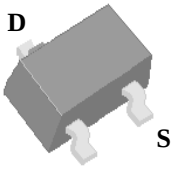
XP2N7002K

Halogen-Free Product

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

- **Simple Drive Requirement**
- **Small Package Outline**
- **Surface Mount Device**
- **RoHS Compliant & Halogen-Free**



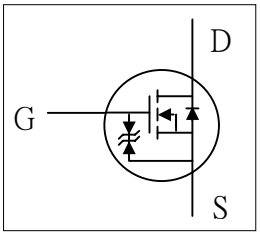
SOT-23S

BV_{DSS}	60V
$R_{DS(ON)}$	2Ω
I_D	450mA

Description

XP2N7002 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 SOT-23S package is universally used for all commercial-industrial 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[3], V_{GS} @ 10V	450	mA
I_D@T_A=70℃	Drain Current[3], V_{GS} @ 10V	360	mA
I_{DM}	Pulsed Drain Current[1]	950	mA
P_D@T_A=25℃	Total Power Dissipation	0.7	W
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]	180	℃/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=450mA	-	-	2	Ω
		V_{GS}=4.5V, I_D=200mA	-	-	4	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	-	2.5	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=450mA	-	400	-	mS
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	-	-	±30	uA
Q_g	Total Gate Charge	I_D=450mA	-	1	1.6	nC
Q_{gs}	Gate-Source Charge	V_{DS}=50V	-	0.5	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	0.5	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=30V	-	12	-	ns
t_r	Rise Time	I_D=450mA	-	10	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	56	-	ns
t_f	Fall Time	V_{GS}=10V	-	29	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	32	50	pF
C_{oss}	Output Capacitance	V_{DS}=25V	-	8	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	6	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=450mA, V_{GS}=0V	-	-	1.2	V

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in^2 copper pad of FR4 board t≦10sec; 400℃/W when mounted on min. copper pad.

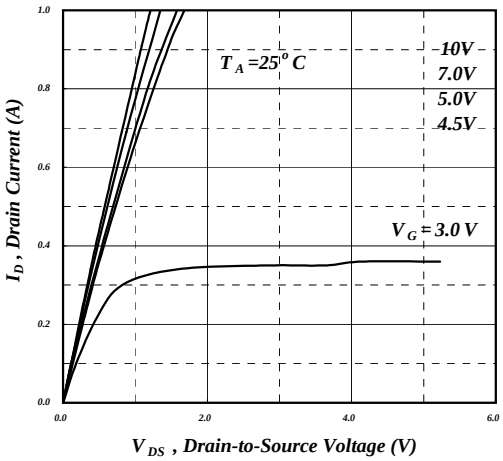


Fig 1. Typical Output Characteristics

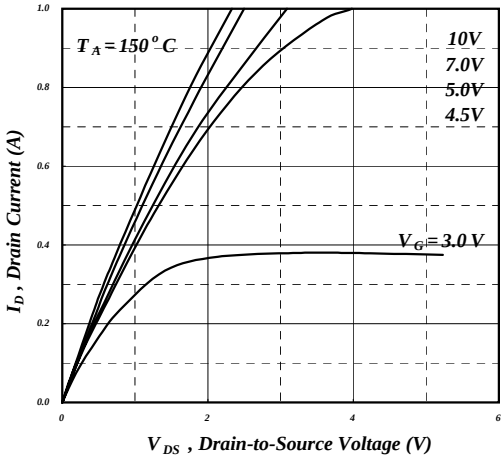


Fig 2. Typical Output Characteristics

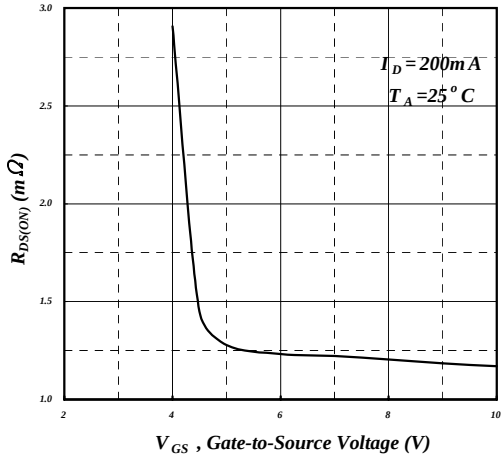


Fig 3. On-Resistance v.s. Gate Voltage

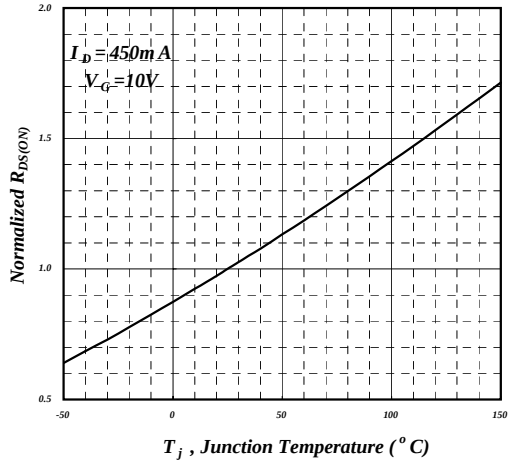


Fig 4. Normalized On-Resistance v.s. Junction Temperature

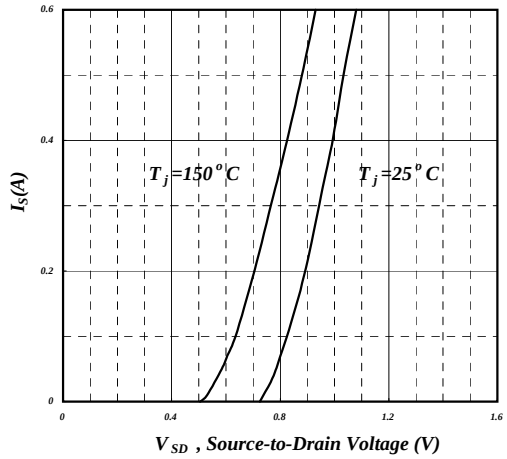


Fig 5. Forward Characteristic of Reverse Diode

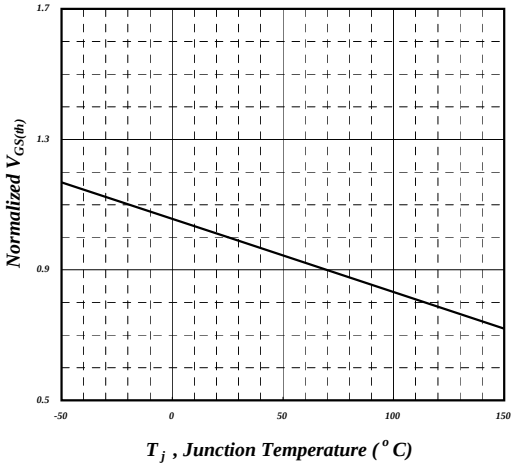


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

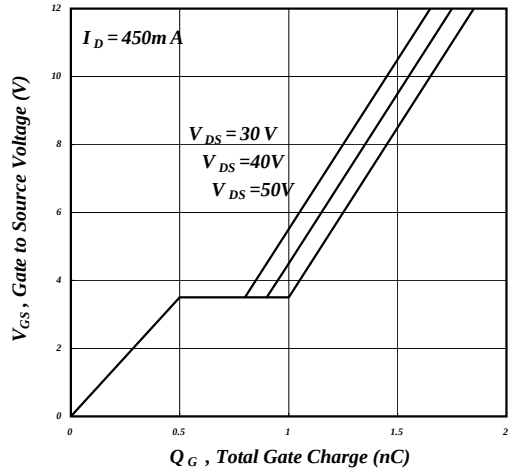


Fig 7. Gate Charge Characteristics

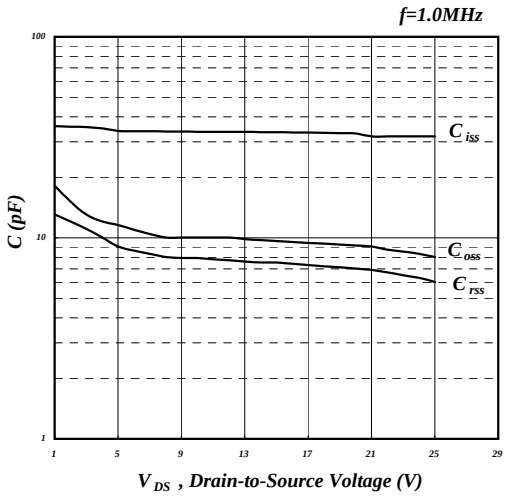


Fig 8. Typical Capacitance Characteristics

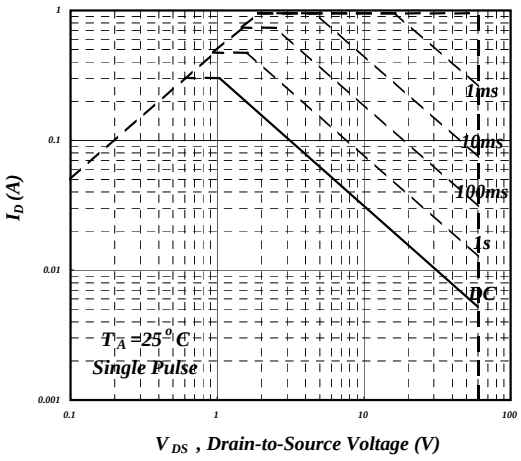


Fig 9. Maximum Safe Operating Area

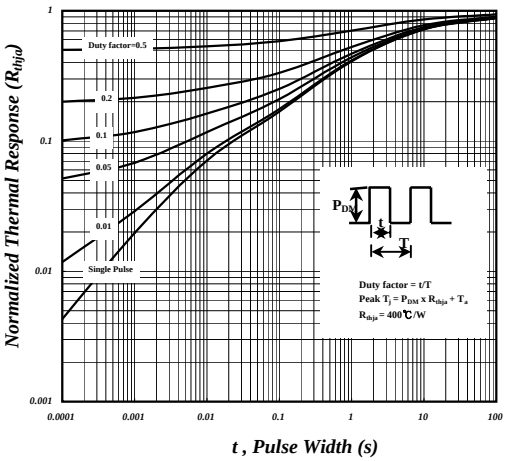


Fig 10. Effective Transient Thermal Impedance

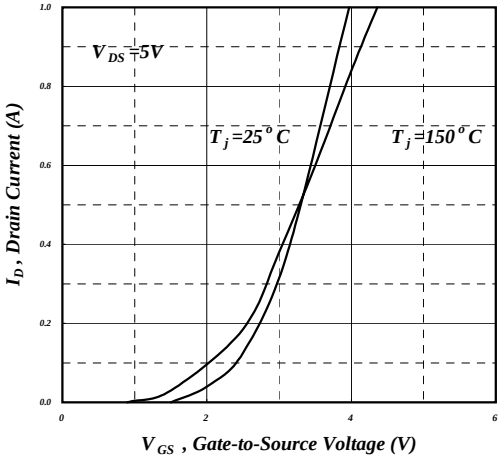


Fig 11. Transfer Characteristics

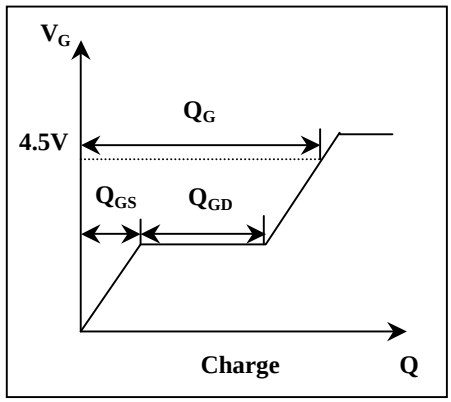
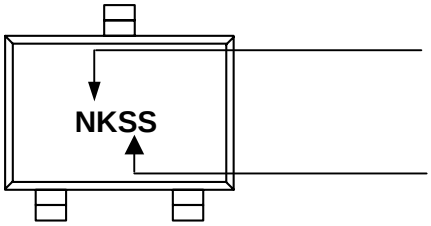


Fig 12. Gate Charge Waveform

MARKING INFORMATION



Part Number : NK

Date Code : SS

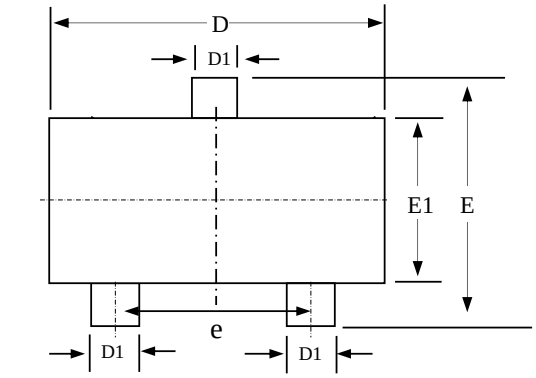
SS:2004,2008,2012,2016,2020,2024...

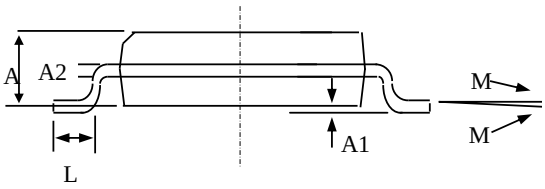
SS:2003,2007,2011,2015,2019,2023...

SS:2002,2006,2010,2014,2018,2022...

SS:2001,2005,2009,2013,2017,2021...

Package Outline : SOT-23S





SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	0.80	1.00	1.20
A1	0.00	—	0.10
A2	0.05	—	0.20
D1	0.30	0.40	0.50
e	1.80	1.90	2.00
D	2.80	2.90	3.10
E	2.10	2.40	2.70
E1	1.20	1.30	1.40
M	0°	5°	10°
L	0.20	—	0.60

1.All Dimension Are In Millimeters.

2.Dimension Does Not Include Mold Protrusions.

Draw No. M1-N3MIBF-G-v04

SOT-23S FOOTPRINT：