XPX2305AS

P-Channel Enhancement Mode Power MOSFET

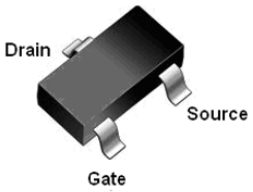
Features

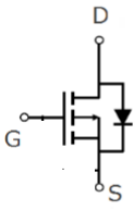
- *Low $R_{DS(on)}$ @V_{GS}=-4.5V*
- *-3.3V Logic Level Control*
- *P Channel SOT23 Package*
- *Pb−Free, RoHS Compliant*

$V_{(BR)DSS}$	$R_{DS(ON)}$ Typ	I_D Max
-20V	28mΩ @-4.5V	-5.2A
	35mΩ @-3.3V	

Applications

- Charging switch for portable devices
- Small brushless DC motor drive
- Load Switch for Portable Devices
- DC-to-DC converters
- Power Management Functions





Order Information

SOT23

Product	Package	Marking	Packing	Min Unit Quantity
XPX2305AS	SOT23	A5SHB	3000PCS/Reel	3000PCS

Absolute Maximum Ratings

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Symbol	Parameter		Rating	Unit
Common Ratings (T_A=25°C Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±12	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		-20	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-50 to 150	°C
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested①	T_A=25°C	-16.8	A
I_D	Continuous Drain Current	T_A=25°C	-5.2	A
		T_A=70°C	-3.8	
P_D	Maximum Power Dissipation	T_A=25°C	1.25	W
		T_A=70°C	1	
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		100	°C/W

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=-250μA	-20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(T_A=25℃)	V_{DS}=-20V, V_{GS}=0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(T_A=125℃)	V_{DS}=-16V, V_{GS}=0V	--	--	-100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±10V, V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-0.7	-1.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=-4.5V, I_D=-4A	--	29	38	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=-3.3V, I_D=-3A	--	35	42	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=-2.5V, I_D=-2A	--	45	60	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=-10V, V_{GS}=0V, f=1MHz	--	760	--	pF
C_{oss}	Output Capacitance		--	94	--	pF
C_{rss}	Reverse Transfer Capacitance		--	76	--	pF
R_g	Gate Resistance	f=1MHz		16		Ω
Q_g	Total Gate Charge	V_{DS}=-10V I_D=-3A, V_{GS}=-4.5V	--	7.6	--	nC
Q_{gs}	Gate Source Charge		--	0.9	--	nC
Q_{gd}	Gate Drain Charge		--	1.8	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn on Delay Time	V_{DD}=-10V, I_D=-2A, R_G=3.3Ω, V_{GS}=-4.5V	--	5.5	--	ns
t_r	Turn on Rise Time		--	3.9	--	ns
$t_{d(off)}$	Turn Off Delay Time		-	11.3	--	ns
t_f	Turn Off Fall Time		--	36	--	ns
Source Drain Diode Characteristics						
I_{SD}	Source drain current(Body Diode)	T_A=25℃	--	--	-2	A
V_{SD}	Forward on voltage②	T_j=25℃, I_{SD}=-4A, V_{GS}=0V	--	-0.87	-1.2	V

Notes:

① Pulse width limited by maximum allowable junction temperature

Typical Characteristics

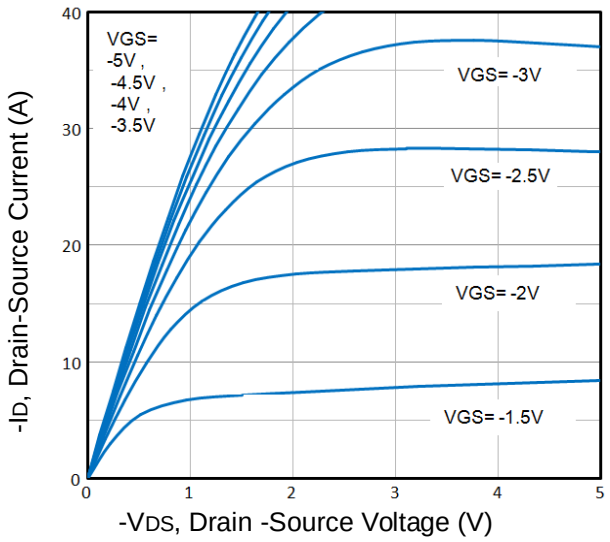


Fig1. Typical Output Characteristics

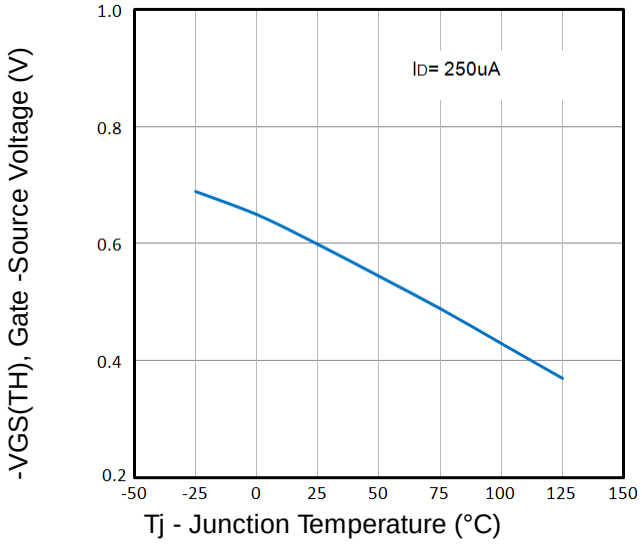


Fig2. Normalized Threshold Voltage Vs. Temperature

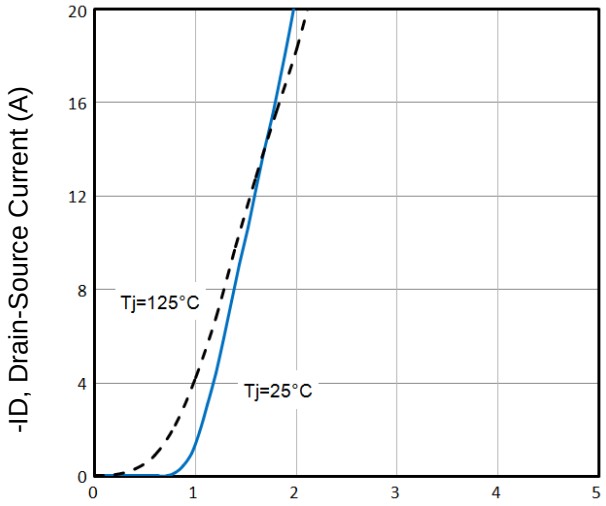


Fig3. Typical Transfer Characteristics

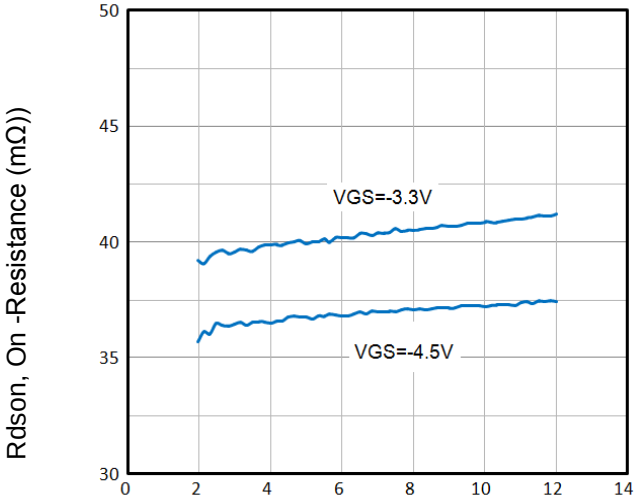


Fig4. On-Resistance vs. Drain Current and Gate Voltage

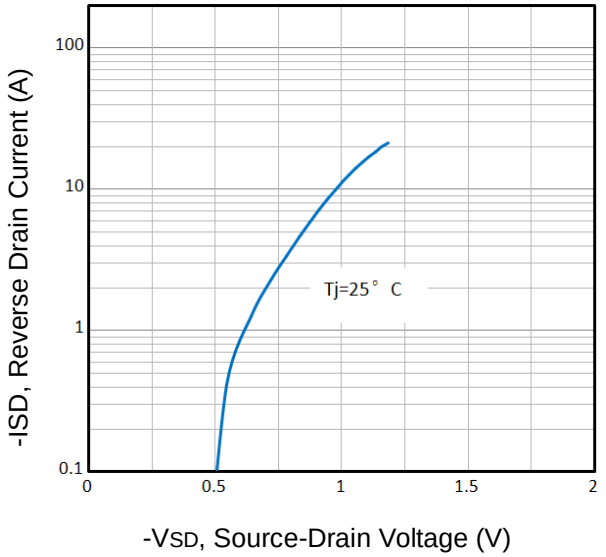


Fig5. Typical Source-Drain Diode Forward Voltage

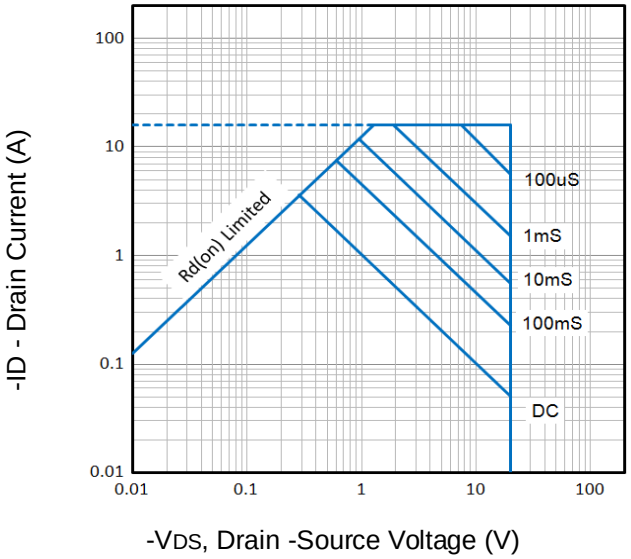


Fig6. Maximum Safe Operating Area

Typical Characteristics

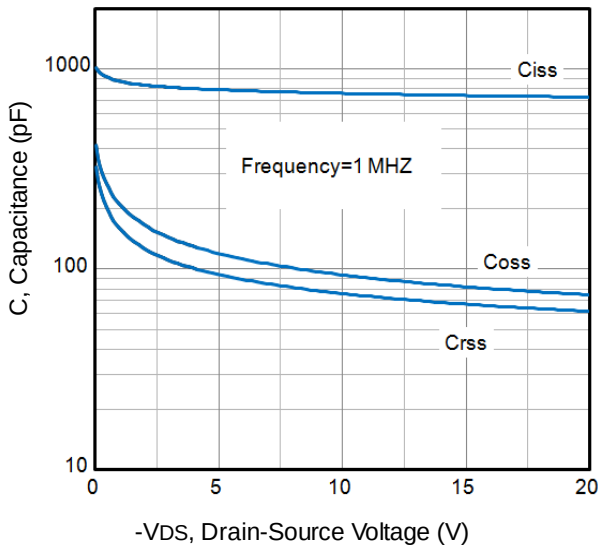


Fig7. Typical Capacitance Vs. Drain-Source Voltage

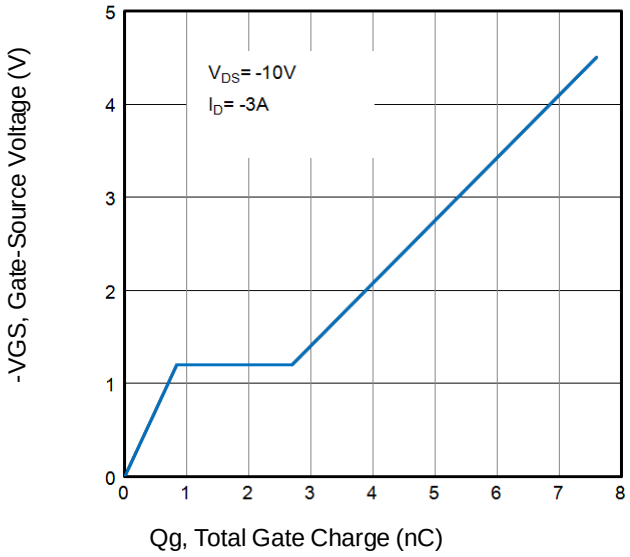


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

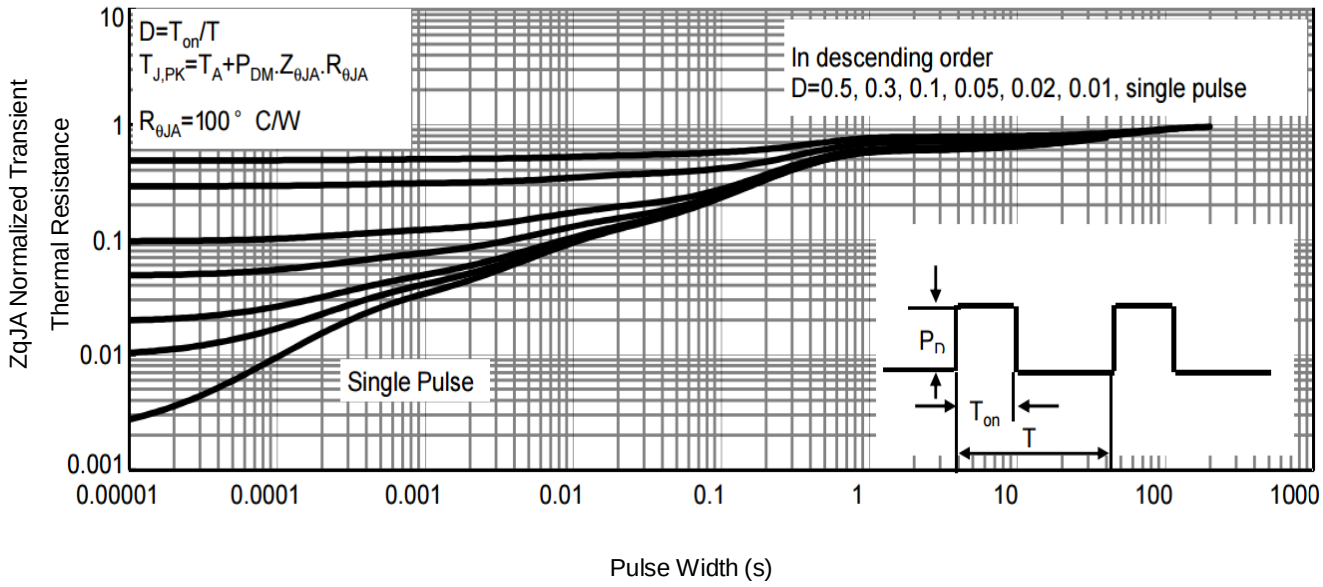


Fig9. Normalized Maximum Transient Thermal Impedance

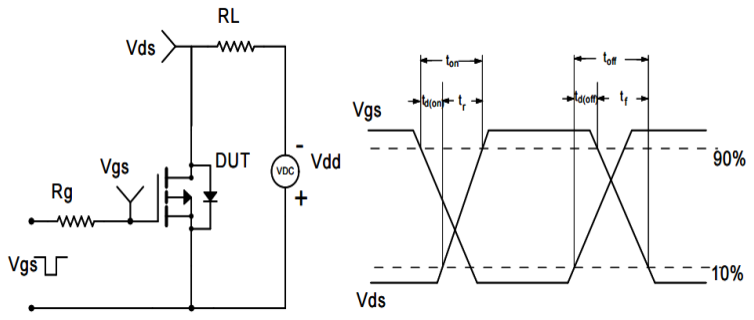
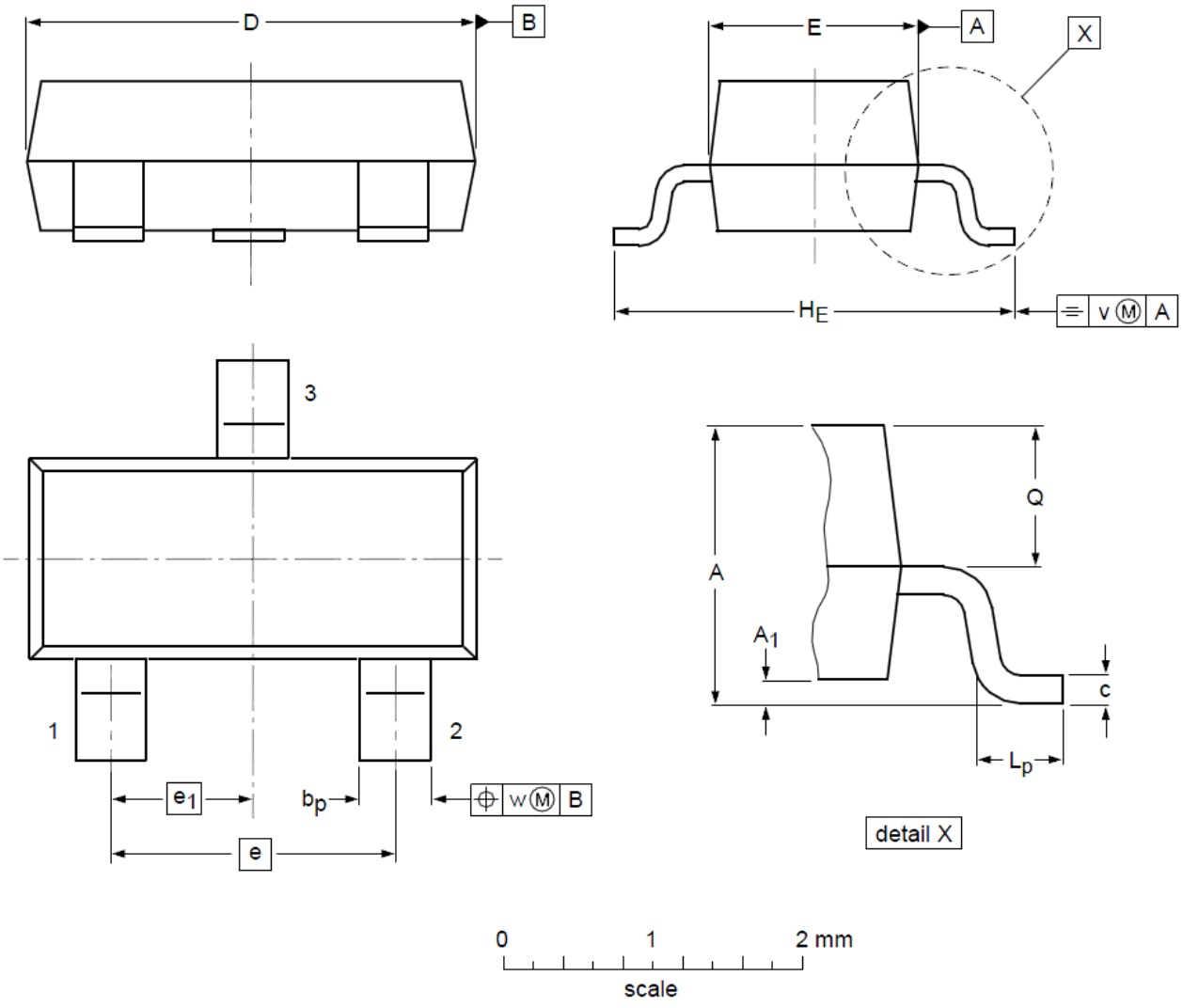


Fig10. Switching Time Test Circuit and waveforms

SOT23 Mechanical Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	**A_1**	0.01	0.05	0.10
b_p	0.30	0.42	0.50	**c**	0.08	0.13	0.15
D	2.80	2.92	3.00	**E**	1.20	1.33	1.40
e	--	1.90	--	**e_1**	--	0.95	--
H_E	2.25	2.40	2.55	**L_p**	0.30	0.42	0.50
Q	0.45	0.49	0.55	**v**	--	0.20	--
w	--	0.10	--				

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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