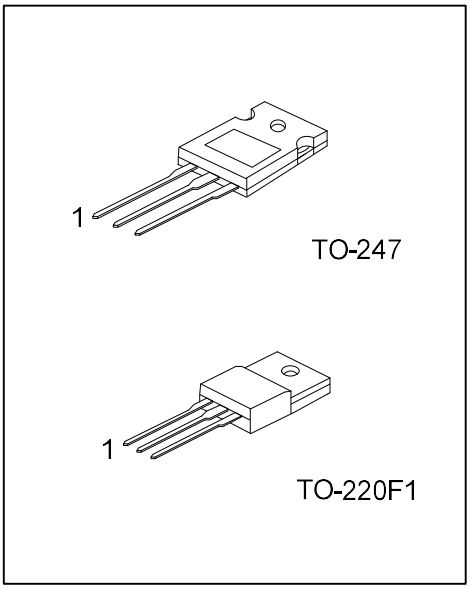
UTG25N120HNH1

Insulated Gate Bipolar Transistor

1200V TRENCH GATE FIELD-STOP IGBT



■ DESCRIPTION

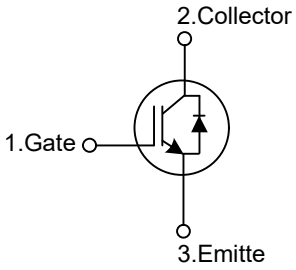
The UTC **UTG25N120HNH1** is an Trench Field-Stop Insulated Gate Bipolar Transistor. it uses UTC's advanced technology to provide customers with high switching speed, low saturation voltage and low switching loss, etc.

The UTC **UTG25N120HNH1** is suitable for the resonant or soft switching applications.

■ FEATURES

* High switching speed
* High avalanche ruggedness
* Low saturation voltage: $V_{CE(SAT).Typ.}$ = 2.0V @ I_C=25A, V_{GE}=15V (T_C =25°C)

■ SYMBOL



■ ORDERING INFORMATION

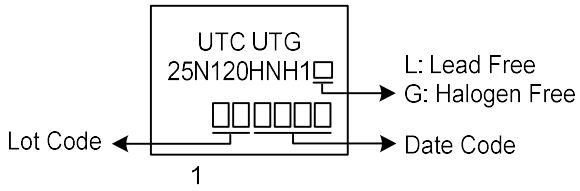
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTG25N120HNH1L-TF1-T	UTG25N120HNH1G-TF1-T	TO-220F1	G	C	E	Tube
UTG25N120HNH1L-T47-T	UTG25N120HNH1G-T47-T	TO-247	G	C	E	Tube

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

UTG25N120HNH1G-TF1-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube (2) TF1: TO-220F1, T47: TO-247 (3) G: Halogen Free and Lead Free, L: Lead Free

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■ MARKING


UTC UTG
25N120HNH1□
□□□□□□
L: Lead Free
G: Halogen Free
Lot Code
Date Code
1

■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	±20	V
Transient Gate-Emitter Voltage (tp < 5 ms)			±25	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	25	A
	T_C=100°C		12.5	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}	8	μs
Power Dissipation (T_C=25°C)	TO-220F1	P_D	39	W
	TO-247		260	W
Operating Junction Temperature		T_J	-40 ~ +150	°C
Storage Temperature Range		T_{STG}	-55 ~ +150	°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	RATINGS	UNIT
Junction to Case	TO-220F1	θ_{JC}	3.2	°C/W
	TO-247		0.48	°C/W

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

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}=1200V, V_{GE}=0V				5	μA
G-E Leakage Current	I_{GES}	V_{CE}=0V, V_{GE}=±20V				±400	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	T_C=25°C		2.0	2.5	V
			T_C=125°C		2.4		V
Dynamic Characteristics							
Input Capacitance	C_{IES}	V_{CE}=25V, V_{GE}=0V, f=1MHz			1120		pF
Output Capacitance	C_{OES}				76		pF
Reverse Transfer Capacitance	C_{RES}				48		pF
Switching Characteristics							
Total Gate Charge	Q_G	V_{CE}=600V, I_C=25A, V_{GE}=15V			95		nC
Gate-Emitter Charge	Q_{GE}				16		nC
Gate-Collector Charge	Q_{GC}				63		nC
Turn-On Delay Time	$t_{DON)}$	V_{CC}=600V, I_C=25A, R_G=5Ω, V_{GE}=0~15V, L=500μH			10		ns
Rise Time	t_R				26		ns
Turn-Off Delay Time	$t_{DOFF)}$				86		ns
Fall Time	t_F				209		ns
Turn-On Switching Loss	E_{ON}				1.8		mJ
Turn-Off Switching Loss	E_{OFF}				1.6		mJ
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Forward Voltage Drop	V_F	I_F=12.5A				3.0	V
Reverse Recovery Time	t_{rr}	I_F=12.5A, dI/dt=100A/μS, V_{CC}=600V			50		ns
Reverse Recovery Charge	Q_{rr}				1065		nC

■ TEST CIRCUIT AND WAVEFORMS

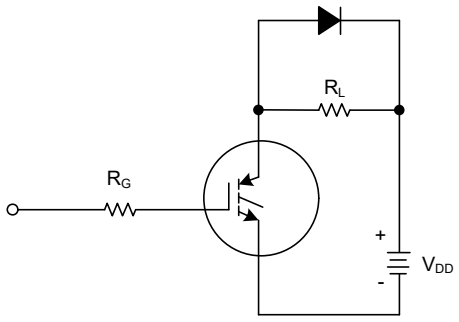


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

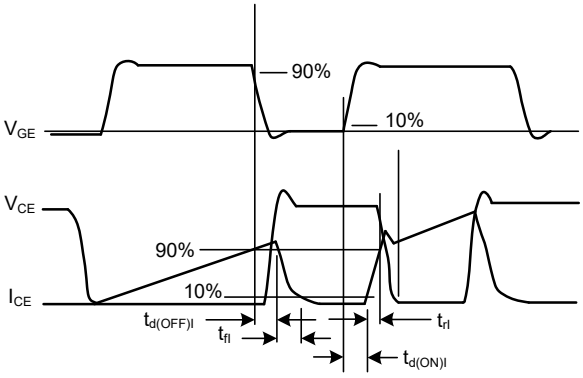
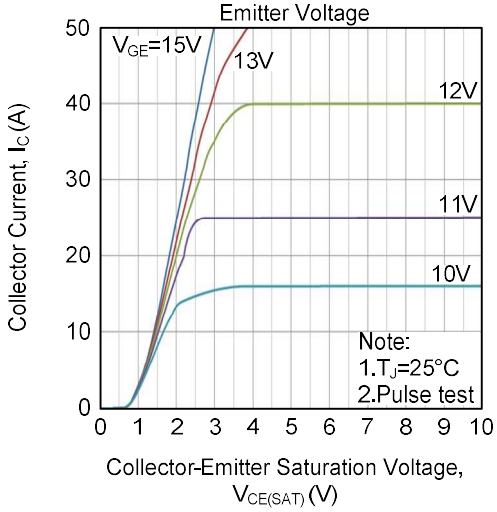


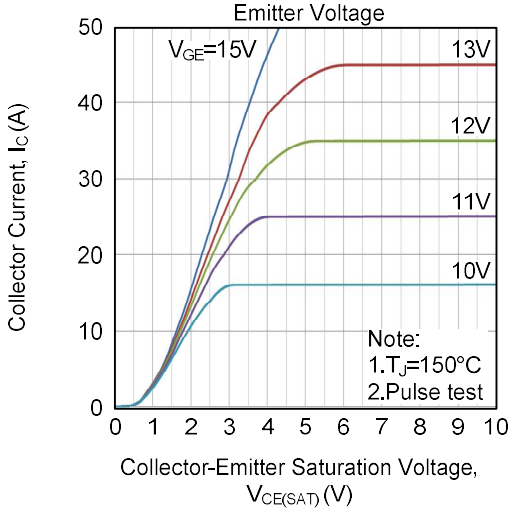
Fig 2. SWITCHING TEST WAVEFORMS

■ TYPICAL CHARACTERISTICS

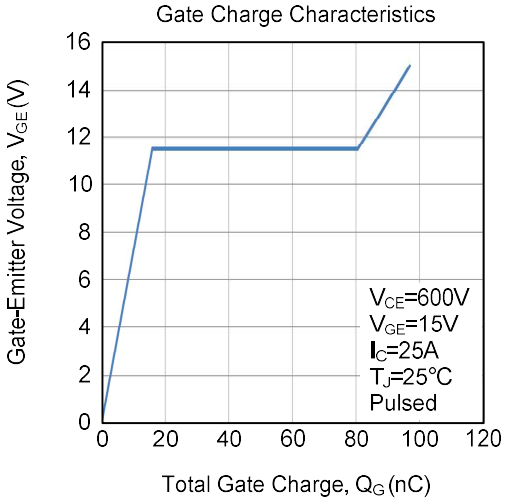
Collector Current vs. Collector-Emitter Voltage



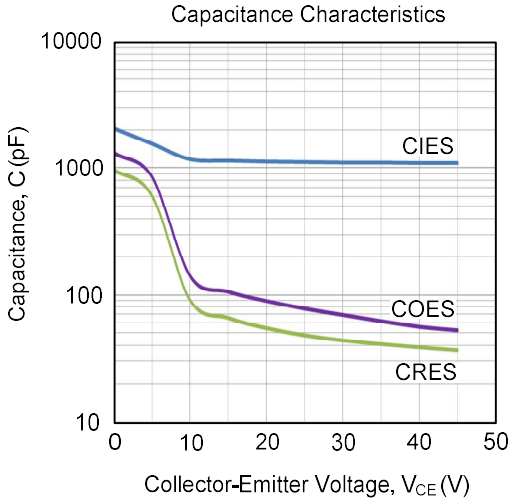
Collector Current vs. Collector-Emitter Voltage



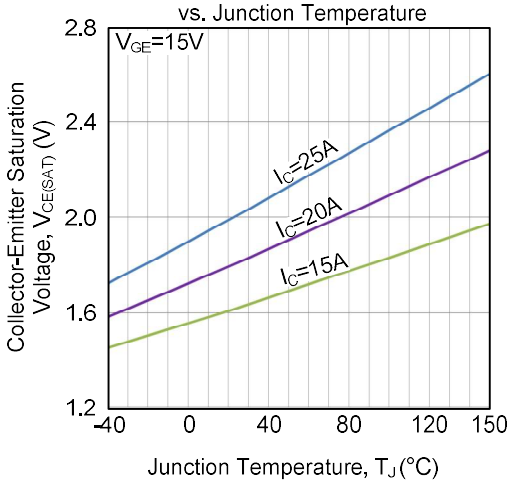
Gate Charge Characteristics



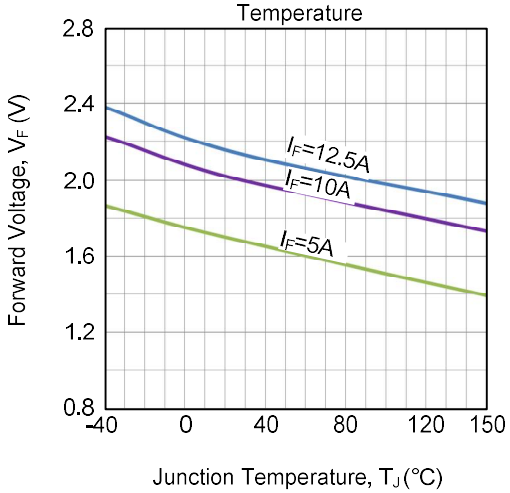
Capacitance Characteristics



Collector-Emitter Saturation Voltage vs. Junction Temperature

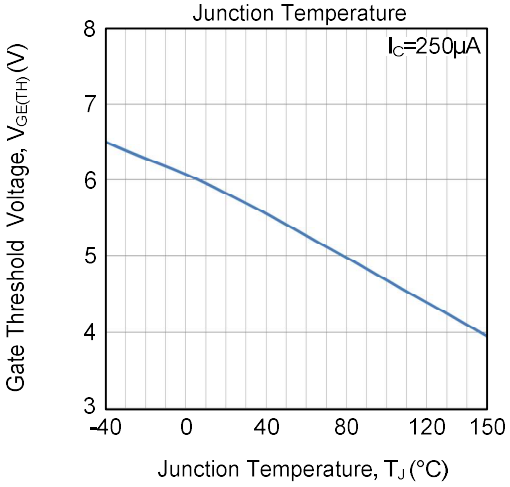


Forward Voltage vs. Junction Temperature

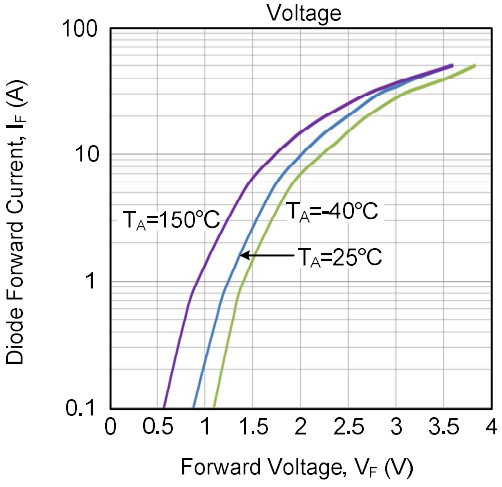


■ TYPICAL CHARACTERISTICS (Cont.)

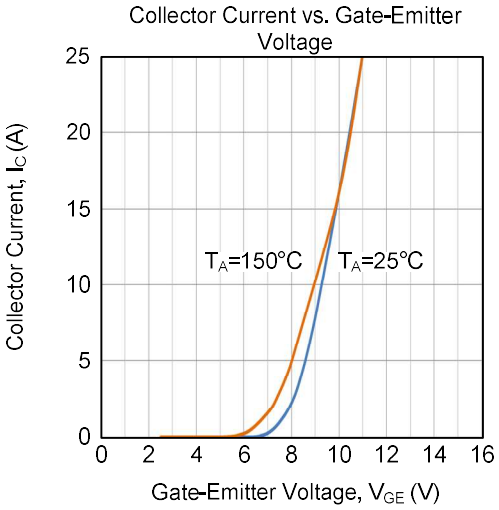
Gate Threshold Voltage vs. Junction Temperature



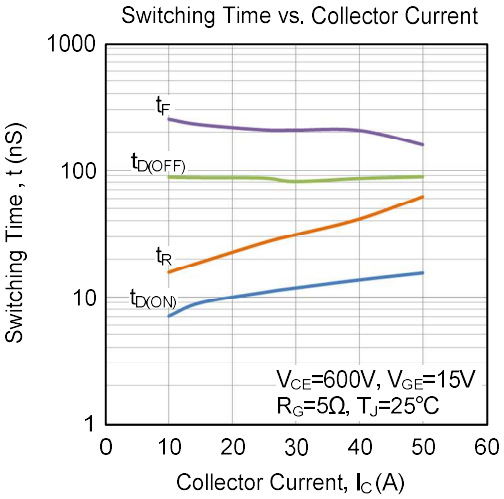
Diode Forward Current vs. Forward Voltage



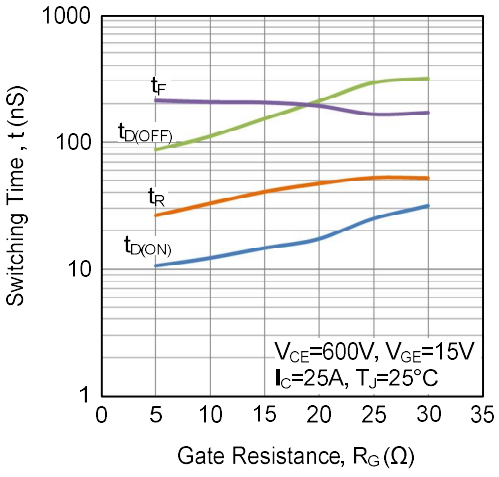
Collector Current vs. Gate-Emitter Voltage



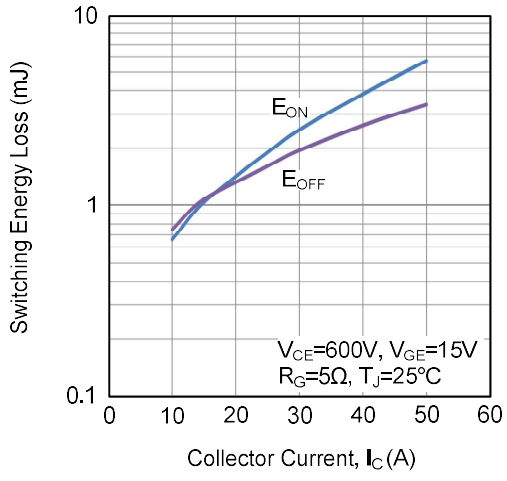
Switching Time vs. Collector Current



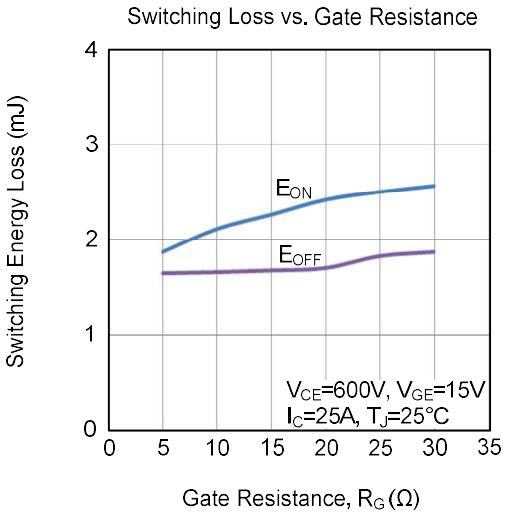
Switching Time vs. Gate Resistance

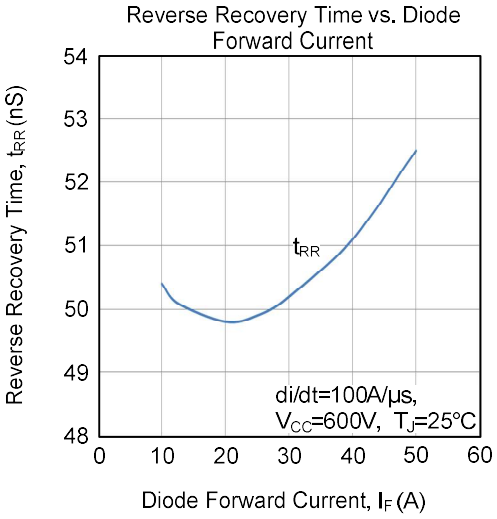


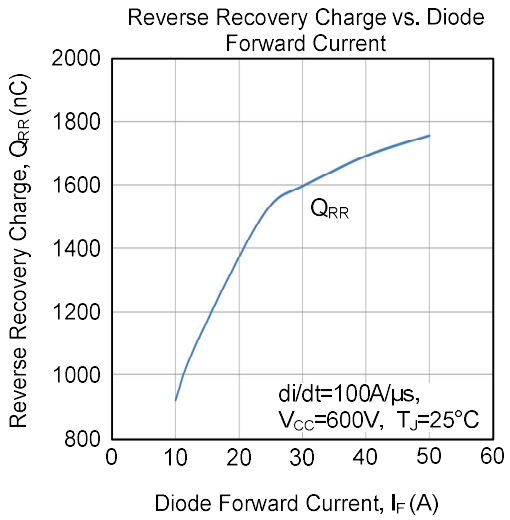
Switching Loss vs. Collector Current

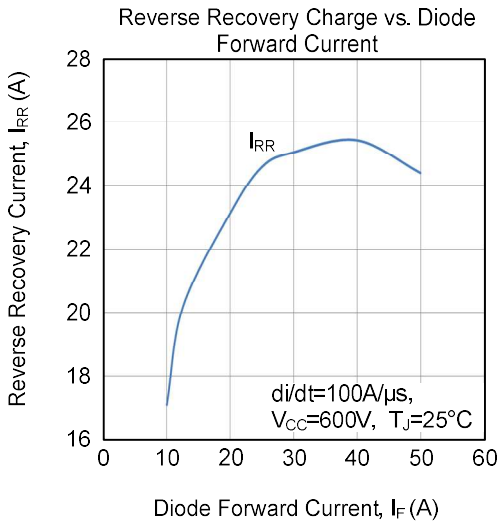


■ TYPICAL CHARACTERISTICS (Cont.)









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