



UG11N120

Preliminary

Insulated Gate Bipolar Transistor

43A, 1200V NPT N-CHANNEL IGBT WITH ANTI-PARALLEL HYPERFAST DIODES

DESCRIPTION

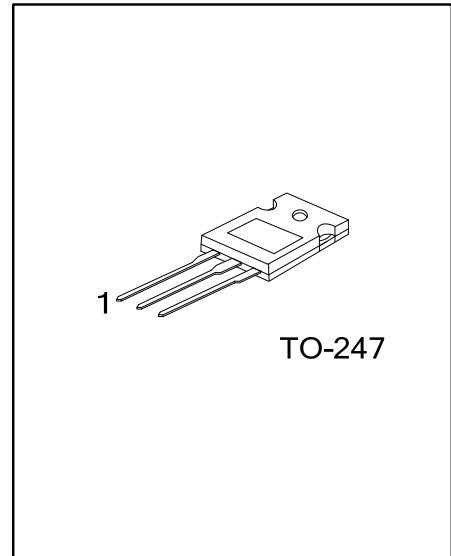
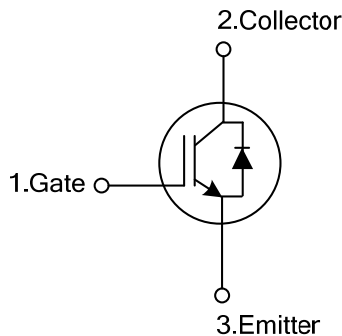
The UTC **UG11N120** is a NPT N-Channel IGBT, it uses UTC's advanced technology to provide the customers with a minimum on-state resistance, etc.

The UTC **UG11N120** 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



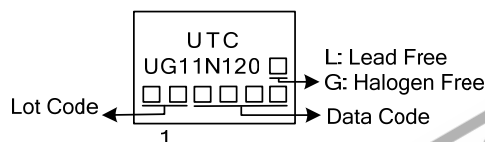
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UG11N120L-T47-T	UG11N120G-T47-T	TO-247	G	C	E	Tube

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

UG11N120L-T47-T	(1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube (2) T47: TO-247 (3) L: Lead Free, G: Halogen Free and Lead Free
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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-Emitter Voltage	V_{GES}	± 20	V	
Gate to Emitter Voltage Pulsed	V_{GEM}	± 30	V	
Collector Current Continuous	I_C	$T_C=25^\circ\text{C}$	43	A
		$T_C=110^\circ\text{C}$	22	A
Collector Current Pulsed (Note 2)	I_{CM}	80	A	
Power Dissipation Total at $T_C = 25^\circ\text{C}$	P_D	298	W	
Power Dissipation Derating $T_C > 25^\circ\text{C}$		2.38	W/ $^\circ\text{C}$	
Short Circuit Withstand Time (Note 3) at $V_{GE}=15\text{V}$	t_{SC}	8	μs	
Short Circuit Withstand Time (Note 3) at $V_{GE}=12\text{V}$		15	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. $V_{CE(PK)}=840\text{V}$, $T_J=125^\circ\text{C}$, $R_G=10\Omega$.

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case	θ_{JC}	0.42	$^\circ\text{C}/\text{W}$

■ 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	
Collector to Emitter Leakage Current	I_{CES}	$V_{CE}=1200\text{V}$	$T_C=25^\circ\text{C}$		250	μA	
			$T_C=125^\circ\text{C}$		300	μA	
			$T_C=150^\circ\text{C}$		3.5	mA	
Collector to Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=11\text{A}$, $V_{GE}=15\text{V}$	$T_C=25^\circ\text{C}$	2.1	2.4	V	
			$T_C=150^\circ\text{C}$	2.9	3.5	V	
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	$I_C=90\mu\text{A}$, $V_{CE}=V_{GE}$	5.0	5.9		V	
Gate to Emitter Leakage Current	I_{GES}	$V_{GE}=\pm 20\text{V}$			± 250	nA	
Switching SOA	SSOA	$T_J=150^\circ\text{C}$, $R_G=10\Omega$, $V_{GE}=15\text{V}$, $L=400\mu\text{H}$, $V_{CE(PK)}=1200\text{V}$	55			A	
Gate to Emitter Plateau Voltage	V_{GEP}	$I_C=11\text{A}$, $V_{CE}=600\text{V}$		10.4		V	
On-State Gate Charge	$Q_{G(ON)}$	$I_C=11\text{A}$, $V_{CE}=600\text{V}$	$V_{GE}=15\text{V}$	100	120	nC	
			$V_{GE}=20\text{V}$	130	150	nC	
Current Turn-On Delay Time	$t_{d(ON)}$	IGBT and Diode at $T_J=25^\circ\text{C}$ $I_{CE}=11\text{A}$, $V_{CE}=960\text{V}$, $V_{GE}=15\text{V}$, $R_G=10\Omega$, $L=2\text{mH}$		23	26	ns	
Current Rise Time	t_{rl}			12	16	ns	
Current Turn-Off Delay Time	$t_{d(OFF)}$			180	240	ns	
Current Fall Time	t_{fl}			190	220	ns	
Turn-On Energy	E_{ON}			0.95	1.3	mJ	
Turn-Off Energy	E_{OFF}			1.3	1.6	mJ	
Diode Forward Voltage	V_{EC}		$I_{EC}=11\text{A}$		2.6	3.2	V
Diode Reverse Recovery Time	t_{rr}		$I_{EC}=11\text{A}$, $dI_{EC}/dt=200\text{A}/\mu\text{s}$		60	70	ns
		$I_{EC}=1\text{A}$, $dI_{EC}/dt=200\text{A}/\mu\text{s}$		32	40	ns	

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