


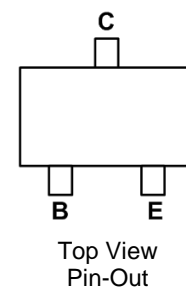
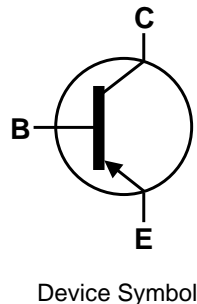
40V PNP LOW SATURATION TRANSISTOR IN SOT323

Features

- $BV_{CEO} > -40V$
- $I_C = -1A$ Continuous Collector Current
- $I_{CM} = -2A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -500mV @ I_C = -1A$
- Ultra-Small Surface Mount Package
- Complementary NPN Type: DSS4140U
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT323
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin Plated leads. Solderable per MIL-STD-202, Method 208 
- Weight: 0.006 grams (Approximate)

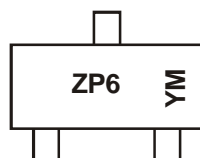


Ordering Information (Note 4)

| Device | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per reel |
|------------|------------|---------|--------------------|-----------------|-------------------|
| DSS5140U-7 | AEC-Q101 | ZP6 | 7 | 8 | 3,000 |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



ZP6 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: A = 2013)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | X | Y | Z | A | B | C | D | E | F | G | H |

| 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 |

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|--------------------------------|------------------|-------|------|
| Collector-Base Voltage | V _{CBO} | -40 | V |
| Collector-Emitter Voltage | V _{CEO} | -40 | V |
| Emitter-Base Voltage | V _{EBO} | -5 | V |
| Collector Current - Continuous | I _C | -1 | A |
| Peak Pulse Collector Current | I _{CM} | -2 | A |
| Peak Base Current | I _{BM} | -1 | A |

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

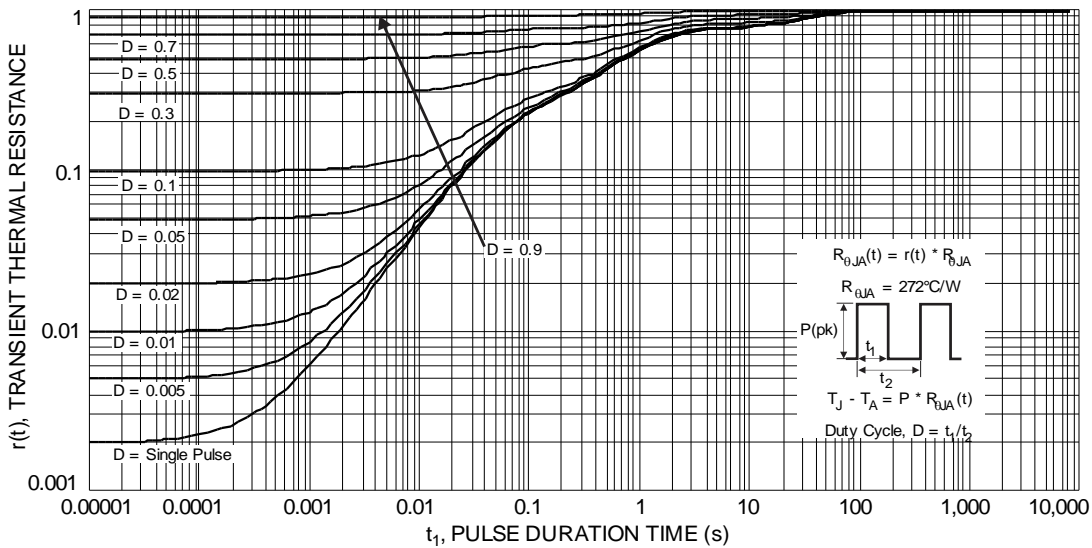
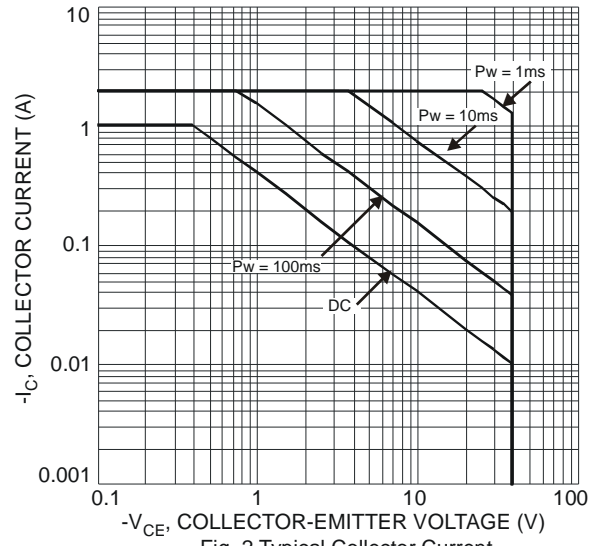
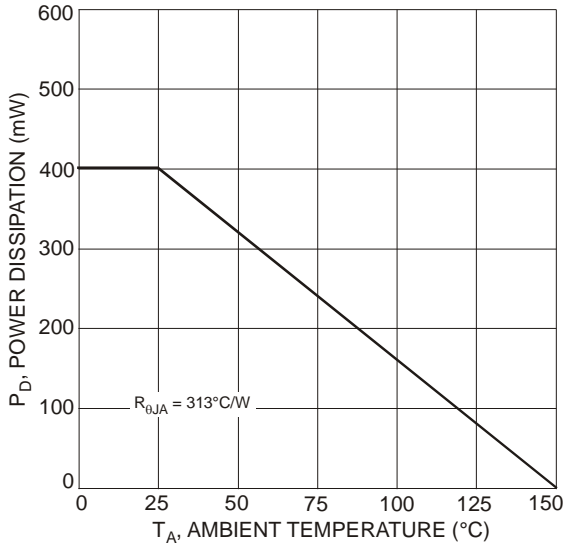
| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-----------------|------|
| Power Dissipation | P _D | (Note 5) 400 | mW |
| | | (Note 6) 500 | |
| Thermal Resistance, Junction to Ambient | R _{θJA} | (Note 5) 313 | °C/W |
| | | (Note 6) 250 | |
| Thermal Resistance, Junction to Leads | R _{θJL} | 350 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

ESD Ratings (Note 8)

| Characteristic | Symbol | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V | 3A |
| Electrostatic Discharge - Machine Model | ESD MM | 400 | V | C |

- Notes:
5. For a device mounted with collector lead on minimum recommended pad layout 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Same as Note 5, except the collector lead is on a 25mm x 25mm 1oz copper.
 7. Thermal resistance from junction to solder-point (at the end of the leads).
 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information



Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|----------------------|--------------------------|------------------|----------------------|----------|--|
| OFF CHARACTERISTICS | | | | | | |
| Collector-Base Breakdown Voltage | BV _{CBO} | -40 | — | — | V | I _C = -100μA, I _E = 0 |
| Collector-Emitter Breakdown Voltage (Note 9) | BV _{CEO} | -40 | — | — | V | I _C = -10mA, I _B = 0 |
| Emitter-Base Breakdown Voltage | BV _{EBO} | -5 | — | — | V | I _E = -100μA, I _C = 0 |
| Collector Cutoff Current | I _{CBO} | — | — | -100 -50 | nA μA | V _{CB} = -40V, I _E = 0 V _{CB} = -40V, I _E = 0, T _J = +150°C |
| Collector Cutoff Current | I _{CES} | — | — | -100 | nA | V _{CE} = -40V, V _{BE} = 0 |
| Emitter Cutoff Current | I _{EBO} | — | — | -100 | nA | V _{EB} = -5V, I _C = 0 |
| ON CHARACTERISTICS (Note 9) | | | | | | |
| DC Current Gain | h _{FE} | 300 300 250 160 | — — — — | — 800 — — | — | V _{CE} = -5V, I _C = -1mA V _{CE} = -5V, I _C = -100mA V _{CE} = -5V, I _C = -500mA V _{CE} = -5V, I _C = 1A |
| Collector-Emitter Saturation Voltage | V _{CE(SAT)} | — — — | — — — | -200 -250 -500 | mV | I _C = -100mA, I _B = -1mA I _C = -500mA, I _B = -50mA I _C = -1A, I _B = -100mA |
| Collector-Emitter Saturation Resistance | R _{CE(SAT)} | — | — | 500 | mΩ | I _C = -500mA, I _B = -50mA |
| Base-Emitter Saturation Voltage | V _{BE(SAT)} | — | — | -1.1 | V | I _C = -1A, I _B = -50mA |
| Base-Emitter Turn On Voltage | V _{BE(ON)} | — | — | -1 | V | V _{CE} = -5V, I _C = -1A |
| SMALL SIGNAL CHARACTERISTICS | | | | | | |
| Output Capacitance | C _{obo} | — | 13 | — | pF | V _{CB} = -10V, f = 1.0MHz |
| Current Gain-Bandwidth Product | f _T | 150 | — | — | MHz | V _{CE} = -10V, I _C = -50mA, f = 100MHz |
| SWITCHING CHARACTERISTICS | | | | | | |
| Turn-On Time | t _{on} | — | 60 | — | ns | V _{CC} = -10V I _C = -0.5A, I _{B1} = -I _{B2} = -25mA |
| Delay Time | t _d | — | 25 | — | ns | |
| Rise Time | t _r | — | 35 | — | ns | |
| Turn-Off Time | t _{off} | — | 250 | — | ns | |
| Storage Time | t _s | — | 220 | — | ns | |
| Fall Time | t _f | — | 30 | — | ns | |

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

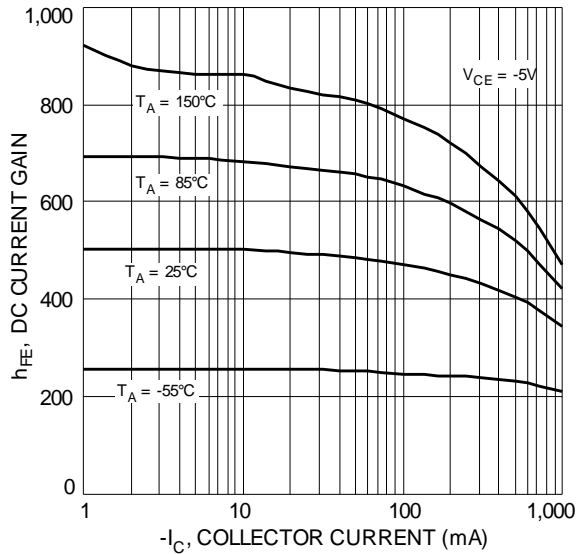


Fig. 4 Typical DC Current Gain vs. Collector Current

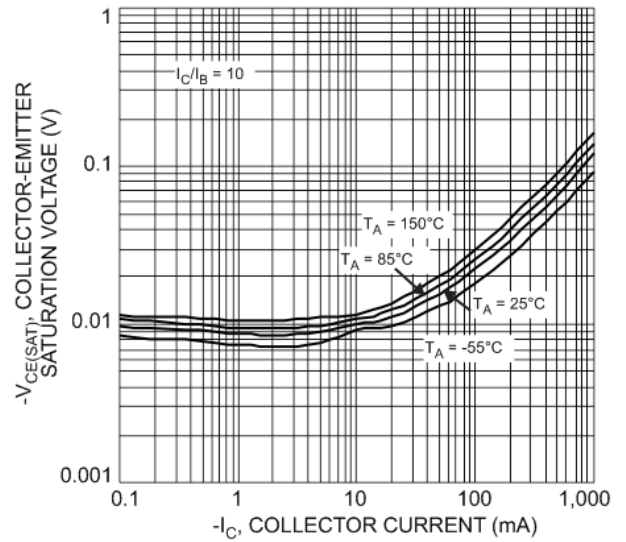


Fig. 5 Typical Collector-Emitter Saturation Voltage vs. Collector Current

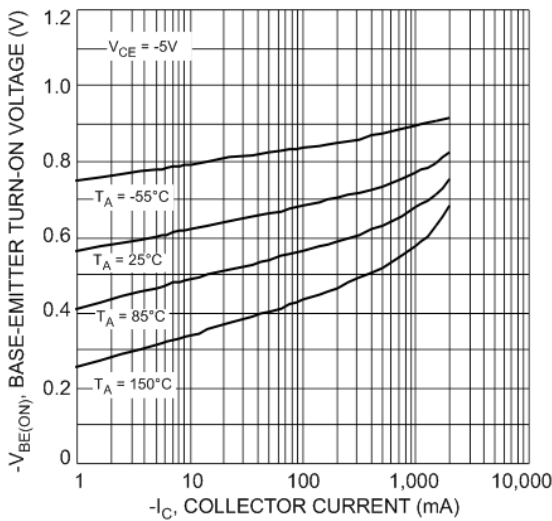


Fig. 6 Typical Base-Emitter Turn-On Voltage vs. Collector Current

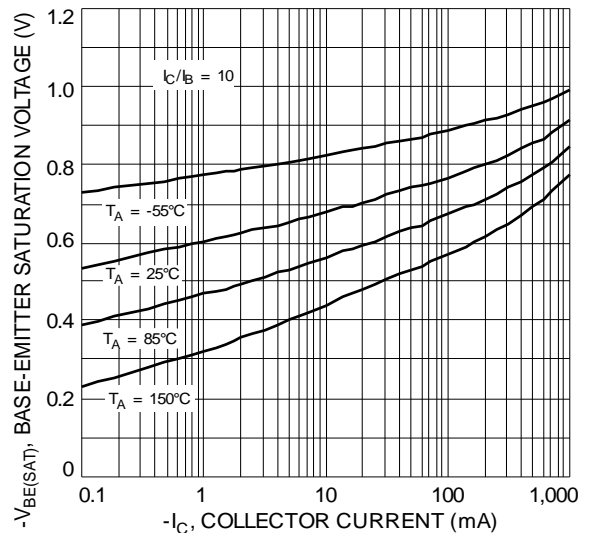


Fig. 7 Typical Base-Emitter Saturation Voltage vs. Collector Current

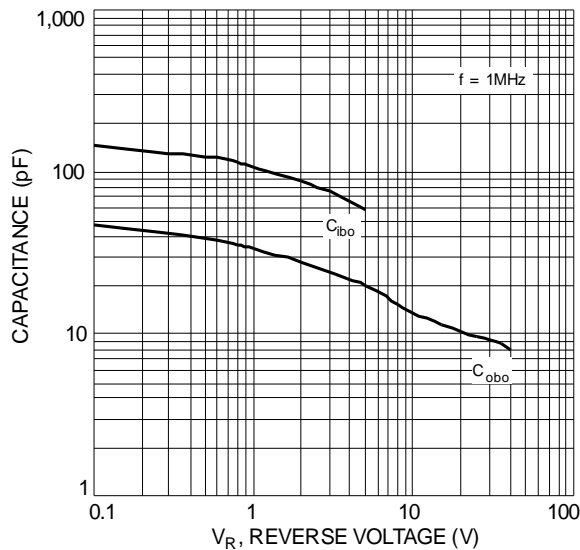
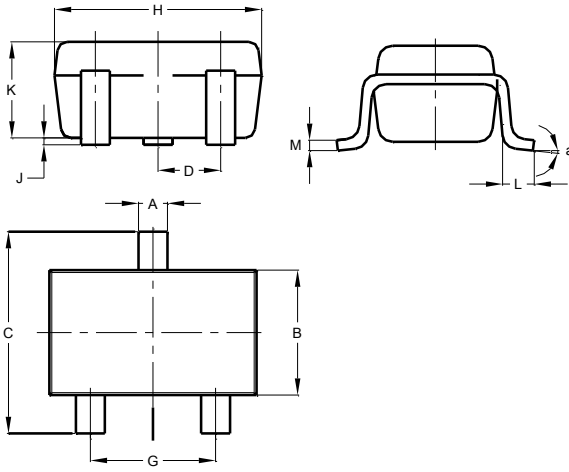


Fig. 8 Typical Capacitance Characteristics

Package Outline Dimensions

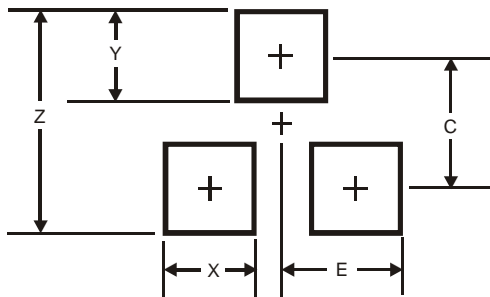
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| SOT323 | | | |
|----------------------|-----------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.25 | 0.40 | 0.30 |
| B | 1.15 | 1.35 | 1.30 |
| C | 2.00 | 2.20 | 2.10 |
| D | 0.650 BSC | | |
| F | 0.375 | 0.475 | 0.425 |
| G | 1.20 | 1.40 | 1.30 |
| H | 1.80 | 2.20 | 2.15 |
| J | 0.00 | 0.10 | 0.05 |
| K | 0.90 | 1.00 | 0.95 |
| L | 0.25 | 0.40 | 0.30 |
| M | 0.10 | 0.18 | 0.11 |
| a | 8° | | |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | SOT323 |
|------------|--------|
| Z | 2.8 |
| X | 0.7 |
| Y | 0.9 |
| C | 1.9 |
| E | 1.0 |

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