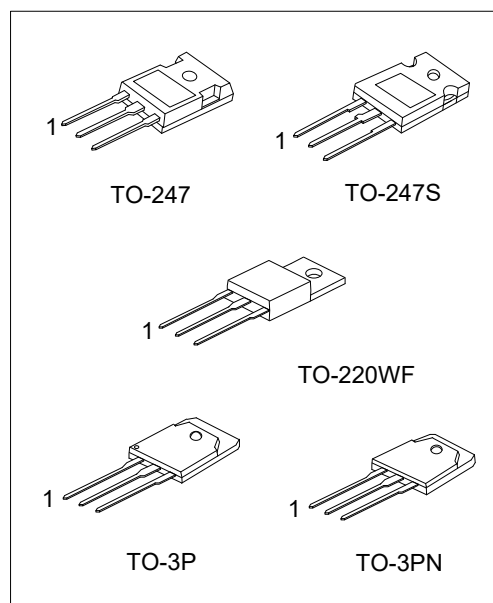
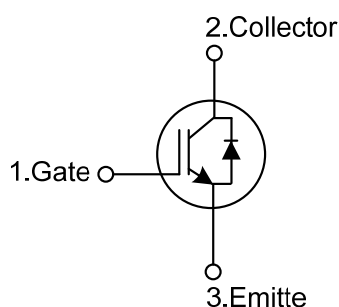


**UTG40N65SQ***Insulated Gate Bipolar Transistor***650V, TRENCH GATE
FIELD-STOP IGBT****DESCRIPTION**

Using UTC's proprietary trench design and advanced Field Stop (FS) technology, offering superior conduction and switching performances.

FEATURES

- * FS Trench Technology, Positive temperature coefficient
- * Low saturation voltage: $V_{CE(SAT), Typ.} = 1.7V @ I_C=40A, V_{GE}=15V$ ($T_C = 25^\circ C$)

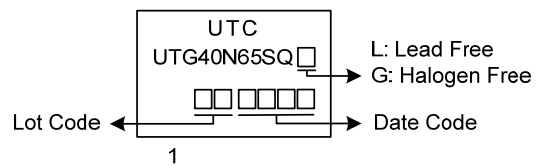
SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTG40N65SQL-TW1-T	UTG40N65SQG-TW1-T	TO-220WF	G	C	E	Tube
UTG40N65SQL-T3P-T	UTG40N65SQG-T3P-T	TO-3P	G	C	E	Tube
UTG40N65SQL-T3N-T	UTG40N65SQG-T3N-T	TO-3PN	G	C	E	Tube
UTG40N65SQL-T47-T	UTG40N65SQG-T47-T	TO-247	G	C	E	Tube
UTG40N65SQL-T47S-T	UTG40N65SQG-T47S-T	TO-247S	G	C	E	Tube

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

UTG40N65SQG-TW1-T	(1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube (2) TW1: TO-220WF, T3P: TO-3P, T3N: TO-3PN T47: TO-247, T47S: TO-247S (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		V _{CES}	650	V
Gate-Emitter Voltage		V _{GES}	±20	V
Transient Gate-Emitter Voltage (t _p ≤ 10 μs, D < 0.01)			±30	V
Continuous Collector Current	T _C =25°C	I _C	80	A
	T _C =100°C		40	A
Collector Current Pulsed (Note 1)		I _{CM}	120	A
Diode Forward Current	T _C =25°C	I _F	40	A
	T _C =100°C		20	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}	5	μs
Power Dissipation (T _C =25°C)	TO-220WF	P _D	35	W
	TO-3P		298	W
	TO-3PN			
	TO-247 TO-247S		220	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.

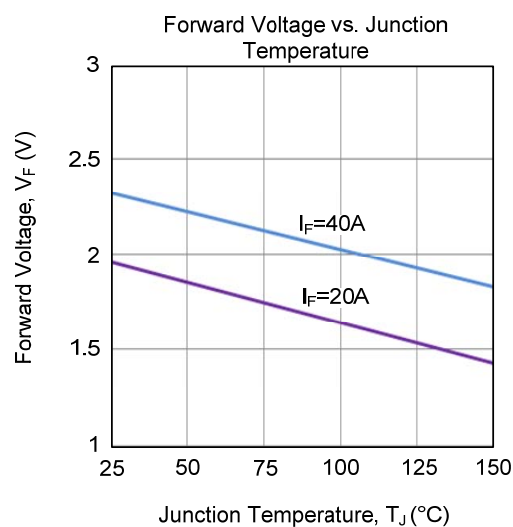
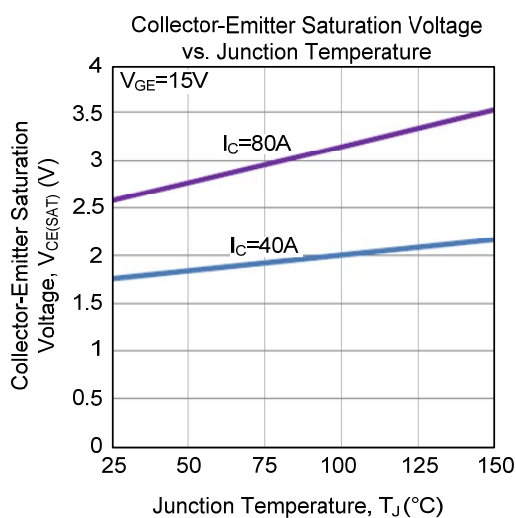
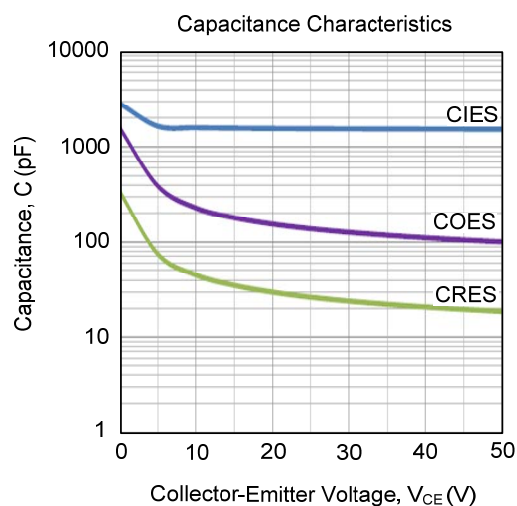
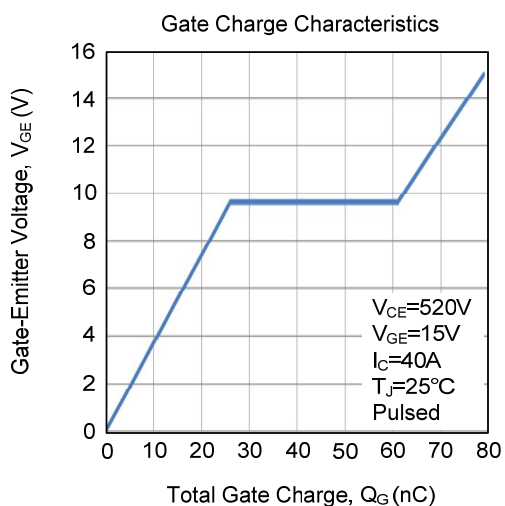
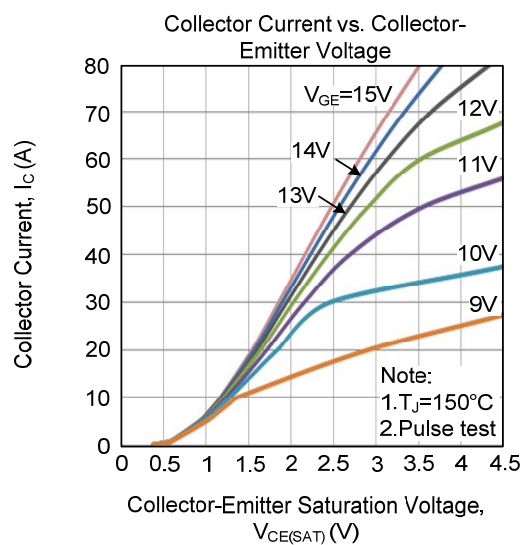
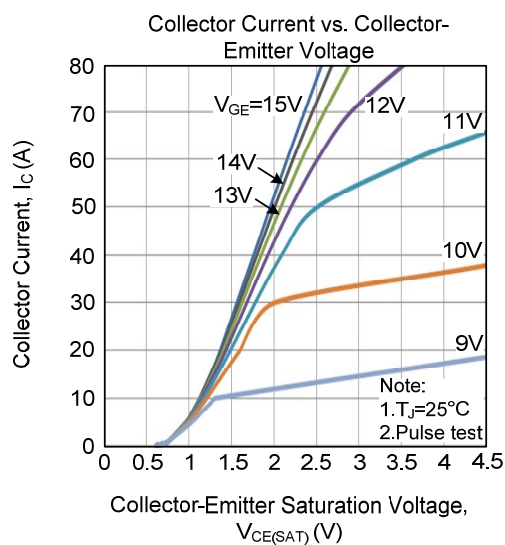
■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Case	TO-220WF	θ _{JC}	3.57	°C/W
	TO-3P		0.42	°C/W
	TO-3PN			
	TO-247 TO-247S		0.57	°C/W

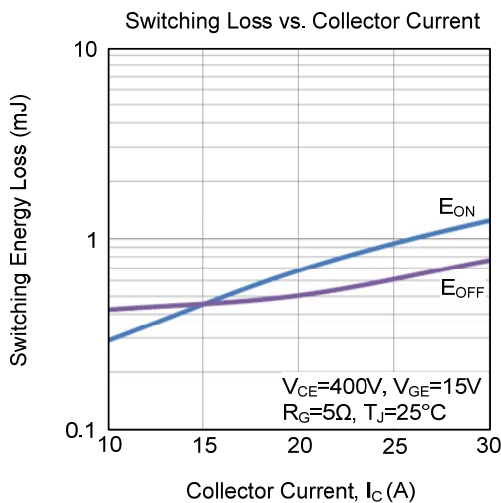
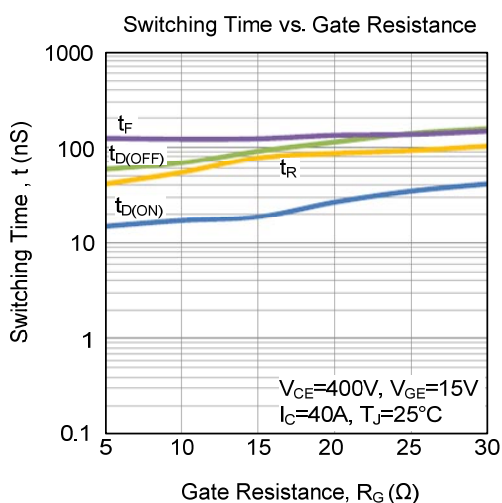
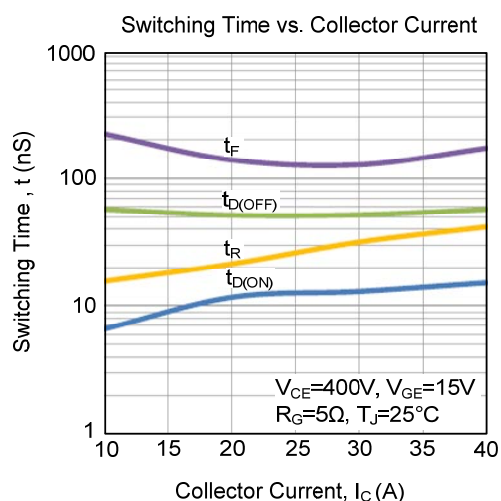
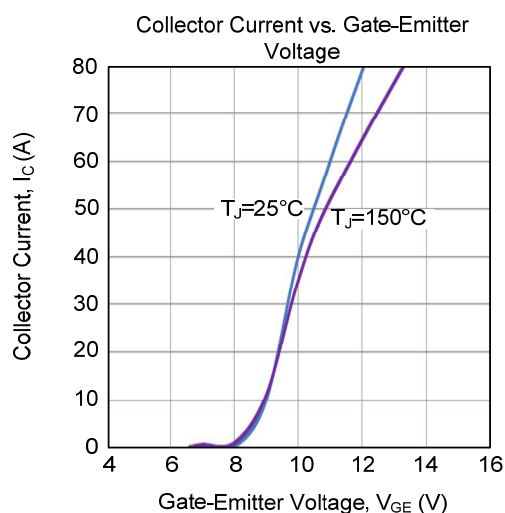
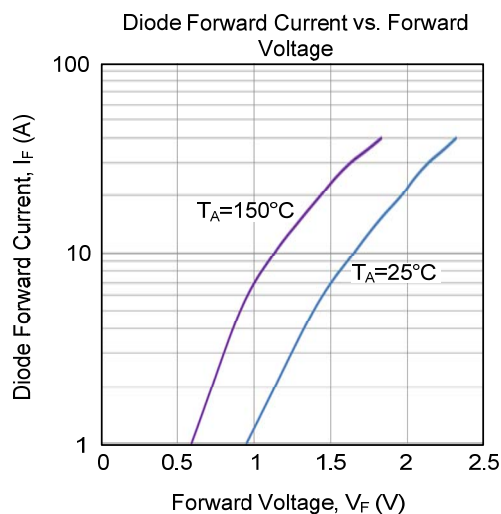
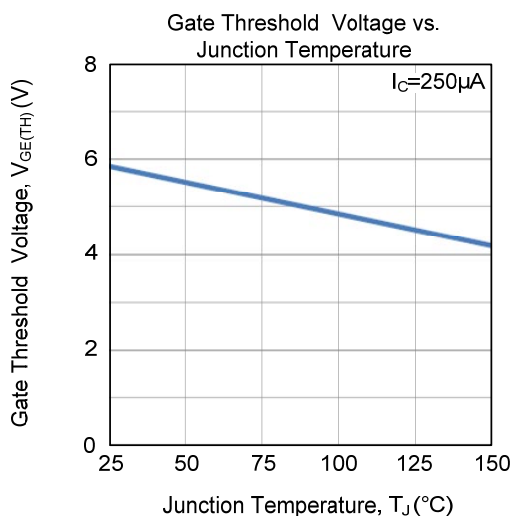
■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise noted)

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				1	mA
Gate-Emitter Forward Leakage Current	I _{GES_F}	V _{CE} =0V, V _{GE} =+20V				+250	nA
Gate-Emitter Reverse Leakage Current	I _{GES_F}	V _{CE} =0V, V _{GE} =-20V				-250	nA
ON CHARACTERISTICS							
Gate to Emitter Threshold Voltage	V _{GE(TH)}	I _C =250μA, V _{CE} =V _{GE}		4.5		6.5	V
Collector to Emitter Saturation Voltage	V _{CE(SAT)}	I _C =40A, V _{GE} =15V	T _C =25°C		1.7	2.1	V
			T _C =125°C		2.1		V
DYNAMIC CHARACTERISTICS							
Input Capacitance	C _{IES}	V _{CE} =25V, V _{GE} =0V, f=1MHz			1560		pF
Output Capacitance	C _{OES}				125		pF
Reverse Transfer Capacitance	C _{RES}				23		pF
SWITCHING CHARACTERISTICS							
Total Gate Charge	Q _G	V _{CE} =520V, I _C =40A, V _{GE} =15V			79		nC
Gate-Emitter Charge	Q _{GE}				26		nC
Gate-Collector Charge	Q _{GC}				35		nC
Turn-On Delay Time	t _{DON})	V _{CC} =400V, I _C =40A, R _G =5Ω, V _{GE} =0~15V, L=500μH			16		ns
Rise Time	t _R				41		ns
Turn-Off Delay Time	t _{DOFF})				58		ns
Fall Time	t _F				117		ns
Turn-On Switching Loss	E _{ON}				1.8		mJ
Turn-Off Switching Loss	E _{OFF}				1.1		mJ
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Forward Voltage Drop	V _F	I _F =20A			2.1	3.0	V
Reverse Recovery Time	t _{rr}	I _F =20A, dI/dt=100A/μS, V _{CC} =400V			88		ns
Reverse Recovery Charge	Q _{rr}				75		nC

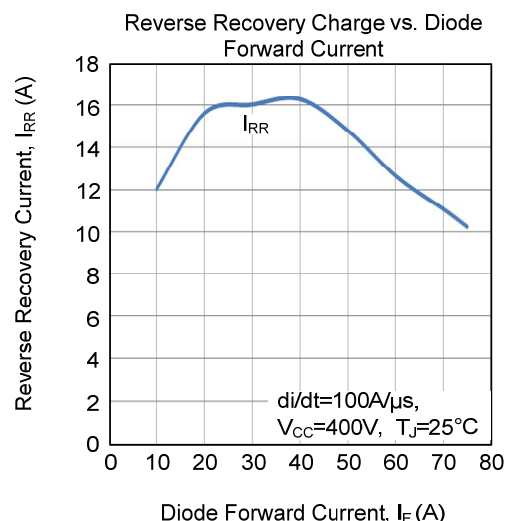
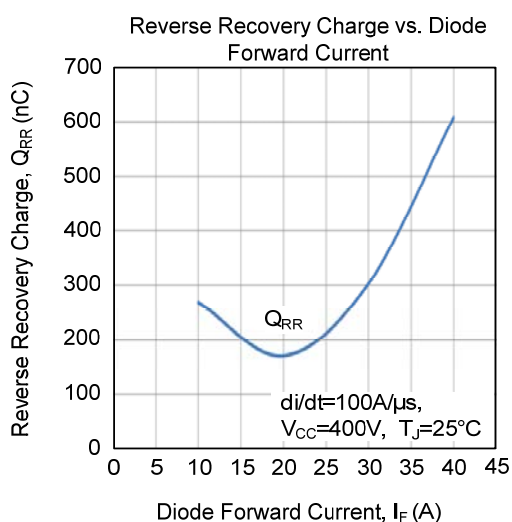
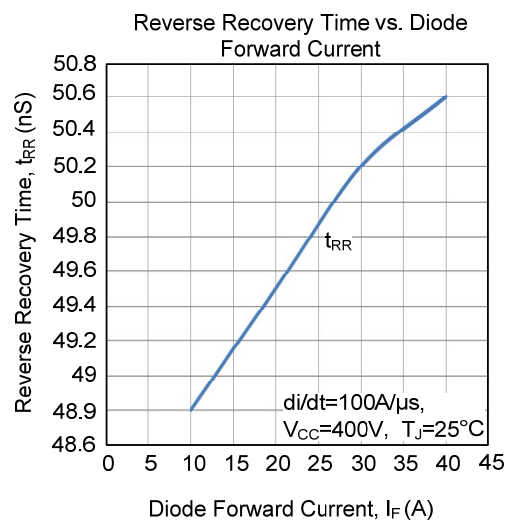
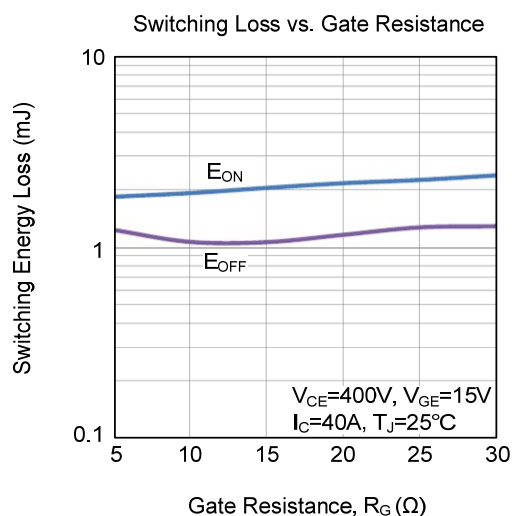
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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