UNISONIC TECHNOLOGIES CO., LTD

UGV3040

Insulated Gate Bipolar Transistor

300mJ, 400V N-CHANNEL IGNITION IGBT

■ DESCRIPTION

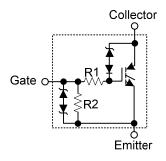
The UTC **UGV3040** is an N-channel ignition Insulated Gate Bipolar Transistor. It uses UTC's advanced technology to provide customers with outstanding SCIS capability.

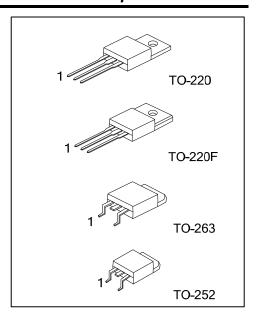
The UTC **UGV3040** is suitable for Coil –On plug applications and Automotive Ignition Coil driver circuits, etc.

■ FEATURES

- * Outstanding SCIS capability
- * Logic level gate drive

■ SYMBOL

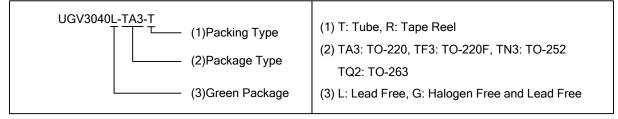




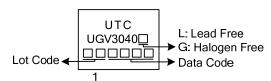
■ ORDERING INFORMATION

Ordering Number		Package	Pin	Assignn	Packing	
Lead Free	Halogen Free	Fackage	1	2	3	Facking
UGV3040L-TA3-T	UGV3040G-TA3-T	TO-220	G	C	Е	Tube
UGV3040L-TF3-T	UGV3040G-TF3-T	TO-220F	G	C	Е	Tube
UGV3040L-TN3-R	UGV3040G-TN3-R	TO-252	G	C	Е	Tape Reel
UGV3040L-TQ2-T	UGV3040G-TQ2-T	TO-263	G	C	Е	Tube
UGV3040L-TQ2-R	UGV3040G-TQ2-R	TO-263	G	С	Е	Tape Reel

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



■ MARKING



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■ 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 Otantina	T _J =25°C, I _{SCIS} =14.2A, L=3.0mHy		_	300	mJ	
At Starting	T _J = 150°C, I	_{SCIS} =10.6A, L=3.0mHy	E _{SCIS}	300 m 170 m 21 // 17 ±10 125 41.6 125	mJ	
Cantinuous Callester Current	T _C =25°C T _C =110°C			21	Α	
Continuous Collector Current Gate to Emitter Voltage Conti			Ic	17	Α	
Gate to Emitter Voltage Continuous			V_{GEM}	±10	V	
		TO-220/TO-263		125		
Power Dissipation Total at T _C =25°C		TO-220F		41.6	W	
		TO-252	D	170 n 21		
		TO-220/TO-263	P _D 1			
Power Dissipation Derating T _C >25°C		TO-220F		0.332	W/°C	
		TO-252		1		
Electrostatic Discharge Voltage at 100pF, 1500Ω			ESD	4	kV	
Junction Temperature			TJ	-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 CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT	
Junction to Case		TO-220/TO-252 TO-263	θ_{JC}	1.0	°C/W
		TO-220F		3.0	

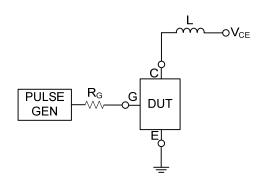
■ **ELECTRICAL CHARACTERISTICS** (T_A=25°C, unless otherwise specified)

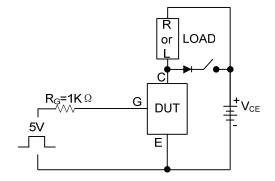
PARAMETER	SYMBOL	TEST COND	MIN	TYP	MAX	UNIT		
Off State Characteristics				_	_			
Collector to Emitter Breakdown Voltage	BV _{CER}	I_C =2mA, V_{GE} =0V, R_G =1K Ω , T_J =-40~150°C		350	400	450	V	
Collector to Emitter to Breakdown Voltage	BV _{CES}	I _C =10mA, V _{GE} =0V, R _G =0, T _J =-40~150°C		400	450	500	>	
Emitter to Collector Breakdown Voltage	BV _{ECS}	I _C =-75mA, V _{GE} =0V, T _C =25°C		30			٧	
Gate to Emitter Breakdown Voltage	BV _{GES}	I _{GES} =±2mA		±12	±14		٧	
Collector to Emitter Leakage Current	I _{CER}	V _{CER} =250V,	T _C =25°C			25	μΑ	
Collector to Emitter Leakage Current		$R_G=1K\Omega$	T _C =150°C			1	mΑ	
Emitter to Collector Leakage Current		IV=c=24V	T _C =25°C			1	mΑ	
Emitter to Collector Leakage Current	I _{ECS}		T _C =150°C			40	mΑ	
Series Gate Resistance	R ₁				70		Ω	
Gate to Emitter Resistance	R_2			10K		26K	Ω	
On State Characteristics								
		I _C =6A, V _{GE} =4V	T _C =25°C		1.25	1.60	V	
Collector to Emitter Saturation Voltage	$V_{CE(SAT)}$	I _C =10A, V _{GE} =4.5V	T _C =150°C		1.40	1.80	V	
		I _C =15A, V _{GE} =4.5V	T _C =150°C		1.90	2.20	V	
Dynamic Characteristics								
Gate Charge	$Q_{G(ON)}$	I _C =10A, V _{CE} =12V, V _{GE} =5V			17		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			3.0		V	
Switching Characteristics								
Current Turn-On Delay Time-Resistive	t _{d(ON)R}				0.48	4	μs	
Current Rise Time-Resistive	t_{rR}	$V_{CE} = 14V, R_{L} = 1\Omega, V_{GE} = 5V,$ $V_{CF} = 14V, T_{J} = 25^{\circ}C$			2.1	7	μs	
Current Turn-Off Delay Time-Inductive	t _{d(OFF)L}				1.4	15	μs	
Current Fall Time Inductive	t _{fL}				2.2	15	μs	
Self Clamped Inductive Switching	SCIS	T_J = 25°C, L=3.0mHy, R_G =1K Ω , V_{GE} =5V				300	mJ	

Notes: 1. Pulse Test: Pulse width ≤ 300µs, Duty cycle ≤ 2%

^{2.} Essentially independent of operating temperature

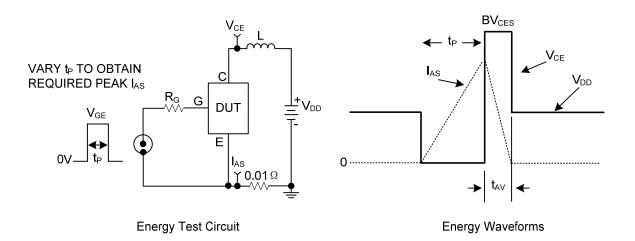
■ TEST CIRCUIT AND WAVEFORMS





Inductive Switching Test Circuit

ton and toff Switching Test Circuit



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