



# BD241A/B/C BD242A/B/C

## COMPLEMENTARY SILICON POWER TRANSISTORS

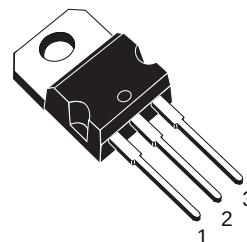
- STMicroelectronics PREFERRED SALESTYPES
- COMPLEMENTARY PNP - NPN DEVICES

### DESCRIPTION

The BD241A, BD241B and BD241C are silicon epitaxial-base NPN transistors mounted in Jedec TO-220 plastic package.

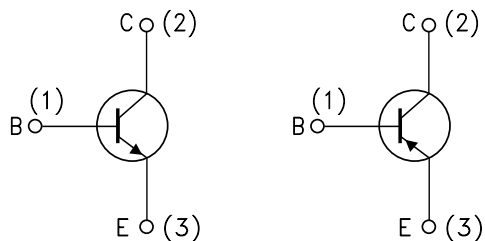
They are intended for use in medium power linear and switching applications.

The complementary PNP types are BD242A, BD242B and BD242C respectively.



TO-220

### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

| Symbol           | Parameter                                        | Value |            |        |        | Unit |
|------------------|--------------------------------------------------|-------|------------|--------|--------|------|
|                  |                                                  | NPN   | BD241A     | BD241B | BD241C |      |
|                  |                                                  | PNP   | BD242A     | BD242B | BD242C |      |
| V <sub>CER</sub> | Collector-Base Voltage (R <sub>BE</sub> = 100 Ω) |       | 70         | 90     | 115    | V    |
| V <sub>CEO</sub> | Collector-Emitter Voltage (I <sub>B</sub> = 0)   |       | 60         | 80     | 100    | V    |
| V <sub>EBO</sub> | Emitter-Base Voltage (I <sub>C</sub> = 0)        |       | 5          |        |        | V    |
| I <sub>C</sub>   | Collector Current                                |       | 3          |        |        | A    |
| I <sub>CM</sub>  | Collector Peak Current                           |       | 5          |        |        | A    |
| I <sub>B</sub>   | Base Current                                     |       | 1          |        |        | A    |
| P <sub>tot</sub> | Total Dissipation at T <sub>c</sub> ≤ 25 °C      |       | 40         |        |        | W    |
| P <sub>tot</sub> | Total Dissipation at T <sub>amb</sub> ≤ 25 °C    |       | 2          |        |        | W    |
| T <sub>stg</sub> | Storage Temperature                              |       | -65 to 150 |        |        | °C   |

## BD241A/B/C/BD242A/B/C

### THERMAL DATA

|                       |                                     |     |      |      |
|-----------------------|-------------------------------------|-----|------|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case    | Max | 3.13 | °C/W |
| R <sub>thj-amb</sub>  | Thermal Resistance Junction-ambient | Max | 62.5 | °C/W |

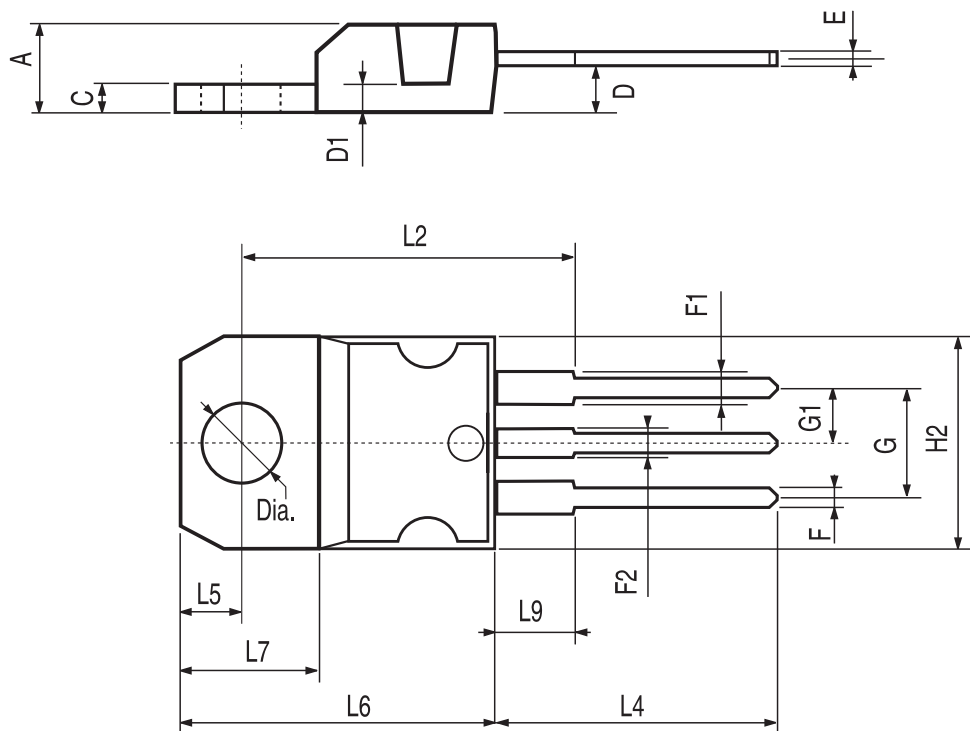
### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

| Symbol                 | Parameter                                       | Test Conditions                                                                                                                                       | Min.            | Typ. | Max.              | Unit           |
|------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|-------------------|----------------|
| I <sub>CES</sub>       | Collector Cut-off Current (V <sub>BE</sub> = 0) | V <sub>CE</sub> = rated V <sub>CEO</sub>                                                                                                              |                 |      | 0.2               | mA             |
| I <sub>CEO</sub>       | Collector Cut-off Current (I <sub>B</sub> = 0)  | for <b>BD241A/BD242A</b> V <sub>CE</sub> = 30 V<br>for <b>BD241B/BD242B</b> V <sub>CE</sub> = 60 V<br>for <b>BD241C/BD242C</b> V <sub>CE</sub> = 60 V |                 |      | 0.3<br>0.3<br>0.3 | mA<br>mA<br>mA |
| I <sub>EBO</sub>       | Emitter Cut-off Current (I <sub>C</sub> = 0)    | V <sub>EB</sub> = 5 V                                                                                                                                 |                 |      | 1                 | mA             |
| V <sub>CEO(sus)*</sub> | Collector-Emitter Sustaining Voltage            | I <sub>C</sub> = 30 mA<br>for <b>BD241A/BD242A</b><br>for <b>BD241B/BD242B</b><br>for <b>BD241C/BD242C</b>                                            | 60<br>80<br>100 |      |                   | V<br>V<br>V    |
| V <sub>CE(sat)*</sub>  | Collector-Emitter Saturation Voltage            | I <sub>C</sub> = 3 A I <sub>B</sub> = 0.6 A                                                                                                           |                 |      | 1.2               | V              |
| V <sub>BE*</sub>       | Base-Emitter Voltage                            | I <sub>C</sub> = 3 A V <sub>CE</sub> = 4 V                                                                                                            |                 |      | 1.8               | V              |
| h <sub>FE*</sub>       | DC Current Gain                                 | I <sub>C</sub> = 1 A V <sub>CE</sub> = 4 V<br>I <sub>C</sub> = 3 A V <sub>CE</sub> = 4 V                                                              | 25<br>10        |      |                   |                |
| h <sub>fe</sub>        | Small Signal Current Gain                       | I <sub>C</sub> = 0.5 A V <sub>CE</sub> = 10 V f = 1MHz<br>I <sub>C</sub> = 0.5 A V <sub>CE</sub> = 10 V f = 1KHz                                      | 3<br>20         |      |                   |                |

\* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 2 %  
For PNP types voltage and current values are negative.  
For the characteristics curves see TIP31/TIP32 series.

## TO-220 MECHANICAL DATA

| DIM. | mm    |      |       | inch  |       |       |
|------|-------|------|-------|-------|-------|-------|
|      | MIN.  | TYP. | MAX.  | MIN.  | TYP.  | MAX.  |
| A    | 4.40  |      | 4.60  | 0.173 |       | 0.181 |
| C    | 1.23  |      | 1.32  | 0.048 |       | 0.051 |
| D    | 2.40  |      | 2.72  | 0.094 |       | 0.107 |
| D1   |       | 1.27 |       |       | 0.050 |       |
| E    | 0.49  |      | 0.70  | 0.019 |       | 0.027 |
| F    | 0.61  |      | 0.88  | 0.024 |       | 0.034 |
| F1   | 1.14  |      | 1.70  | 0.044 |       | 0.067 |
| F2   | 1.14  |      | 1.70  | 0.044 |       | 0.067 |
| G    | 4.95  |      | 5.15  | 0.194 |       | 0.203 |
| G1   | 2.4   |      | 2.7   | 0.094 |       | 0.106 |
| H2   | 10.0  |      | 10.40 | 0.393 |       | 0.409 |
| L2   |       | 16.4 |       |       | 0.645 |       |
| L4   | 13.0  |      | 14.0  | 0.511 |       | 0.551 |
| L5   | 2.65  |      | 2.95  | 0.104 |       | 0.116 |
| L6   | 15.25 |      | 15.75 | 0.600 |       | 0.620 |
| L7   | 6.2   |      | 6.6   | 0.244 |       | 0.260 |
| L9   | 3.5   |      | 3.93  | 0.137 |       | 0.154 |
| DIA. | 3.75  |      | 3.85  | 0.147 |       | 0.151 |



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