

High voltage NPN power transistor

Features

- High voltage capability (450 V V_{CE0})
- Minimum lot-to-lot spread for reliable operation
- High DC current gain

Applications

- Flyback and forward single transistor low power converters

Description

The BUX87 is manufactured using high voltage multi-epitaxial planar technology for high switching speeds and high voltage withstand capability.

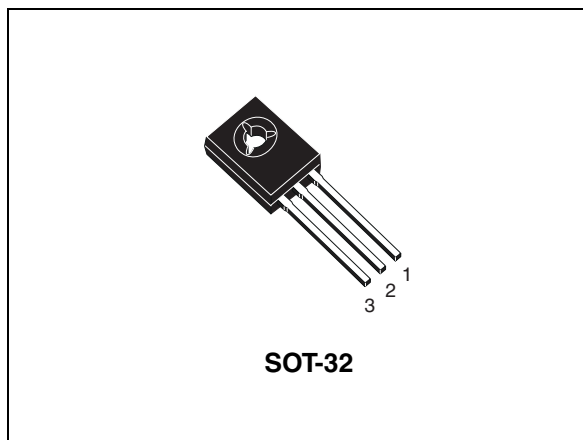


Figure 1. Internal schematic diagram

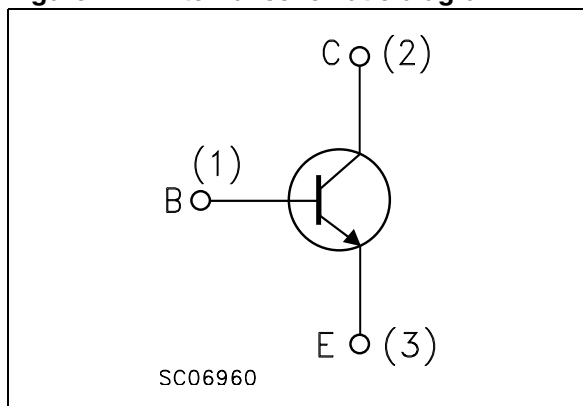


Table 1. Device summary

Order code	Marking	Package	Packaging
BUX87	BUX87	SOT-32	Tube

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CES}	Collector-emitter voltage ($V_{BE} = 0$)	1000	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	450	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	5	V
I_C	Collector current	0.5	A
I_{CM}	Collector peak current ($t_p \leq 5\text{ms}$)	1	A
I_B	Base current	0.3	A
I_{BM}	Base peak current ($t_p \leq 5\text{ms}$)	0.6	A
P_{TOT}	Total power dissipation at $T_c = 25\text{ }^\circ\text{C}$	40	W
T_{stg}	Storage temperature	-65 to 150	$^\circ\text{C}$
T_J	Max. operating junction temperature	150	

Table 3. Thermal data

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Thermal resistance junction-case max.	3.1	$^\circ\text{C/W}$

2 Electrical characteristics

$T_{\text{case}} = 25\text{ }^{\circ}\text{C}$; unless otherwise specified.

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current ($V_{\text{BE}} = 0$)	$V_{\text{CE}} = 1000\text{ V}$ $V_{\text{CE}} = 1000\text{ V}$ $T_{\text{C}} = 125\text{ }^{\circ}\text{C}$			100 1	μA mA
I_{EBO}	Emitter cut-off current ($I_{\text{C}} = 0$)	$V_{\text{EB}} = 5\text{ V}$			1	mA
$V_{\text{CEO(sus)}}^{(1)}$	Collector-emitter sustaining voltage ($I_{\text{B}} = 0$)	$I_{\text{C}} = 10\text{ mA}$	450			V
V_{EBO}	Emitter-base voltage ($I_{\text{C}} = 0$)	$I_{\text{E}} = 10\text{ mA}$	5			V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 0.1\text{ A}$ $I_{\text{B}} = 10\text{ mA}$ $I_{\text{C}} = 0.2\text{ A}$ $I_{\text{B}} = 20\text{ mA}$			0.8 1	V V
$V_{\text{BE(sat)}}^{(1)}$	Base-emitter saturation voltage	$I_{\text{C}} = 0.2\text{ A}$ $I_{\text{B}} = 20\text{ mA}$			1	V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = 50\text{ mA}$ $V_{\text{CE}} = 5\text{ V}$ $I_{\text{C}} = 40\text{ mA}$ $V_{\text{CE}} = 5\text{ V}$	12	50		
f_{T}	Transition frequency	$I_{\text{C}} = 50\text{ mA}$ $V_{\text{CE}} = 10\text{ V}$ $f = 1\text{ MHz}$		20		MHz
t_{s} t_{f}	Resistive load Storage time Fall time	$V_{\text{CC}} = 250\text{ V}$ $I_{\text{C}} = 200\text{ mA}$ $I_{\text{B(on)}} = 40\text{ mA}$ $I_{\text{B(off)}} = -80\text{ mA}$ $t_{\text{P}} = 20\text{ }\mu\text{s}$			4.5 0.5	μs μs

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

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

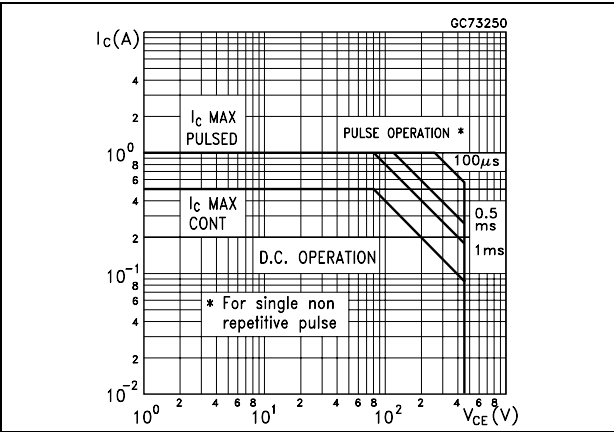


Figure 3. Derating curve

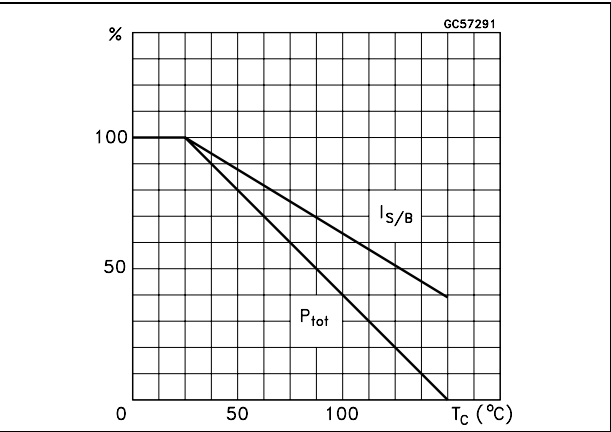


Figure 4. DC current gain

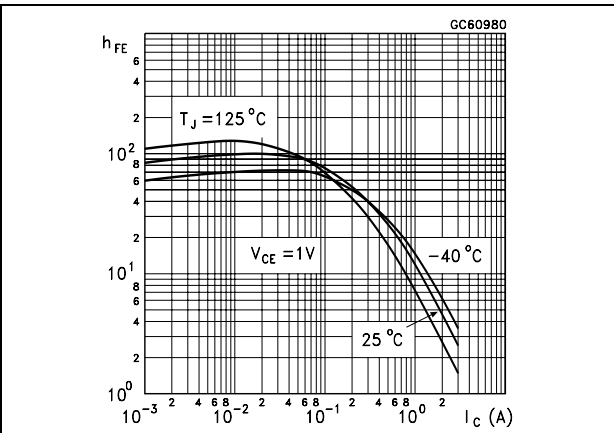


Figure 5. DC current gain

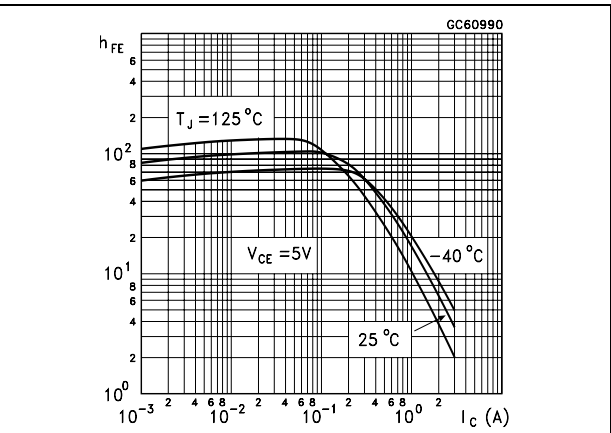


Figure 6. Collector-emitter saturation voltage Figure 7. Base-emitter saturation voltage

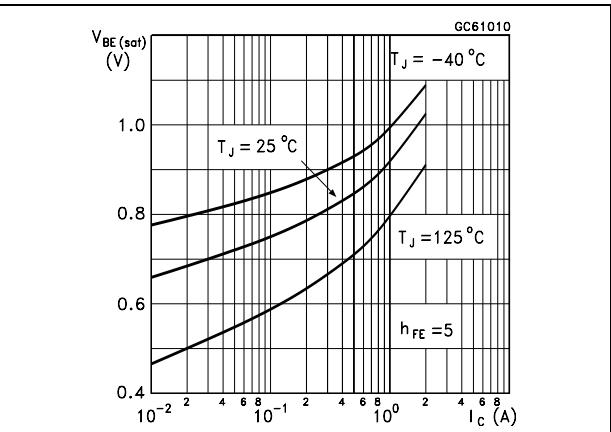
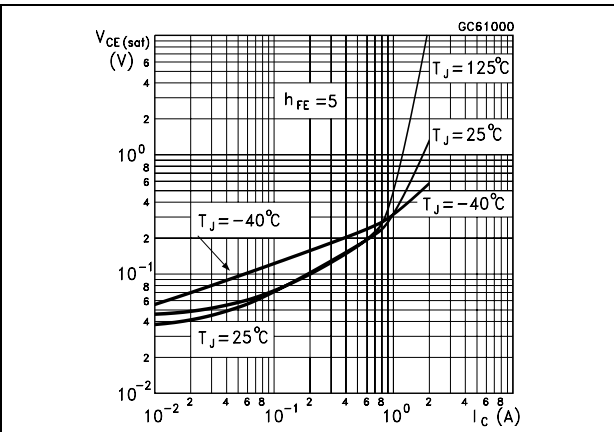
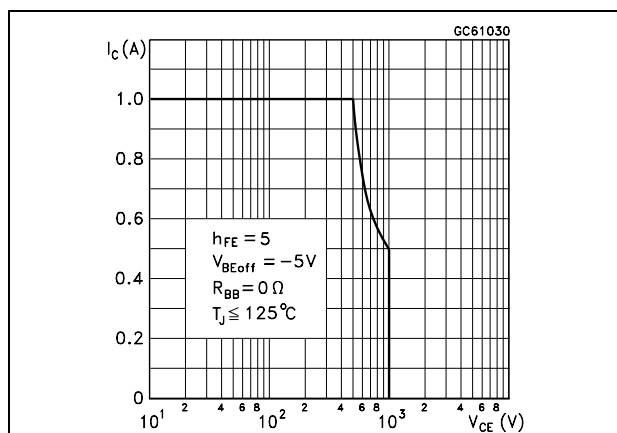


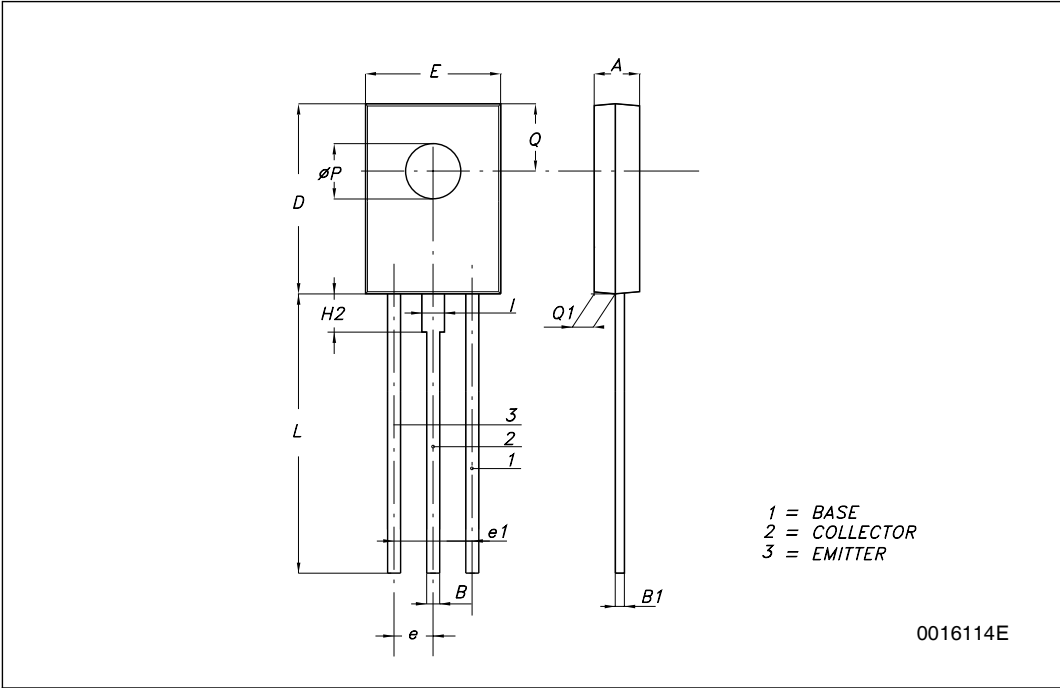
Figure 8. Reverse biased SOA

3 Package mechanical data

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SOT-32 (TO-126) MECHANICAL DATA

DIM.	mm.		
	MIN.	TYP	MAX.
A	2.4		2.9
B	0.64		0.88
B1	0.39		0.63
D	10.5		11.05
E	7.4		7.8
e	2.04	2.29	2.54
e1	4.07	4.58	5.08
L	15.3		16
P	2.9		3.2
Q		3.8	
Q1	1		1.52
H2		2.15	
I		1.27	



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
21-Jun-2004	4	Document migration, no content change.
30-Apr-2009	5	Modified: Section 3 on page 6 .

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