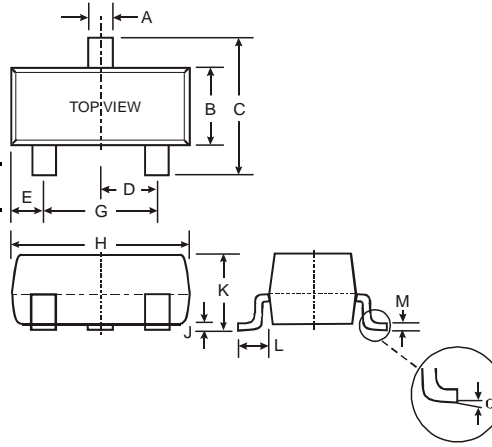


Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTD)
- Built-In Biasing Resistors, R1, R2
- **Lead, Halogen and Antimony Free, RoHS Compliant "Green" Device (Notes 2 and 3)**

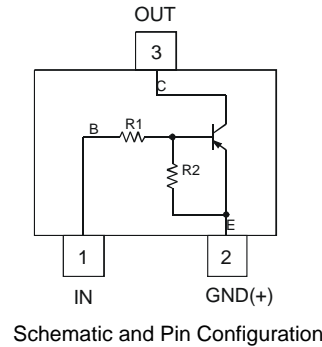
Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminal Connections: See Diagram
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe)
- Marking Information: See Table Below & Page 3
- Ordering Information: See Page 3
- Weight: 0.008 grams (approximate)



| SOT-23 | | |
|----------------------|-------|-------|
| Dim | Min | Max |
| A | 0.37 | 0.51 |
| B | 1.20 | 1.40 |
| C | 2.30 | 2.50 |
| D | 0.89 | 1.03 |
| E | 0.45 | 0.60 |
| G | 1.78 | 2.05 |
| H | 2.80 | 3.00 |
| J | 0.013 | 0.10 |
| K | 0.903 | 1.10 |
| L | 0.45 | 0.61 |
| M | 0.085 | 0.180 |
| α | 0° | 8° |
| All Dimensions in mm | | |

| P/N | R1 (NOM) | R2 (NOM) | Type Code |
|-----------|----------|----------|-----------|
| DDTB113EC | 1K | 1K | P60 |
| DDTB123EC | 2.2K | 2.2K | P61 |
| DDTB143EC | 4.7K | 4.7K | P62 |
| DDTB114EC | 10K | 10K | P63 |
| DDTB122JC | 0.22K | 4.7K | P64 |
| DDTB113ZC | 1K | 10K | P65 |
| DDTB123YC | 2.2K | 10K | P66 |
| DDTB133HC | 3.3K | 10K | P67 |
| DDTB123TC | 2.2K | OPEN | P69 |
| DDTB143TC | 4.7K | OPEN | P70 |
| DDTB114TC | 10K | OPEN | P71 |
| DDTB114GC | 0 | 10K | P72 |



Maximum Ratings @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|---|------|
| Supply Voltage, (3) to (2) | V _{CC} | -50 | V |
| Input Voltage, (1) to (2) | V _{IN} | DDTB113EC: +10 to -10 DDTB123EC: +10 to -12 DDTB143EC: +10 to -30 DDTB114EC: +10 to -40 DDTB122JC: +5 to -5 DDTB113ZC: +5 to -10 DDTB123YC: +5 to -12 DDTB133HC: +6 to -20 | V |
| Input Voltage, (1) to (2) | V _{EBO (MAX)} | -5 | V |
| Output Current | I _C | -500 | mA |
| Power Dissipation | P _D | 200 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 1) | R _{θJA} | 625 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

- Notes:
1. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.
 2. No purposefully added lead. Halogen and Antimony Free.
 3. Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb₂O₃ Fire Retardants.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified **R1, R2 Types**

| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------|--|--------------|--|-----|--|---------|--|
| Input Voltage | DDTB113EC DDTB123EC DDTB143EC DDTB114EC DDTB122JC DDTB113ZC DDTB123YC DDTB133HC | $V_{I(off)}$ | -0.5 -0.5 -0.5 -0.5 -0.5 -0.3 -0.3 -0.3 | — | — | V | $V_{CC} = -5V, I_O = -100\mu A$ |
| | DDTB113EC DDTB123EC DDTB143EC DDTB114EC DDTB122JC DDTB113ZC DDTB123YC DDTB133HC | $V_{I(on)}$ | — | — | -3.0 -3.0 -3.0 -3.0 -3.0 -2.0 -2.0 -2.0 | V | $V_O = -0.3V, I_O = -20mA$ $V_O = -0.3V, I_O = -20mA$ $V_O = -0.3V, I_O = -20mA$ $V_O = -0.3V, I_O = -10mA$ $V_O = -0.3V, I_O = -30mA$ $V_O = -0.3V, I_O = -20mA$ $V_O = -0.3V, I_O = -20mA$ $V_O = -0.3V, I_O = -20mA$ |
| Output Voltage | | $V_{O(on)}$ | — | — | -0.3V | V | $I_O/I_I = -50mA/-2.5mA$ |
| Input Current | DDTB113EC DDTB123EC DDTB143EC DDTB114EC DDTB122JC DDTB113ZC DDTB123YC DDTB133HC | I_I | — | — | -7.2 -3.8 -1.8 -0.88 -28 -7.2 -3.6 -2.4 | mA | $V_I = -5V$ |
| Output Current | | $I_{O(off)}$ | — | — | -0.5 | μA | $V_{CC} = -50V, V_I = 0V$ |
| DC Current Gain | DDTB113EC DDTB123EC DDTB143EC DDTB114EC DDTB122JC DDTB113ZC DDTB123YC DDTB133HC | G_I | 33 39 47 56 47 56 56 56 | — | — | — | $V_O = -5V, I_O = -50mA$ |
| Gain-Bandwidth Product* | | f_T | — | 200 | — | MHz | $V_{CE} = -10V, I_E = -5mA, f = 100MHz$ |

* Transistor - For Reference Only

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified **R1-Only, R2-Only Types**

| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|--------------------------------------|--|---------------|-------------------------|------------------------|------------------------------|---------|---|
| Collector-Base Breakdown Voltage | | BV_{CBO} | -50 | — | — | V | $I_C = -50\mu A$ |
| Collector-Emitter Breakdown Voltage | | BV_{CEO} | -40 | — | — | V | $I_C = -1mA$ |
| Emitter-Base Breakdown Voltage | DDTB123TC DDTB143TC DDTB114TC DDTB114GC | BV_{EBO} | -5 | — | — | V | $I_E = -50\mu A$ $I_E = -50\mu A$ $I_E = -50\mu A$ $I_E = -720\mu A$ |
| Collector Cutoff Current | | I_{CBO} | — | — | -0.5 | μA | $V_{CB} = -50V$ |
| Emitter Cutoff Current | DDTB123TC DDTB143TC DDTB114TC DDTB114GC | I_{EBO} | — — — -300 | — | -0.5 -0.5 -0.5 -580 | μA | $V_{EB} = -4V$ |
| Collector-Emitter Saturation Voltage | | $V_{CE(sat)}$ | — | — | -0.3 | V | $I_C = -50mA, I_B = -2.5mA$ |
| DC Current Transfer Ratio | DDTB123TC DDTB143TC DDTB114TC DDTB114GC | h_{FE} | 100 100 100 56 | 250 250 250 — | 600 600 600 — | — | $I_C = -5mA, V_{CE} = -5V$ |
| Gain-Bandwidth Product* | | f_T | — | 200 | — | MHz | $V_{CE} = -10V, I_E = 5mA, f = 100MHz$ |

* Transistor - For Reference Only

Ordering Information (Note 4)

| Device | Packaging | Shipping |
|---------------|-----------|------------------|
| DDTB113EC-7-F | SOT-23 | 3000/Tape & Reel |
| DDTB123EC-7-F | SOT-23 | 3000/Tape & Reel |
| DDTB143EC-7-F | SOT-23 | 3000/Tape & Reel |
| DDTB114EC-7-F | SOT-23 | 3000/Tape & Reel |
| DDTB122JC-7-F | SOT-23 | 3000/Tape & Reel |
| DDTB113ZC-7-F | SOT-23 | 3000/Tape & Reel |
| DDTB123YC-7-F | SOT-23 | 3000/Tape & Reel |
| DDTB133HC-7-F | SOT-23 | 3000/Tape & Reel |
| DDTB123TC-7-F | SOT-23 | 3000/Tape & Reel |
| DDTB143TC-7-F | SOT-23 | 3000/Tape & Reel |
| DDTB114TC-7-F | SOT-23 | 3000/Tape & Reel |
| DDTB114GC-7-F | SOT-23 | 3000/Tape & Reel |

Notes: 4. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



PXX = Product Type Marking Code, See Table on Page 1
 YM = Date Code Marking
 Y = Year ex: N = 2002
 M = Month ex: 9 = September

Date Code Key

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | N | P | R | S | T | U | V | W | X | Y | Z |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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