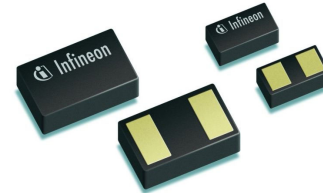


**Ultra-Low Capacitance TVS Diode**

- ESD / transient protection of high-speed data lines exceeding IEC61000-4-2 (ESD):  $\pm 20$  kV (air / contact)  
IEC61000-4-4 (EFT): 2.5 kV/50 A (5/50 ns)  
IEC61000-4-5 (surge): 3 A (8/20  $\mu$ s)
- Extremely small form factor down to 0.62 x 0.32 x 0.31 mm<sup>3</sup>
- Max. working voltage: 3.3 V
- Very low reverse current: < 1 nA typ.
- Extremely low capacitance: 0.4 pF typ.
- Very low clamping voltage: 12 V typ. at positive transients, 4 V typ. at negative transients
- Very low series inductance down to 0.2 nH typ.
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101

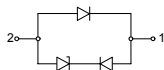


**Applications**

- USB 2.0, 10/100/1000 Ethernet, Firewire, DVI, HDMI, S-ATA
- Mobile communication
- Consumer products (STB, MP3, DVD, DSC...)
- LCD displays, camera
- Notebooks and desktop computers, peripherals



**ESD3V3U1U-02LS**  
**ESD3V3U1U-02LRH**



Type	Package	Configuration	Marking
ESD3V3U1U-02LRH	TSLP-2-7	1 line, uni-directional	E3
ESD3V3U1U-02LS	TSSLP-2-1	1 line, uni-directional	Z

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

Parameter	Symbol	Value	Unit
ESD (air / contact) discharge <sup>1)</sup>	$V_{\text{ESD}}$	20	kV
Peak pulse current ( $t_p = 8 / 20 \mu\text{s}$ ) <sup>2)</sup>	$I_{\text{pp}}$	3	A
Operating temperature range	$T_{\text{op}}$	-55...125	°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.	
<b>Characteristics</b>					
Reverse working voltage	$V_{\text{RWM}}$	-	-	3.3	V
Breakdown voltage $I_{\text{(BR)}} = 1 \text{ mA}$ , from pin 1 to 2	$V_{\text{(BR)}}$	5	-	-	
Reverse current $V_{\text{R}} = 3.3 \text{ V}$ , from pin 1 to 2	$I_{\text{R}}$	-	< 1	50	nA
Clamping voltage $I_{\text{PP}} = 1 \text{ A}$ , $t_p = 8/20 \mu\text{s}$ <sup>2)</sup> , from pin 1 to 2 $I_{\text{PP}} = 3 \text{ A}$ , $t_p = 8/20 \mu\text{s}$ <sup>2)</sup> , from pin 1 to 2	$V_{\text{CL}}$	-	10 12	13 15	V
Forward clamping voltage $I_{\text{PP}} = 1 \text{ A}$ , $t_p = 8/20 \mu\text{s}$ <sup>2)</sup> , from pin 2 to 1 $I_{\text{PP}} = 3 \text{ A}$ , $t_p = 8/20 \mu\text{s}$ <sup>2)</sup> , from pin 2 to 1	$V_{\text{FC}}$	-	2 4	4 6	
Line capacitance <sup>3)</sup> $V_{\text{R}} = 0 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{\text{T}}$	-	0.4	0.6	
Series inductance ESD3V3U1U-02LS ESD3V3U1U-02LRH	$L_{\text{S}}$	-	0.2 0.4	- -	nH

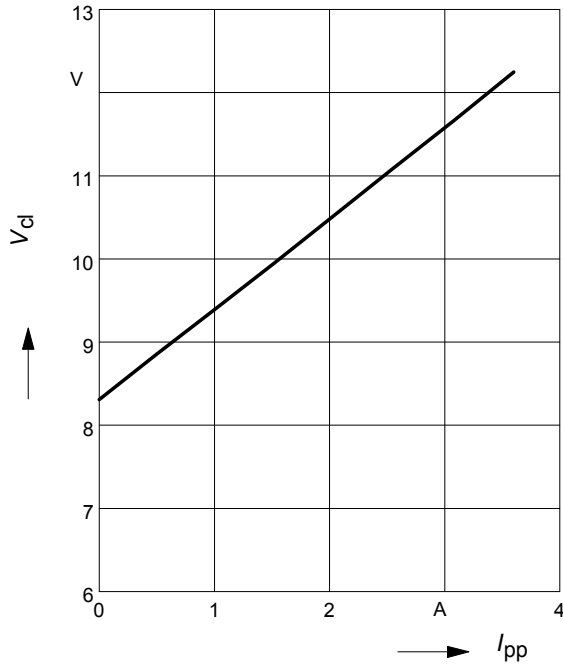
<sup>1)</sup> $V_{\text{ESD}}$  according to IEC61000-4-2

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

<sup>3)</sup>Total capacitance line to ground

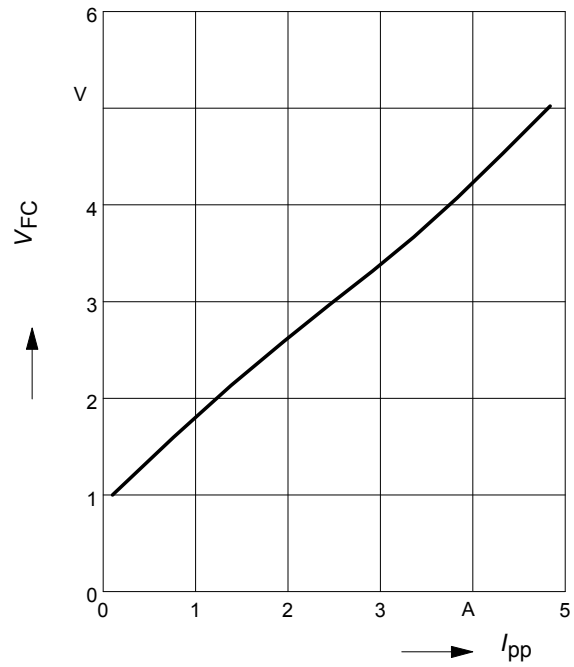
**Clamping voltage,  $V_{cl} = f(I_{pp})$**

$t_p = 8 / 20 \mu s$ , from pin 1 to 2



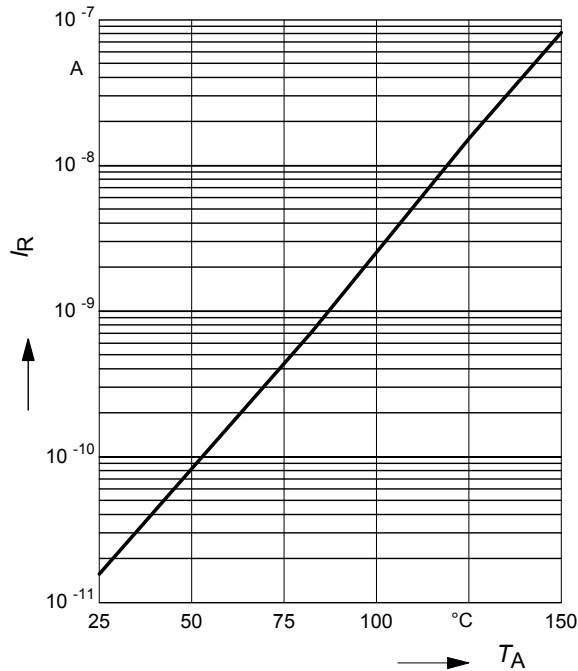
**Forward clamping voltage  $V_{FC} = f(I_{pp})$**

$t_p = 8 / 20 \mu s$ , from pin 2 to 1



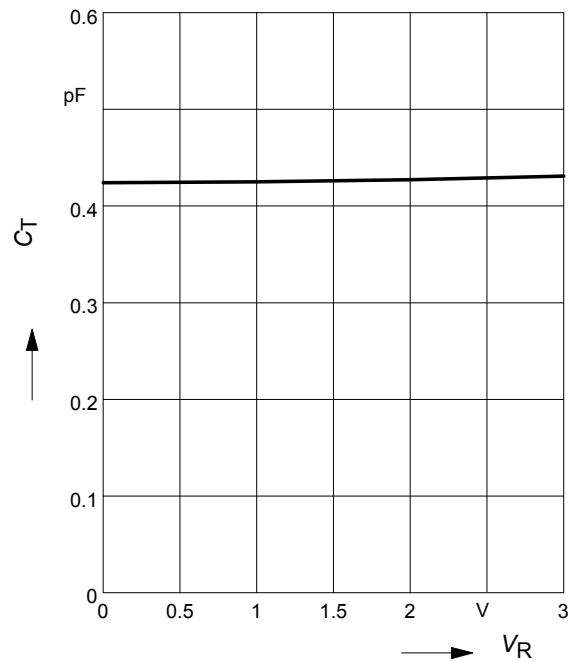
**Reverse current  $I_R = f(T_A)$**

$V_R = 3.3 V$ , from pin 1 to 2



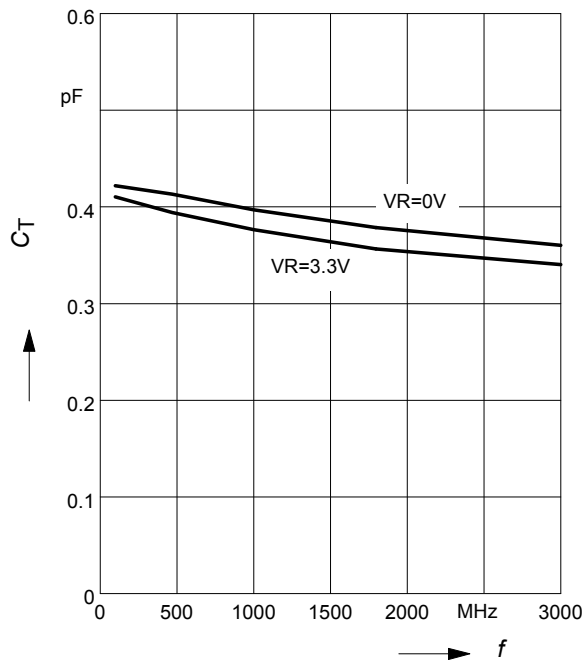
**Line capacitance  $C_T = f(V_R)$**

$f = 1 MHz$ , from pin 1 to 2



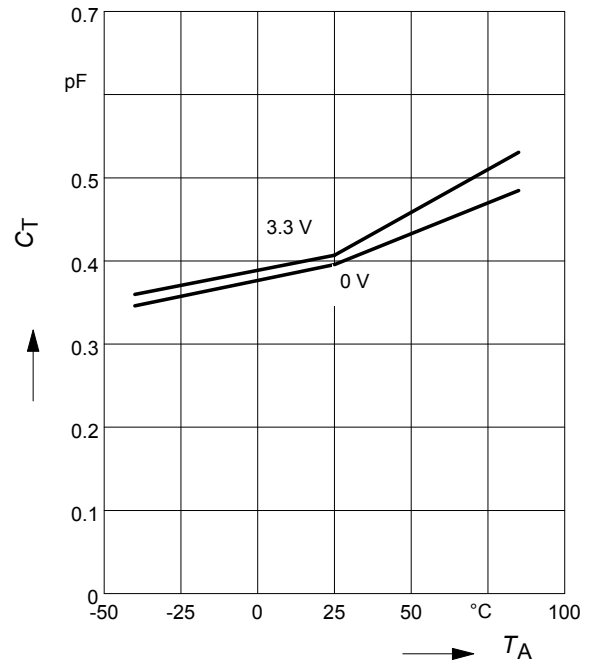
**Line capacitance  $C_T = f(f)$**

$V_R$  = parameter, from pin 1 to 2

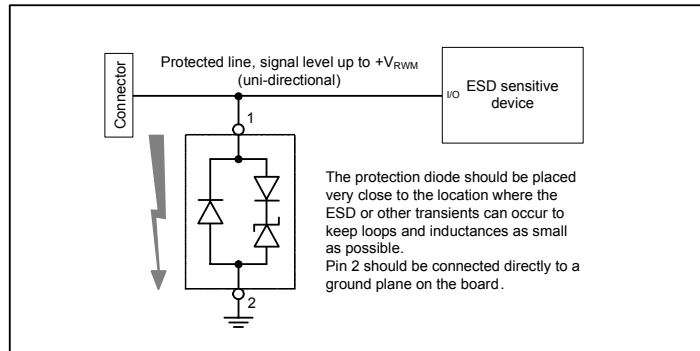


**Line capacitance  $C_T = f(T_A)$**

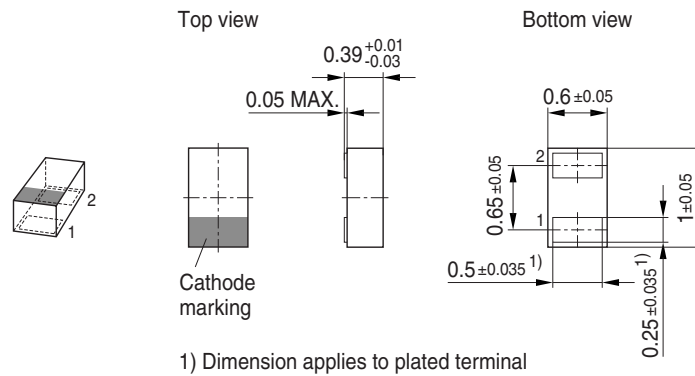
$V_R = 0V$ ,  $f = 1\text{ MHz}$



**Application example ESD3V3U1U...**  
1-channel, uni-directional

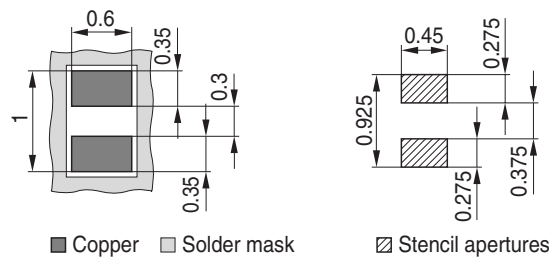


### Package Outline

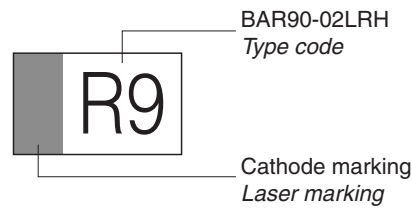


### Foot Print

For board assembly information please refer to Infineon website "Packages"

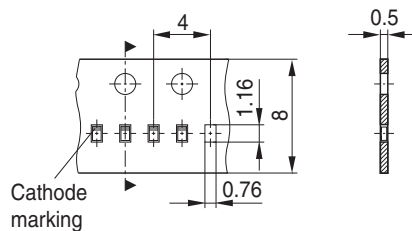


### Marking Layout (Example)

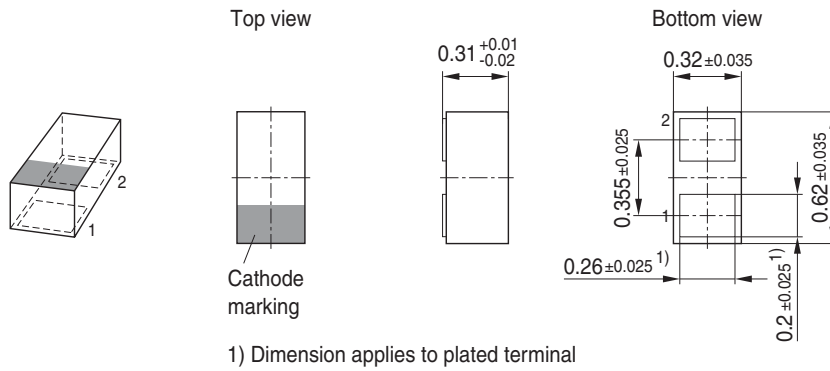


### Standard Packing

Reel  $\varnothing$ 180 mm = 15.000 Pieces/Reel  
 Reel  $\varnothing$ 330 mm = 50.000 Pieces/Reel (optional)

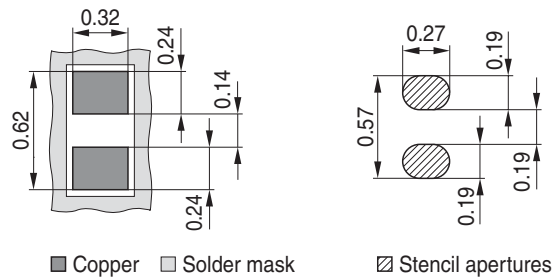


### Package Outline

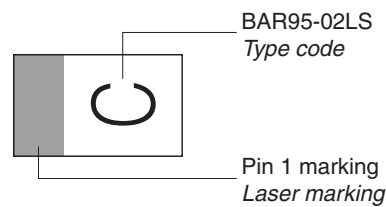


### Foot Print

For board assembly information please refer to Infineon website "Packages"

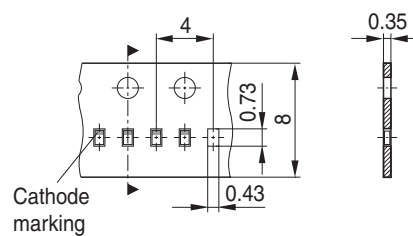


### Marking Layout



### Standard Packing

Reel  $\varnothing$ 180 mm = 15.000 Pieces/Reel



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