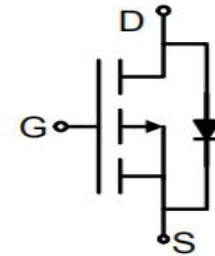




P-Channel Enhancement Mode Power MOSFET

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.

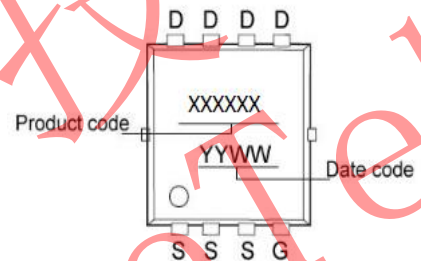


General Features

- ◆ $V_{DS} = -30V$, $I_D = -50A$
- ◆ $R_{DS(ON)}$ (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

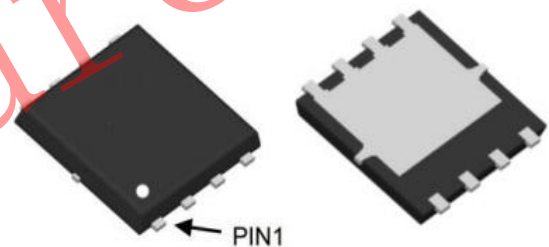
Schematic diagram



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}	± 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
OFF Characteristics						
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	μA
Gate-body leakage	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	μA
ON Characteristics						
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 Ω
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-15A$	-	20	-	S
Dynamic Characteristics						
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	-	
Switching Characteristics						
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	-	
DRAIN-SOURCE DIODE CHARACTERISTICS						
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

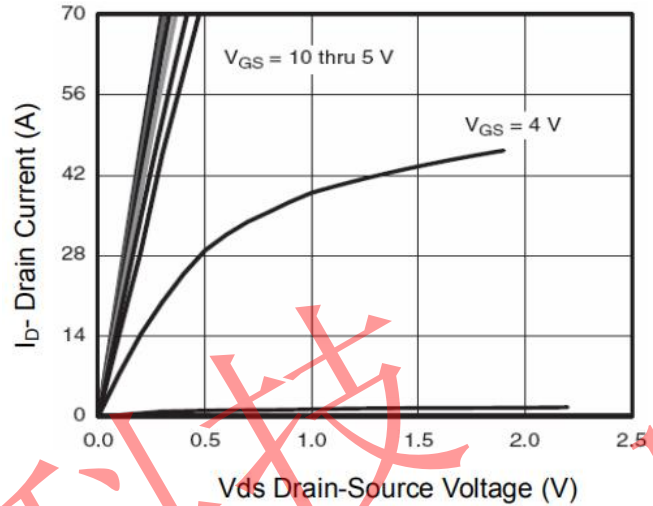
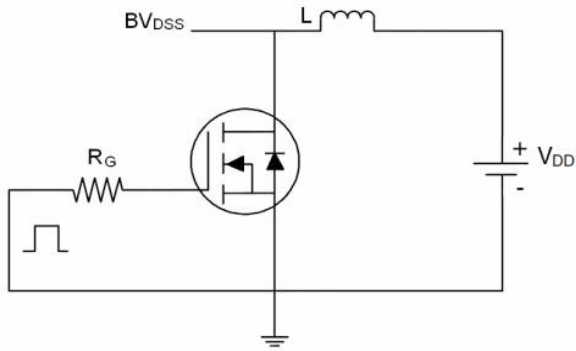


Figure 1 Output Characteristics

2) Gate Charge Test Circuit

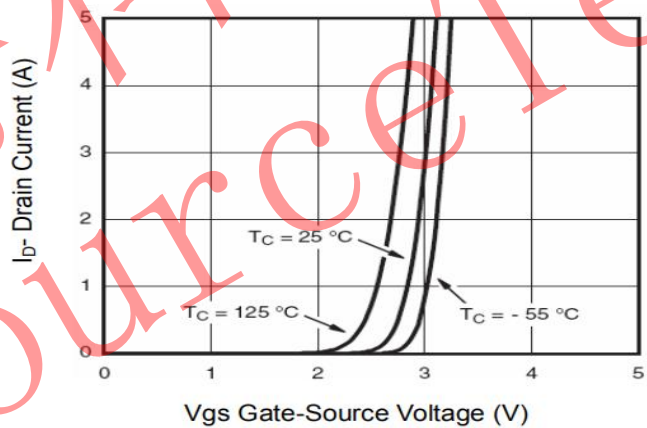
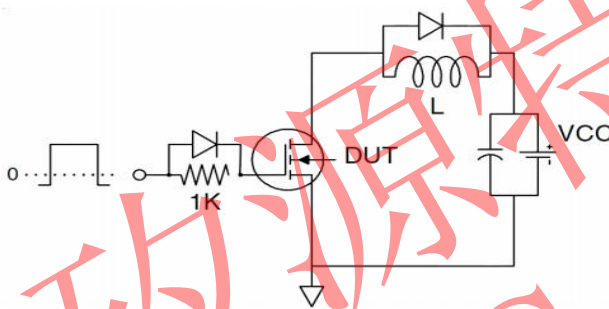


Figure 2 Transfer Characteristics

3) Switch Time Test Circuit

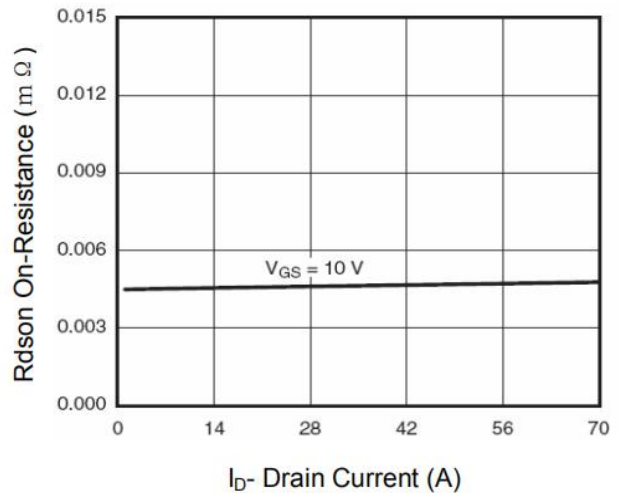
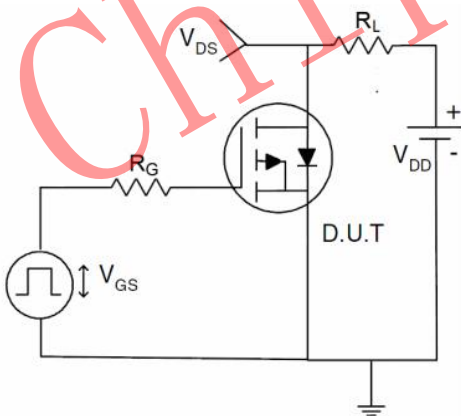


Figure 3 R_{dson} - Drain Current

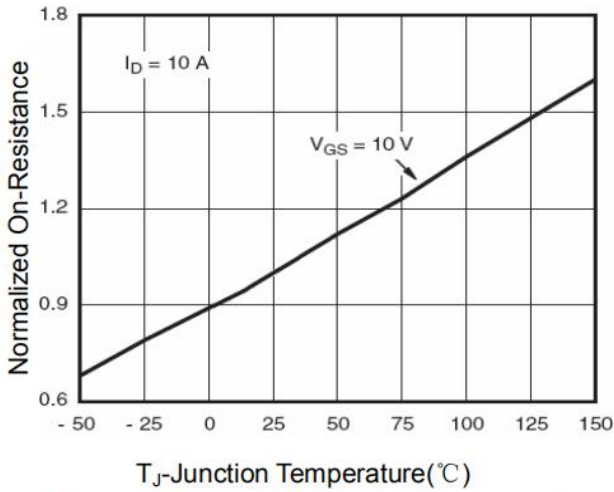


Figure 4 R_{ds(on)}-Junction Temperature

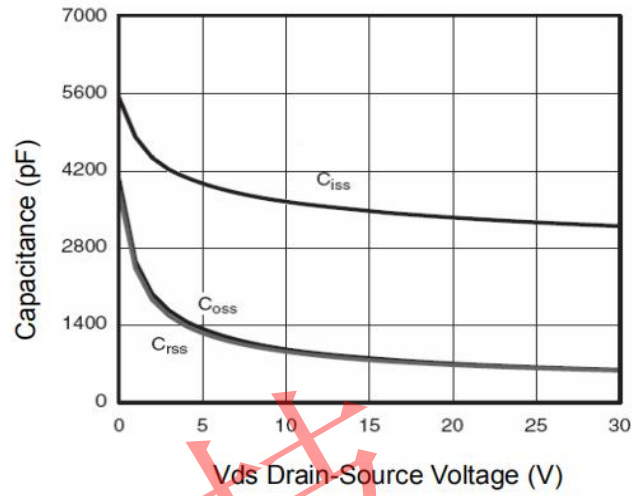


Figure 7 Capacitance vs V_{ds}

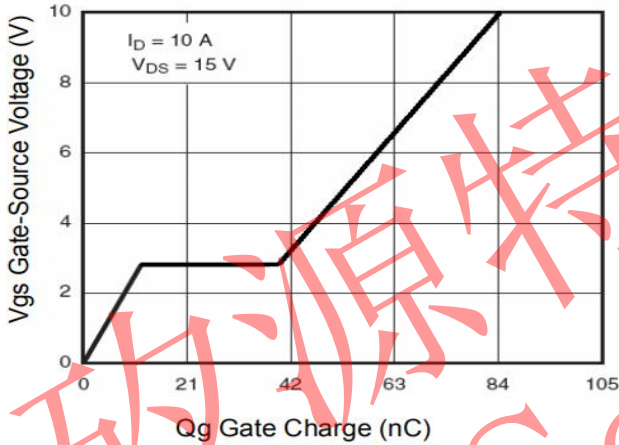


Figure 5 Gate Charge

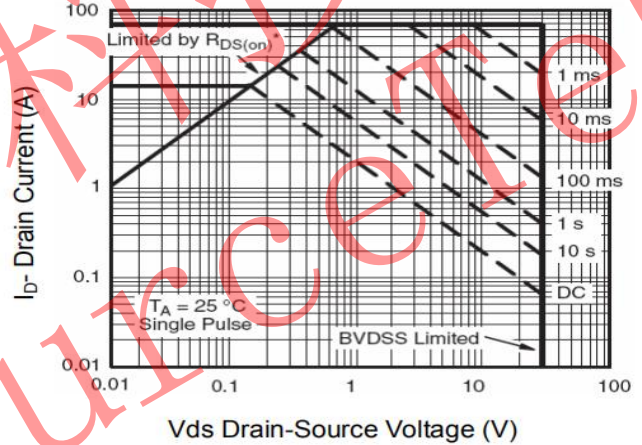


Figure 8 Safe Operation Area

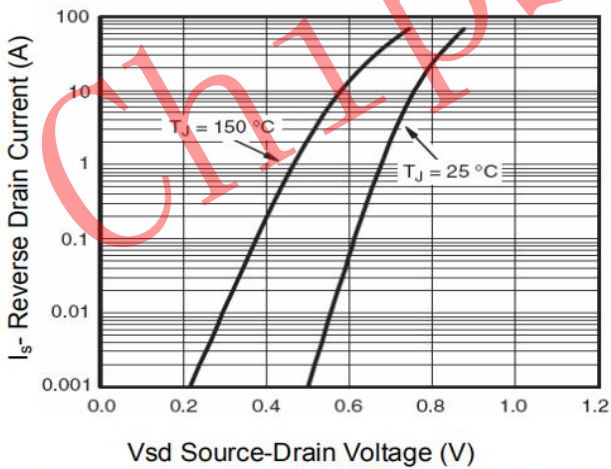


Figure 6 Source- Drain Diode Forward

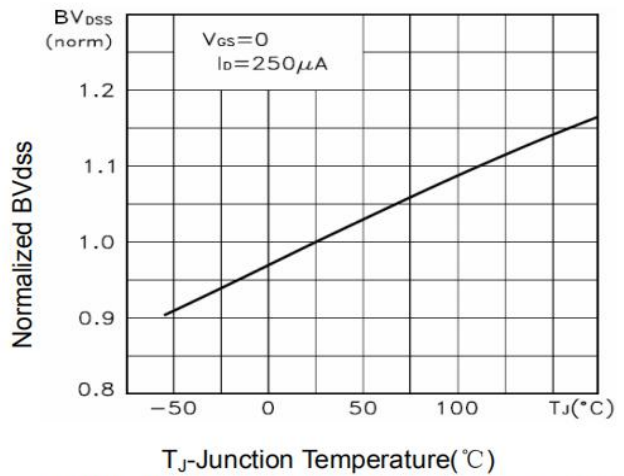


Figure 9 BV_{DSS} vs Junction Temperature

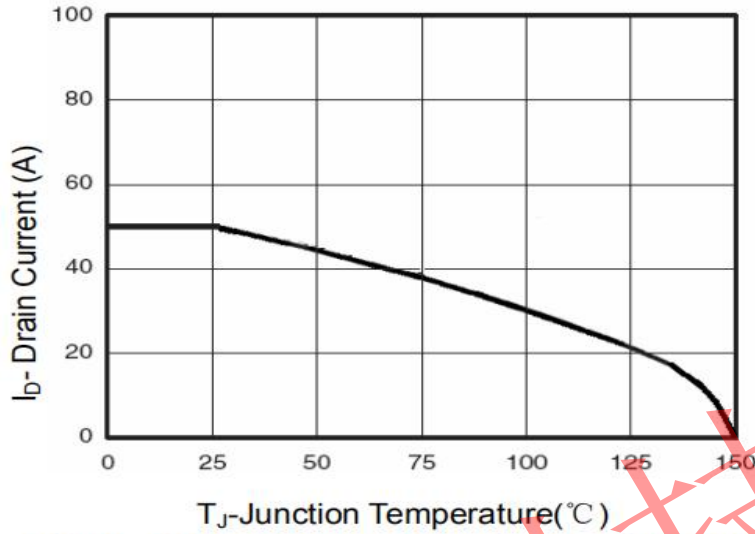


Figure 10 ID Current Derating vs Junction Temperature

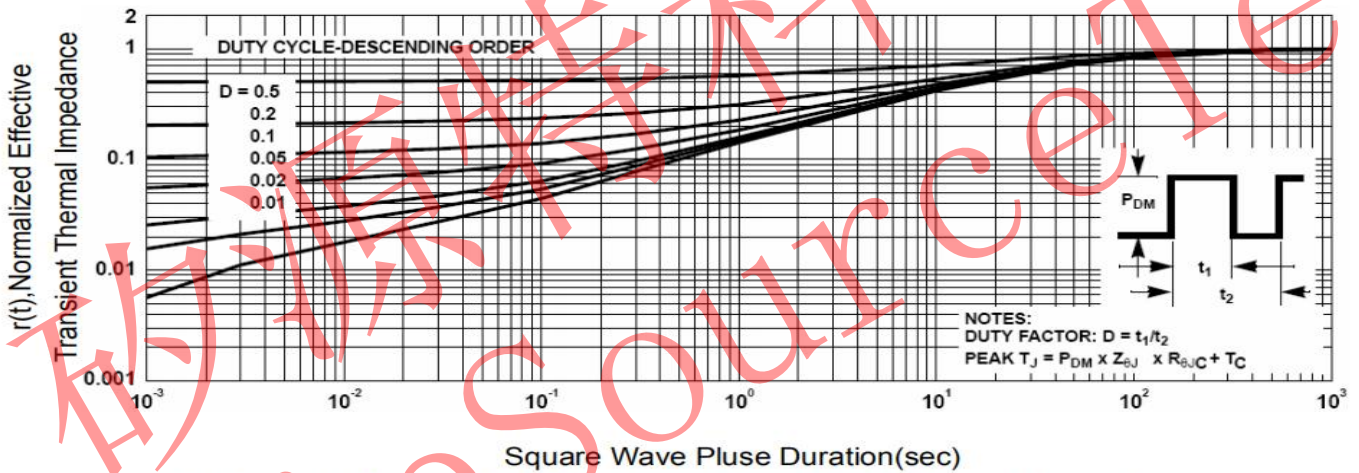
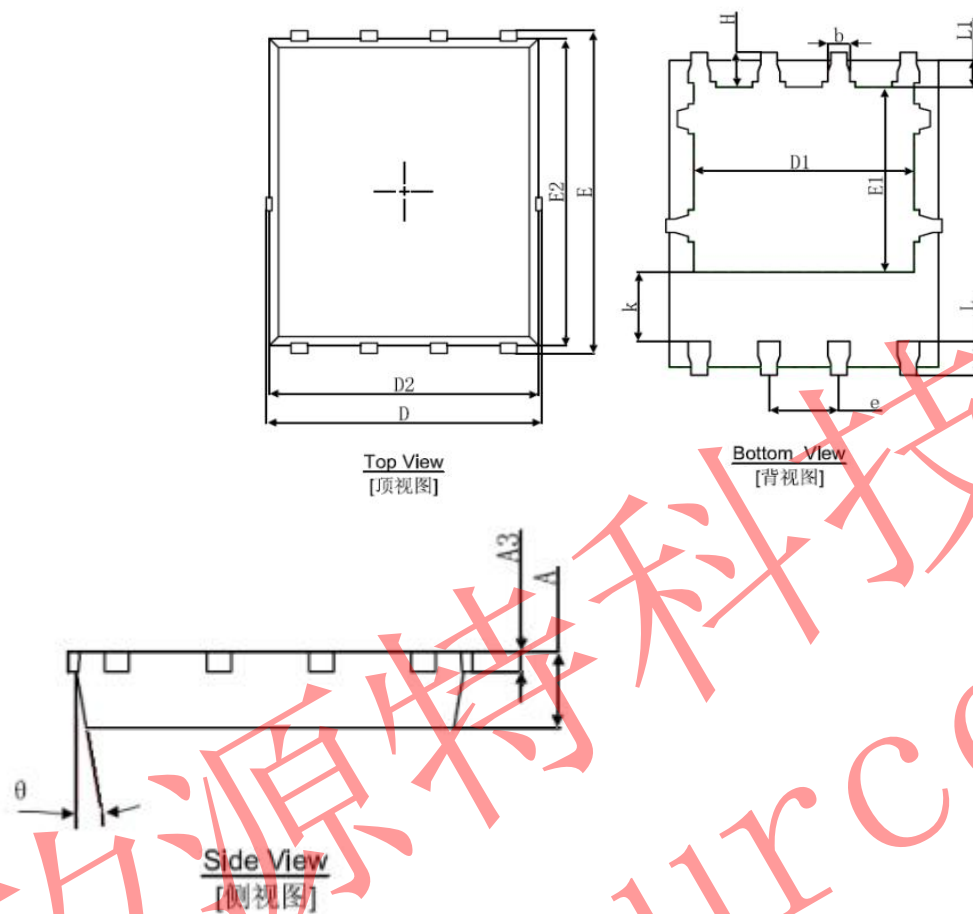


Figure 11 Normalized Maximum Transient Thermal Impedance



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
θ	8°	12°	8°	12°