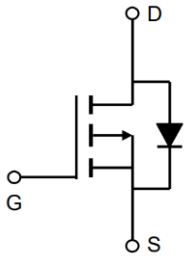
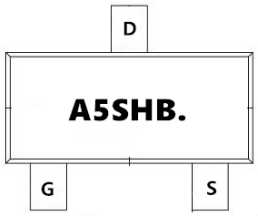
AP2305BI

-20V P-Channel Enhancement Mode MOSFET

Description

The AP2305BI uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.





General Features

V_{DS} = -20V I_D =-4.2A

$R_{DS(ON)}$ < 50mΩ @ V_{GS}=-4.5V

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP2305BI	SOT-23	A5SHB.	3000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Maximum	Unit
V_{DS}	Drain-source Voltage	-20	V
V_{GS}	Gate-source Voltage	±10	V
I_D	Drain Current T_A=25℃	-4.2	A
I_D	Drain Current T_A=70℃	-2.7	A
IDM	Pulsed Drain Current [A]	-14	A
P_D	Total Power Dissipation @ T_A=25℃	1	W
$R_{\theta}JA$	Thermal Resistance Junction-to-Ambient [B]	125	℃/ 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			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}= ±10V, V_{DS}=0V			±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=-250μA	-0.5	-0.69	-1.2	V
RDS(ON)	Static Drain-Source On-Resistance	V_{GS}= -4.5V, I_D=-3.4A		43	50	mΩ
		V_{GS}= -2.5V, I_D=-3A		57	68	
		V_{GS}= -1.8V, I_D=-2.5A		83	90	
V_{SD}	Diode Forward Voltage	I_S=-3.4A,V_{GS}=0V		-0.8	-1.2	V
I_S	Maximum Body-Diode Continuous Current				-3.4	A
C_{iss}	Input Capacitance	V_{DS}=-10V,V_{GS}=0V,f=1MHZ		550		pF
C_{oss}	Output Capacitance			89		
C_{rss}	Reverse Transfer Capacitance			65		
Q_g	Total Gate Charge	V_{GS}=-4.5V,V_{DS}=-10V,I_D=-3.4A		4.3		nC
Q_{gs}	Gate Source Charge			0.8		
Q_{gd}	Gate Drain Charge			1.1		
tD(on)	Turn-on Delay Time	V_{GS}=-4.5V,V_{DD}=-10V, I_D=-1A, R_{GEN}=2.5Ω		12		ns
t_r	Turn-on Rise Time			54		
tD(off)	Turn-off Delay Time			15		
t_f	Turn-off Fall Time			9		

Notes:
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.

Typical Characteristics

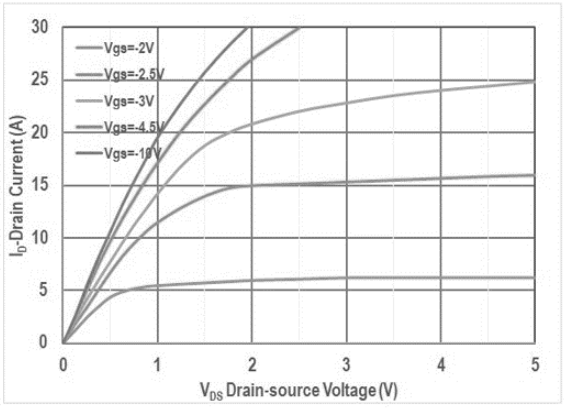


Figure1. Output Characteristics

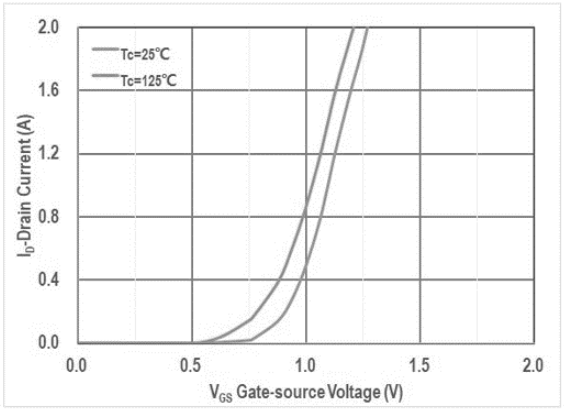


Figure2. Transfer Characteristics

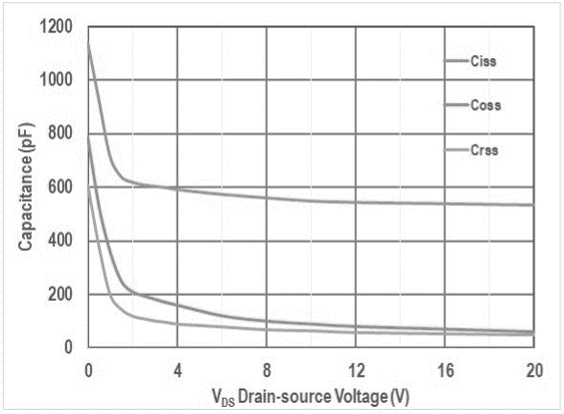


Figure3. Capacitance Characteristics

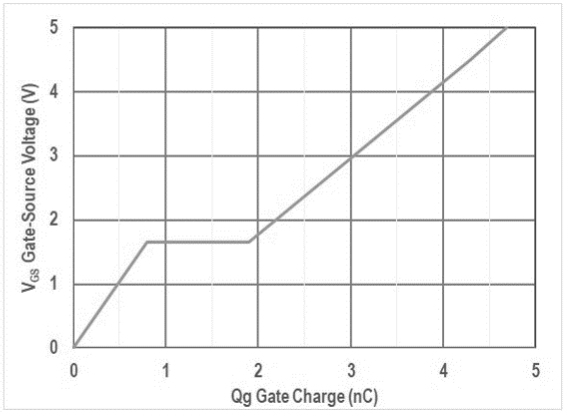


Figure4. Gate Charge

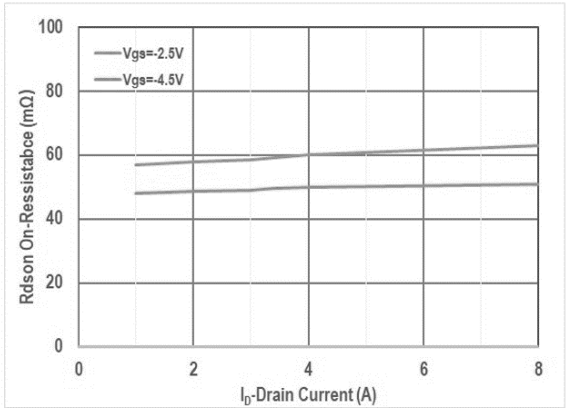


Figure5. Drain-Source on Resistance

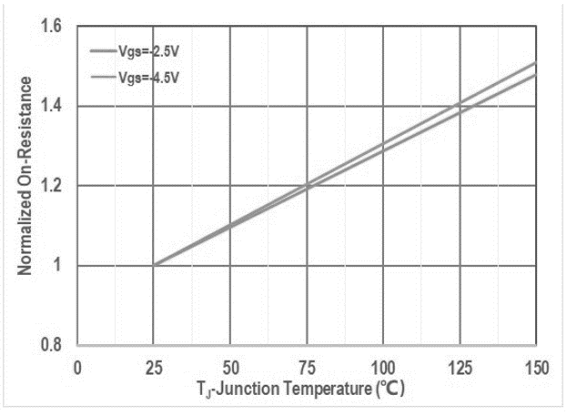


Figure6. Drain-Source on Resistance

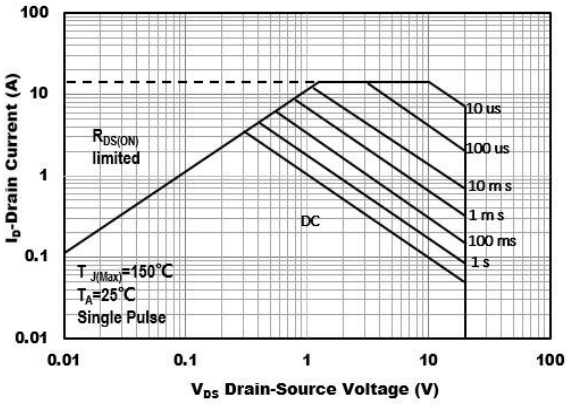


Figure7. Safe Operation Area

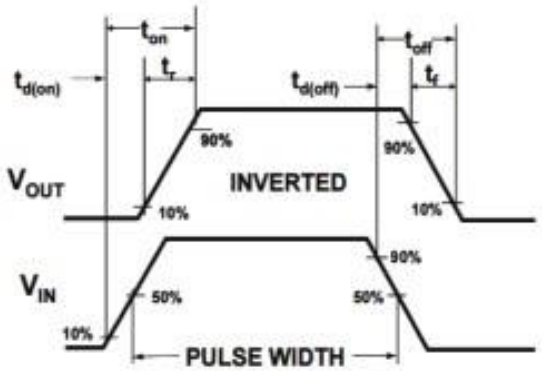
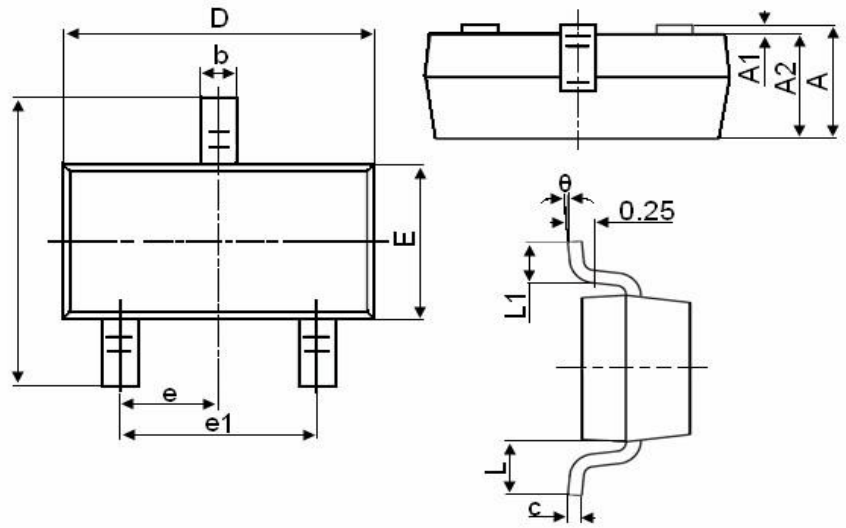


Figure8. Switching wave

Package Mechanical Data-SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

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Edition	Date	Change
Rve1.0	2020/4/31	Initial release