



15N20

Preliminary

Power MOSFET

15A, 200V N-CHANNEL POWER MOSFET

DESCRIPTION

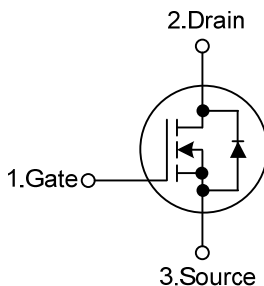
The UTC **15N20** is an N-channel enhancement MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$, high switching speed, high current capacity and low gate charge.

The UTC **15N20** is universally applied in low voltage such as automotive, high efficiency switching for DC/DC converters and DC motor control, etc.

FEATURES

- * $R_{DS(ON)}=0.12\Omega @ V_{GS}=10V, I_D=7.5A$
- * Low Gate Charge (Typical 20nC)
- * Low C_{RSS} (Typical 25pF)
- * High Switching Speed

SYMBOL

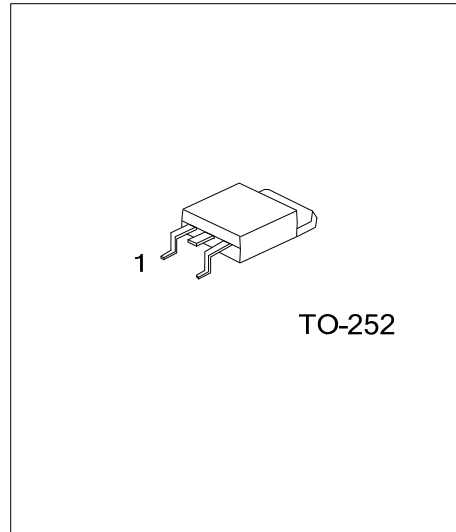


ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|-----------------|--------------|---------|----------------|---|---|-----------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| 15N20L-TN3-R | 15N20G-TN3-R | TO-252 | G | D | S | Tape Reel |
| 15N20L-TN3-T | 15N20G-TN3-T | TO-252 | G | D | S | Tube |

Note: Pin Assignment: G: Gate D: Drain S: Source

| | |
|---|--|
| <p>15N20L-TN3-R</p> <p>(1)Packing Type (2)Package Type (3)Lead Free</p> | <p>(1) R: Tape Reel, T: Tube (2) TN3: TO-252 (3) G: Halogen Free, L: Lead Free</p> |
|---|--|



■ ABSOLUTE MAXIMUM RATINGS (unless otherwise specified)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------------------|------------|------------|--------------------|
| Drain-Source Voltage | V_{DSS} | 200 | V |
| Gate-Source Voltage | V_{GSS} | ± 30 | V |
| Continuous Drain Current | Continuous | I_D | 15 |
| | Pulsed | I_{DM} | 60 |
| Single Pulsed Avalanche Current | I_{AS} | 15 | A |
| Single Pulsed Avalanche Energy | E_{AS} | 340 | mJ |
| Power Dissipation | P_D | 83 | W |
| Junction Temperature | T_J | +150 | $^{\circ}\text{C}$ |
| Storage Temperature | T_{STG} | -55 ~ +150 | $^{\circ}\text{C}$ |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------|---------------|---------|-----------------------------|
| Junction to Ambient | θ_{JA} | 110 | $^{\circ}\text{C}/\text{W}$ |
| Junction to Case | θ_{JC} | 1.5 | $^{\circ}\text{C}/\text{W}$ |

■ ELECTRICAL CHARACTERISTICS

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|--------------|--|-----|------|------|---------------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $I_D=250\mu\text{A}, V_{GS}=0\text{V}$ | 200 | | | V |
| Drain-Source Leakage Current | I_{DSS} | $V_{DS}=200\text{V}, V_{GS}=0\text{V}$ | | | 1 | μA |
| Gate-Source Leakage Current | I_{GSS} | Forward | | | +100 | nA |
| | | Reverse | | | -100 | nA |
| ON CHARACTERISTICS | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}=V_{GS}, I_D=250\mu\text{A}$ | 3 | | 5 | V |
| Static Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}=10\text{V}, I_D=7.5\text{A}$ | | 0.12 | 0.14 | Ω |
| DYNAMIC PARAMETERS | | | | | | |
| Input Capacitance | C_{ISS} | $V_{GS}=0\text{V}, V_{DS}=25\text{V}, f=1.0\text{MHz}$ | | 830 | 1080 | pF |
| Output Capacitance | C_{OSS} | | | 200 | 260 | pF |
| Reverse Transfer Capacitance | C_{RSS} | | | 25 | 33 | pF |
| SWITCHING PARAMETERS | | | | | | |
| Total Gate Charge | Q_G | $V_{GS}=10\text{V}, V_{DD}=120\text{V}, I_D=18\text{A}$ | | 20 | 26 | nC |
| Gate to Source Charge | Q_{GS} | | | 5.6 | | nC |
| Gate to Drain Charge | Q_{GD} | | | 10 | | nC |
| Turn-ON Delay Time | $t_{D(ON)}$ | $V_{DD}=30\text{V}, I_D=1\text{A}, R_G=25\Omega,$ $V_{GS}=10\text{V}, R_L=30\Omega$ | | 16 | 40 | ns |
| Rise Time | t_R | | | 133 | 275 | ns |
| Turn-OFF Delay Time | $t_{D(OFF)}$ | | | 38 | 85 | ns |
| Fall-Time | t_F | | | 62 | 135 | ns |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS | | | | | | |
| Maximum Body-Diode Continuous Current | I_S | | | | 15 | A |
| Maximum Body-Diode Pulsed Current | I_{SM} | | | | 60 | A |
| Drain-Source Diode Forward Voltage | V_{SD} | $I_S=15\text{A}, V_{GS}=0\text{V}$ | | | 1.5 | V |

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