



UTG25N135LNS1

Insulated Gate Bipolar Transistor

1350V TRENCH GATE FIELD-STOP IGBT

■ DESCRIPTION

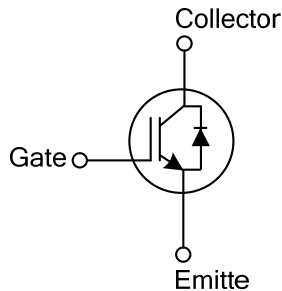
The UTC **UTG25N135LNS1** is an Trench Field-Stop Insulated Gate Bipolar Transistor. it uses UTC's advanced technology to provide customers with high switching speed, low saturation voltage and low switching loss, etc.

The UTC **UTG25N135LNS1** is suitable for the resonant or soft switching applications.

■ FEATURES

- * High switching speed
- * High avalanche ruggedness
- * Low saturation voltage: $V_{CE(sat)}$, typ = 2.1V @ $I_C=25A$, $V_{GE}=15V$ ($T_C=25^\circ C$)

■ SYMBOL

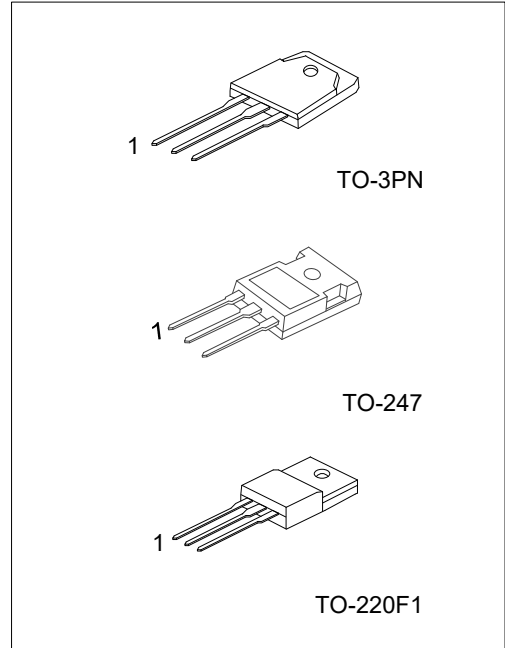


■ ORDERING INFORMATION

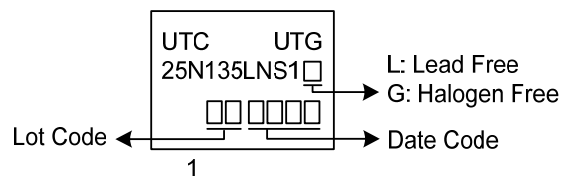
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTG25N135LNS1L-TF1-T	UTG25N135LNS1G-TF1-T	TO-220F1	G	C	E	Tube
UTG25N135LNS1L-T3N-T	UTG25N135LNS1G-T3N-T	TO-3PN	G	C	E	Tube
UTG25N135LNS1L-T47-T	UTG25N135LNS1G-T47-T	TO-247	G	C	E	Tube

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

UTG25N135LNS1G-TF1-T	(1)Packing Type	(1) T: Tube
	(2)Package Type	(2) TF1: TO-220F1, T3N: TO-3PN, T47: TO-247
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free



■ MARKING



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		V_{CES}	1350	V
Gate-Emitter Voltage		V_{GES}	± 20	V
Continuous Collector Current	$T_C=25^{\circ}\text{C}$	I_C	50	A
	$T_C=100^{\circ}\text{C}$		25	A
Collector Current Pulsed (Note 3)		I_{CM}	120	A
Diode Forward Current	$T_C=25^{\circ}\text{C}$	I_F	50	A
	$T_C=100^{\circ}\text{C}$		25	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	TO-220F1	P_D	35	W
	TO-3PN		260	W
	TO-247		250	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.

3. During production, high current switching capability is 100% verified with the inductive load single-pulse switching test. ($I_C=120\text{A}$)

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Case	TO-220F1	θ_{JC}	3.57	$^{\circ}\text{C/W}$
	TO-3PN		0.48	$^{\circ}\text{C/W}$
	TO-247		0.5	$^{\circ}\text{C/W}$

■ 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}		1350			V
Collector Cut-Off Current	I _{CES}	V _{CE} =V _{CES} , V _{GE} =0V			5	μA
G-E Leakage Current	I _{GES}	V _{GE} =V _{GES} , V _{CE} = 0V			±100	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 =25A, V _{GE} =15V		2.1	2.6	V
		I _C =25A, V _{GE} =15V, T _C =125°C		2.6		V
Dynamic Characteristics						
Input Capacitance	C _{IES}	V _{CE} =25V, V _{GE} =0V, f=1MHz		1620		pF
Output Capacitance	C _{OES}			86		pF
Reverse Transfer Capacitance	C _{RES}			44		pF
Switching Characteristics						
Total Gate Charge	Q _G	V _{CE} =600V, I _C =25A, V _{GE} =15V		109		nC
Gate-Emitter Charge	Q _{GE}			18		nC
Gate-Collector Charge	Q _{GC}			61.2		nC
Turn-On Delay Time	t _{DON})	V _{CC} =600V, I _C =25A, R _G =5Ω, V _{GE} =0~15V, L=500uH		13		ns
Rise Time	t _{tr}			33		ns
Turn-Off Delay Time	t _{DOFF})			99.8		ns
Fall Time	t _f			196		ns
Turn-On Switching Loss	E _{ON}			2.04		mJ
Turn-Off Switching Loss	E _{OFF}			1.41		mJ
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Forward Voltage Drop	V _{FM}	I _F =25A			3.5	V
Reverse Recovery Time	t _{rr}	I _F =25A, dI/dt=100A/μS		50.2		ns
Reverse Recovery Charge	Q _{rr}			1.29		μC

■ TEST CIRCUIT AND WAVEFORMS

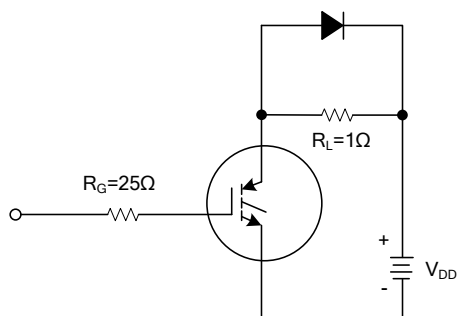


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

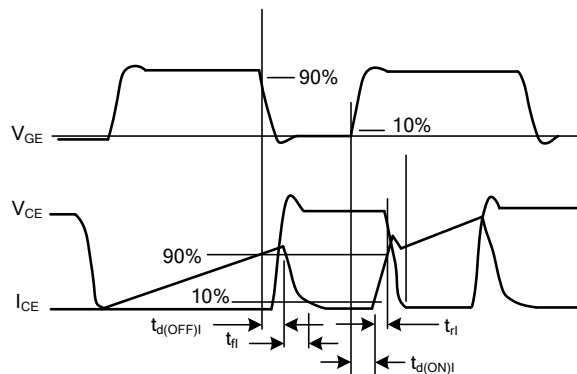
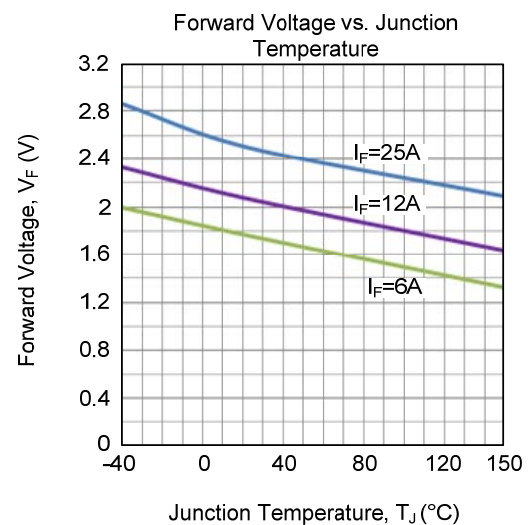
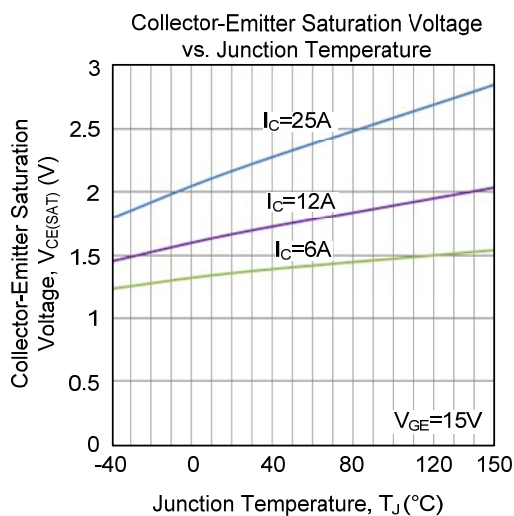
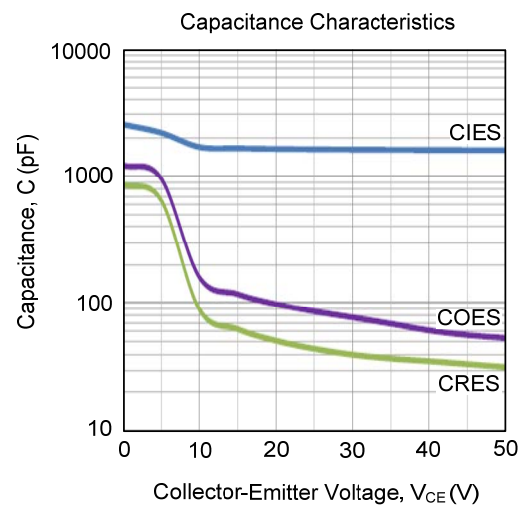
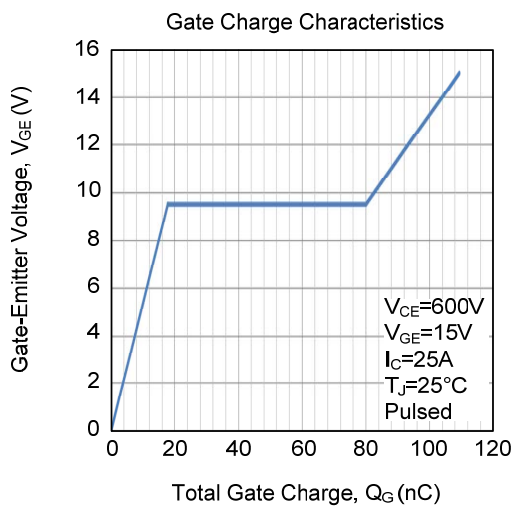
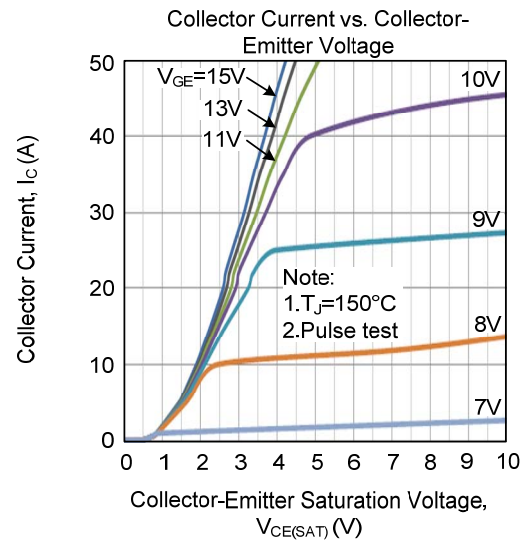
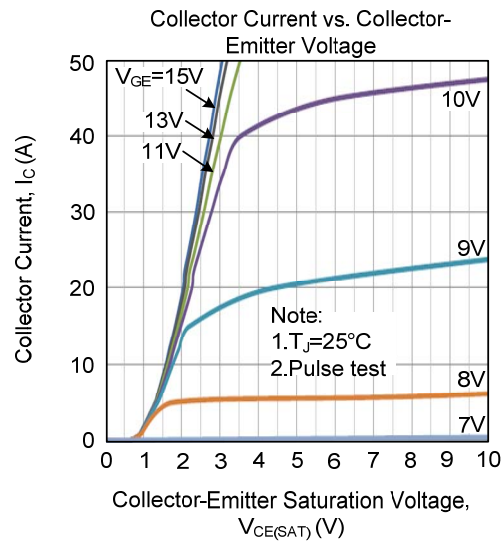
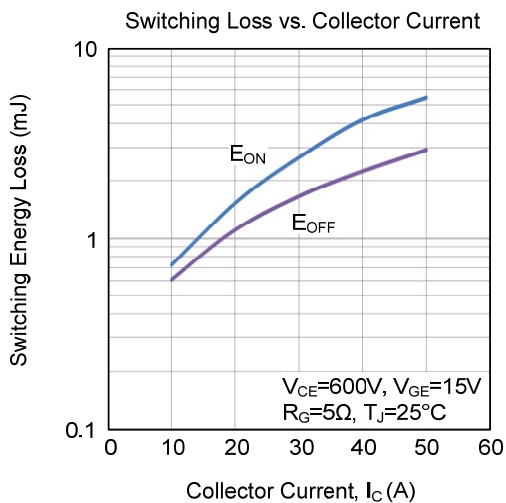
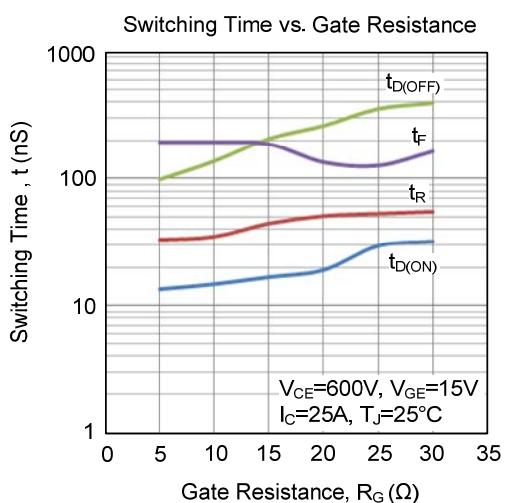
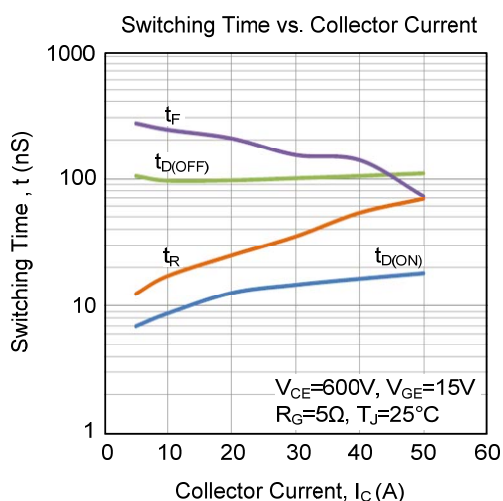
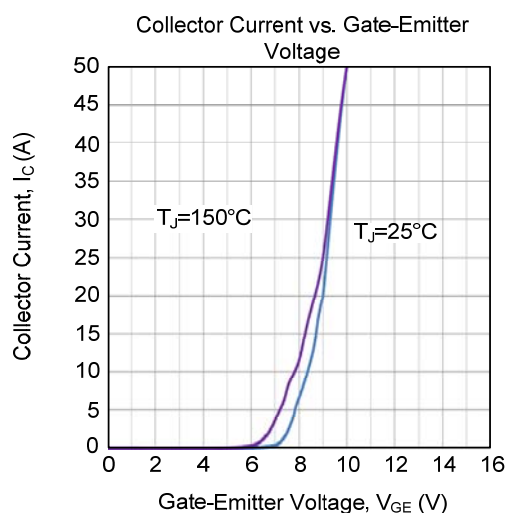
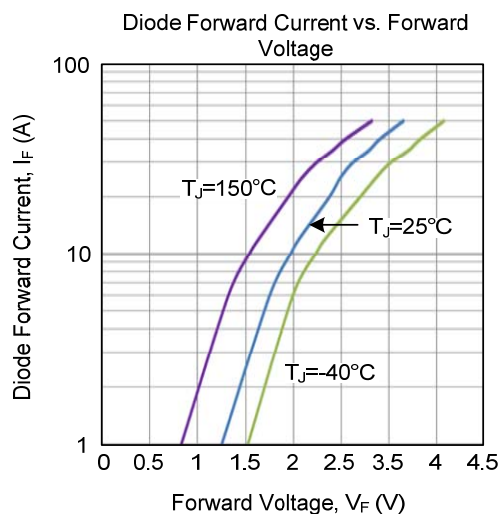
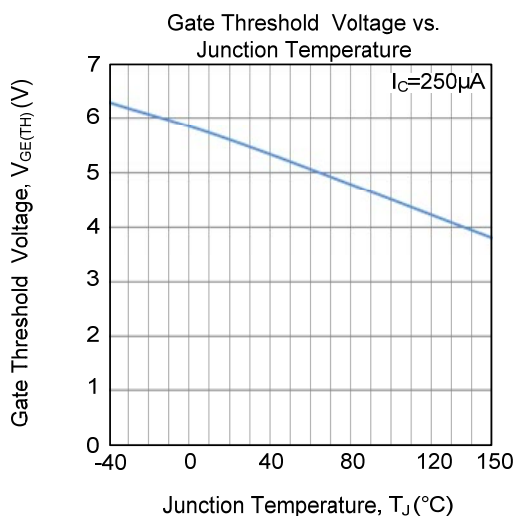


Fig 2. SWITCHING TEST WAVEFORMS

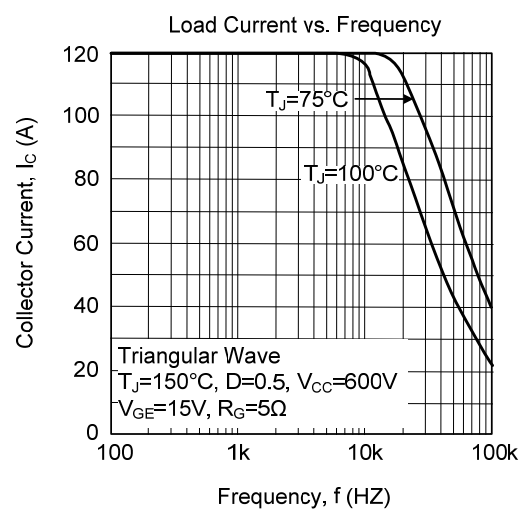
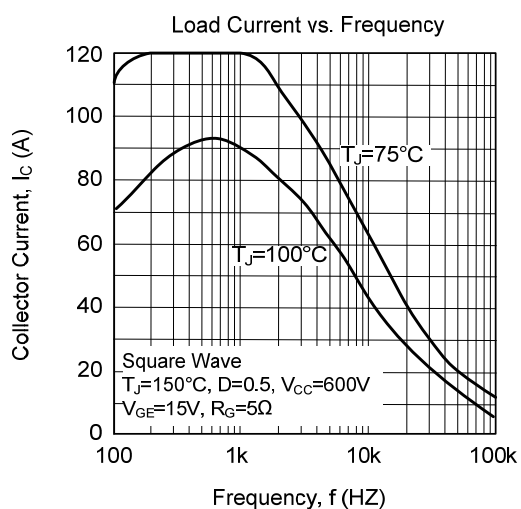
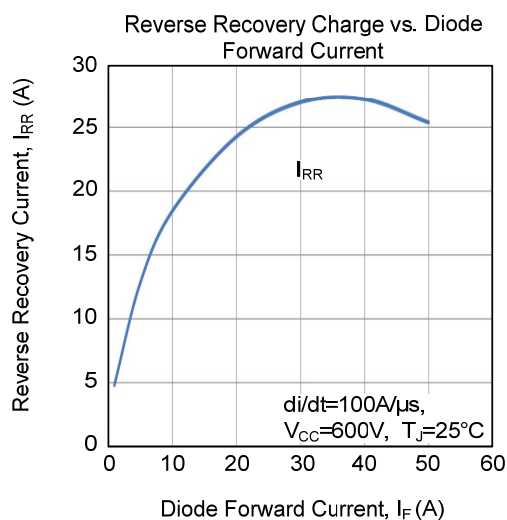
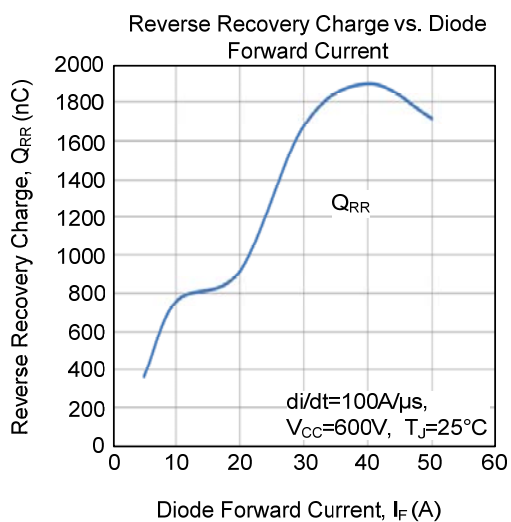
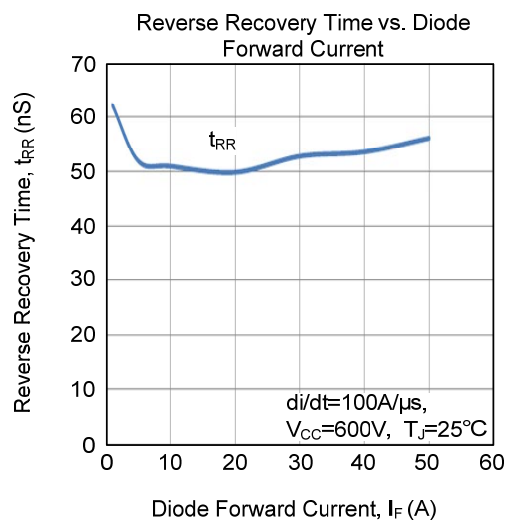
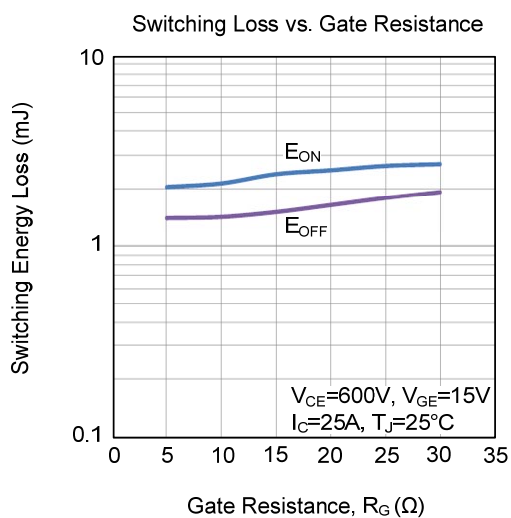
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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