

ST(意法) 2SC5200 PDF

深圳创唯电子有限公司

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High power NPN epitaxial planar bipolar transistor

Preliminary data

Features

- High breakdown voltage $V_{CE0} = 230\text{ V}$
- Typical $f_T = 30\text{ MHz}$

Application

- Audio power amplifier

Description

This device is a NPN transistor manufactured using new BiT-LA (bipolar transistor for linear amplifier) technology. The resulting transistor shows good gain linearity behaviour.

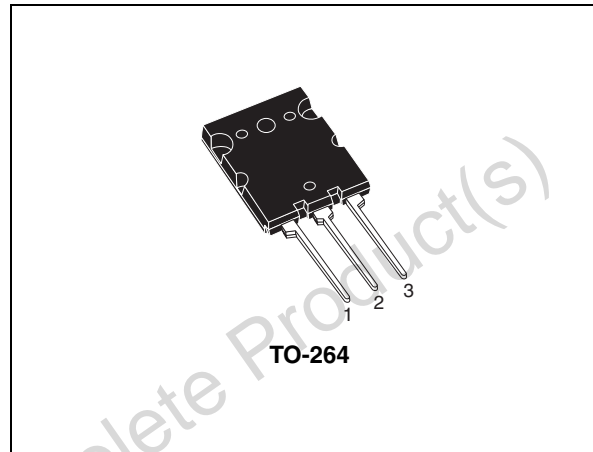


Figure 1. Internal schematic diagram

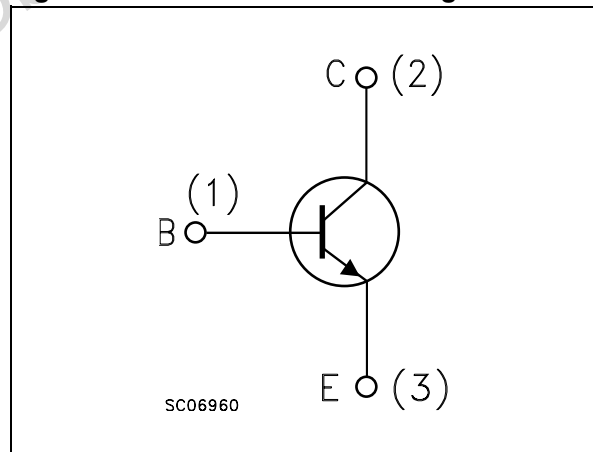


Table 1. Device summary

| Order code | Marking | Package | Packaging |
|------------|---------|---------|-----------|
| 2SC5200 | 2SC5200 | TO-264 | Tube |

1 Electrical ratings

Table 2. Absolute maximum ratings

| Symbol | Parameter | Value | Unit |
|-----------|---|------------|------|
| V_{CBO} | Collector-base voltage ($I_E = 0$) | 230 | V |
| V_{CEO} | Collector-emitter voltage ($I_B = 0$) | 230 | V |
| V_{EBO} | Emitter-base voltage ($I_C = 0$) | 5 | V |
| I_C | Collector current | 15 | A |
| I_{CM} | Collector peak current | 30 | A |
| P_{TOT} | Total dissipation at $T_C = 25\text{ °C}$ | 150 | W |
| T_{STG} | Storage temperature | -55 to 150 | °C |
| T_J | Operating junction temperature | 150 | °C |

Table 3. Thermal data

| Symbol | Parameter | Value | Unit |
|------------|--------------------------------------|-------|------|
| R_{thJC} | Thermal resistance junction-case max | 0.83 | °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_{CBO} | Collector cut-off current ($I_{\text{E}} = 0$) | $V_{\text{CB}} = 230\text{ V}$ | | | 5 | μA |
| I_{EBO} | Emitter cut-off current ($I_{\text{C}} = 0$) | $V_{\text{EB}} = 5\text{ V}$ | | | 5 | μA |
| $V_{(\text{BR})\text{CEO}}^{(1)}$ | Collector-emitter breakdown voltage ($I_{\text{B}} = 0$) | $I_{\text{C}} = 50\text{ mA}$ | 230 | | | V |
| $V_{(\text{BR})\text{CBO}}$ | Collector-base breakdown voltage ($I_{\text{E}} = 0$) | $I_{\text{C}} = 100\text{ }\mu\text{A}$ | 230 | | | V |
| $V_{(\text{BR})\text{EBO}}^{(1)}$ | Emitter-base breakdown voltage ($I_{\text{C}} = 0$) | $I_{\text{E}} = 1\text{ mA}$ | 5 | | | V |
| $V_{\text{CE(sat)}}^{(1)}$ | Collector-emitter saturation voltage | $I_{\text{C}} = 8\text{ A}$ $I_{\text{B}} = 800\text{ mA}$ | | | 3 | V |
| V_{BE} | Base-emitter voltage | $I_{\text{C}} = 7\text{ A}$ $V_{\text{CE}} = 5\text{ V}$ | | | 1.5 | V |
| h_{FE} | DC current gain | $I_{\text{C}} = 1\text{ A}$ $V_{\text{CE}} = 5\text{ V}$ $I_{\text{C}} = 7\text{ A}$ $V_{\text{CE}} = 5\text{ V}$ | 55 35 | 80 | 120 | |
| t_{on} t_{s} t_{f} | Resistive load Turn-on time Storage time Fall time | $V_{\text{CC}} = 60\text{ V}$ $I_{\text{C}} = 5\text{ A}$ $I_{\text{B1}} = -I_{\text{B2}} = 0.5\text{ A}$ | | 0.24 4.7 0.6 | | μs μs μs |
| f_{T} | Transition frequency | $I_{\text{C}} = 1\text{ A}$ $V_{\text{CE}} = 5\text{ V}$ | | 30 | | MHz |
| C_{CBO} | Collector-base capacitance ($I_{\text{E}} = 0$) | $V_{\text{CB}} = 10\text{ V}$ $f = 1\text{ MHz}$ | | 150 | | pF |

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

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

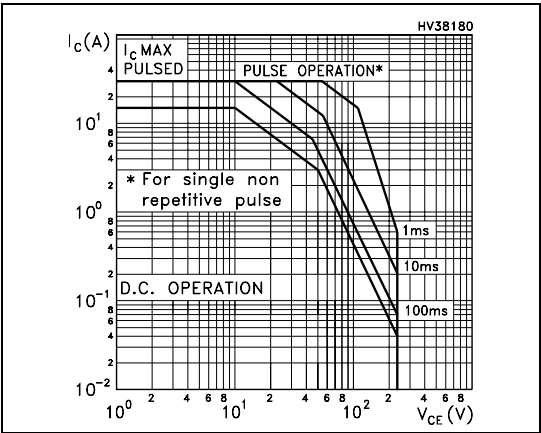
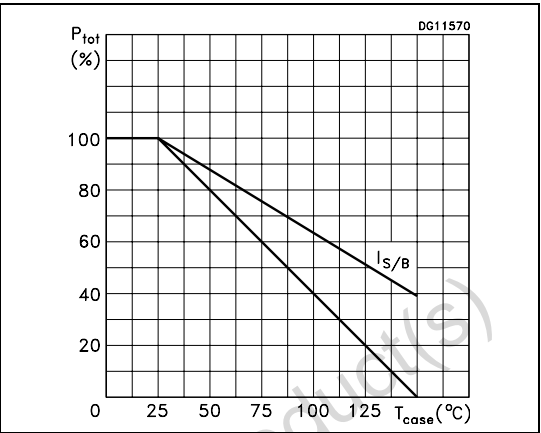
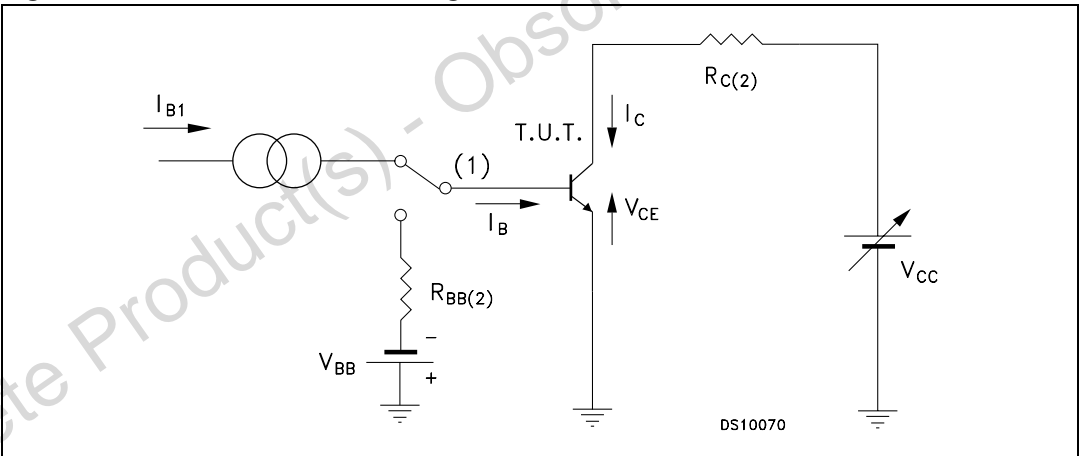


Figure 3. Derating curve



2.2 Test circuit

Figure 4. Resistive load switching test circuit



1. Fast electronic switch
2. Non-inductive resistor

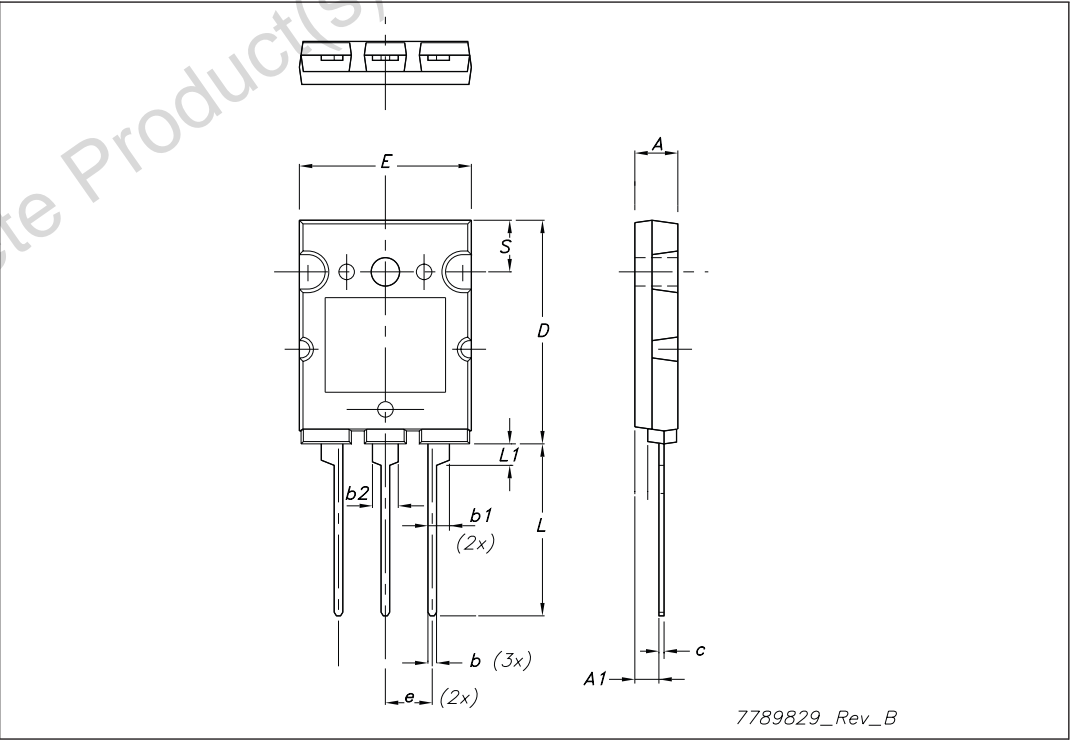
3 Package mechanical data

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Obsolete Product(s) - Obsolete Product(s)

TO-264 Mechanical data

| Dim. | mm. | | |
|------|-------|------|-------|
| | Min. | Typ | Max. |
| A | 4.80 | | 5.20 |
| A1 | 2.50 | | 3.10 |
| b | 0.90 | 1.0 | 1.25 |
| b1 | | 2.5 | |
| b2 | | 2.8 | |
| c | 0.50 | 0.60 | 0.85 |
| D | 25.6 | | 26.4 |
| E | 19.80 | | 20.20 |
| e | 5.15 | | 5.75 |
| L | 19.50 | | 20.50 |
| L1 | 2.30 | | 2.70 |
| øP | 3.55 | | 3.65 |



4 Revision history

Table 5. Document revision history

| Date | Revision | Changes |
|-------------|----------|------------------|
| 28-Sep-2009 | 1 | Initial release. |

Obsolete Product(s) - Obsolete Product(s)

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