XP6N023H-AT

Automotive Grade Product

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

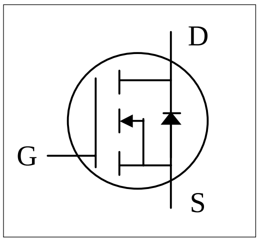
▼ **100% R_g & UIS Test**

▼ **Simple Drive Requirement**

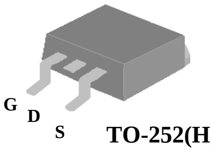
▼ **Fast Switching Characteristic**

▼ **RoHS Compliant & Halogen-Free**

▼ **AEC Qualified**



BV_{DSS}	60V
$R_{DS(ON)}$	23mΩ
I_D	26.2A



TO-252(H)

Description

XP6N023 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.

TO-252 package is widely preferred for all commercial-industrial surface mount applications using infrared reflow technique and suited for high current application due to the low connection resistance.

Absolute Maximum Ratings@T_j=25^{o}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℃	Drain Current, V_{GS} @ 10V	26.2	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V	18.5	A
I_{DM}	Pulsed Drain Current[1]	100	A
P_D@T_C=25℃	Total Power Dissipation	37.5	W
P_D@T_A=25℃	Total Power Dissipation[4]	2.4	W
E_{AS}	Single Pulse Avalanche Energy[3]	16.2	mJ
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	4	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount)[4]	62.5	℃/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=12A	-	-	23	mΩ
		V_{GS}=4.5V, I_D=8A	-	-	50	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	-	3	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=12A	-	42	-	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	-	-	±100	nA
Q_g	Total Gate Charge[5]	I_D=12A	-	32	51	nC
Q_{gs}	Gate-Source Charge[5]	V_{DS}=30V	-	8	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge[5]	V_{GS}=10V	-	6	-	nC
$t_{d(on)}$	Turn-on Delay Time[5]	V_{DS}=30V	-	10	-	ns
t_r	Rise Time[5]	I_D=12A	-	23	-	ns
$t_{d(off)}$	Turn-off Delay Time[5]	R_G=3Ω	-	23	-	ns
t_f	Fall Time[5]	V_{GS}=10V	-	5	-	ns
C_{iss}	Input Capacitance[5]	V_{GS}=0V	-	1770	2832	pF
C_{oss}	Output Capacitance[5]	V_{DS}=30V	-	100	-	pF
C_{rss}	Reverse Transfer Capacitance[5]	f=1.0MHz	-	70	-	pF
R_g	Gate Resistance	f=1.0MHz	-	1	2	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=12A, V_{GS}=0V	-	-	1.3	V
t_{rr}	Reverse Recovery Time[5]	I_S=12A, V_{GS}=0V	-	21	-	ns
Q_{rr}	Reverse Recovery Charge[5]	dI/dt=100A/μs	-	21	-	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

4.Surface mounted on 1 in^2 copper pad of FR4 board

5.Defined by design. Not subject to production test.

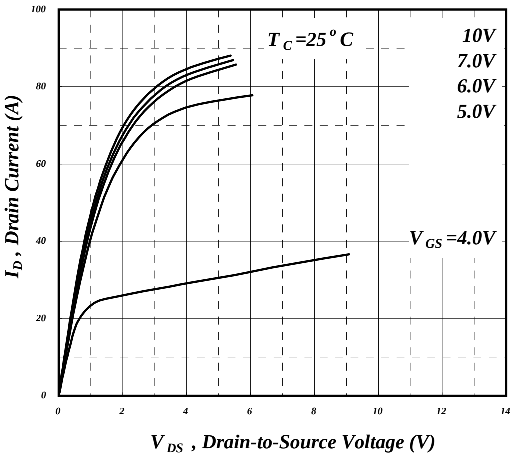


Fig 1. Typical Output Characteristics

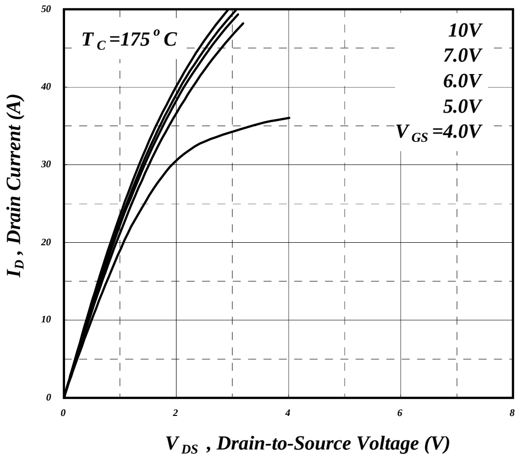


Fig 2. Typical Output Characteristics

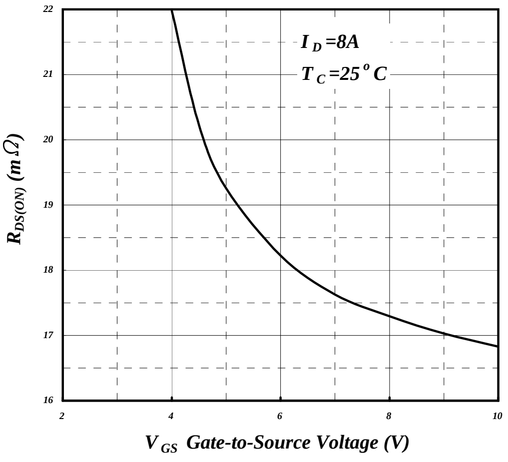


Fig 3. On-Resistance v.s. Gate Voltage

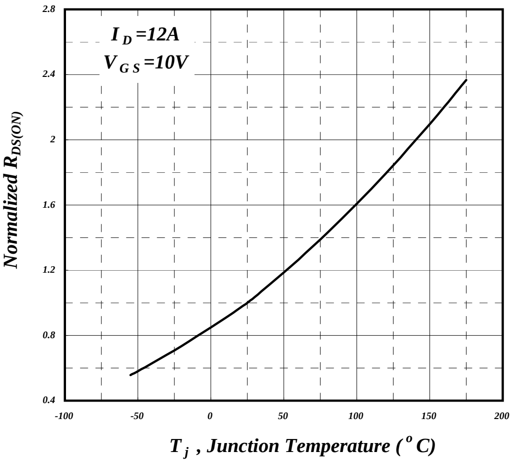


Fig 4. Normalized On-Resistance v.s. Junction Temperature

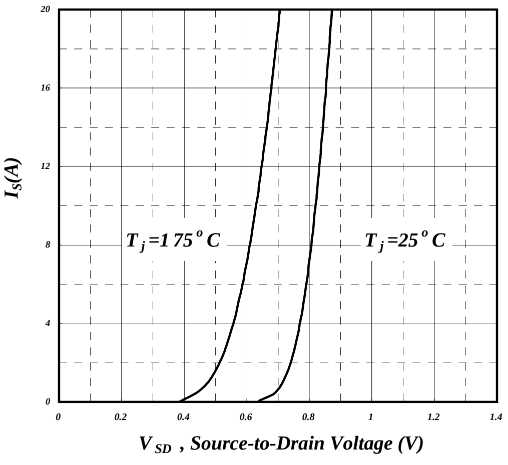


Fig 5. Forward Characteristic of Reverse Diode

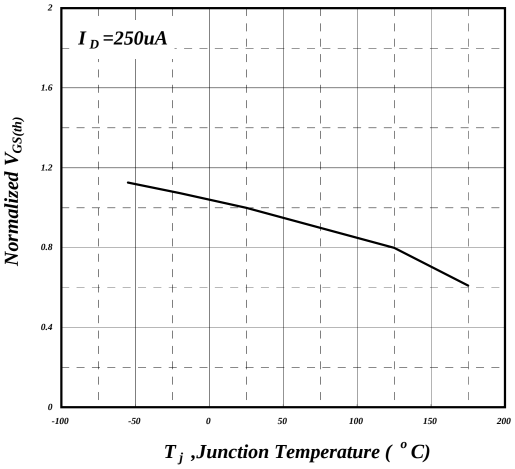


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

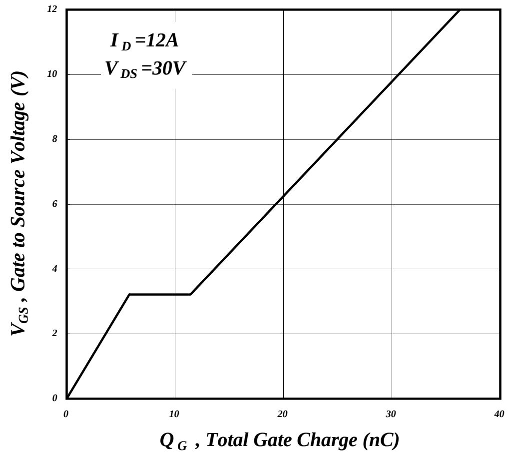


Fig 7. Gate Charge Characteristics

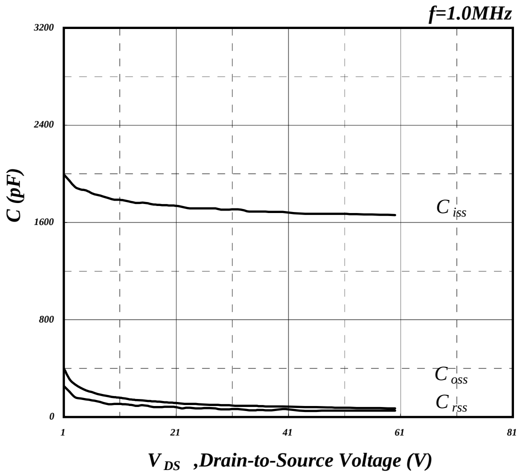


Fig 8. Typical Capacitance Characteristics

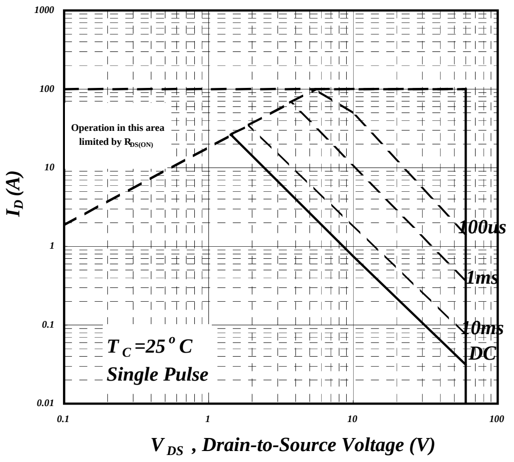


Fig 9. Maximum Safe Operating Area

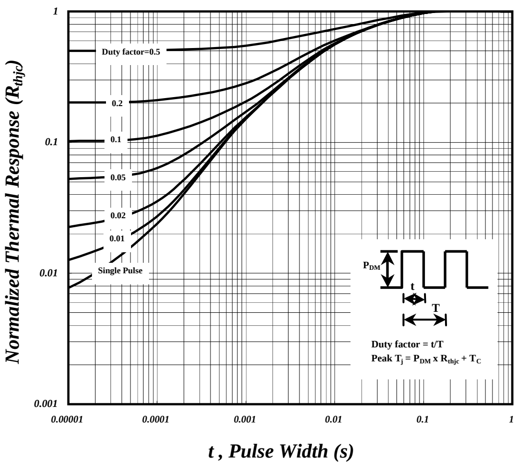


Fig 10. Effective Transient Thermal Impedance

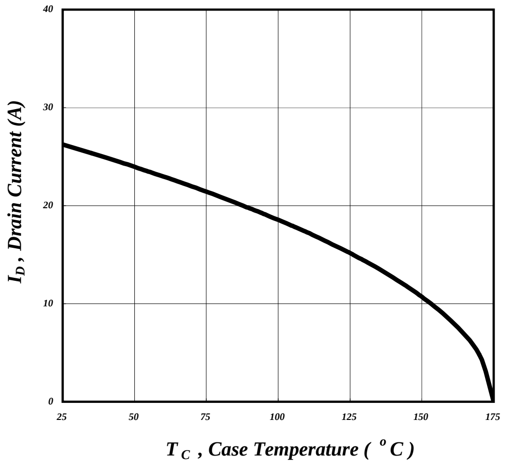


Fig 11. Drain Current v.s. Case Temperature

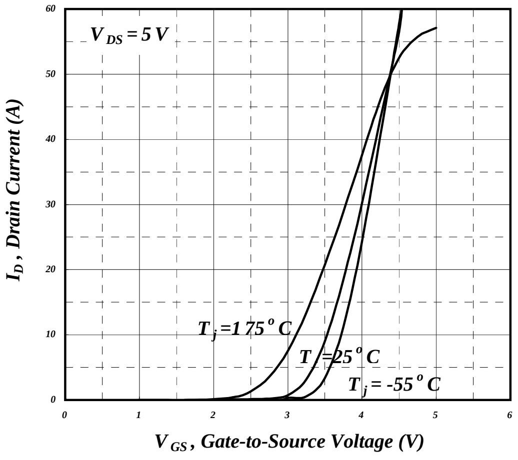


Fig 12. Transfer Characteristics

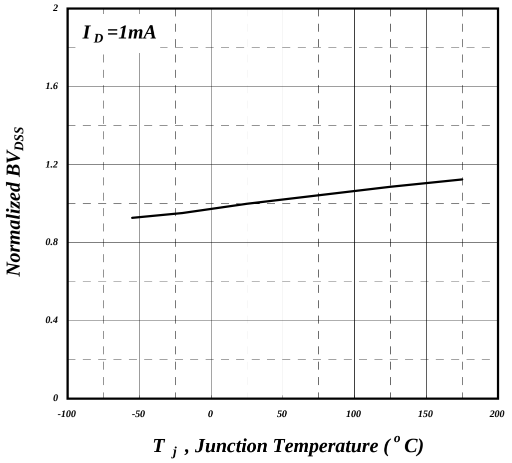


Fig 13. Normalized BV_{DSS} v.s. Junction Temperature

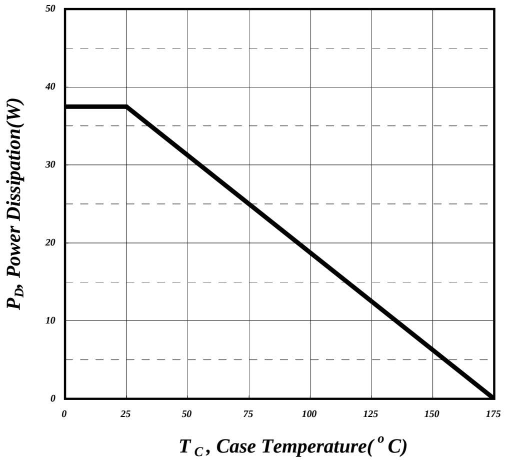


Fig 14. Total Power Dissipation

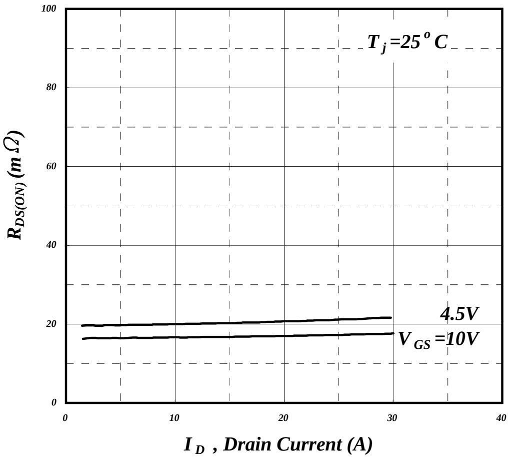
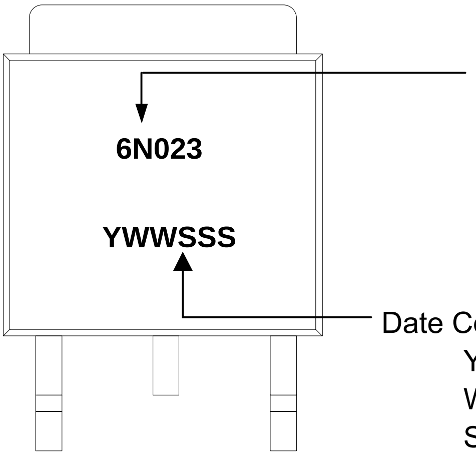


Fig 15. Typ. Drain-Source on State Resistance

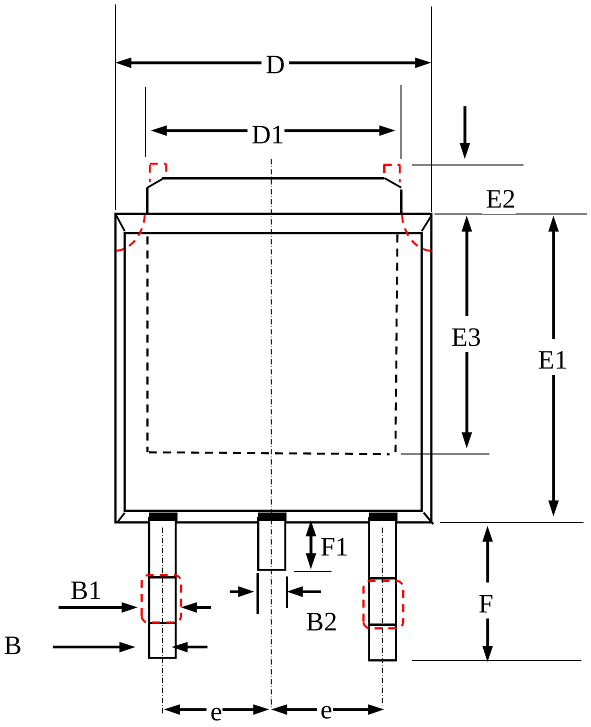
MARKING INFORMATION



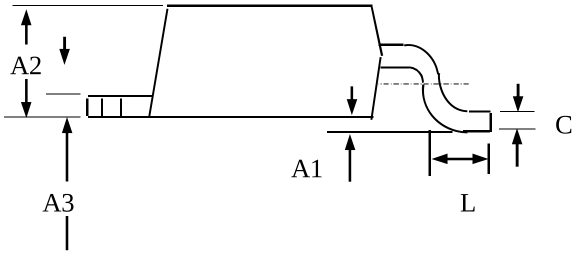
Part Number

Date Code (YWWSSS)
Y：Last Digit Of The Year
WW：Week
SSS：Sequence

Package Outline : TO-252



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A2	2.18	2.30	2.40
A3	0.40	0.50	0.65
B	0.40	0.70	1.00
B1	0.50	0.85	1.20
D	6.00	6.50	6.80
D1	4.80	5.35	5.90
E3	4.00 (ref.)		
F	2.00	2.63	3.05
F1	0.50	0.85	1.20
E1	5.00	5.70	6.30
E2	0.50	1.10	1.80
e	2.3 (ref)		
C	0.35	0.525	0.70
A1	0.00	—	0.25
B2	—	—	1.25
L	0.90	1.34	1.78



1.All Dimensions Are in Millimeters.

2.Dimension Does Not Include Mold Protrusions.

3. Thermal PAD, Body and Pin contour is for reference, it may has little difference by option.

Draw No. M1-H3EFIMT-G-v10

TO-252 FOOTPRINT：