

Features

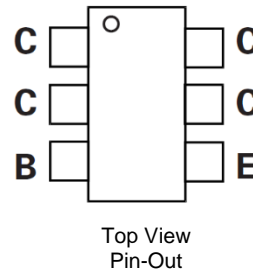
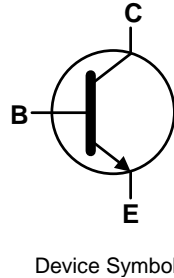
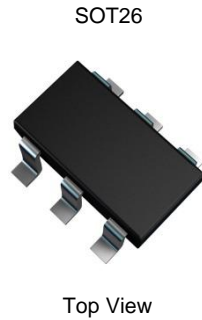
- $BV_{CEO} > 20V$
- $I_C = 4.5A$ Continuous Collector Current
- $I_{CM} = 15A$ Peak Pulse Current
- $R_{CE(SAT)} = 38m\Omega$ for a Low Equivalent On-Resistance
- Low Saturation Voltage (75mV max @ 1A)
- h_{FE} Characterized up to 15A
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen 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
- Weight: 0.015 grams (Approximate)

Applications

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

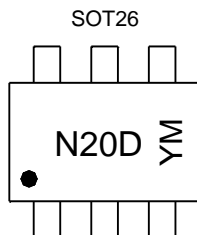


Ordering Information (Note 4)

| Product | Compliance | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|---------------|------------|---------|--------------------|-----------------|-------------------|
| ZXT13N20DE6TA | AEC-Q101 | N20D | 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



N20D = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: C = 2015)
 M or \bar{M} = Month (ex: 9 = September)

Date Code Key

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | C | D | E | F | G | H | I | J | K | L | M |

| 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} | 50 | V |
| Collector-Emitter Voltage | V _{CEO} | 20 | V |
| Emitter-Base Voltage | V _{EBO} | 7.5 | V |
| Base Current | I _B | 500 | mA |
| Continuous Collector Current | I _C | 4.5 | A |
| Peak Pulse Collector Current | I _{CM} | 15 | A |

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

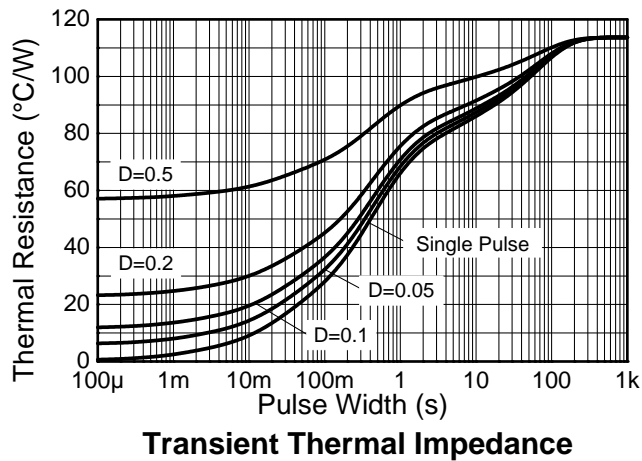
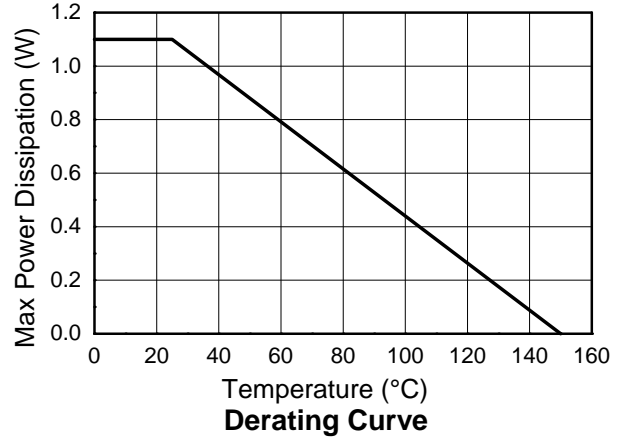
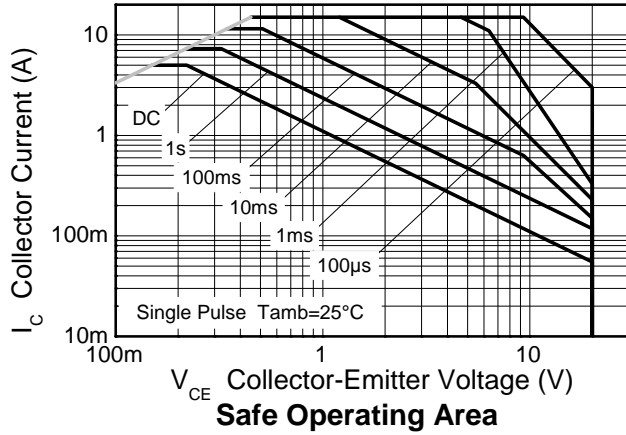
| Characteristic | Symbol | Value | Unit |
|-----------------------------------------|-----------------------------------|-------------|-------|
| Power Dissipation | P _D | 1.1 | W |
| | | 8.8 | |
| Linear Derating Factor | | 1.7 | mW/°C |
| | | 13.6 | |
| Thermal Resistance, Junction to Ambient | R _{θJA} | 113 | °C/W |
| | | 73 | |
| Thermal Resistance, Junction to Lead | R _{θJL} | 18.6 | |
| 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 the collector lead on 25mm x 25mm 1oz copper that is on single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Same as Note 6, except the device is measured at t ≤ 5 sec.
 7. Thermal resistance from junction to solder-point (at the end of the collector lead).
 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

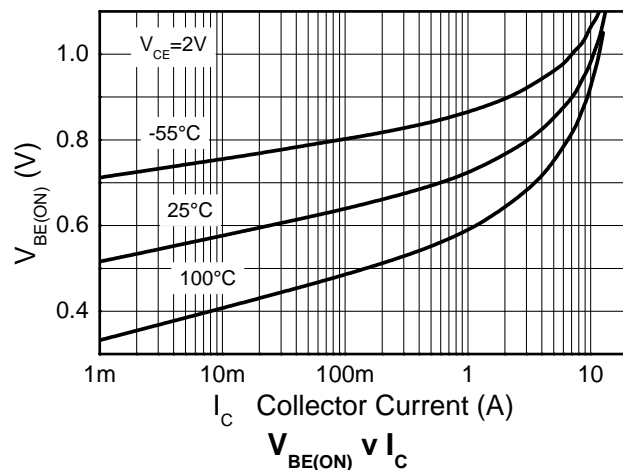
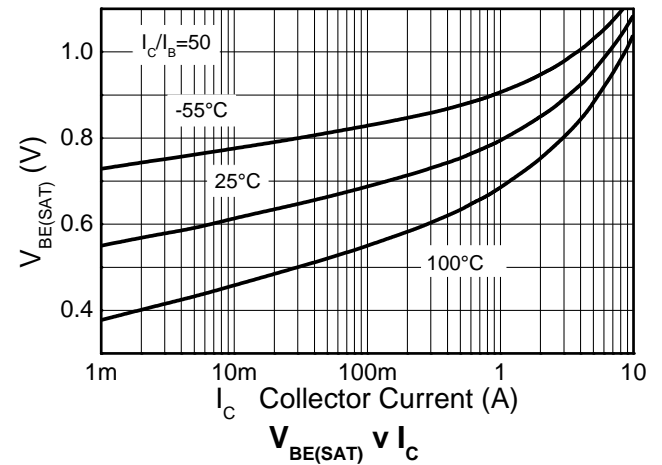
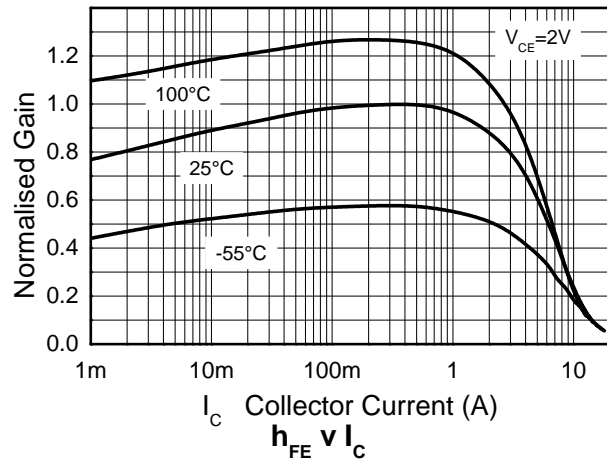
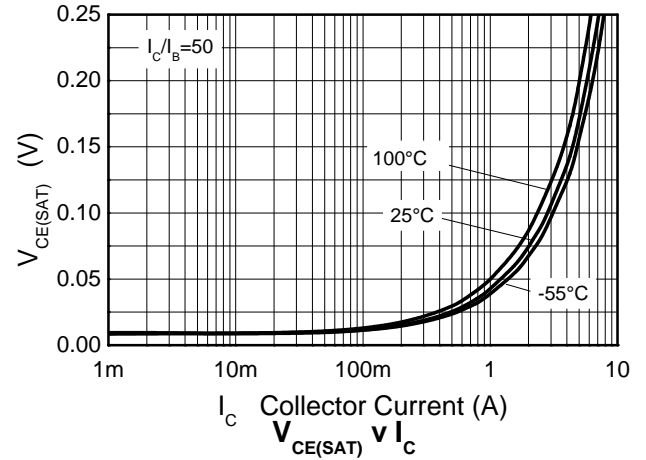
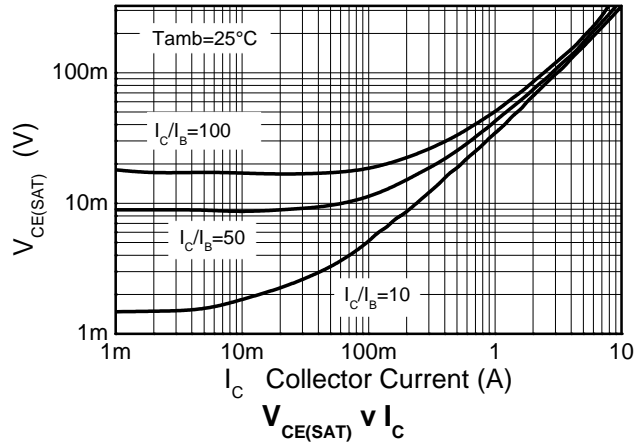


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|----------------------------------------------|----------------------|-----|------|------|------|---------------------------------------------------------|
| OFF CHARACTERISTICS | | | | | | |
| Collector-Base Breakdown Voltage | BV _{CBO} | 50 | 100 | — | V | I _C = 100μA |
| Collector-Emitter Breakdown Voltage (Note 9) | BV _{CEO} | 20 | 33 | — | V | I _C = 10mA |
| Emitter-Base Breakdown Voltage | BV _{EBO} | 7.5 | 8.5 | — | V | I _E = 100μA |
| Collector-Base Cutoff Current | I _{CBO} | — | — | 100 | nA | V _{CB} = 40V |
| Emitter Cutoff Current | I _{EBO} | — | — | 100 | nA | V _{EB} = 6V |
| Collector-Emitter Cutoff Current | I _{CES} | — | — | 100 | nA | V _{CES} = 40V |
| ON CHARACTERISTICS (Note 9) | | | | | | |
| DC Current Gain | h _{FE} | 250 | 400 | — | — | I _C = 10mA, V _{CE} = 2V |
| | | 300 | 450 | 900 | | I _C = 1A, V _{CE} = 2V |
| | | 200 | 300 | — | | I _C = 5A, V _{CE} = 2V |
| | | 15 | 45 | — | | I _C = 15A, V _{CE} = 2V |
| Collector-Emitter Saturation Voltage | V _{CE(sat)} | — | 5 | 8 | mV | I _C = 100mA, I _B = 10mA |
| | | — | 55 | 75 | | I _C = 1A, I _B = 10mA |
| | | — | 170 | 230 | | I _C = 4.5A, I _B = 45mA |
| Base-Emitter Turn-On Voltage | V _{BE(on)} | — | 0.85 | 0.90 | V | I _C = 4.5A, V _{CE} = 2V |
| SMALL SIGNAL CHARACTERISTICS | | | | | | |
| Current Gain-Bandwidth Product | f _T | — | 96 | — | MHz | V _{CE} = 10V, I _C = 50mA, f = 50MHz |
| Output Capacitance | C _{obo} | — | 50 | — | pF | V _{CB} = 10V, f = 1MHz |
| Turn-On Time | t _(on) | — | 115 | — | ns | V _{CC} = 10V, I _C = 2A |
| Turn-Off Time | t _(off) | — | 485 | — | ns | I _{B1} = I _{B2} = 40mA |

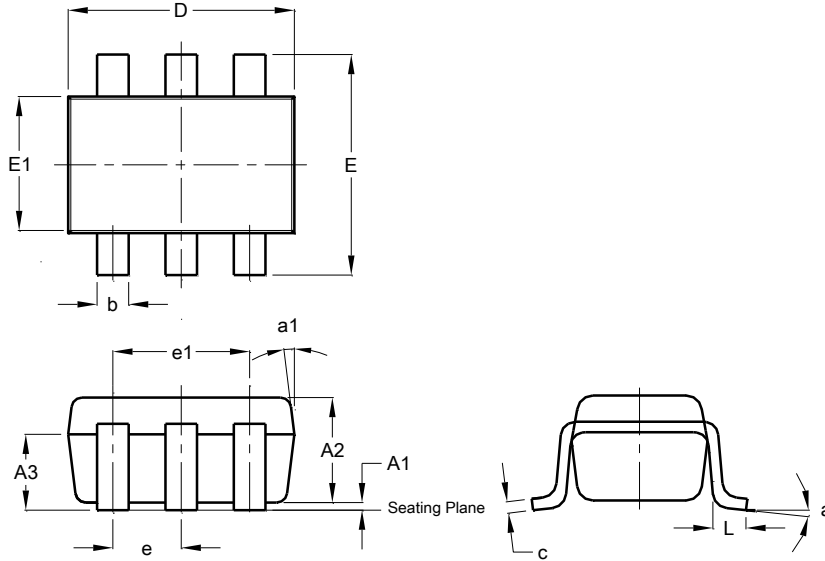
Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

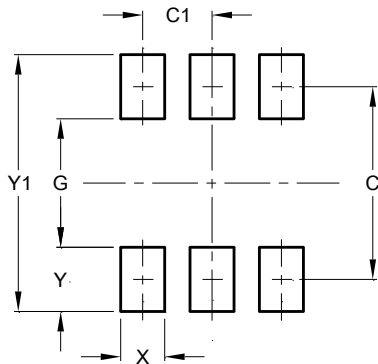
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| 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 AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> 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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