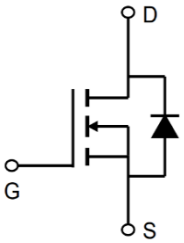
AP15N06SI

65V N-Channel Enhancement Mode MOSFET

Description

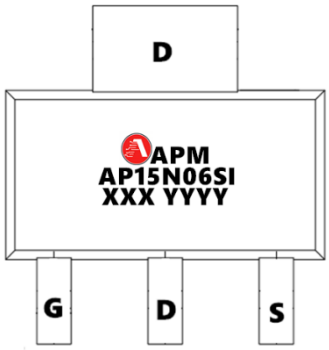
The AP15N06SI uses advanced **APM-SGT**$_{II}$ technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

V_{DS} = 65V I_D =15A

$R_{DS(ON)}$ < 18mΩ @ V_{GS}=10V **(Type：13mΩ)**

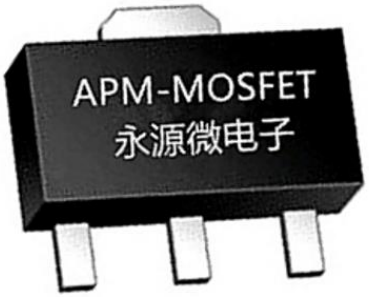


Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP15N06SI	SOT89-3L	AP15N06SI XXX YYYY	3000

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	65	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current[1,6]	15	A
I_D@T_C=100℃	Continuous Drain Current[1,6]	7.2	A
IDM	Pulsed Drain Current[2]	46	A
EAS	Single Pulse Avalanche Energy[3]	33.8	mJ
P_D@T_C=25℃	Total Power Dissipation[4]	3.1	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	4.0	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case[1]	125	℃/W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	65	72	-	V
IGSS	Gate-body Leakage Current	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
IDSS T_J=25°C	Zero Gate Voltage Drain Current	V_{DS}=65V, V_{GS}=0V			1	μA
IDSS T_J=100°C					100	
VGS(th)	Gate-Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.2	1.7	2.5	V
RDS(on)	Drain-Source On-Resistance[4]	V_{GS}=10V, I_D=10A	-	13	18	mΩ
RDS(on)	Drain-Source On-Resistance[4]	V_{GS}=4.5V, I_D=5A		16	22	mΩ
gfs	Forward Transconductance[4]	V_{DS} = 10V, I_D = 10A	-	81	-	S
Ciss	Input Capacitance	V_{DS}=30V, V_{GS}=0V, f =1MHz	-	755	-	pF
Coss	Output Capacitance		-	215	-	
Crss	Reverse Transfer Capacitance		-	11.5	-	
R_g	Gate Resistance	f=1MHz	-	1.2	-	Ω
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=30V, I_D= 10A	-	14	-	nC
Qgs	Gate-Source Charge		-	2.6	-	
Qgd	Gate-Drain Charge		-	2.9	-	
td(on)	Turn-On Delay Time	V_{GS}=10V, V_{DD}=30V, R_G= 1.5Ω, I_D=10A	-	6.2	-	ns
t_r	Rise Time		-	1.9	-	
td(off)	Turn-Off Delay Time		-	14.8	-	
t_f	Fall Time		-	3.2	-	
trr	Body Diode Reverse Recovery Time	I_F=10A, dI/dt=100A/μs	-	28	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	11.2	-	nC
VSD	Diode Forward Voltage[4]	I_S=10A, V_{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current	T_A=25°C	-	-	15	A

Note

1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

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

3、The EAS data shows Max. rating . The test condition is VDD=48V,VGS=10V,L=0.1mH,IAS=18A

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

5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation

Typical Characteristics

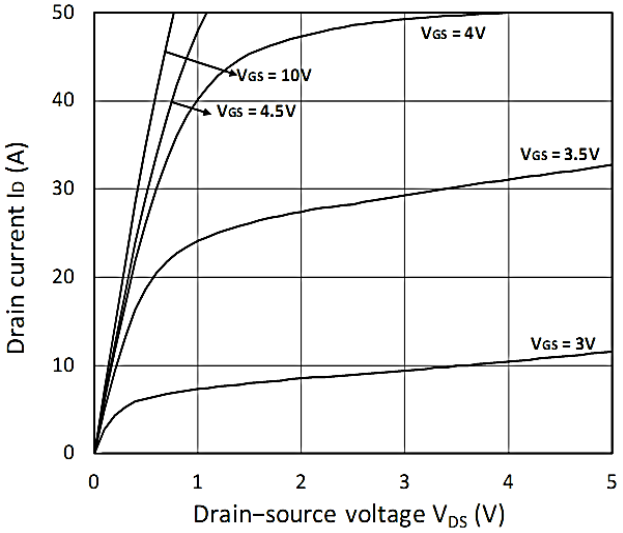


Figure 1. Output Characteristics

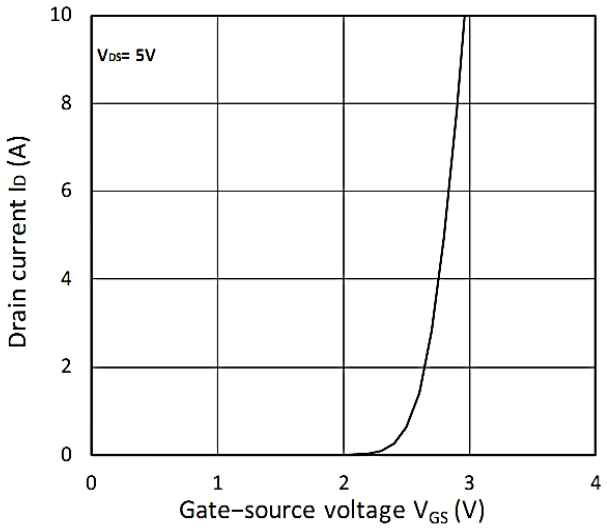


Figure 2. Transfer Characteristics

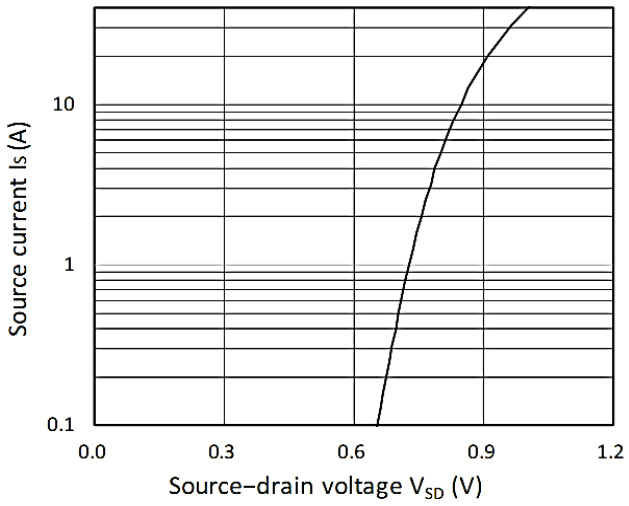


Figure 3. Forward Characteristics of Reverse

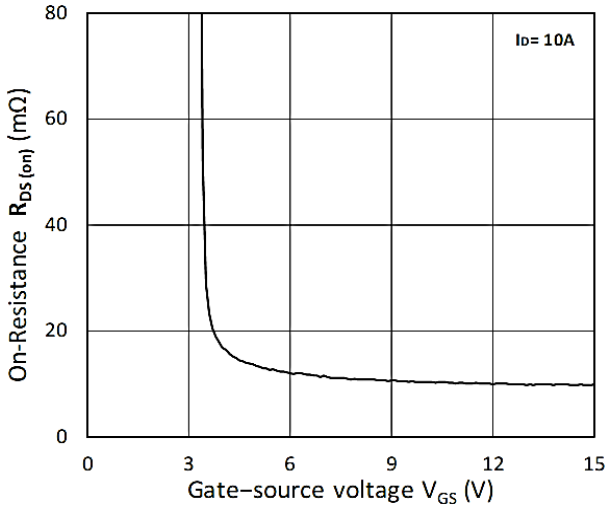


Figure 4. RDS(ON) vs. VGS

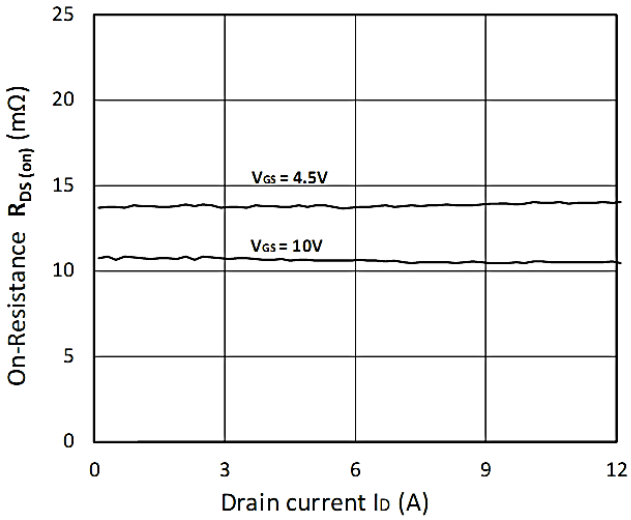


Figure 5. R DS(ON) vs. ID

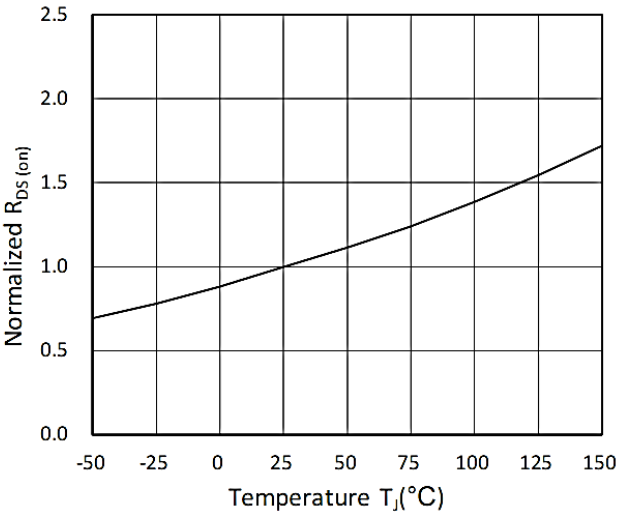


Figure 6. Normalized R DS(on) vs. Temperature

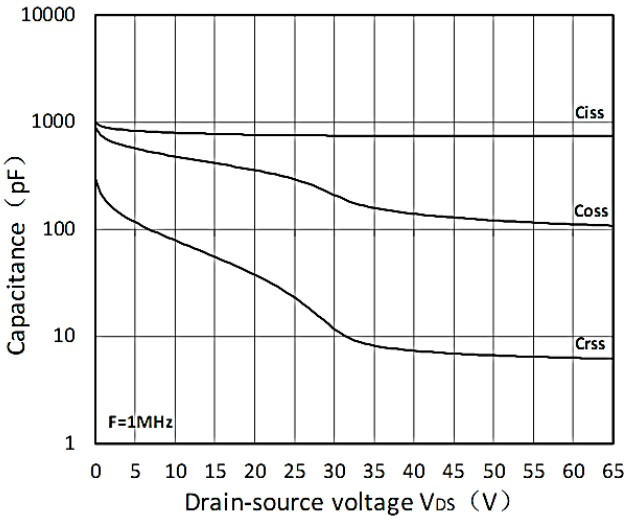


Figure 7. Capacitance Characteristics

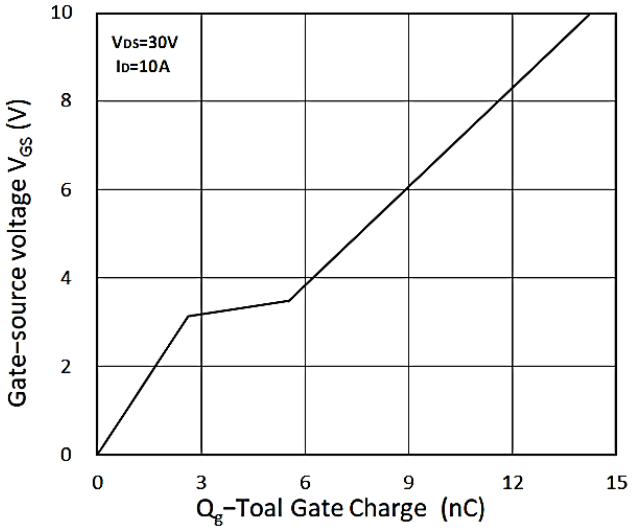


Figure 8. Gate Charge Characteristics

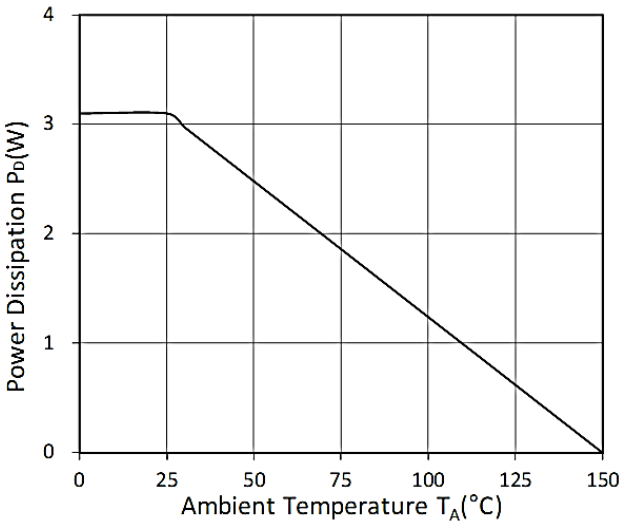


Figure 9. Power Dissipation

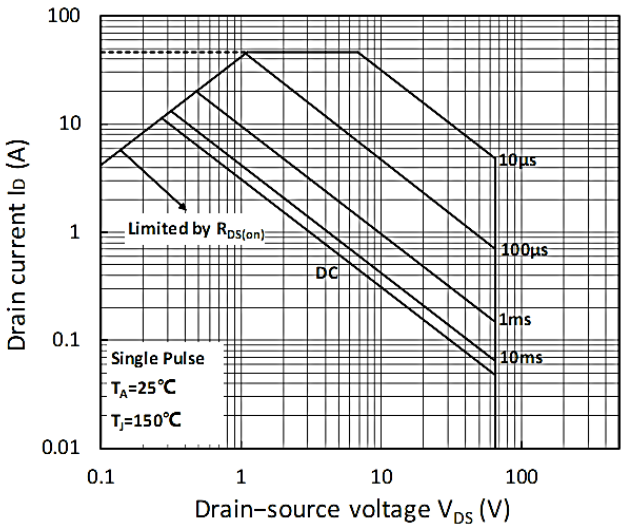


Figure10. Safe Operating Area

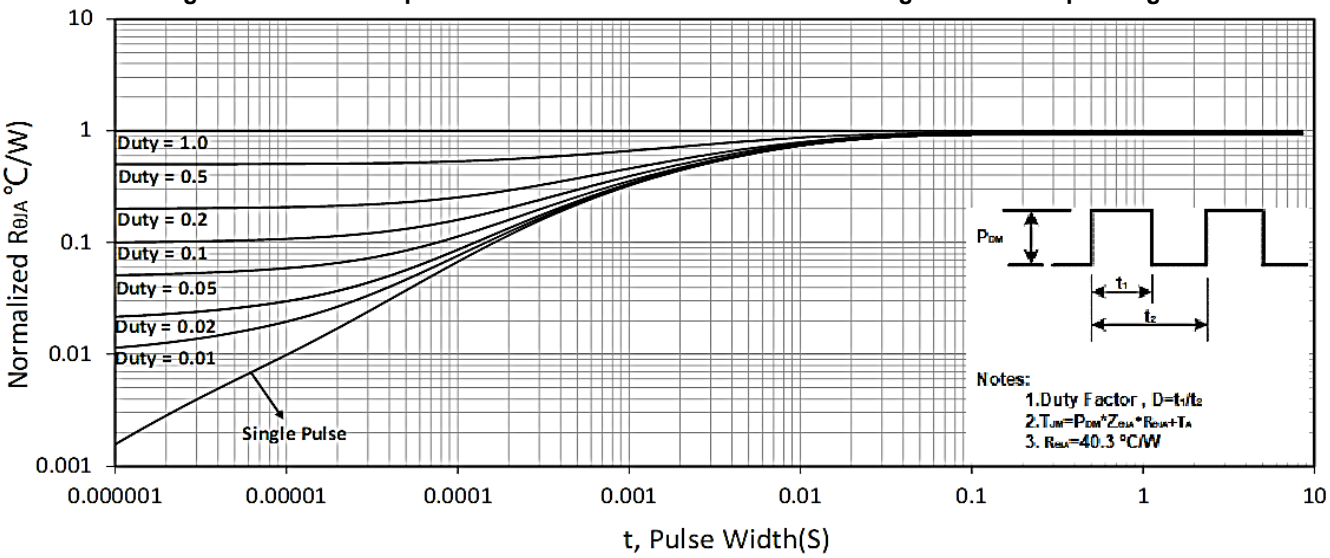
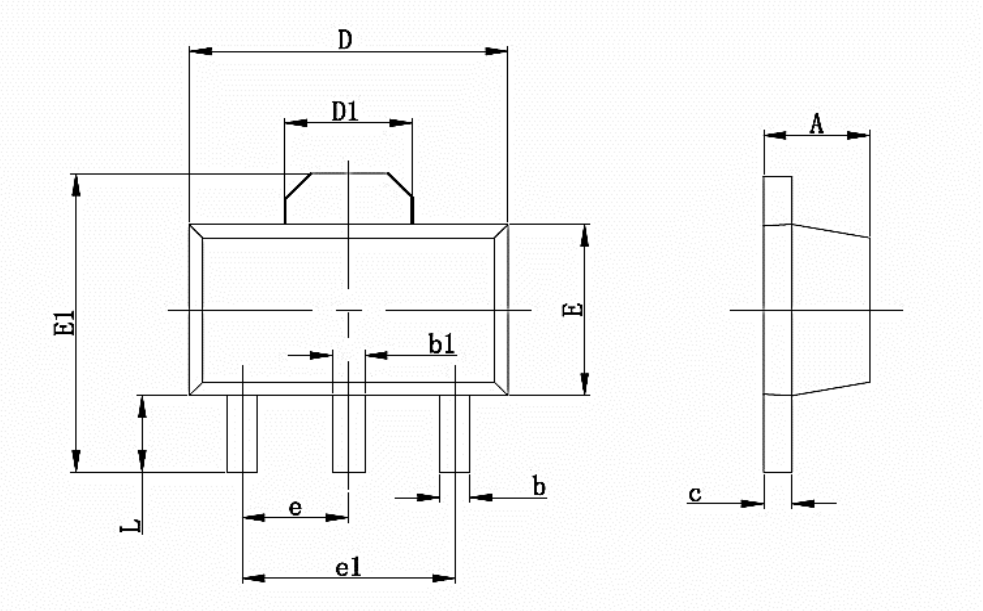


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data:SOT89-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.350	2.550	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP	
e1	3.000 TYP		0.118TYP	
L	0.900	1.100	0.035	0.047

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Edition	Date	Change
REV1.0	2023/12/1	Initial release