

Complementary transistor pair in a single package

Preliminary data

Features

- Low $V_{CE(sat)}$
- Simplified circuit design
- Reduced component count
- Low spread of dynamic parameters

Applications

- Compact fluorescent lamp (CFL) 110 V mains

Description

The STD830CP20 is a hybrid complementary pair of power bipolar transistors manufactured by using the high voltage multi-epitaxial planar technology for high switching speeds and medium voltage capability.

The STD830CP20 is housed in dual island DIP-8 package with separated terminals for higher assembly flexibility, specifically recommended to be used in a new solution for compact fluorescent lamp (CFL).

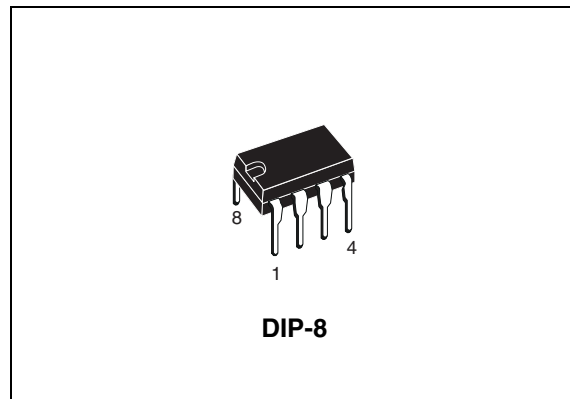


Figure 1. Internal schematic diagram

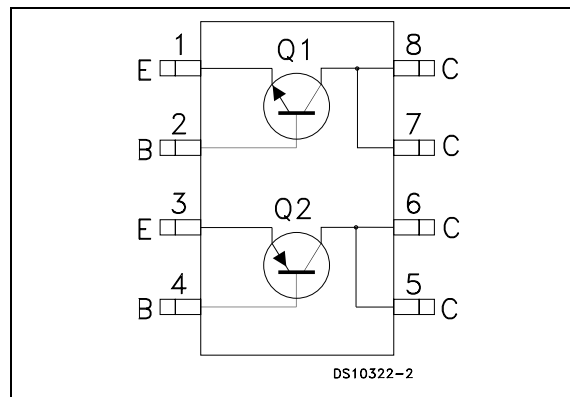


Table 1. Device summary

Order code	Marking	Package	Packing
STD830CP20	D830CP20	DIP-8	Tube

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value		Unit
		NPN	PNP	
V_{CBO}	Collector-base voltage ($I_E = 0$)	400	300	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	200		V
V_{EBO}	Emitter-base voltage ($I_C = 0, I_b = 1.5 \text{ A}, t_p < 10 \text{ ms}$)	$V_{(BR)EBO}$		V
I_C	Collector current	3		A
I_{CM}	Collector peak current ($t_p < 5 \text{ ms}$)	6		A
I_B	Base current	1.5		A
I_{BM}	Base peak current ($t_p < 1 \text{ ms}$)	3		A
P_{tot}	Total dissipation at $T_{amb} = 25 \text{ °C}$ single transistor	TBD		W
P_{tot}	Total dissipation at $T_{amb} = 25 \text{ °C}$ both transistors	TBD		W
T_{stg}	Storage temperature	-65 to 150		°C
T_J	Max. operating junction temperature	150		°C

Table 3. Thermal data

Symbol	Parameter	Value	Unit
$R_{thj-amb}^{(1)}$	Thermal resistance junction-ambient (Single transistor)	TBD	°C/W
$R_{thj-amb}^{(1)}$	Thermal resistance junction-ambient (Both transistors)	TBD	°C/W

1. When mounted on 1 inch square pad of 2 oz. copper, $t \leq 10 \text{ sec}$.

Note: For PNP types voltage and current values are negative

2 Electrical characteristics

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

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current ($V_{\text{BE}} = 0$)	For NPN: $V_{\text{CE}} = 400 \text{ V}$ $V_{\text{CE}} = 400 \text{ V}$ $T_{\text{C}} = 125^{\circ}\text{C}$			0.1 0.5	mA mA
		For PNP: $V_{\text{CE}} = 300 \text{ V}$ $V_{\text{CE}} = 300 \text{ V}$ $T_{\text{C}} = 125^{\circ}\text{C}$			0.1 0.5	mA mA
$V_{(\text{BR})\text{EBO}}$	Emitter-base breakdown voltage ($I_{\text{C}} = 0$)	$I_{\text{E}} = 10 \text{ mA}$ For NPN: For PNP:	9 6		18 12	V V
$V_{\text{CEO(sus)}}^{(1)}$	Collector-emitter sustaining voltage ($I_{\text{B}} = 0$)	$I_{\text{C}} = 5 \text{ mA}$	200			V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 0.5 \text{ A}$ $I_{\text{B}} = 0.05 \text{ A}$			400	mV
		$I_{\text{C}} = 0.7 \text{ A}$ $I_{\text{B}} = 0.1 \text{ A}$			400	mV
$V_{\text{BE(sat)}}^{(1)}$	Base-emitter saturation voltage	$I_{\text{C}} = 0.5 \text{ A}$ $I_{\text{B}} = 0.1 \text{ A}$			1	V
		$I_{\text{C}} = 1 \text{ A}$ $I_{\text{B}} = 0.2 \text{ A}$			1.1	V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = 10 \text{ mA}$ $V_{\text{CE}} = 5 \text{ V}$	10		36	
		$I_{\text{C}} = 0.75 \text{ A}$ $V_{\text{CE}} = 5 \text{ V}$	22			
		$I_{\text{C}} = 2 \text{ A}$ $V_{\text{CE}} = 5 \text{ V}$	4			
t_{r} t_{s} t_{f}	Resistive load Rise time Storage time Fall time	$I_{\text{C}} = 0.7 \text{ A}$ $V_{\text{CC}} = 150 \text{ V}$		80		ns
		$I_{\text{B1}} = 0.14 \text{ A}$ $I_{\text{B2}} = -0.14 \text{ A}$		1.2		μs
		$t_{\text{p}} = 30 \mu\text{s}$		80		ns
t_{s} t_{f}	Inductive load Storage time Fall time	$I_{\text{C}} = 1 \text{ A}$ $I_{\text{B1}} = 0.1 \text{ A}$		120		ns
		$V_{\text{BE(off)}} = -5 \text{ V}$ $R_{\text{BB}} = 0$ $V_{\text{clamp}} = 150 \text{ V}$ $L = 1 \text{ mH}$		50		ns

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

Note: For PNP types voltage and current values are negative

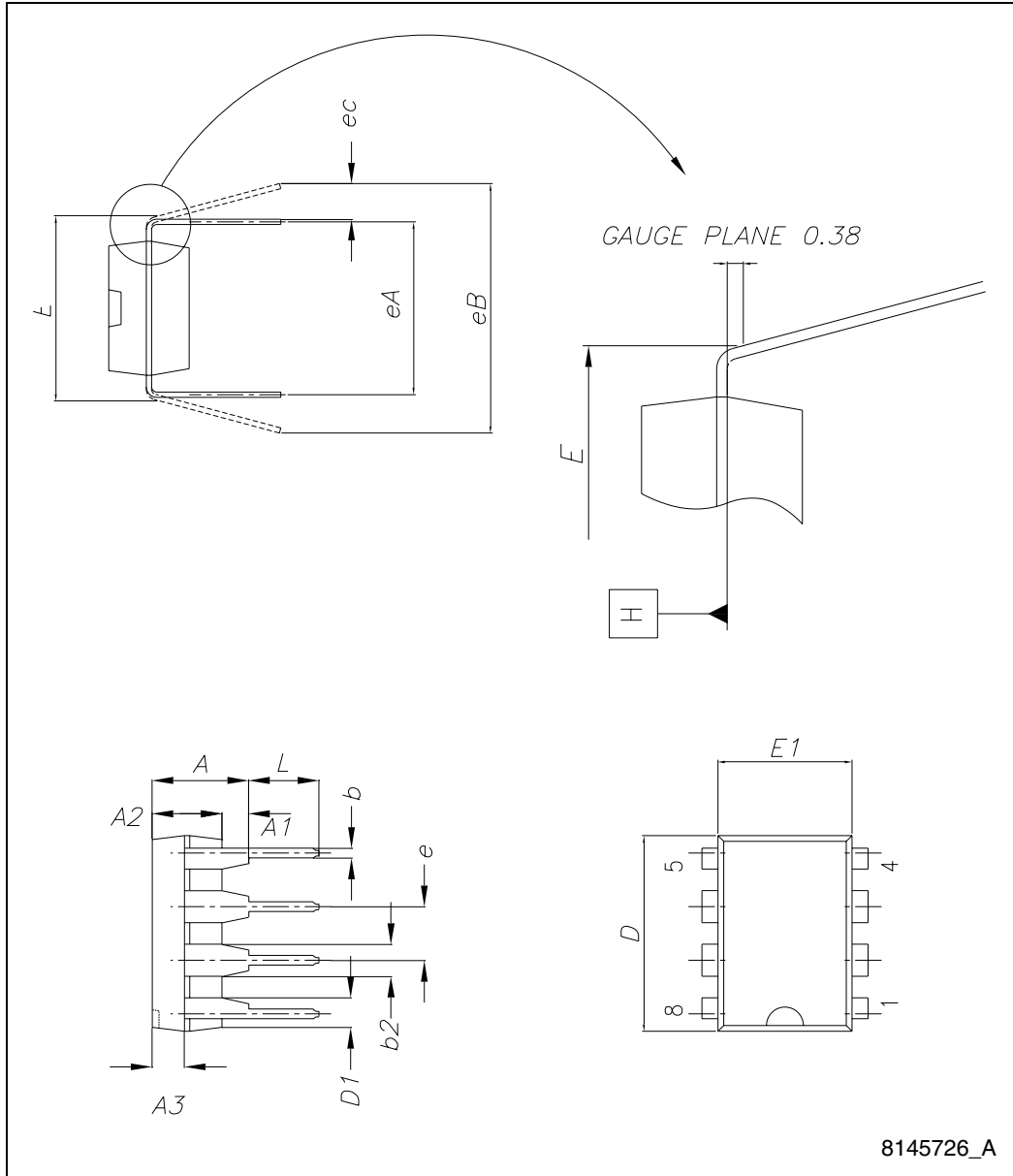
3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: www.st.com. ECOPACK[®] is an ST trademark.

Table 5. DIP-8 mechanical data

Dim.	mm.		
	Min	Typ.	Max.
A			4.80
A1	0.50		
A2	3.10		3.50
A3	1.40		1.60
b	0.38		0.55
b1	0.38		0.51
b2	1.47		1.57
b3	0.89		1.09
c	0.21		0.35
c1	0.20		0.30
D	9.10		9.30
D1	0.13		
E	7.62		8.25
E1	6.25		6.45
e		2.54	
eA		7.62	
eB	7.62		10.90
eC	0		1.52
L	2.92		3.81

Figure 2. Drawing dimension DIP-8



4 Revision history

Table 6. Document revision history

Date	Revision	Changes
26-May-2009	1	Initial release.



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