AP2N7002BI

60V N-Channel Enhancement Mode MOSFET

Description

The AP2N7002BI 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}=60V I_D =0.35A

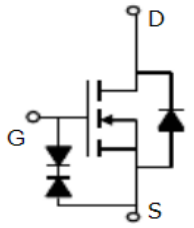
$R_{DS(ON)}$ < 2200mΩ @ V_{GS}=10V **(Type：1700mΩ)**

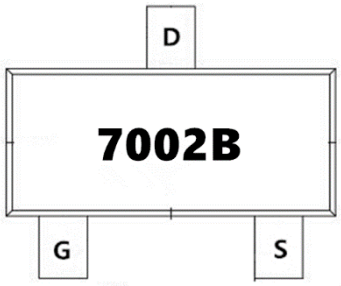
ESD Rating：HBM≥2000V

Application

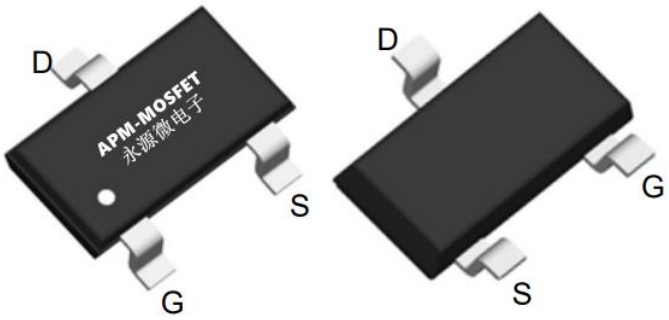
Load switch

Uninterruptible power supply





Top View Bottom View



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP2N7002BI	SOT23L	7002B	3000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	0.35	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	0.10	A
I_{DM}	Pulsed Drain Current[2]	1.2	A
P_D@T_C=25℃	Total Power Dissipation[4]	0.35	mW
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]	357	℃/W

Electrical Characteristics (T_A=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	60	-	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS} = 0V,	-	-	1	μA
IGSS	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}=±20V	-	-	±10	uA
VGS(th)	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1	1.5	2.5	V
RDS(on)	Static Drain-Source on-Resistance	V_{GS}=10V, I_D=0.3A	-	1700	2200	mΩ
		V_{GS} =4.5V, I_D =0.2A	-	2100	2800	
Ciss	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	28	-	pF
Coss	Output Capacitance		-	11	-	pF
Crss	Reverse Transfer Capacitance		-	4	-	pF
Q_g	Total Gate Charge	V_{DS}=10V, I_D=0.3A, V_{GS}=4.5V	-	1.7	-	nC
Qgs	Gate-Source Charge		-	0.3	-	nC
Qgd	Gate-Drain(“Miller”) Charge		-	0.6	-	nC
td(on)	Turn-on Delay Time	V_{DD}=10V, I_D=0.2A, R_{GEN}=10Ω,V_{GS}=10V,	-	2	-	ns
tr	Turn-on Rise Time		-	15	-	ns
td(off)	Turn-off Delay Time		-	7	-	ns
t_f	Turn-off Fall Time		-	20	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	0.3	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	1.2	A
VSD	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S =0.3A	-	-	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

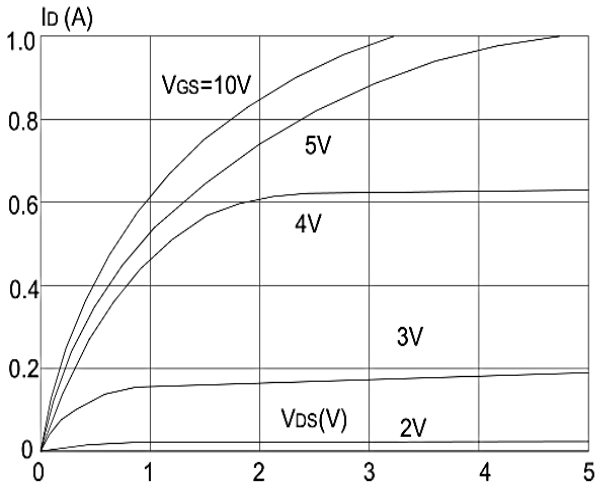


Figure1: Output Characteristics

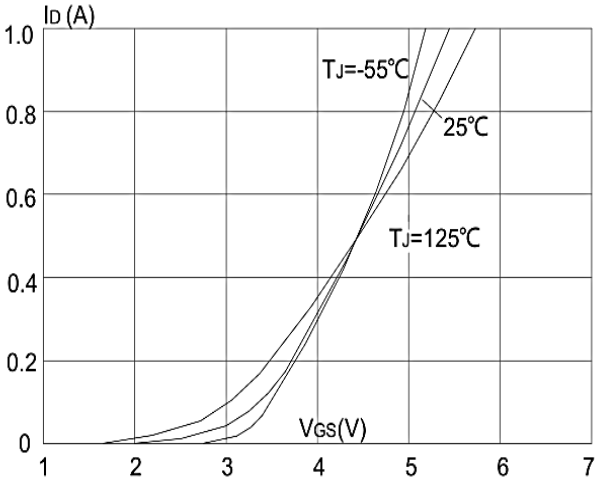


Figure 2: Typical Transfer Characteristics

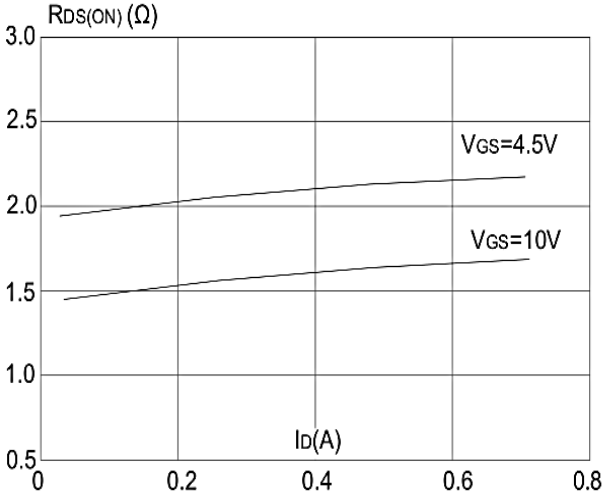


Figure 3:On-resistance vs. Drain Current

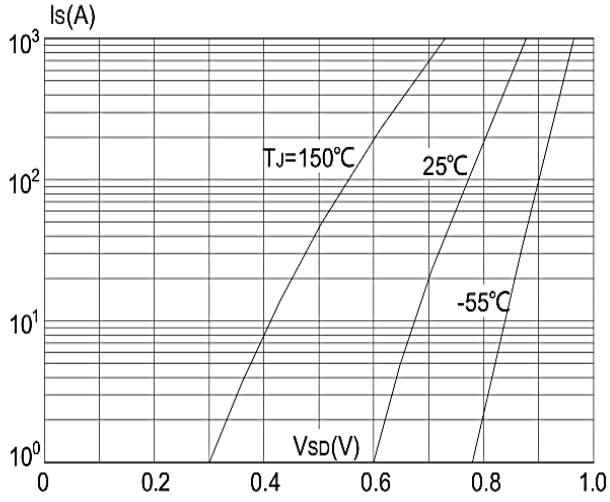


Figure 4: Body Diode Characteristics

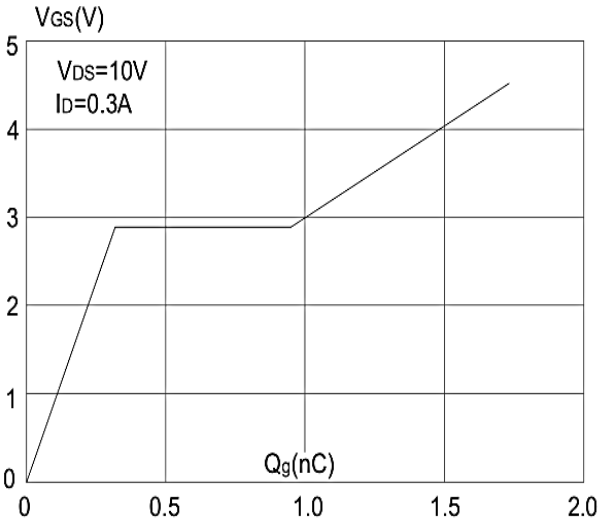


Figure 5: Gate Charge Characteristics

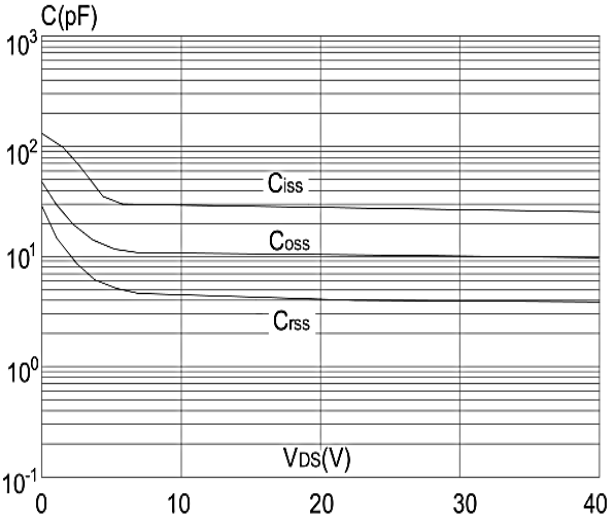


Figure 6: Capacitance Characteristics

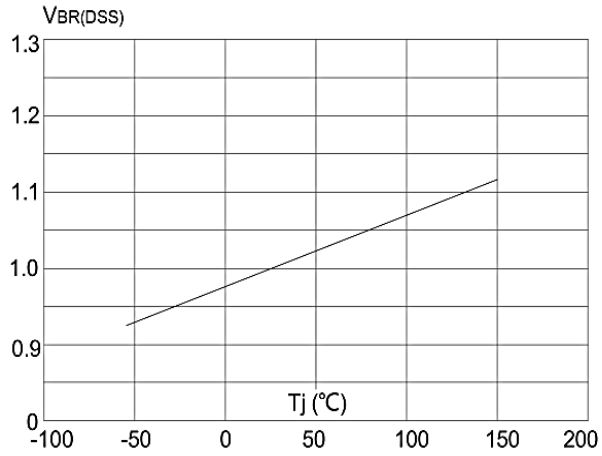


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

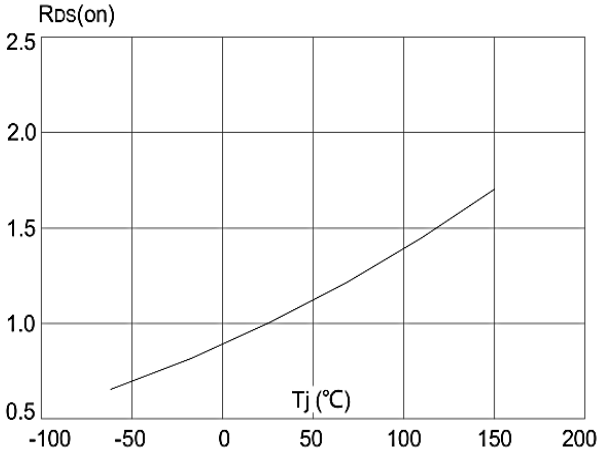


Figure 8: Normalized on Resistance vs Junction Temperature

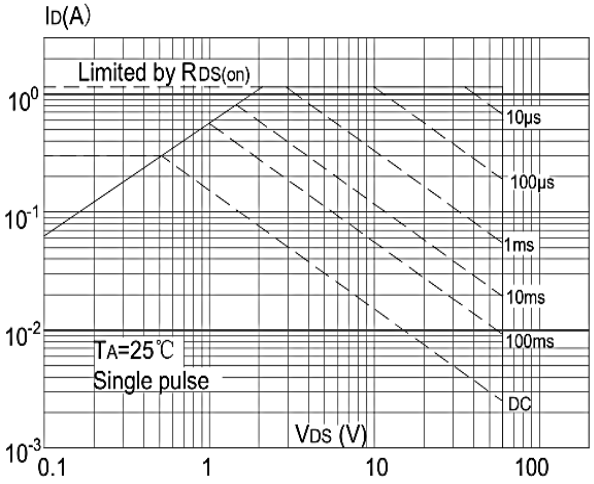


Figure 9: Maximum Safe Operating Area vs. Case Temperature

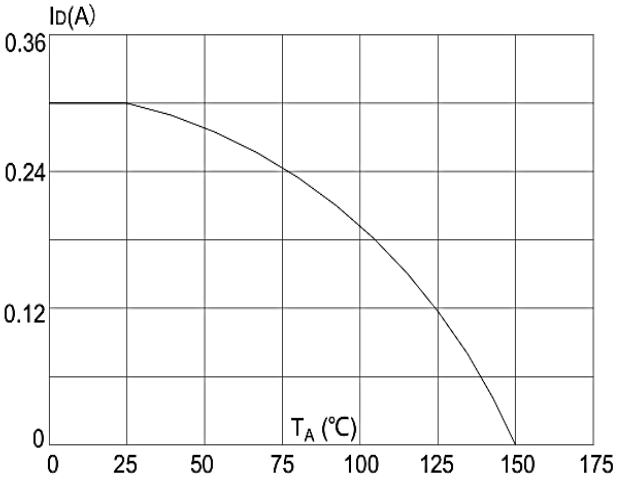


Figure 10: Maximum Continuous Drain Current

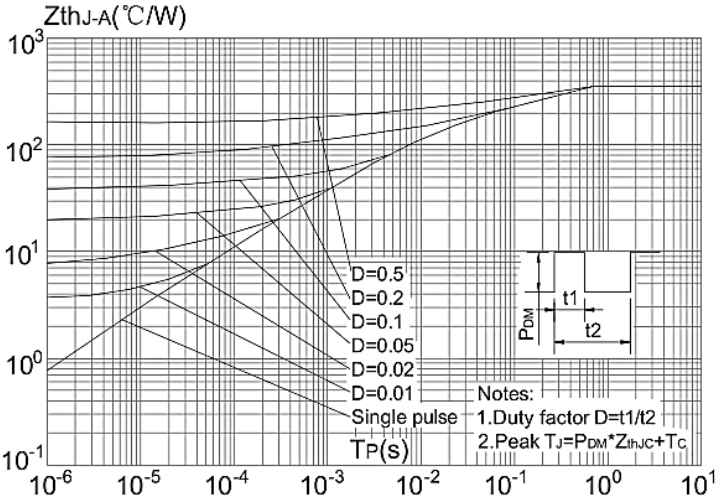
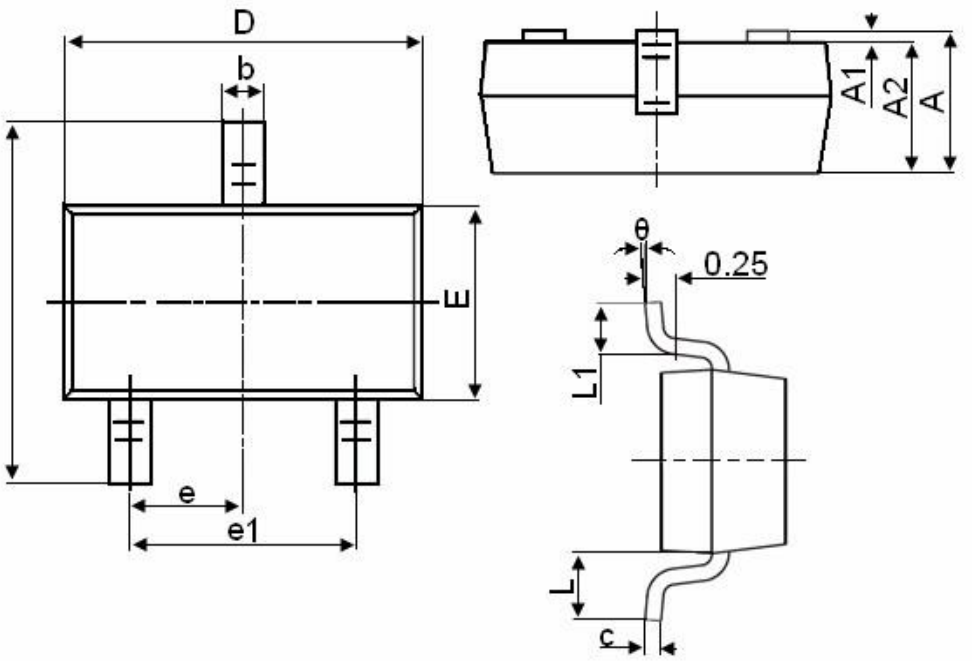


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Mechanical Data-SOT23-XC-Single



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
REV1.0	2023/3/8	Initial release