



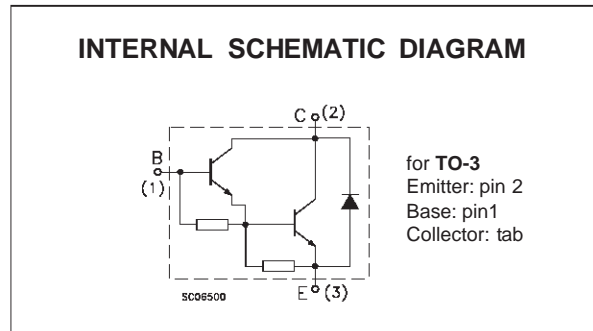
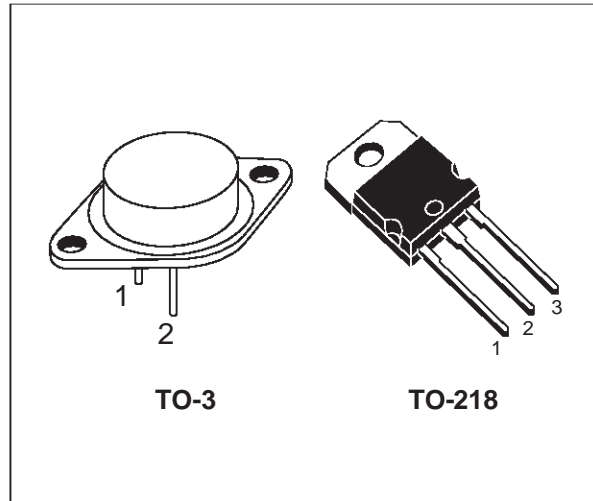
# BU931 BU931P

## HIGH VOLTAGE IGNITION COIL DRIVER NPN POWER DARLINGTON

- VERY RUGGED BIPOLAR TECHNOLOGY
- HIGH OPERATING JUNCTION TEMPERATURE
- WIDE RANGE OF PACKAGES

### APPLICATIONS

- HIGH RUGGEDNESS ELECTRONIC IGNITIONS



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		BU931	BU931P	
$V_{CES}$	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	15		A
$I_{CM}$	Collector Peak Current	30		A
$I_B$	Base Current	1		A
$I_{BM}$	Base Peak Current	5		A
$P_{tot}$	Total Dissipation at $T_C = 25\text{ }^\circ\text{C}$	175	135	W
$T_{stg}$	Storage Temperature	-65 to 200	-65 to 175	$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	200	175	$^\circ\text{C}$

# BU931 / BU931P

## THERMAL DATA

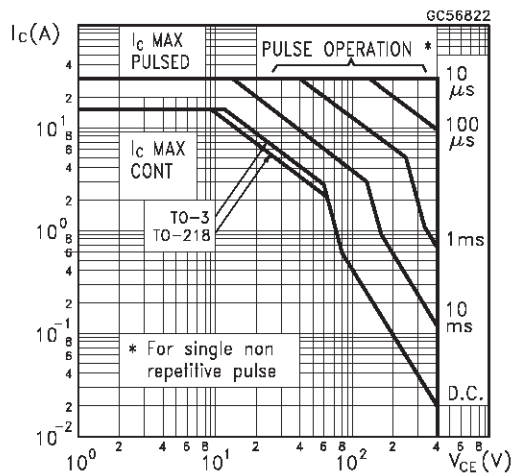
		TO-3	TO-218	
$R_{thj-case}$	Thermal Resistance Junction-case Max	1	1.1	°C/W

## ELECTRICAL CHARACTERISTICS ( $T_{case} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

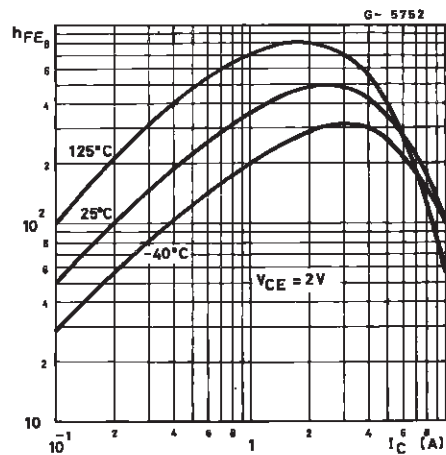
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cut-off Current ( $V_{BE} = 0$ )	$V_{CE} = 500\text{ V}$ $V_{CE} = 500\text{ V}$ $T_j = 125\text{ }^{\circ}\text{C}$			100 0.5	$\mu\text{A}$ mA
$I_{CEO}$	Collector Cut-off Current ( $I_B = 0$ )	$V_{CE} = 450\text{ V}$ $V_{CE} = 450\text{ V}$ $T_j = 125\text{ }^{\circ}\text{C}$			100 0.5	$\mu\text{A}$ mA
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = 5\text{ V}$			20	mA
$V_{CEO(sus)}^*$	Collector-Emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 100\text{ mA}$ $L = 10\text{ mH}$ $V_{Clamp} = 400\text{ V}$ (See Fig.4)	400			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 7\text{ A}$ $I_B = 70\text{ mA}$ $I_C = 8\text{ A}$ $I_B = 100\text{ mA}$ $I_C = 10\text{ A}$ $I_B = 250\text{ mA}$			1.6 1.8 1.8	V V V
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = 7\text{ A}$ $I_B = 70\text{ mA}$ $I_C = 8\text{ A}$ $I_B = 100\text{ mA}$ $I_C = 10\text{ A}$ $I_B = 250\text{ mA}$			2.2 2.4 2.5	V V V
$h_{FE}^*$	DC Current Gain	$I_C = 5\text{ A}$ $V_{CE} = 10\text{ V}$	300			
$V_F$	Diode Forward Voltage	$I_F = 10\text{ A}$			2.5	V
	Functional Test (see fig. 1)	$V_{CC} = 24\text{ V}$ $V_{clamp} = 400\text{ V}$ $L = 7\text{ mH}$	8			A
$t_s$	INDUCTIVE LOAD Storage Time	$V_{CC} = 12\text{ V}$ $V_{clamp} = 300\text{ V}$ $L = 7\text{ mH}$		15		$\mu\text{s}$
$t_f$	Fall Time (see fig. 3)	$I_C = 7\text{ A}$ $I_B = 70\text{ mA}$ $V_{BE} = 0$ $R_{BE} = 47\text{ }\Omega$		0.5		$\mu\text{s}$

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

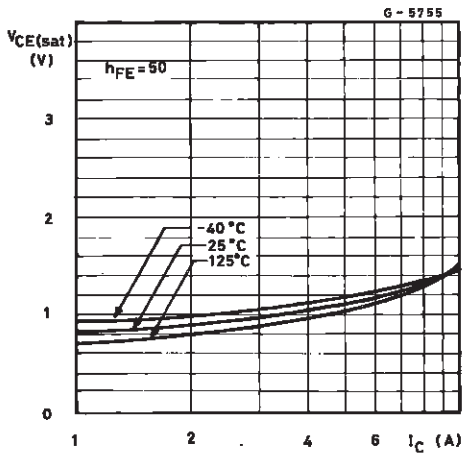
## Safe Operating Area



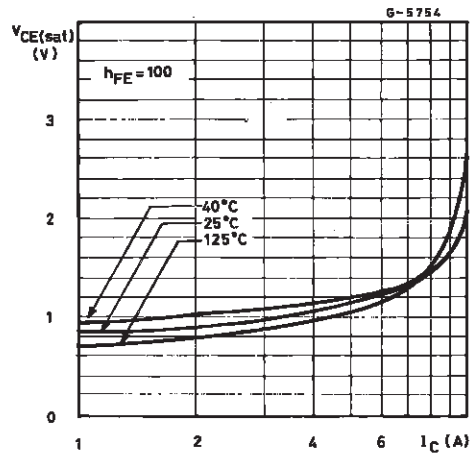
## DC Current Gain



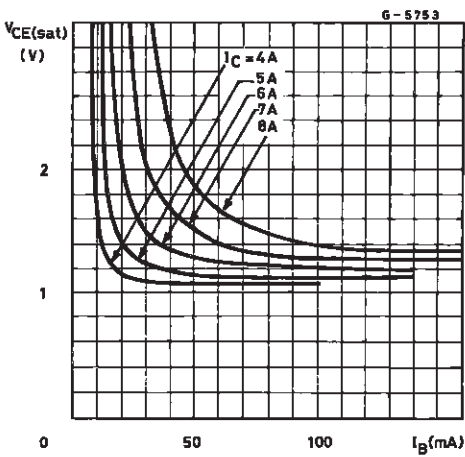
Collector Emitter Saturation Voltage



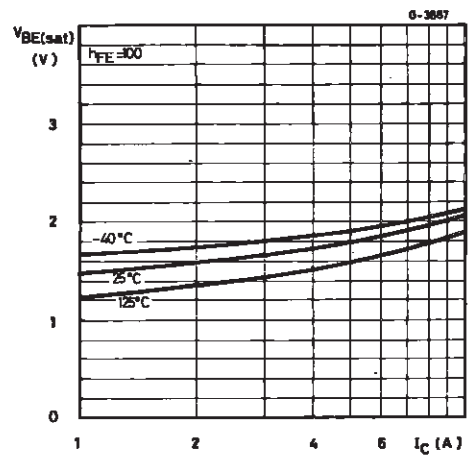
Collector Emitter Saturation Voltage



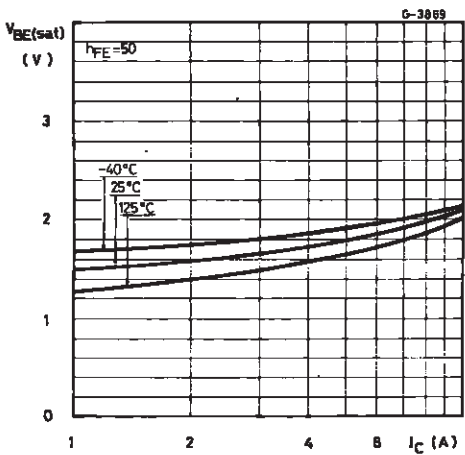
Collector Emitter Saturation Voltage



Base Emitter Saturation Voltage



Base Emitter Saturation Voltage



Switching Time Inductive Load

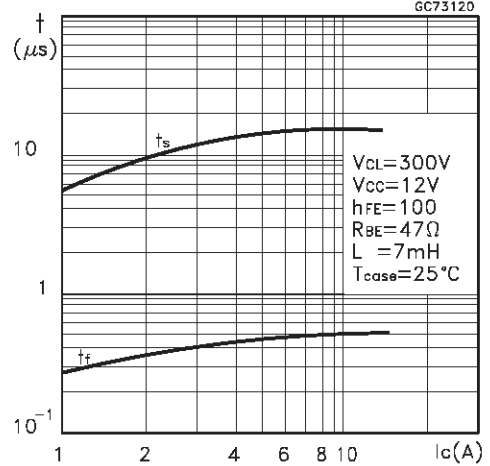


FIGURE 1: Functional Test Circuit

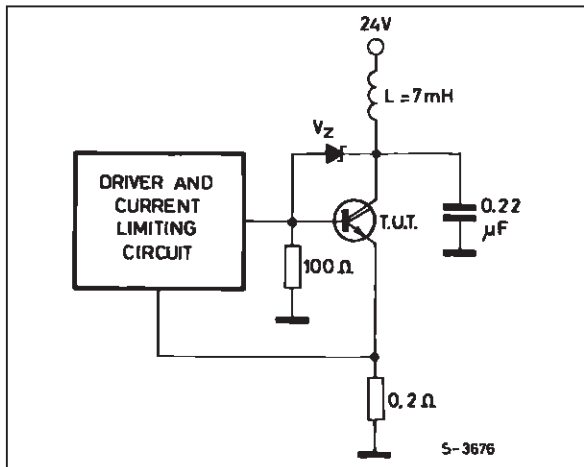


FIGURE 2: Functional Test Waveforms

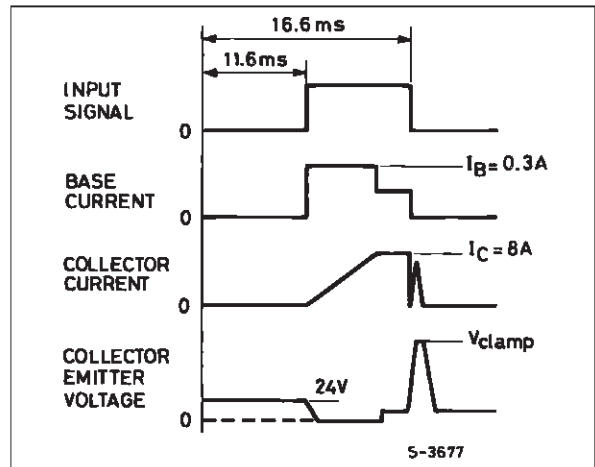


FIGURE 3: Switching Time Test Circuit

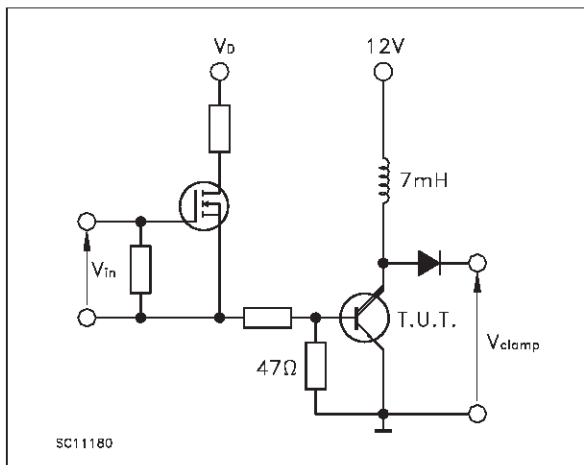
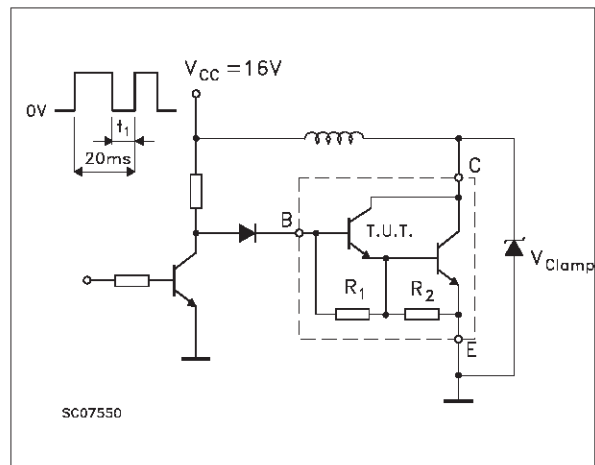
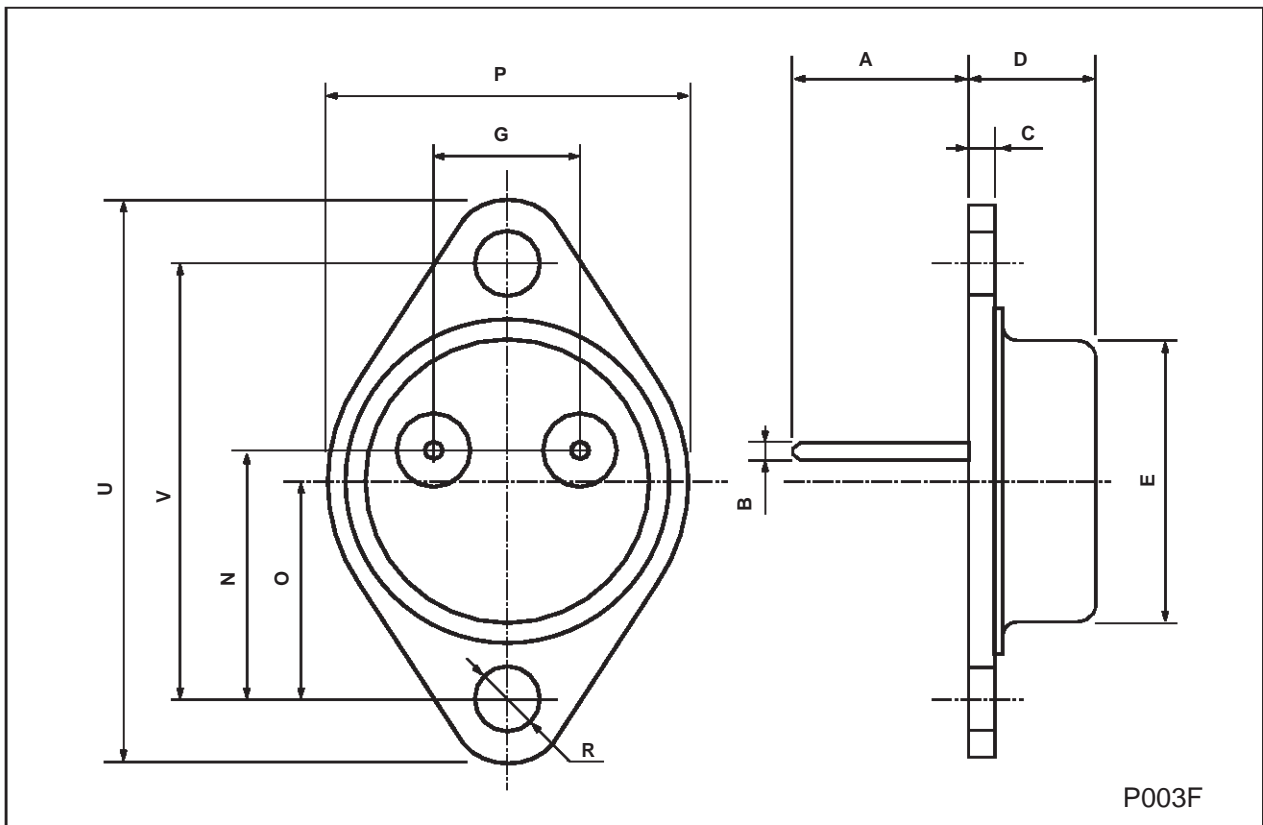


FIGURE 4: Sustaining Voltage Test Circuit



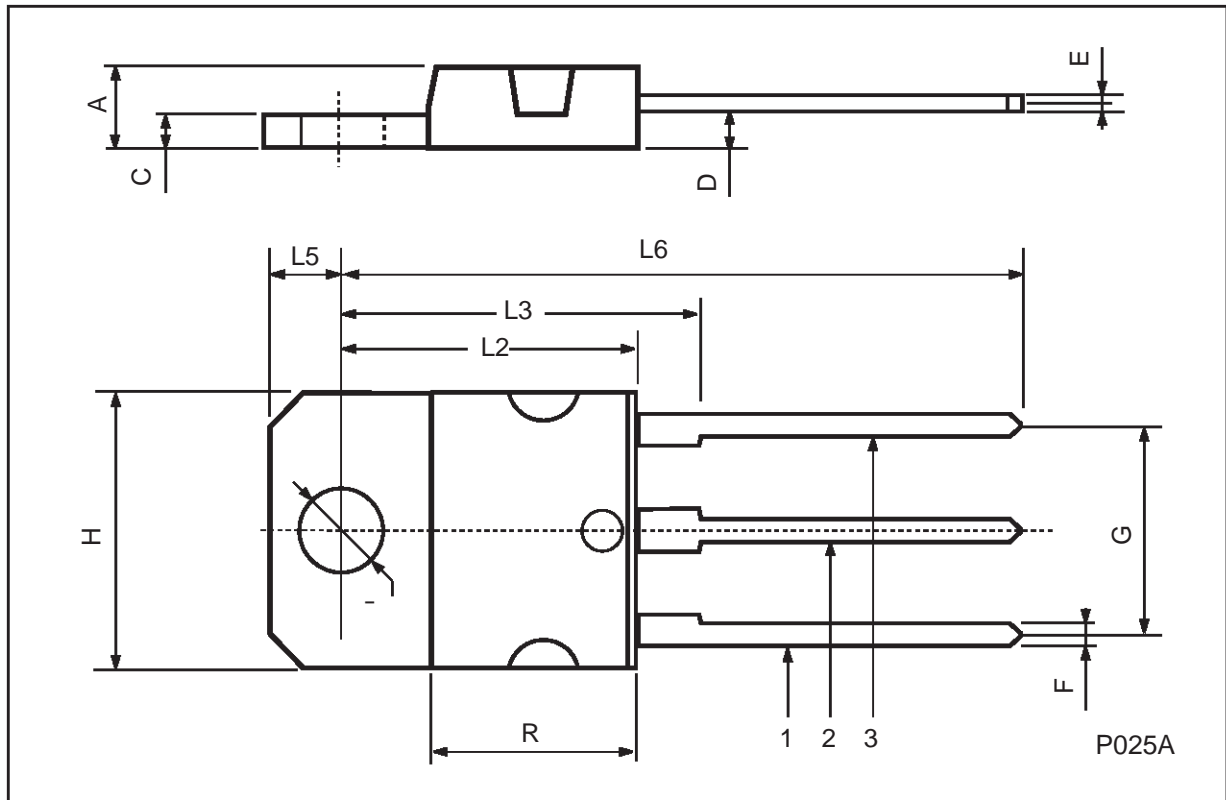
**TO-3 MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	11.00		13.10	0.433		0.516
B	0.97		1.15	0.038		0.045
C	1.50		1.65	0.059		0.065
D	8.32		8.92	0.327		0.351
E	19.00		20.00	0.748		0.787
G	10.70		11.10	0.421		0.437
N	16.50		17.20	0.649		0.677
P	25.00		26.00	0.984		1.023
R	4.00		4.09	0.157		0.161
U	38.50		39.30	1.515		1.547
V	30.00		30.30	1.187		1.193



**TO-218 (SOT-93) MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.7		4.9	0.185		0.193
C	1.17		1.37	0.046		0.054
D		2.5			0.098	
E	0.5		0.78	0.019		0.030
F	1.1		1.3	0.043		0.051
G	10.8		11.1	0.425		0.437
H	14.7		15.2	0.578		0.598
L2	-		16.2	-		0.637
L3		18			0.708	
L5	3.95		4.15	0.155		0.163
L6		31			1.220	
R	-		12.2	-		0.480
Ø	4		4.1	0.157		0.161



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