



UTG40N65-S

Insulated Gate Bipolar Transistor

650V TRENCH GATE FIELD-STOP IGBT

■ DESCRIPTION

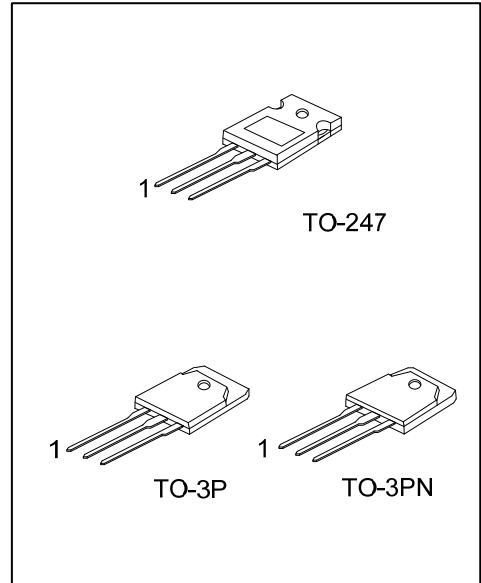
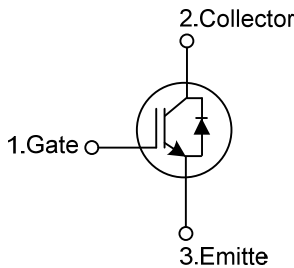
The UTC **UTG40N65-S** is an Trench Field-Stop Insulated Gate Bipolar Transistor. it uses UTC's advanced technology to provide customers with high switching speed, low saturation voltage and low switching loss, etc.

The UTC **UTG40N65-S** is suitable for the resonant or soft switching applications.

■ FEATURES

- * High switching speed
- * High avalanche ruggedness
- * Low saturation voltage: $V_{CE(SAT),Typ.}=1.65V @ I_c=40A, V_{GE}=15V$ ($T_c = 25^\circ C$)

■ SYMBOL



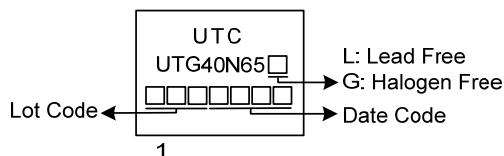
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTG40N65L-T47-T	UTG40N65G-T47-T	TO-247	G	C	E	Tube
UTG40N65L-T3P-T	UTG40N65G-T3P-T	TO-3P	G	C	E	Tube
UTG40N65L-T3N-T	UTG40N65G-T3N-T	TO-3PN	G	C	E	Tube

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

<p>UTG40N65G-T47-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube</p> <p>(2) T47: TO-247, T3P: TO-3P, T3N: TO-3PN</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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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 < 5 ms)		±25	V	
Continuous Collector Current	I _C	T _C =25°C	80	A
		T _C =100°C	40	A
Collector Current Pulsed (Note 1)	I _{CM}	160	A	
Diode Forward Current	I _F	T _C =25°C	80	A
		T _C =100°C	40	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}	3	μs	
Power Dissipation (T _C =25°C)	P _D	TO-247	298	W
		TO-3P/TO-3PN	320	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.

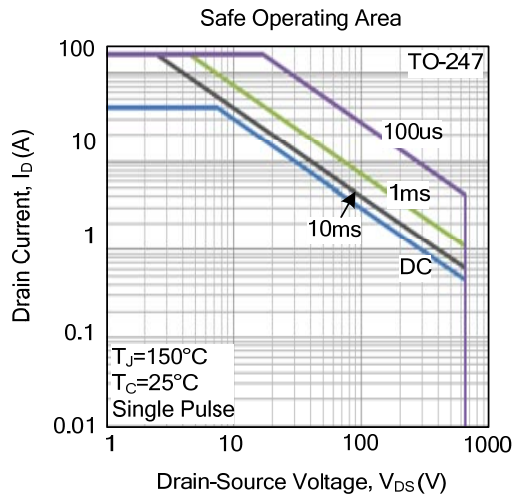
■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT	
Junction to Case	θ _{JC}	TO-247	0.41	°C/W
		TO-3P/TO-3PN	0.39	°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}	2.5		6.5	V	
Collector to Emitter Saturation Voltage	V _{CE(SAT)}	I _C =40A, 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		2590		pF	
Output Capacitance	C _{OES}			146.3		pF	
Reverse Transfer Capacitance	C _{RES}			35.9		pF	
Switching Characteristics							
Total Gate Charge	Q _G	V _{CE} =520V, I _C =40A, V _{GE} =15V		134.7		nC	
Gate-Emitter Charge	Q _{GE}			23.4		nC	
Gate-Collector Charge	Q _{GC}			48.6		nC	
Turn-On Delay Time	t _{DON}	V _{CC} =400V, I _C =40A, R _G =5Ω, V _{GE} =0~15V, L=500uH		12.8		ns	
Rise Time	t _R			27.1		ns	
Turn-Off Delay Time	t _{DOFF}			113.4		ns	
Fall Time	t _F			61.2		ns	
Turn-On Switching Loss	E _{ON}			0.92		mJ	
Turn-Off Switching Loss	E _{OFF}			1.17		mJ	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Forward Voltage Drop	V _F		I _F =40A		2.0	3.0	V
Reverse Recovery Time	t _{rr}	I _F =40A, dI/dt=100A/μS, V _{CC} =400V		30		ns	
Reverse Recovery Charge	Q _{rr}				615		nC

■ TYPICAL CHARACTERISTICS



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