

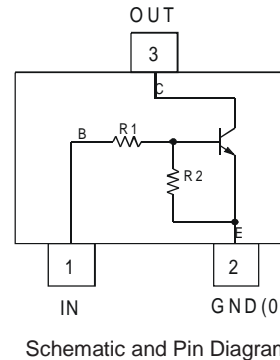
Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors
- **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**

| Part Number | R1 (NOM) | R2 (NOM) | Marking |
|-------------|----------|----------|---------|
| DDTC122LE | 0.22kΩ | 10kΩ | N81 |
| DDTC142JE | 0.47kΩ | 10kΩ | N82 |
| DDTC122TE | 0.22kΩ | OPEN | N83 |
| DDTC142TE | 0.47kΩ | OPEN | N84 |

Mechanical Data

- Case: SOT523
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish. Solderable per MIL-STD-202, Method 208③
- Weight: 0.002 grams (Approximate)

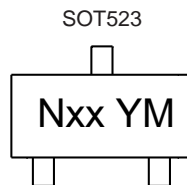


Ordering Information (Note 4)

| Part Number | Compliance | Reel Size (inches) | Tape Width (mm) | Quantity Per Reel |
|---------------|------------|--------------------|-----------------|-------------------|
| DDTC122LE-7-F | AEC-Q101 | 7 | 8 | 3,000 |
| DDTC142JE-7-F | AEC-Q101 | 7 | 8 | 3,000 |
| DDTC122TE-7-F | AEC-Q101 | 7 | 8 | 3,000 |
| DDTC142TE-7-F | AEC-Q101 | 7 | 8 | 3,000 |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 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, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



Nxx = Product Type Marking Code
(See Table in Features)
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 |
|------|------|------|------|------|------|------|------|------|------|------|
| Code | F | G | H | I | J | K | L | M | N | O |

| 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 |
|----------------------------|------------------------|------------------------|----------------------|------|
| Supply Voltage, (3) to (2) | | V _{CC} | 50 | V |
| Input Voltage, (1) to (2) | DDTC122LE DDTC142JE | V _{IN} | -5 to +6 -5 to +6 | V |
| Input Voltage, (2) to (1) | DDTC122TE DDTC142TE | V _{EBO (MAX)} | 5 | V |
| Output Current | All | I _C | 100 | mA |

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

| Characteristic | | Symbol | Value | Unit |
|--|--|-----------------------------------|-------------|------|
| Power Dissipation | | P _D | 150 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 5) | | R _{θJA} | 625 | °C/W |
| Operating and Storage Temperature Range | | T _J , T _{STG} | -55 to +150 | °C |

Note 5: Mounted on FR-4 PC Board with minimum recommended pad layout.

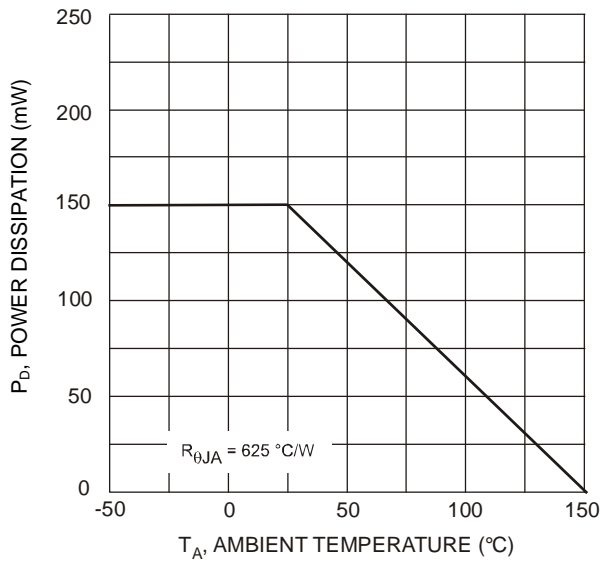


Fig. 1 Power Derating Curve

Electrical Characteristics R1, R2 Types (@T_A = +25°C, unless otherwise specified.)

| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|---------------------------------|------------------------|---------------------|------------|-----|------------|------|--|
| Input Voltage | DDTC122LE DDTC142JE | V _{I(OFF)} | 0.3 0.3 | — | — | V | V _{CC} = 5V, I _O = 100μA |
| | DDTC122LE DDTC142JE | V _{I(ON)} | — | — | 2.0 2.0 | V | V _O = 0.3V, I _O = 20mA V _O = 0.3V, I _O = 20mA |
| Output Voltage | | V _{O(ON)} | — | — | 0.3 | V | I _O /I _I = 5mA/0.25mA |
| Input Current | DDTC122LE DDTC142JE | I _I | — | — | 28 13 | mA | V _I = 5V |
| Output Current | | I _{O(OFF)} | — | — | 0.5 | μA | V _{CC} = 50V, V _I = 0V |
| DC Current Gain | DDTC122LE DDTC142JE | G _I | 56 56 | — | — | — | V _O = 5V, I _O = 10mA |
| Gain-Bandwidth Product (Note 6) | | f _T | — | 200 | — | MHz | V _{CE} = 10V, I _E = 5mA, f = 100MHz |

Electrical Characteristics R1- Only Type (@T_A = +25°C, unless otherwise specified.)

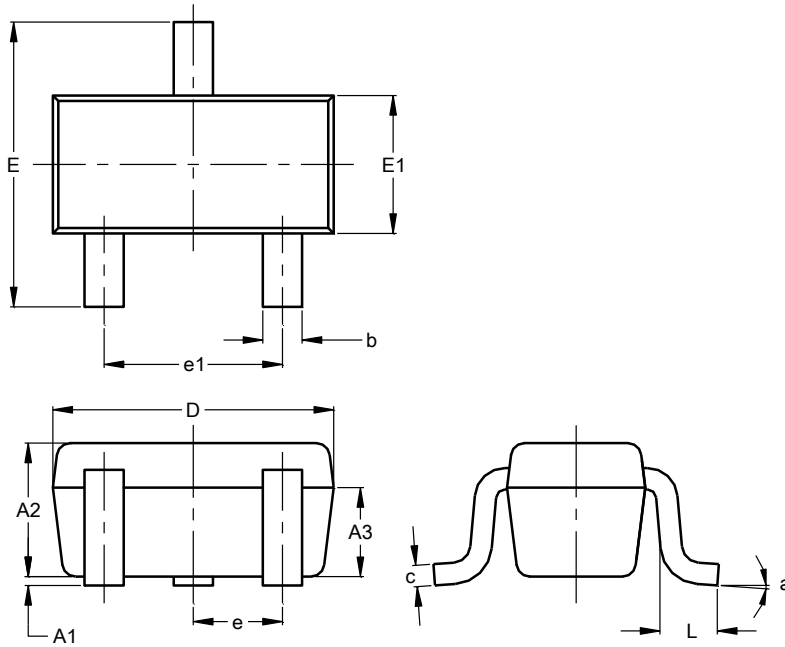
| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|--------------------------------------|------------------------|----------------------|------------|------------|------------|------|--|
| Collector-Base Breakdown Voltage | | BV _{CB0} | 50 | — | — | V | I _C = 50μA |
| Collector-Emitter Breakdown Voltage | | BV _{CEO} | 40 | — | — | V | I _C = 1mA |
| Emitter-Base Breakdown Voltage | DDTC122TE DDTC142TE | BV _{EBO} | 5 | — | — | V | I _E = 50μA I _E = 50μA |
| Collector Cutoff Current | | I _{CB0} | — | — | 0.5 | μA | V _{CB} = 50V |
| Emitter Cutoff Current | DDTC122TE DDTC142TE | I _{EBO} | — | — | 0.5 0.5 | μA | V _{EB} = 4V |
| Collector-Emitter Saturation Voltage | | V _{CE(SAT)} | — | — | 0.3 | V | I _C = 5mA, I _B = 0.25mA |
| DC Current Transfer Ratio | DDTC122TE DDTC142TE | h _{FE} | 100 100 | 250 250 | 600 600 | — | I _C = 1mA, V _{CE} = 5V |
| Gain-Bandwidth Product (Note 6) | | f _T | — | 200 | — | MHz | V _{CE} = 10V, I _E = -5mA, f = 100MHz |

Note 6: Transistor – For Reference only.

Package Outline Dimensions

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

SOT523

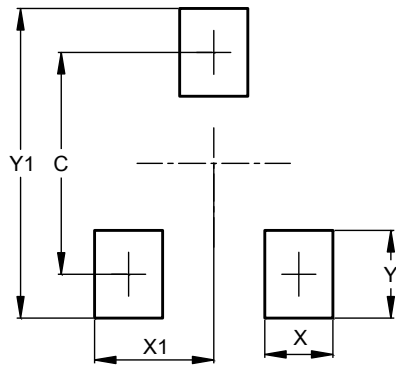


| SOT523 | | | |
|----------------------|----------|------|------|
| Dim | Min | Max | Typ |
| A1 | 0.00 | 0.10 | 0.05 |
| A2 | 0.60 | 0.80 | 0.75 |
| A3 | 0.45 | 0.65 | 0.50 |
| b | 0.15 | 0.30 | 0.22 |
| c | 0.10 | 0.20 | 0.12 |
| D | 1.50 | 1.70 | 1.60 |
| E | 1.45 | 1.75 | 1.60 |
| E1 | 0.75 | 0.85 | 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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