

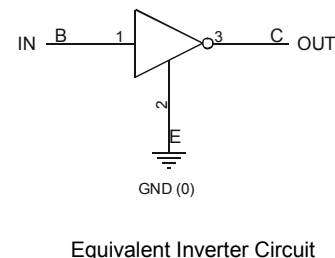
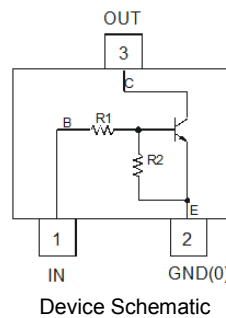
Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTB)
- Built-In Biasing Resistors
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

Mechanical Data

- Case: SOT23
- 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 @3
- Weight: 0.008 grams (Approximate)

| P/N | R1 (NOM) | R2 (NOM) |
|-----------|----------|----------|
| DDTD122LC | 0.22kΩ | 10kΩ |
| DDTD142JC | 0.47kΩ | 10kΩ |
| DDTD122TC | 0.22kΩ | OPEN |
| DDTD142TC | 0.47kΩ | OPEN |

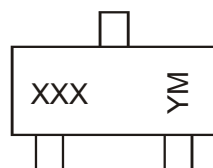


Ordering Information (Note 4)

| Product | Status | Compliance | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|----------------|----------|------------|---------|--------------------|-----------------|-------------------|
| DDTD122LC -7-F | Obsolete | Standard | N75 | 7 | 8 | 3,000 |
| DDTD142JC -7-F | Active | Standard | N76 | 7 | 8 | 3,000 |
| DDTD122TC -7-F | Obsolete | Standard | N77 | 7 | 8 | 3,000 |
| DDTD142TC -7-F | Obsolete | Standard | N78 | 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



XXX = Product Type Marking Code, See Table Above
 YM = Date Code Marking
 Y = Year ex: I = 2021
 M = Month ex: 9 = September

Date Code Key

| Year | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | I | J | K | L | M | N | O | P | R | S | T | U |

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

| Characteristic | | Symbol | Value | Unit |
|----------------------------------|-----------|-----------------|----------|------|
| Supply Voltage <Pin: (3) to (2)> | | V_{CC} | 50 | V |
| Input Voltage <Pin: (1) to (2)> | DDTD122LC | V_{IN} | -5 to +6 | V |
| | DDTD142JC | | -5 to +6 | |
| Input Voltage <Pin: (2) to (1)> | DDTD122TC | $V_{EBO (MAX)}$ | 5 | V |
| | DDTD142TC | | 5 | |
| Output Current | | I_C | 500 | mA |

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

| Characteristic | Symbol | Value | Unit |
|------------------------------------------------------|-----------------|-------------|--------------------|
| Power Dissipation (Note 5) | P_D | 200 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 5) | $R_{\theta JA}$ | 625 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

Note: 5. Mounted on FR4 PC board with recommended pad layout.

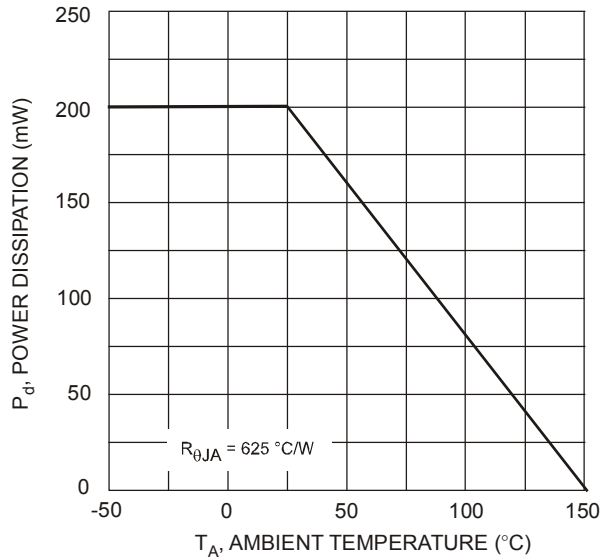


Fig. 1 Power Derating Curve

Electrical Characteristics - R1, R2 Types (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|---------------------------------|------------------------|--------------|------------|-----|------------|---------|------------------------------------------------------|
| Input Voltage | DDTD122LC DDTD142JC | $V_{I(off)}$ | 0.3 0.3 | — | — | V | $V_{CC} = 5V, I_O = 100\mu A$ |
| | DDTD122LC DDTD142JC | $V_{I(on)}$ | — | — | 2.0 2.0 | V | $V_O = 0.3V, I_O = 20mA$ $V_O = 0.3V, I_O = 20mA$ |
| Output Voltage | | $V_{O(on)}$ | — | — | 0.3V | V | $I_O/I_I = 50mA/2.5mA$ |
| Input Current | DDTD122LC DDTD142JC | 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 | DDTD122LC DDTD142JC | G_I | 56 56 | — | — | — | $V_O = 5V, I_O = 50mA$ |
| Gain-Bandwidth Product (Note 6) | | f_T | — | 200 | — | MHz | $V_{CE} = 10V, I_E = 5mA, f = 100MHz$ |

Electrical Characteristics - R1- Only, R2- Only Types (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

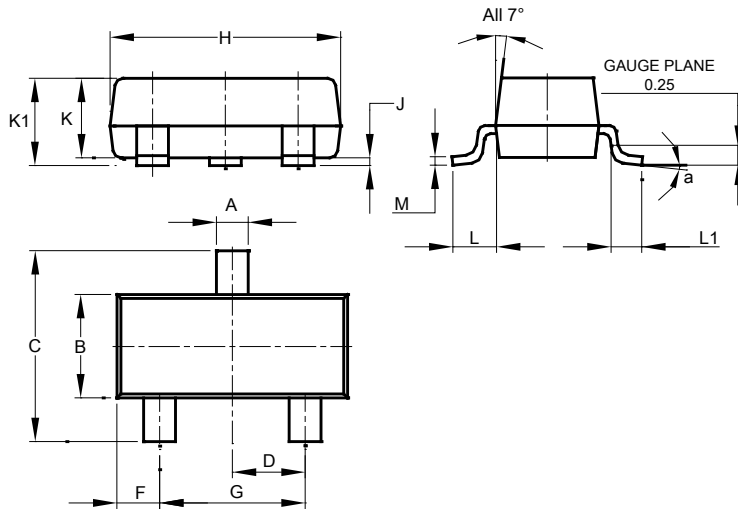
| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|--------------------------------------|------------------------|---------------|------------|------------|------------|---------|----------------------------------------|
| Collector-Base Breakdown Voltage | | BV_{CBO} | 50 | — | — | V | $I_C = 50\mu A$ |
| Collector-Emitter Breakdown Voltage | | BV_{CEO} | 40 | — | — | V | $I_C = 1mA$ |
| Emitter-Base Breakdown Voltage | DDTD122TC DDTD142TC | BV_{EBO} | 5 | — | — | V | $I_E = 50\mu A$ $I_E = 50\mu A$ |
| Collector Cut-Off Current | | I_{CBO} | — | — | 0.5 | μA | $V_{CB} = 50V$ |
| Emitter Cut-Off Current | DDTD122TC DDTD142TC | I_{EBO} | — — | — | 0.5 0.5 | μA | $V_{EB} = 4V$ |
| Collector-Emitter Saturation Voltage | | $V_{CE(sat)}$ | — | — | 0.3 | V | $I_C = 50mA, I_B = 2.5mA$ |
| DC Current Transfer Ratio | DDTD122TC DDTD142TC | h_{FE} | 100 100 | 250 250 | 600 600 | — | $I_C = 5mA, V_{CE} = 5V$ |
| 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.

SOT23

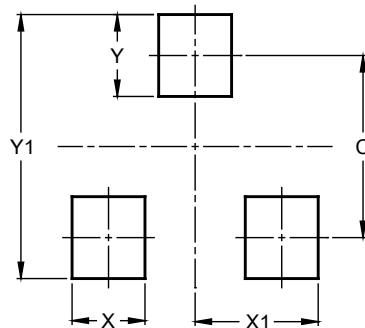


| SOT23 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.37 | 0.51 | 0.40 |
| B | 1.20 | 1.40 | 1.30 |
| C | 2.30 | 2.50 | 2.40 |
| D | 0.89 | 1.03 | 0.915 |
| F | 0.45 | 0.60 | 0.535 |
| G | 1.78 | 2.05 | 1.83 |
| H | 2.80 | 3.00 | 2.90 |
| J | 0.013 | 0.10 | 0.05 |
| K | 0.890 | 1.00 | 0.975 |
| K1 | 0.903 | 1.10 | 1.025 |
| L | 0.45 | 0.61 | 0.55 |
| L1 | 0.25 | 0.55 | 0.40 |
| M | 0.085 | 0.150 | 0.110 |
| a | 0° | 8° | -- |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

SOT23



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 2.0 |
| X | 0.8 |
| X1 | 1.35 |
| Y | 0.9 |
| Y1 | 2.9 |

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