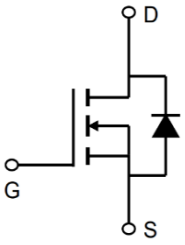
AP80N06D

65V N-Channel Enhancement Mode MOSFET

Description

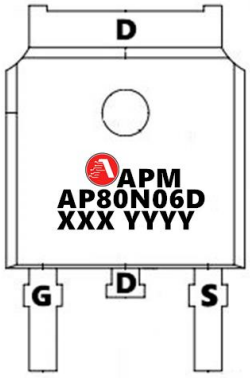
The AP80N06D uses advanced **APM-SGT**Ⅰ Ⅰtechnology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

V_{DS} = 65V I_D =80A

$R_{DS(ON)}$ < 8.5mΩ @ V_{GS}=10V **(Type：6.5mΩ)**

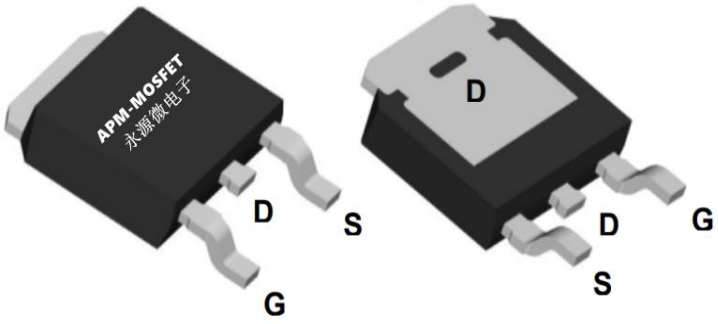


Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP80N06D	TO-252-3L	AP80N06D XXX YYYY	2500

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

Symbol	Parameter	Value	Unit
VDS	Drain source voltage	65	V
VGS	Gate source voltage	±20	V
ID@TA=25℃	Continuous drain current	80	A
ID@TA=70℃	Continuous drain current	44	A
IDM	Pulsed drain current	280	A
PD@TA=25℃	Power dissipation	73.5	W
EAS	Single pulsed avalanche energy	57.5	mJ
TSTG	Storage Temperature Range	-55 to 150	℃
Tj	Operation and storage temperature	-55 to 150	℃
RθJC	Thermal resistance, junction-case	1.7	°C/W
RθJA	Thermal resistance, junction-ambient5)	62.5	°C/W

65V N-Channel Enhancement Mode MOSFET

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=20A	-	6.5	8.5	mΩ
RDS(on)	Drain-Source On-Resistance[4]	V_{GS}=4.5V, I_D=10A		8.5	12	mΩ
gfs	Forward Transconductance[4]	V_{DS} = 10V, I_D = 10A	-	80	-	S
Ciss	Input Capacitance	V_{DS}=30V, V_{GS}=0V, f =1MHz	-	1156	-	pF
Coss	Output Capacitance		-	348	-	
Crss	Reverse Transfer Capacitance		-	19.8	-	
R_g	Gate Resistance	f=1MHz	-	1.5	-	Ω
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=30V, I_D=20A	-	20.6	-	nC
Qgs	Gate-Source Charge		-	3.7	-	
Qgd	Gate-Drain Charge		-	4.3	-	
td(on)	Turn-On Delay Time	V_{GS}=10V, V_{DD}=30V, R_G= 3Ω, I_D=20A	-	6.9	-	ns
t_r	Rise Time		-	8.1	-	
td(off)	Turn-Off Delay Time		-	18.6	-	
t_f	Fall Time		-	5.3	-	
trr	Body Diode Reverse Recovery Time	I_F=20A, dI/dt=100A/μs	-	34	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	17	-	nC
VSD	Diode Forward Voltage[4]	I_S=20A, V_{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current	T_A=25°C	-	-	80	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=29A

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

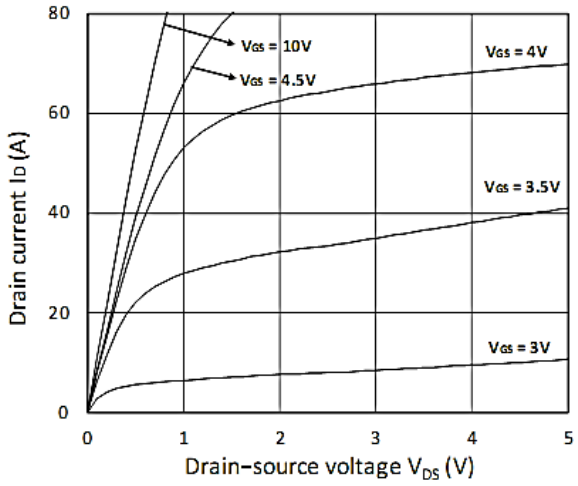


Figure 1. Output Characteristics

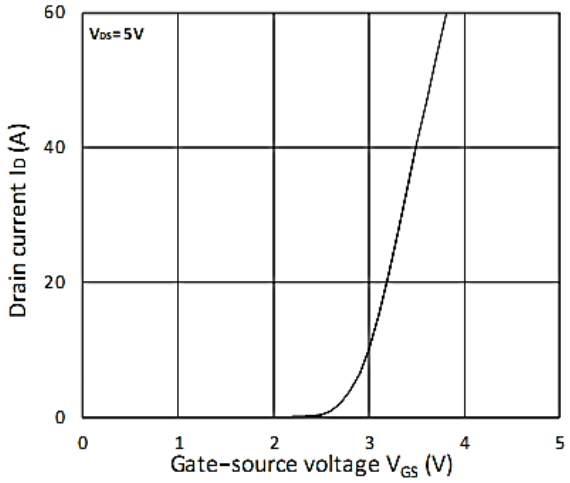


Figure 2. Transfer Characteristics

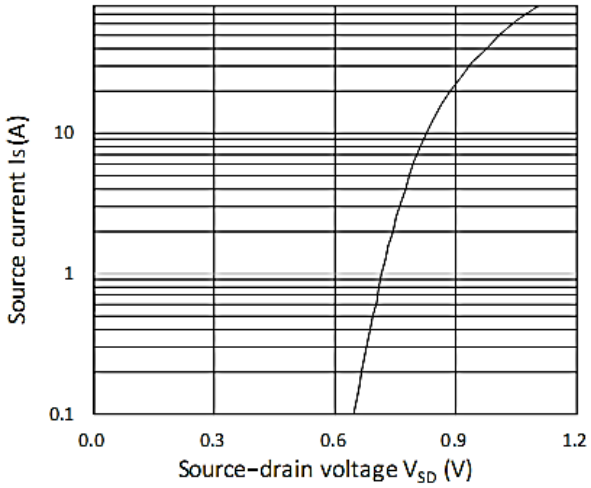


Figure 3. Forward Characteristics of Reverse

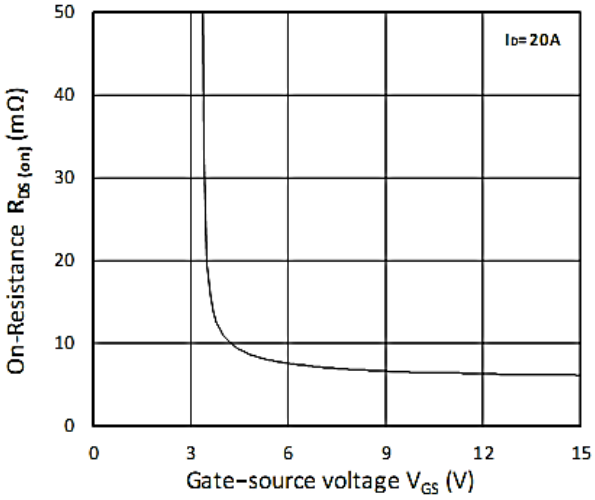


Figure 4. RDS(ON) vs.VGS

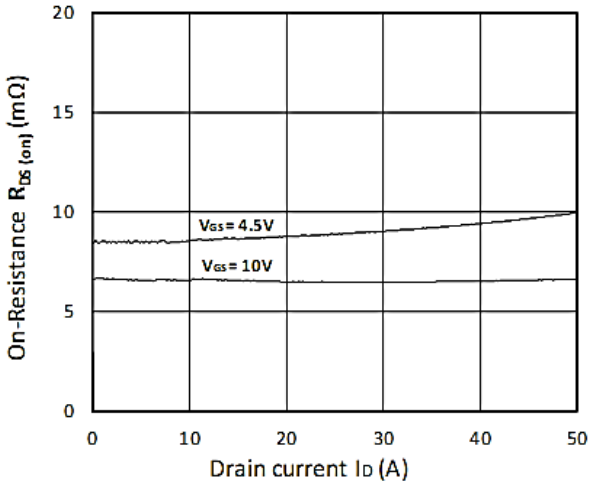


Figure 5. RDS(ON) vs. ID

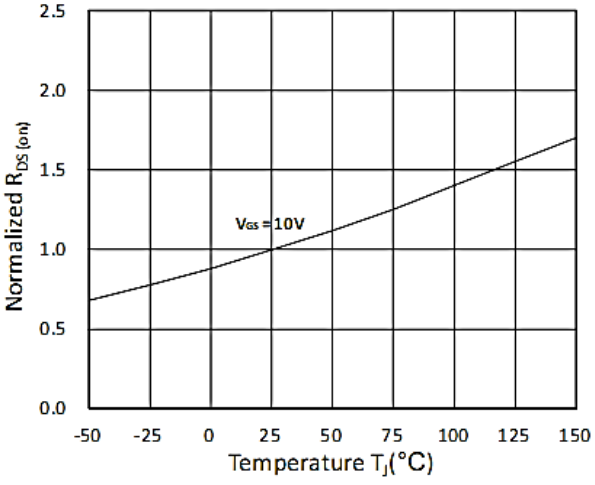


Figure 6. Normalized RDS(on) vs. Temperature

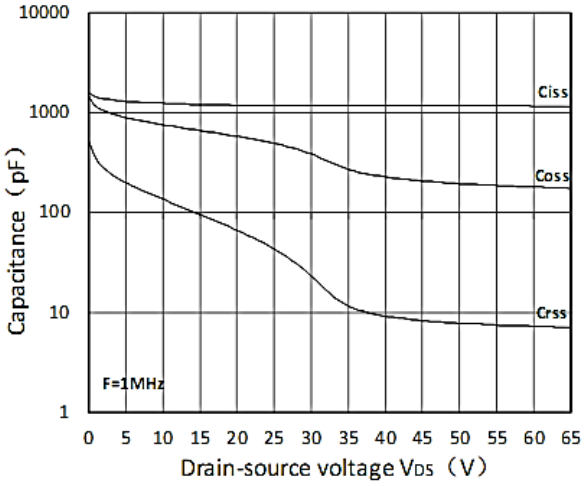


Figure 7. Capacitance Characteristics

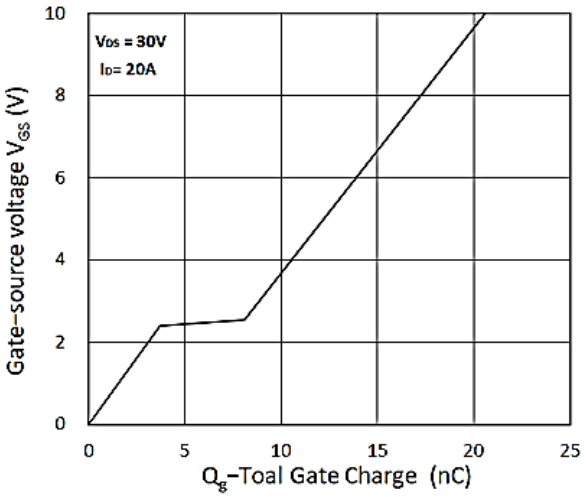


Figure 8. Gate Charge Characteristics

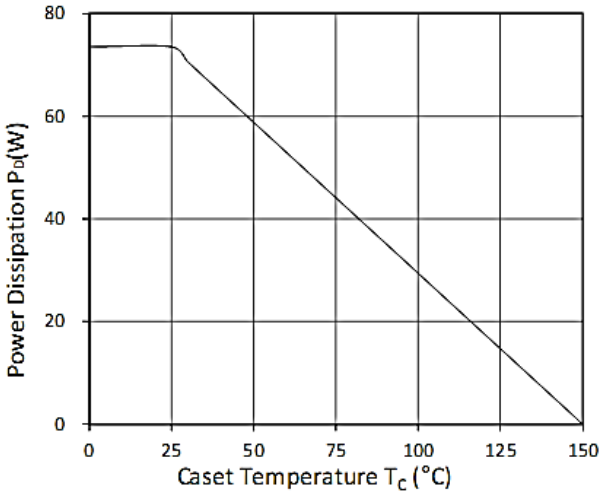


Figure 9. Power Dissipation

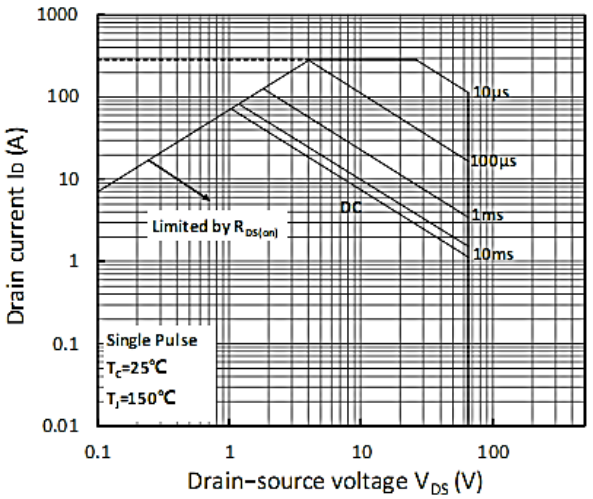


Figure10. Safe Operating Area

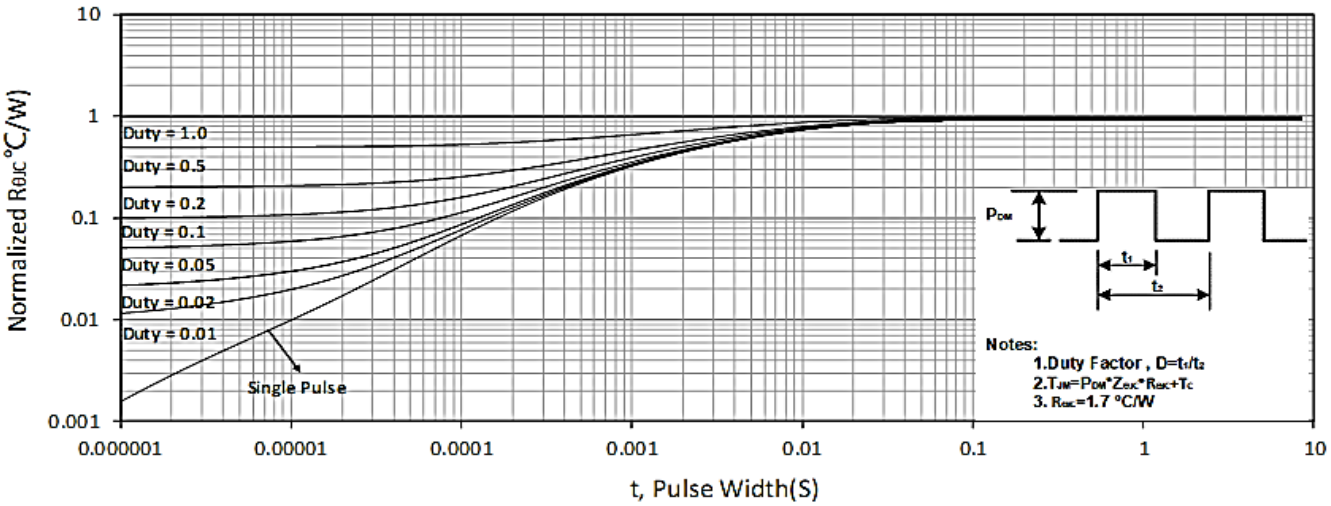
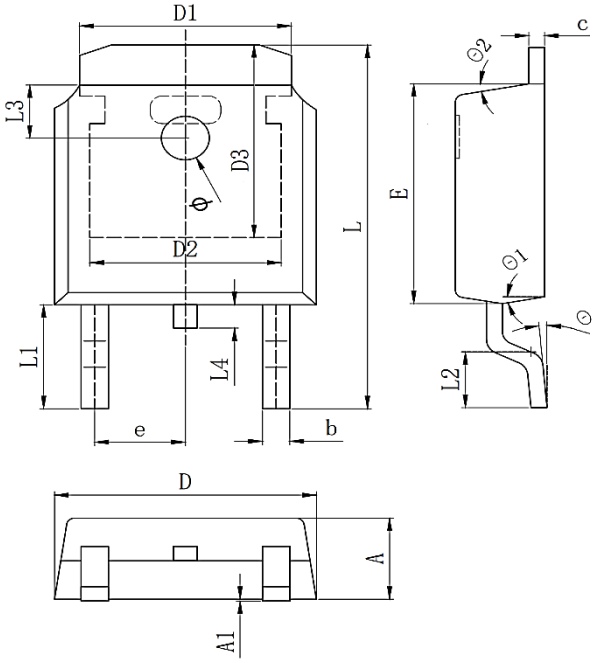


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-TO-252-3L



Symbol	Dim in mm		
	Min	Typ	Max
A	2.1	2.3	2.5
A1	0	0.064	0.128
b	0.64	0.75	0.86
c	0.45	0.52	0.6
D	6.4	6.6	6.8
D1	5.33REF		
D2	4.83REF		
D3	5.25REF		
E	5.9	6.1	6.3
e	2.286TYP		
L	9.8	10.1	10.4
L1	2.888REF		
L2	1.4	1.5	1.7
L3	1.65REF		
L4	0.6	0.8	1
ϕ	1.1	1.2	1.3
θ	0°		10°
θ1	5°		10°
θ2	5°		10°

Attention

1,Any and all APM Microelectronics products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your APM Microelectronics representative nearest you before using any APM Microelectronics products described or contained herein in such applications.

2,APM Microelectronics assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all APM Microelectronics products described or contained herein.

3, Specifications of any and all APM Microelectronics products described or contained here instipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

4, APM Microelectronics Semiconductor CO., LTD. strives to supply high quality high reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design,and structural design.

5,In the event that any or all APM Microelectronics products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.

6, No part of this publication may be reproduced or transmitted in any form or by any means,electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of APM Microelectronics Semiconductor CO., LTD.

7, Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. APM Microelectronics believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

8, Any and all information described or contained herein are subject to change without notice due to product/technology improvement,etc. When designing equipment, refer to the "Delivery Specification" for the APM Microelectronics product that you Intend to use.

65V N-Channel Enhancement Mode MOSFET

Edition	Date	Change
REV1.0	2019/1/31	Initial release
REV1.1	2024/6/15	Reduce RDS(on)