



UTG6N65LNH1

Insulated Gate Bipolar Transistor

650V TRENCH GATE FIELD-STOP IGBT

DESCRIPTION

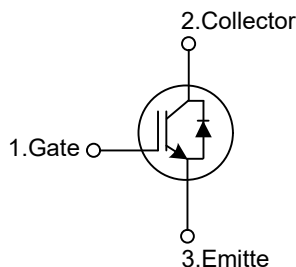
The UTC **UTG6N65LNH1** is an Trench Field-Stop Insulated Gate Bipolar Transistor. it uses UTC's advanced technology to provide customers with high switching speed, low saturation voltage and low switching loss, etc.

The UTC **UTG6N65LNH1** is suitable for the resonant or soft switching applications.

FEATURES

- * High switching speed
- * High avalanche ruggedness
- * Low saturation voltage: $V_{CE(SAT).Typ.} = 1.6V @ I_C=6.0A, V_{GE}=15V$ ($T_C = 25^\circ C$)
- * Green Product

SYMBOL

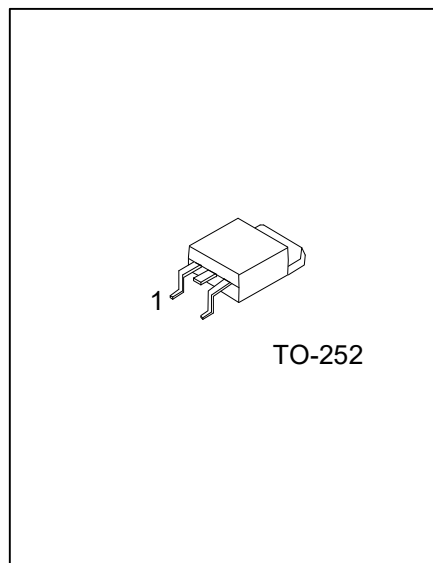


ORDERING INFORMATION

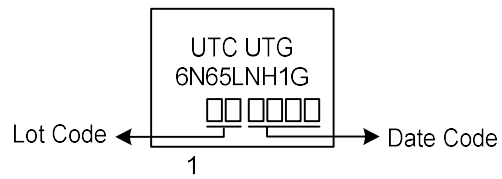
Ordering Number	Package	Pin Assignment			Packing
		1	2	3	
UTG6N65LNH1G-TN3-R	TO-252	G	C	E	Tape Reel

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

UTG6N65LNH1G-TN3-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) TN3: TO-252
	(3)Green Package	(3) G: Halogen Free and Lead Free



■ MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise specified.)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage	V_{CES}	650	V
Gate-Emitter Voltage	V_{GES}	± 20	V
Transient Gate-Emitter Voltage ($t_p < 5 \text{ ms}$)		± 25	V
Continuous Collector Current	I_C	12	A
		6	A
Collector Current Pulsed (Note 1)	I_{CM}	24	A
Diode Forward Current	I_F	6	A
		3	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}	8	μs
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	39	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	RATING	UNIT
Junction to Case	θ_{JC}	3.21	$^\circ\text{C/W}$

■ 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}		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}	4.5		7.5	V
Collector to Emitter Saturation Voltage	V _{CE(SAT)}	I _C =6.0A, V _{GE} =15V	T _C =25°C	1.6	2.1	V
			T _C =125°C	1.9		V
Dynamic Characteristics						
Input Capacitance	C _{IES}	V _{CE} =25V, V _{GE} =0V, f=1MHz		425		pF
Output Capacitance	C _{OES}			31		pF
Reverse Transfer Capacitance	C _{RES}			9		pF
Switching Characteristics						
Total Gate Charge	Q _G	V _{CE} =520V, I _C =6.0A, V _{GE} =15V		35		nC
Gate-Emitter Charge	Q _{GE}			16		nC
Gate-Collector Charge	Q _{GC}			12		nC
Turn-On Delay Time	t _{DON}	V _{CC} =400V, I _C =6.0A, R _G =5Ω, V _{GE} =0~15V, L=500μH		5		ns
Rise Time	t _R			12		ns
Turn-Off Delay Time	t _{DOFF}			13		ns
Fall Time	t _F			212		ns
Turn-On Switching Loss	E _{ON}			0.3		mJ
Turn-Off Switching Loss	E _{OFF}			0.1		mJ
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Forward Voltage Drop	V _F	I _F =3.0A			1.7	V
Reverse Recovery Time	t _{rr}	I _F =3.0A, dI/dt=100A/μS,		54		ns
Reverse Recovery Charge	Q _{rr}	V _{CC} =400V		3		nC

■ TEST CIRCUIT AND WAVEFORMS

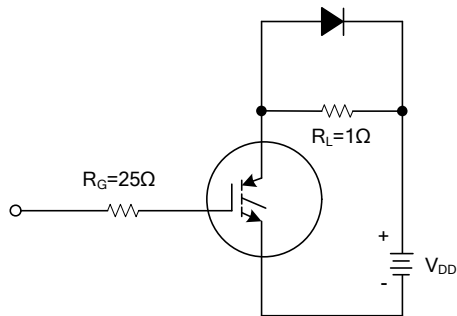


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

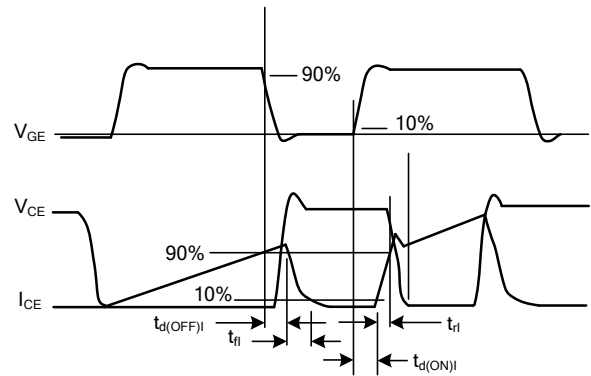
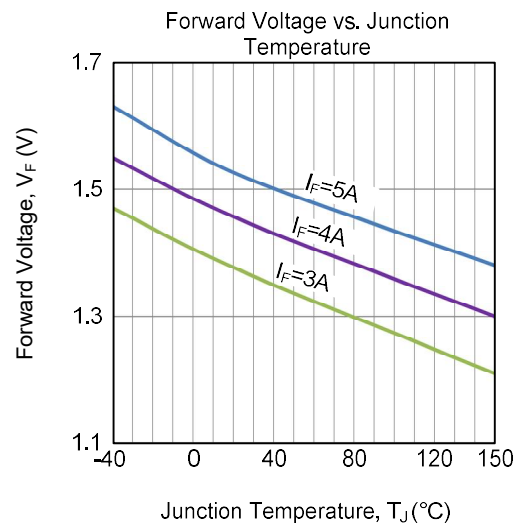
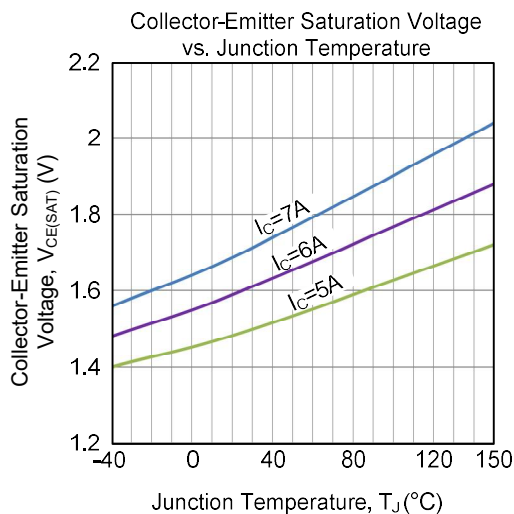
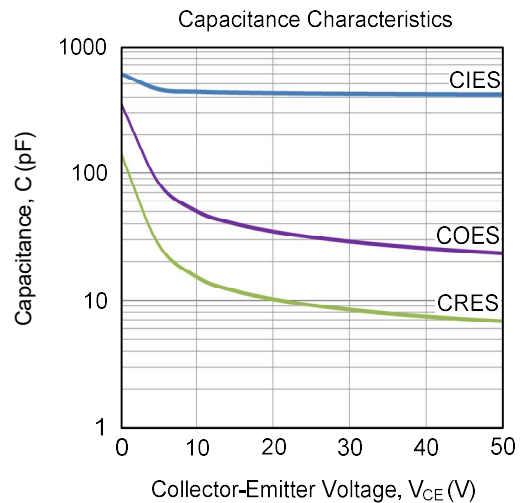
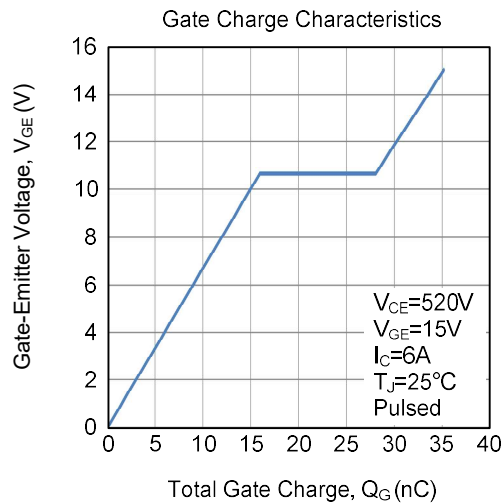
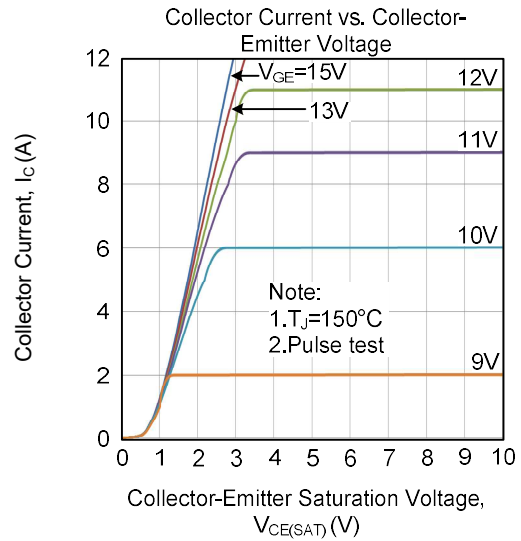
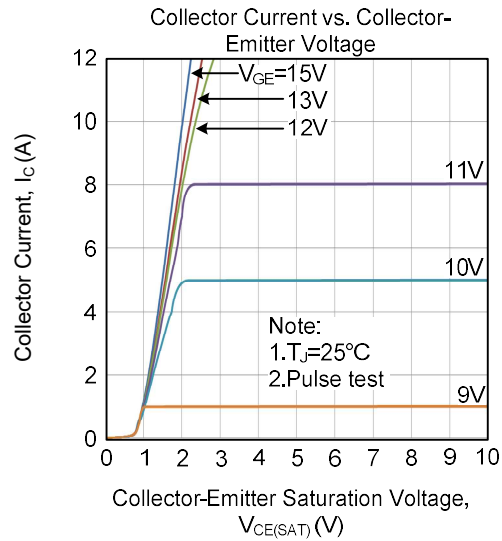
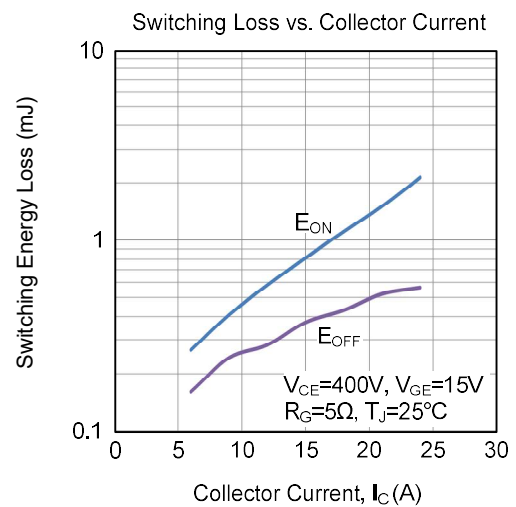
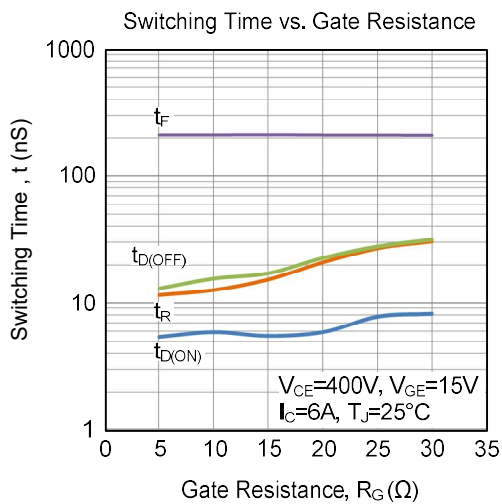
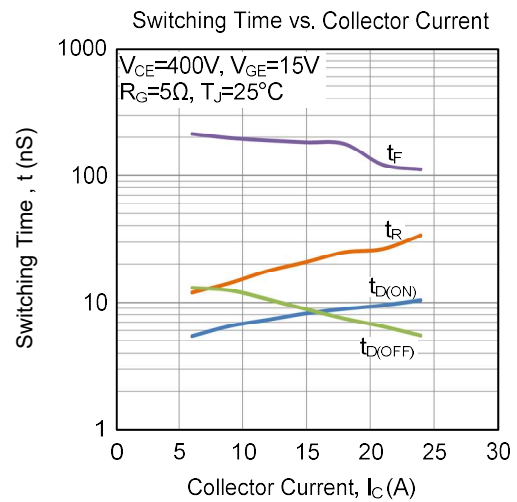
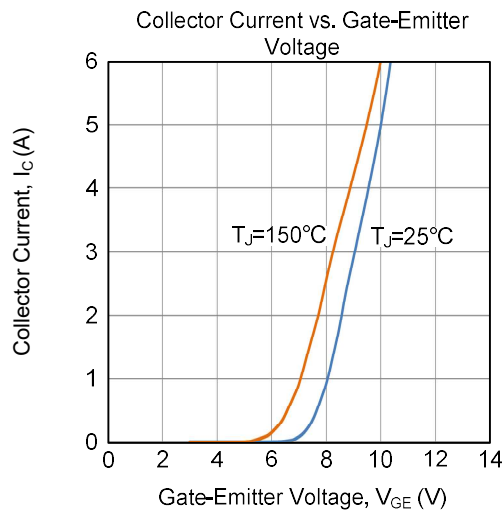
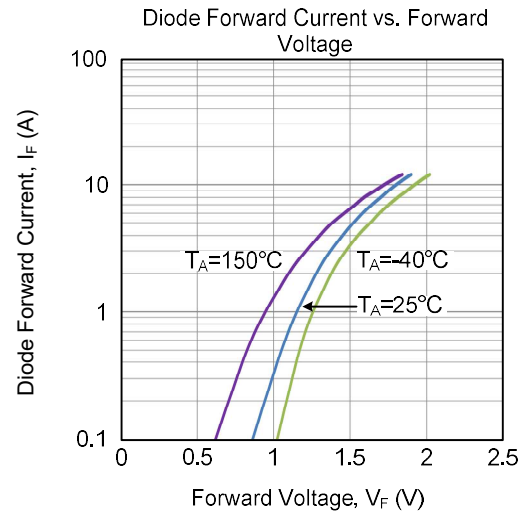
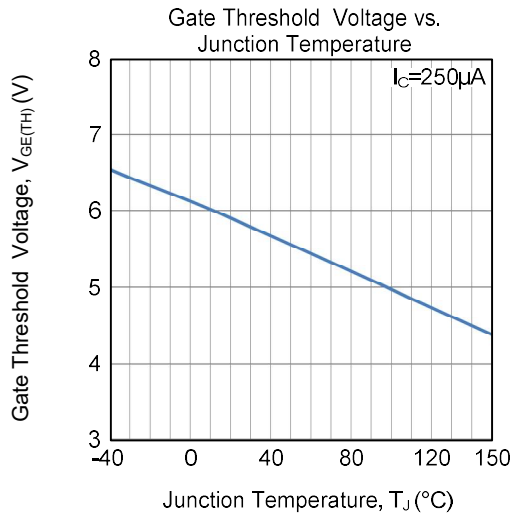


Fig 2. SWITCHING TEST WAVEFORMS

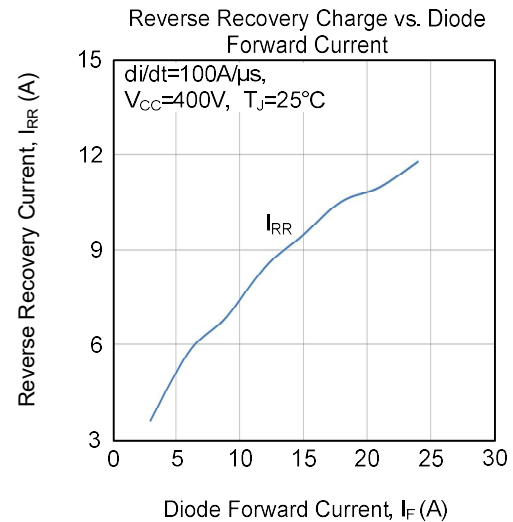
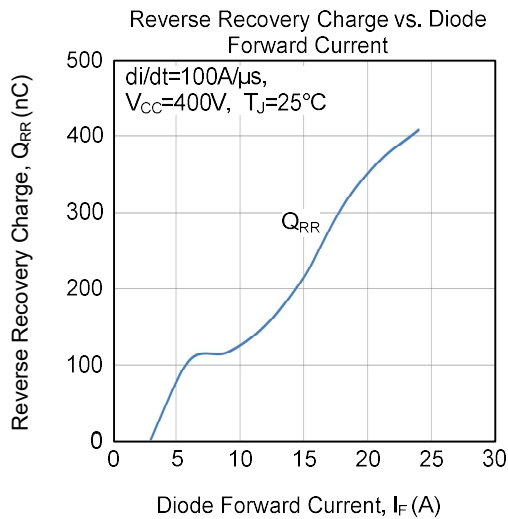
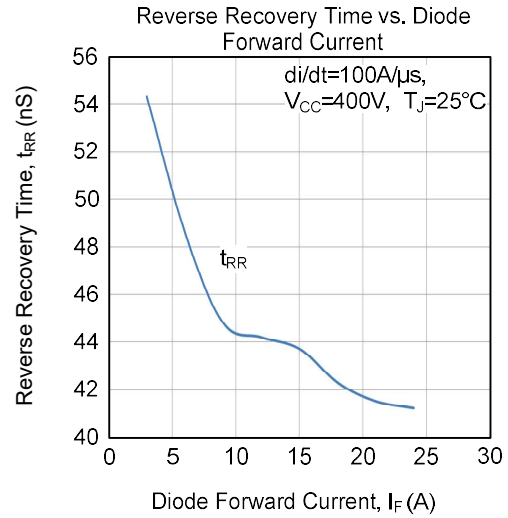
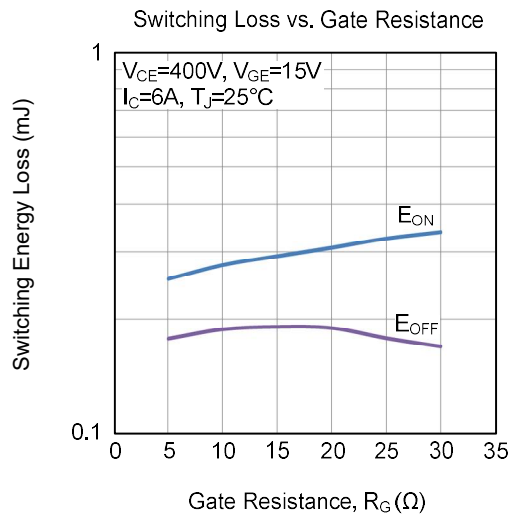
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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