

## NPN 2N5320 – 2N5321

### SILICON PLANAR EPITAXIAL TRANSISTORS

The 2N5320 and 2N5321 are NPN transistors mounted in TO-39 metal case .  
They are especially intended for high-voltage medium power applications in industrial and commercial equipments.  
Compliance to RoHS

#### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Ratings                                       |                         | Value       | Unit       |       |
|-----------|---|-------------------------|-------------|------------|-------|
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )       | 2N5320                  | 75          | V          |       |
|           |   | 2N5321                  | 50          |            |       |
| $V_{CBO}$ | Collector-Base Voltage ( $I_E = 0$ )          | 2N5320                  | 100         | V          |       |
|           |   | 2N5321                  | 75          |            |       |
| $V_{CEV}$ | Collector-Emitter Voltage ( $V_{BE} = 1.5V$ ) | 2N5320                  | 100         | V          |       |
|           |   | 2N5321                  | 75          |            |       |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )            | 2N5320                  | 6           | V          |       |
|           |   | 2N5321                  | 5           |            |       |
| $I_C$     | Collector Current                             | 2N5320                  | 2           | A          |       |
|           |   | 2N5321                  |             |            |       |
| $I_B$     | Base Current                                  | 2N5320                  | 1           | A          |       |
|           |   | 2N5321                  |             |            |       |
| $P_D$     | Total Power Dissipation                       | @ $T_{amb} = 25^\circ$  | 2N5320      | 1          | Watts |
|           |   |                         | 2N5321      |            |       |
|           |   | @ $T_{case} = 25^\circ$ | 2N5320      | 10         |       |
|           |   |                         | 2N5321      |            |       |
| $T_J$     | Junction Temperature                          | 2N5320                  | -65 to +200 | $^\circ C$ |       |
|           |   | 2N5321                  |             |            |       |
| $T_{Stg}$ | Storage Temperature range                     | 2N5320                  | -65 to +200 | $^\circ C$ |       |
|           |   | 2N5321                  |             |            |       |

#### THERMAL CHARACTERISTICS

| Symbol      | Ratings                                 | Value | Unit         |
|-------------|---|-------|--------------|
| $R_{thJ-a}$ | Thermal Resistance, Junction to ambient | 175   | $^\circ C/W$ |
| $R_{thJ-c}$ | Thermal Resistance, Junction to case    | 17.5  | $^\circ C/W$ |

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### ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

| Symbol            | Ratings                              | Test Condition(s)  | Min    | Typ | Max | Unit |               |
|-------------------|--------------------------------------|--|--------|-----|-----|------|---------------|
| $I_{CBO}$         | Collector Cutoff Current             | $V_{CB} = 80\text{ V}, I_E = 0$  | 2N5320 | -   | -   | 0.5  | $\mu\text{A}$ |
|                   |                                      | $V_{CB} = 60\text{ V}, I_E = 0$  | 2N5321 | -   | -   | 5    |               |
| $I_{EBO}$         | Emitter Cutoff Current               | $V_{EB} = 5\text{ V}, I_C = 0$   | 2N5320 | -   | 0.1 | -    | $\mu\text{A}$ |
|                   |                                      | $V_{EB} = 4\text{ V}, I_C = 0$   | 2N5321 | -   | 0.5 | -    |               |
| $V_{CEO}$         | Collector Emitter Breakdown Voltage  | $I_C = 10\text{ mA}, I_B = 0$  | 2N5320 | 75  | -   | -    | V             |
|                   |                                      |  | 2N5321 | 50  | -   | -    |               |
| $V_{CEV}$         | Collector Emitter Breakdown Voltage  | $I_C = 100\text{ }\mu\text{A}$<br>$V_{BE} = 1.5\text{ V}$                            | 2N5320 | 100 | -   | -    | V             |
|                   |                                      |  | 2N5321 | 75  | -   | -    |               |
| $V_{EBO}$         | Emitter Base Breakdown Voltage       | $I_E = 100\text{ }\mu\text{A}, I_C = 0$  | 2N5320 | 6   | -   | -    | V             |
|                   |                                      |  | 2N5321 | 5   | -   | -    |               |
| $h_{FE} (*)$      | DC Current Gain                      | $I_C = 500\text{ mA}$<br>$V_{CE} = 4\text{ V}$                                       | 2N5320 | 30  | -   | 130  | -             |
|                   |                                      |  | 2N5321 | 40  | -   | 250  |               |
|                   |                                      | $I_C = 1\text{ A}$<br>$V_{CE} = 2\text{ V}$  | 2N5320 | 10  | -   | -    |               |
| $V_{CE(SAT)} (*)$ | Collector-Emitter saturation Voltage | $I_C = 500\text{ mA}$<br>$I_B = 50\text{ mA}$  | 2N5320 | -   | -   | 0.5  | V             |
|                   |                                      |  | 2N5321 | -   | -   | 0.8  |               |
| $V_{BE} (*)$      | Base-Emitter Voltage                 | $I_C = 500\text{ mA}$<br>$V_{CE} = 4\text{ V}$                                       | 2N5320 | -   | -   | 1.1  | V             |
|                   |                                      |  | 2N5321 | -   | -   | 1.4  |               |
| $f_T$             | Transition frequency                 | $I_C = 50\text{ mA}$<br>$V_{CE} = 4\text{ V}$<br>$f = 10\text{ MHz}$                 | 2N5320 | 50  | -   | -    | MHz           |
|                   |                                      |  | 2N5321 |     |     |      |               |
| $t_{on}$          | Turn-on Time                         | $I_C = 500\text{ mA}$<br>$V_{CC} = 30\text{ V}$<br>$I_{B1} = 50\text{ mA}$           | 2N5320 | -   | -   | 80   | ns            |
|                   |                                      |  | 2N5321 |     |     |      |               |
| $t_{off}$         | Turn-off Time                        | $I_C = 500\text{ mA}$<br>$V_{CC} = 30\text{ V}$<br>$I_{B1} = -I_{B2} = 50\text{ mA}$ | 2N5320 | -   | -   | 800  | ns            |
|                   |                                      |  | 2N5321 |     |     |      |               |

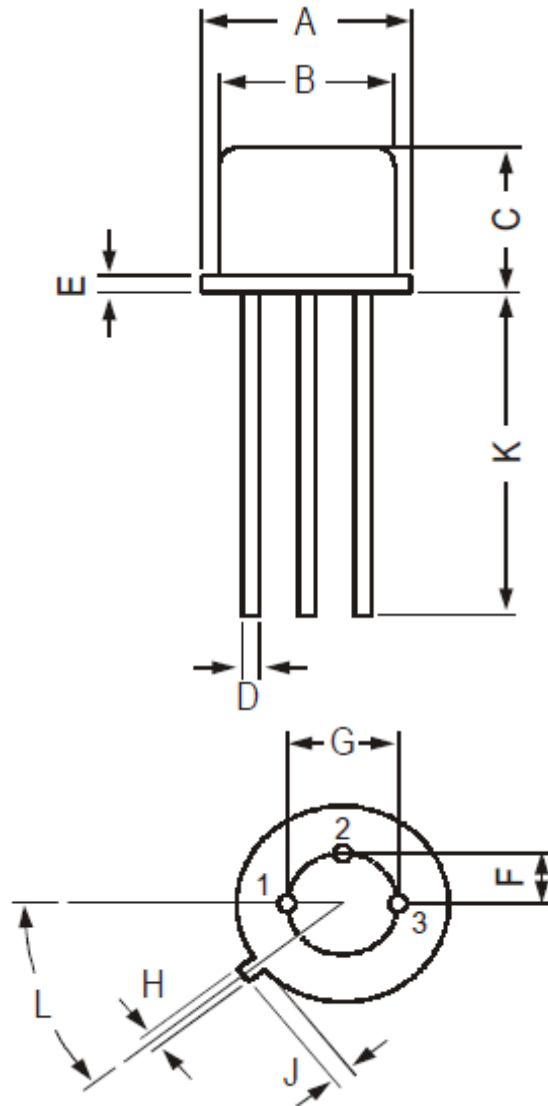
(\*) Pulse conditions :  $t_p < 300\text{ }\mu\text{s}$ ,  $\delta = 1\%$

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### MECHANICAL DATA CASE TO-39

| DIMENSIONS (mm) |       |      |
|-----------------|-------|------|
|                 | min   | max  |
| A               | 8.50  | 9.39 |
| B               | 7.74  | 8.50 |
| C               | 6.09  | 6.60 |
| D               | 0.40  | 0.53 |
| E               | -     | 0.88 |
| F               | 2.41  | 2.66 |
| G               | 4.82  | 5.33 |
| H               | 0.71  | 0.86 |
| J               | 0.73  | 1.02 |
| K               | 12.70 | -    |
| L               | 42°   | 48°  |

|         |           |
|---------|-----------|
| Pin 1 : | Emitter   |
| Pin 2 : | Base      |
| Pin 3 : | Collector |
| Case :  | Collector |



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