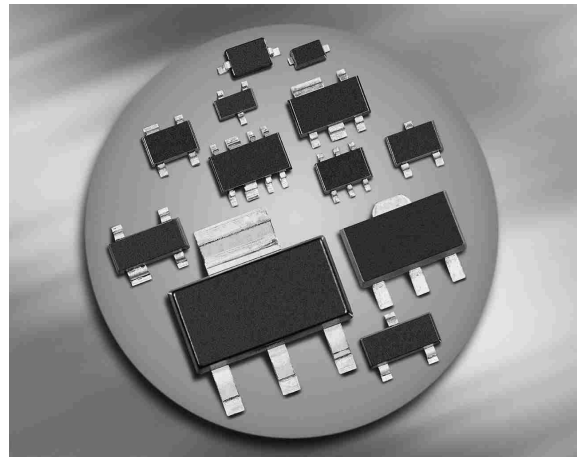


### Silicon TVS Diodes

- ESD / transient protection of data and power lines in 3.3 V / 5 V applications according to:  
IEC61000-4-2 (ESD):  $\pm 30$  kV (contact)  
IEC61000-4-4 (EFT): 80 A (5/50 ns)  
IEC61000-4-5 (surge): 40 A/600 W (8/20  $\mu$ s)
- Max. working voltage: 5 V
- Low clamping voltage
- Low reverse current
- Pb-free (RoHS compliant) package



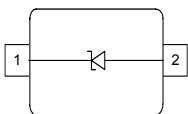
### Applications

- Uni or bi-directional operation possible (see application example page 5)
- Mobile communication
- Consumer products (STB, MP3, DVD, DSC...)
- LCD displays, camera
- Notebooks and desktop computers, peripherals

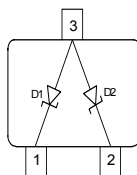
-



#### ESD5V0S1U-03W



#### ESD5V0S2U-06



| Type          | Package | Configuration            | Marking  |
|---------------|---------|--------------------------|----------|
| ESD5V0S1U-03W | SOD323  | 1 line, uni-directional  | yellow E |
| ESD5V0S2U-06  | SOT23   | 2 lines, uni-directional | E5       |

**Maximum Ratings** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| Parameter                                                       | Symbol           | Value     | Unit             |
|-----------------------------------------------------------------|------------------|-----------|------------------|
| ESD contact discharge <sup>1)</sup>                             | $V_{\text{ESD}}$ | 30        | kV               |
| Peak pulse current ( $t_p = 8 / 20 \mu\text{s}$ ) <sup>2)</sup> | $I_{\text{pp}}$  | 40        | A                |
| Peak pulse power ( $t_p = 8 / 20 \mu\text{s}$ ) <sup>2)</sup>   | $P_{\text{pk}}$  | 600       | W                |
| Operating temperature range                                     | $T_{\text{op}}$  | -55...125 | $^\circ\text{C}$ |
| Storage temperature                                             | $T_{\text{stg}}$ | -65...150 |                  |

**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| Parameter | Symbol | Values |      |      | Unit |
|-----------|--------|--------|------|------|------|
|           |        | min.   | typ. | max. |      |

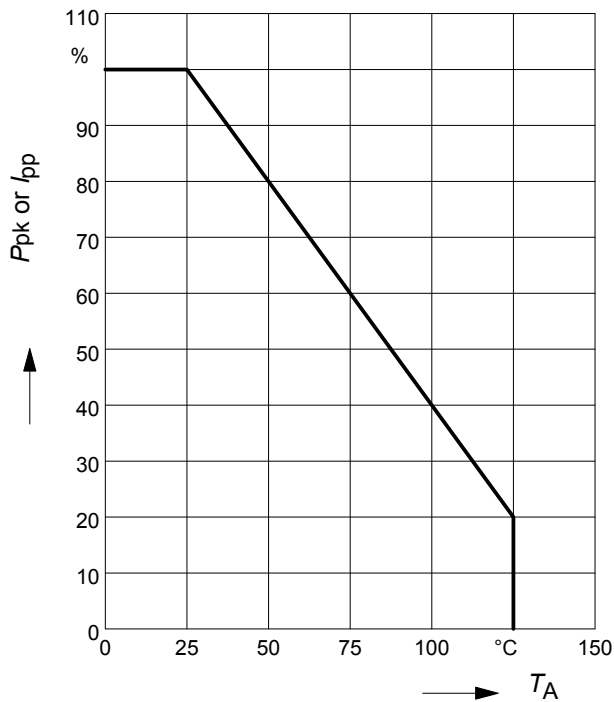
**Characteristics -**

|                                                                                                                                                                                                                                      |                   |             |                |                 |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------|----------------|-----------------|---------------|
| Reverse working voltage                                                                                                                                                                                                              | $V_{\text{RWM}}$  | -           | -              | 5               | V             |
| Breakdown voltage<br>$I_{(\text{BR})} = 1 \text{ mA}$                                                                                                                                                                                | $V_{(\text{BR})}$ | 5.5         | 6.7            | 8               |               |
| Reverse current<br>$V_R = 3.3 \text{ V}$<br>$V_R = 5 \text{ V}$                                                                                                                                                                      | $I_R$             | -<br>-      | -<br>-         | 5<br>20         | $\mu\text{A}$ |
| Clamping voltage (positive transient)<br>$I_{\text{PP}} = 5 \text{ A}, t_p = 8/20 \mu\text{s}^2)$<br>$I_{\text{PP}} = 24 \text{ A}, t_p = 8/20 \mu\text{s}^2)$<br>$I_{\text{PP}} = 40 \text{ A}, t_p = 8/20 \mu\text{s}^2)$          | $V_{\text{CL}}$   | -<br>-<br>- | 7.5<br>9<br>11 | 9.5<br>12<br>14 | V             |
| Forward clamping voltage (negative transients)<br>$I_{\text{PP}} = 5 \text{ A}, t_p = 8/20 \mu\text{s}^2)$<br>$I_{\text{PP}} = 24 \text{ A}, t_p = 8/20 \mu\text{s}^2)$<br>$I_{\text{PP}} = 40 \text{ A}, t_p = 8/20 \mu\text{s}^2)$ | $V_{\text{FC}}$   | -<br>-<br>- | 1.5<br>3<br>4  | 3<br>5<br>6     |               |
| Diode capacitance<br>$V_R = 0 \text{ V}, f = 1 \text{ MHz}$                                                                                                                                                                          | $C_T$             | -           | 430            | 500             | pF            |

<sup>1)</sup>  $V_{\text{ESD}}$  according to IEC61000-4-2

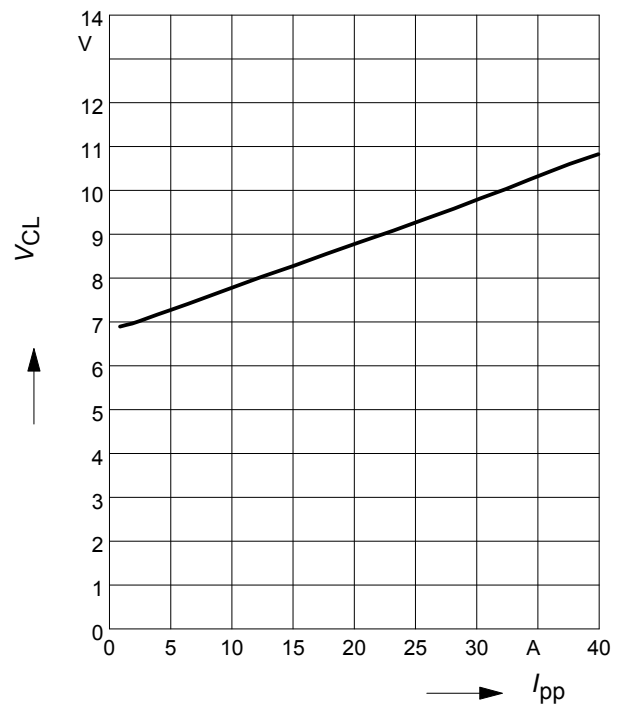
<sup>2)</sup>  $I_{\text{pp}}$  according to IEC61000-4-5

**Power derating curve**  $P_{pk} = f(T_A)$



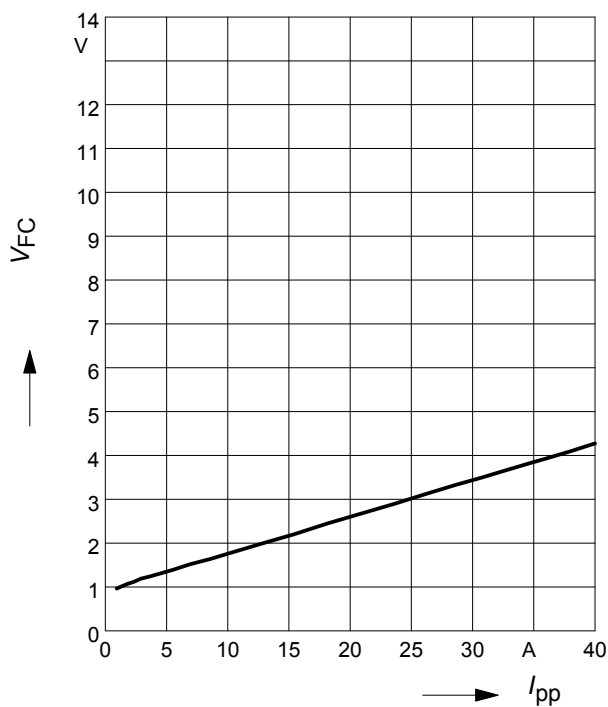
**Clamping voltage**  $V_{cl} = f(I_{pp})$

$t_p = 8 / 20 \mu s$  (positive transients)



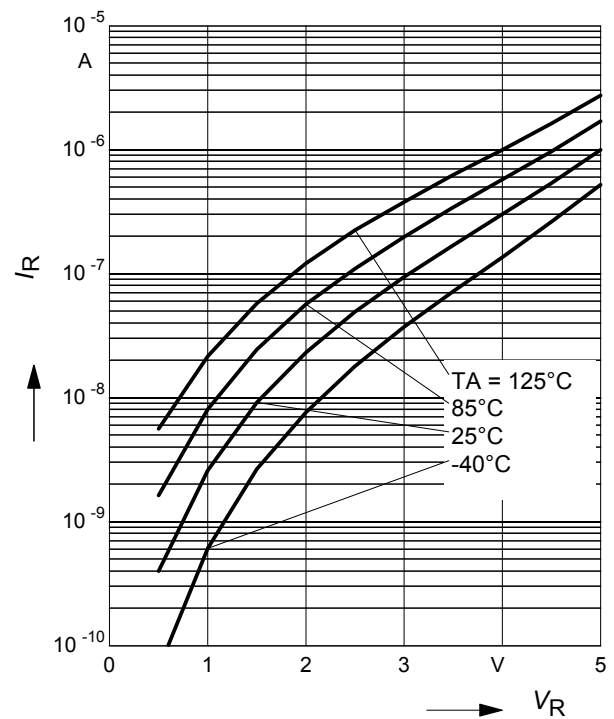
**Forward clamping voltage**  $V_{FC} = f(I_{PP})$

$t_p = 8 / 20 \mu s$  (negative transient)



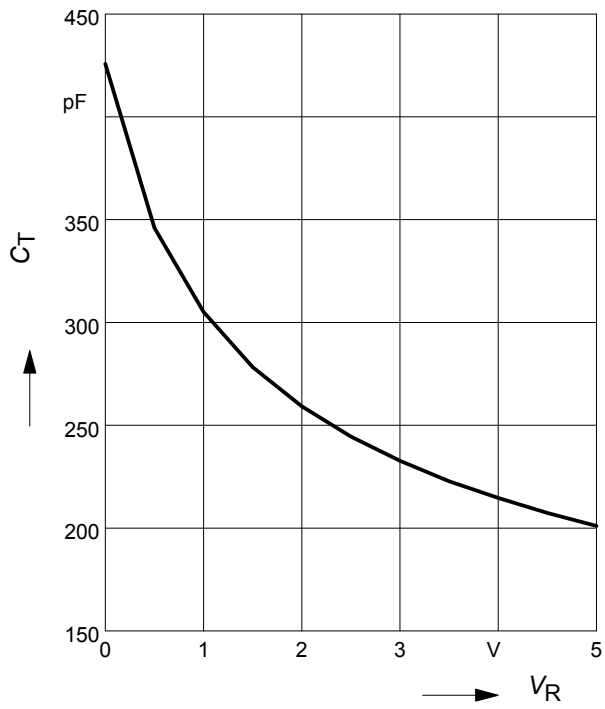
**Reverse current**  $I_R = f(V_R)$

$T_A = \text{Parameter}$



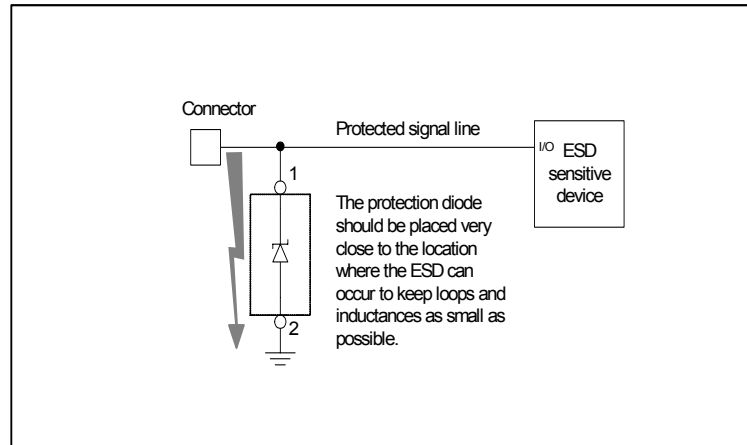
Diode capacitance  $C_T = f(V_R)$

$f = 1\text{MHz}$



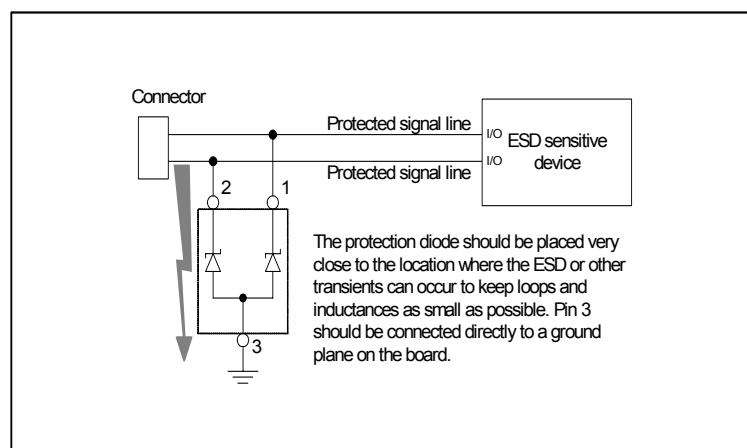
### Application example ESD5V01U-03W

single channel, uni-directional



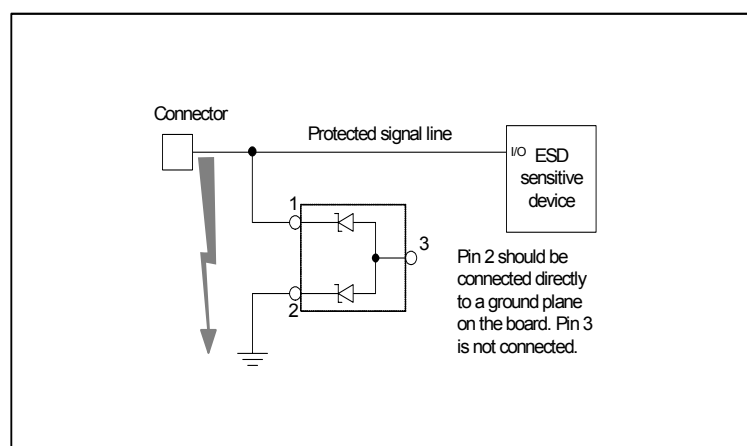
### Application example ESD5V0S2U-06

dual channel, uni-directional

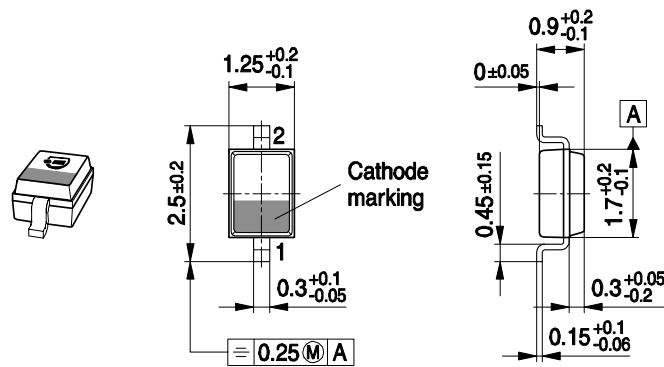


### Application example ESD5V0S2U-06

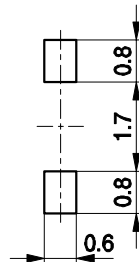
single channel, bi-directional



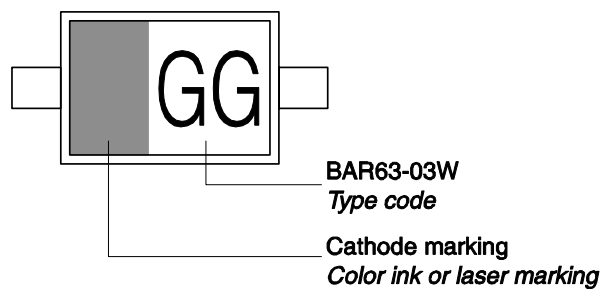
## Package Outline



## Foot Print

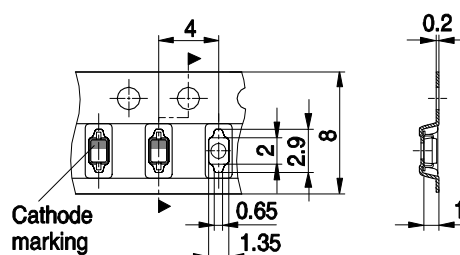


## Marking Layout (Example)



## Standard Packing

Reel  $\varnothing 180 \text{ mm}$  = 3.000 Pieces/Reel  
 Reel  $\varnothing 330 \text{ mm}$  = 10.000 Pieces/Reel

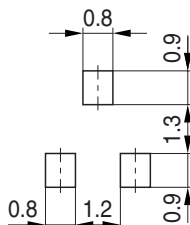


## Package Outline

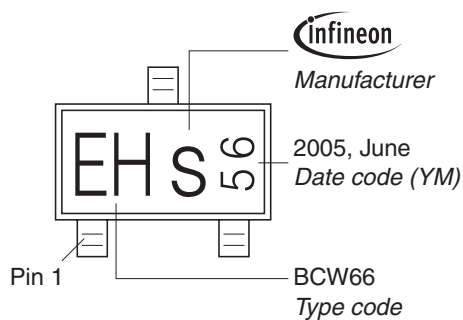


1) Lead width can be 0.6 max. in dambar area

## Foot Print

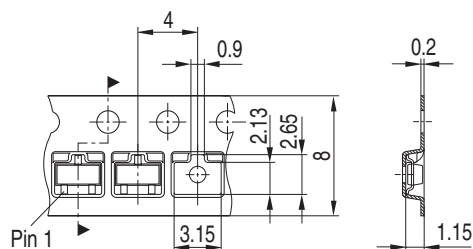


## Marking Layout (Example)



## Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel  
Reel ø330 mm = 10.000 Pieces/Reel



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