

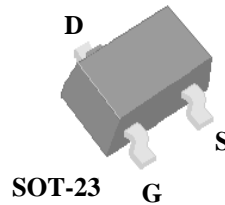
# XP2306AGN-HF

**Halogen-Free Product**

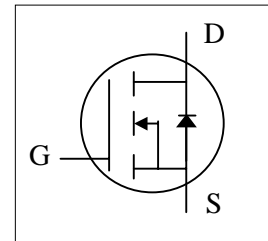


*N-CHANNEL ENHANCEMENT MODE  
POWER MOSFET*

- ▼ Capable of 1.8V Gate Drive
- ▼ Lower On-resistance
- ▼ Surface Mount Package
- ▼ RoHS Compliant



$BV_{DSS}$	30V
$R_{DS(ON)}$	35m $\Omega$
$I_D$	5A



## Description

XSEMI MOSFETs utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.

The SOT-23 package is widely used for all commercial-industrial applications.

## Absolute Maximum Ratings @ $T_J=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	+8	V
$I_D@T_A=25^\circ\text{C}$	Drain Current <sup>3</sup> , $V_{GS}$ @ 4.5V	5	A
$I_D@T_A=70^\circ\text{C}$	Drain Current <sup>3</sup> , $V_{GS}$ @ 4.5V	4	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	20	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation	1.38	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

## Thermal Data

Symbol	Parameter	Value	Unit
Rthj-a	Maximum Thermal Resistance Junction-ambient <sup>3</sup>	90	$^\circ\text{C}/\text{W}$

**Electrical Characteristics @T<sub>j</sub>=25°C(unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A	-	-	35	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =2.6A	-	-	50	mΩ
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =1.0A	-	-	80	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.3	-	1.2	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =5A	-	9	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V	-	-	10	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> = ±8V, V <sub>DS</sub> =0V	-	-	±100	nA
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	I <sub>D</sub> =5A	-	8.5	15	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =16V	-	1	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =4.5V	-	3	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =15V	-	5	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =1A	-	9	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω	-	20	-	ns
t <sub>f</sub>	Fall Time	V <sub>GS</sub> =5V	-	5	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	400	1050	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =25V	-	90	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	70	-	pF

**Source-Drain Diode**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =1.2A, V <sub>GS</sub> =0V	-	-	1.2	V

**Notes:**

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board, t ≤ 10s ; 270°C/W when mounted on min. copper pad.

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

XSEMI DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT

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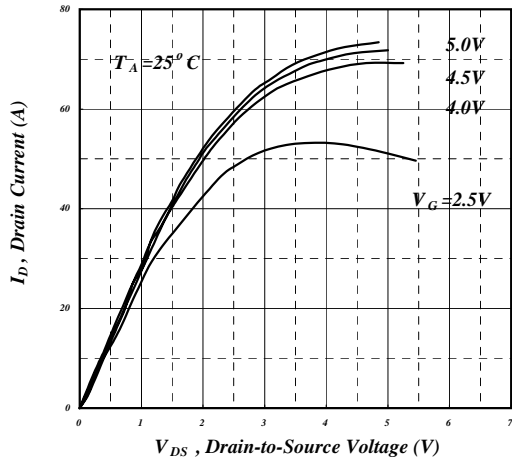


Fig 1. Typical Output Characteristics

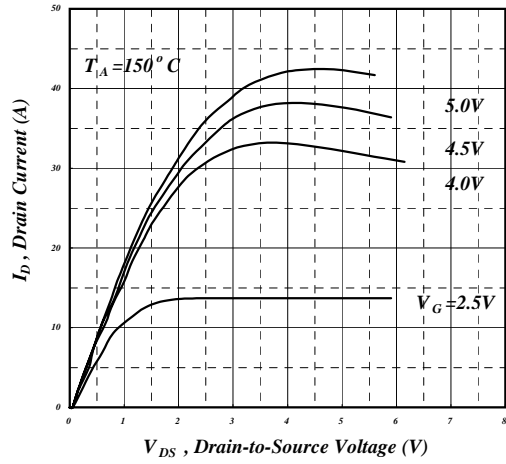


Fig 2. Typical Output Characteristics

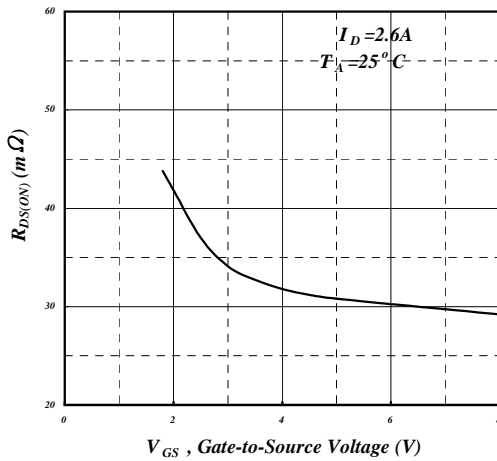


Fig 3. On-Resistance v.s. Gate Voltage

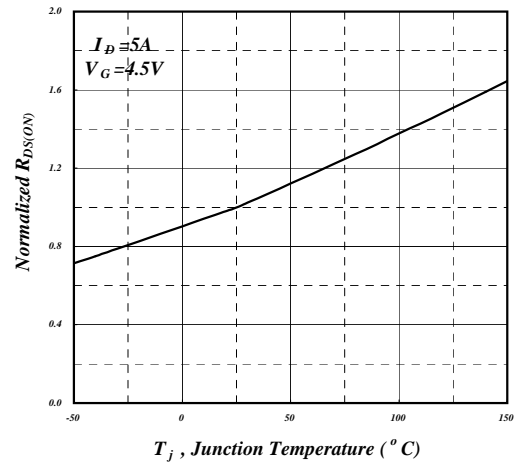


Fig 4. Normalized On-Resistance v.s. Junction Temperature

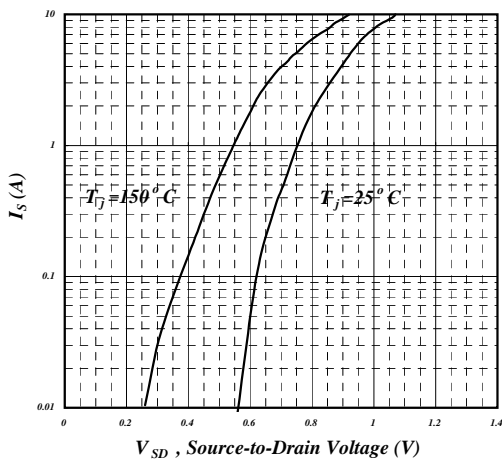


Fig 5. Forward Characteristic of Reverse Diode

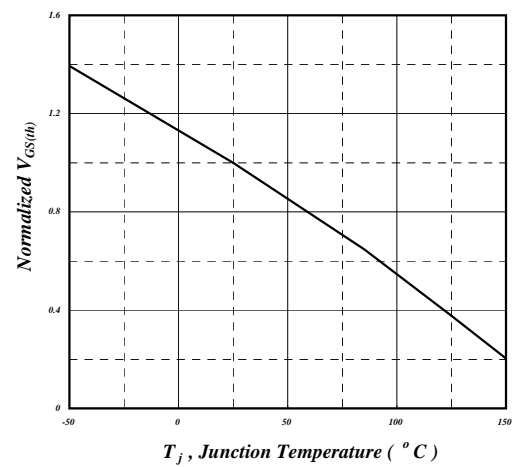
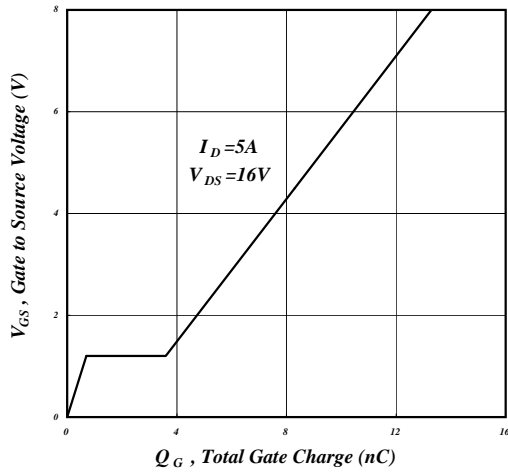
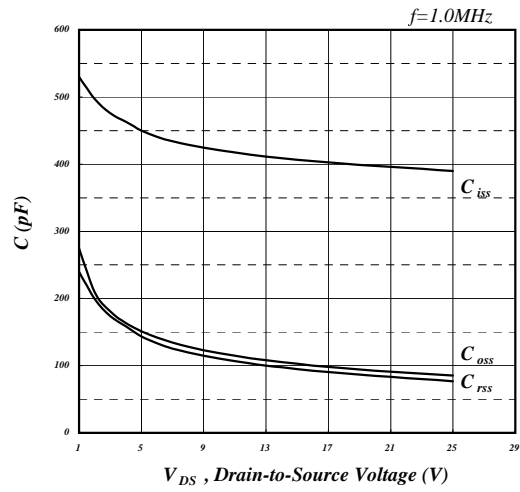


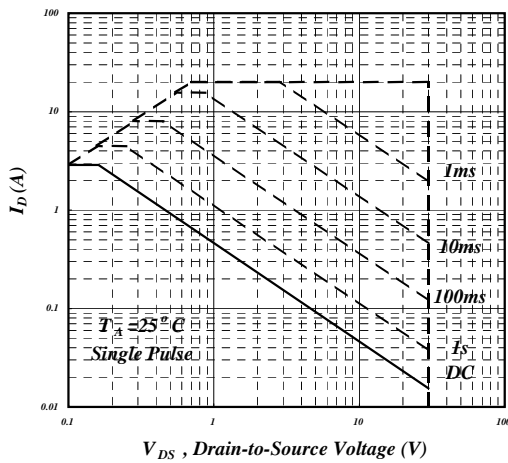
Fig 6. Gate Threshold Voltage v.s. Junction Temperature



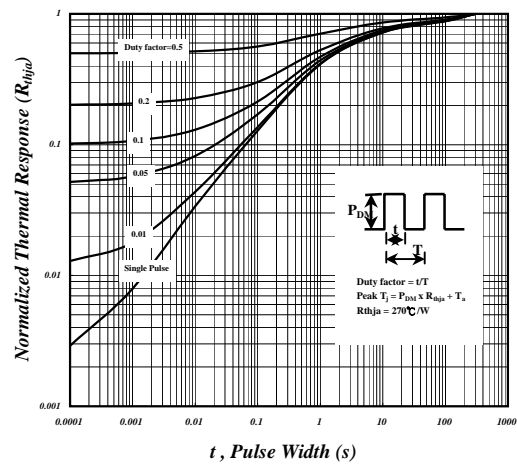
**Fig 7. Gate Charge Characteristics**



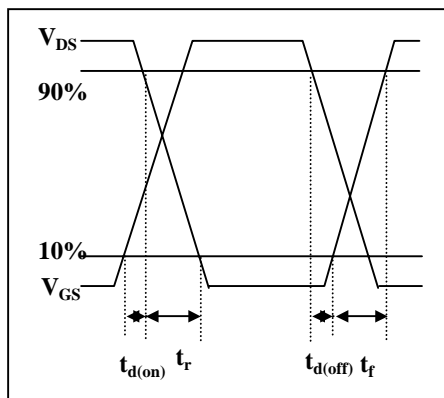
**Fig 8. Typical Capacitance Characteristics**



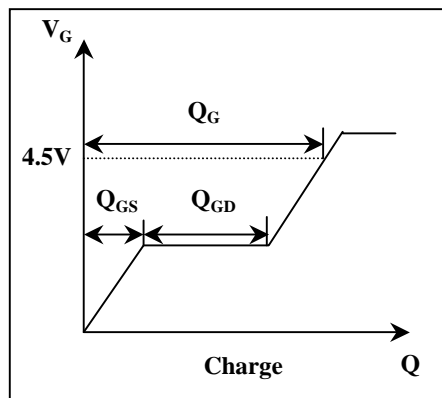
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**