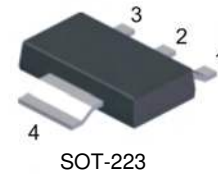


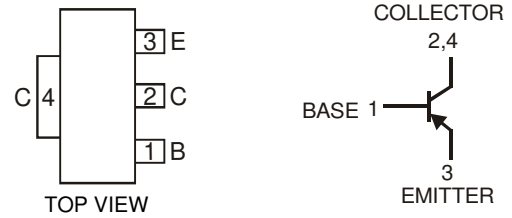
**Features**

- Epitaxial Planar Die Construction
- Low Collector-Emitter Saturation Resistance  $R_{CE(SAT)} = 70m\Omega$  at 3A
- High DC Current Gain  $h_{FE} > 200$  at  $I_C = 2A$
- Complementary NPN Type Available (DNLS320E)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **“Green” Device (Note 2)**



**Mechanical Data**

- Case: SOT-223
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish – Matte Tin annealed over Copper Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.112 grams (approximate)



**Maximum Ratings** @ $T_A = 25^\circ C$  unless otherwise specified

| Characteristic               | Symbol    | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Base Voltage       | $V_{CBO}$ | -25   | V    |
| Collector-Emitter Voltage    | $V_{CEO}$ | -25   | V    |
| Emitter-Base Voltage         | $V_{EBO}$ | -5    | V    |
| Continuous Collector Current | $I_C$     | -3    | A    |
| Peak Pulse Current           | $I_{CM}$  | -6    | A    |

**Thermal Characteristics**

| Characteristic  | Symbol          | Value       | Unit         |
|---|-----------------|-------------|--------------|
| Power Dissipation @ $T_A = 25^\circ C$ (Note 3)                           | $P_D$           | 1           | W            |
| Thermal Resistance, Junction to Ambient Air (Note 1) @ $T_A = 25^\circ C$ | $R_{\theta JA}$ | 125         | $^\circ C/W$ |
| Operating and Storage Temperature Range                                   | $T_J, T_{STG}$  | -55 to +150 | $^\circ C$   |

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Device mounted on FR-4 PCB, pad layout as shown on page 4 or in Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

## Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic                       | Symbol                | Min | Typ                      | Max                    | Unit          | Test Condition   |
|--------------------------------------|-----------------------|-----|--------------------------|------------------------|---------------|--|
| <b>OFF CHARACTERISTICS (Note 4)</b>  |                       |     |                          |                        |               |  |
| Collector-Base Breakdown Voltage     | $V_{(BR)CBO}$         | -25 | -58                      | —                      | V             | $I_C = -100\mu\text{A}, I_E = 0$   |
| Collector-Emitter Breakdown Voltage  | $V_{(BR)CEO}$         | -25 | -38                      | —                      | V             | $I_C = -10\text{mA}, I_B = 0$  |
| Emitter-Base Breakdown Voltage       | $V_{(BR)EBO}$         | -5  | -8.5                     | —                      | V             | $I_E = -100\mu\text{A}, I_C = 0$   |
| Collector Cutoff Current             | $I_{CBO}$             | —   | —                        | -0.1<br>10             | $\mu\text{A}$ | $V_{CB} = -15\text{V}, I_E = 0, T_A = 100^\circ\text{C}$   |
| Emitter Cutoff Current               | $I_{EBO}$             | —   | —                        | -0.1                   | $\mu\text{A}$ | $V_{EB} = -4\text{V}, I_C = 0$   |
| <b>ON CHARACTERISTICS (Note 4)</b>   |                       |     |                          |                        |               |  |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$         | —   | -0.11<br>-0.20<br>-0.21  | -0.25<br>-0.45<br>-0.5 | V             | $I_C = -1\text{A}, I_B = -10\text{mA}$<br>$I_C = -2\text{A}, I_B = -20\text{mA}$<br>$I_C = -3\text{A}, I_B = -100\text{mA}$  |
| Base-Emitter Saturation Voltage      | $V_{BE(SAT)}$         | —   | -0.8                     | -1.0                   | V             | $I_C = -1\text{A}, I_B = -10\text{mA}$   |
| Base-Emitter Turn-On Voltage         | $V_{BE(ON)}$          | —   | -0.8                     | —                      | V             | $V_{CE} = -2\text{V}, I_C = -1\text{A}$  |
| DC Current Gain                      | $h_{FE}$              | —   | 300<br>250<br>200<br>100 | 800<br>—<br>—<br>—     | —             | $V_{CE} = -2\text{V}, I_C = -10\text{mA}$<br>$V_{CE} = -2\text{V}, I_C = -1\text{A}$<br>$V_{CE} = -2\text{V}, I_C = -2\text{A}$<br>$V_{CE} = -2\text{V}, I_C = -6\text{A}$ |
| <b>AC CHARACTERISTICS</b>            |                       |     |                          |                        |               |  |
| Transition Frequency                 | $f_T$                 | 100 | —                        | —                      | MHz           | $V_{CE} = -5\text{V}, I_C = -50\text{mA}, f = 30\text{MHz}$  |
| Input Capacitance                    | $C_{ibo}$             | —   | 290                      | —                      | MHz           | $V_{EB} = -0.5\text{V}, f = 1\text{MHz}$   |
| Output Capacitance                   | $C_{obo}$             | —   | 46                       | —                      | pF            | $V_{CB} = -10\text{V}, f = 1\text{MHz}$  |
| Switching Times                      | $t_{on}$<br>$t_{off}$ | —   | 38<br>200                | —                      | ns            | $V_{CC} = -10\text{V}, I_C = -500\text{mA}, I_{B1} = -I_{B2} = -50\text{mA}$   |

Notes: 4. Pulse Test: Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2.0\%$ .

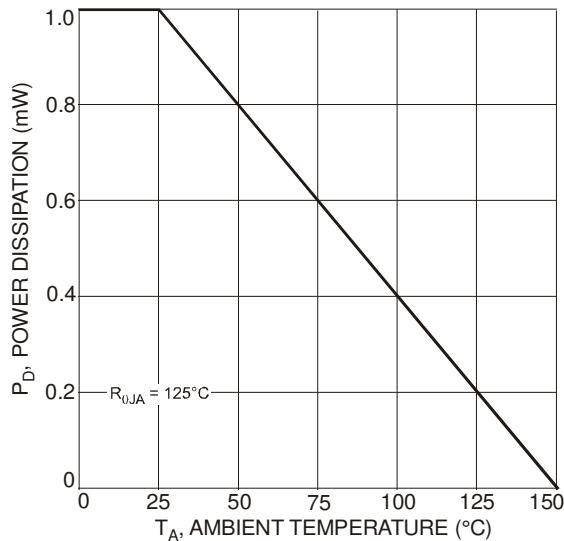


Fig. 1 Max Power Dissipation vs. Ambient Temperature

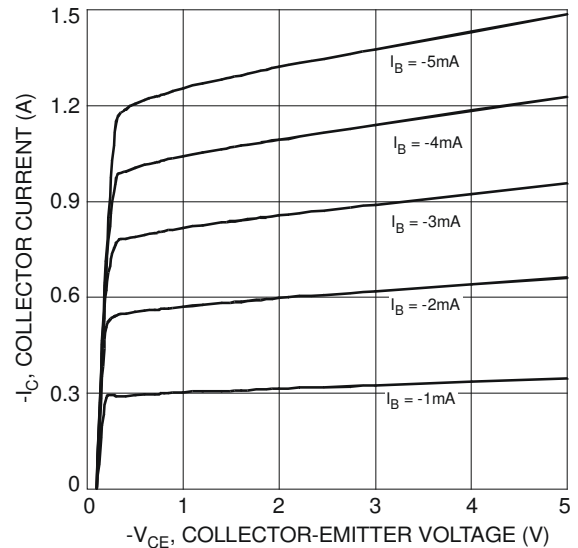


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

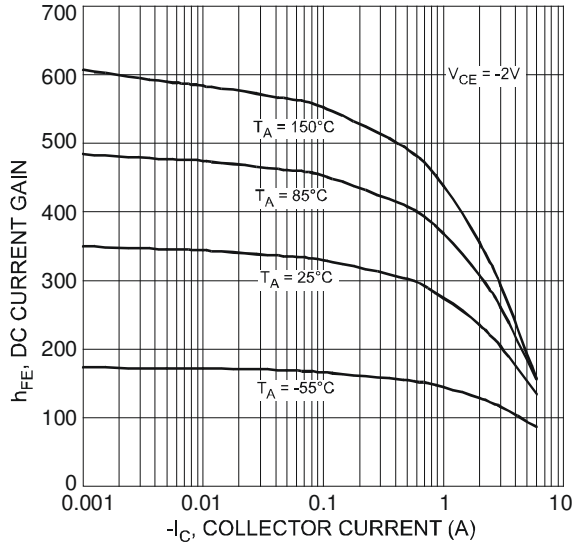


Fig. 3 Typical DC Current Gain vs. Collector Current

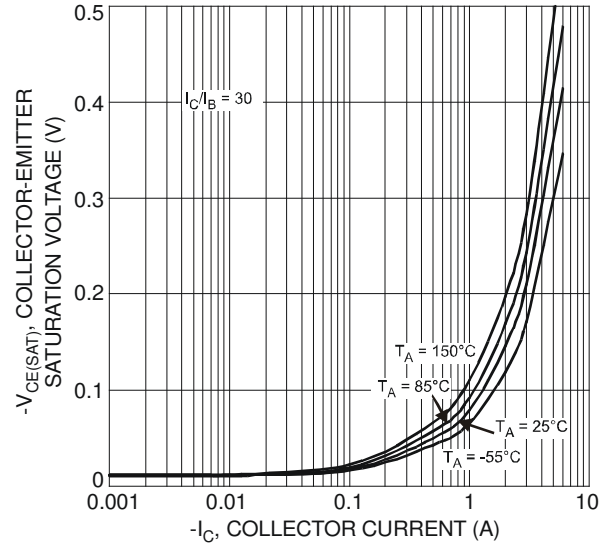


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

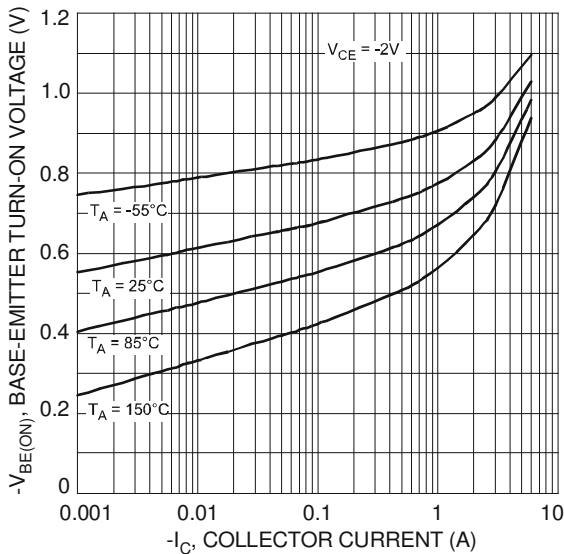


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

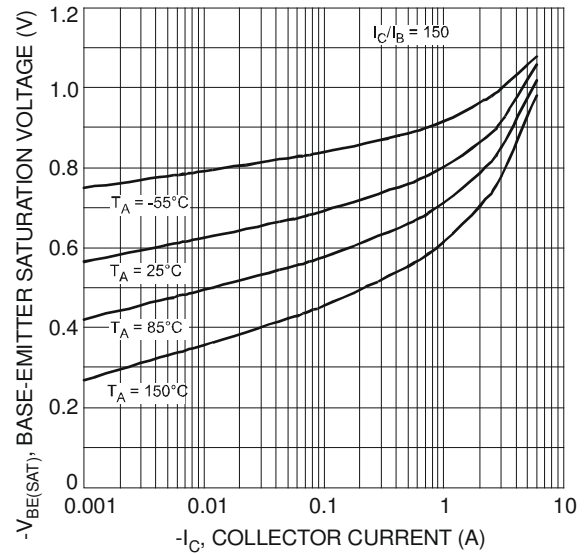


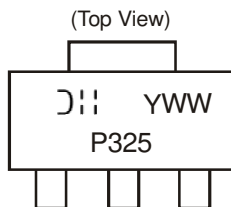
Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

**Ordering Information** (Note 5)

| Device      | Packaging | Shipping         |
|-------------|-----------|------------------|
| DPLS325E-13 | SOT-223   | 2500/Tape & Reel |

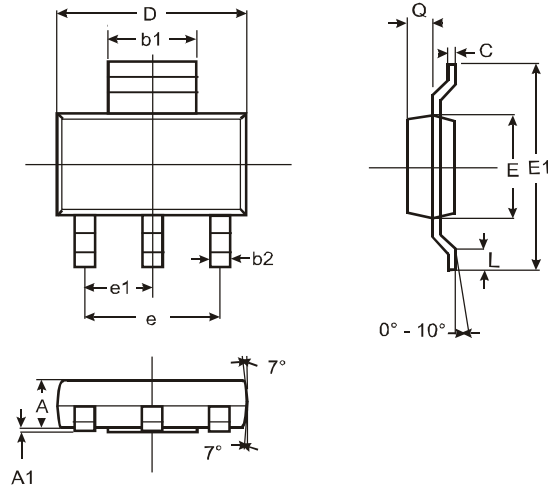
Notes: 5. For packaging details, please go to our website at <http://www.diodes.com/ap02007.pdf>.

**Marking Information**



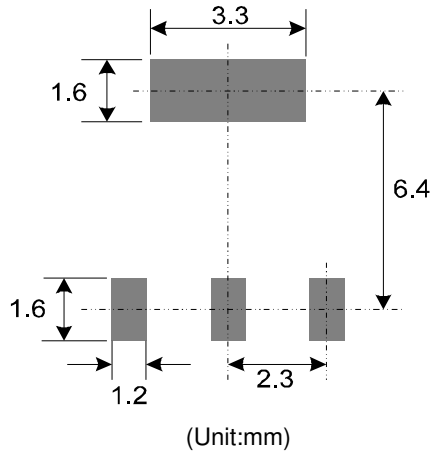
P325 = Product Type Marking Code  
YWW = Date Code Marking  
Y = Last digit of year ex: 7 = 2007  
WW = Week code 01 - 52

**Package Outline Dimensions**



| SOT-223              |       |      |      |
|----------------------|-------|------|------|
| Dim                  | Min   | Max  | Typ  |
| A                    | 1.55  | 1.65 | 1.60 |
| A1                   | 0.010 | 0.15 | 0.05 |
| b1                   | 2.90  | 3.10 | 3.00 |
| b2                   | 0.60  | 0.80 | 0.70 |
| C                    | 0.20  | 0.30 | 0.25 |
| D                    | 6.45  | 6.55 | 6.50 |
| E                    | 3.45  | 3.55 | 3.50 |
| E1                   | 6.90  | 7.10 | 7.00 |
| e                    | —     | —    | 4.60 |
| e1                   | —     | —    | 2.30 |
| L                    | 0.85  | 1.05 | 0.95 |
| Q                    | 0.84  | 0.94 | 0.89 |
| All Dimensions in mm |       |      |      |

**Suggested Pad Layout**



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