



## UTG50N120ND-S

Preliminary

Insulated Gate Bipolar Transistor

### 1200V TRENCH GATE FIELD-STOP IGBT

#### DESCRIPTION

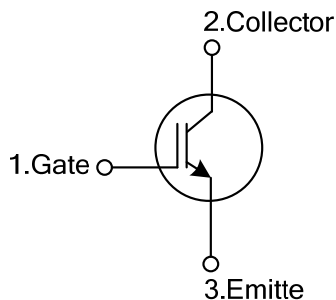
The UTC **UTG50N120ND-S** is an Trench Field-Stop Insulated Gate Bipolar Transistor. it uses UTC's advanced technology to provide customers with high switching speed, low saturation voltage and low switching loss, etc.

The UTC **UTG50N120ND-S** is suitable for the resonant or soft switching applications.

#### FEATURES

- \* High switching speed
- \* High avalanche ruggedness
- \* Low saturation voltage:  $V_{CE(SAT), Typ.} = 1.65V @ I_C=50A, V_{GE}=15V$  ( $T_C = 25^{\circ}C$ )

#### SYMBOL

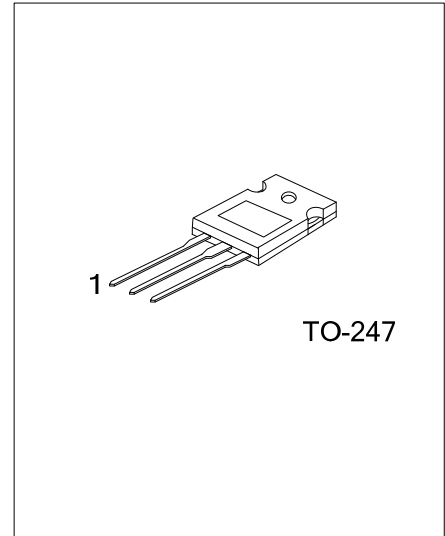


#### ORDERING INFORMATION

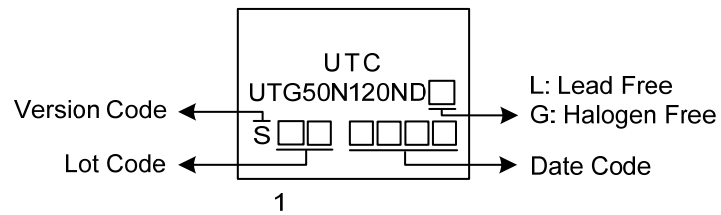
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTG50N120NDL-S-T47-T	UTG50N120NDG-S-T47-T	TO-247	G	C	E	Tube

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

UTG50N120NDG-S-T47-T		(1)Packing Type	(1) T: Tube
		(2)Package Type	(2) T47: TO-247
		(3)Version Code	(3) Version S
		(4)Green Package	(4) 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	$V_{GES}$	$\pm 20$	V
Transient Gate-emitter voltage ( $t_p < 5 \text{ ms}$ )		$\pm 25$	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)	$I_{CM}$	200	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 ( $T_C=25^{\circ}\text{C}$ )	$P_D$	285	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	$\theta_{JC}$	0.44	$^{\circ}\text{C/W}$

■ 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	$I_{CES}$	$V_{CE}=1200V, V_{GE}=0V$			250	$\mu A$
G-E Leakage Current	$I_{GES}$	$V_{CE}=0V, V_{GE}=\pm 20V$			$\pm 250$	nA
On CHARACTERISTICS						
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	$I_C=250\mu A, V_{CE}=V_{GE}$	4.5		6.5	V
Collector to Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=50A, V_{GE}=15V$	$T_C=25^{\circ}C$	1.65	2.1	V
			$T_C=125^{\circ}C$	2.0		V
DYNAMIC CHARACTERISTICS						
Input Capacitance	$C_{IES}$	$V_{CE}=25V, V_{GE}=0V, f=1MHz$		2510		pF
Output Capacitance	$C_{OES}$			156		pF
Reverse Transfer Capacitance	$C_{RES}$			47		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{DON}$	$V_{CC}=600V, I_C=50A, R_G=5\Omega, V_{GE}=0\sim 15V, L=500\mu H$		22		ns
Rise Time	$t_R$			100		ns
Turn-Off Delay Time	$t_{DOFF}$			139		ns
Fall Time	$t_F$			181		ns
Turn-On Switching Loss	$E_{ON}$			6.79		mJ
Turn-Off Switching Loss	$E_{OFF}$			4.93		mJ

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