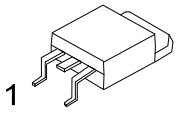
UGV3545 **Preliminary** ***Insulated Gate Bipolar Transistor***

200mJ, 450V N-CHANNEL IGNITION IGBT



TO-252

■ DESCRIPTION

The UTC **UGV3545** is an N-channel ignition Insulated Gate Bipolar Transistor. It uses UTC's advanced technology to provide customers with outstanding SCIS capability, for

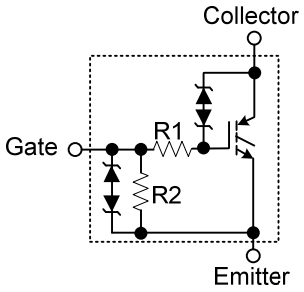
suitable for Coil –On plug applications and Automotive Ignition Coil driver circuits, etc.

UTC **UGV3545** show very low on-state voltage and very high SCIS energy capability over a wide operating temperature range. Moreover, ESD-protected logic level gate input and an integrated gate resistor means no external protection circuitry is required.

■ FEATURES

* ESD gate-emitter protection
* Gate-collector high voltage clamping
* Logic level gate drive
* Very low saturation voltage
* High pulsed current capability
* Gate and gate-emitter resistor

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UGV3545L-TN3-R	UGV3545G-TN3-R	TO-252	G	C	E	Tape Reel

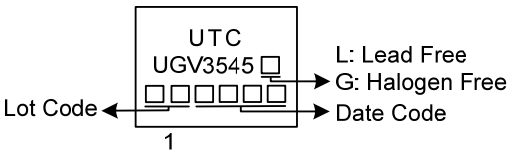
Note: Pin Assignment: G: Gate C: Collector E: Emitter

UGV3545G-TN3-R

(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) TN3: TO-252
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Collector to Emitter Breakdown Voltage		BV_{CER}	450	V
Emitter to Collector Voltage Reverse Battery Condition		BV_{ECS}	30	V
At Starting	T_J=25°C, I_{SCIS}=11.6A, L=3.0mHy	E_{SCIS}	200	mJ
	T_J= 150°C, I_{SCIS}=8.8A, L=3.0mHy		116	mJ
Continuous Collector Current	T_C=25°C	I_C	35	A
	T_C=110°C		21	A
Gate to Emitter Voltage Continuous		V_{GEM}	±10	V
Power Dissipation Total at T_C=25°C		P_D	125	W
Power Dissipation Derating T_C>25°C			1	W/°C
Electrostatic Discharge Voltage at 100pF, 1500Ω		ESD	4	kV
Junction Temperature		T_J	-40 ~ +175	°C
Storage Temperature Range		T_{STG}	-40 ~ +175	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

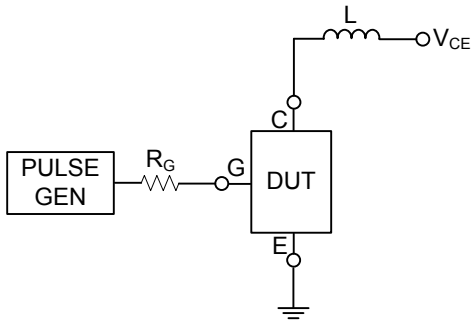
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case	θ_{JC}	1.0	°C/W

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

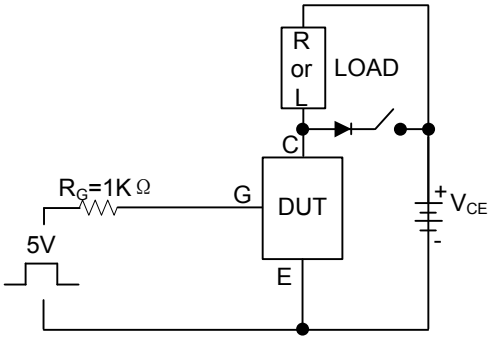
PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Off State Characteristics							
Collector to Emitter Breakdown Voltage	BV_{CER}	I_C=2mA, V_{GE}=0V, R_G=1KΩ, T_J=-40~150°C		400	450	500	V
Collector to Emitter to Breakdown Voltage	BV_{CES}	I_C=10mA, V_{GE}=0V, R_G=0, T_J=-40~150°C		400	450	500	V
Emitter to Collector Breakdown Voltage	BV_{ECS}	I_C=-75mA, V_{GE}=0V, T_C=25°C		30			V
Gate to Emitter Breakdown Voltage	BV_{GES}	I_{GES}=±2mA		±12	±14		V
Collector to Emitter Leakage Current	I_{CER}	V_{CER}=350V, R_G=1KΩ	T_C=25°C			25	μA
			T_C=150°C			1	mA
Emitter to Collector Leakage Current	I_{ECS}	V_{EC}=24V	T_C=25°C			1	mA
			T_C=150°C			40	mA
Series Gate Resistance	R_1				70		Ω
Gate to Emitter Resistance	R_2			10		26	KΩ
On State Characteristics							
Collector to Emitter Saturation Voltage	$V_{CE(SAT)}$	I_C=6A, V_{GE}=4V	T_C=25°C		1.0	1.3	V
		I_C=10A, V_{GE}=4.5V	T_C=150°C		1.2	1.55	V
		I_C=15A, V_{GE}=4.5V	T_C=150°C		1.5	1.9	V
Dynamic Characteristics							
Gate Charge	$Q_{G(ON)}$	I_C=10A, V_{CE}=12V, V_{GE}=5V			14.7		nC
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	I_C=1.0mA, V_{CE}=V_{GE}		1.3		2.2	V
Gate to Emitter Plateau Voltage	V_{GEP}	I_C=10A, V_{CE}=12V			2.6		V
Switching Characteristics							
Current Turn-On Delay Time-Resistive	$t_{d(ON)R}$	V_{CE}=300V, V_{GE}=10V, I_C=10A, L=500μH, R_G=10Ω			16		ns
Current Rise Time-Resistive	t_{rR}				17		ns
Current Turn-Off Delay Time-Inductive	$t_{d(OFF)L}$				0.97		μs
Current Fall Time Inductive	t_{fL}				4.26		μs
Self Clamped Inductive Switching	SCIS	T_J= 25°C, L=3.0mHy, R_G=1KΩ, V_{GE}=5V				200	mJ

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

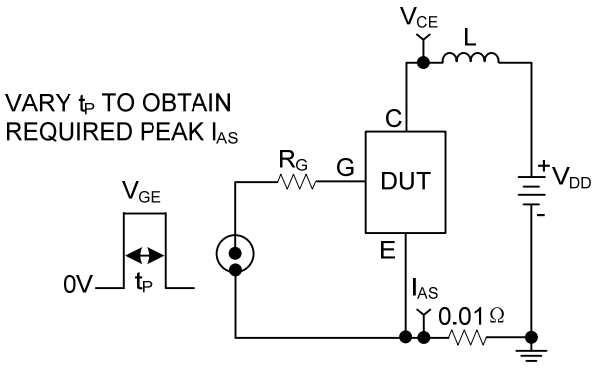
■ TEST CIRCUIT AND WAVEFORMS



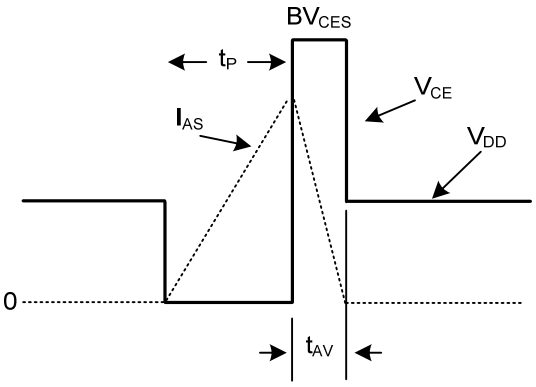
Inductive Switching Test Circuit



t_{ON} and t_{OFF} Switching Test Circuit



Energy Test Circuit



Energy Waveforms