



UPGE120N33LNK1

Preliminary

Insulated Gate Bipolar Transistor

330V, SMPS N-CHANNEL IGBT

DESCRIPTION

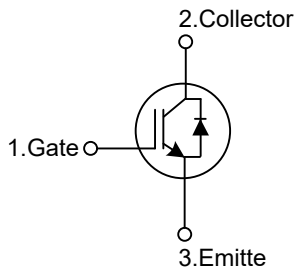
The UTC **UPGE120N33LNK1** is a N-channel IGBT. it uses UTC's advanced technology to provide customers with high input impedance, high switching speed and low conduction loss, etc.

The UTC **UPGE120N33LNK1** is suitable for high voltage switching, high frequency switch mode power supplies.

FEATURES

- * High switching speed
- * High avalanche ruggedness
- * Low saturation voltage: $V_{CE(SAT), Typ.} = 2.0V @ I_C = 120A, V_{GE} = 15V$ ($T_C = 25^\circ C$)

SYMBOL



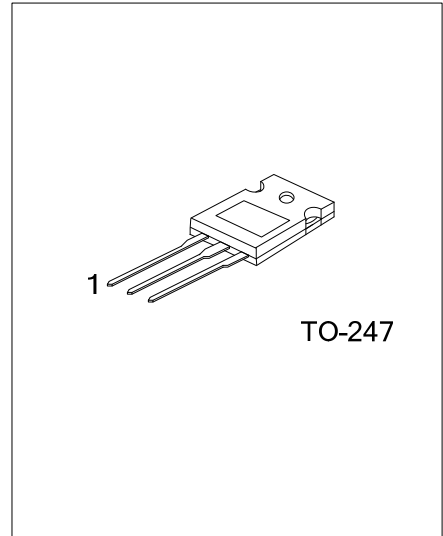
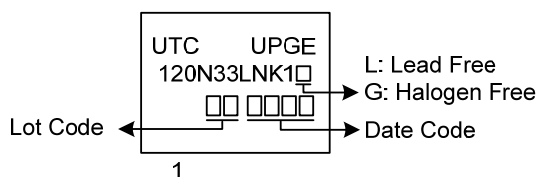
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UPGE120N33LNK1L-T47-T	UPGE120N33LNK1G-T47-T	TO-247	G	C	E	Tube

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

UPGE120N33LNK1G-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 noted)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage	V_{CES}	330	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}	480	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	300	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}	0.417	$^{\circ}\text{C/W}$

■ 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}		330			V
Collector Cut-Off Current	I _{CES}	V _{CE} =330V, V _{GE} =0V			5	μA
G-E Leakage Current	I _{GES}	V _{CE} =0V, V _{GE} =±20V			±400	nA
On Characteristics						
Gate to Emitter Threshold Voltage	V _{GE(TH)}	I _C =250μA, V _{CE} =V _{GE}	2.5		6.5	V
Collector to Emitter Saturation Voltage	V _{CE(SAT)}	I _C =120A, V _{GE} =15V	T _C =25°C	2.0	2.3	V
			T _C =125°C	2.5		V
Dynamic Characteristics						
Input Capacitance	C _{IES}	V _{CE} =25V, V _{GE} =0V, f=1MHz		4300		pF
Output Capacitance	C _{OES}			470		pF
Reverse Transfer Capacitance	C _{RES}			90		pF
Switching Characteristics						
Total Gate Charge	Q _G	V _{CE} =280V, I _C =120A, V _{GE} =15V		110		nC
Gate-Emitter Charge	Q _{GE}			23		nC
Gate-Collector Charge	Q _{GC}			35		nC
Turn-On Delay Time	t _{DON}	V _{CC} =240V, I _C =120A, R _G =5Ω, V _{GE} =0~15V, L=500μH		23		ns
Rise Time	t _R			100		ns
Turn-Off Delay Time	t _{DOFF}			150		ns
Fall Time	t _F			500		ns
Turn-On Switching Loss	E _{ON}			2.8		mJ
Turn-Off Switching Loss	E _{OFF}			6.4		mJ
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Forward Voltage Drop	V _F	I _F =120A			2.0	V
Reverse Recovery Time	t _{rr}	I _F =120A, dI/dt=100A/μS,		426		ns
Reverse Recovery Charge	Q _{rr}	V _{CC} =240V		1.226		μC

■ TEST CIRCUIT AND WAVEFORMS

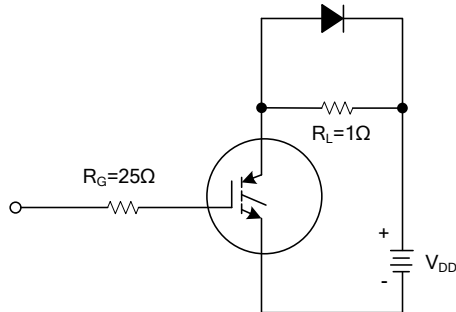


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

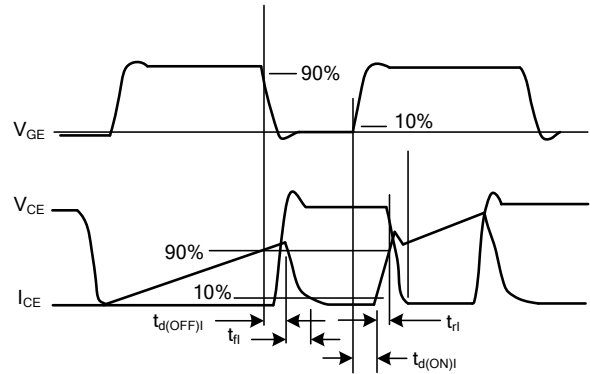


Fig 2. SWITCHING TEST WAVEFORMS

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