

# Central<sup>TM</sup> Semiconductor Corp.

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Manufacturers of World Class Discrete Semiconductors

MJE220 THRU MJE225

NPN SILICON POWER TRANSISTOR

JEDEC TO-126 CASE

## DESCRIPTION

The CENTRAL SEMICONDUCTOR MJE220 series types are NPN silicon power transistors manufactured by the epitaxial-base process designed for general purpose amplifier and switching applications.

MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$  unless otherwise noted)

|  | SYMBOL         | MJE220<br>MJE221<br>MJE222 | MJE223<br>MJE224<br>MJE225 | UNIT                      |
|--|----------------|----------------------------|----------------------------|---------------------------|
| Collector-Base Voltage                       | $V_{CB0}$      | 60                         | 80                         | V                         |
| Collector-Emitter Voltage                    | $V_{CE0}$      | 40                         | 60                         | V                         |
| Emitter-Base Voltage                         | $V_{EB0}$      | 7.0                        | 7.0                        | V                         |
| Collector Current                            | $I_C$          | 4.0                        | 4.0                        | A                         |
| Collector Current (PEAK)                     | $I_{CM}$       | 8.0                        | 8.0                        | A                         |
| Base Current                                 | $I_B$          | 1.0                        | 1.0                        | A                         |
| Power Dissipation                            | $P_D$          | 1.5                        | 1.5                        | W                         |
| Power Dissipation ( $T_C=25^\circ\text{C}$ ) | $P_D$          | 15                         | 15                         | W                         |
| Operating and Storage Junction Temperature   | $T_J, T_{STG}$ | -65 TO +150                |                            | $^\circ\text{C}$          |
| Thermal Resistance                           | $\theta_{JA}$  | 83.4                       |                            | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance                           | $\theta_{JC}$  | 8.34                       |                            | $^\circ\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS ( $T_C=25^\circ\text{C}$  unless otherwise noted)

| SYMBOL        | TEST CONDITIONS                                       |                          | MIN    | MAX | UNIT          |
|---------------|---|--------------------------|--------|-----|---------------|
| $I_{CBO}$     | $V_{CB}=60\text{V}$                                   | (MJE220, MJE221, MJE222) |        | 0.1 | $\mu\text{A}$ |
| $I_{CBO}$     | $V_{CB}=80\text{V}$                                   | (MJE223, MJE224, MJE225) |        | 0.1 | $\mu\text{A}$ |
| $I_{CBO}$     | $V_{CB}=60\text{V}, T_C=125^\circ\text{C}$            | (MJE220, MJE221, MJE222) |        | 0.1 | $\text{mA}$   |
| $I_{CBO}$     | $V_{CB}=80\text{V}, T_C=125^\circ\text{C}$            | (MJE223, MJE224, MJE225) |        | 0.1 | $\text{mA}$   |
| $I_{EBO}$     | $V_{BE}=7.0\text{V}$                                  |                          |        | 0.1 | $\mu\text{A}$ |
| $BV_{CE0}$    | $I_C=10\text{mA}$                                     | (MJE220, MJE221, MJE222) | 40     |     | V             |
| $BV_{CE0}$    | $I_C=10\text{mA}$                                     | (MJE223, MJE224, MJE225) | 60     |     | V             |
| $V_{CE(SAT)}$ | $I_C=500\text{mA}, I_B=50\text{mA}$                   |                          |        | 0.3 | V             |
| $V_{CE(SAT)}$ | $I_C=1.0\text{A}, I_B=100\text{mA}$                   | (MJE221, MJE224)         |        | 0.6 | V             |
| $V_{CE(SAT)}$ | $I_C=2.0\text{A}, I_B=200\text{mA}$                   | (MJE220, MJE223)         |        | 0.8 | V             |
| $V_{CE(SAT)}$ | $I_C=4.0\text{A}, I_B=1.0\text{mA}$                   |                          |        | 2.5 | V             |
| $V_{BE(SAT)}$ | $I_C=2.0\text{A}, I_B=200\text{mA}$                   |                          |        | 1.8 | V             |
| $V_{BE(ON)}$  | $V_{CE}=1.0\text{V}, I_C=500\text{mA}$                |                          |        | 1.5 | V             |
| hFE           | $V_{CE}=1.0\text{V}, I_C=200\text{mA}$                | (MJE220, MJE223)         | 40     | 200 |               |
| hFE           | $V_{CE}=1.0\text{V}, I_C=200\text{mA}$                | (MJE221, MJE224)         | 40     | 150 |               |
| hFE           | $V_{CE}=1.0\text{V}, I_C=200\text{mA}$                | (MJE222, MJE225)         | 25     | -   |               |
| hFE           | $V_{CE}=1.0\text{V}, I_C=1.0\text{A}$                 | (MJE221, MJE224)         | 20     | -   |               |
| hFE           | $V_{CE}=1.0\text{V}, I_C=1.0\text{A}$                 | (MJE222, MJE225)         | 10     | -   |               |
| hFE           | $V_{CE}=1.0\text{V}, I_C=2.0\text{A}$                 | (MJE220, MJE223)         | 20     | -   |               |
| fT            | $V_{CE}=10\text{V}, I_C=100\text{mA}, f=10\text{MHz}$ |                          | 10 TYP |     | $\text{MHz}$  |
| $C_{ob}$      | $V_{CB}=10\text{V}, I_E=0, f=0.1\text{MHz}$           |                          |        | 50  | $\text{pF}$   |