



**THE DATASHEET OF
DDTD122LC-7-F**



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)**
- **Qualified to AEC-Q101 Standards for High Reliability**

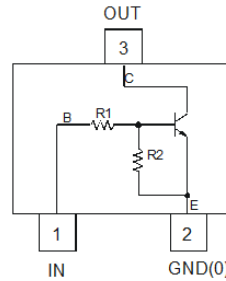
Mechanical Data

- Case: SOT-23
- 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)

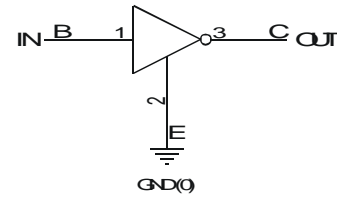
| P/N | R1 (NOM) | R2 (NOM) |
|-----------|----------|----------|
| DDTD122LC | 0.22kΩ | 10kΩ |
| DDTD142JC | 0.47kΩ | 10kΩ |
| DDTD122TC | 0.22kΩ | OPEN |
| DDTD142TC | 0.47kΩ | OPEN |



Top View



Device Schematic



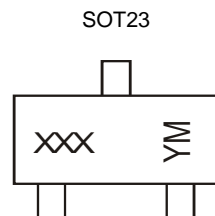
Equivalent Inverter Circuit

Ordering Information (Note 4)

| Product | Compliance | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|----------------|------------|---------|--------------------|-----------------|-------------------|
| DDTD122LC -7-F | AEC-Q101 | N75 | 7 | 8 | 3,000 |
| DDTD142JC -7-F | AEC-Q101 | N76 | 7 | 8 | 3,000 |
| DDTD122TC -7-F | AEC-Q101 | N77 | 7 | 8 | 3,000 |
| DDTD142TC -7-F | AEC-Q101 | N78 | 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



XXX = Product Type Marking Code, See Table Above
 YM = Date Code Marking
 Y = Year ex: B = 2014
 M = Month ex: 9 = September

Date Code Key

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|------|------|------|------|------|------|------|------|------|------|
| Code | B | C | D | E | F | G | H | I | J |

| 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 <Pin: (3) to (2)> | V _{CC} | 50 | V |
| Input Voltage <Pin: (1) to (2)> | V _{IN} | -5 to +6 | V |
| Input Voltage <Pin: (2) to (1)> | V _{EBO (MAX)} | 5 | V |
| Output Current | I _C | 500 | mA |

Thermal Characteristics (@T_A = +25°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 _{θJA} | 625 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

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

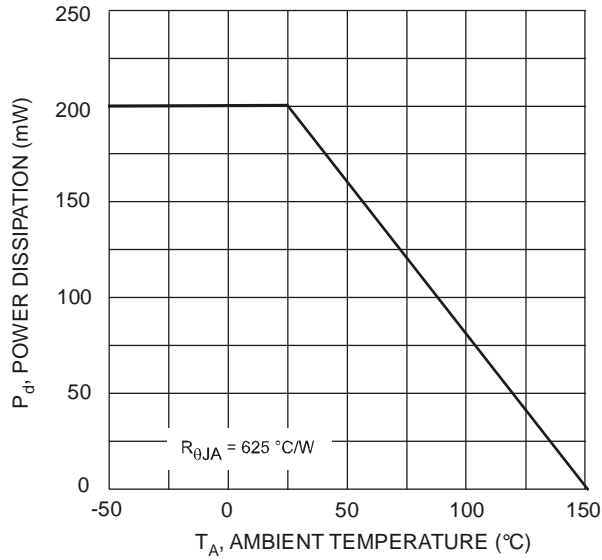


Fig. 1 Power Derating Curve

Electrical Characteristics - R1, R2 Types (@T_A = +25°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 = 100μA |
| | 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 |

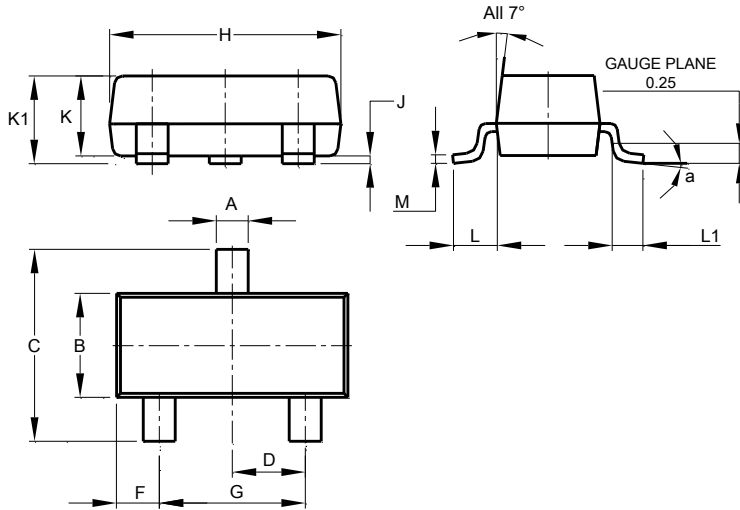
Electrical Characteristics - R1- Only, R2- Only Types (@T_A = +25°C, unless otherwise specified.)

| 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 | DDTD122TC DDTD142TC | BV _{EBO} | 5 | — | — | V | I _E = 50μA I _E = 50μA |
| Collector Cut-Off Current | | I _{CB0} | — | — | 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

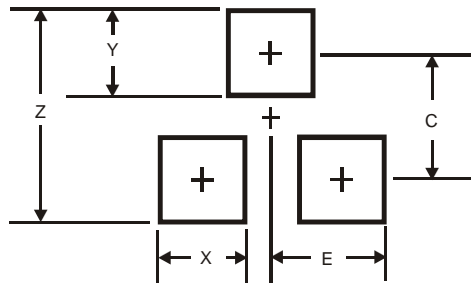
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| 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 | 8° | | |
| All Dimensions in mm | | | |

Suggested Pad Layout

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



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

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