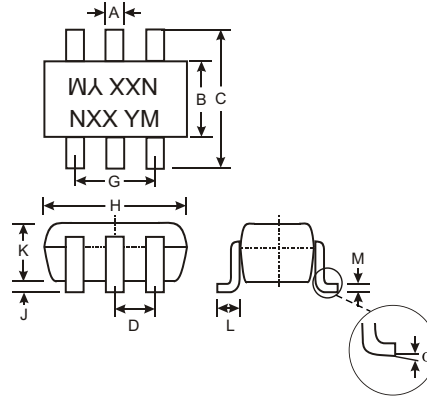


Features

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

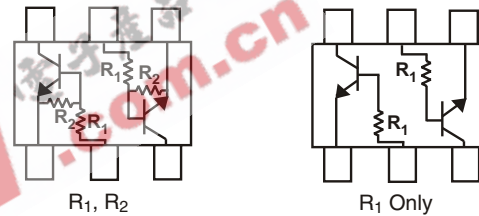
Mechanical Data

- Case: SOT-26, Molded Plastic
- Case material - UL Flammability Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking: Date Code and Marking Code (See Diagrams & Page 3)
- Weight: 0.015 grams (approx.)
- Ordering Information (See Page 3)



| SOT-26 | | | |
|----------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 0.35 | 0.50 | 0.38 |
| B | 1.50 | 1.70 | 1.60 |
| C | 2.70 | 3.00 | 2.80 |
| D | 0.95 | | |
| G | 1.90 | | |
| H | 2.90 | 3.10 | 3.00 |
| J | 0.013 | 0.10 | 0.05 |
| K | 1.00 | 1.30 | 1.10 |
| L | 0.35 | 0.55 | 0.40 |
| M | 0.10 | 0.20 | 0.15 |
| α | 0° | 8° | — |
| All Dimensions in mm | | | |

| P/N | R1 | R2 | MARKING |
|----------|---------------|--------------|---------|
| DDC124EK | 22K Ω | 22K Ω | N17 |
| DDC144EK | 47K Ω | 47K Ω | N20 |
| DDC114YK | 10K Ω | 47K Ω | N14 |
| DDC123JK | 2.2K Ω | 47K Ω | N06 |
| DDC114EK | 10K Ω | 10K Ω | N13 |
| DDC143TK | 4.7K Ω | - | N07 |
| DDC114TK | 10K Ω | - | N12 |



SCHMATIC DIAGRAM

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------------|--|--------------------|
| Supply Voltage, (3) to (1) | V_{CC} | 50 | V |
| Input Voltage, (2) to (1) | V_{IN} | -10 to +40 -10 to +40 -6 to +40 -5 to +12 -10 to +40 -5 V_{max} -5 V_{max} | V |
| Output Current | I_o | 30 30 70 100 50 100 100 | mA |
| Output Current | I_C (Max) | 100 | mA |
| Power Dissipation (Total) | P_d | 300 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 1) | $R_{\theta JA}$ | 416.7 | $^\circ\text{C/W}$ |
| Operating and Storage and Temperature Range | T_j, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

- Note: 1. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.
2. 200mW per element must not be exceeded.

Electrical Characteristics @ T_A = 25°C unless otherwise specified

| Characteristic (DDC143TK & DDC114TK only) | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|----------------------|-----|-----|-----|------|---|
| Collector-Base Breakdown Voltage | BV _{CBO} | 50 | — | — | V | I _C = 50μA |
| Collector-Emitter Breakdown Voltage | BV _{CEO} | 50 | — | — | V | I _C = 1mA |
| Emitter-Base Breakdown Voltage | BV _{EBO} | 5 | — | — | V | I _E = 50μA |
| Collector Cutoff Current | I _{CBO} | — | — | 0.5 | μA | V _{CB} = 50V |
| Emitter Cutoff Current | I _{EBO} | — | — | 0.5 | μA | V _{EB} = 4V |
| Collector-Emitter Saturation Voltage | V _{CE(sat)} | — | — | 0.3 | V | I _C /I _B = 2.5mA / 0.25mA I _C /I _B = 1mA / 0.1mA DDC143TK DDC114TK |
| DC Current Transfer Ratio | h _{FE} | 100 | 250 | 600 | — | I _C = 1mA, V _{CE} = 5V |
| Input Resistor (R ₁) Tolerance | ΔR ₁ | -30 | — | +30 | % | — |
| Gain-Bandwidth Product* | f _T | — | 250 | — | MHz | V _{CE} = 10V, I _E = -5mA, f = 100MHz |

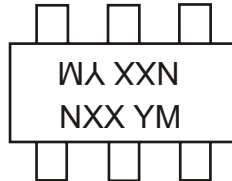
| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|--|--------------------------------|---------------------------------|-----------------------------|-------------------------------------|------|---|
| Input Voltage | DDC124EK DDC144EK DDC114YK DDC123JK DDC114EK | V _{I(off)} | 0.5 0.5 0.3 0.5 0.5 | 1.1 1.1 — — 1.1 | — | V | V _{CC} = 5V, I _O = 100μA |
| | DDC124EK DDC144EK DDC114YK DDC123JK DDC114EK | V _{I(on)} | — | 1.9 1.9 — — 1.9 | 3.0 3.0 1.4 1.1 3.0 | | |
| Output Voltage | DDC124EK DDC144EK DDC114YK DDC123JK DDC114EK | V _{O(on)} | — | 0.1 | 0.3 | V | I _O /I _I = 10mA / 0.5mA I _O /I _I = 10mA / 0.5mA I _O /I _I = 5mA / 0.25mA I _O /I _I = 5mA / 0.25mA I _O /I _I = 10mA / 0.5mA |
| Input Current | DDC124EK DDC144EK DDC114YK DDC123JK DDC114EK | I _I | — | — | 0.36 0.18 0.88 3.6 0.88 | mA | V _I = 5V |
| Output Current | | I _{O(off)} | — | — | 0.5 | μA | V _{CC} = 50V, V _I = 0V |
| DC Current Gain | DDC124EK DDC144EK DDC114YK DDC123JK DDC114EK | G _I | 56 68 68 80 30 | — | — | — | V _O = 5V, I _O = 5mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 5mA |
| Input Resistor (R ₁) Tolerance | | ΔR ₁ | -30 | — | +30 | % | — |
| Resistance Ratio Tolerance | | 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

Ordering Information (Note 3)

| Device | Packaging | Shipping |
|------------|-----------|------------------|
| DDC124EK-7 | SOT-26 | 3000/Tape & Reel |
| DDC144EK-7 | SOT-26 | 3000/Tape & Reel |
| DDC114YK-7 | SOT-26 | 3000/Tape & Reel |
| DDC123JK-7 | SOT-26 | 3000/Tape & Reel |
| DDC114EK-7 | SOT-26 | 3000/Tape & Reel |
| DDC143TK-7 | SOT-26 | 3000/Tape & Reel |
| DDC114TK-7 | SOT-26 | 3000/Tape & Reel |

Notes: 3. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information

NXX = Product Type Marking Code
See Sheet 1 Diagrams
YM = Date Code Marking
Y = Year ex: N = 2002
M = Month ex: 9 = September

Date Code Key

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|------|------|------|------|------|------|------|------|------|
| Code | N | P | R | S | T | U | V | W |

| Month | Jan | Feb | March | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

TYPICAL CURVES - DDC123JK
ONE SECTION

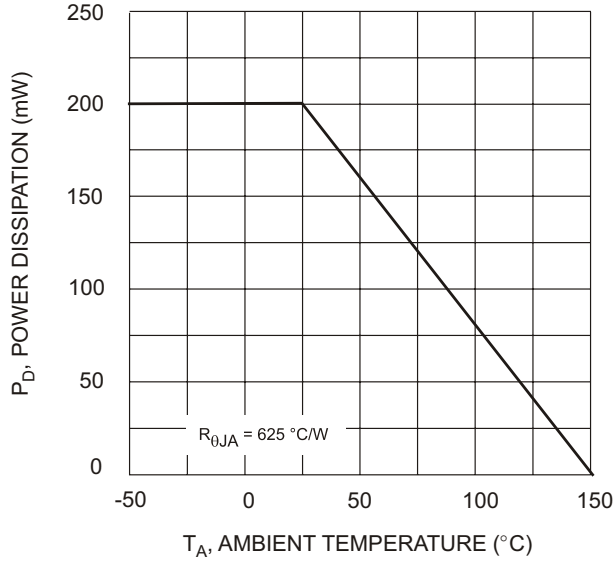


Fig. 1 Derating Curve

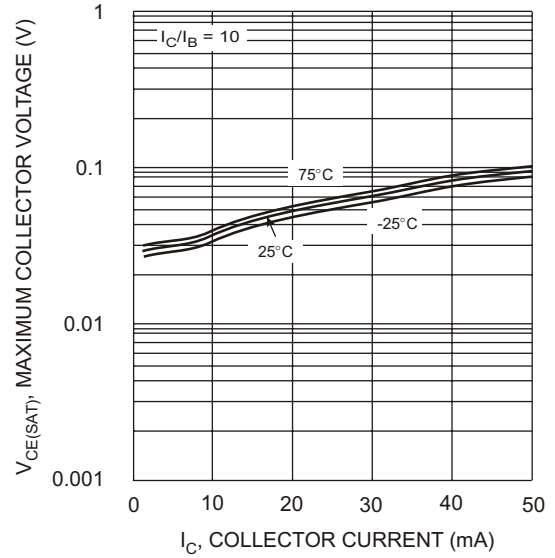


Fig. 2 $V_{CE(SAT)}$ vs. I_C

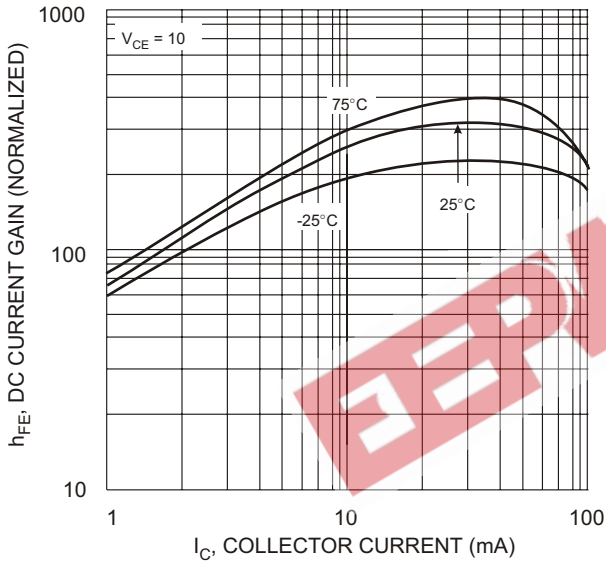


Fig. 3 DC Current Gain

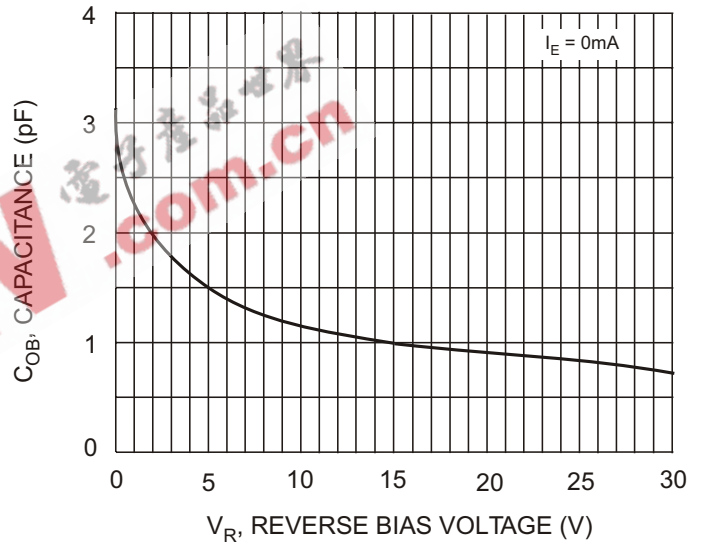


Fig. 4 Output Capacitance

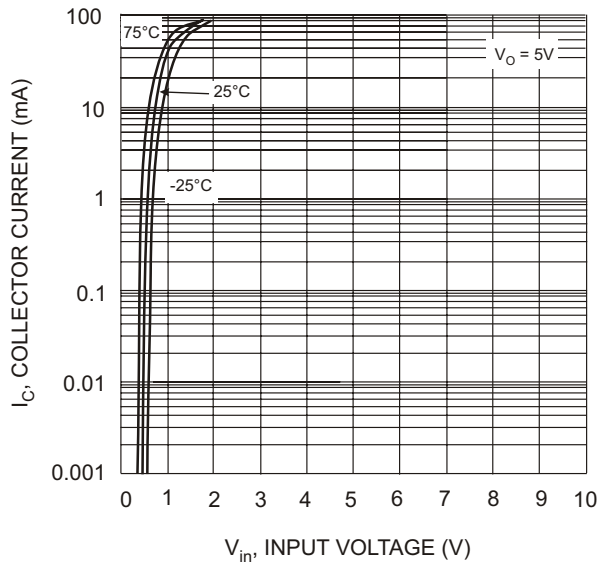


Fig. 5 Collector Current Vs. Input Voltage

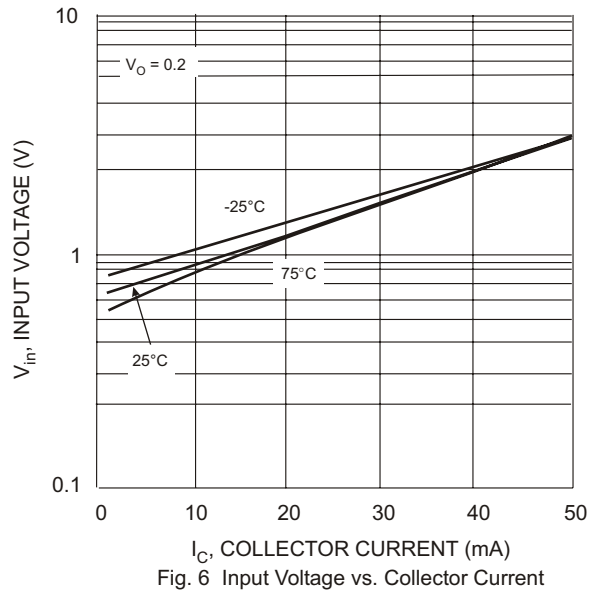


Fig. 6 Input Voltage vs. Collector Current

TYPICAL CURVES - DDC114TK

ONE SECTION

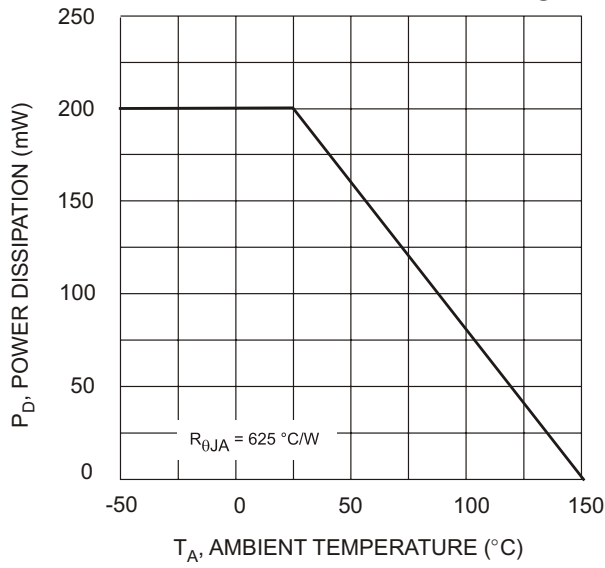


Fig. 1 Derating Curve

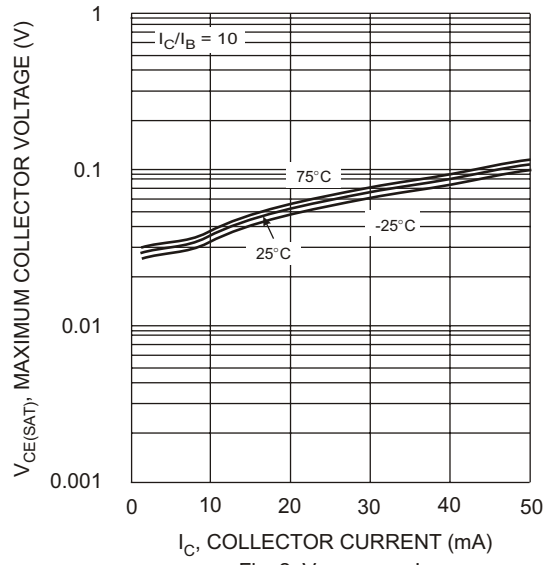


Fig. 2 $V_{CE(SAT)}$ vs. I_C

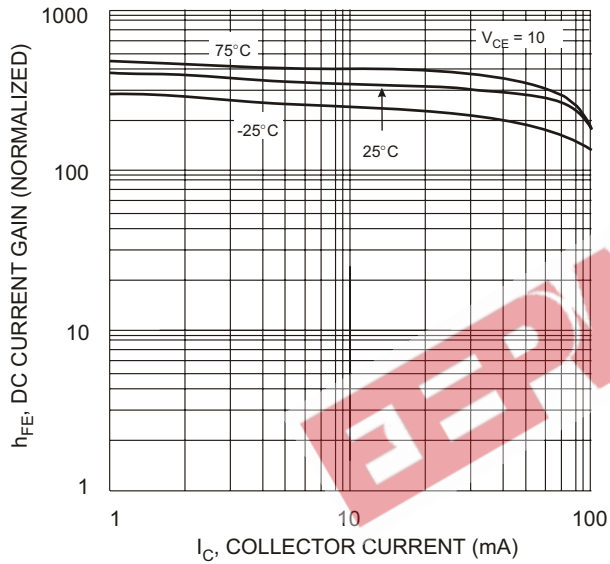


Fig. 3 DC Current Gain

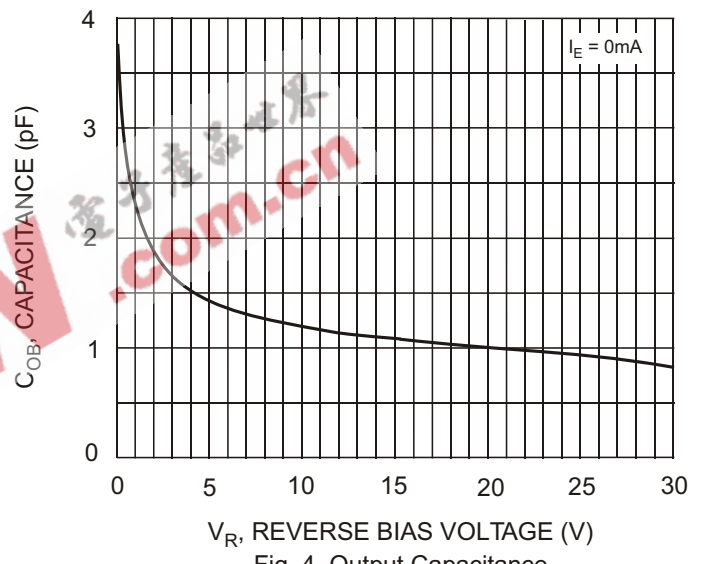


Fig. 4 Output Capacitance

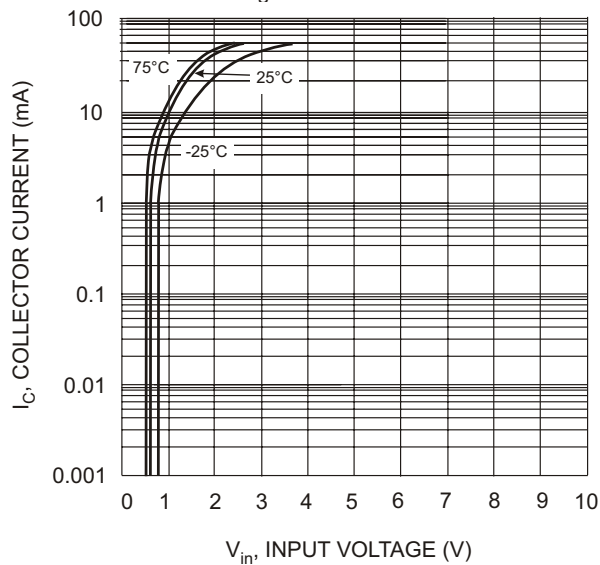


Fig. 5 Collector Current Vs. Input Voltage

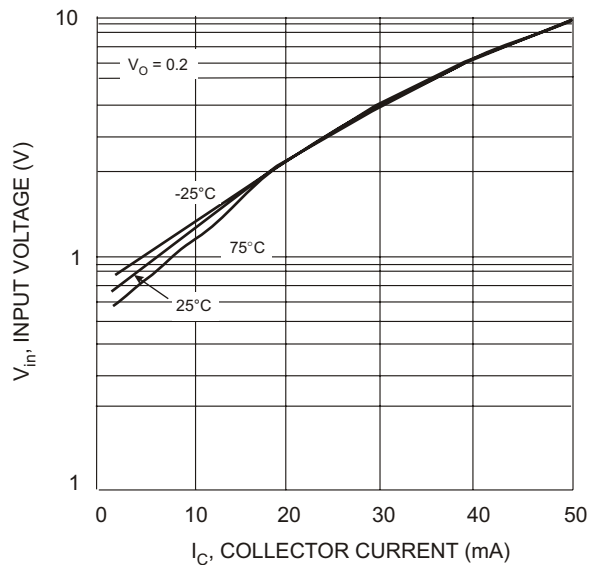


Fig. 6 Input Voltage vs. Collector Current