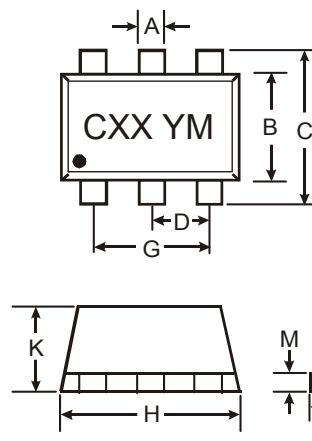


Features

- Epitaxial Planar Die Construction
- Built-In Biasing Resistors
- Lead Free By Design/RoHS Compliant (Note 2)
- "Green" Device (Note 3 and 4)

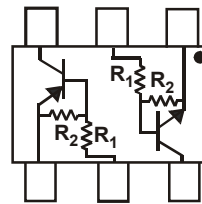
Mechanical Data

- Case: SOT-563
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Matte Tin annealed over Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.005 grams (approximate)

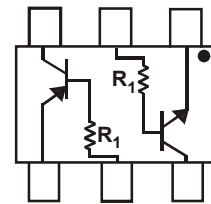


| SOT-563 | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | 0.15 | 0.30 | 0.25 |
| B | 1.10 | 1.25 | 1.20 |
| C | 1.55 | 1.70 | 1.60 |
| D | 0.50 | | |
| G | 0.90 | 1.10 | 1.00 |
| H | 1.50 | 1.70 | 1.60 |
| K | 0.56 | 0.60 | 0.60 |
| L | 0.15 | 0.25 | 0.20 |
| M | 0.10 | 0.18 | 0.11 |
| All Dimensions in mm | | | |

| P/N | R1 | R2 | MARKING |
|----------|-------|-------|---------|
| DCX124EH | 22KΩ | 22KΩ | C17 |
| DCX144EH | 47KΩ | 47KΩ | C20 |
| DCX143EH | 4.7KΩ | 4.7KΩ | C08 |
| DCX114YH | 10KΩ | 47KΩ | C14 |
| DCX123JH | 2.2KΩ | 47KΩ | C06 |
| DCX114EH | 10KΩ | 10KΩ | C13 |
| DCX143TH | 4.7KΩ | — | C07 |
| DCX114TH | 10KΩ | — | C12 |



R₁, R₂



R₁ Only

SCHEMATIC DIAGRAM, TOP VIEW

Maximum Ratings NPN Section

@T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|--|------|
| Supply Voltage | V _{CC} | 50 | V |
| Input Voltage | V _{IN} | DCX124EH -10 to +40 DCX144EH -10 to +40 DCX143EH -10 to +30 DCX114YH -6 to +40 DCX123JH -5 to +12 DCX114EH -10 to +40 DCX143TH -5V max DCX114TH -5V max | V |
| Output Current | I _O | DCX124EH 30 DCX144EH 30 DCX143EH 100 DCX114YH 70 DCX123JH 100 DCX114EH 50 DCX143TH 100 DCX114TH 100 | mA |
| Output Current | I _C (Max) | 100 | mA |
| Power Dissipation | P _d | 150 | mW |
| Thermal Resistance, Junction to Ambient Air | R _{θJA} | 833 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

- Notes:
1. Mounted on FR4 Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.
 2. No purposefully added lead.
 3. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
 4. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

Maximum Ratings PNP Section @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|--|------|
| Supply Voltage | V _{CC} | 50 | V |
| Input Voltage | V _{IN} | +10 to -40 +10 to -40 +10 to -30 +6 to -40 +5 to -12 +10 to -40 +5V max +5V max | V |
| Output Current | I _O | -30 -30 -100 -70 -100 -50 -100 -100 | mA |
| Output Current | I _C (Max) | -100 | mA |
| Power Dissipation (Total) | P _d | 150 | mW |
| Operating and Storage Temperature Range | T _j , T _{STG} | -55 to +150 | °C |

Electrical Characteristics NPN Section @T_A = 25°C unless otherwise specified

| Characteristic (DDC143TH & DDC114TH 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 _O /I _B = 2.5mA / 0.25mA DCX143TH I _O /I _B = 1mA / 0.1mA DCX114TH | |
| DC Current Transfer Ratio | h _{FE} | 100 | 250 | 600 | — | I _C = 1mA, V _{CE} = 5V | |
| 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 | V _{I(off)} | DCX124EH | 0.5 | 1.1 | — | V | V _{CC} = 5V, I _O = 100μA |
| | | DCX144EH | 0.5 | 1.1 | — | | |
| DCX143EH | | 0.5 | 1.1 | — | | | |
| DCX114YH | | 0.3 | — | — | | | |
| DCX123JH | | 0.5 | — | — | | | |
| DCX114EH | | 0.5 | 1.1 | — | | | |
| Input Voltage | V _{I(on)} | DCX124EH | — | 1.9 | 3.0 | V | V _O = 0.3V, I _O = 5mA |
| | | DCX144EH | — | 1.9 | 3.0 | | |
| | | DCX143EH | — | 1.9 | 3.0 | | |
| | | DCX114YH | — | — | 1.4 | | |
| | | DCX123JH | — | — | 1.1 | | |
| | | DCX114EH | — | 1.9 | 3.0 | | |
| Output Voltage | V _{O(on)} | DCX124EH | — | 0.1 | 0.3 | V | I _O /I _I = 10mA / 0.5mA |
| | | DCX144EH | — | 0.1 | 0.3 | | |
| | | DCX143EH | — | 0.1 | 0.3 | | |
| | | DCX114YH | — | — | — | | |
| | | DCX123JH | — | — | — | | |
| | | DCX114EH | — | 0.1 | 0.3 | | |
| Input Current | I _I | DCX124EH | — | — | 0.36 | mA | V _I = 5V |
| | | DCX144EH | — | — | 0.18 | | |
| | | DCX143EH | — | — | 1.8 | | |
| | | DCX114YH | — | — | 0.88 | | |
| | | DCX123JH | — | — | 3.6 | | |
| | | DCX114EH | — | — | 0.88 | | |
| Output Current | I _{O(off)} | — | — | 0.5 | μA | V _{CC} = 50V, V _I = 0V | |
| DC Current Gain | G _I | DCX124EH | 56 | — | — | — | V _O = 5V, I _O = 5mA |
| | | DCX144EH | 68 | — | — | | |
| | | DCX143EH | 20 | — | — | | |
| | | DCX114YH | 68 | — | — | | |
| | | DCX123JH | 80 | — | — | | |
| | | DCX114EH | 30 | — | — | | |

* Transistor - For Reference Only

Electrical Characteristics PNP Section @T_A = 25°C unless otherwise specified

| Characteristic (DCX143TH & DCX114TH 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 DCX143TH I _C /I _B = 1mA / 0.1mA DCX114TH |
| DC Current Transfer Ratio | h _{FE} | 100 | 250 | 600 | — | I _C = -1mA, V _{CE} = -5V |
| 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 | V _{I(off)} | -0.5 | -1.1 | — | V | V _{CC} = -5V, I _O = -100μA |
| | | -0.5 | -1.1 | — | | |
| -0.5 | | -1.1 | — | | | |
| -0.3 | | — | — | | | |
| -0.5 | | — | — | | | |
| -0.5 | | -1.1 | — | | | |
| Input Voltage | V _{I(on)} | — | -1.9 | -3.0 | V | V _O = -0.3V, I _O = -5mA V _O = -0.3V, I _O = -2mA V _O = -0.3V, I _O = -20mA V _O = -0.3V, I _O = -1mA V _O = -0.3V, I _O = -5mA V _O = -0.3V, I _O = -10mA |
| | | — | -1.9 | -3.0 | | |
| | | — | -1.9 | -3.0 | | |
| | | — | -1.4 | -1.1 | | |
| | | — | -1.1 | -3.0 | | |
| | | -1.9 | -3.0 | — | | |
| Output Voltage | 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 = -10mA / -0.5mA I _O /I _I = -5mA / -0.25mA I _O /I _I = -5mA / -0.25mA I _O /I _I = -10mA / -0.5mA |
| | | — | -0.1 | -0.3 | | |
| | | — | -0.1 | -0.3 | | |
| | | — | -0.1 | -0.3 | | |
| | | — | -0.1 | -0.3 | | |
| | | — | -0.1 | -0.3 | | |
| Input Current | I _I | — | — | -0.36 | mA | V _I = -5V |
| | | — | — | -0.18 | | |
| | | — | — | -1.8 | | |
| | | — | — | -0.88 | | |
| | | — | — | -3.6 | | |
| | | — | — | -0.88 | | |
| Output Current | I _{O(off)} | — | — | -0.5 | μA | V _{CC} = 50V, V _I = 0V |
| DC Current Gain | G _I | 56 | — | — | — | 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 = -10mA V _O = -5V, I _O = -5mA |
| | | 68 | — | — | | |
| | | 20 | — | — | | |
| | | 68 | — | — | | |
| | | 80 | — | — | | |
| | | 30 | — | — | | |
| Gain-Bandwidth Product* | f _T | — | 250 | — | MHz | V _{CE} = -10V, I _E = -5mA, f = 100MHz |

* Transistor - For Reference Only

Typical Curves – DCX143EH NPN Section

NEW PRODUCT



Fig. 1 Derating Curve - Total

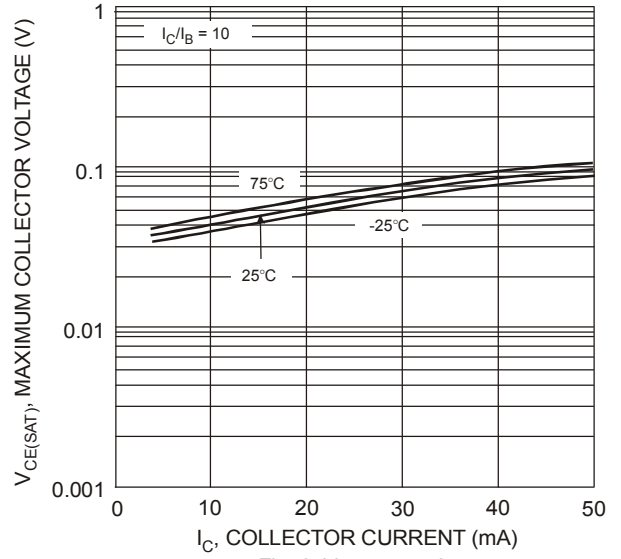


Fig. 2 $V_{CE(SAT)}$ vs. I_C



Fig. 3 DC Current Gain

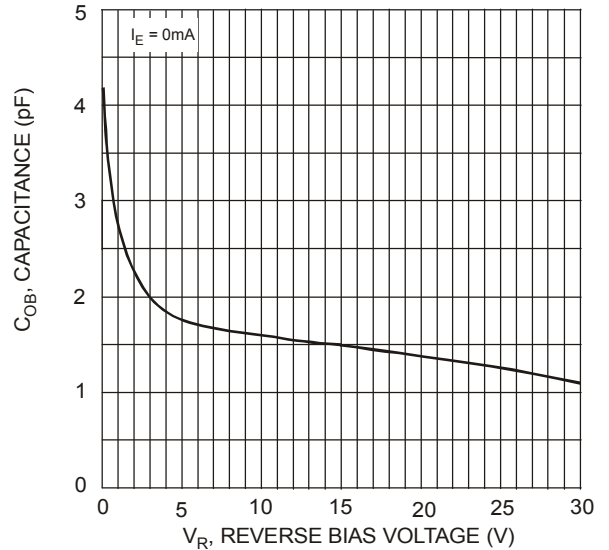


Fig. 4 Output Capacitance

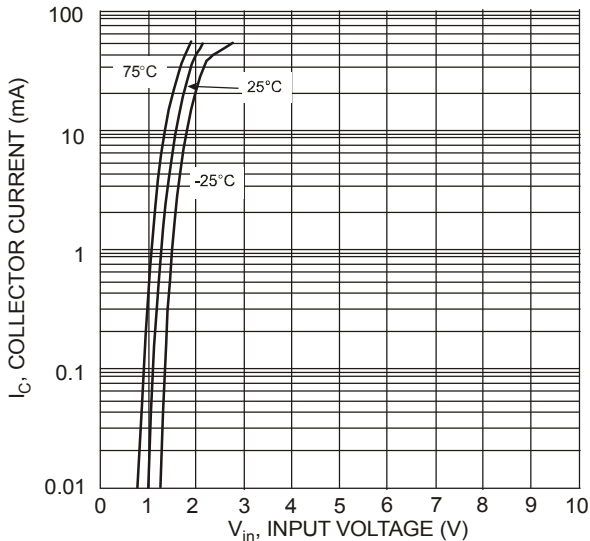


Fig. 5 Collector Current vs. Input Voltage



Fig. 6 Input Voltage vs. Collector Current

Typical Curves – DCX143EH PNP Section

NEW PRODUCT

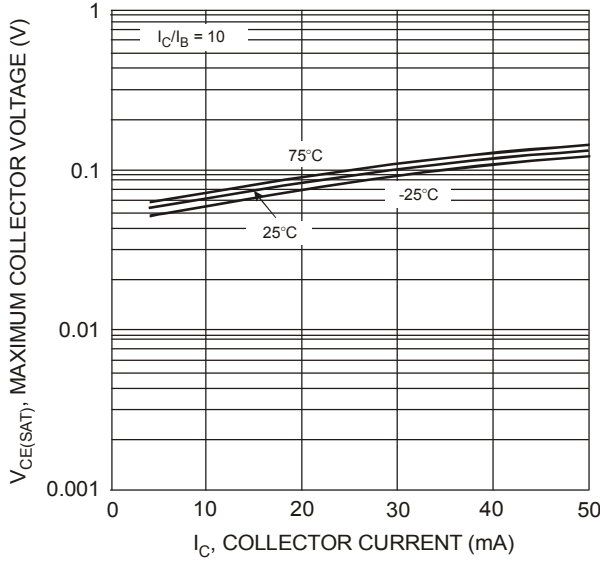


Fig. 7 $V_{CE(SAT)}$ vs. I_C



Fig. 8 DC Current Gain

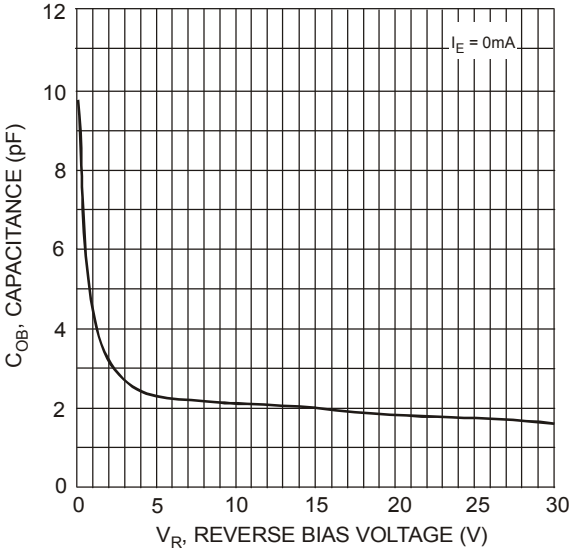


Fig. 9 Output Capacitance

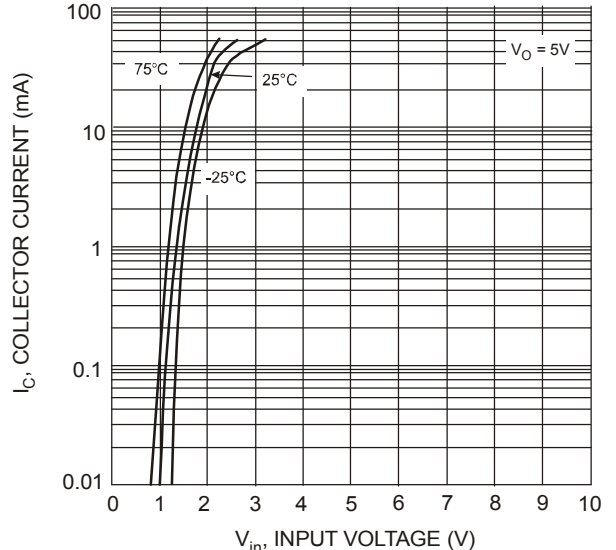


Fig. 10 Collector Current vs. Input Voltage

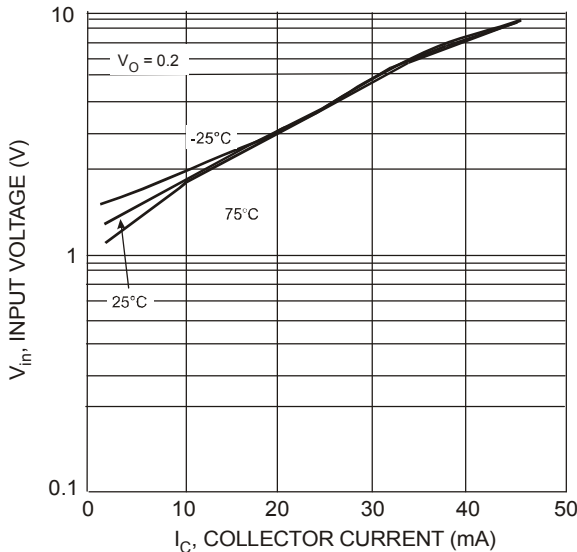


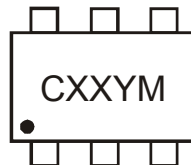
Fig. 11 Input Voltage vs. Collector Current

Ordering Information (Note 5)

| Device | Packaging | Shipping |
|------------|-----------|------------------|
| DCX124EH-7 | SOT-563 | 3000/Tape & Reel |
| DCX144EH-7 | SOT-563 | 3000/Tape & Reel |
| DCX143EH-7 | SOT-563 | 3000/Tape & Reel |
| DCX114YH-7 | SOT-563 | 3000/Tape & Reel |
| DCX123JH-7 | SOT-563 | 3000/Tape & Reel |
| DCX114EH-7 | SOT-563 | 3000/Tape & Reel |
| DCX143TH-7 | SOT-563 | 3000/Tape & Reel |
| DCX114TH-7 | SOT-563 | 3000/Tape & Reel |

Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



CXX = Product Type Marking Code (See Page 1)
 YM = Date Code Marking
 Y = Year ex: P = 2003
 M = Month ex: 9 = September

Date Code Key

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|
| Code | 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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- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

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Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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