

100V N-Channel Enhancement Mode MOSFET

Description

The AP5N10MI-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

$V_{DS} = 100V$ $I_D = 5A$

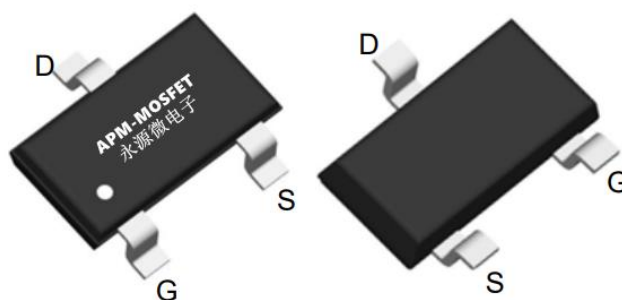
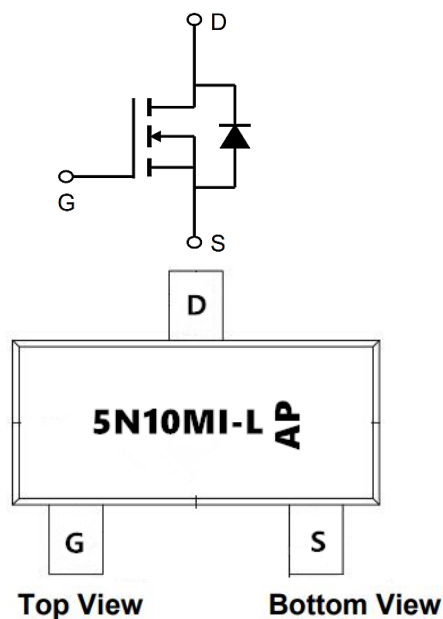
$R_{DS(ON)} < 140m\Omega$ @ $V_{GS}=10V$ (Type: 115m Ω)

Application

Automotive lighting

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP5N10MI-L	SOT23-3L	5N10M-L AP	3000

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_{D@T_A=25^{\circ}C}$	Continuous Drain Current, V_{GS} @ 10V ¹	5	A
$I_{D@T_A=70^{\circ}C}$	Continuous Drain Current, V_{GS} @ 10V ¹	3.0	A
I_{DM}	Pulsed Drain Current ²	18	A
$P_{D@T_A=25^{\circ}C}$	Total Power Dissipation ³	3.1	W
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance Junction-ambient(steady state) ¹	135	$^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance Junction-ambient($t < 10s$) ¹	40	$^{\circ}C/W$

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Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	100	110	-	V
IGSS	Gate-body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
IDSS	Zero Gate Voltage Drain Current	$V_{DS} = 100V, V_{GS} = 0V$	-	-	1	μA
VGS(th)	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	1.7	2.5	V
RDS(on)	Drain-Source On-state Resistance ³	$V_{GS} = 10V, I_D = 3A$	-	115	140	m Ω
		$V_{GS} = 4.5V, I_D = 1A$	-	125	180	
Ciss	Input Capacitance	$V_{GS} = 0V, V_{DS} = 50V, f = 1MHz$	-	200	-	pF
Coss	Output Capacitance		-	35	-	
Crss	Reverse Transfer Capacitance		-	2.5	-	
Qg	Total Gate Charge	$V_{DS} = 50V, V_{GS} = 10V, I_D = 3A$	-	4	-	nC
Qgs	Gate-Source Charge		-	0.9	-	
Qgd	Gate-Drain Charge		-	1.1	-	
td(on)	Turn-on Delay Time	$V_{DD} = 50V, V_{GS} = 10V, I_D = 3A, R_G = 3\Omega$	-	3.6	-	ns
t _r	Turn-on Rise Time		-	1.6	-	
td(off)	Turn-off Delay Time		-	8.5	-	
t _f	Turn- off Fall Time		-	2.6	-	
VSD	Body Diode Voltage ³	$I_S = 3A, V_{GS} = 0V$	-	-	1.2	V
IS	Continuous Source Current		-	-	3.3	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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、The power dissipation is limited by 150°C junction temperature
- 4、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

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Typical Characteristics

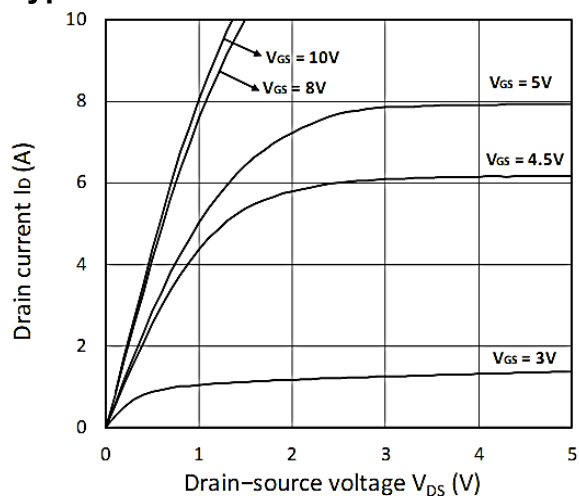


Figure 1. Output Characteristics

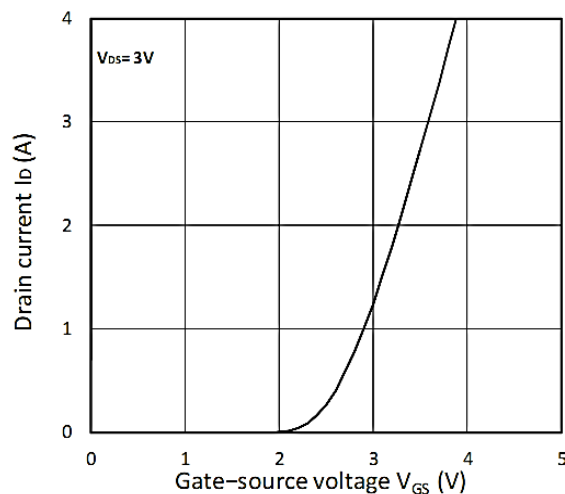


Figure 2. Transfer Characteristics

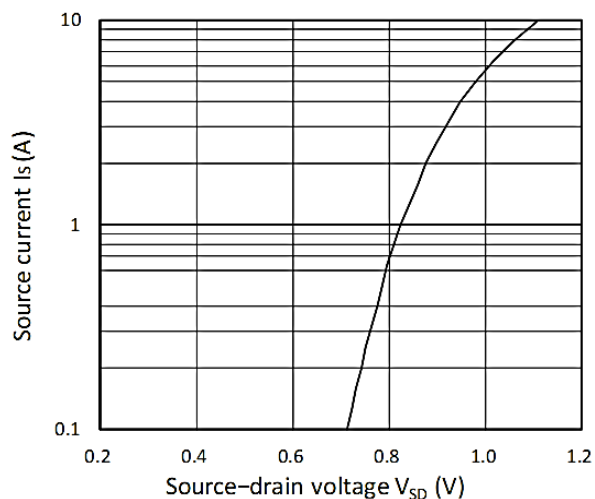


Figure 3. Forward Characteristics of Reverse

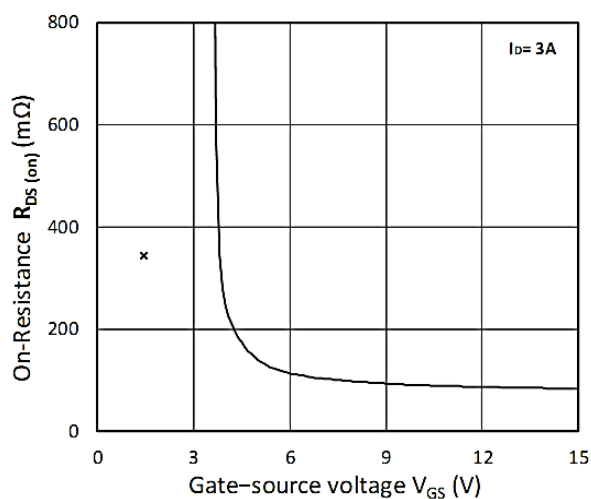


Figure 4. R_DS(ON) vs. V_GS

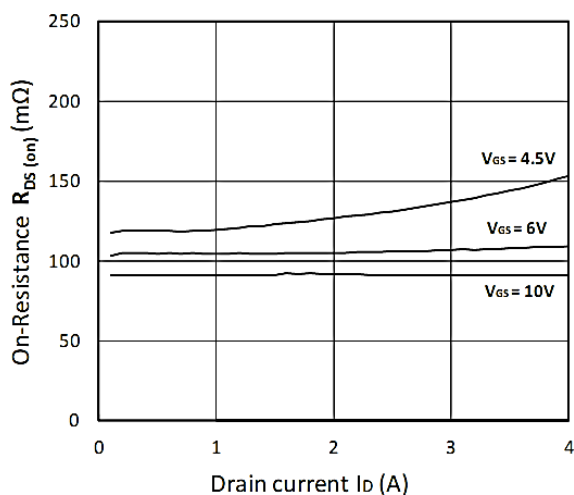


Figure 5. R_DS(ON) vs. I_D

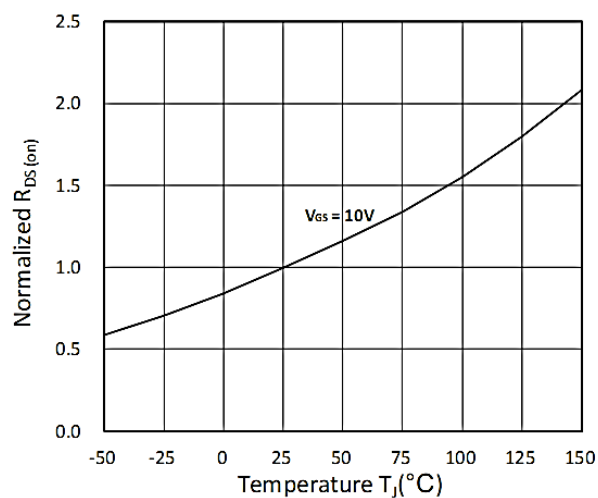


Figure 6. Normalized R_DS(on) vs. Temperature

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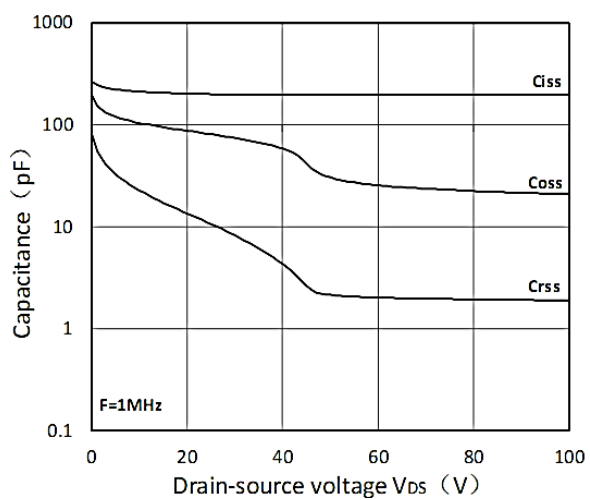


Figure7. Capacitance Characteristics

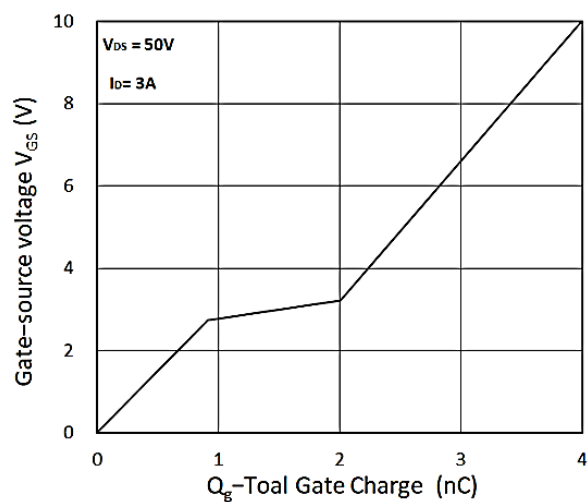
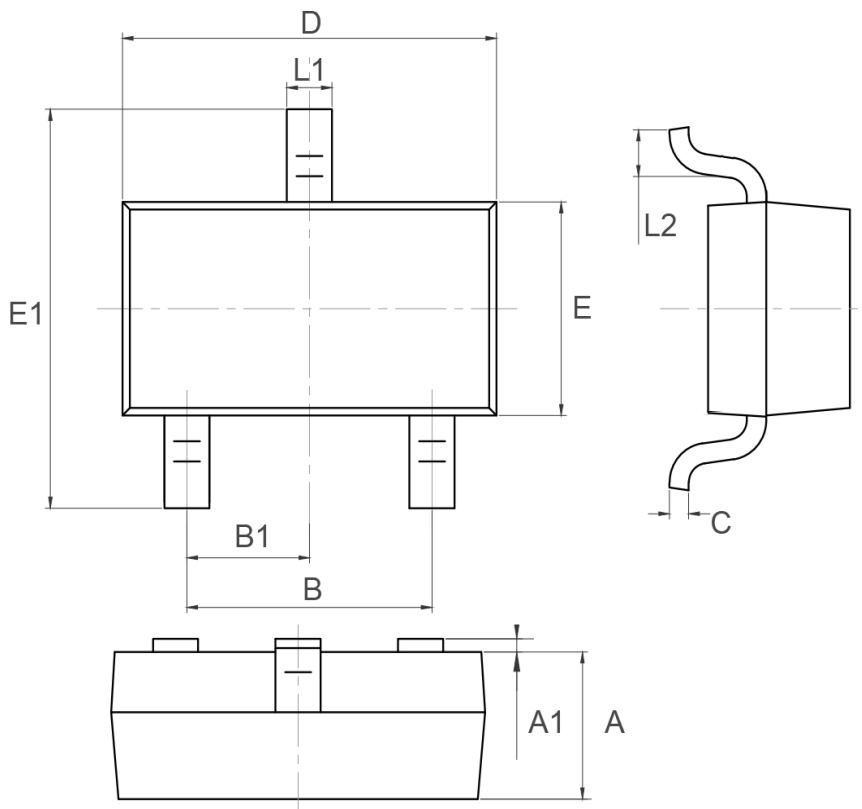


Figure8. Gate Charge Characteristics

Package Mechanical Data-SOT23-3L



Symbol	Dimensions In Millimeters		
	min.	typ.	max.
A	1.00	1.10	1.20
A1	0.00	0.05	0.10
B	1.80	1.90	2.00
B1	0.95TYP		
C	0.10	0.15	0.20
D	2.82	2.92	3.02
E	1.50	1.60	1.70
E1	2.65	2.80	2.95
L1	0.30	0.40	0.50
L2	0.30	0.45	0.60

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Edition	Date	Change
REV1.0	2023/8/9	Initial release

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