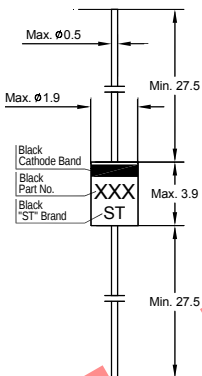


# HS Series

## Silicon Epitaxial Planar Zener Diodes



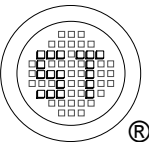
Glass Case DO-35  
Dimensions in mm

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

| Parameter                                                                                                | Symbol           | Value             | Unit               |
|----------------------------------------------------------------------------------------------------------|------------------|-------------------|--------------------|
| Power Dissipation                                                                                        | $P_{\text{tot}}$ | 500 <sup>1)</sup> | mW                 |
| Junction Temperature                                                                                     | $T_j$            | 175               | $^{\circ}\text{C}$ |
| Storage Temperature Range                                                                                | $T_{\text{stg}}$ | - 55 to + 175     | $^{\circ}\text{C}$ |
| <sup>1)</sup> Valid provided that leads are kept at ambient temperature at a distance of 8 mm from case. |                  |                   |                    |

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

| Parameter                                                                                                | Symbol           | Max.              | Unit |
|----------------------------------------------------------------------------------------------------------|------------------|-------------------|------|
| Thermal Resistance Junction to Ambient Air                                                               | $R_{\text{thA}}$ | 0.3 <sup>1)</sup> | K/mW |
| Forward Voltage<br>at $I_F = 100\text{ mA}$                                                              | $V_F$            | 1                 | V    |
| <sup>1)</sup> Valid provided that leads are kept at ambient temperature at a distance of 8 mm from case. |                  |                   |      |



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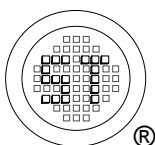


Dated : 18/07/2009

# HS Series

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

| Type   | Zener Voltage <sup>1)</sup> |          |             | Dynamic Resistance |             | Reverse Leakage Current |          |
|--------|-----------------------------|----------|-------------|--------------------|-------------|-------------------------|----------|
|        | $V_Z$                       |          | at $I_{ZT}$ | $Z_{ZT}$           | at $I_{ZT}$ | $I_R$                   | at $V_R$ |
|        | Min. (V)                    | Max. (V) | (mA)        | Max. ( $\Omega$ )  | (mA)        | Max. ( $\mu\text{A}$ )  | (V)      |
| 2V0HS  | 1.88                        | 2.2      | 5           | 100                | 5           | 120                     | 0.5      |
| 2V0HSA | 1.88                        | 2.1      | 5           | 100                | 5           | 120                     | 0.5      |
| 2V0HSB | 2.02                        | 2.2      | 5           | 100                | 5           | 120                     | 0.5      |
| 2V2HS  | 2.12                        | 2.41     | 5           | 100                | 5           | 120                     | 0.7      |
| 2V2HSA | 2.12                        | 2.3      | 5           | 100                | 5           | 120                     | 0.7      |
| 2V2HSB | 2.22                        | 2.41     | 5           | 100                | 5           | 120                     | 0.7      |
| 2V4HS  | 2.33                        | 2.63     | 5           | 100                | 5           | 120                     | 1        |
| 2V4HSA | 2.33                        | 2.52     | 5           | 100                | 5           | 120                     | 1        |
| 2V4HSB | 2.43                        | 2.63     | 5           | 100                | 5           | 120                     | 1        |
| 2V7HS  | 2.54                        | 2.91     | 5           | 110                | 5           | 100                     | 1        |
| 2V7HSA | 2.54                        | 2.75     | 5           | 110                | 5           | 100                     | 1        |
| 2V7HSB | 2.69                        | 2.91     | 5           | 110                | 5           | 100                     | 1        |
| 3V0HS  | 2.85                        | 3.22     | 5           | 120                | 5           | 50                      | 1        |
| 3V0HSA | 2.85                        | 3.07     | 5           | 120                | 5           | 50                      | 1        |
| 3V0HSB | 3.01                        | 3.22     | 5           | 120                | 5           | 50                      | 1        |
| 3V3HS  | 3.16                        | 3.53     | 5           | 120                | 5           | 20                      | 1        |
| 3V3HSA | 3.16                        | 3.38     | 5           | 120                | 5           | 20                      | 1        |
| 3V3HSB | 3.32                        | 3.53     | 5           | 120                | 5           | 20                      | 1        |
| 3V6HS  | 3.47                        | 3.83     | 5           | 120                | 5           | 10                      | 1        |
| 3V6HSA | 3.47                        | 3.68     | 5           | 120                | 5           | 10                      | 1        |
| 3V6HSB | 3.62                        | 3.83     | 5           | 120                | 5           | 10                      | 1        |
| 3V9HS  | 3.77                        | 4.14     | 5           | 120                | 5           | 5                       | 1        |
| 3V9HSA | 3.77                        | 3.98     | 5           | 120                | 5           | 5                       | 1        |
| 3V9HSB | 3.92                        | 4.14     | 5           | 120                | 5           | 5                       | 1        |
| 4V3HS  | 4.05                        | 4.53     | 5           | 120                | 5           | 5                       | 1        |
| 4V3HSA | 4.05                        | 4.26     | 5           | 120                | 5           | 5                       | 1        |
| 4V3HSB | 4.2                         | 4.4      | 5           | 120                | 5           | 5                       | 1        |
| 4V3HSC | 4.34                        | 4.53     | 5           | 120                | 5           | 5                       | 1        |
| 4V7HS  | 4.47                        | 4.91     | 5           | 100                | 5           | 5                       | 1        |
| 4V7HSA | 4.47                        | 4.65     | 5           | 100                | 5           | 5                       | 1        |
| 4V7HSB | 4.59                        | 4.77     | 5           | 100                | 5           | 5                       | 1        |
| 4V7HSC | 4.71                        | 4.91     | 5           | 100                | 5           | 5                       | 1        |
| 5V1HS  | 4.85                        | 5.35     | 5           | 70                 | 5           | 5                       | 1.5      |
| 5V1HSA | 4.85                        | 5.03     | 5           | 70                 | 5           | 5                       | 1.5      |
| 5V1HSB | 4.97                        | 5.18     | 5           | 70                 | 5           | 5                       | 1.5      |
| 5V1HSC | 5.12                        | 5.35     | 5           | 70                 | 5           | 5                       | 1.5      |
| 5V6HS  | 5.29                        | 5.88     | 5           | 40                 | 5           | 5                       | 2.5      |
| 5V6HSA | 5.29                        | 5.52     | 5           | 40                 | 5           | 5                       | 2.5      |
| 5V6HSB | 5.46                        | 5.7      | 5           | 40                 | 5           | 5                       | 2.5      |
| 5V6HSC | 5.64                        | 5.88     | 5           | 40                 | 5           | 5                       | 2.5      |



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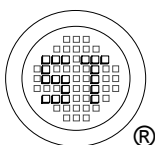


Dated : 18/07/2009

# HS Series

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

| Type   | Zener Voltage <sup>1)</sup> |          |             | Dynamic Resistance |             | Reverse Leakage Current |          |
|--------|-----------------------------|----------|-------------|--------------------|-------------|-------------------------|----------|
|        | $V_Z$                       |          | at $I_{ZT}$ | $Z_{ZT}$           | at $I_{ZT}$ | $I_R$                   | at $V_R$ |
|        | Min. (V)                    | Max. (V) | (mA)        | Max. ( $\Omega$ )  | (mA)        | Max. ( $\mu\text{A}$ )  | (V)      |
| 6V2HS  | 5.81                        | 6.4      | 5           | 30                 | 5           | 5                       | 3        |
| 6V2HSA | 5.81                        | 6.06     | 5           | 30                 | 5           | 5                       | 3        |
| 6V2HSB | 5.99                        | 6.24     | 5           | 30                 | 5           | 5                       | 3        |
| 6V2HSC | 6.16                        | 6.4      | 5           | 30                 | 5           | 5                       | 3        |
| 6V8HS  | 6.32                        | 6.97     | 5           | 25                 | 5           | 2                       | 3.5      |
| 6V8HSA | 6.32                        | 6.59     | 5           | 25                 | 5           | 2                       | 3.5      |
| 6V8HSB | 6.52                        | 6.79     | 5           | 25                 | 5           | 2                       | 3.5      |
| 6V8HSC | 6.7                         | 6.97     | 5           | 25                 | 5           | 2                       | 3.5      |
| 7V5HS  | 6.88                        | 7.64     | 5           | 25                 | 5           | 0.5                     | 4        |
| 7V5HSA | 6.88                        | 7.19     | 5           | 25                 | 5           | 0.5                     | 4        |
| 7V5HSB | 7.11                        | 7.41     | 5           | 25                 | 5           | 0.5                     | 4        |
| 7V5HSC | 7.33                        | 7.64     | 5           | 25                 | 5           | 0.5                     | 4        |
| 8V2HS  | 7.56                        | 8.41     | 5           | 20                 | 5           | 0.5                     | 5        |
| 8V2HSA | 7.56                        | 7.9      | 5           | 20                 | 5           | 0.5                     | 5        |
| 8V2HSB | 7.82                        | 8.15     | 5           | 20                 | 5           | 0.5                     | 5        |
| 8V2HSC | 8.07                        | 8.41     | 5           | 20                 | 5           | 0.5                     | 5        |
| 9V1HS  | 8.33                        | 9.29     | 5           | 20                 | 5           | 0.5                     | 6        |
| 9V1HSA | 8.33                        | 8.7      | 5           | 20                 | 5           | 0.5                     | 6        |
| 9V1HSB | 8.61                        | 8.99     | 5           | 20                 | 5           | 0.5                     | 6        |
| 9V1HSC | 8.89                        | 9.29     | 5           | 20                 | 5           | 0.5                     | 6        |
| 10HS   | 9.19                        | 10.3     | 5           | 20                 | 5           | 0.2                     | 7        |
| 10HSA  | 9.19                        | 9.59     | 5           | 20                 | 5           | 0.2                     | 7        |
| 10HSB  | 9.48                        | 9.9      | 5           | 20                 | 5           | 0.2                     | 7        |
| 10HSC  | 9.82                        | 10.3     | 5           | 20                 | 5           | 0.2                     | 7        |
| 11HS   | 10.18                       | 11.26    | 5           | 20                 | 5           | 0.2                     | 8        |
| 11HSA  | 10.18                       | 10.63    | 5           | 20                 | 5           | 0.2                     | 8        |
| 11HSB  | 10.5                        | 10.95    | 5           | 20                 | 5           | 0.2                     | 8        |
| 11HSC  | 10.82                       | 11.26    | 5           | 20                 | 5           | 0.2                     | 8        |
| 12HS   | 11.13                       | 12.3     | 5           | 25                 | 5           | 0.2                     | 9        |
| 12HSA  | 11.13                       | 11.63    | 5           | 25                 | 5           | 0.2                     | 9        |
| 12HSB  | 11.5                        | 11.92    | 5           | 25                 | 5           | 0.2                     | 9        |
| 12HSC  | 11.8                        | 12.3     | 5           | 25                 | 5           | 0.2                     | 9        |
| 13HS   | 12.18                       | 13.62    | 5           | 25                 | 5           | 0.2                     | 10       |
| 13HSA  | 12.18                       | 12.71    | 5           | 25                 | 5           | 0.2                     | 10       |
| 13HSB  | 12.59                       | 13.16    | 5           | 25                 | 5           | 0.2                     | 10       |
| 13HSC  | 13.03                       | 13.62    | 5           | 25                 | 5           | 0.2                     | 10       |
| 15HS   | 13.48                       | 15.02    | 5           | 25                 | 5           | 0.2                     | 11       |
| 15HSA  | 13.48                       | 14.09    | 5           | 25                 | 5           | 0.2                     | 11       |
| 15HSB  | 13.95                       | 14.56    | 5           | 25                 | 5           | 0.2                     | 11       |
| 15HSC  | 14.42                       | 15.02    | 5           | 25                 | 5           | 0.2                     | 11       |



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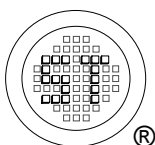


Dated : 18/07/2009

# HS Series

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

| Type  | Zener Voltage <sup>1)</sup> |          |             | Dynamic Resistance |             | Reverse Leakage Current |          |
|-------|-----------------------------|----------|-------------|--------------------|-------------|-------------------------|----------|
|       | $V_Z$                       |          | at $I_{ZT}$ | $Z_{ZT}$           | at $I_{ZT}$ | $I_R$                   | at $V_R$ |
|       | Min. (V)                    | Max. (V) | (mA)        | Max. ( $\Omega$ )  | (mA)        | Max. ( $\mu\text{A}$ )  | (V)      |
| 16HS  | 14.87                       | 16.5     | 5           | 25                 | 5           | 0.2                     | 12       |
| 16HSA | 14.87                       | 15.5     | 5           | 25                 | 5           | 0.2                     | 12       |
| 16HSB | 15.33                       | 15.96    | 5           | 25                 | 5           | 0.2                     | 12       |
| 16HSC | 15.79                       | 16.5     | 5           | 25                 | 5           | 0.2                     | 12       |
| 18HS  | 16.34                       | 18.30    | 5           | 30                 | 5           | 0.2                     | 13       |
| 18HSA | 16.34                       | 17.06    | 5           | 30                 | 5           | 0.2                     | 13       |
| 18HSB | 16.9                        | 17.67    | 5           | 30                 | 5           | 0.2                     | 13       |
| 18HSC | 17.51                       | 18.3     | 5           | 30                 | 5           | 0.2                     | 13       |
| 20HS  | 18.14                       | 20.45    | 5           | 30                 | 5           | 0.2                     | 15       |
| 20HSA | 18.14                       | 18.96    | 5           | 30                 | 5           | 0.2                     | 15       |
| 20HSB | 18.8                        | 19.68    | 5           | 30                 | 5           | 0.2                     | 15       |
| 20HSC | 19.52                       | 20.45    | 5           | 30                 | 5           | 0.2                     | 15       |
| 22HS  | 20.23                       | 22.61    | 5           | 30                 | 5           | 0.2                     | 17       |
| 22HSA | 20.23                       | 21.08    | 5           | 30                 | 5           | 0.2                     | 17       |
| 22HSB | 20.76                       | 21.65    | 5           | 30                 | 5           | 0.2                     | 17       |
| 22HSC | 21.22                       | 22.09    | 5           | 30                 | 5           | 0.2                     | 17       |
| 22HSD | 21.68                       | 22.61    | 5           | 30                 | 5           | 0.2                     | 17       |
| 24HS  | 22.26                       | 24.81    | 5           | 35                 | 5           | 0.2                     | 19       |
| 24HSA | 22.26                       | 23.12    | 5           | 35                 | 5           | 0.2                     | 19       |
| 24HSB | 22.75                       | 23.73    | 5           | 35                 | 5           | 0.2                     | 19       |
| 24HSC | 23.29                       | 24.27    | 5           | 35                 | 5           | 0.2                     | 19       |
| 24HSD | 23.81                       | 24.81    | 5           | 35                 | 5           | 0.2                     | 19       |
| 27HS  | 24.26                       | 27.64    | 5           | 45                 | 5           | 0.2                     | 21       |
| 27HSA | 24.26                       | 25.52    | 5           | 45                 | 5           | 0.2                     | 21       |
| 27HSB | 24.97                       | 26.26    | 5           | 45                 | 5           | 0.2                     | 21       |
| 27HSC | 25.63                       | 26.95    | 5           | 45                 | 5           | 0.2                     | 21       |
| 27HSD | 26.29                       | 27.64    | 5           | 45                 | 5           | 0.2                     | 21       |
| 30HS  | 26.99                       | 30.51    | 5           | 55                 | 5           | 0.2                     | 23       |
| 30HSA | 26.99                       | 28.39    | 5           | 55                 | 5           | 0.2                     | 23       |
| 30HSB | 27.7                        | 29.13    | 5           | 55                 | 5           | 0.2                     | 23       |
| 30HSC | 28.36                       | 29.82    | 5           | 55                 | 5           | 0.2                     | 23       |
| 30HSD | 29.02                       | 30.51    | 5           | 55                 | 5           | 0.2                     | 23       |
| 33HS  | 29.68                       | 33.11    | 5           | 65                 | 5           | 0.2                     | 25       |
| 33HSA | 29.68                       | 31.22    | 5           | 65                 | 5           | 0.2                     | 25       |
| 33HSB | 30.32                       | 31.88    | 5           | 65                 | 5           | 0.2                     | 25       |
| 33HSC | 30.9                        | 32.5     | 5           | 65                 | 5           | 0.2                     | 25       |
| 33HSD | 31.49                       | 33.11    | 5           | 65                 | 5           | 0.2                     | 25       |
| 36HS  | 32.14                       | 35.77    | 5           | 75                 | 5           | 0.2                     | 27       |
| 36HSA | 32.14                       | 33.79    | 5           | 75                 | 5           | 0.2                     | 27       |
| 36HSB | 32.79                       | 34.49    | 5           | 75                 | 5           | 0.2                     | 27       |



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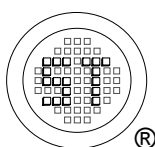
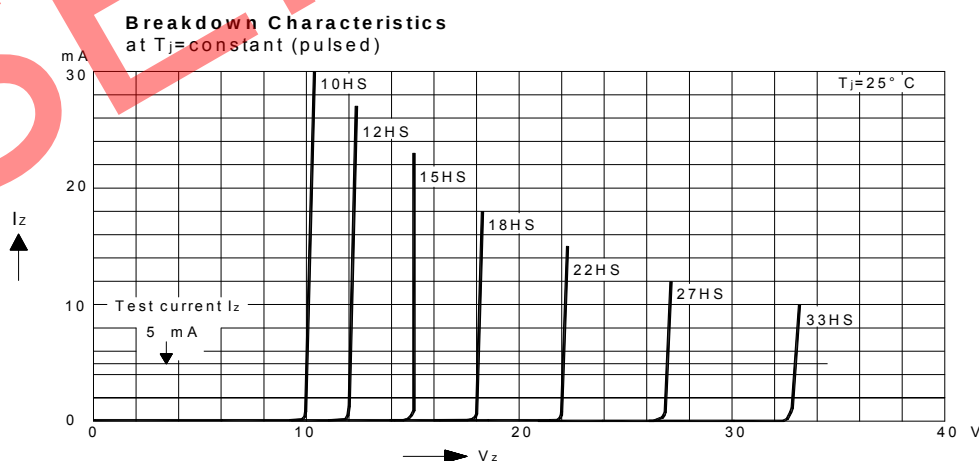
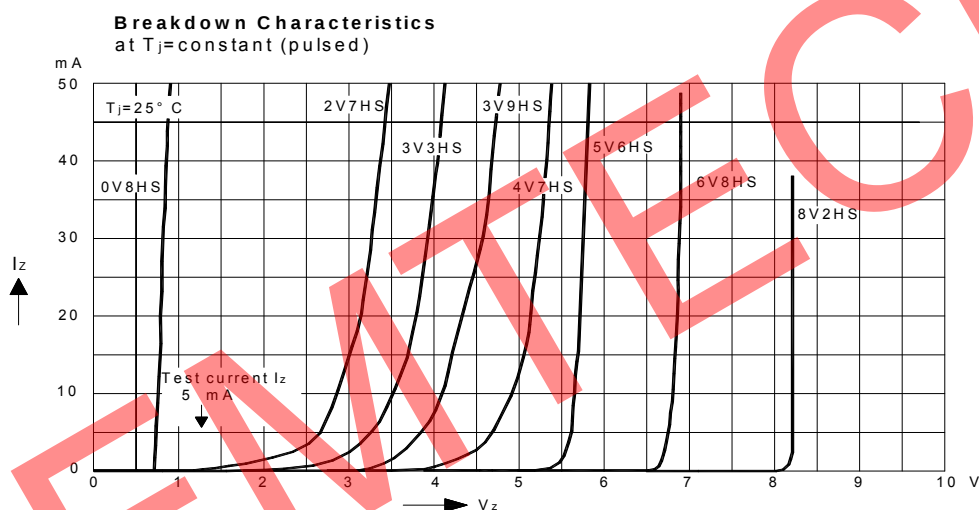
Dated : 18/07/2009

# HS Series

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

| Type  | Zener Voltage <sup>1)</sup> |          |             | Dynamic Resistance |             | Reverse Leakage Current |          |
|-------|-----------------------------|----------|-------------|--------------------|-------------|-------------------------|----------|
|       | $V_Z$                       |          | at $I_{ZT}$ | $Z_{ZT}$           | at $I_{ZT}$ | $I_R$                   | at $V_R$ |
|       | Min. (V)                    | Max. (V) | (mA)        | Max. ( $\Omega$ )  | (mA)        | Max. ( $\mu\text{A}$ )  | (V)      |
| 36HSC | 33.4                        | 35.13    | 5           | 75                 | 5           | 0.2                     | 27       |
| 36HSD | 34.01                       | 35.77    | 5           | 75                 | 5           | 0.2                     | 27       |
| 39HS  | 34.68                       | 38.52    | 5           | 85                 | 5           | 0.2                     | 30       |
| 39HSA | 34.68                       | 36.47    | 5           | 85                 | 5           | 0.2                     | 30       |
| 39HSB | 35.36                       | 37.19    | 5           | 85                 | 5           | 0.2                     | 30       |
| 39HSC | 36                          | 37.85    | 5           | 85                 | 5           | 0.2                     | 30       |
| 39HSD | 36.63                       | 38.52    | 5           | 85                 | 5           | 0.2                     | 30       |

<sup>1)</sup> Tested with pulse  $t_p = 20\text{ ms}$



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