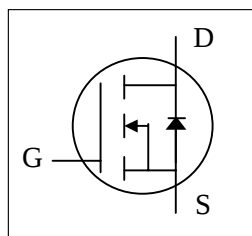


- ▼ 100% R_g & UIS Test
- ▼ Simple Drive Requirement
- ▼ Low On-resistance
- ▼ RoHS Compliant & Halogen-Free

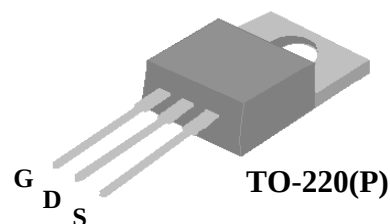


BV _{DSS}	60V
R _{DS(ON)}	3.5mΩ

Description

XP6NA3R5 series are innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The TO-220 package is widely preferred for all commercial-industrial through hole applications. The low thermal resistance and low package cost contribute to the worldwide popular package.



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

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	+20	V
I _D @T _C =25°C	Drain Current, V _{GS} @ 10V	105	A
I _D @T _C =100°C	Drain Current, V _{GS} @ 10V	66	A
I _{DM}	Pulsed Drain Current ¹	360	A
P _D @T _C =25°C	Total Power Dissipation	69.4	W
P _D @T _A =25°C	Total Power Dissipation	2	W
E _{AS}	Single Pulse Avalanche Energy ³	240	mJ
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Value	Units
R _{thj-c}	Maximum Thermal Resistance, Junction-case	1.8	°C/W
R _{thj-a}	Maximum Thermal Resistance, Junction-ambient	62	°C/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	60	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =40A	-	-	3.5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	-	4	V
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =40A	-	90	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =48V, V _{GS} =0V	-	-	25	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±20V, V _{DS} =0V	-	-	±0.1	uA
Q _g	Total Gate Charge ⁴	I _D =40A	-	62	99	nC
Q _{gs}	Gate-Source Charge ⁴	V _{DS} =30V	-	18	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge ⁴	V _{GS} =10V	-	17	-	nC
t _{d(on)}	Turn-on Delay Time ⁴	V _{DS} =30V	-	17	-	ns
t _r	Rise Time ⁴	I _D =40A	-	73	-	ns
t _{d(off)}	Turn-off Delay Time ⁴	R _G =6Ω	-	40	-	ns
t _f	Fall Time ⁴	V _{GS} =10V	-	90	-	ns
C _{iss}	Input Capacitance ⁴	V _{GS} =0V	-	3400	5440	pF
C _{oss}	Output Capacitance ⁴	V _{DS} =50V	-	560	-	pF
C _{rss}	Reverse Transfer Capacitance ⁴	f=1.0MHz	-	30	-	pF
R _g	Gate Resistance	f=1.0MHz	-	1	2	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =40A, V _{GS} =0V	-	-	1.3	V
t _{rr}	Reverse Recovery Time ⁴	I _S =40A, V _{GS} =0V	-	40	-	ns
Q _{rr}	Reverse Recovery Charge ⁴	dI/dt=100A/μs	-	35	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Starting T_j=25°C , V_{DD}=30V , L=0.3mH , R_G=25Ω , V_{GS}=10V
- 4.Guaranteed by design.

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT, AUTOMOTIVE OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

XSEMI DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

XSEMI RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.

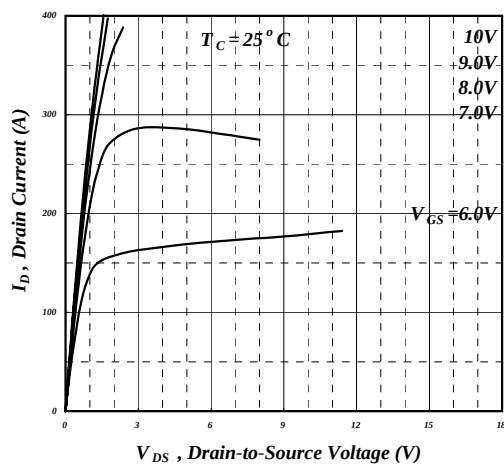


Fig 1. Typical Output Characteristics

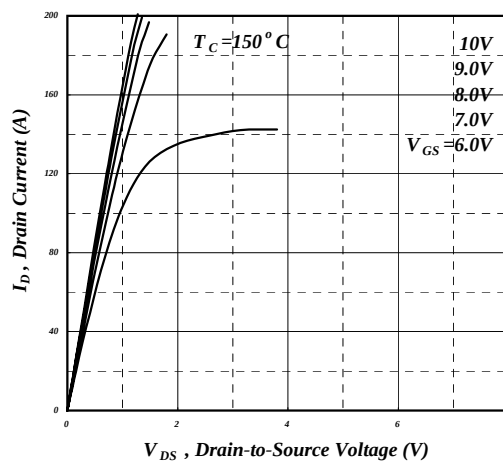


Fig 2. Typical Output Characteristics

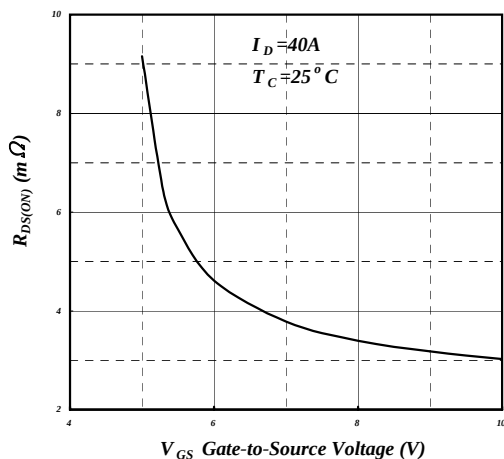


Fig 3. On-Resistance v.s. Gate Voltage

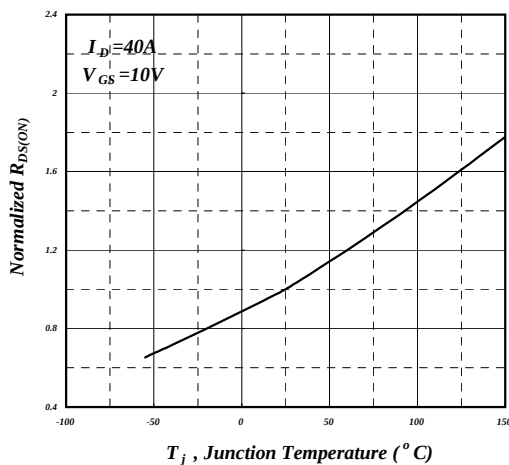


Fig 4. Normalized On-Resistance v.s. Junction Temperature

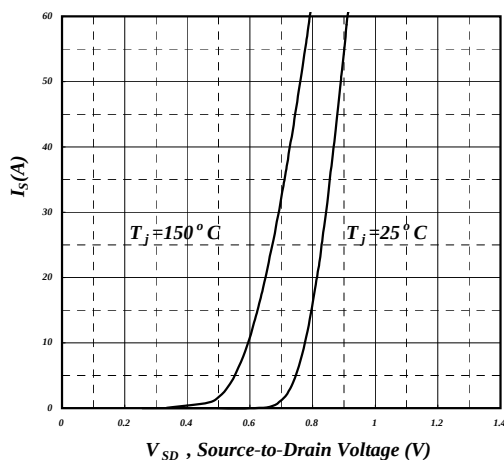


Fig 5. Forward Characteristic of Reverse Diode

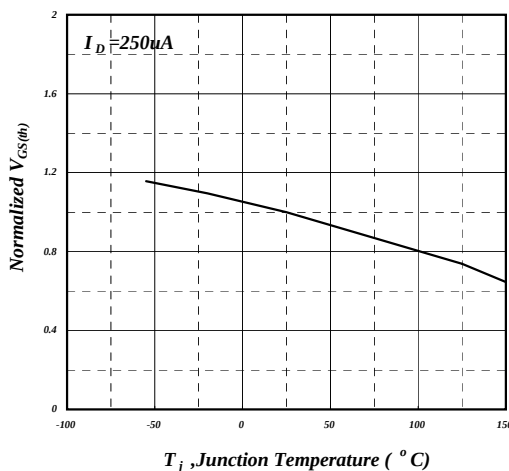
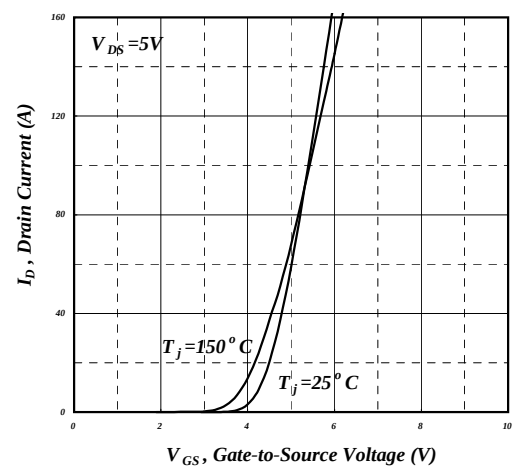
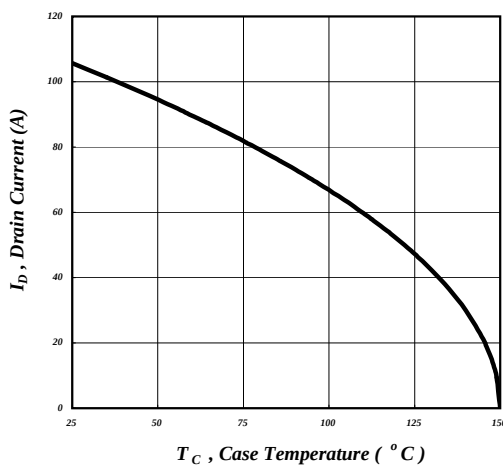
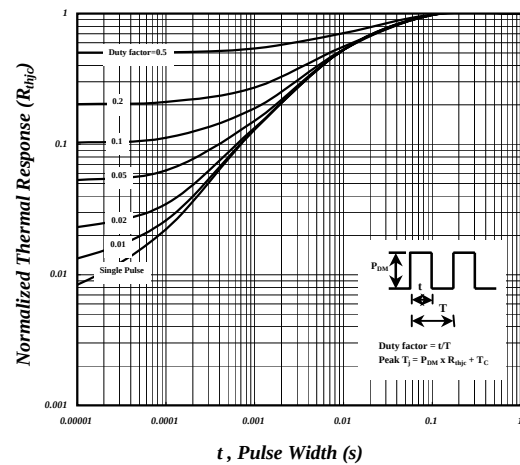
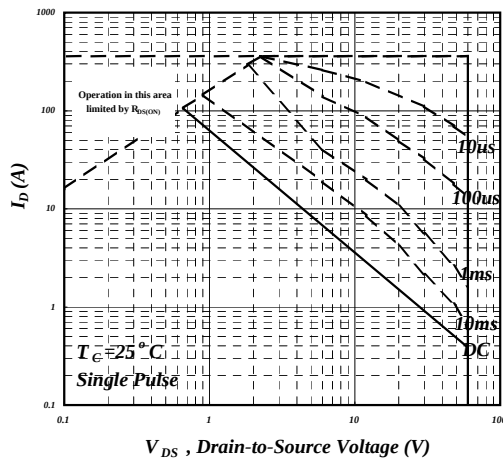
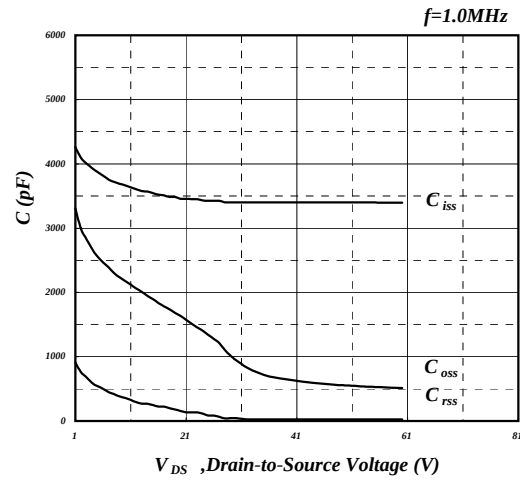
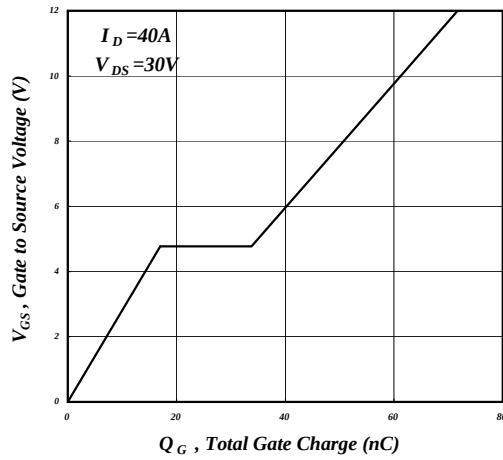


Fig 6. Gate Threshold Voltage v.s. Junction Temperature



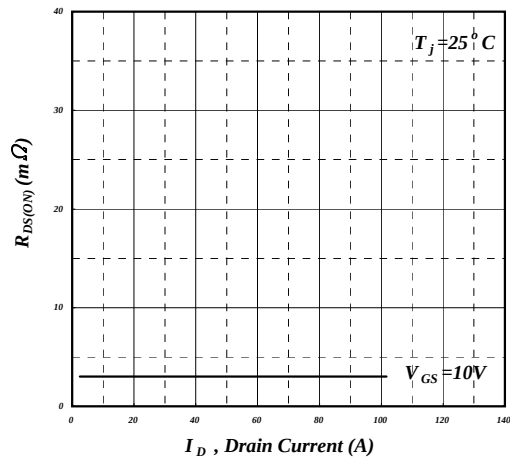


Fig 13. Typ. Drain-Source on State Resistance

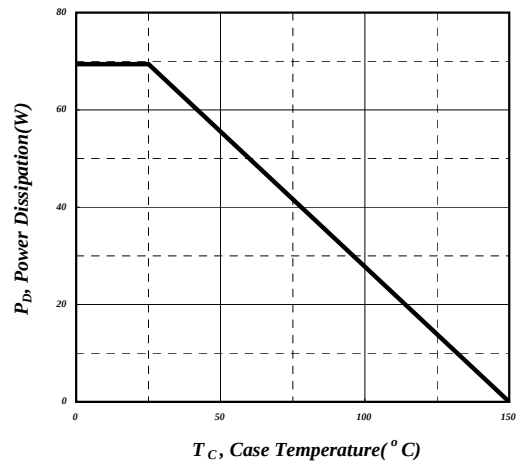


Fig 14. Total Power Dissipation

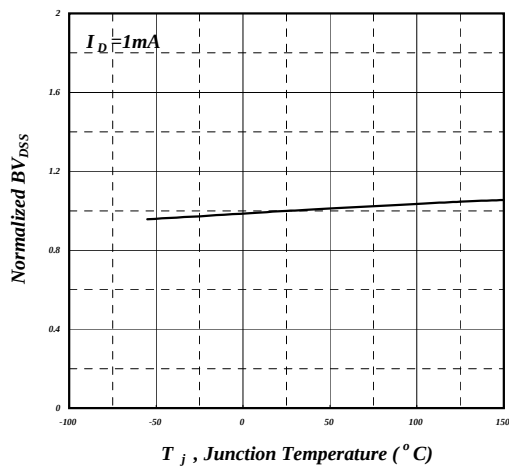
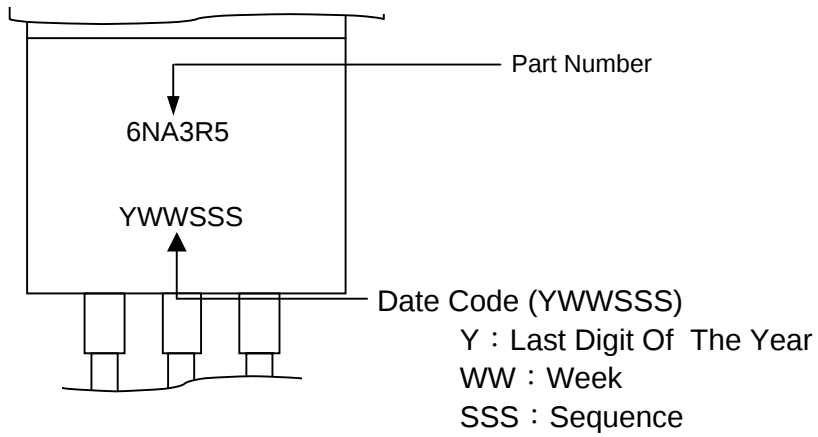
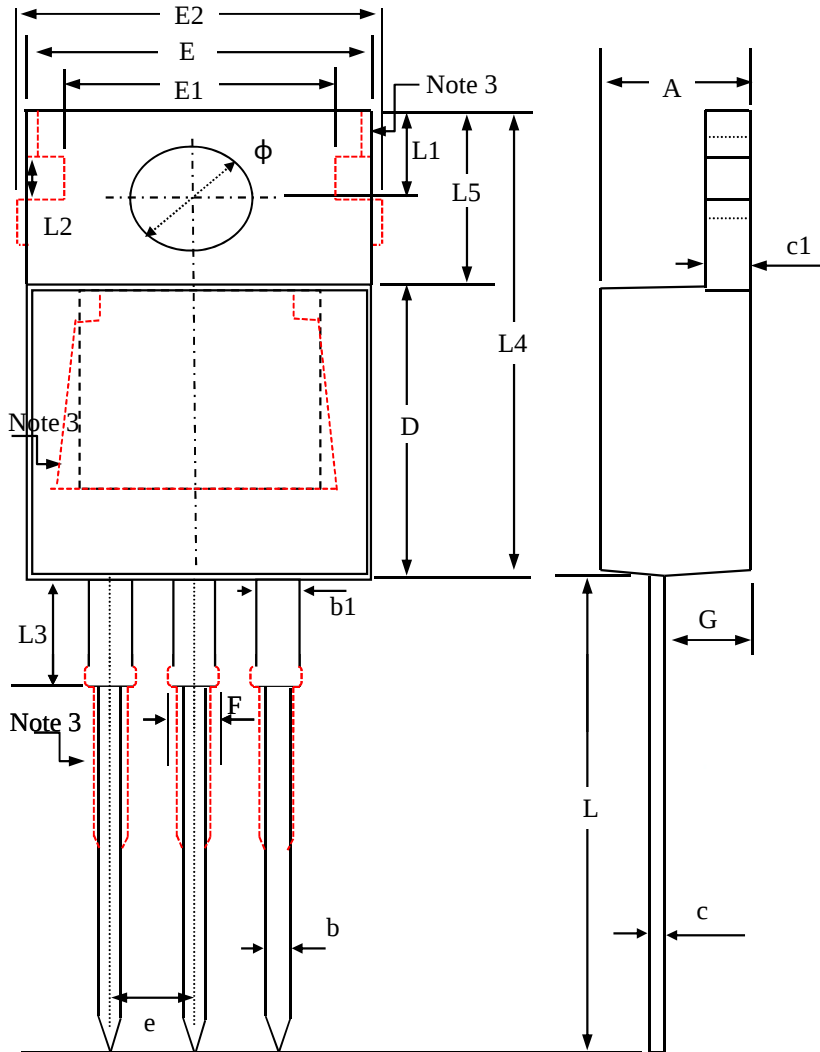


Fig 15. Normalized BV_{DS} v.s. Junction Temperature

MARKING INFORMATION

Package Outline : TO-220



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.20	4.50	4.80
b	0.60	0.80	1.00
b1	1.10	1.38	1.80
c	0.30	0.48	0.65
c1	1.10	1.30	1.50
E	9.70	10.00	10.40
E1	7.40	8.30	9.20
e	2.54 (ref.)		
L	12.70	13.60	14.50
L1	2.50	2.75	3.00
L2	1.00	1.40	1.80
L3	2.60	3.35	4.10
L4	14.30	15.15	16.00
L5	6.00	6.40	6.80
φ	3.40	3.70	4.00
D	8.30	8.85	9.40
F	1.20	1.41	1.85
G	2.20	2.60	3.00
E2	—	—	11.50

Note:

- 1.All Dimensions Are in Millimeters.
- 2.Dimension Does Not Include Mold Protrusions.
3. Thermal PAD and Pin contour is for reference, it may have little difference by option.

TO-220 FOOTPRINT :

