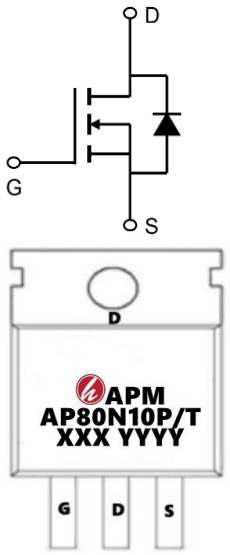
# AP80N10P/T

## 100V N-Channel Enhancement Mode MOSFET

### Description

The AP80N10P/T uses advanced APM-SGTⅡtechnology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.




### General Features

$V_{DS}$ = 100V $I_D$ =80A

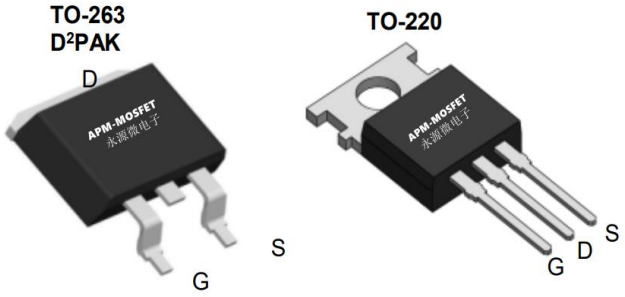
$R_{DS(ON)}$ < 12mΩ @ $V_{GS}$=10V **(Type：8.0mΩ)**

### Application

Isolated DC

Motor control

Synchronous-rectification




### Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|---|---|---|---|
| AP80N10P | TO-220-3L | AP80N10P XXX YYYY | 1000 |
| AP80N10T | TO-263-3L | AP80N10T XXX YYYY | 800 |

### Absolute Maximum Ratings ($T_C$=25℃unless otherwise noted)

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| VDS | Drain source voltage | 100 | V |
| VGS | Gate source voltage | ±20 | V |
| ID | Continuous drain current, TC=25℃ | 80 | A |
| IDM | Pulsed drain current, TC=25 ℃ | 210 | A |
| PD | Power dissipation, TC=25 ℃ | 107 | W |
| EAS | Single pulsed avalanche energy4) | 183.8 | mJ |
| Tstg，Tj | Operation and storage temperature | -55 to 150 | ℃ |
| RθJC | Thermal resistance, junction-case | 1.17 | °C/W |
| RθJA | Thermal resistance, junction-ambient4) | 62 | °C/W |

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

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| BVDSS | Drain-source breakdown voltage | $V_{GS}$=0 V, $I_D$=250 μA | 100 | 111 | | V |
| VGS(th) | Gate threshold voltage | $V_{DS}$=$V_{GS}$, $I_D$=250 μA | 2.0 | 3.0 | 4.0 | V |
| RDS(ON) | Drain-source on-state resistance | $V_{GS}$=10 V, $I_D$=20 A | | 8 | 12.0 | mΩ |
| RDS(ON) | Drain-source on-state resistance | $V_{GS}$=4.5 V, $I_D$=12 A | | 12 | 14.0 | mΩ |
| IGSS | Gate-source leakage current | $V_{GS}$=±20 V | | | ±100 | nA |
| IDSS | 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 |
| Ciss | Input capacitance | $V_{GS}$=0 V, $V_{DS}$=50 V, $f$=100 kHz | | 1998.1 | | pF |
| Coss | Output capacitance | | | 321.7 | | pF |
| Crss | Reverse transfer capacitance | | | 7.1 | | pF |
| td(on) | Turn-on delay time | $V_{GS}$=10 V, | | 22.1 | | ns |
| $t_r$ | Rise time | $V_{DS}$=50 V, | | 5.2 | | ns |
| td(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, $V_{DS}$=50 V, $V_{GS}$=10 V | | 28.9 | | nC |
| $Q_{gs}$ | Gate-source charge | | | 6 | | nC |
| Qgd | Gate-drain charge | | | 6.8 | | nC |
| Vplateau | Gate plateau voltage | | | 3.7 | | V |
| $I_S$ | Diode forward current | VGS<Vth | | | 60 | A |
| ISP | Pulsed source current | | | | 180 | |
| VSD | Diode forward voltage | $I_S$=20 A, $V_{GS}$=0 V | | | 1.3 | V |
| trr | Reverse recovery time | $I_S$=25 A, di/dt=100 A/μs | | 102.9 | | ns |
| $Q_{rr}$ | Reverse recovery charge | | | 379 | | nC |
| Irrm | Peak reverse recovery current | | | 6.4 | | 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=30V,VGS=10V, L=0.3mH, starting Tj=25°C

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

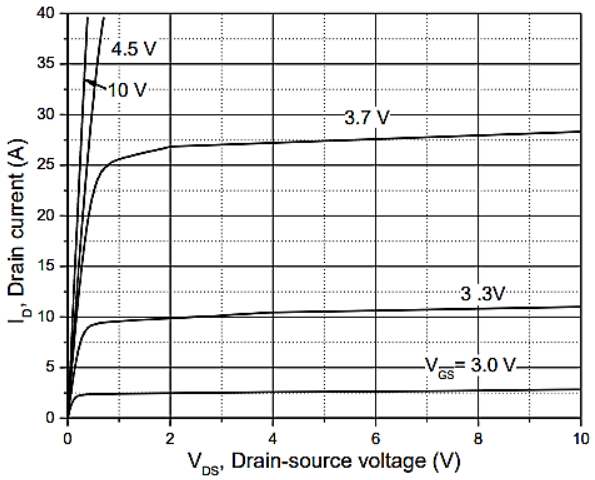



**Figure 1. Typ. output characteristics**

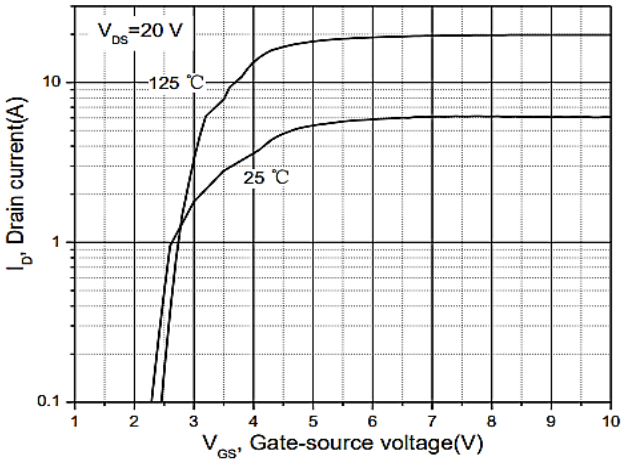



**Figure 2. Typ. transfer characteristics**

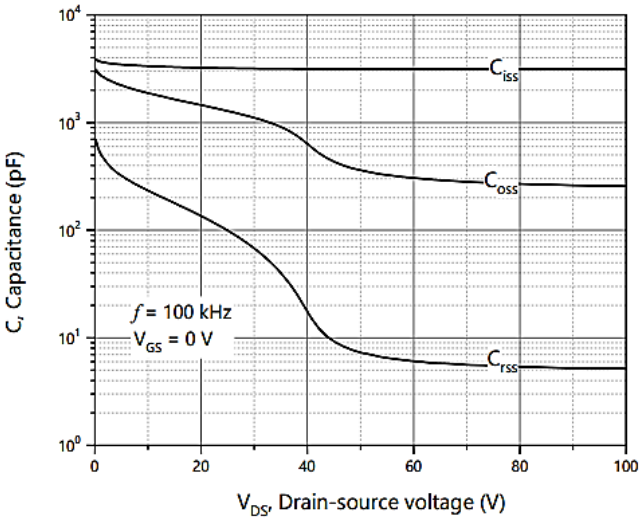



**Figure 3. Typ. capacitances**

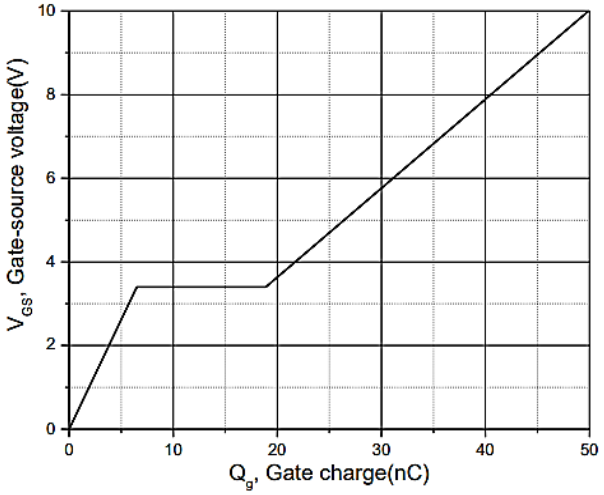



**Figure 4. Typ. gate charge**

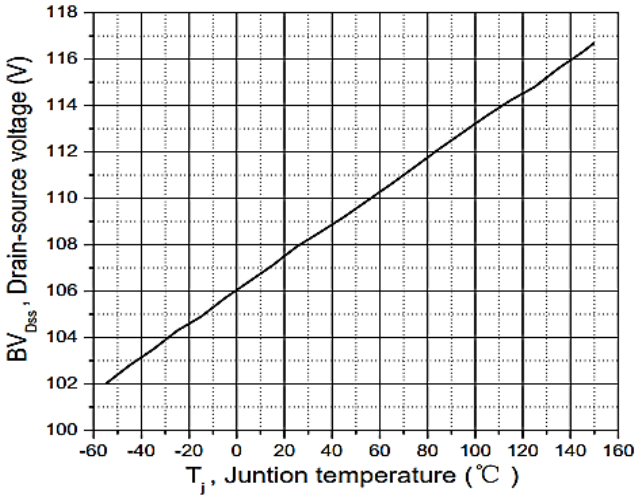



**Figure 5. Drain-source breakdown voltage**

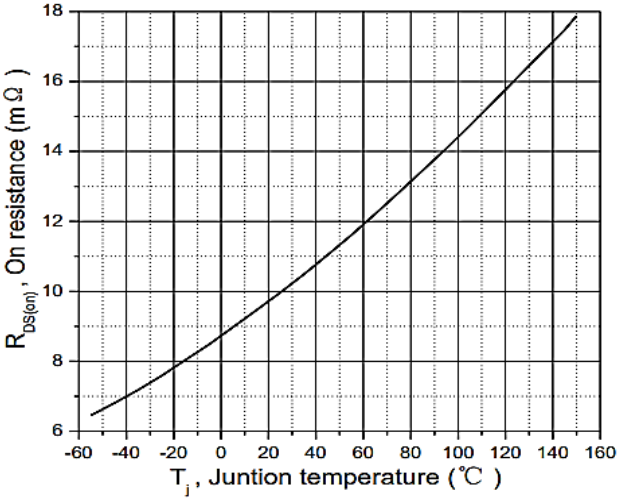



**Figure 6. Drain-source on-state resistance**

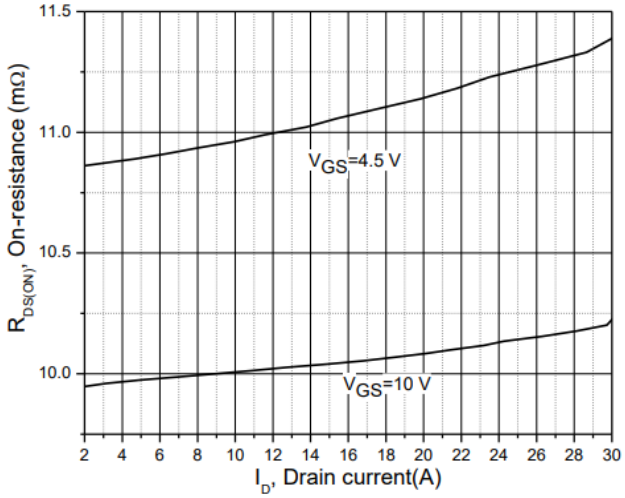



**Figure 7. Drain-source on-state resistance**

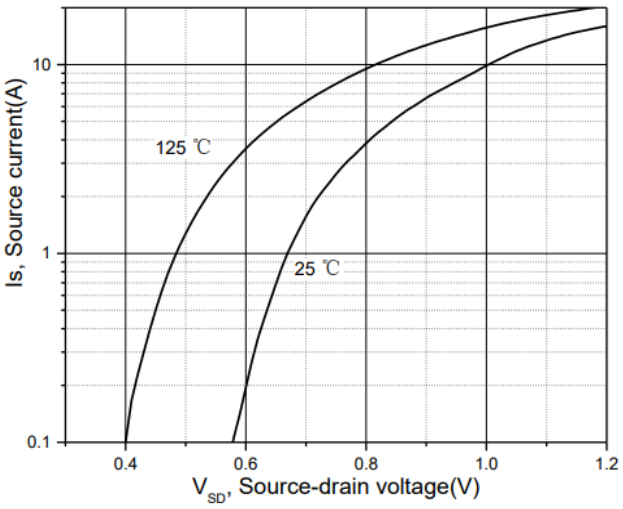



**Figure 8. Forward characteristic of body diode**

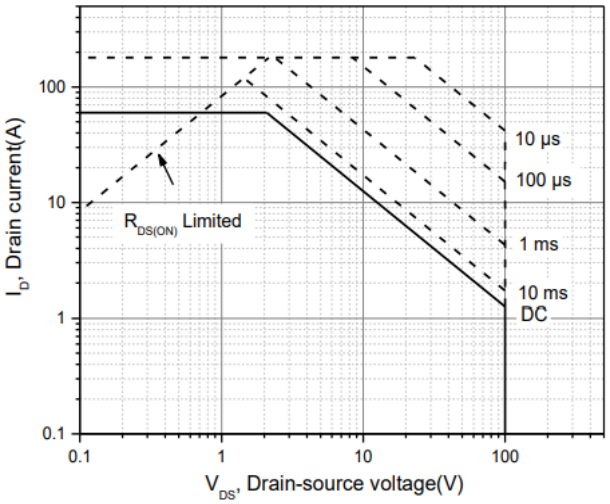
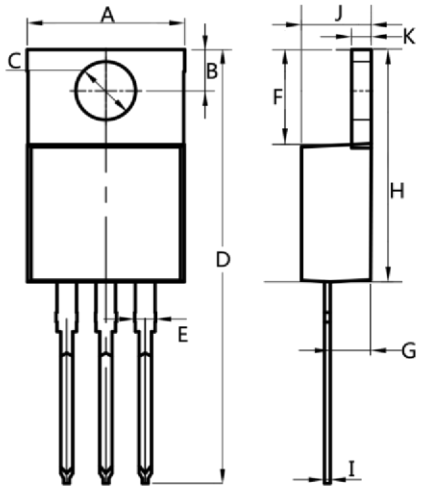



**Figure 9. Safe operation area $T_C$=25 ℃**

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 | | |

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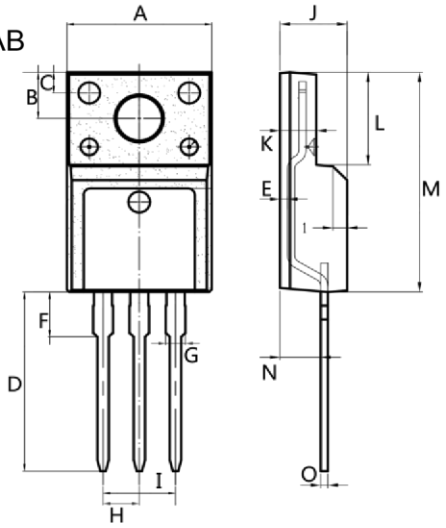


| Dim. | Min. | Max. |
|---|---|---|
| A | 9.9 | 10.3 |
| B | 2.9 | 3.5 |
| C | 1.15 | 1.45 |
| D | 12.75 | 13.25 |
| E | 0.55 | 0.75 |
| F | 3.1 | 3.5 |
| G | 1.25 | 1.45 |
| H | Typ 2.54 | |
| I | Typ 5.08 | |
| J | 4.55 | 4.75 |
| K | 2.4 | 2. 7 |
| L | 6.35 | 6.75 |
| M | 15.0 | 16.0 |
| N | 2.75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

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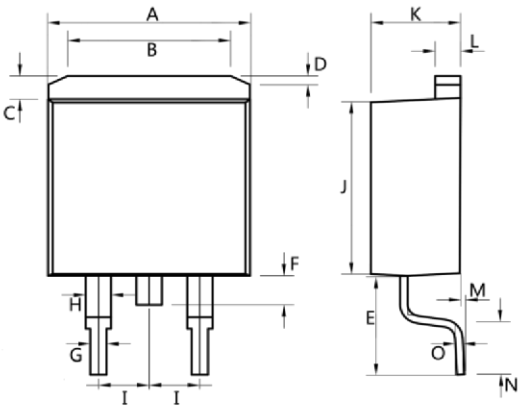


| Dim. | Min. | Max. |
|---|---|---|
| A | 10.0 | 10. 5 |
| B | 7.25 | 7.75 |
| C | 1.3 | 1.5 |
| D | 0.55 | 0.75 |
| E | 5.0 | 6.0 |
| F | 1.4 | 1.6 |
| G | 0.75 | 0.95 |
| H | 1.15 | 1.35 |
| I | Typ 2.54 | |
| J | 8.4 | 8.6 |
| K | 4.4 | 4.6 |
| L | 1.25 | 1.45 |
| M | 0.02 | 0.1 |
| N | 2.4 | 2.8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

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# AP80N10P/T

## 100V N-Channel Enhancement Mode MOSFET

| Edition | Date | Change |
|---|---|---|
| Rve1.0 | 2018/1/31 | Initial release |