AP2312CI

20V NChannel Enhancement Mode MOSFET

Description

The AP2312CI 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 =6.0A

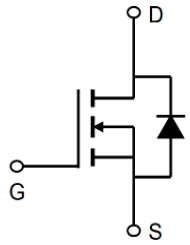
$R_{DS(ON)}$ < 23mΩ @ V_{GS}=4.5V （**Type：18mΩ**）

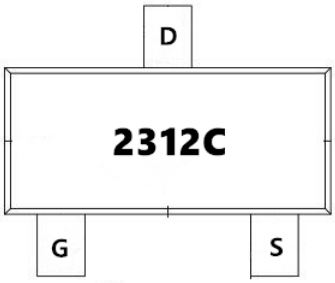
Application

Battery protection

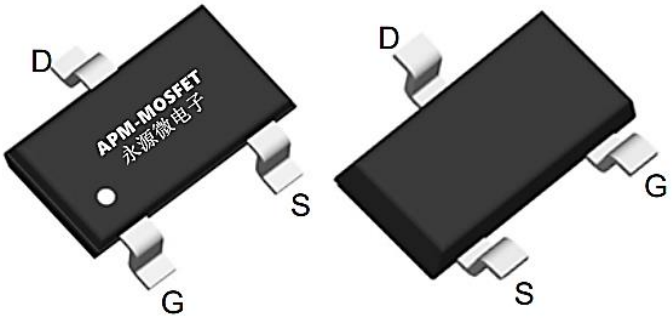
Load switch

Uninterruptible power supply





Top View Bottom View



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP2312C	SOT23L	2312C	3000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 4.5V[1]	6.0	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 4.5V[1]	3.9	A
I_{DM}	Pulsed Drain Current[2]	20	A
P_D@T_A=25℃	Total Power Dissipation[3]	1.25	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	85	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	74	℃/W

20V NChannel Enhancement Mode MOSFET

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	20	22	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V_{DS}=0V, V_{GS} =±12V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	0.4	0.7	1.0	V
RDS(on)	Static Drain-Source on-Resistance note2	V_{GS}=4.5V, I_D=4.5A	-	18	23	mΩ
		V_{GS}=2.5V, I_D=2.5A	-	24	28	
C_{iss}	Input Capacitance	V_{DS}=10V, V_{GS}=0V, f=1.0MHz	-	358	-	pF
Coss	Output Capacitance		-	69.3	-	pF
Crss	Reverse Transfer Capacitance		-	58.5	-	pF
Q_g	Total Gate Charge	V_{DS}=10V, I_D=3A, V_{GS}=4.5V	-	5.6	-	nC
Q_{gs}	Gate-Source Charge		-	0.8	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	1	-	nC
td(on)	Turn-on Delay Time	V_{DS}=10V, I_D=6A, R_{GEN}=3Ω, V_{GS}=4.5V	-	16	-	ns
t_r	Turn-on Rise Time		-	51	-	ns
td(off)	Turn-off Delay Time		-	21	-	ns
t_f	Turn-off Fall Time		-	19	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	6	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	24	A
VSD	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=6A	-	-	1.2	V

Note :

1、The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3、The power dissipation is limited by 150℃ junction temperature

4、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

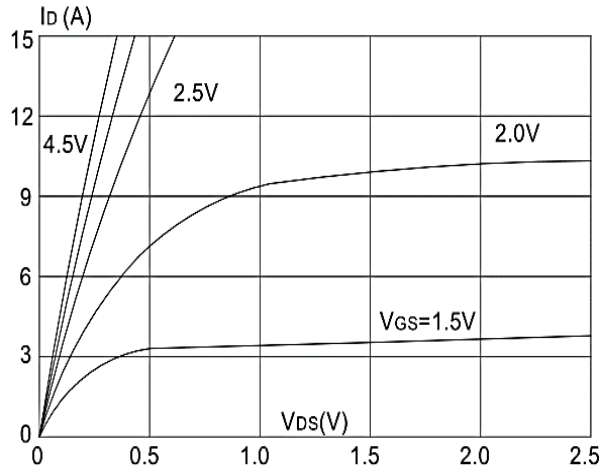


Figure1: Output Characteristics

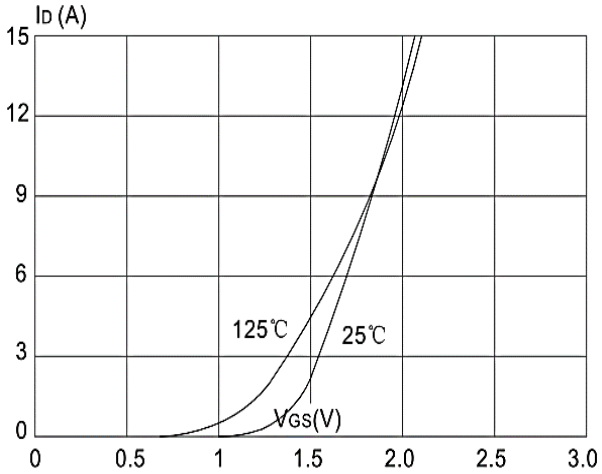


Figure 2: Typical Transfer Characteristics

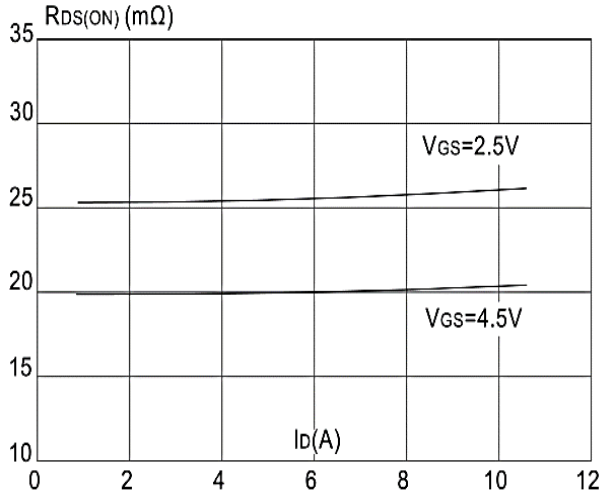


Figure 3:On-resistance vs. Drain Current

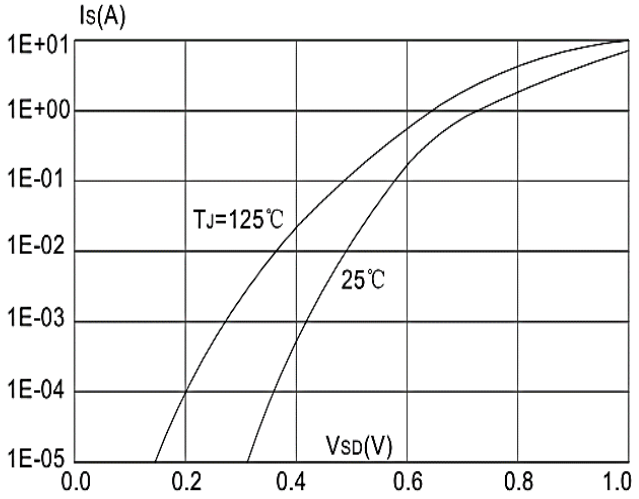


Figure 4: Body Diode Characteristics

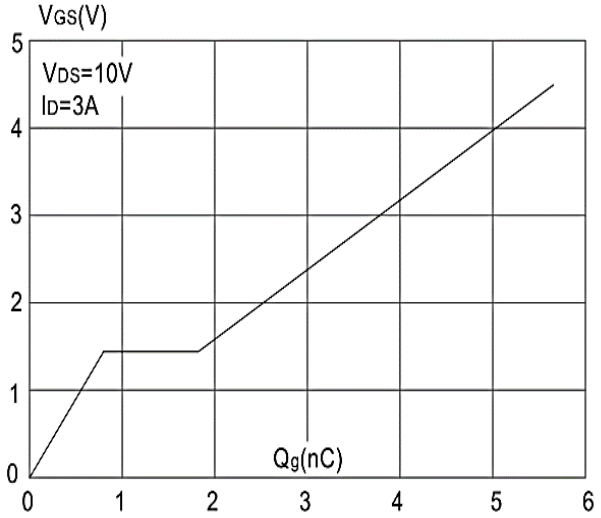


Figure 5: Gate Charge Characteristics

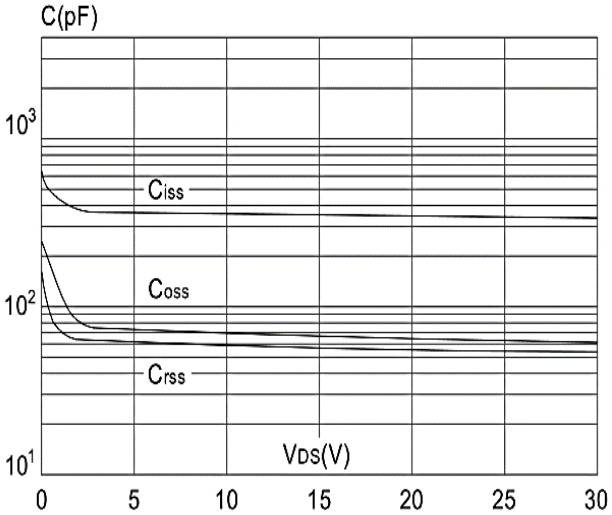


Figure 6: Capacitance Characteristics

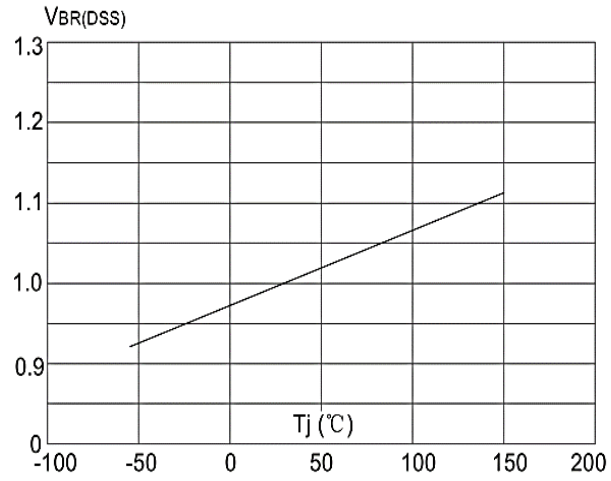


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

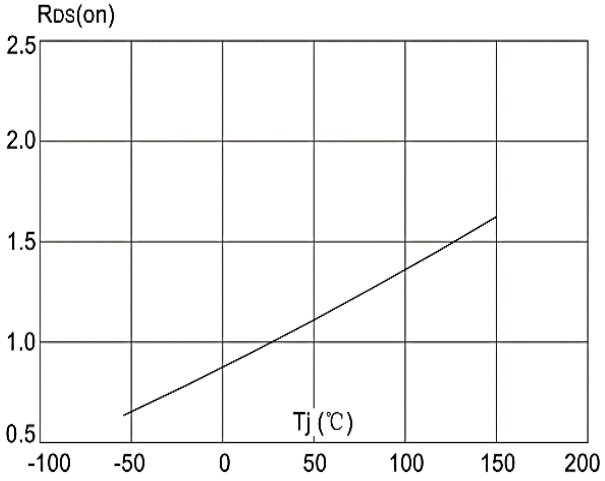


Figure 8: Normalized on Resistance vs. Junction Temperature

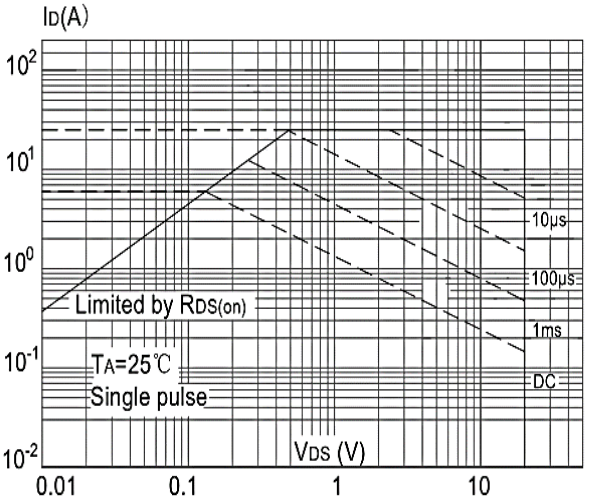


Figure 9: Maximum Safe Operating Area

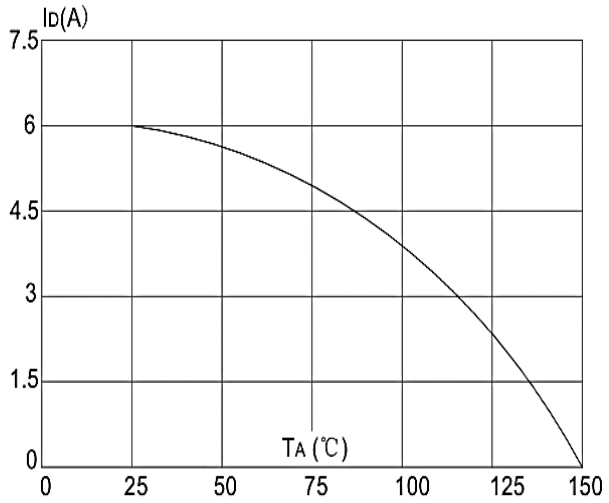


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

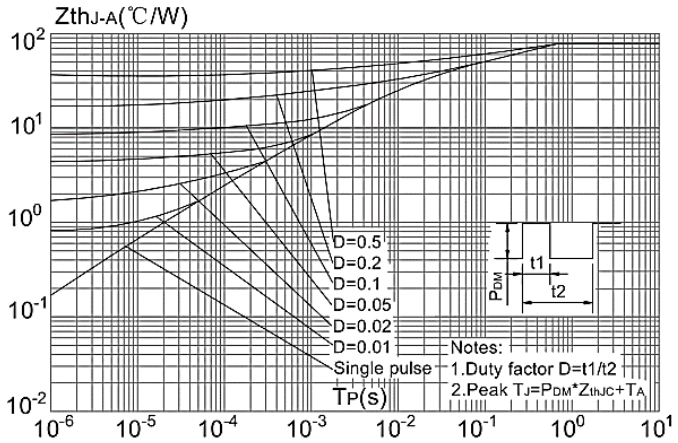
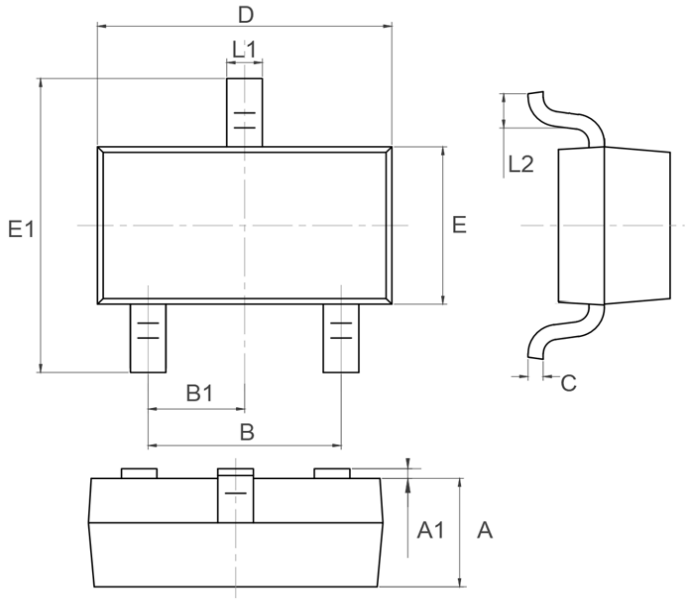


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

Package Mechanical Data-SOT23L



Symbol	Dim in mm		
	Min	Typ	Max
A	0.9	1	1.1
A1	0	0.05	0.1
B	1.8	1.9	2
B1	0.95TYP		
C	0.08	0.115	0.15
D	2.8	2.9	3
E	1.2	1.3	1.4
E1	2.25	2.4	2.55
L1	0.3	0.4	0.5
L2	0.2	0.35	0.5

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Edition	Date	Change
REV1.0	2023/12/18	Initial release