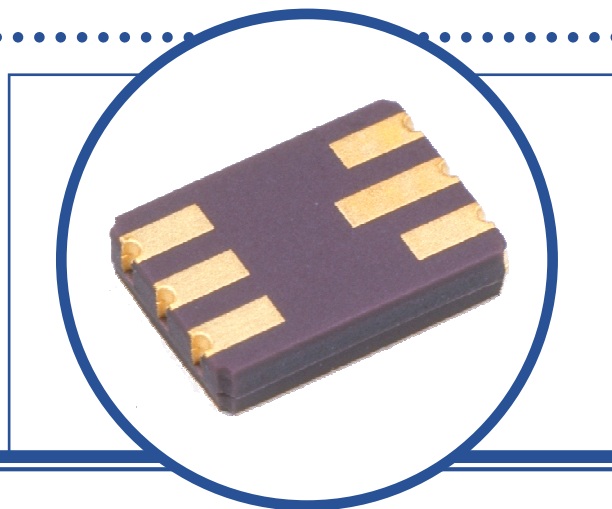


# DUAL PNP SWITCHING TRANSISTORS

## 2N3251DCSM

- Dual Silicon Planer PNP Transistors
- Hermetic Ceramic Surface Mount Package
- Designed For Small Signal, General Purpose and Switching Applications
- Screening Options Available



### ABSOLUTE MAXIMUM RATINGS (Each Side, $T_A = 25^\circ\text{C}$ unless otherwise stated)

|           |  | Each Side                         | Total Device         |
|-----------|--|-----------------------------------|----------------------|
| $V_{CBO}$ | Collector – Base Voltage   | -50V                              |                      |
| $V_{CEO}$ | Collector – Emitter Voltage  | -40V                              |                      |
| $V_{EBO}$ | Emitter – Base Voltage   | -5V                               |                      |
| $I_C$     | Continuous Collector Current   | -200mA                            |                      |
| $P_D$     | Total Power Dissipation at $T_A = 25^\circ\text{C}$<br>Derate Above $25^\circ\text{C}$ | 360mW<br>2.06mW/ $^\circ\text{C}$ | 500mW <sup>(1)</sup> |
| $T_J$     | Junction Temperature Range   | -65 to $+200^\circ\text{C}$       |                      |
| $T_{stg}$ | Storage Temperature Range  | -65 to $+200^\circ\text{C}$       |                      |

### THERMAL PROPERTIES (Each Side)

| Symbols                | Parameters                                   | Max.   | Units              |
|------------------------|--|--------|--------------------|
| $R_{\theta JA}$        | Thermal Resistance, Junction To Ambient      | 486    | $^\circ\text{C/W}$ |
| $R_{\theta JSP}^{(2)}$ | Thermal Resistance, Junction To Solder Point | 208.33 | $^\circ\text{C/W}$ |

#### Notes

- (1) Total device power dissipation limited by package.  
 (2) Infinite sink mount to PCB

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## ELECTRICAL CHARACTERISTICS (Each Side , $T_A = 25^\circ\text{C}$ unless otherwise stated)

| Symbols             | Parameters                           | Test Conditions                               | Min. | Typ. | Max.  | Units         |
|---------------------|--------------------------------------|---|------|------|-------|---------------|
| $V_{(BR)CEO}^{(3)}$ | Collector-Emitter Breakdown Voltage  | $I_C = -10\text{mA}$ $I_B = 0$                | -40  |      |       | V             |
| $I_{CBO}$           | Collector Cut-Off Current            | $V_{CB} = -50\text{V}$                        |      |      | -10   | $\mu\text{A}$ |
|                     |                                      | $V_{CB} = -40\text{V}$                        |      |      | -20   | nA            |
| $I_{EBO}$           | Emitter Cut-Off Current              | $V_{EB} = -5\text{V}$                         |      |      | -10   | $\mu\text{A}$ |
| $I_{CEX}$           | Collector Cut-Off Current            | $V_{CE} = -40\text{V}$ $V_{BE} = -3\text{V}$  |      |      | -20   | nA            |
|                     |                                      | $T_A = 150^\circ\text{C}$                     |      |      | -20   | $\mu\text{A}$ |
| $h_{FE}^{(3)}$      | Forward-current transfer ratio       | $I_C = -0.1\text{mA}$ $V_{CE} = -1.0\text{V}$ | 80   |      |       |               |
|                     |                                      | $I_C = -1.0\text{mA}$ $V_{CE} = -1.0\text{V}$ | 90   |      |       |               |
|                     |                                      | $T_A = -55^\circ\text{C}$                     | 40   |      |       |               |
|                     |                                      | $I_C = -10\text{mA}$ $V_{CE} = -1.0\text{V}$  | 100  |      | 300   |               |
| $V_{CE(sat)}^{(3)}$ | Collector-Emitter Saturation Voltage | $I_C = -10\text{mA}$ $I_B = -1.0\text{mA}$    |      |      | -0.25 | V             |
|                     |                                      | $I_C = -50\text{mA}$ $I_B = -5\text{mA}$      |      |      | -0.5  |               |
| $V_{BE(sat)}^{(3)}$ | Base-Emitter Saturation Voltage      | $I_C = -10\text{mA}$ $I_B = -1.0\text{mA}$    | -0.6 |      | -0.9  | V             |
|                     |                                      | $I_C = -50\text{mA}$ $I_B = -5\text{mA}$      |      |      | -1.2  |               |

## DYNAMIC CHARACTERISTICS (Each Side , $T_A = 25^\circ\text{C}$ unless otherwise stated)

| Symbols        | Parameters                | Test Conditions   | Min. | Typ. | Max. | Units            |
|----------------|---------------------------|---|------|------|------|------------------|
| $f_T$          | Transition Frequency      | $I_C = -10\text{mA}$ $V_{CE} = -20\text{V}$<br>$f = 100\text{MHz}$  | 300  |      |      | MHz              |
| $C_{obo}$      | Output Capacitance        | $V_{CB} = -10\text{V}$ $I_E = 0$<br>$f = 1.0\text{MHz}$             |      |      | 6    | pF               |
| $C_{ibo}$      | Input Capacitance         | $V_{EB} = -1.0\text{V}$ $I_C = 0$<br>$f = 1.0\text{MHz}$            |      |      | 8    |                  |
| $h_{ie}^{(4)}$ | Input Impedance           | $I_C = -1.0\text{mA}$ $V_{CE} = -10\text{V}$<br>$f = 1.0\text{KHz}$ | 2    |      | 12   | $\text{k}\Omega$ |
| $h_{re}^{(4)}$ | Reverse Voltage Ratio     | $I_C = -1.0\text{mA}$ $V_{CE} = -10\text{V}$<br>$f = 1.0\text{KHz}$ |      |      | 20   | $\times 10^{-4}$ |
| hfe            | Small Signal Current Gain | $I_C = -1.0\text{mA}$ $V_{CE} = -10\text{V}$<br>$f = 1.0\text{KHz}$ | 100  |      | 400  |                  |
| $h_{oe}^{(4)}$ | Output Admittance         | $I_C = -1.0\text{mA}$ $V_{CE} = -10\text{V}$<br>$f = 1.0\text{KHz}$ | 10   |      | 60   | $\mu\text{S}$    |

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### DYNAMIC CHARACTERISTICS (Each Side, $T_A = 25^\circ\text{C}$ unless otherwise stated)

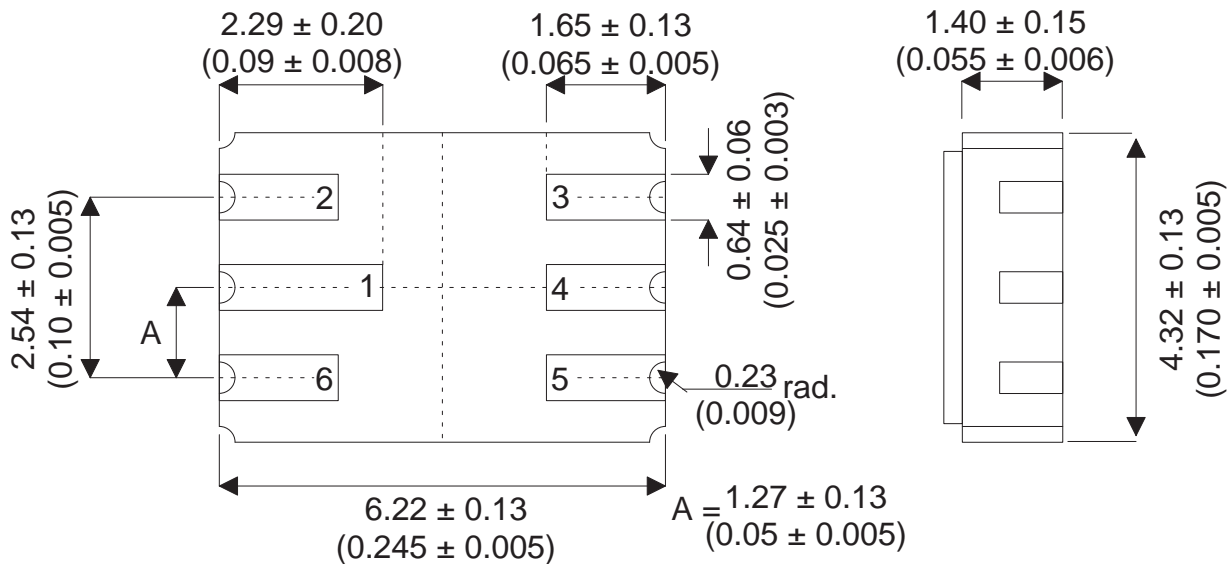
| Symbols               | Parameters                   | Test Conditions   | Min. | Typ. | Max. | Units |
|-----------------------|------------------------------|---|------|------|------|-------|
| $\tau_{cb} C_C^{(4)}$ | Collector Base Time Constant | $I_C = -10\text{mA}$ $V_{CE} = -20\text{V}$<br>$f = 31.8\text{MHz}$                           |      |      | 250  | ps    |
| NF <sup>(4)</sup>     | Noise Figure                 | $I_C = -0.1\text{mA}$ $V_{CE} = -5\text{V}$<br>$R_S = 1.0\text{K}\Omega$ $f = 100\text{Hz}$   |      |      | 6    | dB    |
| $t_{on}$              | Turn-On Time                 | $V_{CC} = -3\text{V}$ $V_{BE} = 0.5\text{V}$<br>$I_C = -10\text{mA}$ $I_{B1} = -1.0\text{mA}$ |      |      | 70   | ns    |
| $t_{off}$             | Turn-Off Time                | $V_{CC} = -3\text{V}$ $I_C = -10\text{mA}$<br>$I_{B1} = -I_{B2} = -1.0\text{mA}$              |      |      | 300  |       |

#### Notes

- (3) Pulse Width  $\leq 300\mu\text{s}$ ,  $\delta \leq 2\%$   
 (4) By design only, not a production test.

### MECHANICAL DATA

Dimensions in mm (inches)



### LCC2 (MO-041BB)

#### Underside View

- |                     |                     |
|---------------------|---------------------|
| Pad 1 – Collector 1 | Pad 4 – Collector 2 |
| Pad 2 – Base 1      | Pad 5 – Emitter 2   |
| Pad 3 – Base 2      | Pad 6 – Emitter 1   |