

## Silicon NPN Triple Diffused Transistor

### D209L

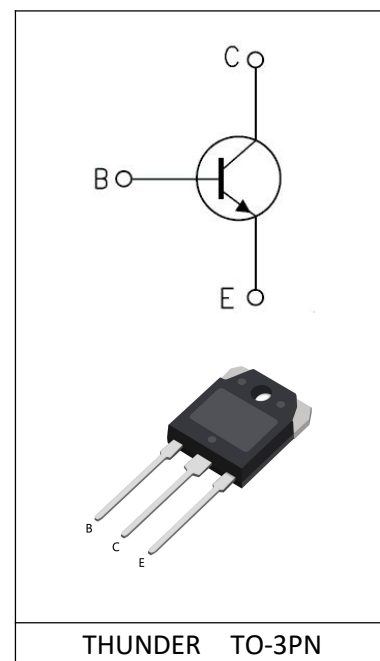
D209L, the silicon NPN power switch transistor, is manufactured using planar technology, guard ring terminal structure and minority life-time controlling technology for realization of high voltage capability, high switching speed and reliability.

#### Features:

- High Breakdown Voltage
- High Switching Speed
- High Reliability
- RoHS product

#### Applications:

- High frequency switching power supply
- High frequency power transfer



#### Absolute Maximum Ratings ( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter                                  | Symbol    | Rating  | Unit               |
|--------------------------------------------|-----------|---------|--------------------|
| Collector-Base Voltage                     | $V_{CBO}$ | 700     | V                  |
| Collector-Emitter Voltage                  | $V_{CEO}$ | 400     | V                  |
| Emitter-Base Voltage                       | $V_{EBO}$ | 9       | V                  |
| Collector Current(DC)                      | $I_C$     | 12      | A                  |
| Collector Peak Current( $t_p<5\text{ms}$ ) | $I_{CM}$  | 24      | A                  |
| Base Current(DC)                           | $I_B$     | 6       | A                  |
| Base Peak Current( $t_p<5\text{ms}$ )      | $I_{BM}$  | 12      | A                  |
| Collector Power Dissipation                | $P_C$     | 150     | W                  |
| Junction Temperature                       | $T_j$     | 150     | $^{\circ}\text{C}$ |
| Storage Temperature Range                  | $T_{STG}$ | -65~150 | $^{\circ}\text{C}$ |

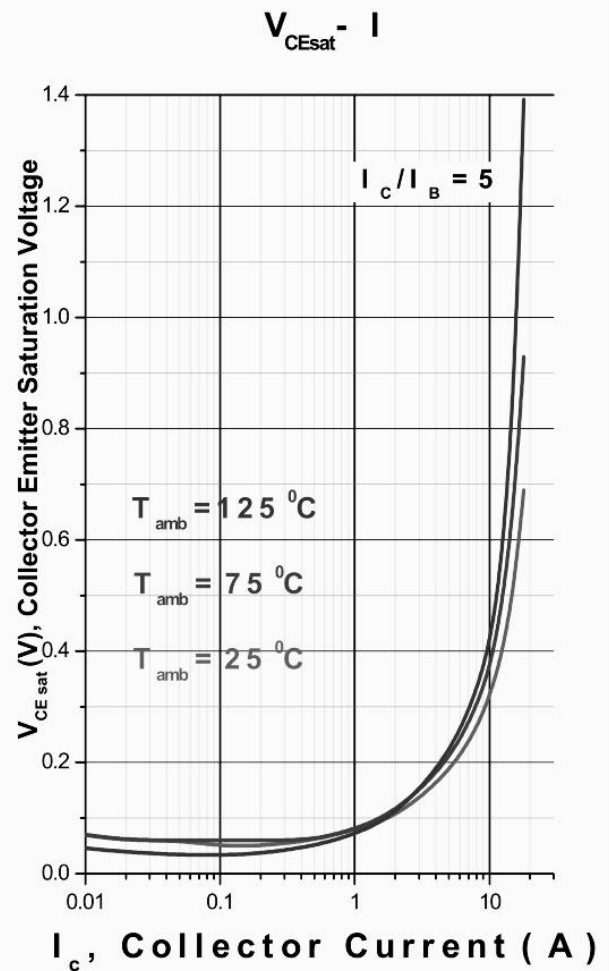
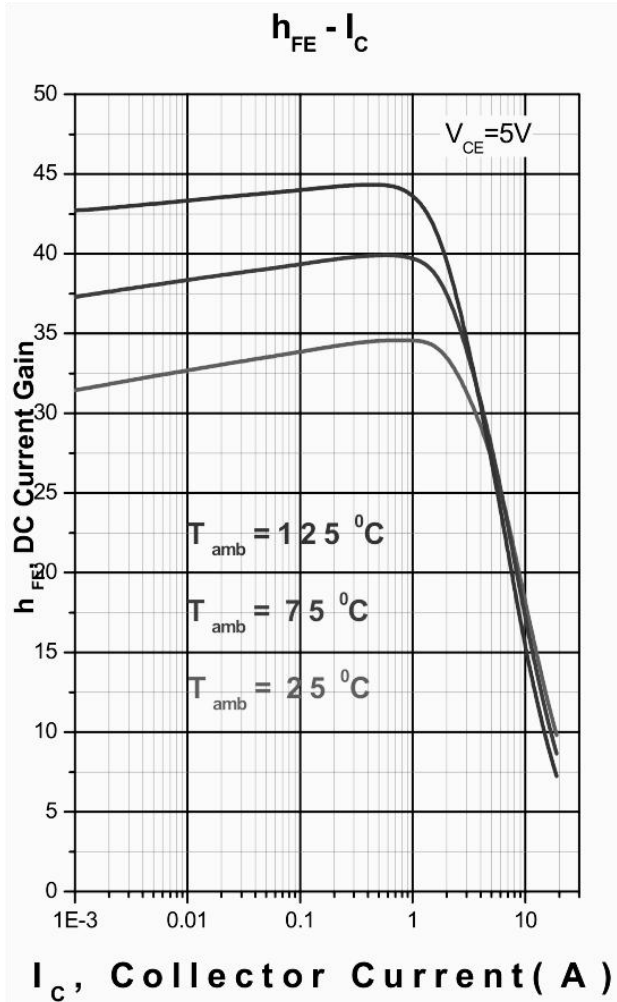
**Electrical Characteristics ( $T_a=25^{\circ}\text{C}$  unless otherwise noted)**

| Parameter                            | Symbol      | Test Condition                      | Min. | Typ. | Max. | Unit          |
|--------------------------------------|-------------|-------------------------------------|------|------|------|---------------|
| Collector-Base Cut-off Current       | $I_{CBO}$   | $V_{CB}=700\text{V}, I_E=0$         |      |      | 0.1  | mA            |
| Collector-Emitter Cut-off Current    | $I_{CEO}$   | $V_{CE}=400\text{V}, I_B=0$         |      |      | 0.1  | mA            |
| Emitter-Base Cut-off Current         | $I_{EBO}$   | $V_{EB}=9\text{V}, I_C=0$           |      |      | 0.1  | mA            |
| Collector-Base Breakdown Voltage     | $V_{CBO}$   | $I_C=0.1\text{mA}$                  | 700  |      |      | V             |
| Collector-Emitter Breakdown Voltage  | $V_{CEO}$   | $I_C=1\text{mA}$                    | 400  |      |      | V             |
| Emitter-Base Breakdown Voltage       | $V_{EBO}$   | $I_E=100\mu\text{A}$                | 9    |      |      | V             |
| DC Current Gain                      | $h_{FE1}$   | $V_{CE}=5\text{V}, I_C=10\text{mA}$ | 10   |      | 45   |               |
|                                      | $h_{FE2}$   | $V_{CE}=5\text{V}, I_C=2\text{A}$   | 15   |      | 40   |               |
|                                      | $h_{FE3}$   | $V_{CE}=5\text{V}, I_C=5\text{A}$   | 15   |      | 35   |               |
| Collector-Emitter Saturation Voltage | $V_{CEsat}$ | $I_C=5\text{A}, I_B=1.0\text{A}$    |      |      | 0.8  | V             |
| Base-Emitter Saturation Voltage      | $V_{BEsat}$ | $I_C=5\text{A}, I_B=1.0\text{A}$    |      |      | 1.30 | V             |
| Storage Time                         | $t_s$       | UI9600, $I_C=500\text{mA}$          | 2.0  |      | 6.0  | $\mu\text{s}$ |
| Rise Time                            | $t_r$       |                                     |      |      | 1.0  | $\mu\text{s}$ |
| Fall Time                            | $t_f$       |                                     |      |      | 1.0  | $\mu\text{s}$ |
| Transition Frequency                 | $f_T$       | $V_{CE}=10\text{V}, I_C=1\text{A}$  | 4    |      |      | Mhz           |

**Thermal Characteristics**

| Symbol          | Parameter        | Typ. | Unit                        |
|-----------------|------------------|------|-----------------------------|
| $R_{\theta JC}$ | Junction-to-Case | 0.83 | $^{\circ}\text{C}/\text{W}$ |

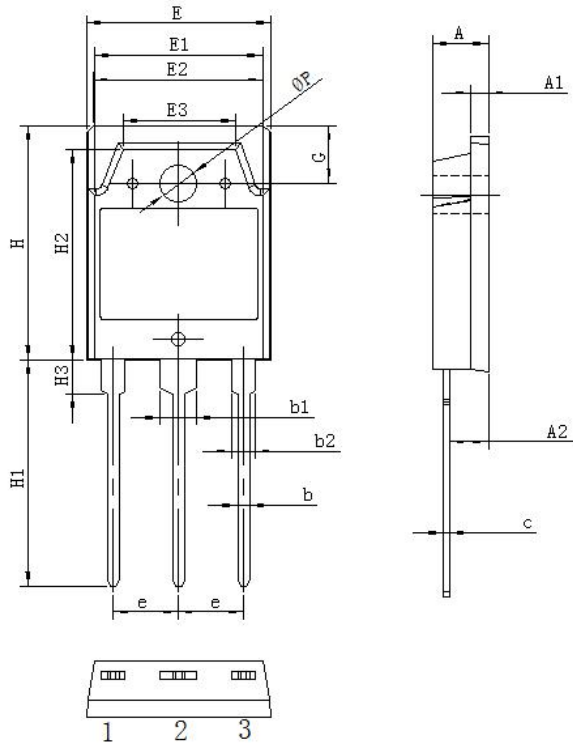
## Typical Characteristics



## Package Information

### TO-3PN PACKAGE

#### 基本尺寸



| Symbol | 单位 mm |      |      |
|--------|-------|------|------|
|        | Min   | Nom  | Max  |
| A      | 4.60  | 4.80 | 5.00 |
| A1     | 1.3   | 1.5  | 1.7  |
| A2     | 2.20  | 2.40 | 2.60 |
| b      | 0.80  | 1.0  | 1.20 |
| b1     | 2.90  | 3.10 | 3.30 |
| b2     | 1.90  | 2.10 | 2.30 |
| c      | 0.50  | 0.60 | 0.70 |
| e      | 5.25  | 5.45 | 5.65 |
| E      | 15.2  | 15.6 | 16.0 |
| E1     | 13.2  | 13.4 | 13.6 |
| E2     | 13.1  | 13.3 | 13.5 |
| E3     | 9.1   | 9.3  | 9.5  |
| H      | 19.8  | 20.0 | 20.2 |
| H1     | 19.4  | 19.8 | 20.2 |
| H2     | 18.5  | 18.7 | 18.9 |
| H3     | 2.9   | 3.1  | 3.3  |
| G      | 4.8   | 5.0  | 5.2  |
| ΦP     | 3.00  | 3.20 | 3.40 |

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