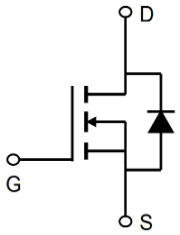
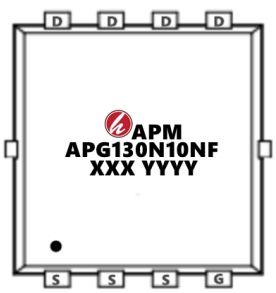
# APG130N10NF

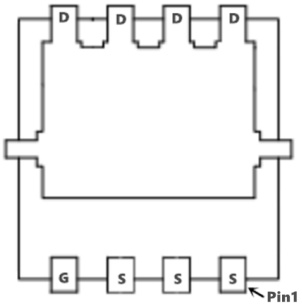
## 100V N-Channel Enhancement Mode MOSFET

### Description

The APG120N10NF uses advanced APM-SGTII 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 $I_D$ =120A

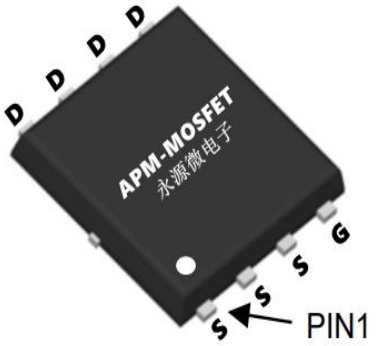
$R_{DS(ON)}$ < 4.2mΩ @ $V_{GS}$=10V **(Type：3.2mΩ)**

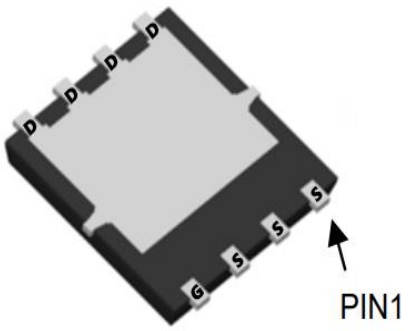
### Application

Isolated DC

Motor control

Synchronous-rectification




### Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|---|---|---|---|
| APG130N10NF | PDFN5*6-8L | APG130N10NF XXX YYYY | 5000 |

### 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 |
| $I_D$@$T_A$=25℃ | Continuous Drain Current[1] | 130 | A |
| $I_D$@$T_A$=70℃ | Continuous Drain Current[1] | 78 | A |
| IDM | Pulsed Drain Current[2] | 480 | A |
| EAS | Single Pulse Avalanche Energy[3] | 320 | mJ |
| IAS | Avalanche Current | 40 | A |
| $P_D$@$T_A$=25℃ | Total Power Dissipation[4] | 131.6 | W |
| TSTG | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | ℃ |
| $R_{\theta}JA$ | Thermal Resistance Junction-Ambient [1] | 25 | ℃/W |
| $R_{\theta}JC$ | Thermal Resistance Junction-Case[1] | 0.95 | ℃/W |

## Electrical Characteristics ($T_C$=25℃unless otherwise noted)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| V(BR)DSS | Drain-Source Breakdown Voltage | $V_{GS}$ = 0V, $I_D$ = 250μA | 100 | 107 | - | V |
| IGSS | Gate-body Leakage current | $V_{DS}$ = 0V, $V_{GS}$ = ±20V | - | - | ±100 | nA |
| IDSS | Zero Gate Voltage Drain Current $T_J$=25°C | $V_{DS}$ =100V, $V_{GS}$ = 0V | - | - | 1 | μA |
| | Zero Gate Voltage Drain Current $T_J$=100°C | | - | - | 100 | |
| VGS(th) | Gate-Threshold Voltage | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 1.2 | 1.8 | 2.5 | V |
| RDS(on) | Drain-Source on-Resistance[4] | $V_{GS}$ = 10V, $I_D$ = 20A | - | 3.2 | 4.5 | mΩ |
| | | $V_{GS}$ = 4.5V, $I_D$ = 15A | - | 5.2 | 6.7 | |
| gfs | Forward Transconductance[4] | $V_{DS}$ = 10V, $I_D$ = 20A | - | 70 | - | S |
| Ciss | Input Capacitance | $V_{DS}$ = 50V, $V_{GS}$ =0V, f =1MHz | - | 5475 | - | pF |
| Coss | Output Capacitance | | - | 768 | - | |
| Crss | Reverse Transfer Capacitance | | - | 22 | - | |
| $R_g$ | Gate Resistance | f =1MHz | - | 1.3 | - | Ω |
| $Q_g$ | Total Gate Charge | $V_{GS}$ = 10V, $V_{DS}$ = 50V, $I_D$=20A | - | 111.2 | - | nC |
| Qgs | Gate-Source Charge | | - | 17.5 | - | |
| Qgd | Gate-Drain Charge | | - | 30.2 | - | |
| td(on) | Turn-on Delay Time | $V_{GS}$ =10V, $V_{DD}$ =50V, $R_G$ = 3Ω, $I_D$= 20A | - | 22.2 | - | ns |
| $t_r$ | Rise Time | | - | 37.8 | - | |
| td(off) | Turn-off Delay Time | | - | 95.2 | - | |
| $t_f$ | Fall Time | | - | 35.6 | - | |
| trr | Body Diode Reverse Recovery Time | $I_F$ = 20A, dI/dt=100A/μs | - | 59.4 | - | ns |
| $Q_{rr}$ | Body Diode Reverse Recovery Charge | | - | 91.8 | - | nC |
| VSD | Diode Forward Voltage[4] | $I_S$ = 20A, $V_{GS}$ = 0V | - | - | 1.2 | V |
| IS | Continuous Source Current $T_C$=25°C | - | - | - | 120 | A |

**Note :**

1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3、The EAS data shows Max. rating . The test condition is VDD=72V,VGS=10V, L=0.1mH IAS=40A

4、The power dissipation is limited by 150℃ junction temperature

5、The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation

## Typical Characteristics

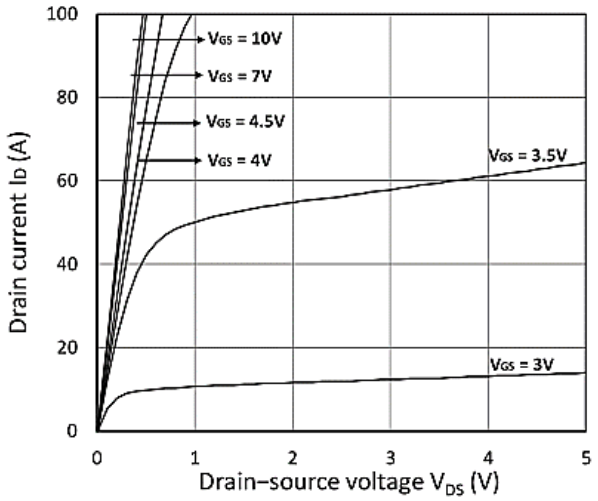



Figure 1. Output Characteristics

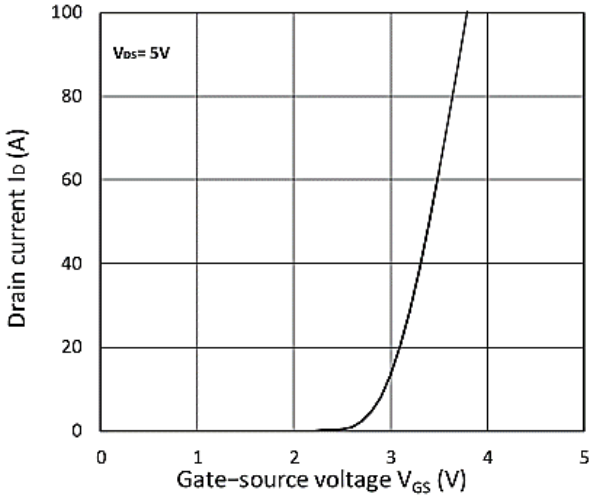



Figure 2. Transfer Characteristics

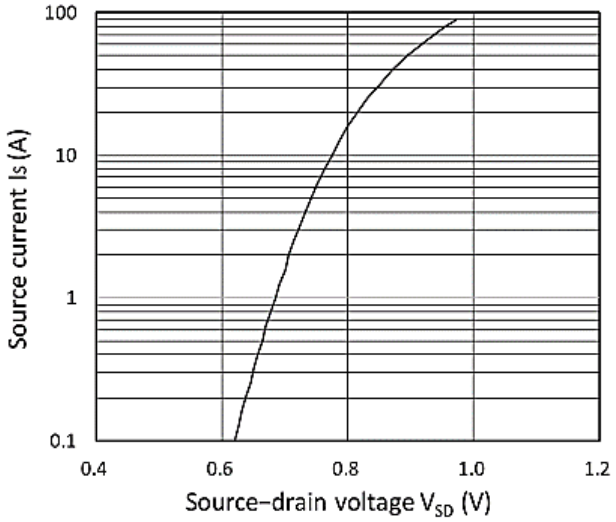



Figure 3. Forward Characteristics of Reverse

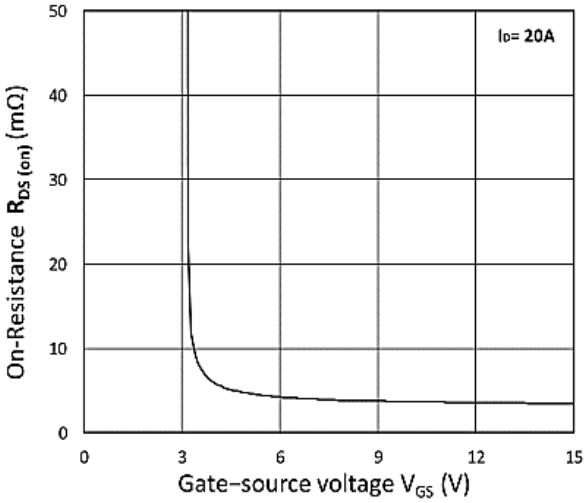



Figure 4. RDS(ON) vs. VGS

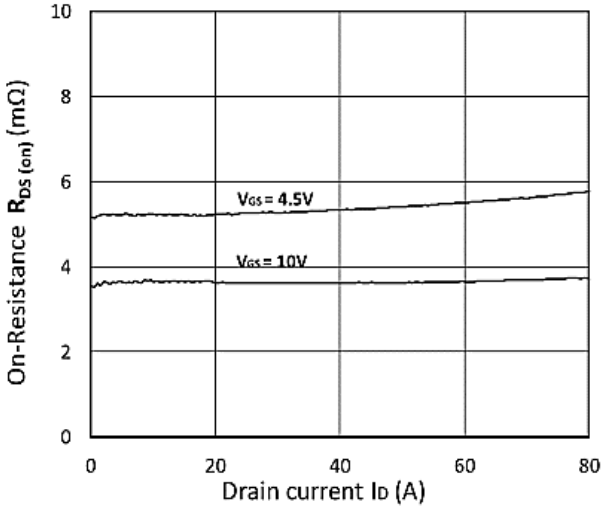



Figure 5. RDS(ON) vs. ID

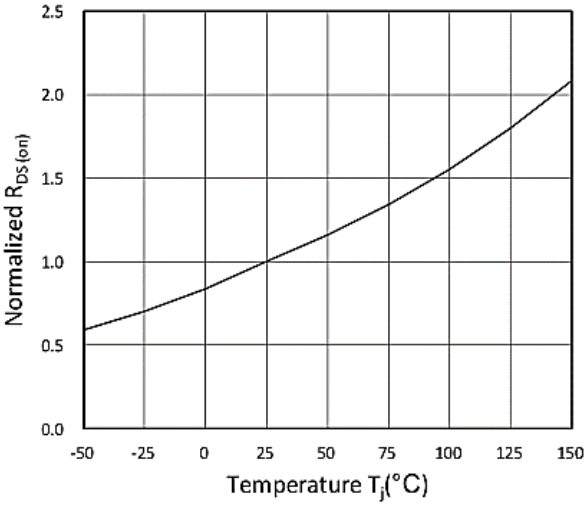



Figure 6. Normalized RDS(on) vs. Temperature

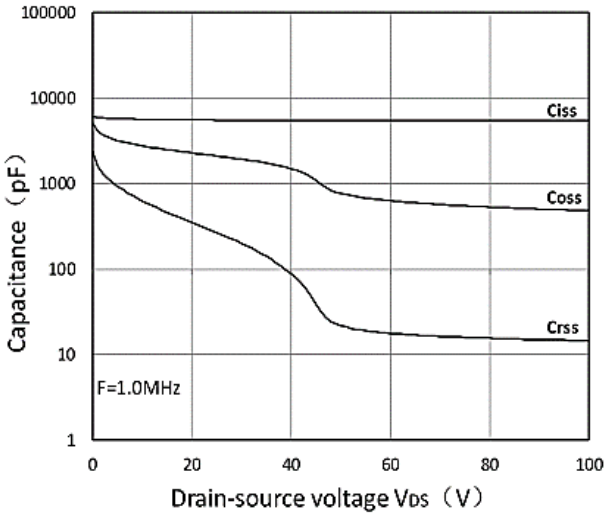



Figure 7. Capacitance Characteristics

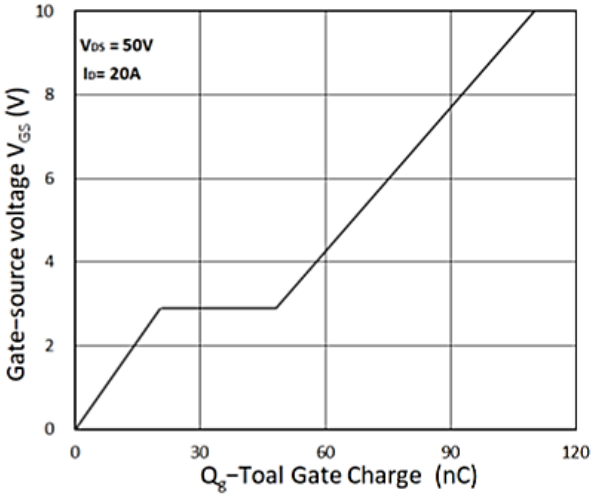



Figure 8. Gate Charge Characteristics

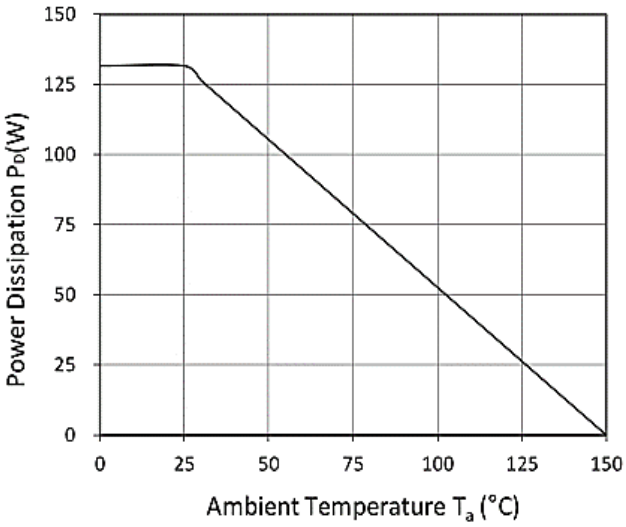



Figure 9. Power Dissipation

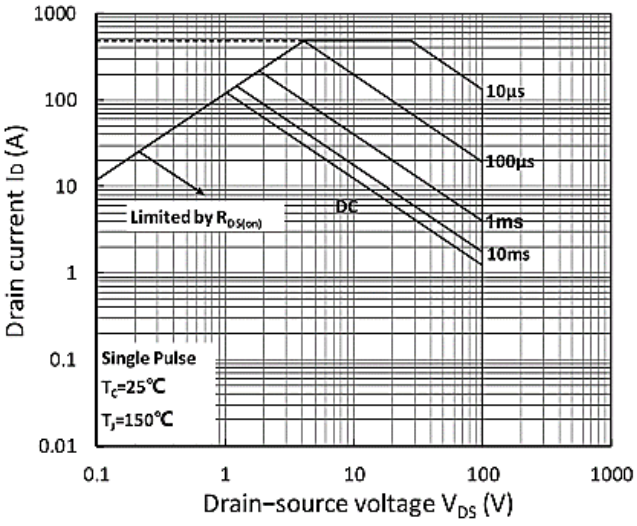



Figure10. Safe Operating Area

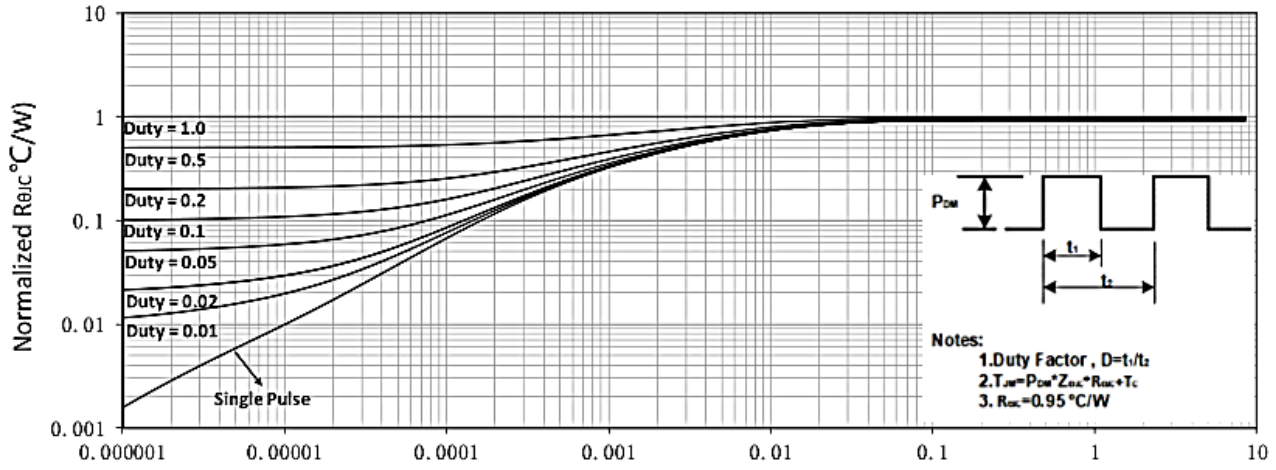
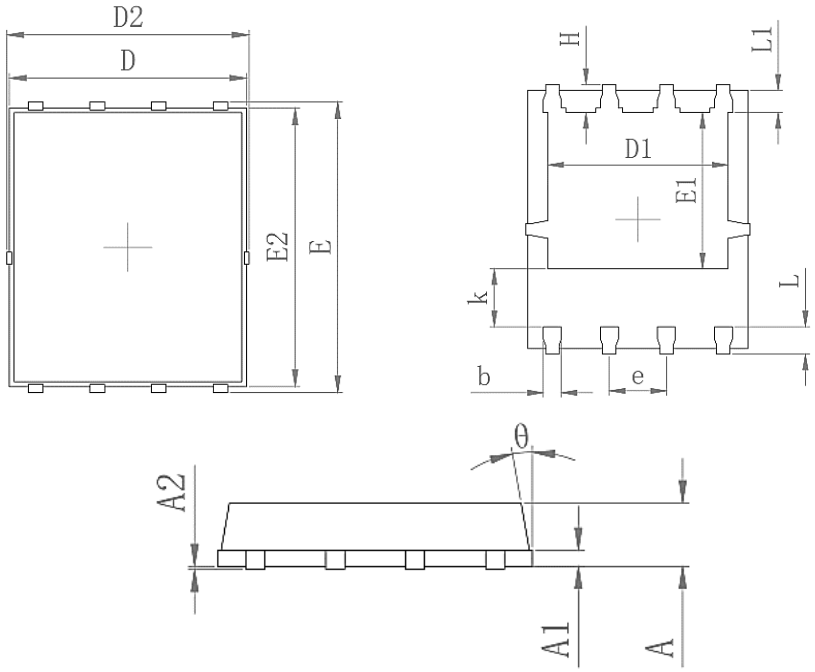



Figure 11. Normalized Maximum Transient Thermal Impedance

## Package Mechanical Data-PDFN5X6-8L-XZT Single




| Symbol | Common | |
|---|---|---|
| | mm | |
| | Mim | Max |
| A | 0.90 | 1.10 |
| A1 | 0.254 REF | |
| A2 | 0-0.05 | |
| D | 4.824 | 4.976 |
| D1 | 3.910 | 4.110 |
| D2 | 4.944 | 5.076 |
| E | 5.924 | 6.076 |
| E1 | 3.375 | 3.575 |
| E2 | 5.674 | 5.826 |
| b | 0.350 | 0.450 |
| e | 1.270 | |
| L | 0.534 | 0.686 |
| L1 | 0.424 | 0.576 |
| K | 1.190 | 1.390 |
| H | 0.549 | 0.701 |
| Φ | 8° | 12° |

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# APG130N10NF

## 100V N-Channel Enhancement Mode MOSFET

| Edition | Date | Change |
|---|---|---|
| Rve1.0 | 2021/1/31 | Initial release |