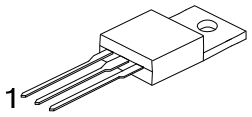
# 100A, 30V P-CHANNEL POWER MOSFET




TO-220

## ■ DESCRIPTION

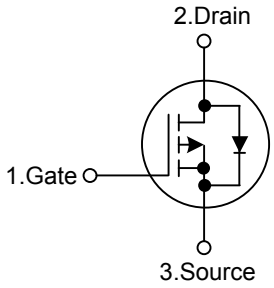
The UTC **UTT100P03** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance. It can also withstand high energy in the avalanche.

The UTC **UTT100P03** is suitable for low voltage and high speed switching applications

## ■ FEATURES

* $R_{DS(ON)}$=3.3mΩ @ $V_{GS}$=-10V, $I_D$=-80A
* High Switching Speed

## ■ SYMBOL




## ■ ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| UTT100P03L-TA3-T | UTT100P03G-TA3-T | TO-220 | G | D | S | Tube |

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

UTT100P03L-TA3-T

(1)Packing Type — (1) T: Tube

(2)Package Type — (2) TA3: TO-220

(3)Lead Free — (3) G: Halogen Free, L: Lead Free

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

| PARAMETER | | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|---|
| Drain-Source Voltage | | | $V_{DSS}$ | -30 | V |
| Gate-Source Voltage | | | $V_{GSS}$ | -16/+5 | V |
| Drain Current | Continuous (Note 2) | $T_C$=25°C, $V_{GS}$=-10V | $I_D$ | -100 | A |
| | | $T_C$=100°C, $V_{GS}$=-10V | | -100 (Note 3) | A |
| | Pulsed (Note 3) | $T_C$=25°C | $I_{DM}$ | -400 | A |
| Single Pulsed Avalanche Energy | | $I_D$=-80A | $E_{AS}$ | 450 | mJ |
| Power Dissipation | | $T_C$=25°C | $P_D$ | 200 | W |
| Junction Temperature | | | $T_J$ | +175 | °C |
| Storage Temperature | | | $T_{STG}$ | -55~+175 | °C |

Notes: 1. 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.
2. Current is limited by bondwire; with a $\theta_{JC}$ = 0.65 °C/W the chip is able to carry $I_D$=-195A at 25°C.
3. Defined by design. Not subject to production test.

## ■ THERMAL DATA (Note 2)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Junction to Ambient | $\theta_{JA}$ | 62 | °C/W |
| Junction to Case | $\theta_{JC}$ | 0.65 | °C/W |

## ■ ELECTRICAL CHARACTERISTICS ($T_J$=25°C, 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 | -30 | | | V |
| Drain-Source Leakage Current | | $I_{DSS}$ | $V_{DS}$=-30V, $V_{GS}$=0V, $T_J$=25°C | | -0.1 | -1 | μA |
| | | | $V_{DS}$=-30V,$V_{GS}$=0V,$T_C$=125°C (Note 1) | | -10 | -100 | μA |
| Gate-Source Leakage Current | Forward | $I_{GSS}$ | $V_{GS}$=+16V, $V_{DS}$=0V | | +10 | +100 | nA |
| | Reverse | | $V_{GS}$=-16V, $V_{DS}$=0V | | -10 | -100 | nA |
| **ON CHARACTERISTICS** | | | | | | | |
| Gate Threshold Voltage | | $V_{GS(TH)}$ | $V_{DS}$=$V_{GS}$, $I_D$=-475μA | -1 | -1.5 | -2.1 | V |
| Static Drain-Source On-State Resistance | | $R_{DS(ON)}$ | $V_{GS}$=-4.5V, $I_D$=-50A | | 4.8 | 7.6 | mΩ |
| | | | $V_{GS}$=-10, $I_D$=-80A | | 3.3 | 4.3 | mΩ |
| **DYNAMIC PARAMETERS** (Note 1) | | | | | | | |
| Input Capacitance | | $C_{ISS}$ | $V_{GS}$=0V, $V_{DS}$=-25V, f=1.0MHz | | 7150 | 9300 | pF |
| Output Capacitance | | $C_{OSS}$ | | | 2150 | 2800 | pF |
| Reverse Transfer Capacitance | | $C_{RSS}$ | | | 1650 | 2500 | pF |
| **SWITCHING PARAMETERS** (Note 1) | | | | | | | |
| Total Gate Charge | | $Q_G$ | $V_{DD}$=-24V, $V_{GS}$=0~-10V, $I_D$=-80A | | 150 | 200 | nC |
| Gate to Source Charge | | $Q_{GS}$ | | | 25 | 33 | nC |
| Gate to Drain Charge | | $Q_{GD}$ | | | 55 | 82.5 | nC |
| Turn-ON Delay Time | | $t_{D(ON)}$ | $V_{DD}$=-15V, $V_{GS}$=-10V, $I_D$=-50A, $R_G$=6Ω | | 30 | | ns |
| Rise Time | | $t_R$ | | | 45 | | ns |
| Turn-OFF Delay Time | | $t_{D(OFF)}$ | | | 200 | | ns |
| Fall-Time | | $t_F$ | | | 180 | | ns |
| **SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS** | | | | | | | |
| Maximum Body-Diode Continuous Current | | $I_S$ | $T_A$ = 25°C (Note 1) | | | -100 | A |
| Maximum Body-Diode Pulsed Current | | $I_{SM}$ | $T_A$ = 25°C (Note 1) | | | -400 | A |
| Drain-Source Diode Forward Voltage | | $V_{SD}$ | $I_S$=-80A, $V_{GS}$=0V | -0.6 | -1 | -1.2 | V |
| Body Diode Reverse Recovery Time | | $t_{rr}$ | $V_R$=-15V, $I_F$=-50A, dI$_F$/dt=100A/μs (Note 1) | | 50 | | ns |
| Body Diode Reverse Recovery Charge | | $Q_{RR}$ | | | 55 | | nC |

Notes: 1. Defined by design. Not subject to production test.
2. Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 $cm^2$ (one layer, 70 μm thick) copper area for drain connection. PCB is vertical in still air.