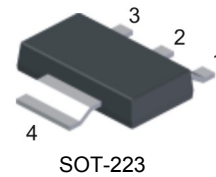


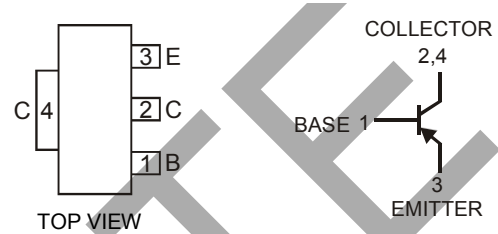
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Features

- Epitaxial Planar Die Construction
- Low Collector-Emitter Saturation Resistance $R_{CE(SAT)} = 70m\Omega$ at 3A
- High DC Current Gain $h_{FE} > 300$ at $I_C = 2A$
- Complementary NPN Type Available (DNLS412E)
- 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)**



SOT-223



Schematic and Pin Configuration

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_{CB0} | -15 | V |
| Collector-Emitter Voltage | V_{CEO} | -15 | V |
| Emitter-Base Voltage | V_{EBO} | -5 | V |
| Continuous Collector Current | I_C | -3 | A |
| Peak Pulse Current | I_{CM} | -8 | 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.
 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°C unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--------------------------------------|-------------------------------------|--------------------------|----------------------------------|---------------------------------|------|--|
| OFF CHARACTERISTICS (Note 4) | | | | | | |
| Collector-Base Breakdown Voltage | V _{(BR)CBO} | -15 | — | — | V | I _C = -100μA, I _E = 0 |
| Collector-Emitter Breakdown Voltage | V _{(BR)CEO} | -15 | — | — | V | I _C = -10mA, I _B = 0 |
| Emitter-Base Breakdown Voltage | V _{(BR)EBO} | -5 | — | — | V | I _E = -100μA, I _C = 0 |
| Collector Cutoff Current | I _{CBO} | — | — | -0.1 | μA | V _{CB} = -10V, I _E = 0 |
| Emitter Cutoff Current | I _{EBO} | — | — | -0.1 | μA | V _{EB} = -4V, I _C = 0 |
| ON CHARACTERISTICS (Note 4) | | | | | | |
| Collector-Emitter Saturation Voltage | V _{CE(SAT)} | — | -0.08 -0.12 -0.22 -0.21 | -0.15 -0.25 -0.45 -0.5 | V | I _C = -0.5A, I _B = -2.5mA I _C = -1A, I _B = -5mA I _C = -2A, I _B = -10mA I _C = -3A, I _B = -50mA |
| Base-Emitter Saturation Voltage | V _{BE(SAT)} | — | — | -0.9 | V | I _C = -1A, I _B = -5mA |
| Base-Emitter Turn-On Voltage | V _{BE(ON)} | — | -0.75 | — | V | V _{CE} = -2V, I _C = -1A |
| DC Current Gain | h _{FE} | 500 400 300 150 | — | 1500 | — | V _{CE} = -2V, I _C = -10mA V _{CE} = -2V, I _C = -1A V _{CE} = -2V, I _C = -2A V _{CE} = -2V, I _C = -6A |
| AC CHARACTERISTICS | | | | | | |
| Transition Frequency | f _T | 100 | — | — | MHz | V _{CE} = -5V, I _C = -50mA, f = 50MHz |
| Input Capacitance | C _{ibo} | — | 245 | — | pF | V _{EB} = -0.5V, f = 1MHz |
| Output Capacitance | C _{obo} | — | 45 | — | pF | V _{CB} = -10V, f = 1MHz |
| Switching Times | t _{on} t _{off} | — | 35 200 | — | ns | V _{CC} = -10V, I _C = -500mA, I _{B1} = -I _{B2} = -50mA |

Notes: 4. Pulse Test: Pulse width ≤300μs. Duty cycle ≤2.0%.

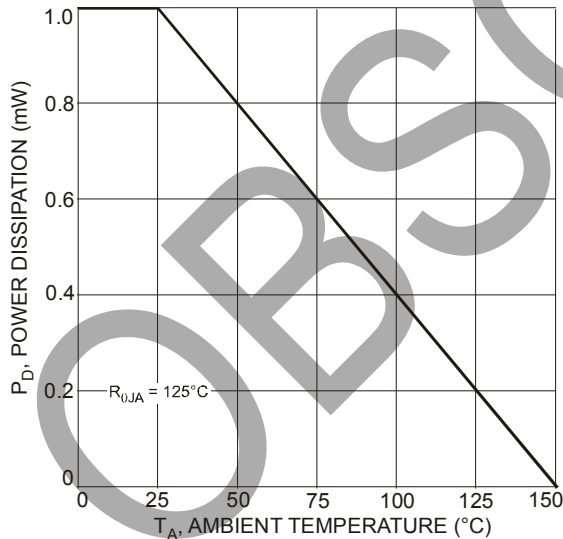


Fig. 1 Max Power Dissipation vs. Ambient Temperature

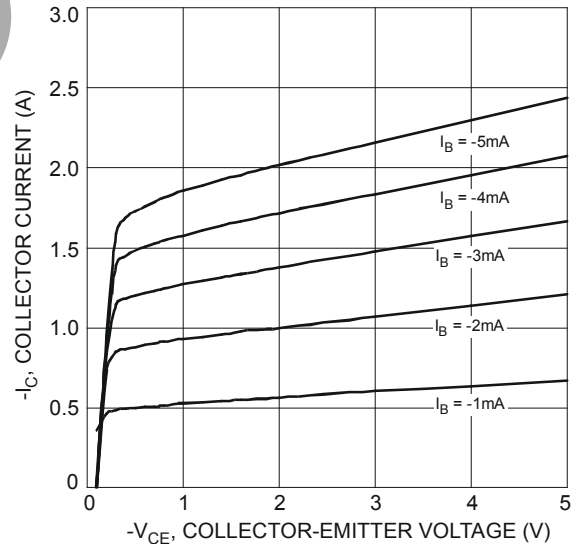


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

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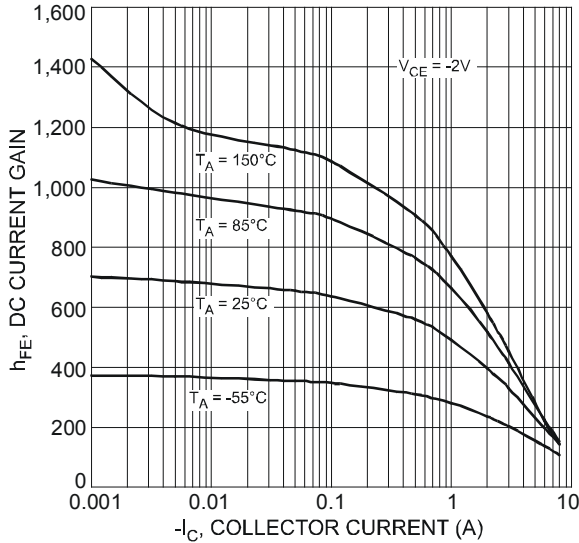


Fig. 3 Typical DC Current Gain vs. Collector Current

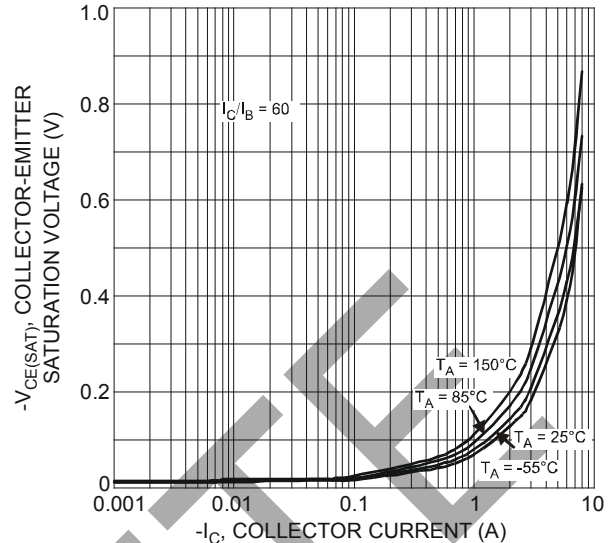


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

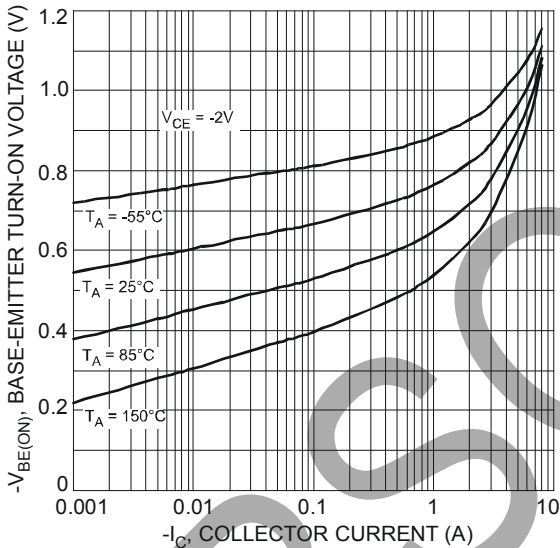


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

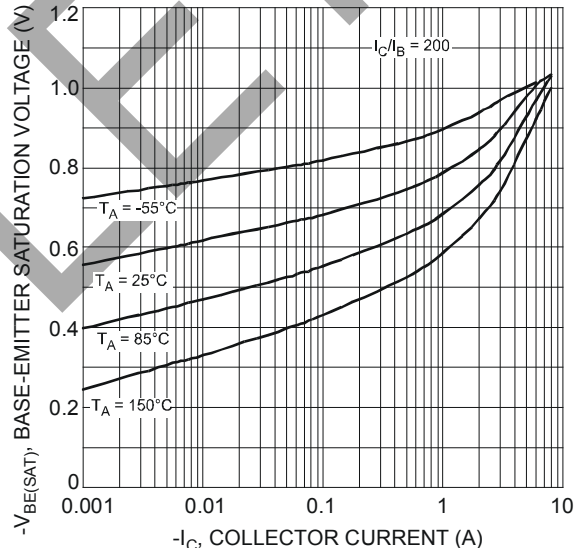


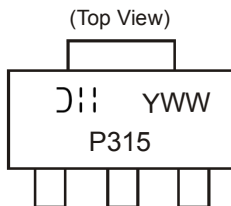
Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

Ordering Information (Note 5)

| Device | Packaging | Shipping |
|-------------|-----------|------------------|
| DPLS315E-13 | SOT-223 | 2500/Tape & Reel |

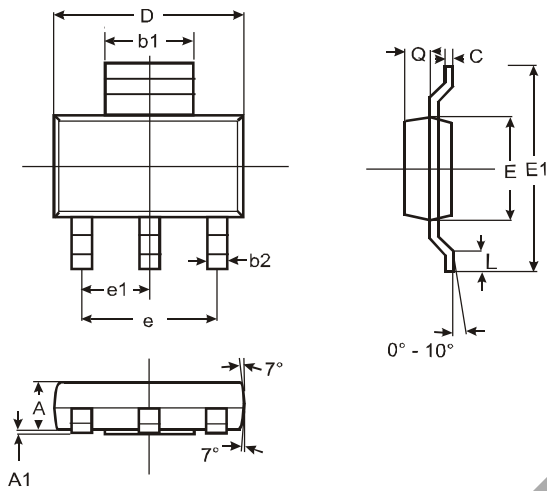
Notes: 5. For packaging details, please go to our website at <http://www.diodes.com/ap02007.pdf>.

Marking Information



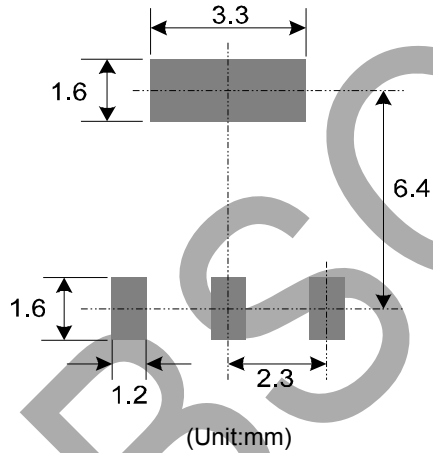
P315 = Product Type Marking Code
 YWW = Date Code Marking
 Y = Last digit of year ex: 7 = 2007
 WW = Week code 01 - 52

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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