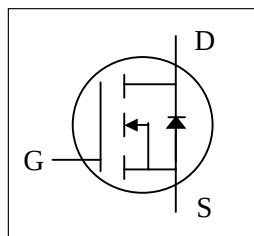


- ▼ 100% R_g & UIS Test
- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant & Halogen-Free

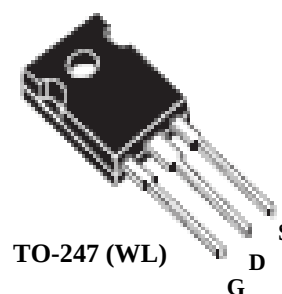


BV_{DSS}	100V
$R_{DS(ON)}$	2.5mΩ

Description

XP10NB2R5 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-247 package is widely preferred for commercial-industrial applications. The device is suited for switch mode power supplies, DC-AC converters and high current high speed switching circuits.



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
$I_D@T_C=25^{\circ}C$	Drain Current, $V_{GS} @ 10V^5$ (Silicon Limited)	220	A
$I_D@T_C=25^{\circ}C$	Drain Current, $V_{GS} @ 10V^5$ (Package Limited)	195	A
$I_D@T_C=100^{\circ}C$	Drain Current, $V_{GS} @ 10V$	156	A
I_{DM}	Pulsed Drain Current ¹	600	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation	250	W
$P_D@T_A=25^{\circ}C$	Total Power Dissipation	3.75	W
E_{AS}	Single Pulse Avalanche Energy ³	500	mJ
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Value	Units
R _{thj-c}	Maximum Thermal Resistance, Junction-case	0.6	°C/W
R _{thj-a}	Maximum Thermal Resistance, Junction-ambient	40	°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 =100A	-	-	2.5	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 =100A	-	210	-	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 ⁴	I _D =100A	-	136	217.6	nC
Q _{gs}	Gate-Source Charge ⁴	V _{DS} =50V	-	36	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge ⁴	V _{GS} =10V	-	42	-	nC
t _{d(on)}	Turn-on Delay Time ⁴	V _{DS} =50V	-	28	-	ns
t _r	Rise Time ⁴	I _D =100A	-	115	-	ns
t _{d(off)}	Turn-off Delay Time ⁴	R _G =6Ω	-	91	-	ns
t _f	Fall Time ⁴	V _{GS} =10V	-	218	-	ns
C _{iss}	Input Capacitance ⁴	V _{GS} =0V	-	7600	12160	pF
C _{oss}	Output Capacitance ⁴	V _{DS} =80V	-	1085	-	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 =100A, V _{GS} =0V	-	-	1.3	V
t _{rr}	Reverse Recovery Time ⁴	I _S =100A, V _{GS} =0V	-	118	-	ns
Q _{rr}	Reverse Recovery Charge ⁴	dI/dt=100A/μs	-	225	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Starting T_J=25°C , V_{DD}=50V , L=0.1mH , R_G=25Ω , V_{GS}=10V , I_{AS}=100A
- 4.Guaranteed by design.
- 5.Package limitation current is 195A .
- 6.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)}=175°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.

YAGEO 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.

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

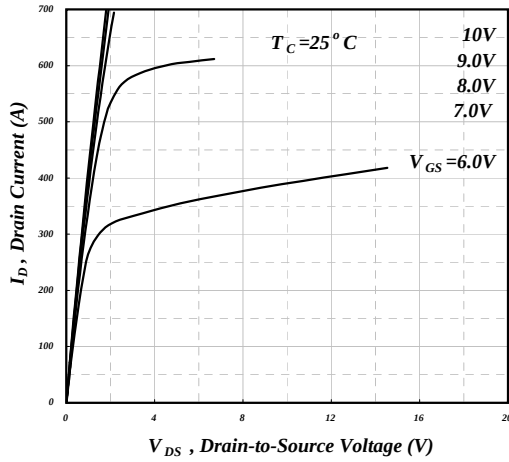


Fig 1. Typical Output Characteristics

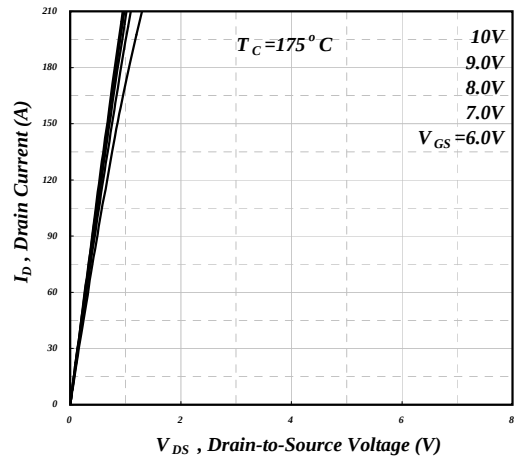


Fig 2. Typical Output Characteristics

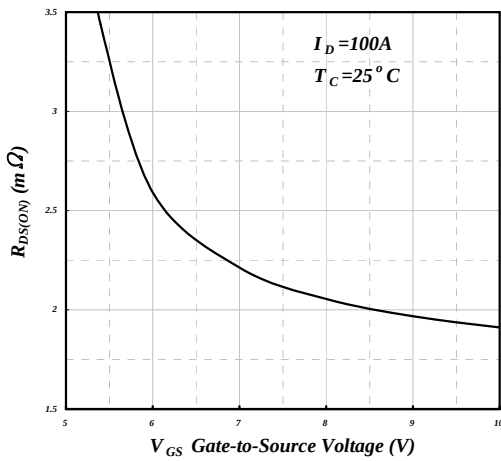


Fig 3. On-Resistance v.s. Gate Voltage

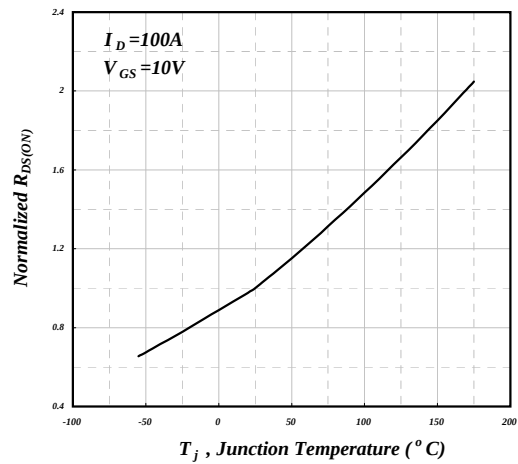


Fig 4. Normalized On-Resistance v.s. Junction Temperature

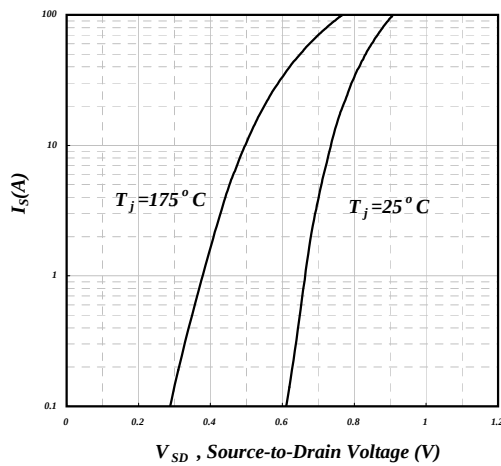


Fig 5. Forward Characteristic of Reverse Diode

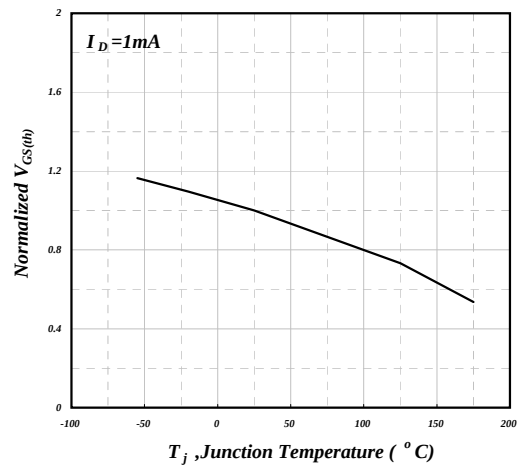


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

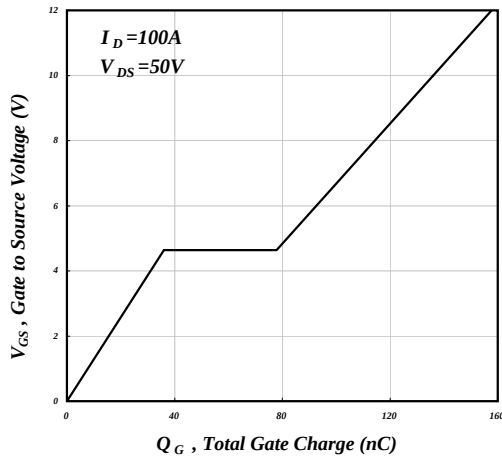


Fig 7. Gate Charge Characteristics

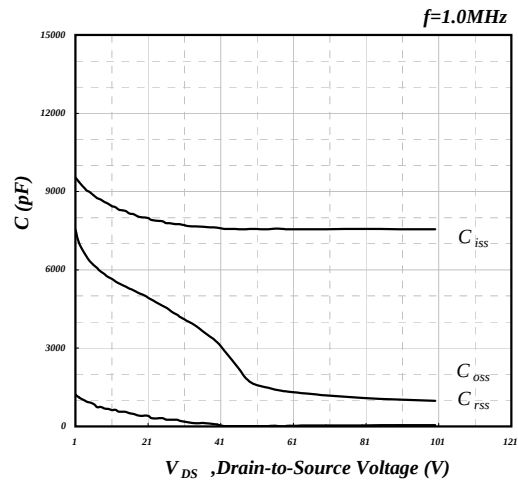


Fig 8. Typical Capacitance Characteristics

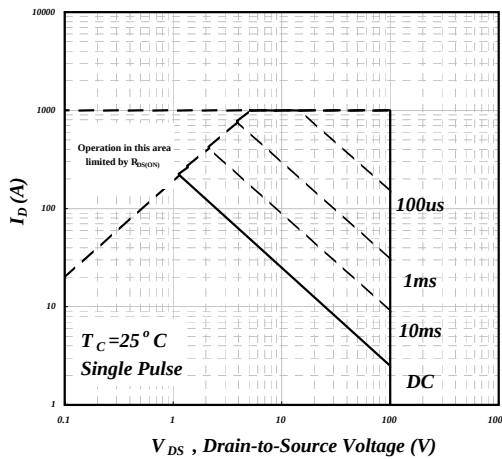


Fig 9. Maximum Safe Operating Area⁶

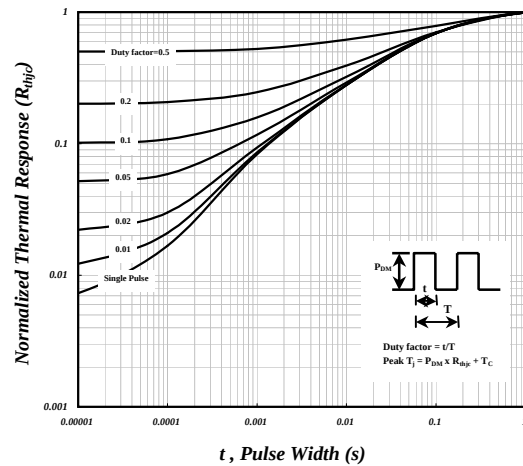


Fig 10. Effective Transient Thermal Impedance

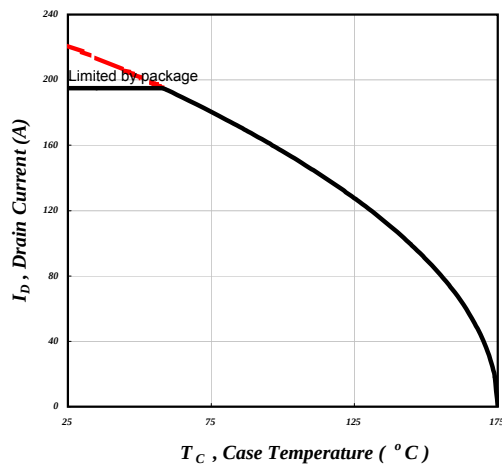


Fig 11. Drain Current v.s. Case Temperature

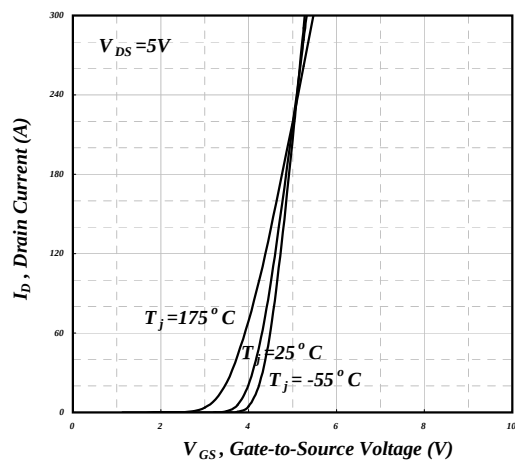


Fig 12. Transfer Characteristics

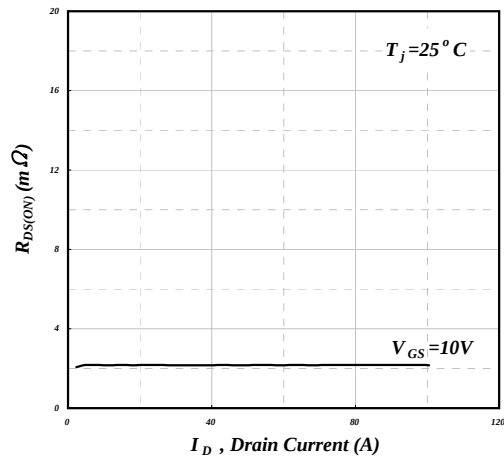


Fig 13. Typ. Drain-Source on State Resistance

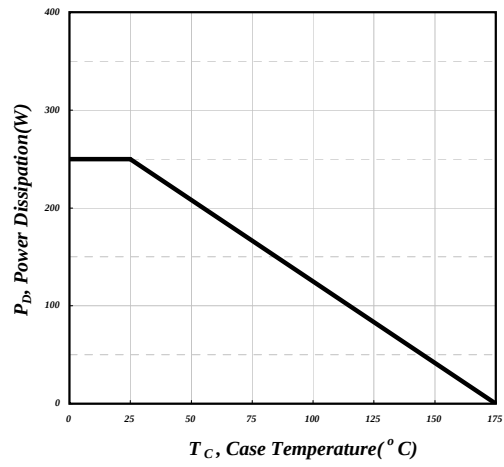


Fig 14. Total Power Dissipation

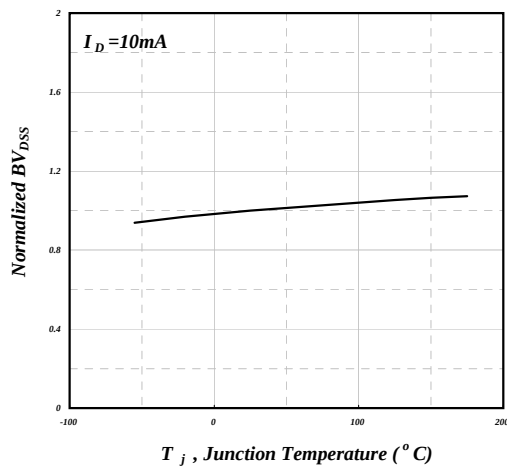
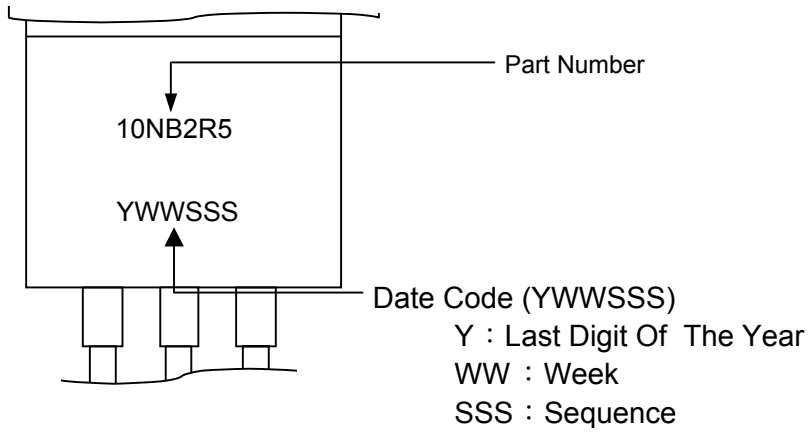
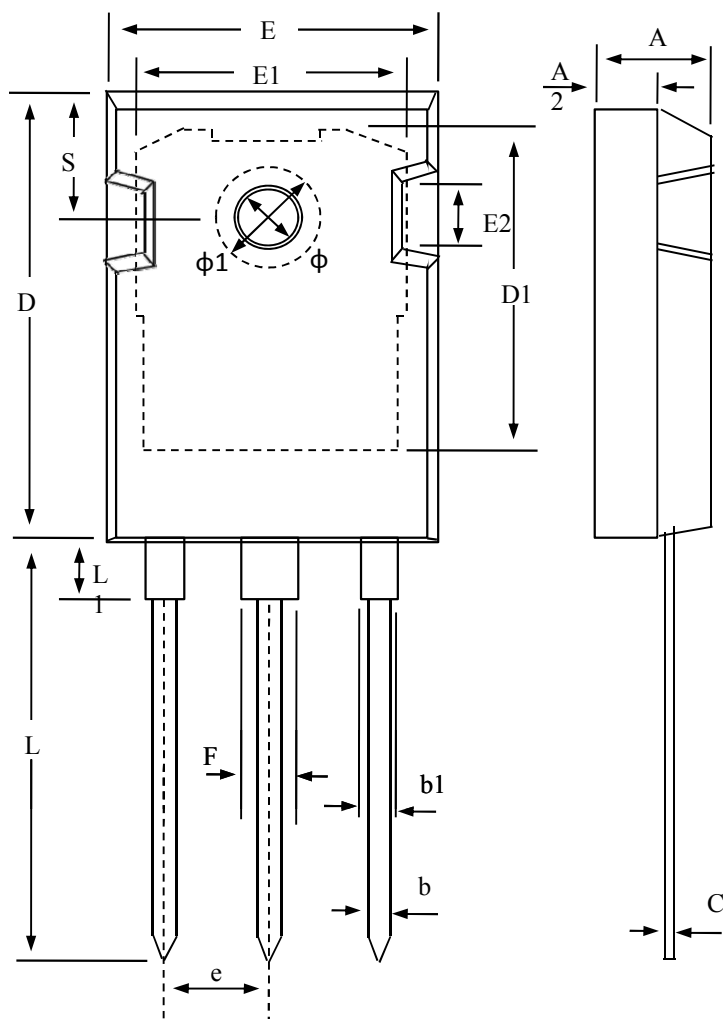


Fig 15. Normalized BV_{DSS} v.s. Junction Temperature

MARKING INFORMATION



Package Outline : TO-247



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.80	5.03	5.25
A2	1.90	2.05	2.20
E	15.75	15.95	16.15
E1	13.00	13.60	14.20
E2	3.60	4.35	5.10
D	20.80	20.95	21.10
D1	16.20	16.95	17.70
C	0.50	0.60	0.70
L	19.80	20.10	20.40
L1	4.10	4.25	4.40
F	2.80	3.10	3.40
b	1.05	1.20	1.35
b1	1.90	2.18	2.45
e	5.44 ref.		
ϕ	3.50	3.58	3.65
$\phi 1$	7.18 ref.		
S	6.00	6.15	6.30

1.All Dimensions Are in Millimeters.

2.Dimension Does Not Include Mold Protrusions.

TO-247 FOOTPRINT :

