1 Characteristics

Table 1. Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{PP} (1)	Peak pulse voltage	IEC 61000-4-2 contact discharge IEC 61000-4-2 air discharge	8 15	kV
T_j	Maximum operating junction temperature		125	°C
T_{stg}	Storage temperature range		- 55 to +150	°C
T_L	Maximum lead temperature for soldering during 10 s at 5 mm for case		260	°C

1. For a surge greater than the maximum values, the diode will fail in short-circuit.

Figure 2. Electrical characteristics (definitions)

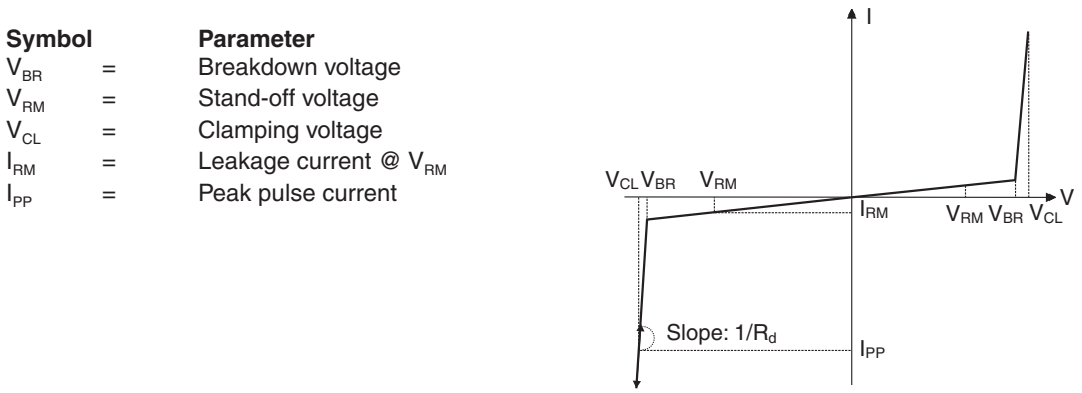


Table 2. Electrical characteristics (values, T_{amb} = 25 °C)

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{BR}	Breakdown voltage	I_R = 1 mA	0.7	1.0	1.3	V
I_{RM}	Leakage Current	V_{RM} = 100 mV			0.3	µA
$C_{i/o-i/o}$	Capacitance between I/O and GND	V_R = 0 V, F = 1 MHz, any I/O pin to GND		3	3.5	pF

Figure 3. Relative variation of leakage current versus junction temperature (typical values)

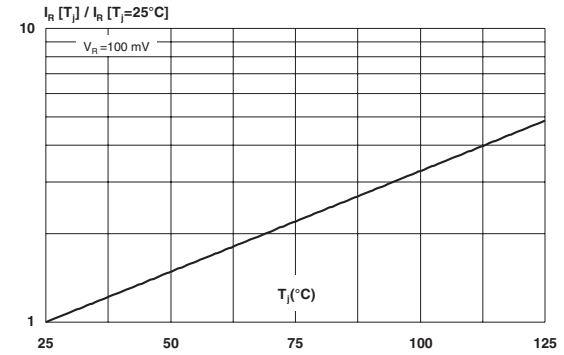


Figure 4. S21 attenuation measurements (50 Ω / 50 Ω)

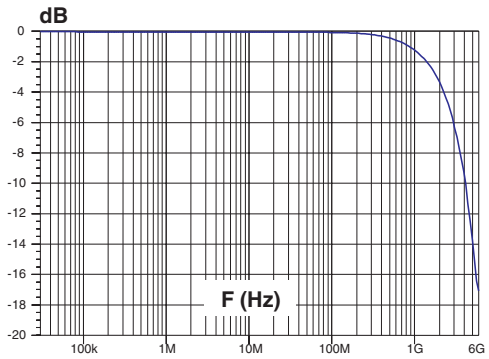


Figure 5. ESD response to IEC 61000-4-2 (+15 kV air discharge)

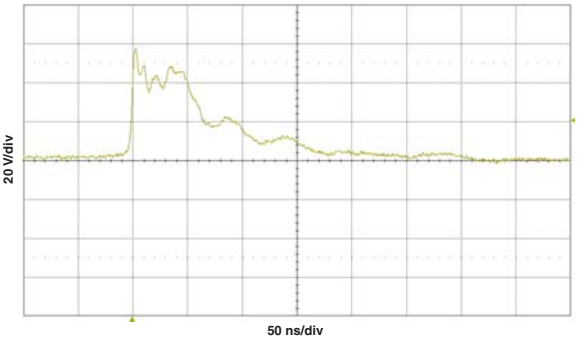


Figure 6. ESD response to IEC 61000-4-2 (-15 kV air discharge)

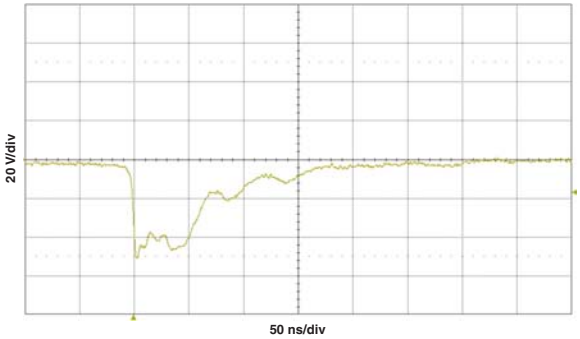
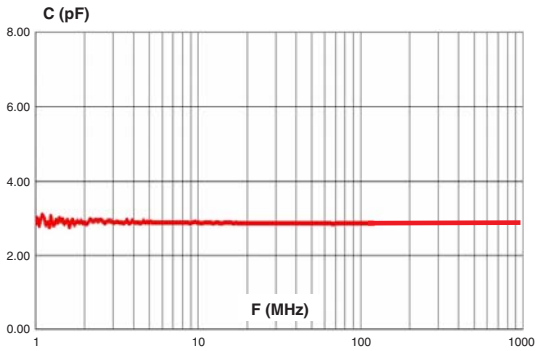


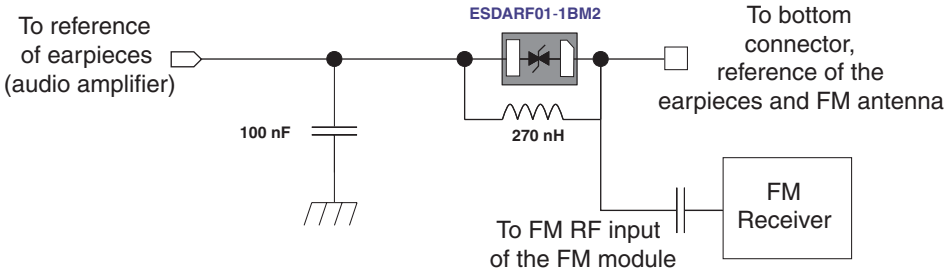
Figure 7. Junction capacitance versus frequency (typical values)



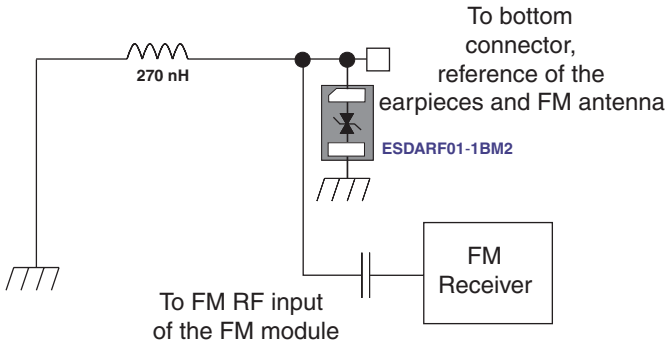
2 Application schematics

Figure 8. Application schematics

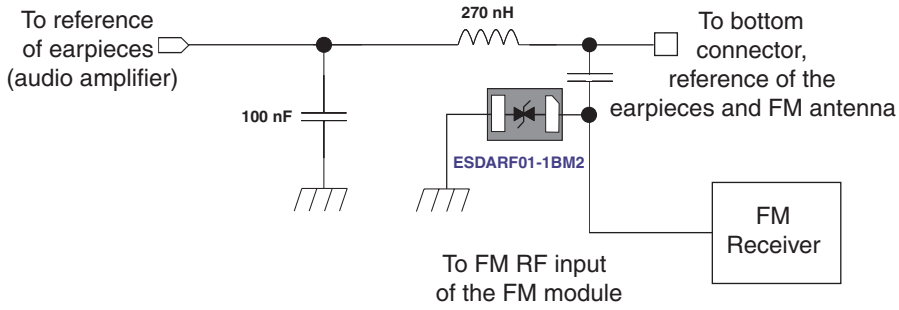
When the reference of earpieces (audio amplifier) is different from 0 V



When the reference of earpieces (audio amplifier) is 0 V

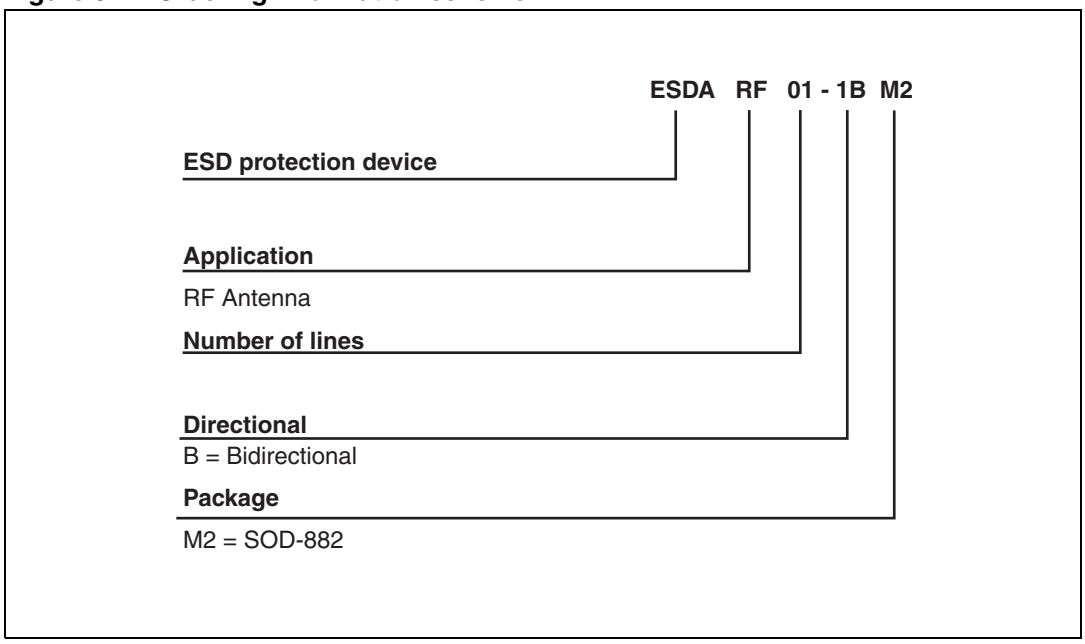


Whatever the reference of earpieces (audio amplifier)



3 Ordering information scheme

Figure 9. Ordering information scheme



4 Package information

- Epoxy meets UL94, V0
- Lead-free packages

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

Figure 10. SOD882 dimension definitions

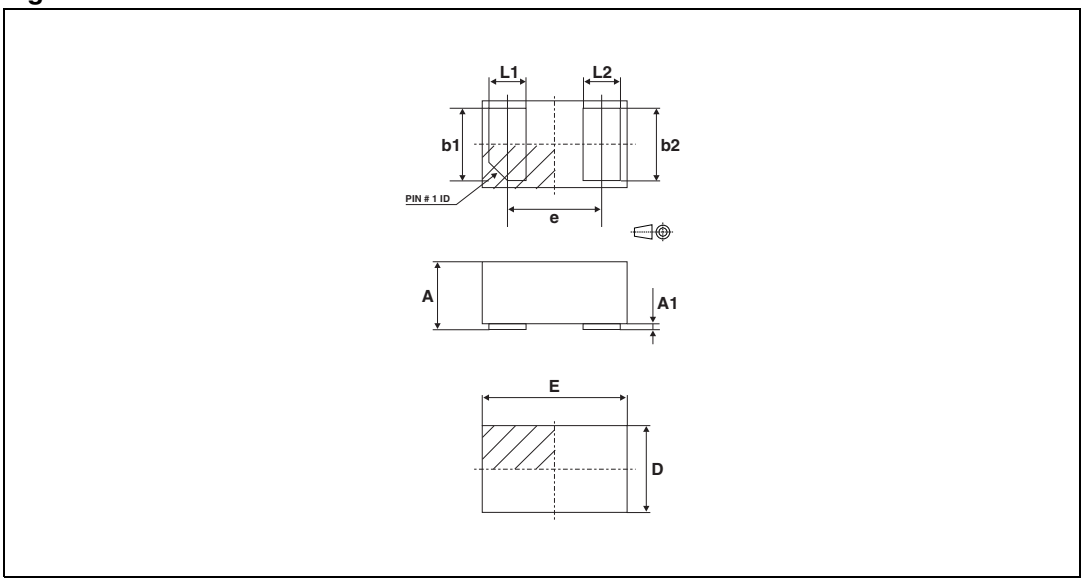


Table 3. SOD882 dimension values

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.40	0.47	0.50	0.016	0.019	0.020
A1	0.00		0.05	0.000		0.002
b1	0.45	0.50	0.55	0.018	0.020	0.022
b2	0.45	0.50	0.55	0.018	0.020	0.022
D	0.55	0.60	0.65	0.022	0.024	0.026
E	0.95	1.00	1.05	0.037	0.039	0.041
e	0.60	0.65	0.70	0.024	0.026	0.028
L1	0.20	0.25	0.30	0.008	0.010	0.012
L2	0.20	0.25	0.30	0.008	0.010	0.012

Figure 11. SOD882 footprint in mm (inches)

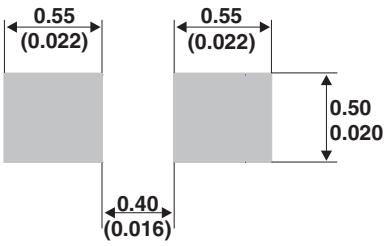
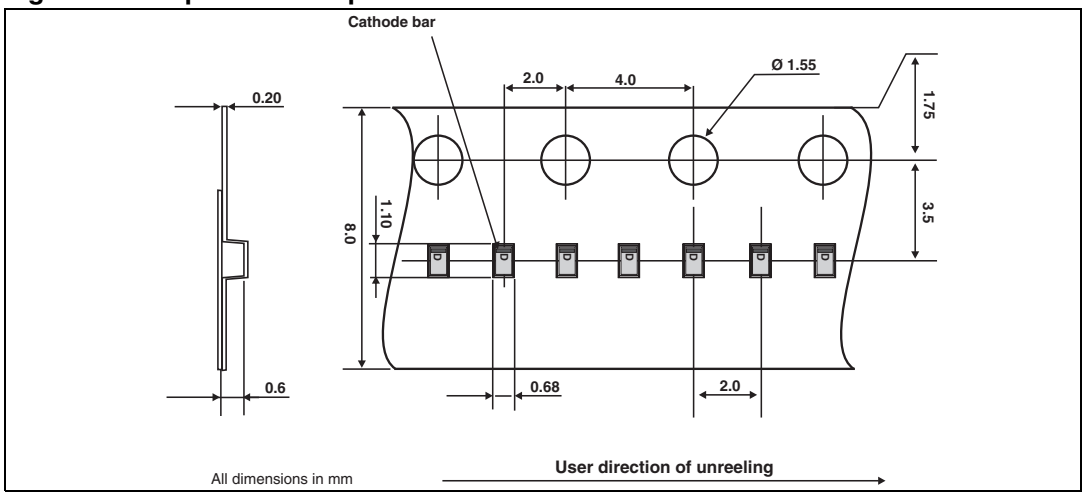


Figure 12. Marking

Note: Product marking may be rotated by 90° for assembly plant differentiation. In no case should this product marking be used to orient the component for its placement on a PCB. Only pin 1 mark is to be used for this purpose.

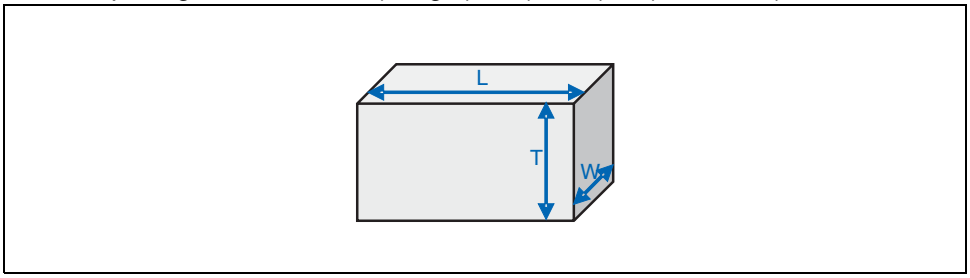
Figure 13. Tape and reel specifications



5 Recommendation on PCB assembly

5.1 Stencil opening design

1. General recommendation on stencil opening design
   a) Stencil Opening Dimensions: L (Length), W (Width), T (Thickness).



   b) General Design Rule

   Stencil thickness (T) = 75 ~ 125 µm

$$\text{Aspect Ratio} = \frac{W}{T} \geq 1.5$$

$$\text{Aspect Area} = \frac{L \times W}{2T(L+W)} \geq 0.66$$

2. Reference design
   a) Stencil opening thickness: 100 µm
   b) Stencil opening for leads: Opening to footprint ratio is 60% to 75%.

5.2 Solder paste

1. Halide-free flux qualification ROL0 according to ANSI/J-STD-004.
2. “No clean” solder paste is recommended.
3. Offers a high tack force to resist component movement during high speed
4. Solder paste with fine particles: powder particle size is 20-45 µm.

5.3 Placement

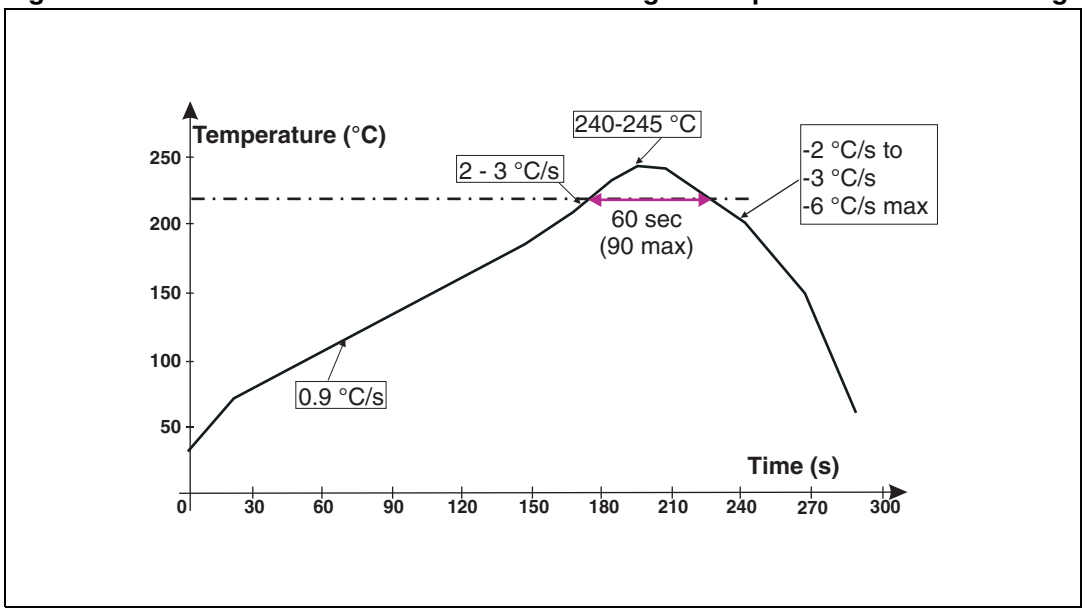
1. Manual positioning is not recommended.
2. It is recommended to use the lead recognition capabilities of the placement system, not the outline centering
3. Standard tolerance of ± 0.05 mm is recommended.
4. 3.5 N placement force is recommended. Too much placement force can lead to squeezed out solder paste and cause solder joints to short. Too low placement force can lead to insufficient contact between package and solder paste that could cause open solder joints or badly centered packages.
5. To improve the package placement accuracy, a bottom side optical control should be performed with a high resolution tool.
6. For assembly, a perfect supporting of the PCB (all the more on flexible PCB) is recommended during solder paste printing, pick and place and reflow soldering by using optimized tools.

5.4 PCB design preference

1. To control the solder paste amount, the closed via is recommended instead of open vias.
2. The position of tracks and open vias in the solder area should be well balanced. The symmetrical layout is recommended, in case any tilt phenomena caused by asymmetrical solder paste amount due to the solder flow away.

5.5 Reflow profile

Figure 14. ST ECOPACK® recommended soldering reflow profile for PCB mounting



Note: Minimize air convection currents in the reflow oven to avoid component movement.

6 Ordering information

Table 4. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
ESDARF01-1BM2	D(1)	SOD882	0.9 mg	12000	Tape and reel

1. The marking can be rotated by multiples of 90° to differentiate assembly location

7 Revision history

Table 5. Document revision history

Date	Revision	Changes
17-Apr-2007	1	First issue
17-Nov-2010	2	Updated *Figure 4*. and updated opening to footprint ratio to 60% - 75% in *Section 5: Recommendation on PCB assembly*. Updated base qty in *Table 4.*
13-Jun-2012	3	Updated *Table 3* and added *Figure 10*.

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