

## 65V N-Channel Enhancement Mode MOSFET

### Description

The AP150N06MP uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.

### General Features

$V_{DS} = 65V$   $I_D = 150A$

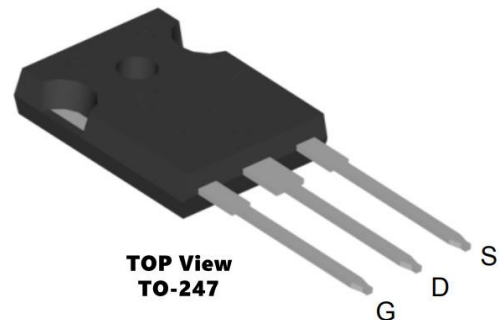
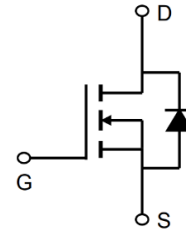
$R_{DS(ON)} < 5.6m\Omega @ V_{GS}=10V$  (Type: 4.8m $\Omega$ )

### Application

UPS

BMS

Uninterruptible power supply



### Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP150N06MP	TO-247-3L	AP150N06MP XXX YYYY	1000

### Absolute Maximum Ratings@ $T_j=25^\circ C$ (unless otherwise specified)

Symbol	Parameter	Value	Unit
VDS	Drain source voltage	65	V
VGS	Gate source voltage	$\pm 25$	V
ID	Continuous drain current <sup>1)</sup>	150	A
IDM	Pulsed drain current <sup>2)</sup>	520	A
IAS	Diode forward current	55	A
P <sub>D</sub>	Power dissipation	172	W
EAS	Single pulsed avalanche energy <sup>3)</sup>	225	mJ
T <sub>stg</sub> , T <sub>j</sub>	Operation and storage temperature	-55 to 150	$^\circ C$
R $\theta$ JC	Thermal resistance, junction-case	1.4	$^\circ C/W$
R $\theta$ JA	Thermal resistance, junction-ambient <sup>4)</sup>	40	$^\circ C/W$

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### Electrical Characteristics (T<sub>J</sub>=25°C, unless otherwise noted)

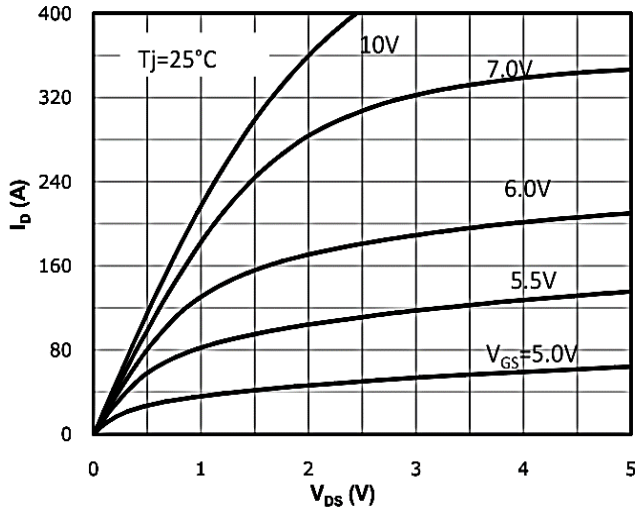
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	65	72	-	V
IDSS	Zero Gate Voltage Drain Current	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0	2.8	4.0	V
RDS(on)	Static Drain-Source on-Resistance note	V <sub>GS</sub> =10V, I <sub>D</sub> =55A	-	4.8	5.6	mΩ
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1.0MHz	-	3135	-	pF
C <sub>oss</sub>	Output Capacitance		-	521	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	306	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =30V, I <sub>D</sub> =55A, V <sub>GS</sub> =10V	-	77	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	18	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	30	-	nC
td(on)	Turn-on Delay Time	V <sub>DS</sub> =30V, I <sub>D</sub> =55A, R <sub>G</sub> =1.8Ω, V <sub>GS</sub> =10V	-	15	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	89	-	ns
td(off)	Turn-off Delay Time		-	36	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	91	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	123	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	492	A
VSD	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I <sub>F</sub> =550A, dI/dt=100A/μs	-	32	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	31	-	nC

#### Note :

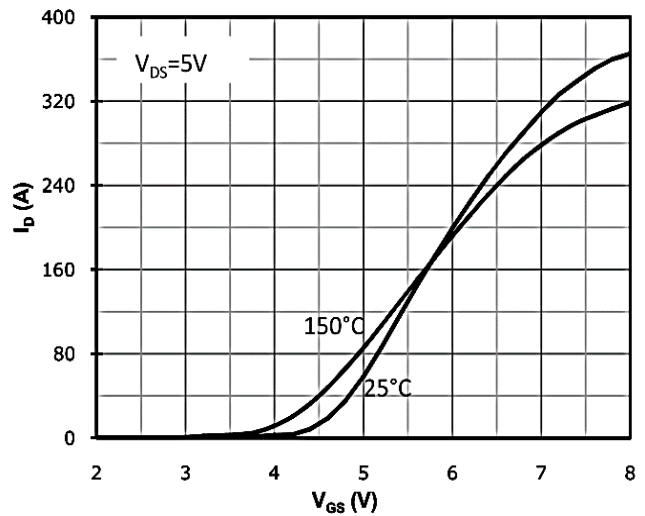
- 1、 The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3、 The test cond ≅ 300us duty cycle ≅ 2%, duty cycle ition is T<sub>J</sub> =25°C, VDD =35V, VG =10V, R G =25Ω, L=0.5mH, IAS =55A
- 4、 The power dissipation is limited by 175°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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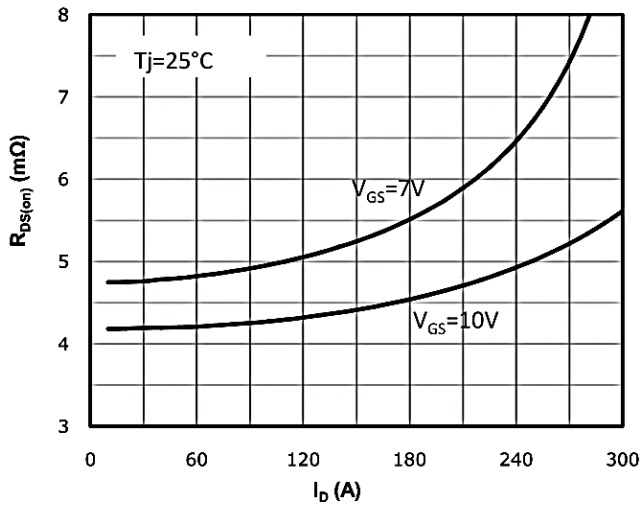
**Electrical Characteristics Diagrams**



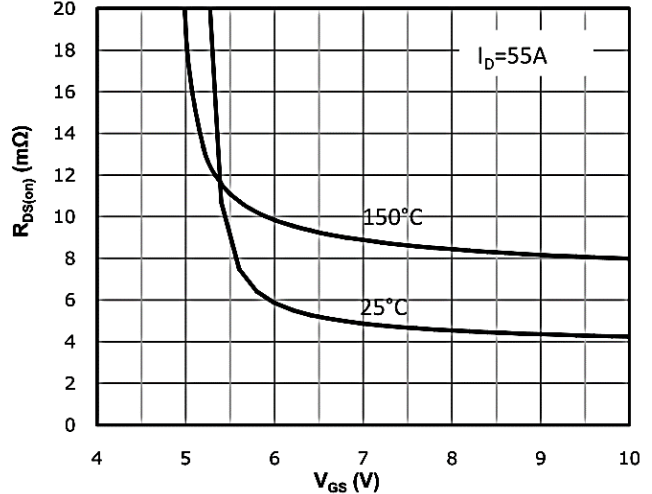
**Figure 1: Output Characteristics**



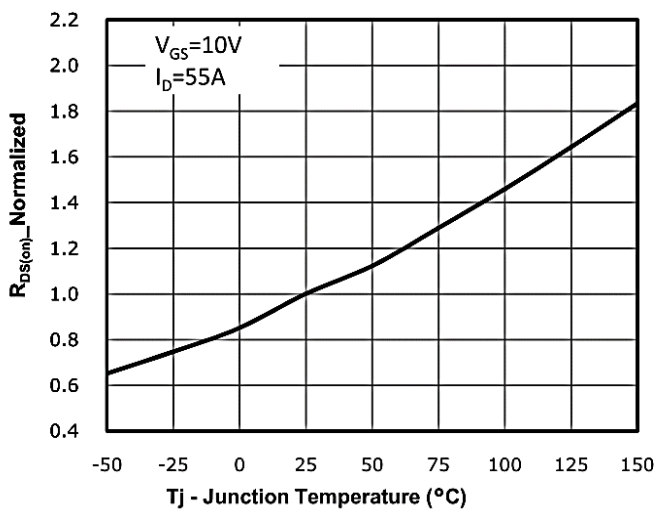
**Figure 2: Typical Transfer Characteristics**



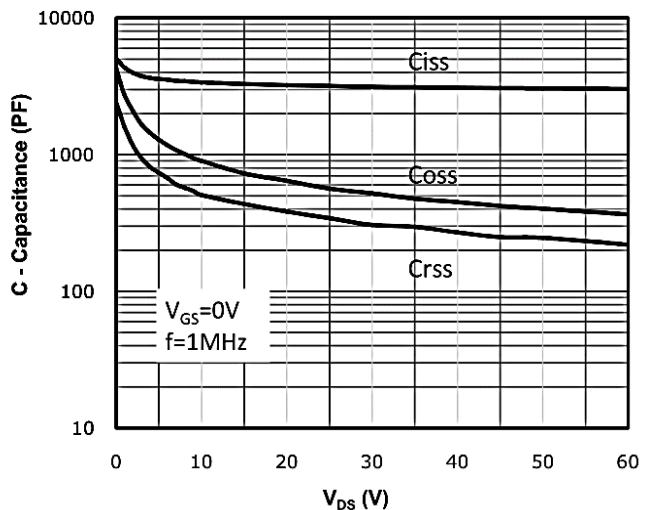
**Figure 3:  $R_{ds(on)}$  vs Drain Current and**



**Figure 4:  $R_{ds(on)}$  vs Gate Voltage**

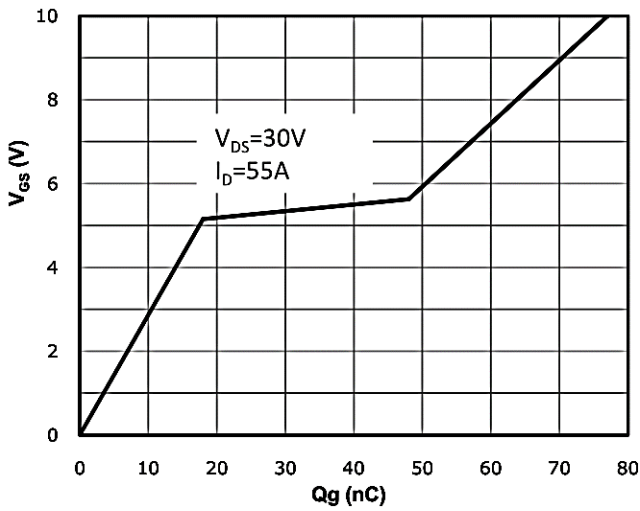


**Figure 5:  $R_{ds(on)}$  vs. Temperature**

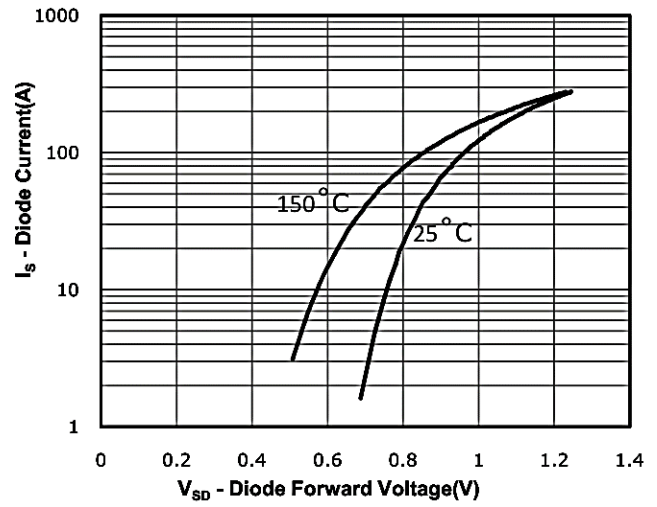


**Figure 6: Capacitance Characteristics**

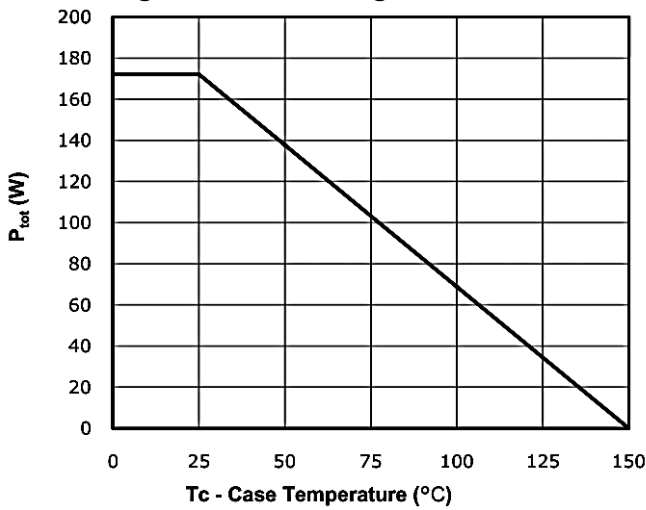
**65V N-Channel Enhancement Mode MOSFET**



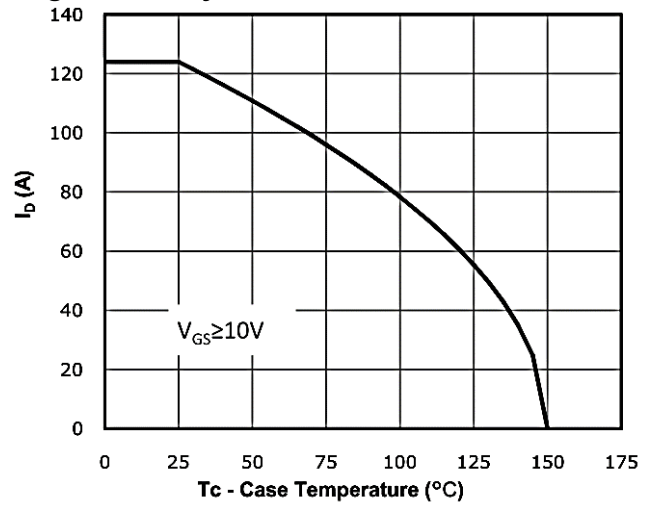
**Figure 7: Gate Charge Characteristics**



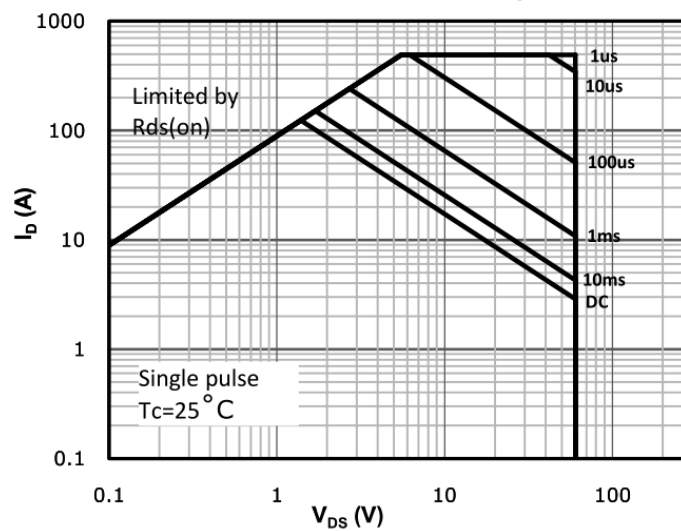
**Figure 8: Body-diode Forward Characteristics**



**Figure 9: Power Dissipation**



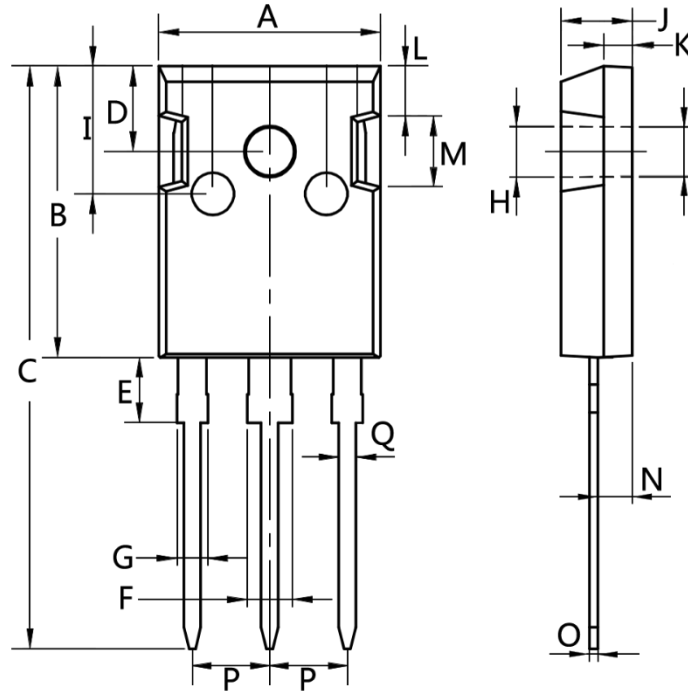
**Figure 10: Drain Current Derating**



**Figure.11: Safe Operating Area**

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**Package Mechanical Data-TO-247-3L**



Dim.	Min.	Max.
A	15.0	16.0
B	20.0	21.0
C	41.0	42.0
D	5.0	6.0
E	4.0	5.0
F	2.5	3.5
G	1.75	2.5
H	3.0	3.5
I	8.0	10.0
J	4.9	5.1
K	1.9	2.1
L	3.5	4.0
M	4.75	5.25
N	2.0	3.0
O	0.55	0.75
P	Typ 5.08	
Q	1.2	1.3