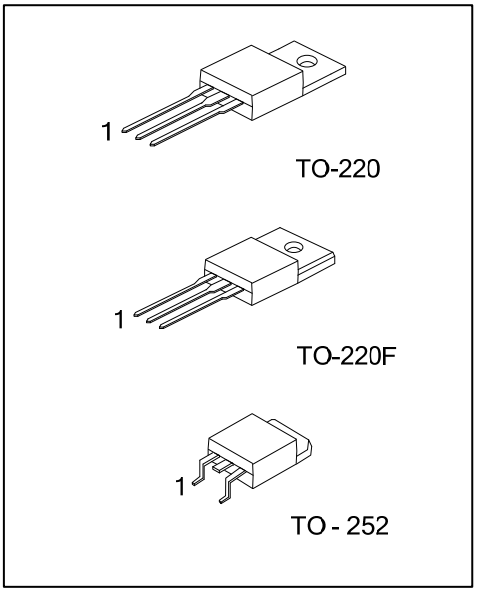
UGP7N60 **Preliminary** ***Insulated Gate Bipolar Transistor***

600V, SMPS N-CHANNEL IGBT



■ DESCRIPTION

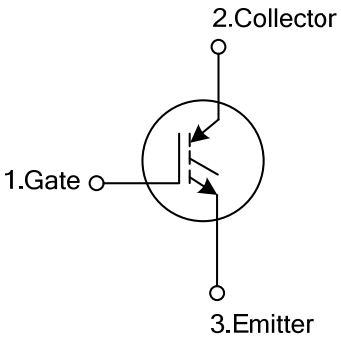
The UTC **UGP7N60** is a N-channel IGBT. it uses UTC's advanced technology to provide customers with high input impedance, high switching speed and low conduction loss, etc.

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

■ FEATURES

* >100kHz Operation at 390V, 7A
* 200kHz Operation at 390V, 5A
* 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	
UGP7N60L-TA3-T	UGP7N60G-TA3-T	TO-220	G	C	E	Tube
UGP7N60L-TF3-T	UGP7N60G-TF3-T	TO-220F	G	C	E	Tube
UGP7N60L-TN3-R	UGP7N60G-TN3-R	TO-252	G	C	E	Tape Reel

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

UGP7N60G-TA3-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF3: TO-220F, TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free

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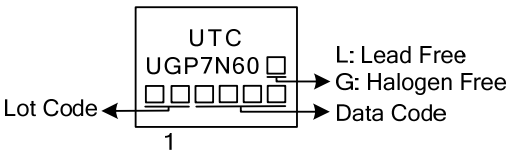
■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		V_{CES}	600	V
Continuous Collector Current	T_C=25°C	I_C	34	A
	T_C=110°C		14	A
Collector Current Pulsed (Note 2)		I_{CM}	56	A
Gate to Emitter Voltage Continuous		V_{GES}	±20	V
Gate to Emitter Voltage Pulsed		V_{GEM}	±30	V
Switching Safe Operating Area at T_J=150°C		SSOA	35 (at 600V)	A
Single Pulse Avalanche Energy at T_C=25°C		E_{AS}	25 (at 7A)	mJ
Power Dissipation Total at T_C=25°C	TO-220/TO-252	P_D	125	W
	TO-220F		41.6	W
Power Dissipation Derating T_C>25°C	TO-220/TO-252		1	W/°C
	TO-220F		3	W/°C
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. Pulse width limited by maximum junction temperature.

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Case	TO-220/TO-252	θ_{JC}	1	°C/W
	TO-220F		3	°C/W

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

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Collector-Emitter Breakdown Voltage	BV_{CES}	I_C=250μA, V_{GE}=0V		600			V
Emitter to Collector Breakdown Voltage	BV_{ECS}	I_C=10mA, V_{GE}=0V		20			V
Collector-Emitter Leakage Current	I_{CES}	V_{CE}=600V	T_J=25°C			250	μA
			T_J=125°C			2	mA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	I_C=7A, V_{GE}=15V	T_J=25°C		1.3	2.7	V
			T_J=125°C		1	2.2	V
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	I_C=250μA		4.5	5.0	7.2	V
Gate to Emitter Leakage Current	I_{GES}	V_{GE}=±20V				±250	nA
Switching SOA	SSOA	T_J=150°C, R_G=25Ω, V_{GE}=15V L=100μH, V_{GE}=600V		35			A
Pulsed Avalanche Energy	E_{AS}	I_{CE}=7A, L=500μH		25			mJ
Gate to Emitter Plateau Voltage	V_{GEP}	I_C=7A, V_{CE}=80V			10		V
On-State Gate Charge	$Q_{g(ON)}$	I_C=7A, V_{CE}=300V	V_{GE}=15V		37	45	nC
			V_{GE}=20V		48	60	nC
Current Turn-On Delay Time	$t_{d(ON)I}$	IGBT and Diode at T_J=25°C, I_{CE}=7A, V_{GE}=13.5V, R_G=50Ω, R_L=1Ω, Test Circuit (Note)			30		ns
Current Rise Time	t_{rI}				40		ns
Current Turn-Off Delay Time	$t_{d(OFF)I}$				60		ns
Current Fall Time	t_{fI}				90		ns

Note: Pulse Test: Pulse width≦50μs.

■ TEST CIRCUIT AND WAVEFORMS

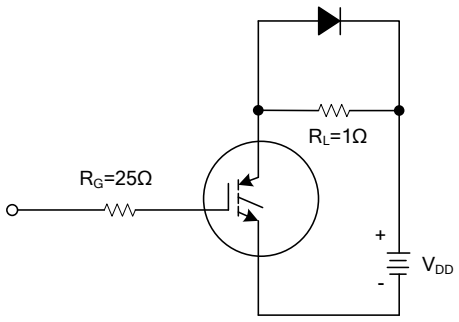


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

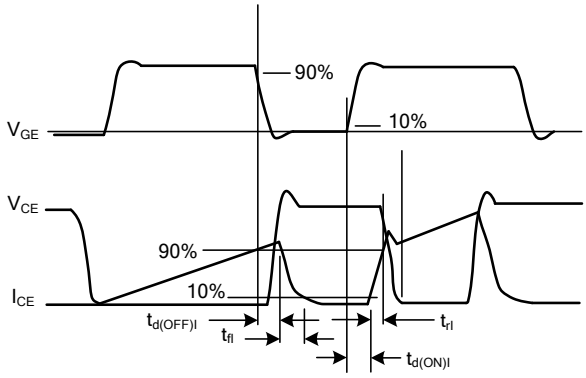


Fig 2. SWITCHING TEST WAVEFORMS

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