

**ISL9V3040D3S**

Preliminary

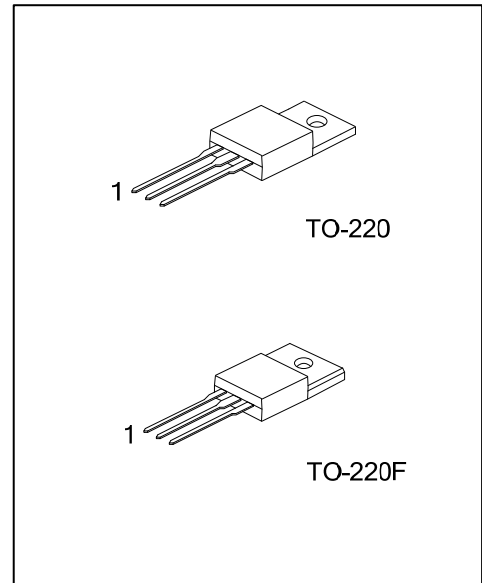
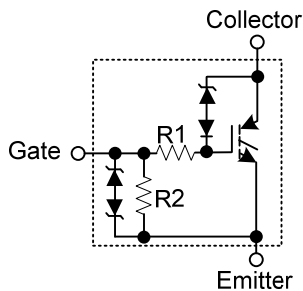
*Insulated Gate Bipolar Transistor***300mJ, 400V, N-CHANNEL
IGNITION IGBT****DESCRIPTION**

The UTC **ISL9V3040D3S** is an N-channel ignition Insulated Gate Bipolar Transistor. It uses UTC's advanced technology to provide customers with outstanding SCIS capability.

The UTC **ISL9V3040D3S** 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 Assignment			Packing
Lead Free	Halogen Free		1	2	3	
ISL9V3040D3SL-TA3-T	ISL9V3040D3SG-TA3-T	TO-220	G	C	E	Tube
ISL9V3040D3SL-TF3-T	ISL9V3040D3SG-TF3-T	TO-220F	G	C	E	Tube

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

ISL9V3040D3SL-TA3-T	(1)Packing Type	(1) T: Tube
	(2)Package Type	(2) TA3: TO-220, TF3: TO-220F
	(3)Lead Free	(3) L: Lead Free, G: Halogen Free

MARKING INFORMATION

PACKAGE	MARKING
TO-220 TO-220F	UTC 9V3040D3S Lot Code Data Code L: Lead Free G: Halogen Free

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

PARAMETER		SYMBOL	RATINGS	UNIT
Collector to Emitter Breakdown Voltage		BV_{CER}	510	V
Emitter to Collector Voltage Reverse Battery Condition		BV_{ECS}	30	V
At Starting	$T_J=25^{\circ}\text{C}$, $I_{\text{SCIS}}=14.2\text{A}$, $L=3.0\text{mHy}$	E_{SCIS}	300	mJ
	$T_J=150^{\circ}\text{C}$, $I_{\text{SCIS}}=10.6\text{A}$, $L=3.0\text{mHy}$		170	mJ
Continuous Collector Current	$T_C=25^{\circ}\text{C}$	I_C	21	A
	$T_C=110^{\circ}\text{C}$		17	A
Gate to Emitter Voltage Continuous		V_{GEM}	± 10	V
Power Dissipation Total at $T_C=25^{\circ}\text{C}$	TO-220	P_D	125	W
	TO-220F		41.6	
Power Dissipation Derating $T_C>25^{\circ}\text{C}$	TO-220		1	$\text{W}/^{\circ}\text{C}$
	TO-220F		0.332	
Electrostatic Discharge Voltage at 100pF, 1500 Ω		ESD	4	kV
Junction Temperature		T_J	$-40\sim 175$	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	$-40\sim 175$	$^{\circ}\text{C}$

Note: 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.

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Case	TO-220	θ_{JC}	1.0	$^{\circ}\text{C}/\text{W}$
	TO-220F		3.0	

■ ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

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		310		510	V
Collector to Emitter to Breakdown Voltage	BV _{CES}	I _C =10mA, V _{GE} =0V, R _G =0, T _J =-40~150°C		340		560	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} =250V, 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			10K		26K	Ω
On State Characteristics							
Collector to Emitter Saturation Voltage	V _{CE(SAT)}	I _C =6A, V _{GE} =4V	T _C =25°C		1.25	1.60	V
		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 =10mA, V _{CE} =12V			3.0		V
Switching Characteristics							
Current Turn-On Delay Time-Resistive	t _{d(ON)R}	V _{CE} =14V, R _L =1Ω, V _{GE} =5V, R _G =1KΩ, T _J =25°C			0.48	4	μs
Current Rise Time-Resistive	t _{rR}				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 =1KΩ,				300	mJ

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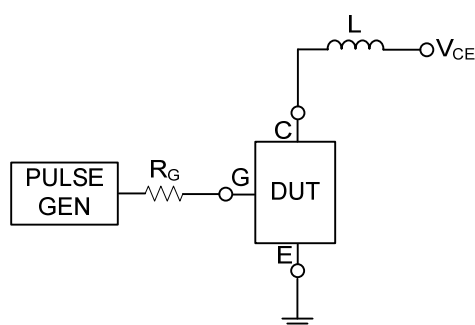
Preliminary

Insulated Gate Bipolar Transistor

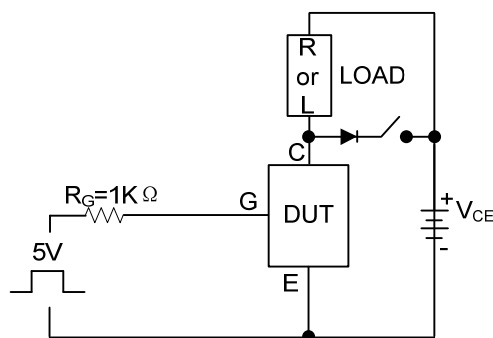
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
		$V_{GE}=5V$				



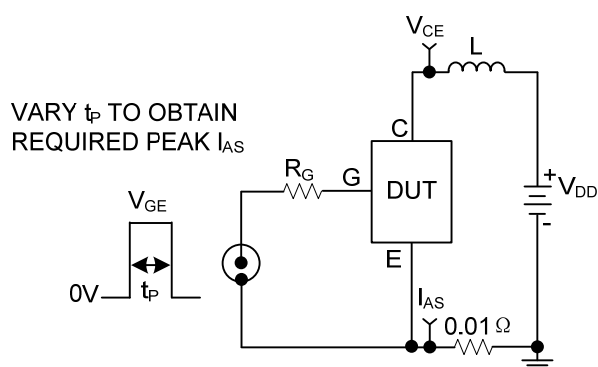
■ TEST CIRCUIT AND WAVEFORMS



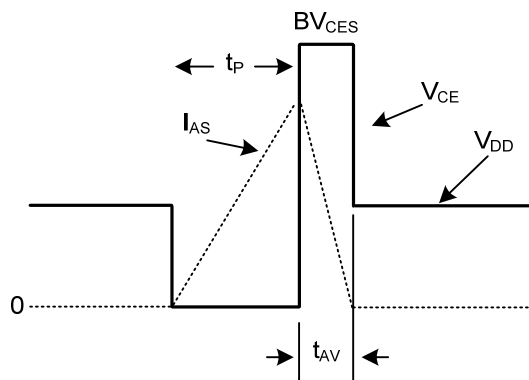
Inductive Switching Test Circuit



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



Energy Test Circuit



Energy Waveforms

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