



# UG40N120

## Insulated Gate Bipolar Transistor

### 1200V NPT PLANAR IGBT

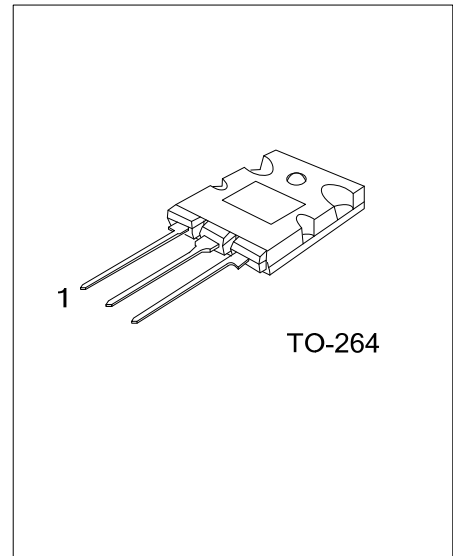
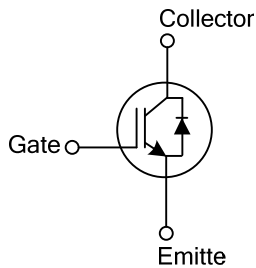
■ DESCRIPTION

The UTC **UG40N120** 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:  $V_{CE(SAT)} = 2.6V @ I_C=40A$

■ SYMBOL



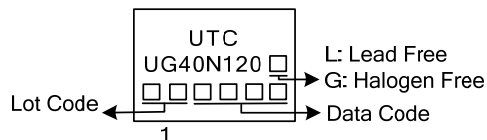
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UG40N120L-T64-T	UG40N120G-T64-T	TO-264	G	C	E	Tube

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

<p>UG40N120G-T64-T</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	$I_C$	$T_C=25^\circ\text{C}$	160	A
		$T_C=100^\circ\text{C}$	40	A
Collector Current Pulsed (Note 1)	$I_{CM}$	160	A	
Diode Continuous Forward Current ( $T_C=100^\circ\text{C}$ )	$I_F$	40	A	
Diode Maximum Forward Current	$I_{FM}$	160	A	
Power Dissipation	$P_D$	500	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.

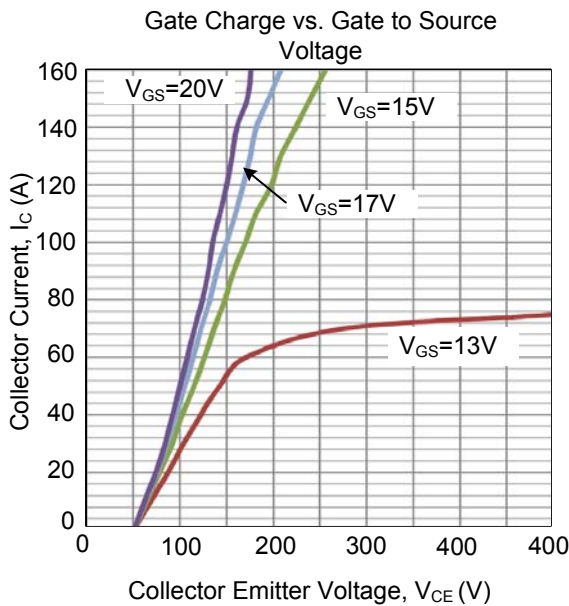
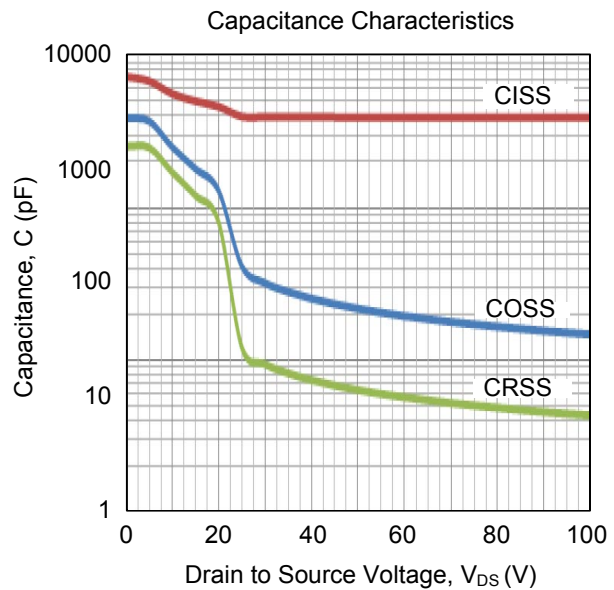
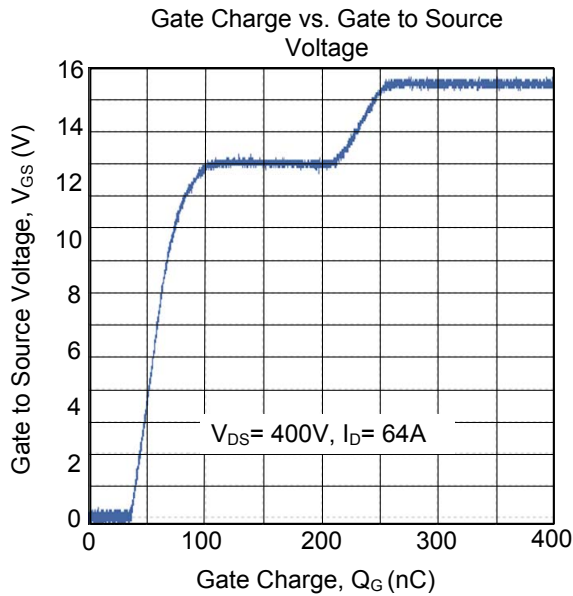
### ■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to 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	$V_{CE(SAT)}$	$I_C=40\text{A}, V_{GE}=15\text{V}$		2.2	2.6	V
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{IES}$	$V_{CE}=30\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		4000		pF
Output Capacitance	$C_{OES}$			340		pF
Reverse Transfer Capacitance	$C_{RES}$			95		pF
<b>Switching Characteristics</b>						
Turn-On Delay Time	$t_{DON}$	$V_{CC}=500\text{V}, I_C=64\text{A}, R_G=10\Omega, V_{GE}=10\text{V}$		52		ns
Rise Time	$t_R$			106		ns
Turn-Off Delay Time	$t_{DOFF}$			25		ns
Fall Time	$t_F$			64		ns
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
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Forward Voltage Drop	$V_{FM}$	$I_F=40\text{A}$	$T_C=25^\circ\text{C}$	3.2	4.0	V
			$T_C=125^\circ\text{C}$	2.7		V
Reverse Recovery Time	$t_{rr}$	$I_F=30\text{A}$ ,	$T_C=25^\circ\text{C}$	460		ns
Reverse Recovery Charge	$Q_{rr}$	$dI/dt=200\text{A}/\mu\text{S}$	$T_C=25^\circ\text{C}$	5		$\mu\text{C}$

### TYPICAL CHARACTERISTICS



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