

Features

- Very rugged Bipolar technology
- High operating junction temperature
- Wide range of packages

Applications

- High ruggedness electronic ignitions

Description

The devices are bipolar Darlington transistors manufactured using Multi-Epitaxial Planar technology. They have been properly designed to be used in automotive environment as electronic ignition power actuators.

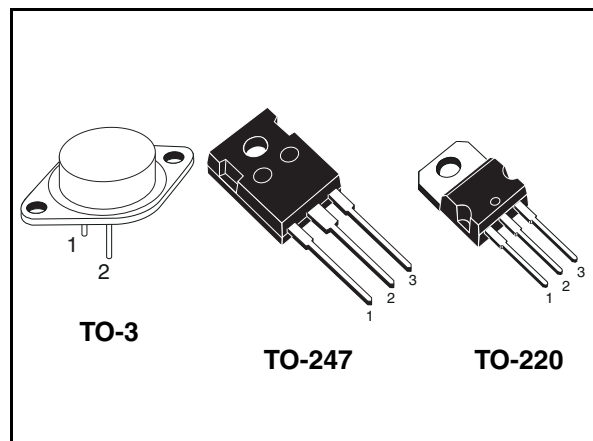


Figure 1. Internal schematic diagrams

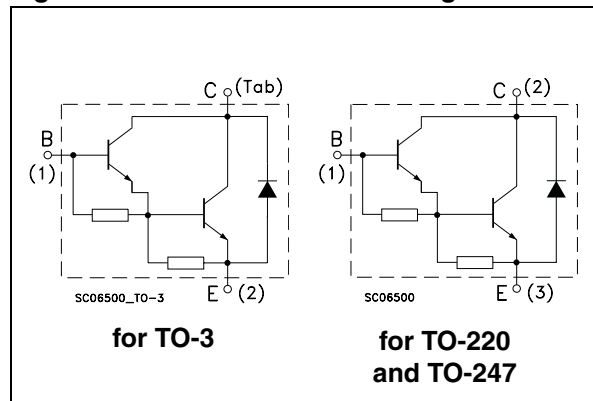


Table 1. Device summary

Order codes	Marking	Package	Packaging
BU931	BU931	TO-3	Tray
BU931P	BU931P	TO-247	Tube
BU931T	BU931T	TO-220	Tube

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value			Unit
		BU931	BU931P	BU931T	
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		10	A
I_{CM}	Collector peak current	30		20	A
I_B	Base current	1			A
I_{BM}	Base peak current	5			A
P_{TOT}	Total dissipation at $T_c = 25\text{ °C}$	175	135	125	W
T_{stg}	Storage temperature	-65 to 200	-65 to 175		°C
T_J	Max. operating junction temperature	200	175		

Table 3. Thermal data

Symbol	Parameter	Value			Unit
		BU931	BU931P	BU931T	
$R_{thj-case}$	Thermal resistance junction-case max.	1	1.1	1.2	°C/W

2 Electrical characteristics

($T_{\text{case}} = 25\text{ °C}$; unless otherwise specified)

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current ($V_{\text{BE}} = 0$)	$V_{\text{CE}} = 500\text{ V}$ $V_{\text{CE}} = 500\text{ V}$ $T_{\text{C}} = 125\text{ °C}$			100 0.5	μA mA
I_{CEO}	Collector cut-off current ($I_{\text{B}} = 0$)	$V_{\text{CE}} = 450\text{ V}$ $V_{\text{CE}} = 450\text{ V}$ $T_{\text{C}} = 125\text{ °C}$			100 0.5	μA mA
I_{EBO}	Emitter cut-off current ($I_{\text{C}} = 0$)	$V_{\text{EB}} = 5\text{ V}$			20	mA
$V_{\text{CEO(sus)}}^{(1)}$	Collector-emitter sustaining voltage ($I_{\text{B}} = 0$)	$I_{\text{C}} = 10\text{ mA}$ $L = 10\text{ mH}$ $V_{\text{clamp}} = 400\text{ V}$ see Figure 14	400			V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 7\text{ A}$ $I_{\text{B}} = 70\text{ mA}$ $I_{\text{C}} = 8\text{ A}$ $I_{\text{B}} = 100\text{ mA}$ $I_{\text{C}} = 10\text{ A}$ $I_{\text{B}} = 250\text{ mA}$			1.6 1.8 1.8	V V V
$V_{\text{BE(sat)}}^{(1)}$	Base-emitter saturation voltage	$I_{\text{C}} = 7\text{ A}$ $I_{\text{B}} = 70\text{ mA}$ $I_{\text{C}} = 8\text{ A}$ $I_{\text{B}} = 100\text{ mA}$ $I_{\text{C}} = 10\text{ A}$ $I_{\text{B}} = 250\text{ mA}$			2.2 2.4 2.5	V V V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = 5\text{ A}$ $V_{\text{CE}} = 10\text{ V}$	300			
V_{F}	Diode forward voltage	$I_{\text{F}} = 10\text{ A}$			2.5	V
	Functional test	$V_{\text{CC}} = 24\text{ V}$ $L = 7\text{ mH}$ $V_{\text{clamp}} = 400\text{ V}$ see Figure 11	8			A
t_{s} t_{f}	Inductive Load Storage time Fall time	$I_{\text{C}} = 7\text{ A}$ $V_{\text{clamp}} = 300\text{ V}$ $I_{\text{B}} = 70\text{ mA}$ $L = 7\text{ mH}$ $V_{\text{BE}} = 0$ $R_{\text{BE}} = 47\text{ }\Omega$ $V_{\text{CC}} = 12\text{ V}$ see Figure 13		15 0.5		μs μs

1. Pulsed duration = 300 μs , duty cycle $\leq 1.5\%$

4 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark.

TO-247 Mechanical data

Dim.	mm.		
	Min.	Typ	Max.
A	4.85		5.15
A1	2.20		2.60
b	1.0		1.40
b1	2.0		2.40
b2	3.0		3.40
c	0.40		0.80
D	19.85		20.15
E	15.45		15.75
e		5.45	
L	14.20		14.80
L1	3.70		4.30
L2		18.50	
øP	3.55		3.65
øR	4.50		5.50
S		5.50	

