



**THE DATASHEET OF
TC74LCX14FT(EL)**



Features

- Epitaxial Planar Die Construction
- Built-In Biasing Resistors
- Surface Mount Package Suited for Automated Assembly
- **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/>**

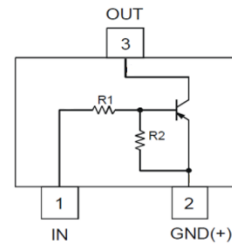
Mechanical Data

- Package: SOT23
- Package 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: 0.008 grams (Approximate)

| Part Number | R1(NOM) | R2(NOM) |
|-------------|---------|---------|
| DDTB113EC | 1kΩ | 1kΩ |
| DDTB123EC | 2.2kΩ | 2.2kΩ |
| DDTB143EC | 4.7kΩ | 4.7kΩ |
| DDTB114EC | 10kΩ | 10kΩ |
| DDTB122JC | 0.22kΩ | 4.7kΩ |
| DDTB113ZC | 1kΩ | 10kΩ |
| DDTB123YC | 2.2kΩ | 10kΩ |
| DDTB133HC | 3.3kΩ | 10kΩ |
| DDTB123TC | 2.2kΩ | Open |
| DDTB143TC | 4.7kΩ | Open |
| DDTB114TC | 10kΩ | Open |
| DDTB114GC | 0 | 10kΩ |



Top View



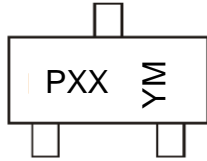
Device Schematic

Ordering Information (Note 4)

| Part Number | Status | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Packing | |
|---------------|----------|------------|---------|--------------------|-----------------|---------|---------|
| | | | | | | Qty. | Carrier |
| DDTB113EC-7-F | Obsolete | Standard | P60 | 7 | 8 | 3,000 | Reel |
| DDTB123EC-7-F | Obsolete | Standard | P61 | 7 | 8 | 3,000 | Reel |
| DDTB143EC-7-F | Obsolete | Standard | P62 | 7 | 8 | 3,000 | Reel |
| DDTB114EC-7-F | Active | Standard | P63 | 7 | 8 | 3,000 | Reel |
| DDTB122JC-7-F | Obsolete | Standard | P64 | 7 | 8 | 3,000 | Reel |
| DDTB113ZC-7-F | Active | Standard | P65 | 7 | 8 | 3,000 | Reel |
| DDTB123YC-7-F | Active | Standard | P66 | 7 | 8 | 3,000 | Reel |
| DDTB133HC-7-F | Obsolete | Standard | P67 | 7 | 8 | 3,000 | Reel |
| DDTB123TC-7-F | Obsolete | Standard | P69 | 7 | 8 | 3,000 | Reel |
| DDTB143TC-7-F | Obsolete | Standard | P70 | 7 | 8 | 3,000 | Reel |
| DDTB114TC-7-F | Obsolete | Standard | P71 | 7 | 8 | 3,000 | Reel |
| DDTB114GC-7-F | Obsolete | Standard | P72 | 7 | 8 | 3,000 | Reel |

- 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



PXX = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: I = 2021)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2010 | ... | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| Code | X | ... | I | J | K | L | M | N | O | P | 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 |

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) | V _{IN} | +10 to -10 +10 to -12 +10 to -30 +10 to -40 +5 to -5 +5 to -10 +5 to -12 +6 to -20 | V |
| Input Voltage, (1) to (2) | 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 minimum recommended pad layout.

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

| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|---------------------------------|--|---------------------|--|-----|--|------|--|
| Input Voltage | DDTB113EC DDTB123EC DDTB143EC DDTB114EC DDTB122JC DDTB113ZC DDTB123YC DDTB133HC | V _{I(off)} | -0.5 -0.5 -0.5 -0.5 -0.5 -0.3 -0.3 -0.3 | — | — | V | V _{CC} = -5V, I _O = -100μA |
| | DDTB113EC DDTB123EC DDTB143EC DDTB114EC DDTB122JC DDTB113ZC DDTB123YC DDTB133HC | V _{I(on)} | — | — | -3.0 -3.0 -3.0 -3.0 -3.0 -2.0 -2.0 -2.0 | V | V _O = -0.3V, I _O = -20mA V _O = -0.3V, I _O = -20mA V _O = -0.3V, I _O = -20mA V _O = -0.3V, I _O = -10mA V _O = -0.3V, I _O = -30mA V _O = -0.3V, I _O = -20mA 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 = -50mA/-2.5mA |
| Input Current | DDTB113EC DDTB123EC DDTB143EC DDTB114EC DDTB122JC DDTB113ZC DDTB123YC DDTB133HC | I _I | — | — | -7.2 -3.8 -1.8 -0.88 -28 -7.2 -3.6 -2.4 | mA | V _I = -5V |
| Output Current | | I _{O(off)} | — | — | -0.5 | μA | V _{CC} = -50V, V _I = 0V |
| DC Current Gain | DDTB113EC DDTB123EC DDTB143EC DDTB114EC DDTB122JC DDTB113ZC DDTB123YC DDTB133HC | G _I | 33 39 47 56 47 56 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 (@T_A = +25°C, unless otherwise specified.) **R1-Only, R2-Only Types**

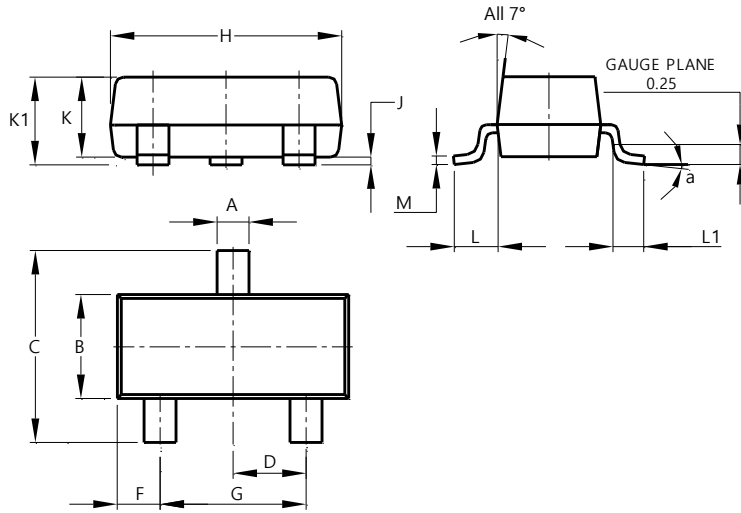
| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|--------------------------------------|--|----------------------|-------------------------|------------------------|------------------------------|------|---|
| Collector-Base Breakdown Voltage | | BV _{CBO} | -50 | — | — | V | I _C = -50μA |
| Collector-Emitter Breakdown Voltage | | BV _{CEO} | -40 | — | — | V | I _C = -1mA |
| Emitter-Base Breakdown Voltage | DDTB123TC DDTB143TC DDTB114TC DDTB114GC | BV _{EBO} | -5 | — | — | V | I _E = -50μA I _E = -50μA I _E = -50μA I _E = -720μA |
| Collector Cutoff Current | | I _{CBO} | — | — | -0.5 | μA | V _{CB} = -50V |
| Emitter Cutoff Current | DDTB123TC DDTB143TC DDTB114TC DDTB114GC | I _{EBO} | — — — -300 | — | -0.5 -0.5 -0.5 -580 | 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 | DDTB123TC DDTB143TC DDTB114TC DDTB114GC | h _{FE} | 100 100 100 56 | 250 250 250 — | 600 600 600 — | — | 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

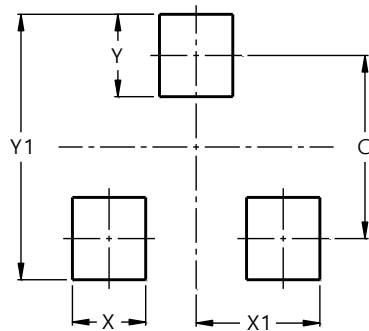


| SOT23 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.37 | 0.51 | 0.40 |
| B | 1.20 | 1.40 | 1.30 |
| C | 2.30 | 2.50 | 2.40 |
| D | 0.89 | 1.03 | 0.915 |
| F | 0.45 | 0.60 | 0.535 |
| G | 1.78 | 2.05 | 1.83 |
| H | 2.80 | 3.00 | 2.90 |
| J | 0.013 | 0.10 | 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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