

150V N-Channel Enhancement Mode MOSFET

Description

The AP300N15MP uses advanced **APM-SGT** 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

$V_{DS} = 150V$ $I_D = 300A$

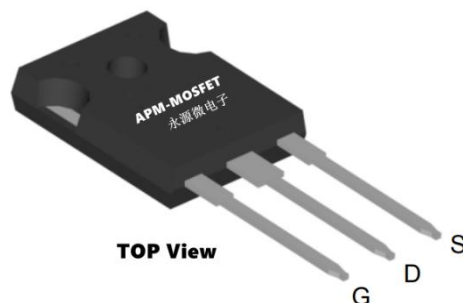
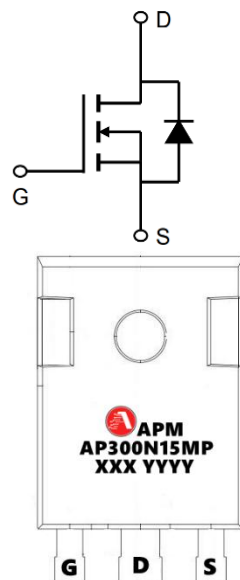
$R_{DS(ON)} < 4.5m\Omega$ @ $V_{GS}=10V$ (Type: **3.5mΩ**)

Application

DC/DC Converter

LED Backlighting

Power Management Switches



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP300N15MP	TO247-3L	AP300N15MP XXX YYYY	330

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, V_{GS} @ 10V	300	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, V_{GS} @ 10V	188	A
IDM	Pulsed Drain Current	817	A
EAS	Single Pulse Avalanche Energy	2201	mJ
IAS	Avalanche Current	88	A
$P_D@T_C=25^\circ C$	Total Power Dissipation ⁴	600	W
TSTG	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	0.25	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case	62.5	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	150	165		V
IDSS	Zero Gate Voltage Drain Current	$V_{DS} = 150V, V_{GS} = 0V$			1.0	nA
IDSS $T_J = 55^{\circ}\text{C}$	Zero Gate Voltage Drain Current	$V_{DS} = 150V, T_J = 55^{\circ}\text{C}$			5.0	
IGSS	Gate-Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
VGS(th)	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.5	3.2	4.5	V
RDS(ON)	Static Drain-Source	$V_{GS} = 10V, I_D = 40A$		3.5	4.5	m Ω
gFS	Forward Transconductance	$V_{DS} = 5V, I_D = 20A$		65		S
Rg	Gate Resistance	$V_{GS} = 0V, V_{DS} = 0V, f = 1\text{MHz}$		2.4		Ω
Ciss	Input Capacitance	$V_{GS}=0V, V_{DS}=25V, f=1\text{MHz}$		6540		pF
Coss	Output Capacitance			772		pF
Crss	Reverse Transfer Capacitance			6.7		pF
Qg	Total Gate Charge	$V_{GS} = 0 \text{ to } 10V$ $V_{DS} = 75V, I_D = 20A$		88		nC
Qgs	Gate Source Charge			32		nC
Qgd	Gate Drain Charge			16		nC
tD(on)	Turn-On DelayTime	$V_{GS} = 10V, V_{DS} = 75V$ $R_L = 3.75\Omega, R_{GEN} = 6\Omega$		48		ns
tr	Turn-On Rise Time			90		ns
tD(off)	Turn-Off DelayTime			94		ns
tf	Turn-Off Fall Time			60		ns
trr	Body Diode Reverse Recovery Time	$I_F = 20A, dI/dt = 500A/\mu s$		122		ns
Qrr	Body Diode Reverse Recovery Charge	$I_F = 20A, dI/dt = 500A/\mu s$		279		nC
VSD	Diode Forward Voltage	$I_S = 1A, V_{GS} = 0V$		0.71	1.0	V
IS	Diode Continuous Current	$T_c = 25^{\circ}\text{C}$			600	A

Notes:

- 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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、The EAS data shows Max. rating . The test condition is $V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=88A$
- 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.

Typical Characteristics

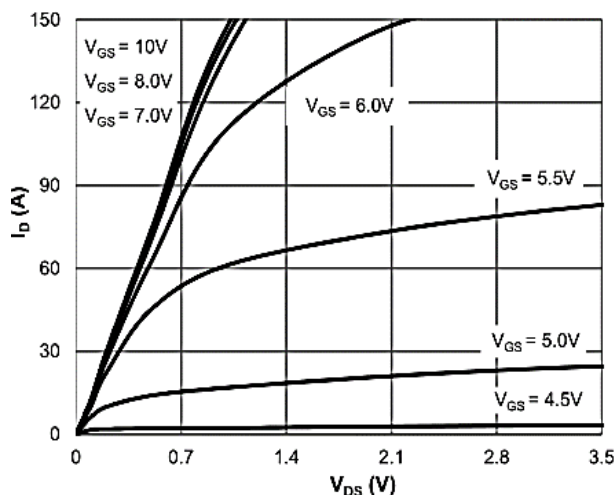


Figure 1: Saturation Characteristics

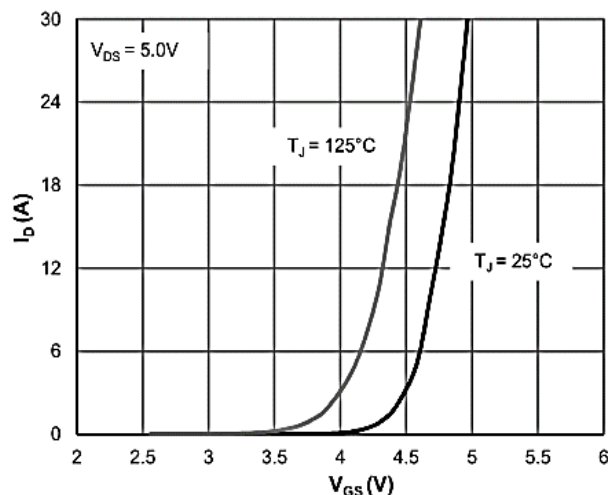


Figure 2: Transfer Characteristics

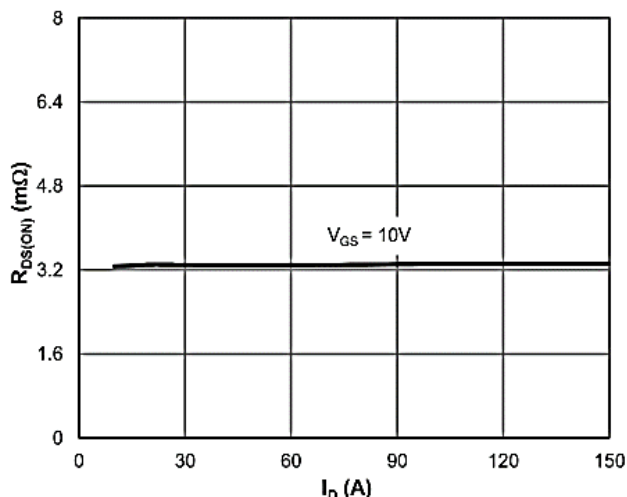


Figure 3: $R_{DS(ON)}$ vs. Drain Current

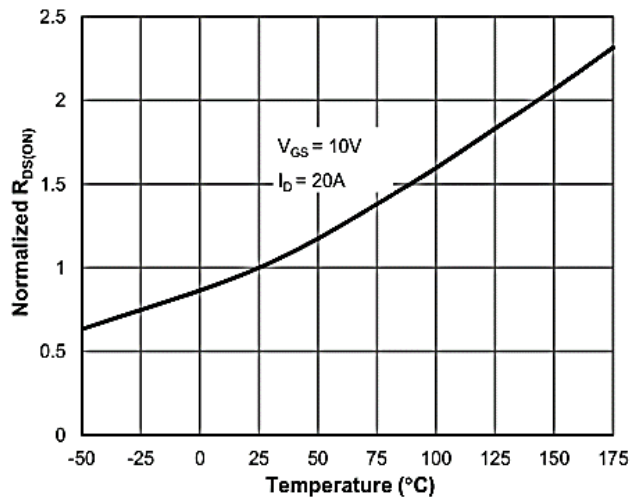


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

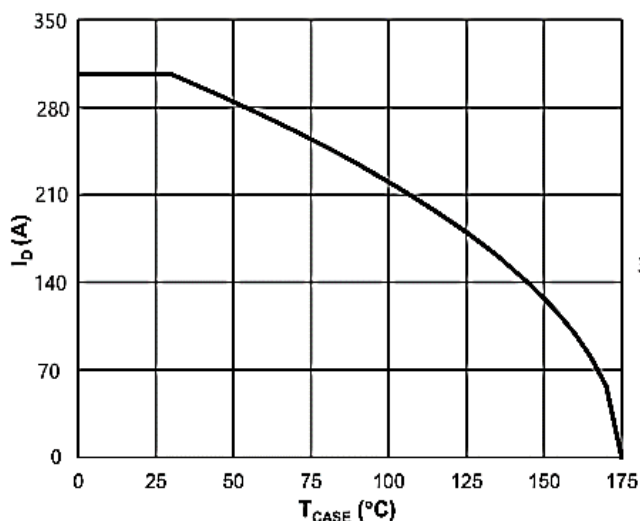


Figure 5: Current De-rating

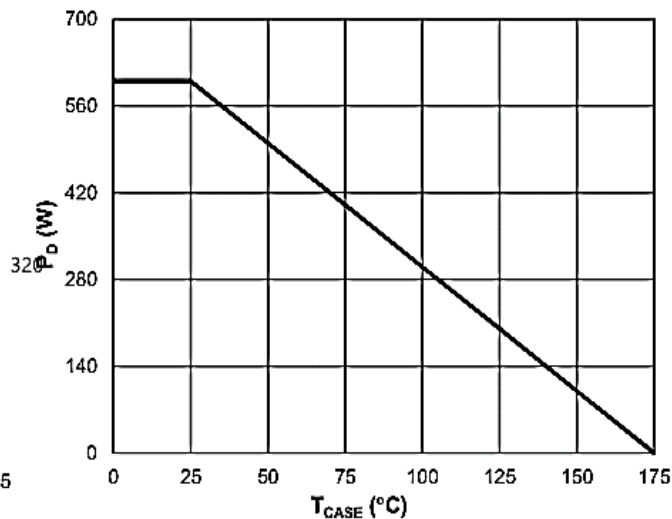


Figure 6: Power De-rating

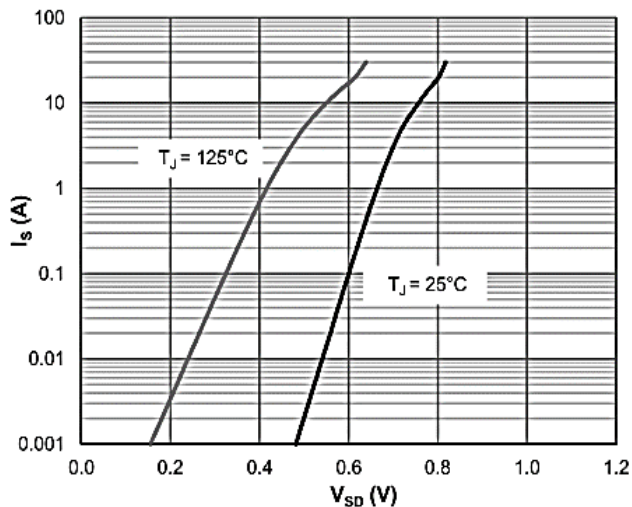


Figure 7: Body-Diode Characteristics

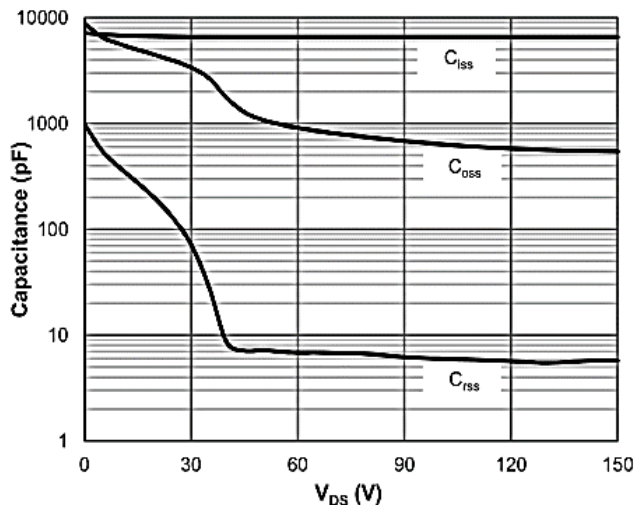


Figure 8: Capacitance Characteristics

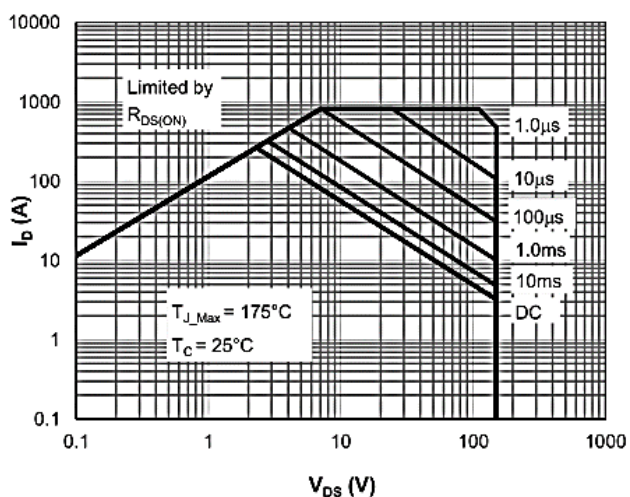


Figure 9: Maximum Safe Operating Area

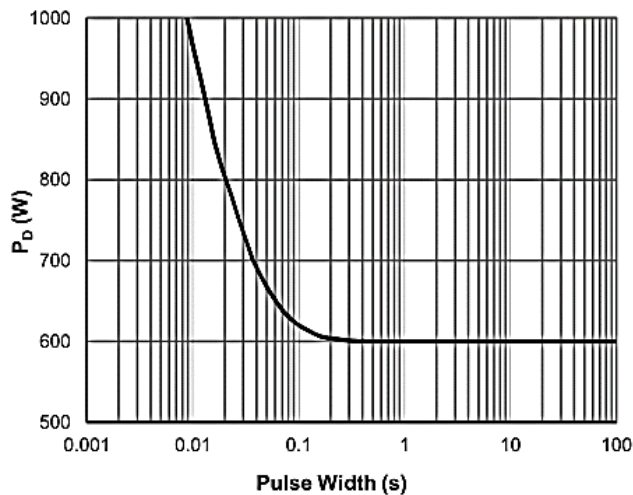


Figure 10: Single Pulse Power Rating, Junction-to-Case

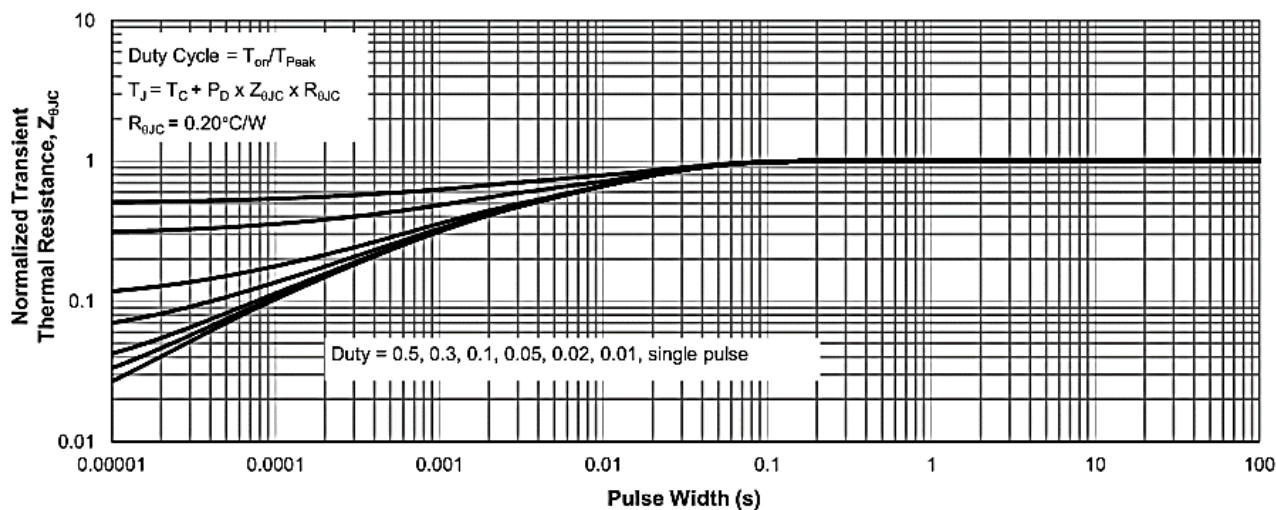
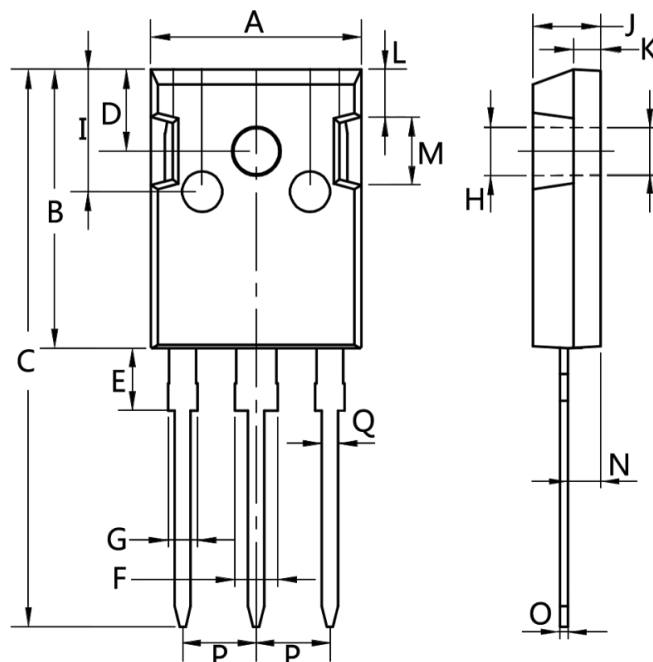


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-TO247-3L



Symbol	Dimensions In Millimeters		
	min.	typ.	max.
A	15.00	15.50	16.00
B	20.00	20.50	21.00
C	40.00	41.00	42.0
D	5.50	6.00	6.50
E	4.00	4.75	5.50
F	2.50	3.00	3.50
G	1.75	2.12	2.50
H	3.00	3.50	4.00
I	8.00	9.00	10.0
J	4.90	5.00	5.10
K	1.90	2.00	2.10
L	3.00	3.50	4.00
M	4.75	5.00	5.25
N	2.00	2.50	3.00
O	0.55	0.60	0.65
P	Typ5.40		
Q	1.17	1.23	1.30

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Edition	Date	Change
REV1.0	2023/3/5	Initial release
REV1.1	2026/6/29	Update LOGO And Corrected Manual POD

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