AP300N15TLG1

150V N-Channel Enhancement Mode MOSFET

Description

The AP300N15TLG1 uses advanced **APM-SGT**Ⅰtechnology 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

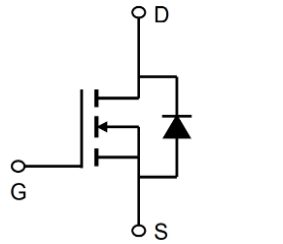
$R_{DS(ON)}$ < 4.2mΩ @ V_{GS}=10V **(Type：3.3mΩ)**

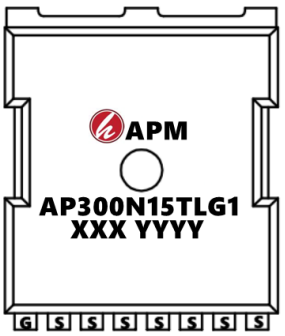
Application

DC/DC Converter

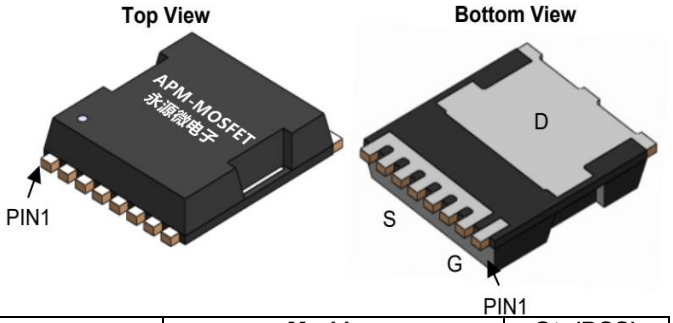
LED Backlighting

Power Management Switches





TOLLA



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP300N15TLG1	TOLLA-8L	AP300N15TLG1 XXX YYYY	2000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	150	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	300	A
I_D@T_C=100℃	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℃	Total Power Dissipation[4]	600	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient	0.25	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case	40	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS} = 0V I_D = 250μA	150	165		V
IDSS	Zero Gate Voltage Drain Current	V_{DS} = 150V, V_{GS} = 0V			1.0	nA
IDSS T_J = 55°C	Zero Gate Voltage Drain Current	V_{DS} = 150V,T_J = 55°C			5.0	
IGSS	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	2.5	3.2	4.5	V
RDS(ON)	Static Drain-Source	V_{GS} = 10V, I_D =40A		3.3	4.2	mΩ
gFS	Forward Transconductance	V_{DS} = 5V, I_D = 20A		65		S
R_g	Gate Resistance	V_{GS} = 0V, V_{DS}= 0V, f = 1MHz		2.4		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=25V, f=1MHz		6540		pF
C_{oss}	Output Capacitance			772		pF
C_{rss}	Reverse Transfer Capacitance			6.7		pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 75V, I_D = 20A		88		nC
Q_{gs}	Gate Source Charge			32		nC
Q_{gd}	Gate Drain Charge			16		nC
tD(on)	Turn-On DelayTime	V_{GS} = 10V, V_{DS} = 75V R_L = 3.75Ω , R_{GEN} = 6Ω		48		ns
t_r	Turn-On Rise Time			90		ns
tD(off)	Turn-Off DelayTime			94		ns
t_f	Turn-Off Fall Time			60		ns
trr	Body Diode Reverse Recovery Time	I_F=20A, dI/dt=500A/us		122		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=20A, dI/dt=500A/us		279		nC
V_{SD}	Diode Forward Voltage	I_S = 1A, V_{GS} = 0V		0.71	1.0	V
IS	Diode Continuous Current	T_C = 25°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 ≤ 300us , duty cycle ≤ 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

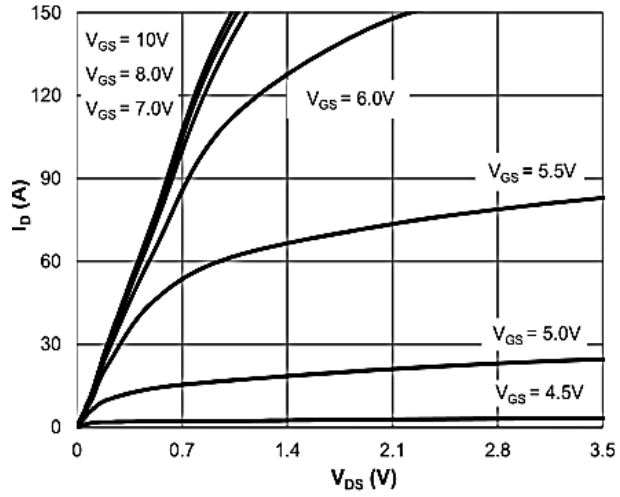


Figure 1: Saturation Characteristics

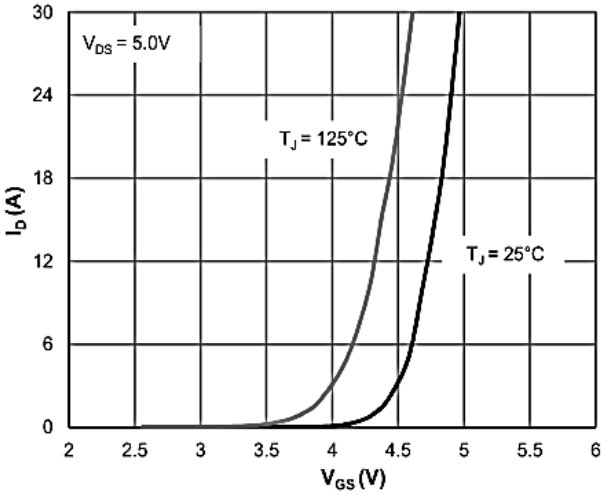


Figure 2: Transfer Characteristics

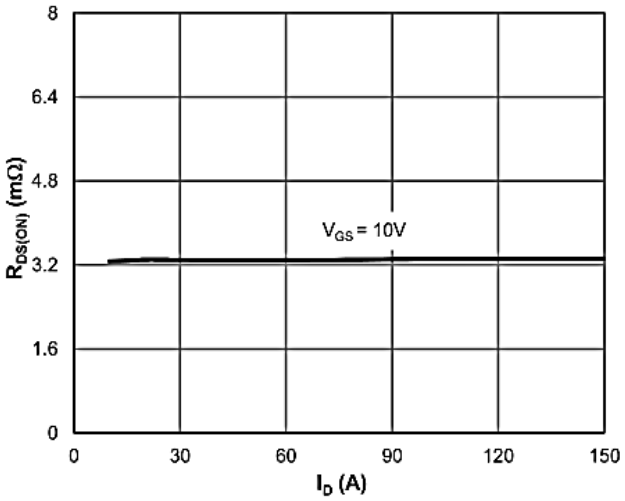


Figure 3: RDS(ON) vs. Drain Current

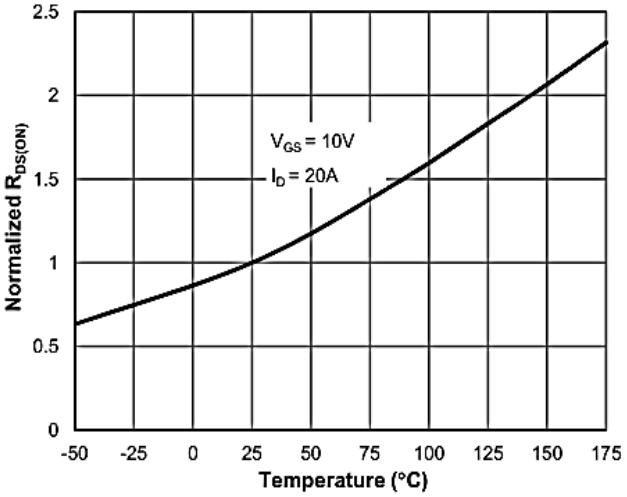


Figure 4: RDS(ON) vs. Junction Temperature

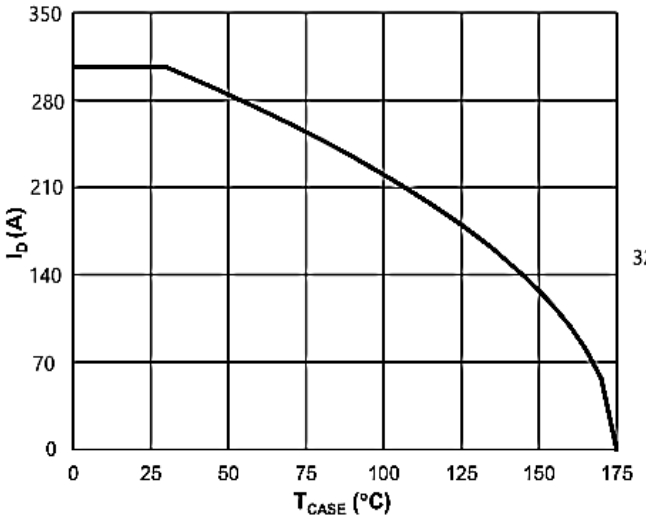


Figure 5: Current De-rating

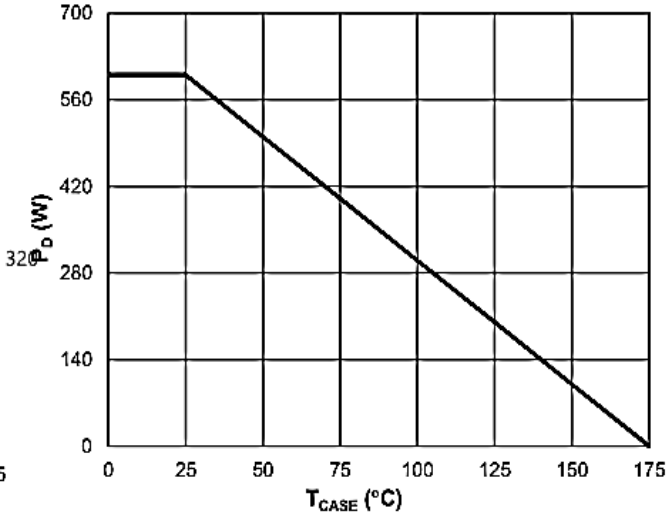


Figure 6: Power De-rating

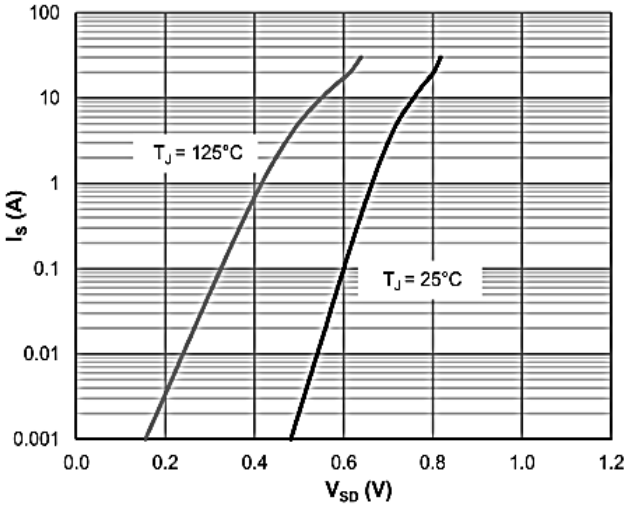


Figure 7: Body-Diode Characteristics

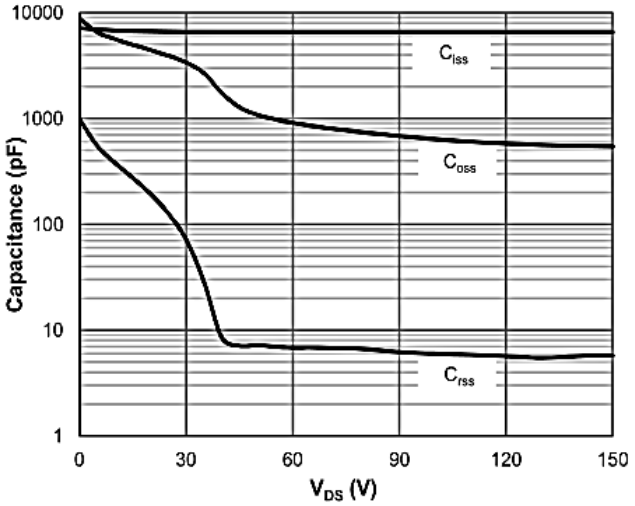


Figure 8: Capacitance Characteristics

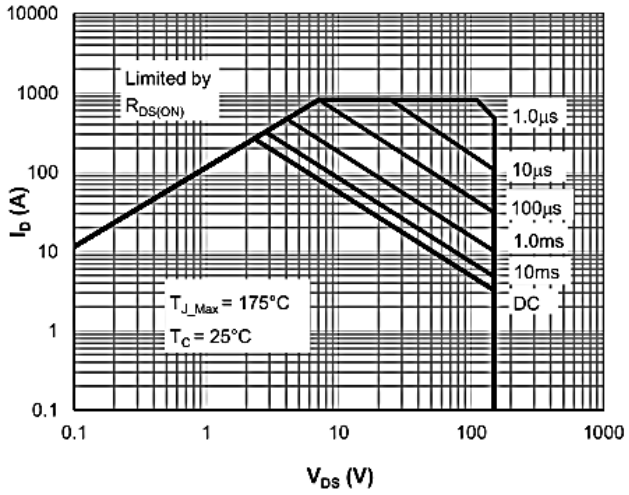


Figure 9: Maximum Safe Operating Area

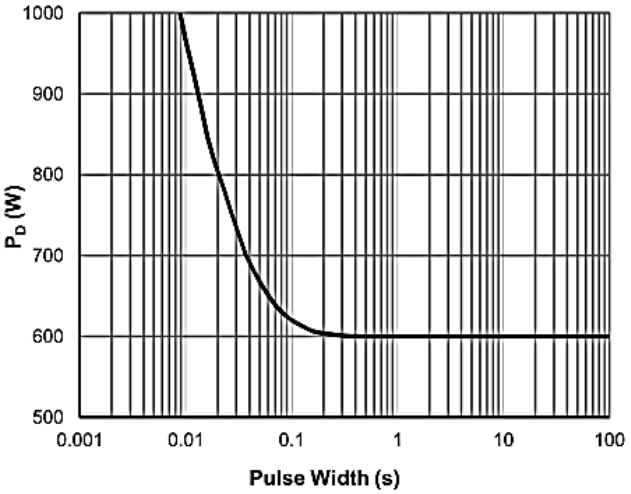


Figure 10: Single Pulse Power Rating, Junction-to-Case

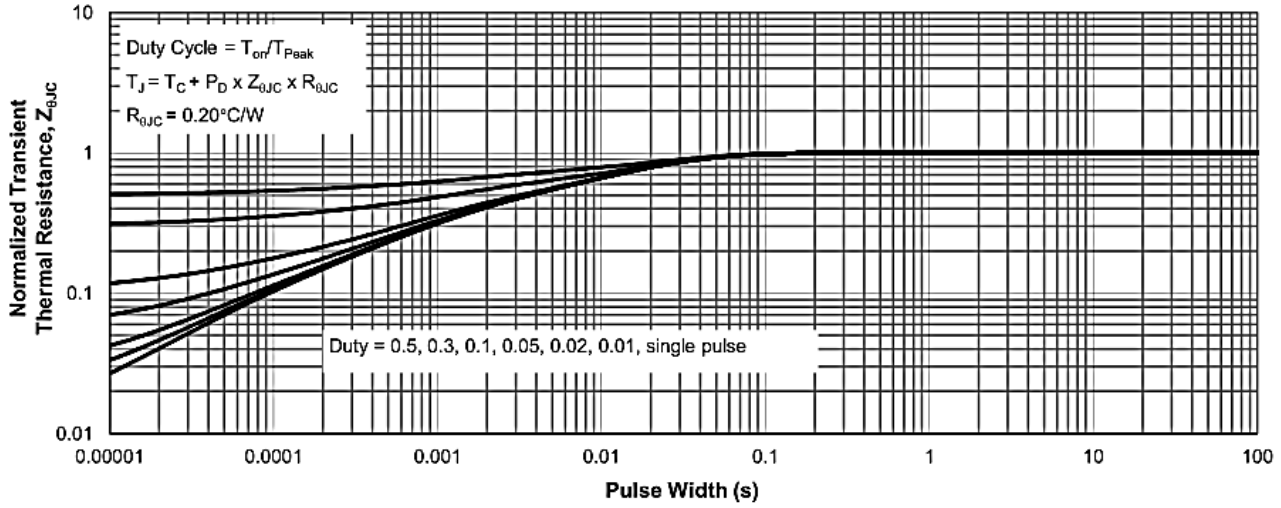
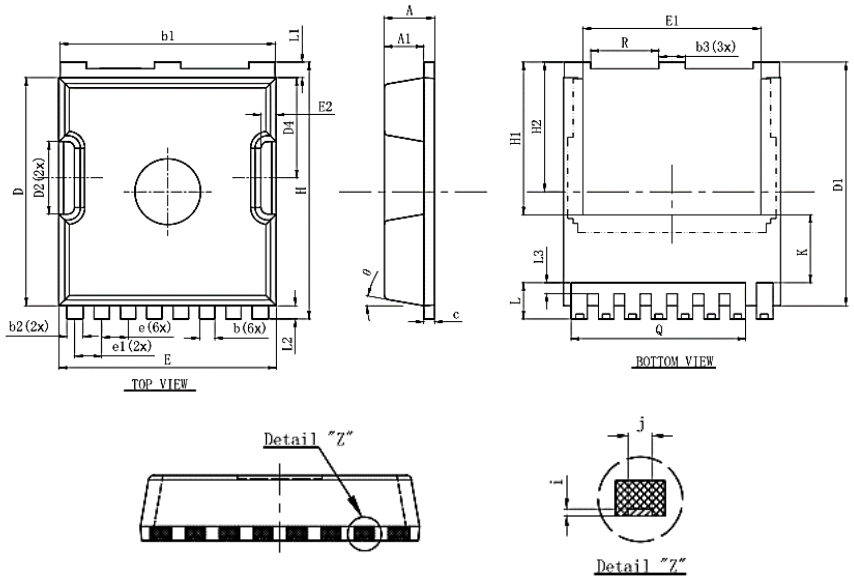


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-TOLLA-8-XZ Single



Symbol	Dimensions In Millimeters		
	Min.	Nom	Max.
A	2.2	2.3	2.4
A1	1.7	1.8	1.9
b	0.6	0.7	0.8
b1	9.7	9.8	9.9
b2	0.65	0.75	0.85
b3	1.1	1.2	1.3
C	0.4	0.5	0.6
D	10.3	10.4	10.5
D1	11.0	11.1	11.2
D2	3.2	3.3	3.4
D4	4.47	4.57	4.67
E	9.8	9.9	10.0
E1	8.0	8.1	8.2
E2	0.5	0.6	0.7
e	1.200（BSC）		
e1	1.225（BSC）		
H	11.6	11.7	11.8
H1	6.95BSC		
H2	5.9BSC		
i	0.1REF		
j	0.350REF		
K	3.100REF		
L	1.55	1.65	1.75
L1	0.6	0.7	0.8
L2	0.5	0.6	0.7
L3	0.4	0.5	0.6
Q	7.95REF		
R	3.0	3.1	3.2
θ	10°REG		

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150V N-Channel Enhancement Mode MOSFET

Edition	Date	Change
REV1.0	2023/3/5	Initial release