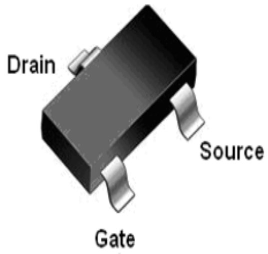
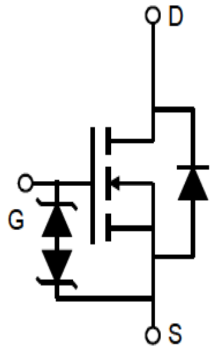
300V N-Channel Enhancement Mode MOSFET

Description

The XPX15N300AS is silicon N-channel Enhanced VDMOSFETs, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.





SOT23-3L

General Features

VDS =300V,ID =1.5A

RDS(ON) <3.0Ω@ VGS=10V

Application

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
XPX15N300AS	SOT-23-3L	MC3-2A	3000

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	VDSS	300	V
Continuous Drain Current	I_D	1.5	A
Pulsed Drain Current	IDM	12	A
Gate-Source Voltage	VGSS	±20	V
Single Pulse Avalanche Energy	E_{AS}	30	mJ
Avalanche Current	IAR	1.9	A
Repetitive Avalanche Energy	E_{AR}	0.9	mJ
Power Dissipation (T_C = 25ºC)	P_D	35.2	W
Operating Junction and Storage Temperature Range	TJ, Tstg	-55~+150	ºC
Thermal Resistance, Junction-to-Case	RthJC	3.55	ºC/W
Thermal Resistance, Junction-to-Ambient	RthJA	60	

Electrical Characteristics (T_A=25℃unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	300	--	--	V
VGS(th)	Gate-Source Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.0	--	4.0	V
RDS(on)	Drain-Source On-Resistance (Note3)	V_{GS} = 10V, I_D = 1.5A	--	3.0	4.0	Ω
IDSS	Zero Gate Voltage Drain Current	V_{DS} = 300V, V_{GS} = 0V, T_J = 25ºC	--	--	1	μA
		V_{DS} = 240V, V_{GS} = 0V, T_J = 125ºC	--	--	100	
IGSS	Gate-Source Leakage	V_{GS} = ±25V	--	--	±100	nA
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz	--	127	--	pF
C_{oss}	Output Capacitance		--	30	--	
C_{rss}	Reverse Transfer Capacitance		--	5	--	
Q_g	Total Gate Charge	V_{DD} = 240V, I_D = 3.0A, V_{GS} = 10V	--	4.4	--	nC
Q_{gs}	Gate-Source Charge		--	0.7	--	
Q_{gd}	Gate-Drain Charge		--	2	--	
td(on)	Turn-on Delay Time	V_{DD} = 150V, I_D = 3.0A, R_G = 25 Ω	--	18	--	ns
t_r	Turn-on Rise Time		--	55	--	
td(off)	Turn-off Delay Time		--	60	--	
t_f	Turn-off Fall Time		--	55	--	
I_S	Continuous Body Diode Current	T_C = 25 ºC	--	--	3	A
ISM	Pulsed Diode Forward Current		--	--	12	
t_{rr}	Reverse Recovery Time	V_{GS} = 0V,I_S = 3A, di_F/dt =100A /μs	--	250	--	ns
Q_{rr}	Reverse Recovery Charge		--	1.8	--	μC
V_{SD}	Body Diode Voltage	T_J = 25ºC, I_{SD} = 3A, V_{GS} = 0V	--	--	1.4	V

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS} = 1.9A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25 ºC
3. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

Typical Characteristics T_J = 25ºC, unless otherwise noted

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Figure 1. Output Characteristics (T_J = 25ºC)

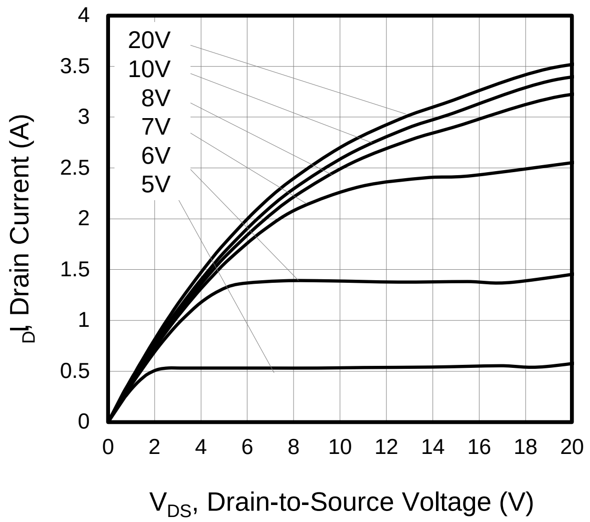


Figure 2. Body Diode Forward Voltage

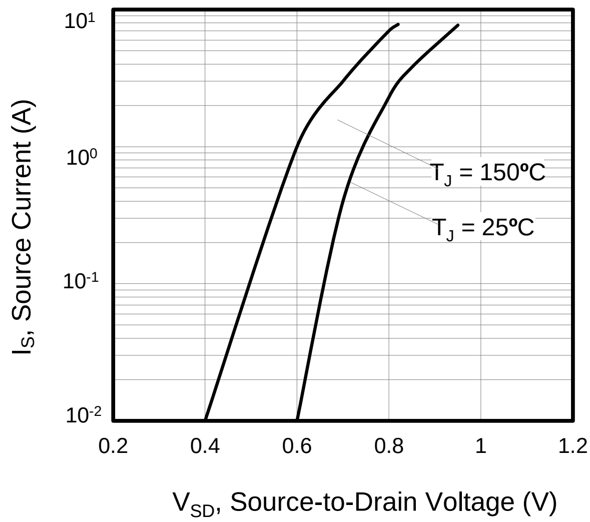


Figure 3. Drain Current vs. Temperature

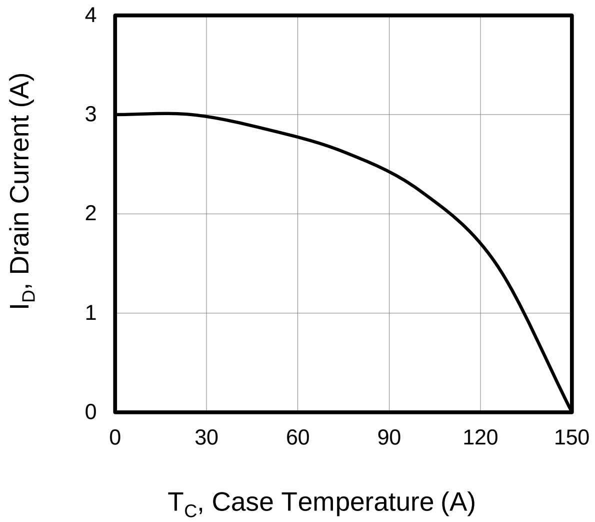


Figure 4. BV_{DSS} Variation vs. Temperature

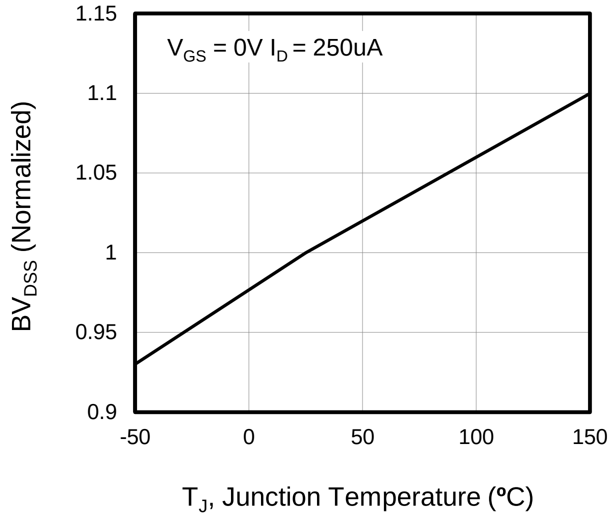


Figure 5. Transfer Characteristics

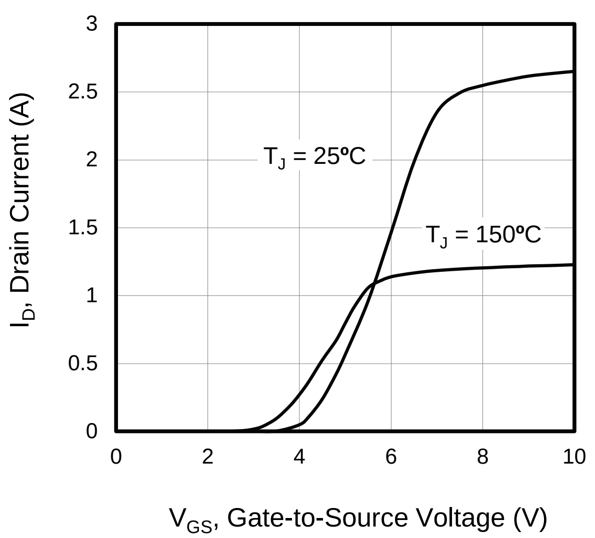


Figure 6. On-Resistance vs. Temperature

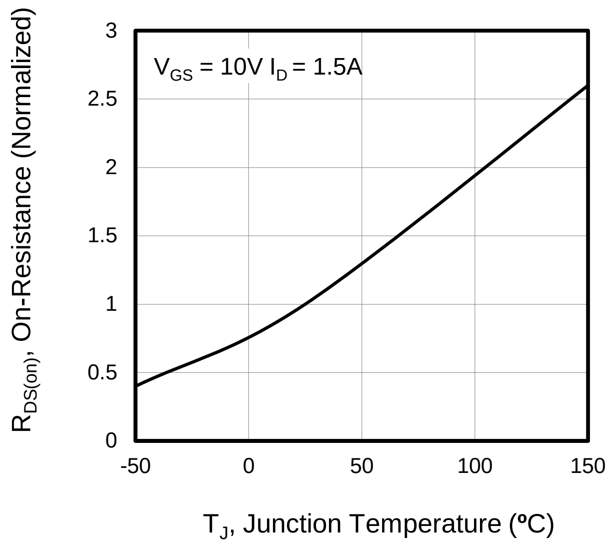


Figure 7. Capacitance

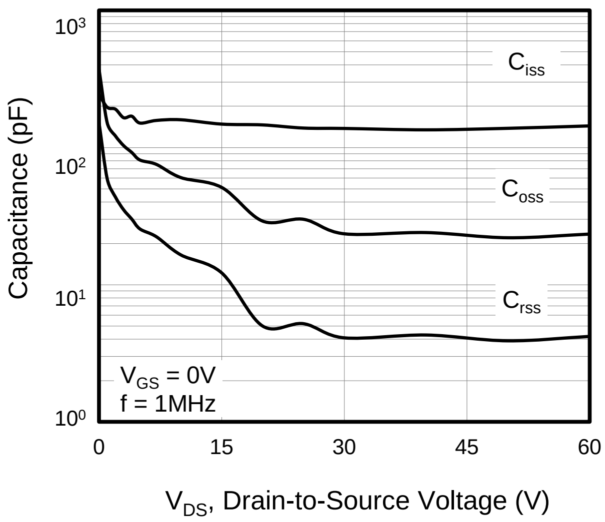


Figure 8. Gate Charge

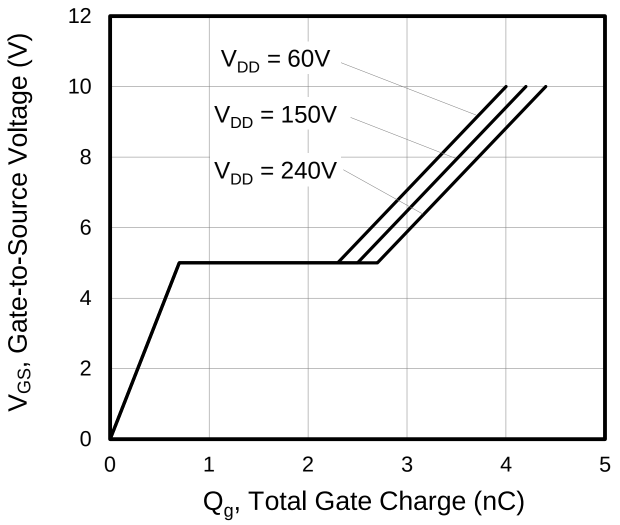
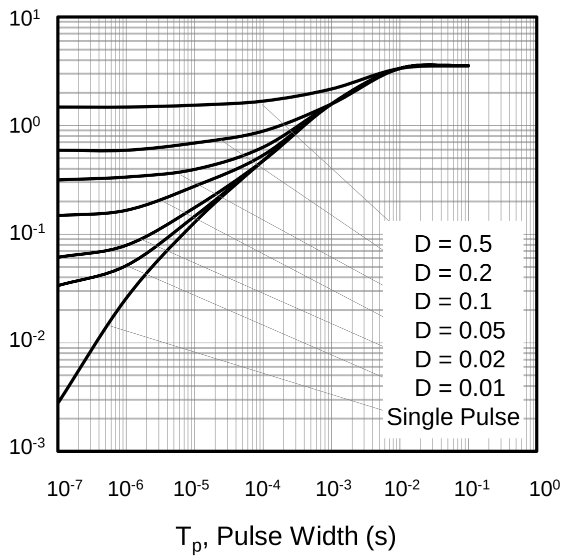
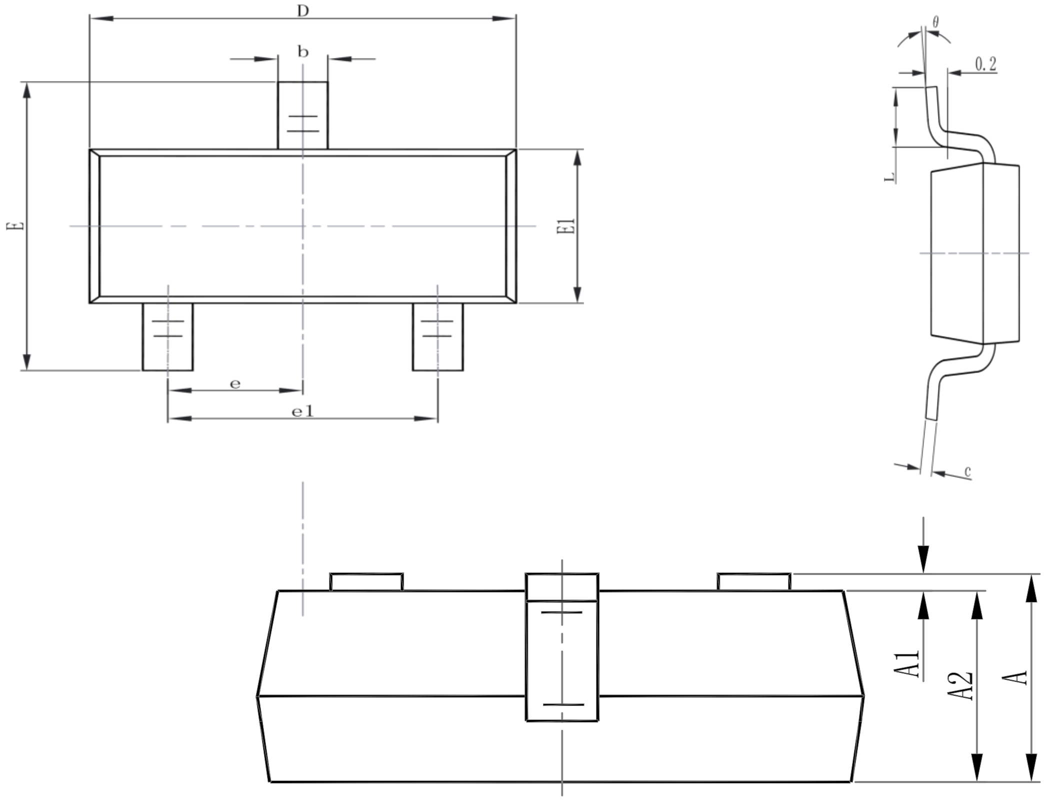


Figure 9. Transient Thermal Impedance



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

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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