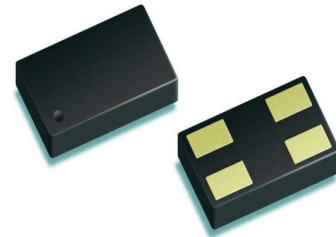


RF ESD Protection Diodes

- ESD protection of RF antenna / interfaces or ultra high speed data lines acc. to:
IEC61000-4-2 (ESD): ± 15 KV (air / contact)
IEC61000-4-4 (EPT): 40 A (5/50 ns)
IEC61000-4-5 (surge): 5 A (8/20 μ s)
- Very low line capacitance: 0.4 pF @ 1 GHz
(0.2 pF per diode)
- Ultra low series inductance: 0.4 nH per diode
- Very low clamping voltage
- Ultra small leadless package: 1.2 x 0.8 x 0.39 mm³
- Pb-free (RoHS compliant) package



Applications in anti-parallel configuration

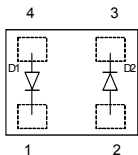
- For low RF signal levels without superimposed DC voltage: e.g. GPS, XM-Radio, Sirius, DVB, DMB, DAB, Remote Keyless Entry

Applications in rail-to-rail configuration

- For high RF signal levels or low RF signal levels with superimposed DC voltage: e.g. HDMI, S-ATA, Gbit Ethernet



ESD0P4RFL



Type	Package	Configuration	Marking
ESD0P4RFL	TSLP-4-7	anti-parallel	E4

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

Parameter	Symbol	Value	Unit
ESD contact discharge ¹⁾	V_{ESD}	15	kV
Peak pulse current ($t_p = 8 / 20 \mu\text{s}$) ²⁾	I_{pp}	5	A
Operating temperature range	T_{op}	-55...150	$^\circ\text{C}$
Storage temperature	T_{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 ³⁾	V _{RWM}	-	-	50	V
Reverse current ³⁾ V _R = 50 V	I _R	-	20	100	nA
Forward clamping voltage ²⁾ I _{PP} = 5 A	V _{FC}	-	6	9	V
Diode capacitance ⁴⁾ V _R = 0 V, f = 1 GHz	C _T	-	0.4	-	pF
Series inductance per diode	L _S	-	0.4	-	nH

¹⁾ V_{ESD} according to IEC61000-4-2, only valid in anti-parallel or rail-to-rail connection.

Please refer to the application examples.

²⁾ I_{pp} according to IEC61000-4-5, only valid in anti-parallel or rail-to-rail connection.

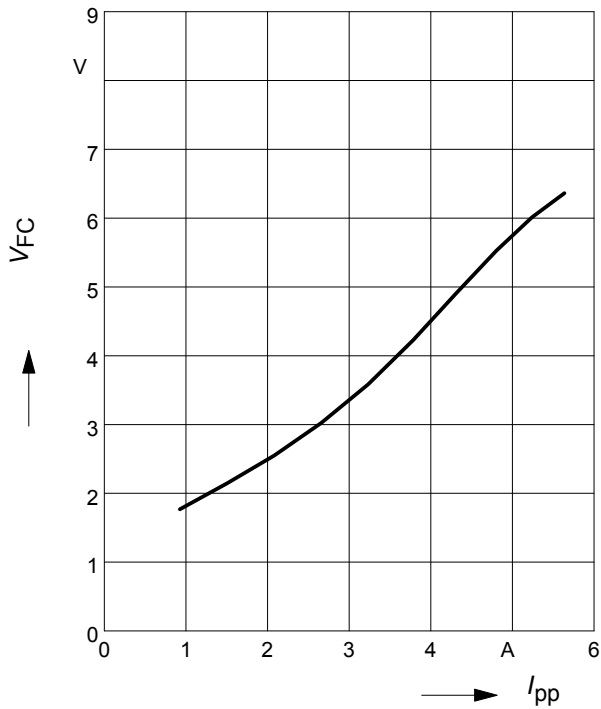
Please refer to the application examples.

³⁾Only valid in rail-to-rail configuration with $V_{\text{CC}} \leq V_{\text{RWM}}$

⁴⁾Total capacitance line to ground (2 diodes in parallel)

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

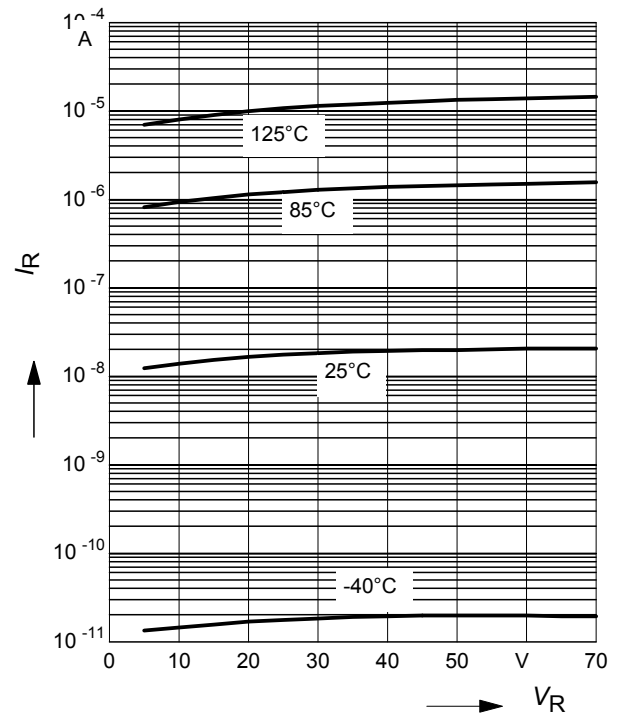
$t_p = 8 / 20 \mu s$



Reverse current $I_R = f(V_R)$

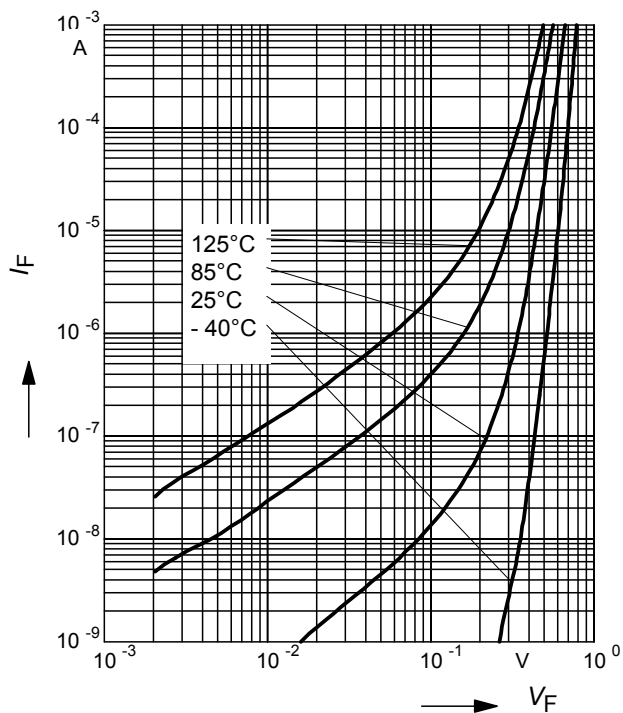
$T_A = \text{Parameter}$

leakage in rail-to-rail configuration



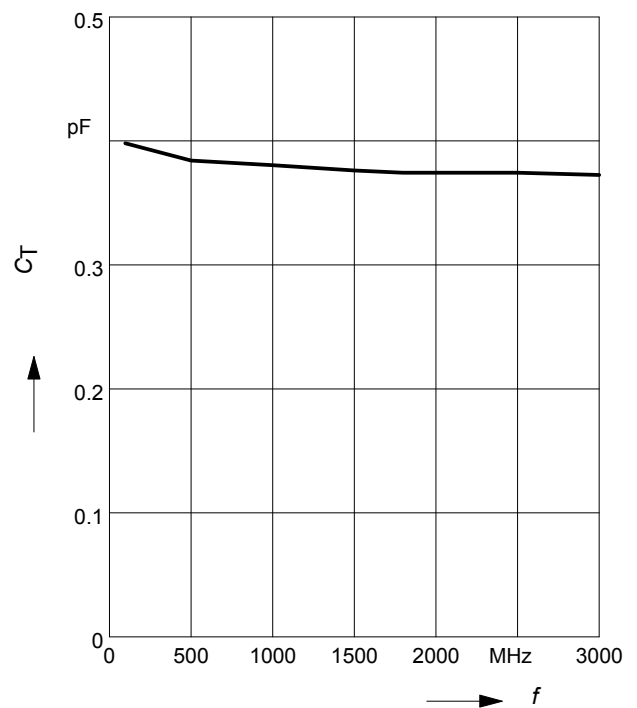
Forward current $I_F = f(V_F)$

leakage in anti-parallel configuration



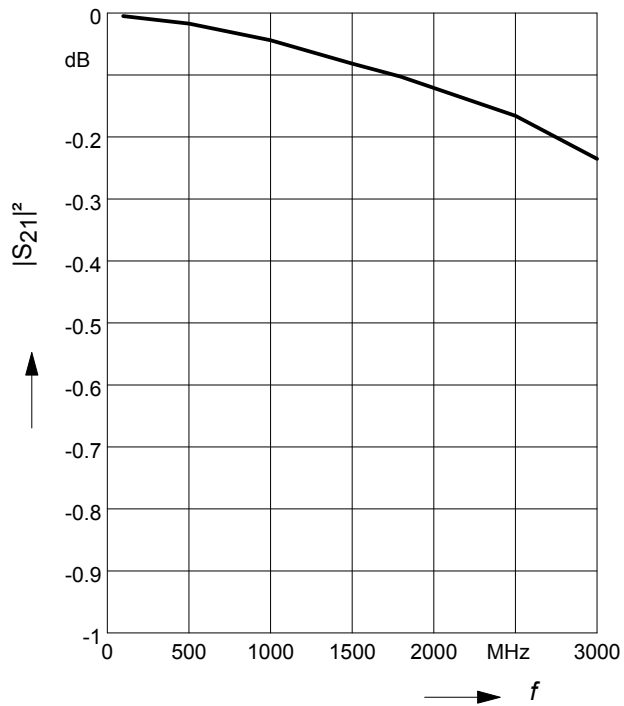
Line capacitance $C_T = f(f)$

$V_R = 0 V$



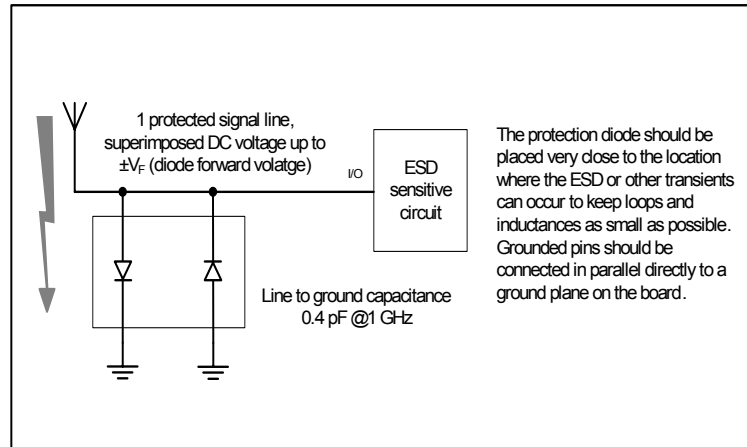
Insertion loss $I_L = -|S_{21}|^2 = f(f)$

$V_R = 0 \text{ V}$, $Z = 50 \Omega$



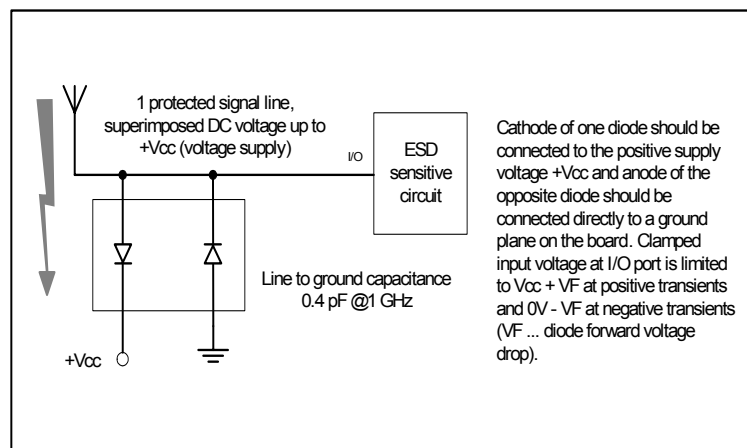
1. Application example ESD0P4RFL

1 RF signal channel, anti-parallel configuration



2. Application example ESD0P4RFL

1 RF signal channel, rail-to-rail configuration



Technical drawing of a 2x2 grid of holes. The drawing includes the following dimensions and labels:

- Top horizontal dimension: 0.8 ± 0.05
- Left horizontal dimension: $4 \times 0.25 \pm 0.035$ with a superscript 1)
- Right vertical dimension: $4 \times 0.35 \pm 0.035$ with a superscript 1)
- Bottom horizontal dimension: 0.45 ± 0.05
- Left vertical dimension: 0.75 ± 0.05
- Right vertical dimension: 1.2 ± 0.05
- Labels 1, 2, 3, and 4 are placed near the corners of the grid.

☒ Stencil apertures

Diagram illustrating the pin marking and type code for a 4-pin D-sub connector. The connector is shown with a rectangular body and a circular pin 1 marking. The type code is labeled as BAR90-07LRH, and the pin 1 marking is labeled as Pin 1 marking.

Technical drawing of a mechanical part. The main view shows a rectangular block with a width of 8 and a height of 1.45. There are four circular features, each with a diameter of 4. The distance between the centers of the first and second circles is 1.05. The distance between the centers of the third and fourth circles is 1.05. The distance between the center of the second circle and the center of the third circle is 4. A label 'Pin 1 marking' points to the first circle. A cross-section view on the right shows a rectangular block with a width of 0.5 and a height of 1.45. The cross-section is divided into three regions: a hatched region on the left, a white region in the middle, and a hatched region on the right.

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