

Description

The AP300N10TLG2 uses advanced **APM-SGT_{II}** 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

$V_{DS} = 100V$ $I_D = 300A$

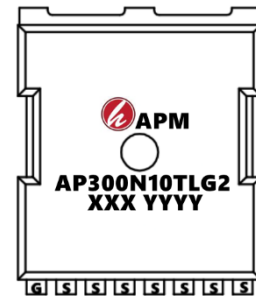
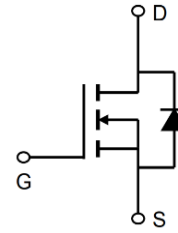
$R_{DS(ON)} < 2.0m\Omega$ @ $V_{GS}=10V$ (Type: **1.6mΩ**)

Application

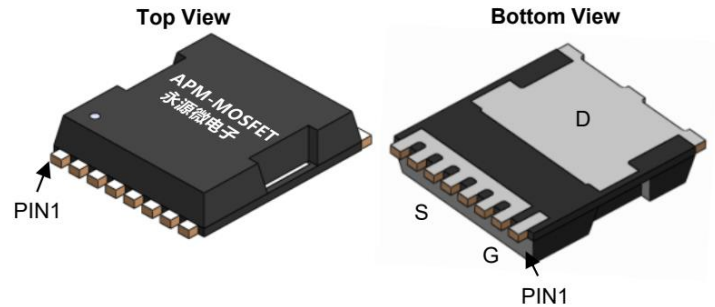
DC/DC Converter

LED Backlighting

Power Management Switches



TOLLA



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP300N10TLG2	TOLLA-8L	AP300N10TLG2 XXX YYYY	2000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	300	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	210	A
IDM	Pulsed Drain Current	960	A
EAS	Single Pulse Avalanche Energy	2340	mJ
IAS	Avalanche Current	53.4	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	313	W
TSTG	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	0.15	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case	40	$^\circ\text{C/W}$

100V N-Channel Enhancement Mode MOSFET

Electrical Characteristics (T_C=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	100	107	-	V
IGSS	Gate-body Leakage current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
IDSS	Zero Gate Voltage Drain Current T _J =25°C	V _{DS} =100V, V _{GS} = 0V	-	-	1	μA
	Zero Gate Voltage Drain Current T _J =100°C		-	-	100	
VGS(th)	Gate-Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2.0	3.0	4.0	V
RDS(on)	Drain-Source on-Resistance ⁴	V _{GS} = 10V, I _D = 50A	-	1.6	2.0	mΩ
gfs	Forward Transconductance ⁴	V _{DS} = 10V, I _D = 50A	-	190	-	S
Ciss	Input Capacitance	V _{DS} = 50V, V _{GS} = 0V, f = 1MHz	-	11300	-	pF
Coss	Output Capacitance		-	1400	-	
Crss	Reverse Transfer Capacitance		-	48	-	
R _g	Gate Resistance	f = 1MHz	-	2	-	Ω
Q _g	Total Gate Charge	V _{GS} = 10V, V _{DS} = 50V, I _D =20A	-	165	-	nC
Q _{gs}	Gate-Source Charge		-	67	-	
Q _{gd}	Gate-Drain Charge		-	35	-	
td(on)	Turn-on Delay Time	V _{GS} = 10V, V _{DD} = 50V, R _G = 3Ω, I _D = 20A	-	37	-	ns
t _r	Rise Time		-	112	-	
td(off)	Turn-off Delay Time		-	85	-	
t _f	Fall Time		-	115	-	
trr	Body Diode Reverse Recovery Time	I _F = 30A, dI/dt=500A/μs	-	100	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F = 30A, dI/dt=100A/μs	-	323	-	nC
VSD	Diode Forward Voltage ⁴	I _S = 50A, V _{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current T _C =25°C	-	-	-	300	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=0.5mH, I_{AS}=50A
- 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

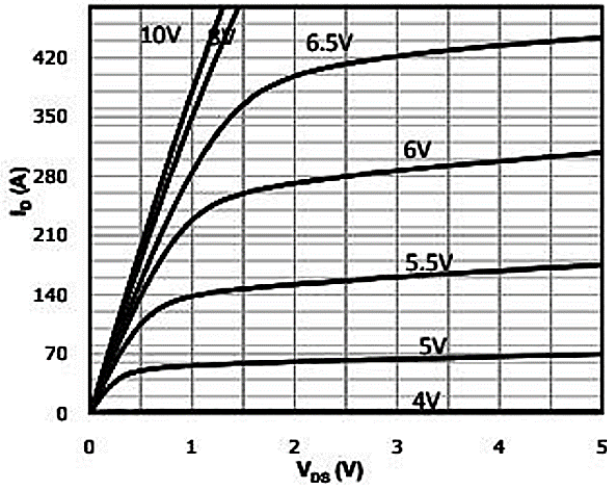


Figure 1. Output Characteristics

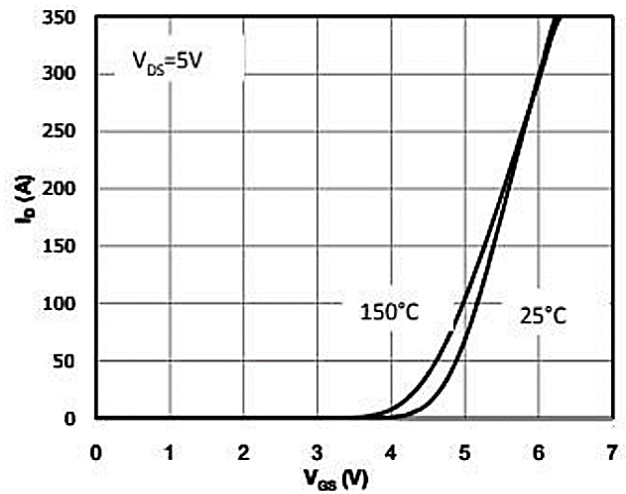


Figure 2. Transfer Characteristics

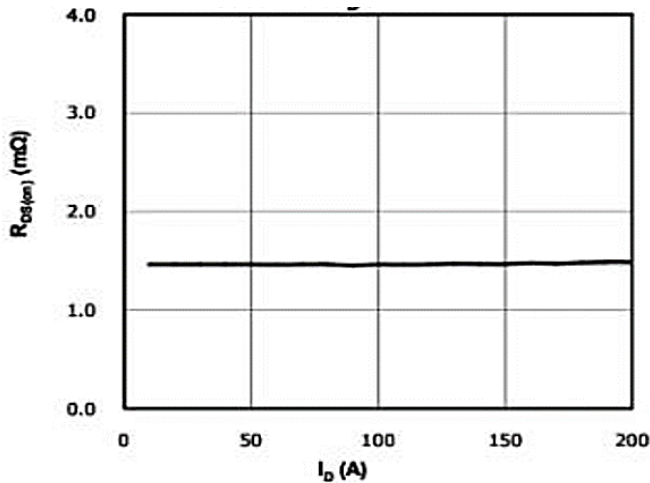


Figure 3. R_DS (ON) VS Drain Current and V_GS

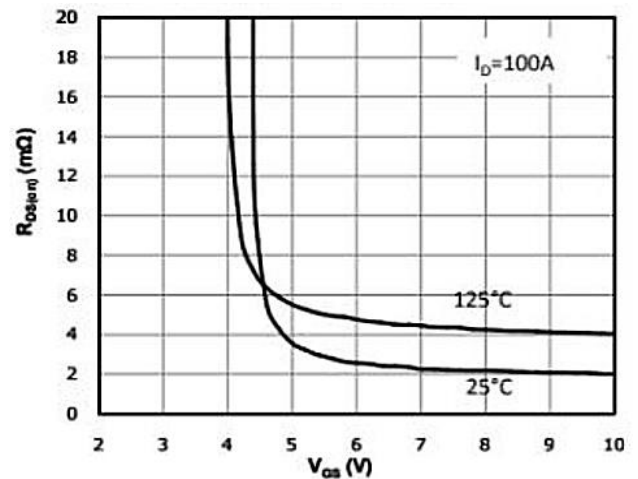


Figure 4. R_DS(ON) vs. V_GS

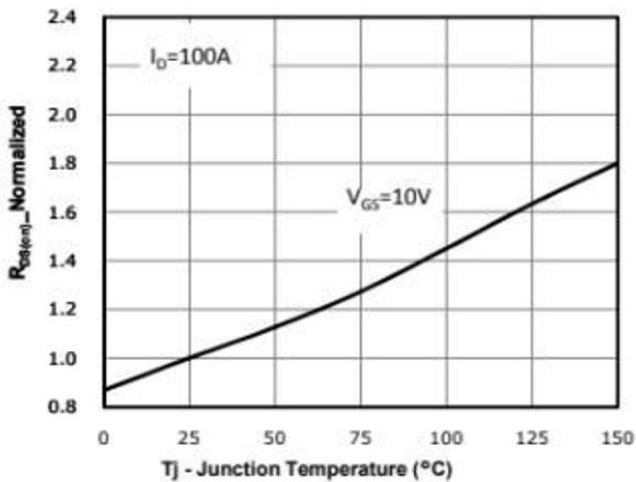


Figure 5. R_DS(ON) vs. Temperature

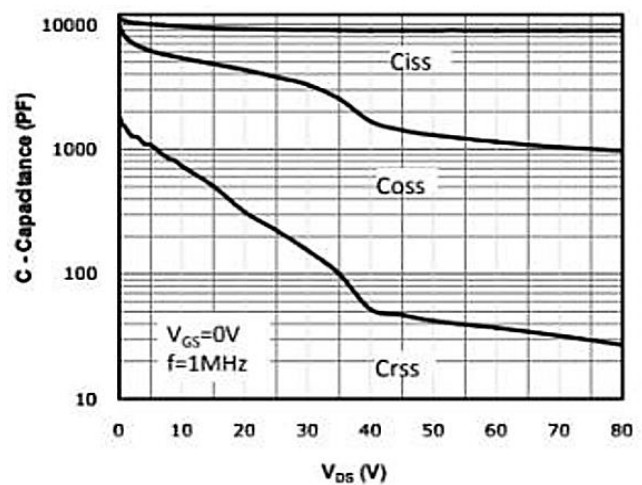


Figure 6. Capacitance Characteristics

100V N-Channel Enhancement Mode MOSFET

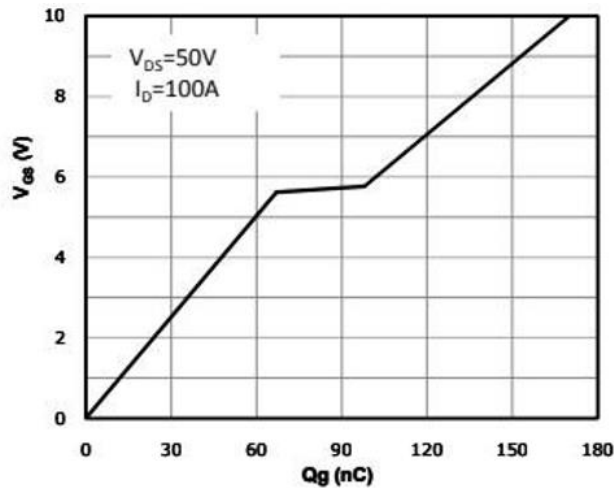


Figure 7. Gate Charge Characteristics

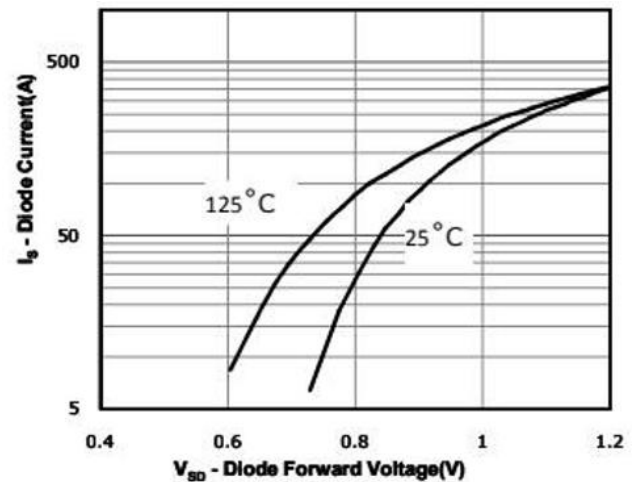


Figure 8. Body-Diode Forward Characteristics

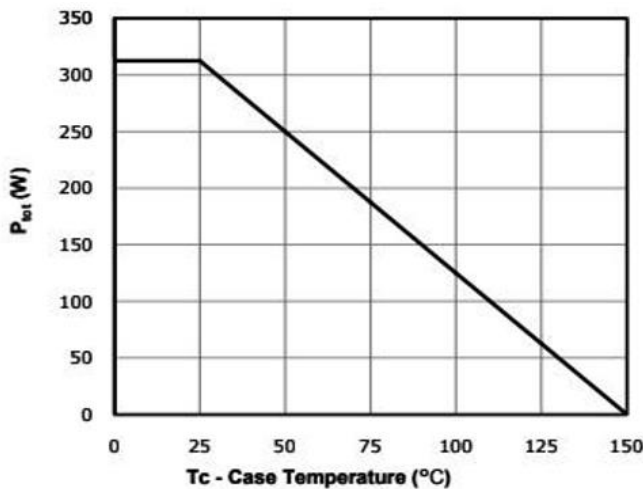


Figure 9. Power Dissipation

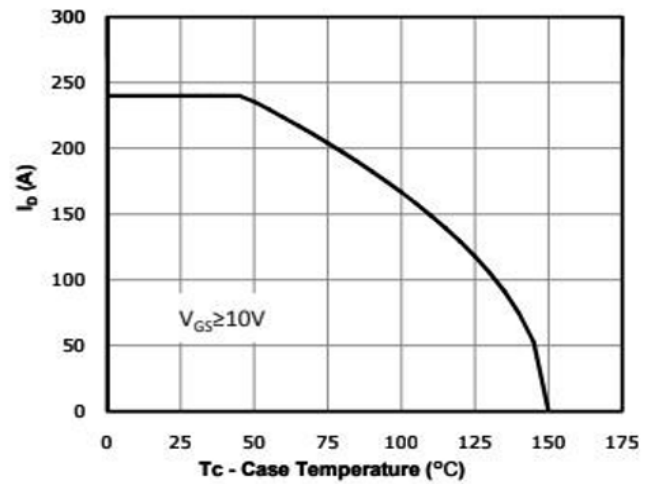


Figure 10. Drain Current Dearing

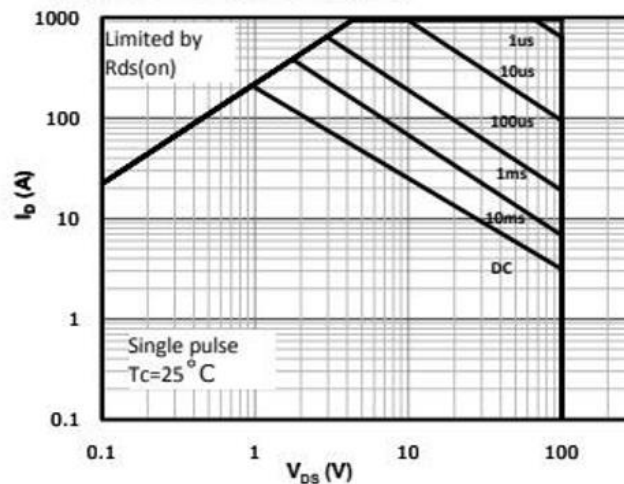
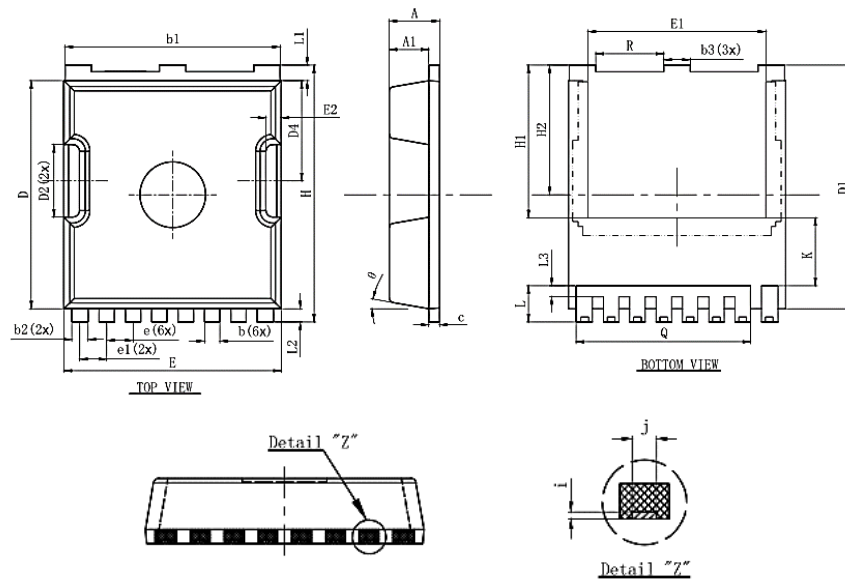


Figure 11. Safe Operating Area

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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Edition	Date	Change
Rve1.0	2022/5/5	Initial release

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