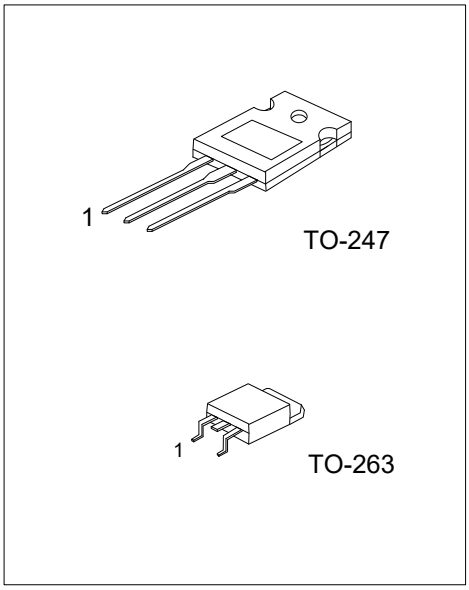
UTG25N120-G2

Insulated Gate Bipolar Transistor

1200V TRENCH GATE FIELD-STOP IGBT



■ DESCRIPTION

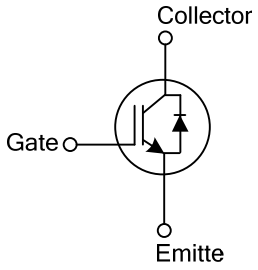
The UTC **UTG25N120-G2** is an Trench Field-Stop Insulated Gate Bipolar Transistor. it uses UTC's advanced technology to provide customers with high switching speed, low saturation voltage and low switching loss, etc.

The UTC **UTG25N120-G2** is suitable for the resonant or soft switching applications.

■ FEATURES

* High switching speed
* High avalanche ruggedness
* Low saturation voltage: $V_{CE(sat),\ typ}$ =1.8V @ I_C=25A (T_C =25°C)
* Low switching loss: $E_{OFF,\ typ}$=2.36mJ @ I_C=25A (T_C =25°C)

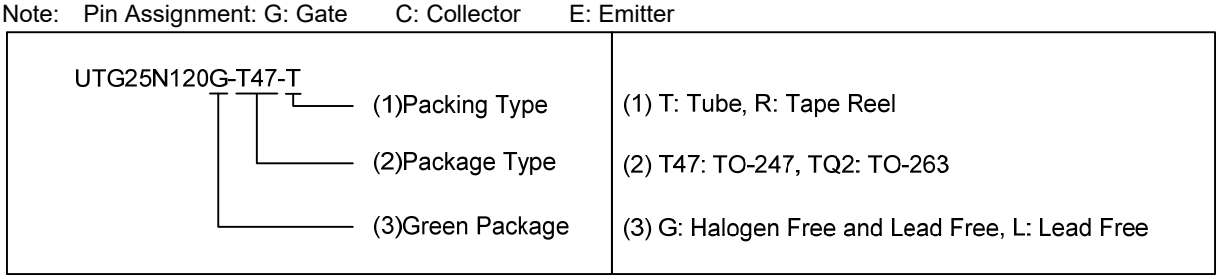
■ SYMBOL



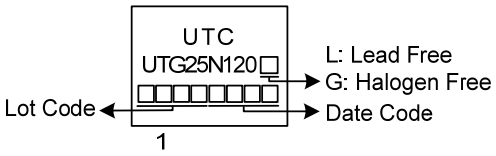
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTG25N120L-T47-T	UTG25N120G-T47-T	TO-247	G	C	E	Tube
UTG25N120L-TQ2-T	UTG25N120G-TQ2-T	TO-263	G	C	E	Tube
UTG25N120L-TQ2-R	UTG25N120G-TQ2-R	TO-263	G	C	E	Tape Reel

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



■ MARKING



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	±20	V
Continuous Collector Current	T_C=25°C	I_C	50	A
	T_C=100°C		25	A
Collector Current Pulsed (Note 1)		I_{CM}	100	A
Diode Forward Current	T_C=25°C	I_F	50	A
	T_C=100°C		25	A
Short Circuit Withstand Time V_{GE} = 15V, V_{CC} ≤ 200V Allowed number of short circuits < 1000 Time between short circuits: ≥1.0s T_{VJ}= 25°C		t_{SC}	10	μs
Power Dissipation (T_C=25°C)	TO-247	P_D	260	W
	TO-263		100	W
Operating Junction Temperature		T_J	-40 ~ +175	°C
Storage Temperature Range		T_{STG}	-55 ~ +175	°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.

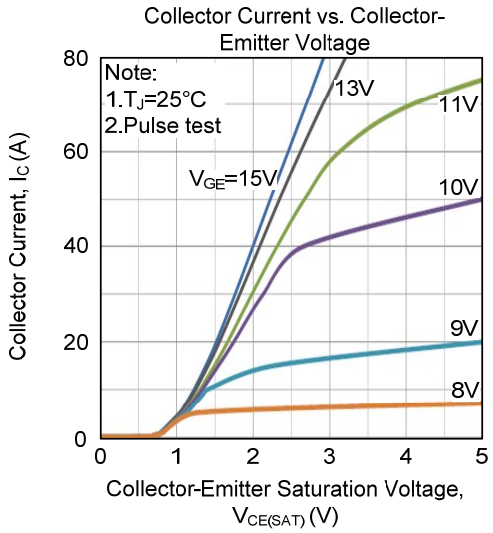
■ THERMAL DATA

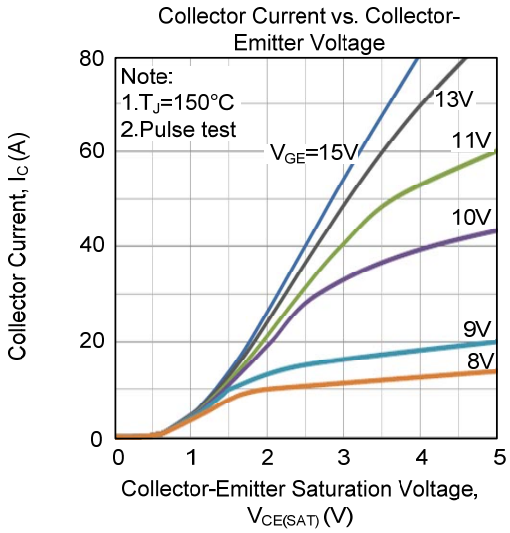
PARAMETER		SYMBOL	RATING	UNIT
Junction to Case	TO-247	θ_{JC}	0.48	°C/W
	TO-263		1.25	°C/W

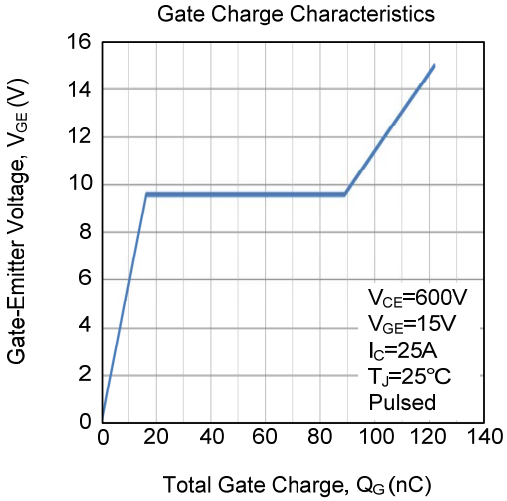
■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise noted)

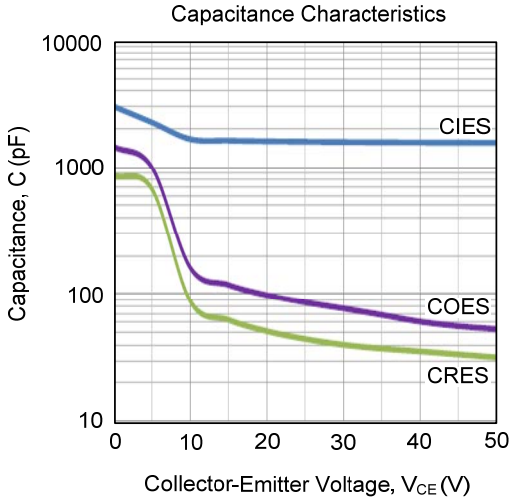
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off Characteristics						
Collector-Emitter Breakdown Voltage	BV_{CES}		1200			V
Collector Cut-Off Current	I_{CES}	V_{CE}=V_{CES}, V_{GE}=0V			5	μA
G-E Leakage Current	I_{GES}	V_{GE}=V_{GES}, V_{CE}= 0V			±100	nA
On Characteristics						
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	I_C=250μA, V_{CE}=V_{GE}	4.5		7.5	V
Collector to Emitter Saturation Voltage	$V_{CE(SAT)}$	I_C=25A, V_{GE}=15V		1.8	2.1	V
		I_C=25A, V_{GE}=15V, T_C=125°C		2.2		V
Dynamic Characteristics						
Input Capacitance	C_{IES}	V_{CE}=25V, V_{GE}=0V, f=1MHz		1370		pF
Output Capacitance	C_{OES}			72.8		pF
Reverse Transfer Capacitance	C_{RES}			43.6		pF
Switching Characteristics						
Total Gate Charge	Q_G	V_{CE}=600V, I_C=25A, V_{GE}=15V		121.7		nC
Gate-Emitter Charge	Q_{GE}			15.6		nC
Gate-Collector Charge	Q_{GC}			85.6		nC
Turn-On Delay Time	$t_{DON)}$	V_{CC}=600V, I_C=25A, R_G=5Ω, V_{GE}=0~15V, L=500uH		16.7		ns
Rise Time	t_R			28.4		ns
Turn-Off Delay Time	$t_{DOFF)}$			132.3		ns
Fall Time	t_F			222		ns
Turn-On Switching Loss	E_{ON}			2.11		mJ
Turn-Off Switching Loss	E_{OFF}			2.36		mJ
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Forward Voltage Drop	V_{FM}	I_F=25A			3.5	V
Reverse Recovery Time	t_{rr}	I_F=25A, dI/dt=100A/μS		50		ns
Reverse Recovery Charge	Q_{rr}			0.94		μC

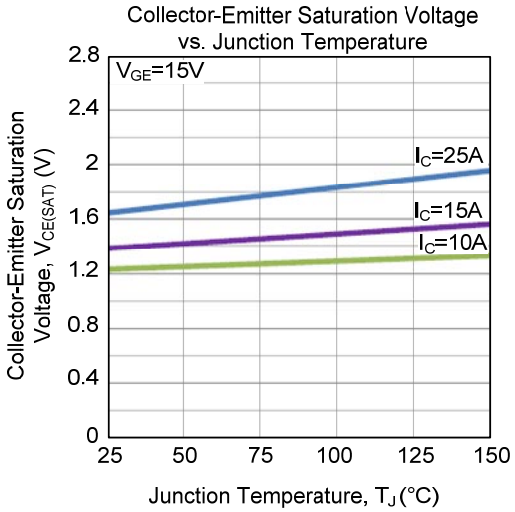
■ TYPICAL CHARACTERISTICS

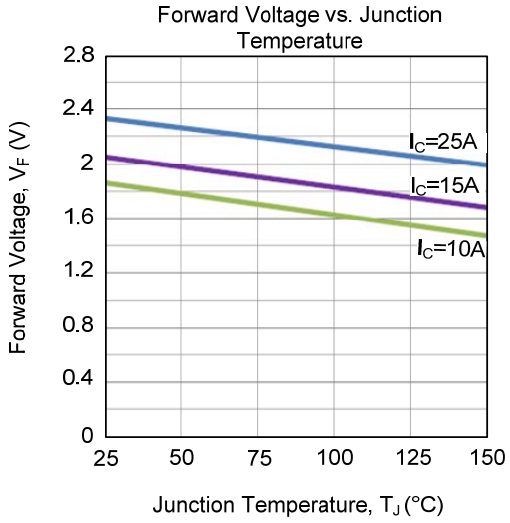






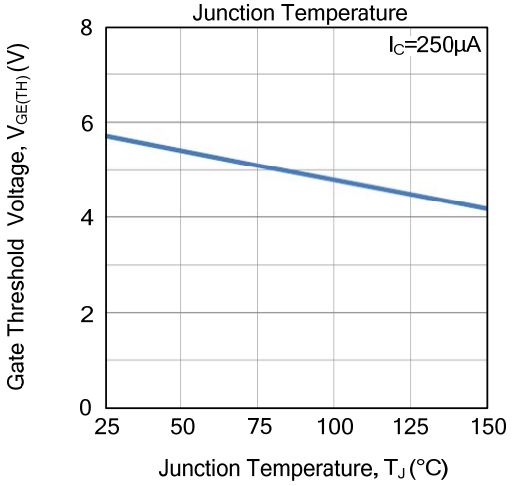




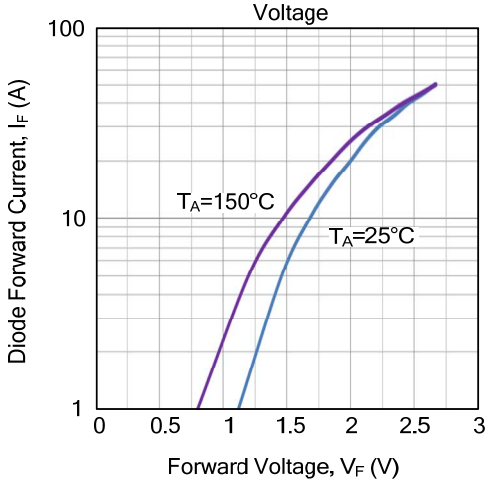


■ TYPICAL CHARACTERISTICS (Cont.)

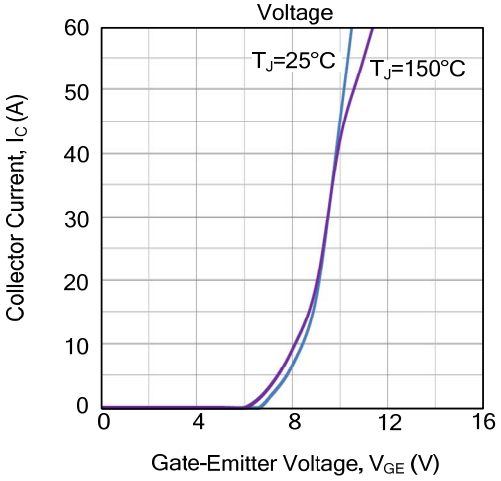
Gate Threshold Voltage vs. Junction Temperature



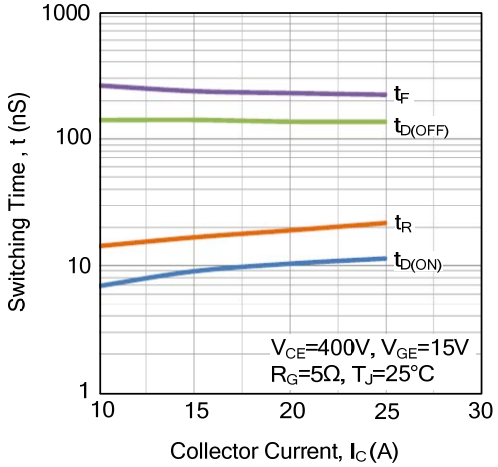
Diode Forward Current vs. Forward Voltage



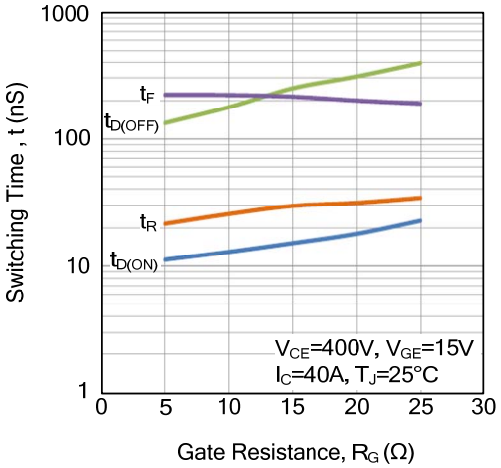
Collector Current vs. Gate-Emitter Voltage



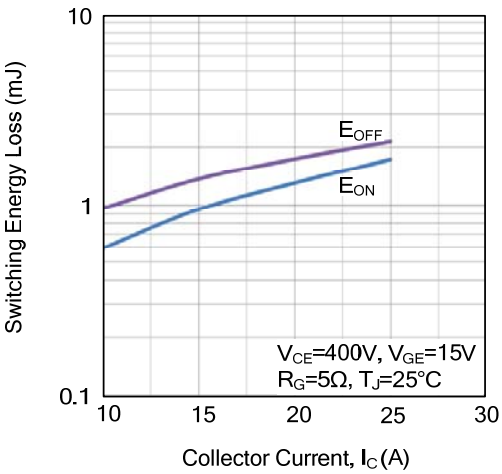
Switching Time vs. Collector Current



Switching Time vs. Gate Resistance



Switching Loss vs. Collector Current



■ TYPICAL CHARACTERISTICS (Cont.)