



## 100N02

Power MOSFET

### 100A, 15V N-CHANNEL POWER TRENCH MOSFET

#### DESCRIPTION

The UTC **100N02** is an N-channel Power Trench MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

The UTC **100N02** is generally applied in synchronous Rectification or DC to DC convertor.

#### FEATURES

- \*  $R_{DS(ON)} \leq 7.5m\Omega$  @  $V_{GS}=4.5V$ ,  $I_D=55A$   
 $R_{DS(ON)} \leq 17m\Omega$  @  $V_{GS}=3.5V$ ,  $I_D=30A$
- \* Low Gate Charge (Typical 46nC)
- \* High Switching Speed
- \* High Power and Current Handling Capability

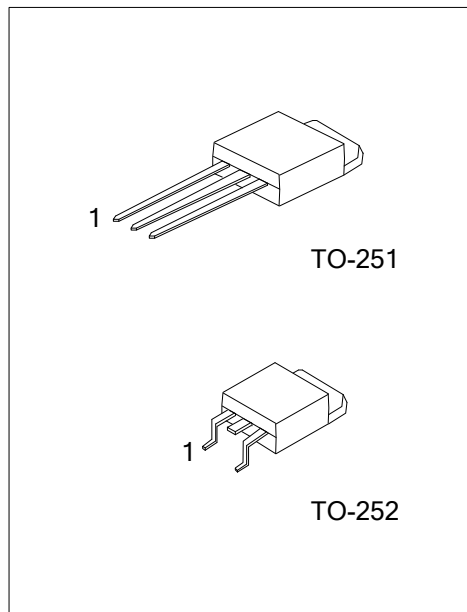
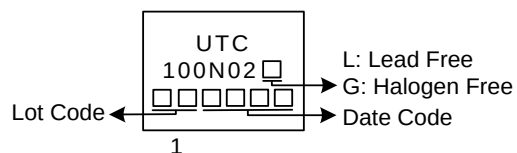
#### ORDERING INFORMATION

| Ordering Number |               | Package | Pin Assignment |   |   | Packing   |
|-----------------|---------------|---------|----------------|---|---|-----------|
| Lead Free       | Halogen Free  |         | 1              | 2 | 3 |           |
| 100N02L-TM3-T   | 100N02G-TM3-T | TO-251  | G              | D | S | Tube      |
| 100N02L-TN3-R   | 100N02G-TN3-R | TO-252  | G              | D | S | Tape Reel |

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

|                                                                                            |                                                                                                                             |
|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <p>100N02G-TM3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p> | <p>(1) R: Tape Reel, T: Tube</p> <p>(2) TN3: TO-252, TM3: TO-251</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|

#### MARKING



## ■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER                 |               | SYMBOL    | RATINGS    | UNIT               |
|---------------------------|---------------|-----------|------------|--------------------|
| Drain-Source Voltage      |               | $V_{DS}$  | 15         | V                  |
| Gate-Source Voltage       |               | $V_{GS}$  | $\pm 8$    | V                  |
| Drain Current             | Continuous    | $I_D$     | 100        | A                  |
|                           | Pulsed        | $I_{DM}$  | 400        | A                  |
| Avalanche Energy          | Single Pulsed | $E_{AS}$  | 12         | mJ                 |
| Power Dissipation         |               | $P_D$     | 54         | W                  |
| Junction Temperature      |               | $T_J$     | +150       | $^{\circ}\text{C}$ |
| Storage Temperature Range |               | $T_{STG}$ | -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

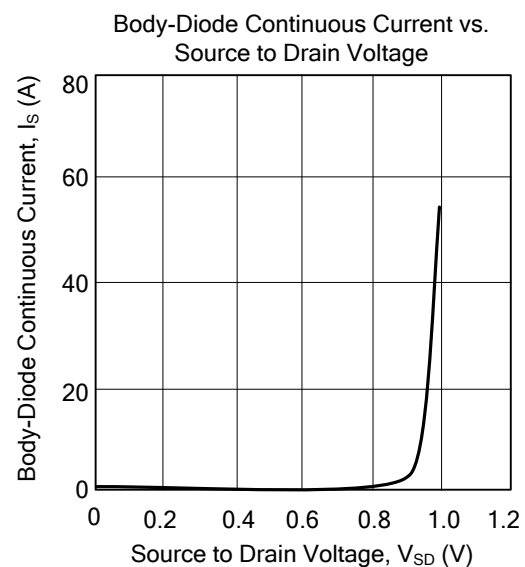
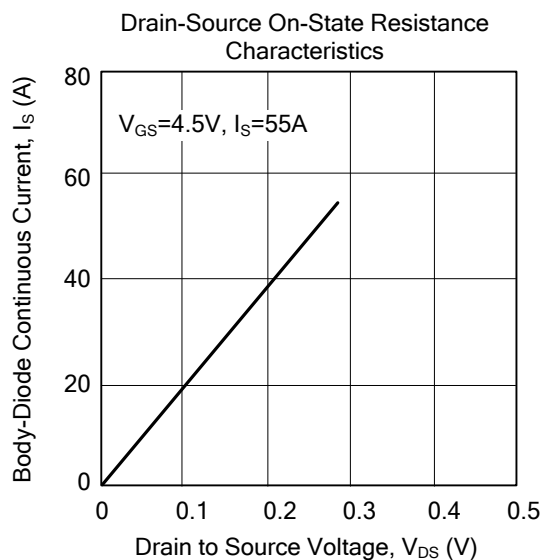
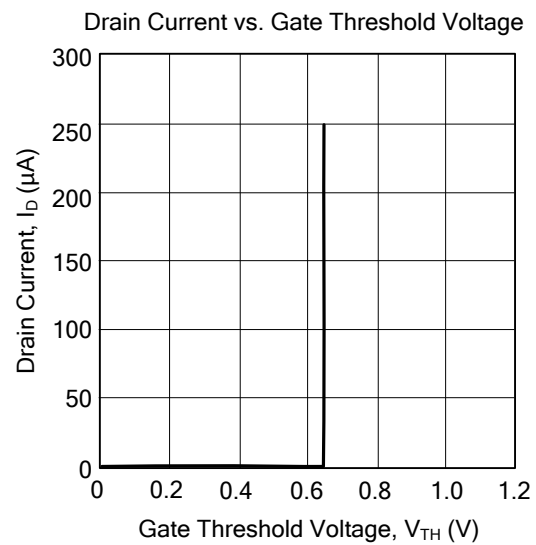
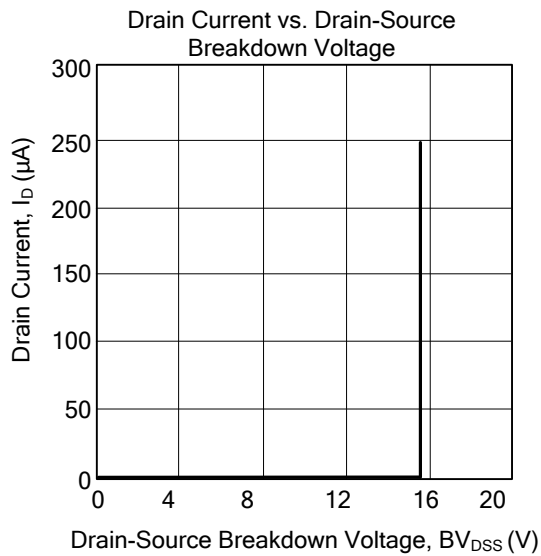
| PARAMETER           |  | SYMBOL        | RATINGS | UNIT                 |
|---------------------|--|---------------|---------|----------------------|
| Junction to Ambient |  | $\theta_{JA}$ | 62.5    | $^{\circ}\text{C/W}$ |
| Junction to Case    |  | $\theta_{JC}$ | 2.3     | $^{\circ}\text{C/W}$ |

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

## ■ ELECTRICAL CHARACTERISTICS

| PARAMETER                                       |         | SYMBOL              | TEST CONDITIONS                                                                          | MIN | TYP  | MAX  | UNIT |
|-------------------------------------------------|---------|---------------------|------------------------------------------------------------------------------------------|-----|------|------|------|
| OFF CHARACTERISTICS                             |         |                     |                                                                                          |     |      |      |      |
| Drain-Source Breakdown Voltage                  |         | BV <sub>DSS</sub>   | I <sub>D</sub> =250μA, V <sub>GS</sub> =0V                                               | 15  |      |      | V    |
| Drain-Source Leakage Current                    |         | I <sub>DSS</sub>    | V <sub>DS</sub> =15V                                                                     |     |      | 1    | μA   |
| Gate-Source Leakage Current                     | Forward | I <sub>GSS</sub>    | V <sub>GS</sub> =+8V                                                                     |     |      | ±100 | nA   |
|                                                 | Reverse |                     | V <sub>GS</sub> =-8V                                                                     |     |      | ±100 | nA   |
| ON CHARACTERISTICS                              |         |                     |                                                                                          |     |      |      |      |
| Gate Threshold Voltage                          |         | V <sub>GS(TH)</sub> | I <sub>D</sub> =250μA                                                                    | 0.5 |      | 1.2  | V    |
| Static Drain-Source On-State Resistance         |         | R <sub>DS(ON)</sub> | V <sub>GS</sub> =4.5V, I <sub>D</sub> =55A                                               |     |      | 7.5  | mΩ   |
|                                                 |         |                     | V <sub>GS</sub> =3.5V, I <sub>D</sub> =30A                                               |     |      | 17   | mΩ   |
| DYNAMIC PARAMETERS                              |         |                     |                                                                                          |     |      |      |      |
| Input Capacitance                               |         | C <sub>ISS</sub>    | V <sub>GS</sub> =0V, V <sub>DS</sub> =20V, f=1.0MHz                                      |     | 3565 |      | pF   |
| Output Capacitance                              |         | C <sub>OSS</sub>    |                                                                                          |     | 1310 |      | pF   |
| Reverse Transfer Capacitance                    |         | C <sub>RSS</sub>    |                                                                                          |     | 395  |      | pF   |
| SWITCHING PARAMETERS                            |         |                     |                                                                                          |     |      |      |      |
| Total Gate Charge                               |         | Q <sub>G</sub>      | V <sub>GS</sub> =10V, V <sub>DD</sub> =12V, I <sub>D</sub> =0.3A, I <sub>G</sub> =100μA  |     | 46   | 60   | nC   |
| Gate to Source Charge                           |         | Q <sub>GS</sub>     |                                                                                          |     | 6.9  |      | nC   |
| Gate to Drain Charge                            |         | Q <sub>GD</sub>     |                                                                                          |     | 9.8  |      | nC   |
| Turn-ON Delay Time                              |         | t <sub>D(ON)</sub>  | V <sub>DD</sub> =10V, I <sub>D</sub> =0.16A, R <sub>G</sub> =25Ω, V <sub>GS</sub> =0~10V |     | 9    |      | ns   |
| Rise Time                                       |         | t <sub>R</sub>      |                                                                                          |     | 106  |      | ns   |
| Turn-OFF Delay Time                             |         | t <sub>D(OFF)</sub> |                                                                                          |     | 53   |      | ns   |
| Fall-Time                                       |         | t <sub>F</sub>      |                                                                                          |     | 41   |      | ns   |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS |         |                     |                                                                                          |     |      |      |      |
| Drain-Source Diode Forward Voltage              |         | V <sub>SD</sub>     | I <sub>S</sub> =55A                                                                      |     |      | 1.3  | V    |

## ■ TYPICAL CHARACTERISTICS



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.