



UTG30N120-G2

Insulated Gate Bipolar Transistor

1200V TRENCH GATE FIELD-STOP IGBT

■ DESCRIPTION

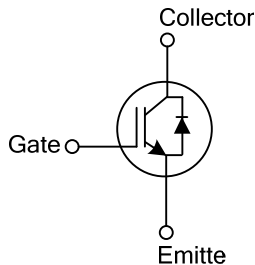
The UTC **UTG30N120-G2** is an Trench Field-Stop Insulated Gate Bipolar Transistor. it uses UTC's advanced technology to provide customers with high switching speed, low saturation voltage and low switching loss, etc.

The UTC **UTG30N120-G2** is suitable for the resonant or soft switching applications.

■ FEATURES

- * High switching speed
- * High avalanche ruggedness
- * Low saturation voltage: $V_{CE(sat)}$, typ. = 1.66V @ $I_C=30A$, $V_{GE}=15V$ ($T_C=25^\circ C$)
- * Low switching loss: E_{OFF} , typ. = 2.28mJ @ $I_C=30A$ ($T_C=25^\circ C$)

■ SYMBOL

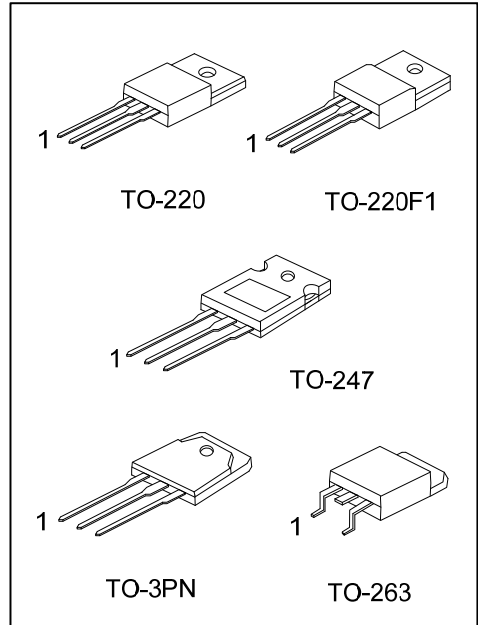


■ ORDERING INFORMATION

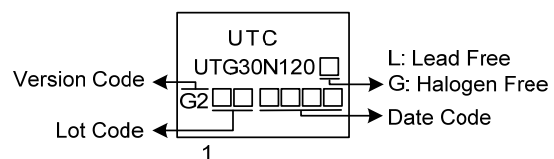
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTG30N120L-TA3-T	UTG30N120G-TA3-T	TO-220	G	D	S	Tube
UTG30N120L-TF1-T	UTG30N120G-TF1-T	TO-220F1	G	D	S	Tube
UTG30N120L-TQ2-T	UTG30N120G-TQ2-T	TO-263	G	C	E	Tube
UTG30N120L-TQ2-R	UTG30N120G-TQ2-R	TO-263	G	C	E	Tape Reel
UTG30N120L-T3N-T	UTG30N120G-T3N-T	TO-3PN	G	C	E	Tube
UTG30N120L-T47-T	UTG30N120G-T47-T	TO-247	G	C	E	Tube

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

UTG30N120G-TA3-T	(1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF1: TO-220F1, TQ2: TO-263 T3N: TO-3PN, T47: TO-247 (3) G: Halogen Free and Lead Free, L: Lead Free
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■ 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	$T_C=25^{\circ}\text{C}$	I_C	60	A	
	$T_C=100^{\circ}\text{C}$		30	A	
Collector Current Pulsed (Note 1)		I_{CM}	100	A	
Diode Forward Current	$T_C=25^{\circ}\text{C}$	I_F	60	A	
	$T_C=100^{\circ}\text{C}$		30	A	
Short Circuit Withstand Time $V_{GE} = 15\text{V}$, $V_{CC} \leq 200\text{V}$ Allowed number of short circuits < 1000 Time between short circuits: $\geq 1.0\text{s}$ $T_{VJ}= 25^{\circ}\text{C}$		t_{SC}	10	μs	
Power Dissipation	$T_C=25^{\circ}\text{C}$	TO-247	260	W	
		TO-263	90	W	
		TO-3PN	285	W	
Operating Junction Temperature		T_J	$-40 \sim +150$	$^{\circ}\text{C}$	
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 DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Case	TO-247	θ_{JC}	0.48	$^{\circ}\text{C/W}$
	TO-263		1.39	$^{\circ}\text{C/W}$
	TO-3PN		0.44	$^{\circ}\text{C/W}$

■ 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			±250	mA
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 =30A, V _{GE} =15V		1.66	2.1	V
		I _C =30A, V _{GE} =15V, T _C =125°C		2.0		V
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{IES}	V _{CE} =25V, V _{GE} =0V, f=1MHz		1690		pF
Output Capacitance	C _{OES}			82		pF
Reverse Transfer Capacitance	C _{RES}			52.7		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q _G	V _{CE} =600V, I _C =30A, V _{GE} =15V		138.3		nC
Gate-Emitter Charge	Q _{GE}			17.1		nC
Gate-Collector Charge	Q _{GC}			99.3		nC
Turn-On Delay Time	t _{DON})	V _{CC} =600V, I _C =30A, R _G =5Ω, V _{GE} =0~15V, L=500uH		16.4		ns
Rise Time	t _R			23		ns
Turn-Off Delay Time	t _{DOFF})			144.6		ns
Fall Time	t _F			217.7		ns
Turn-On Switching Loss	E _{ON}			2.21		mJ
Turn-Off Switching Loss	E _{OFF}			2.28		mJ
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Forward Voltage Drop	V _{FM}	I _F =30A			3.0	V
Reverse Recovery Time	t _{rr}	I _F =30A,		53.7		ns
Reverse Recovery Charge	Q _{rr}	dI/dt=100A/μS		1243		nC

■ TEST CIRCUIT AND WAVEFORMS

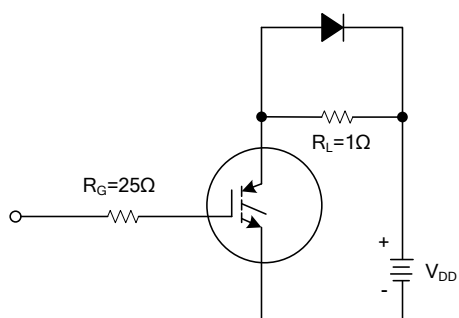


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

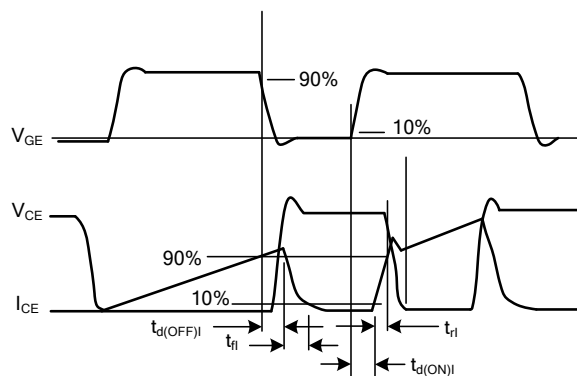
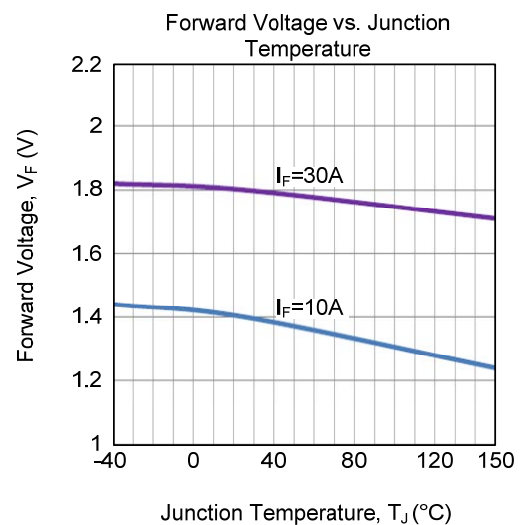
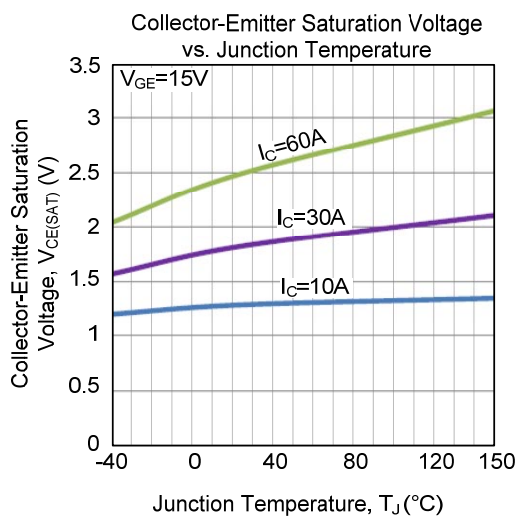
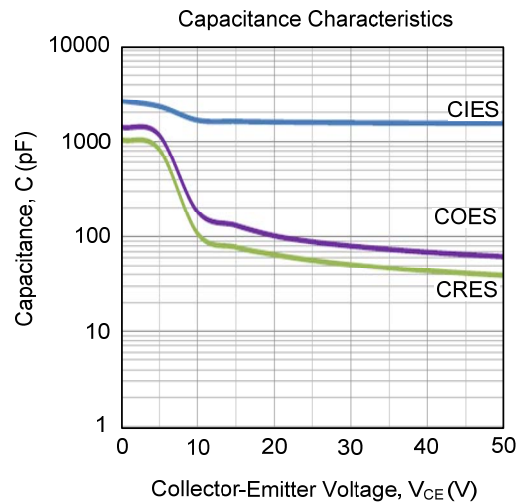
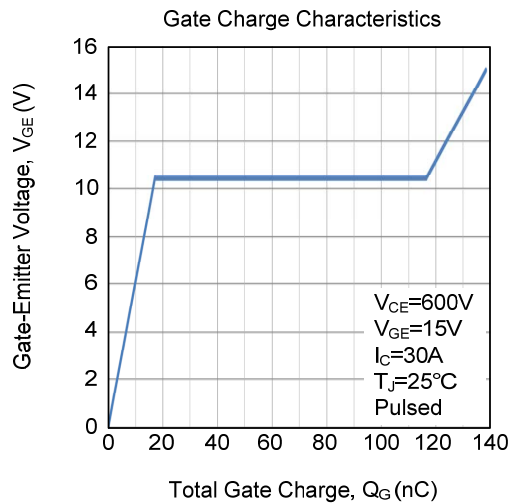
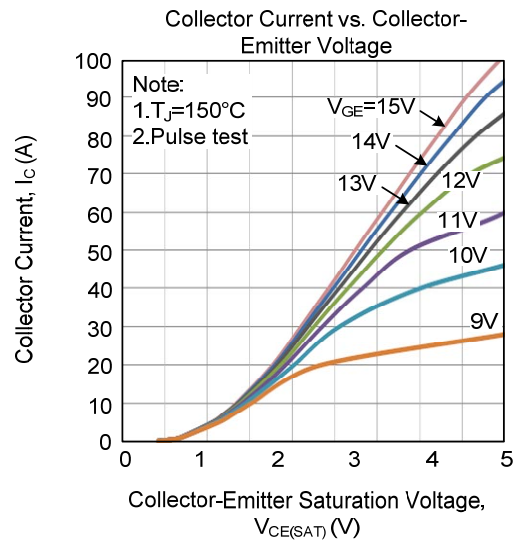
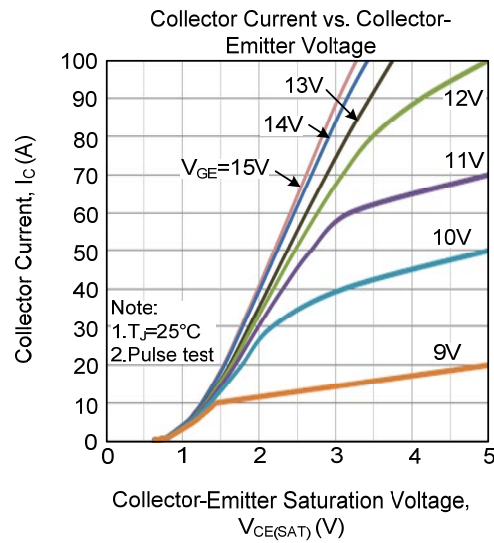
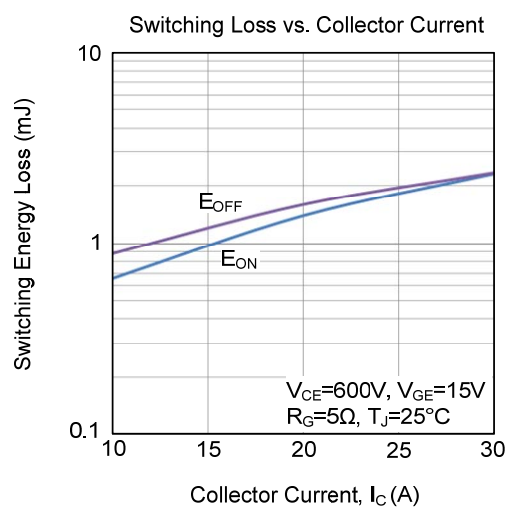
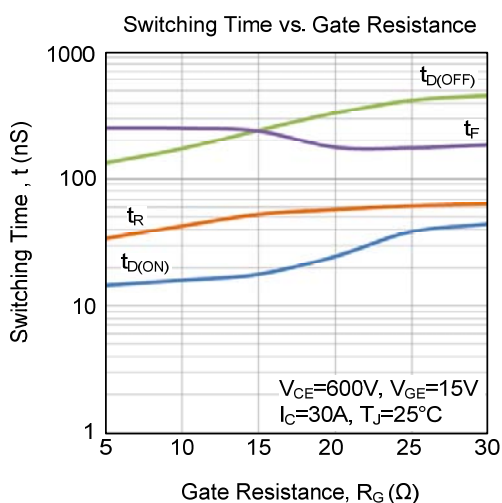
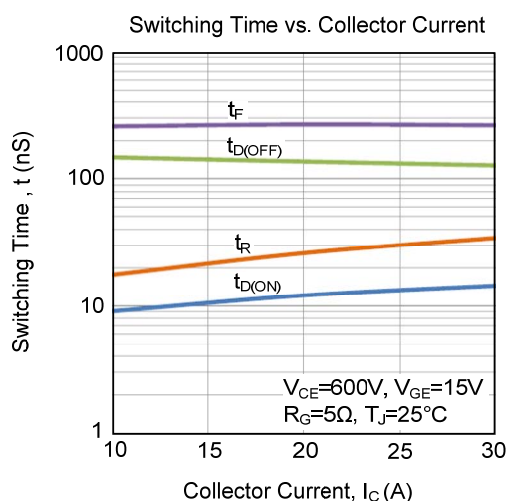
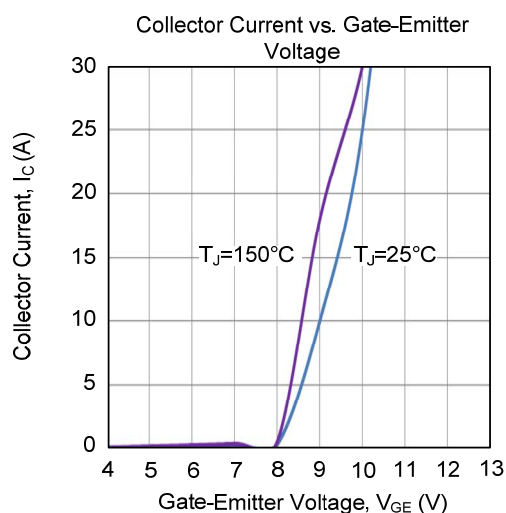
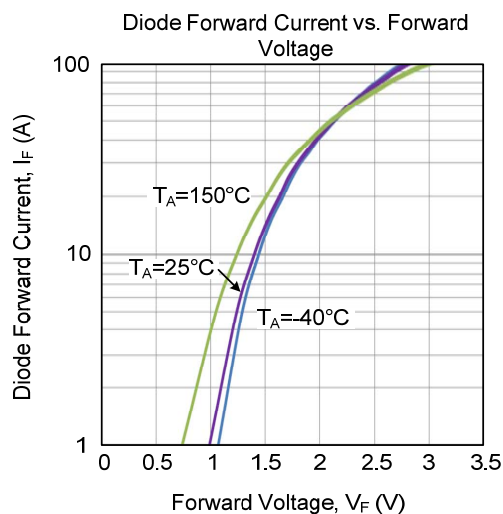
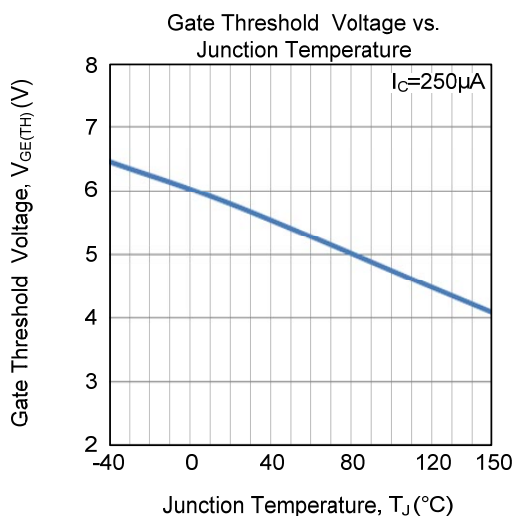


Fig 2. SWITCHING TEST WAVEFORMS

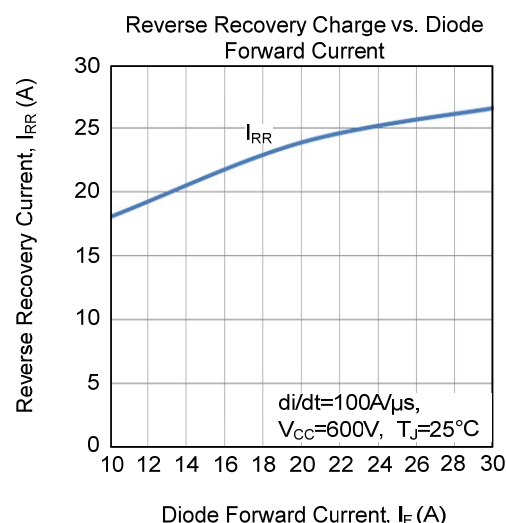
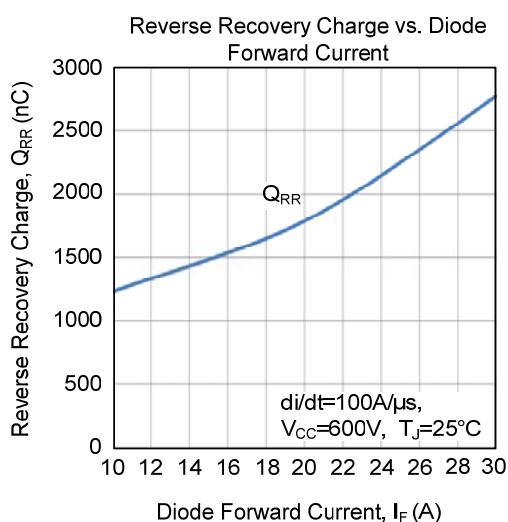
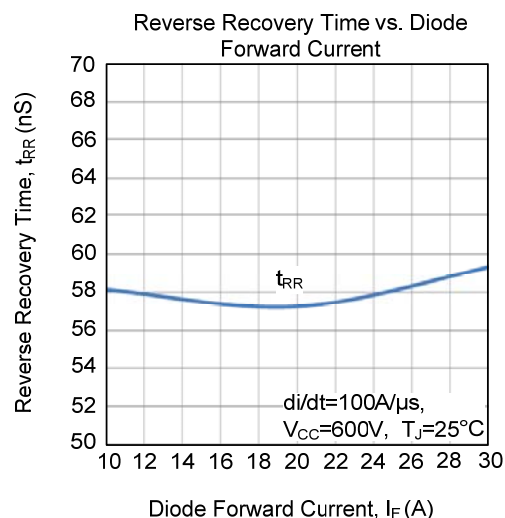
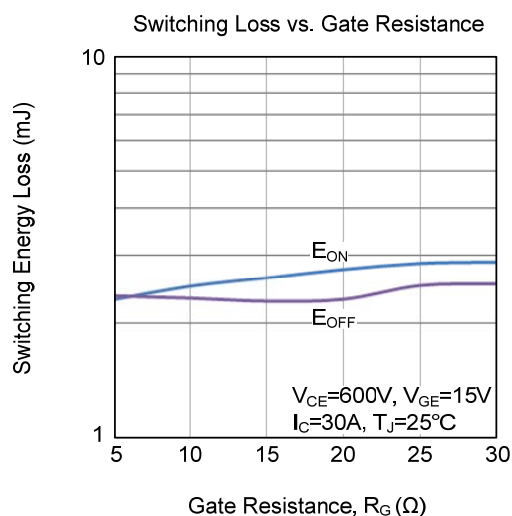
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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