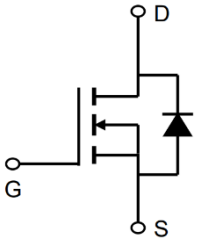
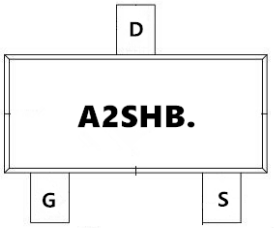
AP2302BI

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

$R_{DS(ON)}$ < 56mΩ@ 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℃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℃	Continuous Drain Current VGS @ 4.5V	2.3	A
$I_{D@}$ T_A=70℃	Continuous Drain Current VGS @ 4.5V	1.8	A
IDM	Pulsed Drain Current [A]	14	A
P_D	Total Power Dissipation @ T_A=25℃	0.7	W
$R_{\theta}JA$	Thermal Resistance Junction-to-Ambient@Steady State	178	℃/ W
TJ ,TSTG	Junction and Storage Temperature Range	-55～+150	℃

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Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}= 0V, I_D=250μA	20	21		V
IDSS	Zero Gate Voltage Drain Current	V_{DS}=20V,V_{GS}=0V,T_C=25℃			1	μA
IGSS	Gate-Body Leakage Current	V_{GS}= ±12V, V_{DS}=0V			±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	0.52	0.66	0.9	V
RDS(ON)	Static Drain-Source On-Resistance	V_{GS}= 4.5V, I_D=2.0A		43	56	mΩ
		V_{GS}= 2.5V, I_D=1.5A		58	78	
C_{iss}	Input Capacitance	V_{DS}=10V,V_{GS}=0V,f=1MHZ		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=1.5Ω, R_{GEN}=3Ω		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≤300us,Duty cycle ≤2%.

2、Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

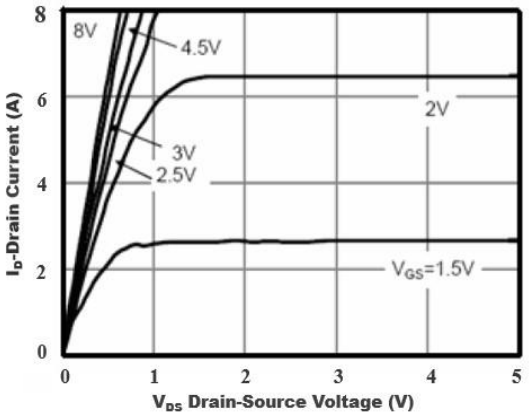

Figure1. Output Characteristics

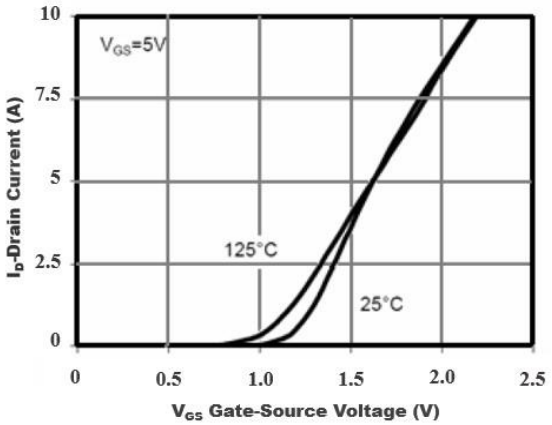

Figure2. Transfer Characteristics

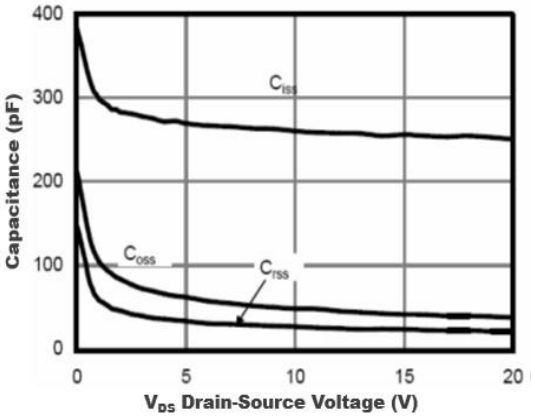

Figure3. Capacitance Characteristics

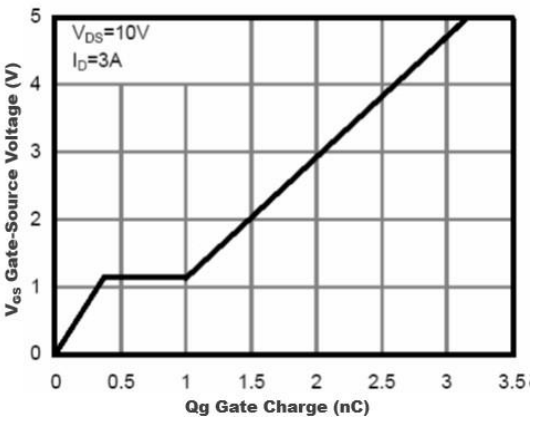

Figure4. Gate Charge

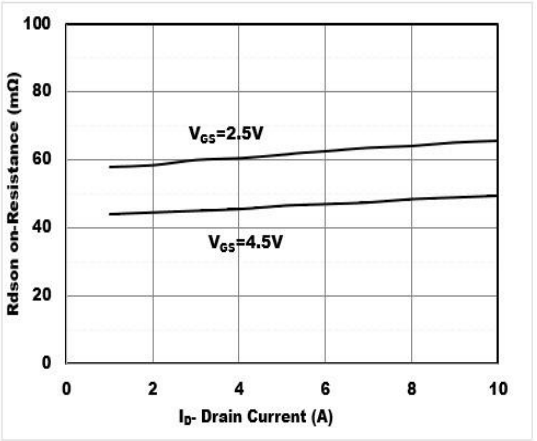

Figure5. Drain-Source on Resistance

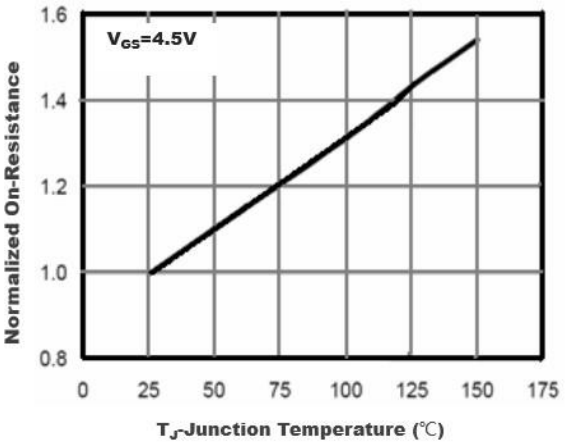

Figure6. Drain-Source on Resistance

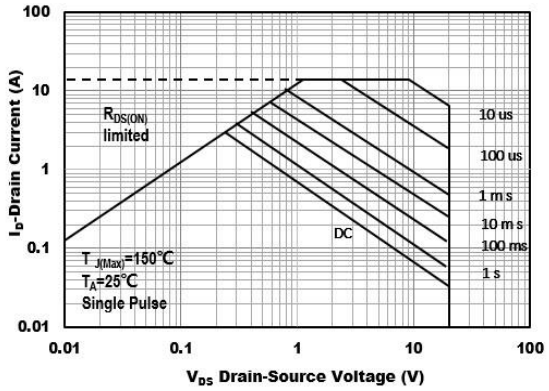

Figure7. Safe Operation Area

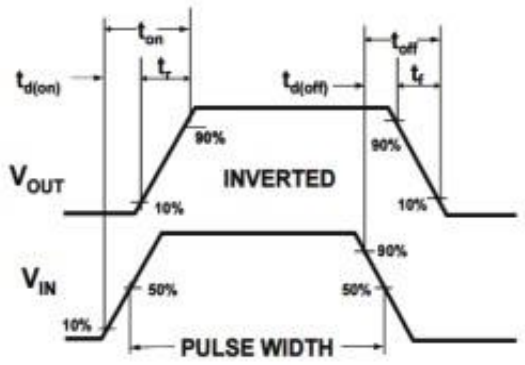

Figure8. Switching wave

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20V N-Channel Enhancement Mode MOSFET

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

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