



**UGP7N60**

Preliminary

*Insulated Gate Bipolar Transistor*

**600V, SMPS N-CHANNEL IGBT**

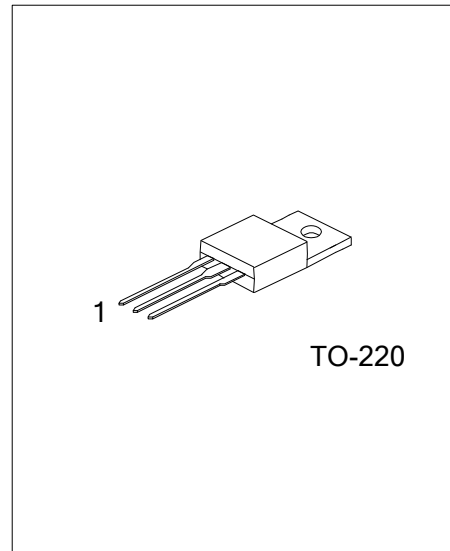
■ DESCRIPTION

The UTC **UGP7N60** is an N-channel IGBT. It uses UTC's advanced technology to provide customers with high input impedance, high switching speed and low conduction loss, etc.

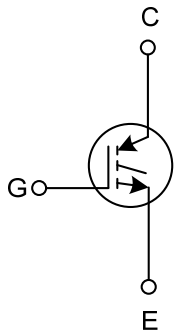
The UTC **UGP7N60** is suitable for high voltage switching, high frequency switch mode power supplies.

■ FEATURES

- \* 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	
UGP7N60L-TA3-T	UGP7N60G-TA3-T	TO-220	G	C	E	Tube

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

<p>UGP7N60L-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Free</p>	<p>(1) T: Tube</p> <p>(2) TA3: TO-220</p> <p>(3) L: Lead Free, G: Halogen Free</p>
---	--

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

PARAMETER SYMBOL			RATINGS	UNIT
Collector-Emitter Voltage		$V_{CES}$	600	V
Continuous Collector Current	$T_C=25^\circ\text{C}$	$I_C$	34 A	A
	$T_C=110^\circ\text{C}$			
Collector Current Pulsed (Note 2)		$I_{CM}$	56	A
Gate to Emitter Voltage Continuous		$V_{GES}$	$\pm 20$	V
Gate to Emitter Voltage Pulsed		$V_{GEM}$	$\pm 30$	V
Switching Safe Operating Area at $T_J=150^\circ\text{C}$		SSOA	35 (at 600V)	A
Single Pulse Avalanche Energy at $T_C=25^\circ\text{C}$ E		$E_{AS}$	25 (at 7A)	mJ
Power Dissipation Total at $T_C=25^\circ\text{C}$ P		$P_D$	125	W
Power Dissipation Derating $T_C>25^\circ\text{C}$			1.0	W/ $^\circ\text{C}$
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 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 CHARACTERISTICS

PARAMETER SYMBOL		RATINGS	UNIT
Junction to Case	$\theta_{JC}$	1.0	$^\circ\text{C}/\text{W}$

■ 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
Emitter to Collector Breakdown Voltage	$BV_{ECS}$	$I_C=10\text{mA}$ , $V_{GE}=0\text{V}$	20			V
Collector-Emitter Leakage Current	$I_{CES}$	$V_{CE}=600\text{V}$	$T_J=25^\circ\text{C}$		250	$\mu\text{A}$
			$T_J=125^\circ\text{C}$		2	mA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=7\text{A}$ , $V_{GE}=15\text{V}$	$T_J=25^\circ\text{C}$	1.3	2.7	V
			$T_J=125^\circ\text{C}$	1	2.2	V
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	$I_C=250\mu\text{A}$	4.5	5.9	7.2	V
Gate to Emitter Leakage Current	$I_{GES}$	$V_{GE}=\pm 20\text{V}$			$\pm 250$	nA
Switching SOA	SSOA	$T_J=150^\circ\text{C}$ , $R_G=25\Omega$ , $V_{GE}=15\text{V}$ $L=100\mu\text{H}$ , $V_{GE}=600\text{V}$	35			A
Pulsed Avalanche Energy	$E_{AS}$	$I_{CE}=7\text{A}$ , $L=500\mu\text{H}$	25			mJ
Gate to Emitter Plateau Voltage	$V_{GEP}$	$I_C=7\text{A}$ , $V_{CE}=80\text{V}$	10			V
On-State Gate Charge	$Q_{g(ON)}$	$I_C=7\text{A}$ , $V_{CE}=300\text{V}$	$V_{GE}=15\text{V}$	37	45	nC
			$V_{GE}=20\text{V}$	48	60	nC
Current Turn-On Delay Time	$t_{d(ON)}$	IGBT and Diode at $T_J=25^\circ\text{C}$ , $I_{CE}=7\text{A}$ , $V_{GE}=13.5\text{V}$ , $R_G=50\Omega$ , $R_L=1\Omega$ , Test Circuit (Note 1)	400			ns
Current Rise Time	$t_{r1}$			2.6		$\mu\text{s}$
Current Turn-Off Delay Time	$t_{d(OFF)}$			300		ns
Current Fall Time	$t_{f1}$			2		$\mu\text{s}$

Note: 1. Pulse Test: Pulse width  $\leq 50\mu\text{s}$ .

■ TEST CIRCUIT AND WAVEFORMS

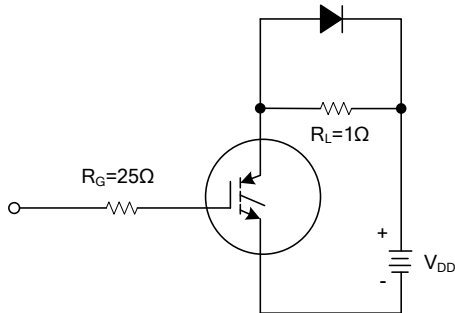


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

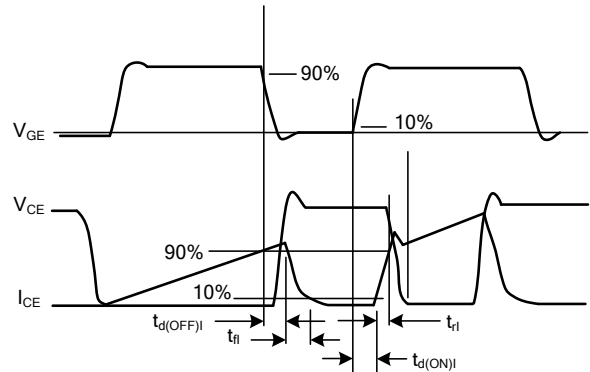


Fig 2. SWITCHING TEST WAVEFORMS

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. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.