Lead-free Green

## Features

- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DXTA92)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- Lead Free By Design/RoHS Compliant (Note 1)
- "Green" Device (Note 2)


## Mechanical Data

- Case: SOT89-3L
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Matte Tin annealed over Copper leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking \& Type Code Information: See Page 3
- Ordering Information: See Page 3
- Weight: 54.8 mg (approximate)


Top View


TOP VIEW
Device Schematic


EMITTER
Pin Out Configuration

Maximum Ratings $@ T_{A}=25^{\circ} \mathrm{C}$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
| :--- | :---: | :---: | :---: |
| Collector-Base Voltage | $\mathrm{V}_{\text {CBO }}$ | 300 | V |
| Collector-Emitter Voltage | $\mathrm{V}_{\text {CEO }}$ | 300 | V |
| Emitter-Base Voltage | $\mathrm{V}_{\text {EBO }}$ | 6 | V |
| Continuous Collector Current | $\mathrm{IC}_{C}$ | 500 | mA |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
| :--- | :---: | :---: | :---: |
| Power Dissipation (Note 3) @ $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}$ | $\mathrm{P}_{\mathrm{D}}$ | 1 | W |
| Thermal Resistance, Junction to Ambient (Note 3) | $\mathrm{R}_{\theta \mathrm{JJA}}$ | 125 | ${ }^{\circ} \mathrm{C} / \mathrm{W}$ |
| Operating and Storage Temperature Range | $\mathrm{T}_{\mathrm{J}, \mathrm{T}} \mathrm{T}_{\mathrm{STG}}$ | -55 to +150 | ${ }^{\circ} \mathrm{C}$ |

Electrical Characteristics $@ T_{A}=25^{\circ} \mathrm{C}$ unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Conditions |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OFF CHARACTERISTICS (Note 4) |  |  |  |  |  |  |
| Collector-Base Breakdown Voltage | $\mathrm{V}_{\text {(BR) }}$ CBO | 300 | - | - | V | $\mathrm{IC}_{\mathrm{C}}=100 \mu \mathrm{~A}, \mathrm{I}_{\mathrm{E}}=0$ |
| Collector-Emitter Breakdown Voltage | $\mathrm{V}_{\text {(BR)CEO }}$ | 300 | - | - | V | $\mathrm{I}_{\mathrm{C}}=1 \mathrm{~mA}, \mathrm{I}_{\mathrm{B}}=0$ |
| Emitter-Base Breakdown Voltage | $\mathrm{V}_{(\mathrm{BR}) \text { EBO }}$ | 6 | - | - | V | $\mathrm{IE}_{\mathrm{E}}=100 \mu \mathrm{~A}, \mathrm{IC}=0$ |
| Collector Cut-off Current | $\mathrm{I}_{\text {cbo }}$ | - | - | 0.1 | $\mu \mathrm{A}$ | $\mathrm{V}_{\mathrm{CB}}=200 \mathrm{~V}, \mathrm{I}_{\mathrm{E}}=0$ |
| Emitter Cut-off Current | Iebo | - | - | 0.1 | $\mu \mathrm{A}$ | $\mathrm{V}_{\mathrm{EB}}=6 \mathrm{~V}, \mathrm{IC}_{\mathrm{C}}=0$ |
| ON CHARACTERISTICS (Note 4) |  |  |  |  |  |  |
| Collector-Emitter Saturation Voltage | $\mathrm{V}_{\text {CE(SAT) }}$ | - | - | 0.5 | V | $\mathrm{IC}_{\mathrm{C}}=20 \mathrm{~mA}, \mathrm{I}_{\mathrm{B}}=2 \mathrm{~mA}$ |
| Base-Emitter Saturation Voltage | $\mathrm{V}_{\text {BE(SAT }}$ | - | - | 0.9 | V | $\mathrm{I}_{\mathrm{C}}=20 \mathrm{~mA}, \mathrm{I}_{\mathrm{B}}=2 \mathrm{~mA}$ |
| Static Forward Current Transfer Ratio | $h_{\text {FE }}$ | $\begin{aligned} & 25 \\ & 40 \\ & 40 \end{aligned}$ | - | - | - | $\begin{aligned} & \mathrm{IC}=1 \mathrm{~mA}, \mathrm{~V}_{\mathrm{CE}}=10 \mathrm{~V} \\ & \mathrm{IC}=10 \mathrm{~mA}, \mathrm{~V}_{\mathrm{CE}}=10 \mathrm{~V} \\ & \mathrm{IC}=30 \mathrm{~mA}, \mathrm{~V}_{\mathrm{CE}}=10 \mathrm{~V} \end{aligned}$ |
| SMALL SIGNAL CHARACTERISTICS |  |  |  |  |  |  |
| Transition Frequency | $\mathrm{f}_{\top}$ | 50 | - | - | MHz | $\begin{aligned} & \mathrm{IC}_{\mathrm{C}}=10 \mathrm{~mA}, \mathrm{~V}_{\mathrm{CE}}=20 \mathrm{~V}, \\ & \mathrm{f}=100 \mathrm{MHz} \end{aligned}$ |
| Output Capacitance | $\mathrm{C}_{\text {obo }}$ | - | - | 3 | pF | $\mathrm{V}_{\mathrm{CB}}=20 \mathrm{~V}, \mathrm{f}=1 \mathrm{MHz}$ |

Notes: 1. No purposefully added lead.
2. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
3. Device mounted on FR-4 PCB; pad layout as shown on page 4 or in Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
4. Measured under pulsed conditions. Pulse width $=300 \mu \mathrm{~s}$. Duty cycle $\leq 2 \%$.


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)


Fig. 3 Typical DC Current Gain vs. Collector Current


Fig. 5 Base-Emitter Turn-On Voltage vs. Collector Current


Fig. 2 Collector Current vs. Collector-Emitter Voltage

$\mathrm{I}_{\mathrm{C}}$, COLLECTOR CURRENT (mA)
Fig. 4 Collector-Emitter Saturation Voltage vs. Collector Current


Fig. 6 Base-Emitter Saturation Voltage vs. Collector Current

DXTA42


Fig. 7 Typical Capacitance Characteristics


Fig. 8 Gain-Bandwidth Product vs. Collector Current

## Ordering Information (Note 5)

| Part Number | Case | Packaging |
| :---: | :---: | :---: |
| DXTA42-13 | SOT89-3L | $2500 /$ Tape \& Reel |

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

## Marking Information



## Package Outline Dimensions



| SOT89-3L |  |  |  |
| :---: | :---: | :---: | :---: |
| Dim | Min | Max | Typ |
| A | 1.40 | 1.60 | 1.50 |
| B | 0.45 | 0.55 | 0.50 |
| B1 | 0.37 | 0.47 | 0.42 |
| C | 0.35 | 0.43 | 0.38 |
| D | 4.40 | 4.60 | 4.50 |
| D1 | 1.50 | 1.70 | 1.60 |
| E | 2.40 | 2.60 | 2.50 |
| e | - | - | 1.50 |
| H | 3.95 | 4.25 | 4.10 |
| L | 0.90 | 1.20 | 1.05 |
| All Dimensions in $\mathbf{~ m m}$ |  |  |  |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
| :---: | :---: |
| $\mathbf{X 1}$ | 1.7 |
| $\mathbf{X 2}$ | 0.9 |
| $\mathbf{X 3}$ | 0.4 |
| $\mathbf{Y 1}$ | 2.7 |
| Y2 | 1.3 |
| Y3 | 1.9 |
| $\mathbf{C}$ | 3.0 |

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