

100V N-Channel Enhancement Mode MOSFET

Description

The AP12N10Y 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

$V_{DS} = 100V$ $I_D = 12A$

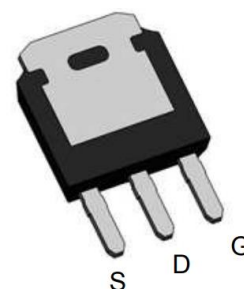
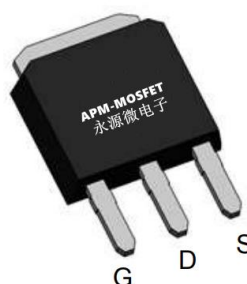
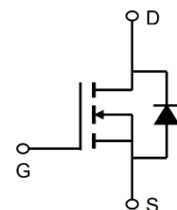
$R_{DS(ON)} < 140m\Omega$ @ $V_{GS}=10V$ (Type: 110m Ω)

Application

LED lighting

Load switch

Atomizer



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP12N10Y	TO-251-3L	AP12N10Y XXX YYYY	4000

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⁾ , $T_C=25^{\circ}C$	12	A
I_{DM}	Pulsed drain current ²⁾ , $T_C=25^{\circ}C$	24	A
P_D	Power dissipation ³⁾ , $T_C=25^{\circ}C$	17	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⁾	62	$^{\circ}C/W$

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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	180	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 20Z copper.
- 2、The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3、The test condition is $V \cong 300\mu\text{s}$, duty cycle $V_{DD}=50\text{ V}$, $R_G=25\Omega$, $L=0.1\text{ mH}$, starting $T_J=25^{\circ}\text{C}$.
- 4、The power dissipation is limited by 150°C junction temperature
- 5、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

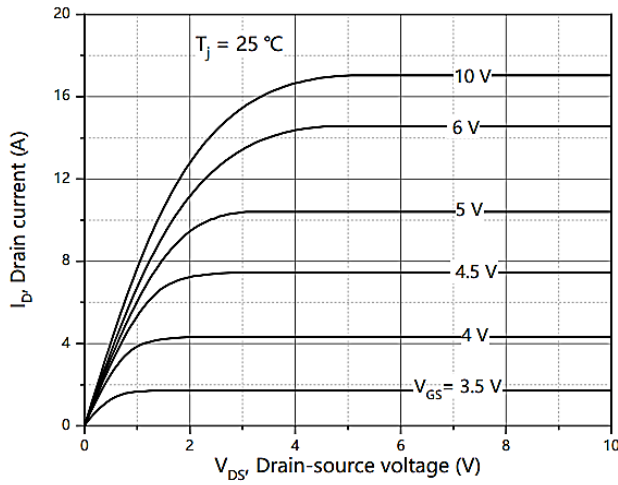


Figure 1. Typ. output characteristics

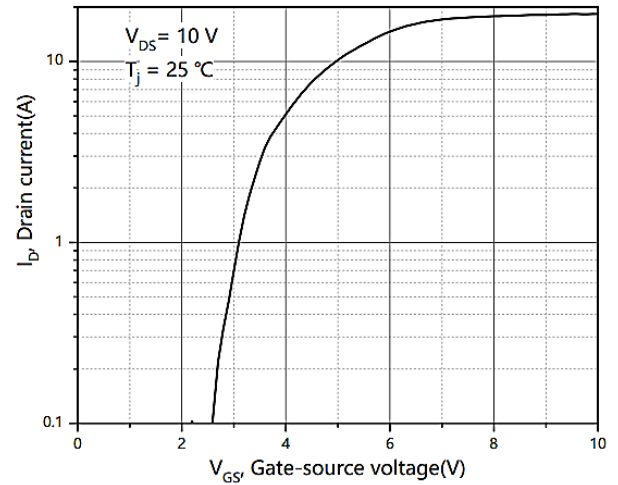


Figure 2. Typ. transfer characteristics

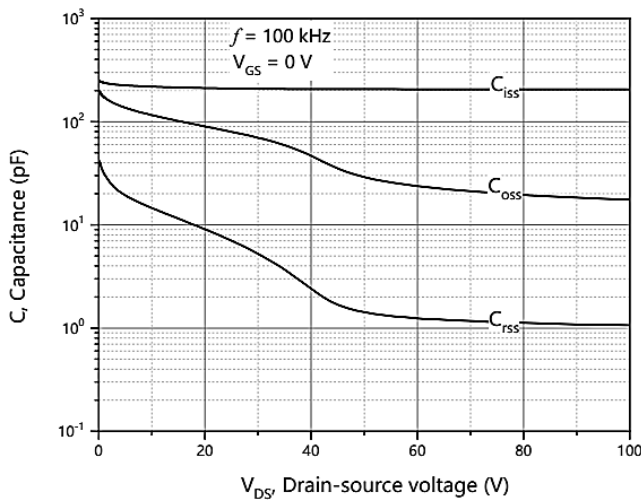


Figure 3. Typ. capacitances

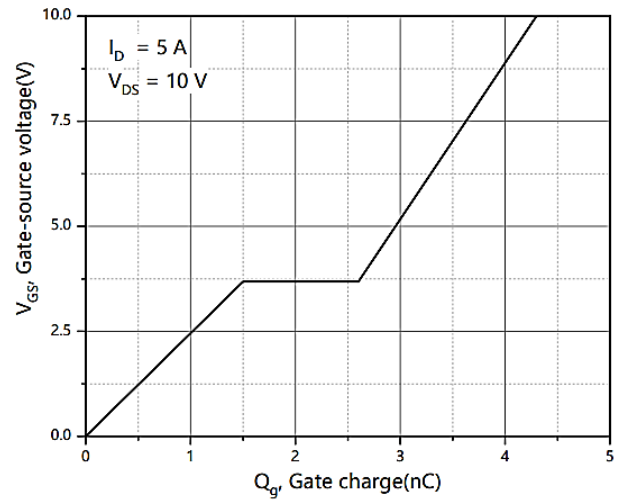


Figure 4. Typ. gate charge

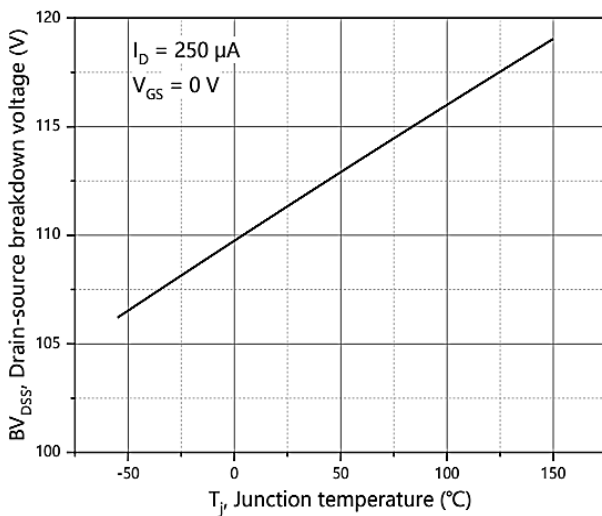


Figure 5. Drain-source breakdown voltage

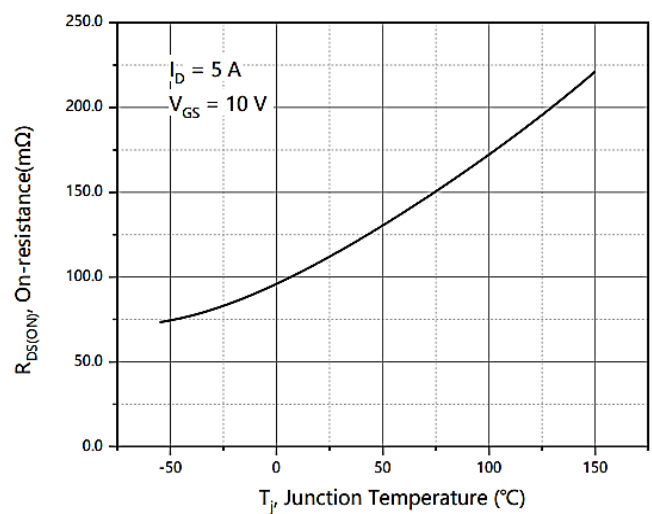


Figure 6. Drain-source on-state resistance

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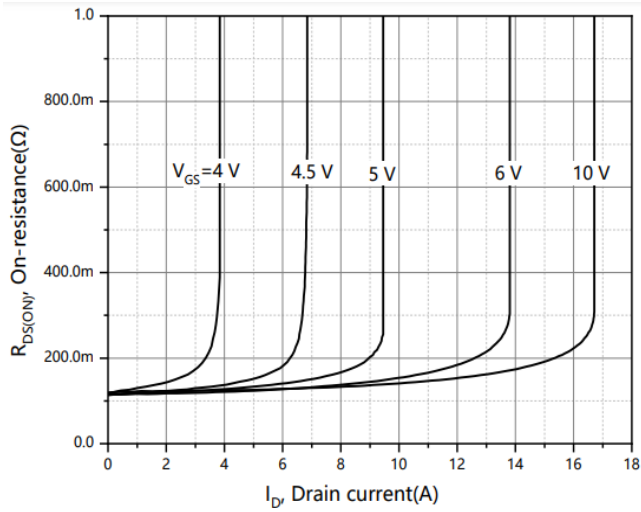


Figure 7. Drain-source on-state resistance

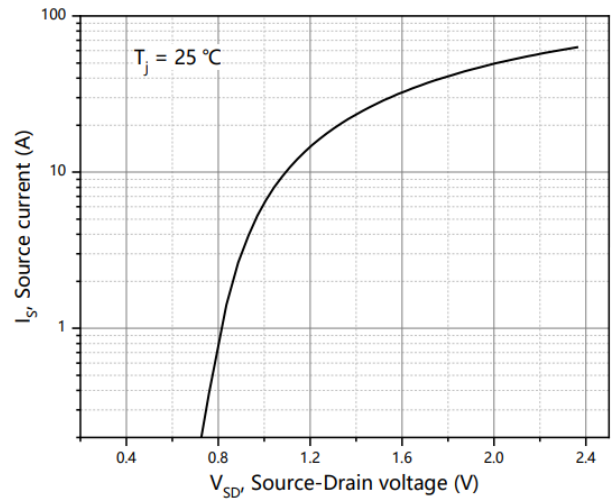


Figure 8. Forward characteristic of body diode

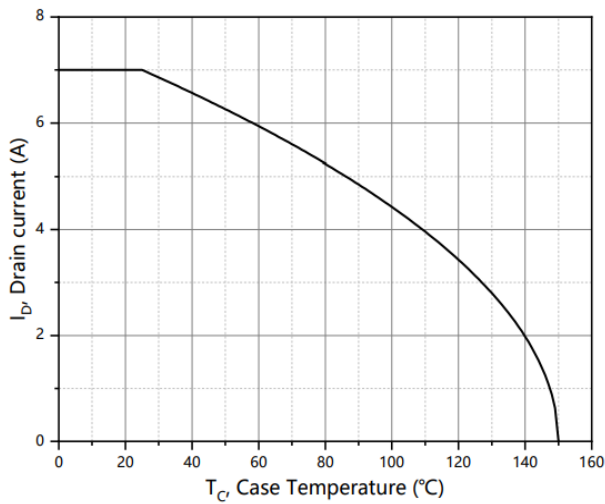


Figure 9. Drain current

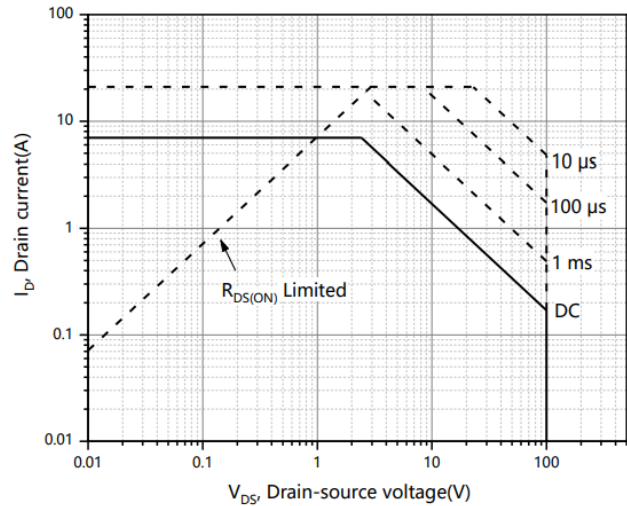
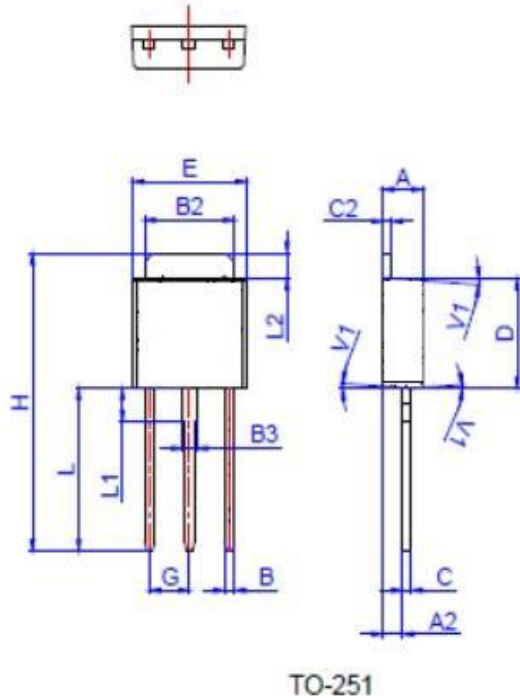


Figure 10. Safe operation area $T_C=25^\circ\text{C}$

Package Mechanical Data



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.20		2.40	0.086		0.095
A2	0.90		1.20	0.035		0.047
B	0.55		0.65	0.022		0.026
B2	5.10		5.40	0.200		0.213
B3	0.76		0.85	0.030		0.033
C	0.45		0.62	0.018		0.024
C2	0.48		0.62	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.70	0.252		0.264
G		2.30			0.091	
H	16.0		17.0	0.630		0.669
L	8.90		9.40	0.350		0.370
L1	1.80		1.90	0.071		0.075
L2	1.37		1.50	0.054		0.059
V1		4°			4°	

Package Information -TO-251

OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON (PCS)
TUBE	80	4,000	32,000

100V N-Channel Enhancement Mode MOSFET**Attention**

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