

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

| Symbol | Parameter | Value | Unit |
|-----------|--|------------|------|
| V_{CEO} | Collector-emitter voltage ($I_B = 0$) | 80 | V |
| V_{EBO} | Emitter-base voltage ($I_C = 0$) | 5 | V |
| I_C | Collector current | 10 | A |
| I_{CM} | Collector peak current | 20 | A |
| P_{TOT} | Total dissipation at $T_{case} = 25\text{ °C}$ | 36 | W |
| T_{STG} | Storage temperature | -55 to 150 | °C |
| T_J | Max. operating junction temperature | 150 | °C |

Note: For PNP types voltage and current values are negative.

Table 3. Thermal data

| Symbol | Parameter | Value | Unit |
|------------|---|-------|------|
| R_{thJC} | Thermal resistance junction-case max | 3.5 | °C/W |
| R_{thJA} | Thermal resistance junction-ambient max | 62.5 | °C/W |

2 Electrical characteristics

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

Table 4. Electrical characteristics

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|-----------------------------|---|---|------|------|------|---------------|
| $V_{\text{CEO(sus)}}^{(1)}$ | Collector-emitter sustaining voltage ($I_{\text{B}} = 0$) | $I_{\text{C}} = 30\text{ mA}$ | 80 | - | | V |
| I_{CES} | Collector cut-off current ($V_{\text{BE}} = 0$) | $V_{\text{CE}} = 80\text{ V}$ | | - | 10 | μA |
| I_{EBO} | Emitter cut-off current ($I_{\text{C}} = 0$) | $V_{\text{EB}} = 5\text{ V}$ | | - | 50 | μA |
| $V_{\text{CE(sat)}}^{(1)}$ | Collector-emitter saturation voltage | $I_{\text{C}} = 8\text{ A}$ $I_{\text{B}} = 0.4\text{ A}$ | | - | 1 | V |
| $V_{\text{BE(sat)}}^{(1)}$ | Base-emitter saturation voltage | $I_{\text{C}} = 8\text{ A}$ $I_{\text{B}} = 0.8\text{ A}$ | | - | 1.5 | V |
| $h_{\text{FE}}^{(1)}$ | DC current gain | $I_{\text{C}} = 2\text{ A}$ $V_{\text{CE}} = 1\text{ V}$ | 60 | - | | |
| | | $I_{\text{C}} = 4\text{ A}$ $V_{\text{CE}} = 1\text{ V}$ | 40 | - | | |

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

Note: For PNP types voltage and current values are negative.

2.1 Electrical characteristics (curves)

Figure 2. DC current gain (NPN)

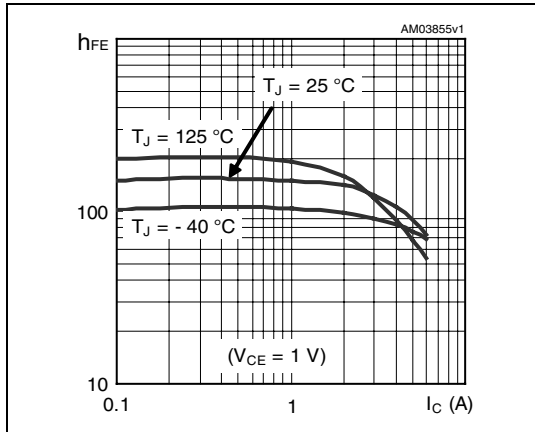


Figure 3. DC current gain (PNP)

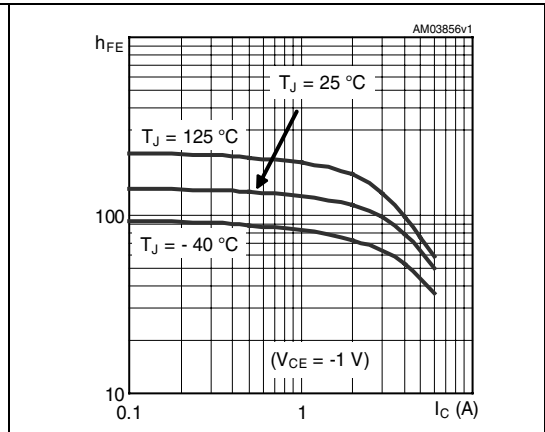


Figure 4. Saturation voltage (NPN)

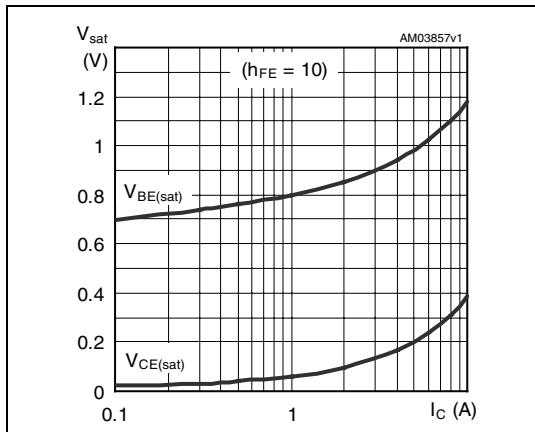
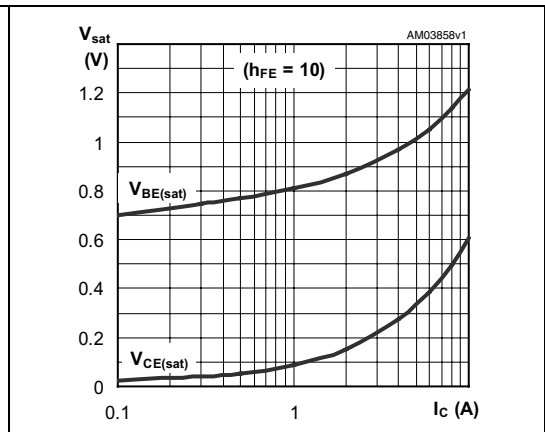


Figure 5. Saturation voltage (PNP)



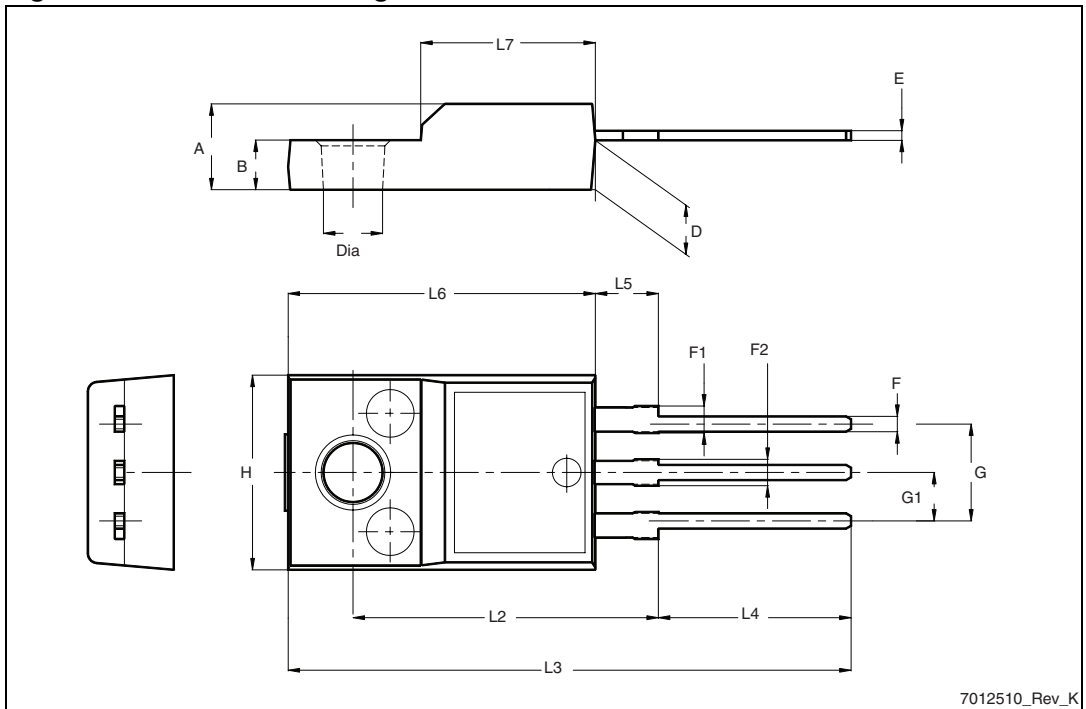
3 Package mechanical data

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Table 5. TO-220FP mechanical data

| Dim. | mm | | |
|------|------|------|------|
| | Min. | Typ. | Max. |
| A | 4.4 | | 4.6 |
| B | 2.5 | | 2.7 |
| D | 2.5 | | 2.75 |
| E | 0.45 | | 0.7 |
| F | 0.75 | | 1 |
| F1 | 1.15 | | 1.70 |
| F2 | 1.15 | | 1.70 |
| G | 4.95 | | 5.2 |
| G1 | 2.4 | | 2.7 |
| H | 10 | | 10.4 |
| L2 | | 16 | |
| L3 | 28.6 | | 30.6 |
| L4 | 9.8 | | 10.6 |
| L5 | 2.9 | | 3.6 |
| L6 | 15.9 | | 16.4 |
| L7 | 9 | | 9.3 |
| Dia | 3 | | 3.2 |

Figure 6. TO-220FP drawing



4 Revision history

Table 6. Document revision history

| Date | Revision | Changes |
|-------------|----------|---|
| 06-Aug-2009 | 1 | Initial release. |
| 22-Oct-2009 | 2 | Document status promoted from preliminary data to datasheet, updated I_C current value on Table 2: Absolute maximum ratings , inserted new Section 2.1: Electrical characteristics (curves) and updated package mechanical data (see Table 5 and Figure 6) |
| 11-Mar-2011 | 3 | Updated $V_{CE(sat)}$ and $V_{BE(sat)}$ maximum values on Table 4: Electrical characteristics |

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