



UPGE15N60

Insulated Gate Bipolar Transistor

600V, SMPS N-CHANNEL IGBT

DESCRIPTION

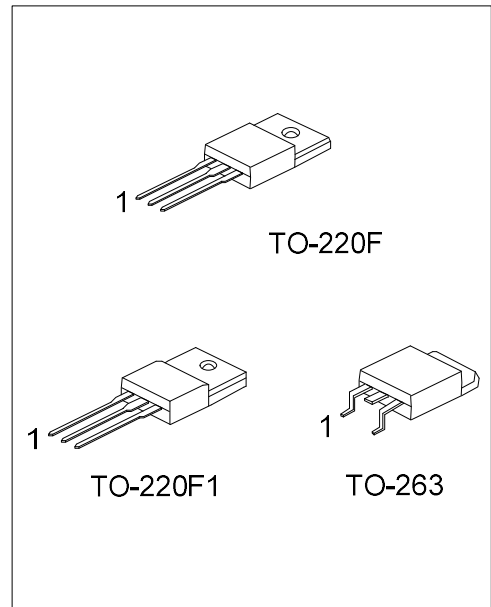
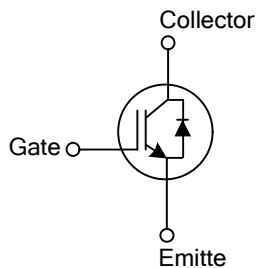
The UTC **UPGE15N60** is a N-channel IGBT. it uses UTC's advanced technology to provide customers with high input impedance, high switching speed and low conduction loss, etc.

The UTC **UPGE15N60** is suitable for high voltage switching, high frequency switch mode power supplies.

FEATURES

- * $V_{CE(SAT)} \leq 2.3V$ @ $I_C=15A$, $V_{GE}=15V$
- * High switching speed
- * High input impedance
- * Low conduction loss

SYMBOL



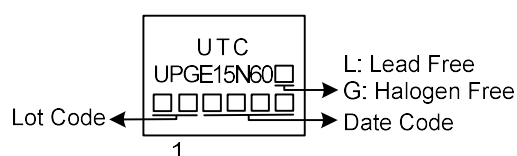
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UPGE15N60L-TF1-T	UPGE15N60G-TF1-T	TO-220F1	G	C	E	Tube
UPGE15N60L-TF3-T	UPGE15N60G-TF3-T	TO-220F	G	C	E	Tube
UPGE15N60L-TQ2-T	UPGE15N60G-TQ2-T	TO-263	G	C	E	Tube
UPGE15N60L-TQ2-R	UPGE15N60G-TQ2-R	TO-263	G	C	E	Tape Reel

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

UPGE15N60G-TF1-T	(1)Packing Type	(1) T: Tube, R: Tape Reel
	(2)Package Type	(2) TF1: TO-220F1, TF3: TO-220F, TQ2: TO-263
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_C=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		V _{CES}	600	V
Gate to Emitter Voltage Continuous		V _{GES}	±20	V
Continuous Collector Current	T _C =25°C	I _C	30	A
	T _C =100°C		15	A
Collector Current Pulsed (Note 2)		I _{CM}	45	A
Continuous Forward Current	T _C =25°C	I _F	15	A
	T _C =100°C		7.5	A
Forward Current Pulsed		I _{FM}	104	A
Peak Diode Recovery dv/dt (Note 3)		dv/dt	6.7	V/ns
Power Dissipation	TO-220F TO-220F1	P _D	30	W
	TO-263		88	W
Junction Temperature		T _J	-55 ~ +150	°C
Storage Temperature Range		T _{STG}	-55 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating: Pulse width limited by maximum junction temperature.

3. I_F ≤ 15A, di/dt ≤ 200A/μs, V_{CC} ≤ BV_{CES}, Starting T_J=25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Case	TO-220F TO-220F1	θ _{JC}	4.17	°C/W
	TO-263		1.42	°C/W

■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Collector-Emitter Breakdown Voltage	BV_{CES}	$I_C=250\mu A, V_{GE}=0V$		600			V
Collector-Emitter Leakage Current	I_{CES}	$V_{CE}=600V, V_{GE}=0V$				10	μA
Gate to Emitter Leakage Current	I_{GES}	$V_{CE}=0V, V_{GE}=\pm 20V$				± 400	nA
ON CHARACTERISTICS							
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	$I_C=250\mu A, V_{CE}=V_{GE}$		4.0		6.5	V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=15A, V_{GE}=15V$	$T_J=25^{\circ}C$		1.8	2.3	V
			$T_J=150^{\circ}C$		2.0		V
DYNAMIC CHARACTERISTICS							
Input Capacitance	C_{IES}	$V_{CE}=25V, V_{GE}=0V, f=1MHz$			550		pF
Output Capacitance	C_{OES}				105		pF
Reverse Transfer Capacitance	C_{RES}				24		pF
SWITCHING CHARACTERISTICS							
Total Gate Charge	Q_G	$I_C=15A, V_{CE}=100V, V_{GE}=10V$			65		nC
Gate-Emitter Charge	Q_{GE}				43		nC
Gate-Collector Charge	Q_{GC}				10		nC
Current Turn-On Delay Time	$t_{D(ON)}$	$I_C=15A, V_{CE}=50V, V_{GE}=15V, R_G=10\Omega$			6		ns
Current Rise Time	t_R				40		ns
Current Turn-Off Delay Time	$t_{D(OFF)}$				60		ns
Current Fall Time	t_F				1844		ns
DRAIN-SOURCE DIODE CHARACTERISTICS							
Forward Voltage Drop	V_{FM}	$I_F=15A$				2.2	V
Reverse Recovery Time	t_{rr}	$I_F=15A, dI/dt=150A/\mu S, V_{CC}=400V$			62		ns
Reverse Recovery Charge	Q_{rr}				140		nC

Note: Pulse Test: Pulse width ≤ 50μs.

■ TEST CIRCUIT AND WAVEFORMS

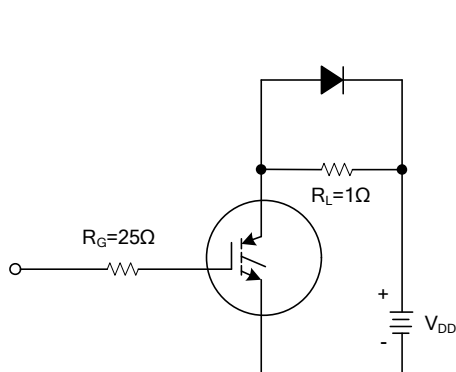


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

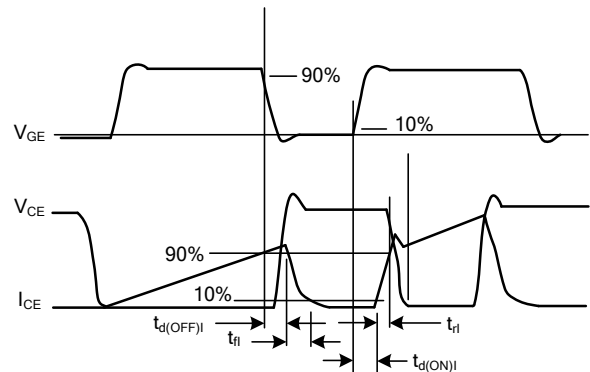


Fig 2. SWITCHING TEST WAVEFORMS

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.