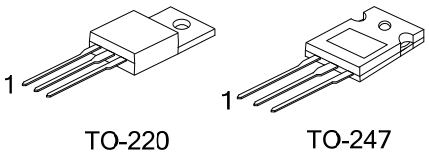
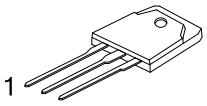
UG5N120 **Preliminary** ***Insulated Gate Bipolar Transistor***

21A, 1200V NPT N-CHANNEL IGBT WITH ANTI-PARALLEL HYPERFAST DIODES





■ DESCRIPTION

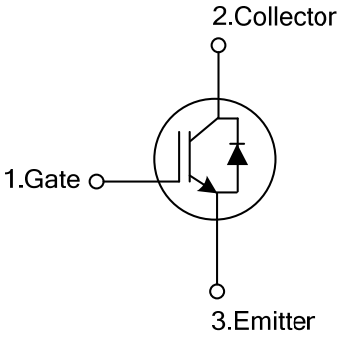
The UTC **UG5N120** is a NPT N-Channel IGBT, it uses UTC's advanced technology to provide the customers with a minimum on-state resistance, etc.

The UTC **UG5N120** is suitable for AC and DC motor controls, power supplies, and drivers for solenoids, relays and contactors, etc.

■ FEATURES

* Low conduction loss
* Short circuit rating

■ SYMBOL



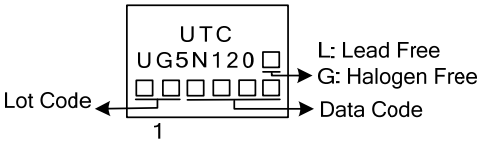
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UG5N120L-TA3-T	UG5N120G-TA3-T	TO-220	G	C	E	Tube
UG5N120L-T3N-T	UG5N120G-T3N-T	TO-3PN	G	C	E	Tube
UG5N120L-T47-T	UG5N120G-T47-T	TO-247	G	C	E	Tube

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

UG5N120L-TA3-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube (2) TA3: TO-220, T3N: TO-3PN, T47: TO-247 (3) L: Lead Free, G: Halogen Free and Lead Free

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Collector to Emitter Voltage		BV_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	±20	V
Gate to Emitter Voltage Pulsed		V_{GEM}	±30	V
Collector Current Continuous	T_C=25°C	I_C	21	A
	T_C=110°C		10	A
Collector Current Pulsed (Note 1)		I_{CM}	40	A
Power Dissipation Total at T_C = 25°C	TO-220	P_D	78	W
	TO-3PN		201	W
	TO-247		167	W
Power Dissipation Derating T_C > 25°C	TO-220		0.62	W/°C
	TO-3PN		1.6	W/°C
	TO-247		1.33	W/°C
Short Circuit Withstand Time (Note 2) at V_{GE}=15V		t_{SC}	8	μs
Short Circuit Withstand Time (Note 2) at V_{GE}=12V		t_{SC}	15	μs
Operating Junction Temperature Range		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.
3. I_{CE}=10A, L=400μH, T_J=25°C.
4. $V_{CE(PK)}$=840V, T_J=125°C, R_G=25Ω.

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Case	TO-220	$θ_{JC}$	1.6	°C/W
	TO-3PN		0.62	°C/W
	TO-247		0.75	°C/W

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

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Collector to Emitter Breakdown Voltage	BV_{CES}	I_C=250μA, V_{GE}=0V		1200			V
Collector to Emitter Leakage Current	I_{CES}	V_{CE}=1200V	T_C=25°C			250	μA
			T_C=125°C		100		μA
			T_C=150°C			1.5	mA
Collector to Emitter Saturation Voltage	$V_{CE(SAT)}$	I_C=5A, V_{GE}=15V	T_C=25°C		2.45	2.7	V
			T_C=150°C		3.7	4.2	V
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	I_C=45μA, V_{CE}=V_{GE}		6.0	6.8		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=5mH, $V_{CE(PK)}$=1200V		30			A
Gate to Emitter Plateau Voltage	V_{GEP}	I_C=5A, V_{CE}=600V			10.5		V
On-State Gate Charge	$Q_{G(ON)}$	I_C=5A, V_{CE}=600V	V_{GE}=15V		53	65	nC
			V_{GE}=20V		60	72	nC
Current Turn-On Delay Time	$t_{d(ON)I}$	IGBT and Diode at T_J=25°C I_{CE}=1.0A, V_{CE}=30V, V_{GE}=15V, R_G=25Ω			220		ns
Current Rise Time	t_{rI}				360		ns
Current Turn-Off Delay Time	$t_{d(OFF)I}$				320		ns
Current Fall Time	t_{fI}				120		ns