# 40V PNP LOW SATURATION SWITCHING TRANSISTOR IN SOT26

## Features

- $BV_{CEO}$ > -40V
- $I_C$ = -2A Continuous Collector Current
- $I_{CM}$ = -4A Peak Pulse Current
- $R_{CE(sat)}$ = 105mΩ for a Low Equivalent On-Resistance
- Low Saturation Voltage of <-220mV @ -1A
- $h_{FE}$ Characterized up to -3A for High Current Gain Hold-Up
- **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**

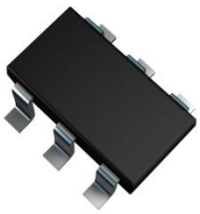
## Mechanical Data

- Case: SOT26
- 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 e3
- Weight: 0.015 grams (Approximate)

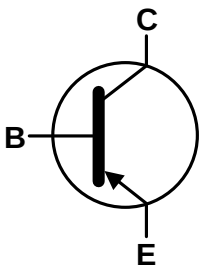
## Applications

- DC-DC Converters
- Power Management Functions
- Power Switches
- Motor Control

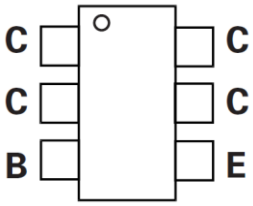
SOT26



Top View




Device Symbol




Pin-Out Top

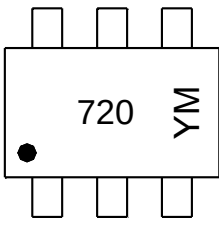
## Ordering Information (Note 4)

| Product | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|---|---|---|---|---|
| ZXT10P40DE6TA | 720 | 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

SOT26




720 = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: D = 2016)
M or $\overline{M}$ = Month (ex: 9 = September)

Date Code Key

| Year | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | D | E | F | G | H | I | J | K | L | M | N |

| 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 |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | -40 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | -40 | V |
| Emitter-Base Voltage | $V_{EBO}$ | -5 | V |
| Base Current | $I_B$ | -500 | mA |
| Continuous Collector Current | $I_C$ | -2 | A |
| Peak Pulse Collector Current | $I_{CM}$ | -4 | A |

## Thermal Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

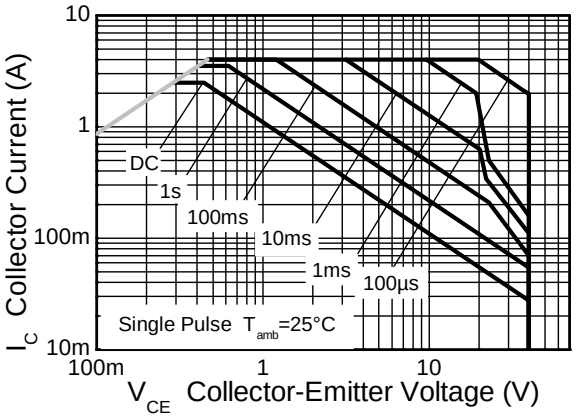
| Characteristic | | Symbol | Value | Unit |
|---|---|---|---|---|
| Power Dissipation<br>Linear Derating Factor | (Note 5) | $P_D$ | 1.1<br>8.8 | W<br>mW/°C |
| | (Note 6) | | 1.7<br>13.6 | |
| Thermal Resistance, Junction to Ambient | (Note 5) | $R_{\theta JA}$ | 113 | °C/W |
| | (Note 6) | | 73 | |
| Thermal Resistance, Junction to Lead | (Note 7) | $R_{\theta JL}$ | 18.61 | |
| Operating and Storage Temperature Range | | $T_J$, $T_{STG}$ | -55 to +150 | °C |

## ESD Ratings (Note 8)

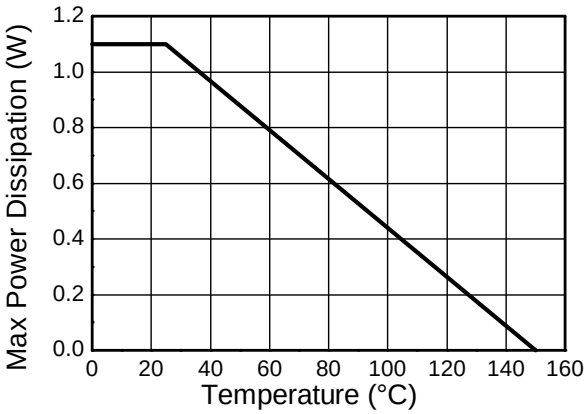
| Characteristic | Symbol | Value | Unit | JEDEC Class |
|---|---|---|---|---|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V | 3A |
| Electrostatic Discharge - Machine Model | ESD MM | 400 | V | C |

Notes:
5. For a device mounted with collector leads on 25mm x 25mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Same as Note 5, except the device is measured at $t \leq 5$ seconds.
7. Thermal resistance from junction to solder-point (at the end of the collector leads).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

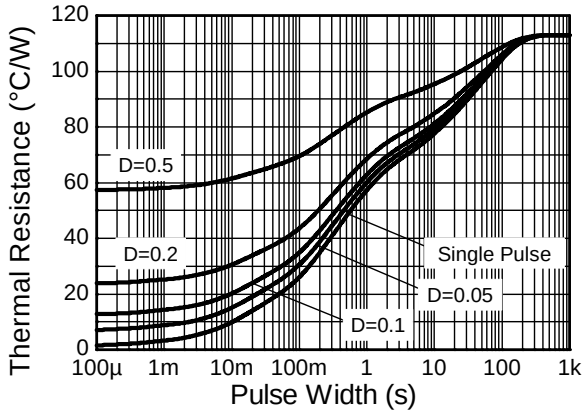
## Thermal Characteristics and Derating Information




**Safe Operating Area**




**Derating Curve**



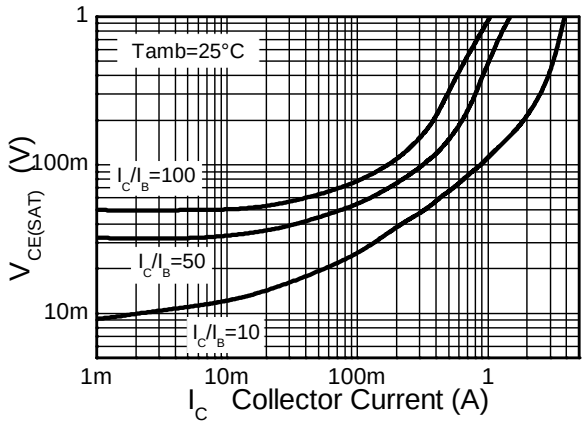

**Transient Thermal Impedance**

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

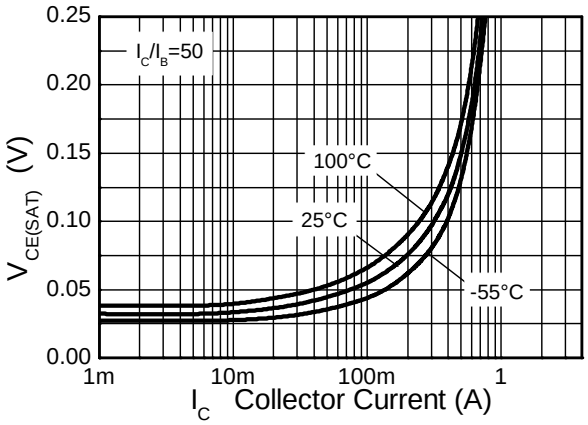
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Collector-Base Breakdown Voltage | $BV_{CBO}$ | -40 | -80 | — | V | $I_C$ = -100µA |
| Collector-Emitter Breakdown Voltage (Note 9) | $BV_{CEO}$ | -40 | -70 | — | V | $I_C$ = -10mA |
| Emitter-Base Breakdown Voltage | $BV_{EBO}$ | -5 | -8.8 | — | V | $I_E$ = -100µA |
| Collector-Base Cut-Off Current | $I_{CBO}$ | — | — | -100 | nA | $V_{CB}$ = -35V |
| Emitter Cut-Off Current | $I_{EBO}$ | — | — | -100 | nA | $V_{EB}$ = -4V |
| Collector-Emitter Cut-Off Current | $I_{CES}$ | — | — | -100 | nA | $V_{CES}$ = -35V |
| **ON CHARACTERISTICS** (Note 9) | | | | | | |
| DC Current Gain | $h_{FE}$ | 300 | 480 | — | — | $I_C$ = -10mA, $V_{CE}$ = -2V |
| | | 300 | 450 | — | — | $I_C$ = -100mA, $V_{CE}$ = -2V |
| | | 180 | 290 | — | — | $I_C$ = -1A, $V_{CE}$ = -2V |
| | | 60 | 130 | — | — | $I_C$ = -1.5A, $V_{CE}$ = -2V |
| | | 12 | 22 | — | — | $I_C$ = -3A, $V_{CE}$ = -2V |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | — | -25 | -40 | mV | $I_C$ = -100mA, $I_B$ = -10mA |
| | | — | -150 | -220 | | $I_C$ = -1A, $I_B$ = -100mA |
| | | — | -195 | -300 | | $I_C$ = -1.5A, $I_B$ = -100mA |
| | | — | -210 | -300 | | $I_C$ = -2A, $I_B$ = -200mA |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | — | -0.95 | -1.0 | V | $I_C$ = -2A, $I_B$ = -200mA |
| Base-Emitter Turn-On Voltage | $V_{BE(on)}$ | — | -0.85 | -0.95 | V | $I_C$ = -2A, $V_{CE}$ = -2V |
| **SMALL SIGNAL CHARACTERISTICS** | | | | | | |
| Current Gain-Bandwidth Product | $f_T$ | 150 | 190 | — | MHz | $V_{CE}$ = -10V, $I_C$ = -50mA, f = 100MHz |
| Output Capacitance | $C_{obo}$ | — | 19 | 25 | pF | $V_{CB}$ = -10V, f = 1MHz |
| Turn-On Time | $t_{(on)}$ | — | 40 | — | ns | $V_{CC}$ = -15V, $I_C$ = -0.75A |
| Turn-Off Time | $t_{(off)}$ | — | 435 | — | ns | $I_{B1}$ = $I_{B2}$ = -15mA |

Note: 9. Measured under pulsed conditions; pulse width ≤ 300µs, duty cycle ≤ 2%.

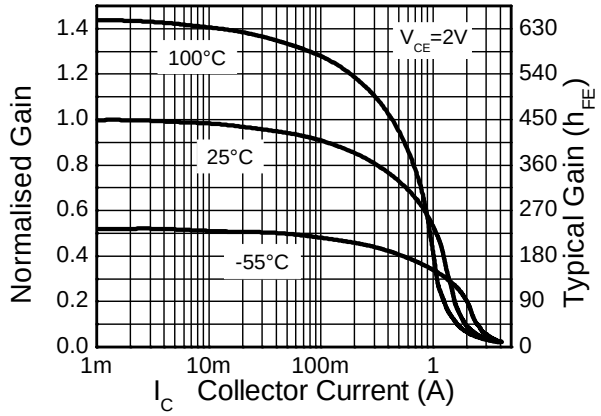
## Typical Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)



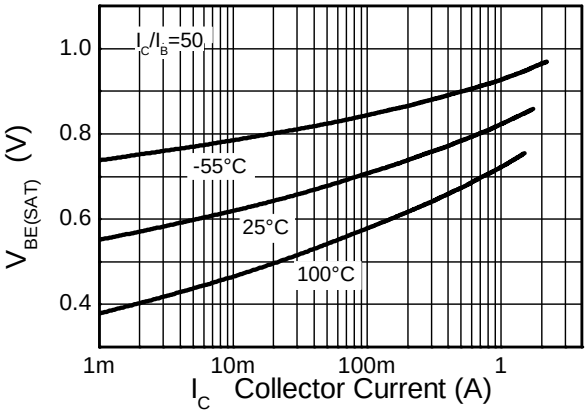

**$V_{CE(SAT)}$ v $I_C$**



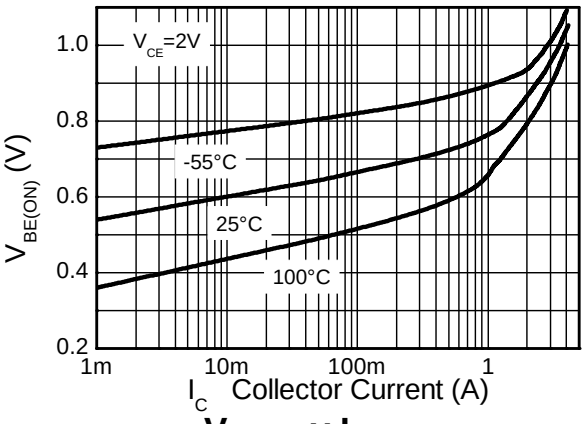

**$V_{CE(SAT)}$ v $I_C$**




**$h_{FE}$ v $I_C$**



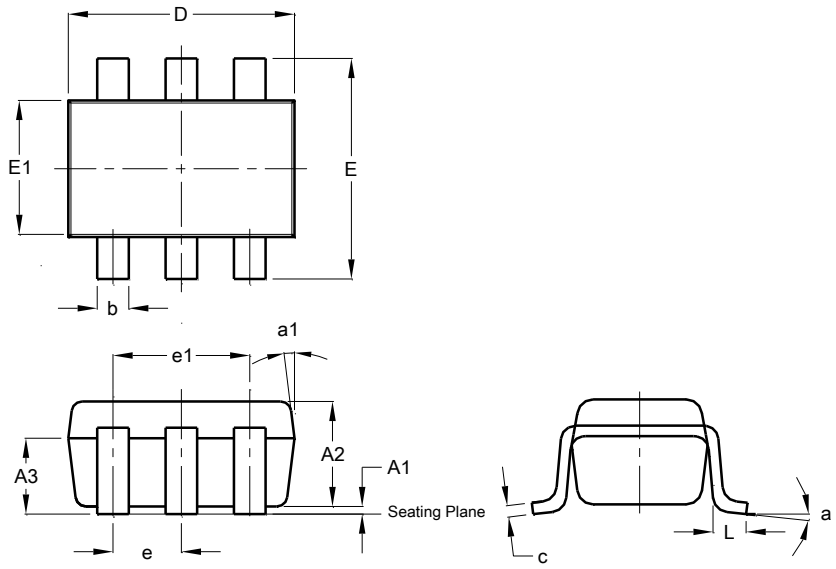

**$V_{BE(SAT)}$ v $I_C$**




**$V_{BE(ON)}$ v $I_C$**

## Package Outline Dimensions

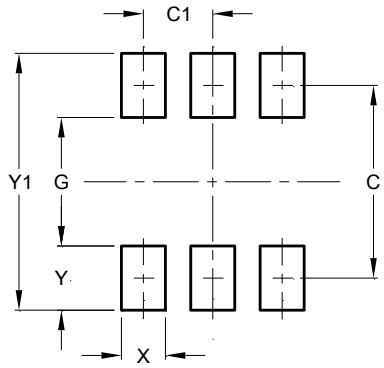
Please see http://www.diodes.com/package-outlines.html for the latest version.




| SOT26 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A1** | 0.013 | 0.10 | 0.05 |
| **A2** | 1.00 | 1.30 | 1.10 |
| **A3** | 0.70 | 0.80 | 0.75 |
| **b** | 0.35 | 0.50 | 0.38 |
| **c** | 0.10 | 0.20 | 0.15 |
| **D** | 2.90 | 3.10 | 3.00 |
| **e** | - | - | 0.95 |
| **e1** | - | - | 1.90 |
| **E** | 2.70 | 3.00 | 2.80 |
| **E1** | 1.50 | 1.70 | 1.60 |
| **L** | 0.35 | 0.55 | 0.40 |
| **a** | - | - | 8° |
| **a1** | - | - | 7° |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.




| Dimensions | Value (in mm) |
|---|---|
| **C** | 2.40 |
| **C1** | 0.95 |
| **G** | 1.60 |
| **X** | 0.55 |
| **Y** | 0.80 |
| **Y1** | 3.20 |

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