-18V P-Channel Enhancement Mode MOSFET

Description

The XPX20P07AS uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications.

- High power and current handing capability
- Lead free product is acquired
- Surface mount package

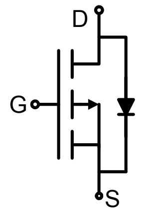
General Features

- V_{DS} = -18V, I_D = -7.0A
  $R_{DS(ON)}$ =19mΩ(typ) @ V_{GS}=-4.5V
  $R_{DS(ON)}$ =25mΩ(typ) @ V_{GS}=-2.5V

Application

- PWM applications
- Load switch
- Power management

SOT-23-3 top view



Schematic diagram

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
XPX20P07AS	SOT23-3L	20P07	3000

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

Symbol	Parameter	Rating	Units
VDSS	Drain-Source Voltage	-18	V
VGSS	Gate-Source Voltage	±12	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	-7.0	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	-3.6	A
IDM	Pulsed Drain Current [note1]	-22	A
P_D@T_C=25℃	Power Dissipation	1.6	W
RθJA	Thermal Resistance, Junction to Ambient	125	℃/W
TJ, TSTG	Operating and Storage Temperature Range	-55 to +150	℃

RoHS COMPLIANT

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-12	-18	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS} =-12V, V_{GS} = 0V,	-	-	-1	μA
IGSS	Gate to Body Leakage Current	V_{DS} =0V, V_{GS} = ±12V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-0.5	-0.65	-1.0	V
RDS(on)	Static Drain-Source on-Resistance note2	V_{GS}=-4.5V, I_D=-5.2A	-	19	24	mΩ
RDS(on)	Static Drain-Source on-Resistance note2	V_{GS}=-2.5V, I_D=-4.2A		25	35	mΩ
C_{iss}	Input Capacitance	V_{DS}=-6V, V_{GS}=0V f=1.0MHz	-	1100	-	pF
Coss	Output Capacitance		-	390	-	pF
Crss	Reverse Transfer Capacitance		-	300	-	pF
Q_g	Total Gate Charge	V_{DS}=-4V, I_D=-4.1A, V_{GS} = -4.5V	-	11.5		nC
Q_{gs}	Gate-Source Charge		-	1.5	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	3.2	-	nC
td(on)	Turn-on Delay Time	V_{DD} =-4V, I_D=-3.3A, R_G=1.0Ω, V_{GEN}=-4.5V, R_L=1.2Ω	-	25	-	ns
t_r	Turn-on Rise Time		-	45	-	ns
td(off)	Turn-off Delay Time		-	72	-	ns
t_f	Turn-off Fall Time		-	60	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-6.0	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-16	A
VSD	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S =-4.1A	-	-	-1.2	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V, I_S=-4.1A, di/dt=100A/μs	-	20	-	ns
Q_{rr}	Reverse Recovery Charge		-	9	-	nC

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

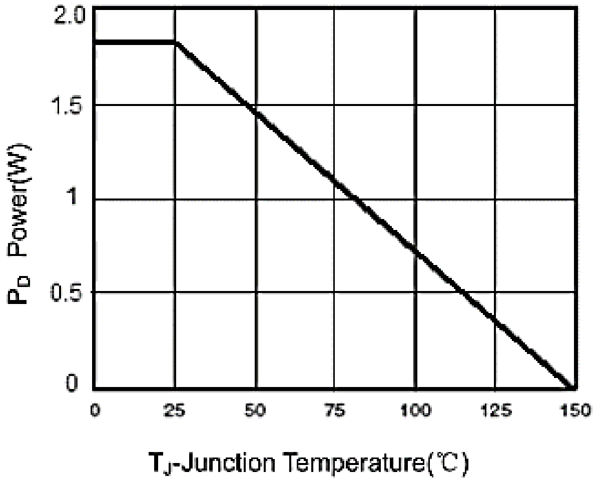


Figure 1 Power Dissipation

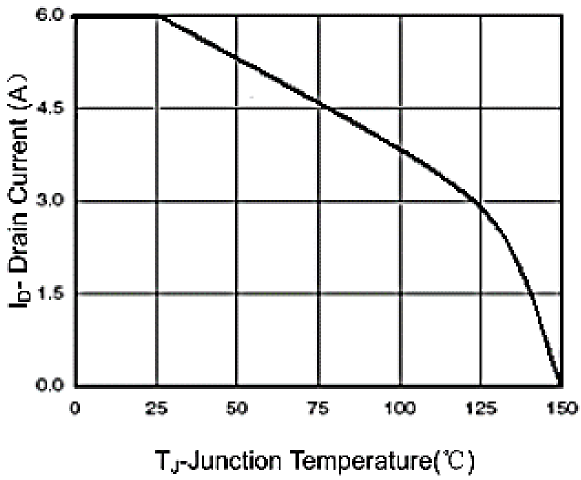


Figure 2 Drain Current

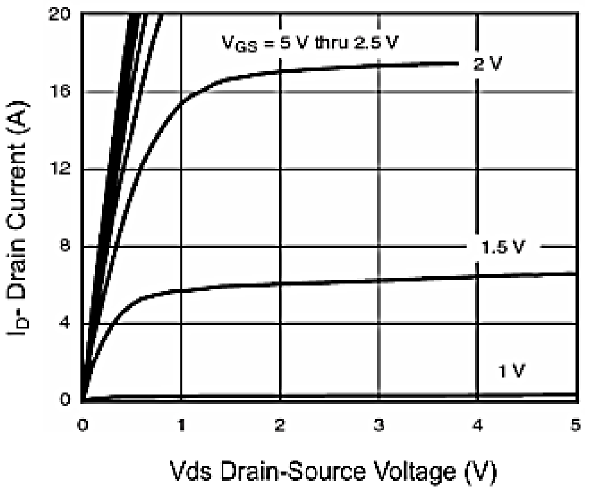


Figure 3 Output Characteristics

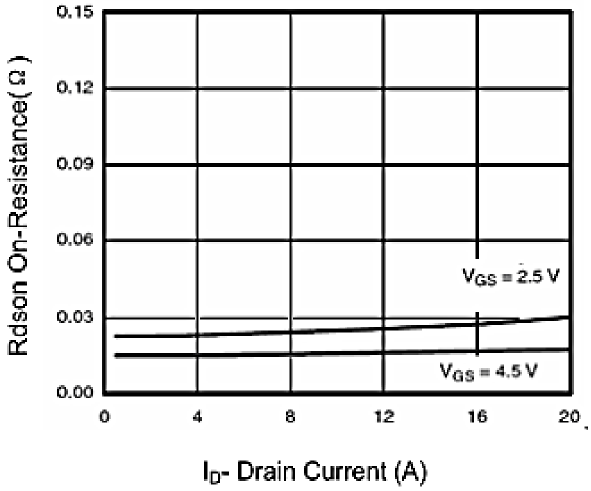


Figure 4 Drain-Source On-Resistance

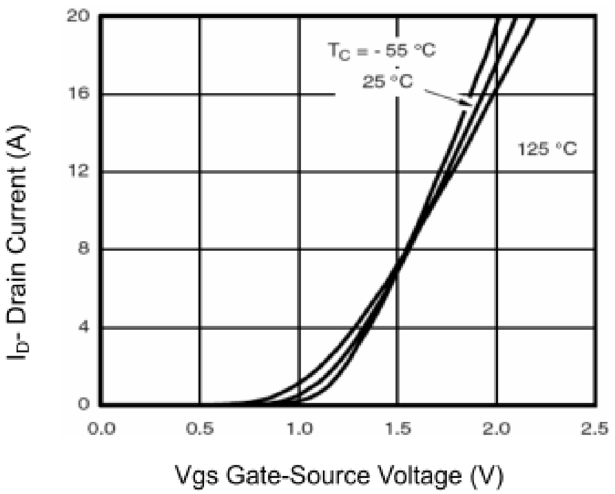


Figure 5 Transfer Characteristics

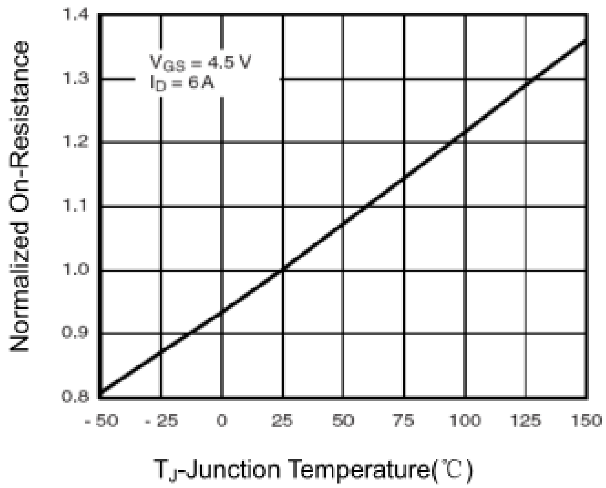


Figure 6 Drain-Source On-Resistance

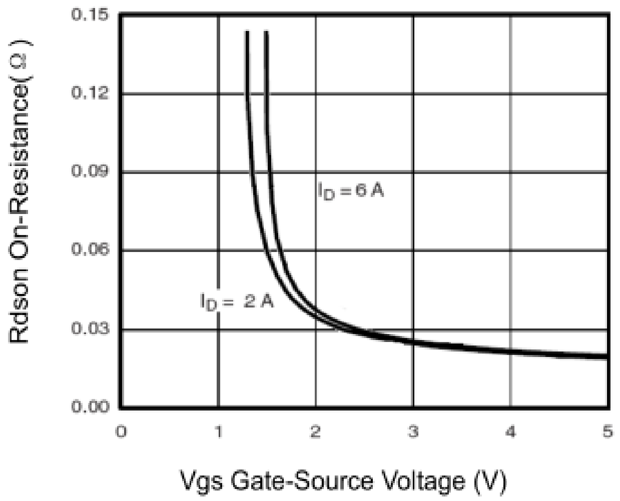


Figure 7 Rdson vs Vgs

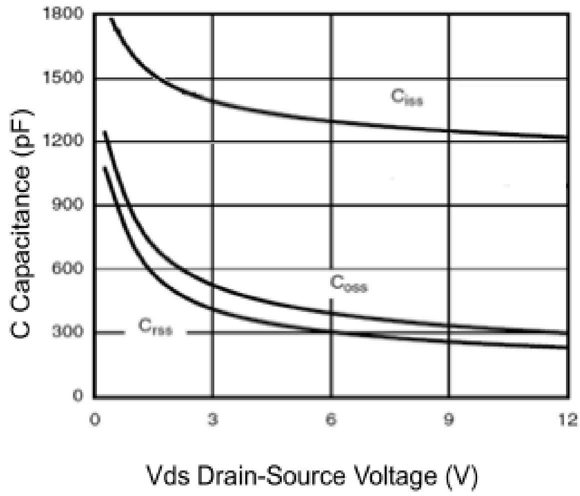


Figure 8 Capacitance vs Vds

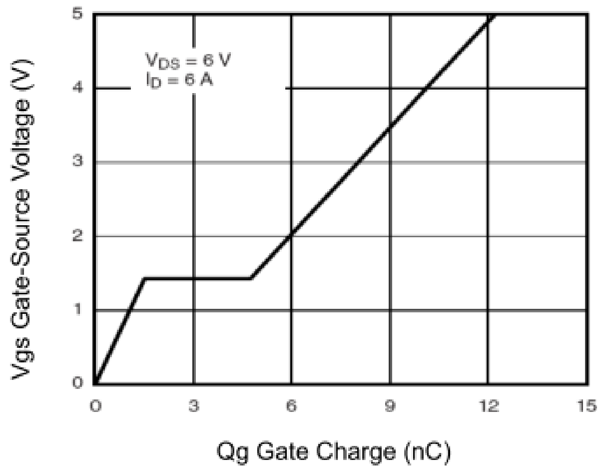


Figure 9 Gate Charge

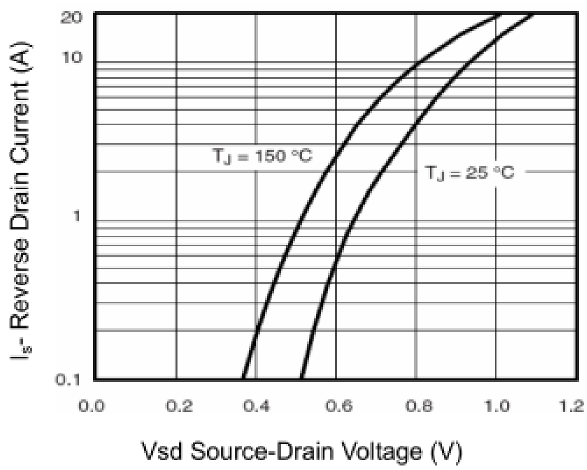


Figure 10 Source- Drain Diode Forward

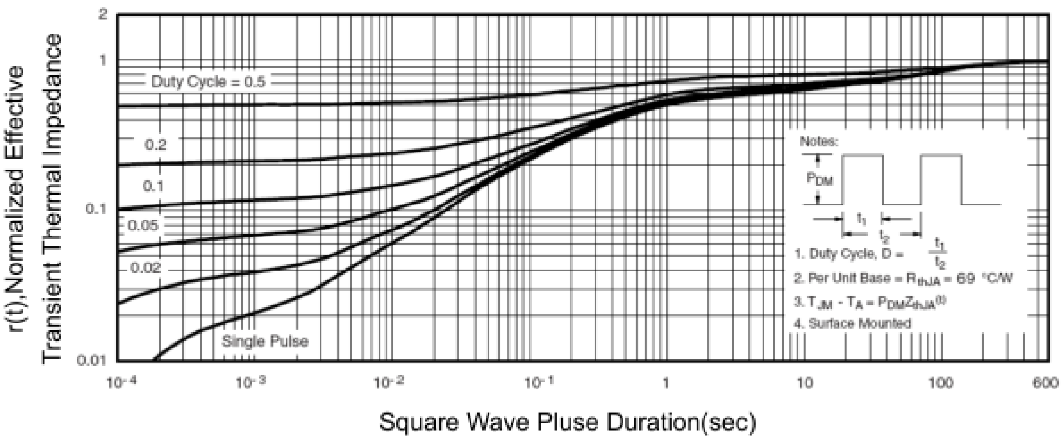
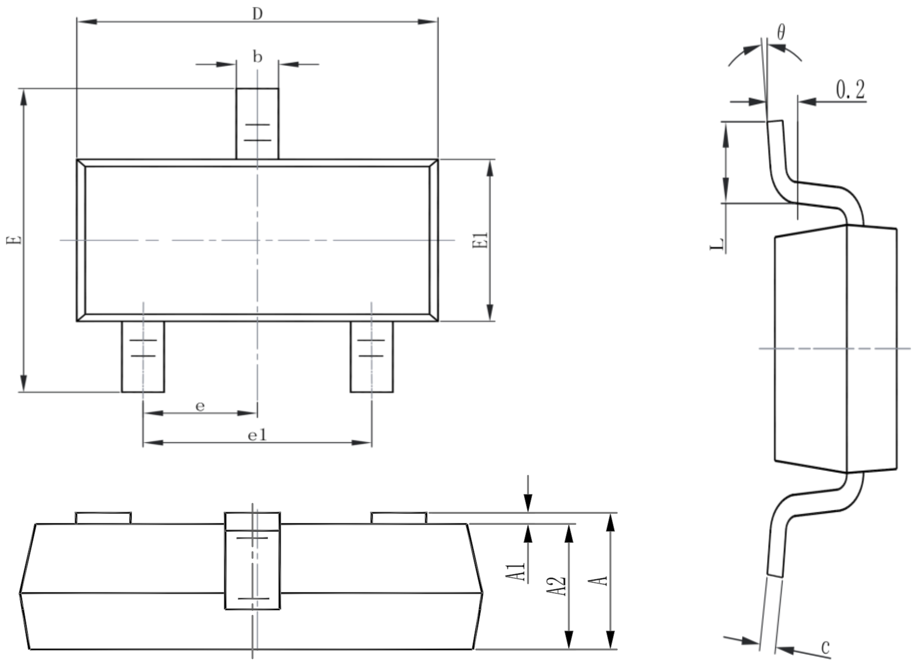


Figure 12 Normalized Maximum Transient Thermal Impedance

MOSFET Package Mechanical Data-SOT23-3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	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

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