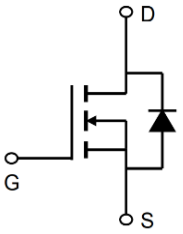
AP400N08TLG1

85V N-Channel Enhancement Mode MOSFET

Description

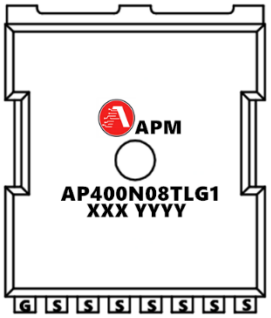
The AP400N08TLG1 uses advanced **APM-SGT Ⅰ** technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

V_{DS} = 85V I_D =400A

$R_{DS(ON)}$ <1.3mΩ @ V_{GS}=10V **(Type：1.0mΩ)**

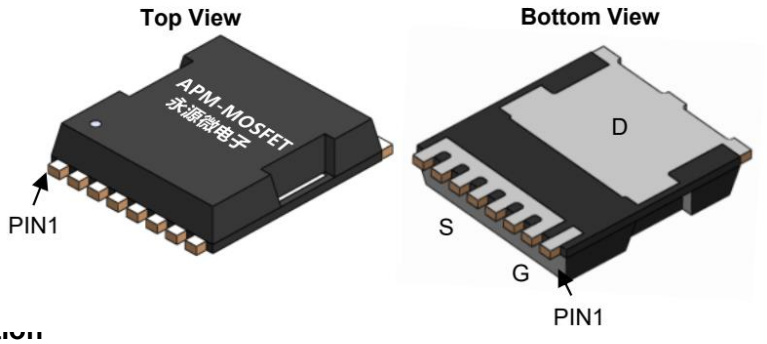


Application

DC/DC Converter

LED Backlighting

Power Management Switches



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP400N08TLG1	TOLLL	AP400N08TLG1 XXX YYYY	2000

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	85	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	400	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	220	A
IDM	Pulsed Drain Current	960	A
EAS	Single Pulse Avalanche Energy	2025	mJ
IAS	Avalanche Current	53.4	A
P_D@T_C=25℃	Total Power Dissipation[4]	313	W
TSTG	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient	0.54	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case	40	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	85	92	-	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} =85V, 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	-	1.0	1.3	mΩ
gfs	Forward Transconductance[4]	V_{DS} = 5V, I_D = 40A	-	145	-	S
Ciss	Input Capacitance	V_{DS} =20V, V_{GS} =0V, f =1MHz	-	13590	-	pF
Coss	Output Capacitance		-	2099	-	
Crss	Reverse Transfer Capacitance		-	269	-	
R_g	Gate Resistance	f =1MHz	-	2.4	-	Ω
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=20V, I_D=20A	-	230	-	nC
Qgs	Gate-Source Charge		-	154	-	
Qgd	Gate-Drain Charge		-	56	-	
td(on)	Turn-on Delay Time	V_{GS}=10V, V_{DD}=20V, R_G=3Ω, Rl=1.0Ω	-	40	-	ns
t_r	Rise Time		-	67	-	
td(off)	Turn-off Delay Time		-	131	-	
t_f	Fall Time		-	91	-	
trr	Body Diode Reverse Recovery Time	I_F=15A, dI/dt=100A/μs	-	112	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=15A, dI/dt=100A/μs	-	213	-	nC
VSD	Diode Forward Voltage[4]	I_S =50A, V_{GS} = 0V	-	0.85	1.2	V
IS	Continuous Source Current T_C=25°C	-	-	-	400	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

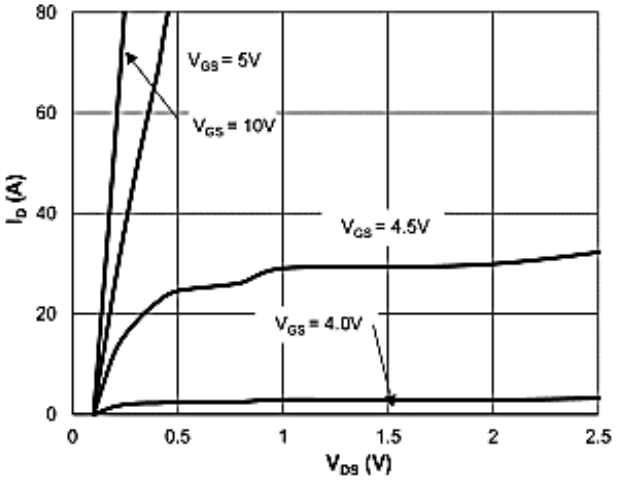


Figure 1: Saturation Characteristics

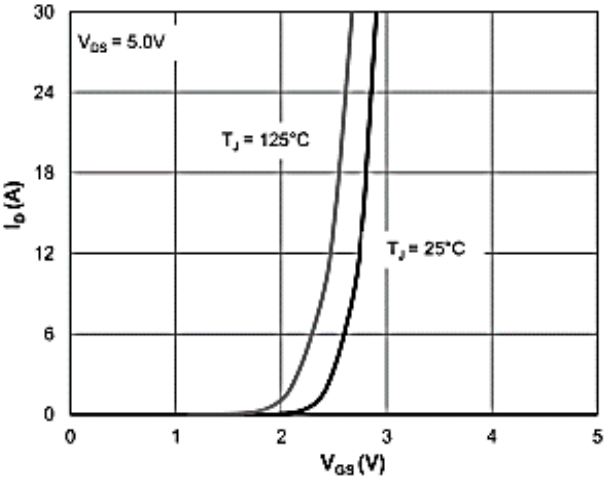


Figure 2: Transfer Characteristics

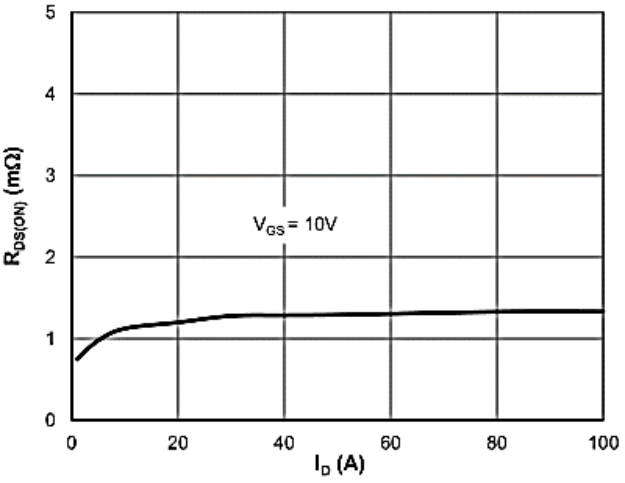


Figure 3: $R_{DS(ON)}$ vs. Drain Current

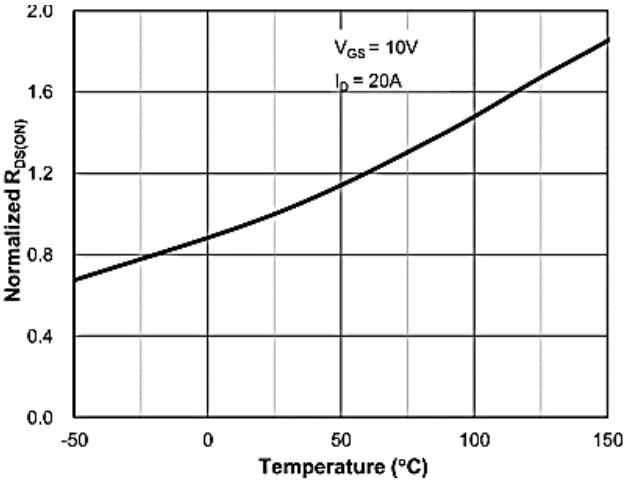


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

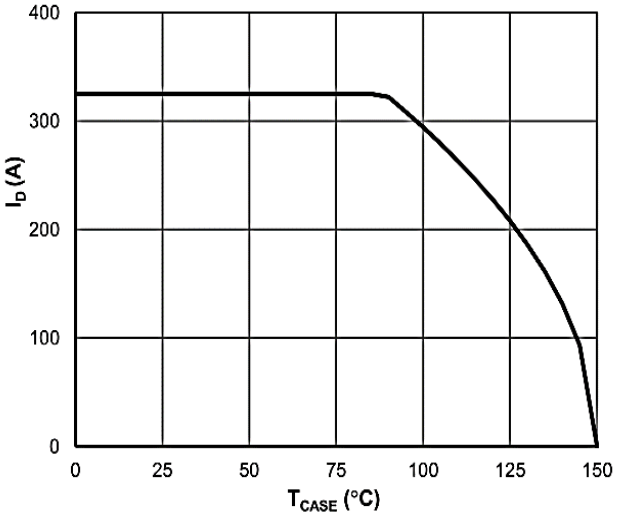


Figure 5: Current De-rating

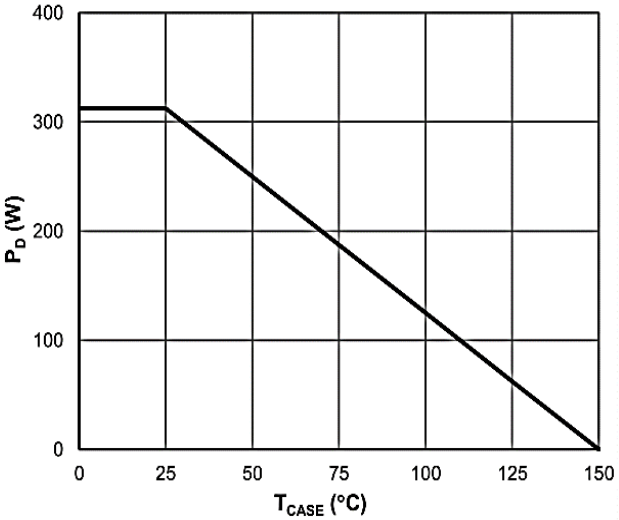


Figure 6: Power De-rating

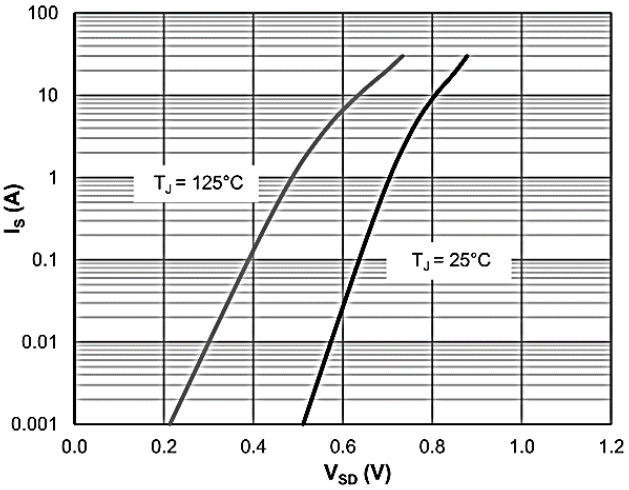


Figure 7: Body-Diode Characteristics

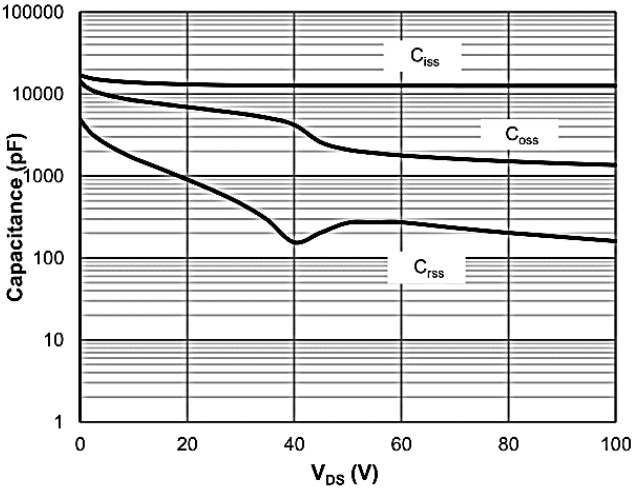


Figure 8: Capacitance Characteristics

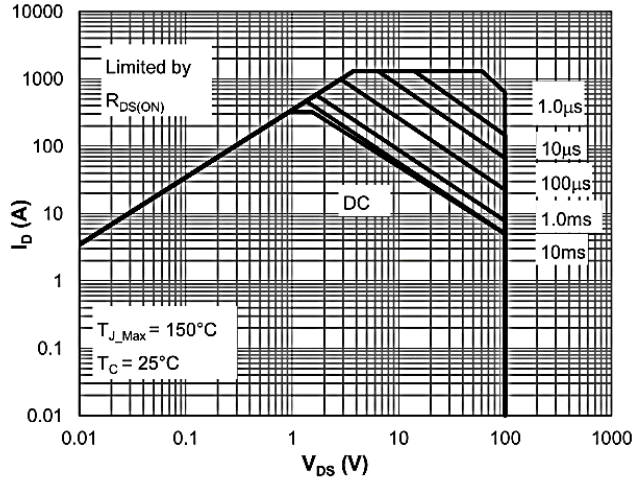


Figure 9: Maximum Safe Operating Area

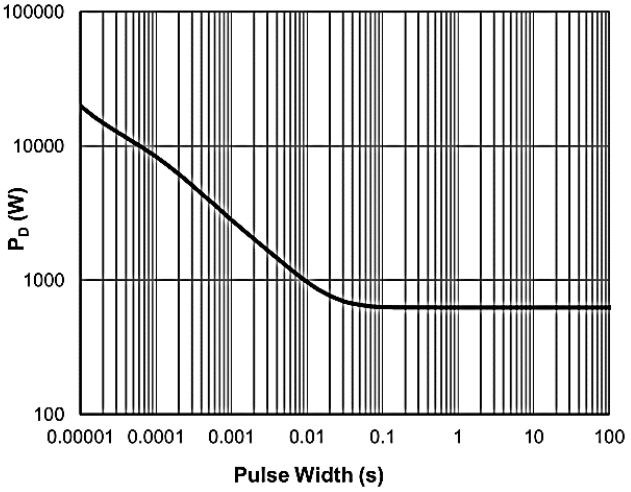


Figure 10: Single Pulse Power Rating, Junction-to-Case

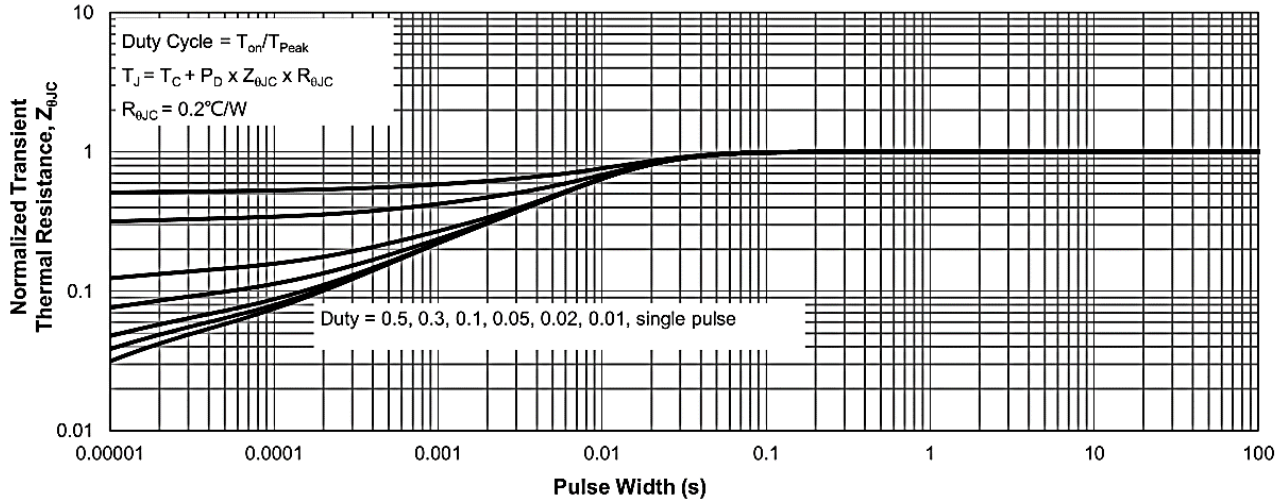


Figure 11: Normalized Transient Thermal Impedance

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Edition	Date	Change
REV1.0	2024/05/05	Initial release