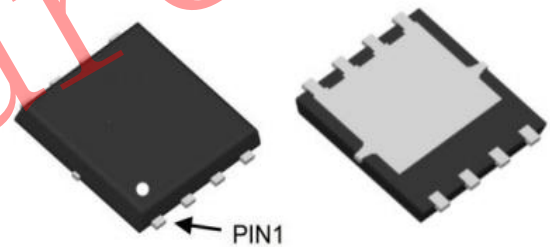
#### Schematic diagram



#### Marking and pin Assignment

#### Application

Battery and loading switching



DFN5x6-8L

#### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	-50	A
Pulsed Drain Current	$I_{DM}$	-70	A
Maximum Power Dissipation	$P_D$	35	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	°C
Derating factor		0.28	W/°C
Single pulse avalanche energy (Note 5)	$E_{AS}$	300	mJ



**Electrical Characteristics** (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Drain-source breakdown voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30	-33	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-body leakage	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	$\mu A$
<b>ON Characteristics</b>						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.5	-2.2	V
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-10A$	-	4.4	7	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=-10V, I_D=-15A$	-	20	-	S
<b>Dynamic Characteristics</b>						
Input capacitance	$C_{ISS}$	$V_{DS}=-15V, V_{GS}=0V$ $f=1.0MHz$	-	3590	-	pF
Output capacitance	$C_{OSS}$		-	695	-	
Reverse transfer capacitance	$C_{RSS}$		-	665	-	
<b>Switching Characteristics</b>						
Turn-on delay time	$t_{D(ON)}$	$V_{DD}=-15V,$ $I_D=-10$ $V_{GS}=-$ $10V, R_{GEN}$ $=6\Omega$	-	13	-	ns
Rise time	$t_r$		-	12	-	
Turn-off delay time	$t_{D(OFF)}$		-	50	-	
Fall time	$t_f$		-	14	-	
Total gate charge	$Q_g$	$V_{DS}=-15V, I_D=-$ $10A, V_{GS}=-10V$	-	84	12	nC
Gate-source charge	$Q_{gs}$		-	11.7	-	
Gate-drain charge	$Q_{gd}$		-	25	-	
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=-10A$	-	-0.85	-1.2	V
Diode Forward Current (Note 2)	$I_S$		-	-	50	A
Reverse Recovery Time	$t_{rr}$	$T_J = 25^\circ C, I_F = -10A$	-	-	45	ns
Reverse Recovery Charge	$Q_{rr}$	$di/dt = 100A/\mu s$ (Note3)	-	-	43	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,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production
5. EAS condition:  $T_J=25^\circ C, V_{DD}=-15V, V_G=-10V, L=0.5mH, R_g=25\Omega$



## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

### Test Circuit

#### 1) $E_{AS}$ Test Circuits

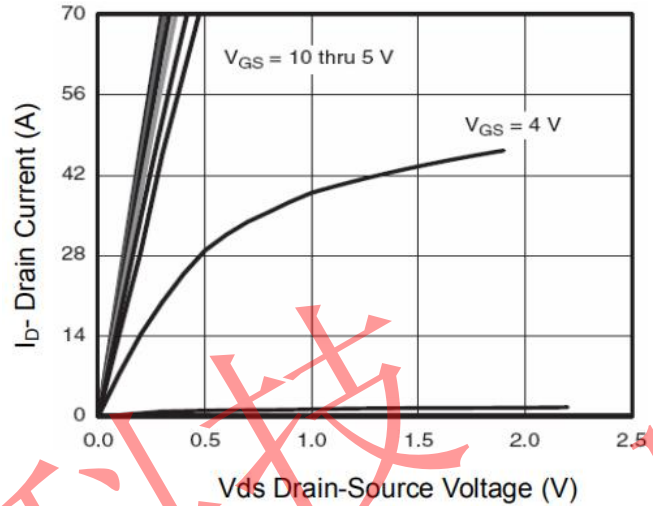
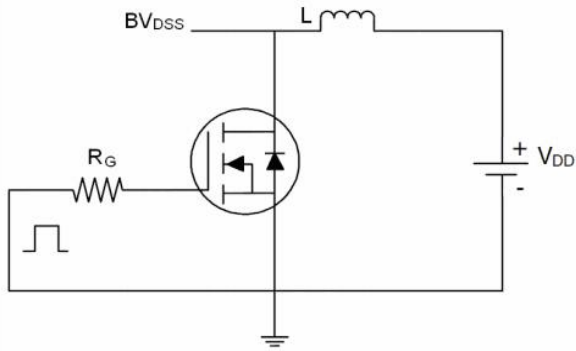


Figure 1 Output Characteristics

#### 2) Gate Charge Test Circuit

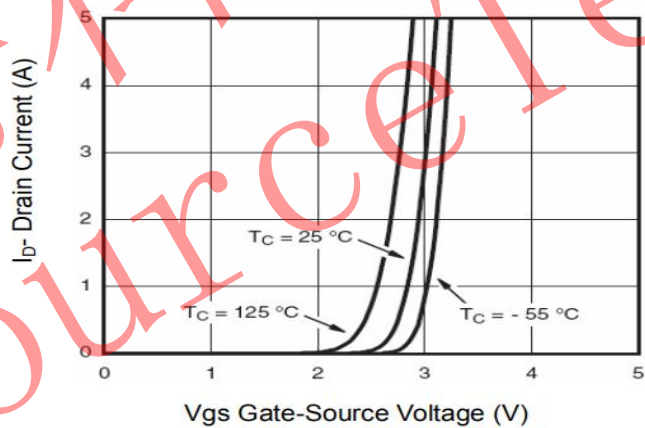
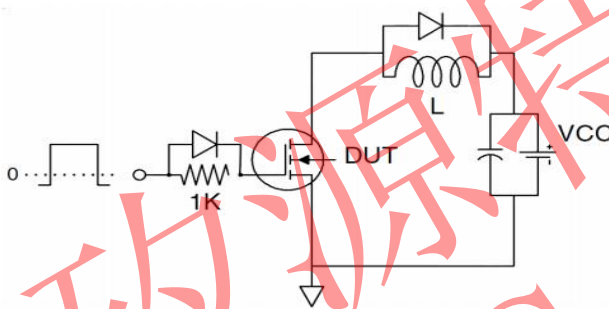


Figure 2 Transfer Characteristics

#### 3) Switch Time Test Circuit

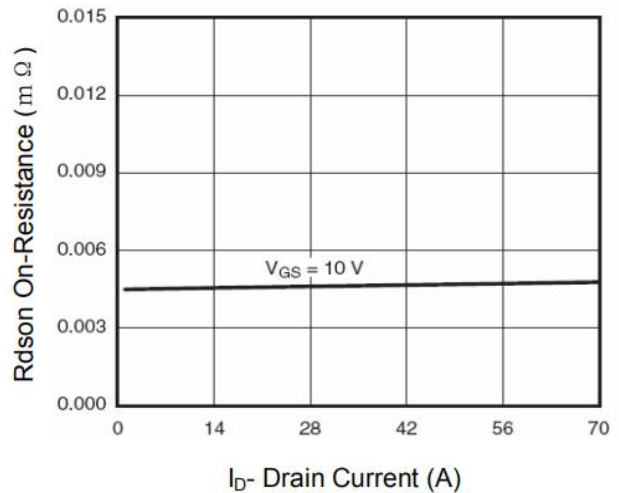
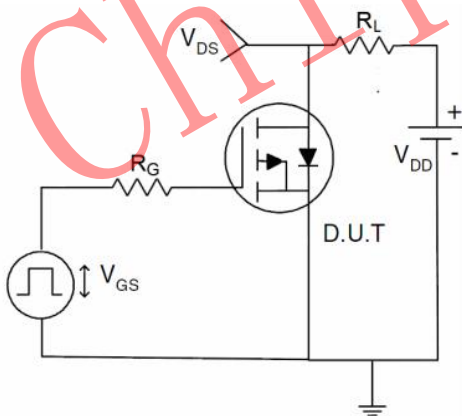


Figure 3  $R_{dson}$ - Drain Current

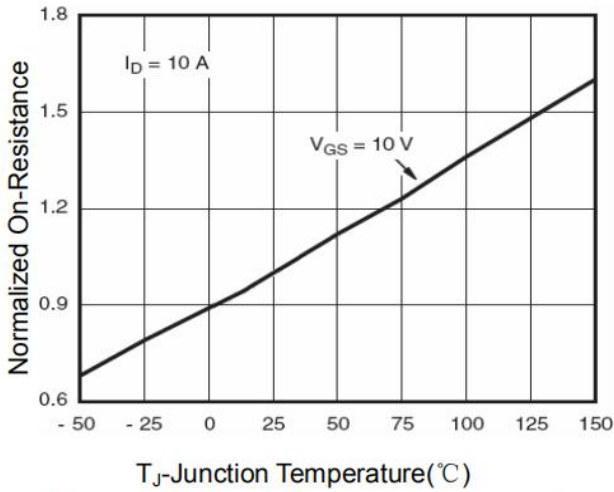


Figure 4 R<sub>DS(on)</sub>-Junction Temperature

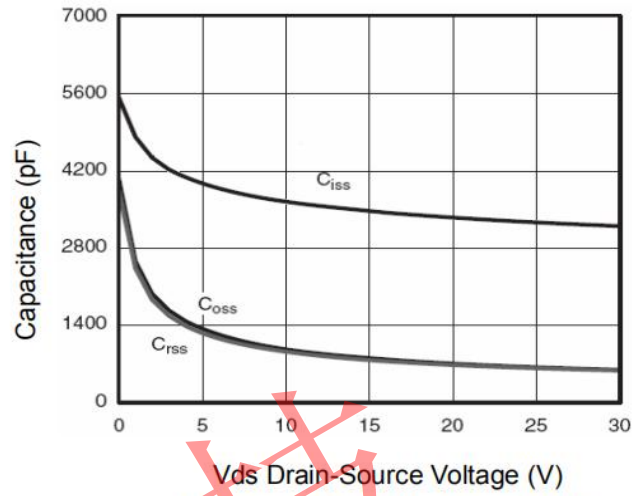


Figure 7 Capacitance vs  $V_{ds}$

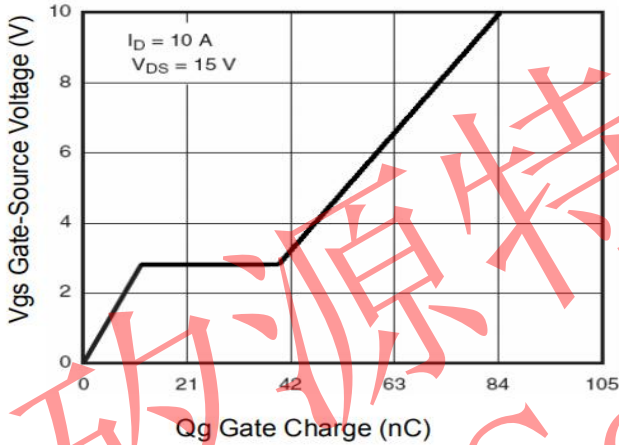


Figure 5 Gate Charge

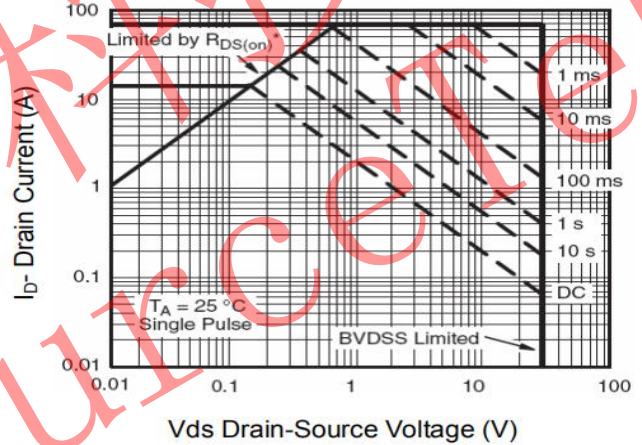


Figure 8 Safe Operation Area

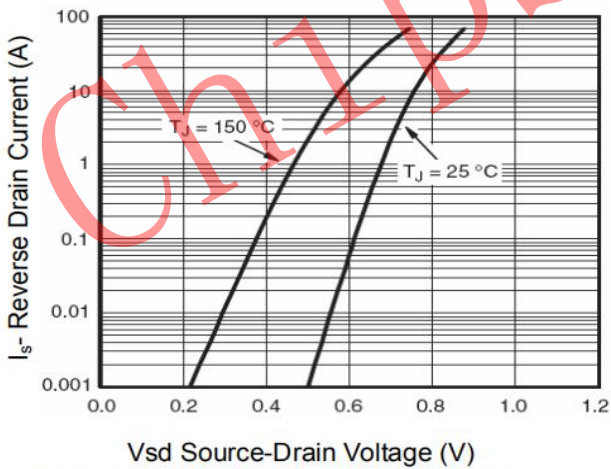


Figure 6 Source- Drain Diode Forward

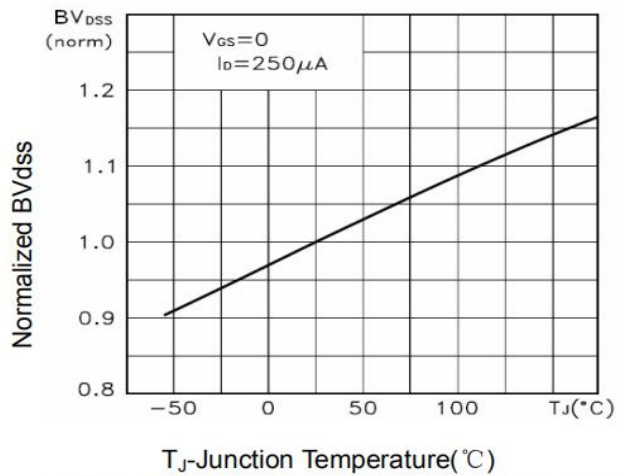


Figure 9  $BV_{DSS}$  vs Junction Temperature

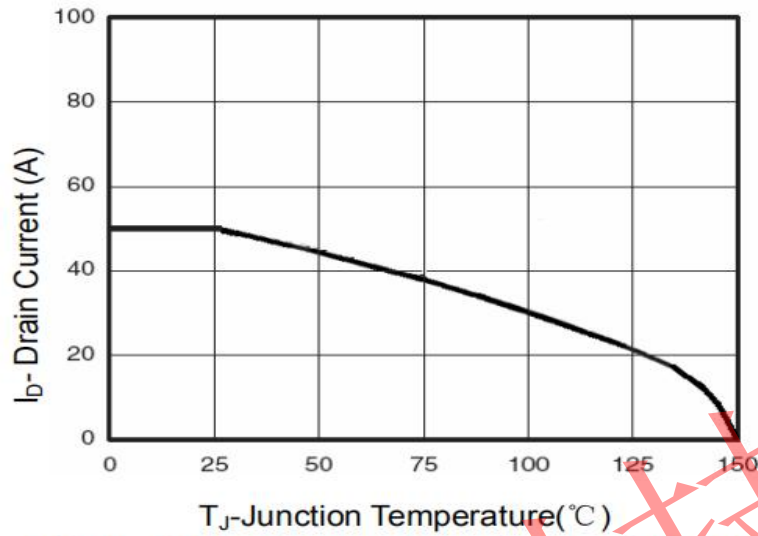


Figure 10 ID Current Derating vs Junction Temperature

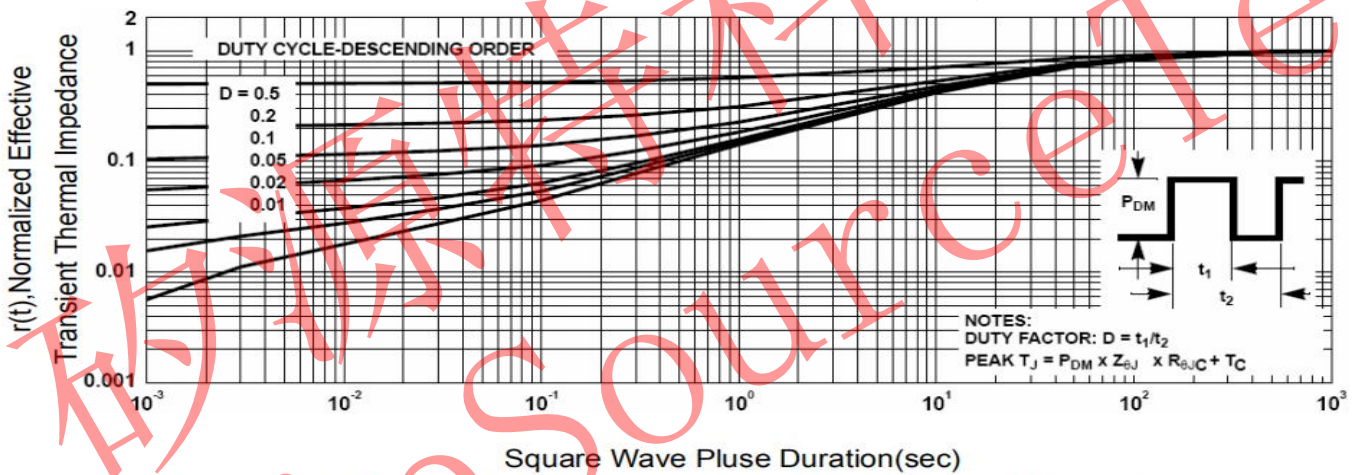
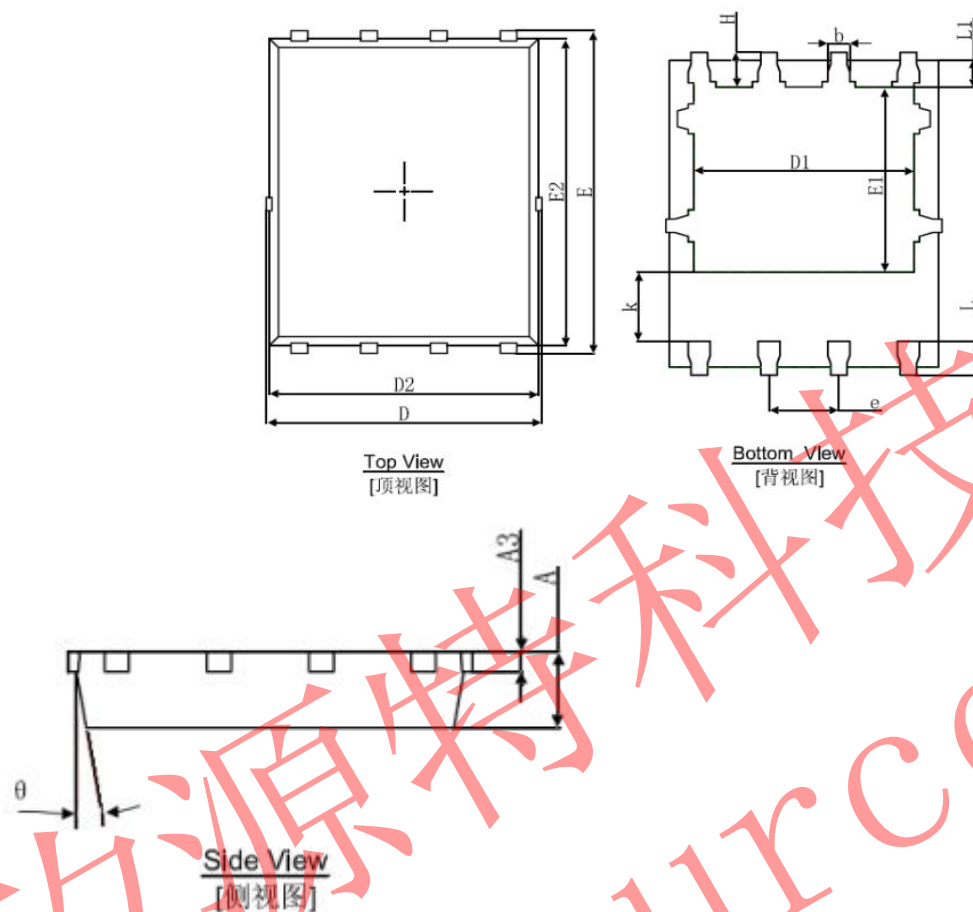


Figure 11 Normalized Maximum Transient Thermal Impedance



DFN5X6-8L Package Information



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	0.035	0.450	0.014	0.018
e	1.270(TYP.)		0.050(TYP.)	
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
$\theta$	8°	12°	8°	12°