



## UTG25N120LND3

Insulated Gate Bipolar Transistor

### 1200V TRENCH GATE FIELD-STOP IGBT

#### DESCRIPTION

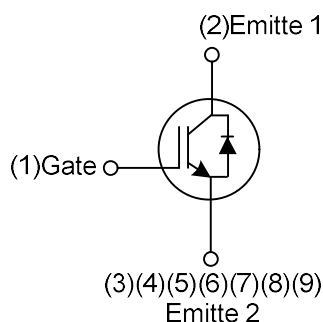
The UTC **UTG25N120LND3** is an Trench Field-Stop Insulated Gate Bipolar Transistor. it uses UTC's advanced technology to provide customers with high switching speed, low saturation voltage and low switching loss, etc.

The UTC **UTG25N120LND3** is suitable for the resonant or soft switching applications.

#### FEATURES

- \* High switching speed
- \* High avalanche ruggedness
- \* Low saturation voltage:  $V_{CE(SAT).Typ.}=1.6V$  @  $I_C=25A$ ,  $V_{GE}=15V$  ( $T_C=25^{\circ}C$ )

#### SYMBOL

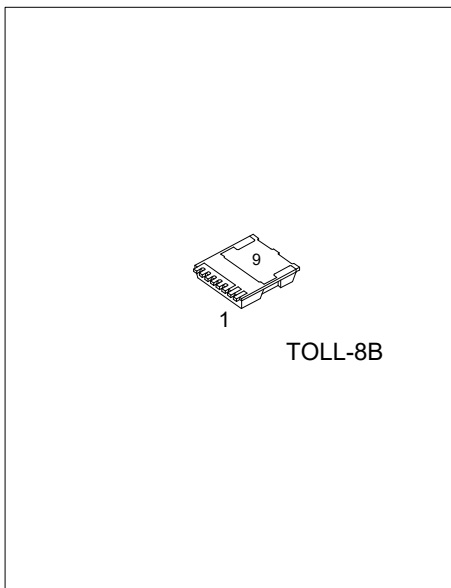


#### ORDERING INFORMATION

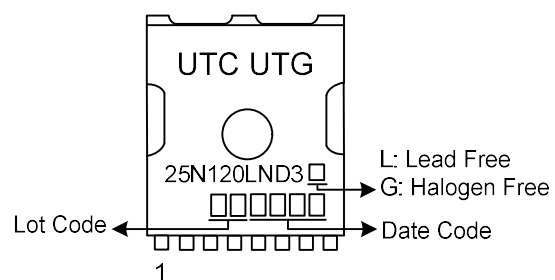
| Ordering Number      |                      | Package | Pin Assignment |    |    |    |    |    |    |    |    | Packing   |
|----------------------|----------------------|---------|----------------|----|----|----|----|----|----|----|----|-----------|
| Lead Free            | Halogen Free         |         | 1              | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |           |
| UTG25N120LND3L-T8B-R | UTG25N120LND3G-T8B-R | TOLL-8B | G              | E1 | E2 | E2 | E2 | E2 | E2 | E2 | E2 | Tape Reel |

Note: Pin Assignment: G: Gate E: Emitter

|                      |  |                  |                                                 |
|----------------------|--|------------------|-------------------------------------------------|
| UTG25N120LND3G-T8B-R |  | (1)Packing Type  | (1) R: Tape Reel                                |
|                      |  | (2)Package Type  | (2) T8B: TOLL-8B                                |
|                      |  | (3)Green Package | (3) G: Halogen Free and Lead Free, L: Lead Free |



### ■ MARKING



### ■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C, unless otherwise specified)

| PARAMETER                                              |                       | SYMBOL           | RATINGS    | UNIT |
|--------------------------------------------------------|-----------------------|------------------|------------|------|
| Collector-Emitter Voltage                              |                       | V <sub>CES</sub> | 1200       | V    |
| Gate-Emitter Voltage                                   |                       | V <sub>GES</sub> | ±20        | V    |
| Transient Gate-emitter voltage (t <sub>p</sub> < 5 ms) |                       |                  | ±25        | V    |
| Continuous Collector Current                           | T <sub>C</sub> =25°C  | I <sub>C</sub>   | 50         | A    |
|                                                        | T <sub>C</sub> =100°C |                  | 25         | A    |
| Collector Current Pulsed (Note 1)                      |                       | I <sub>CM</sub>  | 100        | A    |
| Diode Forward Current                                  | T <sub>C</sub> =25°C  | I <sub>F</sub>   | 50         | A    |
|                                                        | T <sub>C</sub> =100°C |                  | 25         | A    |
| Power Dissipation (T <sub>C</sub> =25°C)               |                       | P <sub>D</sub>   | 170        | W    |
| Operating Junction Temperature                         |                       | T <sub>J</sub>   | -40 ~ +150 | °C   |
| Storage Temperature Range                              |                       | T <sub>STG</sub> | -55 ~ +150 | °C   |

Notes: 1. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

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

2. Pulse width limited by maximum junction temperature.

### ■ THERMAL DATA

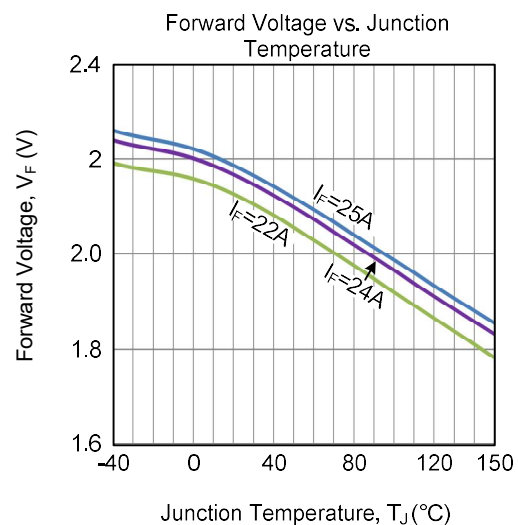
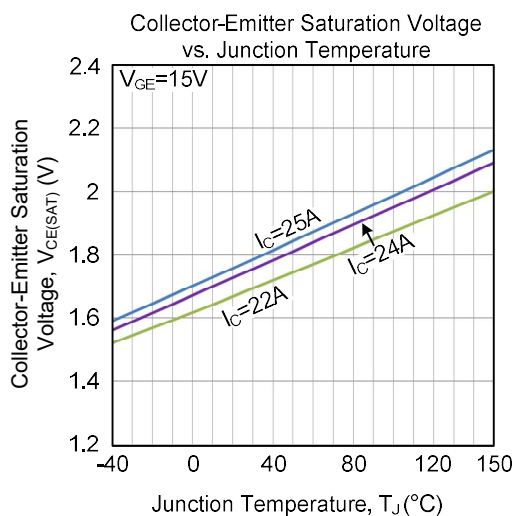
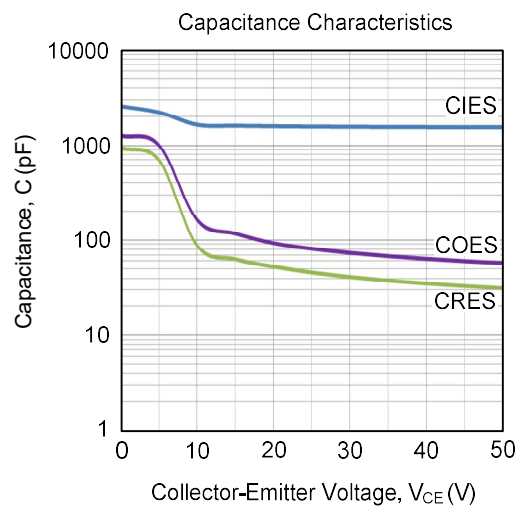
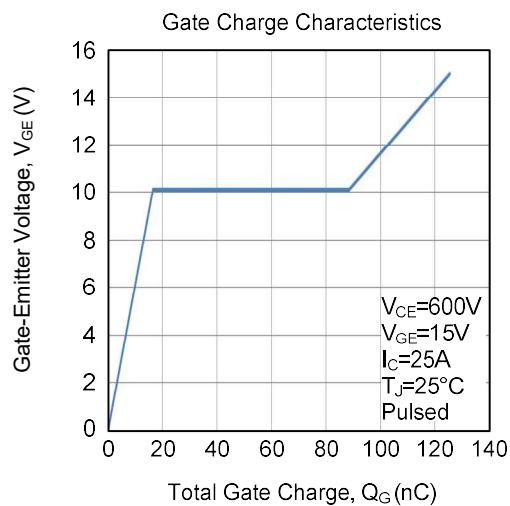
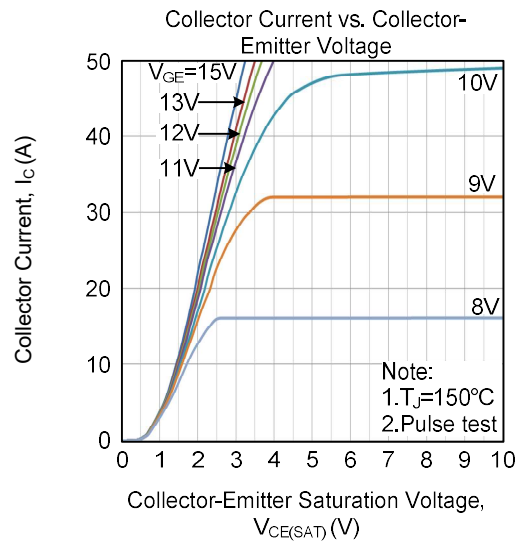
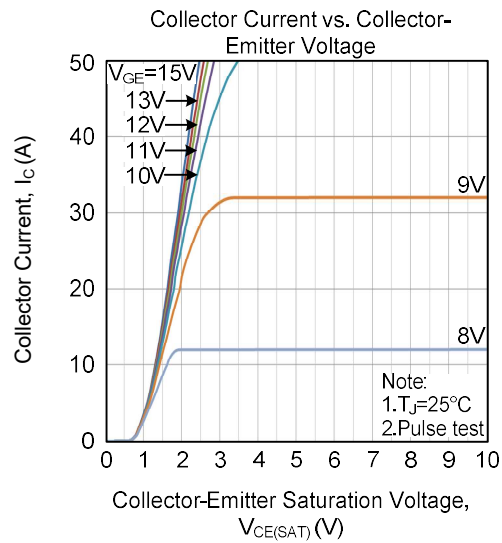
| PARAMETER        | SYMBOL          | RATING | UNIT |
|------------------|-----------------|--------|------|
| Junction to Case | θ <sub>JC</sub> | 0.73   | °C/W |

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

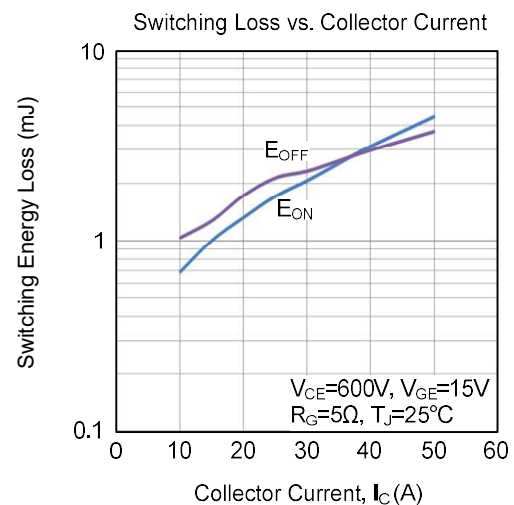
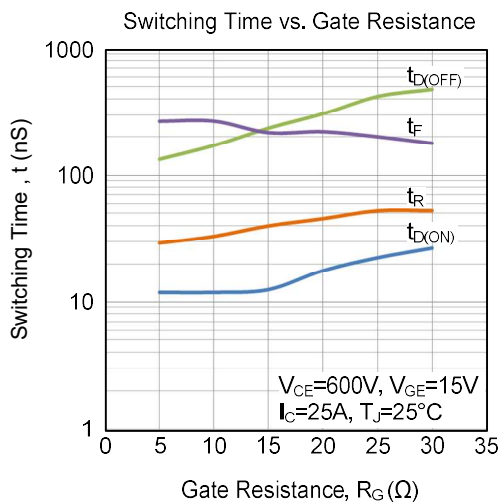
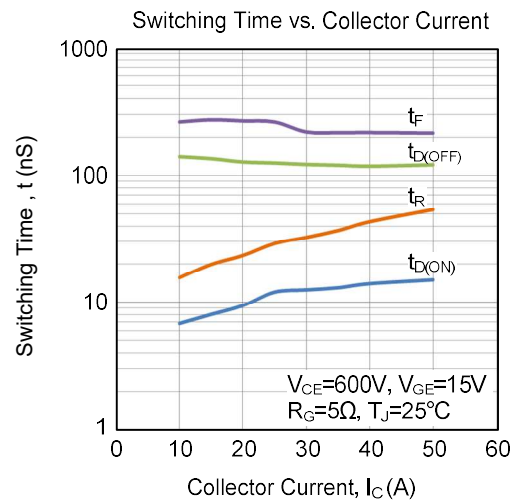
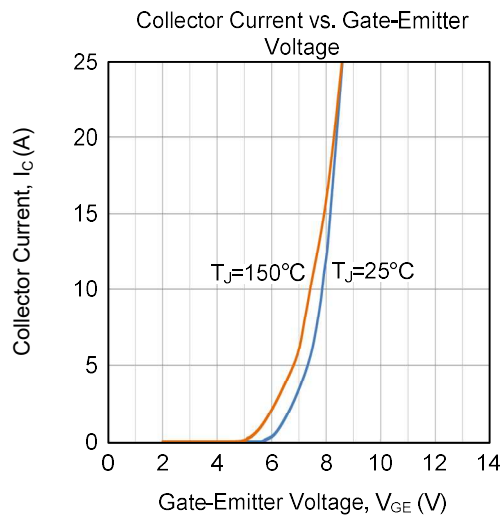
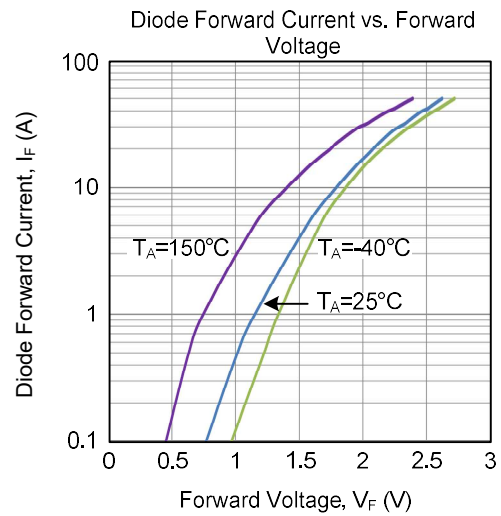
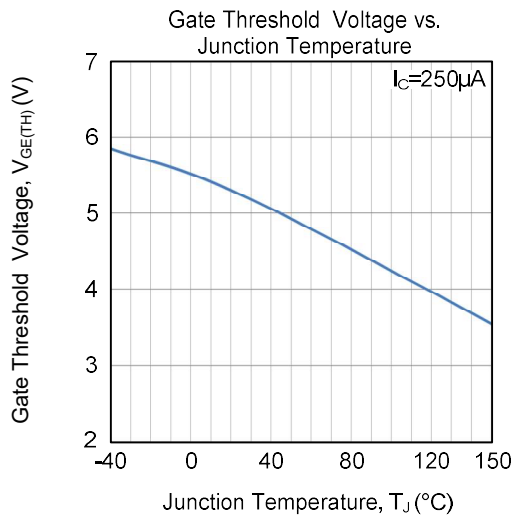
### ■ ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C, unless otherwise specified)

| PARAMETER                                       | SYMBOL               | TEST CONDITIONS                                                                                 | MIN                   | TYP | MAX  | UNIT |
|-------------------------------------------------|----------------------|-------------------------------------------------------------------------------------------------|-----------------------|-----|------|------|
| Off Characteristics                             |                      |                                                                                                 |                       |     |      |      |
| Collector-Emitter Breakdown Voltage             | BV <sub>CES</sub>    |                                                                                                 | 1200                  |     |      | V    |
| Collector Cut-Off Current                       | I <sub>CES</sub>     | V <sub>CE</sub> =1200V, V <sub>GE</sub> =0V                                                     |                       |     | 5    | μA   |
| G-E Leakage Current                             | I <sub>GES</sub>     | V <sub>CE</sub> =0V, V <sub>GE</sub> =±20V                                                      |                       |     | ±400 | nA   |
| On Characteristics                              |                      |                                                                                                 |                       |     |      |      |
| Gate to Emitter Threshold Voltage               | V <sub>GE(TH)</sub>  | I <sub>C</sub> =250μA, V <sub>CE</sub> =V <sub>GE</sub>                                         | 4.5                   |     | 7.5  | V    |
| Collector to Emitter Saturation Voltage         | V <sub>CE(SAT)</sub> | I <sub>C</sub> =25A, V <sub>GE</sub> =15V                                                       | T <sub>C</sub> =25°C  | 1.6 | 2.1  | V    |
|                                                 |                      |                                                                                                 | T <sub>C</sub> =125°C | 2.0 |      | V    |
| Dynamic Characteristics                         |                      |                                                                                                 |                       |     |      |      |
| Input Capacitance                               | C <sub>IES</sub>     | V <sub>CE</sub> =25V, V <sub>GE</sub> =0V, f=1MHz                                               |                       | 1.6 |      | nF   |
| Output Capacitance                              | C <sub>OES</sub>     |                                                                                                 |                       | 75  |      | pF   |
| Reverse Transfer Capacitance                    | C <sub>RES</sub>     |                                                                                                 |                       | 40  |      | pF   |
| Switching Characteristics                       |                      |                                                                                                 |                       |     |      |      |
| Total Gate Charge                               | Q <sub>G</sub>       | V <sub>CE</sub> =600V, I <sub>C</sub> =25A, V <sub>GE</sub> =15V                                |                       | 126 |      | nC   |
| Gate-Emitter Charge                             | Q <sub>GE</sub>      |                                                                                                 |                       | 16  |      | nC   |
| Gate-Collector Charge                           | Q <sub>GC</sub>      |                                                                                                 |                       | 73  |      | nC   |
| Turn-On Delay Time                              | t <sub>DON</sub>     | V <sub>CC</sub> =600V, I <sub>C</sub> =25A, R <sub>G</sub> =5Ω, V <sub>GE</sub> =0~15V, L=500μH |                       | 12  |      | ns   |
| Rise Time                                       | t <sub>R</sub>       |                                                                                                 |                       | 29  |      | ns   |
| Turn-Off Delay Time                             | t <sub>DOFF</sub>    |                                                                                                 |                       | 134 |      | ns   |
| Fall Time                                       | t <sub>F</sub>       |                                                                                                 |                       | 267 |      | ns   |
| Turn-On Switching Loss                          | E <sub>ON</sub>      |                                                                                                 |                       | 1.7 |      | mJ   |
| Turn-Off Switching Loss                         | E <sub>OFF</sub>     |                                                                                                 |                       | 2.1 |      | mJ   |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS |                      |                                                                                                 |                       |     |      |      |
| Forward Voltage Drop                            | V <sub>F</sub>       | I <sub>F</sub> =25A                                                                             |                       |     | 2.7  | V    |
| Reverse Recovery Time                           | t <sub>rr</sub>      | I <sub>F</sub> =25A, dI/dt=100A/μS,                                                             |                       | 46  |      | ns   |
| Reverse Recovery Charge                         | Q <sub>rr</sub>      | V <sub>CC</sub> =600V                                                                           |                       | 938 |      | μC   |

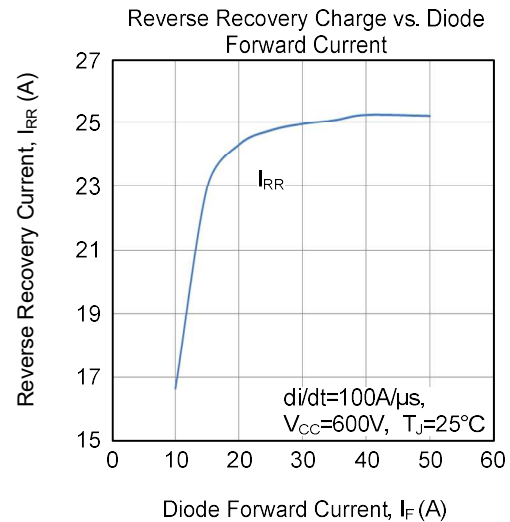
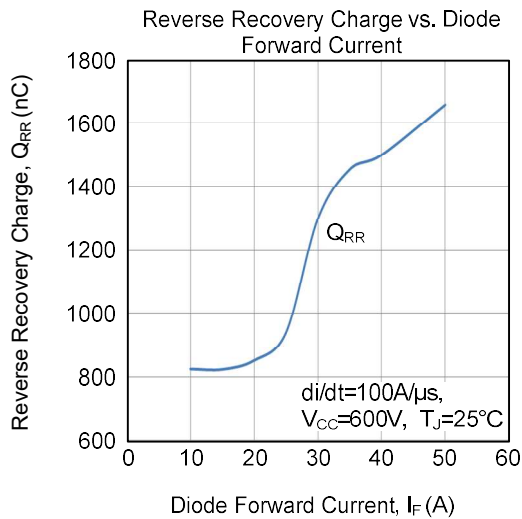
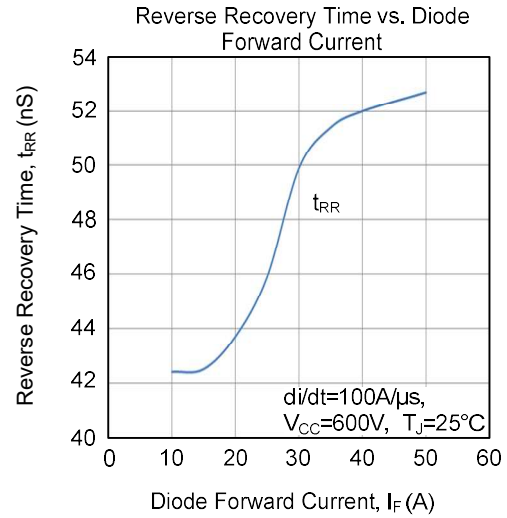
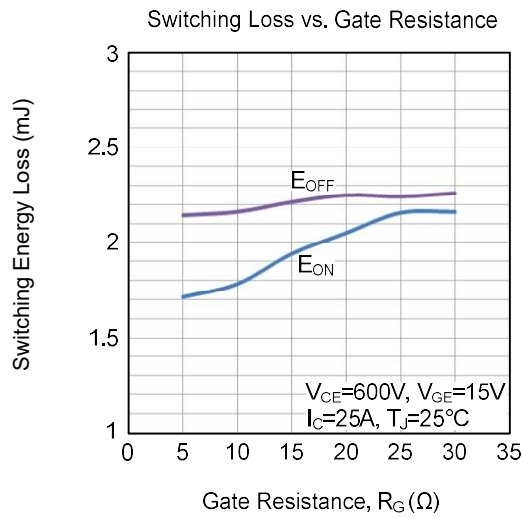
### ■ TYPICAL CHARACTERISTICS



### ■ TYPICAL CHARACTERISTICS (Cont.)



### ■ TYPICAL CHARACTERISTICS (Cont.)



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.