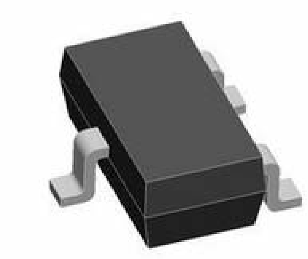
-100V P-Channel Enhancement Mode MOSFET

Description

The XPX3P10AS uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 5V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

V_{DS} = -100V I_D =-3A

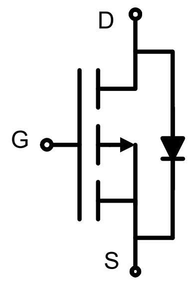
$R_{DS(ON)}$ < 260mΩ @ V_{GS}=-10V

Application

Battery protection

Load switch

Uninterruptible power supply



Schematic diagram

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
XPX3P10AS	SOT-23-3L	XPX3P10AS	3000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25˚C	Continuous Drain Current, V_{GS} @ -10V[1]	-3	A
I_D@T_A=70˚C	Continuous Drain Current, V_{GS} @ -10V[1]	-1.7	A
I_{DM}	Pulsed Drain Current[2]	-9	A
P_D@T_A=25˚C	Total Power Dissipation[3]	1.5	W
T_{STG}	Storage Temperature Range	-55 to 150	˚C
T_J	Operating Junction Temperature Range	-55 to 150	˚C
$R_{θJA}$	Thermal Resistance Junction-ambient [1]	125	˚C/W
$R_{θJC}$	Thermal Resistance Junction-Case[1]	80	˚C/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-100	-111	---	V
△BVDSS/△TJ	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.0624	---	V/℃
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=-10V , I_D=-3A	---	260	350	mΩ
		V_{GS}=-4.5V , I_D=-2A	---	320	400	
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1.2	-1.9	-2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4.5	---	mV/℃
IDSS	Drain-Source Leakage Current	V_{DS}=-100V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=-100V , V_{GS}=0V , T_J=100℃	---	---	100	
IGSS	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-5V , I_D=-0.8A	---	3	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	16	32	Ω
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-15V , V_{GS}=-4.5V , I_D=-0.5A	---	4.5	---	nC
Qgs	Gate-Source Charge		---	1.14	---	
Qgd	Gate-Drain Charge		---	1.5	---	
Td(on)	Turn-On Delay Time	V_{DD}=-50V , V_{GS}=-10V , R_G=3.3Ω I_D=-0.5A	---	17.6	---	ns
T_r	Rise Time		---	2.7	---	
Td(off)	Turn-Off Delay Time		---	4.5	---	
T_f	Fall Time		---	3	---	
Ciss	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	551	---	pF
Coss	Output Capacitance		---	56	---	
Crss	Reverse Transfer Capacitance		---	35	---	
IS	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	-3	A
ISM	Pulsed Source Current[2,4]		---	---	-9	A
VSD	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1.3	V

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˚C 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

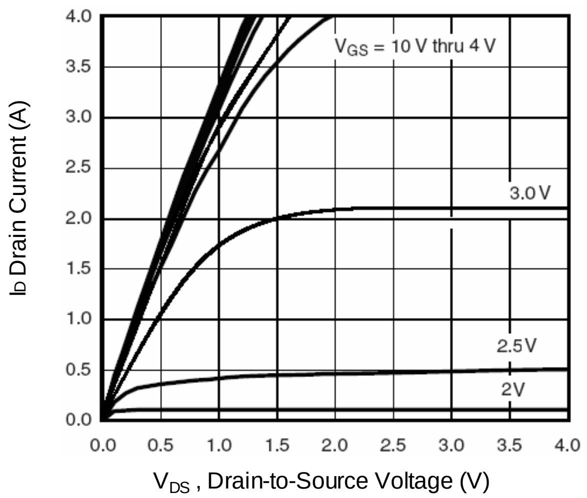


Fig.1 Typical Output Characteristics

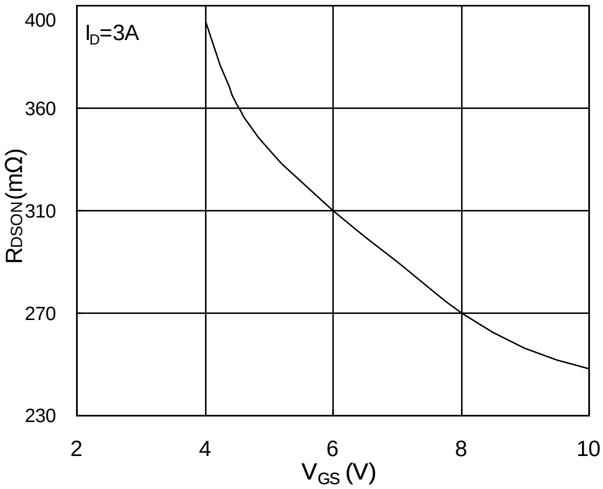


Fig.2 On-Resistance vs. Gate-Source

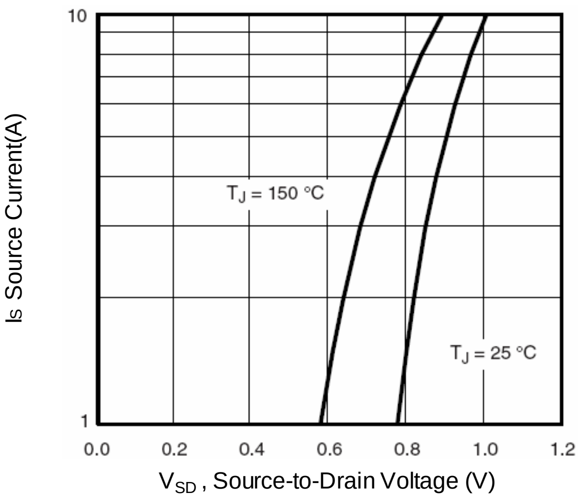


Fig.3 Forward Characteristics of Reverse

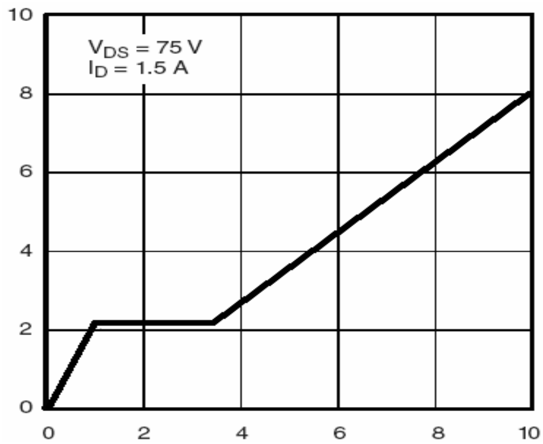
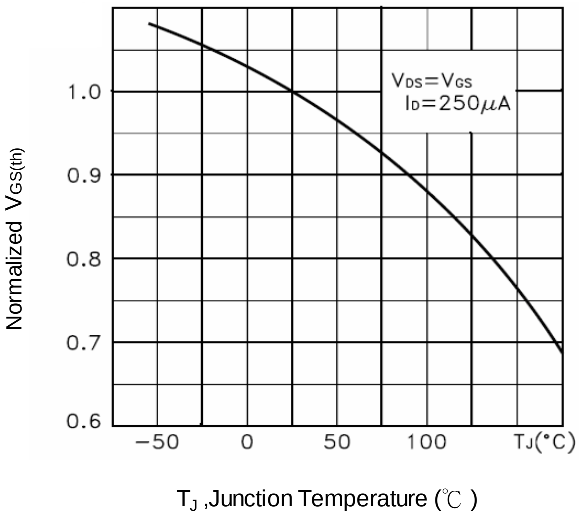
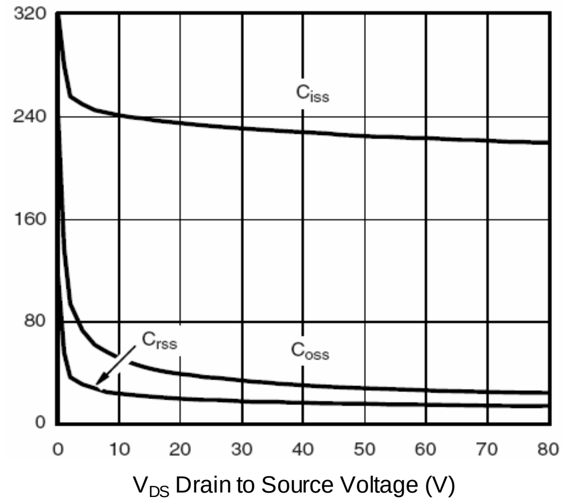


Fig.4 Gate-Charge Characteristics





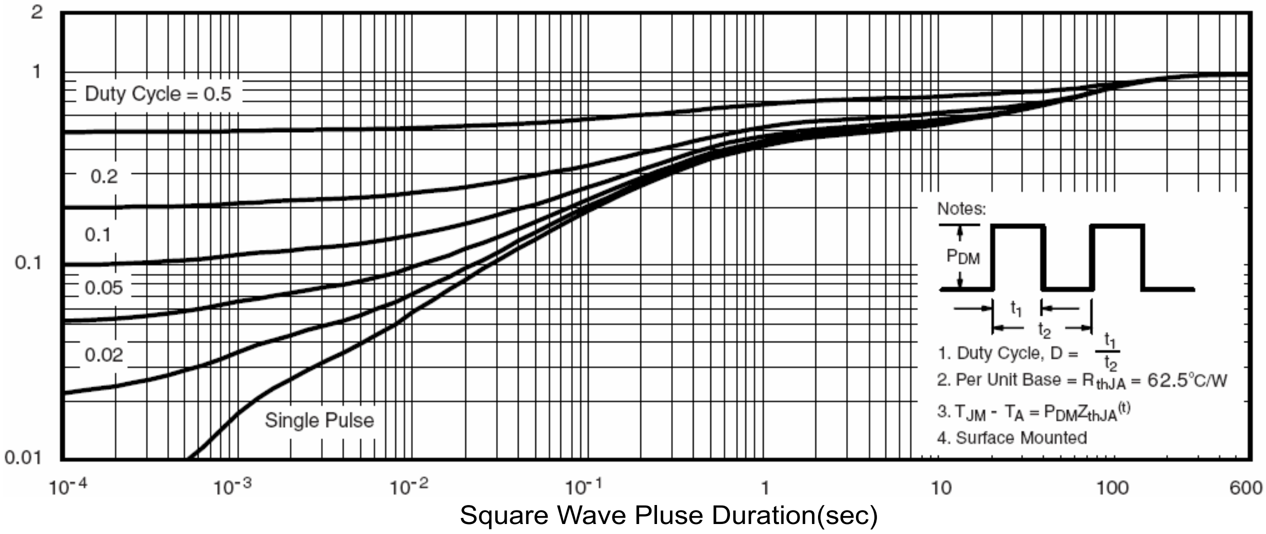
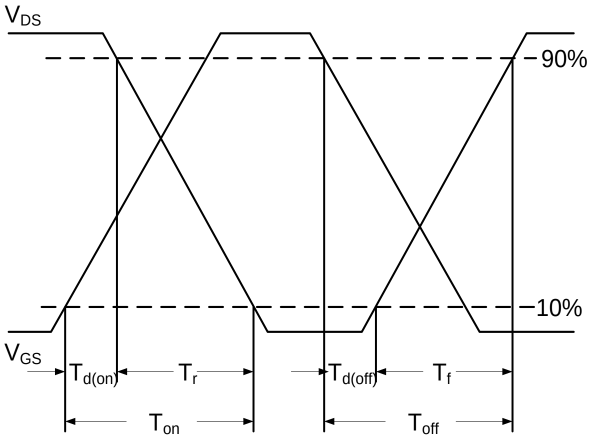


Fig.9 Normalized Maximum Transient Thermal Impedance



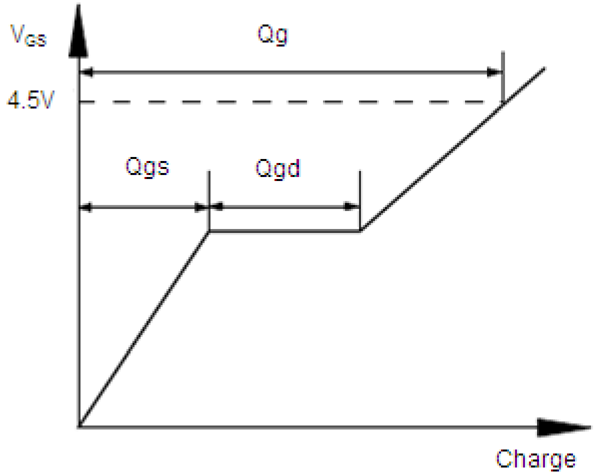
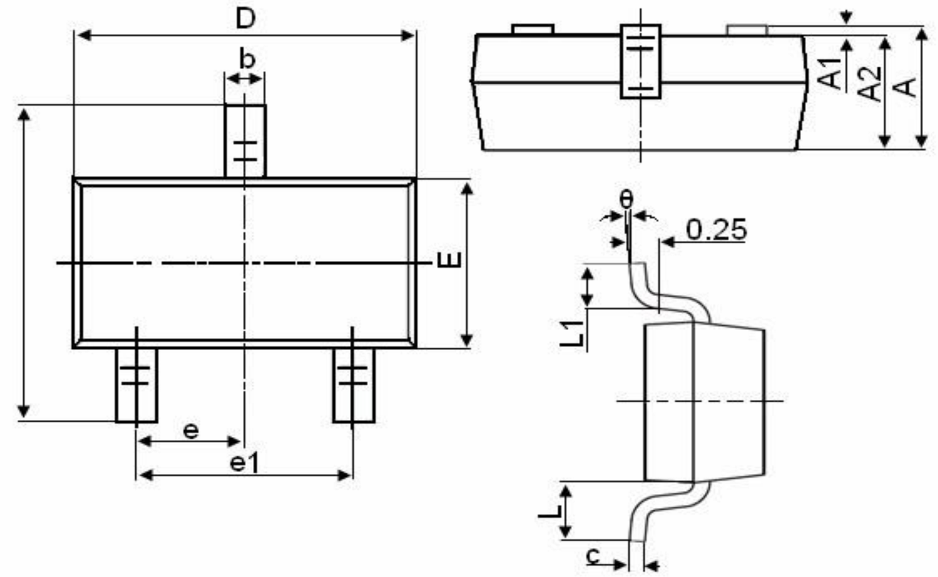


Fig.10 Switching Time Waveform

Fig.11 Gate Charge Waveform



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	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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