



# BU941

## NPN SILICON TRANSISTOR

### NPN POWER DARLINGTON HIGH VOLTAGE IGNITION COIL DRIVER

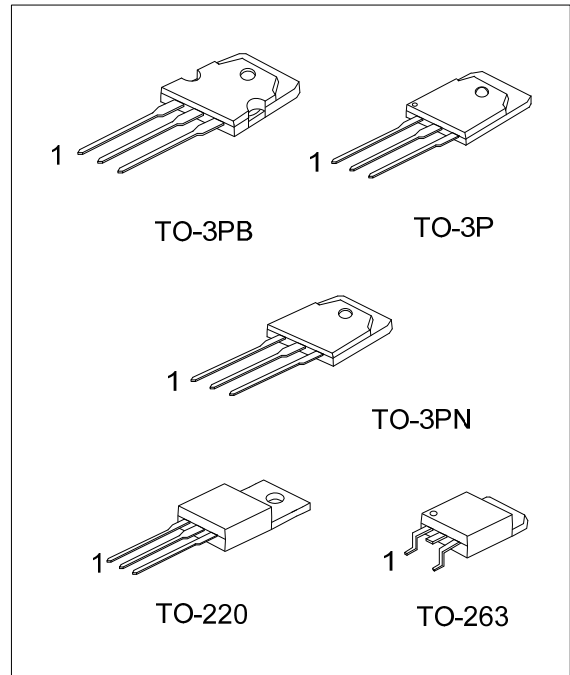
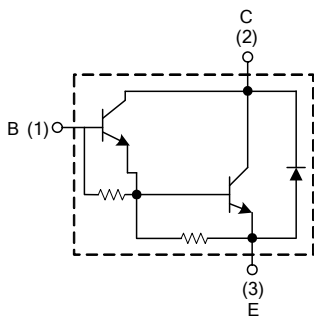
■ FEATURES

- \* NPN Darlington
- \* Integrated antiparallel collector-emitter diode

■ APPLICATIONS

- \* High ruggedness electric ignitions

■ INTERNAL SCHEMATIC DIAGRAM



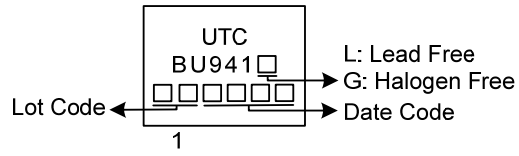
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
BU941L-TA3-T	BU941G-TA3-T	TO-220	B	C	E	Tube
BU941L-TQ2-T	BU941G-TQ2-T	TO-263	B	C	E	Tube
BU941L-TQ2-R	BU941G-TQ2-R	TO-263	B	C	E	Tape Reel
BU941L-T3B-T	BU941G-T3B-T	TO-3PB	B	C	E	Tube
BU941L-T3N-T	BU941G-T3N-T	TO-3PN	B	C	E	Tube
BU941L-T3P-T	BU941G-T3P-T	TO-3P	B	C	E	Tube

Note: Pin Assignment: B: Base C: Collector E: Emitter

<p>BU941G-TA3-T</p>	<p>(1) T: Tube, R: Tape Reel                  (2) TA3: TO-220, TQ2: TO-263, T3B: TO-3PB,                  T3N: TO-3PN, T3P: TO-3P                  (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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## MARKING



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		$V_{CES}$	500	V
Collector-Emitter Voltage		$V_{CEO}$	400	V
Emitter-Base Voltage		$V_{EBO}$	5	V
Collector Current		$I_C$	15	A
Collector Peak Current		$I_{CM}$	30	A
Base Current		$I_B$	1	A
Base Peak Current		$I_{BM}$	5	W
Total Power Dissipation ( $T_C=25^\circ\text{C}$ )	TO-220/TO-263	$P_D$	150	W
	TO-3PB/TO-3PN		155	W
	TO-3P			
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-65 ~ +150	$^\circ\text{C}$

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 Ambient	TO-220/TO-263	$\theta_{JA}$	62.5	$^\circ\text{C/W}$
	TO-3PB/TO-3PN		30	$^\circ\text{C/W}$
	TO-3P			
Junction to Case	TO-220/TO-263	$\theta_{JC}$	0.83	$^\circ\text{C/W}$
	TO-3PB/TO-3PN		0.8	$^\circ\text{C/W}$
	TO-3P			

### ■ ELECTRICAL CHARACTERISTICS ( $T_C=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Emitter Sustaining Voltage (Note)	$V_{CEO(SUS)}$	$I_C=1\text{mA}$ , $V_{CLAMP}=400\text{V}$ , $L=10\text{mH}$ (see Fig. 1)	400			V
Collector Cut-Off Current	$I_{CES}$	$V_{CE}=500\text{V}$ , $V_{BE}=0$ $V_{CE}=500\text{V}$ , $V_{BE}=0$ , $T_J=125^\circ\text{C}$			100 0.5	$\mu\text{A}$ mA
Collector Cut-Off Current	$I_{CEO}$	$V_{CE}=450\text{V}$ , $I_B=0$ $V_{CE}=450\text{V}$ , $I_B=0$ , $T_J=125^\circ\text{C}$			100 0.5	$\mu\text{A}$ mA
Emitter Cut-off Current	$I_{EBO}$	$V_{EB}=5\text{V}$ , $I_C=0$			20	mA
Collector-Emitter Saturation Voltage (Note)	$V_{CE(SAT)}$	$I_C=8\text{A}$ , $I_B=100\text{mA}$ $I_C=10\text{A}$ , $I_B=250\text{mA}$ $I_C=12\text{A}$ , $I_B=300\text{mA}$			1.6 1.8 2	V
Base-Emitter Saturation Voltage (Note)	$V_{BE(SAT)}$	$I_C=8\text{A}$ , $I_B=100\text{mA}$ $I_C=10\text{A}$ , $I_B=250\text{mA}$ $I_C=12\text{A}$ , $I_B=300\text{mA}$			2.2 2.5 2.7	V
DC Current Gain (Note)	$h_{FE}$	$V_{CE}=10\text{V}$ , $I_C=5\text{A}$	300			
Diode Forward Voltage	$V_F$	$I_F=10\text{A}$			2.5	V
Functional Test		$V_{CC}=24\text{V}$ , $V_{CLAMP}=400\text{V}$ , $L=7\text{mH}$ (see Functional Test Circuit)	10			A
Fall Time	$t_F$	$V_{CC}=12\text{V}$ , $V_{CLAMP}=300\text{V}$ , $V_{BE}=0$ , $R_{BE}=47\Omega$ , $L=7\text{mH}$ , $I_C=7\text{A}$ , $I_B=70\text{mA}$ (see Fig.2)		0.5		$\mu\text{s}$
Storage Time	$t_s$			15		$\mu\text{s}$

Note: Pulsed: Pulse duration=300 $\mu\text{s}$ , duty cycle 1.5%

## ■ ELECTRICAL CHARACTERISTICS (Cont.)

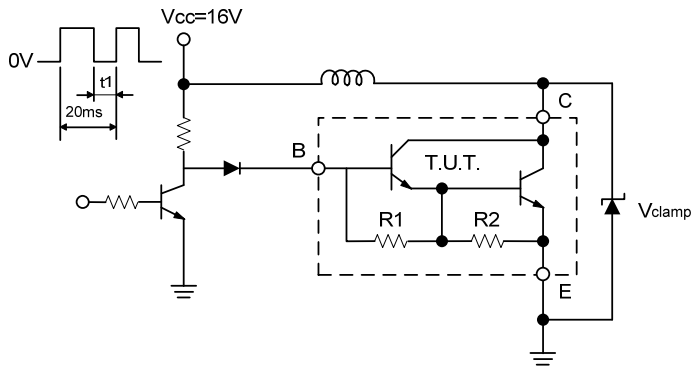


Fig. 1 Sustaining Voltage Test Circuit

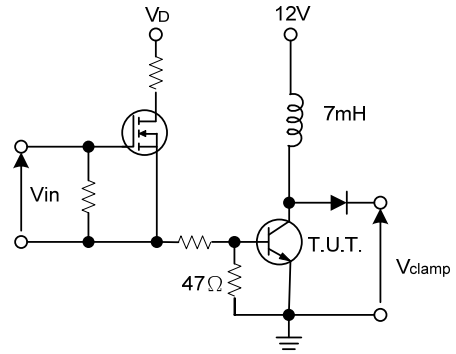
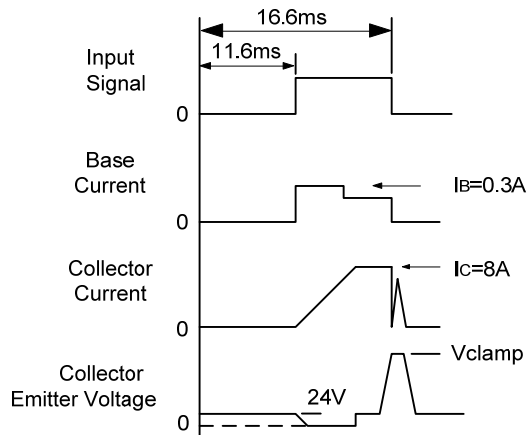
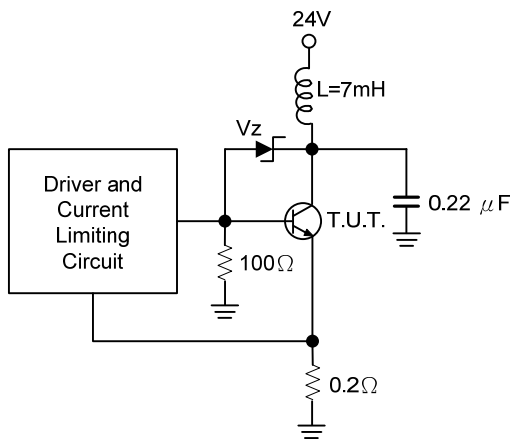
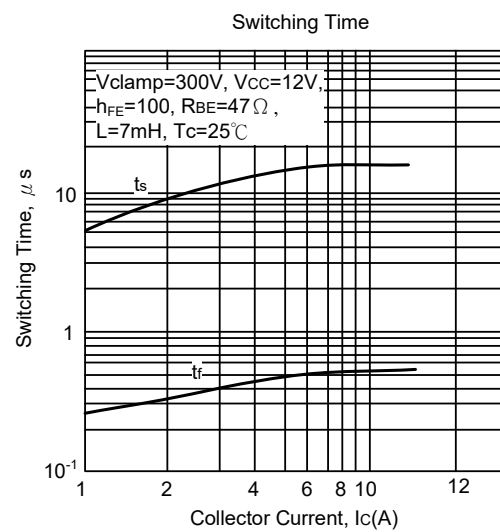
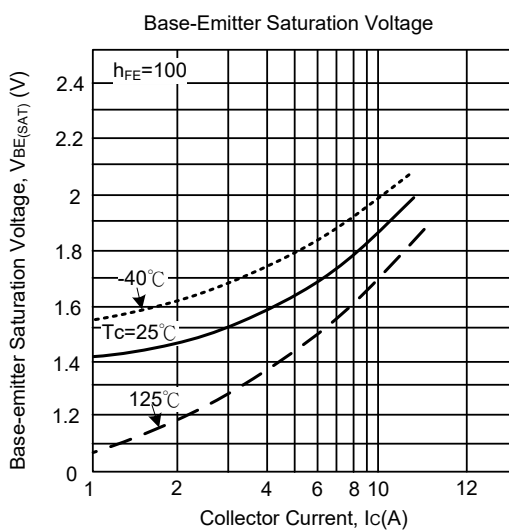
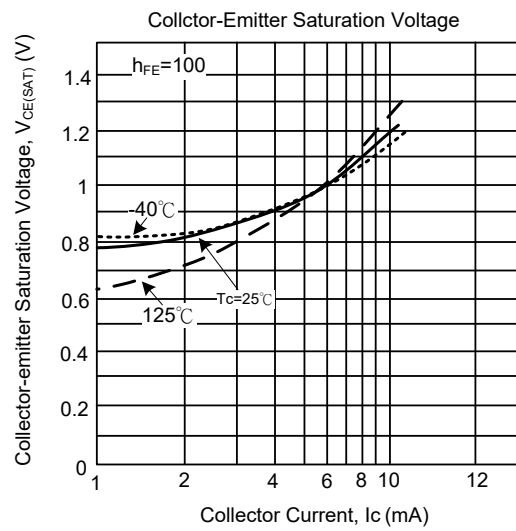
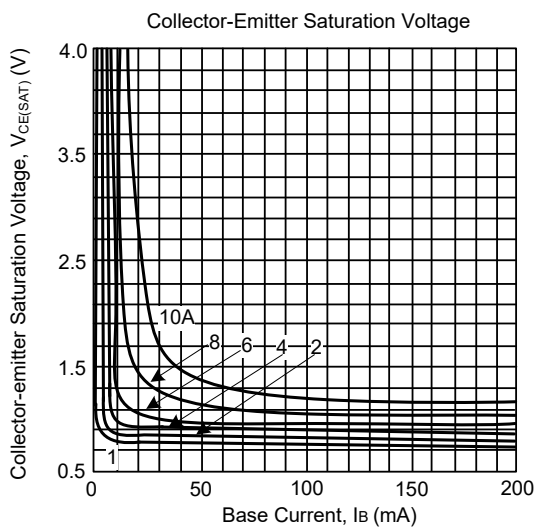
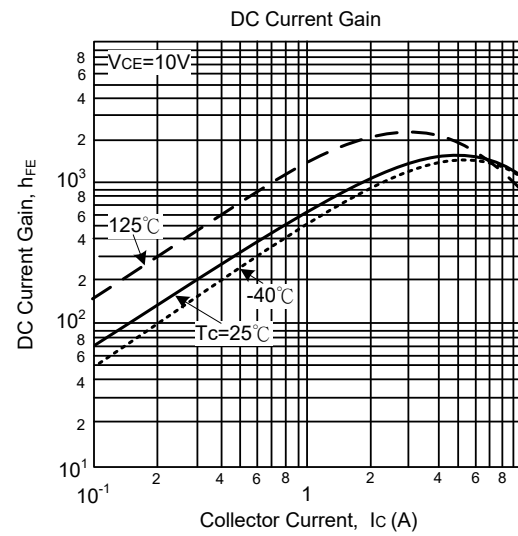
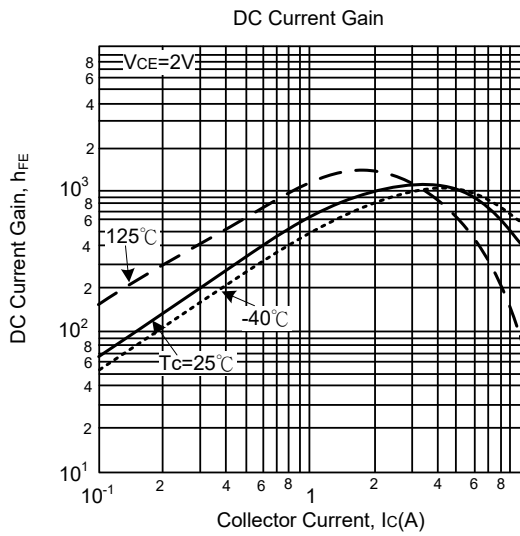


Fig. 2 Switching Time Test Circuit

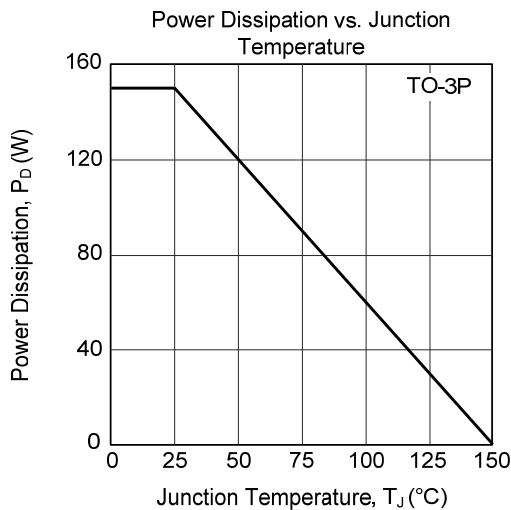
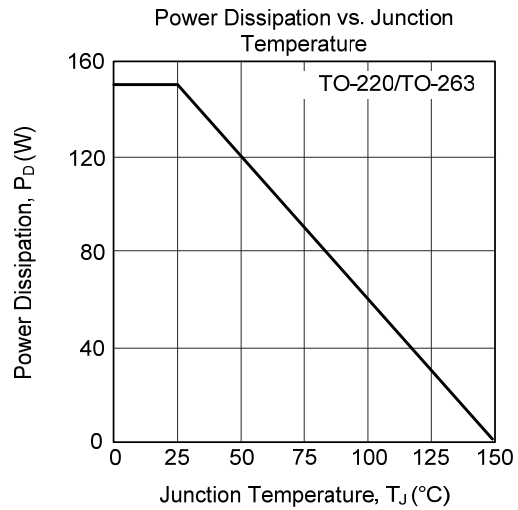
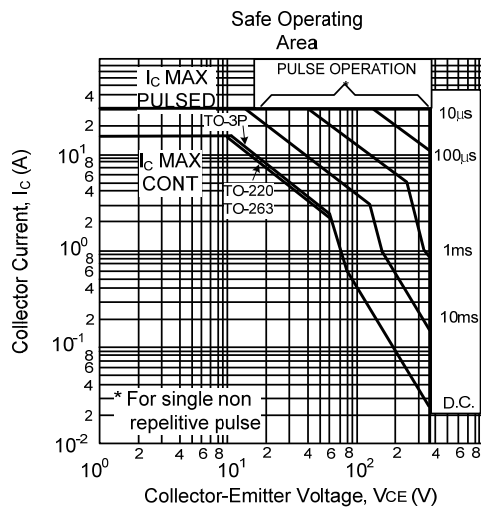
## ■ FUNCTION TEST CIRCUIT



## TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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