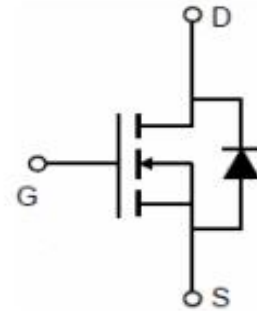




### N-Channel Enhancement Mode Power MOSFET

#### Description

The MXN6542 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

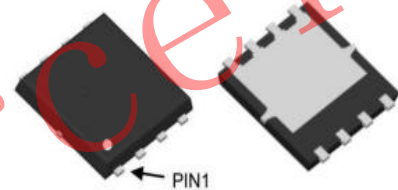
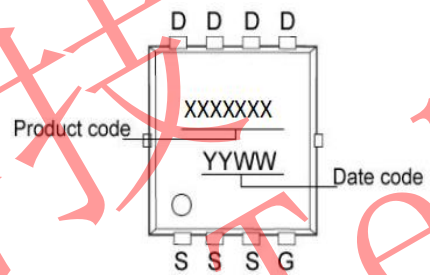
$$V_{DS} = 60V, I_D = 45A$$

$$R_{DS(ON)}(Typ.) < 8.5m\Omega @ V_{GS}=10V$$

$$R_{DS(ON)}(Typ.) < 11m\Omega @ V_{GS}=-4.5V$$

High density cell design for ultra low  $R_{dson}$   
Fully characterized avalanche voltage and current

Low gate to drain charge to reduce switching losses



DFN5X6-8L top&bottom view

#### Application

- Power switching application
- Load switch

#### Absolute Maximum Ratings ( $T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	45	A
Drain Current-Pulsed (Note 1)	$I_{DM}$	140	A
Maximum Power Dissipation	$P_D$	60	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ C$

#### Thermal CharacteristicE

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	2.5	$^\circ C/W$
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**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	60	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =48V, V <sub>GS</sub> =0V	-	-	1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250A	1.2	1.8	2.2	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	8.5	12	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	-	11	16	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =9A	-	25	-	S
<b>Dynamic Characteristics</b> (Note 4)						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, F=1.0MHz	-	3240	-	PF
Output Capacitance	C <sub>oss</sub>		-	210	-	PF
Reverse Transfer Capacitance	C <sub>rss</sub>		-	146	-	PF
<b>Switching Characteristics</b> (Note 4)						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, R <sub>L</sub> =15Ω V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω	-	10.6	-	nS
Turn-on Rise Time	t <sub>r</sub>		-	9	-	nS
Turn-Off Delay Time	t <sub>d(off)</sub>		-	65.6	-	nS
Turn-Off Fall Time	t <sub>f</sub>		-	4.8	-	nS
Total Gate Charge	Q <sub>g</sub>		-	30	-	nC
Gate-Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> =48V, I <sub>D</sub> =8A, V <sub>GS</sub> =4.5V	-	10.7	-	nC
Gate-Drain Charge	Q <sub>gd</sub>		-	9.4	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A	-	-	1.2	V
Diode Forward Current (Note 2)	I <sub>S</sub>		-	-	8	A
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, I <sub>F</sub> = 20A di/dt = 100A/μs (Note 3)	-	18	-	nS
Reverse Recovery Charge	Q <sub>rr</sub>		-	15.6	-	nC

**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



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

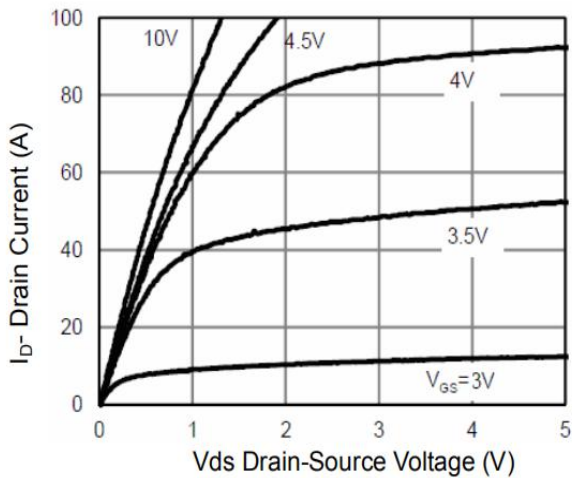


Figure 1 Output Characteristics

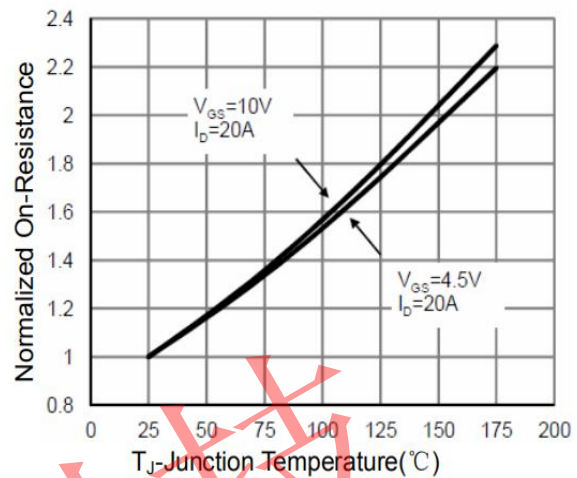


Figure 4 Rds(on)-Junction Temperature

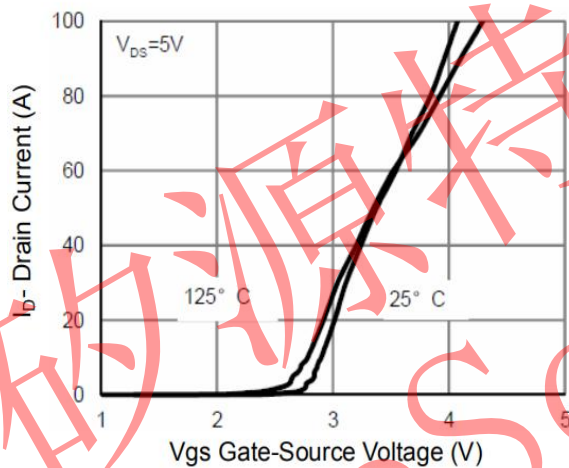


Figure 2 Transfer Characteristics

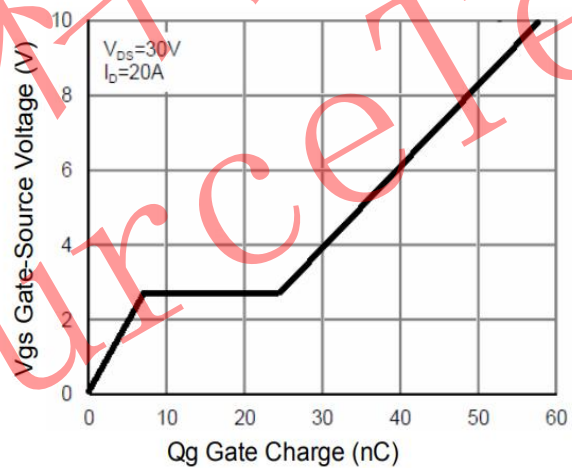


Figure 5 Gate Charge

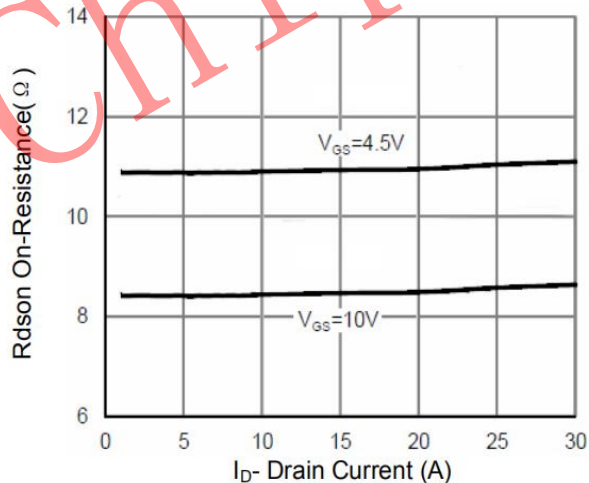


Figure 3 Rds(on)- Drain Current

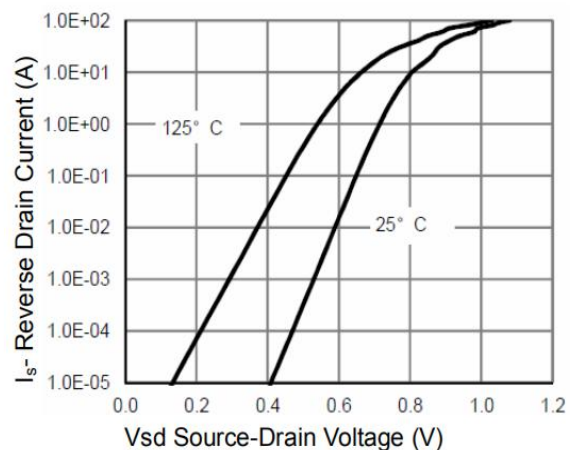
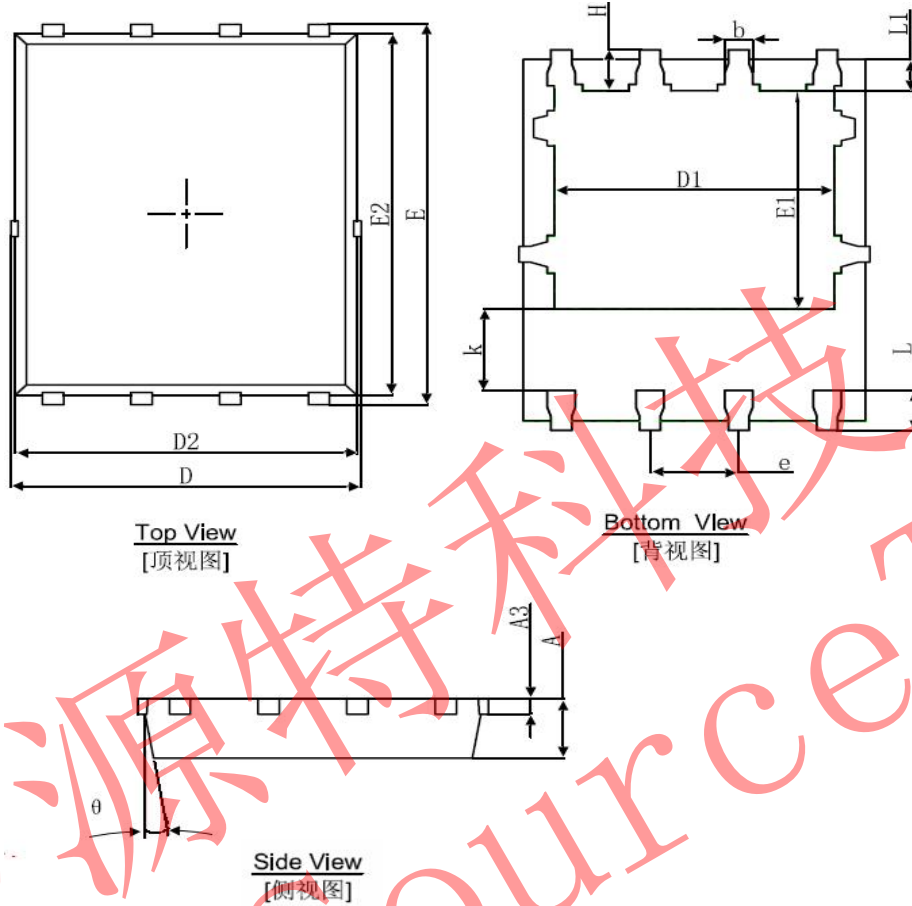


Figure 6 Source- Drain Diode Forward



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	0.350	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
$\theta$	8°	12°	8°	12°