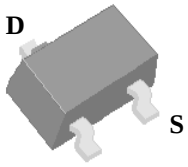
XPX05N10AS

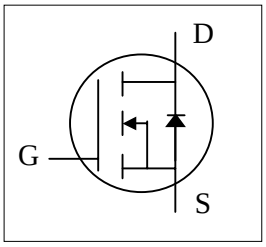
100V N-Channel Enhancement Mode Power MOSFET

- **Simple Drive Requirement**
- **Fast Switching Characteristic**
- **Low Gate Charge**
- **RoHS Compliant & Halogen-Free**



SOT23-3L

BV_{DSS}	100V
$R_{DS(ON)}$	135mΩ
I_D	5A



Description

05N10 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the

The special design SOT23-3Lpackage with good thermall performance is widely preferred for all commercial-industrial surface mount applications using infrared reflow technique and suited for voltage conversion or switch applications.

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
5N10	XPX05N10AS	SOT-23-3L	Ø180mm	8 mm	3000 units

Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V	5	A
I_D@T_A=25℃	Drain Current, V_{GS} @ 10V[3]	4.1	A
I_D@T_A=100℃	Drain Current, V_{GS} @ 10V[3]	1.7	A
I_{DM}	Pulsed Drain Current[1]	10	A
P_D@T_A=25℃	Total Power Dissipation	1.38	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Symbol	Parameter	Value	Unit
Rthj-c	Maximum Thermal Resistance, Junction-case	45	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	90	℃/W

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	100	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=5A	-	112	135	mΩ
		V_{GS}=4.5V, I_D=4A	-	120	145	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	1.7	3	V
g_{fs}	Forward Transconductance	V_{DS}=5V, I_D=2A	-	8	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V, V_{GS}=0V	-	-	25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge	I_D=2A	-	12	20	nC
Q_{gs}	Gate-Source Charge	V_{DS}=80V	-	2.2	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=10V	-	2.5	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=50V	-	7	-	ns
t_r	Rise Time	I_D=1A	-	5	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	16	-	ns
t_f	Fall Time	V_{GS}=10V	-	6	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	610	980	pF
C_{oss}	Output Capacitance	V_{DS}=25V	-	40	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	25	-	pF
R_g	Gate Resistance	f=1.0MHz	-	2.2	4.4	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=1.2A, V_{GS}=0V	-	-	1.2	V
t_{rr}	Reverse Recovery Time	I_S=2A, V_{GS}=0V,	-	21	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	21	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in^2 copper pad of FR4 board, t ≤10sec ; 270 ℃/W when mounted on Min. copper pad.

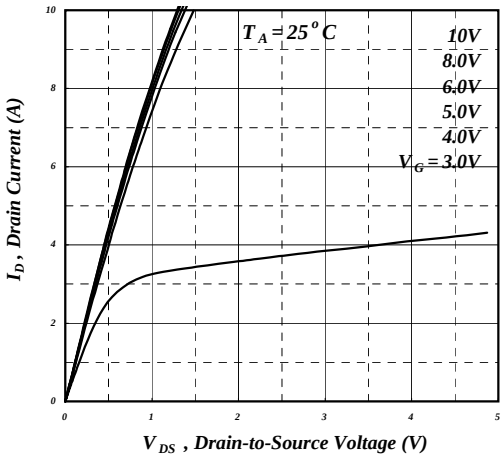


Fig 1. Typical Output Characteristics

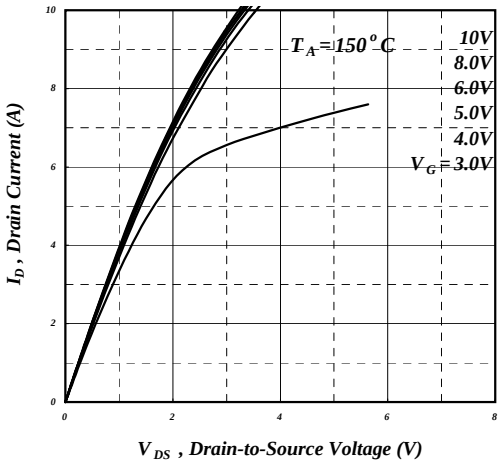


Fig 2. Typical Output Characteristics

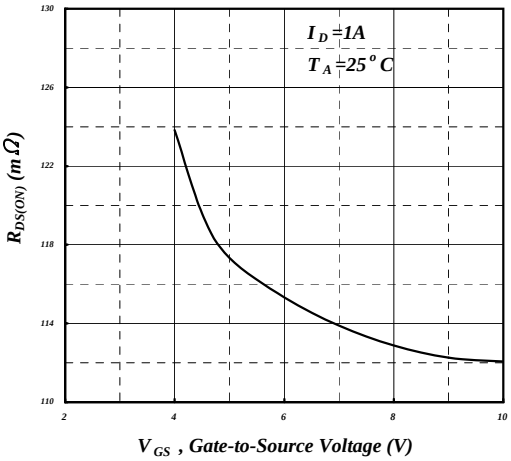


Fig 3. On-Resistance v.s. Gate Voltage

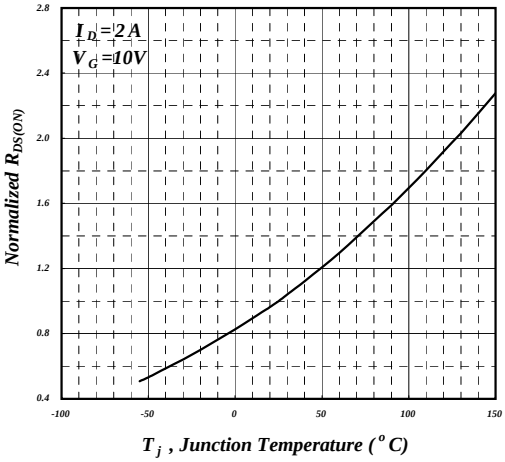


Fig 4. Normalized On-Resistance v.s. Junction Temperature

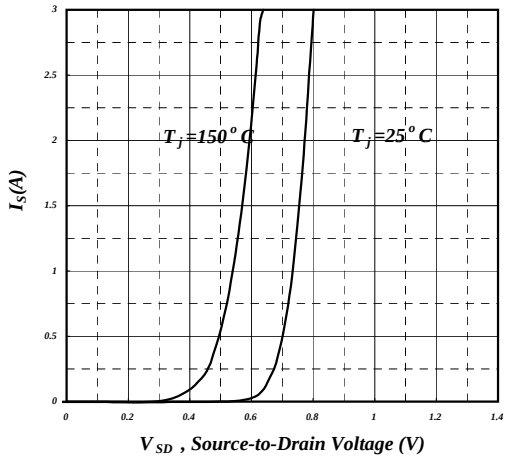


Fig 5. Forward Characteristic of Reverse Diode

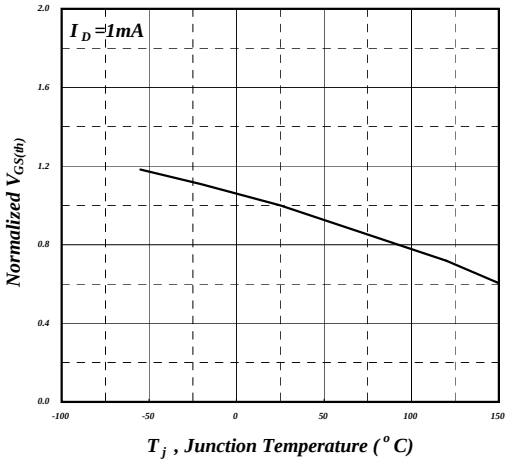


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

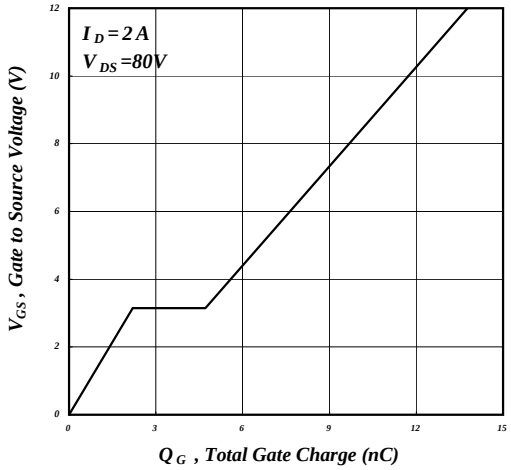


Fig 7. Gate Charge Characteristics

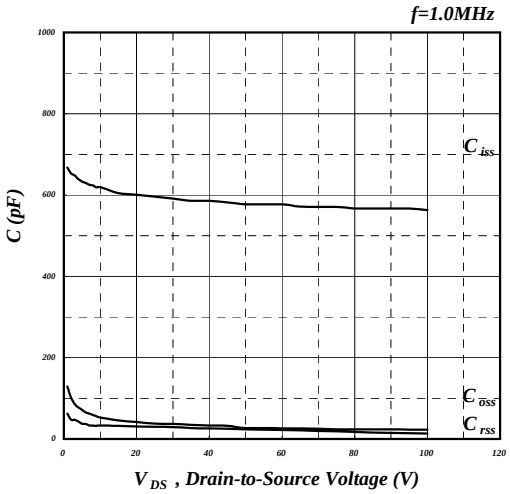


Fig 8. Typical Capacitance Characteristics

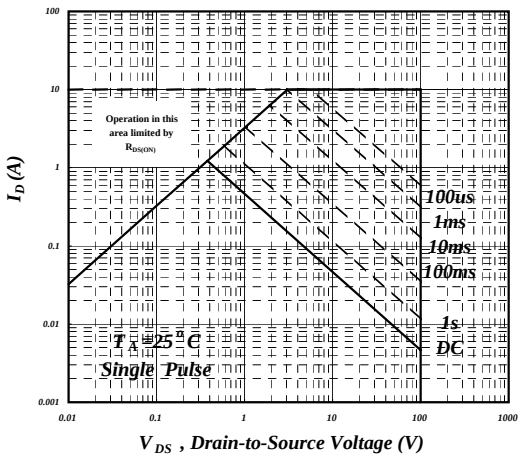


Fig 9. Maximum Safe Operating Area

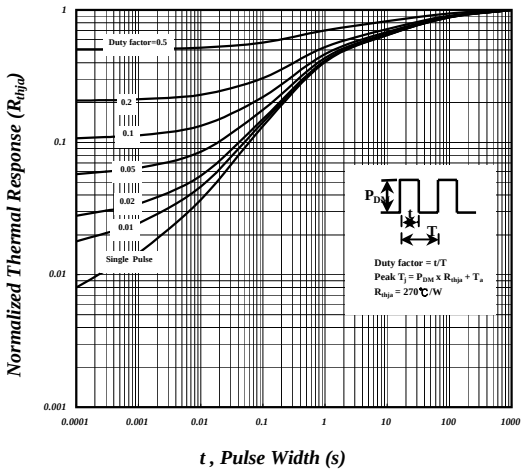


Fig 10. Effective Transient Thermal Impedance

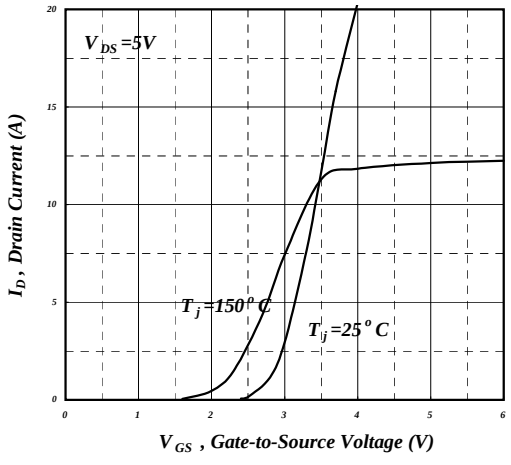


Fig 11. Transfer Characteristics

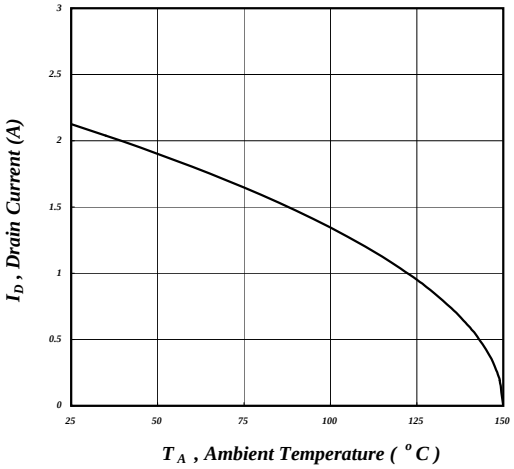


Fig 12. Drain Current v.s. Ambient Temperature

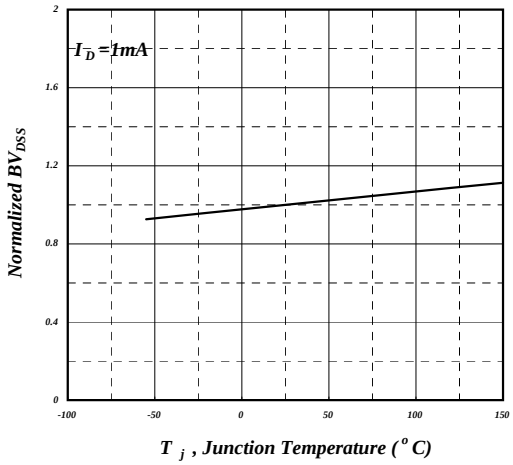


Fig 13. Normalized BV_{DSS} v.s. Junction Temperature

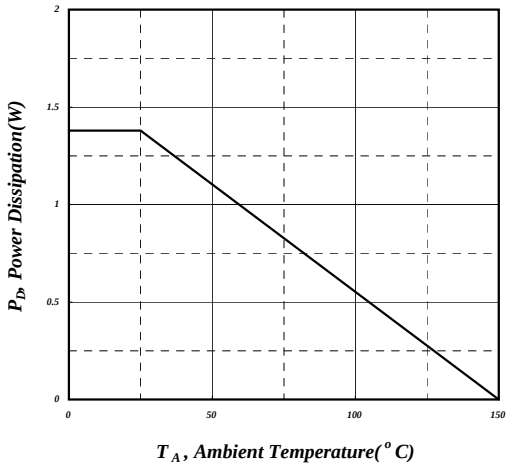


Fig 14. Total Power Dissipation

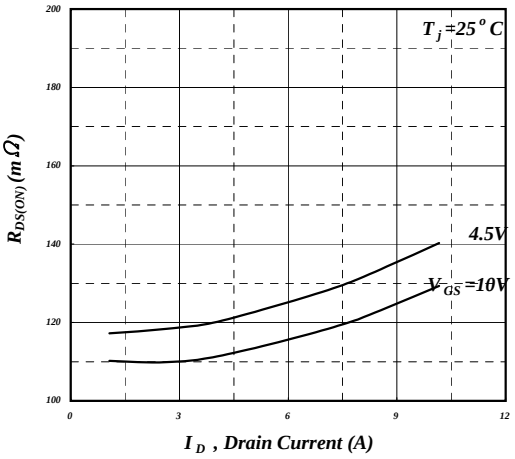


Fig 15. Typ. Drain-Source on State Resistance

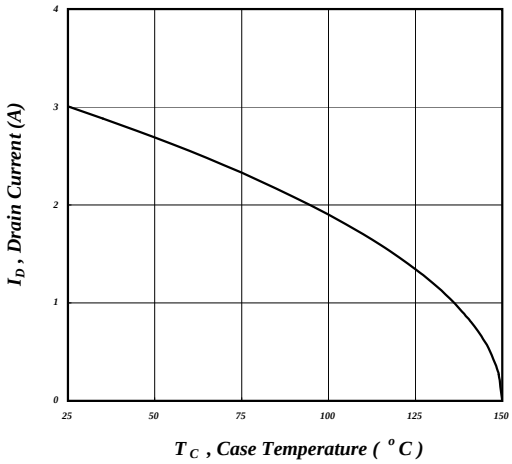
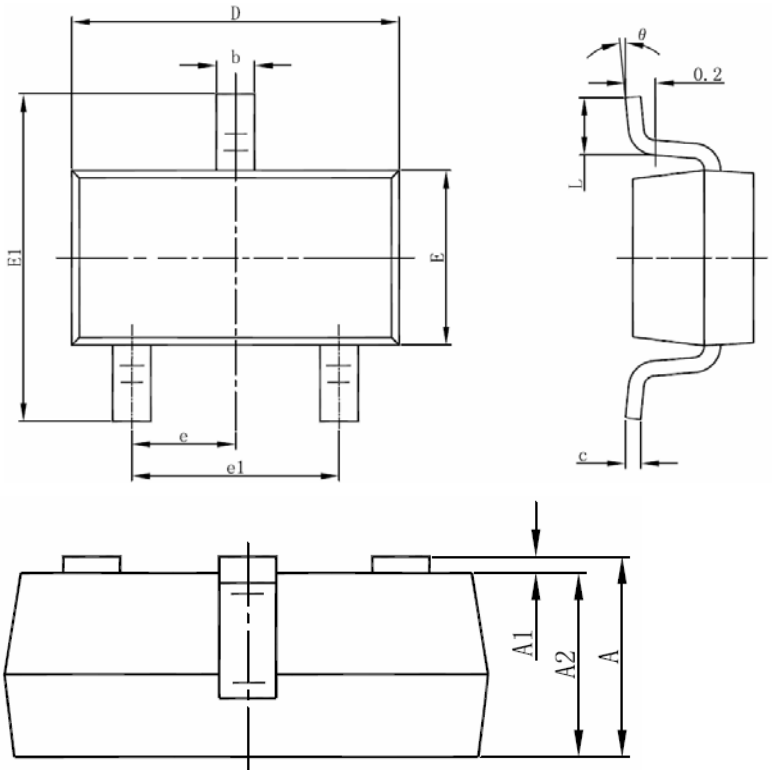


Fig 16. Drain Current v.s. Case Temperature

SOT-23-3L Package Information



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
E	1.500	1.700	0.059	0.067
E1	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°

Notes

1. All dimensions are in millimeters.
2. Tolerance ±0.10mm (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

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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