

100V N-Channel Enhancement Mode MOSFET

Description

The AP5N10BSI 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

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

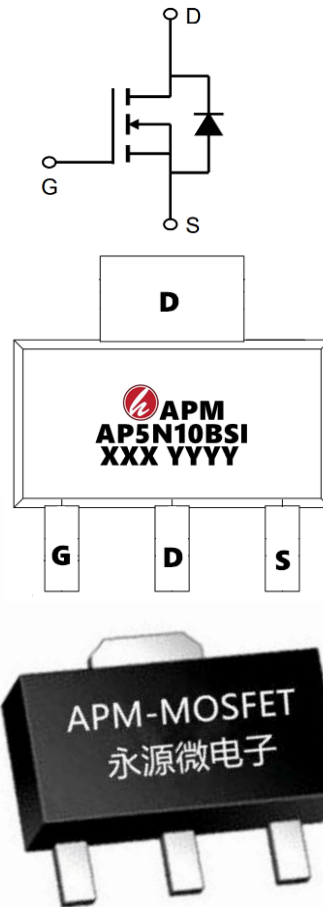
$R_{DS(ON)} < 140m\Omega$ @ $V_{GS}=10V$ (Type: 110m Ω)

Application

LED lighting

Load switch

Atomizer



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP5N10BSI	SOT89-3L	AP5N10BSI XXX YYYY	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	Continuous drain current ¹⁾ , $T_C=25^{\circ}C$	5	A
I_{DM}	Pulsed drain current ²⁾ , $T_C=25^{\circ}C$	15	A
P_D	Power dissipation ³⁾ , $T_C=25^{\circ}C$	0.5	W
EAS	Single pulsed avalanche energy ⁵⁾	1.2	mJ
T_{stg}, T_J	Operation and storage temperature	-55 to 150	$^{\circ}C$
$R_{\theta JC}$	Thermal resistance, junction-case	7.4	$^{\circ}C/W$
$R_{\theta JA}$	Thermal resistance, junction-ambient ⁴⁾	250	$^{\circ}C/W$

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

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BVDSS	Drain-source breakdown voltage	$V_{GS}=0\text{ V}$, $I_D=250\text{ }\mu\text{A}$	100			V
VGS(th)	Gate threshold voltage	$V_{DS}=V_{GS}$, $I_D=250\text{ }\mu\text{A}$	1.2	1.5	2.5	V
RDS(ON)	Drain-source on-state resistance	$V_{GS}=10\text{ V}$, $I_D=5\text{ A}$		110	140	m Ω
RDS(ON)	Drain-source on-state resistance	$V_{GS}=4.5\text{ V}$, $I_D=3\text{ A}$		160	250	m Ω
IGSS	Gate-source leakage current	$V_{GS}=20\text{ V}$			100	nA
		$V_{GS}=-20\text{ V}$			-100	
IDSS	Drain-source leakage current	$V_{DS}=100\text{ V}$, $V_{GS}=0\text{ V}$			1	μA
Ciss	Input capacitance	$V_{GS}=0\text{ V}$, $V_{DS}=50\text{ V}$, $f=100\text{ kHz}$		206.1		pF
Coss	Output capacitance			28.9		pF
Crss	Reverse transfer capacitance			1.4		pF
td(on)	Turn-on delay time	$V_{GS}=10\text{ V}$, $V_{DS}=50\text{ V}$, $R_G=2\text{ }\Omega$, $I_D=5\text{ A}$		14.7		ns
t _r	Rise time			3.5		ns
td(off)	Turn-off delay time			20.9		ns
t _f	Fall time			2.7		ns
Q _g	Total gate charge	$I_D=5\text{ A}$, $V_{DS}=50\text{ V}$, $V_{GS}=10\text{ V}$		4.3		nC
Q _{gs}	Gate-source charge			1.5		nC
Q _{gd}	Gate-drain charge			1.1		nC
Vplateau	Gate plateau voltage			5.0		V
I _S	Diode forward current	$V_{GS}<V_{th}$			7	A
ISP	Pulsed source current				21	
VSD	Diode forward voltage	$I_S=7\text{ A}$, $V_{GS}=0\text{ V}$			1.0	V
t _{rr}	Reverse recovery time	$I_S=5\text{ A}$, $di/dt=100\text{ A}/\mu\text{s}$		32.1		ns
Q _{rr}	Reverse recovery charge			39.4		nC
I _{rrm}	Peak reverse recovery current			2.1		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 .The EAS data shows Max. rating .
- 4、The power dissipation is limited by 150 $^{\circ}\text{C}$ junction temperature
- 5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

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Typical Characteristics

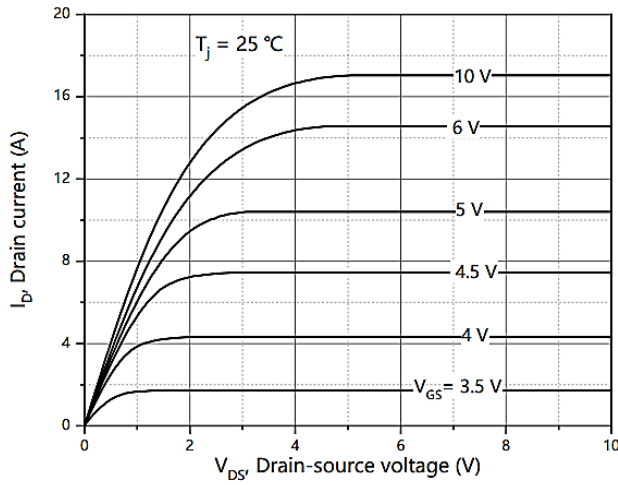


Figure 1. Typ. output characteristics

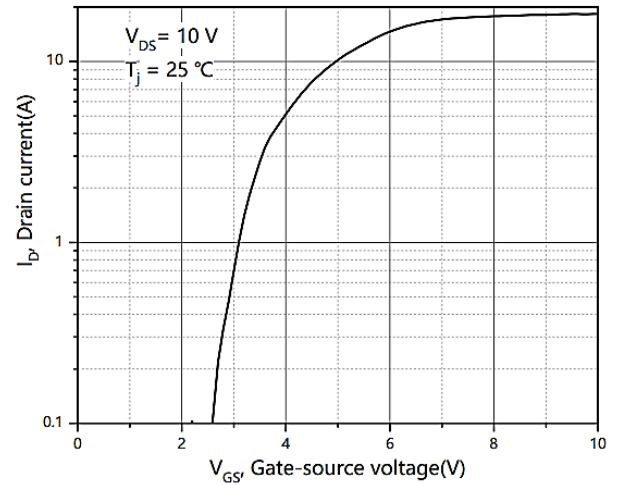


Figure 2. Typ. transfer characteristics

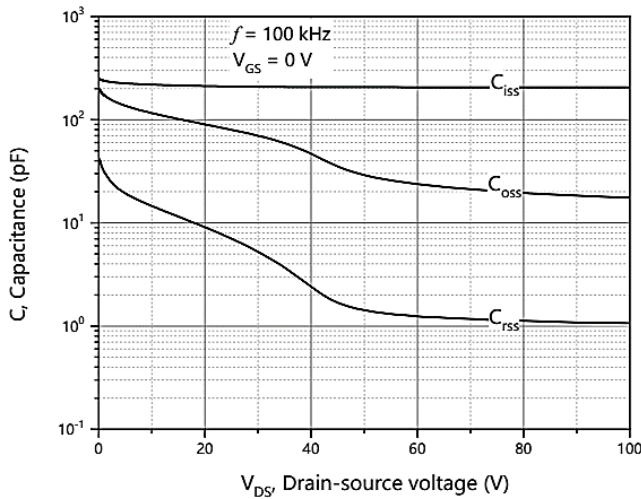


Figure 3. Typ. capacitances

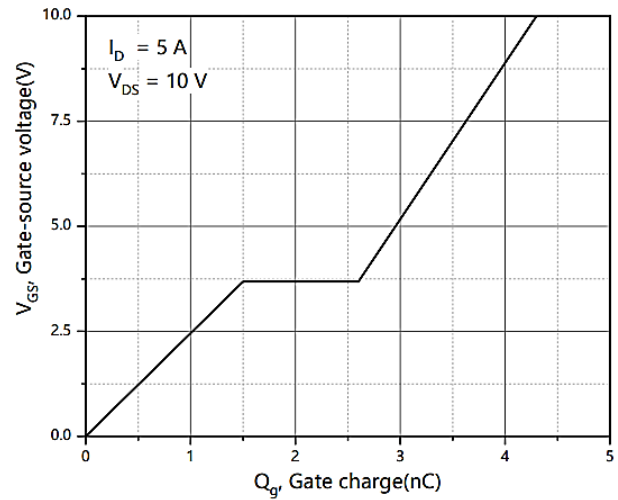


Figure 4. Typ. gate charge

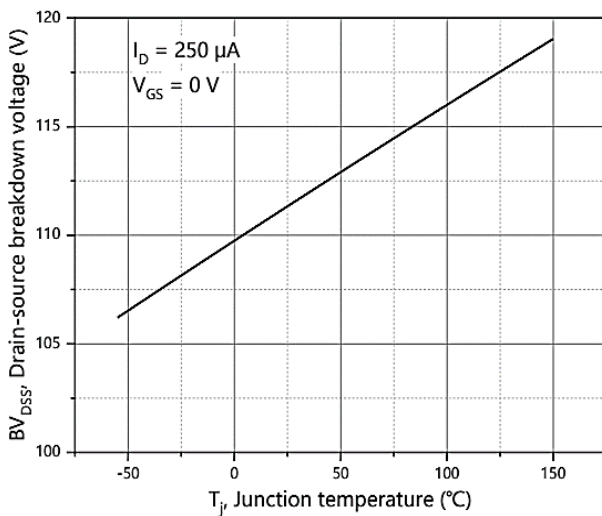


Figure 5. Drain-source breakdown voltage

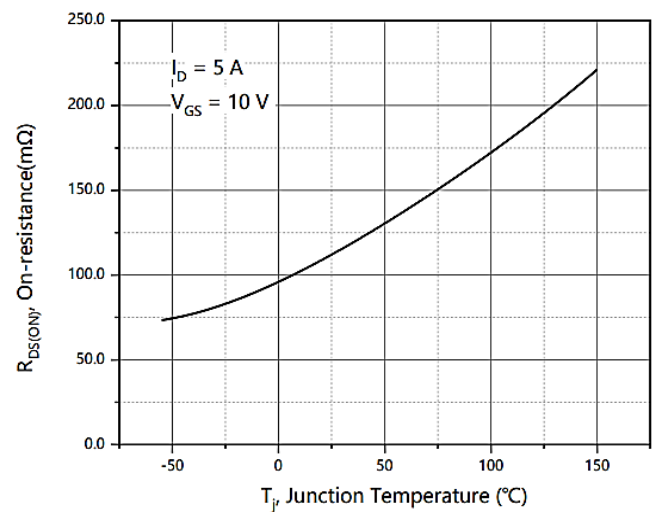


Figure 6. Drain-source on-state resistance

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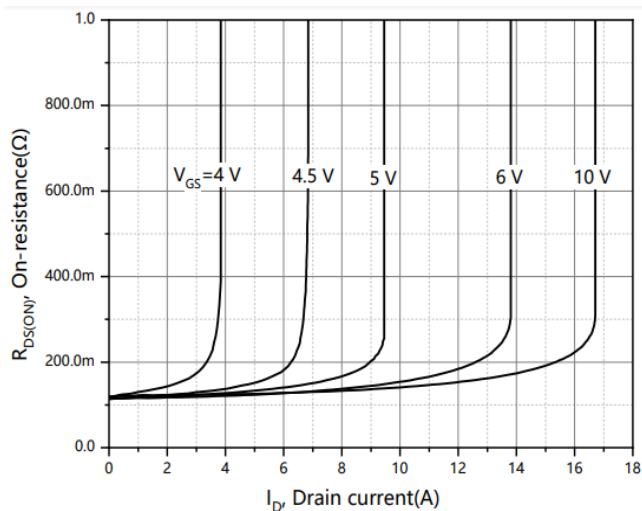


Figure 7. Drain-source on-state resistance

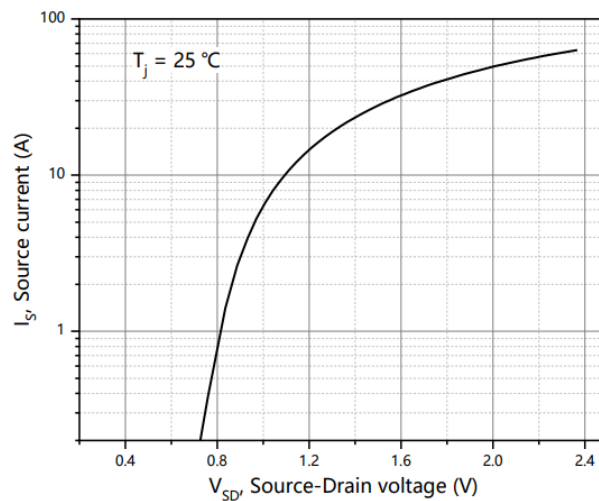


Figure 8. Forward characteristic of body diode

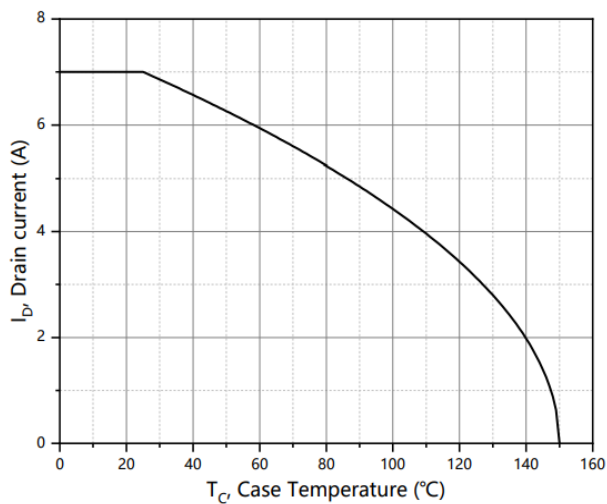


Figure 9. Drain current

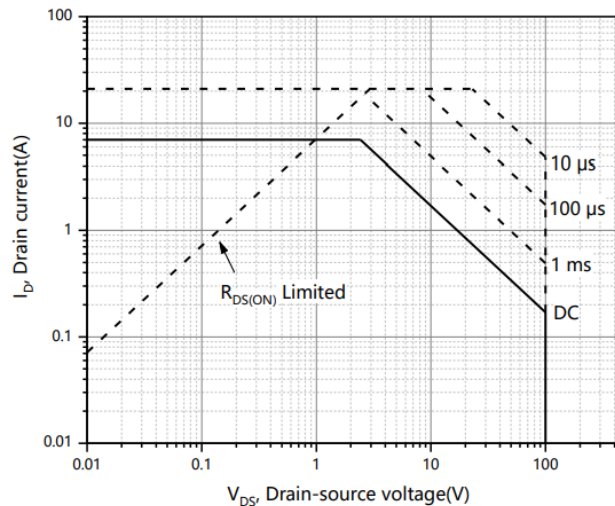
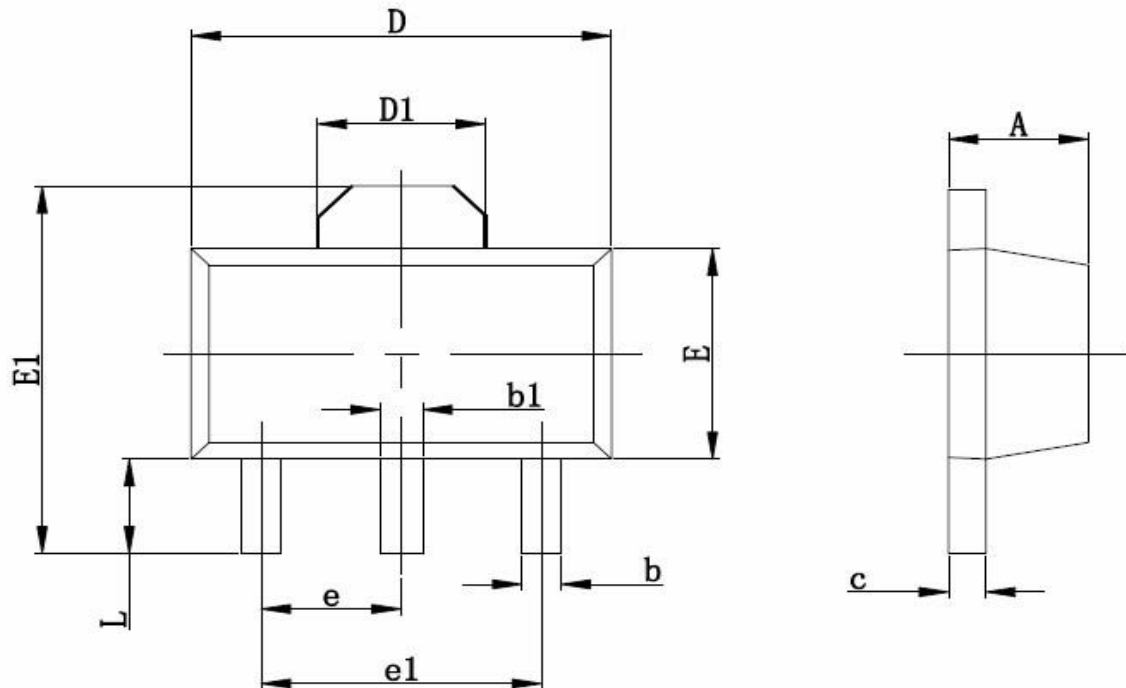


Figure 10. Safe operation area $T_C=25^\circ\text{C}$

Package Mechanical Data:SOT89-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.350	2.550	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP	
e1	3.000 TYP		0.118TYP	
L	0.900	1.100	0.035	0.047

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Edition	Date	Change
REV1.0	2021/9/1	Initial release
REV1.1	2022/4/31	Change Mark

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