



THE DATASHEET OF
2DC4617R-7-F



Features

- $BV_{CEO} > 50V$
- $I_C = 150mA$ High Collector Current
- Ultra-Small Surface Mount Package
- Complementary PNP Type Available (2DA1774Q/R/S)
- **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**

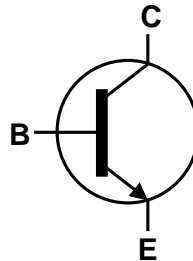
Mechanical Data

- Case: SOT523
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.002 grams (Approximate)

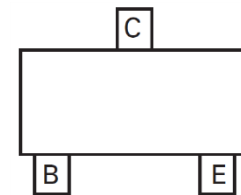
SOT523



Top View



Device Symbol



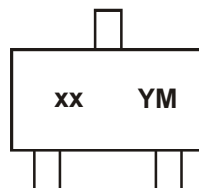
Pin-Out Top View

Ordering Information (Note 4)

| Product | Status | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|--------------|--------|------------|---------|--------------------|-----------------|-------------------|
| 2DC4617Q-7-F | Active | AEC-Q101 | 8D | 7 | 8 | 3000 |
| 2DC4617R-7-F | Active | AEC-Q101 | 8E | 7 | 8 | 3000 |
| 2DC4617S-7-F | Active | AEC-Q101 | 8F | 7 | 8 | 3000 |

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See <https://www.diodes.com/quality/lead-free/> 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, see <http://www.diodes.com/products/packages.html>.

Marking Information



- xx = Product Type Marking Code
- YM = Date Code Marking
- Y or \bar{Y} = Year (ex: F = 2018)
- M or \bar{M} = Month (ex: 9 = September)

Date Code Key

| Year | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | F | G | H | I | J | K | L | M | N | 0 | P | Q | R | S |

| 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 |

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---------------------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | 60 | V |
| Collector-Emitter Voltage | V_{CEO} | 50 | V |
| Emitter-Base Voltage | V_{EBO} | 7 | V |
| Collector Current—Continuous (Note 5) | I_C | 150 | mA |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------------|--------------------|
| Power Dissipation (Note 5) $T_A = 25^\circ\text{C}$ | P_D | 150 | mW |
| Thermal Resistance, Junction to Ambient (Note 5) | $R_{\theta JA}$ | 833 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

ESD Ratings (Note 6)

| Characteristic | Symbol | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge—Human Body Model | ESD HBM | 4000 | V | 3A |
| Electrostatic Discharge—Machine Model | ESD MM | 400 | V | C |

- Notes:
- For a device mounted with the collector lead, on a minimum recommended pad layout of 1oz copper on a single-sided 1.6mm FR4 PCB. Device is measured under still air conditions whilst operating in a steady-state.
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

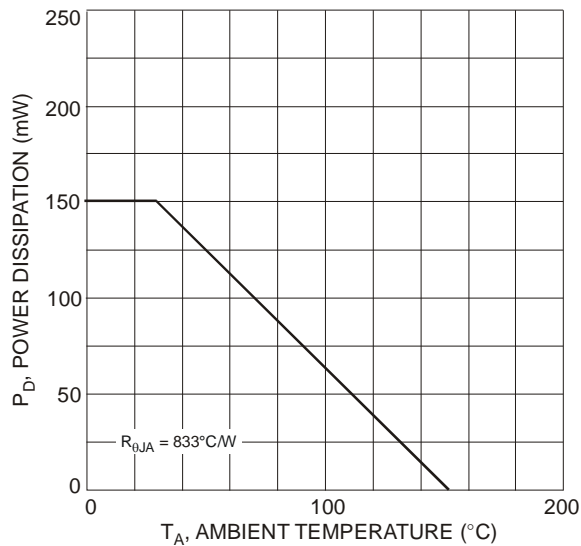
Thermal Characteristics and Derating Information


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 1)

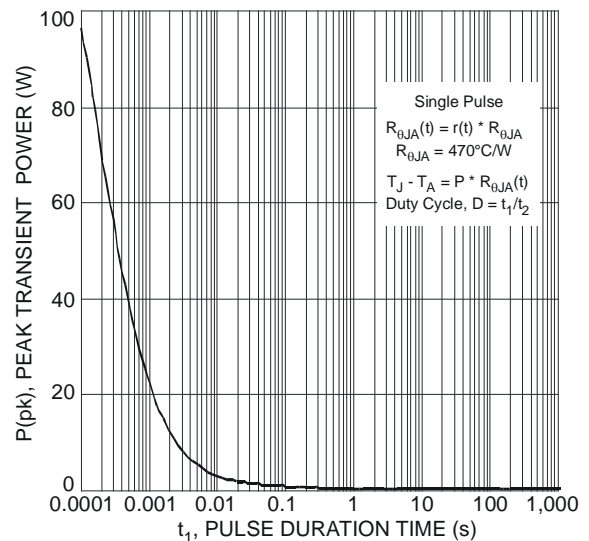


Fig. 2 Single Pulse Maximum Power Dissipation

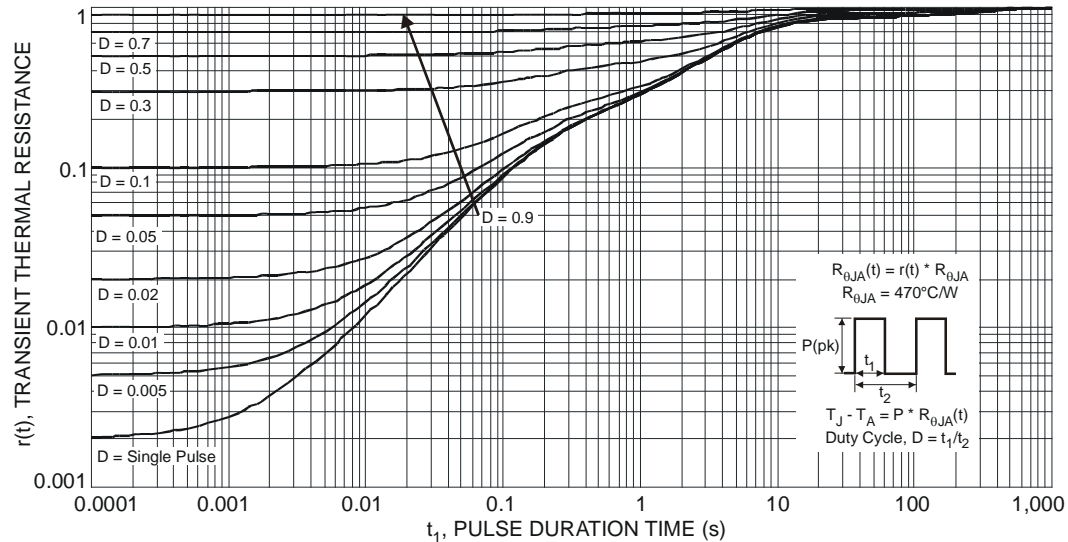
Thermal Characteristics and Derating Information (continued)


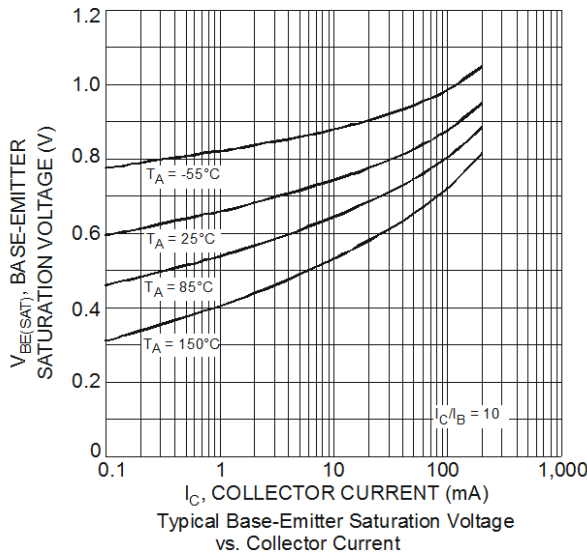
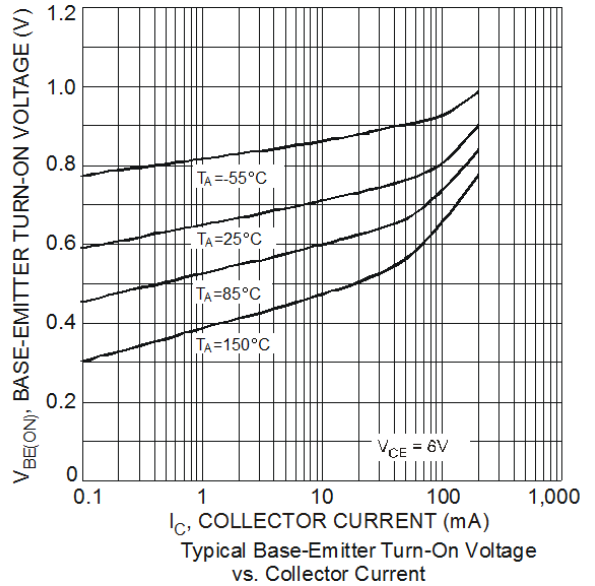
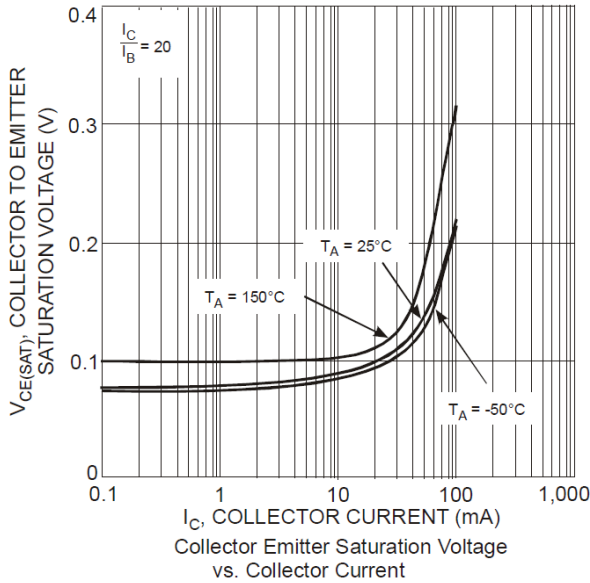
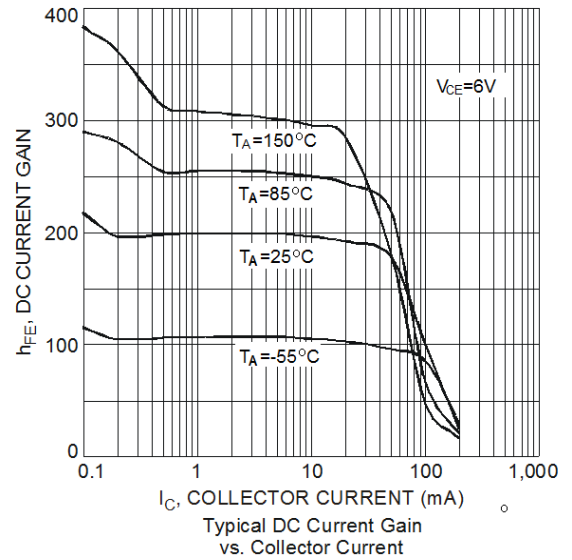
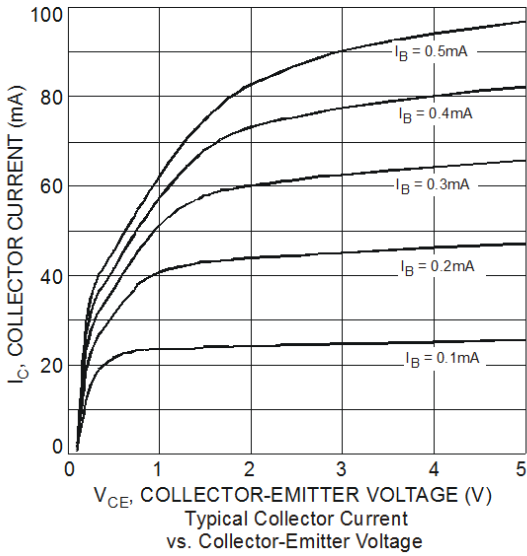
Fig. 3 Transient Thermal Response

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

| Characteristic | Symbol | Min | Typ. | Max | Unit | Test Condition |
|--------------------------------------|----------------------------------|----------|-------------------|-------------|-------------------|--|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | 60 | — | — | V | $I_C = 50\mu\text{A}, I_E = 0$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | 50 | — | — | V | $I_C = 1\text{mA}, I_B = 0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 7 | — | — | V | $I_E = 50\mu\text{A}, I_C = 0$ |
| Collector Cutoff Current | I_{CBO} | — | — | 100 | nA | $V_{CB} = 60\text{V}$ |
| Emitter Cutoff Current | I_{EBO} | — | — | 100 | nA | $V_{EB} = 6\text{V}$ |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| DC Current Gain | 2DC4617Q 2DC4617R 2DC4617S | h_{FE} | 120 180 270 | — — — | 270 390 560 | $V_{CE} = 6\text{V}, I_C = 1\text{mA}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | — | — | 0.4 | V | $I_C = 50\text{mA}, I_B = 5\text{mA}$ |
| SMALL SIGNAL CHARACTERISTICS | | | | | | |
| Output Capacitance | C_{obo} | — | 2 | 3.5 | pF | $V_{CB} = 12\text{V}, f = 1\text{MHz}, I_E = 0$ |
| Current Gain-Bandwidth Product | f_T | — | 140 | — | MHz | $V_{CE} = 12\text{V}, I_C = 2\text{mA}, f = 1\text{MHz}$ |
| Current Gain-Bandwidth Product | f_T | — | 180 | — | MHz | $V_{CE} = 12\text{V}, I_C = 0\text{mA}, f = 1\text{MHz}$ |
| Current Gain-Bandwidth Product | f_T | — | 180 | — | MHz | $V_{CE} = 12\text{V}, I_C = 2\text{mA}, f = 100\text{MHz}$ |

 Notes: 7. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

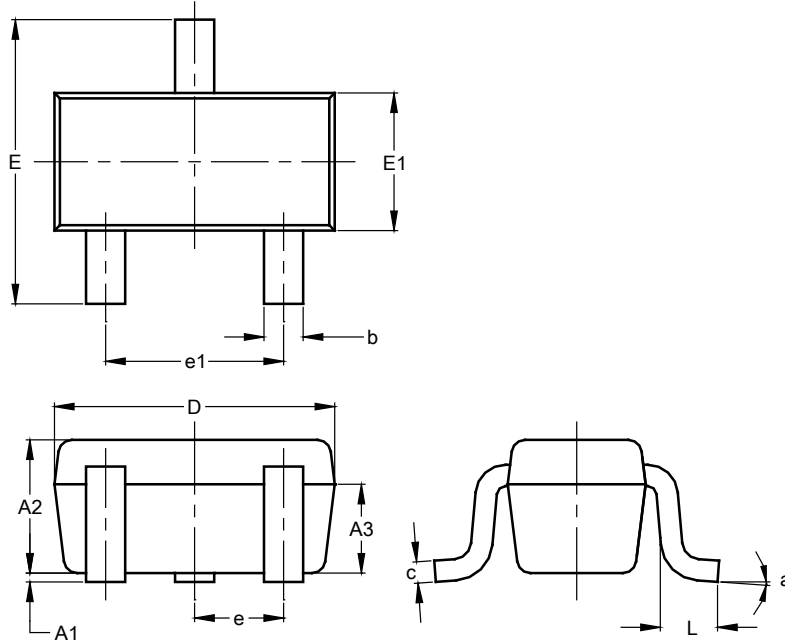
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT523

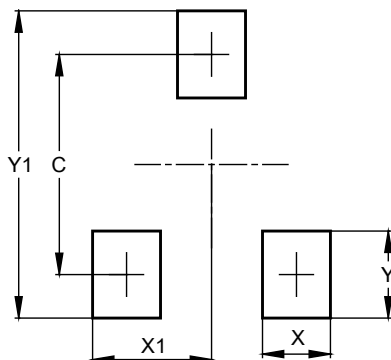


| SOT523 | | | |
|----------------------|----------|------|------|
| Dim | Min | Max | Typ |
| A1 | 0.00 | 0.10 | 0.05 |
| A2 | 0.60 | 0.80 | 0.75 |
| A3 | 0.45 | 0.65 | 0.50 |
| b | 0.15 | 0.30 | 0.22 |
| c | 0.10 | 0.20 | 0.12 |
| D | 1.50 | 1.70 | 1.60 |
| E | 1.45 | 1.75 | 1.60 |
| E1 | 0.75 | 0.85 | 0.80 |
| e | 0.50 BSC | | |
| e1 | 0.90 | 1.10 | 1.00 |
| L | 0.20 | 0.40 | 0.33 |
| a | 0° | -- | 8° |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT523



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 1.29 |
| X | 0.40 |
| X1 | 0.70 |
| Y | 0.51 |
| Y1 | 1.80 |

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