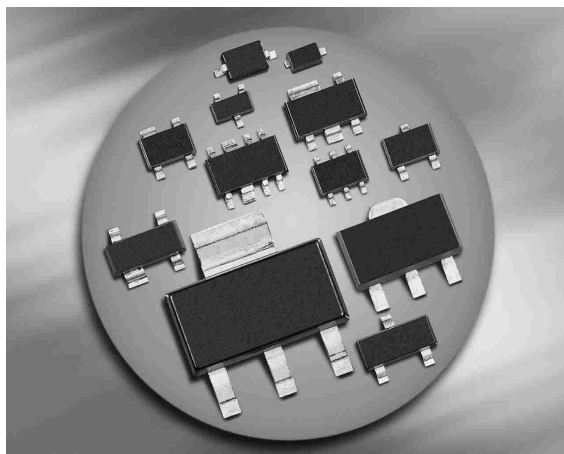


RF ESD Protection Diodes

- ESD / transient protection of RF antenna / interfaces or ultra high speed data lines acc. to:
IEC61000-4-2 (ESD): ± 20 kV (contact)
IEC61000-4-4 (EFT): 40 A (5/50 ns)
IEC61000-4-5 (surge): 10 A (8/20 μ s)
- Ultra low capacitance of 1 pF typ.
(0.5 pF per diode)
- Low clamping voltage
- Pb-free (ROHS compliant) package



Applications in anti-parallel configuration

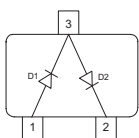
- For low RF signal levels without superimposed DC voltage: e.g. GPS, WLAN, Bluetooth

Applications in rail-to-rail configuration

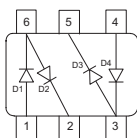
- For high RF signal levels or low RF signal levels with superimposed DC voltage: e.g. HDMI, S-ATA, Gbit Ethernet



ESD1P0RFW



ESD1P0RFS



Type	Package	Configuration	Marking
ESD1P0RFS	SOT363	2 channels	E6s
ESD1P0RFW	SOT323	1 channel	E6s

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

Parameter	Symbol	Value	Unit
ESD contact discharge ¹⁾	V_{ESD}	20	kV
Peak pulse current ($t_p = 8 / 20 \mu\text{s}$) ²⁾	I_{pp}	10	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}	-	-	70	V
Reverse current V _R = 70 V	I _R	-	-	100	nA
Forward clamping voltage ²⁾ I _{PP} = 3 A, t _p = 8/20 μs I _{PP} = 10 A, t _p = 8/20 μs	V _{FC}	- -	4 12	7 15	V
Line capacitance ⁴⁾ V _R = 0 V, f = 1 MHz V _R = 0 V, f = 1 MHz, for Application example 4	C _T	- -	1 0.5	1.5 0.75	pF
Series inductance (per diode) SOT323 SOT363	L _S	- -	1.4 1.6	- -	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.

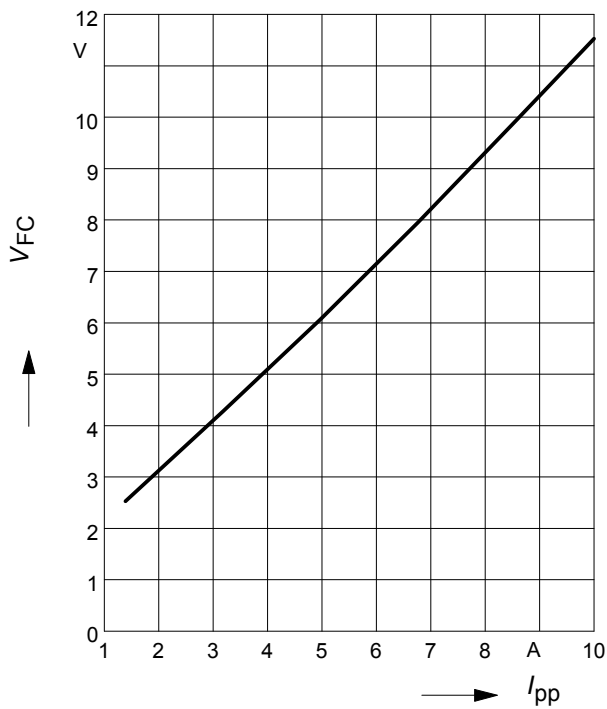
Please refer to the application examples.

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

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

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

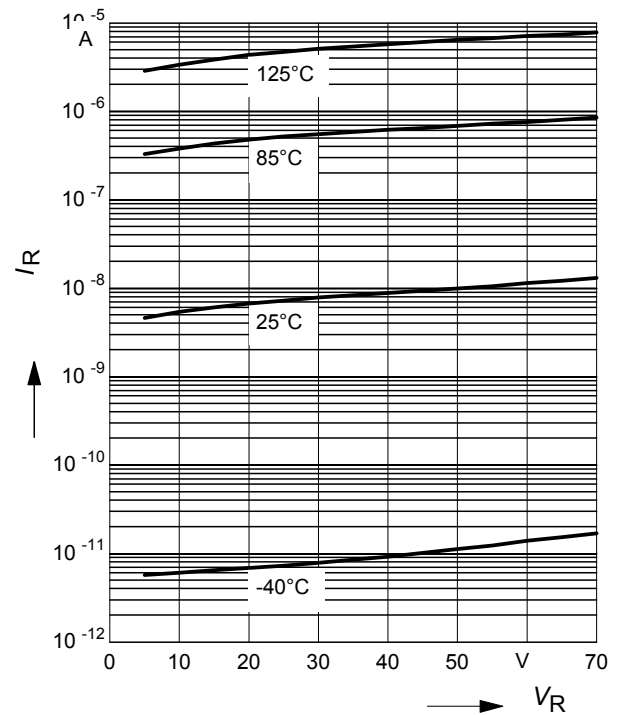
$t_p = 8 / 20 \mu s$



Reverse current $I_R = f(V_R)$

$T_A = \text{Parameter}$

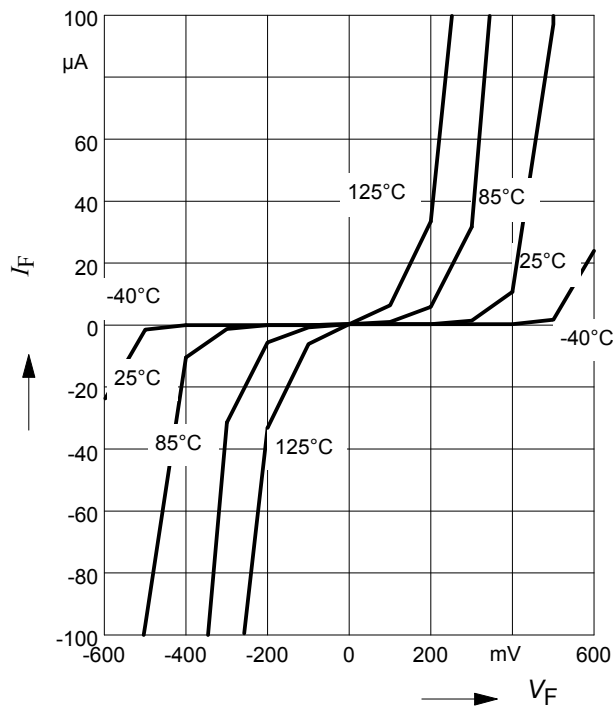
in rail-to-rail configuration



Forward current $I_F = f(V_F)$

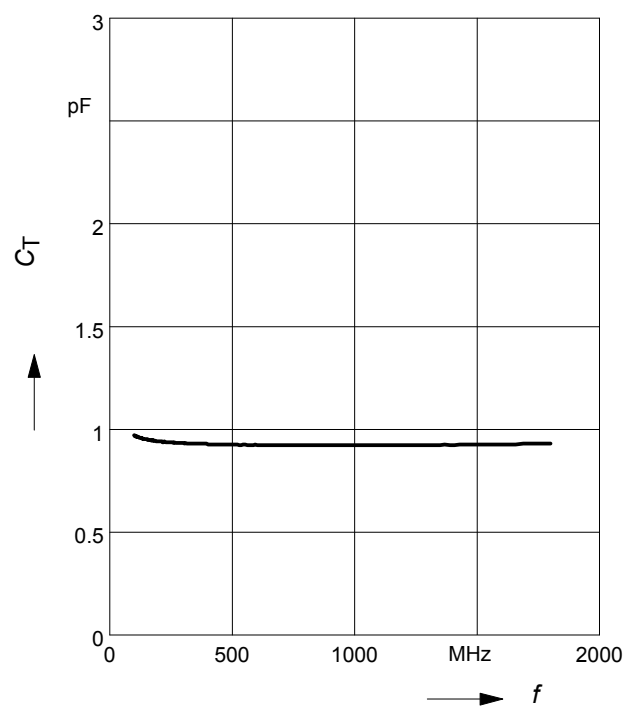
$T_A = \text{Parameter}$

in anti-parallel configuration



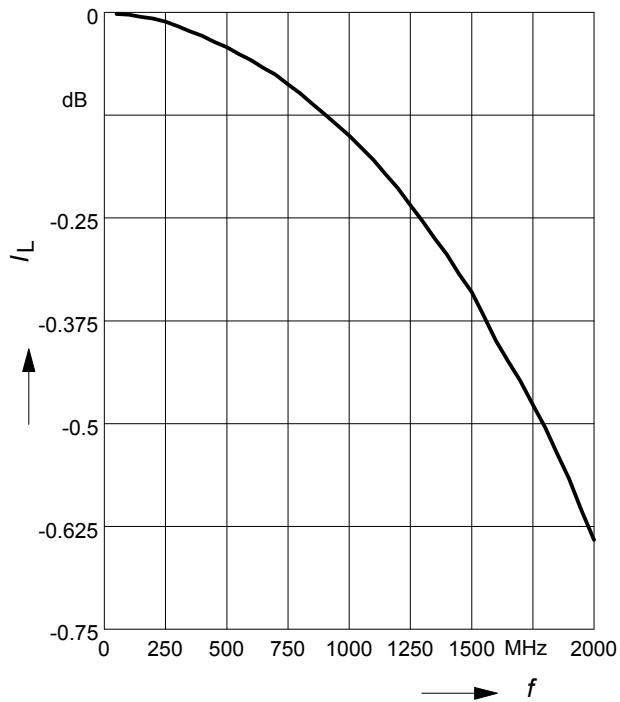
Line capacitance $C_T = f(f)$

$V_R = 0 V$



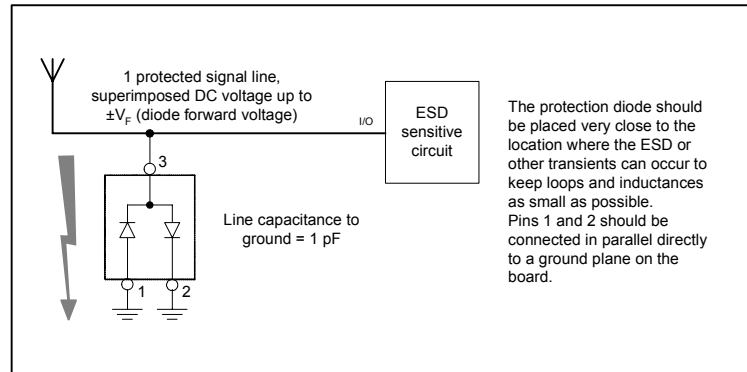
Insertion loss $|S_{21}|^2 = f(f)$

$V_R = 0$ V, line to ground, $Z = 50 \Omega$



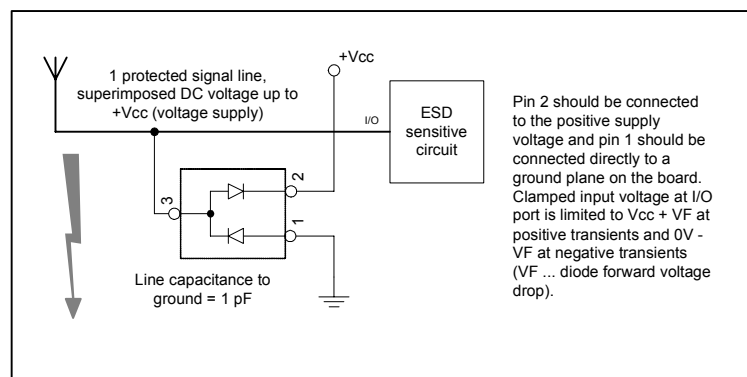
1. Application example ESD1P0RFW

1 channel, anti-parallel configuration



2. Application example ESD1P0RFW

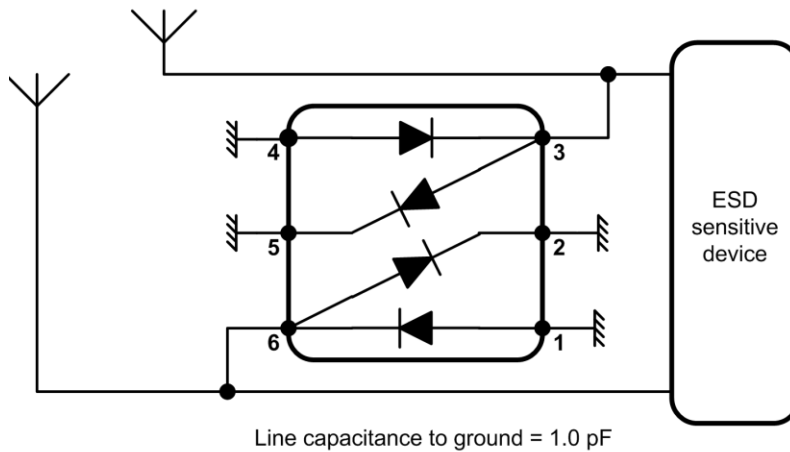
1 channel, rail-to-rail configuration



3. Application example ESD1P0RFS

2 channel, anti-parallel configuration

2 protected signal lines,
superimposed DC voltage up to
 $\pm V_F$ (diode forward voltage)

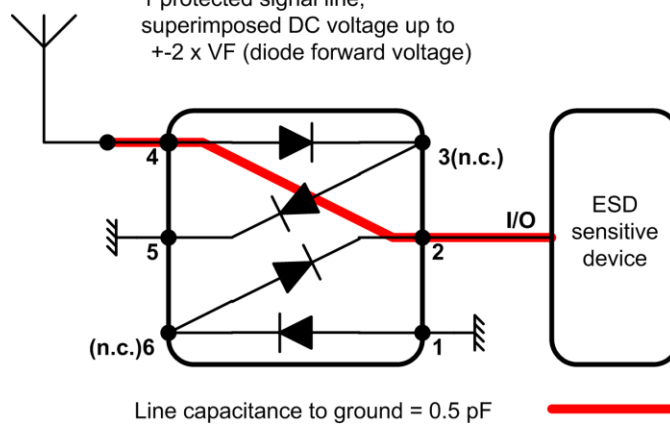


Pins 1, 2 and 4, 5 should be connected in parallel directly to a ground plane on the board. Clamped input voltage at I/O port is limited to $\pm V_{CL}$ (clamping voltage) at positive resp. negative transients.

4. Application example ESD1P0RFS

1 channel, low capacitance anti-parallel configuration

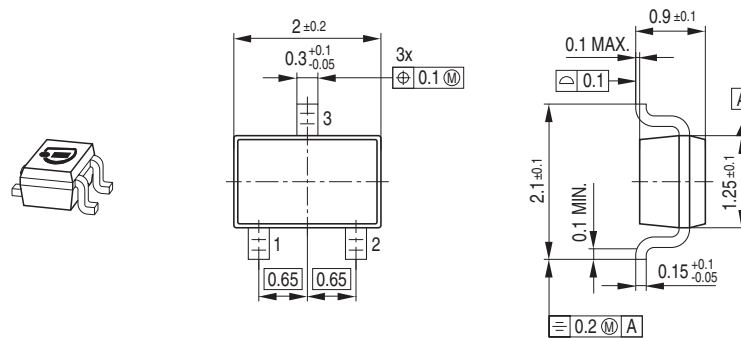
1 protected signal line,
superimposed DC voltage up to
 $\pm 2 \times V_F$ (diode forward voltage)



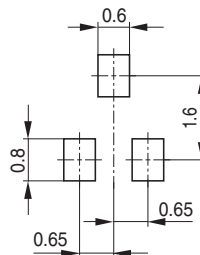
Pins 1 and 5 should be connected directly to a ground plane on the board. Pins 3, 6 are not connected. Clamped input voltage at I/O port is limited to $\pm 2 \times V_{CL}$ (clamping voltage) at positive resp. negative transients.

RF line on PCB

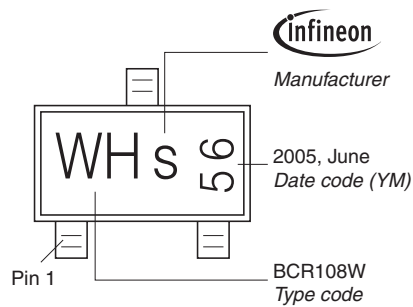
Package Outline



Foot Print

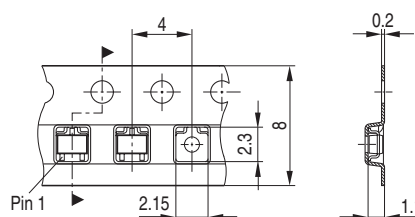


Marking Layout (Example)

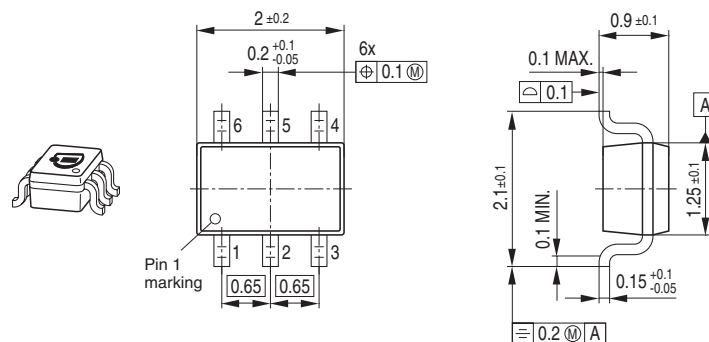


Standard Packing

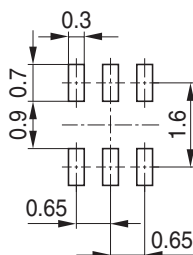
Reel $\varnothing 180$ mm = 3.000 Pieces/Reel
 Reel $\varnothing 330$ mm = 10.000 Pieces/Reel



Package Outline

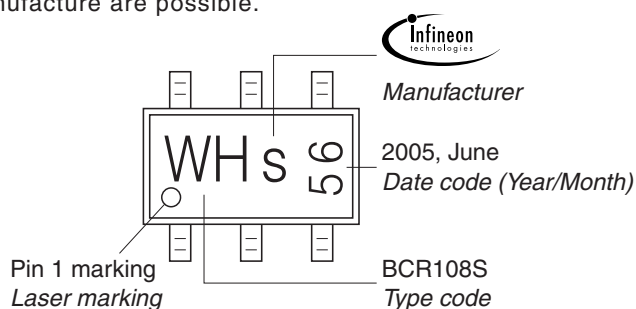


Foot Print



Marking Layout (Example)

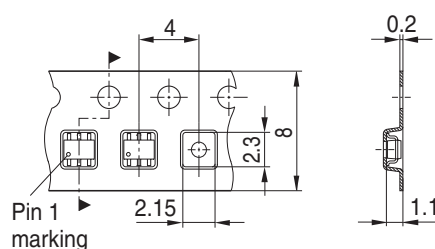
Small variations in positioning of Date code, Type code and Manufacture are possible.



Standard Packing

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

For symmetric types no defined Pin 1 orientation in reel.



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