



## UTG10N120LSS1

Preliminary

Insulated Gate Bipolar Transistor

### 1200V, SMPS N-CHANNEL IGBT

#### DESCRIPTION

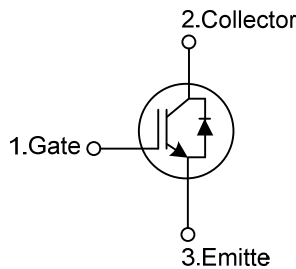
The UTC **UTG10N120LSS1** is a N-channel IGBT. it uses UTC's advanced technology to provide customers with high input impedance, high switching speed and low conduction loss, etc.

The UTC **UTG10N120LSS1** is suitable for high voltage switching, high frequency switch mode power supplies.

#### FEATURES

- \* High switching speed
- \* High avalanche ruggedness
- \* Low saturation voltage:  $V_{CE(SAT), Typ.} = 1.54V @ I_C=10A, V_{GE}=15V$  ( $T_C = 25^{\circ}C$ )

#### SYMBOL

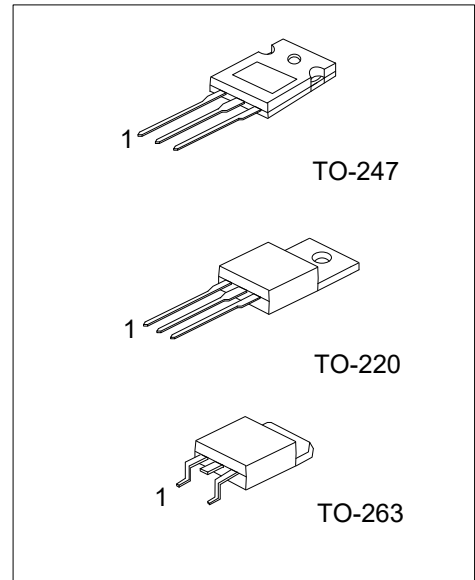


#### ORDERING INFORMATION

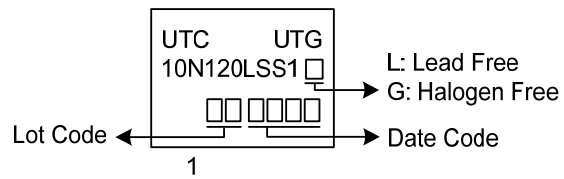
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTG10N120LSS1L-TA3-T	UTG10N120LSS1G-TA3-T	TO-220	G	C	E	Tube
UTG10N120LSS1L-TQ2-T	UTG10N120LSS1G-TQ2-T	TO-263	G	C	E	Tube
UTG10N120LSS1L-TQ2-R	UTG10N120LSS1G-TQ2-R	TO-263	G	C	E	Tape Reel
UTG10N120LSS1L-T47-T	UTG10N120LSS1G-T47-T	TO-247	G	C	E	Tube

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

UTG10N120LSS1G-TA3-T	(1)Packing Type	(1) T: Tube, R: Tape Reel
	(2)Package Type	(2) TA3: TO-220, TQ2: TO-263, 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 noted)

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	$T_C=25^{\circ}\text{C}$	$I_C$	20	A
	$T_C=100^{\circ}\text{C}$		10	A
Collector Current Pulsed (Note 1)		$I_{CM}$	40	A
Diode Forward Current	$T_C=25^{\circ}\text{C}$	$I_F$	20	A
	$T_C=100^{\circ}\text{C}$		10	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: $\geq 1.0\text{s}$ $T_{VJ} = 25^{\circ}\text{C}$		$t_{SC}$	3	$\mu\text{s}$
Power Dissipation ( $T_C=25^{\circ}\text{C}$ )	TO-220	$P_D$	96	W
	TO-263		245	W
	TO-247			
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	TO-220	$\theta_{JC}$	1.3	$^{\circ}\text{C/W}$
	TO-263		0.51	$^{\circ}\text{C/W}$
	TO-247			

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

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				±250	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> =10A, V <sub>GE</sub> =15V	T <sub>C</sub> =25°C		1.54	2.1	V
			T <sub>C</sub> =125°C		2.2		V
DYNAMIC CHARACTERISTICS							
Input Capacitance	C <sub>IES</sub>	V <sub>CE</sub> =25V, V <sub>GE</sub> =0V, f=1MHz			1750		pF
Output Capacitance	C <sub>OES</sub>				56.9		pF
Reverse Transfer Capacitance	C <sub>RES</sub>				38.7		pF
SWITCHING CHARACTERISTICS							
Total Gate Charge	Q <sub>G</sub>	V <sub>CE</sub> =600V, I <sub>C</sub> =10A, V <sub>GE</sub> =15V			103.9		nC
Gate-Emitter Charge	Q <sub>GE</sub>				24.5		nC
Gate-Collector Charge	Q <sub>GC</sub>				52.9		nC
Turn-On Delay Time	t <sub>DON</sub>	V <sub>CC</sub> =600V, I <sub>C</sub> =10A, R <sub>G</sub> =5Ω, V <sub>GE</sub> =0~15V, L=500μH			11.3		ns
Rise Time	t <sub>R</sub>				15.2		ns
Turn-Off Delay Time	t <sub>DOFF</sub>				89.8		ns
Fall Time	t <sub>F</sub>				312.3		ns
Turn-On Switching Loss	E <sub>ON</sub>				0.62		mJ
Turn-Off Switching Loss	E <sub>OFF</sub>				1.03		mJ
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Forward Voltage Drop	V <sub>F</sub>	I <sub>F</sub> =10A				2.5	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =10A, dI/dt=100A/μS, V <sub>CC</sub> =400V			50		ns
Reverse Recovery Charge	Q <sub>rr</sub>				0.58		μC

### ■ TEST CIRCUIT AND WAVEFORMS

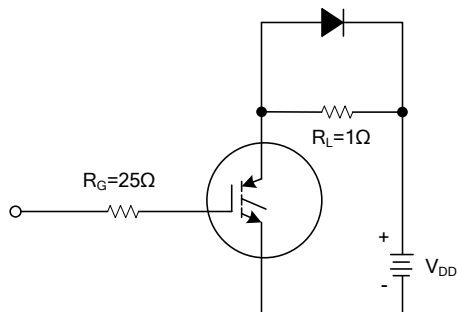


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

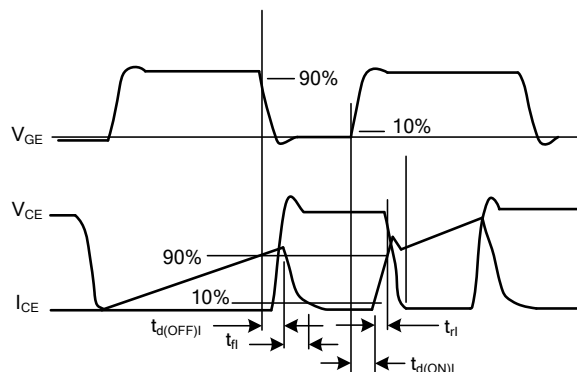


Fig 2. SWITCHING TEST WAVEFORMS

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