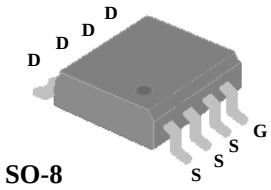
XP6NA6R5M

Halogen-Free Product

N-CHANNEL ENHANCEMENT MODE

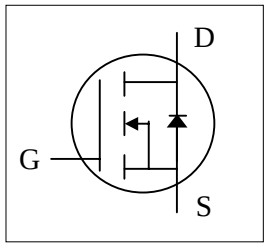
POWER MOSFET

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



SO-8

BV_{DSS}	60V
$R_{DS(ON)}$	6.5mΩ
I_D[3]	15A



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 SO-8 package is widely preferred for all commercial-industrial surface mount applications using infrared reflow technique and suited for voltage conversion or switch applications.

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_A=25℃	Drain Current, V_{GS} @ 10V[3]	15	A
I_D@T_A=70℃	Drain Current, V_{GS} @ 10V[3]	12	A
I_{DM}	Pulsed Drain Current[1]	50	A
P_D@T_A=25℃	Total Power Dissipation	2.5	W
E_{AS}	Single Pulse Avalanche Energy[4]	31.2	mJ
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	50	℃/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=14A	-	-	6.5	mΩ
		V_{GS}=6V, I_D=7A	-	-	11	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	2.2	-	3.6	V
g_{fs}	Forward Transconductance	V_{DS}=5V, I_D=14A	-	38	-	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[5]	I_D=14A	-	33	52.8	nC
Q_{gs}	Gate-Source Charge[5]	V_{DS}=30V	-	10.5	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge[5]	V_{GS}=10V	-	7.5	-	nC
$t_{d(on)}$	Turn-on Delay Time[5]	V_{DS}=30V	-	13	-	ns
t_r	Rise Time[5]	I_D=1A	-	9	-	ns
$t_{d(off)}$	Turn-off Delay Time[5]	R_G=10Ω	-	31	-	ns
t_f	Fall Time[5]	V_{GS}=3.3V	-	60	-	ns
C_{iss}	Input Capacitance[5]	V_{GS}=0V	-	1850	2960	pF
C_{oss}	Output Capacitance[5]	V_{DS}=50V	-	300	-	pF
C_{rss}	Reverse Transfer Capacitance[5]	f=1.0MHz	-	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=1.9A, V_{GS}=0V	-	-	1.3	V
t_{rr}	Reverse Recovery Time[5]	I_S=14A, V_{GS}=0V,	-	33	-	ns
Q_{rr}	Reverse Recovery Charge[5]	dI/dt=100A/μs	-	24	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in^2 2oz copper pad of FR4 board, t ≤10sec, 125°C/W when mounted on min. copper pad.

4.Starting T_j=25°C , V_{DD}=30V , L=0.1mH , R_G=25Ω , V_{GS}=10V

5.Guaranteed by design.

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 $T_{J(MAX)}$=150°C.

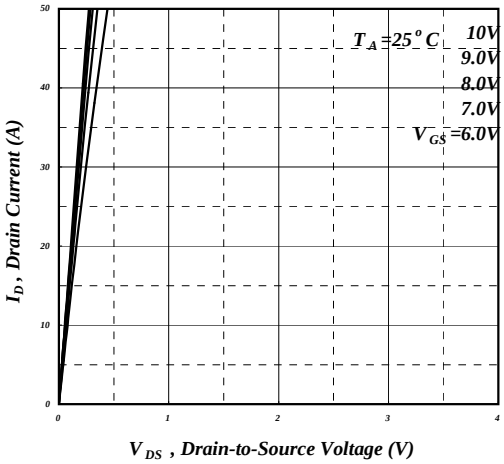


Fig 1. Typical Output Characteristics

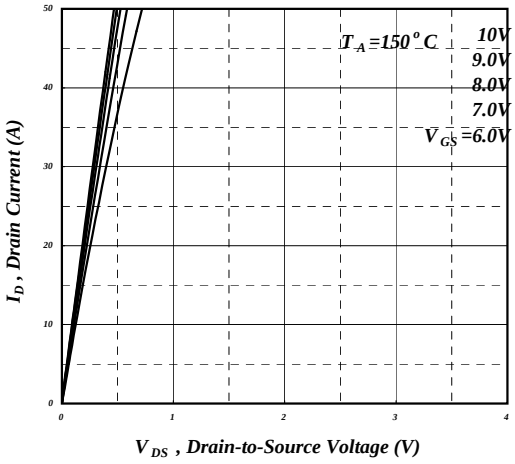


Fig 2. Typical Output Characteristics

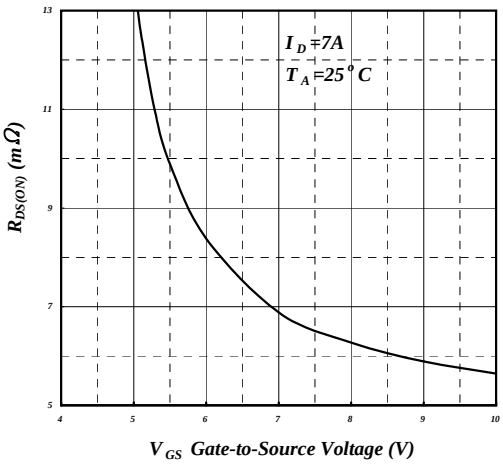


Fig 3. On-Resistance v.s. Gate Voltage

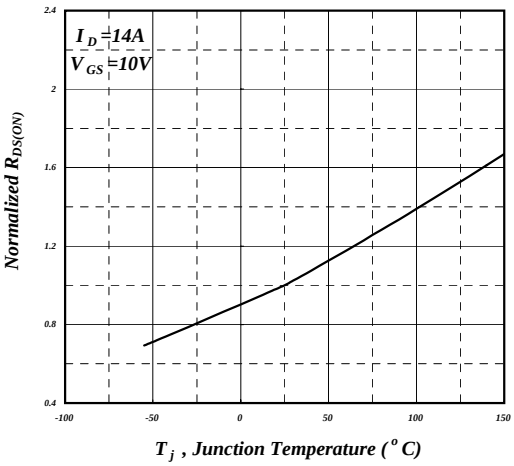


Fig 4. Normalized On-Resistance v.s. Junction Temperature

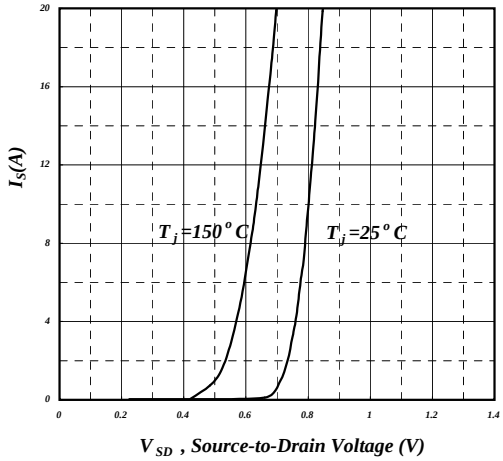


Fig 5. Forward Characteristic of Reverse Diode

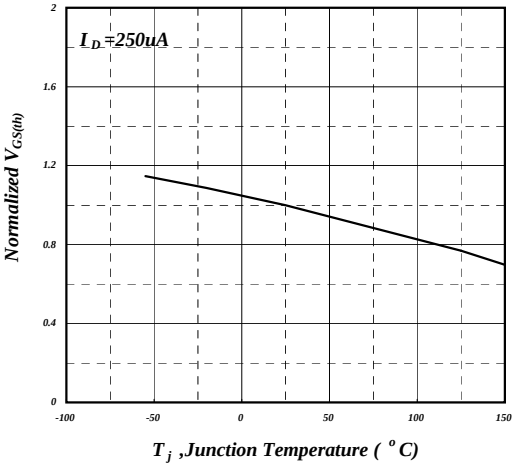


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

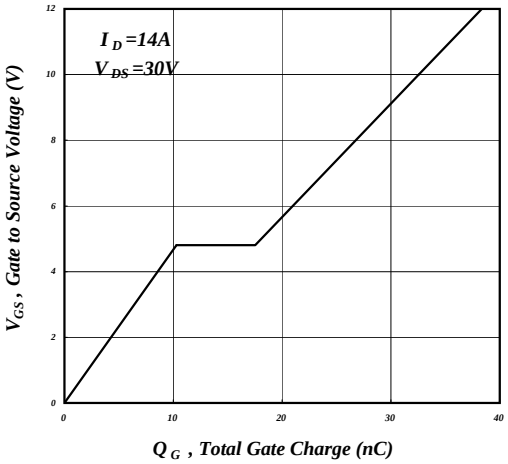


Fig 7. Gate Charge Characteristics

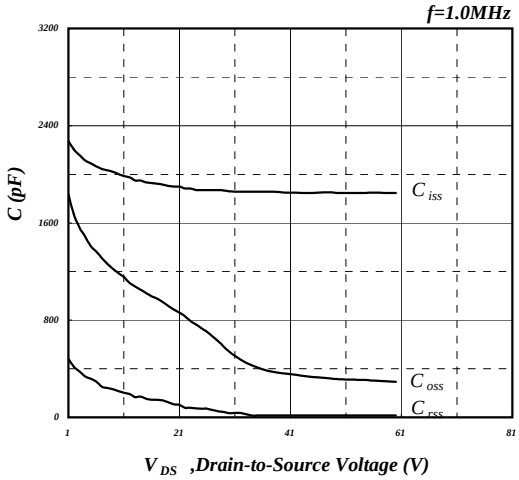


Fig 8. Typical Capacitance Characteristics

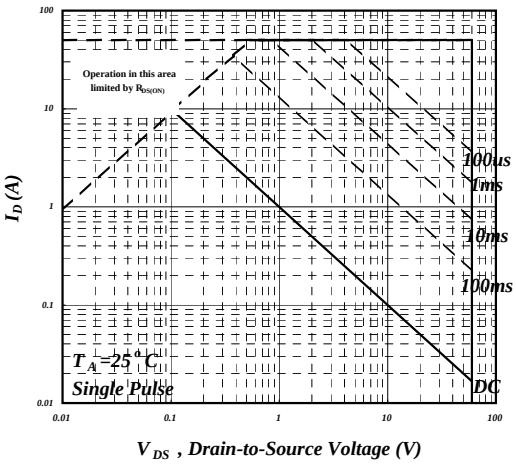


Fig 9. Maximum Safe Operating Area[6]

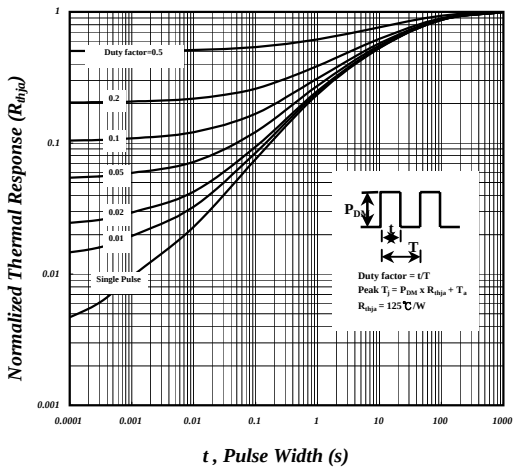


Fig 10. Effective Transient Thermal Impedance

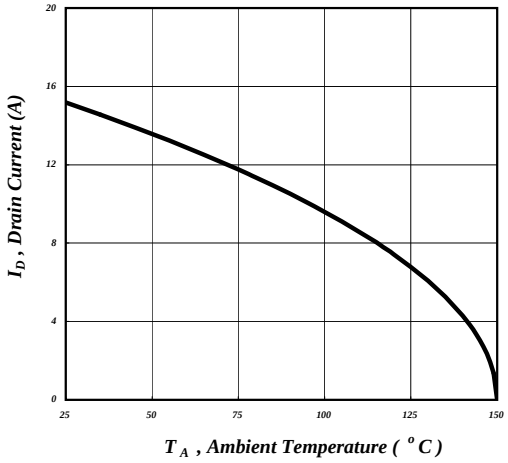


Fig 11. Drain Current v.s. Ambient Temperature

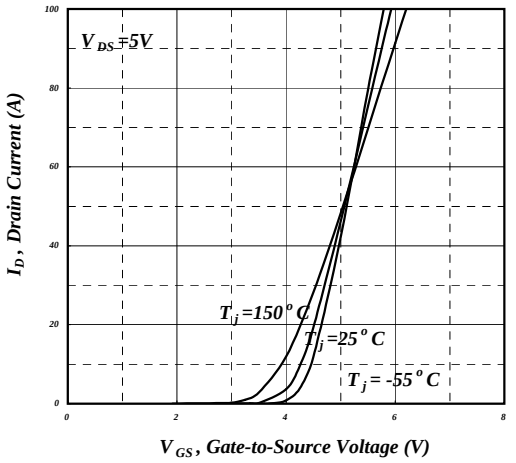


Fig 12. Transfer Characteristics

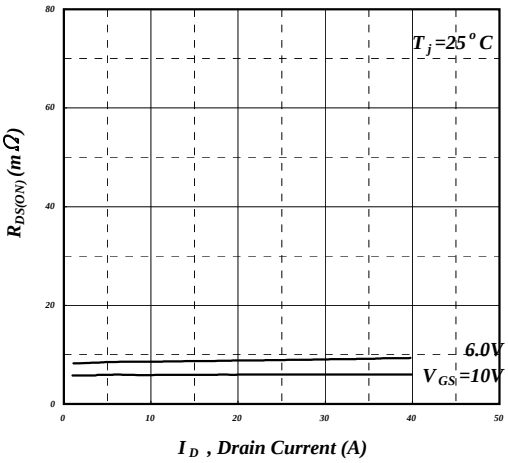


Fig 13. Typ. Drain-Source on State Resistance

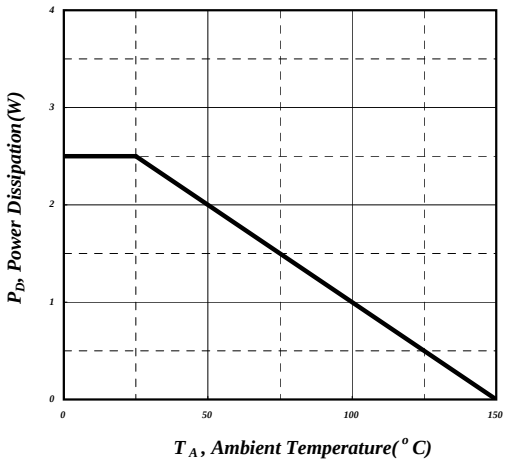
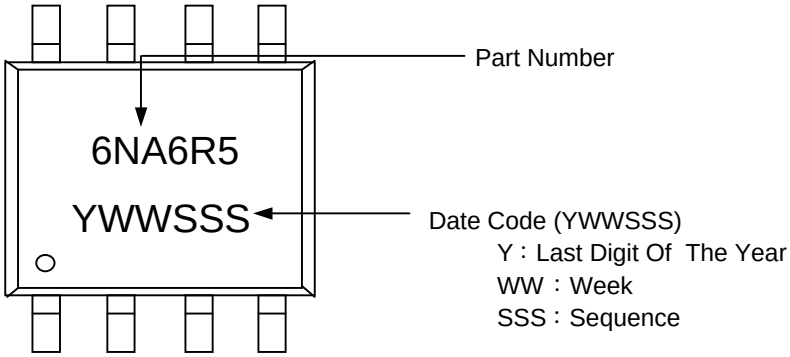
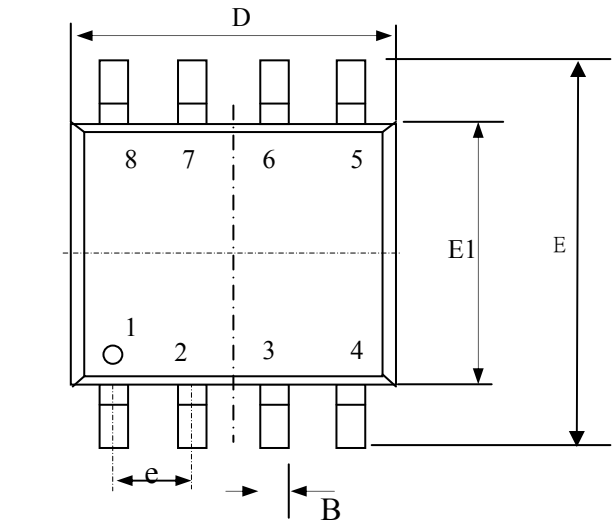


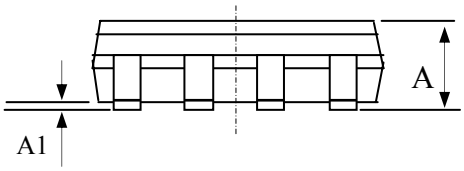
Fig 14. Total Power Dissipation

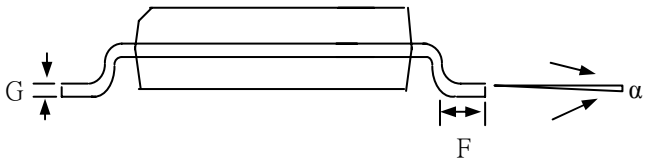
MARKING INFORMATION



Package Outline : SO-8







SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	1.35	1.55	1.75
A1	0.05	0.15	0.25
B	0.30	0.41	0.51
D	4.80	5.05	5.30
E	5.79	6.00	6.20
E1	3.70	3.90	4.10
e	1.27 TYP		
G	0.17	0.21	0.25
F	0.38	0.83	1.27
α	0°	4°	8°

1.All Dimension Are In Millimeters.

2.Dimension Does Not Include Mold Protrusions.

Draw No. M1-M8-G-v03

SO-8 FOOTPRINT：