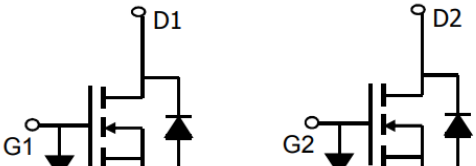
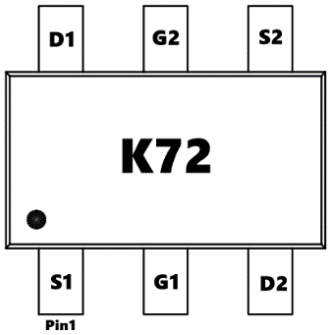
AP2N7002DW

60V N+N-Channel Enhancement Mode MOSFET

Description

The AP2N7002DW uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.





General Features

V_{DS} = 60V I_D =0.3A

$R_{DS(ON)}$ < 2100mΩ @ V_{GS}=10V （**Type：1600mΩ**）

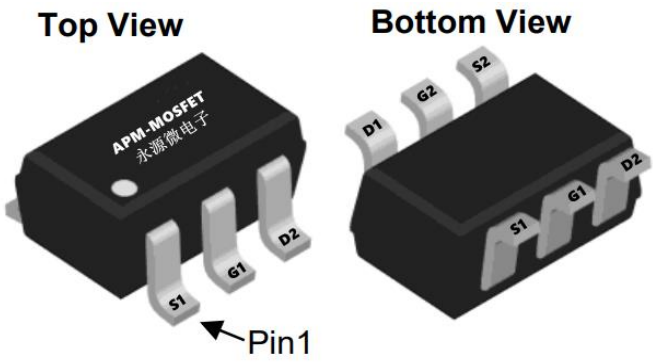
ESD=2KV HBM

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP2N7002DW	SOT363-6L	K72	3000

Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	60	V
VGSS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	0.3	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	0.15	A
IDM	Pulsed Drain Current	1	A
P_D@T_C=25℃	Power Dissipation	0.38	W
TJ, TSTG	Operating and Storage Temperature Range	-55 to +150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	135	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case[1]	100	℃/W

60V N+N-Channel 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= 10μA	60	67	-	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	1.0	1.3	2.5	V
RDS(on)	Static Drain-Source on-Resistance	V_{GS} =10V, I_D =0.3A	-	1600	2100	mΩ
RDS(on)	Static Drain-Source on-Resistance	V_{GS} =4.5V, I_D =0.2A	-	1900	2700	mΩ
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		-	-	0.2	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	0.8	A
VSD	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S =0.2A	-	-	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 .The EAS data shows Max. rating .
3、The power dissipation is limited by 175℃ junction temperature
4、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

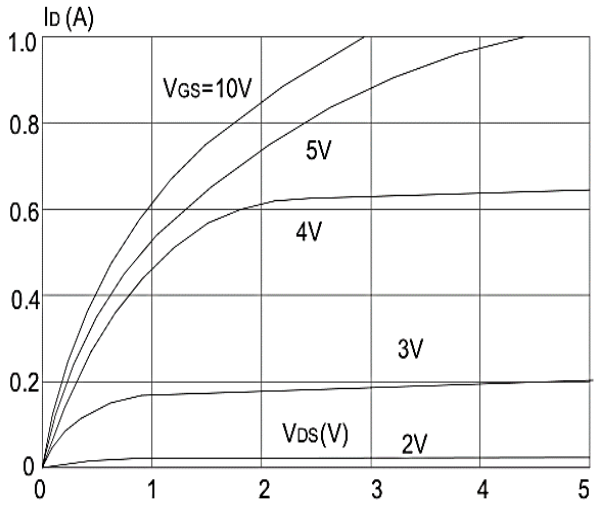


Figure1: Output Characteristics

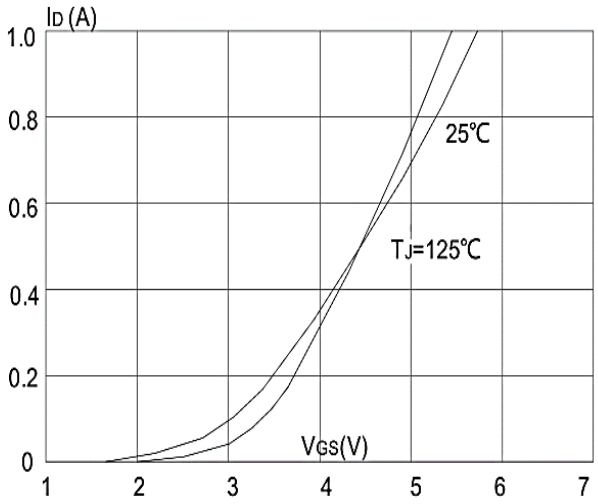


Figure 2: Typical Transfer Characteristics

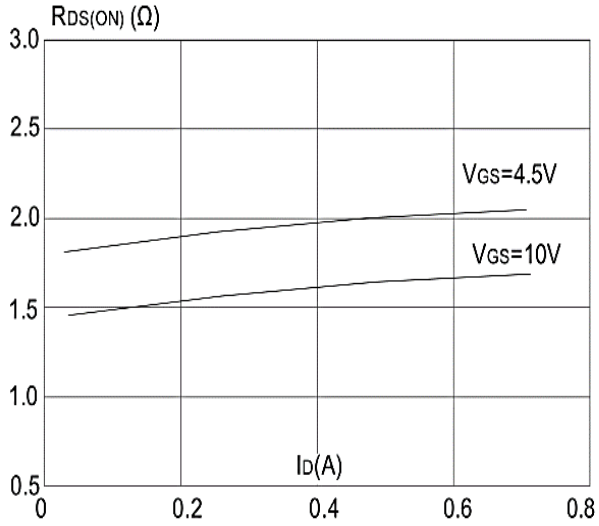


Figure 3:On-resistance vs. Drain Current

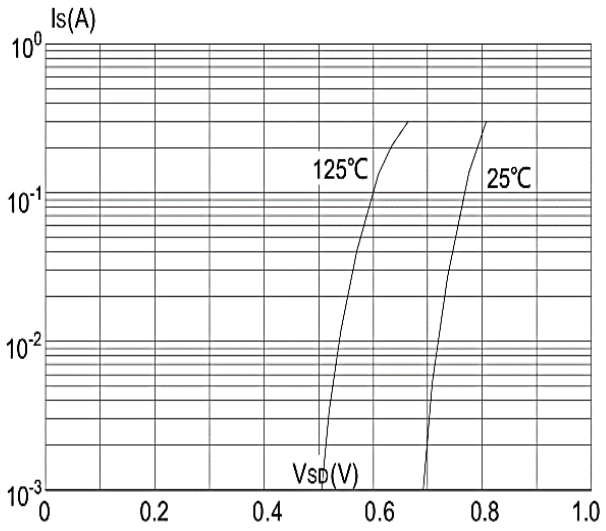


Figure 4: Body Diode Characteristics

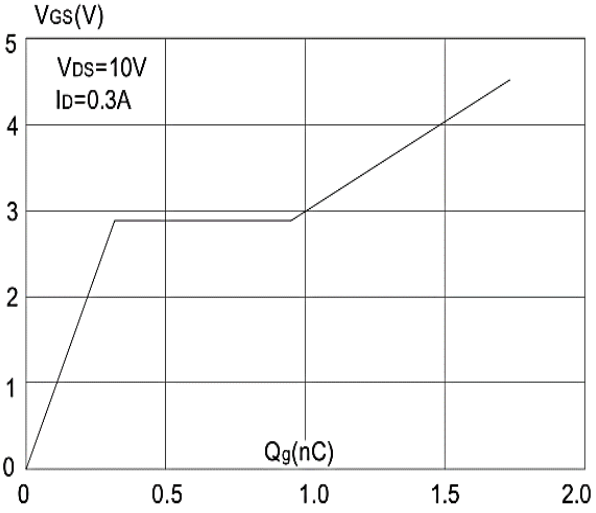


Figure 5: Gate Charge Characteristics

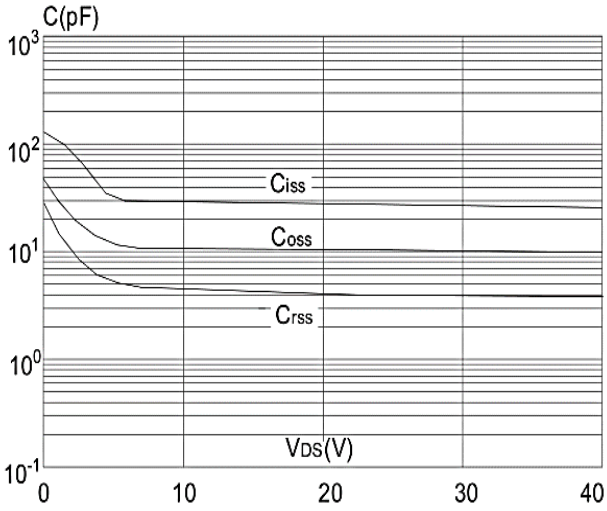


Figure 6: Capacitance Characteristics

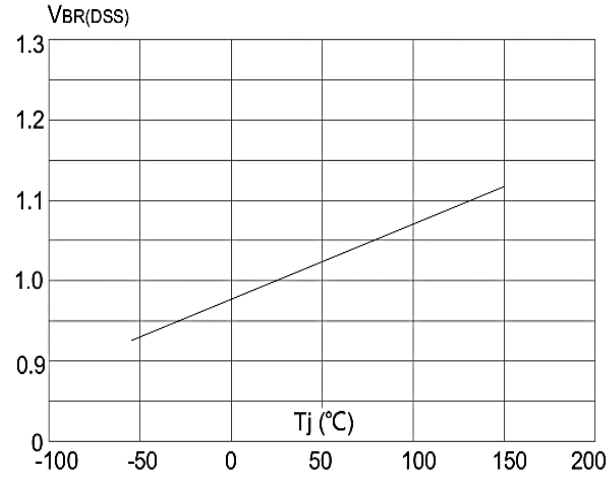


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

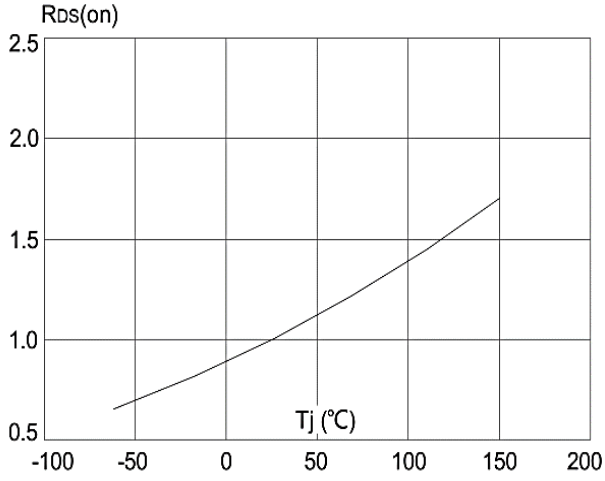


Figure 8: Normalized on Resistance vs. Junction Temperature

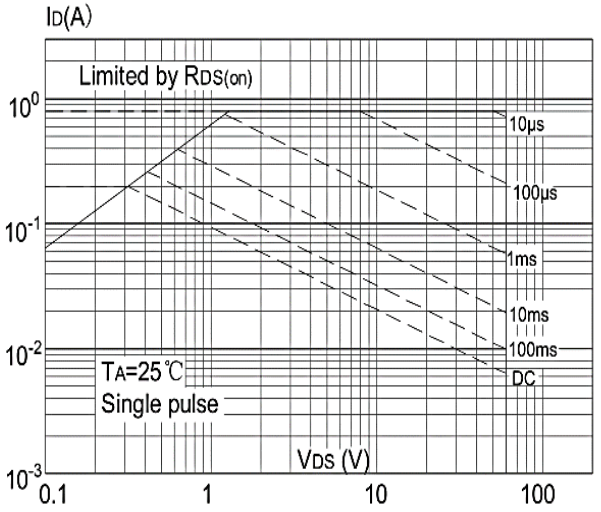


Figure 9: Maximum Safe Operating Area

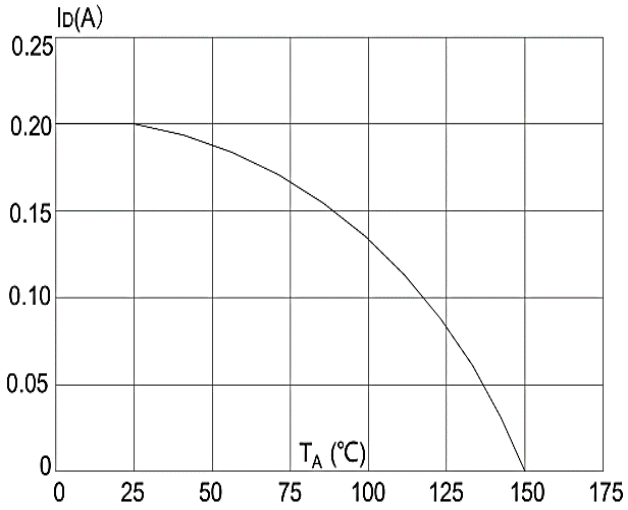


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

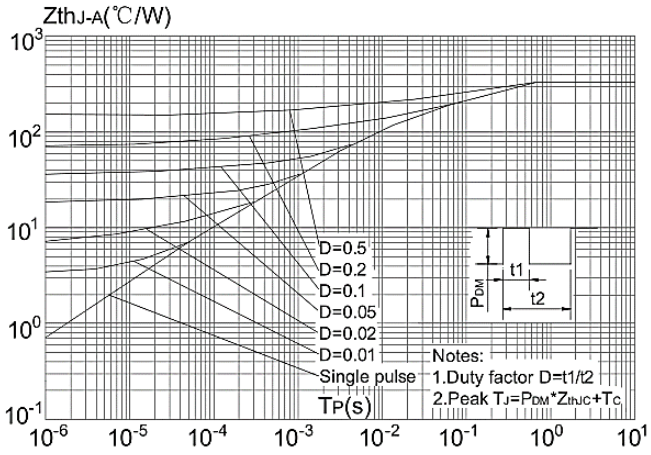
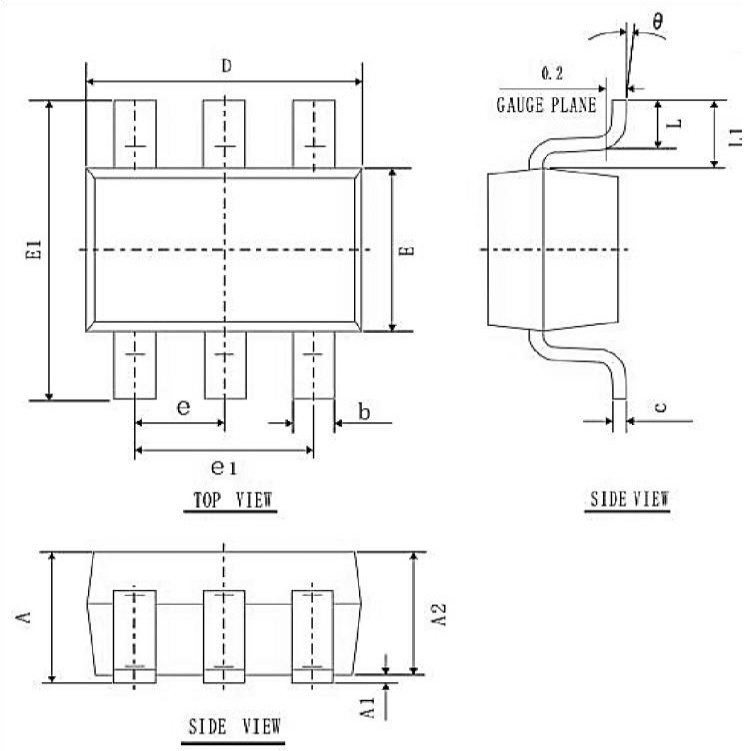


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

Package Mechanical Data-SOT-363-6L



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.90	1.00	1.10
A1	0.00	0.05	0.10
A2	0.90	0.95	1.00
b	0.20	0.25	0.30
c	0.08	0.10	0.15
e1	1.20	1.30	1.40
D	2.00	2.10	2.20
E	1.15	1.25	1.35
E1	2.15	2.30	2.45
L	0.26	0.36	0.46
θ	0°	4°	8°
L1	0.525 REF		
e	0.65 TYP		

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Edition	Date	Change
Rve1.0	2020/7/15	Initial release