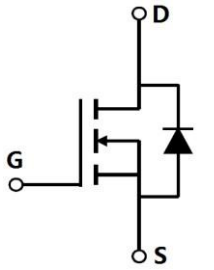
APG20N06S

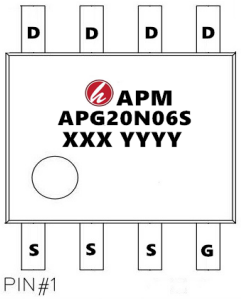
60V N-SGT Enhancement Mode MOSFET

General Description

APG20N06S 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

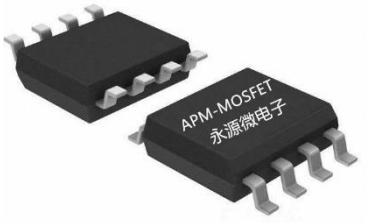
Consumer electronic power supply

Motor control

Synchronous-rectification

Isolated DC

Synchronous-rectification applications



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
APG20N06S	SOP-8	APG20N06S XXX YYYY	3000

Absolute Maximum Ratings at T_j=25℃ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain source voltage	V_{DS}	60	V
Gate source voltage	V_{GS}	±20	V
Continuous drain current[1)]	I_D	20	A
Pulsed drain current[2)]	$I_{D,\ pulse}$	48	A
Power dissipation[3)]	P_D	4	W
Single pulsed avalanche energy[4)]	E_{AS}	30	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	℃
Thermal resistance, junction-ambient[5)]	$R_{\theta JA}$	31	°C/W

60V N-SGT Enhancement Mode MOSFET

Electrical Characteristics at T_j=25 ℃ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	BV_{DSS}	60		100	V	V_{GS}=0 V, I_D=250 μA
Gate threshold voltage	$V_{GS(th)}$	1.0		2.5	V	V_{DS}=V_{GS}, I_D=250 μA
Drain-source on-state resistance	$R_{DS(ON)}$		7.5	10	mΩ	V_{GS}=10 V, I_D=20 A
Drain-source on-state resistance	$R_{DS(ON)}$		10	13	mΩ	V_{GS}=4.5 V, I_D=10 A
Gate-source leakage current	I_{GSS}			100	nA	V_{GS}=20 V
				-100		V_{GS}=-20 V
Drain-source leakage current	I_{DSS}			1	μA	V_{DS}=40 V, V_{GS}=0 V
Input capacitance	C_{iss}		1182.1		pF	V_{GS}=0 V, V_{DS}=50 V, f=100 kHz
Output capacitance	C_{oss}		199.5		pF	
Reverse transfer capacitance	C_{rss}		4.1		pF	
Turn-on delay time	$t_{d(on)}$		17.9		ns	V_{GS}=10 V, V_{DS}=50 V, R_G=2 Ω, I_D=10 A
Rise time	t_r		4.0		ns	
Turn-off delay time	$t_{d(off)}$		34.9		ns	
Fall time	t_f		5.5		ns	
Total gate charge	Q_g		18.4		nC	I_D=10 A, V_{DS}=50 V, V_{GS}=10 V
Gate-source charge	Q_{gs}		3.3		nC	
Gate-drain charge	Q_{gd}		3.1		nC	
Gate plateau voltage	$V_{plateau}$		2.8		V	
Diode forward current	I_S			60	A	V_{GS}<V_{th}
Pulsed source current	I_{SP}			180		
Diode forward voltage	V_{SD}			1.3	V	I_S=20 A, V_{GS}=0 V
Reverse recovery time	t_{rr}		41.8		ns	I_S=10 A, di/dt=100 A/μs
Reverse recovery charge	Q_{rr}		36.1		nC	
Peak reverse recovery current	I_{rrm}		1.4		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) V_{DD}=50 V, R_G=50 Ω, L=0.3 mH, starting T_j=25 ℃.
5) 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 ℃.

Electrical Characteristics Diagrams

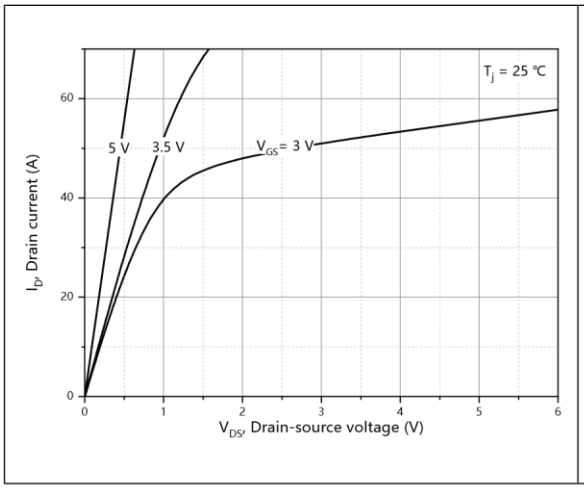


Figure 1, Typ. output characteristics

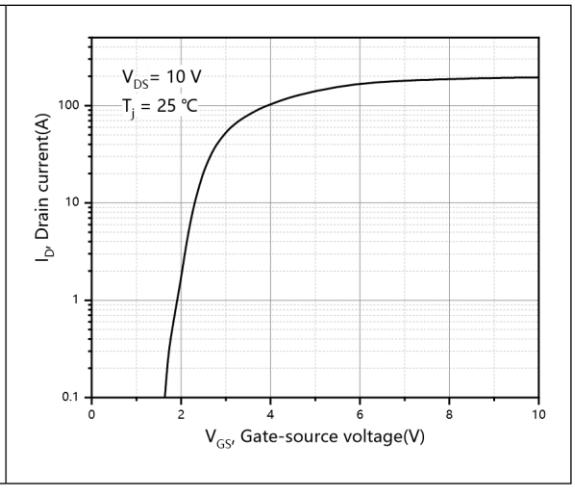


Figure 2, Typ. transfer characteristics

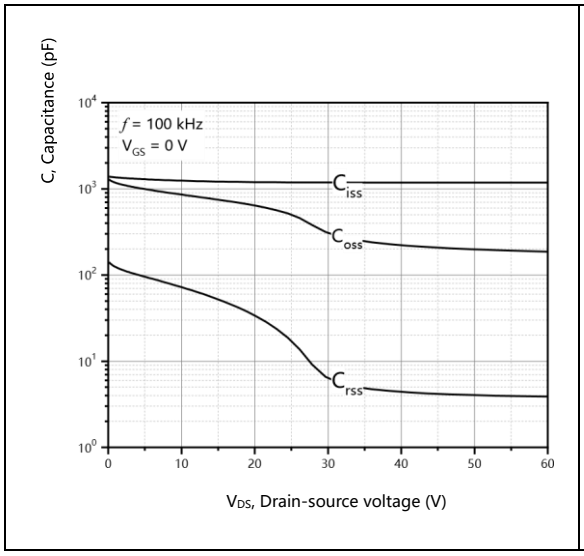


Figure 3, Typ. capacitances

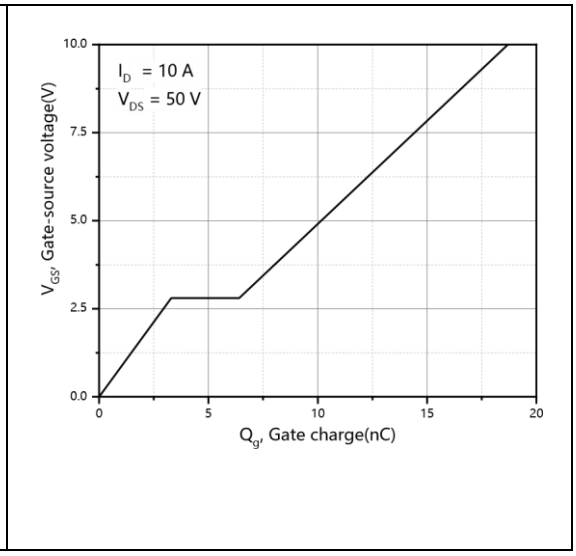


Figure 4, Typ. gate charge

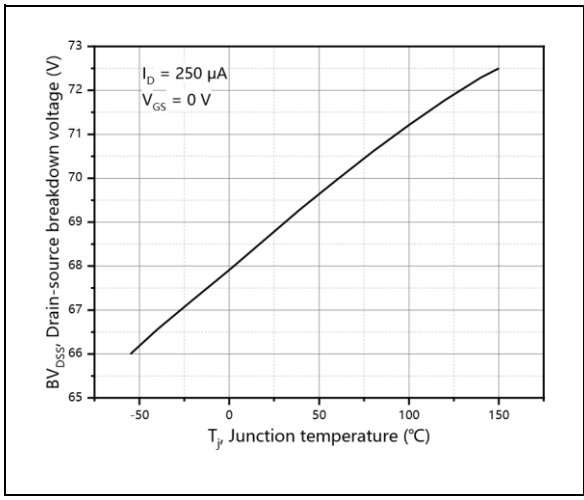


Figure 5, Drain-source breakdown voltage

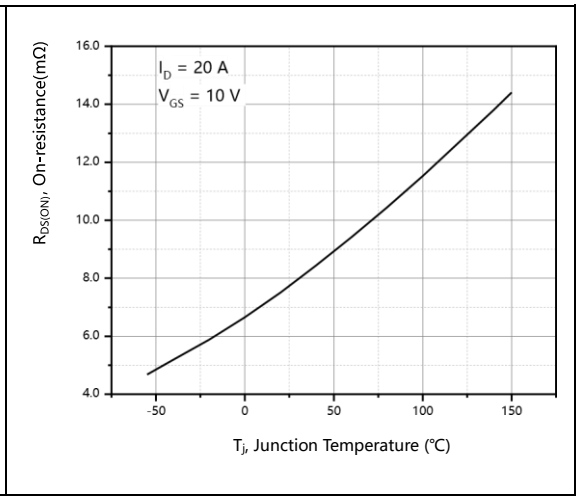


Figure 6, Drain-source on-state resistance

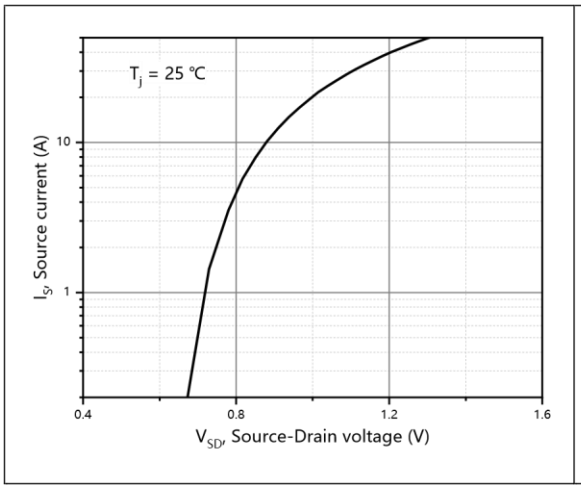


Figure 7, Forward characteristic of body diode

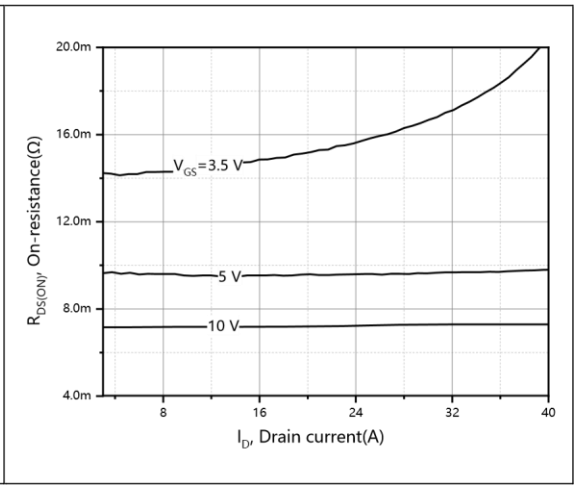


Figure 8, Drain-source on-state resistance

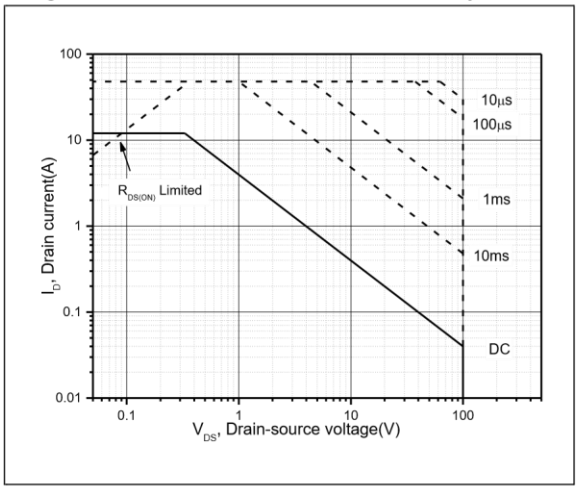


Figure 9, Safe operation area T_C=25 ℃

Test circuits and waveforms

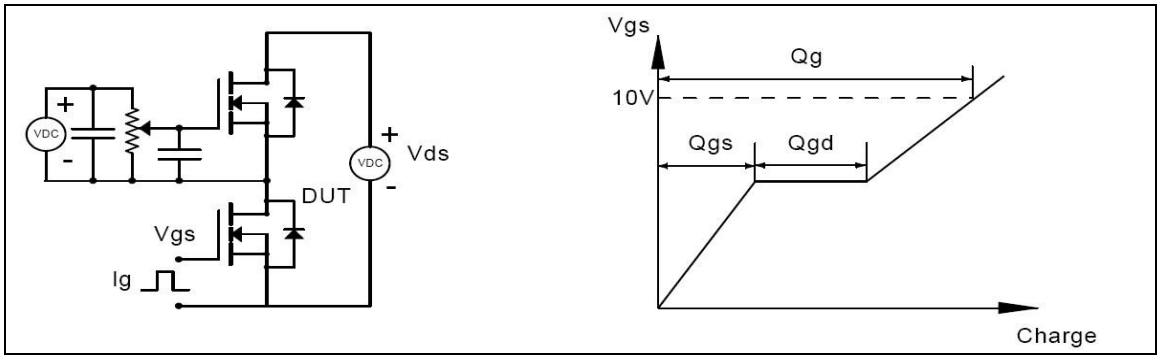


Figure 1, Gate charge test circuit & waveform

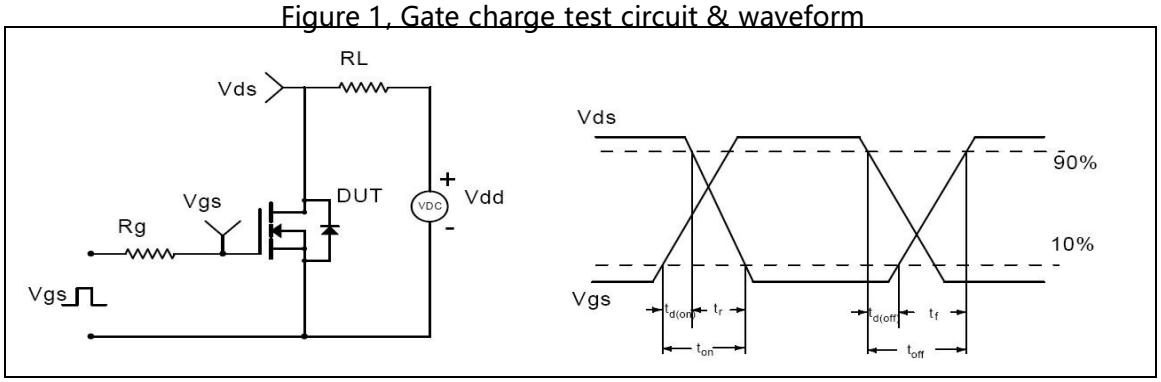


Figure 2, Switching time test circuit & waveforms

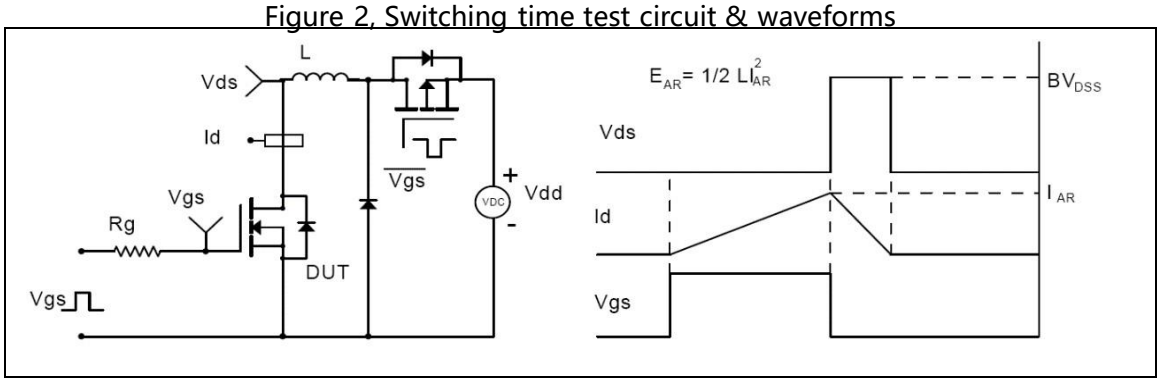


Figure 3, Unclamped inductive switching (UIS) test circuit & waveforms

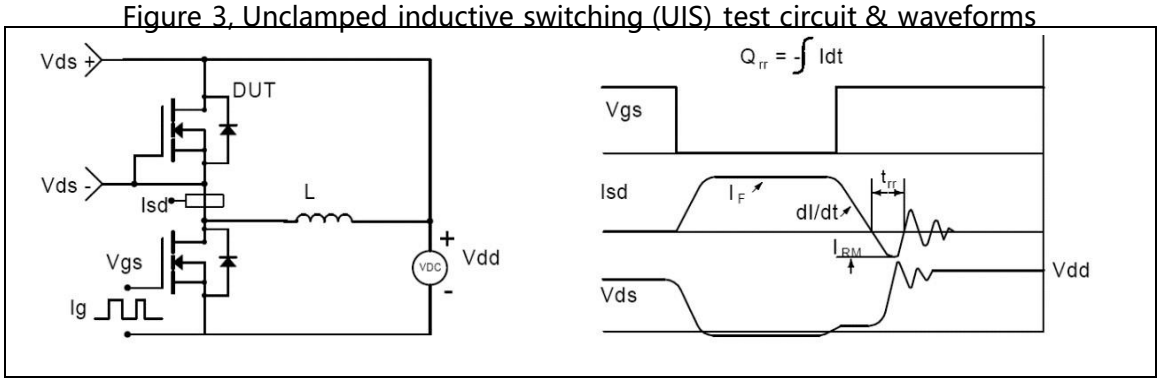
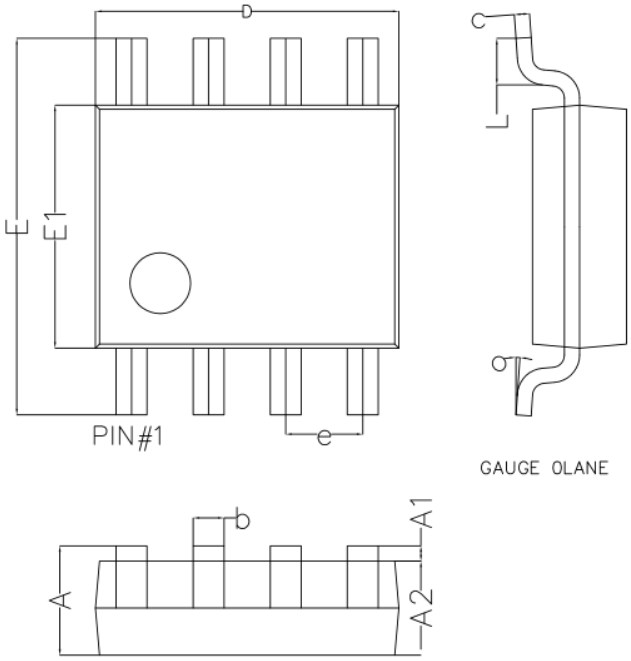


Figure 4, Diode reverse recovery test circuit & waveforms

S0P8 Package outline



Symbol	Dim in mm		
	Min	Nor	Max
A	1.350	1.550	1.750
A1	0.100	0.175	0.250
A2	1.350	1.450	1.550
b	0.330	0.420	0.510
c	0.170	0.210	0.250
D	4.800	4.900	5.000
e	1.270(BSC)		
E	5.800	6.000	6.200
E1	3.800	3.900	4.000
L	0.400	0.835	1.2700
θ	0°	4°	8°

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