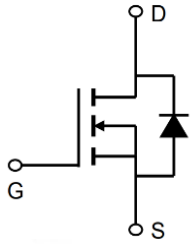
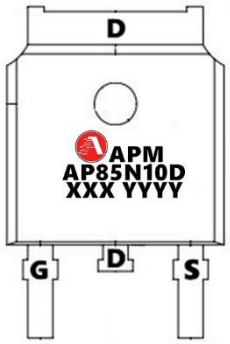
AP85N10D

100V N-Channel Enhancement Mode MOSFET

Description

The AP85N10D uses advanced **APM-SGTⅡ** technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.





General Features

V_{DS} = 100V I_D =85A

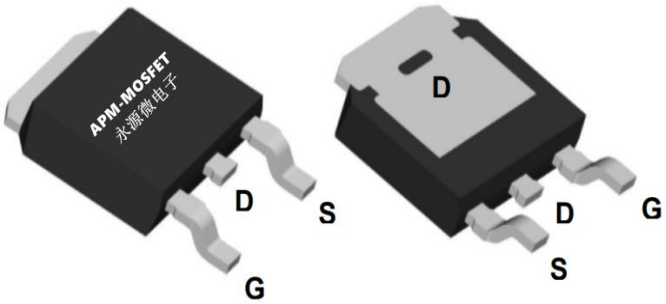
$R_{DS(ON)}$ < 8.8mΩ @ V_{GS}=10V **(Type：7.2mΩ)**

Application

DC/DC Converter

LED Backlighting

Power Management Switches



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP85N10D	TO252-3L	AP85N10D XXX YYYY	2500

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage	100	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	85	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	49	A
IDM	Pulsed Drain Current	260	A
EAS	Single Pulse Avalanche Energy	24	mJ
IAS	Avalanche Current	24	A
P_D@T_C=25℃	Total Power Dissipation[4]	86	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
R_{θ}JA	Thermal Resistance Junction-Ambient	62.5	℃/W
R_{θ}JC	Thermal Resistance Junction-Case	1.5	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	ID = 250uA, VGS = 0V	100			V
IDSS	Zero Gate Voltage Drain Current	VDS=100V, VGS = 0V			1.0	uA
IGSS	Gate-Body Leakage Current	VDS=0V, VGS=±20V			±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250uA	1.2	1.8	2.5	V
RDS(ON)	Static Drain-Source ON-Resistance	VGS=10V, ID=10A		7.2	8.8	mΩ
		VGS=4.5V, ID=6A		10	14	mΩ
gFS	Forward Transconductance	VDS=5V, ID=20A		48		S
Ciss	Input Capacitance	VGS=0V, VDS=50V, f=1MHz		1870		pF
Coss	Output Capacitance			730		pF
Crss	Reverse Transfer Capacitance			22		pF
Rg	Gate Resistance	VGS=0V, VDS=0V, f=1MHz		1.9		Ω
Qg	Total Gate Charge (@ VGS = 10V)	VGS=0 to 10V VDS=50V, ID=10A		27		nC
Qgs	Gate Source Charge			7.6		nC
Qgd	Gate Drain Charge			8.1		nC
tD(on)	Turn-On DelayTime	VGS=10V, VDS=50V RL=2.5Ω, RGEN=6Ω		11		ns
tr	Turn-On Rise Time			21		ns
tD(off)	Turn-Off DelayTime			23		ns
tf	Turn-Off Fall Time			8.8		ns
trr	Body Diode Reverse Recovery Time	IF=20A, dIF/dt = 100A/us		44		ns
Qrr	Body Diode Reverse Recovery Charge	IF=20A, dIF/dt = 100A/us		56		nC
IS	Diode Continuous Current	TC = 25°C			65	A
VSD	Diode Forward Voltage	IS = 1A, VGS = 0V		0.7	1.2	V

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}=24A
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

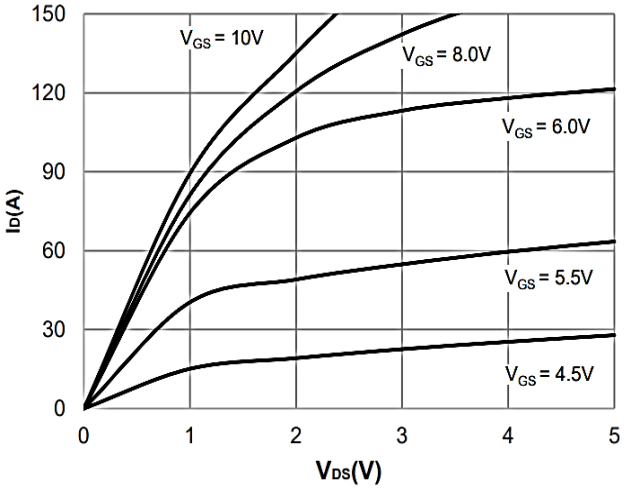


Figure 1: Output Characteristics

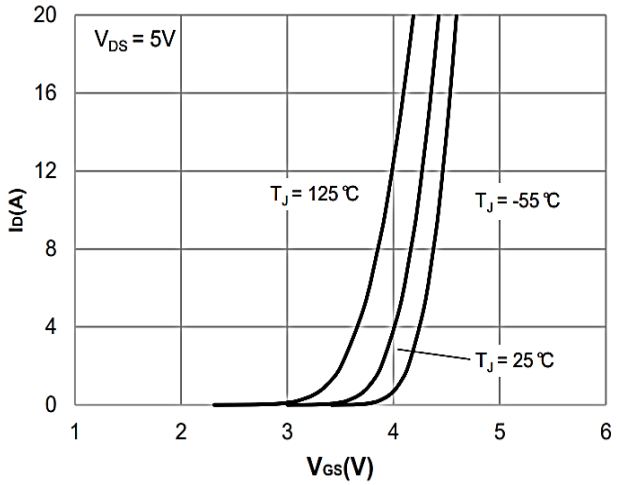


Figure 2: Typical Transfer Characteristics

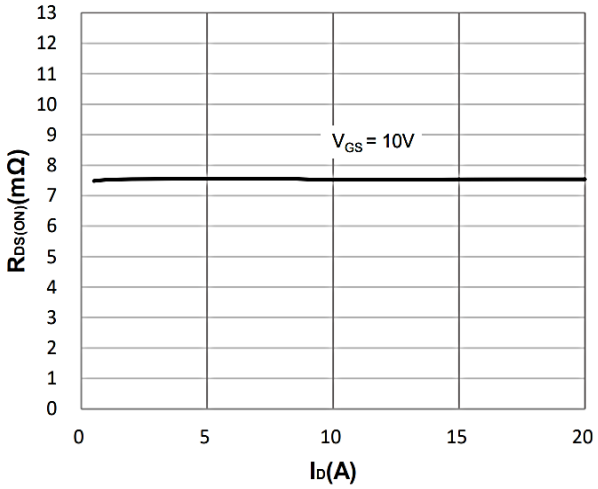


Figure 3: On-resistance vs. Drain Current

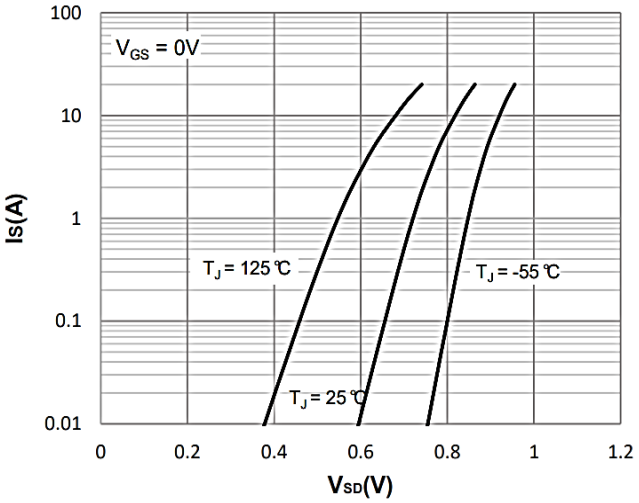


Figure 4: Body Diode Characteristics

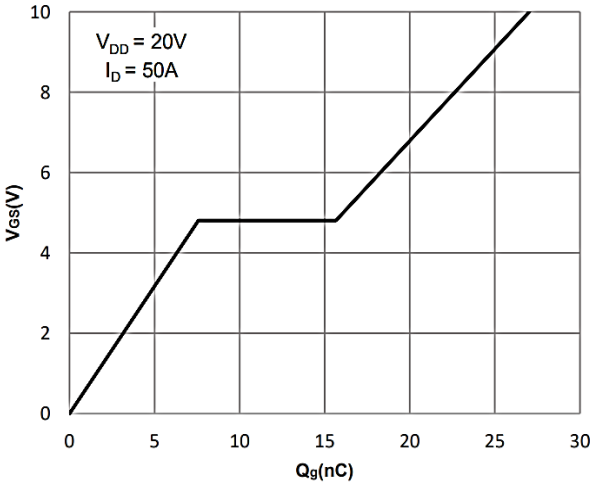


Figure 5: Gate Charge Characteristics

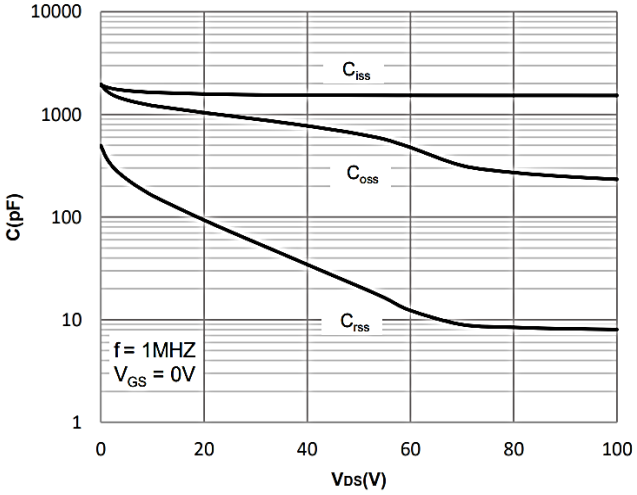


Figure 6: Capacitance Characteristics

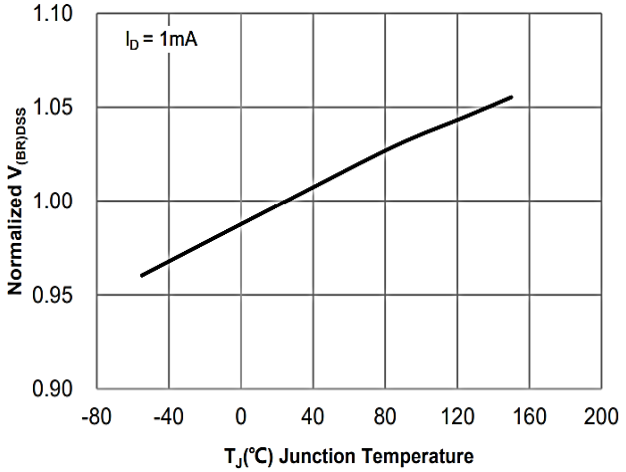


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

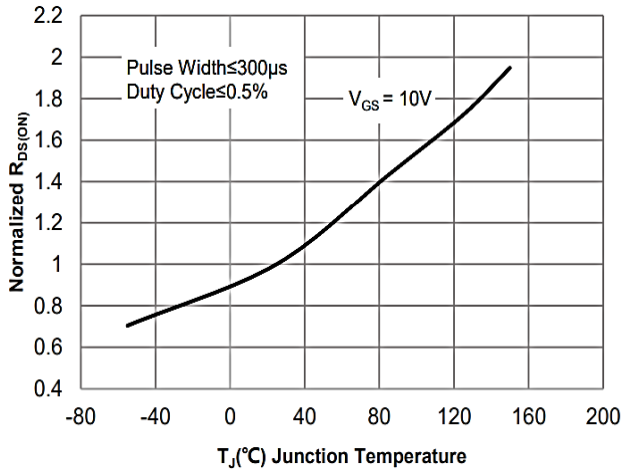


Figure 8: Normalized on Resistance vs. Junction Temperature

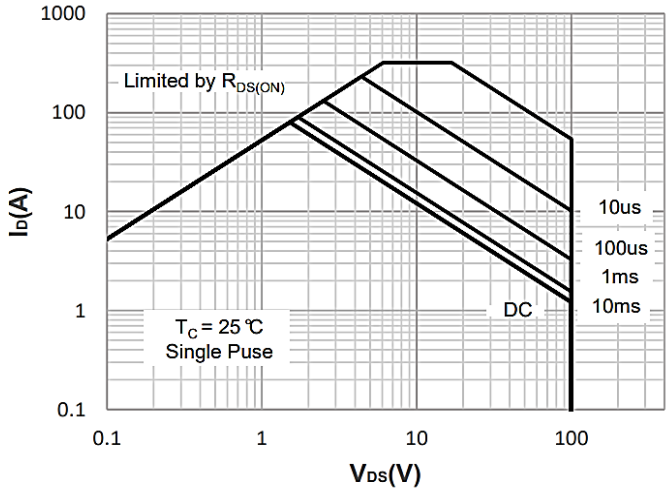


Figure 9: Maximum Safe Operating Area

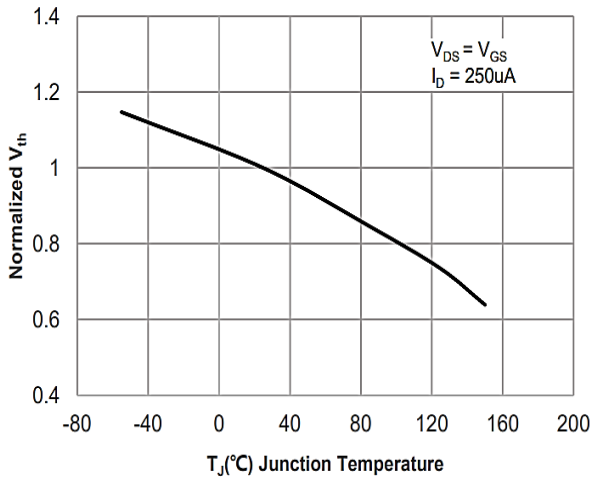


Figure 10: Normalized Threshold Voltage vs. Case Temperature

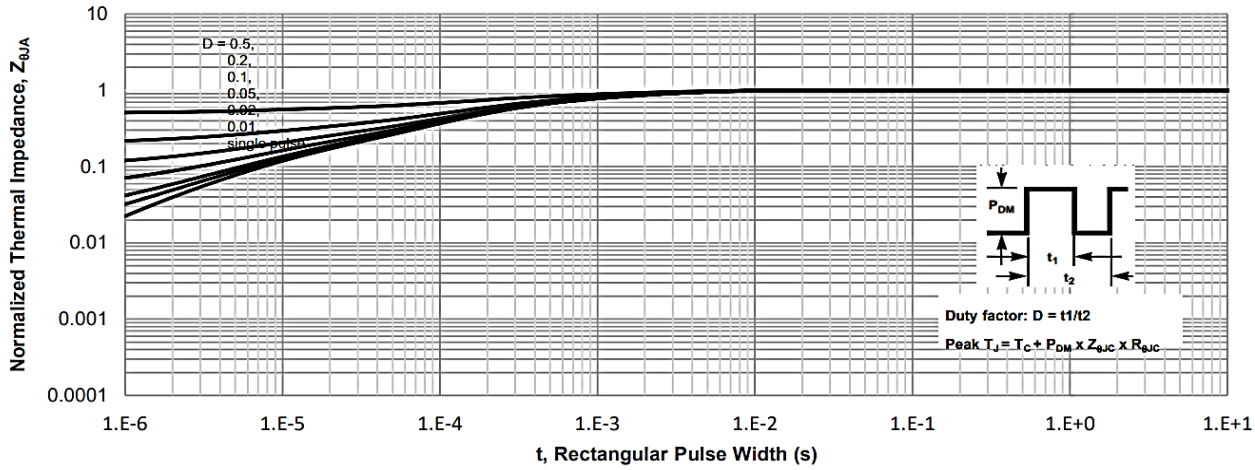
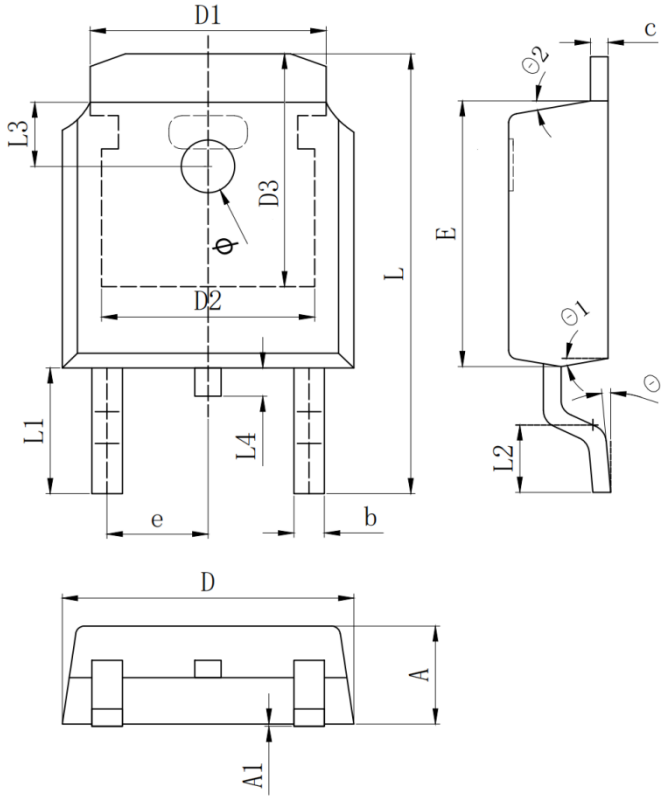


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-TO252-3L



Symbol	Dimensions In Millimeters		
	min.	typ.	max.
A	2.10	2.30	2.50
A1	0.00	0.064	0.128
b	0.64	0.75	0.86
c	0.45	0.52	0.60
D	6.40	6.60	6.80
D1	5.33REF		
D2	4.83REF		
D3	5.25REF		
E	5.90	6.10	6.30
e	2.286TYP		
L	9.80	10.10	10.40
L1	2.888REF		
L2	1.40	1.50	1.70
L3	1.65REF		
L4	0.60	0.80	1.00
ϕ	1.10	1.20	1.30
θ	0°		10°
θ1	5°		10°
θ2	5°		10°

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Edition	Date	Change
REV1.0	2023/11/24	Initial release

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