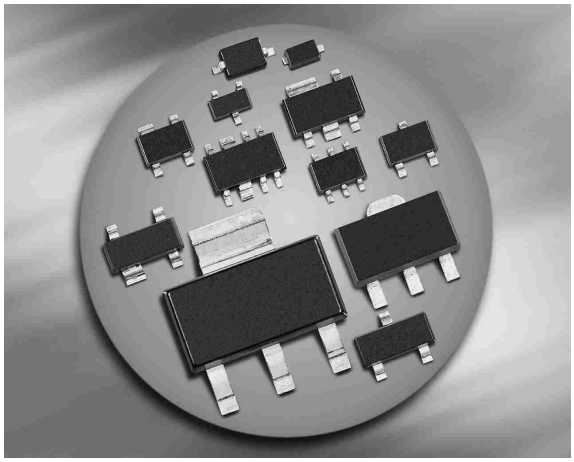
RF ESD Protection Diodes



- 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 µs)
- 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

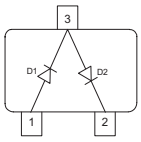
- For low RF signal levels without superimposed DC voltage: e.g. GPS, WLAN, Bluetooth

Applications in rail-to-rail configuration

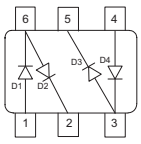
- For high RF signal levels or low RF signal levels with superimposed DC voltage: e.g. HDMI, S-ATA, Gbit Ethernet

RoHS

ESD1P0RFW



ESD1P0RFS



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

Maximum Ratings at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Value	Unit
ESD contact discharge[1)]	V_{ESD}	20	kV
Peak pulse current (t_p = 8 / 20 µs)[2)]	I_{pp}	10	A
Operating temperature range	T_{op}	-55...150	°C
Storage temperature	T_{stg}	-65...150	

Electrical Characteristics at T_A = 25°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)]	V_{FC}				V
I_{PP} = 3 A, t_p = 8/20 µs		-	4	7	
I_{PP} = 10 A, t_p = 8/20 µs		-	12	15	
Line capacitance[4)]	C_T				pF
V_R = 0 V, f = 1 MHz		-	1	1.5	
V_R = 0 V, f = 1 MHz, for Application example 4		-	0.5	0.75	
Series inductance (per diode)	L_S				nH
SOT323		-	1.4	-	
SOT363		-	1.6	-	

[1] V_{ESD} according to IEC61000-4-2, only valid in anti-parallel or rail-to-rail connection.
Please refer to the application examples.

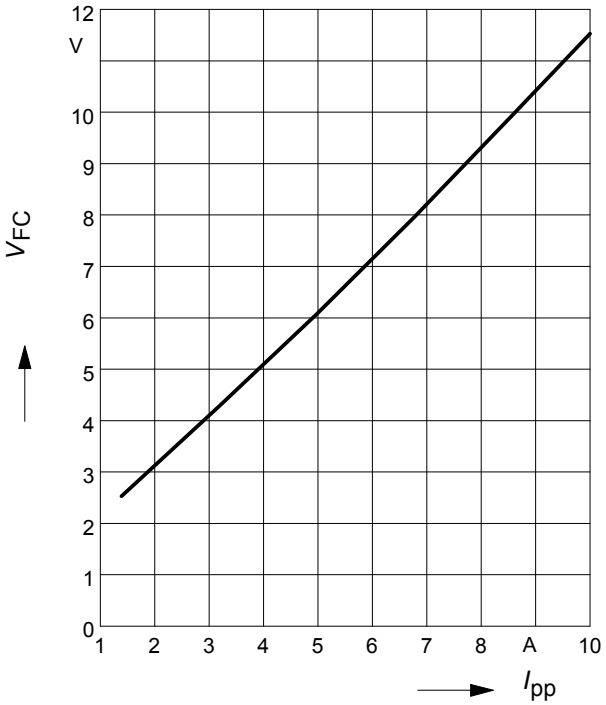
[2] I_{pp} according to IEC61000-4-5, only valid in anti-parallel or rail-to-rail connection.
Please refer to the application examples.

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

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

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

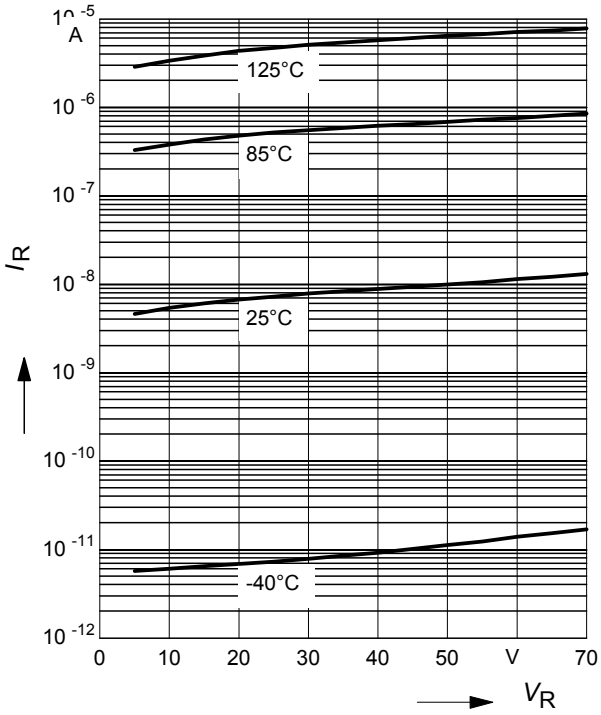
t_p = 8 / 20 µs



Reverse current $I_R = f(V_R)$

T_A = Parameter

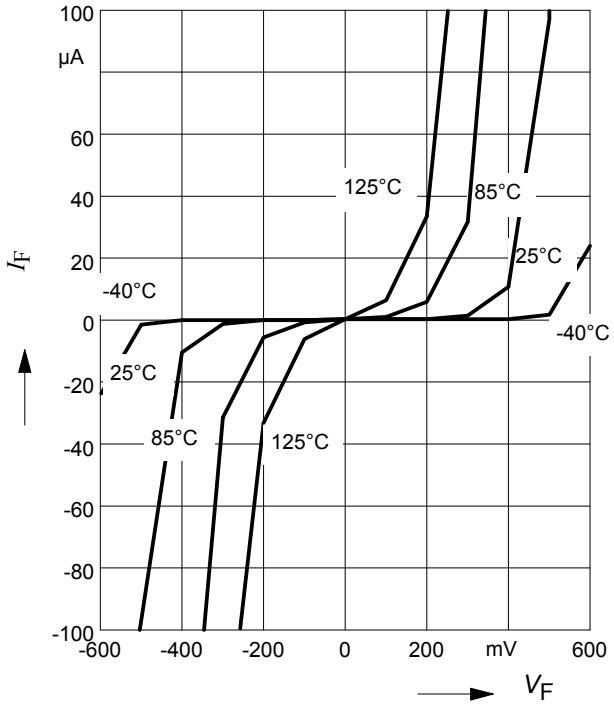
in rail-to-rail configuration



Forward current $I_F = f(V_F)$

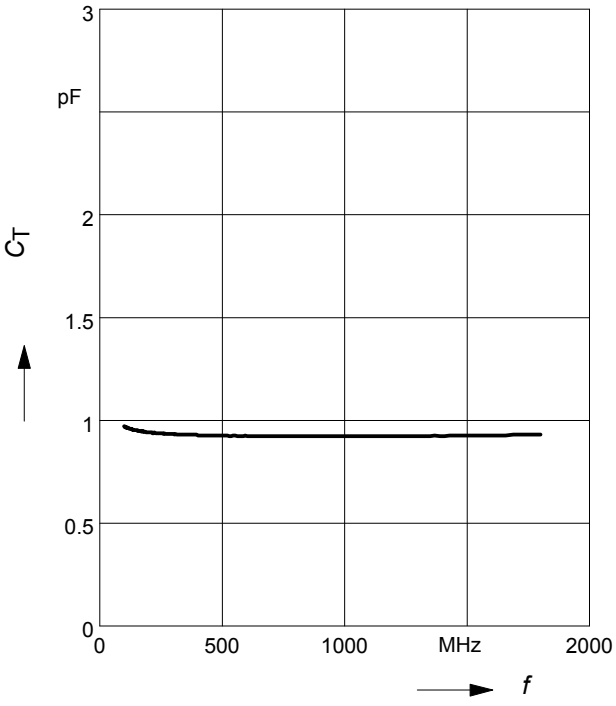
T_A = Parameter

in anti-parallel configuration



Line capacitance $C_T = f$ (f)

V_R = 0 V



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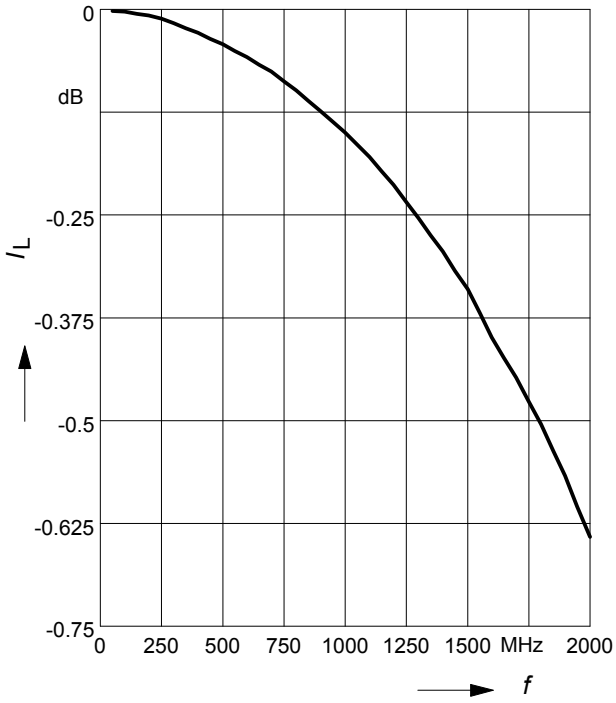
Insertion loss $|S_{21}|^2 = f(f)$

V_R = 0 V, line to ground, Z = 50 Ω



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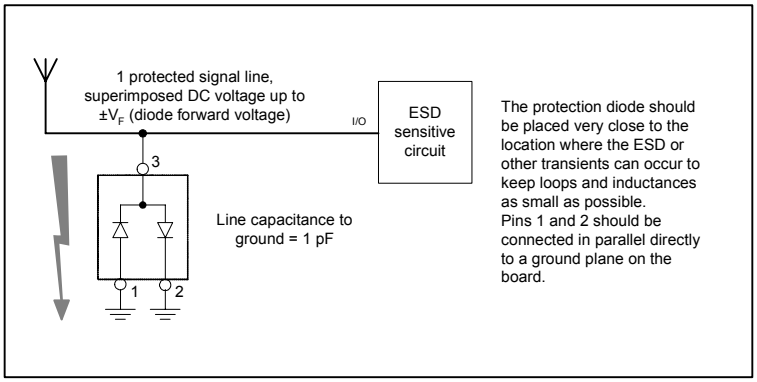
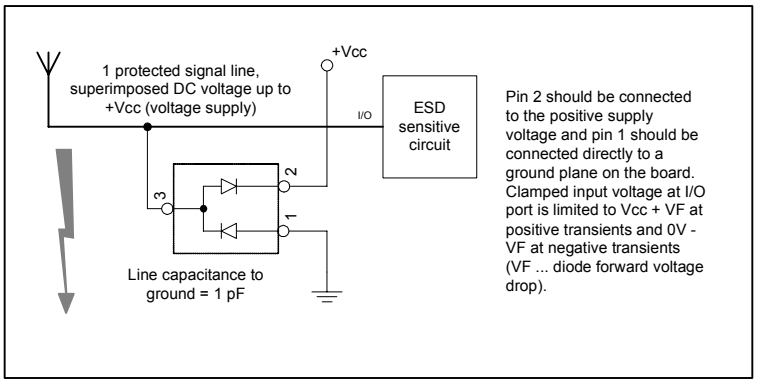
1. Application example ESD1P0RFW
1 channel, anti-parallel configuration



2. Application example ESD1P0RFW
1 channel, rail-to-rail configuration



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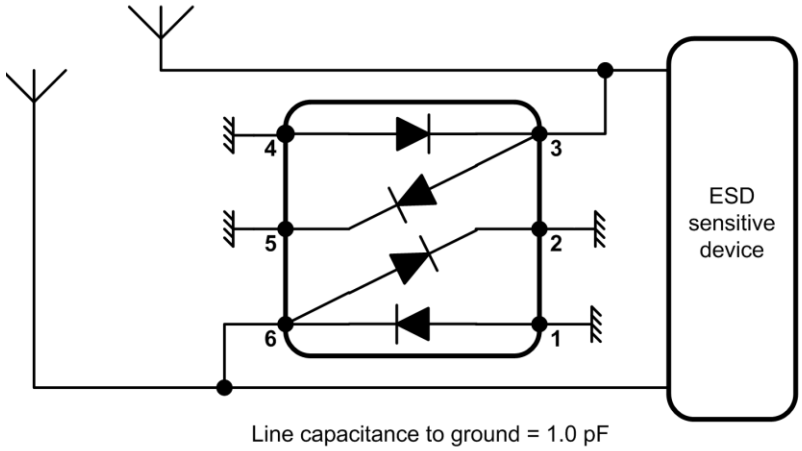
3. Application example ESD1P0RFS
2 channel, anti-parallel configuration

2 protected signal lines,
superimposed DC voltage up to
+-VF (diode forward voltage)

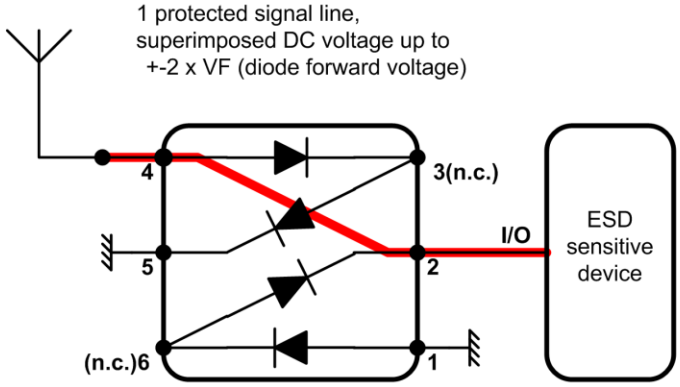


Pins 1, 2 and 4, 5 should be connected in parallel directly to a ground plane on the board. Clamped input voltage at I/O port is limited to ± VCL (clamping voltage) at positive resp. negative transients.

Line capacitance to ground = 1.0 pF

4. Application example ESD1P0RFS
1 channel, low capacitance anti-parallel configuration

1 protected signal line,
superimposed DC voltage up to
+-2 x VF (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 +- 2 x VCL (clamping voltage) at positive resp. negative transients.

Line capacitance to ground = 0.5 pF

RF line on PCB

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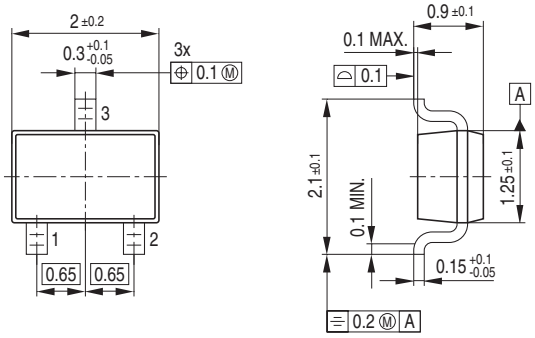
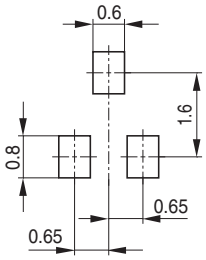
S=

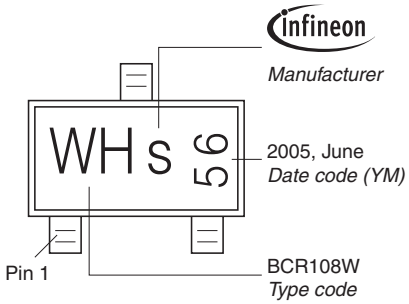
Package Outline



Foot Print

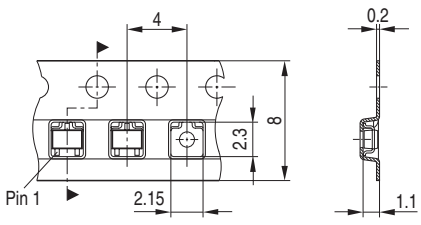


Marking Layout (Example)

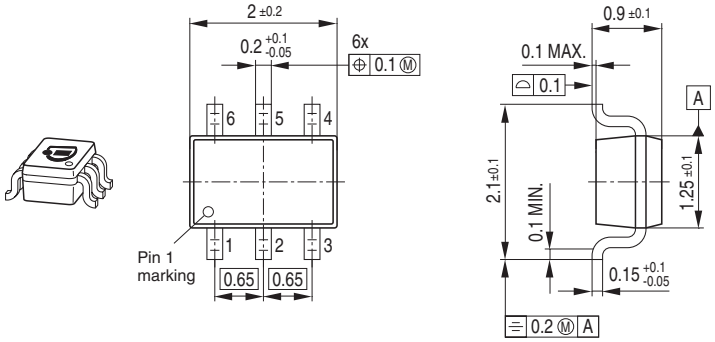


Standard Packing

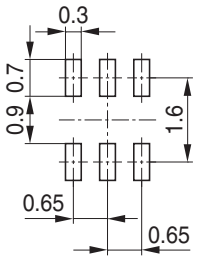
Reel ø180 mm = 3.000 Pieces/Reel
Reel ø330 mm = 10.000 Pieces/Reel



Package Outline

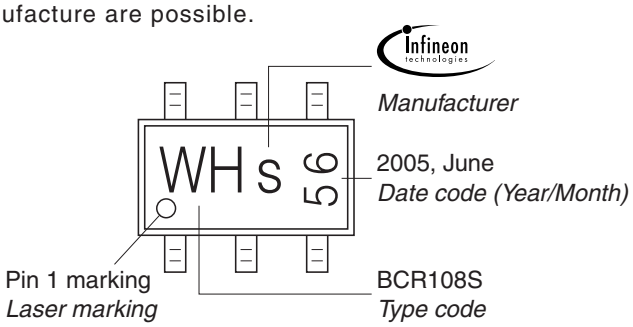


Foot Print



Marking Layout (Example)

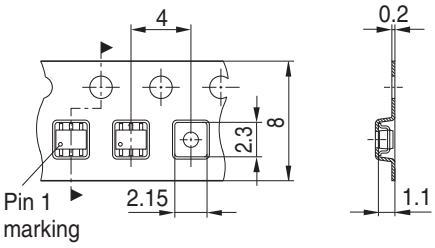
Small variations in positioning of
Date code, Type code and Manufacture are possible.



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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