



UPG25N120

Insulated Gate Bipolar Transistor

1200V, SMPS N-CHANNEL IGBT

■ DESCRIPTION

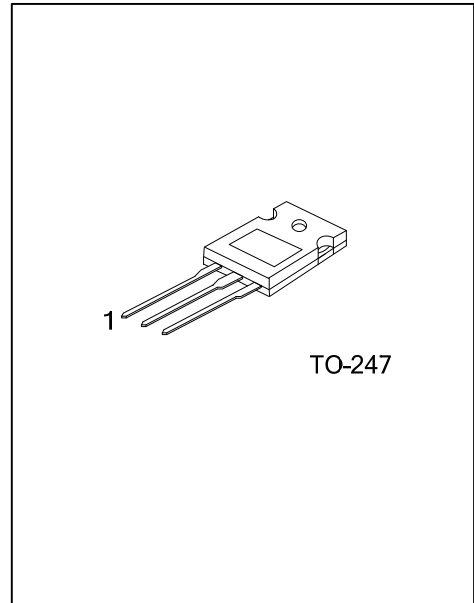
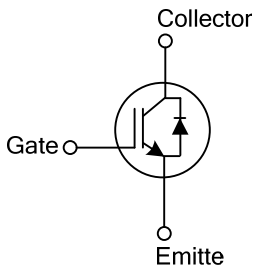
The UTC **UPG25N120** is a N-channel IGBT. it uses UTC's advanced technology to provide customers with high input impedance, high switching speed and low conduction loss, etc.

The UTC **UPG25N120** is suitable for high voltage switching, high frequency switch mode power supplies.

■ FEATURES

- * $V_{CE(SAT)} \leq 2.8V @ I_C=25A, V_{GE}=15V$
- * 1200V Switching SOA Capability
- * High switching speed
- * High input impedance
- * Low conduction loss

■ SYMBOL



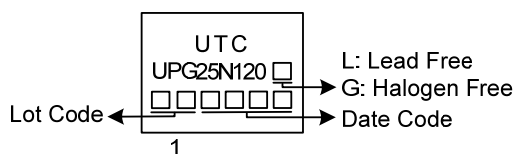
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UPG25N120L-T47-T	UPG25N120G-T47-T	TO-247	G	C	E	Tube

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

<p>UPG25N120G-T47-T</p>	<p>(1) T: Tube</p> <p>(2) T47: TO-247</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
-------------------------	--

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage	V_{CES}	1200	V
Gate to Emitter Voltage Continuous	V_{GES}	± 20	V
Continuous Collector Current	I_C	$T_C=25^\circ\text{C}$	50
		$T_C=100^\circ\text{C}$	25
Collector Current Pulsed (Note 2)	I_{CM}	100	A
Single Pulse Avalanche Energy (Note 3)	E_{AS}	88	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	4.2	V/ns
Power Dissipation	P_D	350	W
Junction Temperature	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +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. $L=10\text{mH}$, $PK_{IL}=4.2\text{A}$, $V_{CC}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$
 4. $I_F \leq 25\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{CC} \leq BV_{CES}$, Starting $T_J=25^\circ\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case	θ_{JC}	0.35	$^\circ\text{C}/\text{W}$

■ 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}	$I_C=250\mu\text{A}$, $V_{GE}=0\text{V}$	1200			V
Collector-Emitter Leakage Current	I_{CES}	$V_{CE}=1200\text{V}$, $V_{GE}=0\text{V}$			200	μA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=25\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^\circ\text{C}$	2.3	2.8	V
			$T_J=150^\circ\text{C}$	2.65		V
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	$I_C=250\mu\text{A}$, $V_{CE}=V_{GE}$	5.5		7.5	V
Gate to Emitter Leakage Current	I_{GES}	$V_{CE}=0\text{V}$, $V_{GE}=15\text{V}$			± 400	nA
Input Capacitance	C_{IES}	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$		1557		pF
Output Capacitance	C_{OES}			168		pF
Reverse Transfer Capacitance	C_{RES}			53.5		pF
Total Gate Charge	Q_G	$I_C=25\text{A}$, $V_{CE}=50\text{V}$, $V_{GE}=15\text{V}$		89.3		nC
Gate-Emitter Charge	Q_{GE}			17		nC
Gate-Collector Charge	Q_{GC}			43.5		nC
Current Turn-On Delay Time	$t_{D(ON)}$	$I_C=25$, $V_{CE}=50\text{V}$, $V_{GE}=15\text{V}$, $R_G=10\Omega$		52		ns
Current Rise Time	t_R			122		ns
Current Turn-Off Delay Time	$t_{D(OFF)}$			105		ns
Current Fall Time	t_F			58.2		ns

SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS

Forward Voltage Drop	V_{FM}	$I_F=25\text{A}$		2.1		V
Reverse Recovery Time	t_{rr}	$I_F=25\text{A}$, $di/dt=100\text{A}/\mu\text{S}$		210		ns
Reverse Recovery Charge	Q_{rr}			0.54		μC

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

■ TEST CIRCUIT AND WAVEFORMS

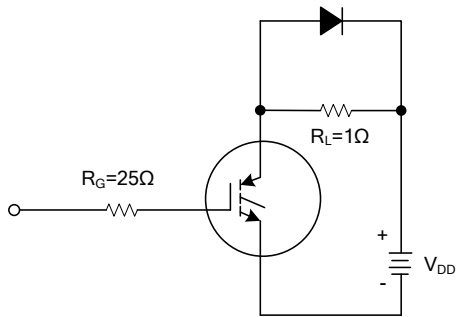


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

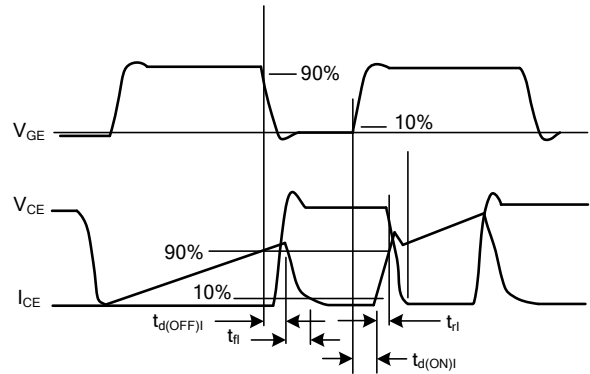
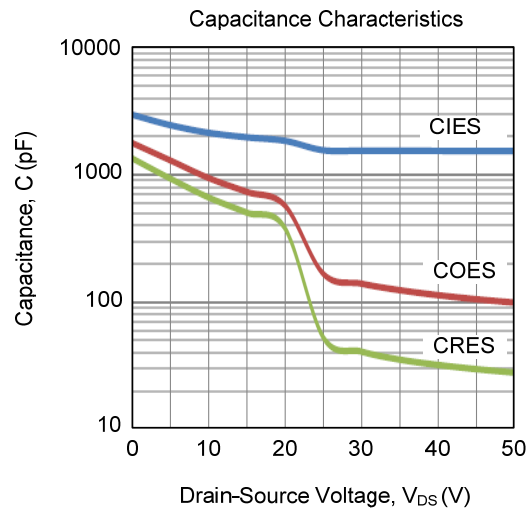
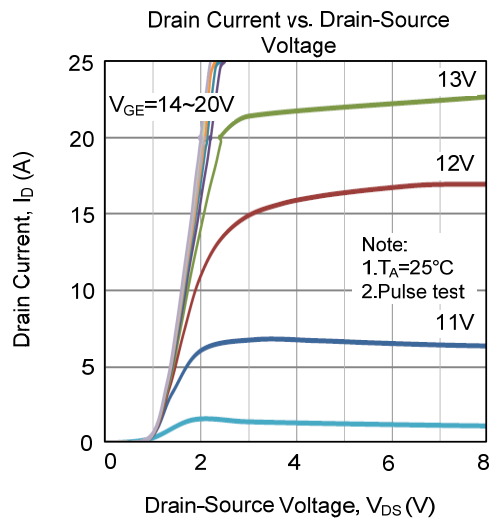


Fig 2. SWITCHING TEST WAVEFORMS

■ TYPICAL CHARACTERISTICS



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.