

### Ultra-Low Capacitance ESD Diode Array

- ESD / transient protection of high-speed data lines exceeding  
IEC61000-4-2 (ESD): 20 kV (air / contact)  
IEC61000-4-4 (EFT): 40 A (5/50 ns)  
IEC61000-4-5 (surge): 3 A (8/20  $\mu$ s)
- Max. working voltage: 5.3 V
- Extremely low capacitance: down to 0.2 pF
- Very low clamping voltage: 12 V typ.
- Extremely low forward clamping voltage: 4 V typ.
- Very low reverse current: < 1 nA typ.
- Pb-free (RoHS compliant) package

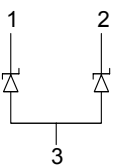


### Applications

- 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



### ESD5V3U2U-03F ESD5V3U2U-03LRH



Type	Package	Configuration	Marking
ESD5V3U2U-03F	TSFP-3	2 lines, uni-directional*	Z1
ESD5V3U2U-03LRH	TSLP-3-7	2 lines, uni-directional*	Z1

\* or 1 line, bi-directional between pins 1 and 2, if pin 3 is not connected

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

Parameter	Symbol	Value	Unit
ESD contact/ air 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	$T_{\text{op}}$	-40...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	$V_{\text{RWM}}$	-	-	5.3	V
Breakdown voltage $I_{\text{(BR)}} = 1 \text{ mA}$ , from pin 1 to 3	$V_{\text{(BR)}}$	6	-	-	
Reverse current $V_{\text{R}} = 5.3 \text{ V}$ , from pin 1 to 3	$I_{\text{R}}$	-	< 1	50	nA
Clamping voltage $I_{\text{PP}} = 1 \text{ A}$ , $t_{\text{p}} = 8/20\mu\text{s}^2)$ , from 1/2 to 3 $I_{\text{PP}} = 3 \text{ A}$ , $t_{\text{p}} = 8/20\mu\text{s}^2)$ , from 1/2 to 3	$V_{\text{CL}}$	- -	10 12	13 15	V
Forward clamping voltage $I_{\text{PP}} = 1 \text{ A}$ , $t_{\text{p}} = 8/20\mu\text{s}^2)$ , from 3 to 1/2 $I_{\text{PP}} = 3 \text{ A}$ , $t_{\text{p}} = 8/20\mu\text{s}^2)$ , from 3 to 1/2	$V_{\text{FC}}$	- -	2 4	4 6	
Line capacitance, $V_{\text{R}} = 0 \text{ V}$ , $f = 1 \text{ MHz}$ from pin 1/2 to 3 <sup>3)</sup> from pin 1 to 2, pin 3 not connected	$C_{\text{T}}$	- -	0.4 0.2	0.6 0.4	pF

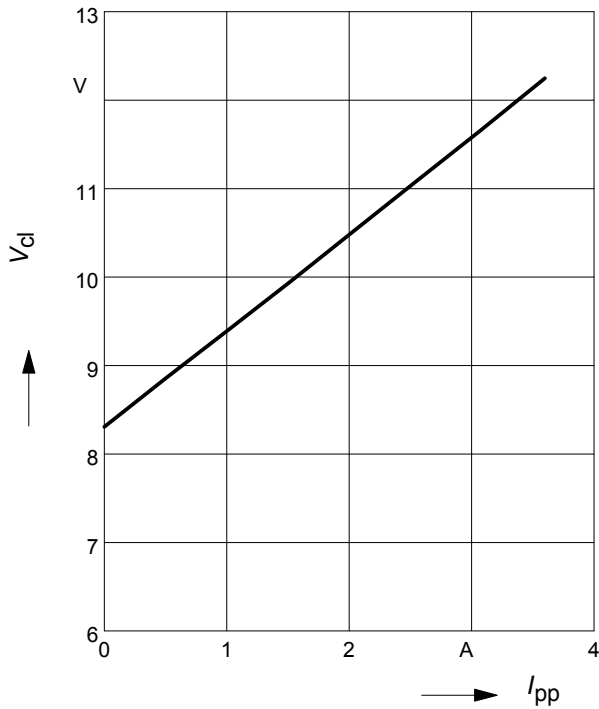
<sup>1)</sup>  $V_{\text{ESD}}$  according to IEC61000-4-2

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

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

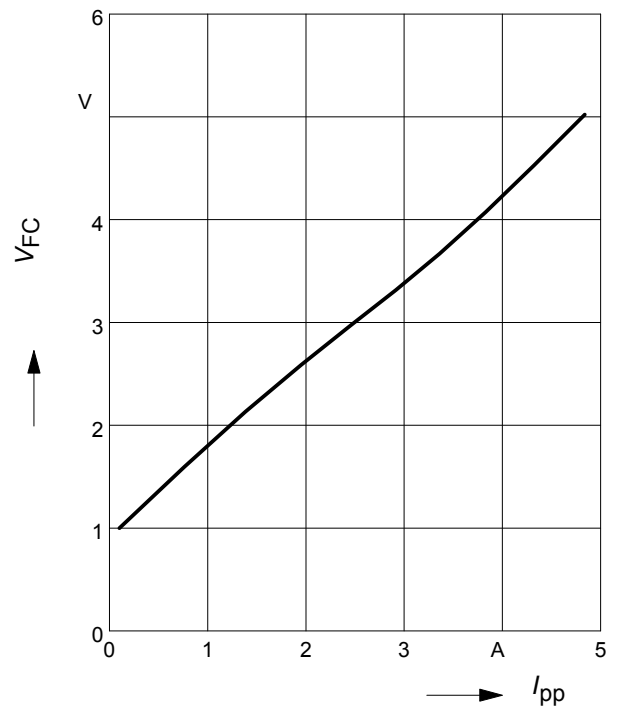
**Clamping voltage,  $V_{cl} = f(I_{pp})$**

$t_p = 8 / 20 \mu s$ , from pin 1/2 to 3



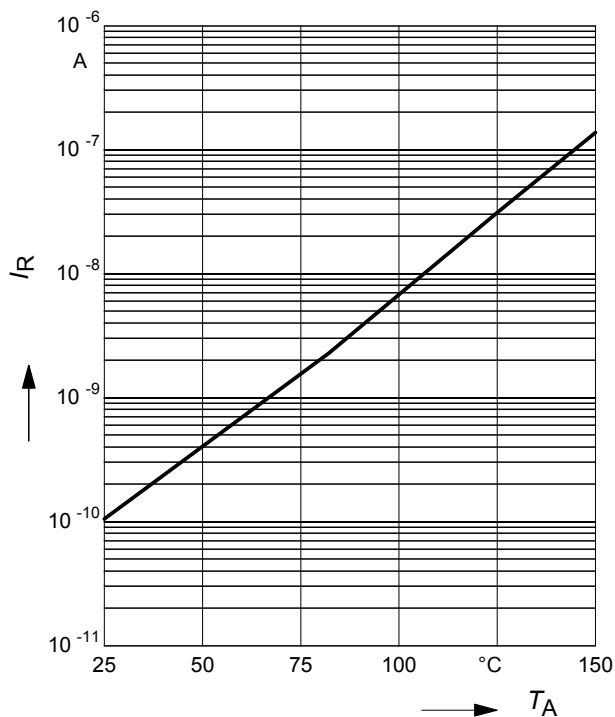
**Forward clamping voltage  $V_{FC} = f(I_{PP})$**

$t_p = 8 / 20 \mu s$ , from pin 3 to 1/2



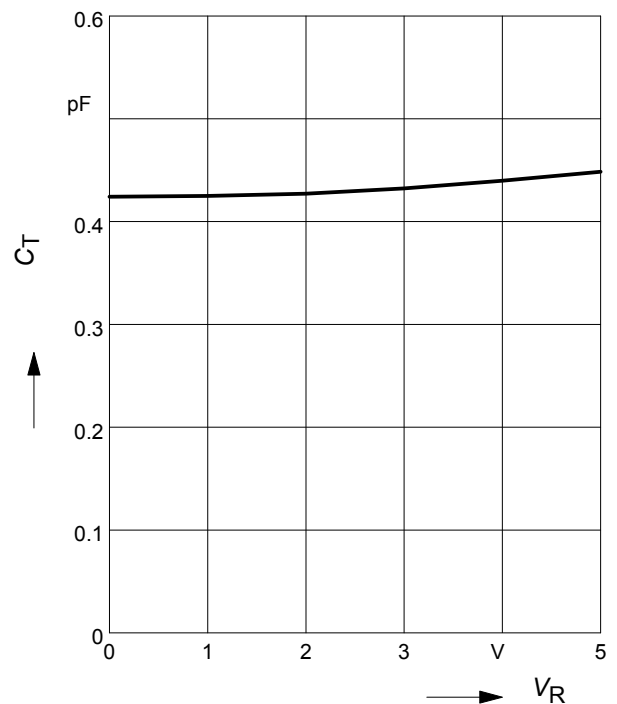
**Reverse current  $I_R = f(T_A)$**

$V_R = \text{Parameter}$ , from pin 1/2 to 3



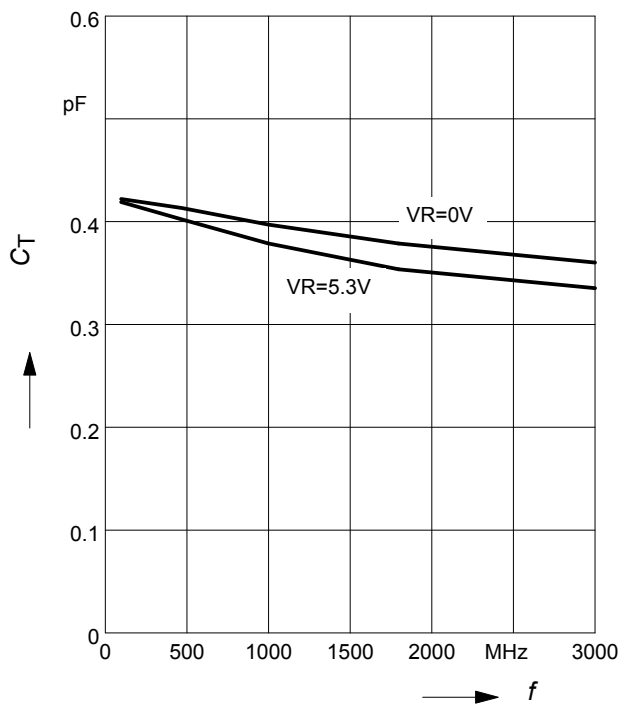
**Diode capacitance  $C_T = f(V_R)$**

$f = 1 \text{ MHz}$ , from pin 1/2 to 3



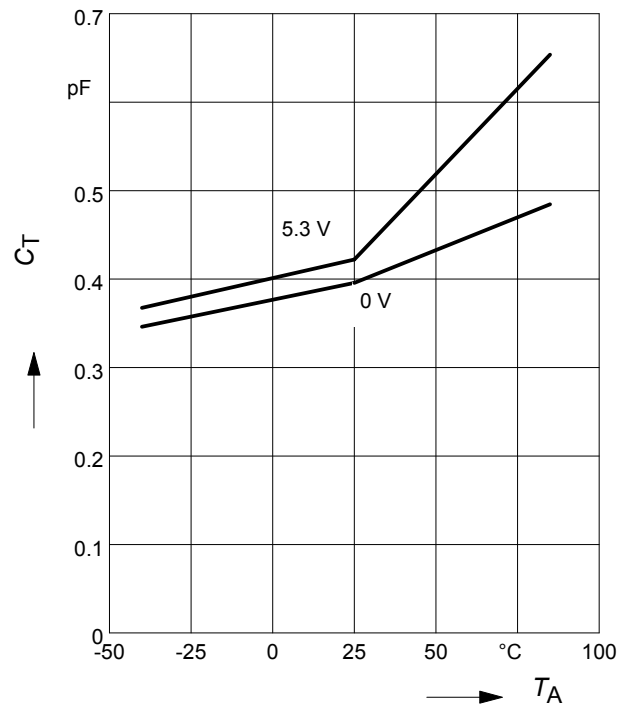
**Line capacitance  $C_T = f(f)$**

$V_R$  = parameter, from pin 1/2 to 3



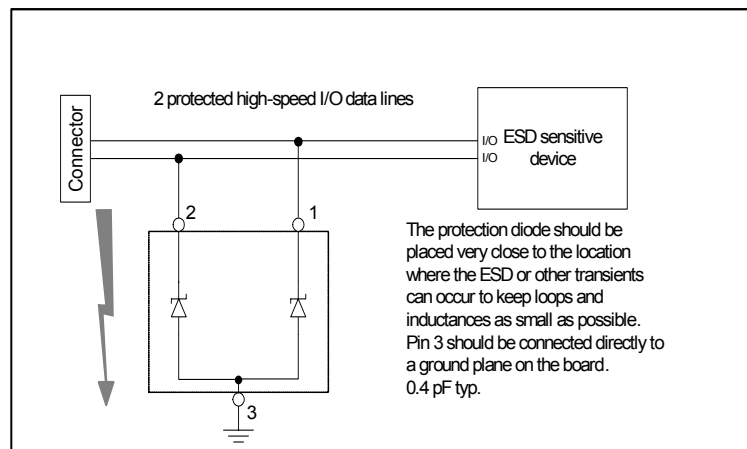
**Line capacitance  $C_T = f(T_A)$**

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



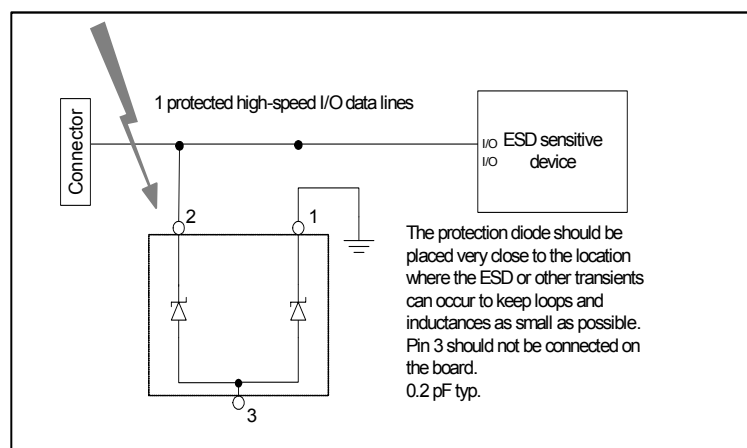
## Application example ESD5V3U2U...

2 lines, uni-directional



## Application example ESD5V3U2U...

1 line, bi-directional



[illegible]

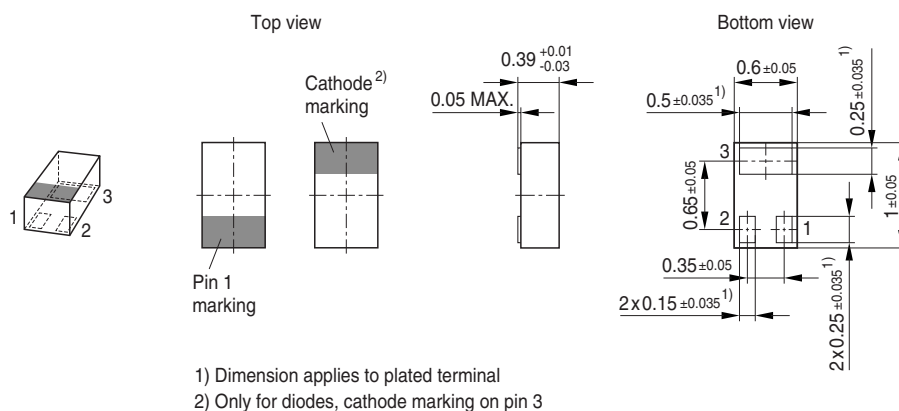
Technical drawing of a mechanical part with dimensions: 0.4, 0.45, 1.05, and 0.4.

Diagram illustrating the marking on the BCR847BF diode:

- Manufacturer:** Infineon
- Type code:** BCR847BF
- Pin 1:** Indicated by a line pointing to the first pin on the left.

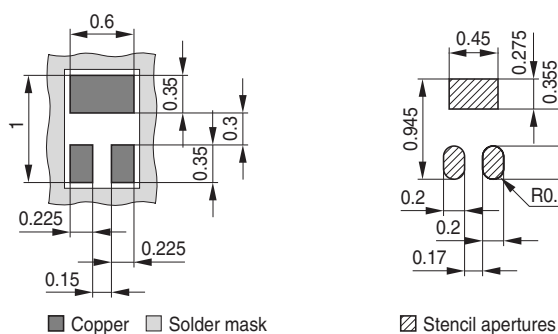
Technical drawing of a mechanical part showing a top view and a side view. The top view includes dimensions: 4, 0.3, 1.2, 1.5, 8, 1.35, and Pin 1. The side view includes dimensions: 0.2 and 0.7.

## Package Outline

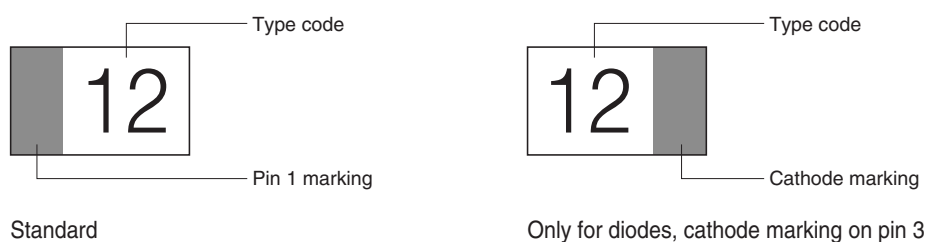


## Foot Print

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

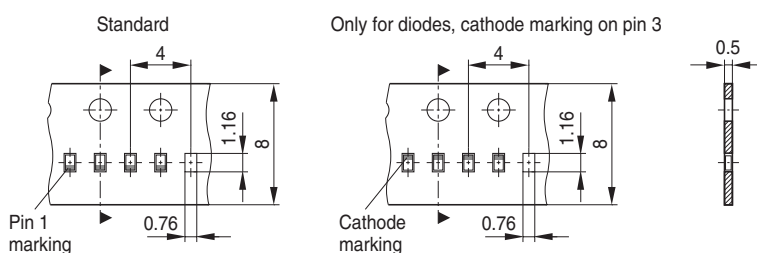


## Marking Layout



## Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel



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