



UTG15N120LNS1

Preliminary

Insulated Gate Bipolar Transistor

1200V, SMPS N-CHANNEL IGBT

DESCRIPTION

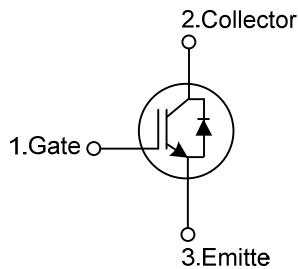
The UTC **UTG15N120LNS1** is a N-channel IGBT. it uses UTC's advanced technology to provide customers with high input impedance, high switching speed and low conduction loss, etc.

The UTC **UTG15N120LNS1** is suitable for high voltage switching, high frequency switch mode power supplies.

FEATURES

- * High switching speed
- * High avalanche ruggedness
- * Low saturation voltage: $V_{CE(SAT), Typ.} = 1.61V @ I_C=15A, V_{GE}=15V$ ($T_C = 25^\circ C$)

SYMBOL



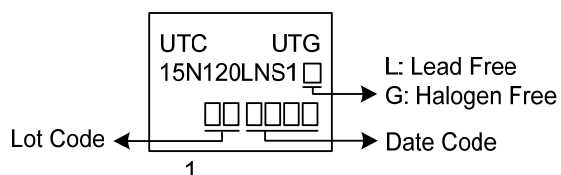
ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|----------------------|----------------------|---------|----------------|---|---|---------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| UTG15N120LNS1L-T47-T | UTG15N120LNS1G-T47-T | TO-247 | G | C | E | Tube |

Note: Pin Assignment: G: Gate C: Collector E: Emitter

| | | |
|----------------------|------------------|---|
| UTG15N120LNS1G-T47-T | (1)Packing Type | (1) T: Tube |
| | (2)Package Type | (2) T47: TO-247 |
| | (3)Green Package | (3) G: Halogen Free and Lead Free, L: Lead Free |

MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|-----------|---------------------------|--------------------|
| Collector-Emitter Voltage | V_{CES} | 1200 | V |
| Gate-Emitter Voltage | V_{GES} | ± 20 | V |
| Transient Gate-Emitter Voltage ($t_p < 5 \text{ ms}$) | | ± 25 | V |
| Continuous Collector Current | I_C | $T_C=25^{\circ}\text{C}$ | A |
| | | $T_C=100^{\circ}\text{C}$ | A |
| Collector Current Pulsed (Note 1) | I_{CM} | 60 | A |
| Diode Forward Current | I_F | $T_C=25^{\circ}\text{C}$ | A |
| | | $T_C=100^{\circ}\text{C}$ | A |
| Power Dissipation ($T_C=25^{\circ}\text{C}$) | P_D | 278 | W |
| Operating Junction Temperature | T_J | $-40 \sim +150$ | $^{\circ}\text{C}$ |
| Storage Temperature Range | T_{STG} | $-55 \sim +150$ | $^{\circ}\text{C}$ |

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_{JC} | 0.45 | $^{\circ}\text{C/W}$ |

■ ELECTRICAL CHARACTERISTICS ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | | MIN | TYP | MAX | UNIT |
|---|----------------------|---|-----------------------|------|------|------|------|
| OFF CHARACTERISTICS | | | | | | | |
| Collector-Emitter Breakdown Voltage | BV _{CES} | | | 1200 | | | V |
| Collector Cut-Off Current | I _{CES} | V _{CE} =1200V, V _{GE} =0V | | | | 5 | μA |
| G-E Leakage Current | I _{GES} | V _{CE} =0V, V _{GE} =±20V | | | | ±250 | nA |
| ON CHARACTERISTICS | | | | | | | |
| Gate to Emitter Threshold Voltage | V _{GE(TH)} | I _C =250μA, V _{CE} =V _{GE} | | 4.0 | | 7.5 | V |
| Collector to Emitter Saturation Voltage | V _{CE(SAT)} | I _C =15A, V _{GE} =15V | T _C =25°C | | 1.61 | 2.3 | V |
| | | | T _C =125°C | | 2.2 | | V |
| DYNAMIC CHARACTERISTICS | | | | | | | |
| Input Capacitance | C _{IES} | V _{CE} =25V, V _{GE} =0V, f=1MHz | | | 863 | | pF |
| Output Capacitance | C _{OES} | | | | 86 | | pF |
| Reverse Transfer Capacitance | C _{RES} | | | | 49 | | pF |
| SWITCHING CHARACTERISTICS | | | | | | | |
| Total Gate Charge | Q _G | V _{CE} =600V, I _C =15A, V _{GE} =15V | | | 63 | | nC |
| Gate-Emitter Charge | Q _{GE} | | | | 20 | | nC |
| Gate-Collector Charge | Q _{GC} | | | | 28 | | nC |
| Turn-On Delay Time | t _{DON} | V _{CC} =600V, I _C =15A, R _G =5Ω, V _{GE} =0~15V, L=500μH | | | 11 | | ns |
| Rise Time | t _R | | | | 21 | | ns |
| Turn-Off Delay Time | t _{DOFF} | | | | 47 | | ns |
| Fall Time | t _F | | | | 275 | | ns |
| Turn-On Switching Loss | E _{ON} | | | | 1.08 | | mJ |
| Turn-Off Switching Loss | E _{OFF} | | | | 1.16 | | mJ |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS | | | | | | | |
| Forward Voltage Drop | V _F | I _F =15A | | | | 2.5 | V |
| Reverse Recovery Time | t _{rr} | I _F =15A, dI/dt=100A/μS, V _{CC} =400V | | | 57 | | ns |
| Reverse Recovery Charge | Q _{rr} | | | | 1828 | | μC |

■ TEST CIRCUIT AND WAVEFORMS

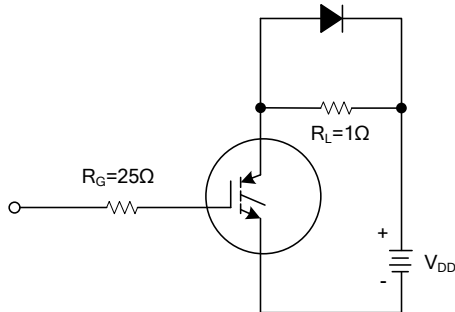


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

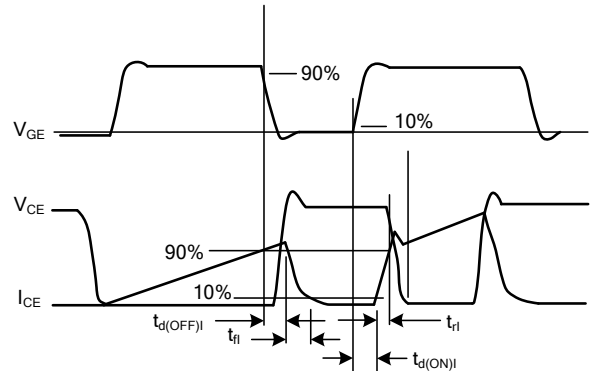


Fig 2. SWITCHING TEST WAVEFORMS

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.