



Description

The XPX150P03RD 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.

$V_{DS} = -30V, I_D = -150A$

$R_{DS(ON)} = 2.5m\Omega @ V_{GS} = -10V$

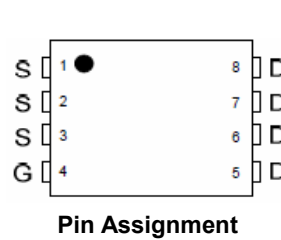
$R_{DS(ON)} = 3.5m\Omega @ V_{GS} = -4.5V$

General Features

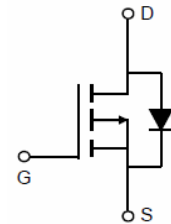
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Application

- Load switch
- Battery protection

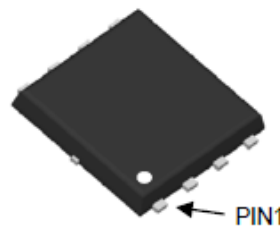


Pin Assignment

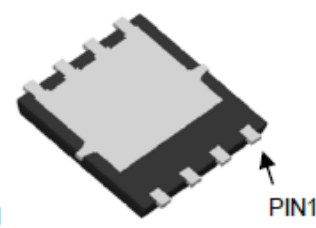


Schematic diagram

Top View



Bottom View



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
XPX150P03RD	XPX150P03RD	DFN5X6-8L	-	-	5000

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 25	V
Drain Current-Continuous	I_D	-150	A
Drain Current-Continuous($T_C = 100^\circ C$)	$I_D(100^\circ C)$	-85	A
Pulsed Drain Current	I_{DM}	-420	A
Maximum Power Dissipation	P_D	85	W
Derating factor		0.68	W/ $^\circ C$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$
Thermal Resistance, Junction-to-Case ^(Note 2)	$R_{\theta JC}$	1.8	$^\circ C/W$

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

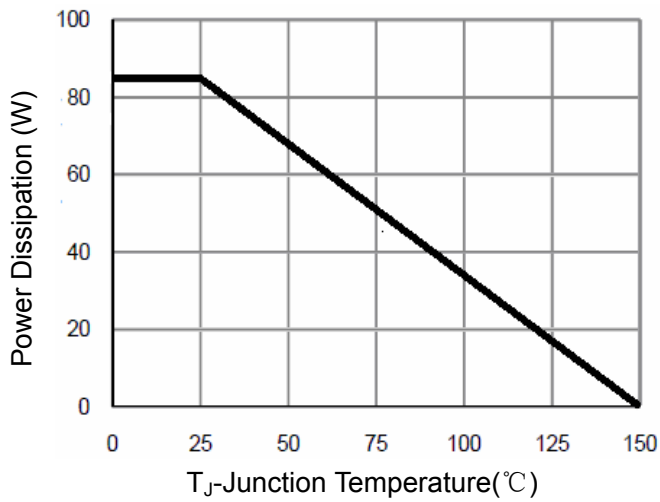
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-30		-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1.2	-1.8	-2.5	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-20A	-	2.5	3.3	mΩ
		V _{GS} =-4.5V, I _D =-20A	-	3.5	4.4	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-20A	-	30	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, F=1.0MHz	-	7536	-	PF
Output Capacitance	C _{oss}		-	980	-	PF
Reverse Transfer Capacitance	C _{rss}		-	550	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-15V, I _D =-20A V _{GS} =-10V, R _G =1.6Ω	-	12	-	nS
Turn-on Rise Time	t _r		-	25	-	nS
Turn-Off Delay Time	t _{d(off)}		-	70	-	nS
Turn-Off Fall Time	t _f		-	20	-	nS
Total Gate Charge	Q _g	V _{DS} =-15V, I _D =-20A, V _{GS} =-10V	-	68	-	nC
Gate-Source Charge	Q _{gs}		-	11	-	nC
Gate-Drain Charge	Q _{gd}		-	9.0	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-20A	-		-1.2	V
Diode Forward Current	I _S		-	-	-125	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = -20A	-		36	nS
Reverse Recovery Charge	Q _{rr}	di/dt = 100A/μs (Note 3)	-		75	nC

Notes:

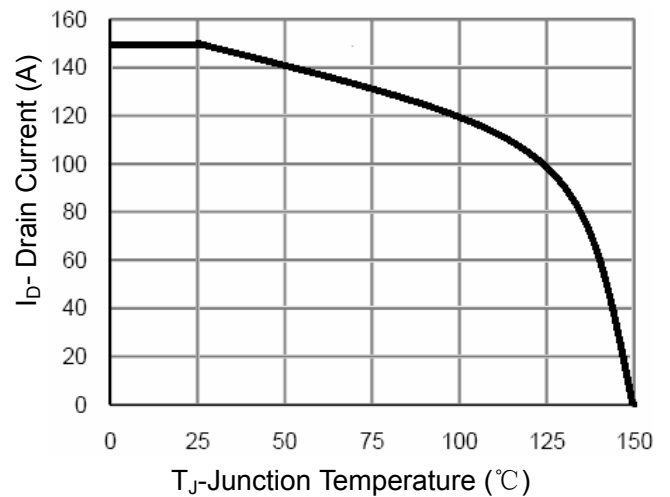
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition : T_J=25°C, V_{DD}=-20V, V_G=-10V, L=0.5mH, R_G=25Ω

Typical Operating Characteristics

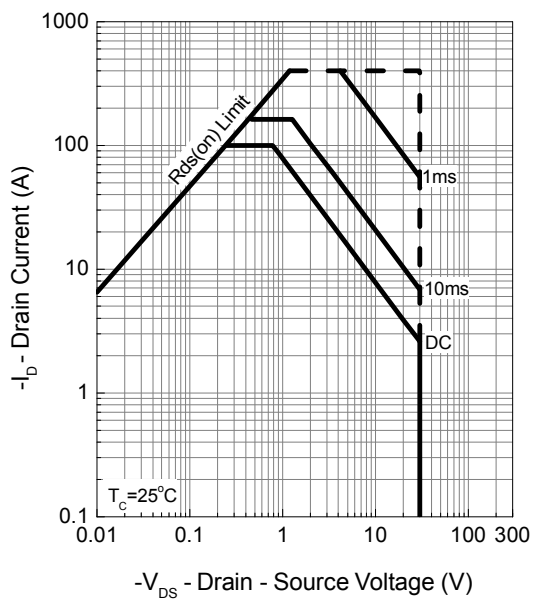
Power Dissipation



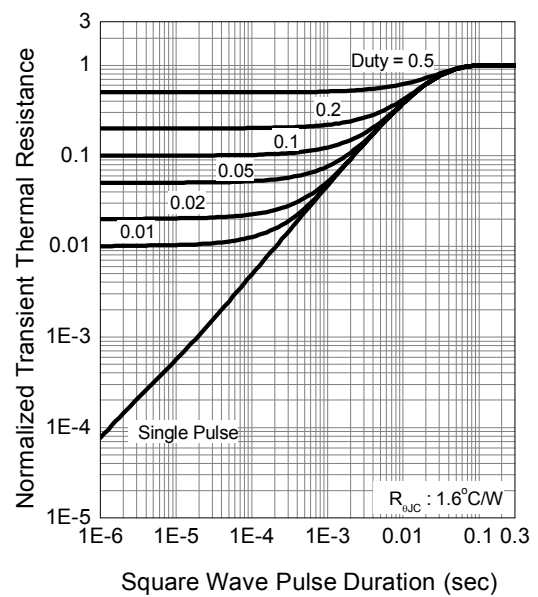
Drain Current



Safe Operation Area

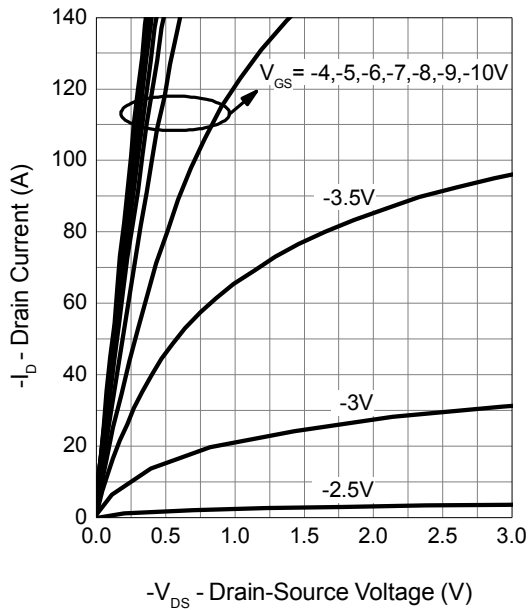


Thermal Transient Impedance

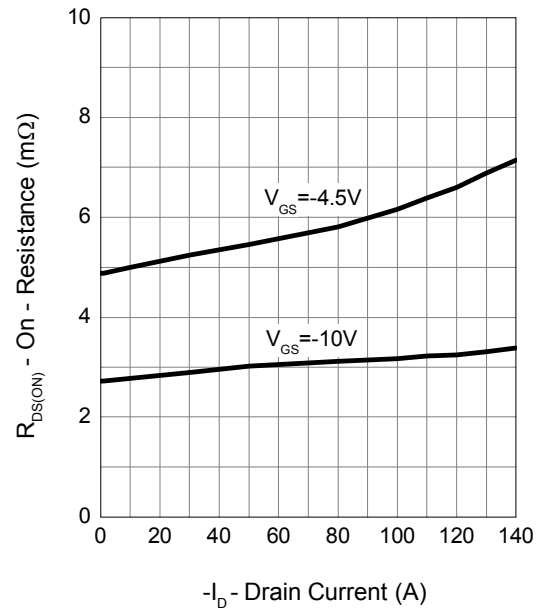


Typical Operating Characteristics (Cont.)

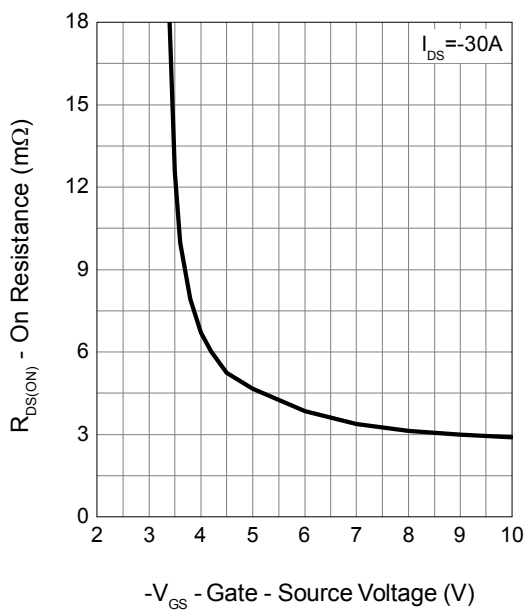
Output Characteristics



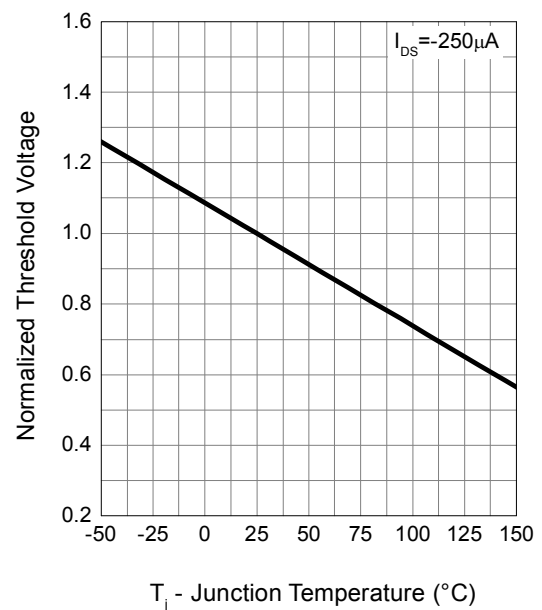
Drain-Source On Resistance

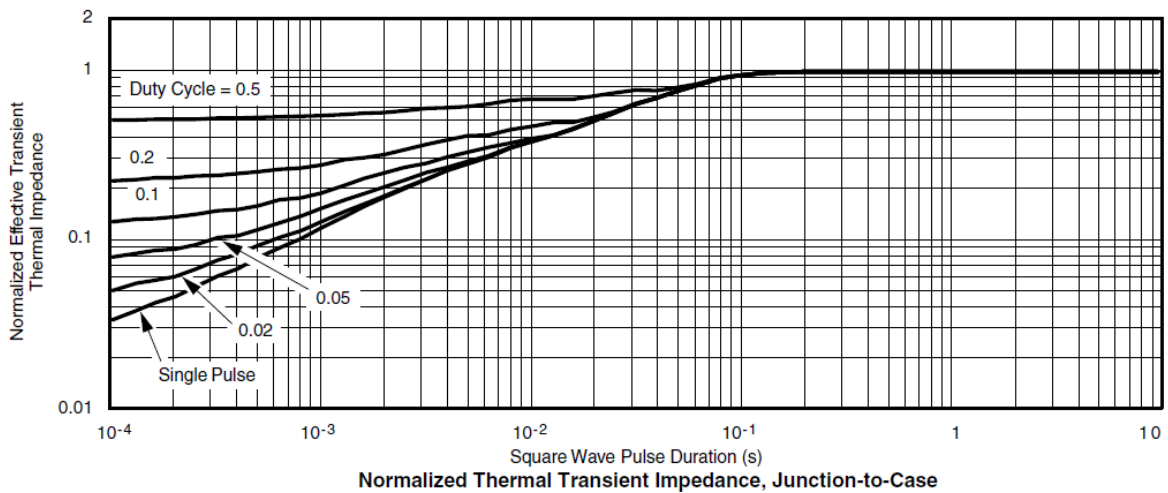
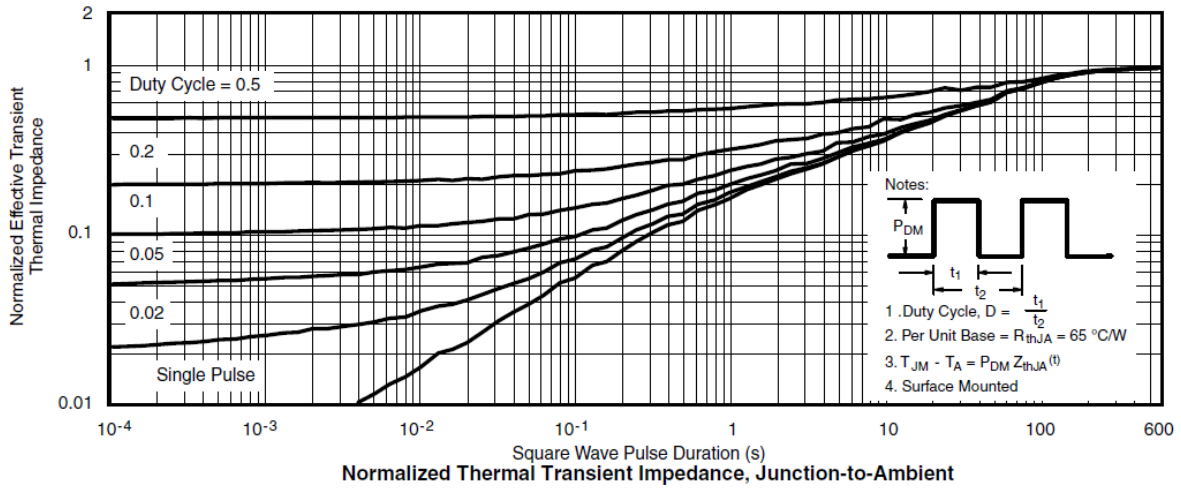


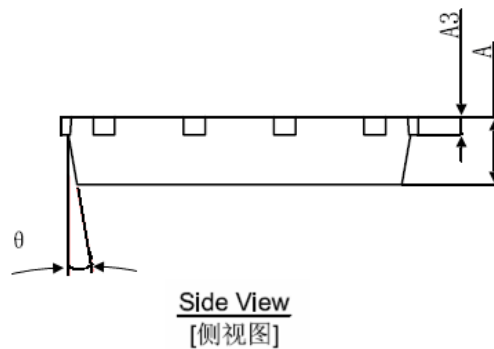
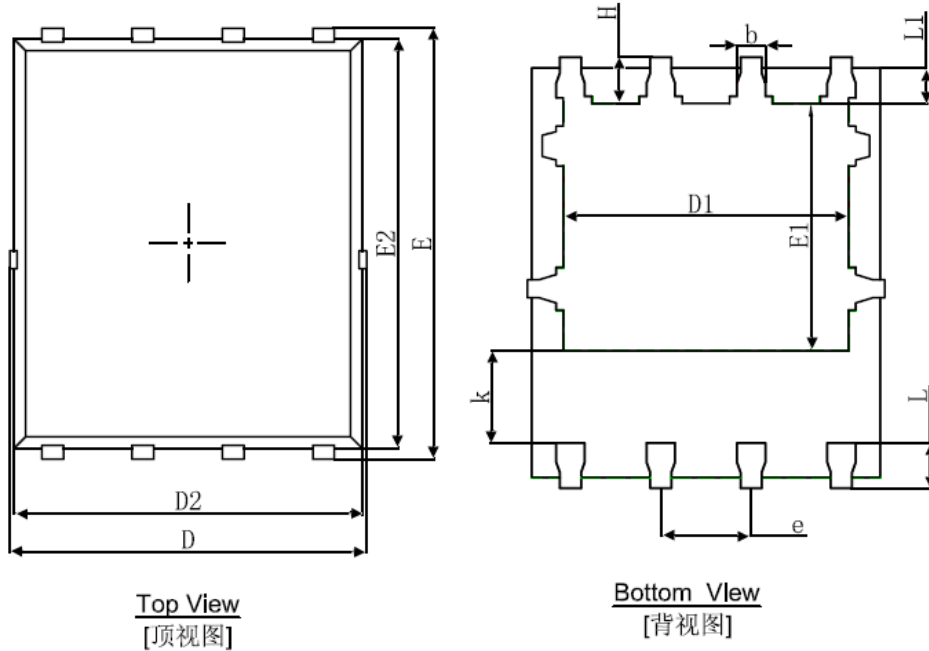
Gate-Source On Resistance



Gate Threshold Voltage





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
θ	8°	12°	8°	12°

Flow (wave) soldering (solder dipping)

Product	Peak Temperature	Dipping Time
Pb device	245°C ±5°C	5sec ±1sec
Pb-Free device	260°C +0/-5°C	5sec ±1sec



This integrated circuit can be damaged by ESD. UniverChip Corporation recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedure can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

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