

-12V P-Channel Enhancement Mode MOSFET

Description

The AP80P01NF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

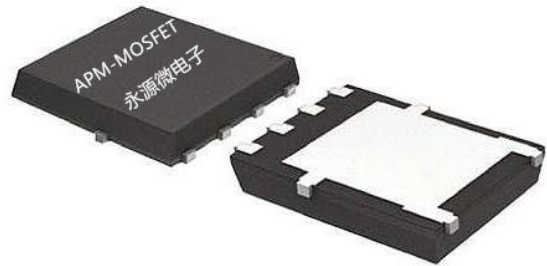
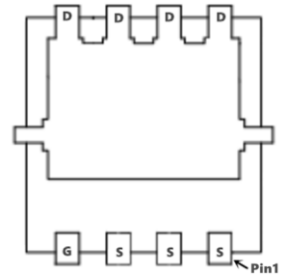
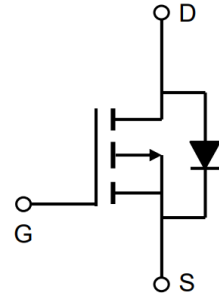
$V_{DS} = -12V$ $I_D = -80A$

$R_{DS(ON)} < 4.5m\Omega$ @ $V_{GS}=10V$

Application

Load switch

electronic cigarette



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP80P01NF	PDFN5*6-8L	AP80P01NF XXX YYYY	2500

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-12	V
V _{GS}	Gate-Source Voltage	±12	V
I _D	Drain Current – Continuous (T _C =25°C)	-80	A
	Drain Current – Continuous (T _C =100°C)	-54	A
I _{DM}	Drain Current – Pulsed ¹	-240	A
P _D	Power Dissipation (T _C =25°C)	41.67	W
	Power Dissipation – Derate above 25°C	0.33	W/°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C
R _{θJA}	Thermal Resistance Junction to ambient	62	°C/W
R _{θJC}	Thermal Resistance Junction to Case	3	°C/W

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Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	VGS=0V, ID=-250uA	-15	-17	---	V
ΔBVDSS/ΔTJ	BVDSS Temperature Coefficient	Reference to 25°C, ID=-1mA	---	-0.008	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance	VGS=-4.5V, ID=-20A	---	3.5	4.5	mΩ
		VGS=-2.5V, ID=-20A	---	4.8	6.0	
VGS(th)	Gate Threshold Voltage	VGS=VDS, ID=-250uA	-0.4	-0.6	-1.0	V
ΔVGS	VGS(th) Temperature Coefficient		---	-3.44	---	mV/°C
IDSS	Drain-Source Leakage Current	VDS=-20V, VGS=0V, TJ=25°C	---	---	-1	uA
		VDS=-16V, VGS=0V, TJ=125°C	---	---	-30	uA
IGSS	Gate-Source Leakage Current	VGS=±12V, VDS=0V	---	---	±500	nA
gfs	Forward Transconductance	VDS=-10V, IS=-3A	---	30	---	S
Qg	Total Gate Charge _{2, 3}	VDS=-16V, VGS=-4.5V, ID=-5A	---	149	225	nC
Qgs	Gate-Source Charge _{2, 3}		---	14.4	22	
Qgd	Gate-Drain Charge _{2, 3}		---	42.8	65	
Td(on)	Turn-On Delay Time _{2, 3}	VDD=-15V, VGS=-4.5V, RG=25, ID=-1A	---	21.2	42	nS
Tr	Rise Time _{2, 3}		---	20.6	40	
Td(off)	Turn-Off Delay Time _{2, 3}		---	26	52	
Tf	Fall Time _{2, 3}		---	400	600	
Ciss	Input Capacitance	VDS=-15V, VGS=0V, F=1MHz	---	6800		pF
Coss	Output Capacitance		---	769		
Crss	Reverse Transfer Capacitance		---	726		
Rg	Gate resistance	VGS=0V, VDS=0V, F=1MHz	---	2.6	---	Ω
IS	Continuous Source Current	Vg=Vd=0V, Force Current	--	--	-90	A
ISM	Pulsed Source Current		--	--	-180	
VSD	Diode Forward Voltage	Vgs=0V Is=1A Tj=25°C	--	--	-1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

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Typical Characteristics

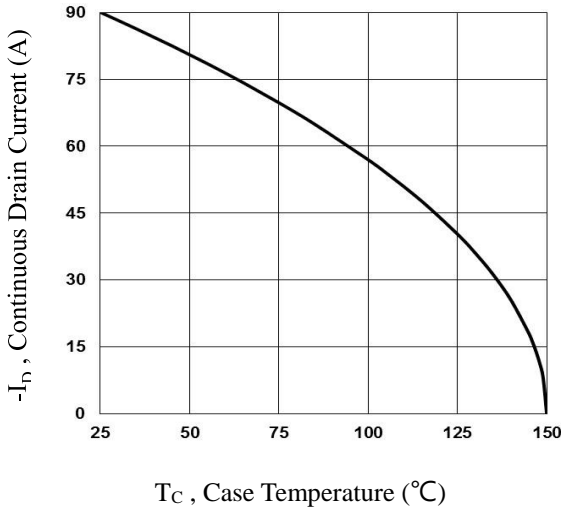


Fig.1 Continuous Drain Current

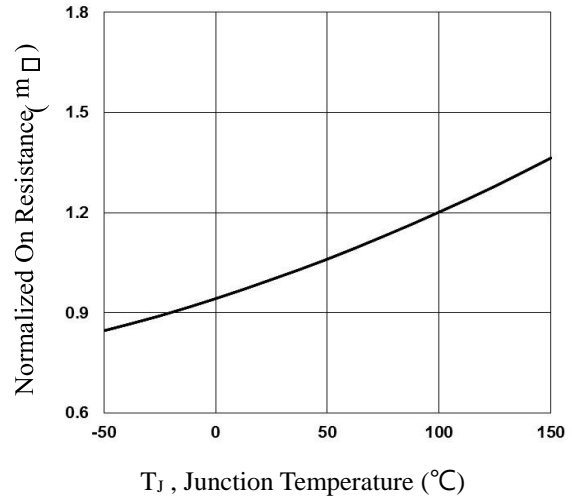


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

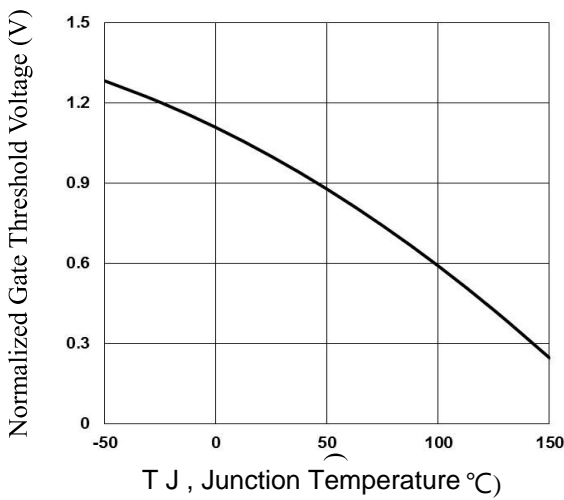


Fig.3 Normalized V_{th} vs. T_J

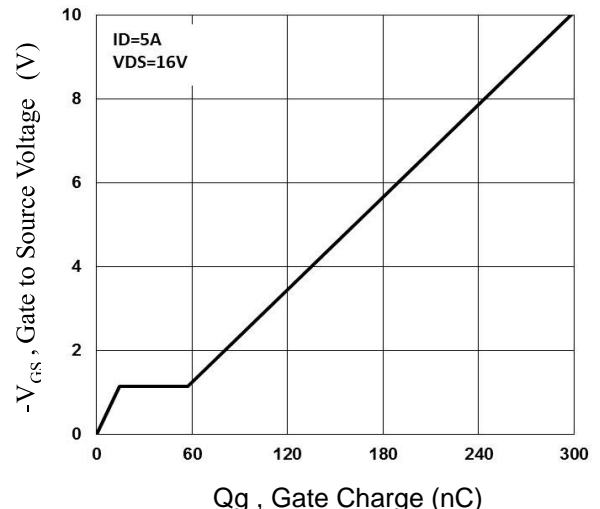


Fig.4 Gate Charge Waveform

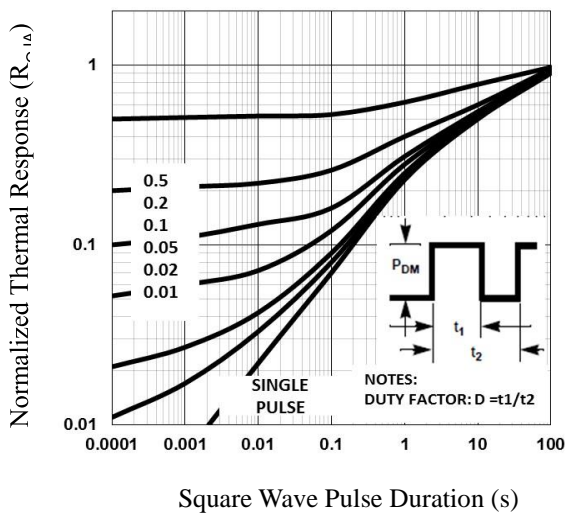


Fig.5 Normalized Transient Response

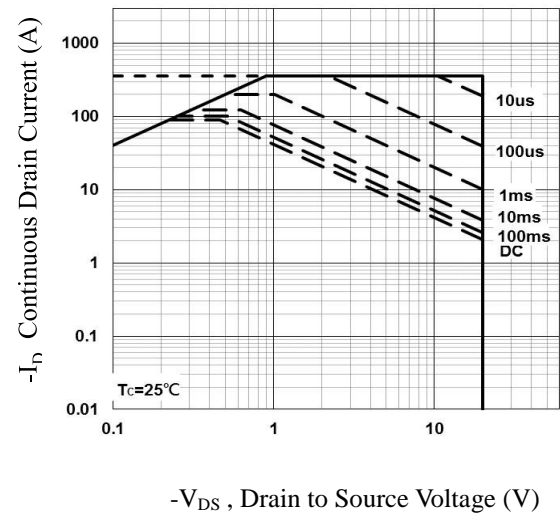


Fig.6 Maximum Safe Operation Area

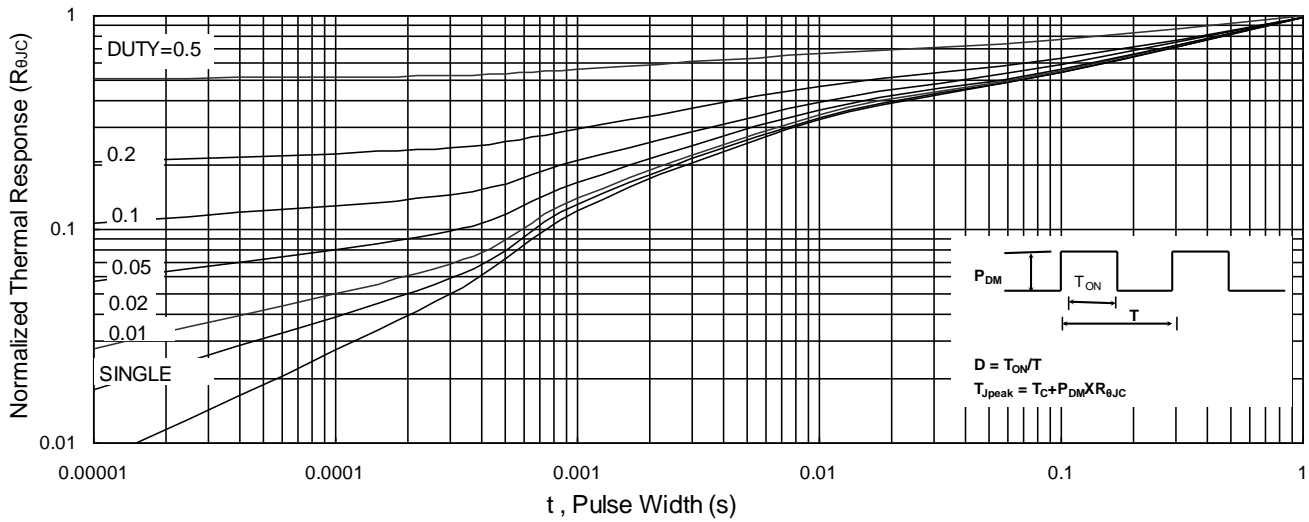


Fig.9 Normalized Maximum Transient Thermal Impedance

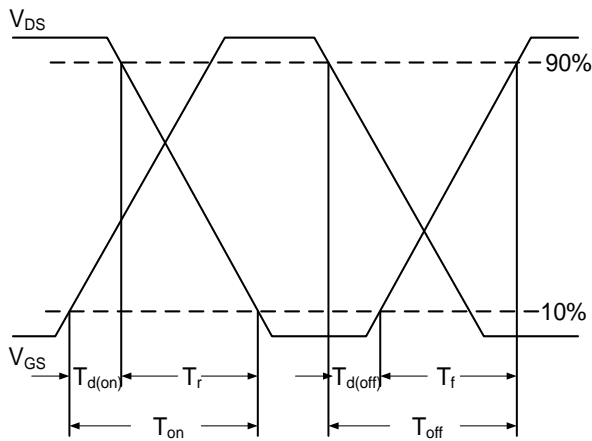


Fig.10 Switching Time Waveform

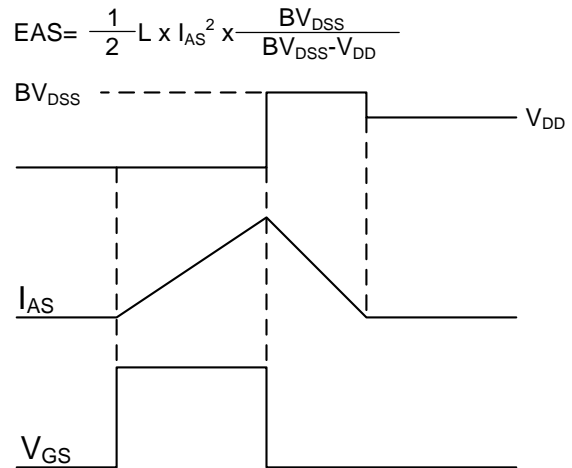
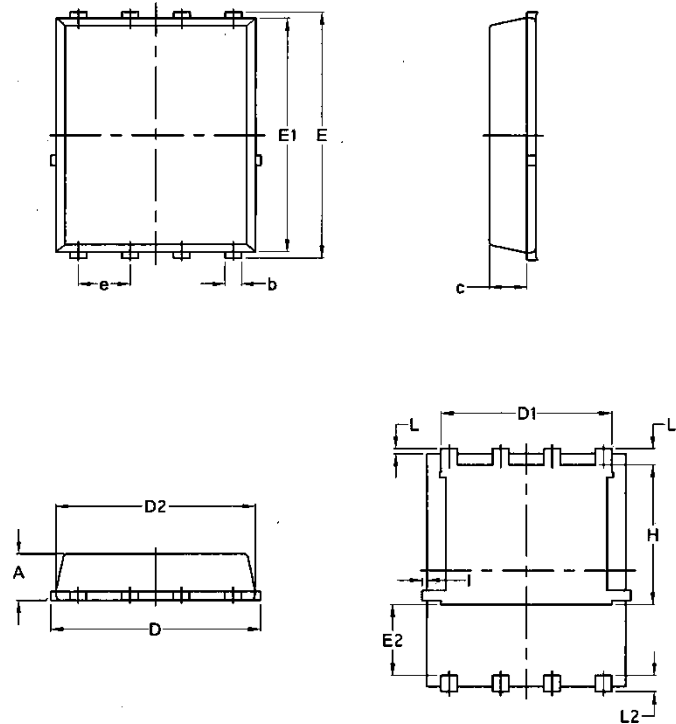


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data-DFN5*6-8L-JQ Single



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

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Edition	Date	Change
Rve1.0	2020/10/22	Initial release

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