

## ESDARF03-1BF3

## Ultralow capacitance ESD protection for antenna

#### **Features**

- ultralow diode capacitance 0.6 pF
- Single line, protected against 15 kV ESD
- breakdown voltage V<sub>BR</sub> = 6.0 V min.
- Flip Chip 400 µm pitch, lead-free
- very low leakage current
- very small PCB area
- RoHS compliant

#### **Benefits**

- minimized impact on rise and fall times for maximum data integrity
- low PCB space occupation
- higher reliability through monolithic integration

#### Complies with the following standards

- IEC 61000-4-2 level 4:
  - 15 kV (air discharge)
  - 8 kV (contact discharge)
- MIL STD 883G Method 3015.7:
  - 25 kV (human body model)

## **Applications**

- antenna protection
- DVB H
- GPS

## **Description**

The ESDARF03-1BF3 is a monolithic, application specific discrete device dedicated to ESD protection of antennas.

Its ultralow line capacitance secures a high level of signal integrity without compromising the protection of sensitive chips against the most stringently characterized ESD strikes.

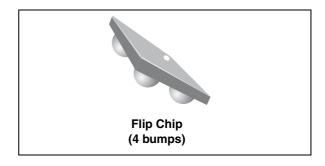


Figure 1. Pin layout (bump side)

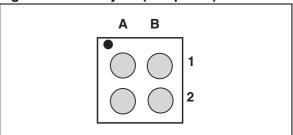
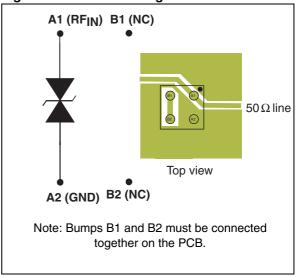


Figure 2. Device configuration



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Characteristics ESDARF03-1BF3

## 1 Characteristics

Table 1. Absolute maximum ratings ( $T_{amb} = 25$  °C)

Symbol	Parameter	Value	Unit
V <sub>PP</sub>	ESD discharge IEC 61000-4-2, air discharge	15	kV
V PP	ESD discharge IEC 61000-4-2, contact discharge	8	ΚV
P <sub>PP</sub>	Peak pulse power dissipation (8/20 μs)	60	W
T <sub>j</sub>	Maximum junction temperature	125	°C
T <sub>op</sub>	Operating temperature range	-30 to + 85	°C
T <sub>stg</sub>	Storage temperature range	-55 to +150	°C

Figure 3. Electrical characteristics (definitions)

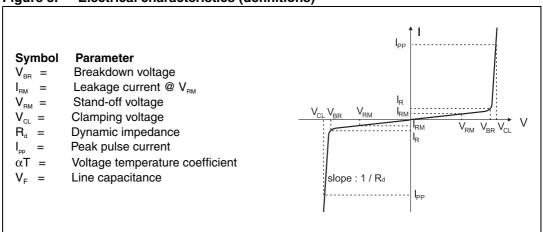


Table 2. Electrical characteristics ( $T_{amb} = 25$  °C)

Symbol	Test conditions	Min.	Тур.	Max.	Unit
$V_{BR}$	I <sub>R</sub> = 1 mA	6	9		V
I <sub>RM</sub>	V <sub>RM</sub> = 3 V			100	nA
$R_d$	Exponential wave form 8/20 $\mu$ s, $I_{pp} = 1$ to 5 A		2.6		Ω
αΤ	I <sub>R</sub> = 1 mA			5	10 <sup>-4</sup> / °C
C <sub>line</sub>	V <sub>LINE</sub> = 0 V, V <sub>OSC</sub> = 30 mV, F = 1 MHz		0.6	0.8	pF

ESDARF03-1BF3 Characteristics

Figure 4. ESD response to IEC 61000-4-2 (+8 kV contact discharge)

Figure 5. ESD response to IEC 61000-4-2 (-8 kV contact discharge)

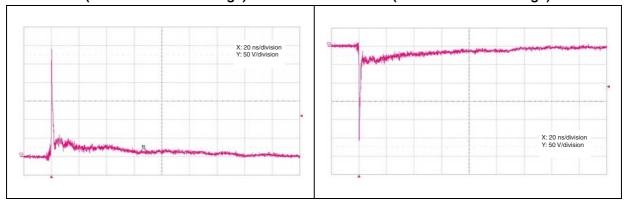


Figure 6. Junction capacitance versus frequency (typical values)

Figure 7. S21 attenuation measurement

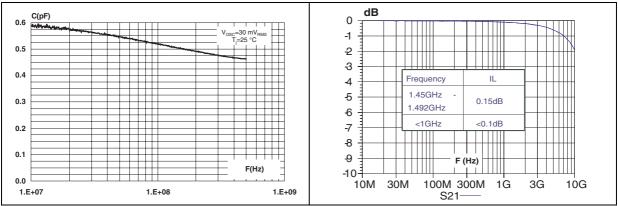
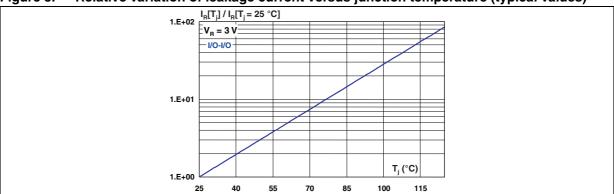
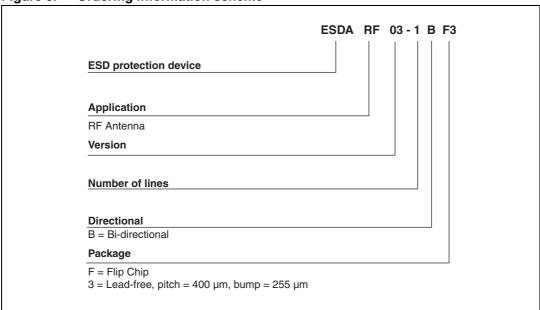


Figure 8. Relative variation of leakage current versus junction temperature (typical values)



# 2 Ordering information scheme

Figure 9. Ordering information scheme



ESDARF03-1BF3 Package information

## 3 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: <a href="https://www.st.com">www.st.com</a>. ECOPACK<sup>®</sup> is an ST trademark.

Figure 10. Package dimensions

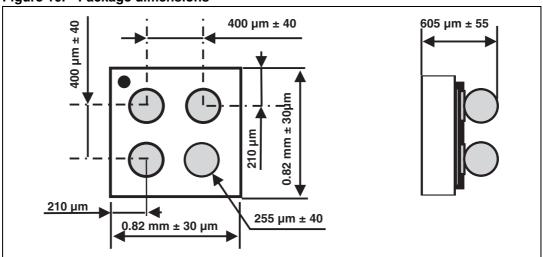
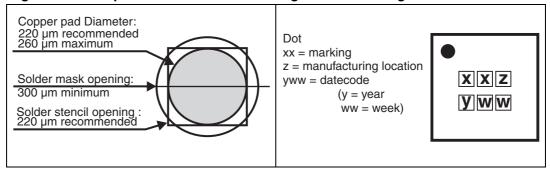


Figure 11. Footprint recommendations Figure 12. Marking



Dot identifying Pin A1 location

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Figure 13. Flip Chip tape and reel specifications

Note:

More information is available in the application notes:

AN2348: "400 μm Flip Chip: Package description and recommendations for use"

AN1751: "EMI Filters: Recommendations and measurements"

# 4 Ordering information

Table 3. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
ESDARF03-1BF3	R3	Flip Chip	0.91 mg	5000	Tape and reel (7")

# 5 Revision history

Table 4. Document revision history

Date	Revision	Changes
15-Nov-2010	1	Initial release.

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