

SIPMOS® Power-Transistor

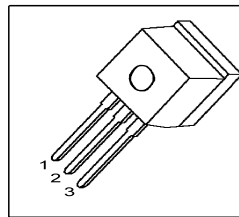
Feature

- N-Channel
- Enhancement mode
- 175°C operating temperature
- Avalanche rated
- dv/dt rated

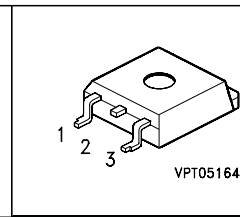
Product Summary

| | | |
|--------------|------|----|
| V_{DS} | 100 | V |
| $R_{DS(on)}$ | 180 | mΩ |
| I_D | 10.3 | A |

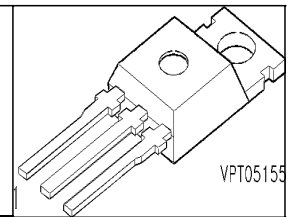
P-TO262-3-1



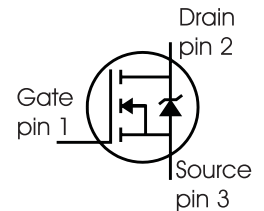
P-TO263-3-2



P-TO220-3-1



| Type | Package | Ordering Code | Marking |
|----------|-------------|---------------|---------|
| SPP10N10 | P-TO220-3-1 | - | 10N10 |
| SPB10N10 | P-TO263-3-2 | - | 10N10 |
| SPI10N10 | P-TO262-3-1 | - | 10N10 |



Maximum Ratings, at $T_j = 25\text{ °C}$, unless otherwise specified

| Parameter | Symbol | Value | Unit |
|---|---------------------|-------------|-------------------|
| Continuous drain current $T_C=25\text{ °C}$ $T_C=100\text{ °C}$ | I_D | 10.3 - | A |
| Pulsed drain current $T_C=25\text{ °C}$ | $I_{D\text{ puls}}$ | 41.2 | |
| Avalanche energy, single pulse $I_D=10.3\text{ A}$, $V_{DD}=25\text{ V}$, $R_{GS}=25\text{ }\Omega$ | E_{AS} | 60 | mJ |
| Reverse diode dv/dt $I_S=10.3\text{ A}$, $V_{DS}=80\text{ V}$, $di/dt=200\text{ A}/\mu\text{s}$, $T_{jmax}=175\text{ °C}$ | dv/dt | 6 | kV/ μs |
| Gate source voltage | V_{GS} | ± 20 | V |
| Power dissipation $T_C=25\text{ °C}$ | P_{tot} | 50 | W |
| Operating and storage temperature | T_j, T_{stg} | -55... +175 | °C |
| IEC climatic category; DIN IEC 68-1 | | 55/175/56 | |

Thermal Characteristics

| Parameter | Symbol | Values | | | Unit |
|--|------------|--------|------|------|------|
| | | min. | typ. | max. | |
| Characteristics | | | | | |
| Thermal resistance, junction - case | R_{thJC} | - | - | 3 | K/W |
| Thermal resistance, junction - ambient, leaded | R_{thJA} | - | - | 100 | |
| SMD version, device on PCB: | R_{thJA} | | | | |
| @ min. footprint | | - | - | 75 | |
| @ 6 cm ² cooling area ¹⁾ | | - | - | 50 | |

Electrical Characteristics, at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|--|---------------|--------|------|------|------------|
| | | min. | typ. | max. | |
| Static Characteristics | | | | | |
| Drain-source breakdown voltage $V_{GS}=0V, I_D=1mA$ | $V_{(BR)DSS}$ | 100 | - | - | V |
| Gate threshold voltage, $V_{GS} = V_{DS}$ $I_D = 21\ \mu A$ | $V_{GS(th)}$ | 2.1 | 3 | 4 | |
| Zero gate voltage drain current $V_{DS}=100V, V_{GS}=0V, T_j=25^\circ C$ $V_{DS}=100V, V_{GS}=0V, T_j=125^\circ C$ | I_{DSS} | - | 0.01 | 1 | μA |
| | | - | 1 | 100 | |
| Gate-source leakage current $V_{GS}=20V, V_{DS}=0V$ | I_{GSS} | - | 1 | 100 | nA |
| Drain-source on-state resistance $V_{GS}=10V, I_D=-A$ | $R_{DS(on)}$ | - | tbd | 180 | m Ω |

¹Device on 40mm*40mm*1.5mm epoxy PCB FR4 with 6cm² (one layer, 70 μm thick) copper area for drain connection. PCB is vertical without blown air.

Electrical Characteristics, at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Conditions | Values | | | Unit |
|-----------|--------|------------|--------|------|------|------|
| | | | min. | typ. | max. | |

Dynamic Characteristics

| | | | | | | |
|------------------------------|--------------|---|-----|-----|-----|----|
| Transconductance | g_{fs} | $V_{DS} \geq 2 \cdot I_D \cdot R_{DS(on)max}$, $I_D = -A$ | tbd | tbd | - | S |
| Input capacitance | C_{iss} | $V_{GS} = 0V$, $V_{DS} = 25V$, $f = 1MHz$ | - | tbd | tbd | pF |
| Output capacitance | C_{oss} | | - | tbd | tbd | |
| Reverse transfer capacitance | C_{rss} | | - | tbd | tbd | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD} = 50V$, $V_{GS} = 10V$, $I_D = 10.3A$, $R_G = 28\Omega$ | - | tbd | tbd | ns |
| Rise time | t_r | | - | tbd | tbd | |
| Turn-off delay time | $t_{d(off)}$ | | - | tbd | tbd | |
| Fall time | t_f | | - | tbd | tbd | |

Gate Charge Characteristics

| | | | | | | |
|-----------------------|-----------------|---|---|-----|-----|----|
| Gate to source charge | Q_{gs} | $V_{DD} = 80V$, $I_D = 10.3A$ | - | tbd | tbd | nC |
| Gate to drain charge | Q_{gd} | | - | tbd | tbd | |
| Gate charge total | Q_g | $V_{DD} = 80V$, $I_D = 10.3A$, $V_{GS} = 0$ to $10V$ | - | tbd | tbd | |
| Gate plateau voltage | $V_{(plateau)}$ | $V_{DD} = 80V$, $I_D = 10.3A$ | - | tbd | - | V |

Reverse Diode

| | | | | | | |
|--|----------|---|---|-----|------|----|
| Inverse diode continuous forward current | I_S | $T_C = 25^\circ\text{C}$ | - | - | 10.3 | A |
| Inverse diode direct current, pulsed | I_{SM} | | - | - | 41.2 | |
| Inverse diode forward voltage | V_{SD} | $V_{GS} = 0V$, $I_F = 10.3A$ | - | tbd | tbd | V |
| Reverse recovery time | t_{rr} | $V_R = 50V$, $I_F = I_S$, $di_F/dt = 100A/\mu s$ | - | tbd | tbd | ns |
| Reverse recovery charge | Q_{rr} | | - | tbd | tbd | nC |

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