



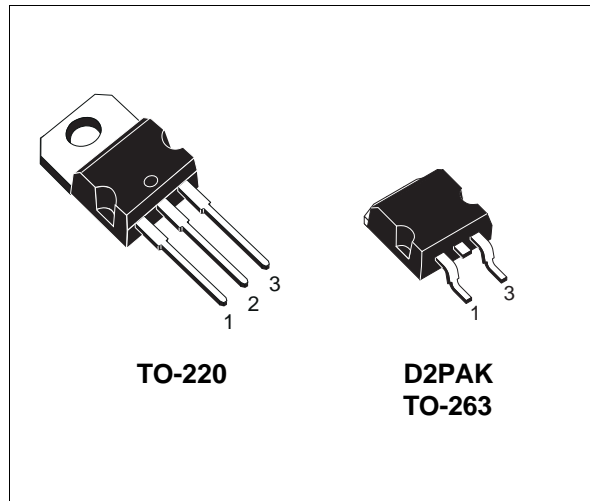
# BU931T BUB931T

## HIGH VOLTAGE IGNITION COIL DRIVER NPN POWER DARLINGTONS

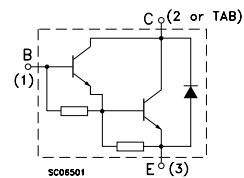
- VERY RUGGED BIPOLAR TECHNOLOGY
- HIGH OPERATING JUNCTION TEMPERATURE
- WIDE RANGE OF PACKAGES
- SURFACE-MOUNTING D2PAK (TO-263) POWER PACKAGE IN TUBE (NO SUFFIX) OR IN TAPE & REEL (SUFFIX "T4")

### APPLICATIONS

- HIGH RUGGEDNESS ELECTRONIC IGNITIONS



### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CES}$	Collector-Emitter Voltage ( $V_{BE} = 0$ )	500	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	400	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	5	V
$I_C$	Collector Current	10	A
$I_{CM}$	Collector Peak Current	15	A
$I_B$	Base Current	1	A
$I_{BM}$	Base Peak Current	5	A
$P_{tot}$	Total Dissipation at $T_c = 25\text{ }^\circ\text{C}$	125	W
$T_{stg}$	Storage Temperature	-65 to 175	$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	175	$^\circ\text{C}$

# BU931T / BUB931T

## THERMAL DATA

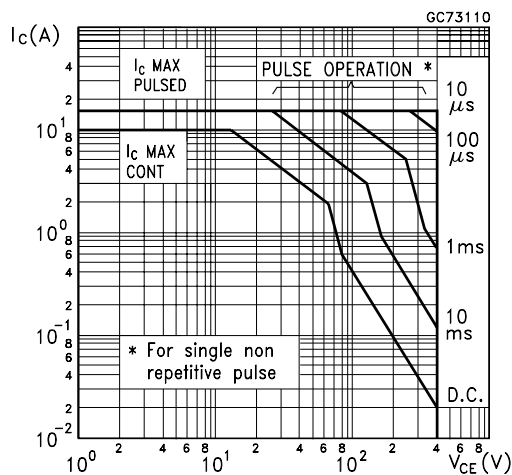
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	1.2	°C/W
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## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

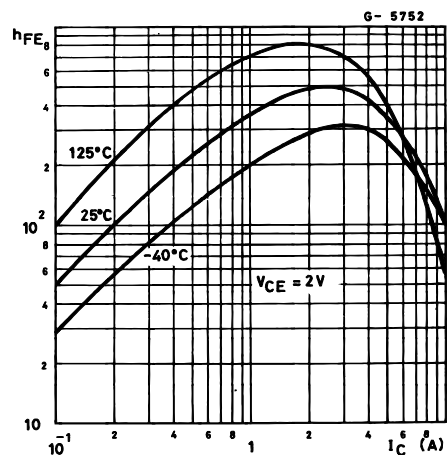
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CEs</sub>	Collector Cut-off Current (V <sub>BE</sub> = 0)	V <sub>CE</sub> = 500 V V <sub>CE</sub> = 500 V T <sub>j</sub> = 125 °C			100 0.5	μA mA
I <sub>CEO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	V <sub>CE</sub> = 450 V V <sub>CE</sub> = 450 V T <sub>j</sub> = 125 °C			100 0.5	μA mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 5 V			20	mA
V <sub>CEO(SUS)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 100 mA L = 10 mH I <sub>B</sub> = 0 V <sub>clamp</sub> = RATED V <sub>CEO</sub> (See fig.4)	400			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 7 A I <sub>B</sub> = 70 mA I <sub>C</sub> = 8 A I <sub>B</sub> = 100 mA			1.6 1.8	V V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 7 A I <sub>B</sub> = 70 mA I <sub>C</sub> = 8 A I <sub>B</sub> = 100 mA			2.2 2.4	V V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 5 A V <sub>CE</sub> = 10 V	300			
V <sub>F</sub>	Diode Forward Voltage	I <sub>F</sub> = 10 A			2.5	V
	Functional Test (see fig. 1)	V <sub>CC</sub> = 24 V V <sub>clamp</sub> = 400 V L = 7 mH	8			A
t <sub>s</sub> t <sub>f</sub>	INDUCTIVE LOAD Storage Time Fall Time (see fig. 3)	V <sub>CC</sub> = 12 V V <sub>clamp</sub> = 300 V L = 7 mH I <sub>C</sub> = 7 A I <sub>B</sub> = 70 mA V <sub>BE</sub> = 0 R <sub>BE</sub> = 47 Ω		15 0.5		μs μs

\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

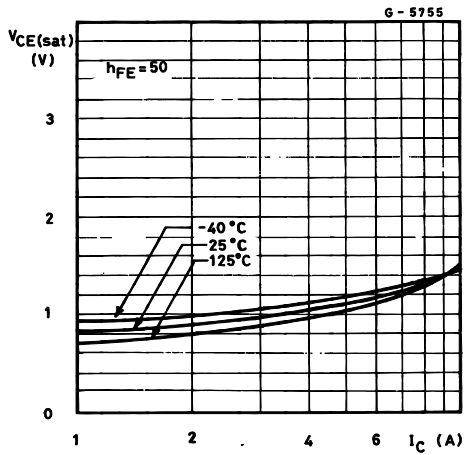
## Safe Operating Area



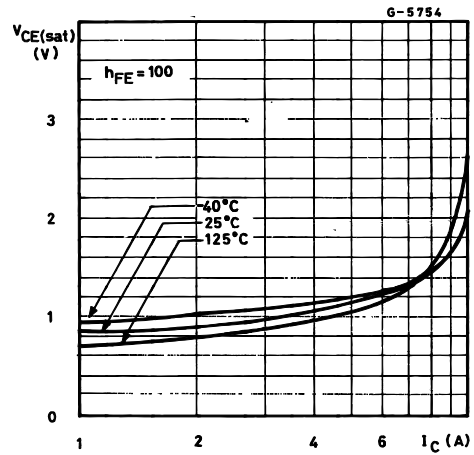
## DC Current Gain



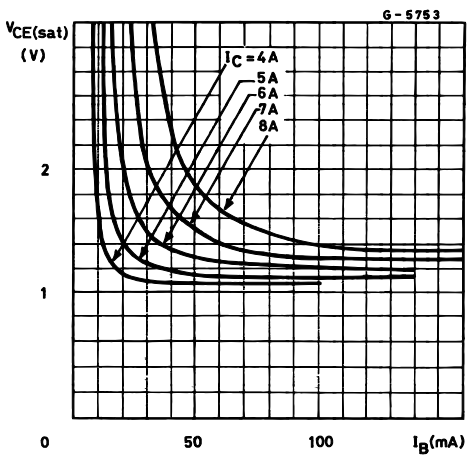
Collector Emitter Saturation Voltage



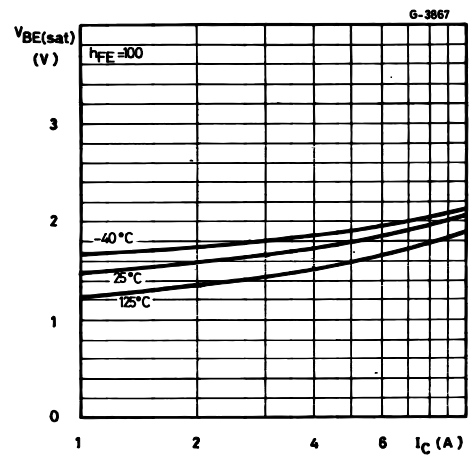
Collector Emitter Saturation Voltage



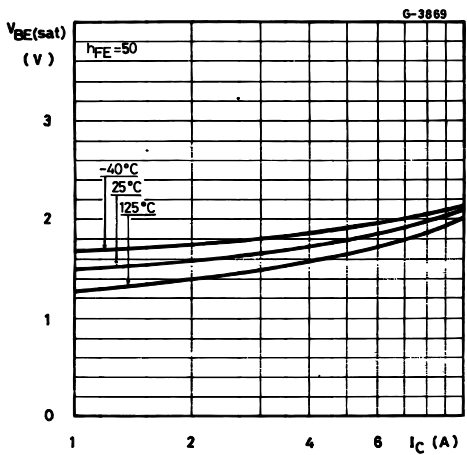
Collector Emitter Saturation Voltage



Base Emitter Saturation Voltage



Base Emitter Saturation Voltage



Switching Time Inductive Load

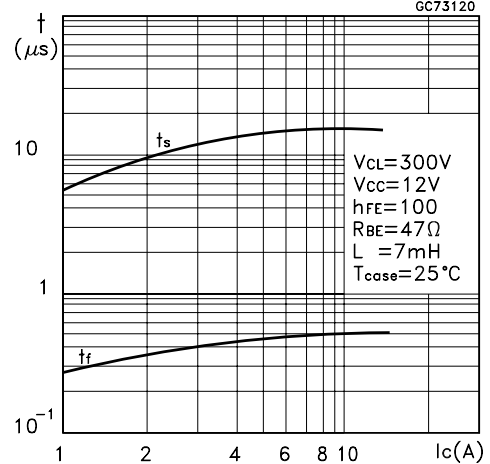


FIGURE 1: Functional Test Circuit

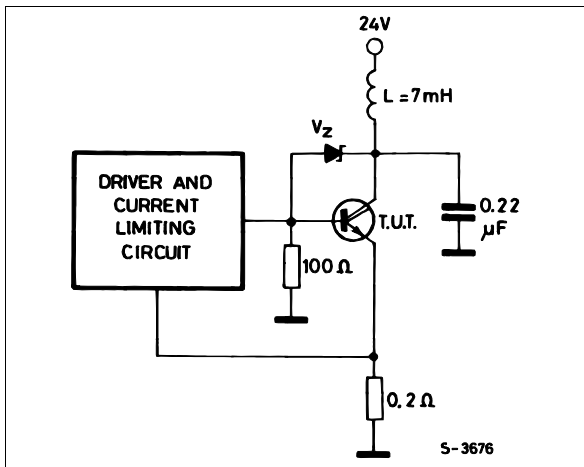


FIGURE 2: Functional Test Waveforms

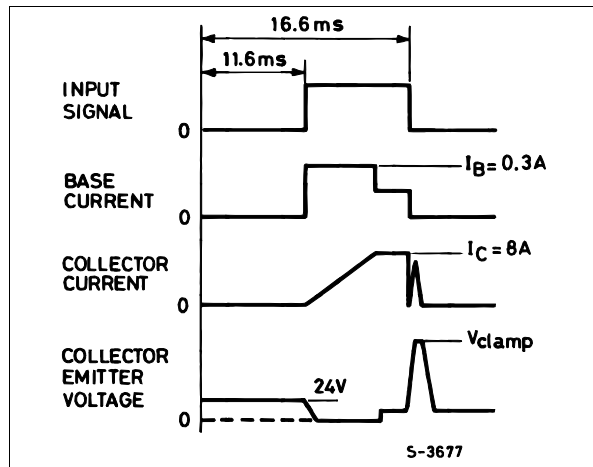


FIGURE 3: Switching Time Test Circuit

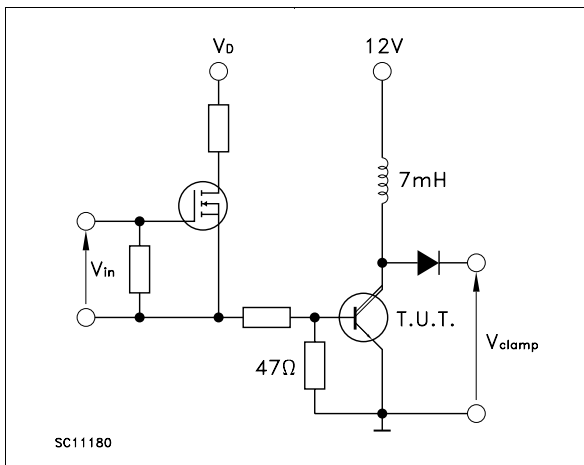
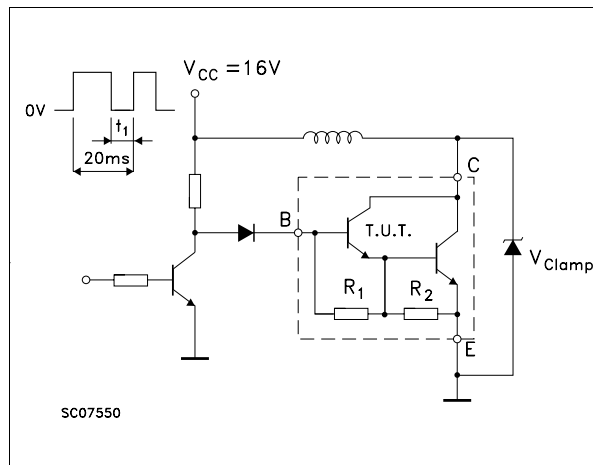
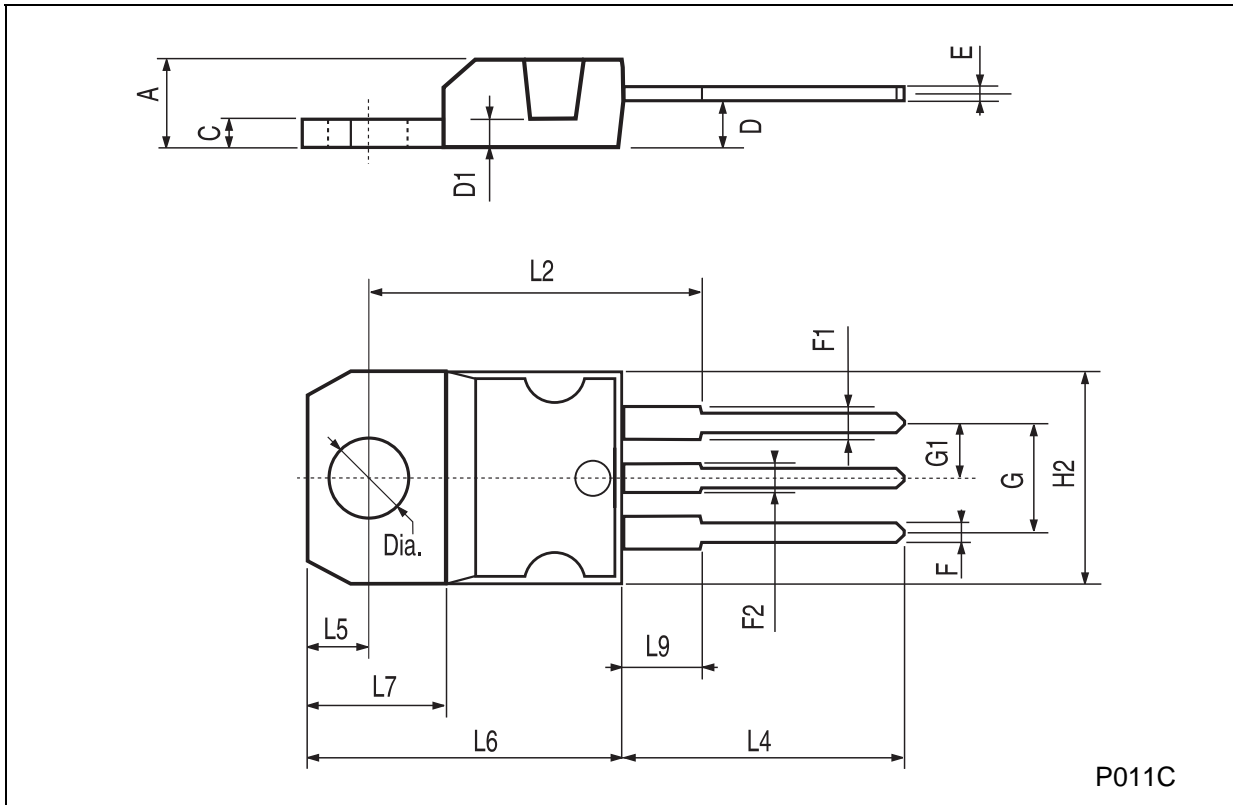


FIGURE 4: Sustaining Voltage Test Circuit



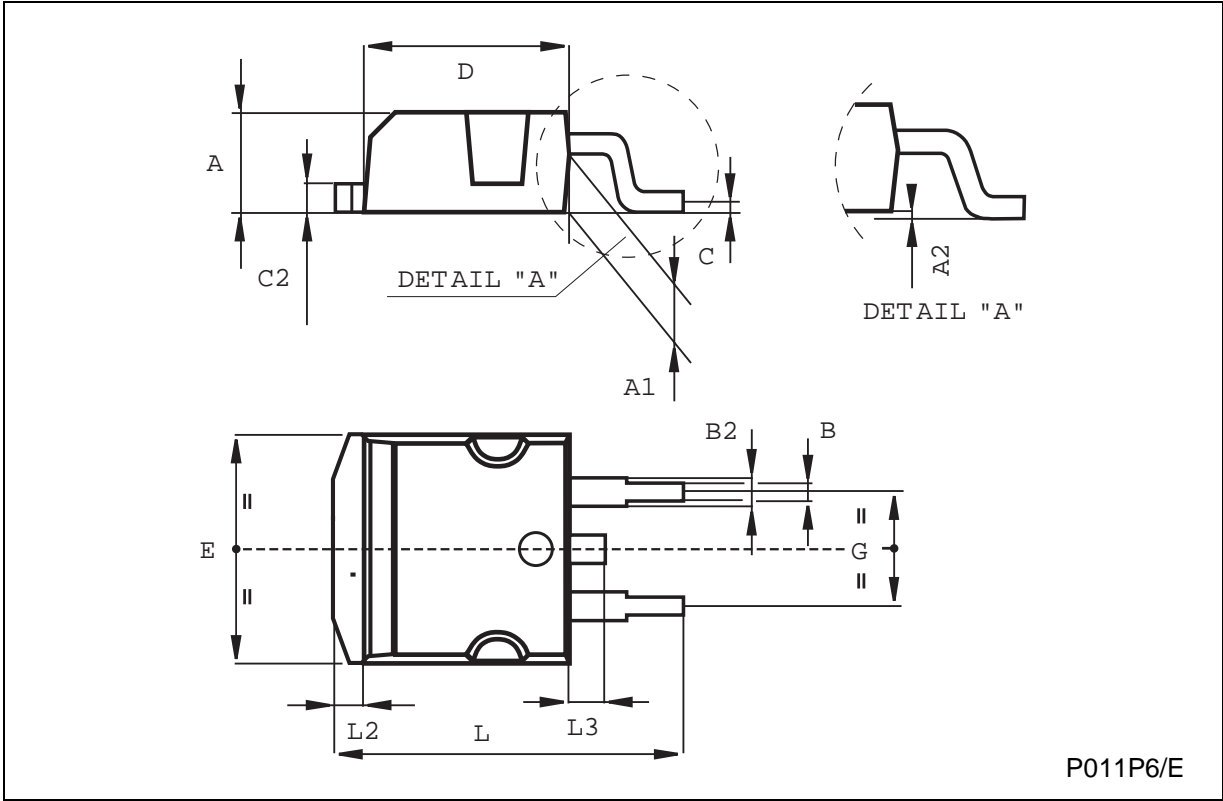
**TO-220 MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151



**TO-263 (D<sup>2</sup>PAK) MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
A1	2.49		2.69	0.098		0.106
B	0.7		0.93	0.027		0.036
B2	1.14		1.7	0.044		0.067
C	0.45		0.6	0.017		0.023
C2	1.21		1.36	0.047		0.053
D	8.95		9.35	0.352		0.368
E	10		10.4	0.393		0.409
G	4.88		5.28	0.192		0.208
L	15		15.85	0.590		0.624
L2	1.27		1.4	0.050		0.055
L3	1.4		1.75	0.055		0.068



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