2STR1230

Low voltage fast-switching NPN power transistor

Features

- Very low collector-emitter saturation voltage
- High current gain characteristic
- Fast switching speed
- Miniature SOT-23 plastic package for surface mounting circuits

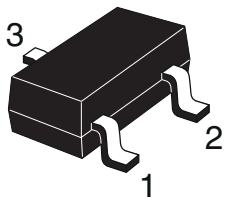
Applications

- LED
- Motherboard & hard disk drive
- Mobile equipment
- DC-DC converter
- Voltage regulation

Description

The device is a NPN transistor manufactured using new “PB-HCD” (power bipolar high current density) technology. The resulting transistor shows exceptional high gain performances coupled with very low saturation voltage.

The complementary PNP is the 2STR2230.



SOT-23

Figure 1. Internal schematic diagram

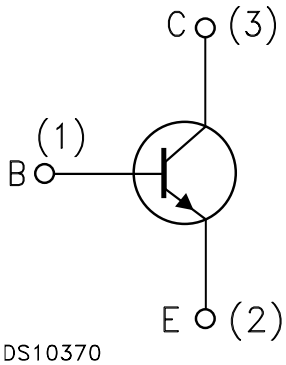


Table 1. Device summary

Order code [1]	Marking	Package	Packing
2STR1230	130	SOT-23	Tape and reel
2STR1230G	130G	SOT-23	Tape and reel

1. The letter "G" in the order code suffix identifies the product as ECOPACK®2 grade. Please see *Section 3* for details.

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CES}	Collector-emitter voltage (V_{BE} = 0)	30	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	30	V
V_{EBO}	Emitter-base voltage (I_C = 0)	5	V
I_C	Collector current	1.5	A
I_{CM}	Collector peak current (t_P < 5 ms)	3	A
P_{tot}	Total dissipation at T_{amb} = 25 °C	0.5	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_{thJA}(1)	Thermal resistance junction-ambient	max	250	°C/W

1. Device mounted on PCB area of 1 cm².

2 Electrical characteristics

T_{case} = 25 °C unless otherwise specified

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current (I_E = 0)	V_{CB} = 30 V			0.1	µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 4 V			0.1	µA
$V_{(BR)CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C = 100 µA	30			V
$V_{(BR)CEO}$ (1)	Collector-emitter breakdown voltage (I_B = 0)	I_C = 10 mA	30			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage (I_C = 0)	I_E = 100 µA	5			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 0.1 A I_B = 1 mA I_C = 1 A I_B = 100 mA I_C = 2 A I_B = 200 mA		 0.2 0.4	0.15 0.5 0.85	V V V
$V_{BE(sat)}$ (1)	Base-emitter saturation voltage	I_C = 1A I_B = 100mA			1.25	V
h_{FE} (1)	DC current gain	I_C = 50 mA V_{CE} = 2 V I_C = 0.5 A V_{CE} = 2 V I_C = 1 A V_{CE} = 2 V I_C = 2 A V_{CE} = 2 V	210 180 130 80	330	560	
C_{CBO}	Collector-base capacitance (I_E = 0)	V_{CB} = 10 V, f = 1 MHz		5		pF
 t_{on} t_{off}	Resistive load Turn-on time Turn-off time	I_C = 1.5 A V_{CC} = 10 V I_{B1} = - I_{B2} = 150 mA		 70 380		 ns ns

1. Pulse test: pulse duration ≤ 300 µs, duty cycle ≤ 2 %

2.1 Electrical characteristics (curves)

Figure 2. DC current gain

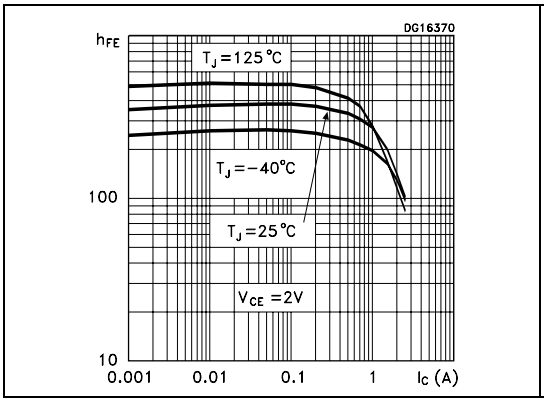


Figure 3. Collector-emitter saturation voltage

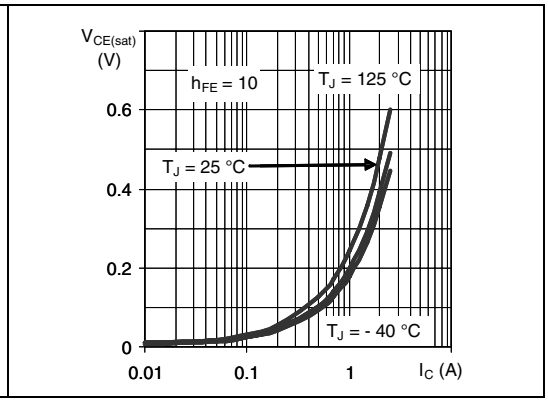


Figure 4. Base-emitter saturation voltage

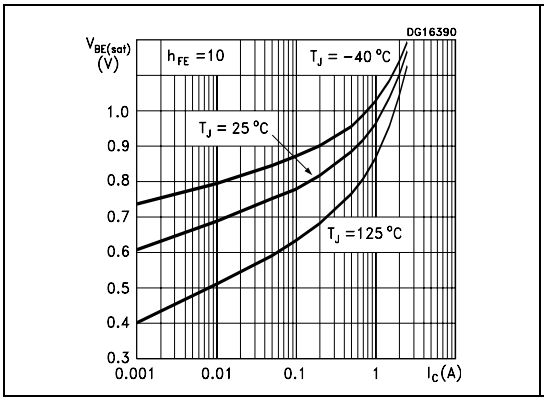


Figure 5. Resistive load switching on

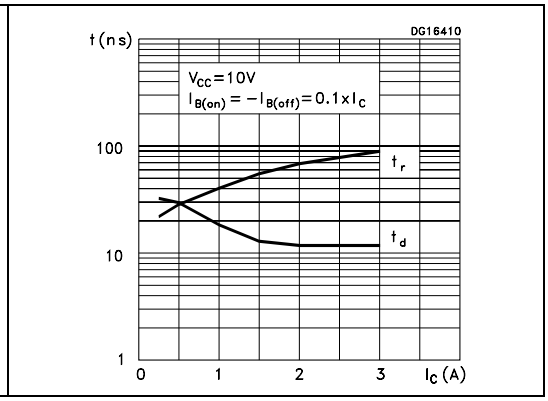


Figure 6. Resistive load switching off

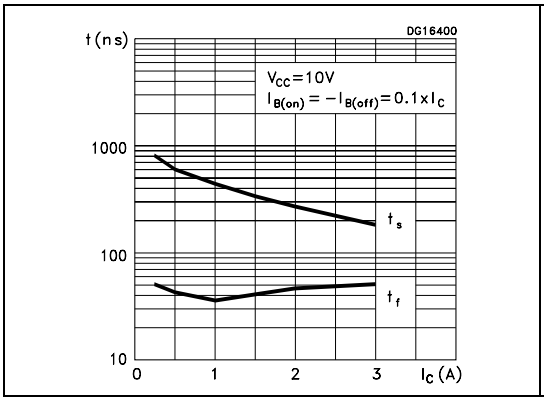
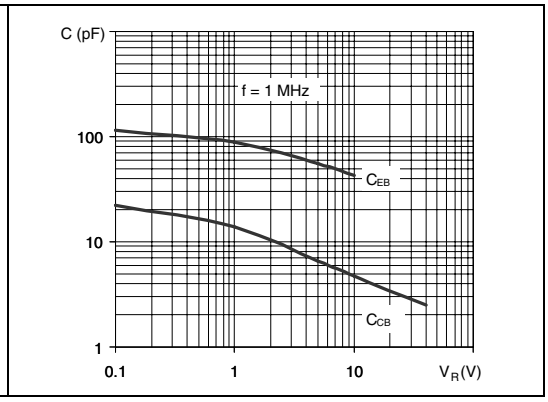
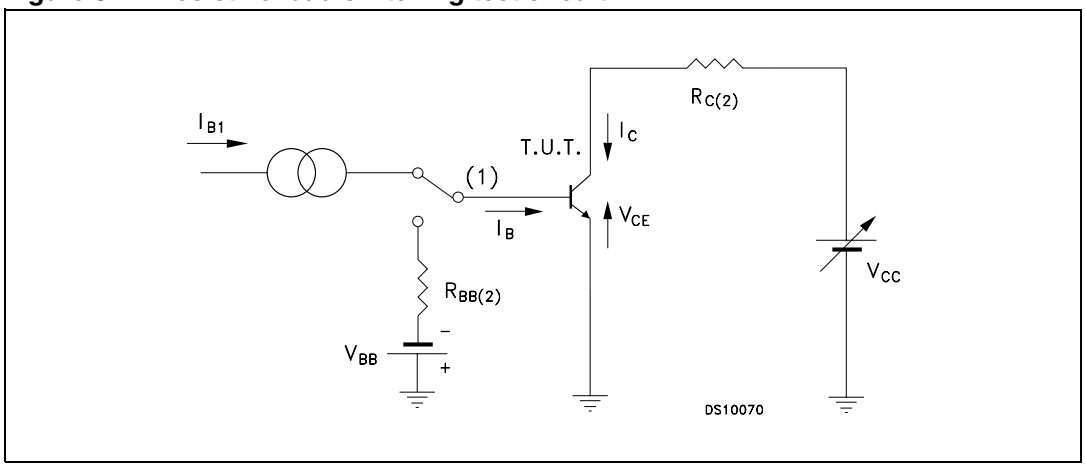


Figure 7. Capacitance



2.2 Test circuits

Figure 8. Resistive load switching test circuit



1. Fast electronic switch
2. Non-inductive resistor

3 Package mechanical data

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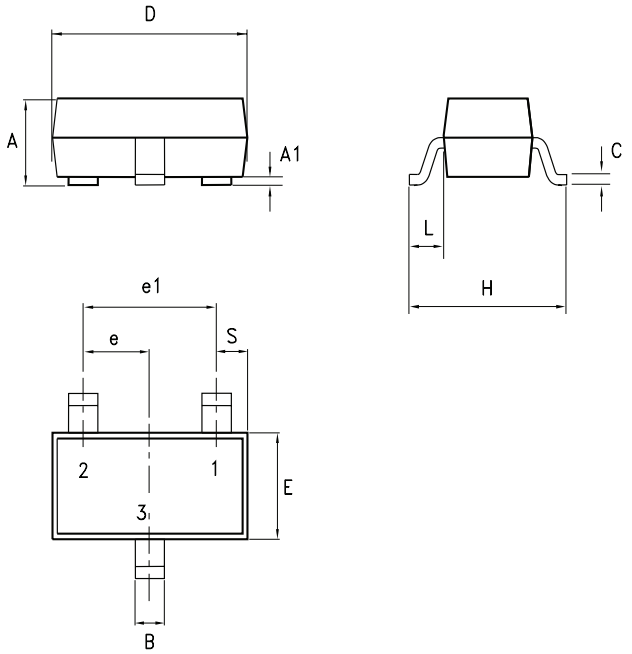
SOT-23 mechanical data

DIM.	mm.		
	min.	typ	max.
A	0.89		1.4
A1	0		0.1
B	0.3		0.51
C	0.085		0.18
D	2.75		3.04
e	0.85		1.05
e1	1.7		2.1
E	1.2		1.6
H	2.1		2.75
L		0.6	
S	0.35		0.65



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4 Revision history

Table 5. Document revision history

Date	Revision	Changes
18-Jul-2006	1	Initial release
24-Oct-2006	2	New graphics
09-Oct-2009	3	Updated: *Figure 3*, *Figure 7* and package mechanical data.

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