



## UTG60N120-G2

Preliminary

Insulated Gate Bipolar Transistor

### 1200V TRENCH GATE FIELD-STOP IGBT

#### DESCRIPTION

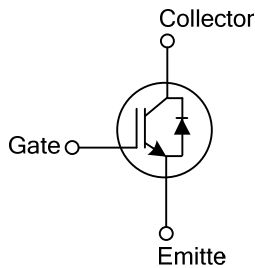
The UTC **UTG60N120-G2** is an Trench Field-Stop Insulated Gate Bipolar Transistor. it uses UTC's advanced technology to provide customers with high switching speed, low saturation voltage and low switching loss, etc.

The UTC **UTG60N120-G2** is suitable for the resonant or soft switching applications.

#### FEATURES

- \* High switching speed
- \* High avalanche ruggedness
- \* Low saturation voltage:  $V_{CE(sat)}$ , typ. = 1.72V @  $I_C=60A$  ( $T_C=25^\circ C$ )
- \* Low switching loss:  $E_{OFF}$ , typ. = 5.0mJ @  $I_C=60A$  ( $T_C=25^\circ C$ )

#### SYMBOL



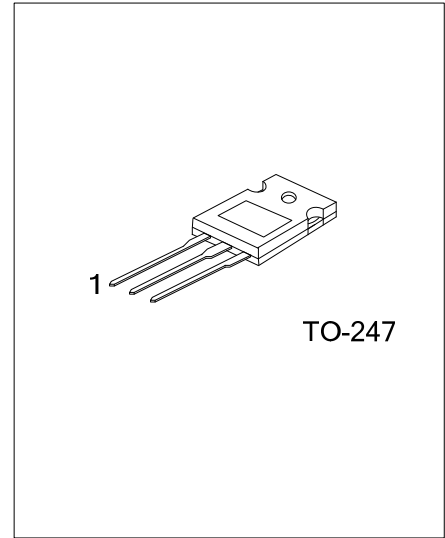
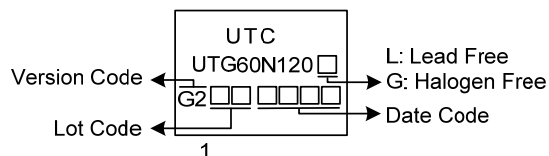
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTG60N120L-G2-T47-T	UTG60N120G-G2-T47-T	TO-247	G	C	E	Tube

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

<b>UTG60N120G-G2-T47-T</b>		(1)Packing Type	(1) T: Tube
		(2)Package Type	(2) T47: TO-247
		(3)Version Code	(3) Version G2
		(4)Green Package	(4) G: Halogen Free and Lead Free, L: Lead Free

#### MARKING



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage	$V_{CES}$	1200	V
Gate-Emitter Voltage	$V_{GES}$	$\pm 20$	V
Continuous Collector Current	$T_C=25^{\circ}\text{C}$	120	A
	$T_C=100^{\circ}\text{C}$	60	A
Collector Current Pulsed (Note 1)	$I_{CM}$	240	A
Diode Forward Current	$T_C=25^{\circ}\text{C}$	120	A
	$T_C=100^{\circ}\text{C}$	60	A
Short Circuit Withstand Time $V_{GE} = 15\text{V}$ , $V_{CC} \leq 200\text{V}$ Allowed number of short circuits < 1000 Time between short circuits: $\geq 1.0\text{s}$ $T_{VJ} = 25^{\circ}\text{C}$	$t_{SC}$	10	$\mu\text{s}$
Power Dissipation	$T_C=25^{\circ}\text{C}$	320	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	$\theta_{JC}$	0.39	$^{\circ}\text{C/W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off Characteristics						
Collector-Emitter Breakdown Voltage	$BV_{CES}$		1200			V
Collector Cut-Off Current	$I_{CES}$	$V_{CE}=V_{CES}$ , $V_{GE}=0V$			5	$\mu A$
G-E Leakage Current	$I_{GES}$	$V_{GE}=V_{GES}$ , $V_{CE}=0V$			$\pm 100$	nA
On Characteristics						
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	$I_C=250\mu A$ , $V_{CE}=V_{GE}$	4.5		7.5	V
Collector to Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=60A$ , $V_{GE}=15V$		1.72	2.1	V
		$I_C=60A$ , $V_{GE}=15V$ , $T_C=125^{\circ}C$		2.1		V
Dynamic Characteristics						
Input Capacitance	$C_{IES}$	$V_{CE}=25V$ , $V_{GE}=0V$ , $f=1MHz$		3310		pF
Output Capacitance	$C_{OES}$			151		pF
Reverse Transfer Capacitance	$C_{RES}$			101		pF
Switching Characteristics						
Total Gate Charge	$Q_G$	$V_{CE}=600V$ , $I_C=60A$ , $V_{GE}=15V$		282		nC
Gate-Emitter Charge	$Q_{GE}$			23		nC
Gate-Collector Charge	$Q_{GC}$			197		nC
Turn-On Delay Time	$t_{DON}$	$V_{CC}=600V$ , $I_C=60A$ , $R_G=5\Omega$ , $V_{GE}=0\sim 15V$ , $L=500\mu H$		22		ns
Rise Time	$t_R$			25		ns
Turn-Off Delay Time	$t_{DOFF}$			324		ns
Fall Time	$t_F$			160		ns
Turn-On Switching Loss	$E_{ON}$			6		mJ
Turn-Off Switching Loss	$E_{OFF}$			5		mJ
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Forward Voltage Drop	$V_{FM}$	$I_F=60A$			2.5	V
Reverse Recovery Time	$t_{rr}$	$I_F=60A$ ,		55		ns
Reverse Recovery Charge	$Q_{rr}$	$dI/dt=100A/\mu S$		3.2		$\mu C$

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.