

20V N-Channel Enhancement Mode MOSFET

Description

The AP2302BI uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

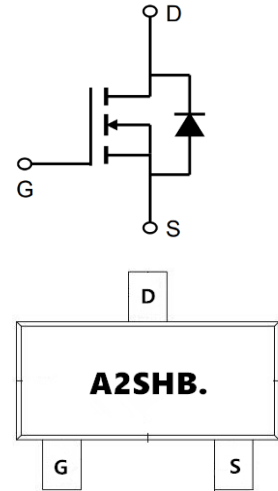
General Features

$V_{DS} = 20V$ $I_D = 2.3A$

$R_{DS(ON)} < 56m\Omega @ V_{GS}=4.5V$

Application

Battery protection
 Load switch
 Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP2302BI	SOT-23	A2SHB.	3000

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

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-source Voltage	20	V
V_{GS}	Gate-source Voltage	± 12	V
$I_D @ T_A=25^\circ C$	Continuous Drain Current $V_{GS} @ 4.5V$	2.3	A
$I_D @ T_A=70^\circ C$	Continuous Drain Current $V_{GS} @ 4.5V$	1.8	A
IDM	Pulsed Drain Current ^A	14	A
P_D	Total Power Dissipation @ $T_A=25^\circ C$	0.7	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient@Steady State	178	$^\circ C/W$
T_J, T_{STG}	Junction and Storage Temperature Range	-55~+150	$^\circ C$

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Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	21		V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V, T_C=25^\circ\text{C}$			1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.52	0.66	0.9	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=2.0A$		43	56	m Ω
		$V_{GS}=2.5V, I_D=1.5A$		58	78	
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$		280		pF
C_{oss}	Output Capacitance			46		
C_{rss}	Reverse Transfer Capacitance			29		
Q_g	Total Gate Charge	$V_{GS}=4.5V, V_{DS}=10V, I_D=3.0A$		2.9		nC
Q_{gs}	Gate Source Charge			0.4		
Q_{gd}	Gate Drain Charge			0.6		
$tD(on)$	Turn-on Delay Time	$V_{GS}=4.5V, V_{DD}=10V, R_L=1.5\Omega, R_{GEN}=3\Omega$		13		ns
t_r	Turn-on Rise Time			54		
$tD(off)$	Turn-off Delay Time			18		
t_f	Turn-off Fall Time			11		
I_S	Maximum Body-Diode Continuous Current				3.0	A
V_{SD}	Diode Forward Voltage	$I_S=3.0A, V_{GS}=0V$			1.2	V

Note:

- 1、Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.
- 2、Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

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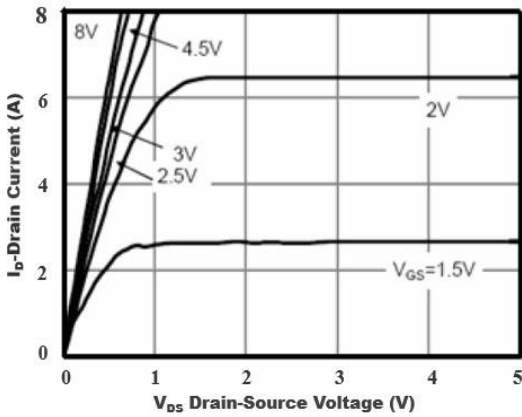


Figure1. Output Characteristics

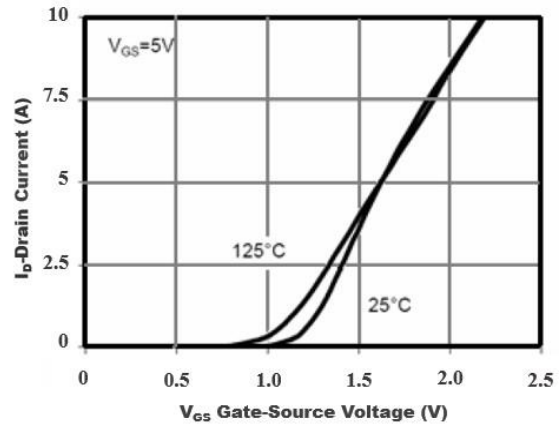


Figure2. Transfer Characteristics

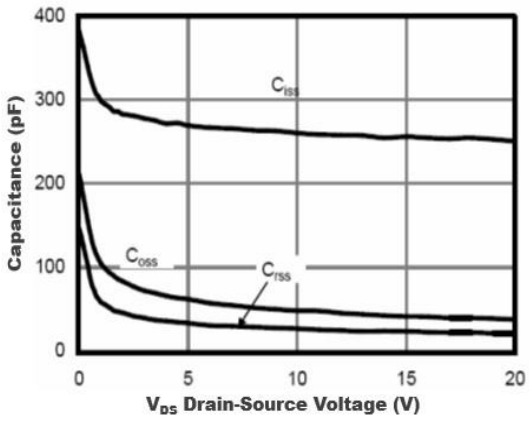


Figure3. Capacitance Characteristics

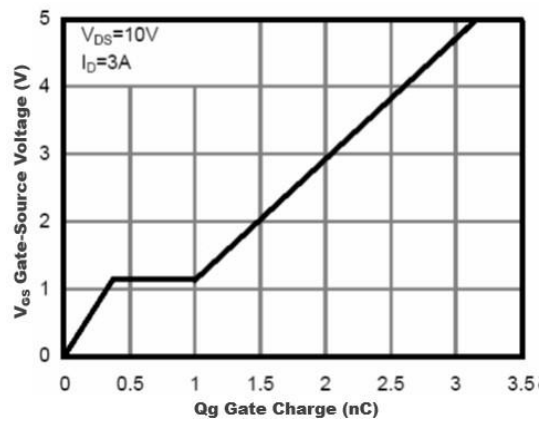


Figure4. Gate Charge

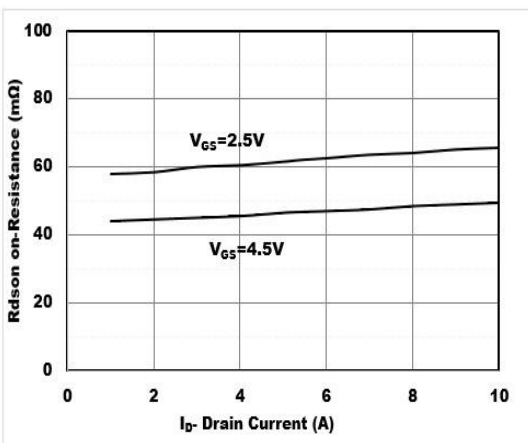


Figure5. Drain-Source on Resistance

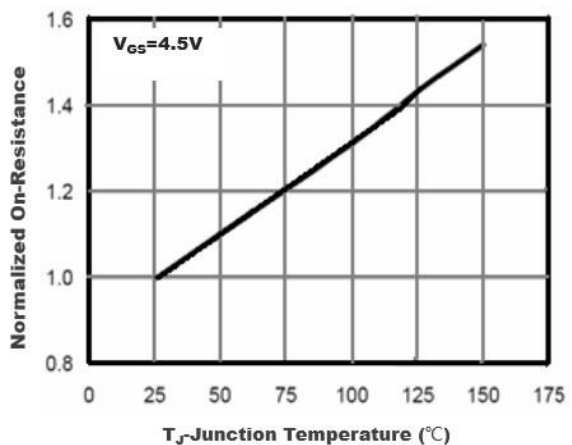


Figure6. Drain-Source on Resistance



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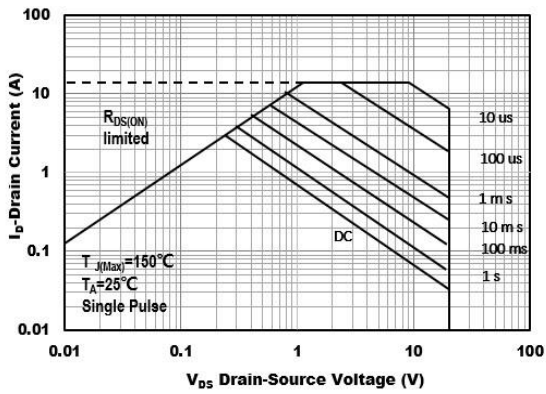


Figure7. Safe Operation Area

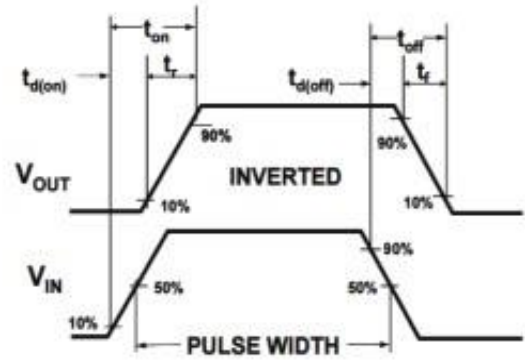


Figure8. Switching wave

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Edition	Date	Change
Rve3.8	2018/1/31	Initial release
Rve3.9	2019/12/01	Reduce RDS(on)

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