



UPG18N60

Insulated Gate Bipolar Transistor

600V, SMPS N-CHANNEL IGBT

■ DESCRIPTION

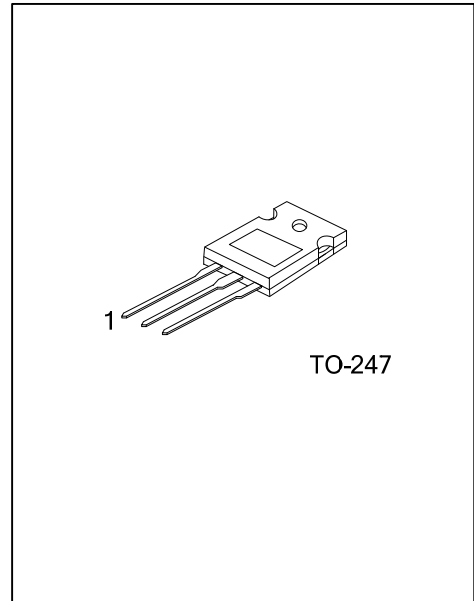
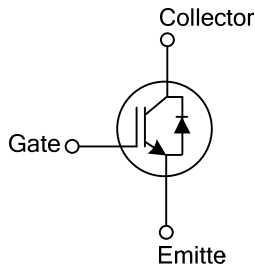
The UTC **UPG18N60** is a N-channel IGBT. it uses UTC's advanced technology to provide customers with high input impedance, high switching speed and low conduction loss, etc.

The UTC **UPG18N60** is suitable for high voltage switching, high frequency switch mode power supplies.

■ FEATURES

- * $V_{CE(SAT)} \leq 2.6V @ I_C=18A, V_{GE}=15V$
- * 600V Switching SOA Capability
- * High switching speed
- * High input impedance
- * Low conduction loss

■ SYMBOL



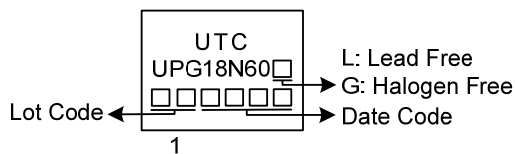
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UPG18N60L-T47-T	UPG18N60G-T47-T	TO-247	G	C	E	Tube

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

<p>UPG18N60G-T47-T</p>	<p>(1) T: Tube (2) T47: TO-247 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ\text{C}$, 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	I_C	$T_C=25^\circ\text{C}$	36
		$T_C=100^\circ\text{C}$	18
Collector Current Pulsed (Note 2)	I_{CM}	72	A
Single Pulse Avalanche Energy (Note 3)	E_{AS}	28.8	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	6.2	V/ns
Power Dissipation	P_D	200	W
Junction Temperature	T_J	$-55 \sim +150$	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

- 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. $L=10\text{mH}$, $PK_{IL}=2.4\text{A}$, $V_{CC}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$
 4. $I_F \leq 18\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{CC} \leq BV_{CES}$, Starting $T_J=25^\circ\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	0.5	$^\circ\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Emitter Breakdown Voltage	BV_{CES}	$I_C=250\mu\text{A}$, $V_{GE}=0\text{V}$	600			V
Collector-Emitter Leakage Current	I_{CES}	$V_{CE}=600\text{V}$, $V_{GE}=0\text{V}$			10	μA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=18\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^\circ\text{C}$	2.1	2.6	V
			$T_J=150^\circ\text{C}$	2.55		V
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	$I_C=250\mu\text{A}$, $V_{CE}=V_{GE}$	4.0		6.5	V
Gate to Emitter Leakage Current	I_{GES}	$V_{CE}=0\text{V}$, $V_{GE}=20\text{V}$			± 100	nA
Input Capacitance	C_{IES}	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$		1430		pF
Output Capacitance	C_{OES}			211		pF
Reverse Transfer Capacitance	C_{RES}			35		pF
Total Gate Charge	Q_G				65.5	
Gate-Emitter Charge	Q_{GE}	$I_C=18\text{A}$, $V_{CE}=50\text{V}$, $V_{GE}=15\text{V}$		46.5		nC
Gate-Collector Charge	Q_{GC}				22.5	
Current Turn-On Delay Time	$t_{D(ON)}$	$I_C=18\text{A}$, $V_{CE}=50\text{V}$, $V_{GE}=15\text{V}$, $R_G=10\Omega$		36.6		ns
Current Rise Time	t_R			26		ns
Current Turn-Off Delay Time	$t_{D(OFF)}$			128		ns
Current Fall Time	t_F			40		ns

SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS

Forward Voltage Drop	V_{FM}	$I_F=18\text{A}$		1.2		V
Reverse Recovery Time	t_{rr}	$I_F=18\text{A}$, $di/dt=100\text{A}/\mu\text{S}$, $V_R=400\text{V}$		162		ns
Reverse Recovery Charge	Q_{rr}			0.8		μC

Note: Pulse Test: Pulse width $\leq 50\mu\text{s}$.

■ TEST CIRCUIT AND WAVEFORMS

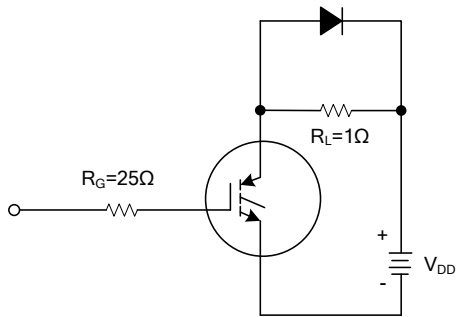


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

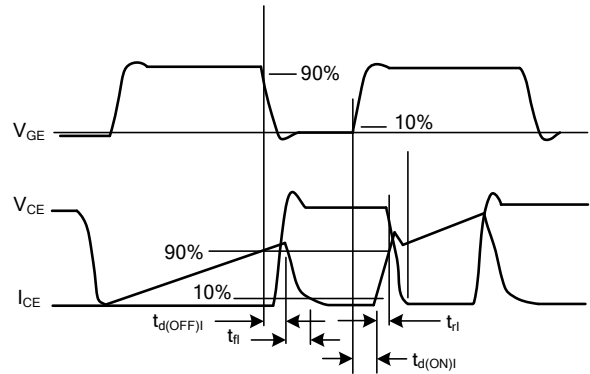
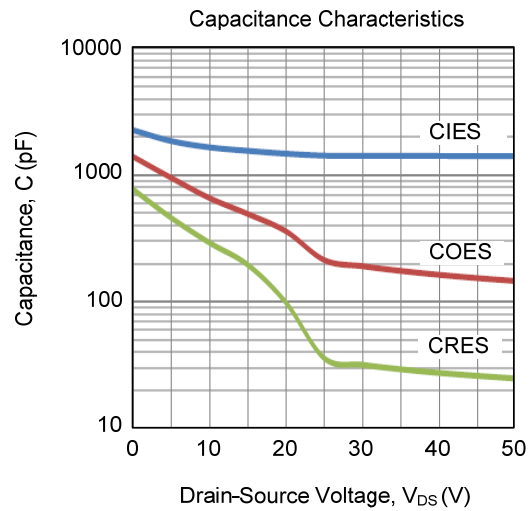
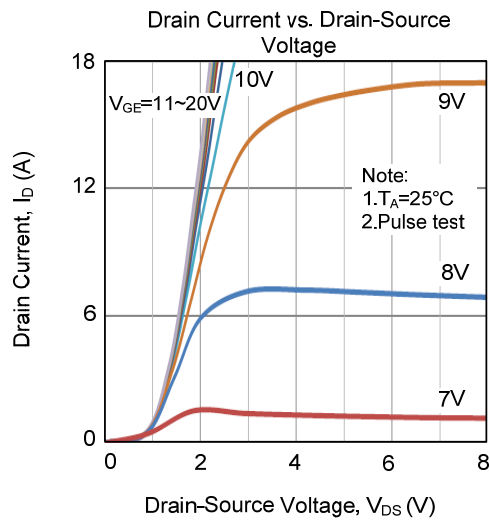


Fig 2. SWITCHING TEST WAVEFORMS

■ TYPICAL CHARACTERISTICS



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