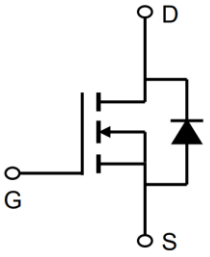
APG80N10NF

100V N-SGT Enhancement Mode MOSFET

General Description

APG80N10NF use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics.

This device is specially designed to get better ruggedness and suitable to use in

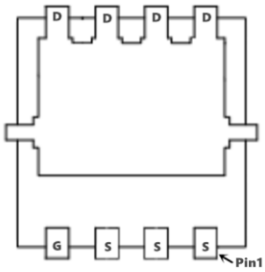


Features

Low RDS(on) & FOM

Extremely low switching loss

Excellent stability and uniformity or Invertors



Applications

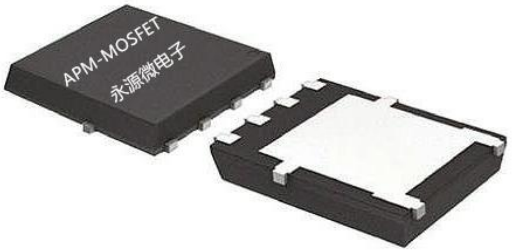
Consumer electronic power supply

Motor control

Synchronous-rectification

Isolated DC

Synchronous-rectification applications



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
APG80N10NF	DFN5*6-8	APG80N10NF XXX YYYY	5000

Absolute Maximum Ratings at T_j=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	100	V
VGS	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current[1]	80	A
I_D@T_A=70℃	Continuous Drain Current[1]	62	A
IDM	Pulsed Drain Current[2]	240	A
EAS	Single Pulse Avalanche Energy[3]	120	mJ
IAS	Avalanche Current	15	A
P_D@T_A=25℃	Total Power Dissipation[4]	135	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1](t≤10s)	54	℃/W
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	62	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case[1]	0.84	℃/W

AElectrical Characteristics at T_j=25 ℃ unless otherwise specified

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100	---	---	V
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=13.5A	---	6.6	8	mΩ
	Static Drain-Source On-Resistance[2]	V_{GS}=4.5V , I_D=11.5A	---	8.7	10.5	
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	---	2.3	V
IDSS	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=55℃	---	---	5	
IGSS	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=13.5A	---	75	---	S
Qg	Total Gate Charge (10V)	VDS=50V , VGS=10V , ID=13.5A	---	45	---	nC
Qg	Total Gate Charge (4.5V)		---	19.3	---	
Qgs	Gate-Source Charge		---	9.5	---	
Qgd	Gate-Drain Charge		---	4.8	---	
Td(on)	Turn-On Delay Time	VDD=50V , VGS=10V , RG=3Ω, ID=13.5A	---	10	---	ns
Tr	Rise Time		---	6.5	---	
Td(off)	Turn-Off Delay Time		---	45	---	
Tf	Fall Time		---	7.5	---	
Ciss	Input Capacitance	VDS=50V , VGS=0V , f=1MHz	---	3320	---	pF
Coss	Output Capacitance		---	605	---	
Crss	Reverse Transfer Capacitance		---	20	---	
IS	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	5	A
VSD	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.1	V
trr	Reverse Recovery Time	IF=13.5A , di/dt=100A/μs , T_J=25℃	---	33	---	nS
Q_{rr}	Reverse Recovery Charge		---	150	---	nC

Note :

1.The data tested by surface mounted on a 1 inch 2 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 =25V,V GS =10V,L=0.3mH,I AS =15A

4.The power dissipation is limited by 150℃ 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

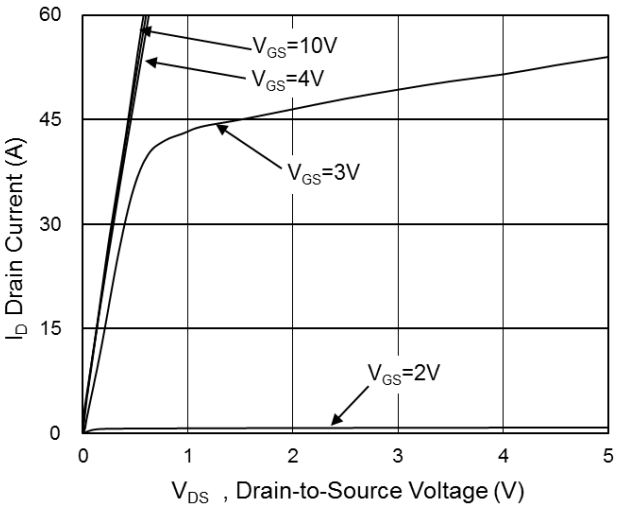


Fig.1 Typical Output Characteristics

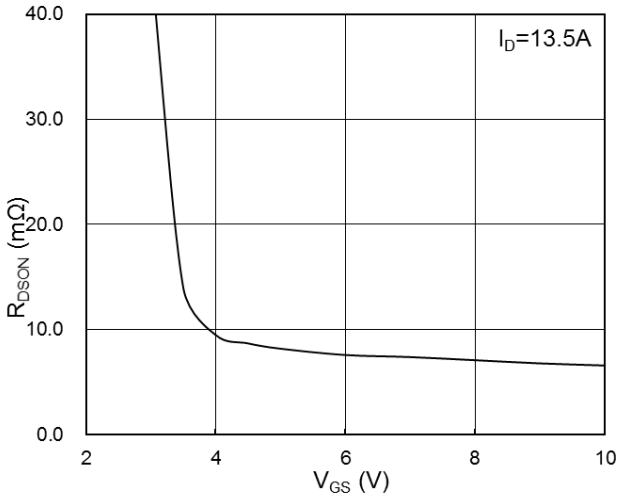


Fig.2 On-Resistance vs. G-S Voltage

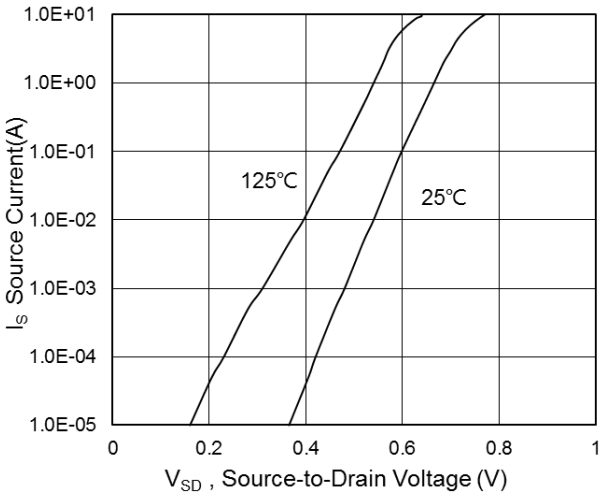


Fig.3 Source-Drain Forward Characteristics

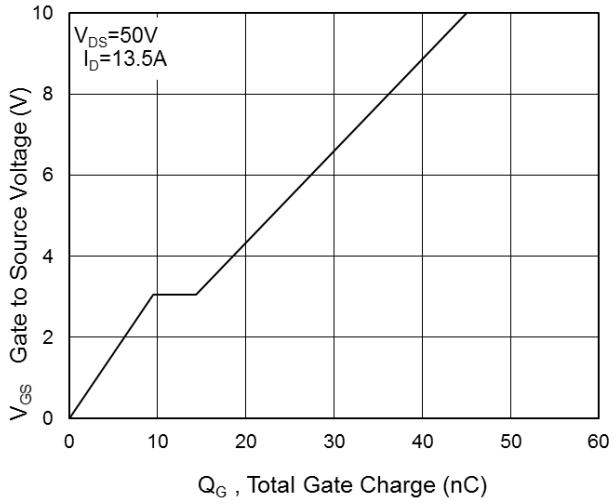


Fig.4 Gate-Charge Characteristics

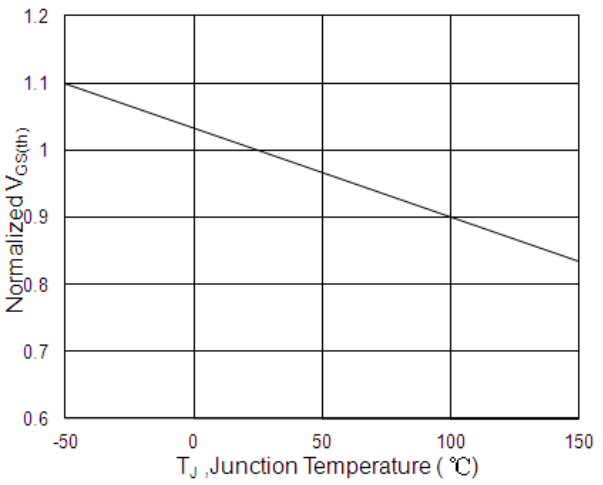


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

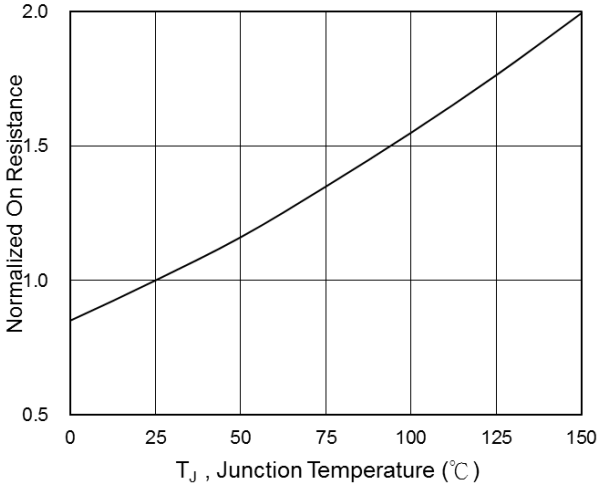


Fig.6 Normalized R_{DSON} vs. T_J

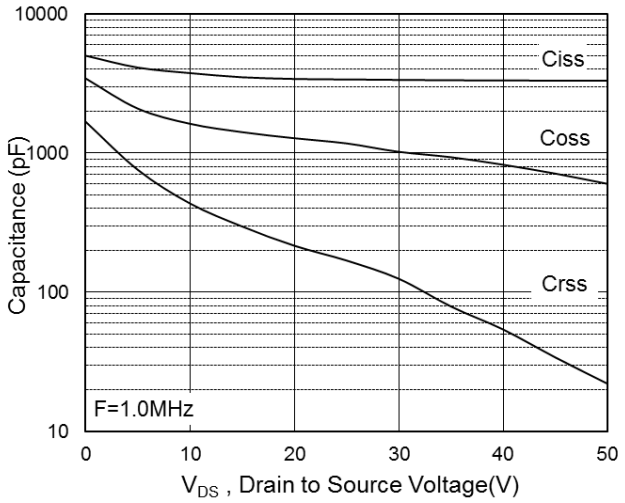


Fig.7 Capacitance

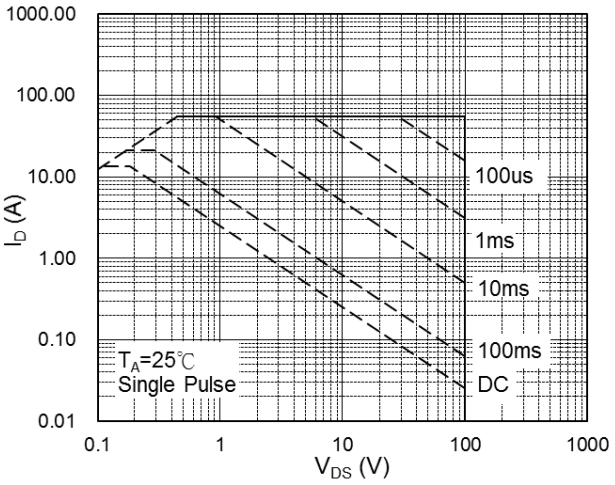


Fig.8 Safe Operating Area

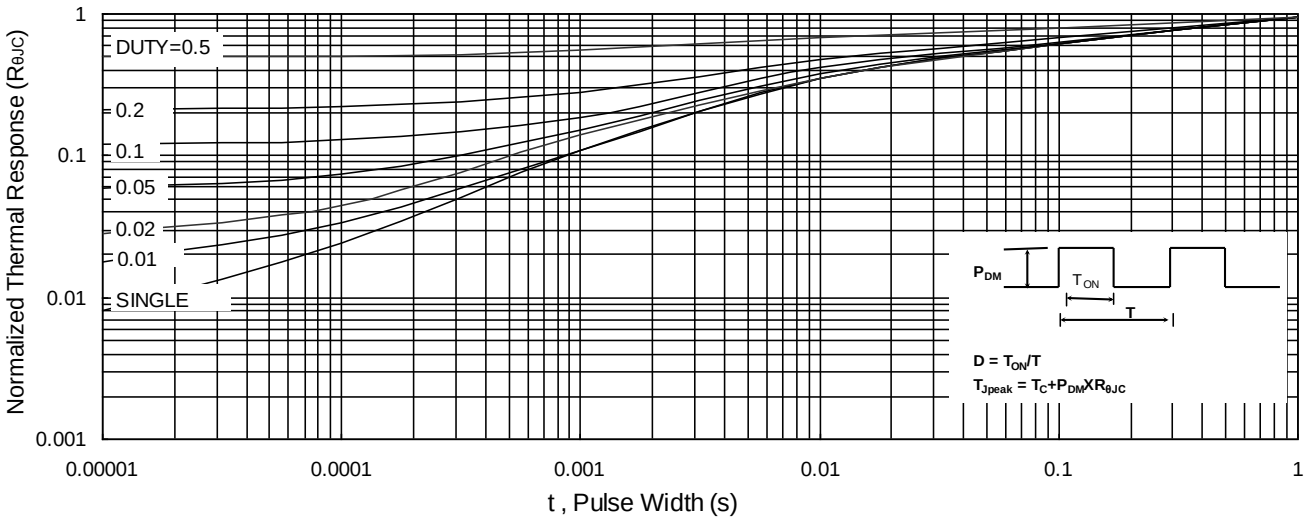


Fig.9 Normalized Maximum Transient Thermal Impedance

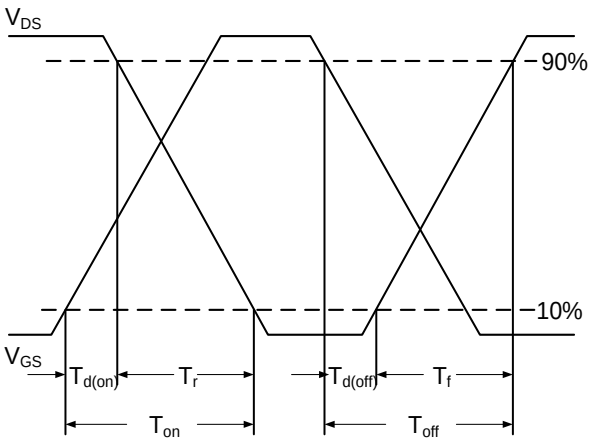


Fig.10 Switching Time Waveform

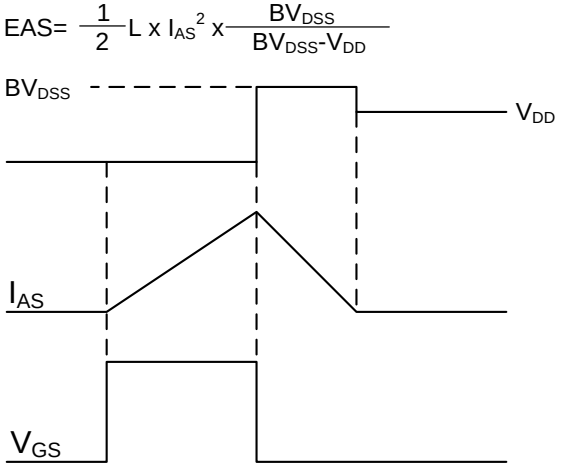
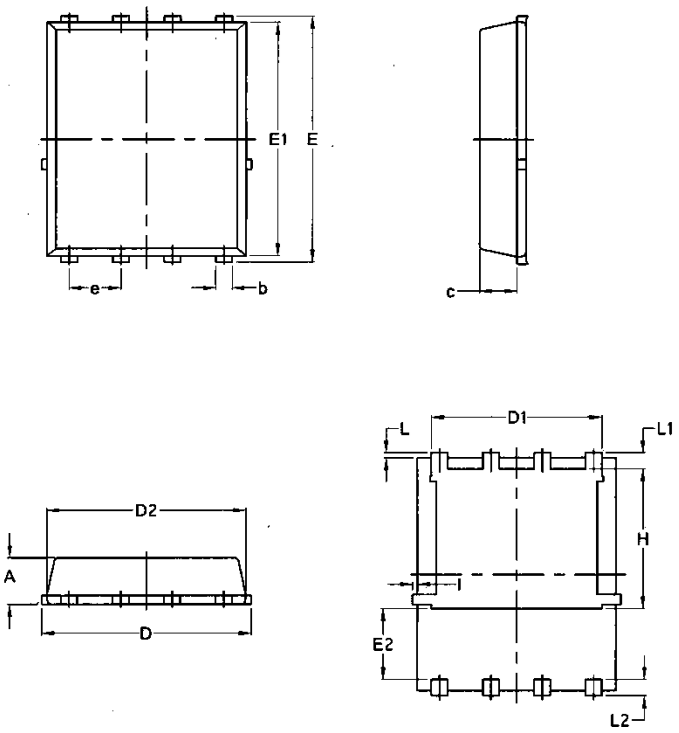


Fig.11 Unclamped Inductive Switching Waveform

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



Symbol	Common			
	mm		Inch	
	Mim	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

Attention

1,Any and all APM Microelectronics products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your APM Microelectronics representative nearest you before using any APM Microelectronics products described or contained herein in such applications.

2,APM Microelectronics assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all APM Microelectronics products described or contained herein.

3, Specifications of any and all APM Microelectronics products described or contained here instipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

4, APM Microelectronics Semiconductor CO., LTD. strives to supply high quality high reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design,and structural design.

5,In the event that any or all APM Microelectronics products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.

7, Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. APM Microelectronics believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

8, Any and all information described or contained herein are subject to change without notice due to product/technology improvement,etc. When designing equipment, refer to the "Delivery Specification" for the APM Microelectronics product that you Intend to use.

APG80N10NF

100V N-SGT Enhancement Mode MOSFET

Edition	Date	Change
Rve1.0	2019/12/1	Initial release