AP3407CI

-30V P-Channel Enhancement Mode MOSFET

Description

The AP3407CI 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 =-3.6A

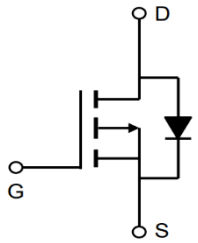
$R_{DS(ON)}$ < 85mΩ @ V_{GS}=10V **(Type：70mΩ)**

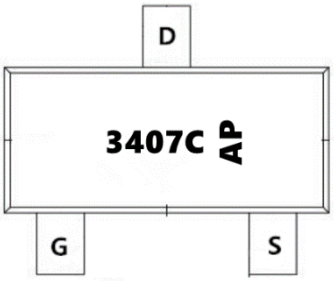
Application

Battery protection

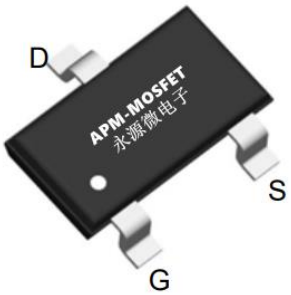
Load switch

Uninterruptible power supply

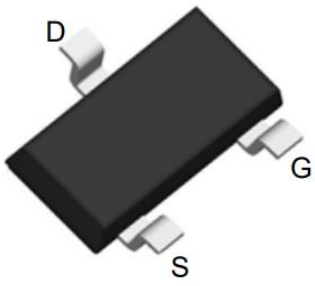




Top View



Bottom View



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP3407CI	SOT23L	3407C-AP	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	℃

-30V P-Channel Enhancement Mode MOSFET

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-30	-33		V
IDSS	Zero Gate Voltage Drain Current	V_{DS}=-30V,V_{GS}=0V			-1	μA
IGSS	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=-250μA	-1.0	-1.5	-2.4	V
RDS(ON)	Static Drain-Source On-Resistance	V_{GS}=-10V, I_D=-3A		70	85	mΩ
		V_{GS}=-4.5V, I_D=-2A		100	120	
C_{iss}	Input Capacitance	V_{DS}=-10V,V_{GS}=0V,f=1MHZ		365		pF
C_{oss}	Output Capacitance			59		
C_{rss}	Reverse Transfer Capacitance			45		
Q_g	Total Gate Charge	V_{GS}=-10V,V_{DS}=-15V,I_D=-3A		7.6		nC
Q_{gs}	Gate-Source Charge			1.64		
Q_{gd}	Gate-Drain Charge			1.22		
Q_{rr}	Reverse Recovery Chrage	I_F=-3A, di/dt=100A/us		3.8		
t_{rr}	Reverse Recovery Time			25		ns
tD(on)	Turn-on Delay Time	V_{GS}=-10V, V_{DS}=-15V, I_D=-1A R_{GEN}=2.5Ω		3.2		
t_r	Turn-on Rise Time			17.8		
tD(off)	Turn-off Delay Time			18		
t_f	Turn-off fall Time			23.2		
V_{SD}	Diode Forward Voltage	I_S=-3A,V_{GS}=0V			-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 ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

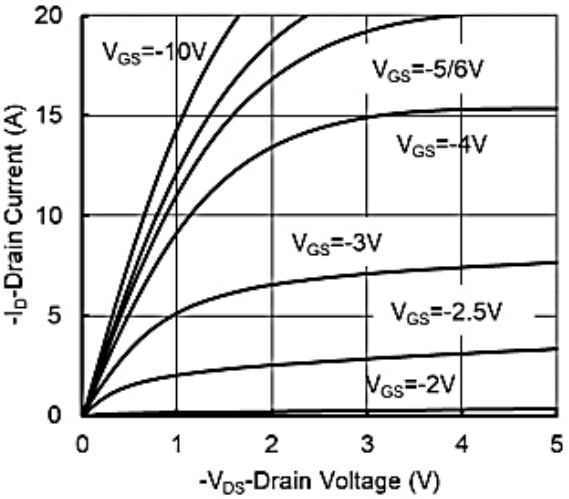


Figure1. Output Characteristics

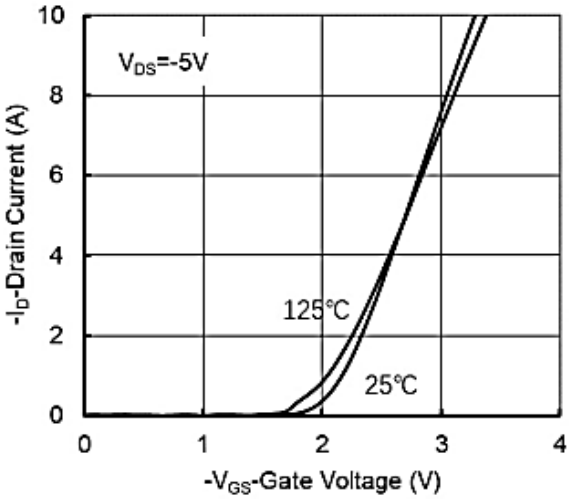


Figure2. Transfer Characteristics

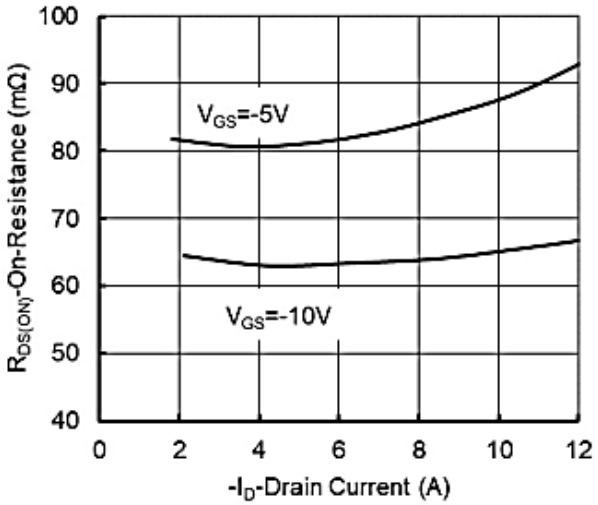


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

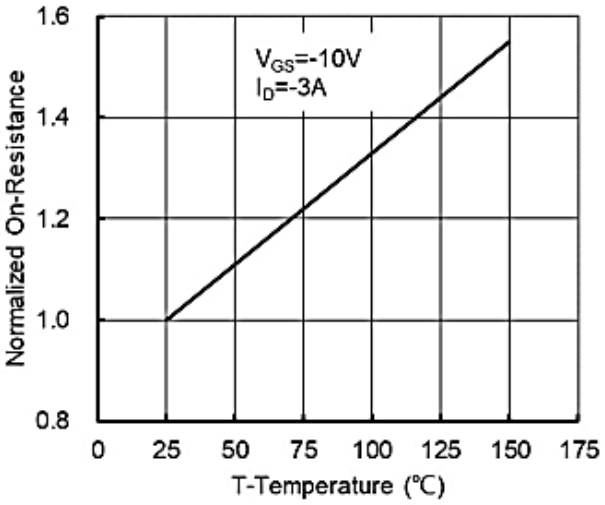


Figure 4: On-Resistance vs. Junction Temperature

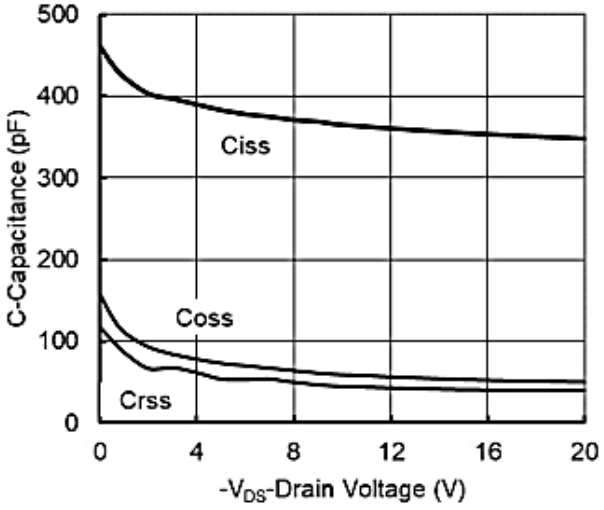


Figure5. Capacitance Characteristics

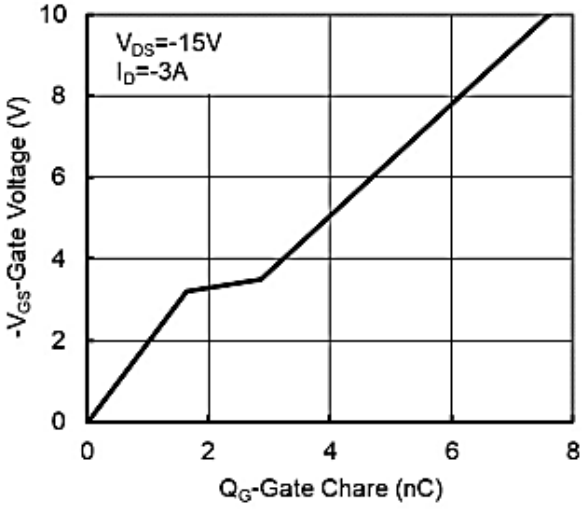


Figure6. Gate Charge

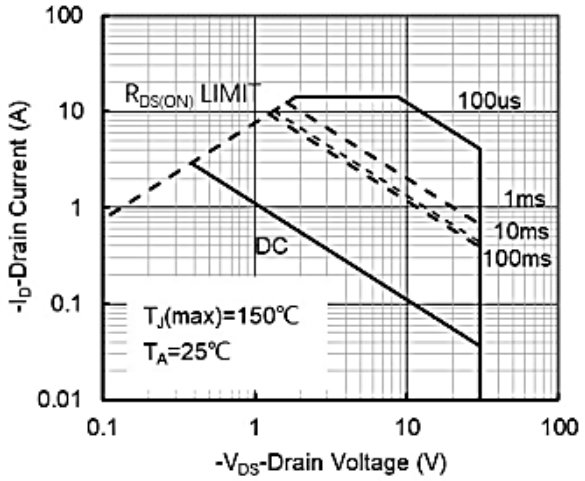


Figure7. Safe Operation Area

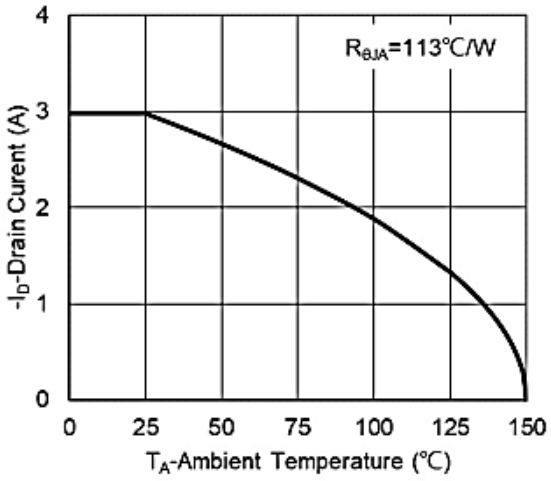


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

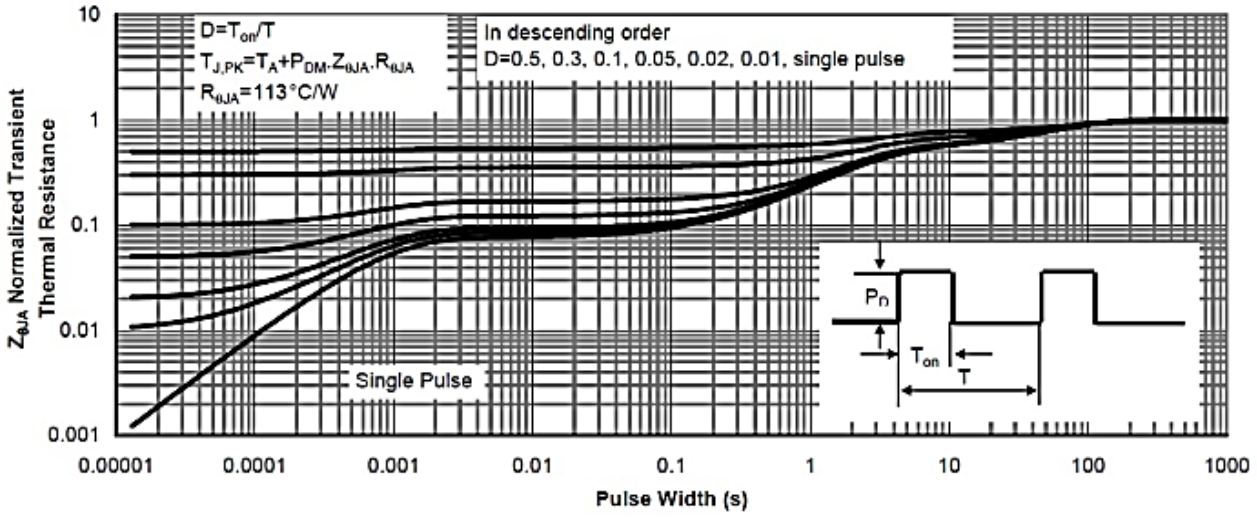


Figure9. Normalized Maximum Transient Thermal Impedance

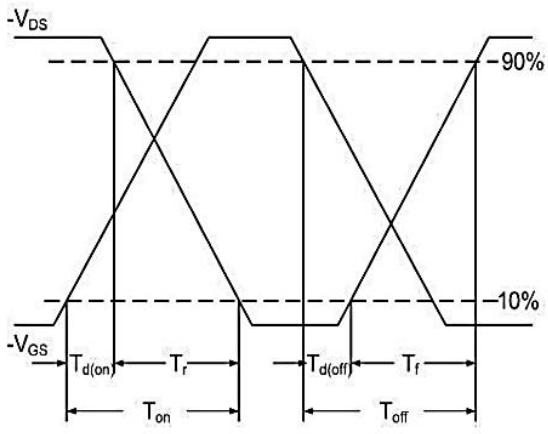


Fig.10 Switching Time Waveform

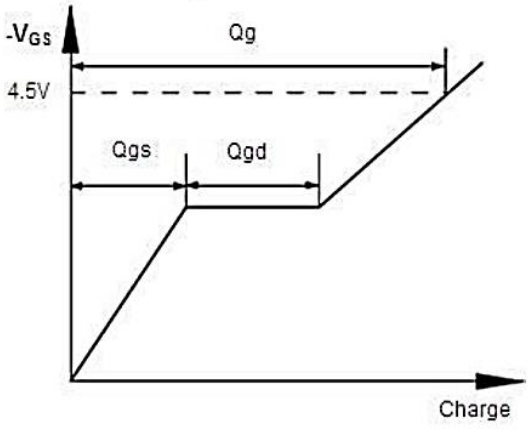
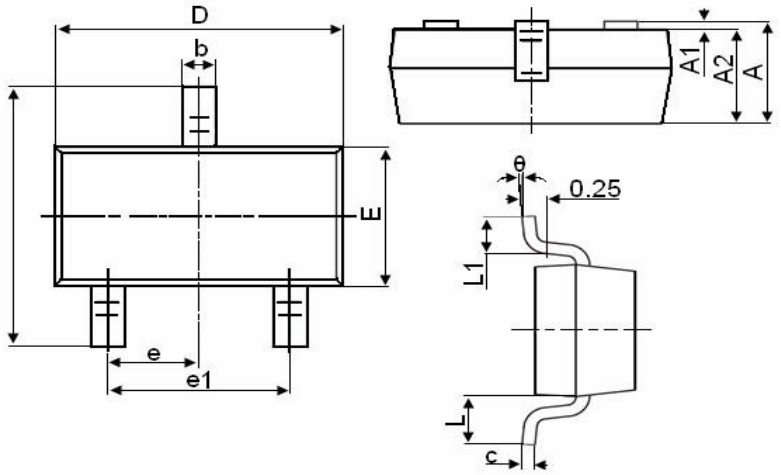


Fig.11 Gate Charge Waveform

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
Rve1.0	2018/11/31	Initial release