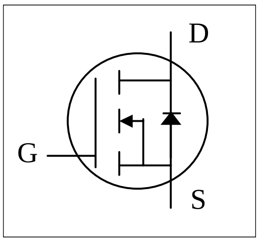
XP12NA012J

Halogen-Free Product

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

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

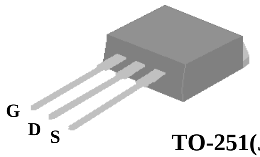


BV_{DSS}	120V
$R_{DS(ON)}$	12mΩ
I_D	60A

Description

XP12NA012 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.



TO-251(J)

Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	120	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V	60	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V	37.6	A
I_{DM}	Pulsed Drain Current[1]	240	A
P_D@T_C=25℃	Total Power Dissipation	83.3	W
P_D@T_A=25℃	Total Power Dissipation	1.13	W
E_{AS}	Single Pulse Avalanche Energy[3]	72	mJ
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	1.5	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	110	℃/W

Electrical Characteristics@T_j=25^{o}C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	120	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=30A	-	-	12	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	2.5	-	4.5	V
g_{fs}	Forward Transconductance	V_{DS}=5V, I_D=30A	-	55	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=96V, V_{GS}=0V	-	-	25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}= $\pm$20V, V_{DS}=0V	-	-	$\pm$0.1	uA
Q_g	Total Gate Charge[4]	I_D=30A	-	45	72	nC
Q_{gs}	Gate-Source Charge[4]	V_{DS}=60V	-	15	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge[4]	V_{GS}=10V	-	14	-	nC
$t_{d(on)}$	Turn-on Delay Time[4]	V_{DS}=60V	-	16	-	ns
t_r	Rise Time[4]	I_D=30A	-	69	-	ns
$t_{d(off)}$	Turn-off Delay Time[4]	R_G=7.5Ω	-	36	-	ns
t_f	Fall Time[4]	V_{GS}=10V	-	72	-	ns
C_{iss}	Input Capacitance[4]	V_{GS}=0V	-	2510	4016	pF
C_{oss}	Output Capacitance[4]	V_{DS}=100V	-	255	-	pF
C_{rss}	Reverse Transfer Capacitance[4]	f=1.0MHz	-	15	-	pF
R_g	Gate Resistance	f=1.0MHz	-	1.25	2.5	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,	-	110	-	ns
Q_{rr}	Reverse Recovery Charge[4]	dI/dt=100A/µs	-	270	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Starting T_j=25^{o}C , V_{DD}=50V , L=1mH , R_G=25Ω , V_{GS}=10V

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^{o}C.

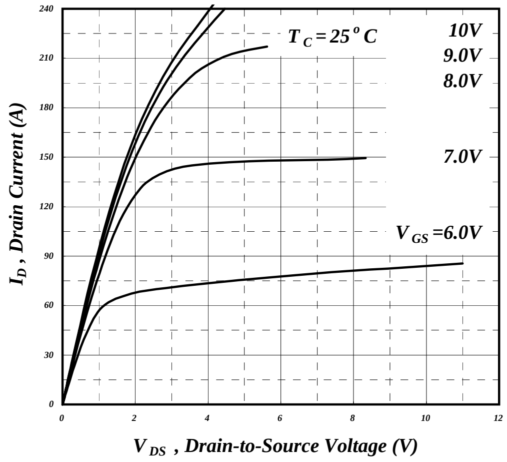


Fig 1. Typical Output Characteristics

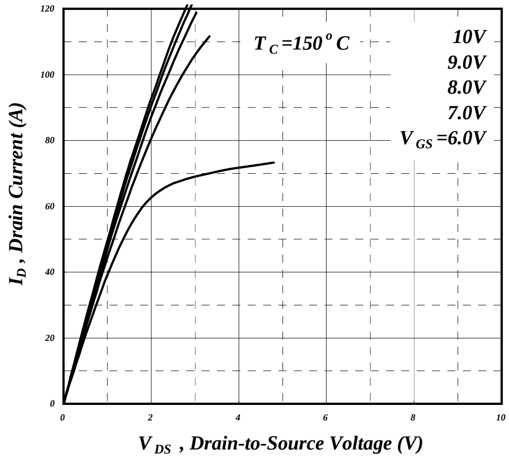


Fig 2. Typical Output Characteristics

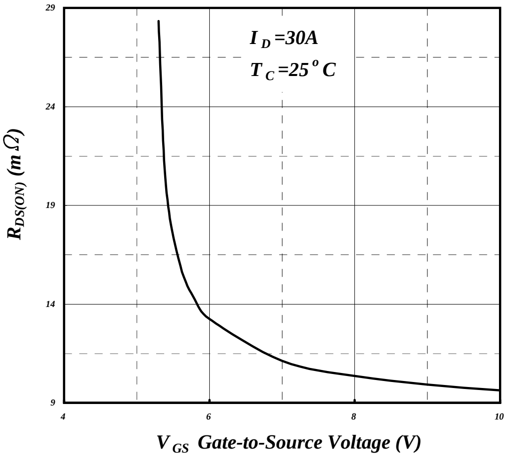


Fig 3. On-Resistance v.s. Gate Voltage

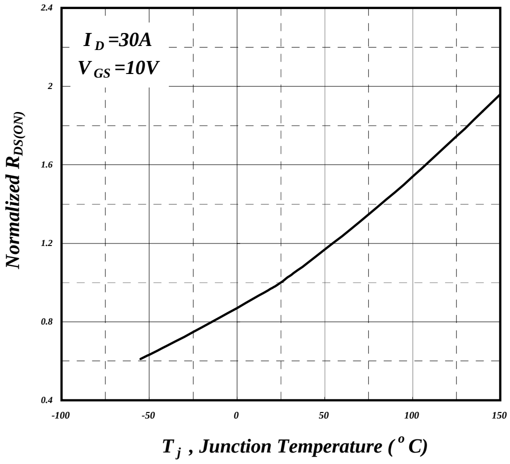


Fig 4. Normalized On-Resistance v.s. Junction Temperature

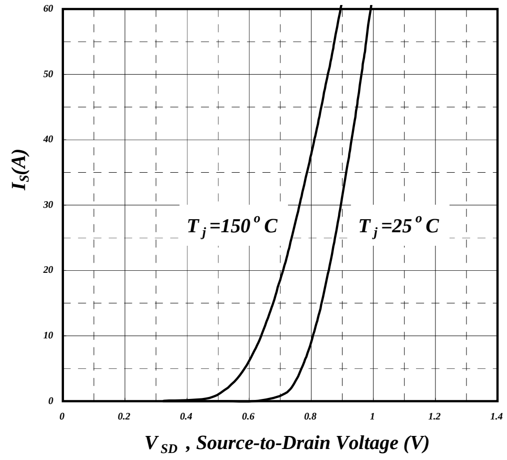


Fig 5. Forward Characteristic of Reverse Diode

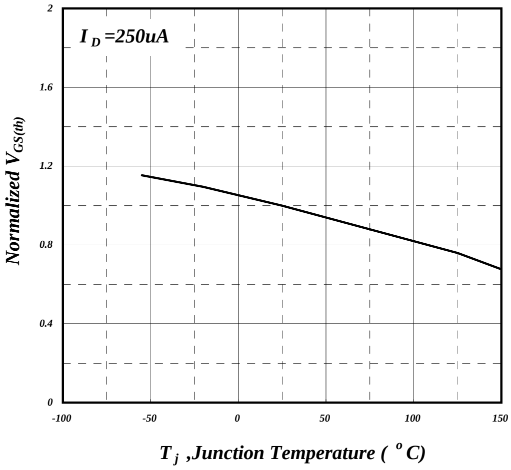


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

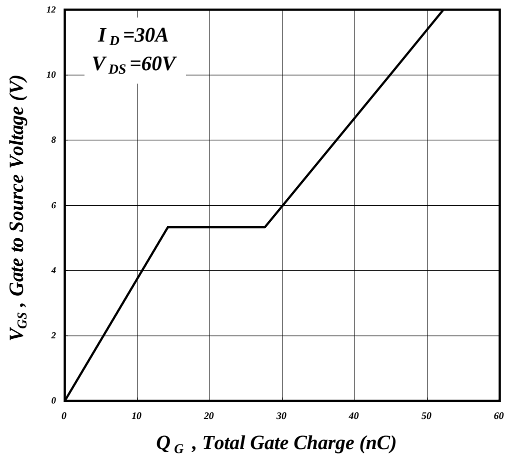


Fig 7. Gate Charge Characteristics

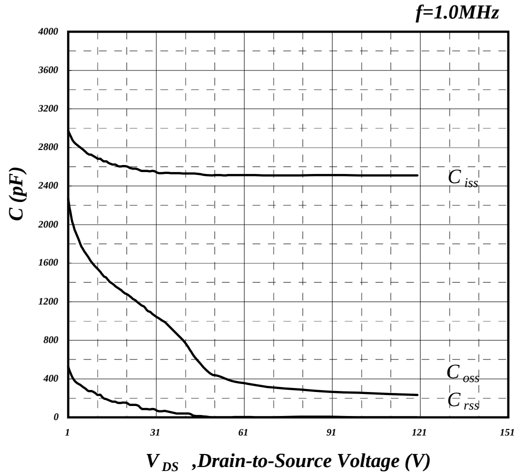


Fig 8. Typical Capacitance Characteristics

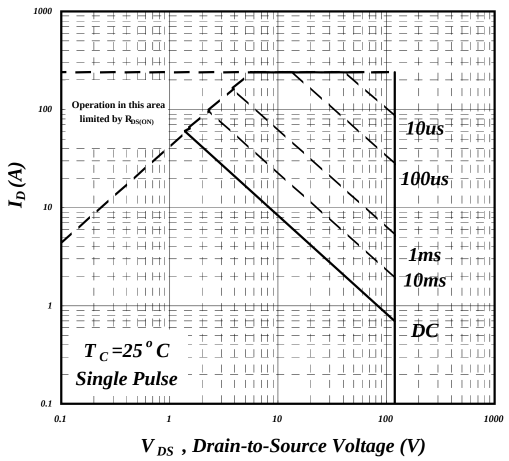


Fig 9. Maximum Safe Operating Area[5]

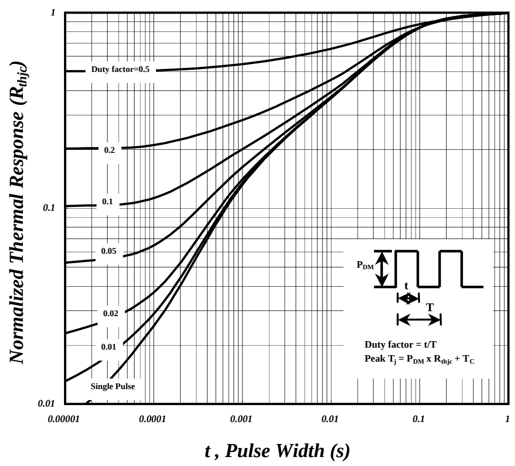


Fig 10. Effective Transient Thermal Impedance

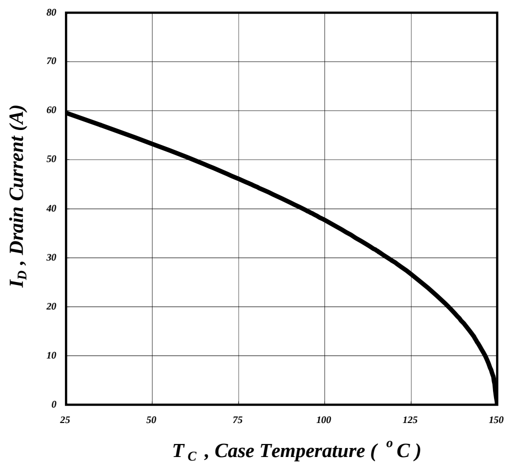


Fig 11. Drain Current v.s. Case Temperature

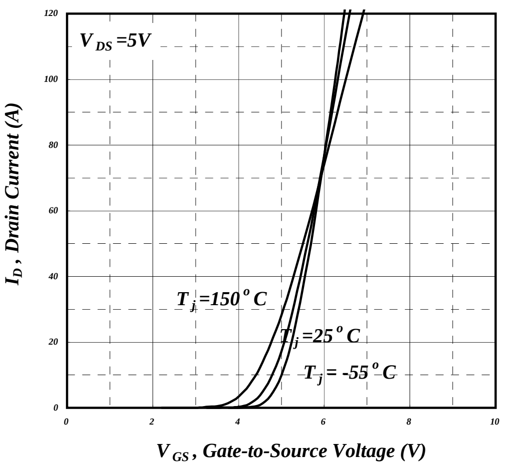


Fig 12. Transfer Characteristics

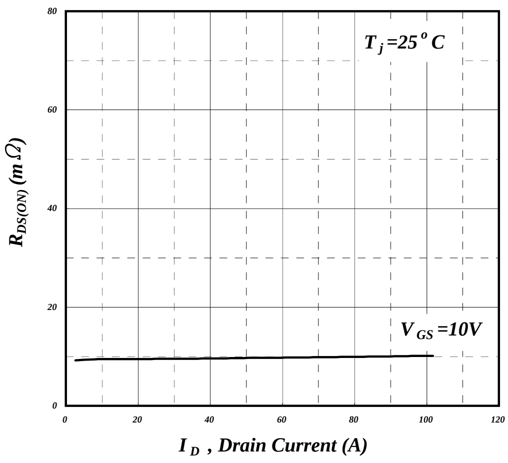


Fig 13. Typ. Drain-Source on State Resistance

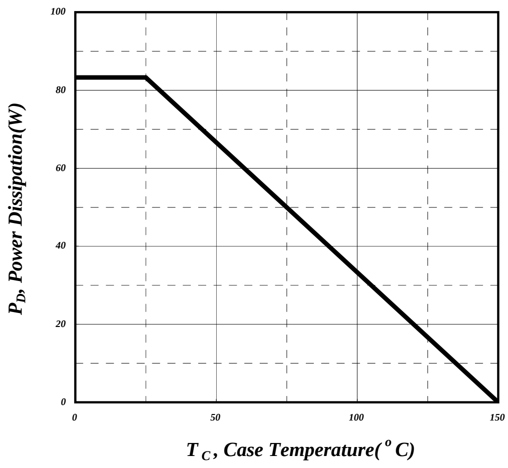
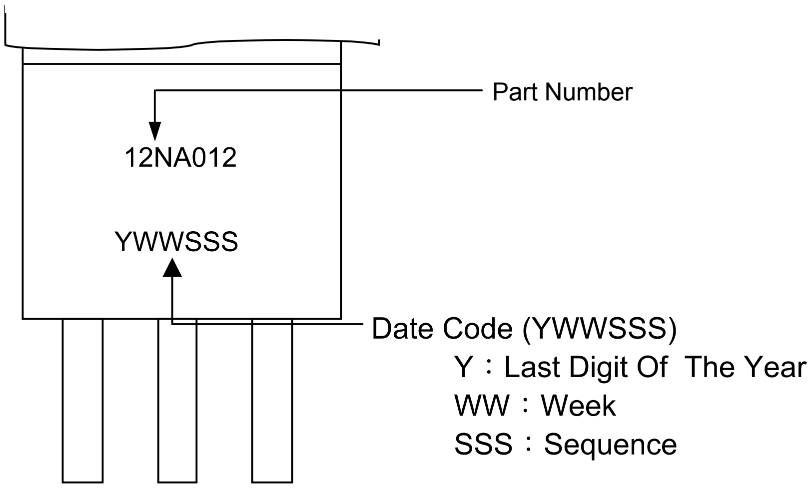
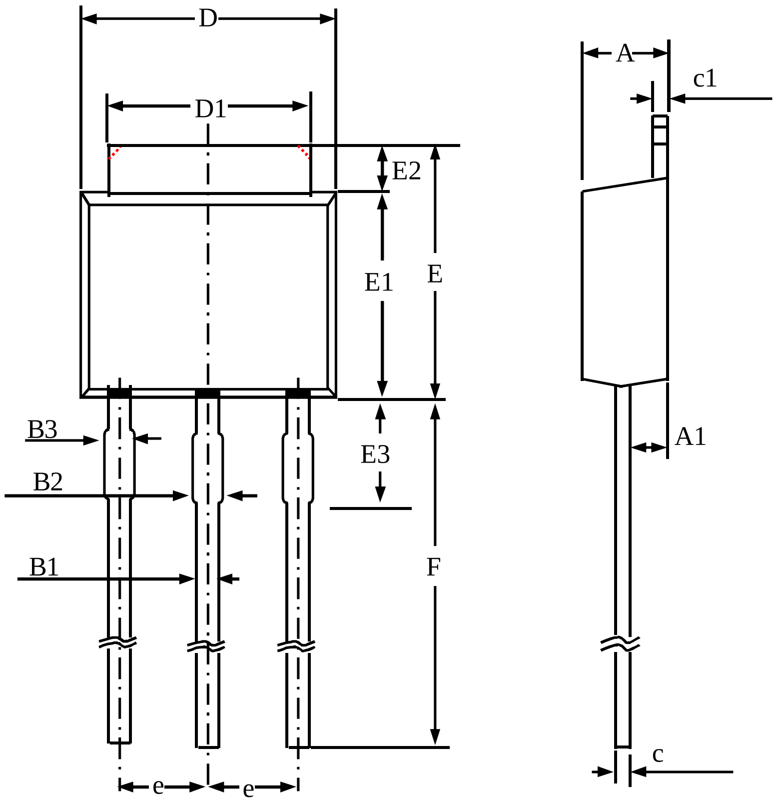


Fig 14. Total Power Dissipation

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.

Draw No. M1-J3-G-v05-1

TO-251 FOOTPRINT：