



UTG5N65-S

Preliminary

Insulated Gate Bipolar Transistor

650V TRENCH GATE FIELD-STOP IGBT

DESCRIPTION

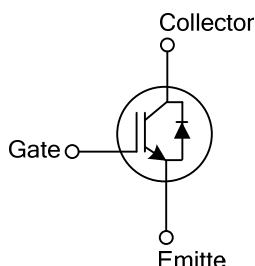
The UTC **UTG5N65-S** is an Trench Field-Stop Insulated Gate Bipolar Transistor. it uses UTC's advanced technology to provide customers with high switching speed, low saturation voltage and low switching loss, etc.

The UTC **UTG5N65-S** is suitable for the resonant or soft switching applications.

FEATURES

- * High switching speed
- * High avalanche ruggedness
- * Low saturation voltage: $V_{CE(SAT), Typ.} = 1.46V @ I_C = 5.0A, V_{GE} = 15V$ ($T_C = 25^\circ C$)

SYMBOL

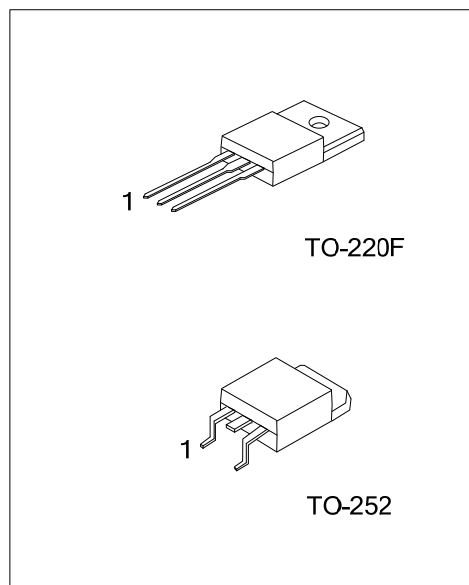


ORDERING INFORMATION

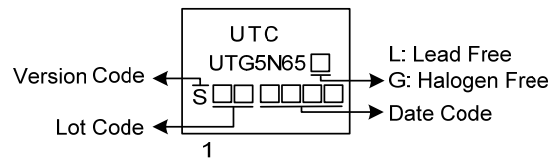
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTG5N65L-S-TF3-T	UTG5N65G-S-TF3-T	TO-220F	G	C	E	Tube
UTG5N65L-S-TN3-R	UTG5N65G-S-TN3-R	TO-252	G	C	E	Tape Reel

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

	(1)Packing Type	(1) T: Tube, R: Tape Reel
	(2)Package Type	(2) TF3: TO-220F, TN3: TO-252
	(3)Version Code	(3) Version S
	(4)Green Package	(4) G: Halogen Free and Lead Free, L: Lead Free



■ 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	I_C	$T_C=25^\circ\text{C}$ 10	A
		$T_C=100^\circ\text{C}$ 5	A
Collector Current Pulsed (Note 1)	I_{CM}	20	A
Diode Forward Current	I_F	$T_C=25^\circ\text{C}$ 10	A
		$T_C=100^\circ\text{C}$ 5	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 ($T_C=25^\circ\text{C}$)	P_D	TO-220F 29	W
		TO-252 38	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	RATINGS	UNIT
Junction to Case	θ_{JC}	TO-220F 4.31	$^\circ\text{C/W}$
		TO-252 3.289	$^\circ\text{C/W}$

■ 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			±100	nA
On Characteristics						
Gate to Emitter Threshold Voltage	V _{GE(TH)}	I _C =250μA, V _{CE} =V _{GE}	4.0		6.5	V
Collector to Emitter Saturation Voltage	V _{CE(SAT)}	I _C =5.0A, V _{GE} =15V	T _C =25°C	1.46	2.1	V
			T _C =125°C	1.9		V
Dynamic Characteristics						
Input Capacitance	C _{IES}	V _{CE} =25V, V _{GE} =0V, f=1MHz		511		pF
Output Capacitance	C _{OES}			34		pF
Reverse Transfer Capacitance	C _{RES}			9.1		pF
Switching Characteristics						
Total Gate Charge	Q _G	V _{CE} =520V, I _C =5.0A, V _{GE} =15V		45.4		nC
Gate-Emitter Charge	Q _{GE}			14.8		nC
Gate-Collector Charge	Q _{GC}			18.8		nC
Turn-On Delay Time	t _{DON}	V _{CC} =400V, I _C =5.0A, R _G =5Ω, V _{GE} =0~15V, L=1000μH		16		ns
Rise Time	t _R			22		ns
Turn-Off Delay Time	t _{DOFF}			45		ns
Fall Time	t _F			220		ns
Turn-On Switching Loss	E _{ON}			0.197		mJ
Turn-Off Switching Loss	E _{OFF}			0.151		mJ
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Forward Voltage Drop	V _F	I _F =5.0A		1.55	3.0	V
Reverse Recovery Time	t _{rr}	I _F =5.0A, dI/dt=100A/μS,		40		ns
Reverse Recovery Charge	Q _{rr}	V _{CC} =400V		14		nC

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