



## UPG15N120

*Insulated Gate Bipolar Transistor*

### 1200V NPT PLANAR IGBT

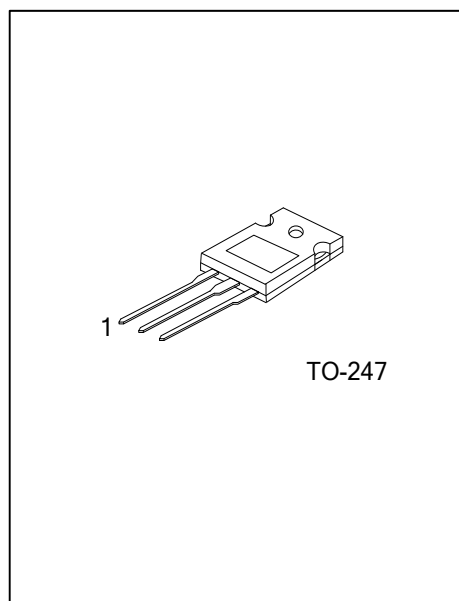
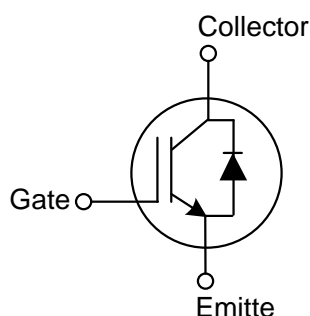
#### ■ DESCRIPTION

The UTC **UPG15N120** is a 1200V NPT Planar Insulated Gate Bipolar Transistor. it uses UTC's advanced technology to offers superior conduction and switching performance, high avalanche ruggedness and easy parallel operation.

#### ■ FEATURES

- \* High speed switching
- \* High input impedance
- \* Low saturation voltage:  $V_{CE(SAT)} \approx 2.4V$  @  $I_C=15A$

#### ■ SYMBOL



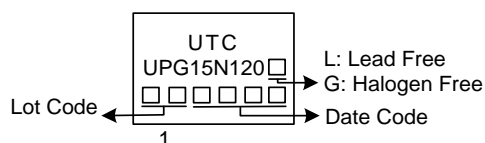
#### ■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UPG15N120L-T47-T	UPG15N120G-T47-T	TO-247	G	C	E	Tube

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

UPG15N120G-T47-T	(1)Packing Type	(1) T: Tube
	(2)Package Type	(2) T47: TO-247
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

#### ■ MARKING



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage	$V_{CES}$	1200	V
Gate-Emitter Voltage	$V_{GES}$	$\pm 20$	V
Continuous Collector Current	$I_C$	$T_C=25^\circ\text{C}$ 30	A
		$T_C=100^\circ\text{C}$ 15	A
Collector Current Pulsed (Note 1)	$I_{CM}$	60	A
Power Dissipation	$P_D$	300	W
Operating Junction Temperature	$T_J$	$-55 \sim +150$	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	$-55 \sim +150$	$^\circ\text{C}$

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.

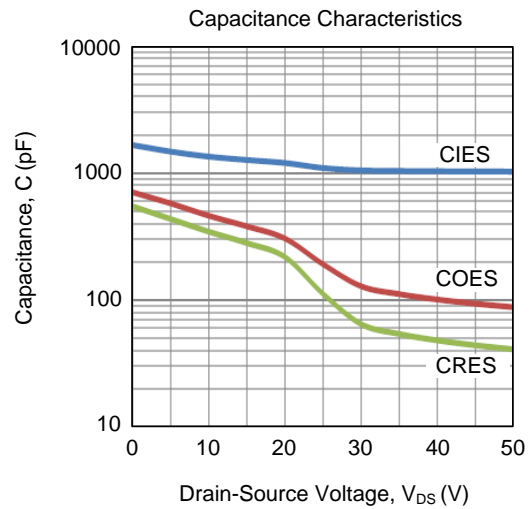
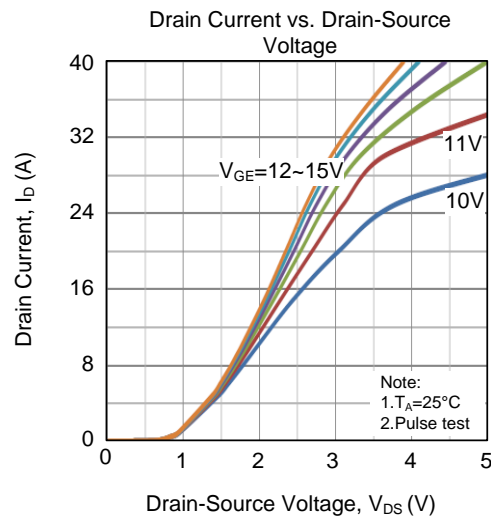
### ■ THERMAL CHARACTERISTICS

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

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off Characteristics						
Collector-Emitter Breakdown Voltage	B <sub>VCE</sub>	I <sub>C</sub> =250μA, V <sub>GE</sub> =0V	1200			V
Collector Cut-Off Current	I <sub>CES</sub>	V <sub>CE</sub> =V <sub>CES</sub> , V <sub>GE</sub> =0V			250	μA
G-E Leakage Current	I <sub>GES</sub>	V <sub>GE</sub> =V <sub>GES</sub> , V <sub>CE</sub> = 0V			±250	nA
On Characteristics						
Gate to Emitter Threshold Voltage	V <sub>GE(TH)</sub>	I <sub>C</sub> =90μA, V <sub>CE</sub> =V <sub>GE</sub>	4.0		6.0	V
Collector to Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	I <sub>C</sub> =15A, V <sub>GE</sub> =15V		2.0	2.4	V
Dynamic Characteristics						
Input Capacitance	C <sub>IES</sub>	V <sub>CE</sub> =25V, V <sub>GE</sub> =0V, f=1MHz		1090		pF
Output Capacitance	C <sub>OES</sub>			190		pF
Reverse Transfer Capacitance	C <sub>RES</sub>			110		pF
Switching Characteristics						
Total Gate Charge	Q <sub>G</sub>	V <sub>CE</sub> =100V, V <sub>GE</sub> =15V, I <sub>C</sub> =15A		95		nC
Gate-Emitter Charge	Q <sub>GE</sub>	V <sub>CE</sub> =100V, V <sub>GE</sub> =15V, I <sub>C</sub> =15A		20		nC
Gate-Collector Charge	Q <sub>GC</sub>			44		nC
Turn-On Delay Time	t <sub>D(ON)</sub>	V <sub>CC</sub> =50V, V <sub>GE</sub> =15V, I <sub>C</sub> =15A, R <sub>G</sub> =10Ω,		50		ns
Rise Time	t <sub>R</sub>			155		ns
Turn-Off Delay Time	t <sub>D(OFF)</sub>			210		ns
Fall Time	t <sub>F</sub>			85		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Forward Voltage Drop	V <sub>FM</sub>	I <sub>F</sub> =15A		2.2		V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =15A, dI/dt=200A/μS		116		ns
Reverse Recovery Charge	Q <sub>rr</sub>			370		nC

### ■ TYPICAL CHARACTERISTICS



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