

Hi-Rel NPN bipolar transistor 80 V - 5 A

Features

BV_{CEO}	80 V
I_C (max)	5 A
H_{FE} at 10 V - 150 mA	> 70
Operating temperature range	-65°C to +200°C

- Hi-Rel NPN bipolar transistor
- Linear gain characteristics
- ESCC qualified
- European preferred part list - EPPL
- Radiation level: lot specific total dose contact marketing for specified level

Description

The BUX77HR is a silicon planar epitaxial NPN transistor in TO-257 package. It is specifically designed for aerospace Hi-Rel applications and ESCC qualified according to the 5203-016 specification. In case of conflict between this datasheet and ESCC detailed specification, the latter prevails.

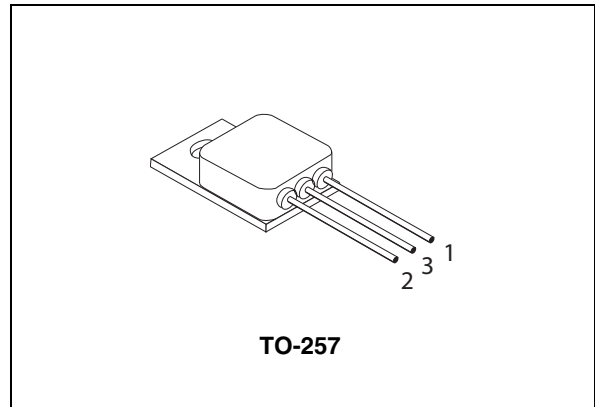


Figure 1. Internal schematic diagram

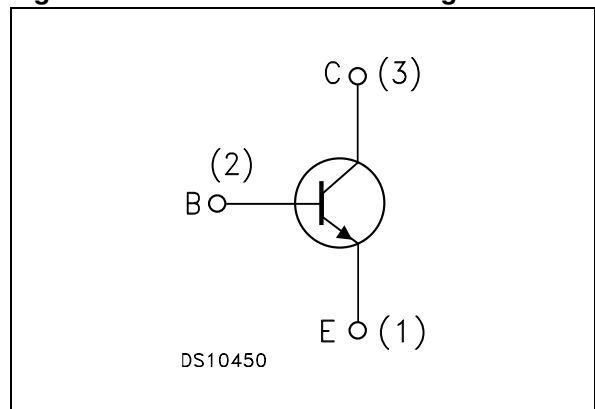


Table 1. Device summary

Order codes	Package	Lead finish	Marking	Type	EPPL	Packaging
BUX77ESYHRB	TO-257	Gold Solder Dip	520301606 520301607	ESCC Flight	Yes	Strip pack
BUX77ESY	TO-257	Gold	BUX77ESY	Engineering model		Strip pack

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage ($I_E = 0$)	100	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	80	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	6	V
I_C	Collector current	5	A
P_{tot}	Total dissipation at $T_C \leq 25\text{ °C}$	35	W
T_{stg}	Storage temperature	-65 to 200	°C
T_J	Max. operating junction temperature	200	°C

Figure 2. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Thermal resistance junction-case max	5	°C/W

2 Electrical characteristics

$T_{\text{case}} = 25\text{ °C}$ unless otherwise specified.

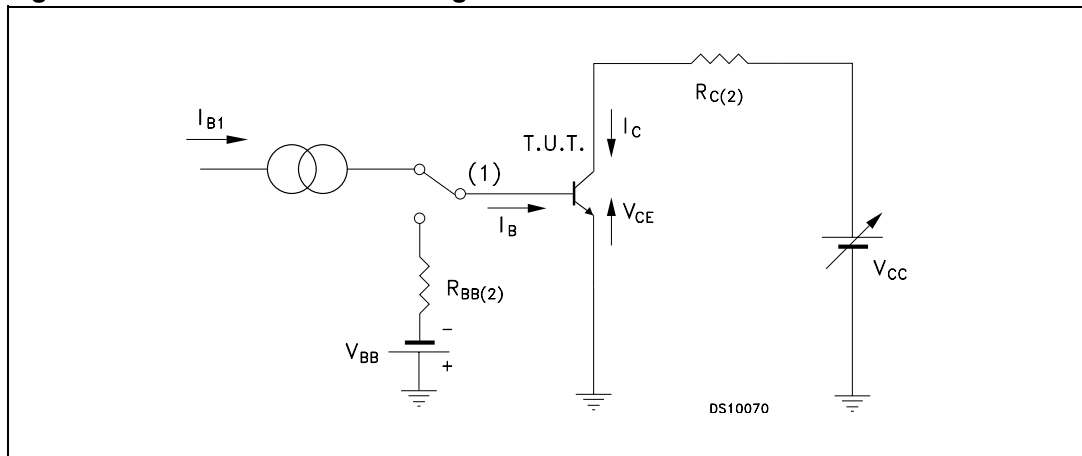
Table 3. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current ($I_{\text{E}} = 0$)	$V_{\text{CB}} = 80\text{ V}$ $V_{\text{CB}} = 80\text{ V}$ $T_{\text{amb}} = 150\text{ °C}$		-	0.5 150	μA μA
I_{CEO}	Collector cut-off current ($I_{\text{B}} = 0$)	$V_{\text{CE}} = 60\text{ V}$		-	10	μA
I_{EBO}	Emitter cut-off current ($I_{\text{C}} = 0$)	$V_{\text{EB}} = 4\text{ V}$		-	0.5	μA
$V_{(\text{BR})\text{CES}}$	Collector-emitter breakdown voltage ($V_{\text{BE}} = 0$)	$I_{\text{C}} = 2\text{ mA}$	100	-		V
$V_{(\text{BR})\text{CEO}}^{(1)}$	Collector-emitter breakdown voltage ($I_{\text{B}} = 0$)	$I_{\text{C}} = 50\text{ mA}$	80	-		V
$V_{(\text{BR})\text{EBO}}$	Emitter-base breakdown voltage ($I_{\text{C}} = 0$)	$I_{\text{E}} = 1\text{ mA}$	6	-		V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 5\text{ A}$ $I_{\text{B}} = 0.5\text{ A}$		-	1	V
$V_{\text{BE(sat)}}^{(1)}$	Base-emitter saturation voltage	$I_{\text{C}} = 5\text{ A}$ $I_{\text{B}} = 0.5\text{ A}$		-	1.3	V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = 0.5\text{ A}$ $V_{\text{CE}} = 5\text{ V}$ $I_{\text{C}} = 2\text{ A}$ $V_{\text{CE}} = 5\text{ V}$ $I_{\text{C}} = 5\text{ A}$ $V_{\text{CE}} = 5\text{ V}$ $I_{\text{C}} = 1\text{ A}$ $V_{\text{CE}} = 5\text{ V}$ $T_{\text{amb}} = -55\text{ °C}$	70 50 30 25	-	200	
h_{fe}	AC forward current transfer ratio	$V_{\text{CE}} = 5\text{ V}$ $I_{\text{C}} = 0.5\text{ A}$ $f = 20\text{ MHz}$	2.5	-		
t_{on}	Turn-on time	$V_{\text{CC}} = 40\text{ V}$ $I_{\text{C}} = 5\text{ A}$ $V_{\text{BB}} = 0.4\text{ V}$ $I_{\text{B1}} = -I_{\text{B2}} = 0.5\text{ A}$		-	0.3	μs
t_{off}	Turn-off time	$V_{\text{CC}} = 40\text{ V}$ $I_{\text{C}} = 5\text{ A}$ $V_{\text{BB}} = 0.4\text{ V}$ $I_{\text{B1}} = -I_{\text{B2}} = 0.5\text{ A}$		-	0.7	μs

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

2.1 Test circuit

Figure 3. Resistive load switching test circuit

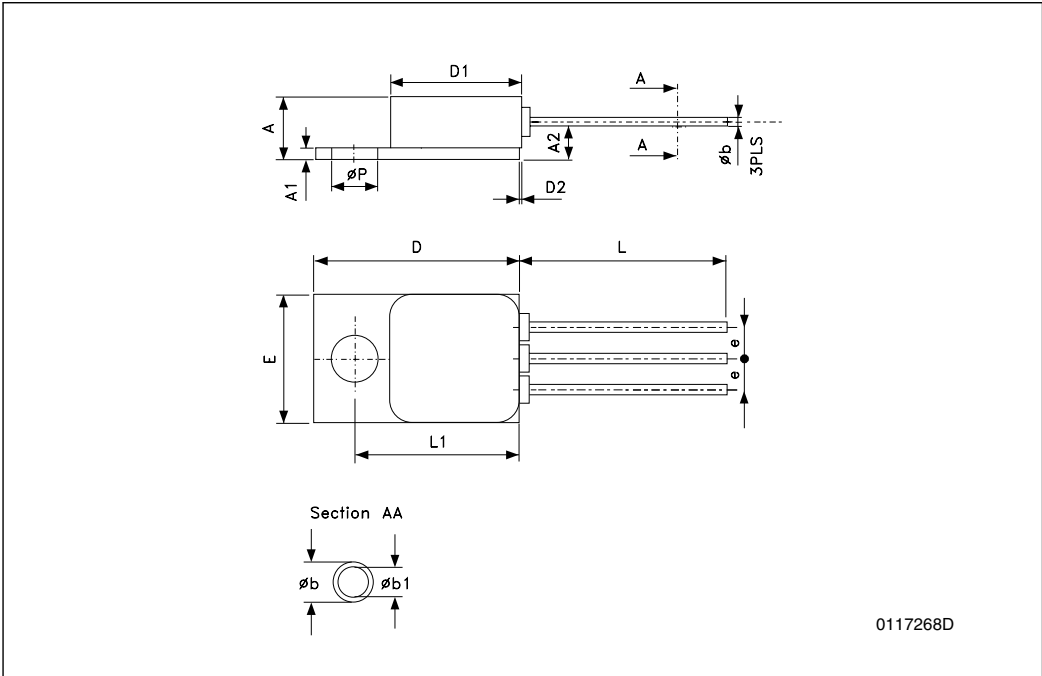


1. Fast electronic switch
2. Non-inductive resistor

3 **Package mechanical data**

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TO-257 mechanical data			
DIM.	mm.		
	MIN.	TYP	MAX.
A	4.83		5.08
A1	0.89		1.14
A2		3.05	
b	0.64		1.02
b1	0.64	0.76	0.89
D	16.38		16.89
D1	10.41		10.92
D2			0.97
e		2.54	
E	10.41		10.67
L	12.70		19.05
L1	13.39		13.64
P	3.56		3.81



4 Revision history

Table 4. Document revision history

Date	Revision	Changes
12-Jan-2010	1	Initial release

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