NEW PRODUCT

# DDTA (R1≠R2 SERIES) CA

**PNP PRE-BIASED SMALL SIGNAL SOT-23 SURFACE MOUNT TRANSISTOR**

Please click here to visit our online spice models database.

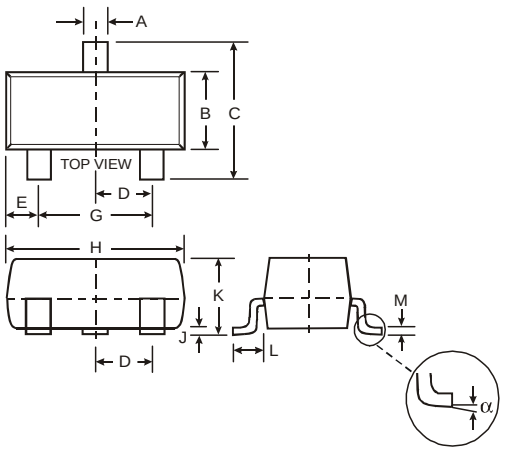
## Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors, R1≠R2
- **Lead, Halogen and Antimony Free, RoHS Compliant "Green" Device (Notes 1 and 2)**

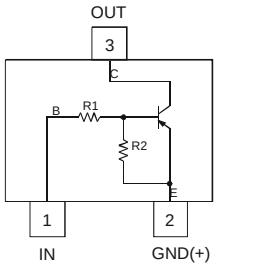
## Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Marking and Date Code: See Table Below & Page 4
- Ordering Information: See Page 4
- Weight: 0.008 grams (approximate)

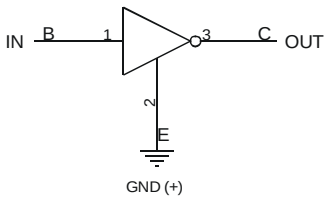
| P/N | R1 (NOM) | R2 (NOM) | MARKING |
|---|---|---|---|
| DDTA113ZCA | 1KΩ | 10KΩ | P02 |
| DDTA123YCA | 2.2KΩ | 10KΩ | P05 |
| DDTA123JCA | 2.2KΩ | 47KΩ | P06 |
| DDTA143XCA | 4.7KΩ | 10KΩ | P09 |
| DDTA143FCA | 4.7KΩ | 22KΩ | P10 |
| DDTA143ZCA | 4.7KΩ | 47KΩ | P11 |
| DDTA114YCA | 10KΩ | 47KΩ | P14 |
| DDTA114WCA | 10KΩ | 4.7KΩ | P15 |
| DDTA124XCA | 22KΩ | 47KΩ | P18 |
| DDTA144VCA | 47KΩ | 10KΩ | P21 |
| DDTA144WCA | 47KΩ | 22KΩ | P22 |




| SOT-23 | | |
|---|---|---|
| **Dim** | **Min** | **Max** |
| **A** | 0.37 | 0.51 |
| **B** | 1.20 | 1.40 |
| **C** | 2.30 | 2.50 |
| **D** | 0.89 | 1.03 |
| **E** | 0.45 | 0.60 |
| **G** | 1.78 | 2.05 |
| **H** | 2.80 | 3.00 |
| **J** | 0.013 | 0.10 |
| **K** | 0.903 | 1.10 |
| **L** | 0.45 | 0.61 |
| **M** | 0.085 | 0.180 |
| **α** | 0° | 8° |
| **All Dimensions in mm** | | |




Schematic and Pin Configuration




Equivalent Inverter Circuit

## 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) | DDTA113ZCA | $V_{IN}$ | +5 to -10 | V |
| | DDTA123YCA | | +5 to -12 | |
| | DDTA123JCA | | +5 to -12 | |
| | DDTA143XCA | | +7 to -20 | |
| | DDTA143FCA | | +6 to -30 | |
| | DDTA143ZCA | | +5 to -30 | |
| | DDTA114YCA | | +6 to -40 | |
| | DDTA114WCA | | +10 to -30 | |
| | DDTA124XCA | | +10 to -40 | |
| | DDTA144VCA | | +15 to -40 | |
| | DDTA144WCA | | +10 to -40 | |
| Output Current | DDTA113ZCA | $I_O$ | -100 | mA |
| | DDTA123YCA | | -100 | |
| | DDTA123JCA | | -100 | |
| | DDTA143XCA | | -100 | |
| | DDTA143FCA | | -100 | |
| | DDTA143ZCA | | -100 | |
| | DDTA114YCA | | -70 | |
| | DDTA114WCA | | -100 | |
| | DDTA124XCA | | -50 | |
| | DDTA144VCA | | -30 | |
| | DDTA144WCA | | -30 | |
| Output Current | All | $I_C$ (Max) | -100 | mA |

Notes: 1. No purposefully added lead. Halogen and Antimony Free.
2. Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or $Sb_2O_3$ Fire Retardants.

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## Thermal Characteristics

| Characteristic | | Symbol | Value | Unit |
|---|---|---|---|---|
| Power Dissipation | | $P_d$ | 200 | mW |
| Thermal Resistance, Junction to Ambient Air | (Note 3) | $R_{\theta JA}$ | 625 | °C/W |
| Operating and Storage Temperature Range | | $T_j$, $T_{STG}$ | -55 to +150 | °C |

Notes: 3. Mounted on FR4 PC Board with recommended pad layout at http://www.diodes.com/datasheets/ap02001.pdf.

## Electrical Characteristics @$T_A$ = 25°C unless otherwise specified

| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|---|
| Input Voltage | DDTA113ZCA | $V_{I(off)}$ | -0.3 | — | — | V | $V_{CC}$ = 5V, $I_O$ = 100μA |
| | DDTA123YCA | | -0.3 | | | | |
| | DDTA123JCA | | -0.5 | | | | |
| | DDTA143XCA | | -0.3 | | | | |
| | DDTA143FCA | | -0.3 | | | | |
| | DDTA143ZCA | | -0.5 | | | | |
| | DDTA114YCA | | -0.3 | | | | |
| | DDTA114WCA | | -0.8 | | | | |
| | DDTA124XCA | | -0.4 | | | | |
| | DDTA144VCA | | -1.0 | | | | |
| | DDTA144WCA | | -0.8 | | | | |
| Input Voltage | DDTA113ZCA | $V_{I(on)}$ | — | — | -3.0 | | $V_O$ = -0.3V, $I_O$ = -20mA |
| | DDTA123YCA | | | | -3.0 | | $V_O$ = -0.3V, $I_O$ = -20mA |
| | DDTA123JCA | | | | -1.1 | | $V_O$ = -0.3V, $I_O$ = -5mA |
| | DDTA143XCA | | | | -2.5 | | $V_O$ = -0.3V, $I_O$ = -20mA |
| | DDTA143FCA | | | | -1.3 | | $V_O$ = -0.3V, $I_O$ = -3mA |
| | DDTA143ZCA | | | | -1.3 | | $V_O$ = -0.3V, $I_O$ = -5mA |
| | DDTA114YCA | | | | -1.4 | | $V_O$ = -0.3V, $I_O$ = -1mA |
| | DDTA114WCA | | | | -3.0 | | $V_O$ = -0.3V, $I_O$ = -2mA |
| | DDTA124XCA | | | | -2.5 | | $V_O$ = -0.3V, $I_O$ = -2mA |
| | DDTA144VCA | | | | -5.0 | | $V_O$ = -0.3V, $I_O$ = -2mA |
| | DDTA144WCA | | | | -4.0 | | $V_O$ = -0.3V, $I_O$ = -2mA |
| Output Voltage | | $V_{O(on)}$ | — | -0.1 | -0.3 | V | $I_O/I_I$ = -5mA/-0.25mA DDTA123JCA<br>$I_O/I_I$ = -5mA/-0.25mA DDTA143ZCA<br>$I_O/I_I$ = -5mA/-0.25mA DDTA114YCA<br>$I_O/I_I$ = -10mA/-0.5mA All Others |
| Input Current | DDTA113ZCA | $I_I$ | — | — | -7.2 | mA | $V_I$ = -5V |
| | DDTA123YCA | | | | -3.8 | | |
| | DDTA123JCA | | | | -3.6 | | |
| | DDTA143XCA | | | | -1.8 | | |
| | DDTA143FCA | | | | -1.8 | | |
| | DDTA143ZCA | | | | -1.8 | | |
| | DDTA114YCA | | | | -0.88 | | |
| | DDTA114WCA | | | | -0.88 | | |
| | DDTA124XCA | | | | -0.36 | | |
| | DDTA144VCA | | | | -0.16 | | |
| | DDTA144WCA | | | | -0.16 | | |
| Output Current | | $I_{O(off)}$ | — | — | -0.5 | μA | $V_{CC}$ = -50V, $V_I$ = 0V |
| DC Current Gain | DDTA113ZCA | $G_I$ | -33 | — | — | — | $V_O$ = -5V, $I_O$ = -10mA |
| | DDTA123YCA | | -33 | | | | |
| | DDTA123JCA | | -80 | | | | |
| | DDTA143XCA | | -30 | | | | |
| | DDTA143FCA | | -68 | | | | |
| | DDTA143ZCA | | -80 | | | | |
| | DDTA114YCA | | -68 | | | | |
| | DDTA114WCA | | -24 | | | | |
| | DDTA124XCA | | -68 | | | | |
| | DDTA144VCA | | -33 | | | | |
| | DDTA144WCA | | -56 | | | | |
| Input Resistor Tolerance | | $\Delta R_1$ | -30 | — | +30 | % | — |
| Resistance Ratio Tolerance | | $\Delta R_2/R_1$ | -20 | — | +20 | % | — |
| Gain-Bandwidth Product* | | $f_T$ | — | 250 | — | MHz | $V_{CE}$ = -10V, $I_E$ = 5mA, f = 100MHz |

* Transistor - For Reference Only

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## Typical Curves –DDTA123JCA

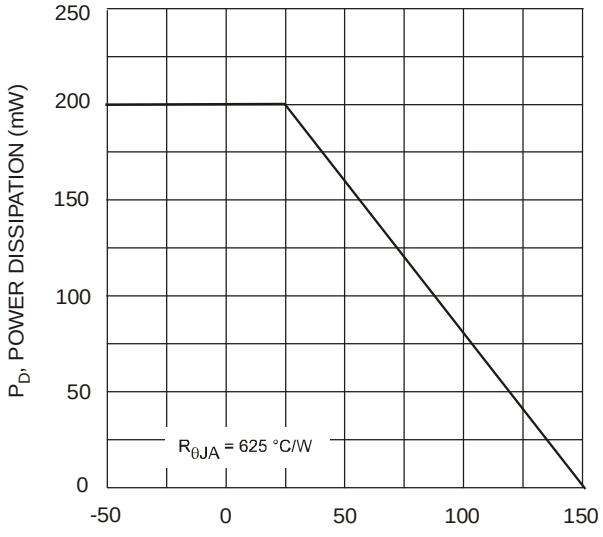


Fig. 1 Derating Curve

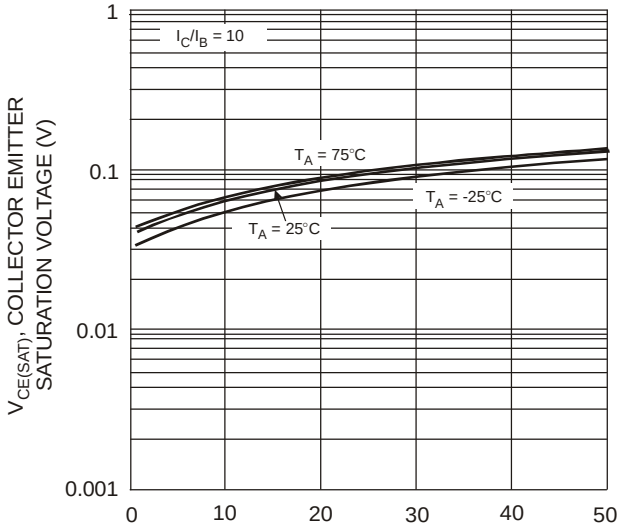


Fig. 2 $V_{CE(SAT)}$ vs. $I_C$

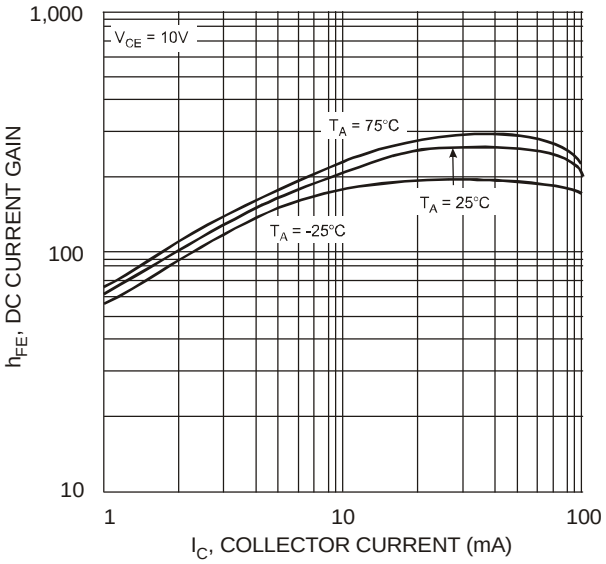


Fig. 3 DC Current Gain

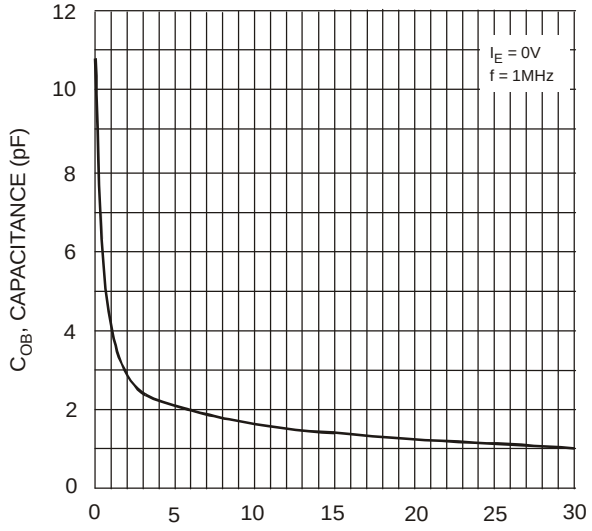


Fig. 4 Output Capacitance

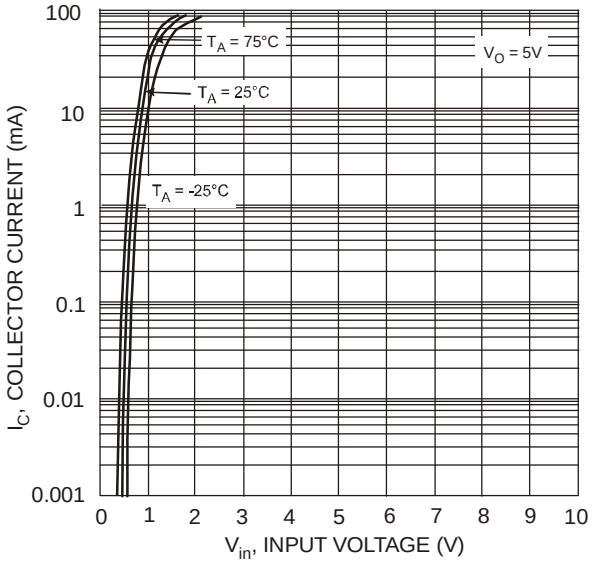


Fig. 5 Collector Current vs. Input Voltage

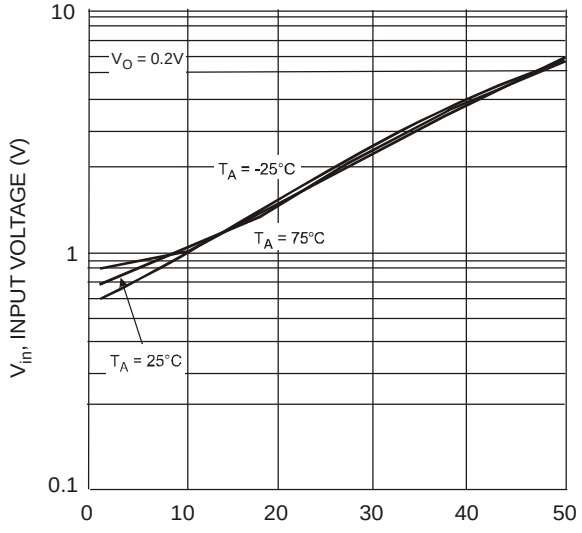


Fig. 6 Input Voltage vs. Collector Current

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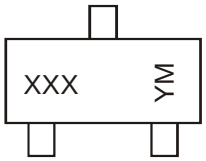
## Ordering Information (Note 4)

| Device | Packaging | Shipping |
|---|---|---|
| DDTA113ZCA-7-F | SOT-23 | 3000/Tape & Reel |
| DDTA123YCA-7-F | SOT-23 | 3000/Tape & Reel |
| DDTA123JCA-7-F | SOT-23 | 3000/Tape & Reel |
| DDTA143XCA-7-F | SOT-23 | 3000/Tape & Reel |
| DDTA143FCA-7-F | SOT-23 | 3000/Tape & Reel |
| DDTA143ZCA-7-F | SOT-23 | 3000/Tape & Reel |
| DDTA114YCA-7-F | SOT-23 | 3000/Tape & Reel |
| DDTA114WCA-7-F | SOT-23 | 3000/Tape & Reel |
| DDTA124XCA-7-F | SOT-23 | 3000/Tape & Reel |
| DDTA144VCA-7-F | SOT-23 | 3000/Tape & Reel |
| DDTA144WCA-7-F | SOT-23 | 3000/Tape & Reel |

Notes: 4. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

## Marking Information




XXX = Product Type Marking Code, See Table on Page 1
YM = Date Code Marking
Y = Year ex: T = 2006
M = Month ex: 9 = September

Date Code Key

| Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|
| Code | R | S | T | U | V | W | X | Y | Z |

| 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 |

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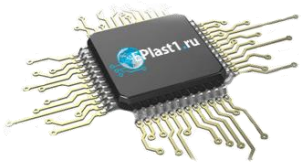


**Как с нами связаться**

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