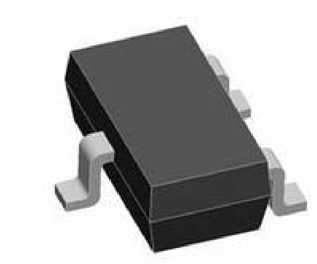
-150V P-Channel Enhancement Mode MOSFET

Description

The XPX3P15AS Suses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

V_{DS} = -150V I_D =-3.0A

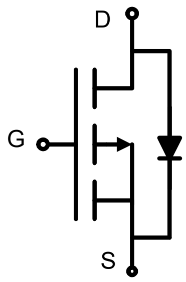
$R_{DS(ON)}$ <620mΩ @ V_{GS}=10V

Application

Brushless motor

Load switch

Uninterruptible power supply



Schematic diagram

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
XPX3P15AS	SOT-23-3L	XPX3P15AS XXX YYYY	3000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	-150	V
VGS	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current, -V_{GS} @ -10V[1]	-3.0	A
I_D@T_A=70℃	Continuous Drain Current, -V_{GS} @ -10V[1]	-1.8	A
IDM	Pulsed Drain Current[2]	-8.5	A
EAS	Single Pulse Avalanche Energy[3]	56.5	mJ
IAS	Avalanche Current	5	A
P_D@T_A=25℃	Total Power Dissipation[4]	2	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{θJA}$	Thermal Resistance Junction-Ambient [1]	125	˚C/W
$R_{θJC}$	Thermal Resistance Junction-Case[1]	40	˚C/W

P-Channel Electrical Characteristics (TJ =25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	VGS=0V , ID=-250uA	-150	-168	---	V
RDS(ON)	Static Drain-Source On-Resistance	VGS=-10V , ID=-1A	---	620	780	mΩ
RDS(ON)	Static Drain-Source On-Resistance	VGS=-6V , ID=-0.5A	---	700	980	
VGS(th)	Gate Threshold Voltage	VGS=VDS , ID =-250uA	-2.0	-3.0	-4.0	V
IDSS	Drain-Source Leakage Current	VDS=120V ,VGS=0V ,TJ=25℃	---	---	1	uA
IDSS	Drain-Source Leakage Current	VDS=120V ,VGS=0V ,TJ=85℃	---	---	30	uA
IGSS	Gate-Source Leakage Current	VGS=±20V , VDS=0V	---	---	±100	nA
Rg	Gate Resistance	VDS=0V , VGS=0V , f=1MHz	---	12	---	Ω
Qg	Total Gate Charge	VDS=-75V , VGS=-10V , ID=-1A	---	10.8	---	nC
Qgs	Gate-Source Charge		---	3.1	---	nC
Qgd	Gate-Drain Charge		---	2.2	---	nC
Td(on)	Turn-On Delay Time	VDD=-30V , VGS=-10V , RG=6Ω, ID=-1A	---	21	---	ns
Tr	Rise Time		---	16	---	ns
Td(off)	Turn-Off Delay Time		---	40	---	ns
Tf	Fall Time		---	18	---	ns
Ciss	Input Capacitance	VDS=-75V , VGS=0V , f=1MHz	---	706	---	pF
Coss	Output Capacitance		---	23	---	pF
Crss	Reverse Transfer Capacitance		---	13	---	pF

Note :
1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3、The power dissipation is limited by 150℃ junction temperature
4、The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.

Typical Characteristics

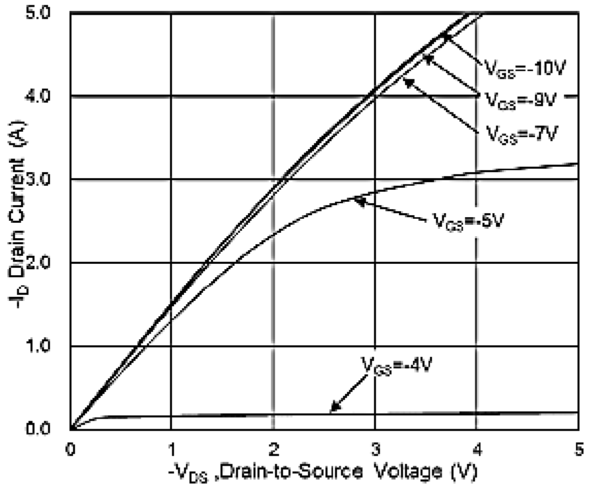


Fig.1 Typical Output Characteristics

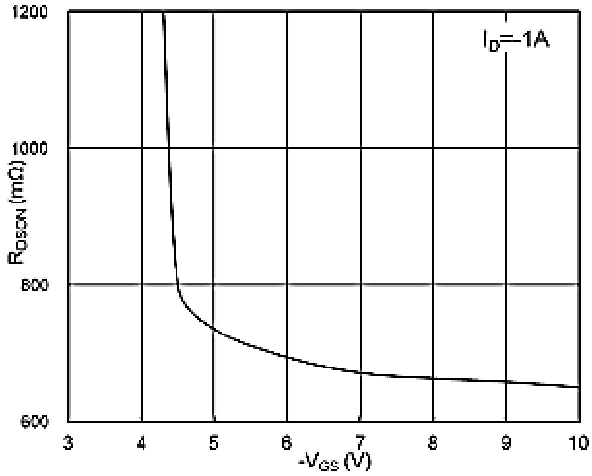


Fig.2 On-Resistance vs G-S Voltage

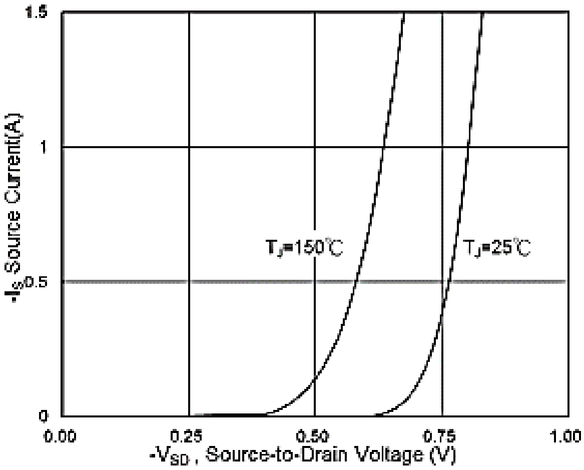


Fig.3 Source Drain Forward Characteristics

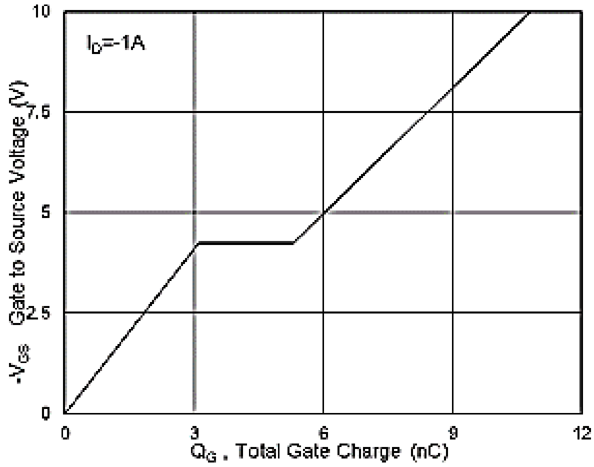


Fig.4 Gate-Charge Characteristics

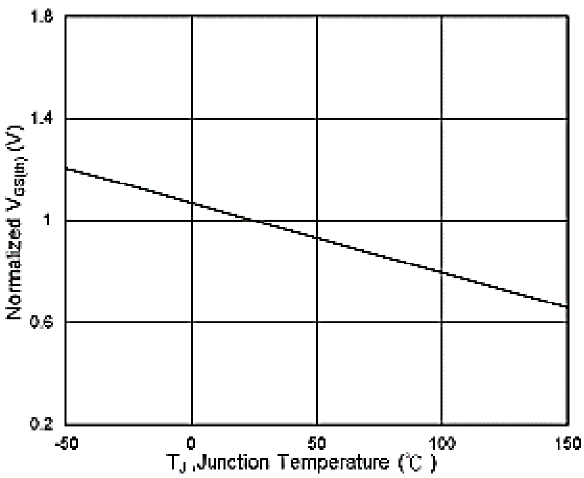


Fig.5 Normalized $V_{GS(th)}$ vs T_J

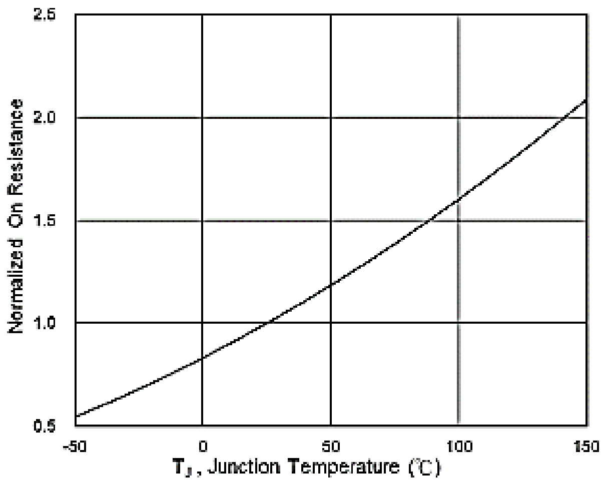


Fig.6 Normalized R_{DSON} vs T_J

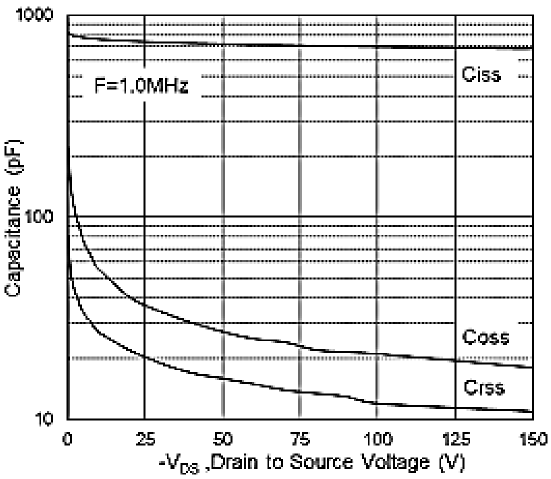


Fig.7 Capacitance

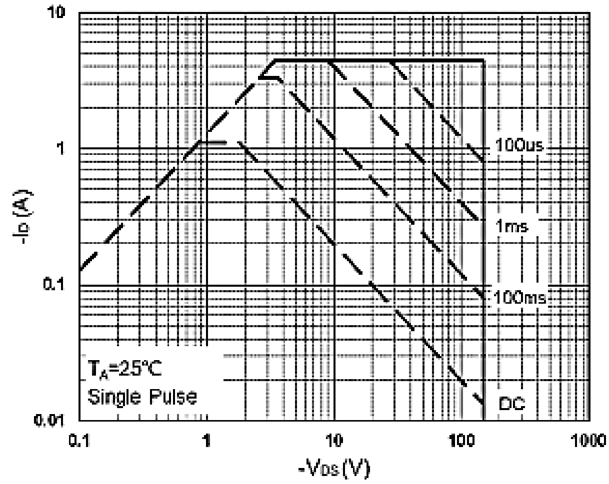


Fig.8 Safe Operating Area

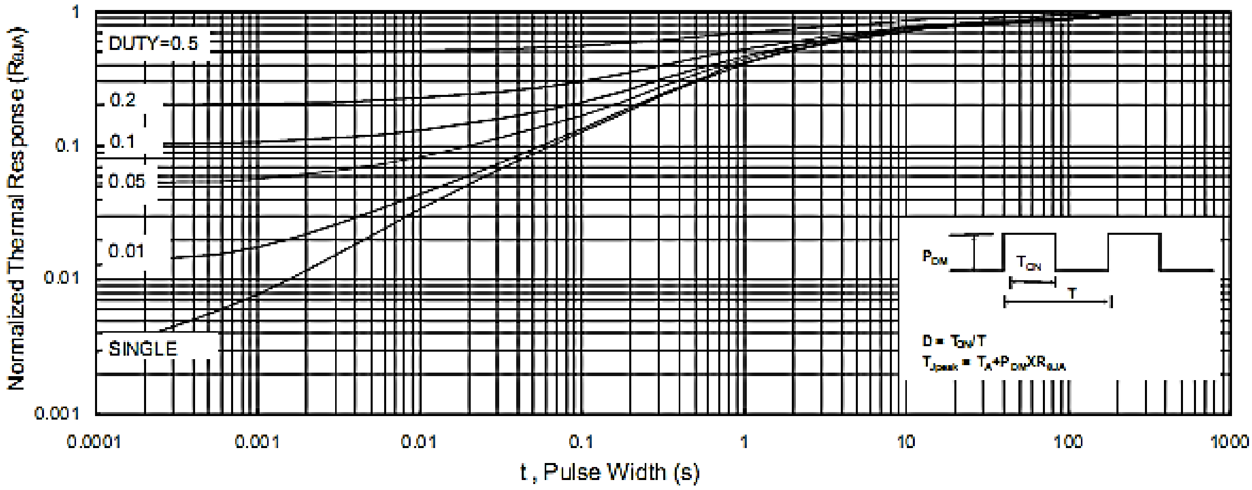


Fig.9 Normalized Maximum Transient Thermal Impedance

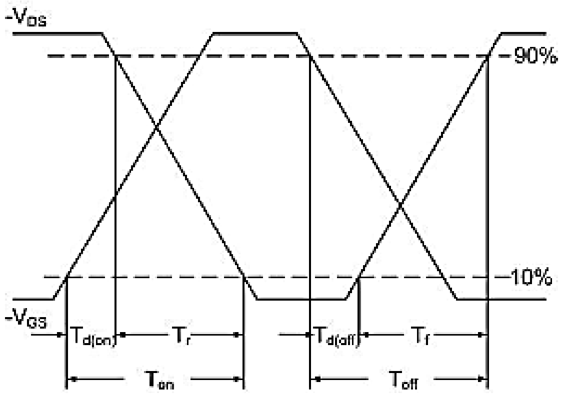


Fig.10 Switching Time Waveform

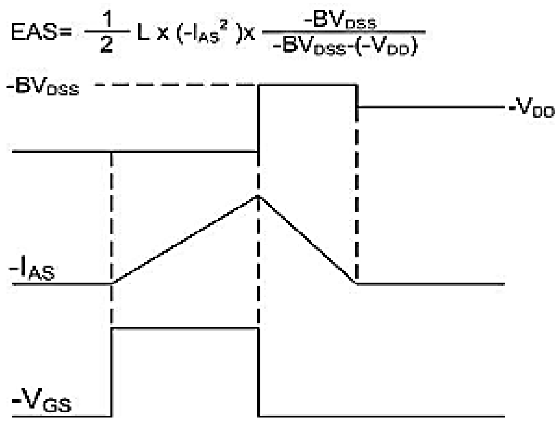
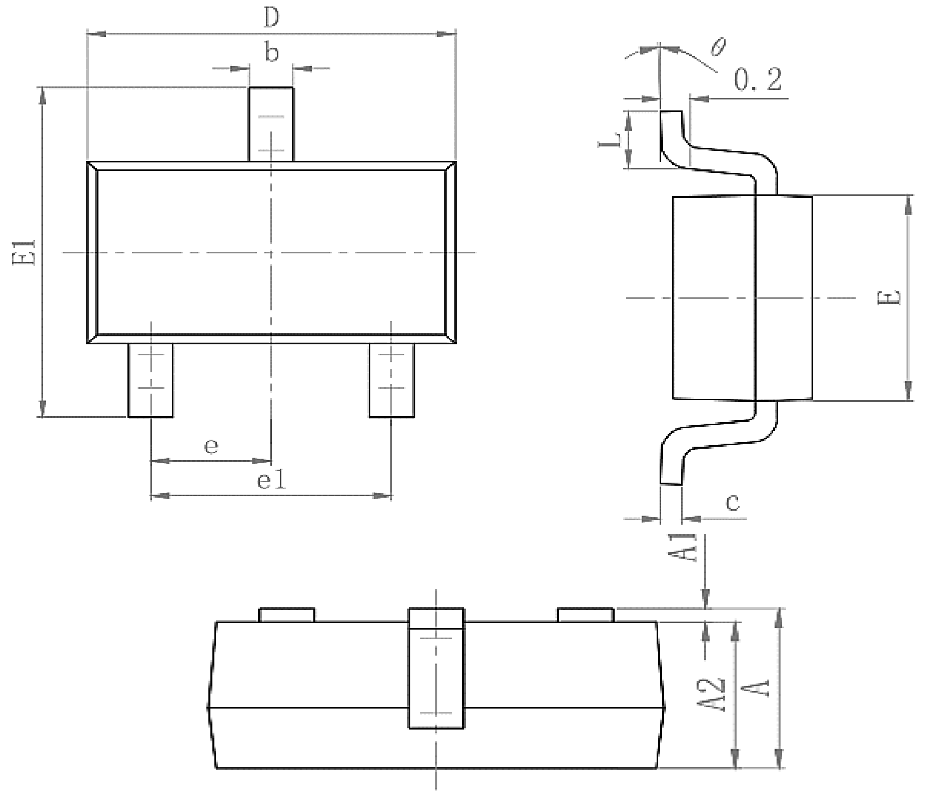


Fig.11 Unclamped Inductive Waveform

Package Mechanical Data-SOT23-3-XC-Single



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.25	0.45
c	0.100	0.200
D	2.820	3.020
E	1.5	1.7
E1	2.650	2.950
e	0.950(BSC)	
e1	1.800	2.000
L	0.300	0.500
θ	0°	8°

Flow (wave) soldering (solder dipping)

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