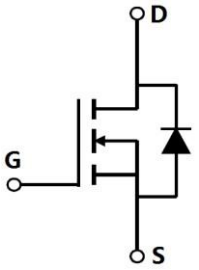
APG60N10D

100V N-SGT Enhancement Mode MOSFET

General Description

APG60N10D 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)
APG60N10D	TO-252-3	APG60N10D XXX YYYY	2500

Absolute Maximum Ratings at T_j=25℃ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain source voltage	V_{DS}	100	V
Gate source voltage	V_{GS}	±20	V
Continuous drain current[1], T_C=25 ℃	I_D	60	A
Pulsed drain current[2], T_C=25 ℃	$I_{D, pulse}$	180	A
Power dissipation[3], T_C=25 ℃	P_D	125	W
Single pulsed avalanche energy[5]	E_{AS}	100	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	℃
Thermal resistance, junction-case	$R_{\theta JC}$	1	℃/W
Thermal resistance, junction-ambient[4]	$R_{\theta JA}$	62	℃/W

100V 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	BVDSS	100			V	V_{GS}=0 V, I_D=250 μA
Gate threshold voltage	VGS(th)	1.0		2.5	V	V_{DS}=V_{GS}, I_D=250 μA
Drain-source on-state resistance	RDS(ON)		8	10	mΩ	V_{GS}=10 V, I_D=10 A
Drain-source on-state resistance	RDS(ON)		10	12	mΩ	V_{GS}=4.5 V, I_D=10 A
Gate-source leakage current	IGSS			100	nA	V_{GS}=20 V
				-100		V_{GS}=-20 V
Drain-source leakage current	IDSS			1	μA	V_{DS}=100 V, V_{GS}=0 V
Input capacitance	Ciss		2604		pF	V_{GS}=0 V, V_{DS}=50 V, ƒ=1 MHz
Output capacitance	Coss		361.2		pF	
Reverse transfer capacitance	Crss		6.5		pF	
Turn-on delay time	td(on)		20.6		ns	V_{GS}=10 V, V_{DS}=50 V, R_G=2.2 Ω, I_D=25 A
Rise time	t_r		5		ns	
Turn-off delay time	td(off)		51.8		ns	
Fall time	t_f		9		ns	
Total gate charge	Q_g		49.9		nC	I_D=25 A, V_{DS}=50 V, V_{GS}=10 V
Gate-source charge	Q_{gs}		6.5		nC	
Gate-drain charge	Qgd		12.4		nC	
Gate plateau voltage	Vplateau		3.4		V	
Diode forward current	I_S			60		VGS<Vth
Pulsed source current	ISP			180	A	
Diode forward voltage	VSD			1.3	V	I_S=12 A, V_{GS}=0 V
Reverse recovery time	trr		60.4		ns	I_S=12 A, di/dt=100 A/μs
Reverse recovery charge	Q_{rr}		106.1		nC	
Peak reverse recovery current	Irrm		3		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 ℃.
5) V_{DD}=50 V, R_G=25 Ω, L=0.3 mH, starting T_j=25 ℃.

Electrical Characteristics Diagrams

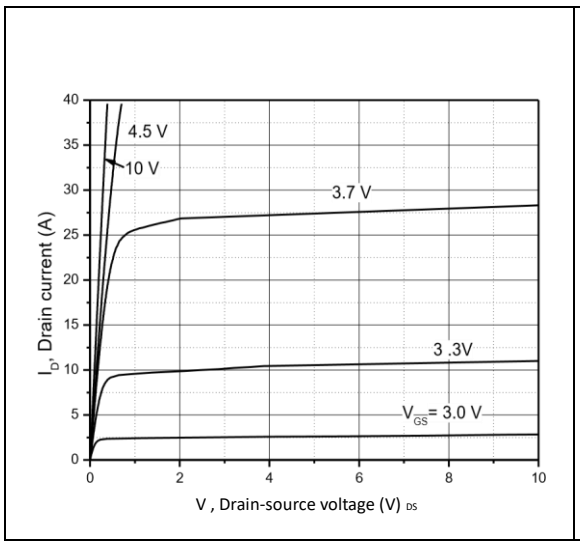


Figure 1, Typ. output characteristics

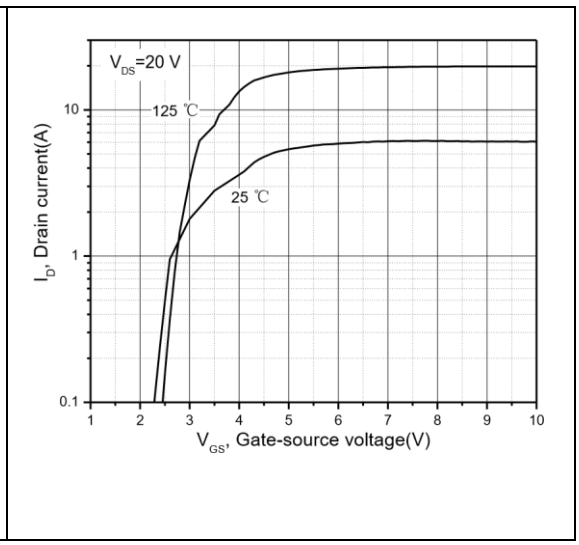


Figure 2, Typ. transfer characteristics

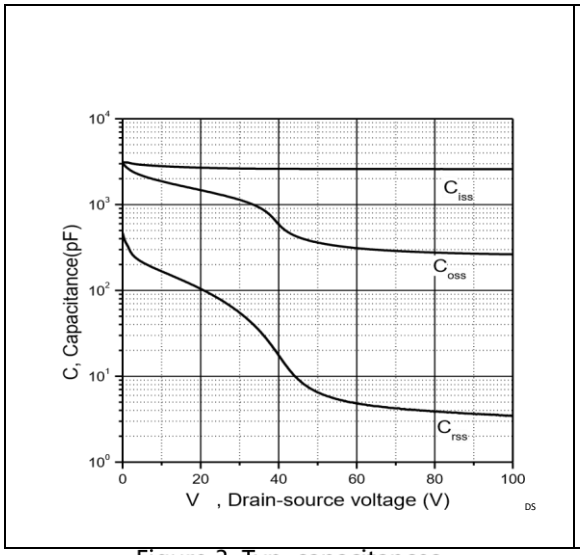


Figure 3, Typ. capacitances

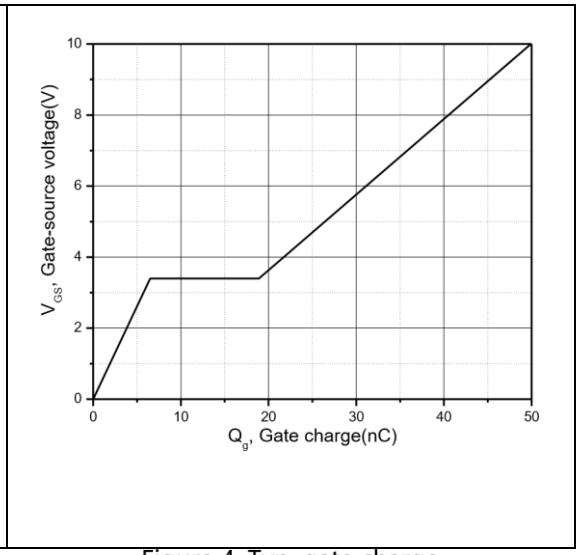


Figure 4, Typ. gate charge

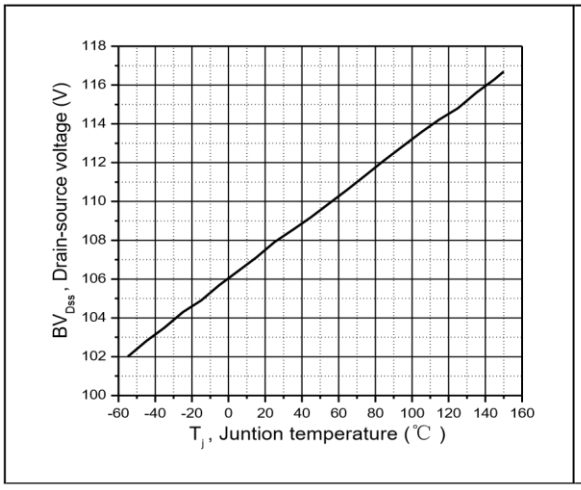


Figure 5, Drain-source breakdown voltage

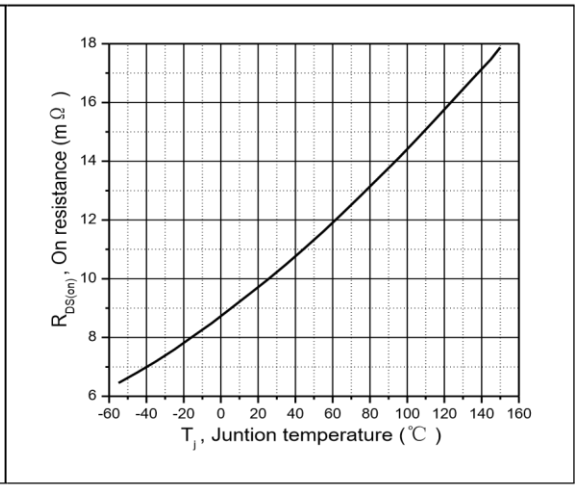


Figure 6, Drain-source on-state resistance

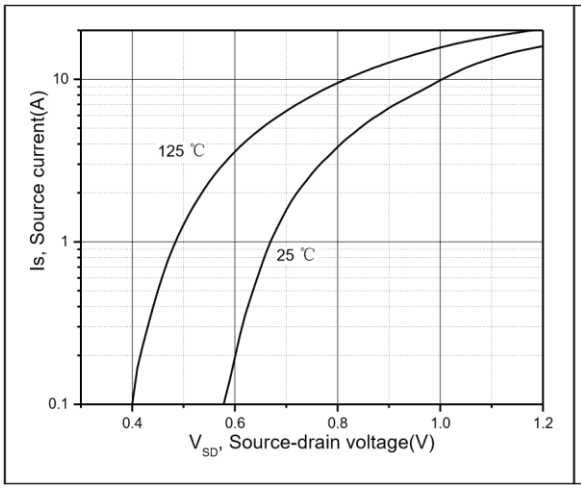


Figure 7, Forward characteristic of body diode

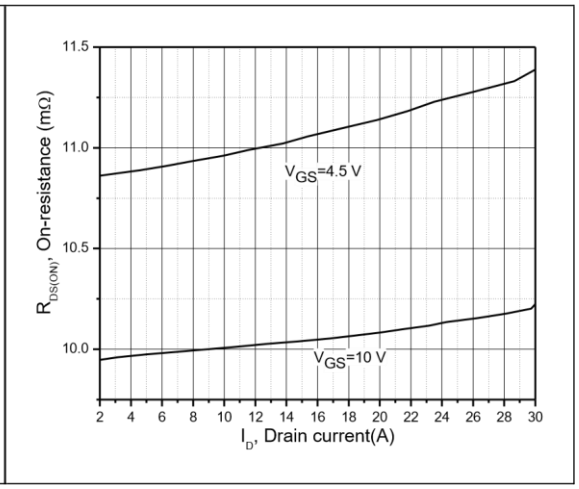


Figure 8, Drain-source on-state resistance

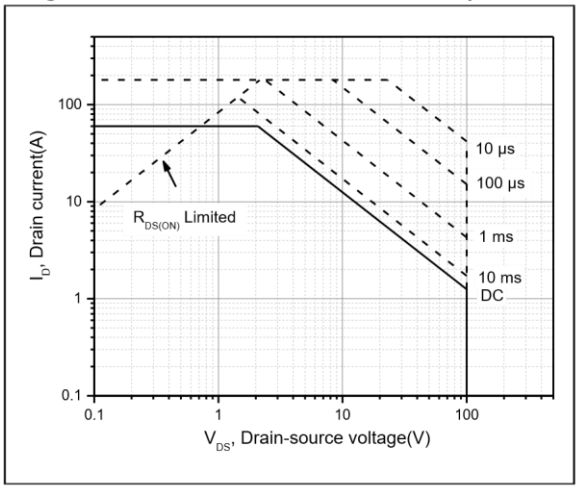


Figure 9, Safe operation area T_C=25 ℃

Test circuits and waveforms

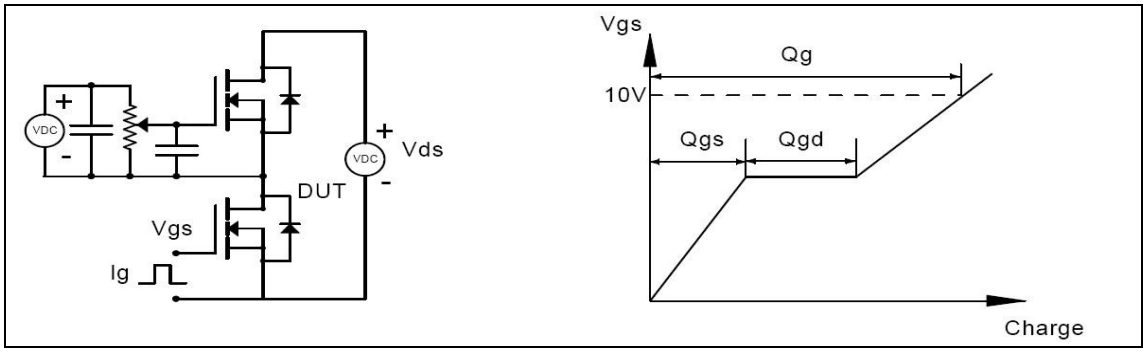


Figure 1, Gate charge test circuit & waveform

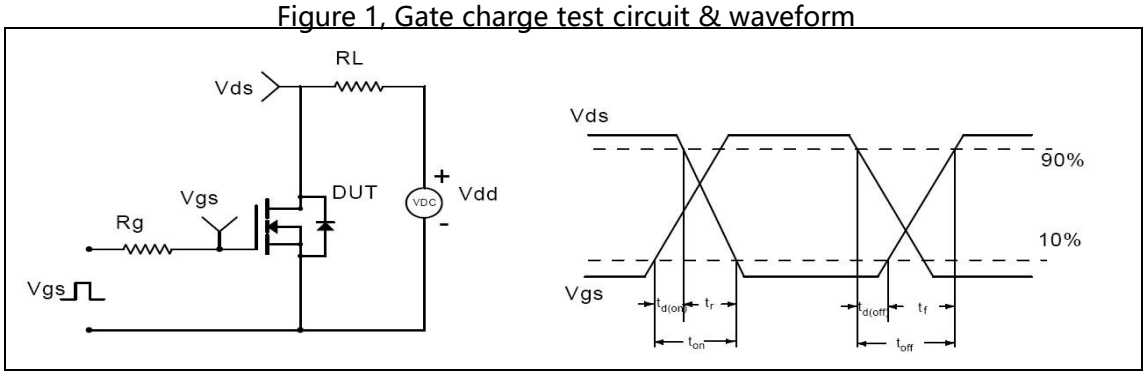


Figure 2, Switching time test circuit & waveforms

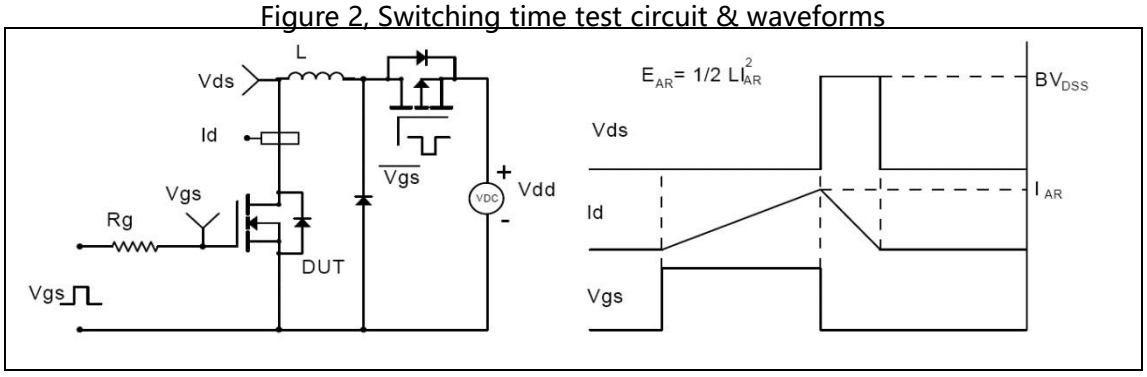


Figure 3, Unclamped inductive switching (UIS) test circuit & waveforms

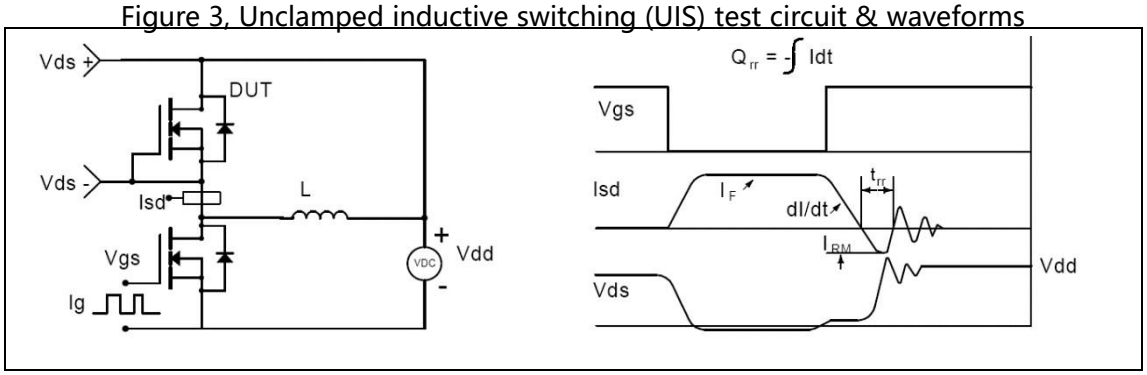
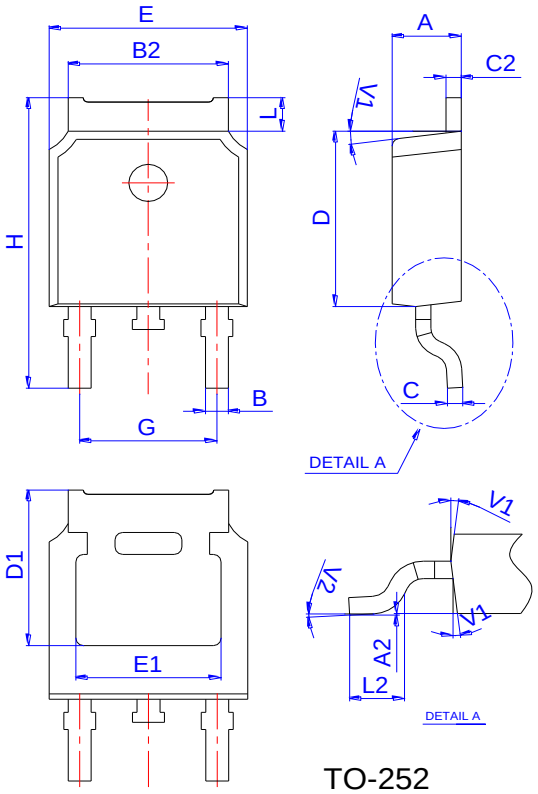


Figure 4, Diode reverse recovery test circuit & waveforms

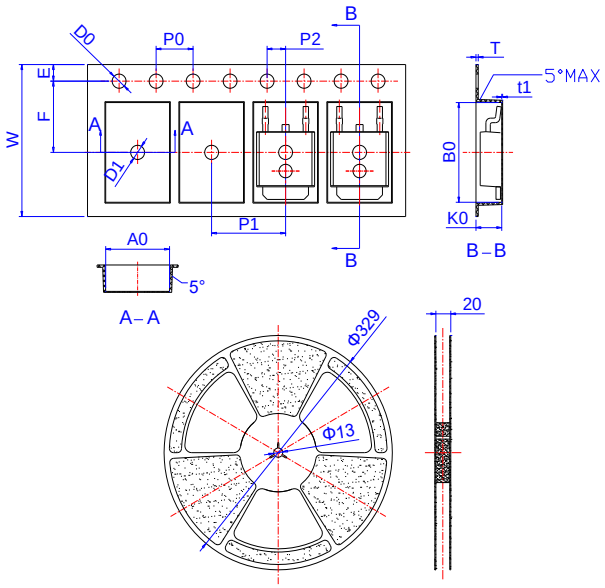
Package Mechanical Data



TO-252

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583

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