AP3407MI

-30V P-Channel Enhancement Mode MOSFET

Description

The AP3407MI 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} = -30V I_D =-4.8A

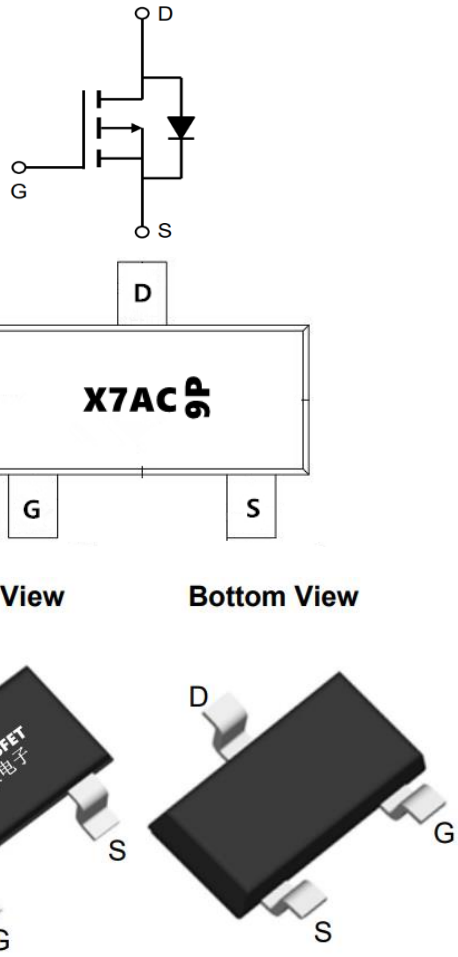
$R_{DS(ON)}$ < 55mΩ @ V_{GS}=10V **(Type：40mΩ)**

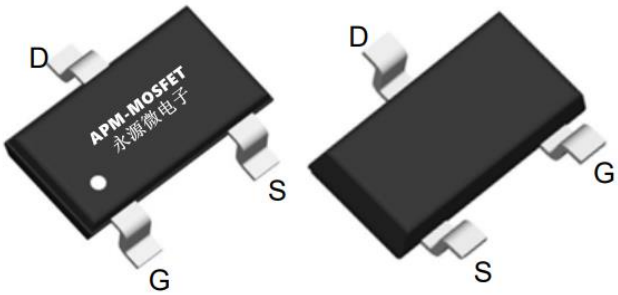
Application

Battery protection

Load switch

Uninterruptible power supply





Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP3407MI	SOT23-3L	X7AC 9P	3000

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

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	-30	V
VGSS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-4.8	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ -10V[1]	-3.3	A
IDM	Pulsed Drain Current note1	-20.4	A
P_D	Power Dissipation T_A= 25℃	2.15	W
RθJA	Thermal Resistance, Junction to Ambient	104	℃/W
RθJC	Thermal Resistance from Junction to Ambient[2]	125	℃/W
TJ, TSTG	Operating and Storage Temperature Range	-55 to +150	℃

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}= 0V, I_D= -250μA	-30	-	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS}= -30V, V_{GS}= 0V	-	-	-1	μA
IGSS	Gate-Source Leakage	V_{DS}= 0V, V_{GS}= ±20V	-	-	±100	nA
VGS(th)	Gate-Source Threshold voltage	V_{DS}= V_{GS}, I_D= -250μA	-1	-1.5	-2.5	V
RDS(on)	Drain-Source on-State Resistance[3]	V_{GS}= -10V, I_D= -4.1A	-	40	55	mΩ
		V_{GS}= -4.5V, I_D= -3A	-	54	65	
Ciss	Input Capacitance	V_{GS} = 0V , V_{DS} = -15V, f = 1.0MHz	-	530	-	pF
Coss	Output Capacitance		-	70	-	
Crss	Reverse Transfer Capacitance		-	56	-	
Q_g	Total Gate Charge	V_{GS} = -10V, V_{DS} = -15V, I_D = -4.1A	-	6.8	-	nC
Qgs	Gate−Source Charge		-	1.0	-	
Qgd	Gate−Drain Charge		-	1.4	-	
td(on)	Turn-on Delay Time	V_{GS}= -10V, V_{DS}= -15V , R_L= 15Ω,R_{GEN}= 2.5Ω	-	14	-	ns
t_r	Rise Time		-	61	-	
td(off)	Turn-off Delay time		-	19	-	
t_f	Fall Time		-	10	-	
VSD	Diode Forward Voltage[3]	I_S = -4.1A, V_{GS} = 0V	-	-	-1.2	V
IS	Continuous Source Current		-	-	-4.1	A

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 ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

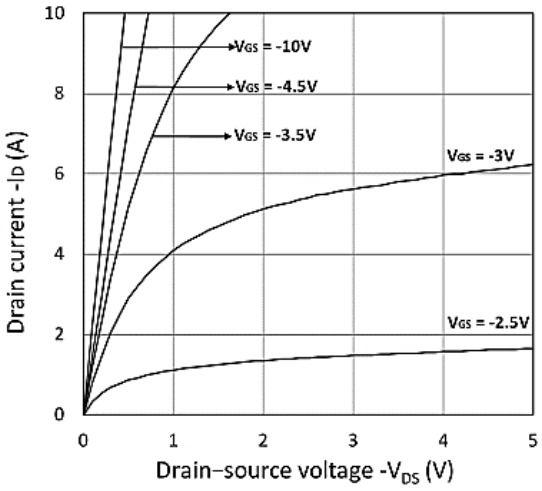


Figure 1. Output Characteristics

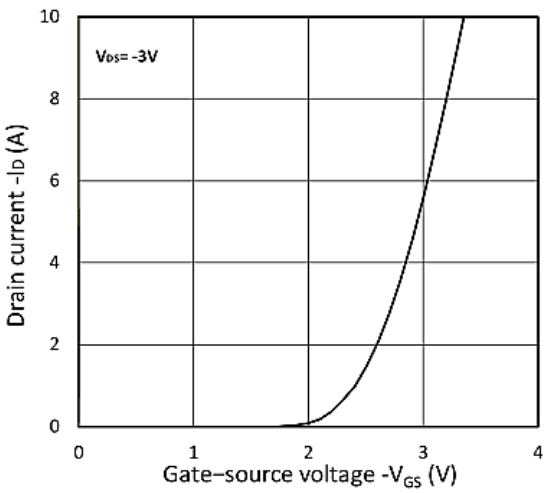


Figure 2. Transfer Characteristics

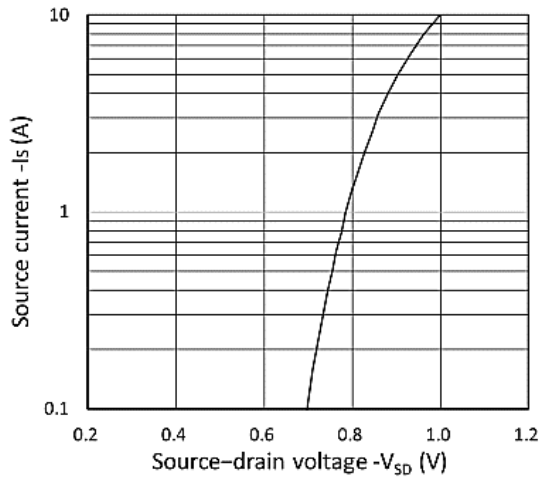


Figure 3. Forward Characteristics of Reverse

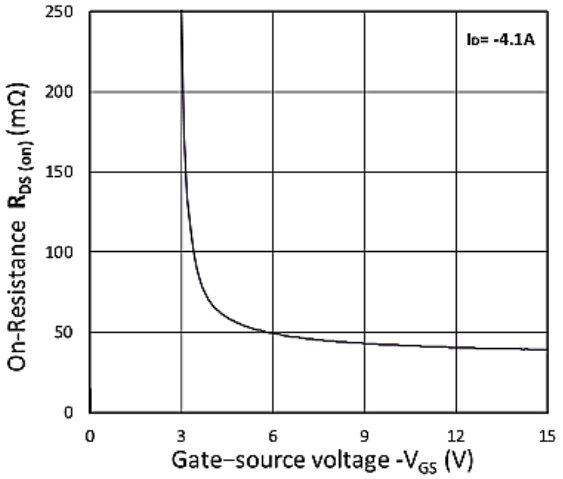


Figure 4. R DS(ON) vs. V GS

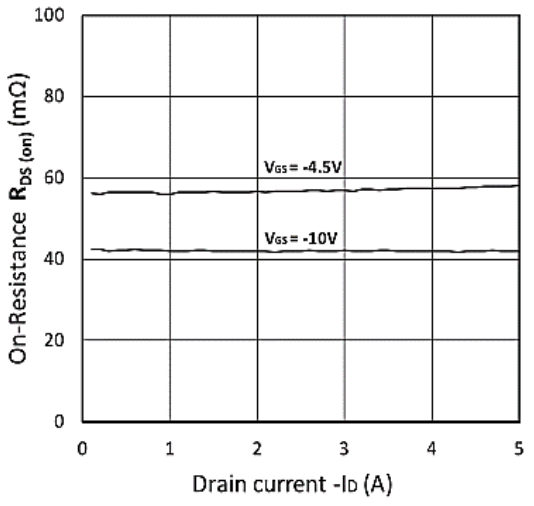


Figure 5. RDS(ON) vs. ID

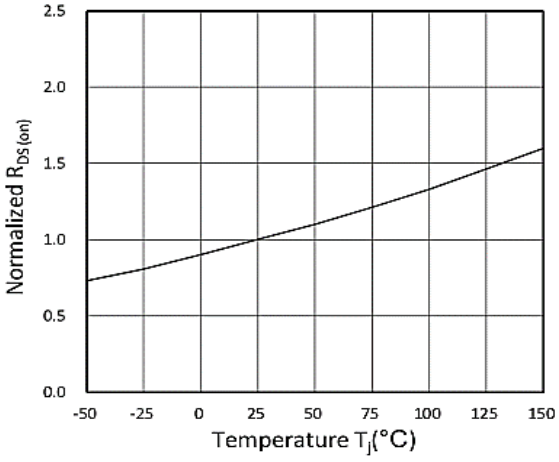


Figure 6. Normalized R DS(on) vs. Temperature

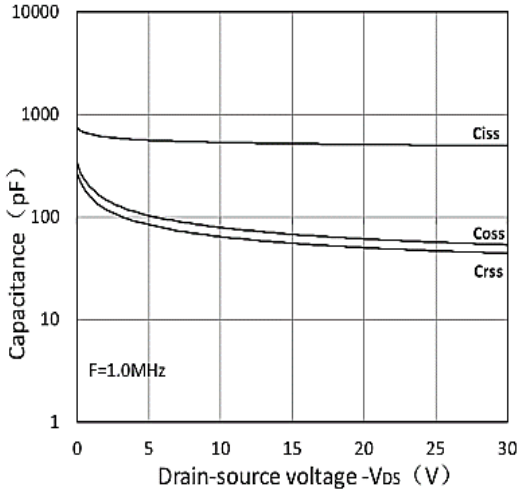


Figure 7. Capacitance Characteristics

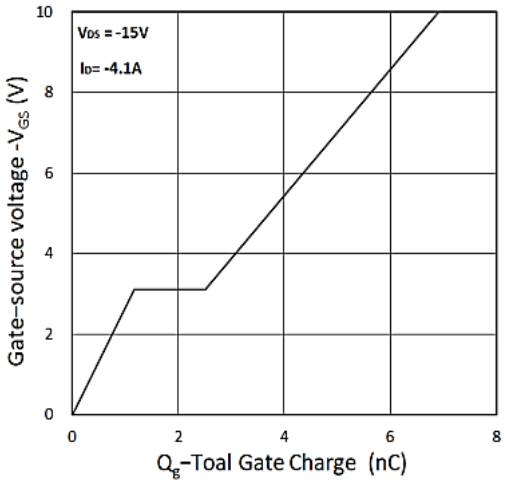


Figure 8. Gate Charge Characteristics

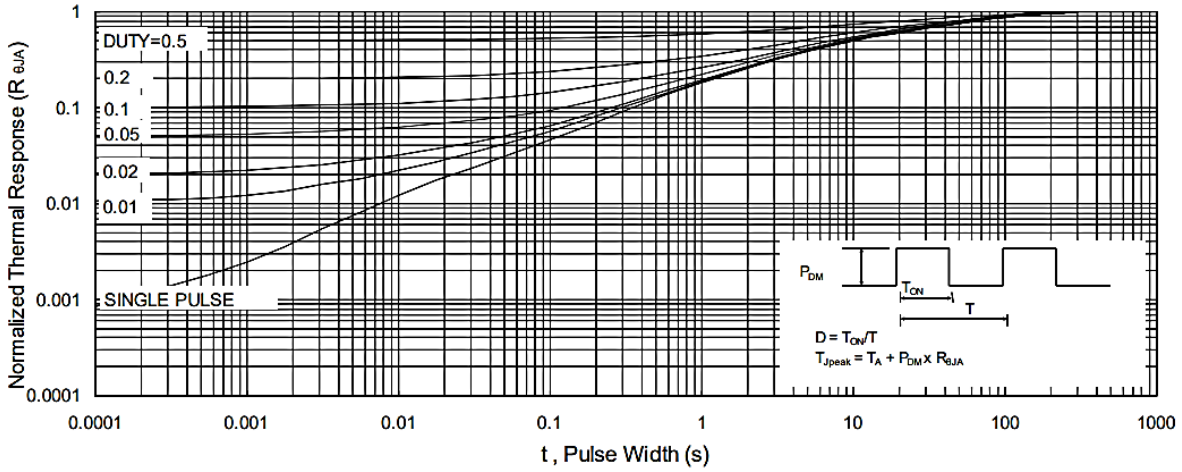


Figure 9 Normalized Maximum Transient Thermal Impedance

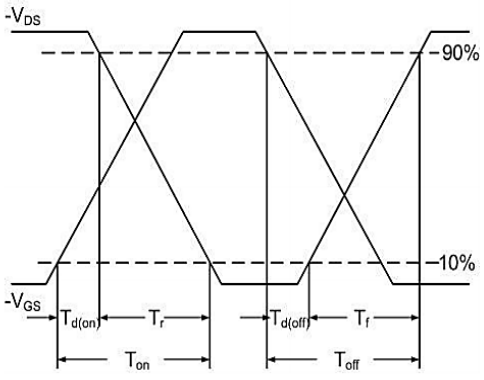


Figure.10 Switching Time Waveform

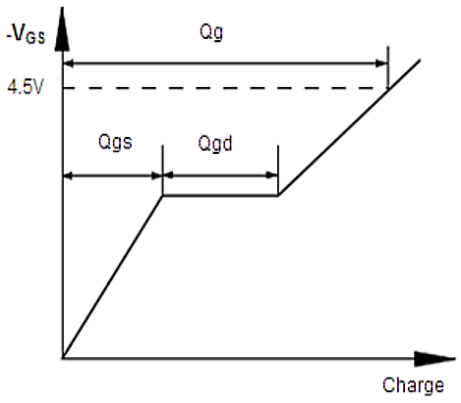
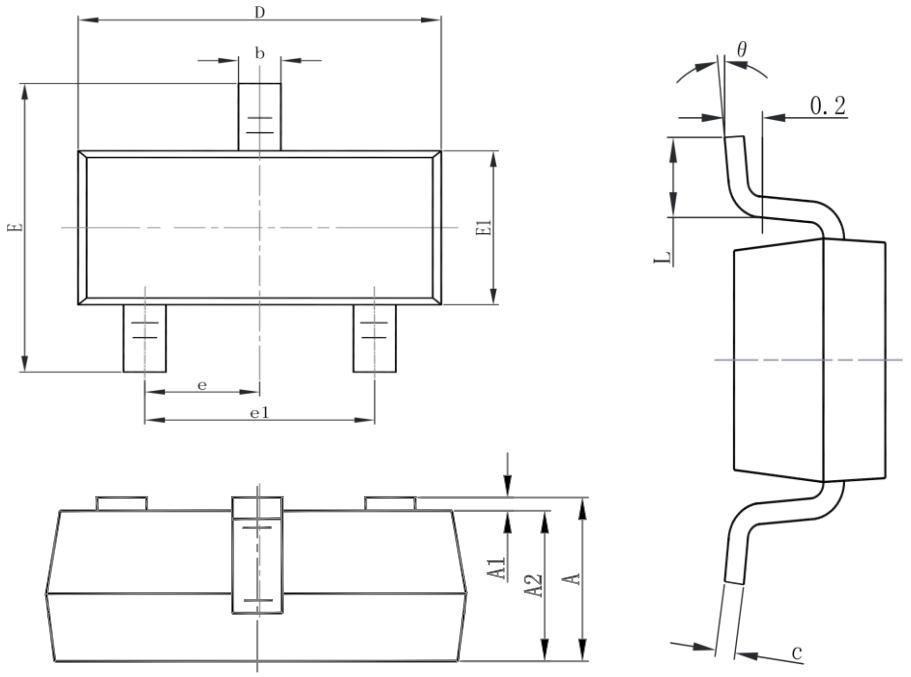


Figure.11 Gate Charge Waveform

Package Mechanical Data-SOT23-3-SLS-Single



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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-30V P-Channel Enhancement Mode MOSFET

Edition	Date	Change
Rve3.9	2018/11/31	Initial release
Rve4.0	2021/12/10	Reduce internal RDS