

XP50AN1K5H

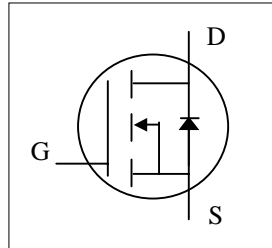
Halogen-Free Product

N-CHANNEL ENHANCEMENT MODE

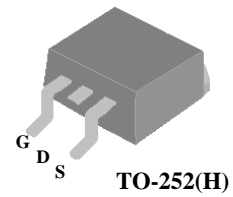
POWER MOSFET



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



BV_{DSS}	500V
$R_{DS(ON)}$	1.5 Ω
I_D^3	5A



Description

XP50AN1K5 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 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 @ $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	500	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D @ T_C=25^\circ\text{C}$	Drain Current, $V_{GS} @ 10V^3$	5	A
I_{DM}	Pulsed Drain Current ¹	15	A
$P_D @ T_C=25^\circ\text{C}$	Total Power Dissipation	50	W
$P_D @ T_A=25^\circ\text{C}$	Total Power Dissipation ⁵	2	W
E_{AS}	Single Pulse Avalanche Energy ⁴	12.5	mJ
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	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	2.5	$^\circ\text{C}/\text{W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount) ⁵	62.5	$^\circ\text{C}/\text{W}$

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	500	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =2.5A	-	-	1.5	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	-	4	V
g _{fs}	Forward Transconductance	V _{DS} =20V, I _D =2A	-	6	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =400V, V _{GS} =0V	-	-	100	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±30V, V _{DS} =0V	-	-	±1	uA
Q _g	Total Gate Charge	I _D =2A	-	15.4	24.6	nC
Q _{gs}	Gate-Source Charge	V _{DS} =400V	-	2.5	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =10V	-	6	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =250V	-	12	-	ns
t _r	Rise Time	I _D =2A	-	17	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =50Ω	-	90	-	ns
t _f	Fall Time	V _{GS} =10V	-	28	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	500	800	pF
C _{oss}	Output Capacitance	V _{DS} =100V	-	35	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	10	-	pF
R _g	Gate Resistance	f=1.0MHz	-	2.5	5	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =2A, V _{GS} =0V	-	-	1.5	V
t _{rr}	Reverse Recovery Time	I _S =2A, V _{GS} =0V	-	210	-	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	-	700	-	nC

Notes:

- 1.Pulse width limited by max. junction temperature.
- 2.Pulse test
- 3.Ensure that the junction temperature does not exceed T_{Jmax}.
- 4.Starting T_j=25°C , V_{DD}=90V , L=1mH , R_G=25Ω , V_{GS}=10V
- 5.Surface mounted on 1 in² copper pad of FR4 board

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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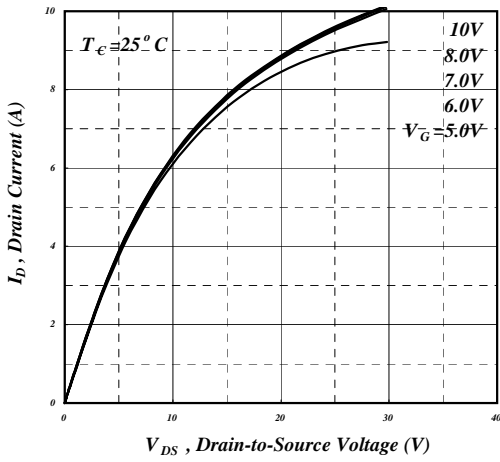


Fig 1. Typical Output Characteristics

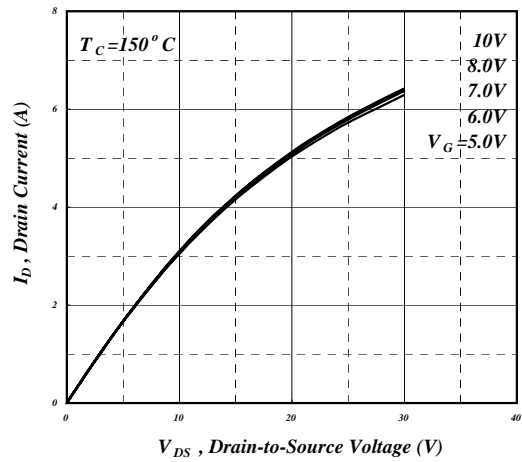


Fig 2. Typical Output Characteristics

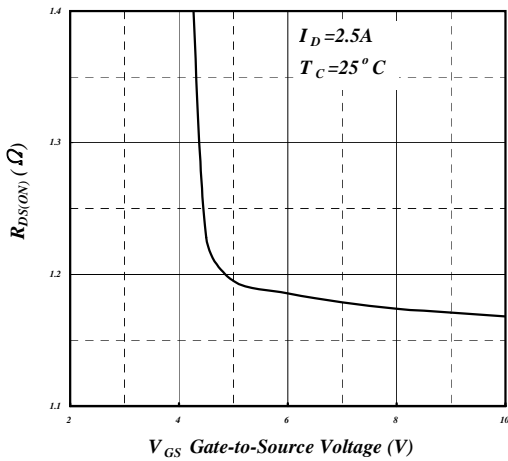


Fig 3. On-Resistance v.s. Gate Voltage

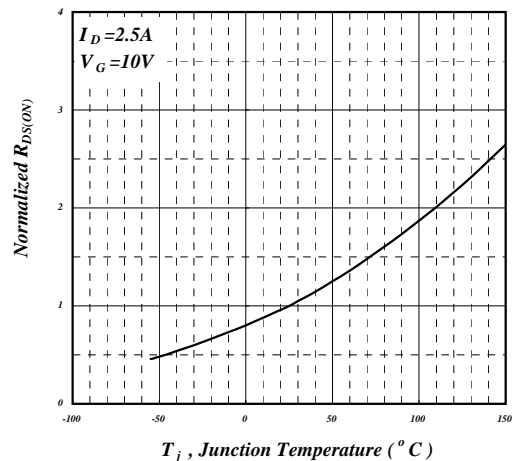


Fig 4. Normalized On-Resistance v.s. Junction Temperature

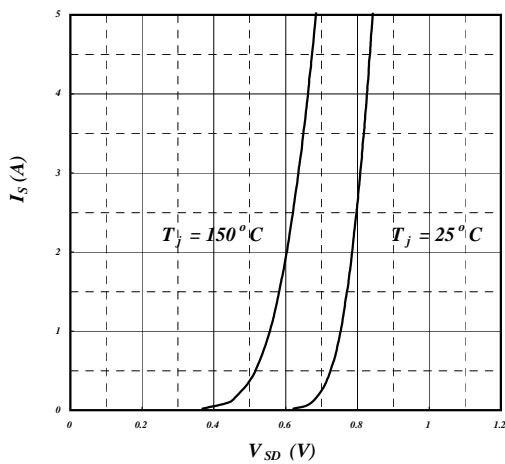


Fig 5. Forward Characteristic of Reverse Diode

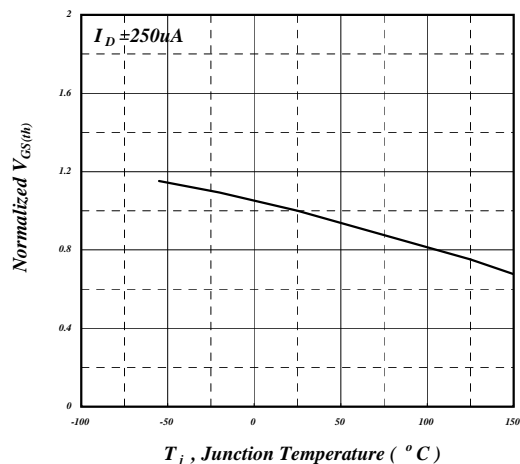


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

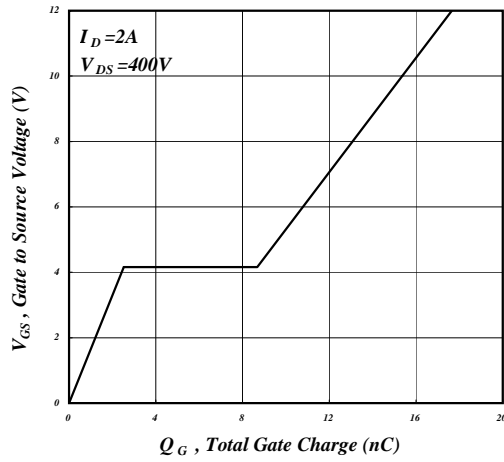


Fig 7. Gate Charge Characteristics

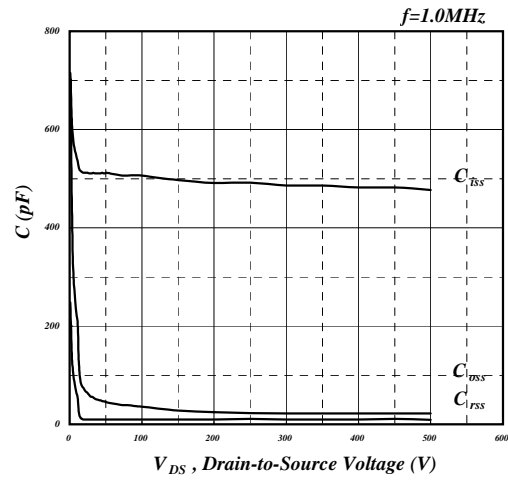


Fig 8. Typical Capacitance Characteristics

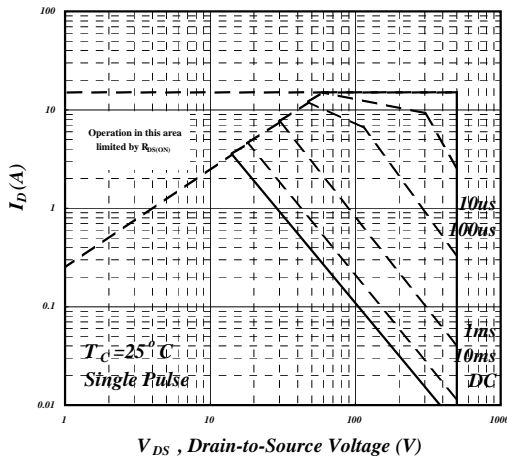


Fig 9. Maximum Safe Operating Area

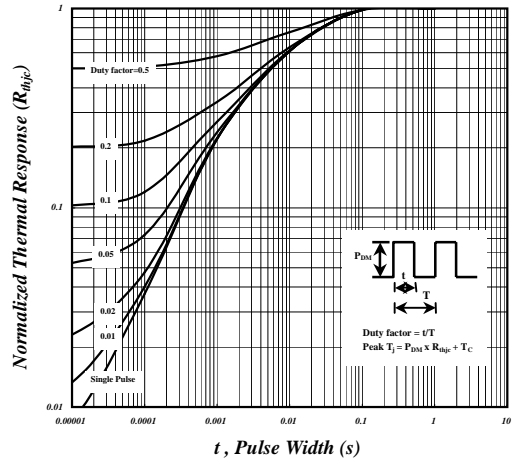


Fig 10. Effective Transient Thermal Impedance

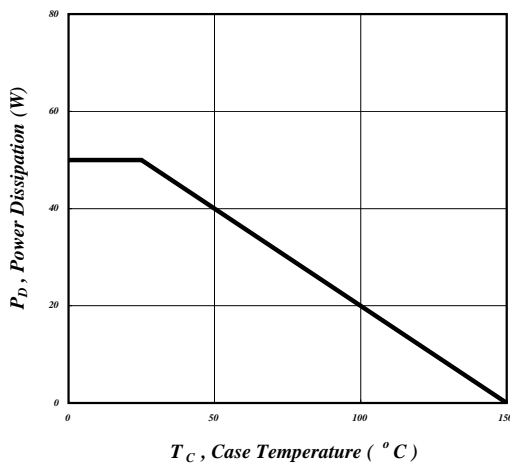


Fig 11. Total Power Dissipation

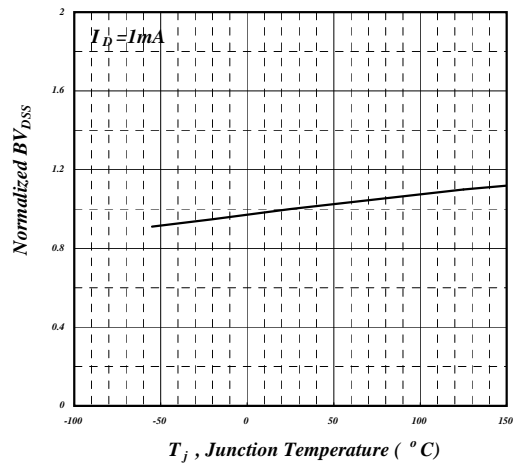


Fig 12. Normalized BV_{DS} v.s. Junction Temperature