

20V N-Ch Power MOSFET
Feature

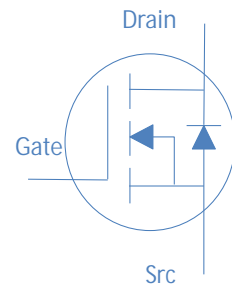
High Speed Power Switching, Logic Level
 Enhanced Avalanche Ruggedness
 100% UIS Tested, 100% Rg Tested
 Lead Free, Halogen Free

| | | |
|-------------------------------|----|------------|
| V_{DS} | 20 | V |
| $R_{DS(on),typ}$ $V_{GS}=10V$ | 26 | m Ω |
| I_D (Silicon Limited) | 5 | A |

Application

Hard Switching and High Speed Circuit
 DC/DC in Telecoms and Industrial

SOT-23



| Part Number | Package | Marking |
|-------------|---------|---------|
| HTJ300N02 | SOT23 | 11 |

Absolute Maximum Ratings at $T_J=25$ (unless otherwise specified)

| Parameter | Symbol | Conditions | Value | Unit |
|--|----------------|------------|------------|------|
| Continuous Drain Current (Silicon Limited) | I_D | $T_A=25$ | 5 | A |
| | | $T_A=100$ | 3.6 | |
| Drain to Source Voltage | V_{DS} | - | 20 | V |
| Gate to Source Voltage | V_{GS} | - | ± 12 | V |
| Pulsed Drain Current | I_{DM} | - | 20 | A |
| Power Dissipation | P_D | $T_A=25$ | 1.25 | W |
| Operating and Storage Temperature | T_J, T_{stg} | - | -55 to 150 | |

Absolute Maximum Ratings

| Parameter | Symbol | Max | Unit |
|-------------------------------------|-----------------|-----|--------------|
| Thermal Resistance Junction-Ambient | $R_{\theta JA}$ | 100 | K/W |
| Thermal Resistance Junction-Lead | $R_{\theta JL}$ | 55 | K/W |

Electrical Characteristics at $T_J=25$ (unless otherwise specified)
Static Characteristics

| Parameter | Symbol | Conditions | Value | | | Unit |
|-----------------------------------|---------------|----------------------------------|-------|------|-----------|------------|
| | | | min | typ | max | |
| Drain to Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 20 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}=V_{DS}, I_D=250\mu A$ | 0.45 | 0.75 | 1.2 | |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{GS}=0V, V_{DS}=16V, T_J=25$ | - | - | 1 | μA |
| | | $V_{GS}=0V, V_{DS}=16V, T_J=125$ | - | - | 10 | |
| Gate to Source Leakage Current | I_{GSS} | $V_{GS}=\pm 12V, V_{DS}=0V$ | - | - | ± 100 | nA |
| Drain to Source on Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=5A$ | - | 26 | 30 | m Ω |
| | | $V_{GS}=2.5V, I_D=4A$ | - | 45 | 51 | |
| | | $V_{GS}=1.8V, I_D=2A$ | - | 56 | 80 | |
| Transconductance | g_{fs} | $V_{DS}=5V, I_D=5A$ | - | 7 | - | S |

Dynamic Characteristics

| | | | | | | |
|-------------------------------|--------------|---|---|-----|---|----|
| Input Capacitance | C_{iss} | $V_{GS}=0V, V_{DS}=10V, f=1MHz$ | - | 280 | - | pF |
| Output Capacitance | C_{oss} | | - | 47 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 38 | - | |
| Total Gate Charge | Q_g | $V_{DD}=10V, I_D=5A, V_{GS}=4.5V$ | - | 6.2 | - | nC |
| Gate to Source Charge | Q_{gs} | | - | 0.9 | - | |
| Gate to Drain (Miller) Charge | Q_{gd} | | - | 2.1 | - | |
| Turn on Delay Time | $t_{d(on)}$ | $V_{DD}=10V, I_D=1A, V_{GS}=4.5V, R_G=6\Omega,$ | - | 12 | - | ns |
| Rise time | t_r | | - | 15 | - | |
| Turn off Delay Time | $t_{d(off)}$ | | - | 30 | - | |
| Fall Time | t_f | | - | 13 | - | |

Reverse Diode Characteristics

| | | | | | | |
|-----------------------|----------|---------------------|---|--|-----|---|
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_F=3A$ | - | | 1.2 | V |
|-----------------------|----------|---------------------|---|--|-----|---|

Fig 1. Typical Output Characteristics

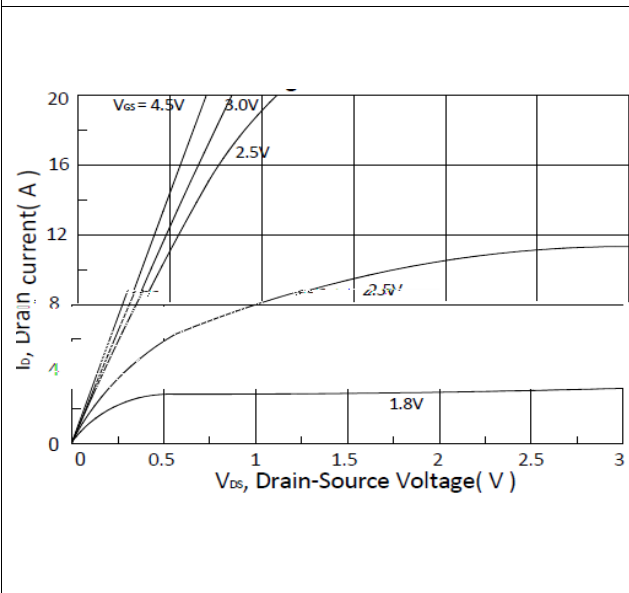


Figure 2. On-Resistance vs. Gate-Source Voltage

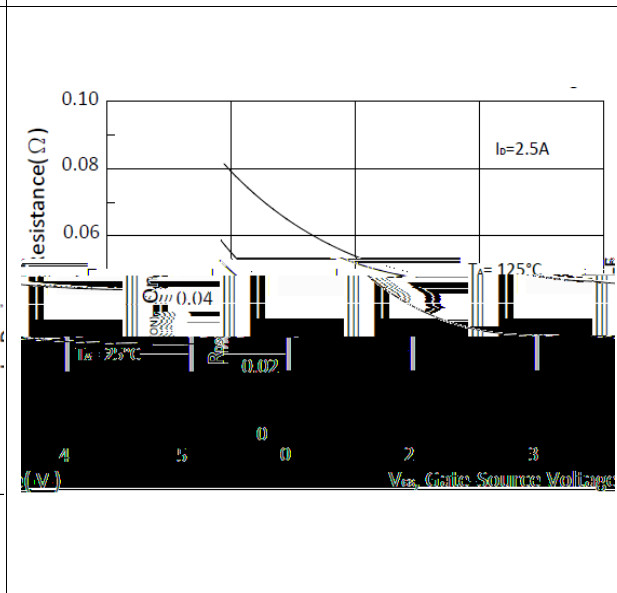


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

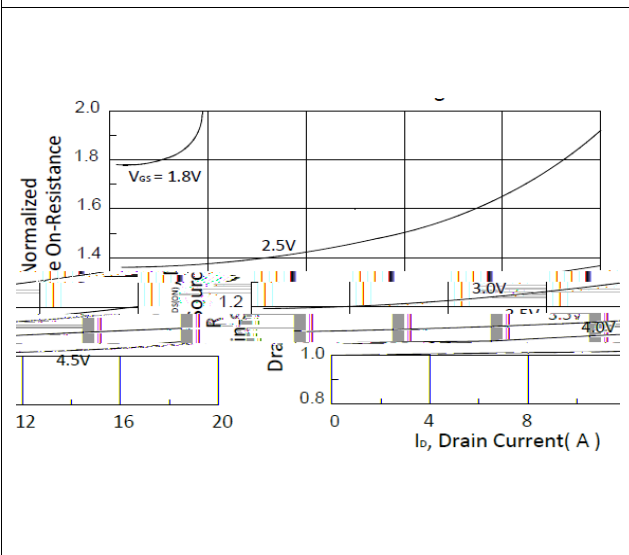


Figure 4. Normalized On-Resistance vs. Junction Temperature

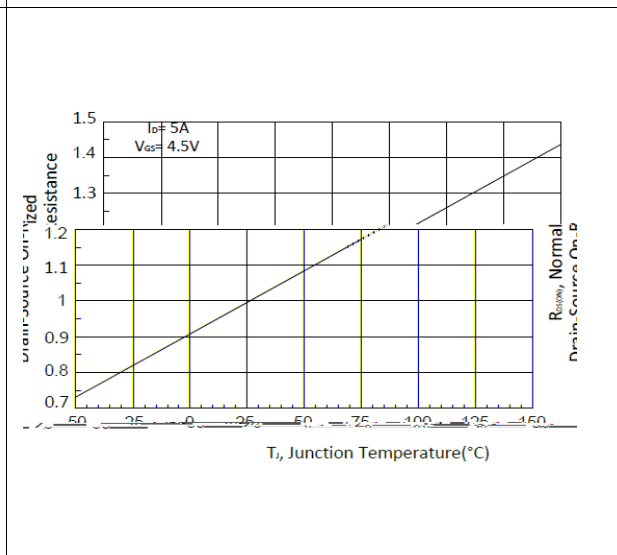


Figure 5. Typical Transfer Characteristics

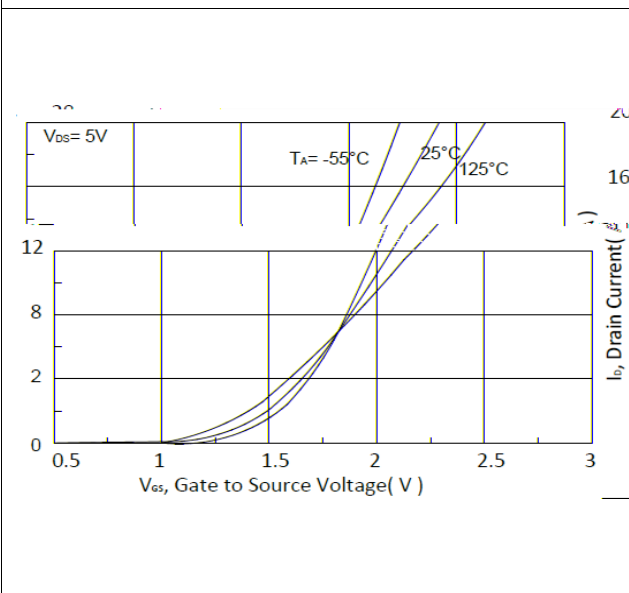


Figure 6. Typical Source-Drain Diode Forward Voltage

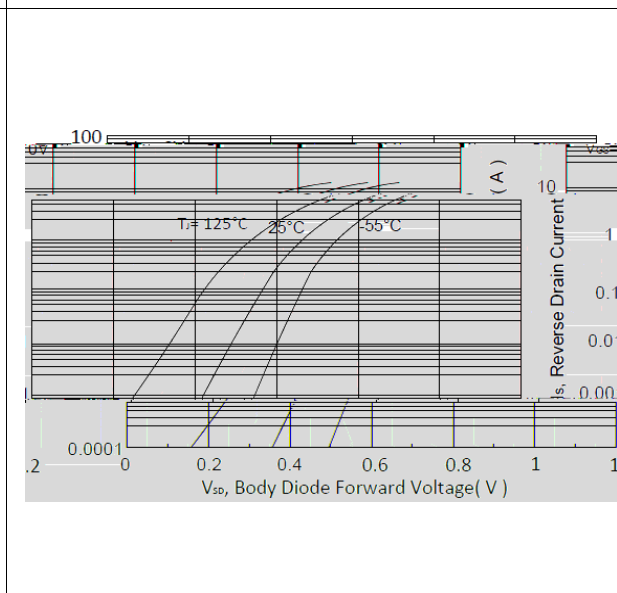


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

Figure 9. Maximum Safe Operating Area

Figure 10. Single Pulse Maximum Power Dissipation

Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient

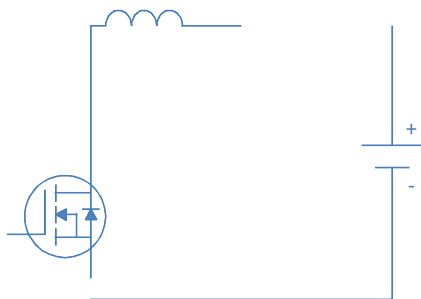
Inductive switching Test

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Gate Charge Test

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Uclamped Inductive Switching (UIS) Test

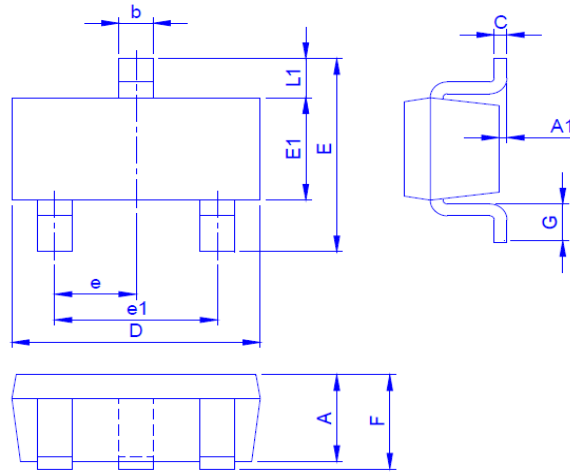


Diode Recovery Test

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Package Outline

SOT-23, 3leads



Dimension in mm

| Dimension | A | A1 | A2 | b | C | D | E | E1 | e | e1 | F | G | L1 |
|-----------|------|-----|----|------|-----|-----|-----|-----|------|-----|-----|-----|------|
| Min. | 0.7 | 0 | | 0.35 | 0.1 | 2.8 | 2.6 | 1.5 | 0.9 | | 0.8 | 0.3 | 0.55 |
| Typ. | | | | | | 2.9 | 2.8 | 1.6 | 0.95 | 1.9 | | | |
| Max. | 1.12 | 0.1 | | 0.5 | 0.2 | 3 | 3 | 1.7 | 1 | | 1.2 | 0.6 | 0.65 |