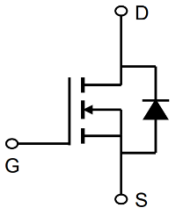
APG40N10S

100V N-Channel Enhancement Mode MOSFET

Description

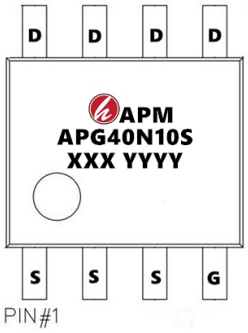
The APG40N10D uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

V_{DS} = 100V I_D =40A

$R_{DS(ON)}$ < 25mΩ @ V_{GS}=10V



Application

Consumer electronic power supply

Motor control

Synchronous-rectification

Isolated DC

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
APG40N10S	SOP-8	APG40N10S XXX YYYY	3000

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

Symbol	Parameter	Rating	Units
VDS	Drain source voltage	100	V
VGS	Gate source voltage	±20	V
ID	Continuous drain current[1], T_C=25 ℃	40	A
ID, pulse	Pulsed drain current[2], T_C=25 ℃	120	A
P_D	Power dissipation[3], T_C=25 ℃	71	W
EAS	Single pulsed avalanche energy[5]	57	mJ
Tstg，Tj	Operation and storage temperature	-55 to 150	℃
RθJC	Thermal resistance, junction-case	1.76	℃/W
RθJA	Thermal resistance, junction-ambient[4]	62	°C/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BVDSS	Drain-source breakdown voltage	V_{GS}=0 V, I_D=250 μA	100	107		V
VGS(th)	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250 μA	1.2	1.5	2.5	V
RDS(ON)	Drain-source on-state resistance	V_{GS}=10 V, I_D=10 A		19.0	25.0	mΩ
RDS(ON)	Drain-source on-state resistance	V_{GS}=4.5 V, I_D=7 A		24.4	30.0	mΩ
IGSS	Gate-source leakage current	V_{GS}=±20 V			±100	nA
IDSS	Drain-source leakage current	V_{DS}=100 V, V_{GS}=0 V			1	uA
Ciss	Input capacitance	V_{GS}=0 V, V_{DS}=50 V, f=100 kHz		1003.9		pF
Coss	Output capacitance			185.4		pF
Crss	Reverse transfer capacitance			9.8		pF
td(on)	Turn-on delay time	V_{GS}=10 V, V_{DS}=50 V, R_G=10 Ω, I_D=5 A		16.6		ns
t_r	Rise time			3.8		ns
td(off)	Turn-off delay time			75.5		ns
t_f	Fall time			46		ns
Q_g	Total gate charge	I_D=5 A, V_{DS}=50V, V_{GS}=10V		16.2		nc
Q_{gs}	Gate-source charge			2.8		nc
Qgd	Gate-drain charge			4.1		nc
Vplateau	Gate plateau voltage			3		V
I_S	Diode forward current	VGS<Vth		30		A
ISP	Pulsed source current			90		A
trr	Reverse recovery time	I_S=1A, di/dt=100 A/μs	49			ns
Q_{rr}	Reverse recovery charge		61.8			nc
Irrm	Peak reverse recovery current		2.4			A

Note :

1、Calculated continuous current based on maximum allowable junction temperature.
2、Repetitive rating; pulse width limited by max. junction temperature.
3、Pd is based on max. junction temperature, using junction-case thermal resistance.
4、The value of $R_{\Theta ja}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.
5、V_{DD}=50 V, R_G=25 Ω, L=0.3 mH, starting T_j=25 °C.

Typical Characteristics

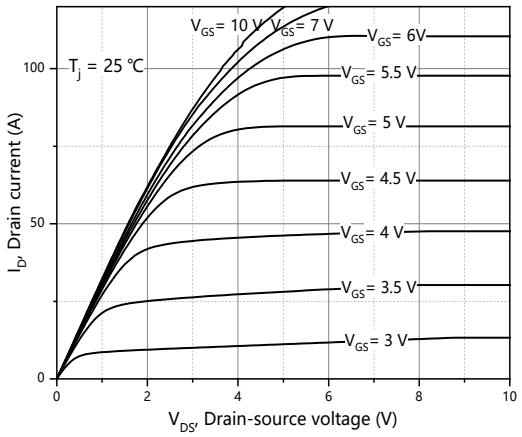


Figure 1, Typ. output characteristics

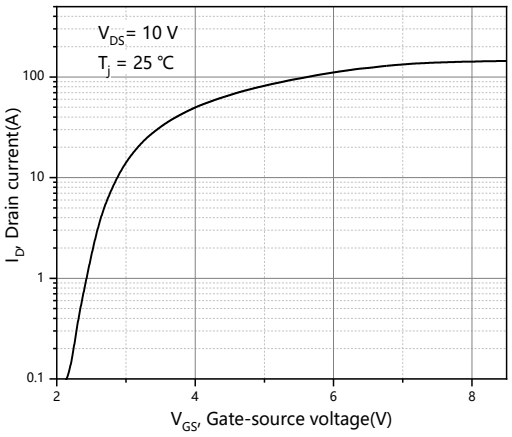


Figure 2, Typ. transfer characteristics

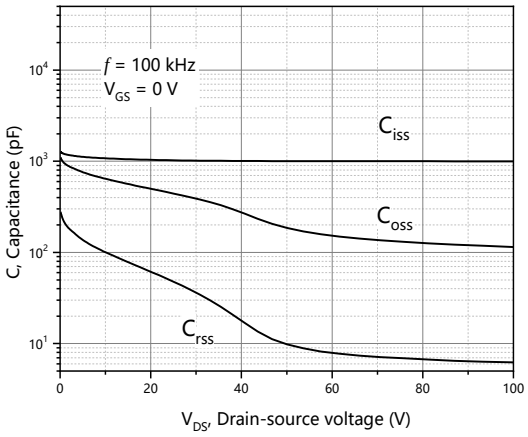


Figure 3, Typ. capacitances

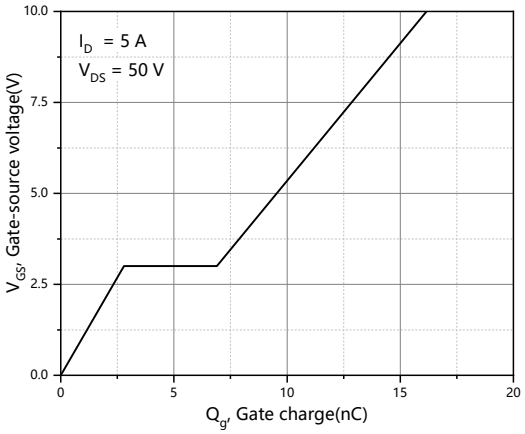


Figure 4, Typ. gate charge

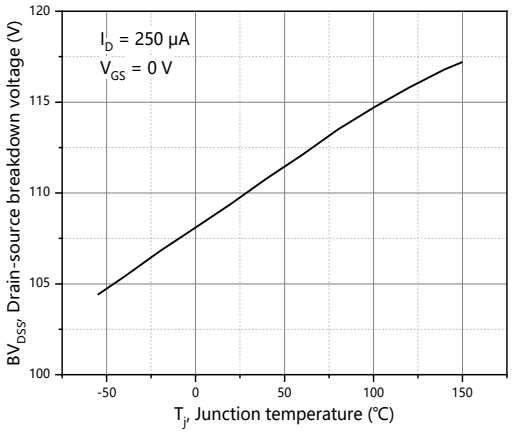


Figure 5, Drain-source breakdown voltage

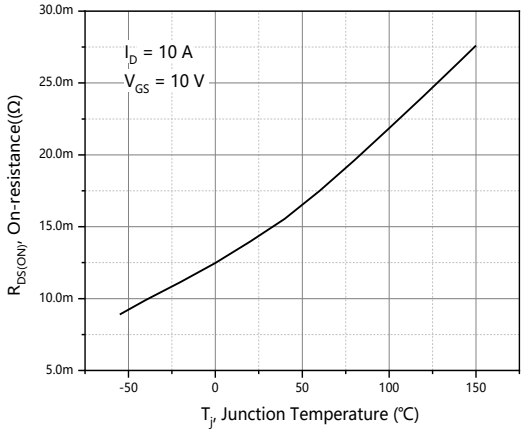


Figure 6, Drain-source on-state resistance

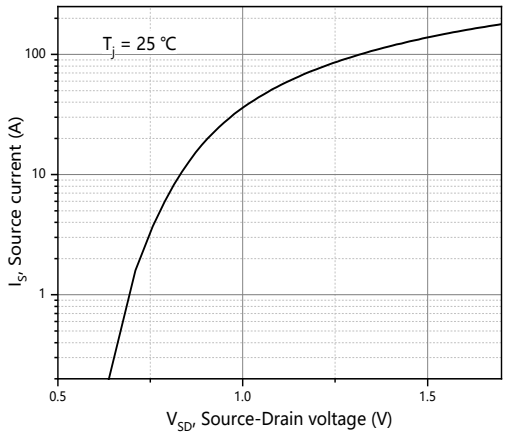


Figure 7, Forward characteristic of body diode

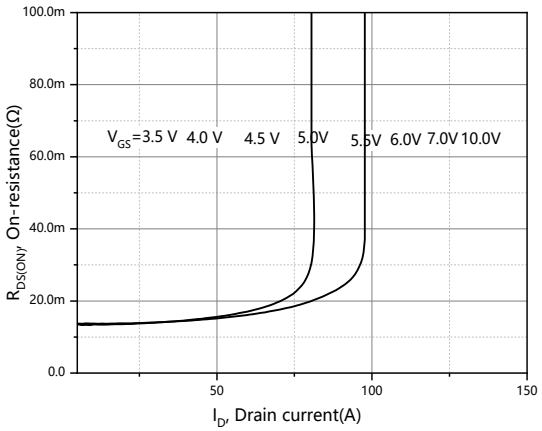


Figure 8, Drain-source on-state resistance

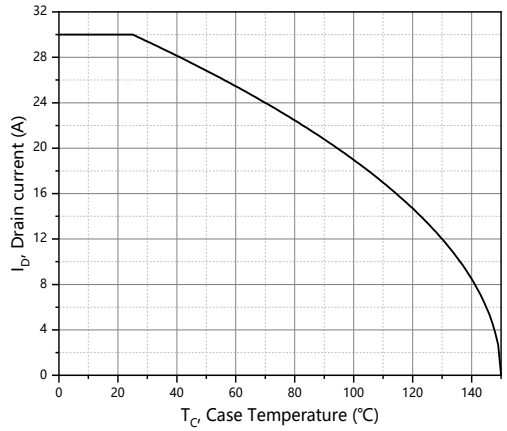


Figure 9, Drain current

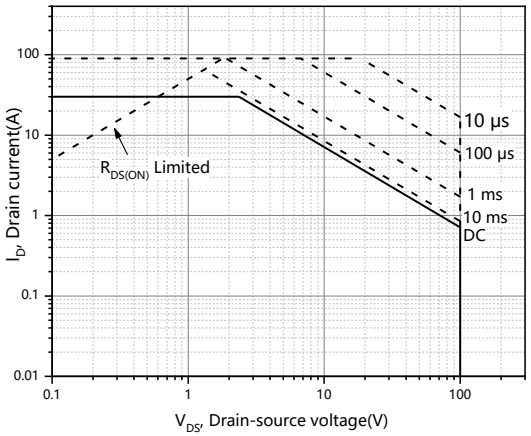
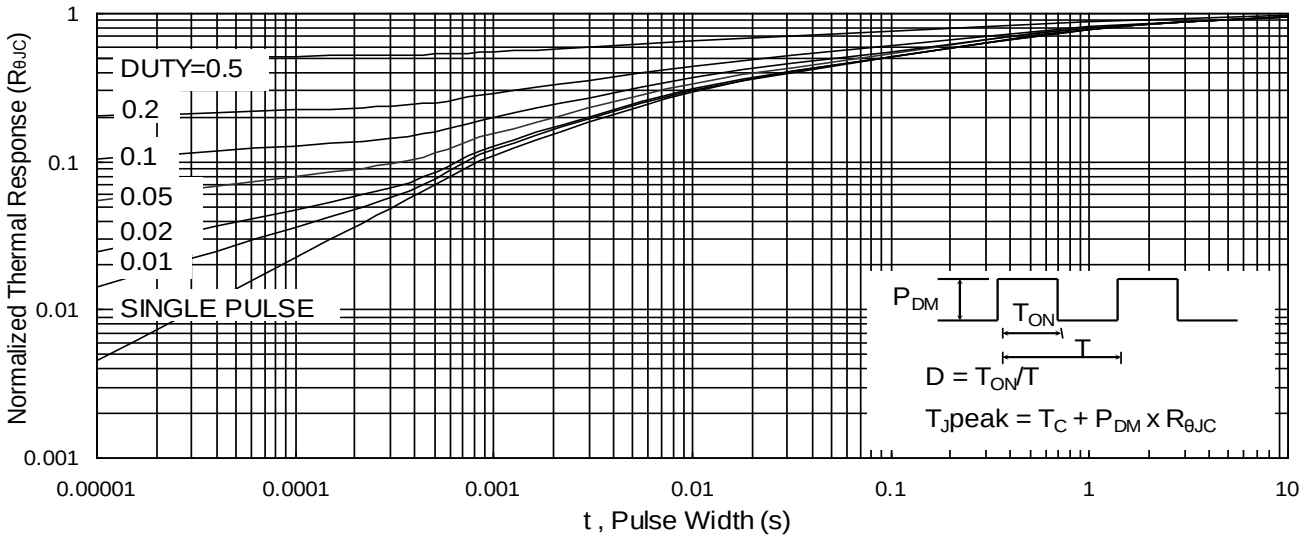
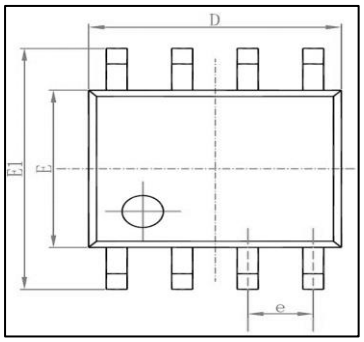


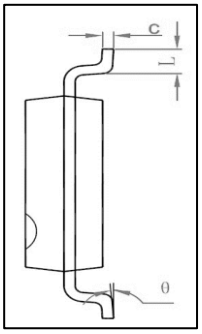
Figure 10, Safe operation area T_C=25 ℃

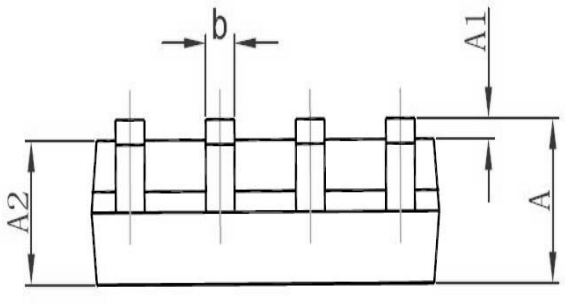


Figu11. Normalized Maximum Transient Thermal Impedance

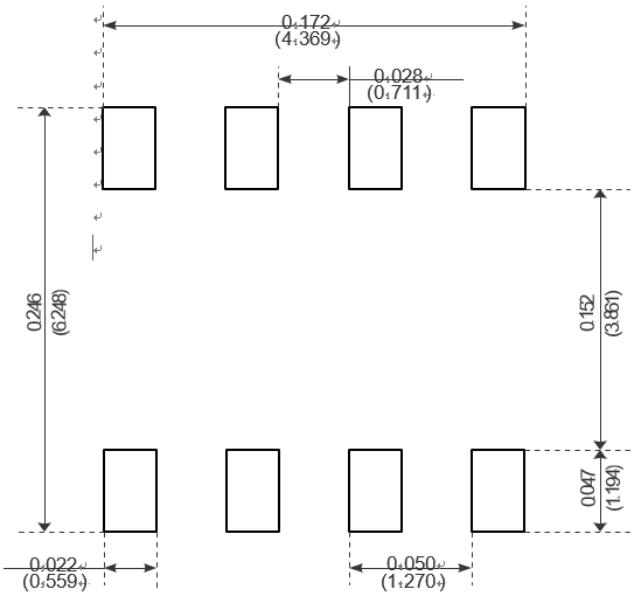
Package Mechanical Data-SOP-8/ESOP-8







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Recommended Minimum Pads

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100V N-Channel Enhancement Mode MOSFET

Edition	Date	Change
Rve1.0	2018/11/10	Initial release