

Description

The APG130N06D 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

$V_{DS} = 60V$ $I_D = 130A$

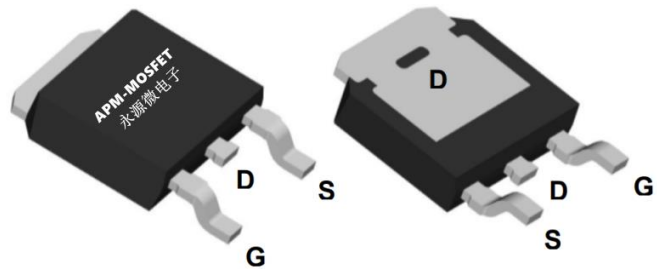
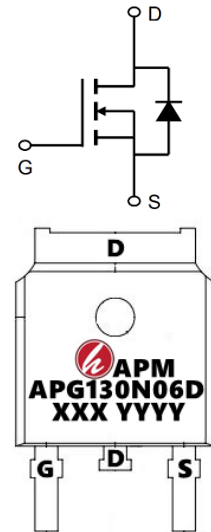
$R_{DS(ON)} < 3.2m\Omega$ @ $V_{GS}=10V$ (Type: $2.35m\Omega$)

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
APG130N06D	TO-252	APG130N06D XXX YYYY	2500

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current ^{1,6}	130	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current ^{1,6}	66	A
I_{DM}	Pulsed Drain Current ²	240	A
EAS	Single Pulse Avalanche Energy ³	101	mJ
IAS	Avalanche Current	45	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	168	W
TSTG	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	0.89	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	1.5	$^\circ\text{C/W}$

60V N-Channel Enhancement Mode MOSFET

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	67		V
$IDSS$	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$			1	μA
$IGSS$	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.6	2.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=20A$		2.35	3.2	m Ω
		$V_{GS}=4.5V, I_D=15A$		2.9	3.6	
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=100KHZ$		5950		pF
C_{oss}	Output Capacitance			1250		
C_{rss}	Reverse Transfer Capacitance			85		
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=50V, I_D=50A$		93		nC
Q_{gs}	Gate-Source Charge			17		
Q_{gd}	Gate-Drain Charge			14		
Q_{rr}	Reverse Recovery Charge	$I_F=25A, di/dt=100A/\mu s$		73		
t_{rr}	Reverse Recovery Time			68		
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=10V, V_{DD}=30V, I_D=25A$ $R_{GEN}=2\Omega$		22.5		ns
t_r	Turn-on Rise Time			6.7		
$t_{d(off)}$	Turn-off Delay Time			80.3		
t_f	Turn-off fall Time			26.9		
V_{SD}	Diode Forward Voltage	$I_S=20A, V_{GS}=0V$			1.2	V
I_S	Maximum Body-Diode Continuous Current				200	A

Typical Characteristics

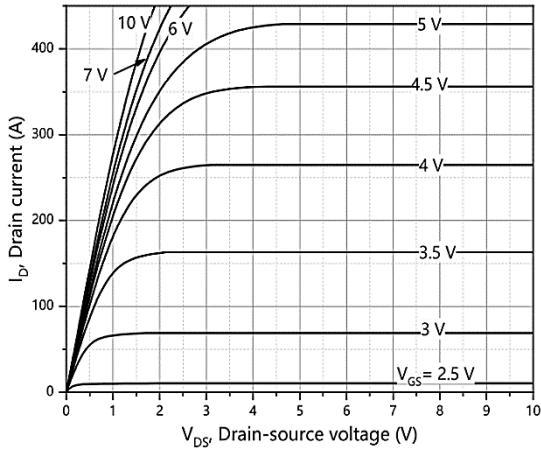


Figure 1. Typ. output characteristics

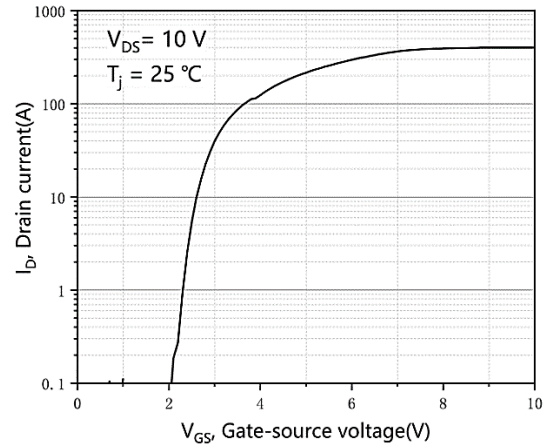


Figure 2. Typ. transfer characteristics

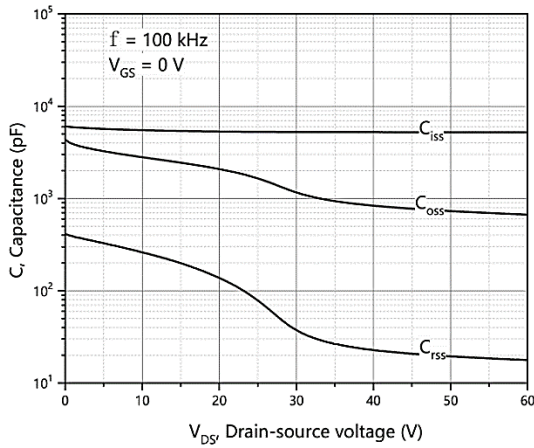


Figure 3. Typ. capacitances

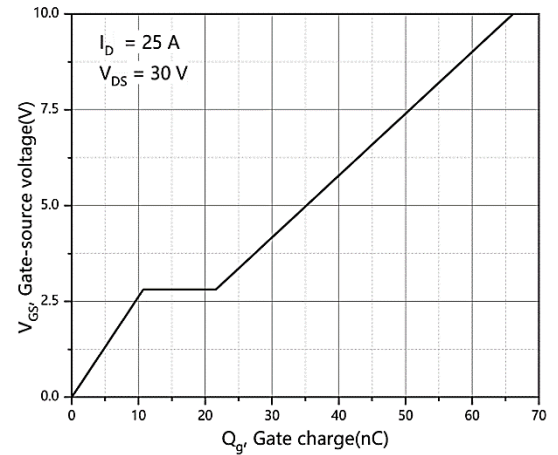


Figure 4. Typ. gate charge

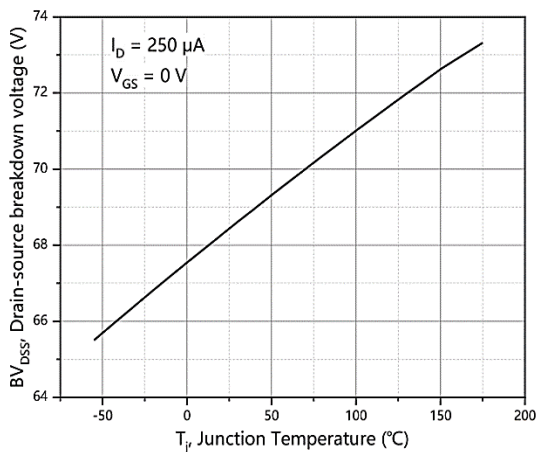


Figure 5. Drain-source breakdown voltage

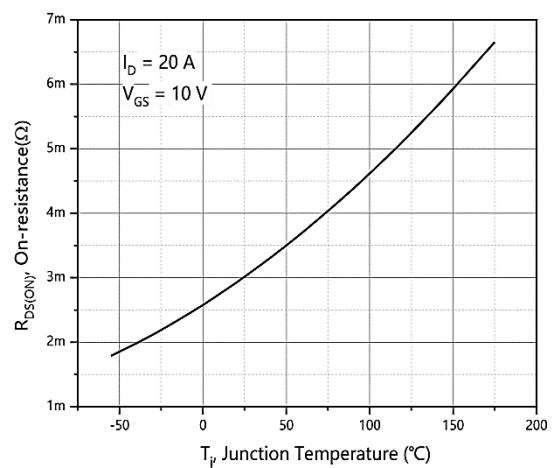


Figure 6. Drain-source on-state resistance

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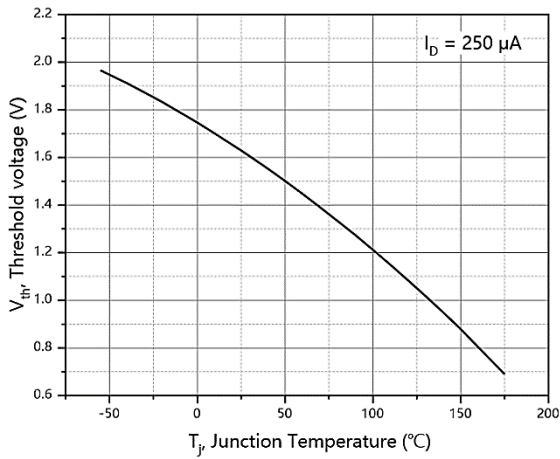


Figure 7. Threshold voltage

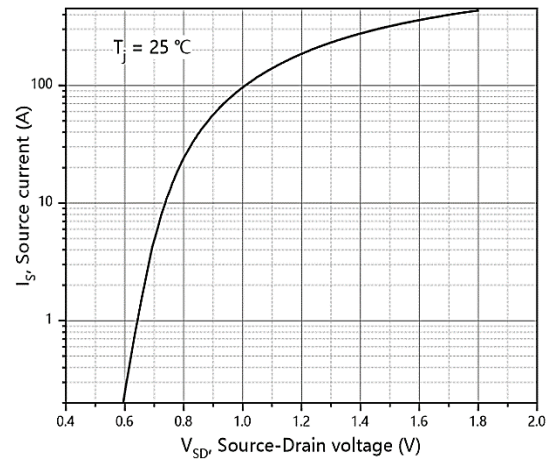


Figure 8. Forward characteristic of body diode

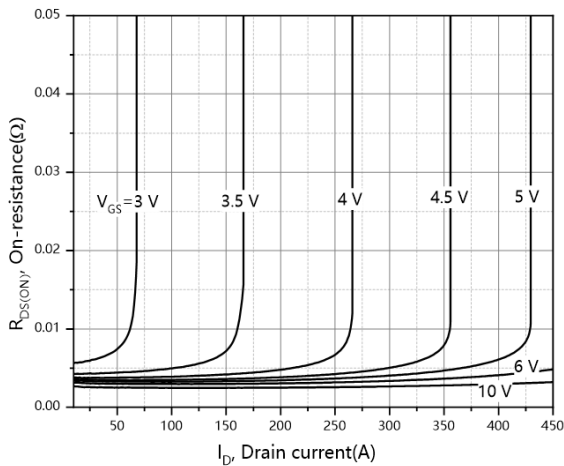


Figure 9. Drain-source on-state resistance

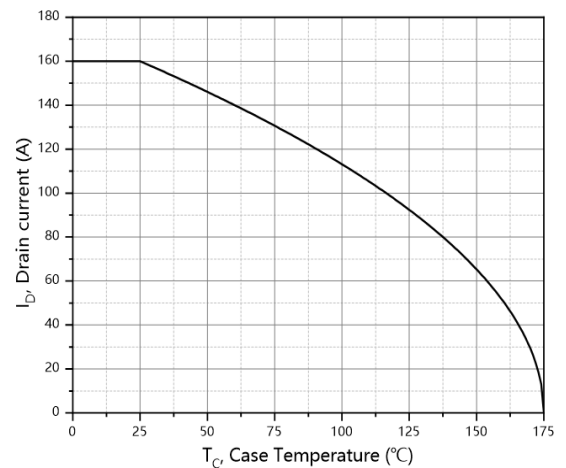


Figure 10. Drain current

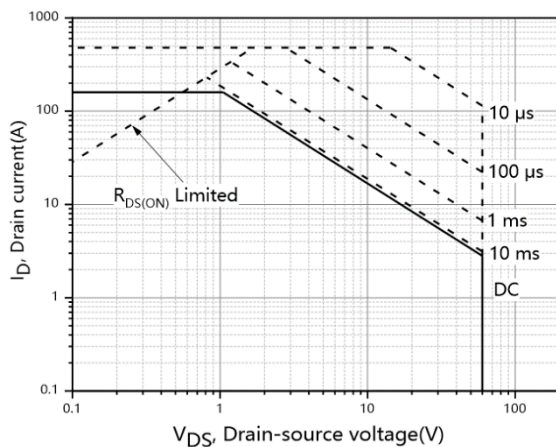


Figure 11. Safe operation area $T_C=25\text{ }^{\circ}\text{C}$

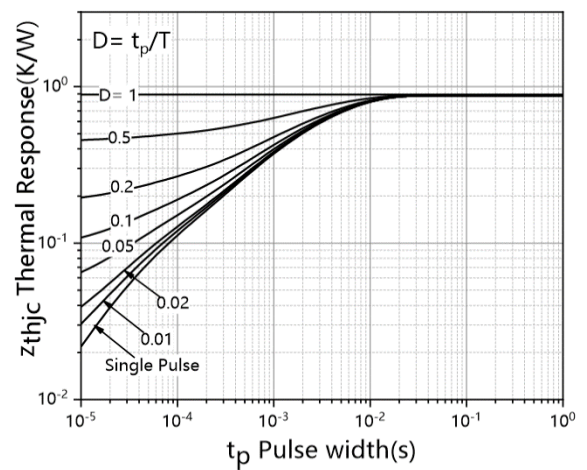
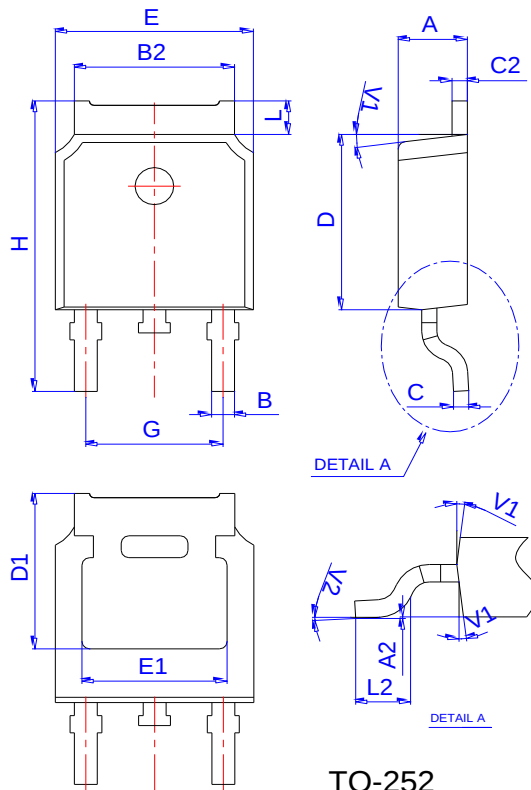


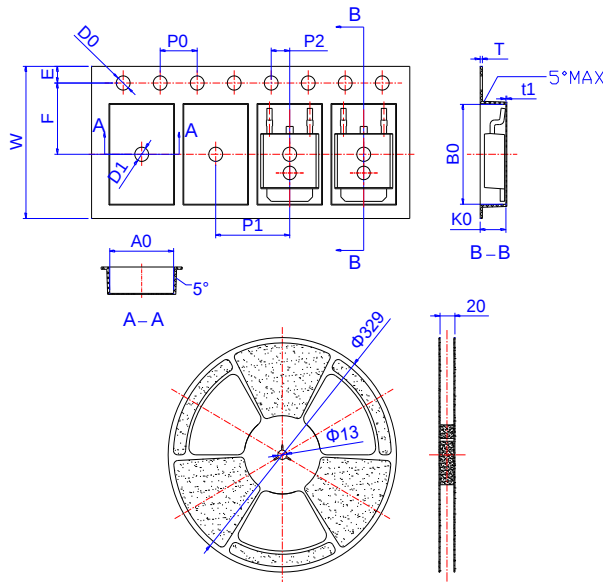
Figure 12. Max. transient thermal impedance

Package Mechanical Data



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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APG130N06D

60V N-Channel Enhancement Mode MOSFET

Edition	Date	Change
Rve1.1	2018/1/31	Initial release
Rve1.2	2021/8/23	Reduce RDS(on)

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