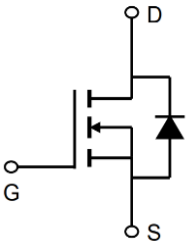
AP140N15NF

150V N-Channel Enhancement Mode MOSFET

Description

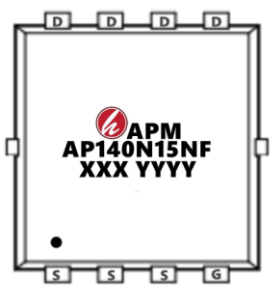
The AP140N15NF uses advanced **APM-SGT**Ⅰtechnology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.

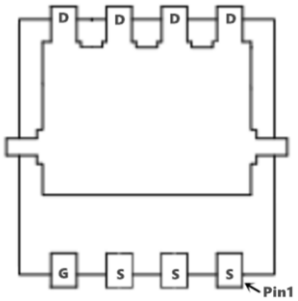


General Features

V_{DS} = 150V I_D =140A

$R_{DS(ON)}$ < 9mΩ @ V_{GS}=10V **(Type：7.4mΩ)**

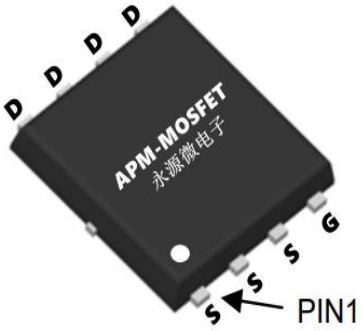


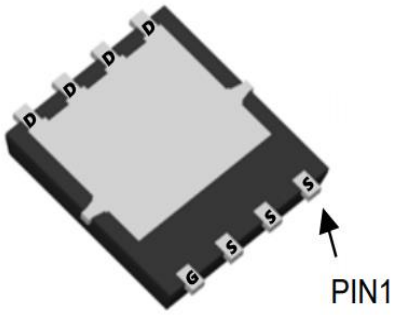


Application

DC/DC Converter

Power Management Switches





Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP140N15NF	PDFN5*6-8L	AP140N15NF XXX YYYY	2500

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	140	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	60	A
IDM	Pulsed Drain Current	520	A
EAS	Single Pulse Avalanche Energy	506	mJ
IAS	Avalanche Current	65	A
P_D@T_C=25℃	Total Power Dissipation[4]	179	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient	25	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case	0.75	℃/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	150	172	-	V
IGSS	Gate-body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
IDSS@T_J=25°C	Zero Gate Voltage Drain Current	V_{DS} = 150V, V_{GS} = 0V			1	μA
IDSS@T_J=100°C					100	
VGS(th)	Gate-Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.0	3.2	4.5	V
RDS(on)	Drain-Source On-Resistance[4]	V_{GS} = 10V, I_D = 20A	-	7.4	9.0	mΩ
gfs	Forward Transconductance[4]	V_{DS} = 5V, I_D = 20A	-	60	-	S
Ciss	Input Capacitance	V_{DS} = 75V, V_{GS} =0V, f =1MHz	-	2181	-	pF
Coss	Output Capacitance		-	363	-	
Crss	Reverse Transfer Capacitance		-	7.9	-	
R_g	Gate Resistance	f = 1MHz	-	2.5	-	Ω
Q_g	Total Gate Charge	V_{GS} = 10V, V_{DS} = 75V, I_D= 20A	-	30	-	nC
Qgs	Gate-Source Charge		-	7.5	-	
Qgd	Gate-Drain Charge		-	6.5	-	
td(on)	Turn-On Delay Time	V_{GS} =10V, V_{DD} = 75V, R_G = 3Ω, I_D= 20A	-	12.5	-	ns
t_r	Rise Time		-	24	-	
td(off)	Turn-Off Delay Time		-	30	-	
t_f	Fall Time		-	26	-	
trr	Body Diode Reverse Recovery Time	IF=20A, dI/dt=100A/μs	-	99	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	318	-	nC
VSD	Diode Forward Voltage[4]	I_F = 20A, V_{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current	T_C=25°C	-	-	140	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}=65A

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

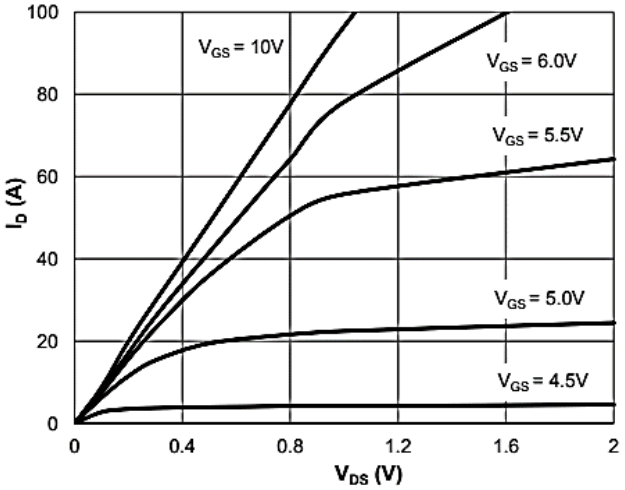


Figure 1: Saturation Characteristics

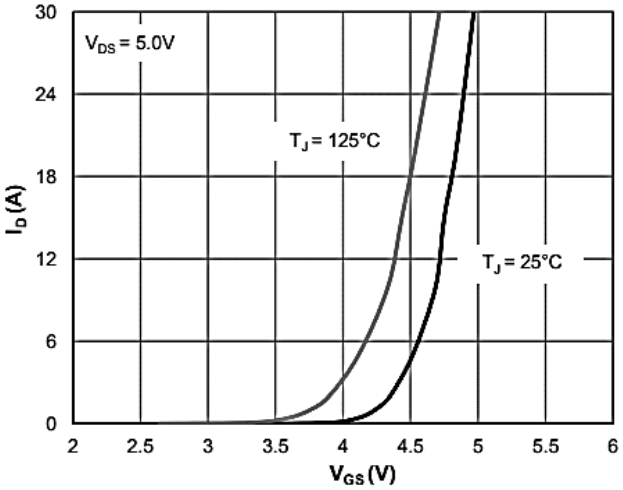


Figure 2: Transfer Characteristics

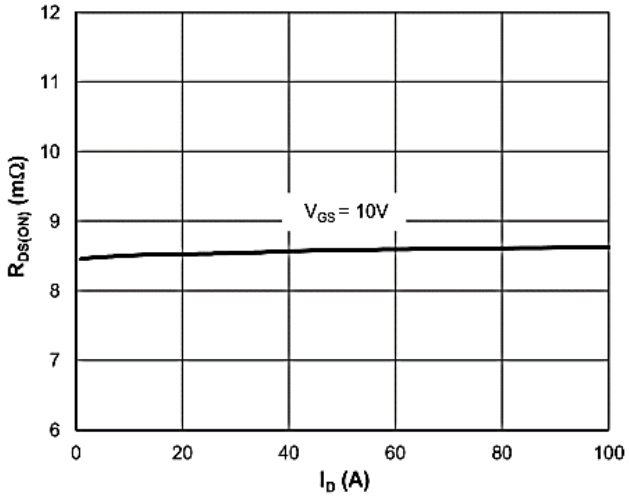


Figure 3: $R_{DS(ON)}$ vs. Drain Current

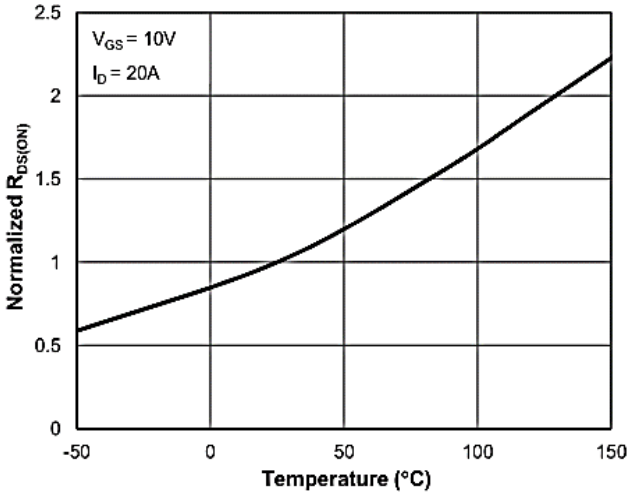


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

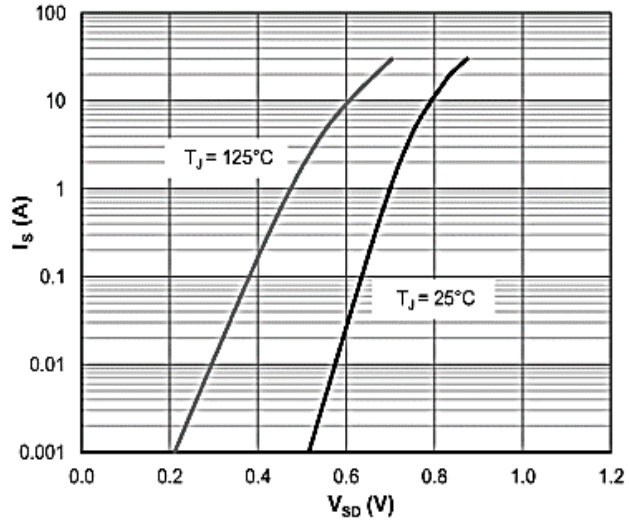


Figure 5: Body-Diode Characteristics

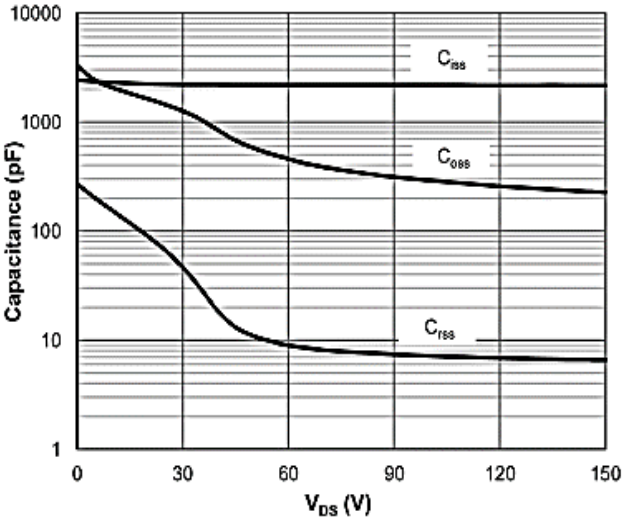


Figure 6: Capacitance Characteristics

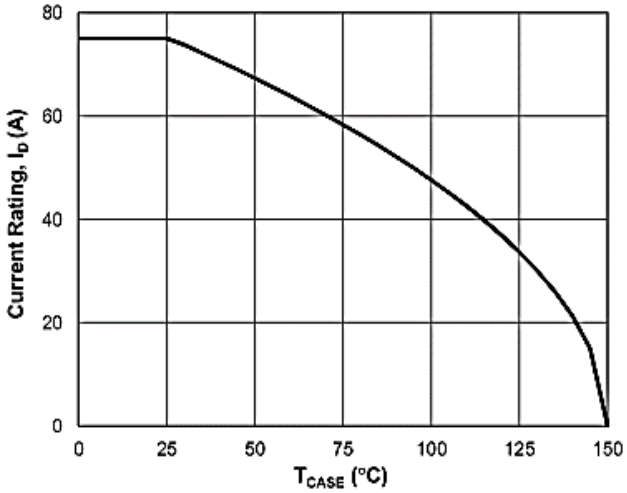


Figure 7: Current De-rating

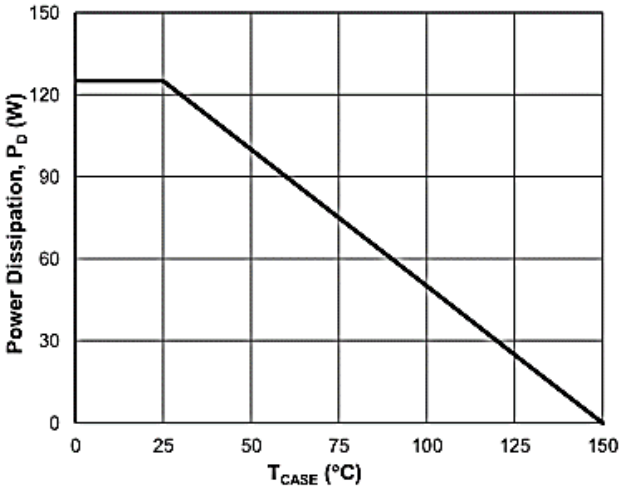


Figure 8: Power De-rating

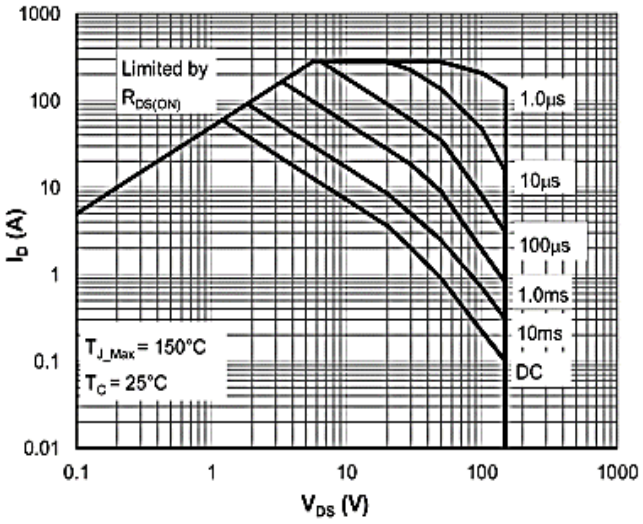


Figure 9: Maximum Safe Operating Area

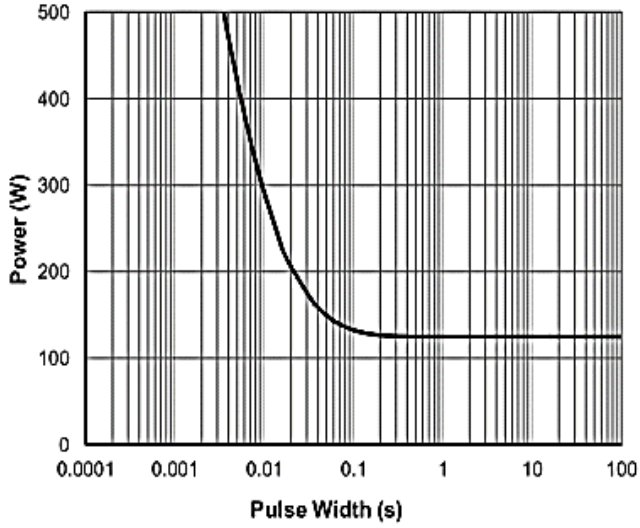


Figure 10: Single Pulse Power Rating, Junction-to-Case

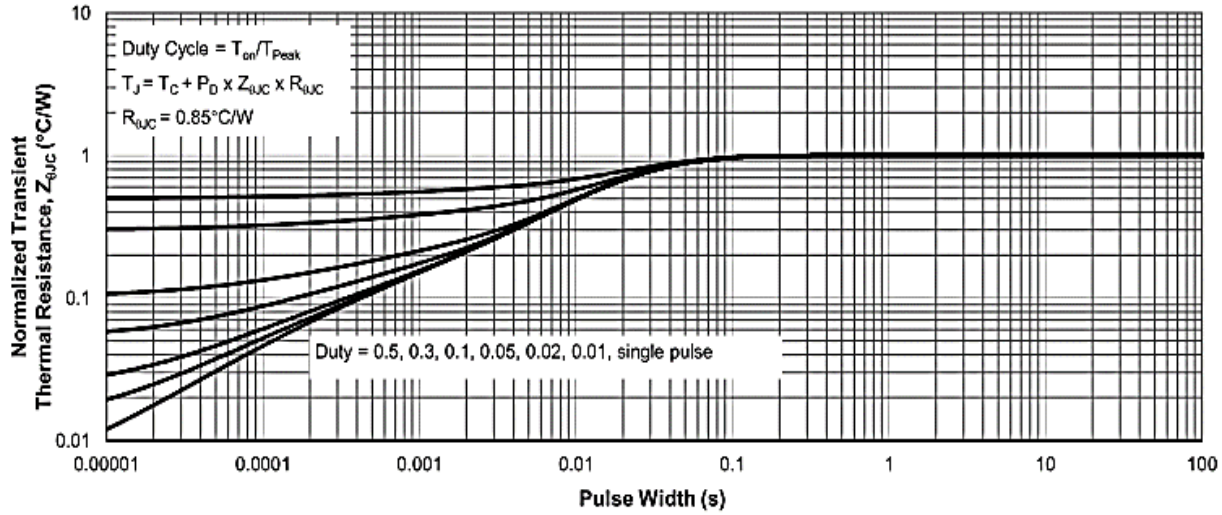
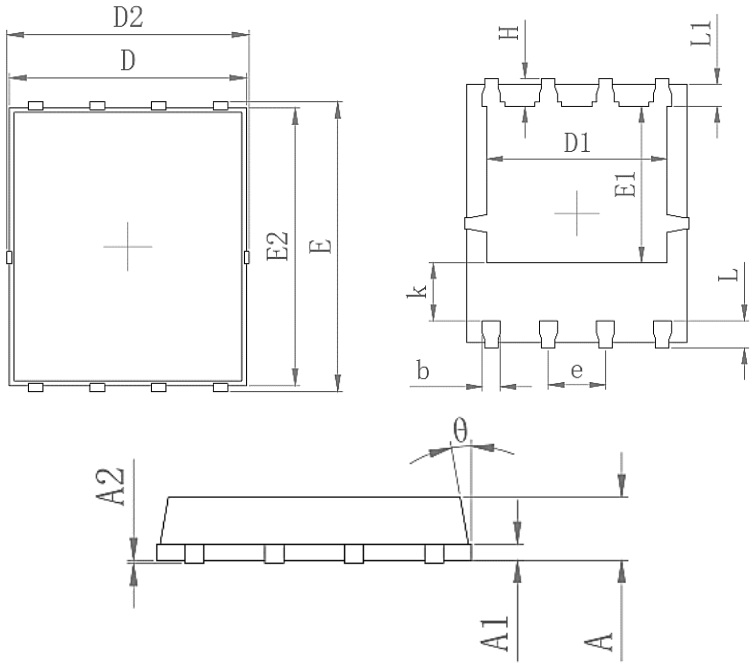


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-PDFN5X6-8L-XZT Single



Symbol	Common	
	mm	
	Mim	Max
A	0.90	1.10
A1	0.254 REF	
A2	0-0.05	
D	4.824	4.976
D1	3.910	4.110
D2	4.944	5.076
E	5.924	6.076
E1	3.375	3.575
E2	5.674	5.826
b	0.350	0.450
e	1.270	
L	0.534	0.686
L1	0.424	0.576
K	1.190	1.390
H	0.549	0.701
Φ	8°	12°

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150V N-Channel Enhancement Mode MOSFET

Edition	Date	Change
REV1.0	2022/8/5	Initial release