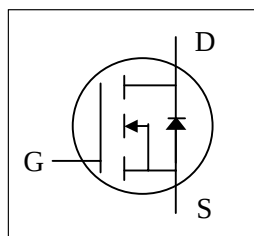


- ▼ 100% R_g & UIS Test
- ▼ Simple Drive Requirement
- ▼ Low On-resistance
- ▼ RoHS Compliant & Halogen-Free

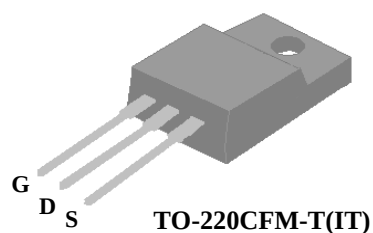


BV _{DSS}	60V
R _{DS(ON)}	4.6mΩ

Description

XP6NA4R6 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-220CFM package is widely preferred for all commercial-industrial through hole applications. The mold compound provides a high isolation voltage capability and low thermal resistance between the tab and the external heat-sink.



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	62.8	A
I _D @T _C =100°C	Drain Current, V _{GS} @ 10V	39.7	A
I _{DM}	Pulsed Drain Current ¹	240	A
P _D @T _C =25°C	Total Power Dissipation	31.2	W
P _D @T _A =25°C	Total Power Dissipation	1.92	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	4	°C/W
R _{thj-a}	Maximum Thermal Resistance, Junction-ambient	65	°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 =30A	-	-	4.6	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 =30A	-	71	-	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 =30A V _{DS} =30V V _{GS} =10V	-	47	75.2	nC
Q _{gs}	Gate-Source Charge ⁴		-	14	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge ⁴		-	12	-	nC
t _{d(on)}	Turn-on Delay Time ⁴	V _{DS} =30V I _D =30A R _G =3.3Ω V _{GS} =10V	-	13	-	ns
t _r	Rise Time ⁴		-	45	-	ns
t _{d(off)}	Turn-off Delay Time ⁴		-	26	-	ns
t _f	Fall Time ⁴		-	9	-	ns
C _{iss}	Input Capacitance ⁴	V _{GS} =0V	-	2600	4160	pF
C _{oss}	Output Capacitance ⁴	V _{DS} =50V	-	430	-	pF
C _{rss}	Reverse Transfer Capacitance ⁴	f=1.0MHz	-	20	-	pF
R _g	Gate Resistance	f=1.0MHz	-	0.8	1.6	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/μs	-	41	-	ns
Q _{rr}	Reverse Recovery Charge ⁴		-	37	-	nC

Notes:

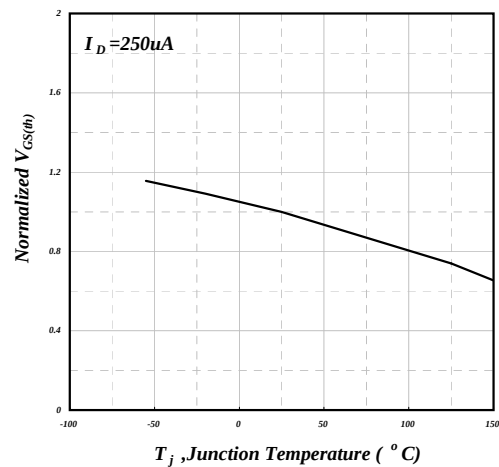
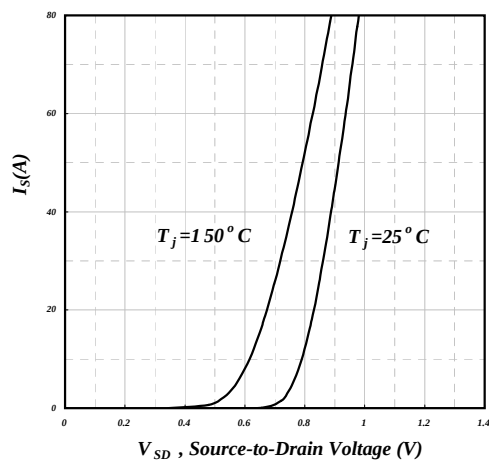
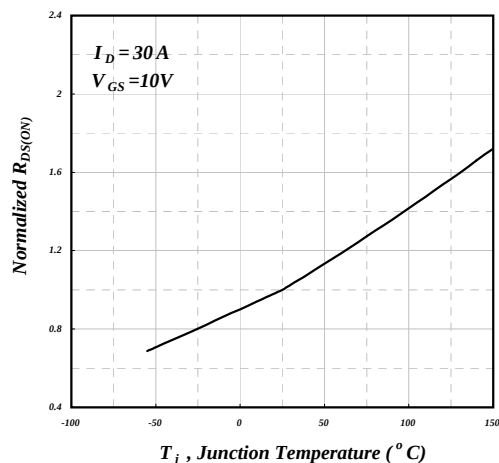
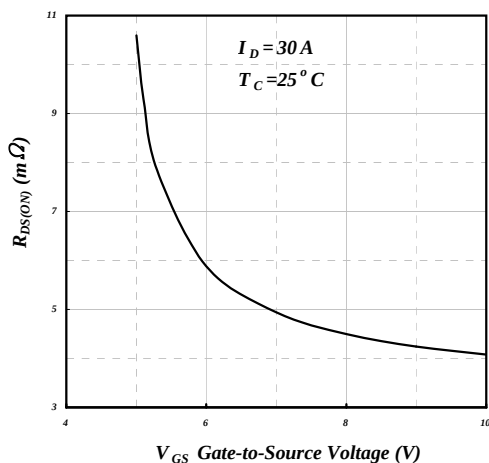
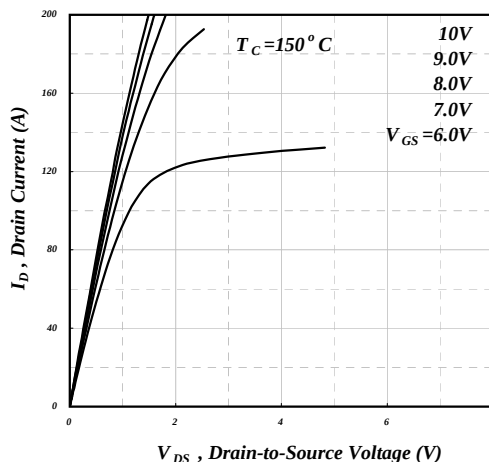
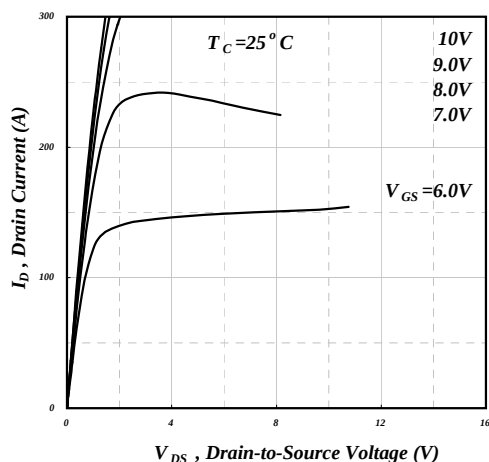
- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Starting T_j=25°C , V_{DD}=30V , L=0.1mH , R_G=25Ω , V_{GS}=10V , I_{AS}=40A
- 4.Guaranteed by design.
- 5.These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, 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.

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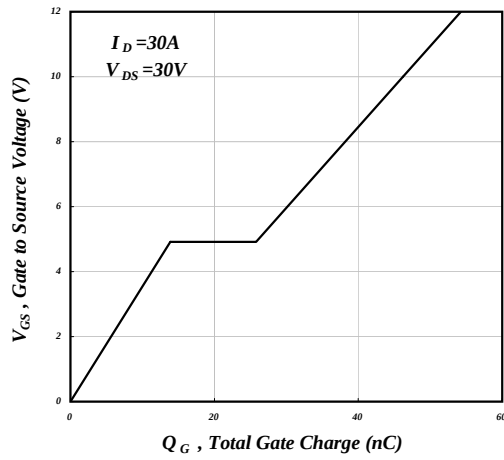


Fig 7. Gate Charge Characteristics

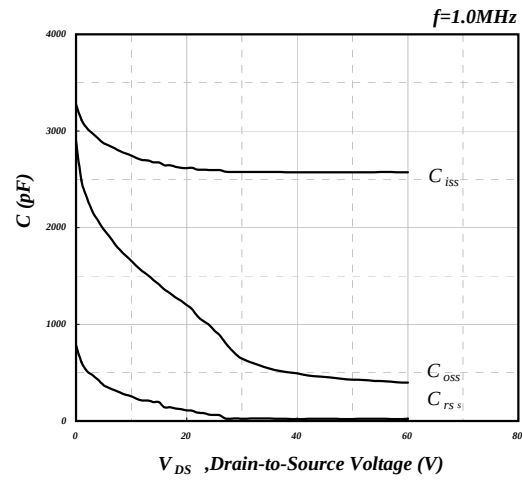


Fig 8. Typical Capacitance Characteristics

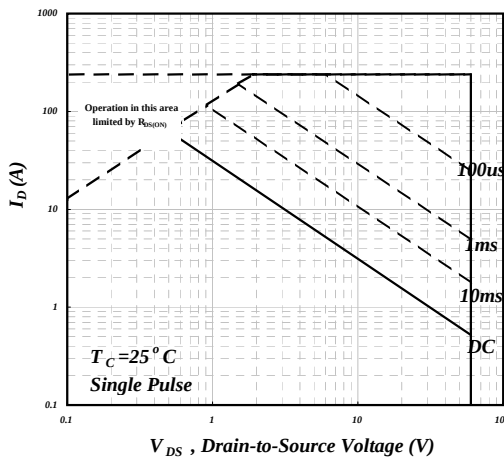


Fig 9. Maximum Safe Operating Area⁵

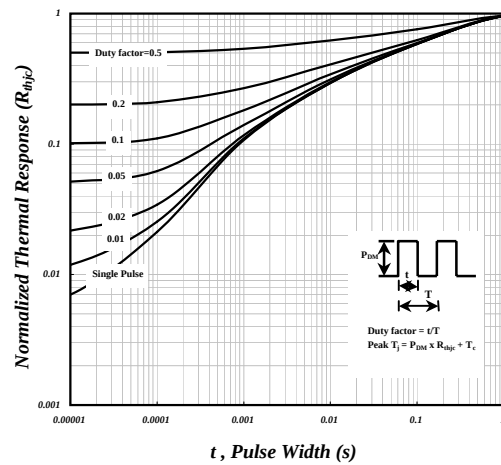


Fig 10. Effective Transient Thermal Impedance

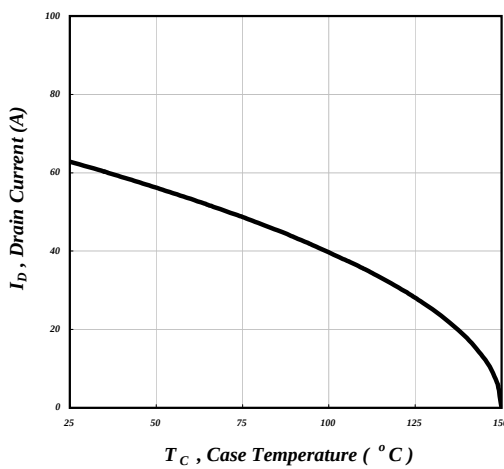


Fig 11. Drain Current v.s. Case Temperature

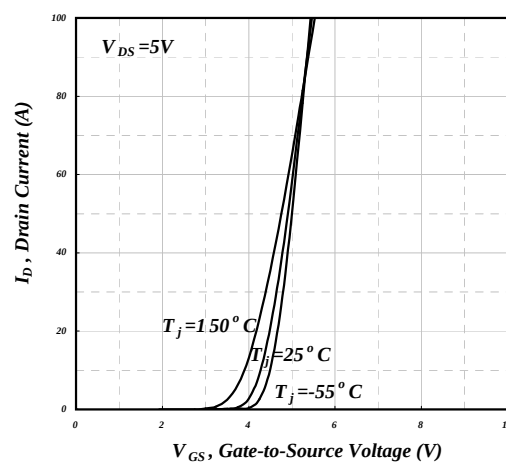


Fig 12. Transfer Characteristics

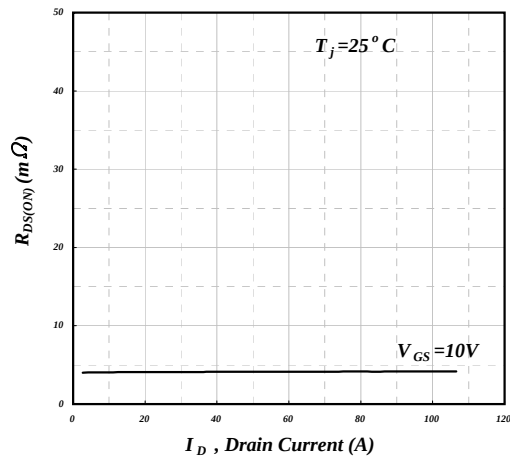


Fig 13. Typ. Drain-Source on State Resistance

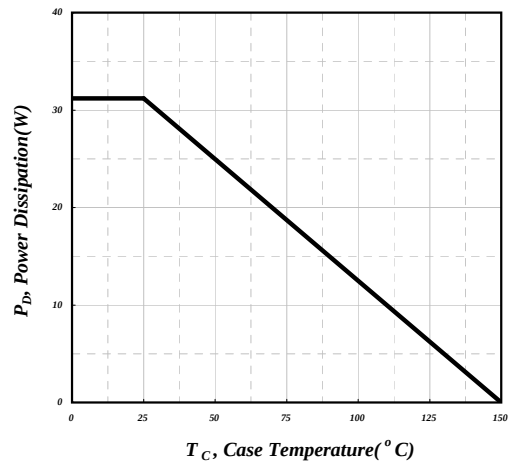


Fig 14. Total Power Dissipation

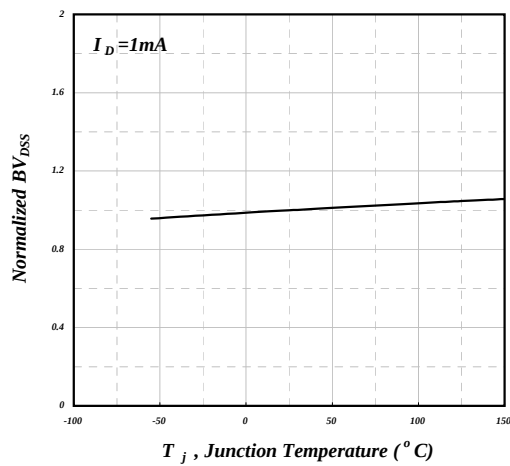
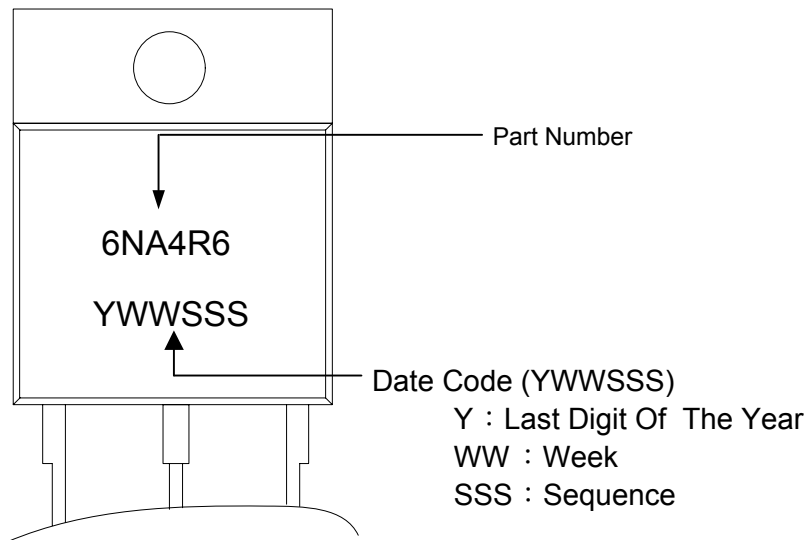
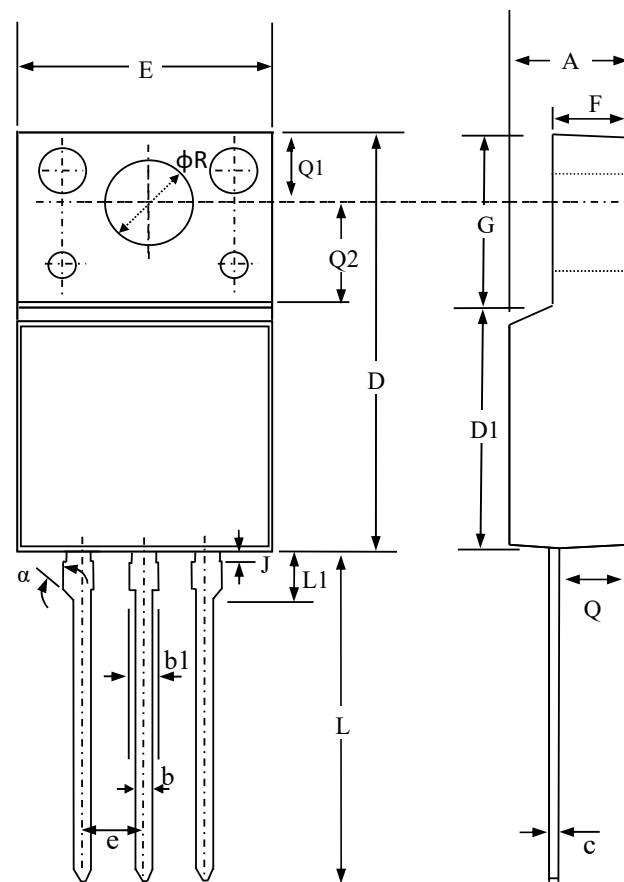


Fig 15. Normalized BV_{DSS} v.s. Junction Temperature

MARKING INFORMATION

Package Outline : TO-220CFM-T



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.30	4.50	4.70
b	0.54	0.69	0.84
b1	0.99	1.14	1.29
c	0.45	0.62	0.79
D	14.70	15.00	15.30
D1	8.5 Ref.		
e	2.54 Ref.		
E	9.70	10.00	10.30
F	2.50	2.70	2.90
G	6.30	6.70	7.10
L	12.50	13.00	13.50
L1	1.80	2.30	2.80
J	0.10	0.20	--
Q	2.50	2.60	2.90
Q1	2.90	3.10	3.30
Q2	3.5 Ref.		
ϕR	3.00	3.20	3.40
α	45° Ref.		

- 1.All dimension are in millimeters.
- 2.Dimension does not include burrs and mold flash/protrusions.
- 3.The outline schematic is not to scale and slightly different from the actual product appearance.

TO-220CFM-T FOOTPRINT :

