



UG1N120

Preliminary

Insulated Gate Bipolar Transistor

5.3A, 1200V NPT SERIES N-CHANNEL IGBT

DESCRIPTION

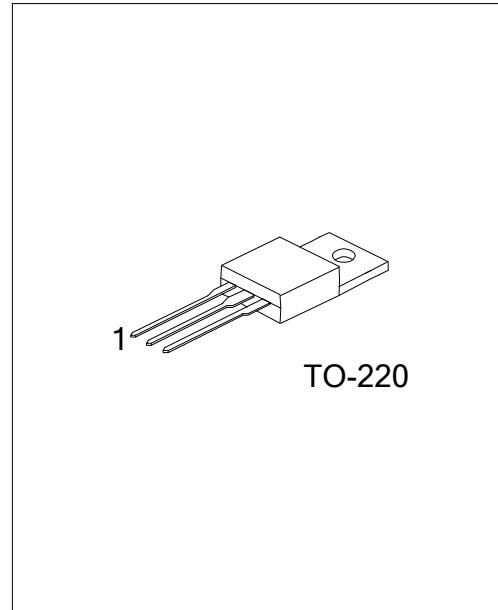
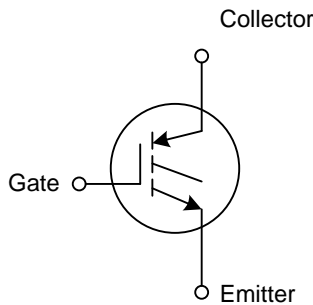
The UTC **UG1N120** is a NPT series N-Channel IGBT, it uses UTC's advanced technology to provide the customers with a minimum on-state resistance, etc.

The UTC **UG1N120** 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



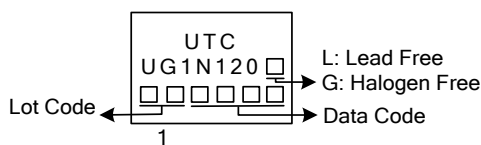
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UG1N120L-TA3-T	UG1N120G-TA3-T	TO-220	G	C	E	Tube

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

<p>UG1N120L-TA3-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) T: Tube (2) TA3: TO-220 (3) L: Lead Free, G: Halogen Free and Lead Free</p>
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MARKING



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

PARAMETER	SYMBOL	RATINGS	UNIT	
Collector to Emitter Voltage	BV_{CES}	1200	V	
Gate to Emitter Voltage Continuous	V_{GES}	± 20	V	
Gate to Emitter Voltage Pulsed	V_{GEM}	± 30	V	
Collector Current Continuous	I_C	$T_C=25^\circ\text{C}$	5.3	A
		$T_C=110^\circ\text{C}$	2.7	A
Collector Current Pulsed (Note 1)	I_{CM}	6	A	
Power Dissipation Total at $T_C=25^\circ\text{C}$	P_D	60	W	
Power Dissipation Derating $T_C>25^\circ\text{C}$		0.476	W/ $^\circ\text{C}$	
Forward Voltage Avalanche Energy (Note 2)	E_{AV}	10	mJ	
Short Circuit Withstand Time (Note 3) at $V_{GE}=15\text{V}$	t_{SC}	8	μs	
Short Circuit Withstand Time (Note 3) at $V_{GE}=12\text{V}$	t_{SC}	13	μs	
Operating Junction Temperature Range	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. Pulse width limited by maximum junction temperature.

3. $I_{CE}=7\text{A}$, $L=400\mu\text{H}$, $V_{GE}=15\text{V}$, $T_J=25^\circ\text{C}$.

4. $V_{CE(PK)}=840\text{V}$, $T_J=125^\circ\text{C}$, $R_G=82\Omega$.

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case	θ_{JC}	2.1	$^\circ\text{C}/\text{W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector to Emitter Breakdown Voltage	BV_{CES}	$I_C=250\mu\text{A}$, $V_{GE}=0\text{V}$	1200			V
Emitter to Collector Breakdown Voltage	BV_{ECS}	$I_C=10\text{mA}$, $V_{GE}=0\text{V}$	15			V
Collector to Emitter Leakage Current	I_{CES}	$V_{CE}=1200\text{V}$	$T_C=25^\circ\text{C}$		250	μA
			$T_C=125^\circ\text{C}$		20	μA
			$T_C=150^\circ\text{C}$		1.0	mA
Collector to Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=1.0\text{A}$, $V_{GE}=15\text{V}$	$T_C=25^\circ\text{C}$	2.5	2.9	V
			$T_C=150^\circ\text{C}$	3.8	4.3	V
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	$I_C=50\mu\text{A}$, $V_{CE}=V_{GE}$	6.0	7.1		V
Gate to Emitter Leakage Current	I_{GES}	$V_{GE}=\pm 20\text{V}$			± 250	nA
Switching SOA	SSOA	$T_J=150^\circ\text{C}$, $R_G=82\Omega$, $V_{GE}=15\text{V}$, $L=2\text{mH}$, $V_{CE(PK)}=1200\text{V}$	6			A
Gate to Emitter Plateau Voltage	V_{GEP}	$I_C=1.0\text{A}$, $V_{CE}=600\text{V}$		9.2		V
On-State Gate Charge	$Q_{G(ON)}$	$I_C=1.0\text{A}$, $V_{CE}=600\text{V}$	$V_{GE}=15\text{V}$	14	20	nC
			$V_{GE}=20\text{V}$	15	21	nC
Current Turn-On Delay Time	$t_{d(ON)I}$	IGBT and Diode at $T_J=25^\circ\text{C}$ $I_{CE}=1.0\text{A}$, $V_{CE}=30\text{V}$, $V_{GE}=15\text{V}$, $R_G=82\Omega$		200		ns
Current Rise Time	t_{rl}			470		ns
Current Turn-Off Delay Time	$t_{d(OFF)I}$			118		ns
Current Fall Time	t_{fl}			200		ns

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