

SOT-23 Plastic-Encapsulate MOSFETS

SI2301

P-Channel 20V(D-S) MOSFET

Features

- $V_{DS} = -20V$, $I_D = -2.5A$
- $R_{DS(ON)} < 150m\Omega$ @ $V_{GS} = -2.5V$
- $R_{DS(ON)} < 110m\Omega$ @ $V_{GS} = -4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Capable doing Cu wire bonding

Applications

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- Load Switch
- DSC

Description

This is the P-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance.

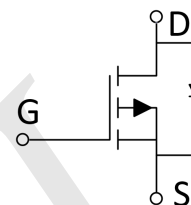
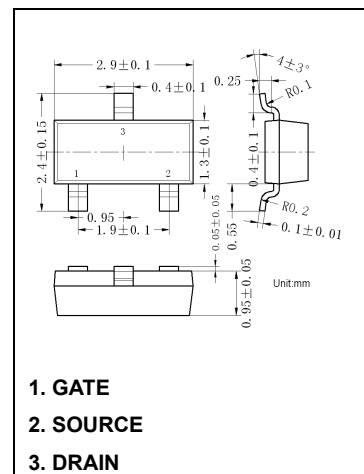
Marking: A1SHB.

Maximum Ratings ($T_a=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage	-20	V
V_{GS}	Gate-source voltage	± 8	V
I_D	Continuous drain current	-2.5	A
I_{DM}	Pulsed Drain Current ¹⁾	-13	
P_D	Power dissipation	0.4	W
T_J	Operating Junction	150	$^\circ C$
T_{stg}	Storage temperature	-55 to 150	$^\circ C$

Thermal Characteristic

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient ($t \leq 5s$) ²⁾	312.5	$^\circ C / W$
$R_{\theta JC}$	Thermal Resistance from Junction to Case	30	$^\circ C / W$



Electrical Characteristics (T_a=25 °C unless otherwise noted)

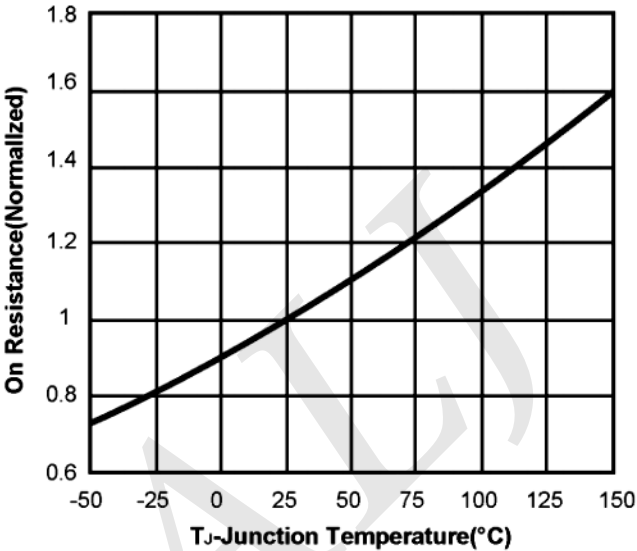
Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
Off Characteristics						
V _{(BR)DSS}	Drain- source breakdown voltage	V _{GS} = 0 V, I _D = -250uA	-20			V
I _{DSS}	Zero gate voltage drain current	V _{DS} = -20 V, V _{GS} = 0 V			-1	μA
I _{GSS}	Gate-body leakage current	V _{GS} = ±8V, V _{DS} = 0 V			±100	nA
On Characteristics						
V _{GS(th)}	Gate threshold voltage	V _{GS} =V _{DS} , I _D = -250uA	-0.4		-1	V
R _{DS(on)}	Drain-Source on-state resistance	V _{GS} = -4.5 V, I _D = -2.5A		90	110	mΩ
		V _{GS} = -2.5 V, I _D = -2A		110	150	
Dynamic Characteristics						
C _{iss}	Input capacitance	V _{GS} = 0 V, V _{DS} = -15V, f = 1 MHz		381		pF
C _{oss}	Output capacitance			49		
C _{rss}	Reverse transfer capacitance			25		
Switching Characteristics						
t _{d(on)}	Turn-on delay time	V _{DS} = -6V, R _L = 6Ω R _{GEN} = 6Ω, V _{GS} = -4.5V		61.6		ns
t _r	Rise time			23.1		
t _{d(off)}	Turn-off delay time			47.6		
t _f	Fall time			7.9		
Q _g	Total gate charge	V _{DS} = -6V, V _{GS} = -4.5V, I _D = -2.5A		5.6		nC
Q _{gs}	Gate-source charge			2.4		
Q _{gd}	Gate-drain charge			1.3		
Drain-source body diode characteristics						
V _{SD}	Diode forward voltage ¹⁾	V _{GS} = 0 V, I _S = -1A		-0.7	-1.4	V

Notes:

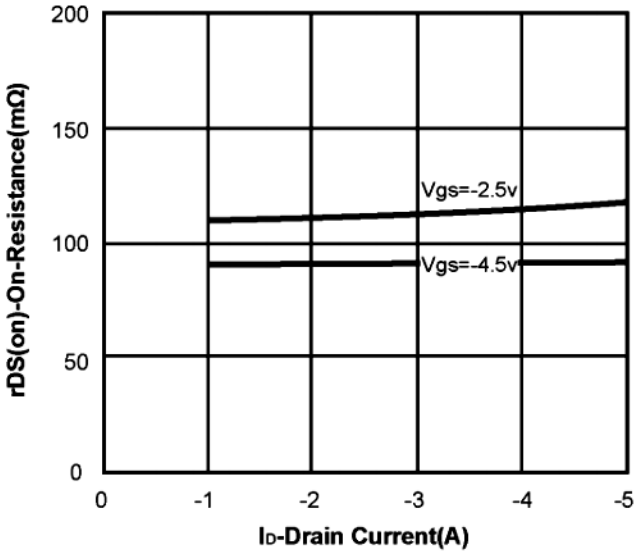
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. The value of R_{θJA} is measured with the device mounted on 1 in2 FR-4 board in a still air environment with T_a=25 °C.

Typical Electrical Characteristics

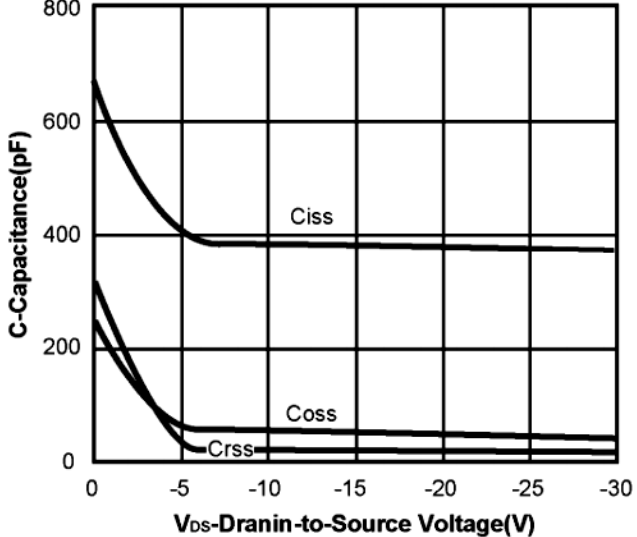
On Resistance vs. Junction Temperature



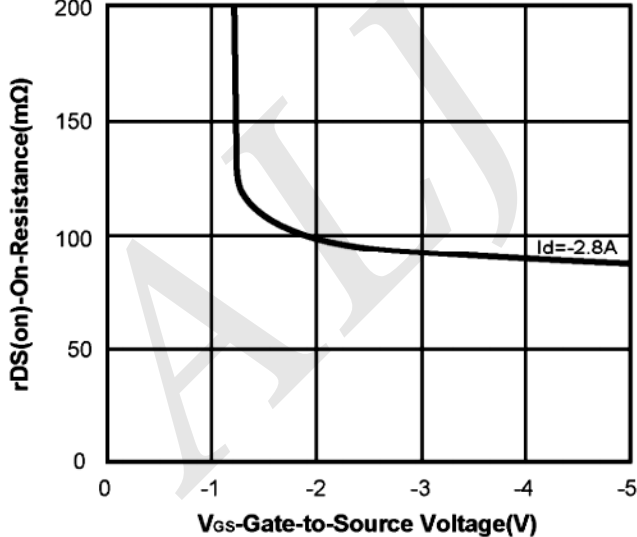
On Resistance vs. Drain Current



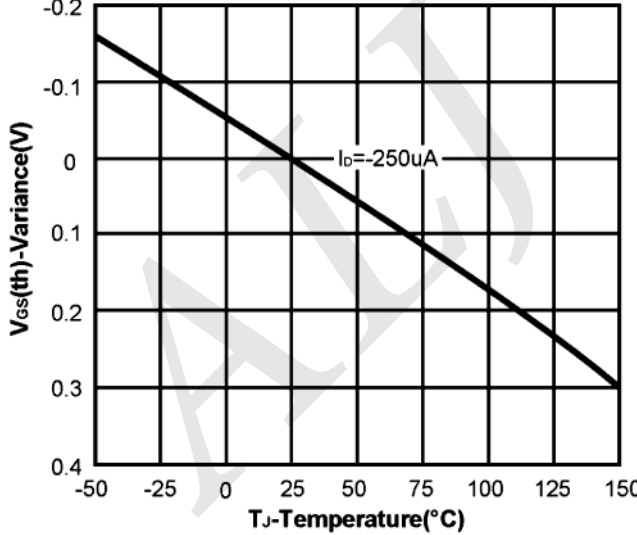
Capacitance



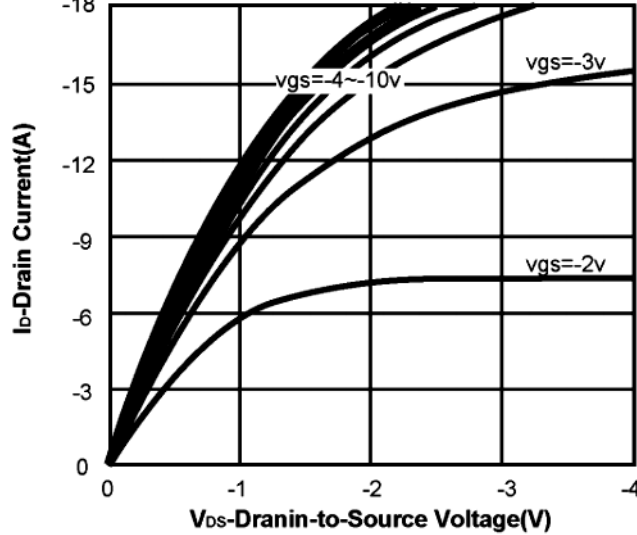
On Resistance vs. Gate-to-Source Voltage



Threshold Voltage



On-Region Characteristics



Typical Electrical Characteristics(Cont.)

