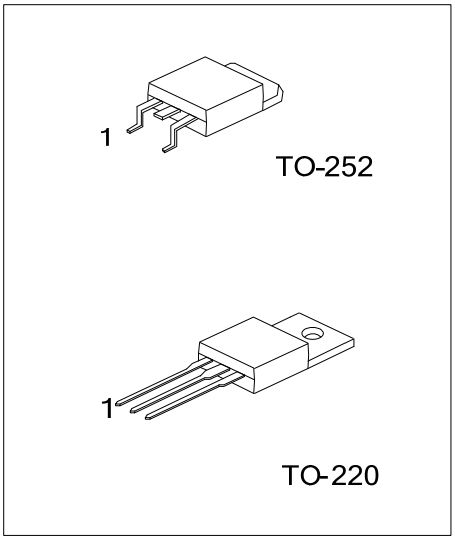
# UTT20N10

**Power MOSFET**

## 20A, 100V N-CHANNEL POWER MOSFET




## ■ DESCRIPTION

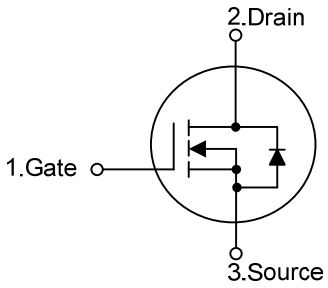
The UTC **UTT20N10** is a N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **UTT20N10** is universally applied in low voltage, such as automotive, high efficiency switching for DC/DC converters, and DC motor control.

## ■ FEATURES

* $R_{DS(on)}$ <0.12Ω @$V_{GS}$ = 10 V
* Typically 32pF low $C_{RSS}$
* High switching speed
* Typically 19nC low gate charge

## ■ SYMBOL




## ■ ORDERING INFORMATION

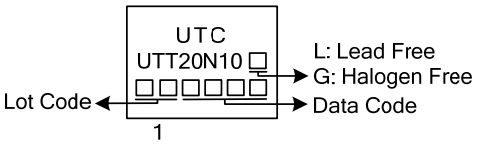
| Ordering Number | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| UTT20N10L-TA3-T | UTT20N10G-TA3-T | TO-220 | G | D | S | Tube |
| UTT20N10L-TN3-R | UTT20N10G-TN3-R | TO-252 | G | D | S | Tape Reel |

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

UTT20N10G-TA3-T

| | |
|---|---|
| (1)Packing Type | (1) T: Tube, R: Tape Reel |
| (2)Package Type | (2) TA3: TO-220, TN3: TO-252 |
| (3)Green Package | (3) G: Halogen Free and Lead Free, L: Lead Free |

■ MARKING



## ■ ABSOLUTE MAXIMUM RATINGS ($T_C$ = 25°C, unless otherwise specified)

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | 100 | V |
| Gate-Source Voltage | | $V_{GSS}$ | ±25 | V |
| Drain Current | Continuous | $I_D$ | 20 | A |
| | Pulsed | $I_{DM}$ | 80 | A |
| Power Dissipation | TO-220 | $P_D$ | 62.5 | W |
| | TO-252 | | 50 | |
| Junction Temperature | | $T_J$ | +150 | °C |
| Storage Temperature | | $T_{STG}$ | -40 ~ +150 | °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 | TO-220 | $\theta_{JA}$ | 62.5 | °C/W |
| | TO-252 | | 100 | |
| Junction to Case | TO-220 | $\theta_{JC}$ | 2 | °C/W |
| | TO-252 | | 2.5 | |

## ■ ELECTRICAL CHARACTERISTICS ($T_J$ = 25℃, unless otherwise specified)

| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | | |
| Drain-Source Breakdown Voltage | | $BV_{DSS}$ | $I_D$=250μA, $V_{GS}$=0V | 100 | | | V |
| Drain-Source Leakage Current | | $I_{DSS}$ | $V_{DS}$=100V, $V_{GS}$=0V | | | 1 | μA |
| Gate- Source Leakage Current | Forward | $I_{GSS}$ | $V_{GS}$=+25V, $V_{DS}$=0V | | | +100 | nA |
| | Reverse | | $V_{GS}$=-25V, $V_{DS}$=0V | | | -100 | nA |
| **ON CHARACTERISTICS** | | | | | | | |
| Gate Threshold Voltage | | $V_{GS(TH)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1.0 | | 3.0 | V |
| Static Drain-Source On-State Resistance | | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=20A | | | 120 | mΩ |
| **DYNAMIC PARAMETERS** | | | | | | | |
| Input Capacitance | | $C_{ISS}$ | $V_{GS}$=0V, $V_{DS}$=25V, f=1.0MHz | | 600 | 780 | pF |
| Output Capacitance | | $C_{OSS}$ | | | 165 | 215 | pF |
| Reverse Transfer Capacitance | | $C_{RSS}$ | | | 32 | 40 | pF |
| **SWITCHING PARAMETERS** | | | | | | | |
| Total Gate Charge | | $Q_G$ | $V_{GS}$=10V, $V_{DS}$=80V, $I_D$=19A (Note 1, 2) | | 19 | 25 | nC |
| Gate to Source Charge | | $Q_{GS}$ | | | 3.9 | | nC |
| Gate to Drain Charge | | $Q_{GD}$ | | | 9.0 | | nC |
| Turn-ON Delay Time | | $t_{D(ON)}$ | $V_{DD}$=50V, $I_D$=1A, $R_L$=50Ω, $V_{GS}$=10V, $R_G$=25Ω (Note 1, 2) | | 7.5 | 25 | ns |
| Rise Time | | $t_R$ | | | 150 | 310 | ns |
| Turn-OFF Delay Time | | $t_{D(OFF)}$ | | | 20 | 50 | ns |
| Fall-Time | | $t_F$ | | | 65 | 140 | ns |
| **SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS** | | | | | | | |
| Maximum Body-Diode Continuous Current | | $I_S$ | | | | 20 | A |
| Maximum Body-Diode Pulsed Current | | $I_{SM}$ | | | | 80 | A |
| Drain-Source Diode Forward Voltage | | $V_{SD}$ | $I_S$=20A, $V_{GS}$=0V | | | 1.5 | V |

Notes: 1. Pulse Test: Pulse width≤300μs, Duty cycle≤2%.
2. Essentially independent of operating temperature.

## ■ TYPICAL CHARACTERISTICS