XPX30P04A1

-30V P-Channe Enhancement Mode Power MOSFET

RoHS COMPLIANT

Description

The XPX30P04A1 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 =-100A
$R_{DS(ON)}$=3.6mΩ@V_{GS}=-10V
$R_{DS(ON)}$=5.0mΩ@V_{GS}=-4.5V

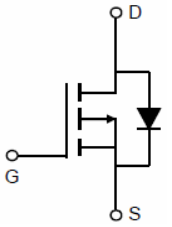
General Features

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

Application

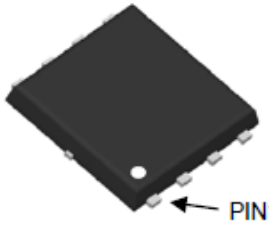
- Load switch
- Battery protection

Pin Assignment

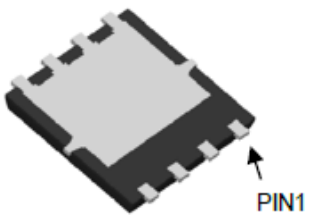


Schematic diagram

Top View



Bottom View



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
XPX30P04A1	XPX30P04A1	DFN5X6-8L	-	-	5000

Absolute Maximum Ratings (T_C=25℃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	-100	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	-75	A
Pulsed Drain Current	I_{DM}	-380	A
Maximum Power Dissipation	P_D	72	W
Derating factor		0.7	W/℃
Single pulse avalanche energy (Note 5)	E_{AS}	455	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃
Thermal Resistance,Junction-to-Case (Note 2)	$R_{\theta JC}$	2.1	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

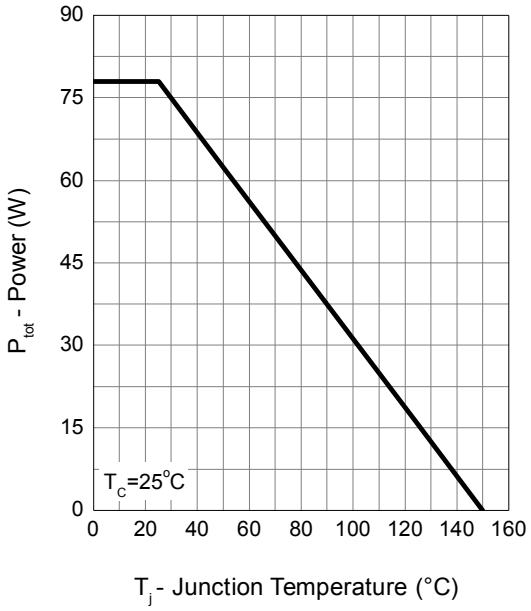
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-30		-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1.0	-1.5	-2.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-30A	-	3.6	4.5	mΩ
		V_{GS}=-4.5V, I_D=-20A	-	5.0	6.5	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-20A	-	30	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=-15V,V_{GS}=0V, F=1.0MHz	-	5189	-	PF
Output Capacitance	C_{oss}		-	688	-	PF
Reverse Transfer Capacitance	C_{rss}		-	592	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	VDD=- 15V,ID=-30A VGS=-10V,R G=1.6Ω	-	17	-	nS
Turn-on Rise Time	t_r		-	12	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	43	-	nS
Turn-Off Fall Time	t_f		-	10	-	nS
Total Gate Charge	Q_g	VDS=-15V,ID=-30A, VGS=-10V	-	62	-	nC
Gate-Source Charge	Q_{gs}		-	15		nC
Gate-Drain Charge	Q_{gd}		-	19		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-30A	-	-	-1.5	V
Diode Forward Current (Note 2)	I_S		-	-	-100	A
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F =-20A di/dt = 100A/μs (Note3)	-		24	nS
Reverse Recovery Charge	Qrr		-		68	nC

Notes:

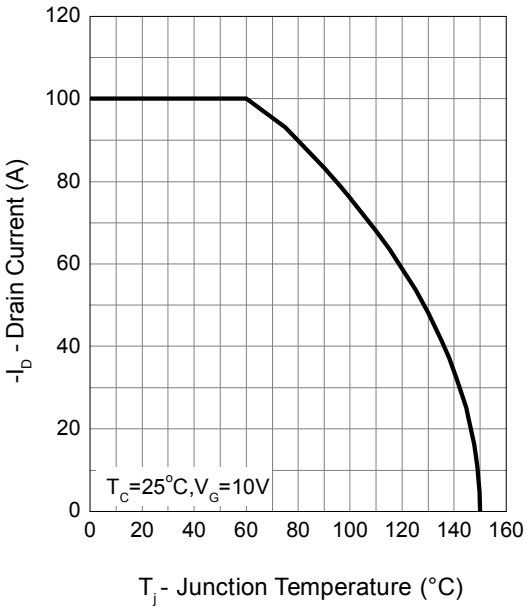
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition : Tj=25℃,V_{DD}=-20V,V_G=-10V,L=0.5mH,Rg=25Ω

Typical Operating Characteristics

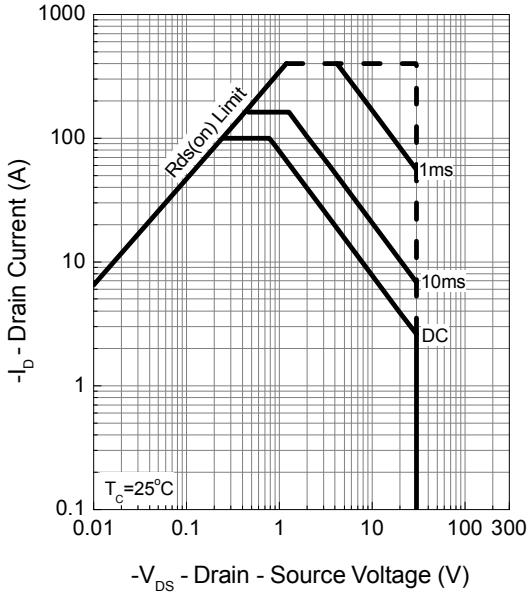
Power Dissipation



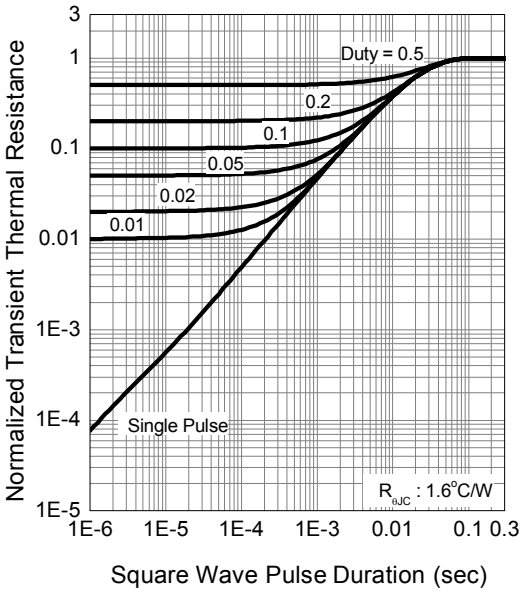
Drain Current



Safe Operation Area

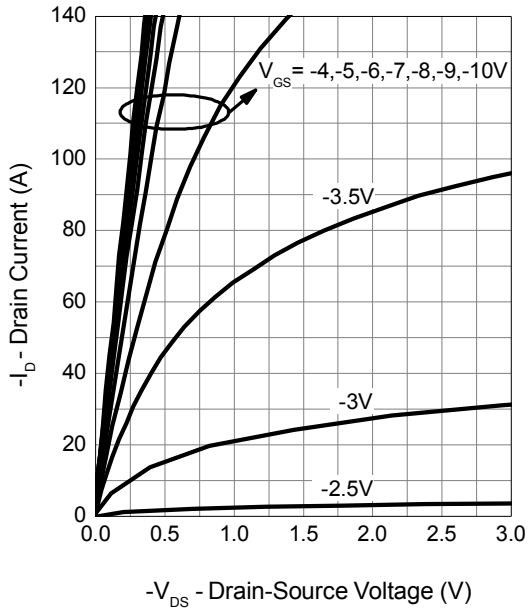


Thermal Transient Impedance

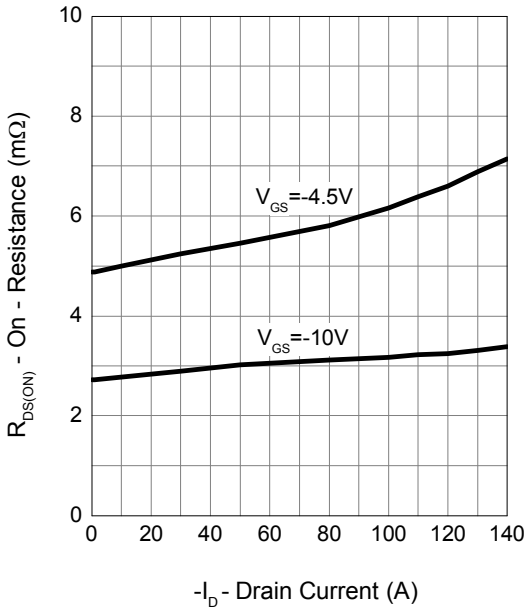


Typical Operating Characteristics (Cont.)

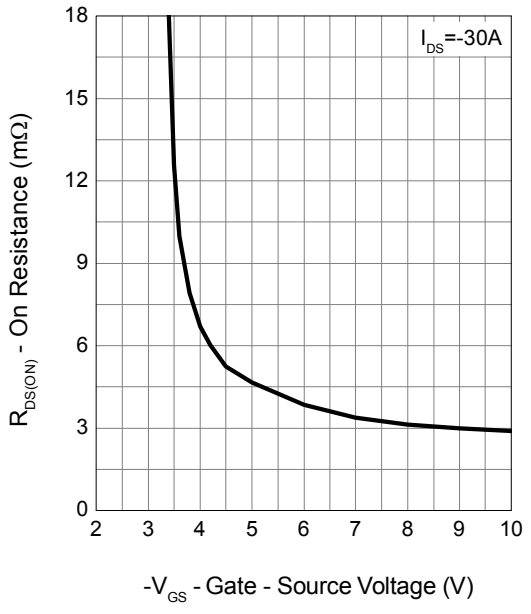
Output Characteristics



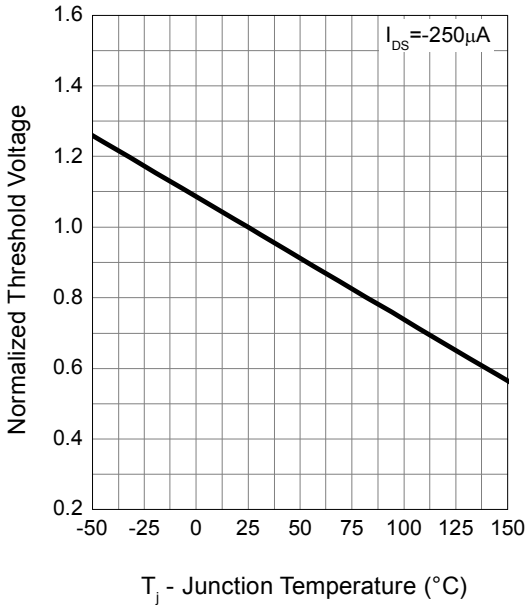
Drain-Source On Resistance



Gate-Source On Resistance

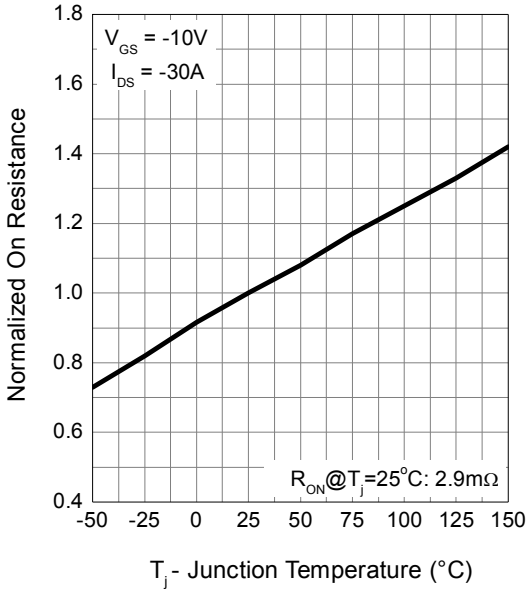


Gate Threshold Voltage

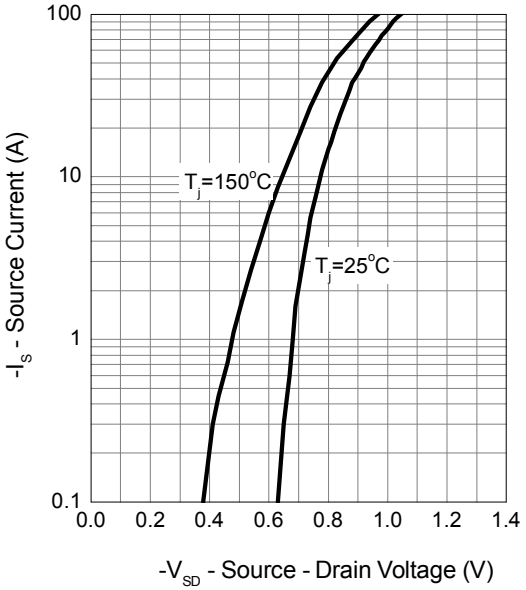


Typical Operating Characteristics (Cont.)

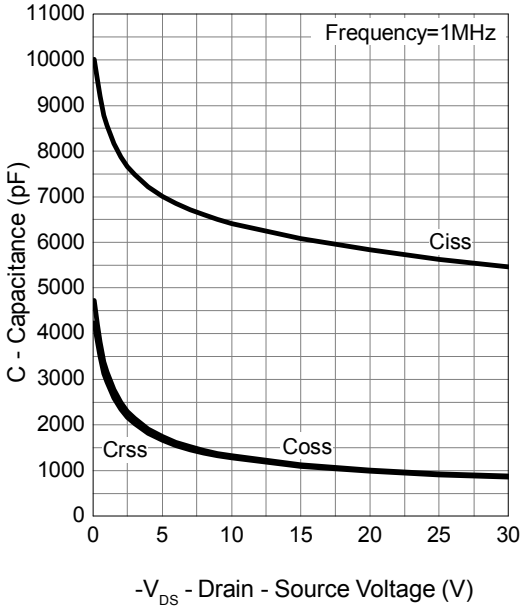
Drain-Source On Resistance



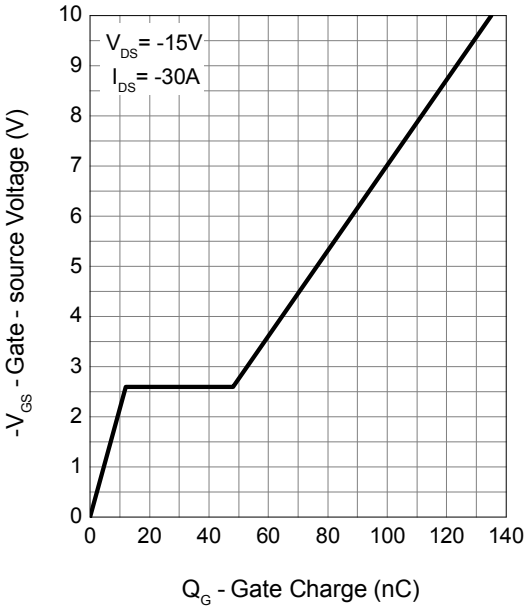
Source-Drain Diode Forward



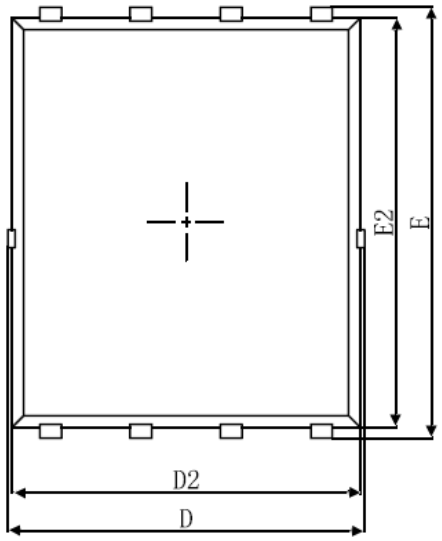
Capacitance



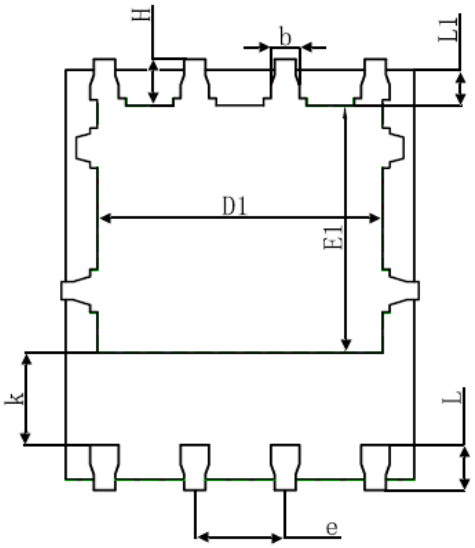
Gate Charge



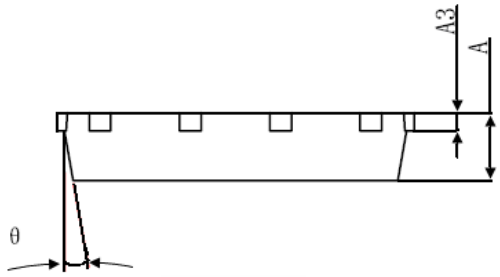
DFN5X6-8L Package Information



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°

Flow (wave) soldering (solder dipping)

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

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