

Description

The AP3407MI-L 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

$V_{DS} = -30V$ $I_D = -4.2A$

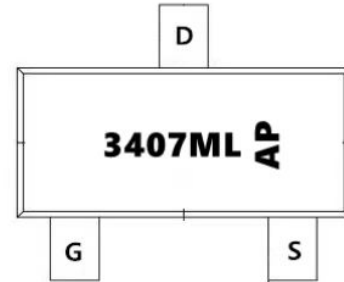
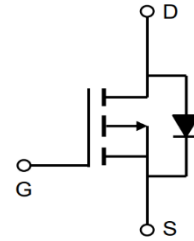
$R_{DS(ON)} < 58m\Omega$ @ $V_{GS}=10V$ (Type: 42m Ω)

Application

Battery protection

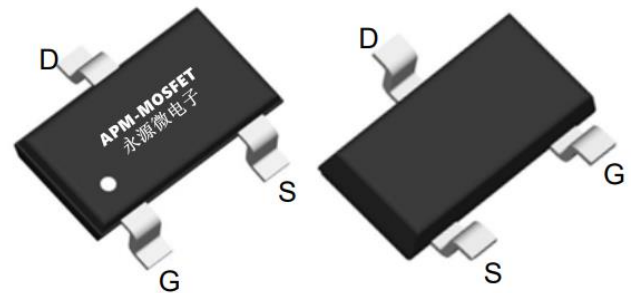
Load switch

Uninterruptible power supply



Top View

Bottom View



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP3407MI-L	SOT23-3L	3407ML- AP	3000

Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	-30	V
V_{GSS}	Gate-Source Voltage	± 20	V
$I_D @ T_C=25^{\circ}C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-4.2	A
$I_D @ T_C=100^{\circ}C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-2.6	A
I_{DM}	Pulsed Drain Current ^{note1}	-16.8	A
P_D	Power Dissipation $T_A = 25^{\circ}C$	1	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	125	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance from Junction to Ambient ²	135	$^{\circ}C/W$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^{\circ}C$

-30V P-Channel Enhancement Mode MOSFET

Electrical Characteristics (T_J=25°C, 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 = -4A	-	42	58	mΩ
		V _{GS} = -4.5V, I _D = -3A	-	62	75	
Ciss	Input Capacitance	V _{GS} = 0V , V _{DS} = -15V, f = 1.0MHz	-	520	-	pF
Coss	Output Capacitance		-	70	-	
Crss	Reverse Transfer Capacitance		-	60	-	
Qg	Total Gate Charge	V _{GS} = -10V, V _{DS} = -15V, I _D = -4.1A	-	12	-	nC
Qgs	Gate-Source Charge		-	3	-	
Qgd	Gate-Drain Charge		-	2	-	
td(on)	Turn-on Delay Time	V _{GS} = -10V, V _{DS} = -15V , R _L = 15Ω,R _{GEN} = 2.5Ω	-	5	-	ns
t _r	Rise Time		-	28	-	
td(off)	Turn-off Delay time		-	30	-	
t _f	Fall Time		-	35	-	
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°C 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

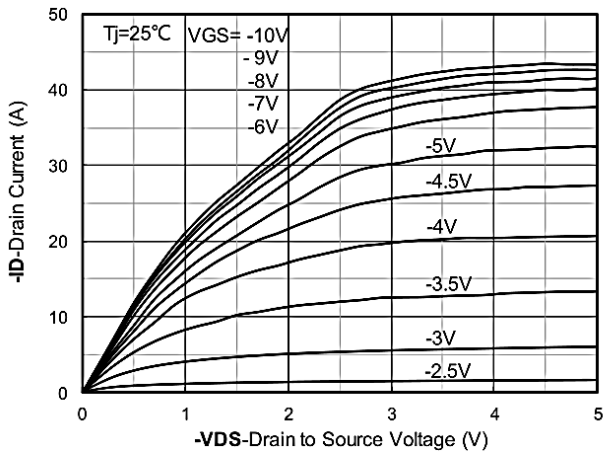


Figure 1. Output Characteristics

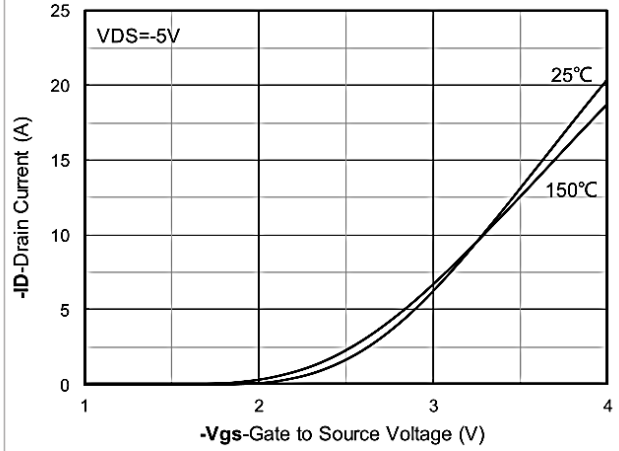


Figure 2. Transfer Characteristics

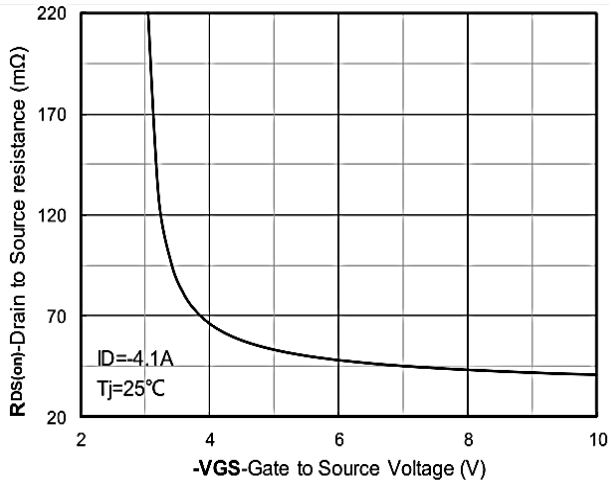


Figure 4. On-Resistance vs Gate to Source Voltage

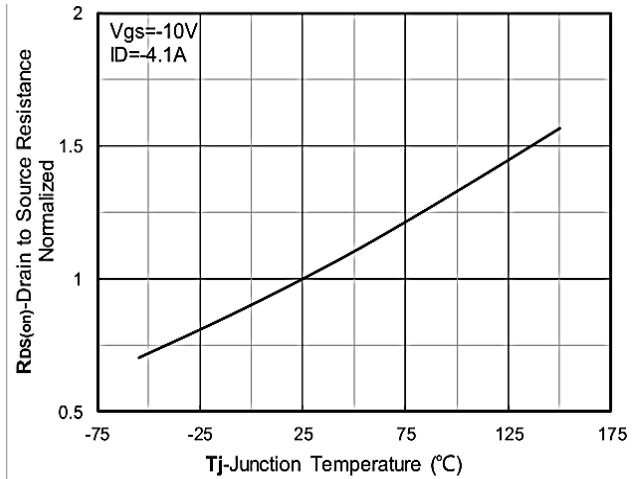


Figure 5. Normalized On-Resistance

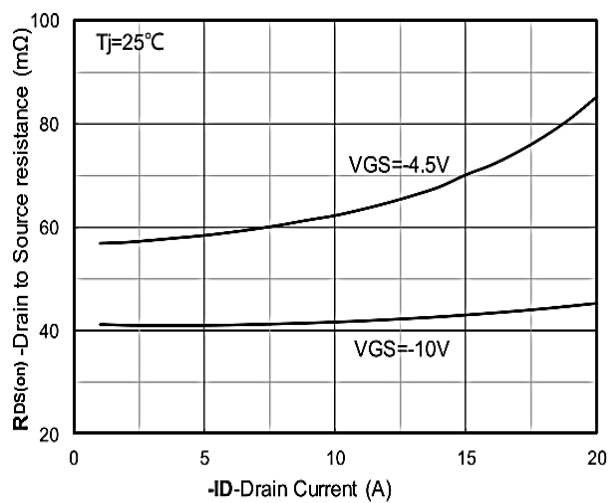


Figure 6. RDS(on) VS Drain Current

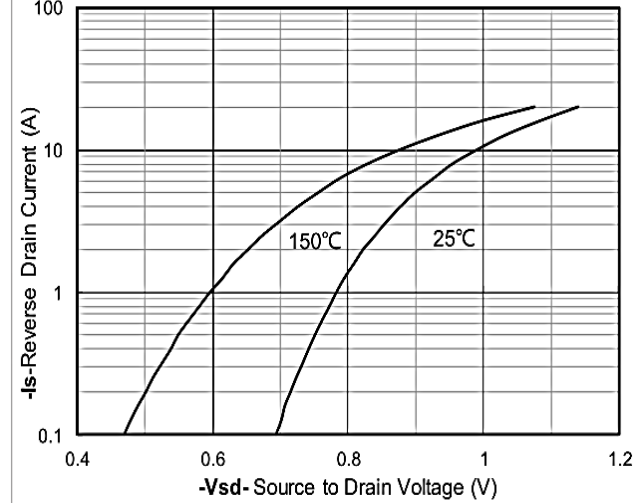


Figure 7. Forward characteristics of reverse diode

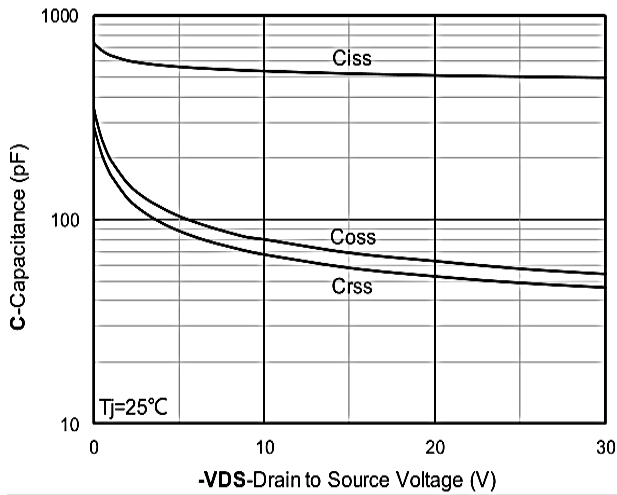


Figure 7. Capacitance Characteristics

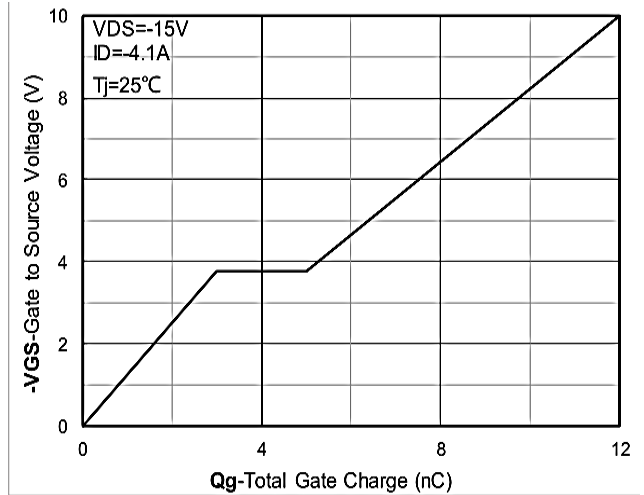


Figure 8. Gate Charge

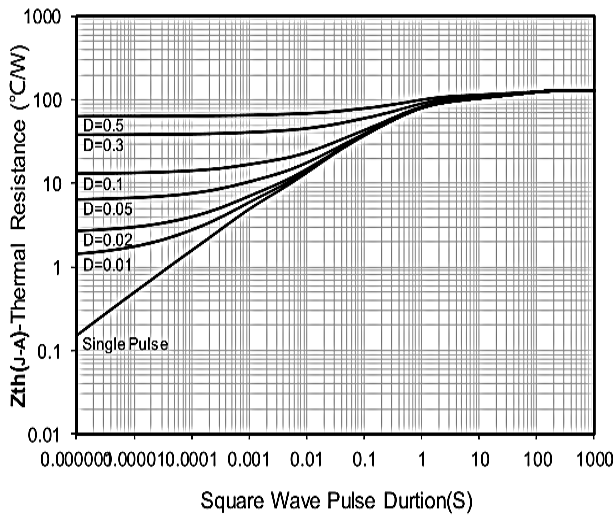


Figure 9. Maximum Transient Thermal Impedance

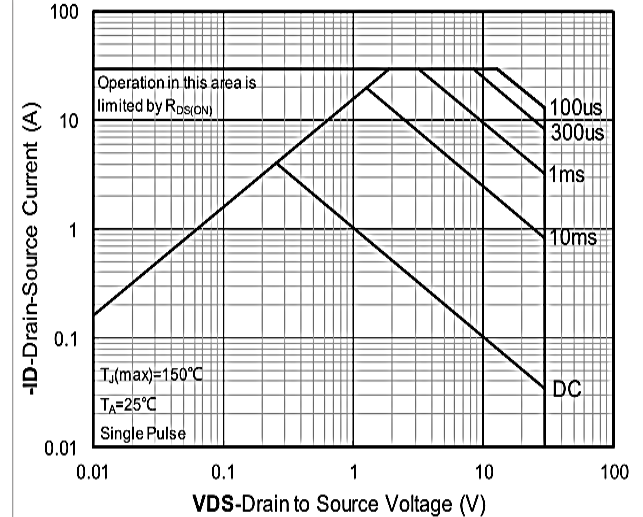
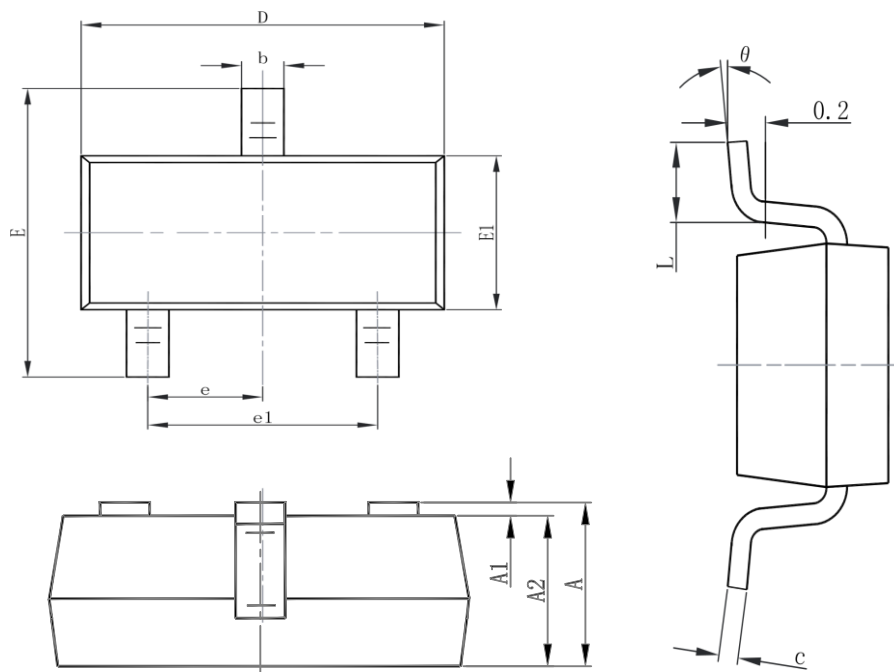


Figure 10. Safe Operation Area

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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A Power Microelectronics

AP3407MI-L

-30V P-Channel Enhancement Mode MOSFET

Edition	Date	Change
REV1.0	2023/3/21	Initial release

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