



## UPG50N120

*Insulated Gate Bipolar Transistor*

### 1200V NPT PLANAR IGBT

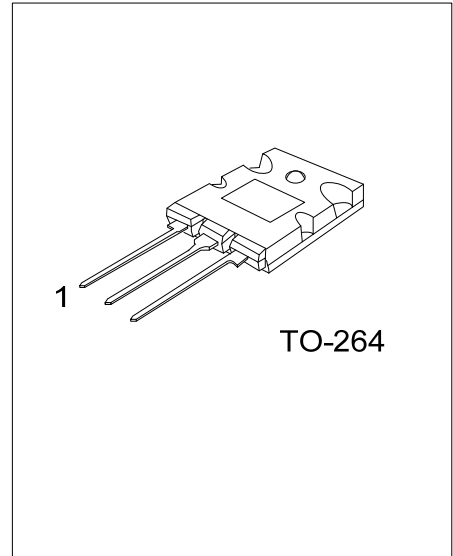
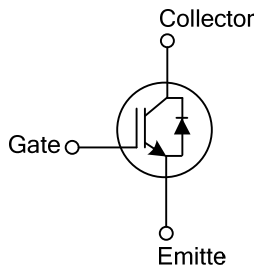
#### DESCRIPTION

The UTC **UPG50N120** 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:  $V_{CE(SAT)} = 2.6V @ I_C = 50A$

#### SYMBOL



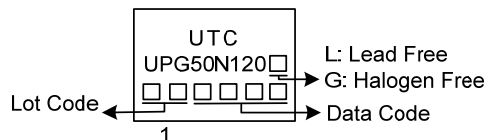
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UPG50N120L-T64-T	UPG50N120G-T64-T	TO-264	G	C	E	Tube

Note: Pin Assignment: G: Gate D: Drain S: Source

<p>UPG50N120G-T64-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube</p> <p>(2) T64: TO-264</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage	$V_{CES}$	1200	V
Gate-Emitter Voltage	$V_{GES}$	$\pm 25$	V
Continuous Collector Current	$I_C$	$T_C=25^\circ\text{C}$	100
		$T_C=100^\circ\text{C}$	50
Collector Current Pulsed (Note 1)	$I_{CM}$	160	A
Power Dissipation	$P_D$	500	W
Operating Junction Temperature	$T_J$	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 ~ +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.

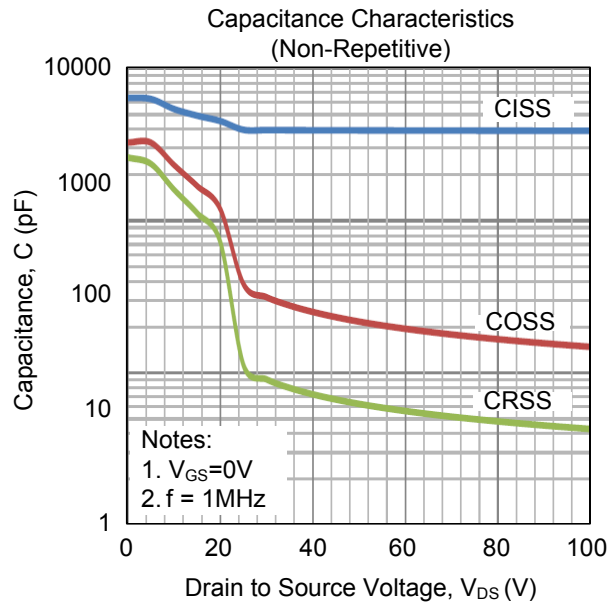
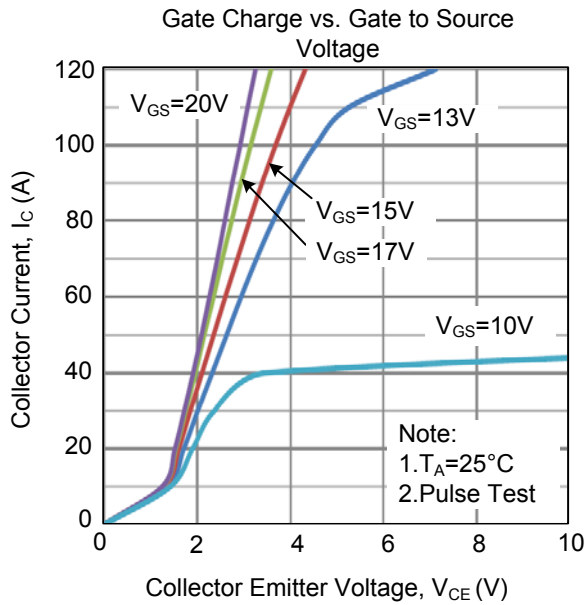
### ■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	25	$^\circ\text{C/W}$
Junction to Case	$\theta_{JC}$	0.25	$^\circ\text{C/W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
<b>Off Characteristics</b>							
Collector-Emitter Breakdown Voltage	$B_{V_{CES}}$	$I_C=1\text{mA}, V_{GE}=0\text{V}$	1200			V	
Collector Cut-Off Current	$I_{CES}$	$V_{CE}=V_{CES}, V_{GE}=0\text{V}$			1	mA	
G-E Leakage Current	$I_{GES}$	$V_{GE}=V_{GES}, V_{CE}=0\text{V}$			$\pm 250$	mA	
<b>On Characteristics</b>							
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	$I_C=250\mu\text{A}, V_{CE}=V_{GE}$	3.5	5.5	7.5	V	
Collector to Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=50\text{A}, V_{GE}=15\text{V}$		2.4	2.6	V	
<b>Dynamic Characteristics</b>							
Input Capacitance	$C_{IES}$	$V_{CE}=30\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		3930		pF	
Output Capacitance	$C_{OES}$			310		pF	
Reverse Transfer Capacitance	$C_{RES}$			95		pF	
<b>Switching Characteristics</b>							
Total Gate Charge	$Q_G$	$V_{CE}=400\text{V}, I_C=64\text{A}, V_{GE}=15\text{V}$		230		nC	
Gate-Emitter Charge	$Q_{GE}$			64		nC	
Gate-Collector Charge	$Q_{GC}$			120		nC	
Turn-On Delay Time	$t_{D(ON)}$	$V_{CC}=400\text{V}, I_C=50\text{A}, R_G=10\Omega, V_{GE}=15\text{V}$		32		ns	
Rise Time	$t_R$			37		ns	
Turn-Off Delay Time	$t_{D(OFF)}$			200		ns	
Fall Time	$t_F$			134		ns	
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>							
Forward Voltage Drop	$V_{FM}$	$I_F=50\text{A}$	$T_C=25^\circ\text{C}$		1.6	4.0	V
Reverse Recovery Time	$t_{rr}$	$I_F=30\text{A}$	$T_C=25^\circ\text{C}$		510		ns
Reverse Recovery Charge	$Q_{rr}$	$dI/dt=200\text{A}/\mu\text{S}$	$T_C=25^\circ\text{C}$		5.5		$\mu\text{C}$

### TYPICAL CHARACTERISTICS



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