



UPGE155N33

Preliminary

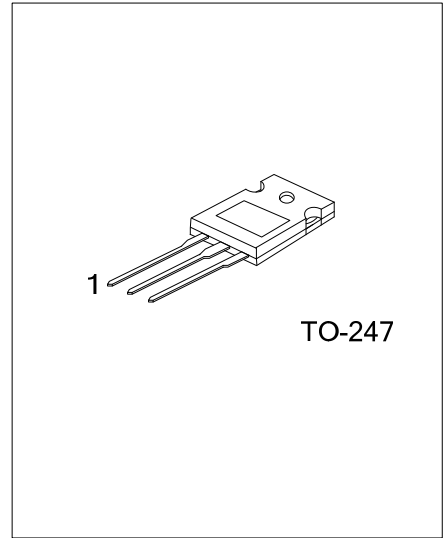
Insulated Gate Bipolar Transistor

330V, SMPS N-CHANNEL IGBT

■ DESCRIPTION

The UTC **UPGE155N33** 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.

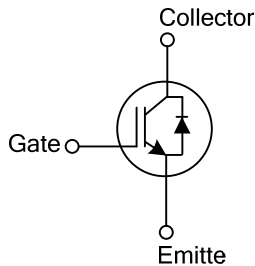
The UTC **UPGE155N33** is suitable for high voltage switching, high frequency switch mode power supplies.



■ FEATURES

- * High switching speed
- * High avalanche ruggedness
- * Low saturation voltage: $V_{CE(SAT),Typ.} = 1.7V @ I_C=77A, V_{GE}=15V$ ($T_C = 25^\circ C$)

■ SYMBOL



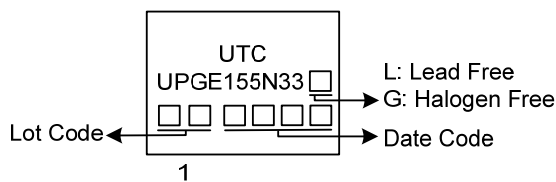
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UPGE155N33L-T47-T	UPGE155N33G-T47-T	TO-247	G	C	E	Tube

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

<p>UPGE155N33G-T47-T</p>	<p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) T: Tube</p> <p>(2) T47: TO-247</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise noted)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage	V _{CE}	330	V
Gate-Emitter Voltage	V _{GE}	±20	V
Transient Gate-emitter voltage (t _p < 5 ms)		±25	V
Continuous Collector Current	I _C	T _C =25°C	310
		T _C =100°C	155
Collector Current Pulsed (Note 1)	I _{CM}	310	A
Diode Forward Current	I _F	T _C =25°C	70
		T _C =100°C	35
Power Dissipation (T _C =25°C)	P _D	380	W
Operating Junction Temperature	T _J	-40 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°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}	0.33	°C/W

■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Off Characteristics							
Collector-Emitter Breakdown Voltage	BV _{CE}		330			V	
Collector Cut-Off Current	I _{CE}	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		5.5	V	
Collector to Emitter Saturation Voltage	V _{CE(SAT)}	I _C =77A, V _{GE} =15V	T _C =25°C	1.7	2.2	V	
			T _C =125°C	2.2		V	
Dynamic Characteristics							
Input Capacitance	C _{IES}	V _{CE} =25V, V _{GE} =0V, f=1MHz		5.77		nF	
Output Capacitance	C _{OES}			616		pF	
Reverse Transfer Capacitance	C _{RES}			147		pF	
Switching Characteristics							
Total Gate Charge	Q _G	V _{CE} =280V, I _C =155A, V _{GE} =15V		164		nC	
Gate-Emitter Charge	Q _{GE}			32		nC	
Gate-Collector Charge	Q _{GC}			57		nC	
Turn-On Delay Time	t _{DON)}	V _{CC} =240V, I _C =155A, R _G =5Ω, V _{GE} =0~15V, L=500μH		32		ns	
Rise Time	t _R			113		ns	
Turn-Off Delay Time	t _{DOFF)}			294		ns	
Fall Time	t _F			1032		ns	
Turn-On Switching Loss	E _{ON}			3.6		mJ	
Turn-Off Switching Loss	E _{OFF}			16		mJ	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Forward Voltage Drop	V _F		I _F =70A			2.0	V
Reverse Recovery Time	t _{rr}	I _F =70A, dI/dt=100A/μS, V _{CC} =400V		750		ns	
Reverse Recovery Charge	Q _{rr}			1.6		μC	

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUIT AND WAVEFORMS

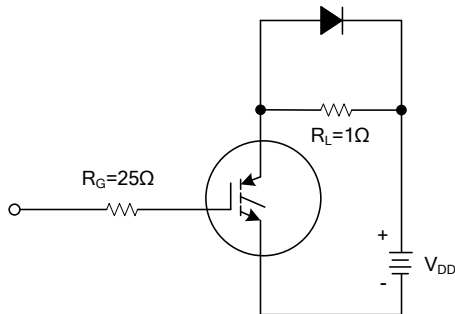


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

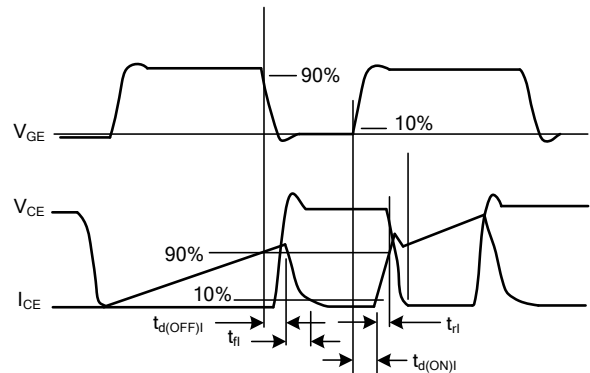


Fig 2. SWITCHING TEST WAVEFORMS

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