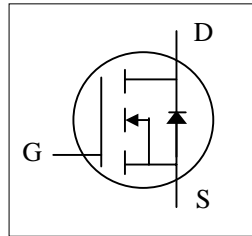


- ▼ 100% R_g & UIS Test
- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant & Halogen-Free

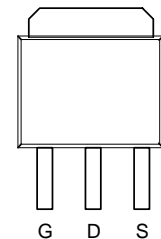


BV_{DSS}	60V
$R_{DS(ON)}$	6.5m Ω
I_D	66A

Description

XP6NA6R5 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-251VS short lead package is preferred for all commercial-industrial through-hole applications without lead-cutted.



TO-251VS(JV)

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
$I_D @ T_C = 25^\circ C$	Drain Current, $V_{GS} @ 10V$	66	A
$I_D @ T_C = 100^\circ C$	Drain Current, $V_{GS} @ 10V$	41.8	A
I_{DM}	Pulsed Drain Current ¹	200	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	50	W
$P_D @ T_A = 25^\circ C$	Total Power Dissipation	1.13	W
E_{AS}	Single Pulse Avalanche Energy ³	80	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	2.5	°C/W
R _{thj-a}	Maximum Thermal Resistance, Junction-ambient	110	°C/W

Electrical Characteristics @ $T_j=25^{\circ}\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=30A$	-	-	6.5	$m\Omega$
		$V_{GS}=6V, I_D=20A$	-	-	11	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=30A$	-	54	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=48V, V_{GS}=0V$	-	-	25	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 0.1	μA
Q_g	Total Gate Charge ⁴	$I_D=30A$ $V_{DS}=30V$ $V_{GS}=10V$	-	35	56	nC
Q_{gs}	Gate-Source Charge ⁴		-	11	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge ⁴		-	10	-	nC
$t_{d(on)}$	Turn-on Delay Time ⁴	$V_{DS}=30V$ $I_D=30A$	-	13	-	ns
t_r	Rise Time ⁴		-	56	-	ns
$t_{d(off)}$	Turn-off Delay Time ⁴	$R_G=10\Omega$	-	33	-	ns
t_f	Fall Time ⁴	$V_{GS}=10V$	-	68	-	ns
C_{iss}	Input Capacitance ⁴	$V_{GS}=0V$ $V_{DS}=50V$ $f=1.0MHz$	-	1860	2976	pF
C_{oss}	Output Capacitance ⁴		-	315	-	pF
C_{riss}	Reverse Transfer Capacitance ⁴		-	20	-	pF
R_g	Gate Resistance	$f=1.0MHz$	-	1.2	2.4	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ²	$I_S=30A, V_{GS}=0V$	-	-	1.3	V
t_{rr}	Reverse Recovery Time ⁴	$I_S=30A, V_{GS}=0V,$ $di/dt=100A/\mu s$	-	30	-	ns
Q_{rr}	Reverse Recovery Charge ⁴		-	20	-	nC

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse test
3. Starting $T_j=25^{\circ}\text{C}$, $V_{DD}=30V$, $L=0.1mH$, $R_G=25\Omega$, $V_{GS}=10V$
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.

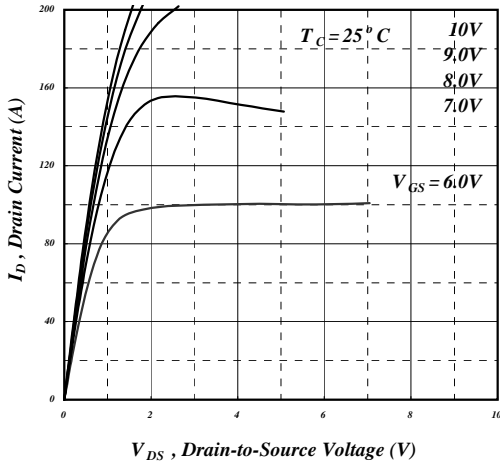


Fig 1. Typical Output Characteristics

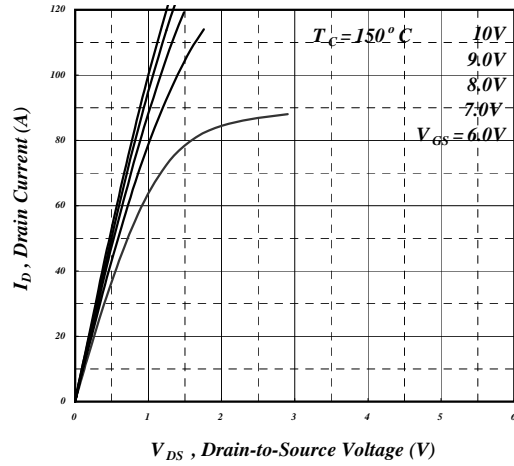


Fig 2. Typical Output Characteristics

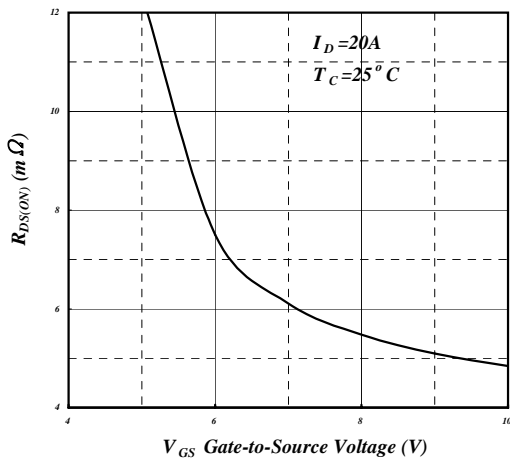


Fig 3. On-Resistance v.s. Gate Voltage

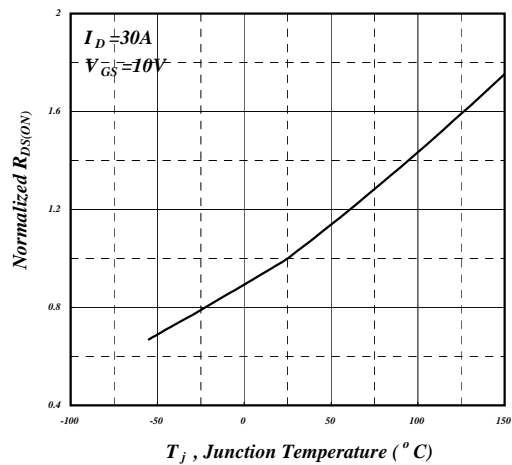


Fig 4. Normalized On-Resistance v.s. Junction Temperature

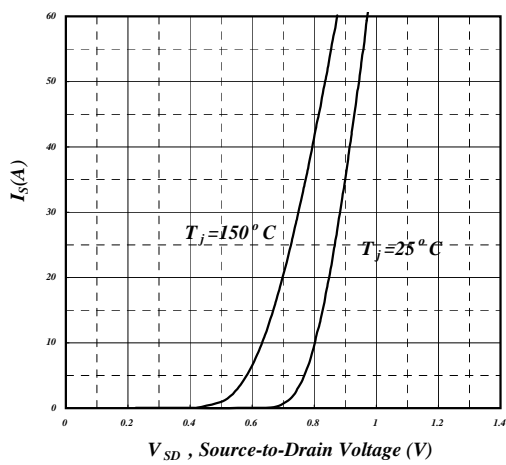


Fig 5. Forward Characteristic of Reverse Diode

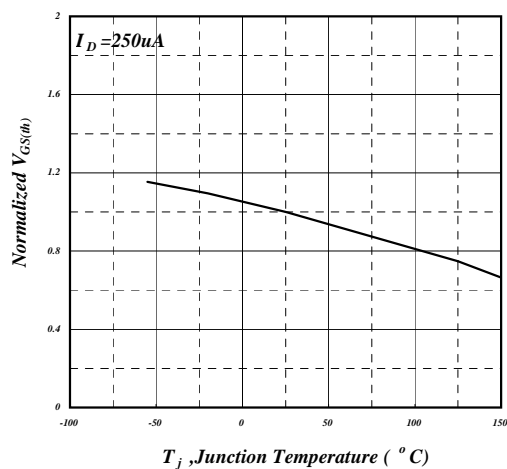


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

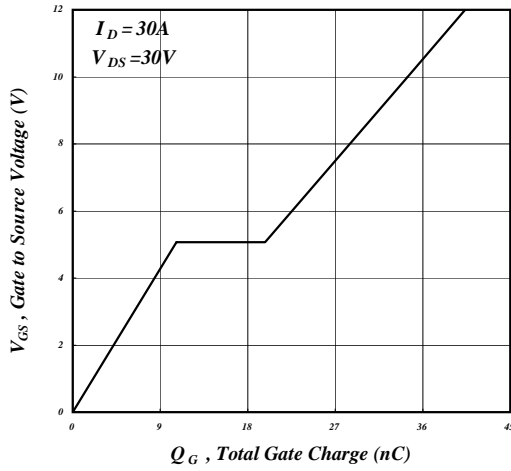


Fig 7. Gate Charge Characteristics

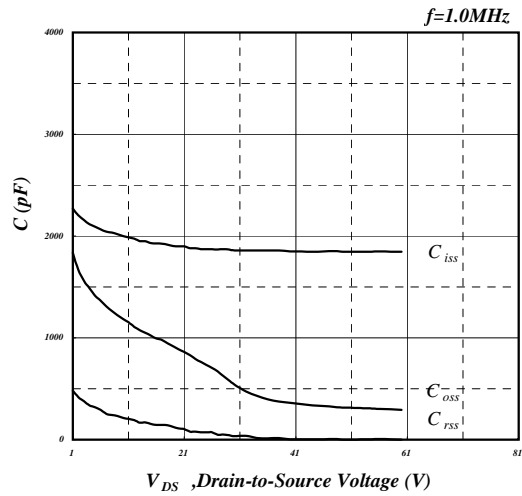


Fig 8. Typical Capacitance Characteristics

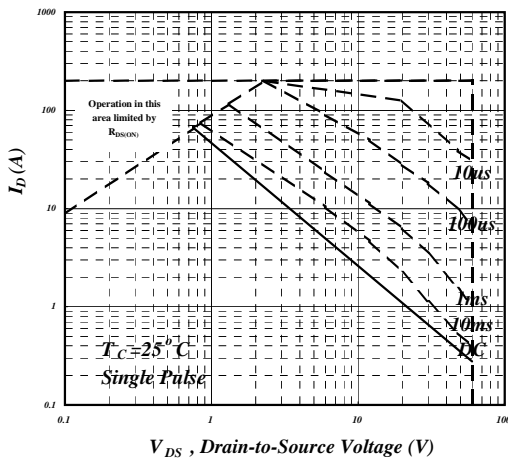


Fig 9. Maximum Safe Operating Area

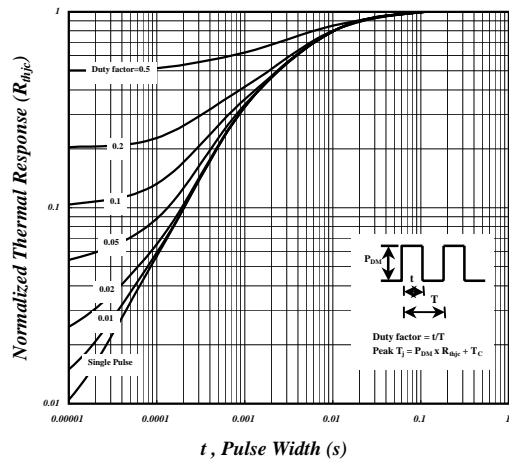


Fig 10. Effective Transient Thermal Impedance

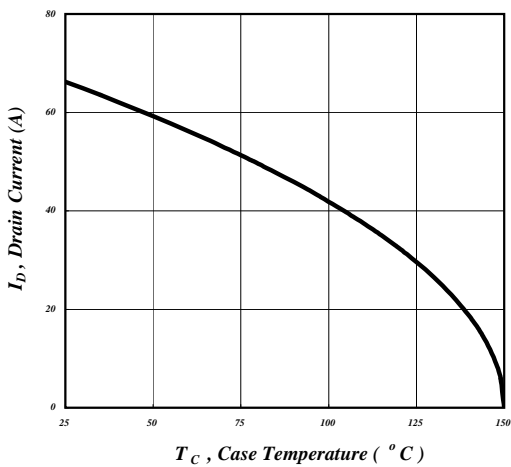


Fig 11. Drain Current v.s. Case Temperature

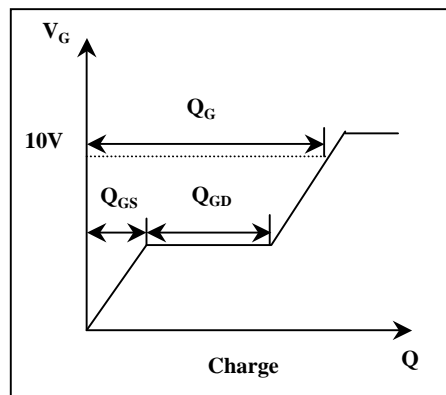


Fig 12. Gate Charge Waveform

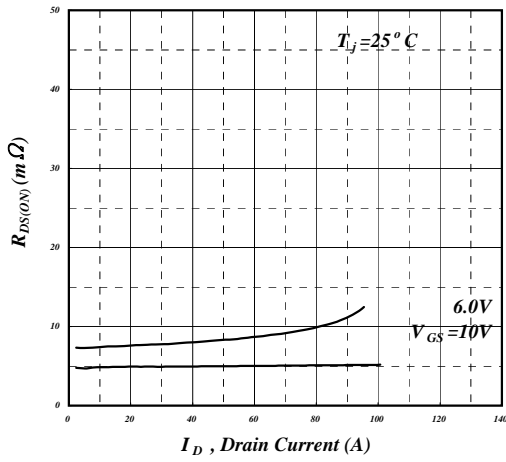


Fig 13. Typ. Drain-Source on State Resistance

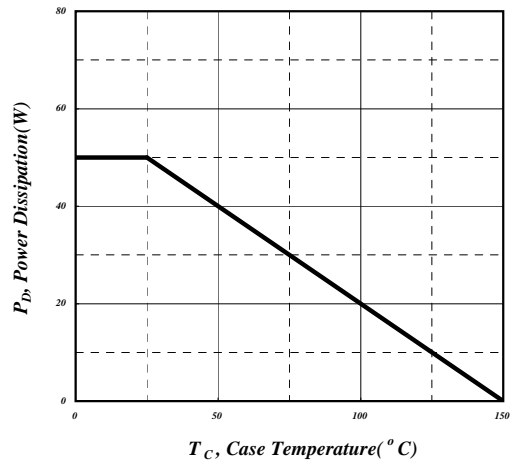


Fig 14. Total Power Dissipation

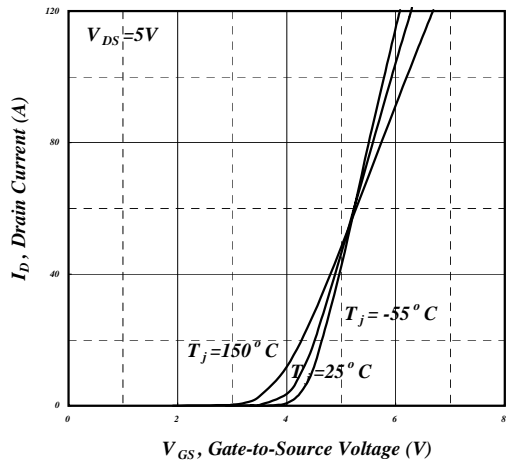
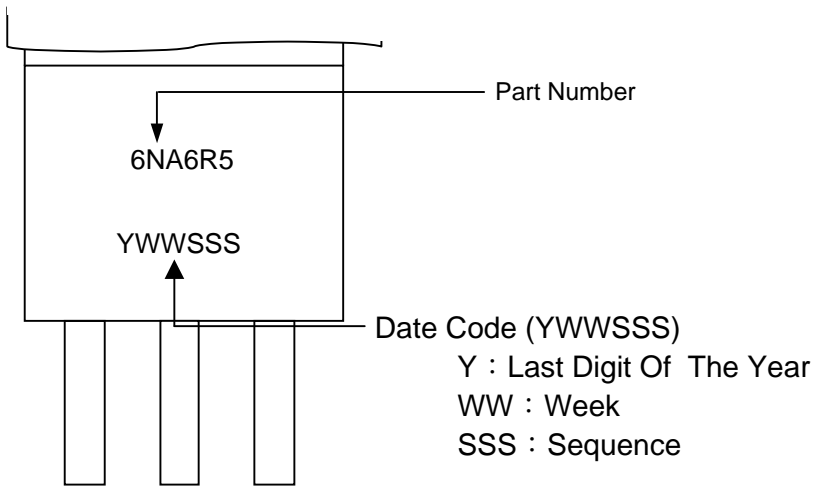
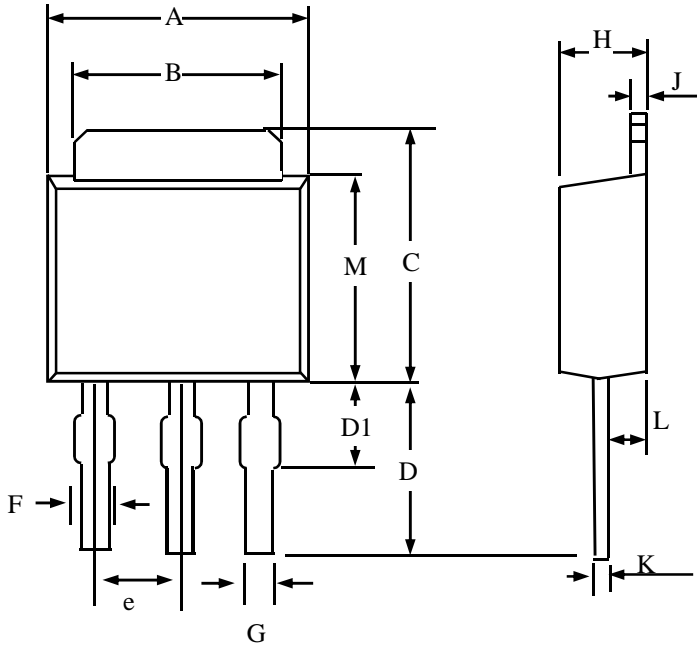


Fig 15. Transfer Characteristics

MARKING INFORMATION



Package Outline : TO-251VS



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	6.30	6.55	6.80
B	4.90	5.20	5.50
C	6.80	7.30	7.80
D	3.35	3.50	3.65
e	2.30 REF.		
F	0.60	0.90	1.20
G	0.50	0.70	0.90
H	2.10	2.25	2.40
J	0.40	0.50	0.60
K	0.40	0.50	0.60
L	0.90	1.20	1.50
M	5.40	5.90	6.40
D1	0.90	1.35	1.80

- 1.All Dimensions Are in Millimeters.
- 2.Dimension Does Not Include Mold Protrusions.

TO-251VS FOOTPRINT :

