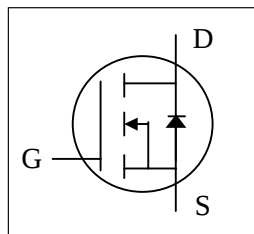
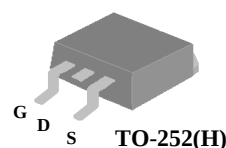


- ▼ 100% R_g & UIS Test
- ▼ Simple Drive Requirement
- ▼ Lower On-resistance
- ▼ RoHS Compliant & Halogen-Free



BV _{DSS}	100V
R _{DS(ON)}	4.2mΩ



Description

XP10NB4R2L 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.

TO-252 package is widely preferred for all commercial-industrial surface mount applications using infrared reflow technique and suited for high current application due to the low connection resistance.

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°C	Drain Current, V _{GS} @ 10V ⁶ (Silicon Limited)	116.5	A
I _D @T _C =25°C	Drain Current, V _{GS} @ 10V ⁶ (Package Limited)	75	A
I _D @T _C =100°C	Drain Current, V _{GS} @ 10V	73.6	A
I _{DM}	Pulsed Drain Current ¹	450	A
P _D @T _C =25°C	Total Power Dissipation	104	W
P _D @T _A =25°C	Total Power Dissipation ³	2	W
E _{AS}	Single Pulse Avalanche Energy ⁴	200	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	1.2	°C/W
R _{thj-a}	Maximum Thermal Resistance, Junction-ambient ³	62.5	°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	100	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =40A	-	-	4.2	mΩ
		V _{GS} =4.5V, I _D =20A	-	-	6.5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	-	3	V
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =40A	-	110	-	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	-	-	±0.1	uA
Q _g	Total Gate Charge ⁵	I _D =40A	-	88	140.8	nC
Q _{gs}	Gate-Source Charge ⁵	V _{DS} =50V	-	16	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge ⁵	V _{GS} =10V	-	28	-	nC
t _{d(on)}	Turn-on Delay Time ⁵	V _{DS} =50V	-	17	-	ns
t _r	Rise Time ⁵	I _D =40A	-	81	-	ns
t _{d(off)}	Turn-off Delay Time ⁵	R _G =7.5 Ω	-	97	-	ns
t _f	Fall Time ⁵	V _{GS} =10V	-	168	-	ns
C _{iss}	Input Capacitance ⁵	V _{GS} =0V	-	3950	6320	pF
C _{oss}	Output Capacitance ⁵	V _{DS} =80V	-	525	-	pF
C _{rss}	Reverse Transfer Capacitance ⁵	f=1.0MHz	-	20	-	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 ⁵	I _S =40A, V _{GS} =0V	-	61	-	ns
Q _{rr}	Reverse Recovery Charge ⁵	dI/dt=100A/μs	-	83	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board
- 4.Starting T_j=25°C , V_{DD}=50V , L=1mH , R_G=25 Ω , V_{GS}=10V
- 5.Guaranteed by design.
- 6.Package limitation current is 75A .
- 7.These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_{J(MAX)}=150°C.

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.

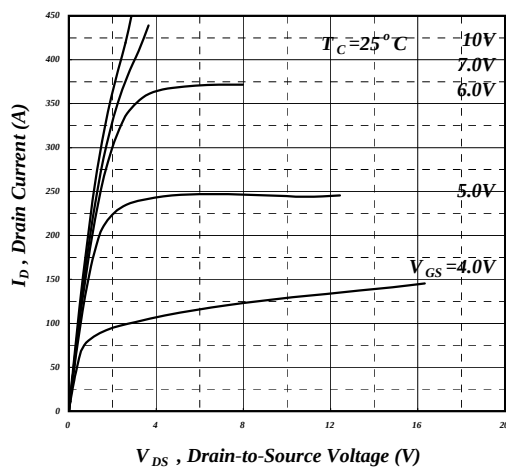


Fig 1. Typical Output Characteristics

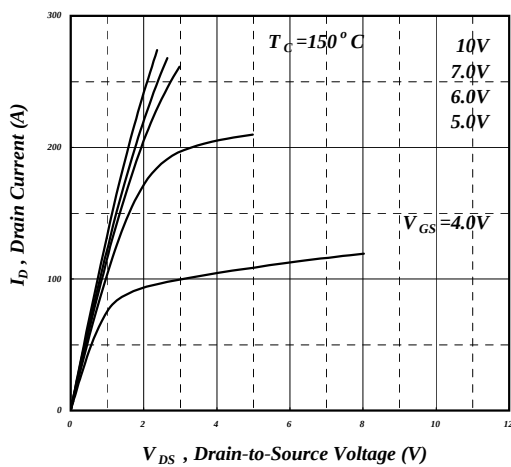


Fig 2. Typical Output Characteristics

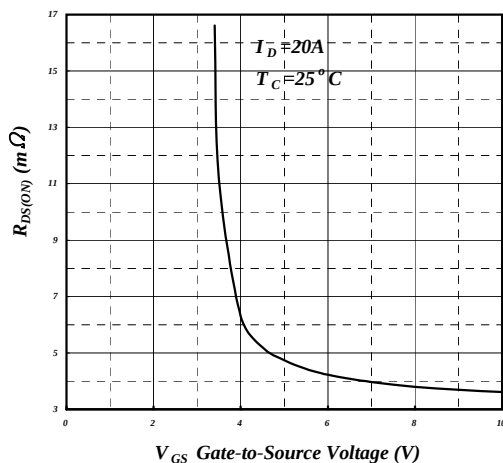


Fig 3. On-Resistance v.s. Gate Voltage

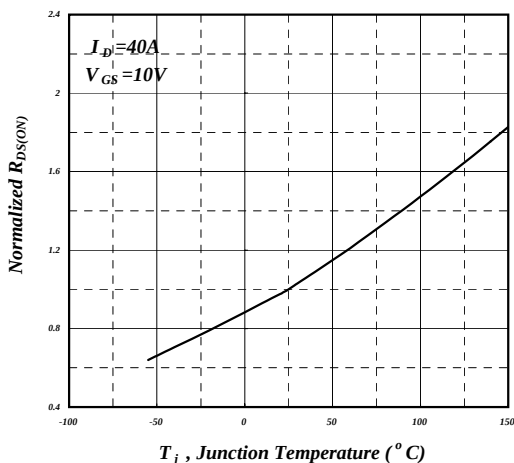


Fig 4. Normalized On-Resistance v.s. Junction Temperature

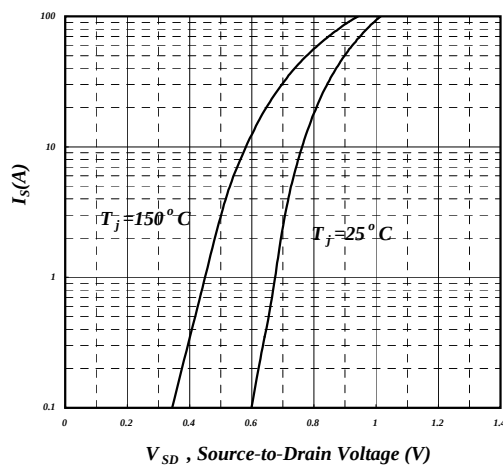


Fig 5. Forward Characteristic of Reverse Diode

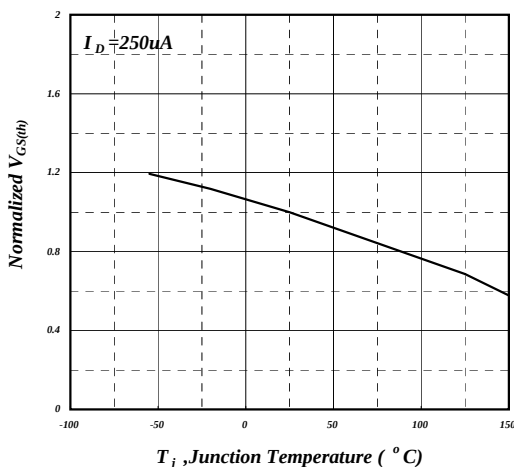


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

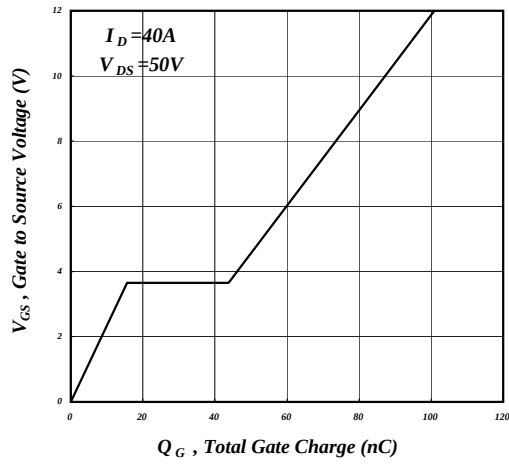


Fig 7. Gate Charge Characteristics

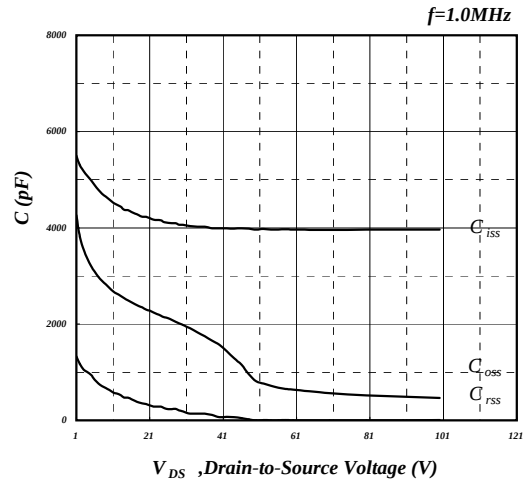


Fig 8. Typical Capacitance Characteristics

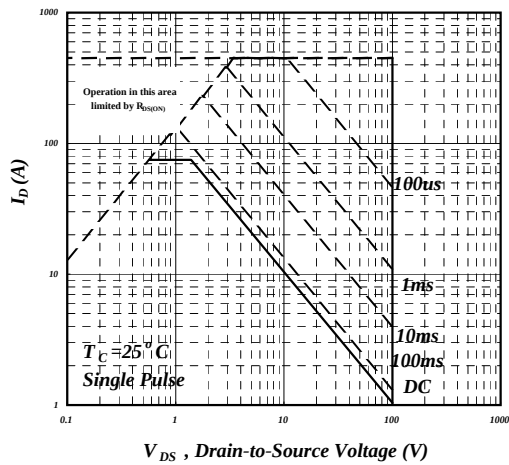


Fig 9. Maximum Safe Operating Area⁶

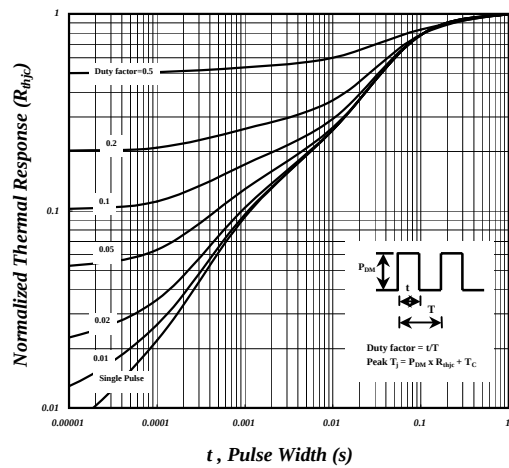


Fig 10. Effective Transient Thermal Impedance

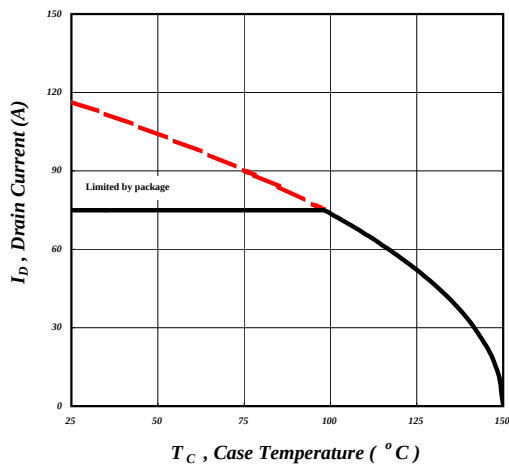


Fig 11. Drain Current v.s. Case Temperature

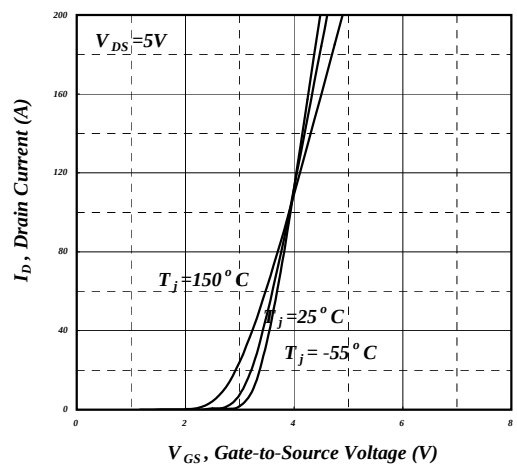


Fig 12. Transfer Characteristics

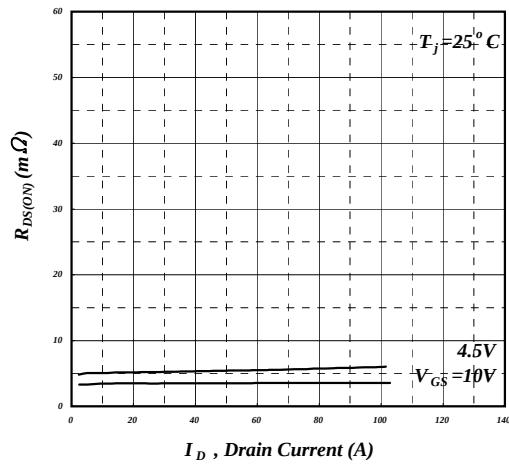


Fig 13. Typ. Drain-Source on State Resistance

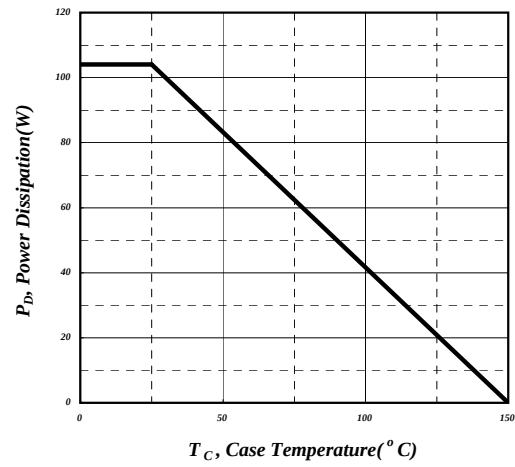


Fig 14. Total Power Dissipation

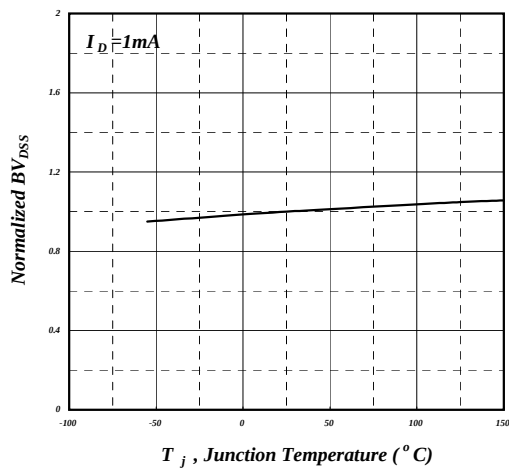
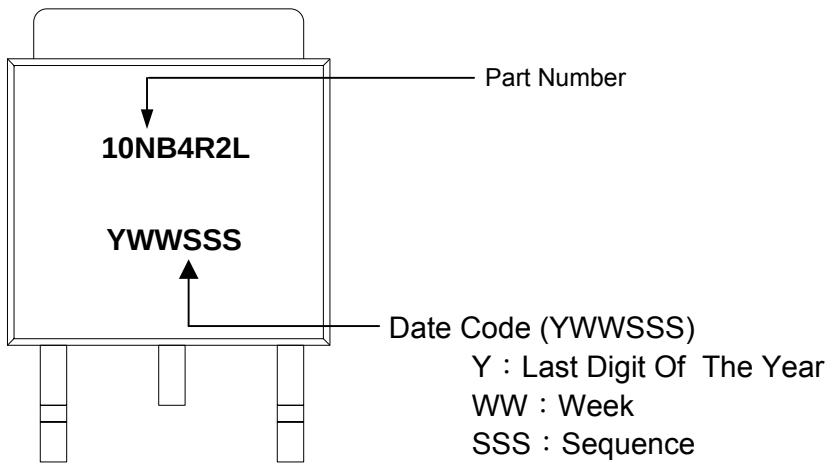
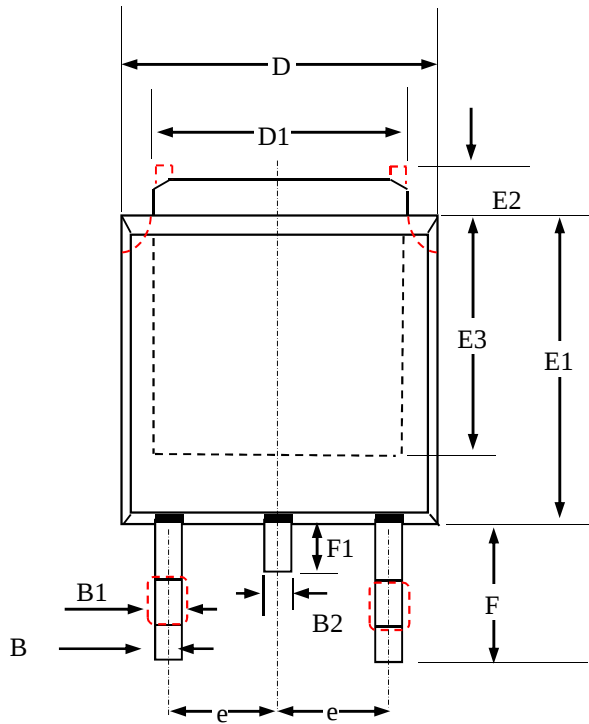


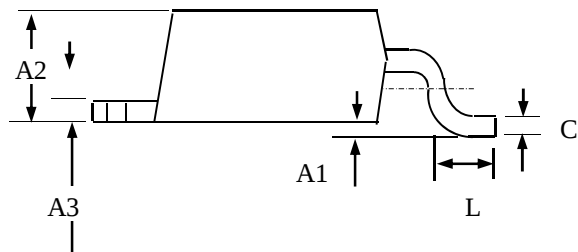
Fig 15. Normalized BV_{DS} v.s. Junction Temperature

MARKING INFORMATION

Package Outline : TO-252



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A2	2.18	2.30	2.40
A3	0.40	0.50	0.65
B	0.40	0.70	1.00
B1	0.50	0.85	1.20
D	6.00	6.50	6.80
D1	4.80	5.35	5.90
E3	4.00 (ref.)		
F	2.00	2.63	3.05
F1	0.50	0.85	1.20
E1	5.00	5.70	6.30
E2	0.50	1.10	1.80
e	2.3 (ref)		
C	0.35	0.525	0.70
A1	0.00	—	0.25
B2	—	—	1.25
L	0.90	1.34	1.78



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

TO-252 FOOTPRINT :

