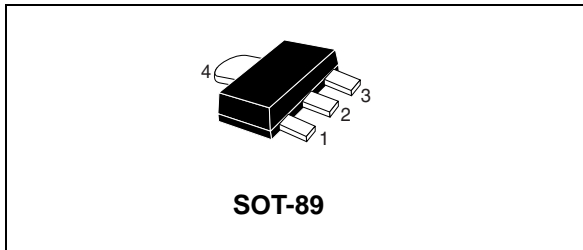
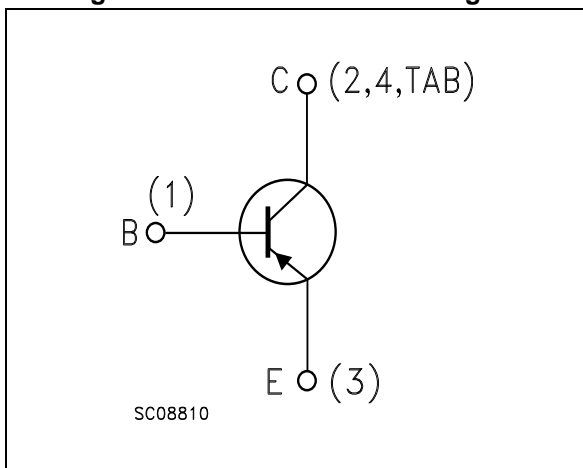


Low voltage fast-switching PNP power transistors

Datasheet - production data


Figure 1. Internal schematic diagram


Applications

- Emergency lighting
- LED
- Voltage regulation
- Relay drive

Description

The device is PNP transistor manufactured using new "PB-HDC" (power bipolar high density current) technology. The resulting transistor shows exceptional high gain performances coupled with very low saturation voltage.

Features

- Very low collector-emitter saturation voltage
- High current gain characteristic
- Fast-switching speed

Table 1. Device summary

| Order code | Marking | Package | Packaging |
|------------|---------|---------|---------------|
| 2STF2360 | 2360 | SOT-89 | Tape and reel |

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1 Absolute maximum ratings

Table 2. Absolute maximum ratings

| Symbol | Parameter | Value | Unit |
|-----------|---|------------|------|
| V_{CBO} | Collector-base voltage ($I_E = 0$) | -60 | V |
| V_{CEO} | Collector-emitter voltage ($I_B = 0$) | -60 | V |
| V_{EBO} | Emitter-base voltage ($I_C = 0$) | -6 | V |
| I_C | Collector current | -3 | A |
| I_{CM} | Collector peak current ($t_p < 5$ ms) | -5 | A |
| I_B | Base current | -0.2 | A |
| I_{BM} | Base peak current ($t_p < 5$ ms) | -0.4 | A |
| P_{TOT} | Total dissipation at $T_{amb} = 25$ °C | 1.4 | W |
| T_{stg} | Storage temperature | -65 to 150 | °C |
| T_J | Max. operating junction temperature | 150 | °C |

Table 3. Thermal data

| Symbol | Parameter | SOT-89 | Unit |
|------------------|---|--------|------|
| $R_{thJA}^{(1)}$ | Thermal resistance junction-ambient Max | 89 | °C/W |

1. Device mounted on a PCB area of 1 cm²

2 Electrical characteristics

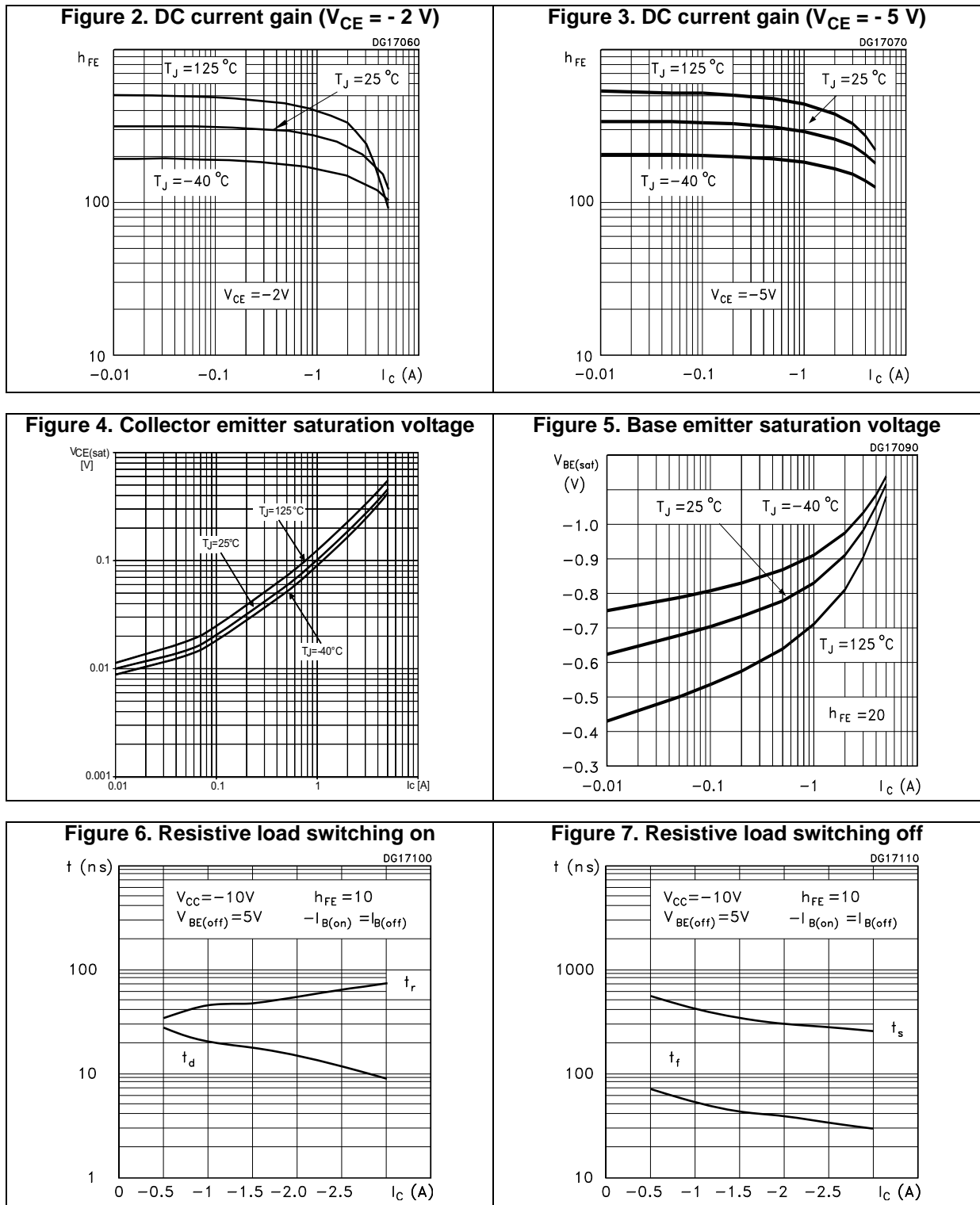
$T_{CASE} = 25^{\circ}\text{C}$; unless otherwise specified.

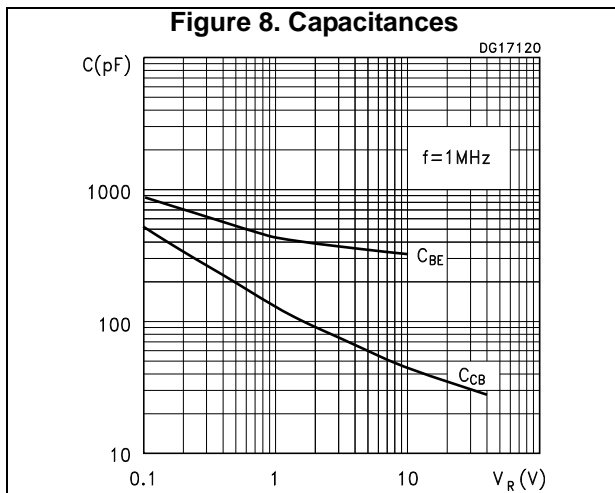
Table 4. Electrical characteristics

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---------------------|--|---|------------|--------------|--------------|----------|
| I_{CBO} | Collector cut-off current ($I_E = 0$) | $V_{CB} = -60\text{ V}$ | | | -100 | nA |
| I_{EBO} | Emitter cut-off current ($I_C = 0$) | $V_{EB} = -6\text{ V}$ | | | -100 | nA |
| $V_{BE(on)}$ | Base-emitter on voltage | $V_{CE} = -2\text{ V}$ $I_C = -100\text{ mA}$ | -630 | -650 | -730 | mV |
| $V_{CE(sat)}^{(1)}$ | Collector-emitter saturation voltage | $I_C = -2\text{ A}$ $I_B = -100\text{ mA}$ $I_C = -3\text{ A}$ $I_B = -150\text{ mA}$ | | -200 -300 | -320 -500 | mV mV |
| $V_{BE(sat)}^{(1)}$ | Base-emitter saturation voltage | $I_C = -2\text{ A}$ $I_B = -100\text{ mA}$ | | -0.9 | -1.2 | V |
| $h_{FE}^{(1)}$ | DC current gain | $I_C = -100\text{ mA}$ $V_{CE} = -2\text{ V}$ $I_C = -1\text{ A}$ $V_{CE} = -2\text{ V}$ | 200 160 | | 400 | |
| t_d | Resistive load Delay time | $I_C = -3\text{ A}$ $V_{CC} = -10\text{ V}$ $I_{B(on)} = -I_{B(off)} = -300\text{ mA}$ $V_{BE(off)} = 5\text{ V}$ | | 10 | 15 | ns |
| t_r | Rise time | | | 75 | 100 | ns |
| t_s | Storage time | | | 250 | 350 | ns |
| t_f | Fall time | | | 35 | 50 | ns |
| f_T | Transition frequency | $I_C = -0.1\text{ A}$ $V_{CE} = -10\text{ V}$ | | 130 | | MHz |

1. Pulse test: pulse duration $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

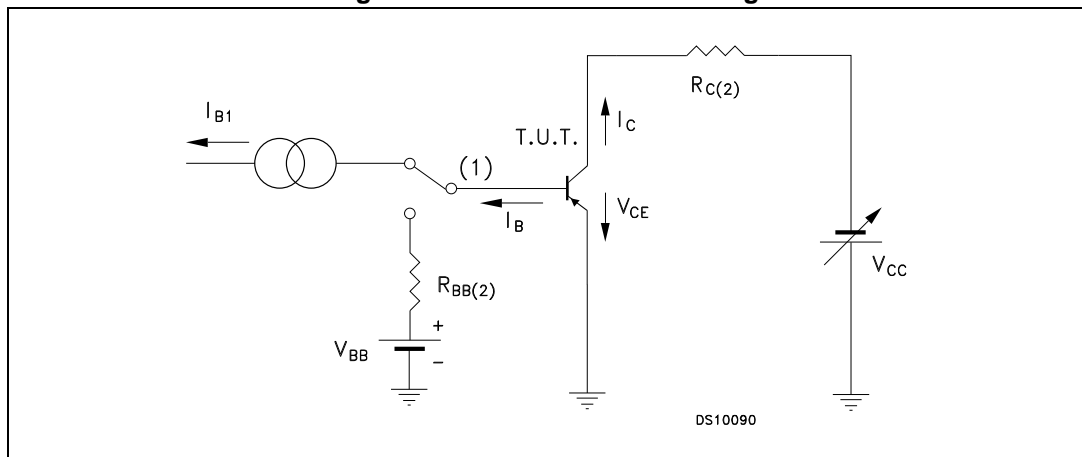
2.1 Typical characteristics (curves)





2.2 Test circuits

Figure 9. Resistive load switching



1. Fast electronic switch
2. Non-inductive resistor

3 Package mechanical data

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3.1 SOT-89

Figure 10. SOT-89 package outline

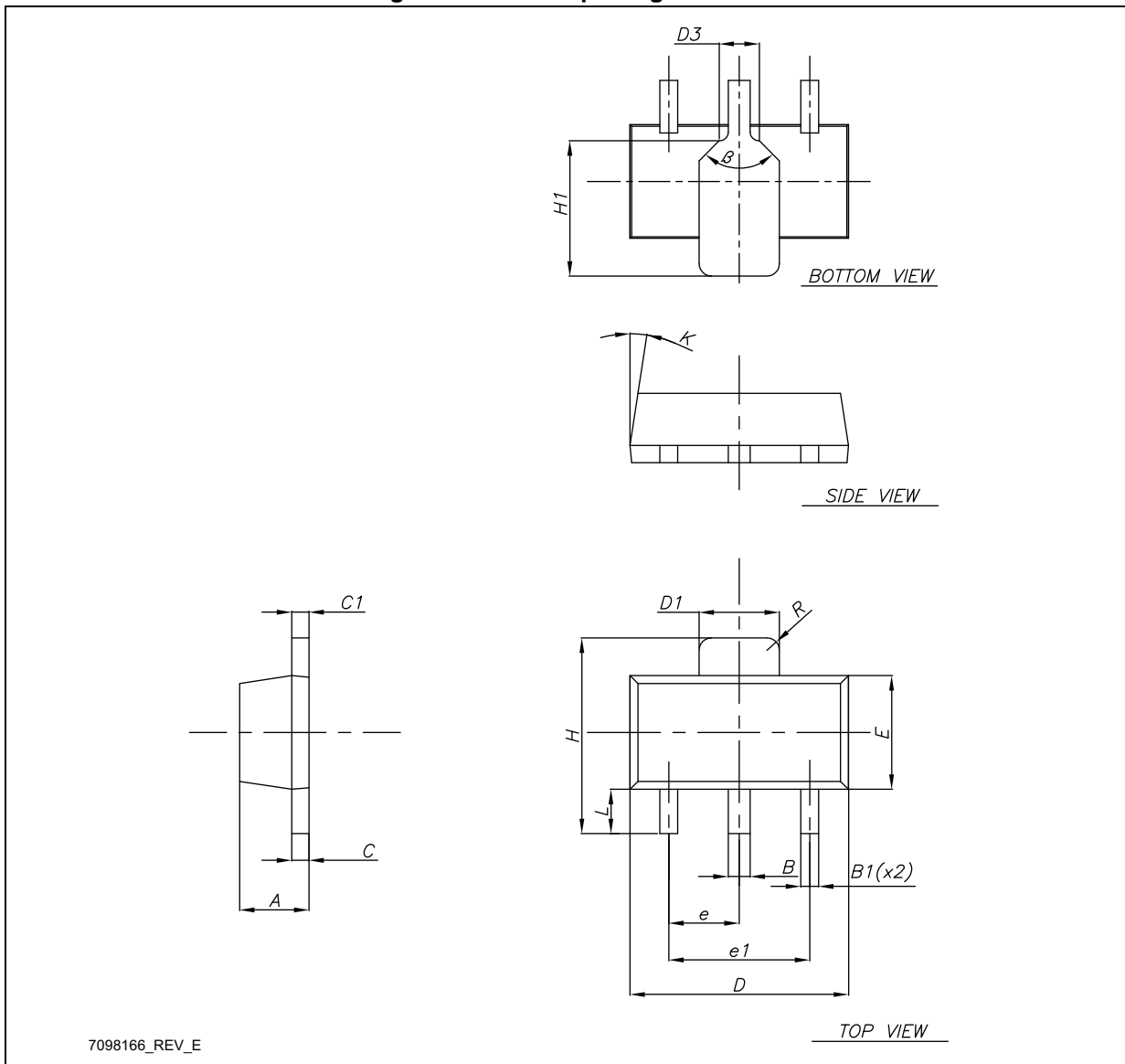
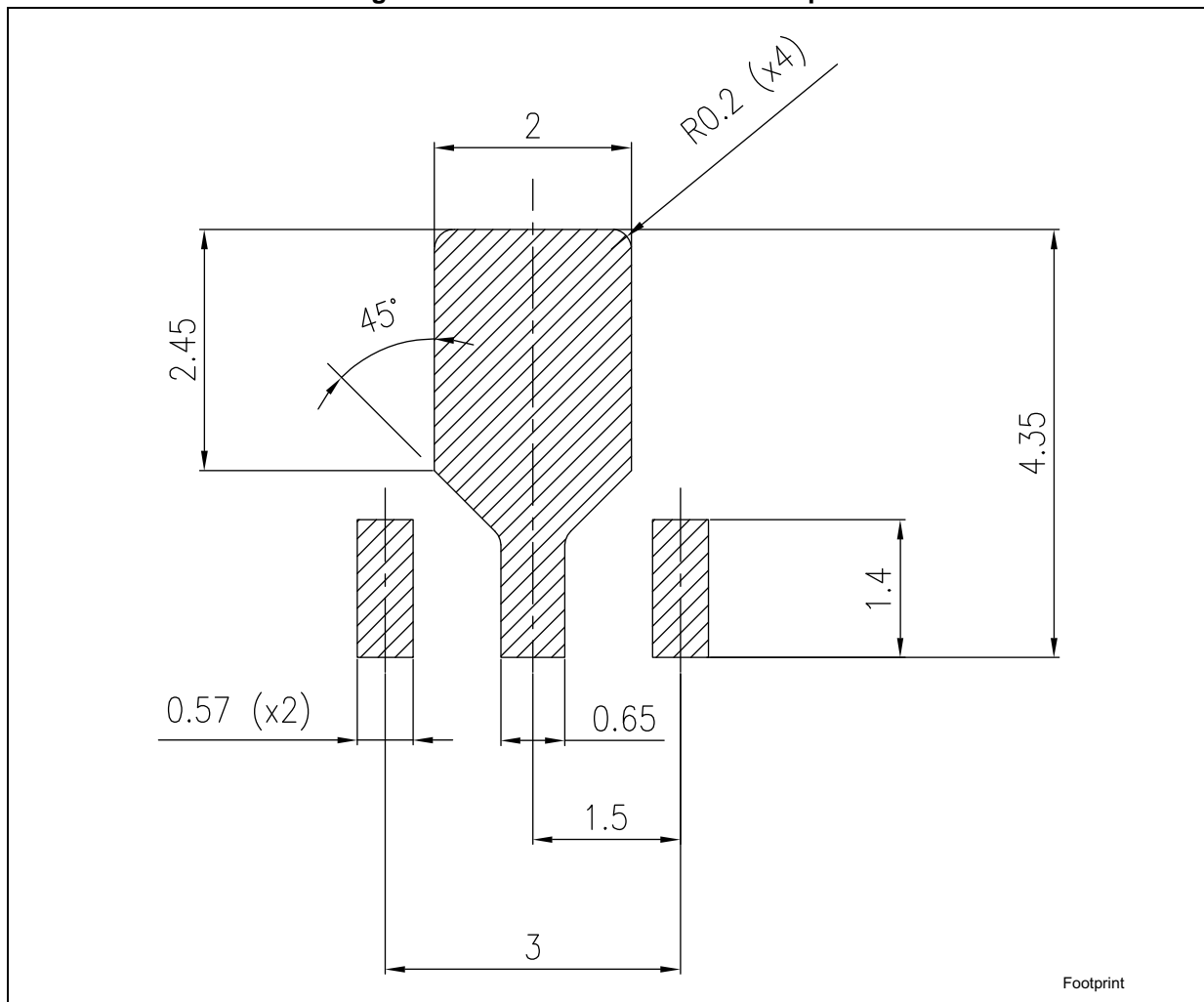


Table 5. SOT-89 mechanical data

| Dim. | mm | | |
|------|------|------|------|
| | Min. | Typ. | Max. |
| A | 1.40 | | 1.60 |
| B | 0.44 | | 0.56 |
| B1 | 0.36 | | 0.48 |
| C | 0.35 | | 0.44 |
| C1 | 0.35 | | 0.44 |
| D | 4.40 | | 4.60 |
| D1 | 1.62 | | 1.83 |
| D3 | | 0.90 | |
| E | 2.29 | | 2.60 |
| e | 1.42 | | 1.57 |
| e1 | 2.92 | | 3.07 |
| H | 3.94 | | 4.25 |
| H1 | 2.70 | | 3.10 |
| K | 1° | | 8° |
| L | 0.89 | | 1.20 |
| R | | 0.25 | |
| b | | 90° | |

Figure 11. SOT-89 recommended footprint



4 Revision history

Table 6. Document revision history

| Date | Revision | Changes |
|-------------|----------|--|
| 13-Sep-2006 | 1 | Initial release |
| 02-Mar-2007 | 2 | New graphics have been added |
| 23-Jan-2009 | 3 | Updated mechanical data |
| 09-Oct-2009 | 4 | Added 2STD2360T4 in TO-252 (DPAK) package |
| 14-Oct-2009 | 5 | Modified Table 1 on page 1 . |
| 05-Dec-2014 | 6 | Removed SOT-223 and TO-250 (DPAK) packages. Update description in cover page, Table 1: Device summary , Section 1: Absolute maximum ratings , Table 4: Electrical characteristics , Section 2.1: Typical characteristics (curves) and Section 3: Package mechanical data . Minor text changes. |

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