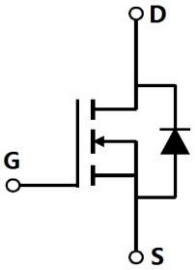
APG60N10P/T

100V N-SGT Enhancement Mode MOSFET

General Description

APG60N10P/T 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)
APG60N10P	TO-220-3L	APG60N10P XXX YYYY	1000
APG60N10T	TO-263-3L	APG60N10T XXX YYYY	1000

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	107	W
Single pulsed avalanche energy[4]	E_{AS}	183.8	mJ
Operation and storage temperature	T_{stg}， T_j	-55 to 150	℃
Thermal resistance, junction-case	$R_{\theta JC}$	1.17	°C/W
Thermal resistance, junction-ambient[4]	$R_{\theta JA}$	62	°C/W

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Electrical Characteristics at T_j=25 ℃ unless otherwise specified

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-source breakdown voltage	V_{GS}=0 V, I_D=250 μA	100			V
$V_{GS(th)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250 μA	1.5		2.5	V
$R_{DS(ON)}$	Drain-source on-state resistance	V_{GS}=10 V, I_D=20 A		9	10.0	mΩ
$R_{DS(ON)}$	Drain-source on-state resistance	V_{GS}=4.5 V, I_D=12 A		12	14.0	mΩ
I_{GSS}	Gate-source leakage current	V_{GS}=20 V			100	nA
		V_{GS}=-20 V			-100	
I_{DSS}	Drain-source leakage current	V_{DS}=100 V, V_{GS}=0 V			1	uA
R_G	Gate resistance	f= 1 MHz, Open drain		5.5		Ω
C_{iss}	Input capacitance	V_{GS}=0 V, V_{DS}=50 V, f=100 kHz		1998.1		pF
C_{oss}	Output capacitance			321.7		pF
C_{rss}	Reverse transfer capacitance			7.1		pF
$t_{d(on)}$	Turn-on delay time	V_{GS}=10 V,		22.1		ns
t_r	Rise time	V_{DS}=50 V,		5.2		ns
$t_{d(off)}$	Turn-off delay time	R_G=2 Ω,		44		ns
t_f	Fall time	I_D=25 A		8.4		ns
Q_g	Total gate charge	I_D=25 A,		28.9		nC
Q_{gs}	Gate-source charge	V_{DS}=50 V,		6		nC
Q_{gd}	Gate-drain charge	V_{GS}=10 V		6.8		nC
$V_{plateau}$	Gate plateau voltage			3.7		V
I_S	Diode forward current				60	A
I_{SP}	Pulsed source current	V_{GS}<V_{th}			180	
V_{SD}	Diode forward voltage	I_S=20 A, V_{GS}=0 V			1.3	V
t_{rr}	Reverse recovery time	I_S=25 A, di/dt=100 A/μs		102.9		ns
Q_{rr}	Reverse recovery charge			379		nC
I_{rrm}	Peak reverse recovery current			6.4		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=25 Ω, L=0.3 mH, starting T_j=25 °C.
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 °C.

Electrical Characteristics Diagrams

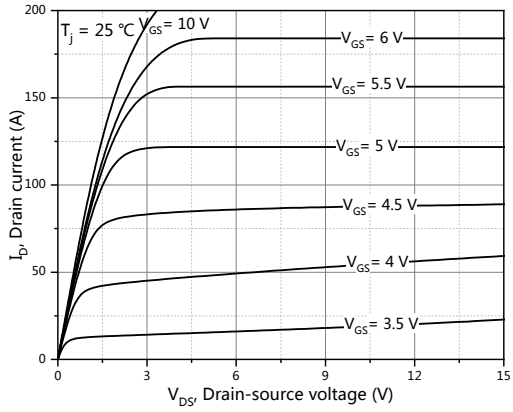


Figure 1, Typ. output characteristics

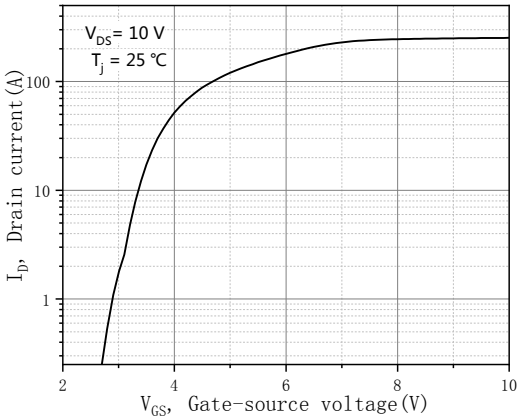


Figure 2, Typ. transfer characteristics

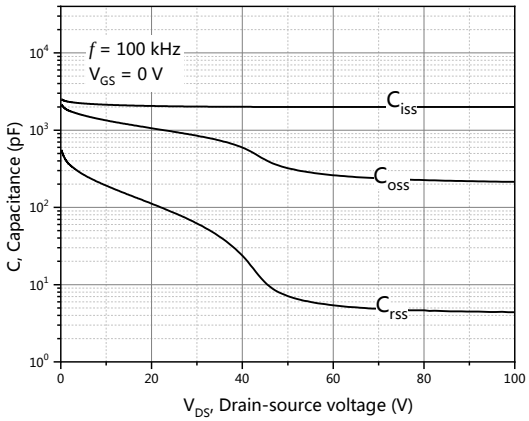


Figure 3, Typ. capacitances

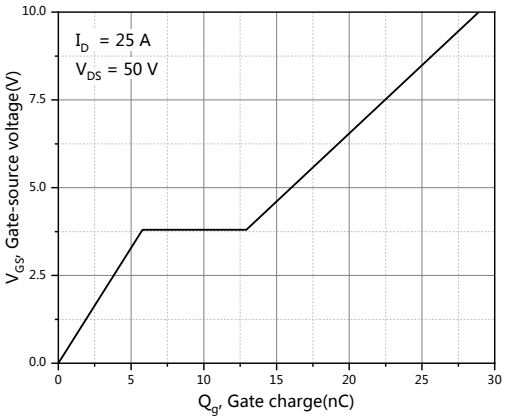


Figure 4, Typ. gate charge

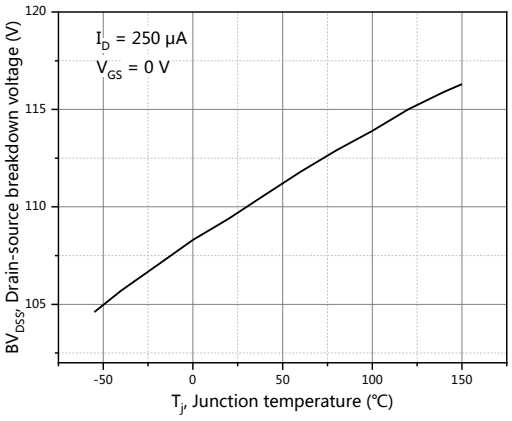


Figure 5, Drain-source breakdown voltage

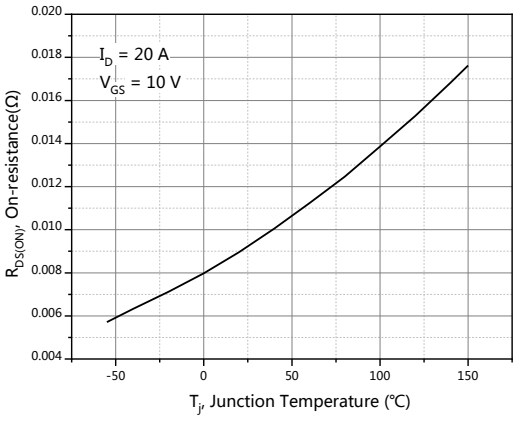


Figure 6, Drain-source on-state resistance

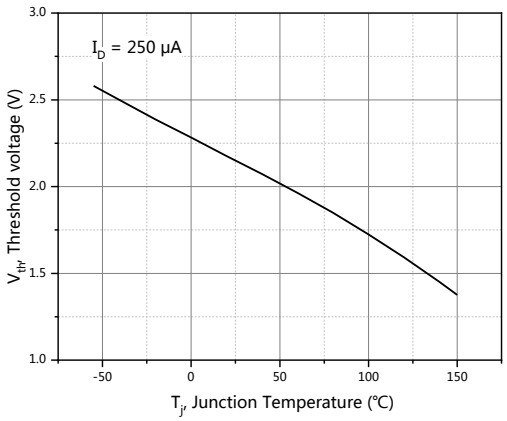


Figure 7, Threshold voltage

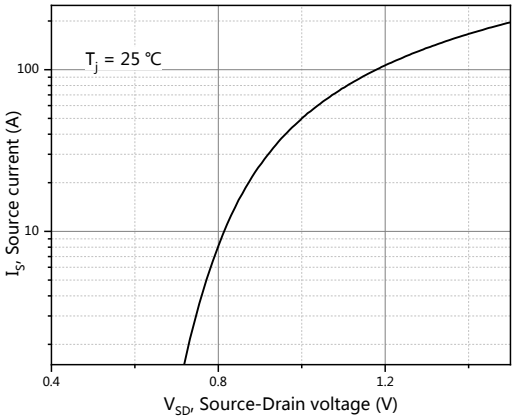


Figure 8, Forward characteristic of body diode

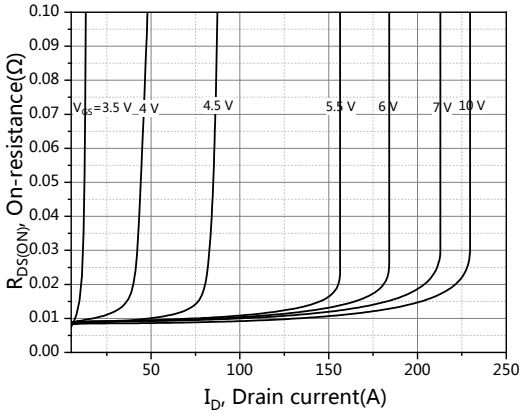


Figure 9, Drain-source on-state resistance

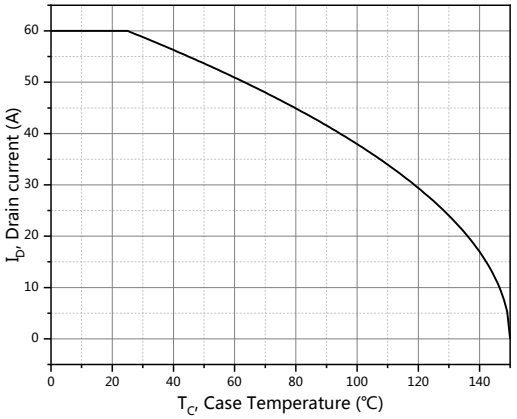


Figure 10, Drain current

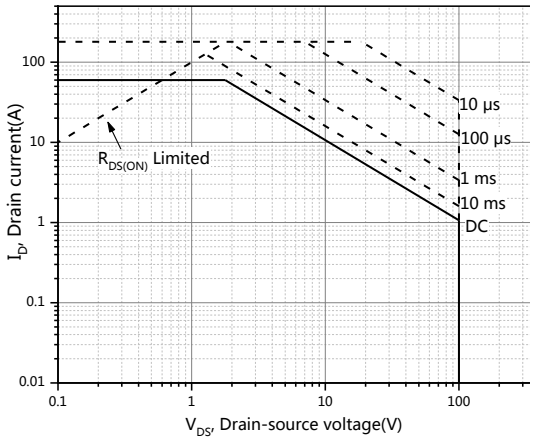
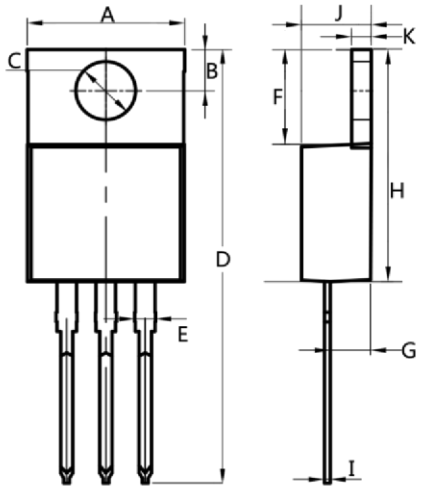


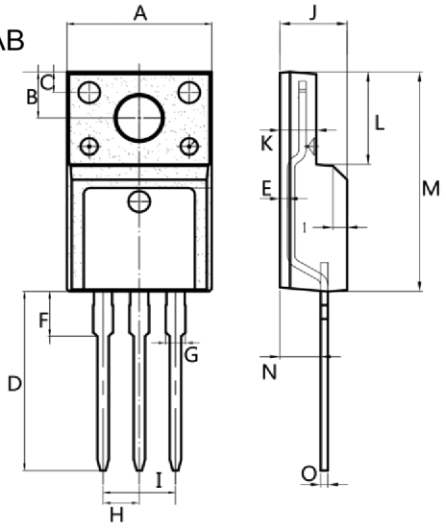
Figure 11, Safe operation area T_C=25 ℃

TO-220AB



Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

ITO-220AB



Dim.	Min.	Max.
A	9.9	10.3
B	2.9	3.5
C	1.15	1.45
D	12.75	13.25
E	0.55	0.75
F	3.1	3.5
G	1.25	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.55	4.75
K	2.4	2. 7
L	6.35	6.75
M	15.0	16.0
N	2.75	3.15
O	0.45	0.60
All Dimensions in millimeter		

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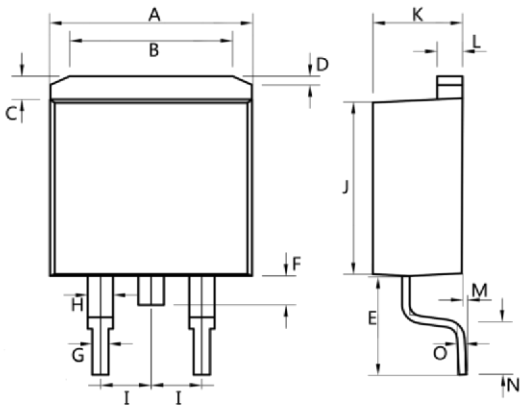

Dim.	Min.	Max.
A	10.0	10. 5
B	7.25	7.75
C	1.3	1.5
D	0.55	0.75
E	5.0	6.0
F	1.4	1.6
G	0.75	0.95
H	1.15	1.35
I	Typ 2.54	
J	8.4	8.6
K	4.4	4.6
L	1.25	1.45
M	0.02	0.1
N	2.4	2.8
O	0.35	0.45
All Dimensions in millimeter		

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100V N-SGT Enhancement Mode MOSFET

Edition	Date	Change
Rve1.0	2018/1/31	Initial release
Rve1.2	2019/5/25	Reduce CiSS and QG