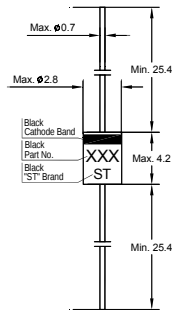


# P...FB Series

## Silicon Epitaxial Planar Zener Diodes

### Applications

- Circuits for constant voltage, constant current, wave form clipper, surge absorber, etc.



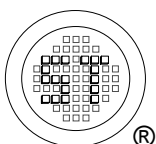
Glass Case DO-41  
Dimensions in mm

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

| Parameter                 | Symbol           | Value         | Unit             |
|---------------------------|------------------|---------------|------------------|
| Power Dissipation         | $P_{\text{tot}}$ | 1             | W                |
| Forward Current           | $I_F$            | 200           | mA               |
| Junction Temperature      | $T_j$            | 175           | $^\circ\text{C}$ |
| Storage Temperature Range | $T_{\text{stg}}$ | - 65 to + 175 | $^\circ\text{C}$ |

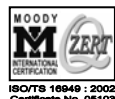
### Characteristics at $T_a = 25^\circ\text{C}$ ( $V_F = 1.2\text{ V Max. at } I_F = 200\text{ mA}$ )

| Type    | Zener Voltage <sup>1)</sup> |          |                    | Dynamic Impedance |                    | Reverse Current |                   |
|---------|-----------------------------|----------|--------------------|-------------------|--------------------|-----------------|-------------------|
|         | V <sub>Z</sub>              |          | at I <sub>ZT</sub> | Z <sub>ZT</sub>   | at I <sub>ZT</sub> | I <sub>R</sub>  | at V <sub>R</sub> |
|         | Min. (V)                    | Max. (V) | (mA)               | Max. (Ω)          | (mA)               | Max. (μA)       | (V)               |
| P2V0FB  | 1.88                        | 2.25     | 40                 | 25                | 40                 | 200             | 0.5               |
| P2V0FB1 | 1.88                        | 2.12     |                    |                   |                    |                 |                   |
| P2V0FB2 | 2.01                        | 2.25     |                    |                   |                    |                 |                   |
| P2V2FB  | 2.11                        | 2.45     | 40                 | 20                | 40                 | 200             | 0.7               |
| P2V2FB1 | 2.11                        | 2.34     |                    |                   |                    |                 |                   |
| P2V2FB2 | 2.21                        | 2.45     |                    |                   |                    |                 |                   |
| P2V4FB  | 2.31                        | 2.65     | 40                 | 15                | 40                 | 200             | 1                 |
| P2V4FB1 | 2.31                        | 2.55     |                    |                   |                    |                 |                   |
| P2V4FB2 | 2.41                        | 2.65     |                    |                   |                    |                 |                   |
| P2V7FB  | 2.52                        | 2.93     | 40                 | 15                | 40                 | 150             | 1                 |
| P2V7FB1 | 2.52                        | 2.78     |                    |                   |                    |                 |                   |
| P2V7FB2 | 2.68                        | 2.93     |                    |                   |                    |                 |                   |
| P3V0FB  | 2.83                        | 3.22     | 40                 | 15                | 40                 | 100             | 1                 |
| P3V0FB1 | 2.83                        | 3.07     |                    |                   |                    |                 |                   |
| P3V0FB2 | 2.97                        | 3.22     |                    |                   |                    |                 |                   |
| P3V3FB  | 3.13                        | 3.51     | 40                 | 15                | 40                 | 80              | 1                 |
| P3V3FB1 | 3.13                        | 3.37     |                    |                   |                    |                 |                   |
| P3V3FB2 | 3.27                        | 3.51     |                    |                   |                    |                 |                   |
| P3V6FB  | 3.43                        | 3.83     | 40                 | 15                | 40                 | 60              | 1                 |
| P3V6FB1 | 3.43                        | 3.68     |                    |                   |                    |                 |                   |
| P3V6FB2 | 3.58                        | 3.83     |                    |                   |                    |                 |                   |
| P3V9FB  | 3.73                        | 4.15     | 40                 | 15                | 40                 | 40              | 1                 |
| P3V9FB1 | 3.73                        | 4        |                    |                   |                    |                 |                   |
| P3V9FB2 | 3.88                        | 4.15     |                    |                   |                    |                 |                   |
| P4V3FB  | 4.03                        | 4.55     | 40                 | 15                | 40                 | 20              | 1                 |
| P4V3FB1 | 4.03                        | 4.28     |                    |                   |                    |                 |                   |
| P4V3FB2 | 4.15                        | 4.41     |                    |                   |                    |                 |                   |
| P4V3FB3 | 4.28                        | 4.55     |                    |                   |                    |                 |                   |



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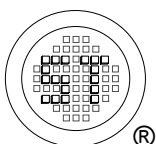


Dated : 18/07/2009

## P...FB Series

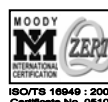
### Characteristics at $T_a = 25\text{ }^{\circ}\text{C}$

| Type    | Zener Voltage <sup>1)</sup> |          | at I <sub>ZT</sub> | Dynamic Impedance |                    | Reverse Current |                   |
|---------|-----------------------------|----------|--------------------|-------------------|--------------------|-----------------|-------------------|
|         | V <sub>Z</sub>              |          |                    | Z <sub>ZT</sub>   | at I <sub>ZT</sub> | I <sub>R</sub>  | at V <sub>R</sub> |
|         | Min. (V)                    | Max. (V) |                    | (mA)              | Max. (Ω)           | (mA)            | Max. (μA)         |
| P4V7FB  | 4.41                        | 4.91     | 40                 | 10                | 40                 | 20              | 1                 |
| P4V7FB1 | 4.41                        | 4.65     |                    |                   |                    |                 |                   |
| P4V7FB2 | 4.53                        | 4.78     |                    |                   |                    |                 |                   |
| P4V7FB3 | 4.66                        | 4.91     |                    |                   |                    |                 |                   |
| P5V1FB  | 4.79                        | 5.38     | 40                 | 8                 | 40                 | 20              | 1                 |
| P5V1FB1 | 4.79                        | 5.05     |                    |                   |                    |                 |                   |
| P5V1FB2 | 4.95                        | 5.22     |                    |                   |                    |                 |                   |
| P5V1FB3 | 5.1                         | 5.38     |                    |                   |                    |                 |                   |
| P5V6FB  | 5.28                        | 5.95     | 40                 | 8                 | 40                 | 20              | 1.5               |
| P5V6FB1 | 5.28                        | 5.56     |                    |                   |                    |                 |                   |
| P5V6FB2 | 5.46                        | 5.75     |                    |                   |                    |                 |                   |
| P5V6FB3 | 5.65                        | 5.95     |                    |                   |                    |                 |                   |
| P6V2FB  | 5.76                        | 6.52     | 40                 | 6                 | 40                 | 20              | 3                 |
| P6V2FB1 | 5.76                        | 6.14     |                    |                   |                    |                 |                   |
| P6V2FB2 | 5.98                        | 6.33     |                    |                   |                    |                 |                   |
| P6V2FB3 | 6.17                        | 6.52     |                    |                   |                    |                 |                   |
| P6V8FB  | 6.35                        | 7.1      | 40                 | 6                 | 40                 | 20              | 3.5               |
| P6V8FB1 | 6.35                        | 6.71     |                    |                   |                    |                 |                   |
| P6V8FB2 | 6.55                        | 6.9      |                    |                   |                    |                 |                   |
| P6V8FB3 | 6.74                        | 7.1      |                    |                   |                    |                 |                   |
| P7V5FB  | 6.93                        | 7.8      | 40                 | 4                 | 40                 | 20              | 4                 |
| P7V5FB1 | 6.93                        | 7.33     |                    |                   |                    |                 |                   |
| P7V5FB2 | 7.17                        | 7.55     |                    |                   |                    |                 |                   |
| P7V5FB3 | 7.39                        | 7.8      |                    |                   |                    |                 |                   |
| P8V2FB  | 7.58                        | 8.54     | 40                 | 4                 | 40                 | 20              | 5                 |
| P8V2FB1 | 7.58                        | 8.03     |                    |                   |                    |                 |                   |
| P8V2FB2 | 7.87                        | 8.28     |                    |                   |                    |                 |                   |
| P8V2FB3 | 8.12                        | 8.54     |                    |                   |                    |                 |                   |
| P9V1FB  | 8.34                        | 9.38     | 40                 | 6                 | 40                 | 20              | 6                 |
| P9V1FB1 | 8.34                        | 8.8      |                    |                   |                    |                 |                   |
| P9V1FB2 | 8.64                        | 9.08     |                    |                   |                    |                 |                   |
| P9V1FB3 | 8.91                        | 9.38     |                    |                   |                    |                 |                   |
| P10FB   | 9.16                        | 10.4     | 40                 | 6                 | 40                 | 10              | 7                 |
| P10FB1  | 9.16                        | 9.67     |                    |                   |                    |                 |                   |
| P10FB2  | 9.5                         | 9.99     |                    |                   |                    |                 |                   |
| P10FB3  | 9.83                        | 10.4     |                    |                   |                    |                 |                   |
| P11FB   | 10.22                       | 11.43    | 20                 | 8                 | 20                 | 10              | 8                 |
| P11FB1  | 10.22                       | 10.75    |                    |                   |                    |                 |                   |
| P11FB2  | 10.54                       | 11.09    |                    |                   |                    |                 |                   |
| P11FB3  | 10.87                       | 11.43    |                    |                   |                    |                 |                   |
| P12FB   | 11.19                       | 12.41    | 20                 | 8                 | 20                 | 10              | 8                 |
| P12FB1  | 11.19                       | 11.77    |                    |                   |                    |                 |                   |
| P12FB2  | 11.5                        | 12.09    |                    |                   |                    |                 |                   |
| P12FB3  | 11.8                        | 12.41    |                    |                   |                    |                 |                   |
| P13FB   | 12.19                       | 13.83    | 20                 | 10                | 20                 | 10              | 10                |
| P13FB1  | 12.19                       | 12.85    |                    |                   |                    |                 |                   |
| P13FB2  | 12.63                       | 13.3     |                    |                   |                    |                 |                   |
| P13FB3  | 13.11                       | 13.83    |                    |                   |                    |                 |                   |



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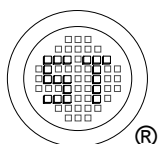
Dated : 18/07/2009

# P...FB Series

## Characteristics at $T_a = 25\text{ }^{\circ}\text{C}$

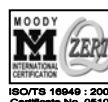
| Type   | Zener Voltage <sup>1)</sup> |          | Dynamic Impedance   |                               | Reverse Current     |                                           |
|--------|-----------------------------|----------|---------------------|-------------------------------|---------------------|-------------------------------------------|
|        | $V_Z$                       |          | at $I_{ZT}$         |                               | $I_R$               |                                           |
|        | Min. (V)                    | Max. (V) | at $I_{ZT}$<br>(mA) | $Z_{ZT}$<br>Max. ( $\Omega$ ) | at $I_{ZT}$<br>(mA) | Max. ( $\mu\text{A}$ )<br>at $V_R$<br>(V) |
| P15FB  | 13.55                       | 15.26    | 20                  | 10                            | 20                  | 10                                        |
| P15FB1 | 13.55                       | 14.28    |                     |                               |                     |                                           |
| P15FB2 | 14.05                       | 14.77    |                     |                               |                     |                                           |
| P15FB3 | 14.52                       | 15.26    |                     |                               |                     |                                           |
| P16FB  | 14.98                       | 16.71    | 20                  | 12                            | 20                  | 10                                        |
| P16FB1 | 14.98                       | 15.75    |                     |                               |                     |                                           |
| P16FB2 | 15.44                       | 16.23    |                     |                               |                     |                                           |
| P16FB3 | 15.89                       | 16.71    |                     |                               |                     |                                           |
| P18FB  | 16.37                       | 18.55    | 20                  | 12                            | 20                  | 10                                        |
| P18FB1 | 16.37                       | 17.27    |                     |                               |                     |                                           |
| P18FB2 | 17.03                       | 17.91    |                     |                               |                     |                                           |
| P18FB3 | 17.64                       | 18.55    |                     |                               |                     |                                           |
| P20FB  | 18.26                       | 20.84    | 20                  | 14                            | 20                  | 10                                        |
| P20FB1 | 18.26                       | 19.21    |                     |                               |                     |                                           |
| P20FB2 | 18.93                       | 19.91    |                     |                               |                     |                                           |
| P20FB3 | 19.59                       | 20.84    |                     |                               |                     |                                           |
| P22FB  | 20.45                       | 22.86    | 10                  | 14                            | 10                  | 10                                        |
| P22FB1 | 20.45                       | 21.51    |                     |                               |                     |                                           |
| P22FB2 | 21.10                       | 22.18    |                     |                               |                     |                                           |
| P22FB3 | 21.75                       | 22.86    |                     |                               |                     |                                           |
| P24FB  | 22.44                       | 25.14    | 10                  | 16                            | 10                  | 10                                        |
| P24FB1 | 22.44                       | 23.59    |                     |                               |                     |                                           |
| P24FB2 | 23.17                       | 24.36    |                     |                               |                     |                                           |
| P24FB3 | 23.9                        | 25.14    |                     |                               |                     |                                           |
| P27FB  | 24.63                       | 28.43    | 10                  | 16                            | 10                  | 10                                        |
| P27FB1 | 24.63                       | 26.1     |                     |                               |                     |                                           |
| P27FB2 | 25.7                        | 27.12    |                     |                               |                     |                                           |
| P27FB3 | 26.72                       | 28.43    |                     |                               |                     |                                           |
| P30FB  | 27.43                       | 31.26    | 10                  | 18                            | 10                  | 10                                        |
| P30FB1 | 27.43                       | 29.09    |                     |                               |                     |                                           |
| P30FB2 | 28.64                       | 30.1     |                     |                               |                     |                                           |
| P30FB3 | 29.57                       | 31.26    |                     |                               |                     |                                           |
| P33FB  | 30.35                       | 34.15    | 10                  | 18                            | 10                  | 10                                        |
| P33FB1 | 30.35                       | 31.97    |                     |                               |                     |                                           |
| P33FB2 | 31.49                       | 33.06    |                     |                               |                     |                                           |
| P33FB3 | 32.39                       | 34.15    |                     |                               |                     |                                           |
| P36FB  | 33.24                       | 37.01    | 10                  | 20                            | 10                  | 10                                        |
| P36FB1 | 33.24                       | 34.94    |                     |                               |                     |                                           |
| P36FB2 | 34.26                       | 36.01    |                     |                               |                     |                                           |
| P36FB3 | 35.19                       | 37.01    |                     |                               |                     |                                           |
| P39FB  | 36.11                       | 40.8     | 10                  | 20                            | 10                  | 10                                        |
| P39FB1 | 36.11                       | 38       |                     |                               |                     |                                           |
| P39FB2 | 37.14                       | 39.04    |                     |                               |                     |                                           |
| P39FB3 | 38.13                       | 40.8     |                     |                               |                     |                                           |
| P43FB  | 40                          | 45       | 10                  | 50                            | 10                  | 5                                         |
| P47FB  | 44                          | 49       | 10                  | 50                            | 10                  | 5                                         |
| P51FB  | 48                          | 54       | 10                  | 50                            | 10                  | 5                                         |

<sup>1)</sup> Tested with pulse (20 ms).



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