XP2N075EN

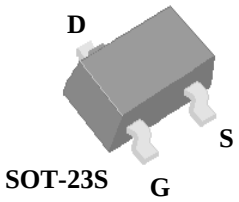
Halogen-Free Product

XSEMI

N-CHANNEL ENHANCEMENT MODE

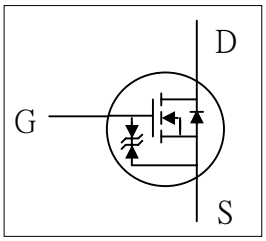
POWER MOSFET

- **Capable of 2.5V Gate Drive**
- **Lower Gate Charge**
- **Fast Switching Performance**
- **RoHS Compliant & Halogen-Free**



SOT-23S

BV_{DSS}	20V
$R_{DS(ON)}$	75mΩ
I_D	3.5A



Description

XP2N075E series are innovative 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 widely preferred for commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_A=25℃	Drain Current[3], V_{GS} @ 4.5V	3.5	A
I_D@T_A=70℃	Drain Current[3], V_{GS} @ 4.5V	2.8	A
I_{DM}	Pulsed Drain Current[1]	10	A
P_D@T_A=25℃	Total Power Dissipation	1.25	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]	100	℃/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	20	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=4.5V, I_D=3.5A	-	-	75	mΩ
		V_{GS}=2.5V, I_D=1.2A	-	-	125	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	0.5	-	1.2	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=3A	-	16	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=16V, V_{GS}=0V	-	-	10	uA
I_{GSS}	Gate-Source Leakage	V_{GS}= ±12V, V_{DS}=0V	-	-	±30	uA
Q_g	Total Gate Charge	I_D=3A	-	6.5	10.4	nC
Q_{gs}	Gate-Source Charge	V_{DS}=10V	-	1	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	1.6	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=10V	-	6	-	ns
t_r	Rise Time	I_D=1A	-	11	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	14	-	ns
t_f	Fall Time	V_{GS}=5V	-	2.5	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	520	832	pF
C_{oss}	Output Capacitance	V_{DS}=10V	-	65	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	60	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=1A, V_{GS}=0V	-	-	1.2	V
t_{rr}	Reverse Recovery Time	I_S=3A, V_{GS}=0V,	-	6	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	1.5	-	nC

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 ≤ 10s ; 300℃/W when mounted on min. copper pad.

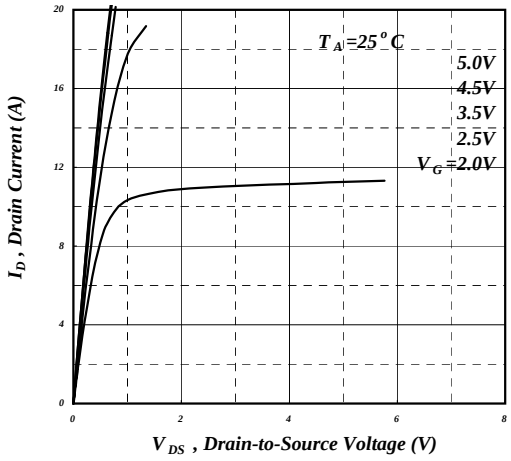


Fig 1. Typical Output Characteristics

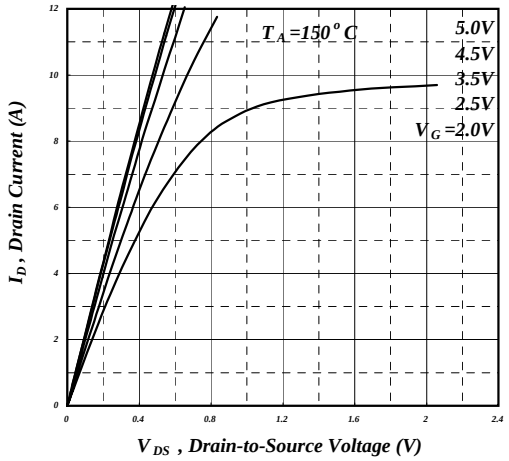


Fig 2. Typical Output Characteristics

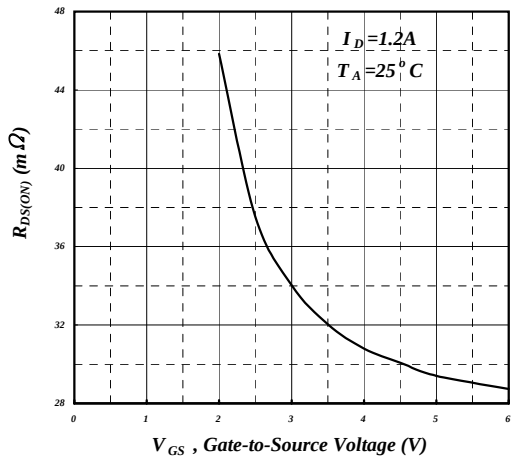


Fig 3. On-Resistance v.s. Gate Voltage

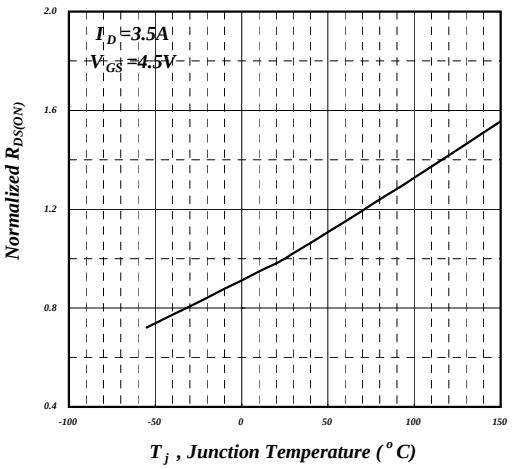


Fig 4. Normalized On-Resistance v.s. Junction Temperature

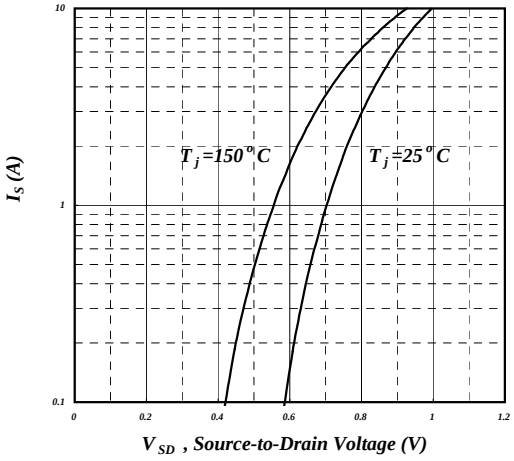


Fig 5. Forward Characteristic of Reverse Diode

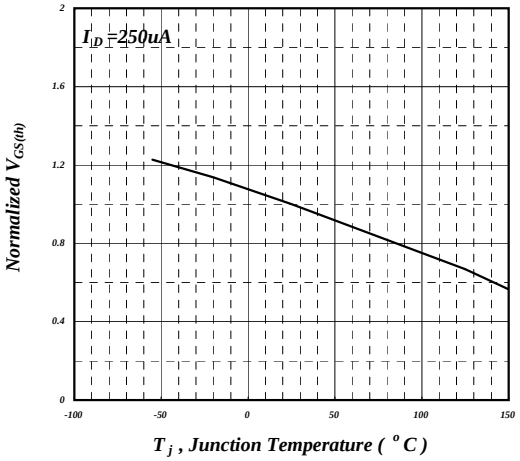


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

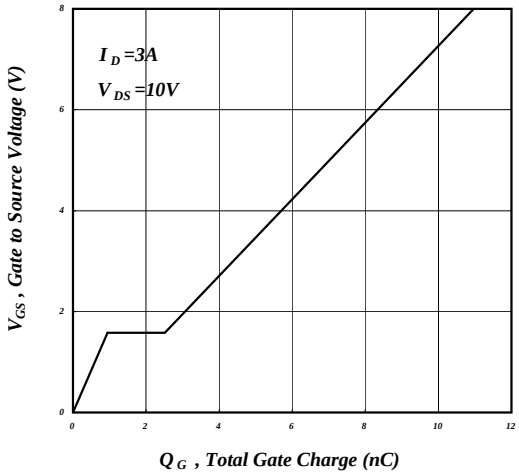


Fig 7. Gate Charge Characteristics

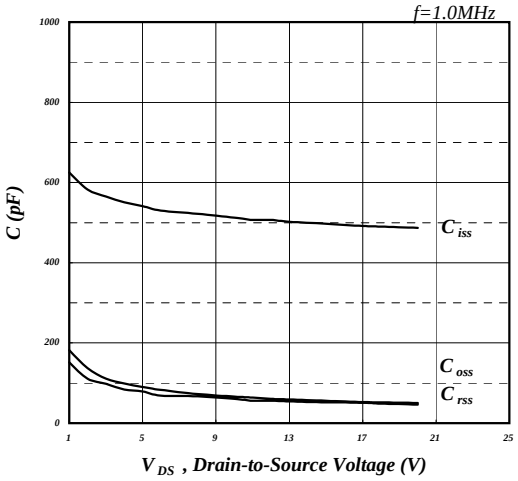


Fig 8. Typical Capacitance Characteristics

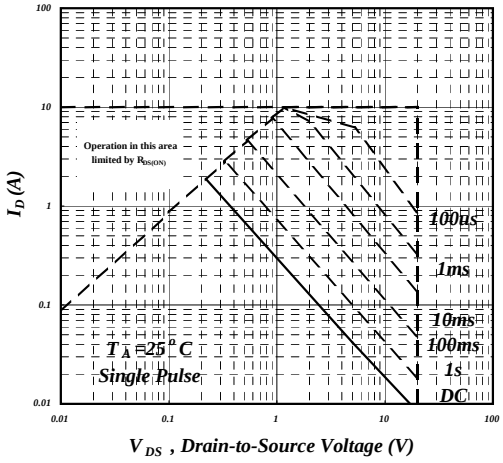


Fig 9. Maximum Safe Operating Area

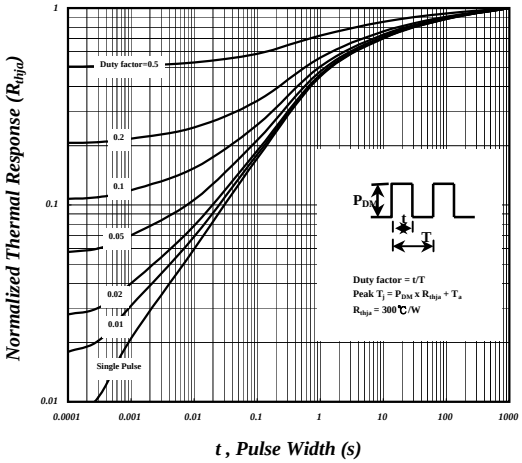


Fig 10. Effective Transient Thermal Impedance

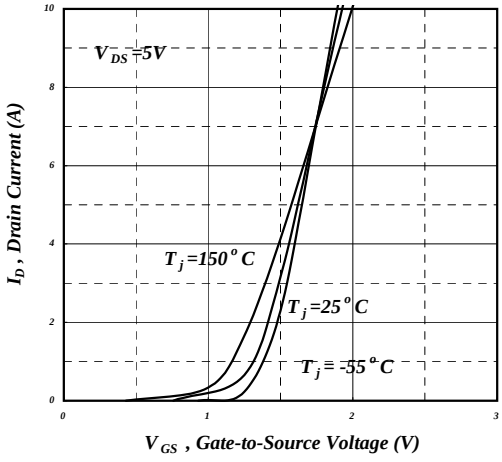


Fig 11. Transfer Characteristics

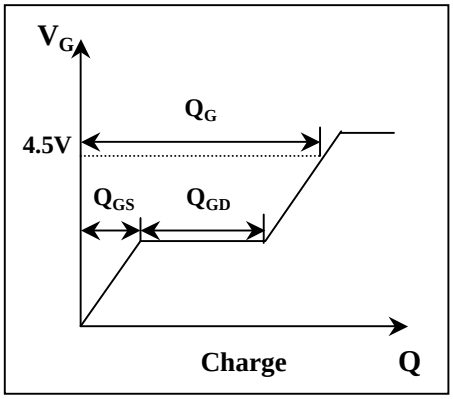


Fig 12. Gate Charge Circuit

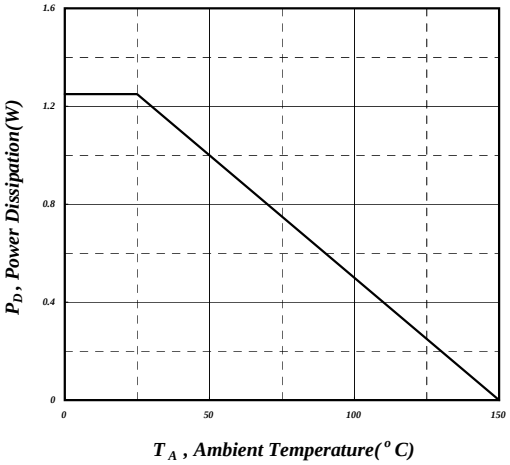


Fig 13. Total Power Dissipation

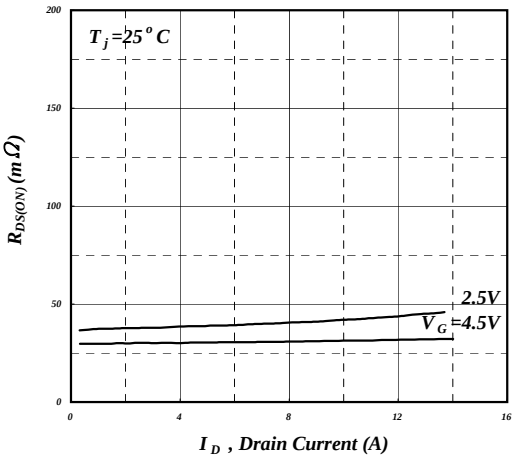


Fig 14. Typ. Drain-Source on State Resistance