



UTG30N65-S

Insulated Gate Bipolar Transistor

650V TRENCH GATE FIELD-STOP IGBT

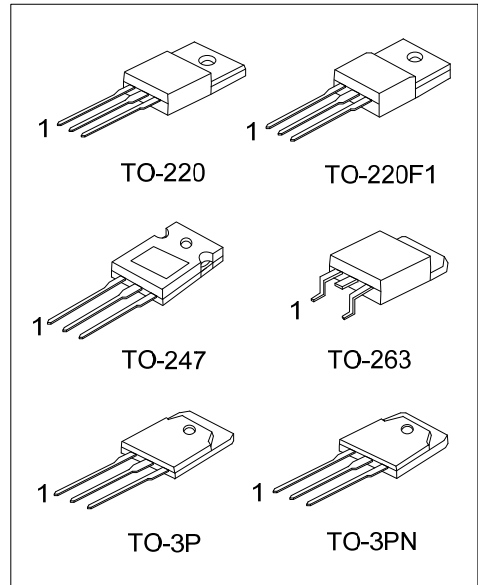
DESCRIPTION

The UTC **UTG30N65-S** 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.

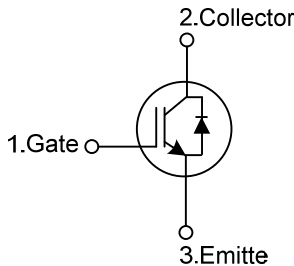
The UTC **UTG30N65-S** is suitable for the resonant or soft switching applications.

FEATURES

- * High switching speed
- * High avalanche ruggedness
- * Low saturation voltage: $V_{CE(SAT),Typ.}=1.65V @ I_C=30A, V_{GE}=15V$ ($T_C = 25^\circ C$)



SYMBOL



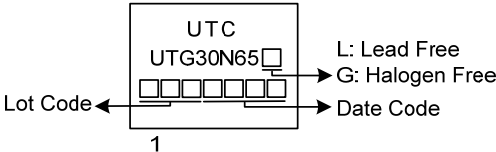
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTG30N65L-TA3-T	UTG30N65G-TA3-T	TO-220	G	C	E	Tube
UTG30N65L-TF1-T	UTG30N65G-TF1-T	TO-220F1	G	C	E	Tube
UTG30N65L-TQ2-T	UTG30N65G-TQ2-T	TO-263	G	C	E	Tube
UTG30N65L-TQ2-R	UTG30N65G-TQ2-R	TO-263	G	C	E	Tape Reel
UTG30N65L-T3P-T	UTG30N65G-T3P-T	TO-3P	G	C	E	Tube
UTG30N65L-T3N-T	UTG30N65G-T3N-T	TO-3PN	G	C	E	Tube
UTG30N65L-T47-T	UTG30N65G-T47-T	TO-247	G	C	E	Tube

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

<p>UTG30N65G-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TF1: TO-220F1, TQ2: TO-263, T3P: TO-3P, T3N: TO-3PN, T47: TO-247</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}	650	V
Gate-Emitter Voltage		V_{GES}	± 20	V
Transient Gate-emitter voltage ($t_p < 5$ ms)			± 25	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}	120	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}	3	μs
Power Dissipation ($T_C=25^\circ\text{C}$)	TO-220/TO-263	P_D	100	W
	TO-220F TO-220F1		38	W
	TO-247		295	W
	TO-3P/TO-3PN		316	W
Operating Junction Temperature		T_J	-40 ~ +175	$^\circ\text{C}$
Storage Temperature Range		T_{STG}	-55 ~ +175	$^\circ\text{C}$

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.

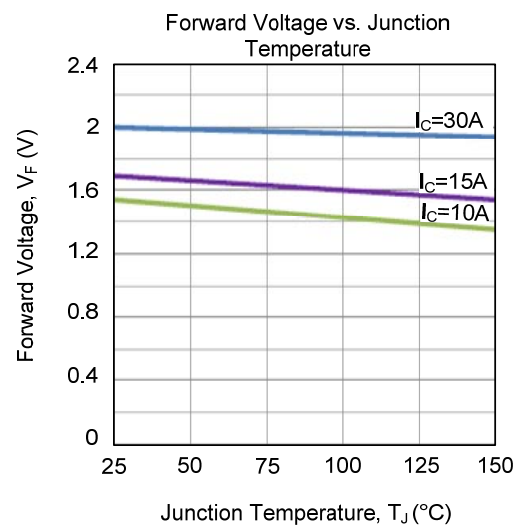
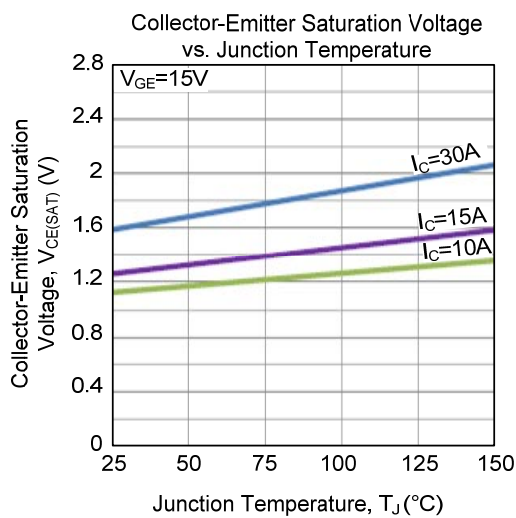
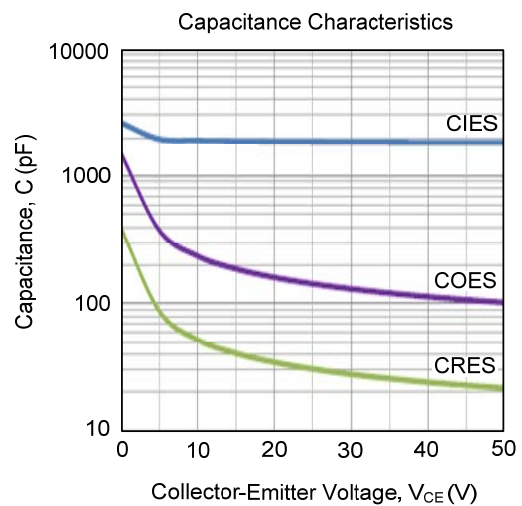
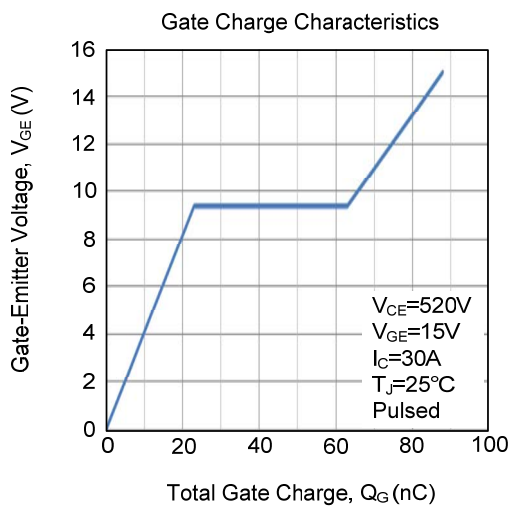
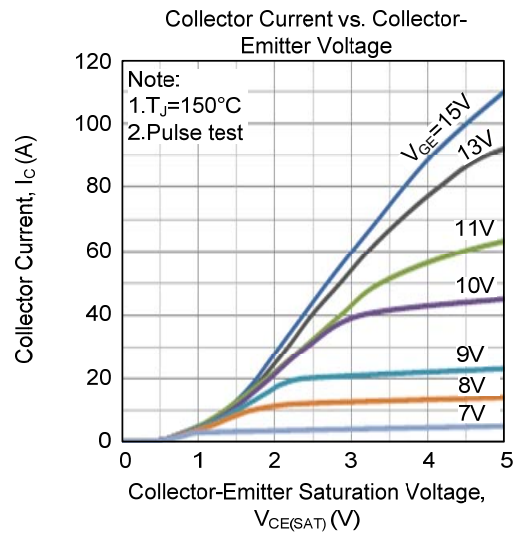
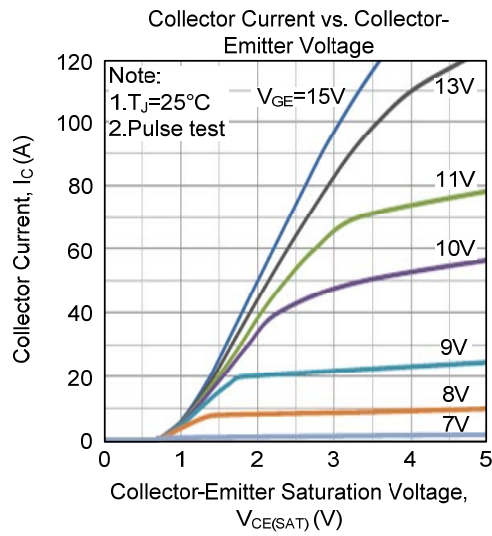
■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Case	TO-220/TO-263	θ_{JC}	1.25	$^\circ\text{C/W}$
	TO-220F TO-220F1		3.28	$^\circ\text{C/W}$
	TO-247		0.42	$^\circ\text{C/W}$
	TO-3P/TO-3PN		0.396	$^\circ\text{C/W}$

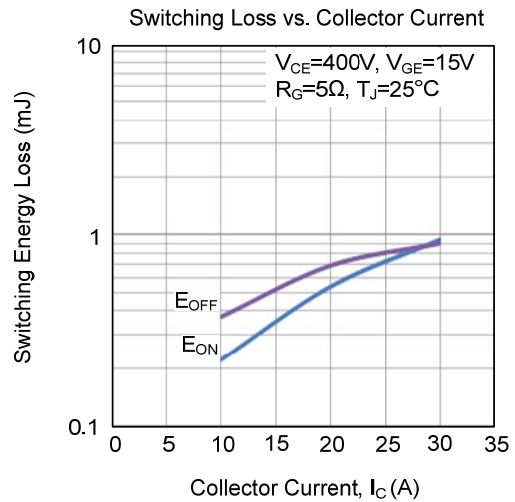
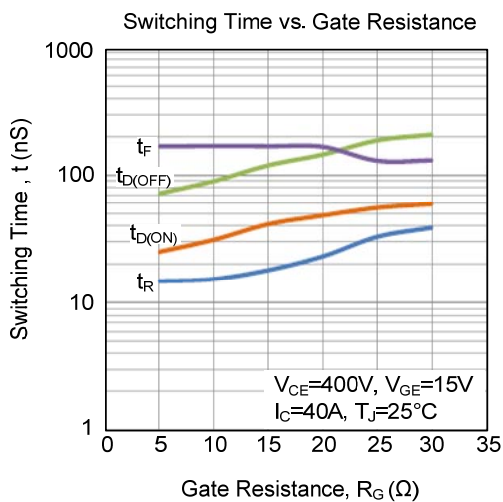
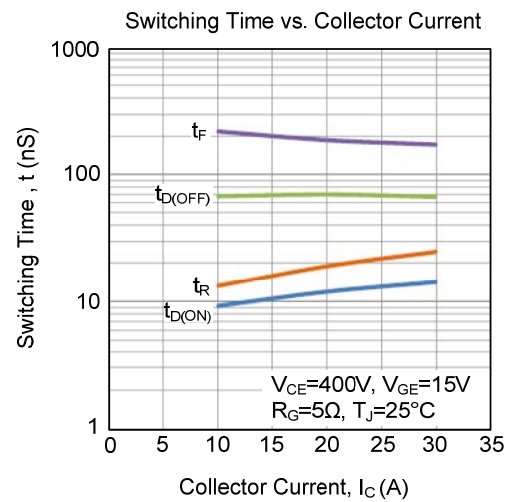
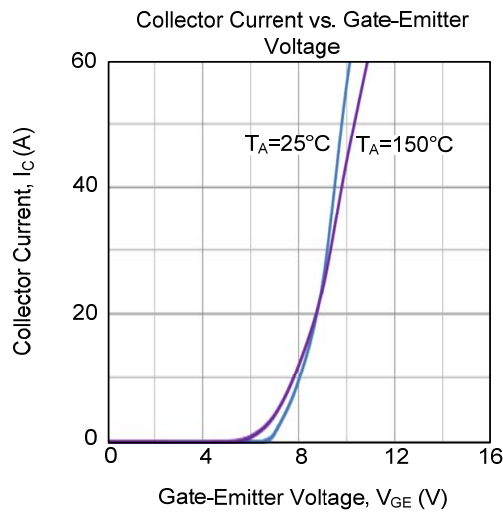
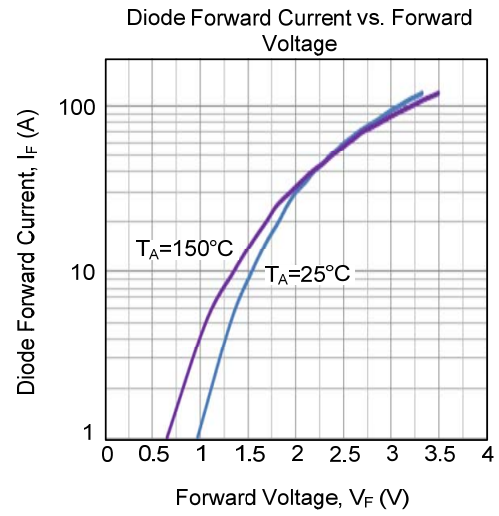
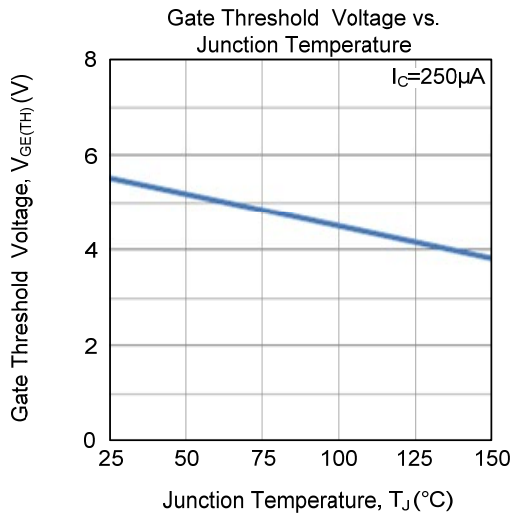
■ ELECTRICAL CHARACTERISTICS (T_c=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Off Characteristics							
Collector-Emitter Breakdown Voltage	BV _{CES}		650			V	
Collector Cut-Off Current	I _{CES}	V _{CE} =650V, 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}	5.0		7.0	V	
Collector to Emitter Saturation Voltage	V _{CE(SAT)}	I _C =30A, V _{GE} =15V	T _C =25°C	1.65	2.1	V	
			T _C =125°C	2.0		V	
Dynamic Characteristics							
Input Capacitance	C _{IES}	V _{CE} =25V, V _{GE} =0V, f=1MHz		1850		pF	
Output Capacitance	C _{OES}			140		pF	
Reverse Transfer Capacitance	C _{RES}			30		pF	
Switching Characteristics							
Total Gate Charge	Q _G	V _{CE} =520V, I _C =30A, V _{GE} =15V		89.3		nC	
Gate-Emitter Charge	Q _{GE}			23.8		nC	
Gate-Collector Charge	Q _{GC}			38		nC	
Turn-On Delay Time	t _{DON}	V _{CC} =400V, I _C =30A, R _G =5Ω, V _{GE} =0~15V, L=1000uH		15.5		ns	
Rise Time	t _R			25.7		ns	
Turn-Off Delay Time	t _{DOFF}			76.8		ns	
Fall Time	t _F			118.1		ns	
Turn-On Switching Loss	E _{ON}			0.98		mJ	
Turn-Off Switching Loss	E _{OFF}			0.899		mJ	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Forward Voltage Drop	V _F		I _F =30A			3.1	V
Reverse Recovery Time	t _{rr}	I _F =30A, di/dt=100A/μS, V _{CC} =400V		42.6		ns	
Reverse Recovery Charge	Q _{rr}			107.4		nC	

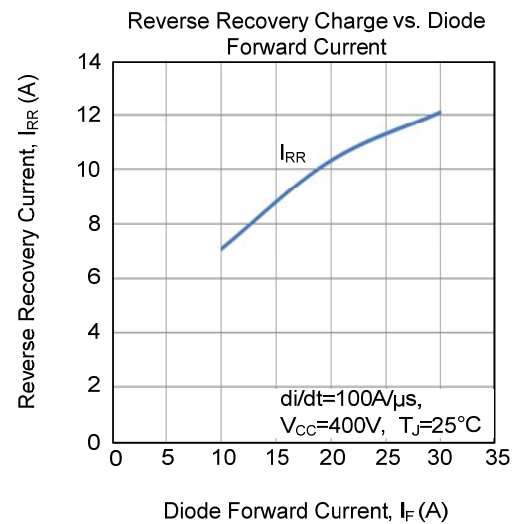
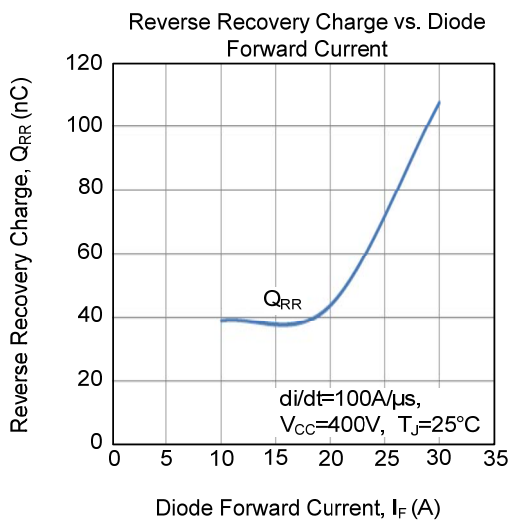
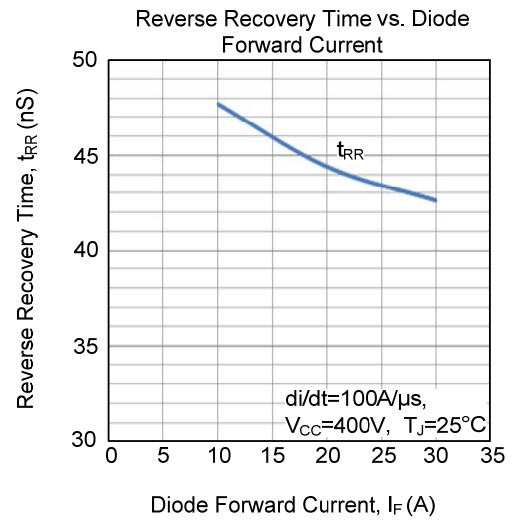
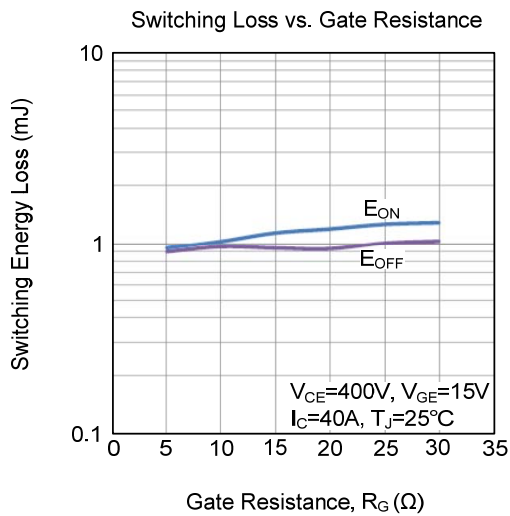
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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