

60V N-Channel Enhancement Mode MOSFET

Description

The AP150N06P/T uses advanced **APM-SGT II** 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

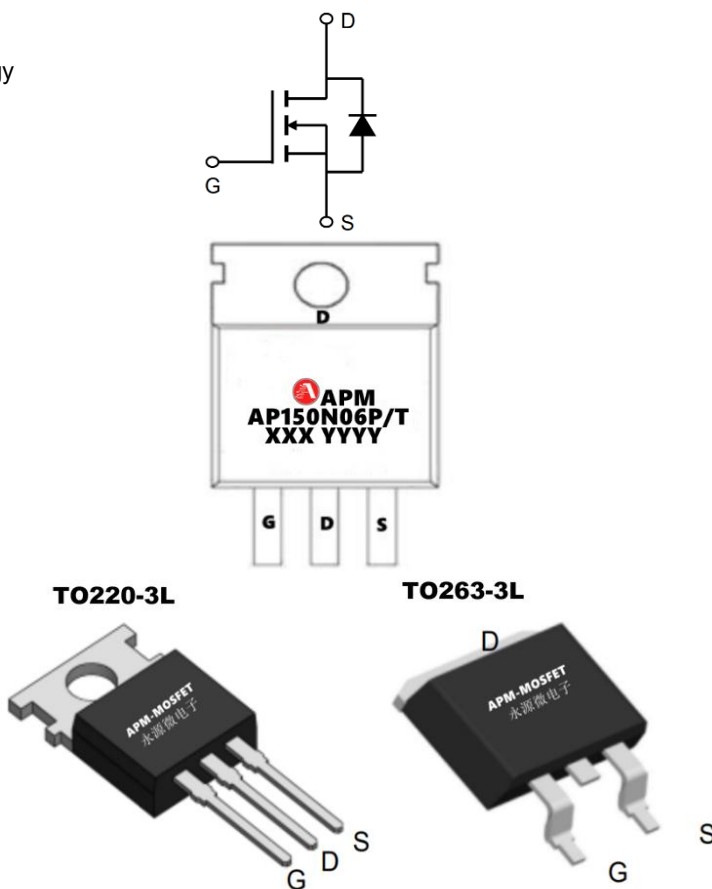
$V_{DS} = 60V$ $I_D = 150A$

$R_{DS(ON)} < 6.0m\Omega$ @ $V_{GS}=10V$ (**Type: 4.2mΩ**)

Application

Battery protection

UPS



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP150N06P	TO220-3L	AP150N06P XXX YYYY	1000
AP150N06T	TO263-3L	AP150N06T XXX YYYY	800

Absolute Maximum Ratings@ $T_J=25^{\circ}C$ (unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain source voltage	60	V
V_{GS}	Gate source voltage	± 20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^1$	150	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^1$	85	A
IDM	Pulsed drain current ²⁾	450	A
EAS	Single pulsed avalanche energy ³⁾	265	mJ
$P_D@T_C=25^{\circ}C$	Total Power Dissipation ⁴⁾	87	W
T_{stg}, T_J	Operation and storage temperature	-55 to 150	$^{\circ}C$
$R_{\theta JC}$	Thermal resistance, junction-case	1.44	$^{\circ}C/W$
$R_{\theta JA}$	Thermal resistance, junction-ambient ⁴⁾	62	$^{\circ}C/W$

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Electrical Characteristics (T_J=25°C, unless otherwise noted)

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
BVDSS	Drain-source breakdown voltage	V _{GS} =0 V, I _D =250 μA	60	65		V
V _{GS(th)}	Gate threshold voltage	V _{DS} =V _{GS} , I _D =250 μA	1.0	1.6	2.5	V
R _{DS(ON)}	Drain-source on-state resistance	V _{GS} =10 V, I _D =20 A		4.2	6	mΩ
R _{DS(ON)}	Drain-source on-state resistance	V _{GS} =4.5 V, I _D =10 A		6.4	10	mΩ
I _{GSS}	Gate-source leakage current	V _{GS} =±20 V			±100	nA
I _{DSS}	Drain-source leakage current	V _{DS} =60 V, V _{GS} =0 V			1	μA
R _g	Gate Resistance	f=1MHz, Open drain		2.8		Ω
C _{iss}	Input capacitance	V _{GS} =0 V, V _{DS} =50 V, f=100 kHz		2136		pF
C _{oss}	Output capacitance			331.5		pF
C _{rss}	Reverse transfer capacitance			10.6		pF
t _{d(on)}	Turn-on delay time	V _{GS} =10 V, V _{DS} =50 V, R _G =2 Ω, I _D =25 A		22.9		ns
t _r	Rise time			6.5		ns
t _{d(off)}	Turn-off delay time			45.7		ns
t _f	Fall time			20.4		ns
Q _g	Total gate charge	I _D =25 A, V _{DS} =50 V, V _{GS} =10 V		30		nC
Q _{gs}	Gate-source charge			5.8		nC
Q _{gd}	Gate-drain charge			6.1		nC
V _{plateau}	Gate plateau voltage			3.6		V
V _{SD}	Diode forward voltage	I _S =20 A, V _{GS} =0 V			1.3	V
t _{rr}	Reverse recovery time	I _S =25A, di/dt=100 A/μs		50.3		ns
Q _{rr}	Reverse recovery charge			45.1		nC
I _{rrm}	Peak reverse recovery current			1.5		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 ≤ 300us , duty cycle ≤ 2%
- 3、The EAS data shows Max. rating . The test condition is VDD=25V,VGS=10V,L=0.1mH,IAS=15A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation

Typical Characteristics

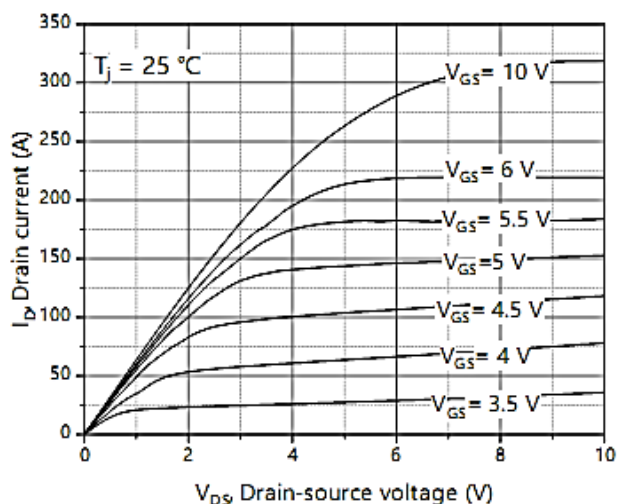


Figure 1. Typ. output characteristics

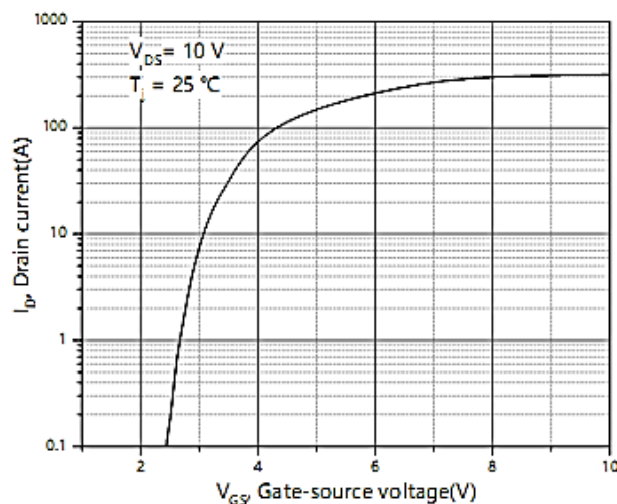


Figure 2. Typ. transfer characteristics

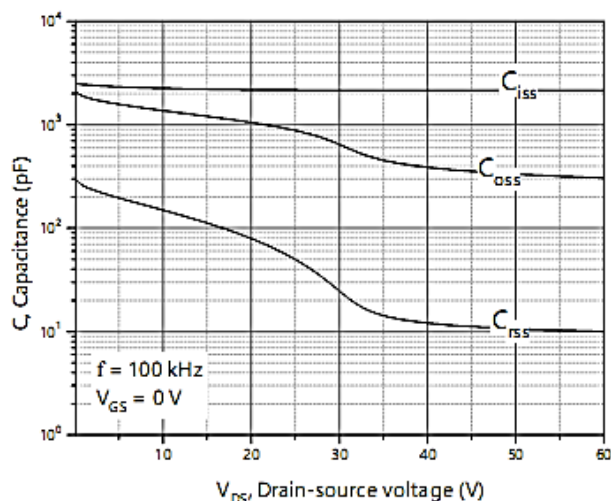


Figure 3. Typ. capacitances

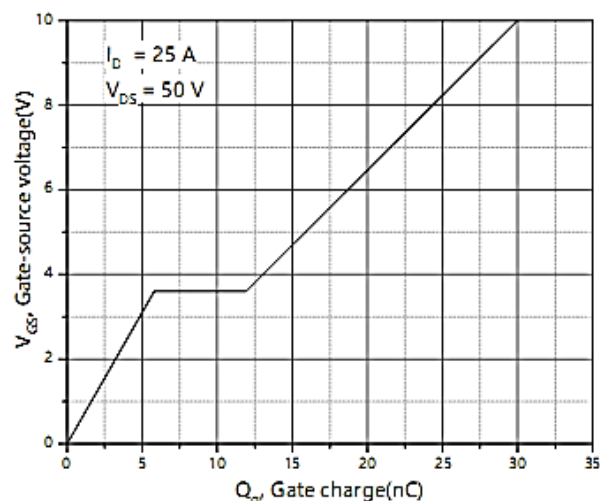


Figure 4. Typ. gate charge

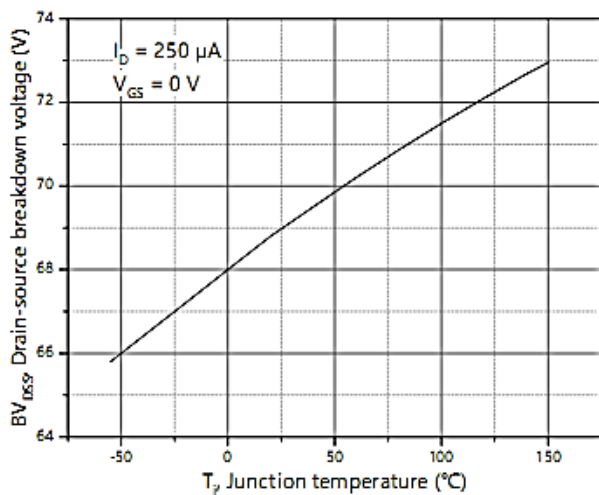


Figure 5. Drain-source breakdown voltage

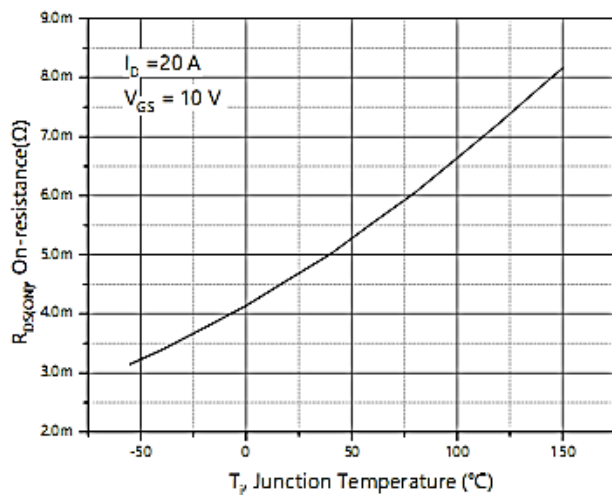


Figure 6. Drain-source on-state resistance

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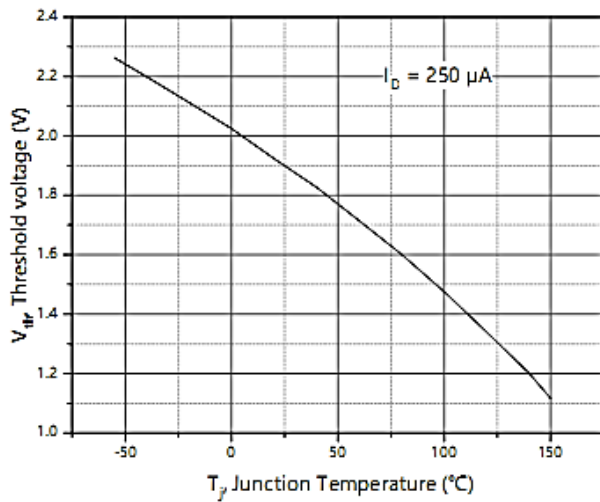


Figure 7. Threshold voltage

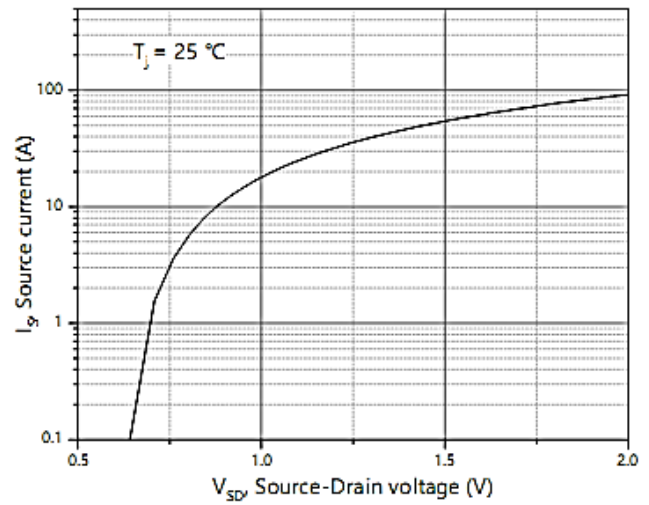


Figure 8. Forward characteristic of body diode

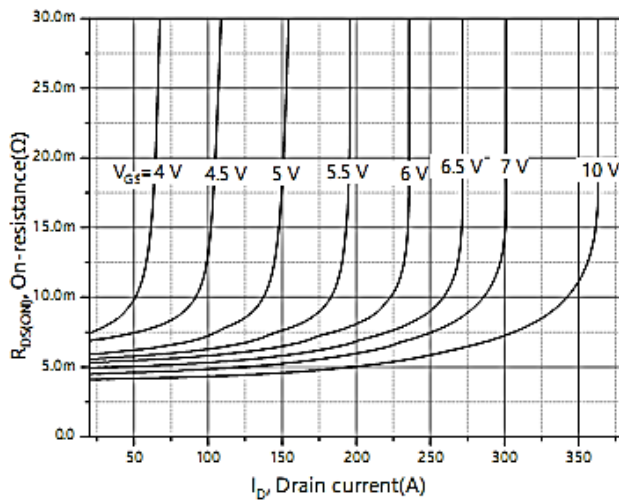


Figure 9. Drain-source on-state resistance

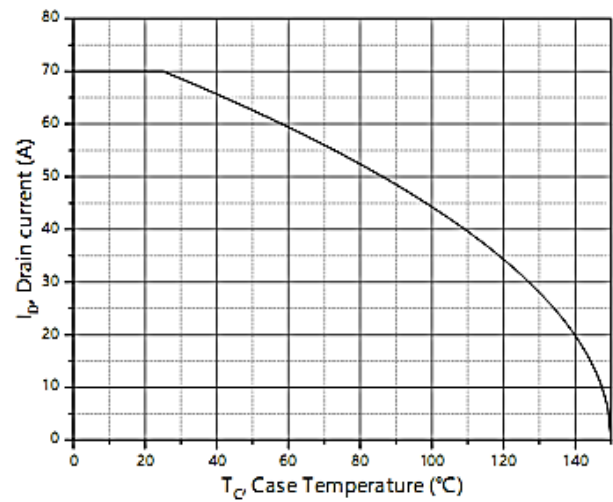


Figure 10. Drain current

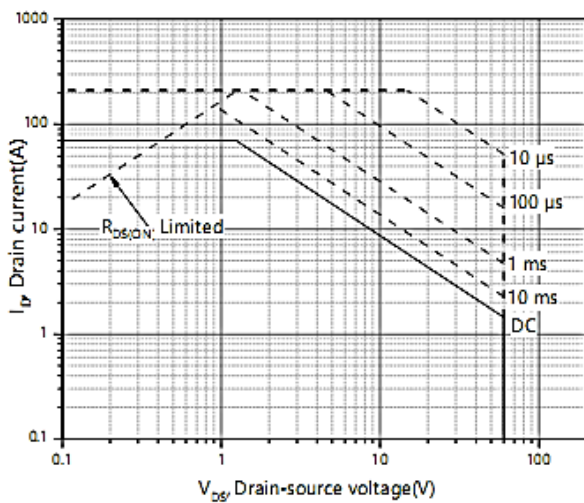


Figure 11. Safe operation area $T_C=25\text{ }^{\circ}\text{C}$

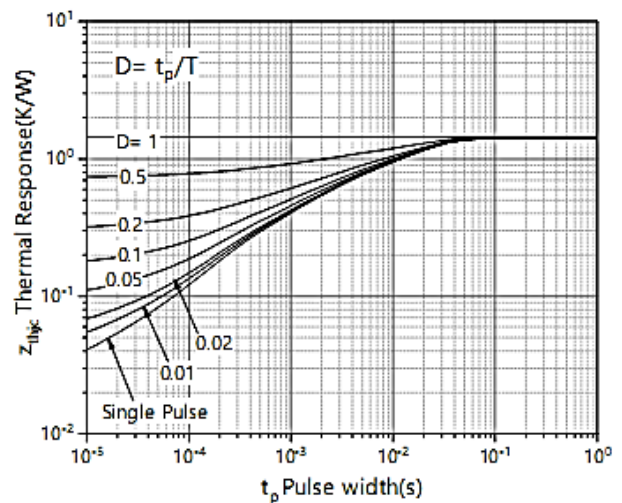
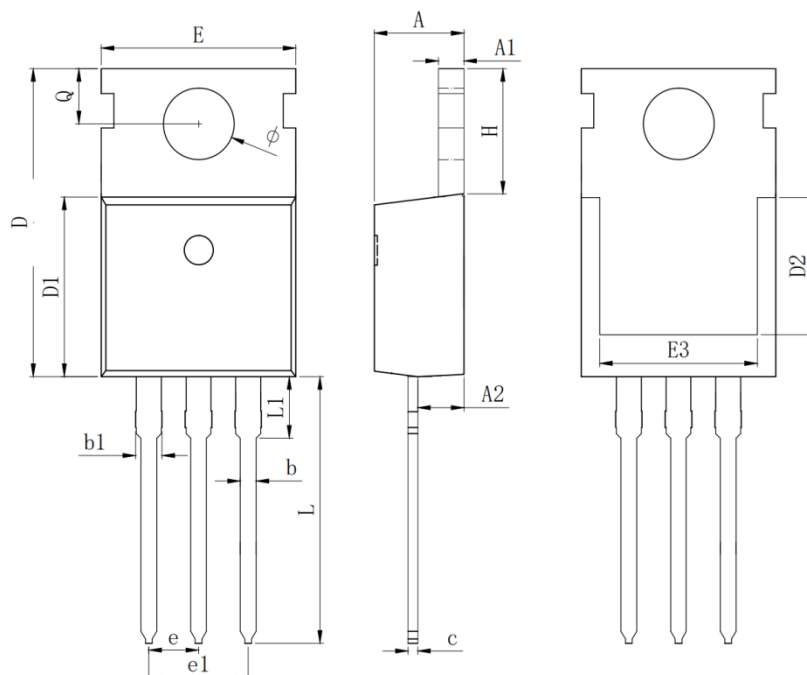


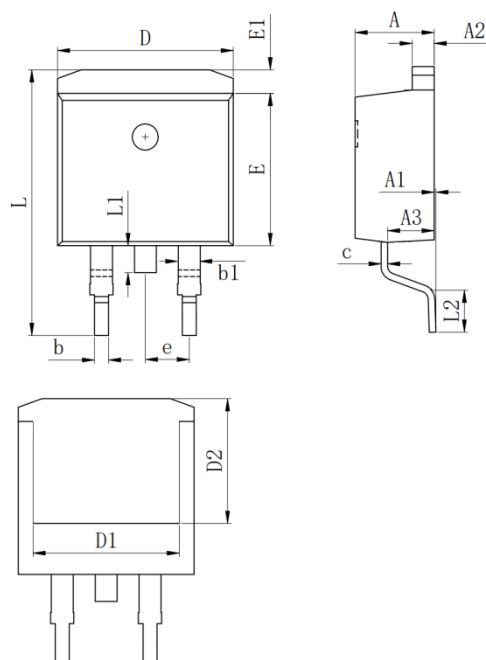
Figure 12. Max. transient thermal impedance

Package Mechanical Data-TO220-3L



Symbol	Dimensions In Millimeters		
	min.	typ.	max.
A	4.25	4.50	4.70
A1	1.15	1.30	1.45
A2	2.15	2.35	2.55
b	0.65	0.80	0.95
b1	1.15	1.35	1.55
c	0.35	0.50	0.65
D	14.30	15.30	16.30
D1	8.80	9.10	9.40
D2	6.3REF		
E	9.70	10.00	10.30
E3	7.00	8.00	9.0
e	2.54BSC		
e1	5.08BSC		
L	12.70	13.50	13.90
L1	2.60	3.10	3.40
H	6.00	6.50	6.85
Q	2.60	2.80	3.00
φ	3.40	3.60	3.80

Package Mechanical Data-TO263-3L



Symbol	Dimensions In Millimeters		
	min.	typ.	max.
A	4.37	4.57	4.77
A1	0.00		0.25
A2	1.22	1.27	1.42
A3	2.49	2.69	2.89
b	0.70	0.81	0.96
b1	1.17	1.27	1.47
c	0.30	0.38	0.53
D	9.86	10.16	10.40
D1	8.4REF		
D2	7.073REF		
E	8.50	8.70	9.30
E1	0.87	1.17	1.47
e	2.54BSC		
L	14.70	15.10	15.50
L1	1.40	1.55	1.70
L2	2.00	2.30	2.60

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Edition	Date	Change
Rve1.0	2019/8/1	Initial release
Rve1.1	2026/6/26	Update LOGO And Corrected Manual POD

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