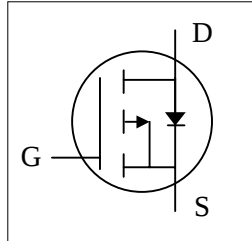
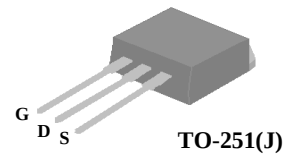


- ▼ 100% UIS Test
- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant & Halogen-Free



BV_{DSS}	-30V
$R_{DS(ON)}$	20m Ω
I_D	-30A



Description

XP3P020 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 straight lead version TO-251 package is widely preferred for all commercial-industrial through hole applications.

Absolute Maximum Ratings@ $T_J=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	+20	V
$I_D@T_C=25^\circ\text{C}$	Drain Current, V_{GS} @ 10V	-30	A
$I_D@T_C=100^\circ\text{C}$	Drain Current, V_{GS} @ 10V	-18.5	A
I_{DM}	Pulsed Drain Current ¹	-100	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	25	W
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation	1.13	W
E_{AS}	Single Pulse Avalanche Energy ³	28.8	mJ
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Units
R_{thj-c}	Maximum Thermal Resistance, Junction-case	5	$^\circ\text{C}/\text{W}$
R_{thj-a}	Maximum Thermal Resistance, Junction-ambient	110	$^\circ\text{C}/\text{W}$

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	-30	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-15A	-	-	20	mΩ
		V _{GS} =-4.5V, I _D =-10A	-	-	40	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 =-10A	-	18	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-24V, V _{GS} =0V	-	-	-10	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Q _g	Total Gate Charge	I _D =-10A	-	12	19.2	nC
Q _{gs}	Gate-Source Charge	V _{DS} =-15V	-	5	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =-4.5V	-	4	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =-15V	-	10	-	ns
t _r	Rise Time	I _D =-15A	-	35	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =6Ω	-	40	-	ns
t _f	Fall Time	V _{GS} =-10V	-	46	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	1300	2080	pF
C _{oss}	Output Capacitance	V _{DS} =-15V	-	190	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	135	-	pF
R _g	Gate Resistance	f=1.0MHz	-	8	16	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =-15A, V _{GS} =0V	-	-	-1.3	V
t _{rr}	Reverse Recovery Time	I _S =-15A, V _{GS} =0V,	-	11	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	4	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Starting T_J=25°C , V_{DD}=-30V , L=0.1mH , R_G=25Ω , V_{GS}=-10V

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.

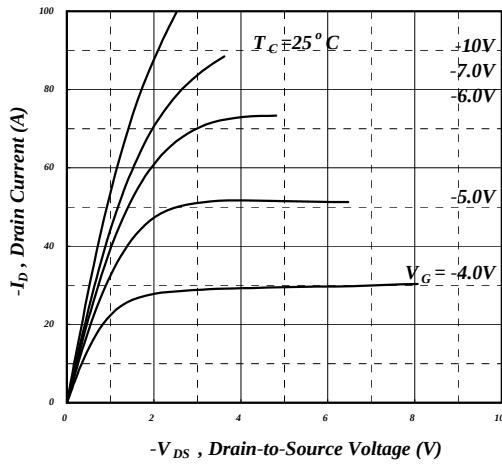


Fig 1. Typical Output Characteristics

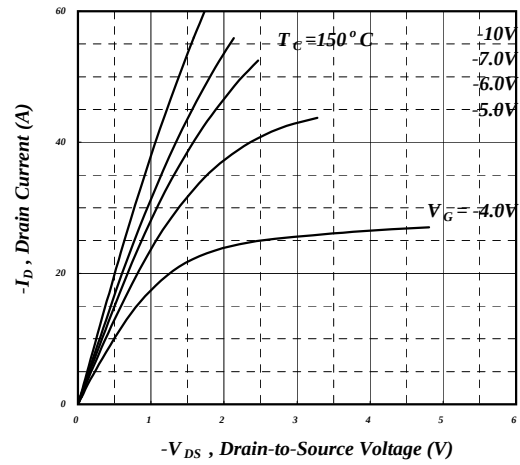


Fig 2. Typical Output Characteristics

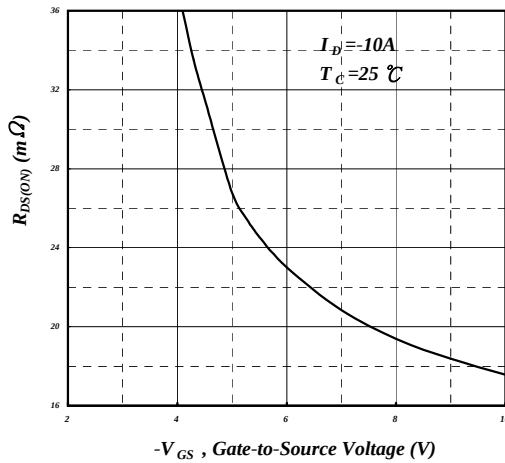
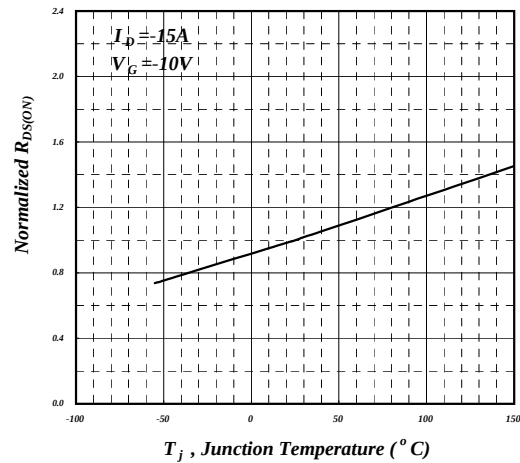
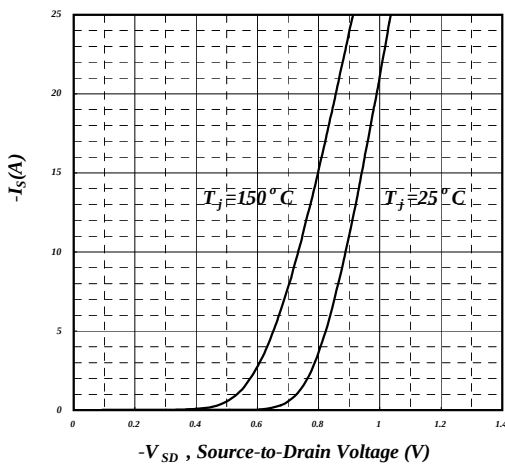


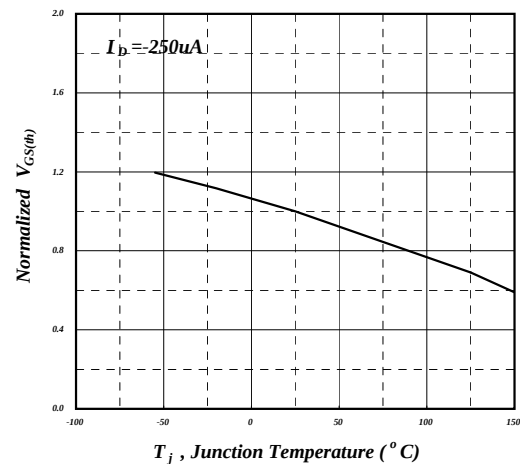
Fig 3. On-Resistance v.s. Gate Voltage



**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**

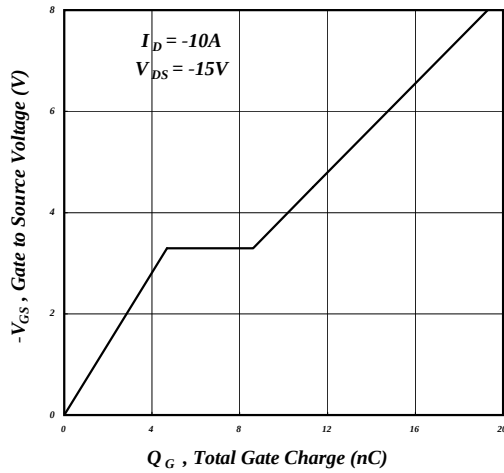


Fig 7. Gate Charge Characteristics

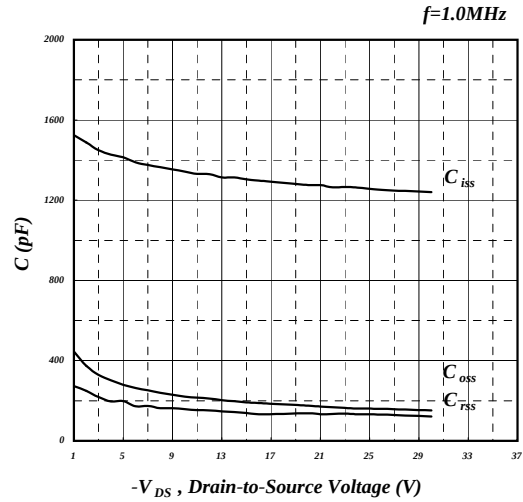


Fig 8. Typical Capacitance Characteristics

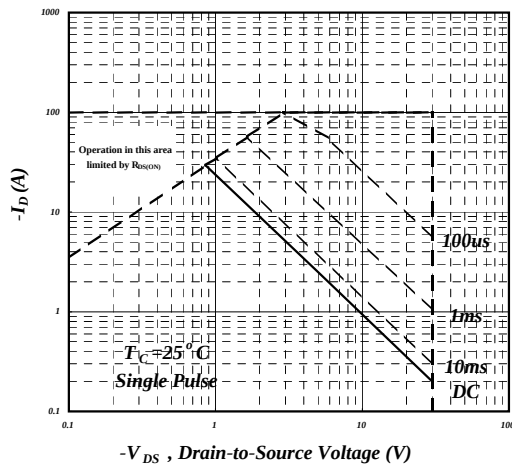


Fig 9. Maximum Safe Operating Area

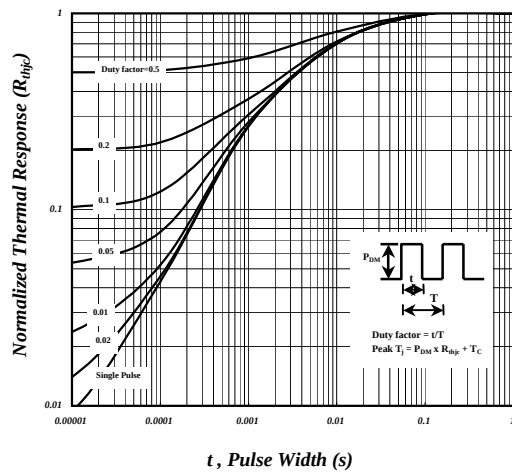


Fig 10. Effective Transient Thermal Impedance

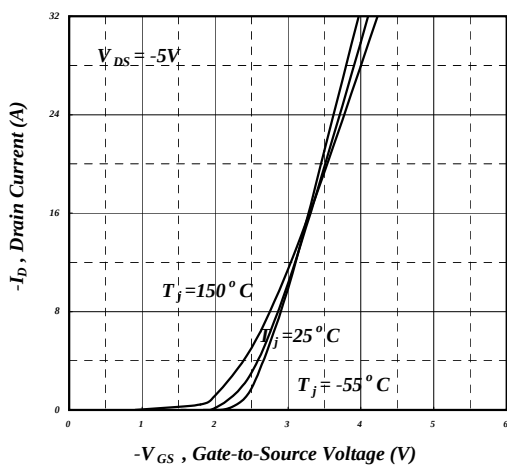


Fig 11. Transfer Characteristics

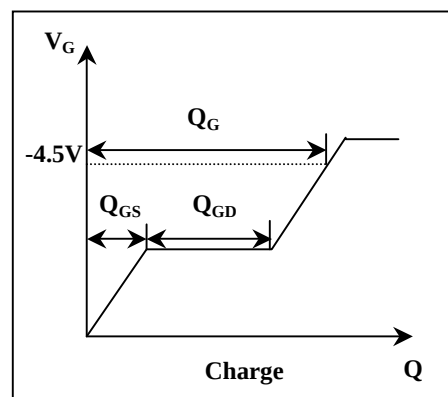


Fig 12. Gate Charge Waveform

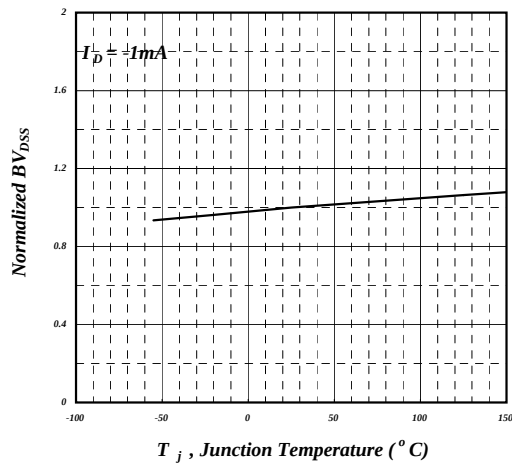


Fig 13. Normalized BV_{DSS} v.s. Junction Temperature

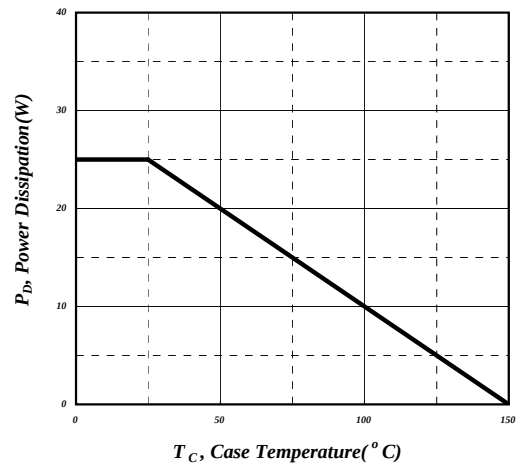


Fig 14. Total Power Dissipation

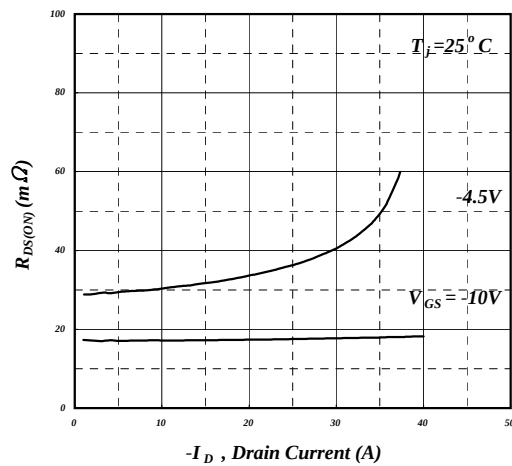


Fig 15. Typ. Drain-Source on State Resistance

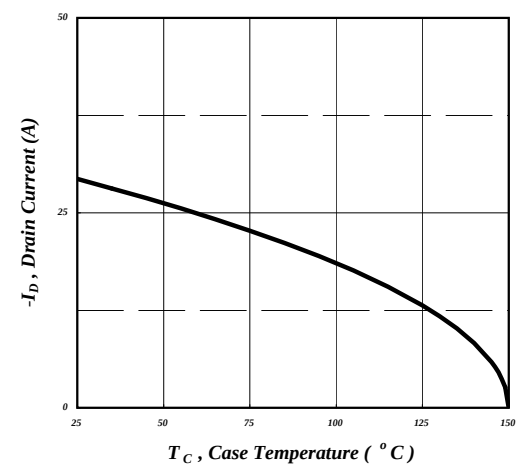
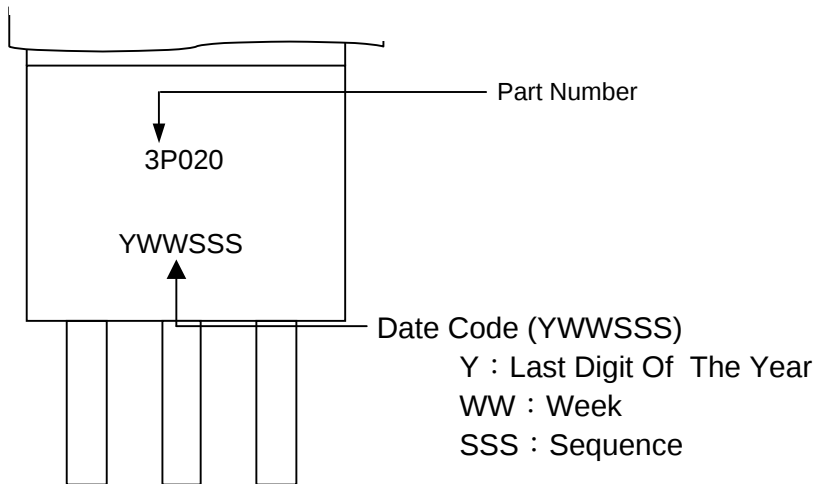
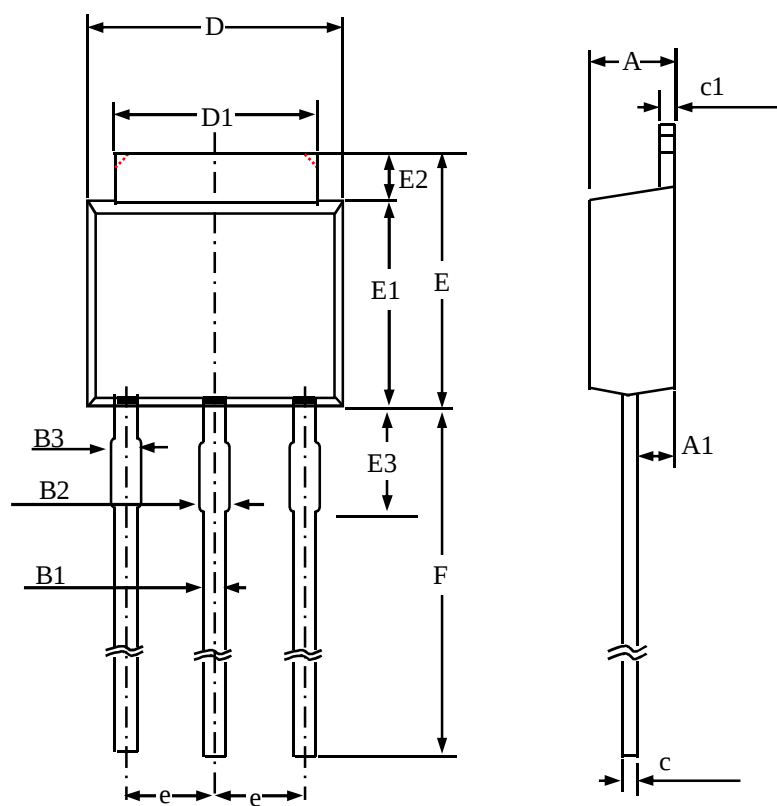


Fig 16. Drain Current v.s. Case Temperature

MARKING INFORMATION



Package Outline : TO-251



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	2.10	2.30	2.50
A1	0.80	1.15	1.50
B1	0.40	0.70	1.00
B2	0.60	0.88	1.15
B3	0.50	0.83	1.15
c	0.30	0.50	0.70
c1	0.30	0.50	0.70
D	6.30	6.55	6.80
D1	4.80	5.20	5.60
E	6.70	7.10	7.50
E1	5.30	5.80	6.30
E2	0.50	1.10	1.70
E3	1.30	1.80	2.30
e	----	2.30	----
F	7.00	8.33	9.65

1.All Dimensions Are in Millimeters.

2.Dimension Does Not Include Mold Protrusions.

TO-251 FOOTPRINT :

