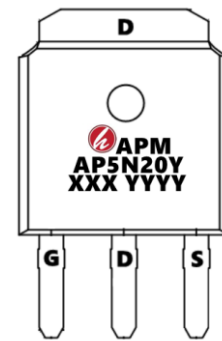
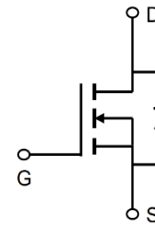


200V N-Channel Enhancement Mode MOSFET

Description

The AP5N20Y is silicon N-channel Enhanced VDMOSFETs, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.



General Features

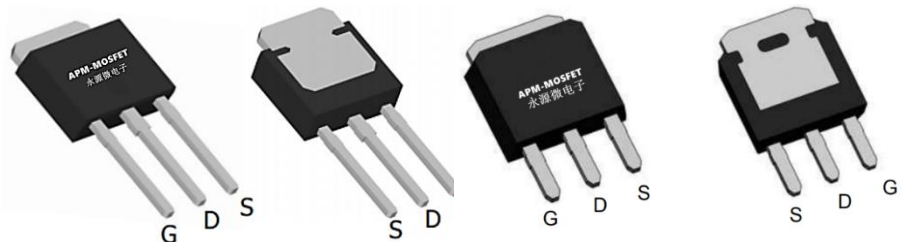
VDS =200V, ID =5A

RDS(ON) <600mΩ@ VGS=10V (Type: 530mΩ)

Application

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)



Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|------------|------------|------------------|----------|
| AP5N20Y | TO-251L-3L | AP5N20Y XXX YYYY | 4000 |
| AP5N20Y | TO-251S-3L | AP5N20Y XXX YYYY | 4000 |

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

| Symbol | Parameter | Value | Unit |
|----------|--|----------|--------------------|
| VDSS | Drain-Source Voltage ($V_{GS} = 0V$) | 200 | V |
| I_D | Continuous Drain Current | 5 | A |
| IDM | Pulsed Drain Current | 20 | A |
| VGSS | Gate-Source Voltage | ± 20 | V |
| EAS | Single Pulse Avalanche Energy | 45 | mJ |
| IAR | Avalanche Current | 3 | A |
| EAR | Repetitive Avalanche Energy | 3.2 | mJ |
| P_D | Power Dissipation ($T_C = 25^\circ\text{C}$) | 46 | W |
| RthJC | Thermal Resistance, Junction-to-Case | 2.7 | $^\circ\text{C/W}$ |
| RthJA | Thermal Resistance, Junction-to-Ambient | 60 | $^\circ\text{C/W}$ |
| TJ, Tstg | Operating Junction and Storage Temperature Range | -55~+150 | $^\circ\text{C}$ |

200V N-Channel Enhancement Mode MOSFET

Electrical Characteristics (T_J=25°C, unless otherwise noted)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|------------------|------------------------------------|--|------|------|------|------|
| V(BR)DSS | Drain-Source Breakdown Voltage | V _{GS} = 0V, I _D = 250μA | 200 | 221 | -- | V |
| IDSS | Zero Gate Voltage Drain Current | V _{DS} = 200V, V _{GS} = 0V, T _J = 25°C | -- | -- | 5 | μA |
| IDSS | | V _{DS} = 160V, V _{GS} = 0V, T _J = 125°C | -- | -- | 100 | |
| IGSS | Gate-Source Leakage | V _{GS} = ±20V | -- | -- | ±100 | nA |
| VGS(th) | Gate-Source Threshold Voltage | V _{DS} = V _{GS} , I _D = 250μA | 1.0 | 1.6 | 3.0 | V |
| RDS(on) | Drain-Source On-Resistance (Note3) | V _{GS} = 10V, I _D = 2.5A | -- | 530 | 600 | mΩ |
| C _{iss} | Input Capacitance | V _{GS} = 0V, V _{DS} = 25V, f = 1.0MHz | -- | 228 | -- | pF |
| C _{oss} | Output Capacitance | | -- | 48 | -- | |
| C _{rss} | Reverse Transfer Capacitance | | -- | 17 | -- | |
| Q _g | Total Gate Charge | V _{DD} = 160V, I _D = 5.0A, V _{GS} = 10V | -- | 18 | -- | nC |
| Q _{gs} | Gate-Source Charge | | -- | 1.5 | -- | |
| Q _{gd} | Gate-Drain Charge | | -- | 9.5 | -- | |
| td(on) | Turn-on Delay Time | V _{DD} = 100V, I _D = 5.0A, R _G = 25 Ω | -- | 10 | -- | ns |
| t _r | Turn-on Rise Time | | -- | 19 | -- | |
| td(off) | Turn-off Delay Time | | -- | 43 | -- | |
| t _f | Turn-off Fall Time | | -- | 32 | -- | |
| I _S | Continuous Body Diode Current | T _C = 25 °C | -- | -- | 5 | A |
| ISM | Pulsed Diode Forward Current | | -- | -- | 20 | |
| V _{SD} | Body Diode Voltage | T _J = 25°C, I _{SD} = 5A, V _{GS} = 0V | -- | -- | 1.4 | V |
| t _{rr} | Reverse Recovery Time | V _{GS} = 0V, I _S = 5A, di _F /dt = 100A/μs | -- | 160 | -- | ns |
| Q _{rr} | Reverse Recovery Charge | | -- | 1.5 | -- | μC |

Note :

- 1、 The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、 The EAS data shows Max. rating . I_{AS} = 3A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25 °C
- 3、 The test condition is Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%
- 4、 The power dissipation is limited by 150°C 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.



200V N-Channel Enhancement Mode MOSFET

Typical Characteristics

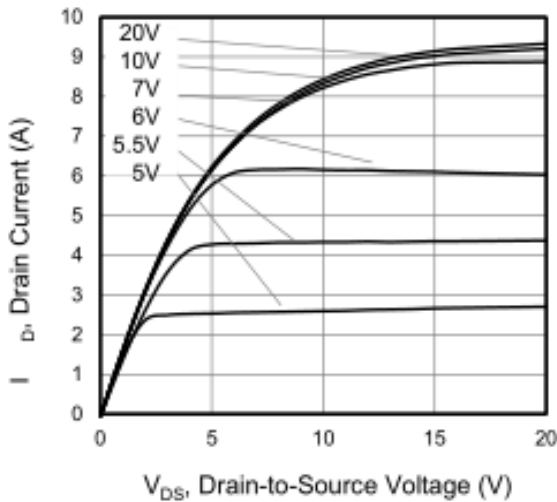


Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

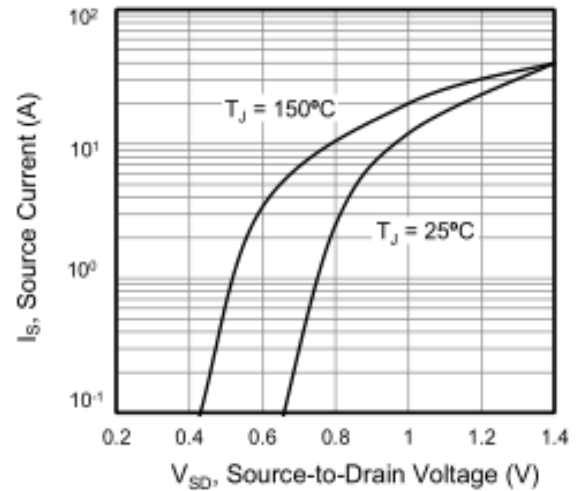


Figure 2. Body Diode Forward Voltage

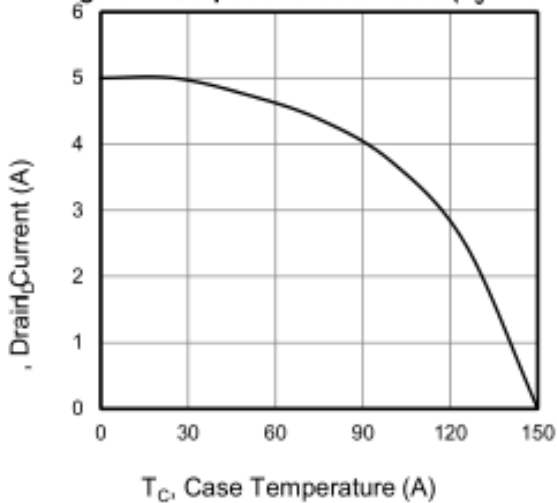


Figure 3. Drain Current vs. Temperature

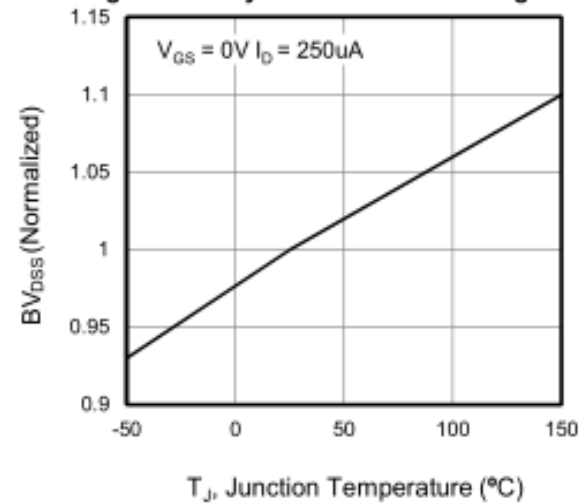


Figure 4. BV_{DSS} Variation vs. Temperature

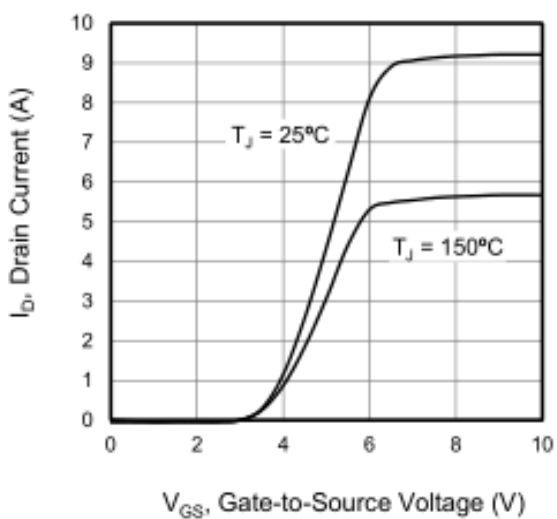


Figure 5. Transfer Characteristics

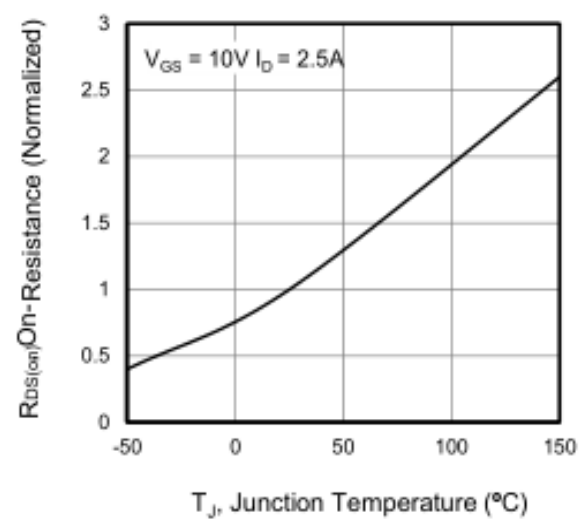


Figure 6. On-Resistance vs. Temperature

200V N-Channel Enhancement Mode MOSFET

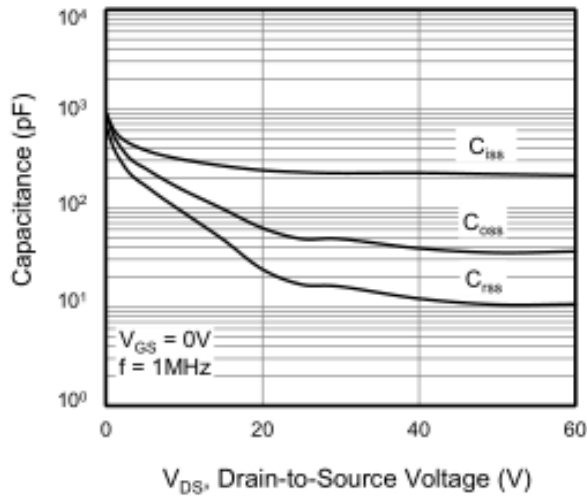


Figure 7. Capacitance

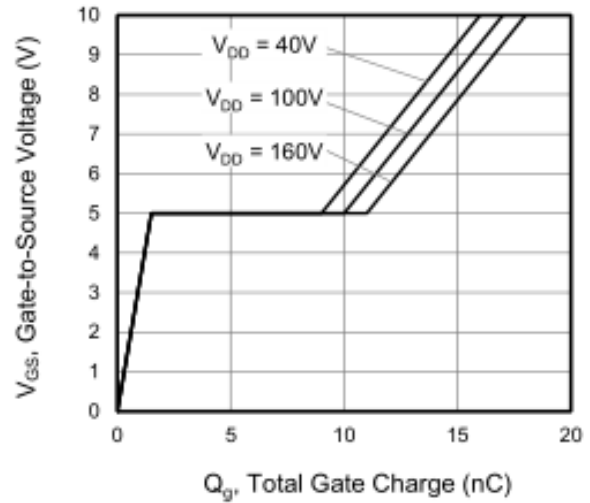


Figure 8. Gate Charge

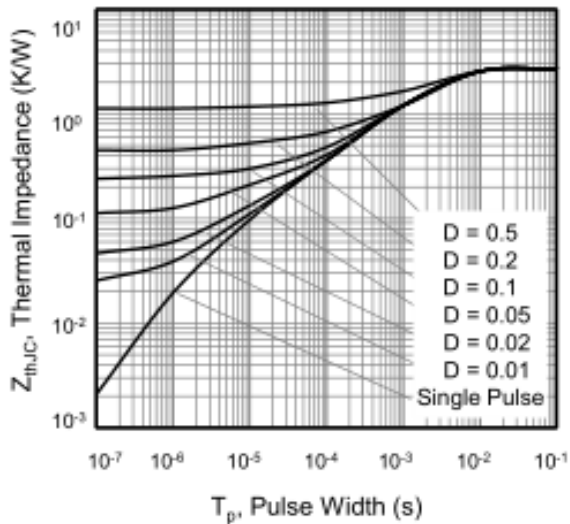
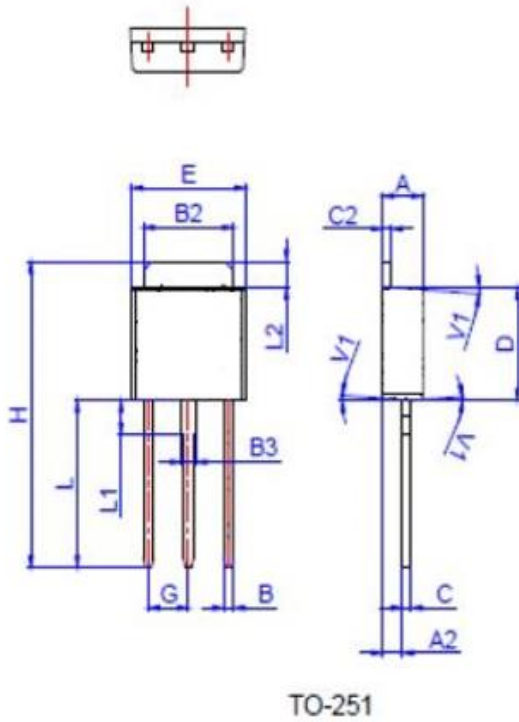


Figure 10. Transient Thermal Impedance

200V N-Channel Enhancement Mode MOSFET Package Mechanical Data-TO-251L-3L



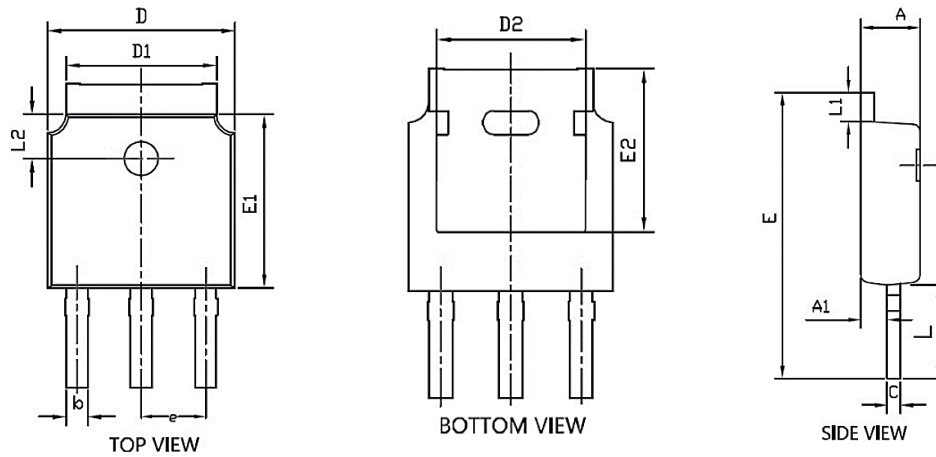
| Ref. | Dimensions | | | | | |
|------|-------------|------|------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.20 | | 2.40 | 0.086 | | 0.095 |
| A2 | 0.90 | | 1.20 | 0.035 | | 0.047 |
| B | 0.55 | | 0.65 | 0.022 | | 0.026 |
| B2 | 5.10 | | 5.40 | 0.200 | | 0.213 |
| B3 | 0.76 | | 0.85 | 0.030 | | 0.033 |
| C | 0.45 | | 0.62 | 0.018 | | 0.024 |
| C2 | 0.48 | | 0.62 | 0.019 | | 0.024 |
| D | 6.00 | | 6.20 | 0.236 | | 0.244 |
| E | 6.40 | | 6.70 | 0.252 | | 0.264 |
| G | | 2.30 | | | 0.091 | |
| H | 16.0 | | 17.0 | 0.630 | | 0.669 |
| L | 8.90 | | 9.40 | 0.350 | | 0.370 |
| L1 | 1.80 | | 1.90 | 0.071 | | 0.075 |
| L2 | 1.37 | | 1.50 | 0.054 | | 0.059 |
| V1 | | 4° | | | 4° | |

Package Information -TO-251

| OUTLINE | TUBE (PCS) | INNER BOX (PCS) | PER CARTON (PCS) |
|---------|------------|-----------------|------------------|
| TUBE | 80 | 4,000 | 32,000 |

200V N-Channel Enhancement Mode MOSFET

Package Mechanical Data-TO-251S-3L



| Symbol | Common | | |
|--------|----------|------|------|
| | mm | | |
| | Mim | Nom | Max |
| A | 2.2 | 2.3 | 2.4 |
| A1 | 0.9 | 1.0 | 1.1 |
| b | 0.66 | 0.76 | 0.86 |
| C | 0.46 | 0.52 | 0.58 |
| D | 6.50 | 6.6 | 6.7 |
| D1 | 5.15 | 5.3 | 5.45 |
| D2 | 4.6 | 4.8 | 4.95 |
| E | 10.4 | ---- | 11.5 |
| E1 | 6.0 | 6.1 | 6.2 |
| E2 | 5.400REF | | |
| e | 2.286BSC | | |
| L | 3.5 | 4.0 | 4.3 |
| L1 | 0.9 | --- | 1.27 |
| L2 | 1.4 | --- | 1.9 |

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200V N-Channel Enhancement Mode MOSFET

| Edition | Date | Change |
|---------|-----------|-----------------|
| Rve1.0 | 2020/5/31 | Initial release |

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