AN4046
Application note

EnFilm™ micro battery EFL700A39 recommendations for manual assembly on PCB

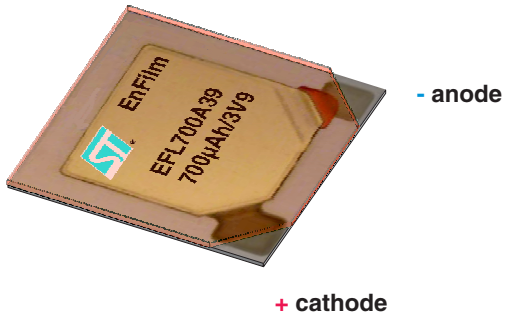
Introduction

This document provides recommendations to manually mount EnFilm™ micro battery EFL700A39 on printed circuit board (PCB) for prototyping purposes (mount 1 to 6 micro batteries to assemble in one step on PCB).

This prototype mounting process is intended for use at room temperature (glue polymerization has to be done at room temperature).

STMicroelectronics has developed micro battery packaging with reduced thickness and weight.

Figure 1. Micro battery package overview



1 PCB design recommendations

For optimum electrical performance and highly reliable solder joints, STMicroelectronics recommends the PCB design guidelines listed in *Table 1.*

Note: A too thick gold layer finishing on the PCB pad is not recommended (low joint reliability).

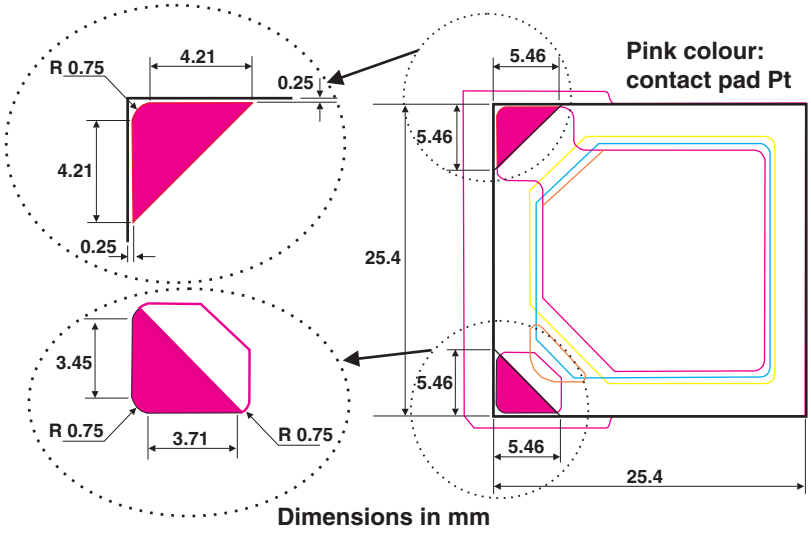
1.1 Micro vias

An alternative to routing on the top surface is to route on buried layers. To achieve this, the pads are connected to the lower layers using micro vias.

Table 1. PCB design recommendations

PCB pad design	Micros vias under pad are not allowed
PCB pad size (NSMD design)	Same pad size as micro battery (see *Figure 2*)
Solder mask opening (SMD design)	Same pad size as micro battery (see *Figure 2*)
PCB pad finishing	Cu-Ni (2-6µm max) or Cu OSP (organic substrate protection)

Figure 2. Contact dimensions



2 Conductive glue assembly recommendations

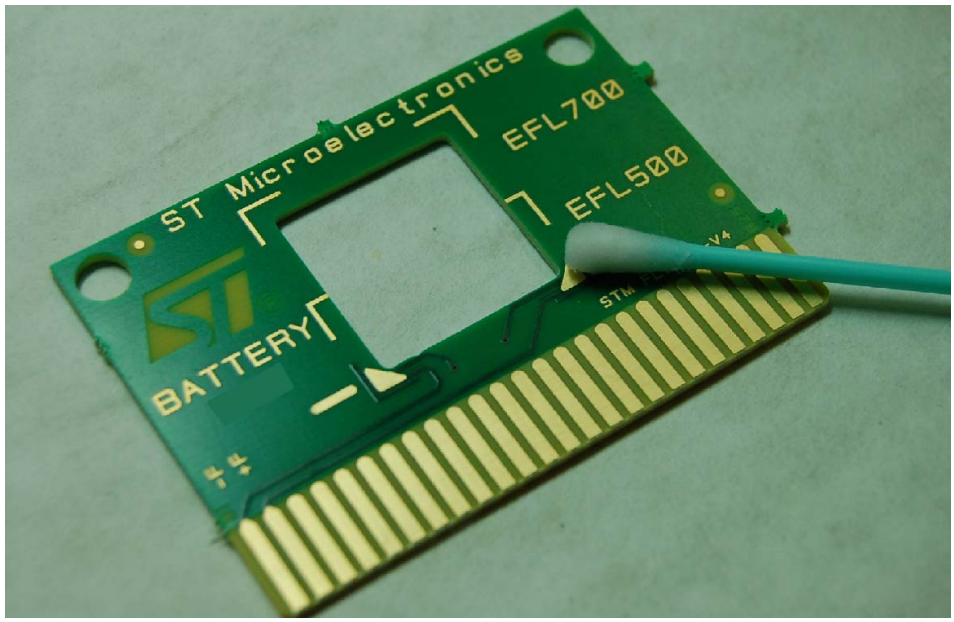
Circuit Works® Conductive epoxy CW 2400.

Suppliers: Radio Spares n° 496265 or Farnell n° 604057.

3 Mounting procedure

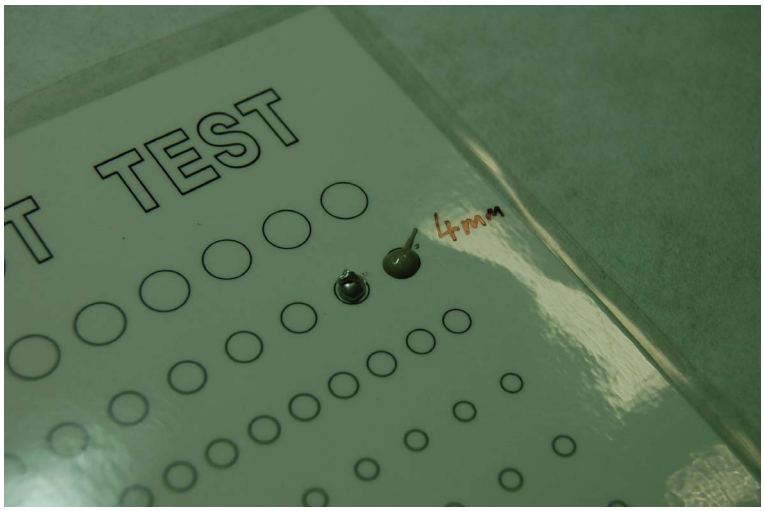
1. Read conductive epoxy MSDS carefully prior to use.
2. Use surgical gloves and goggles.
3. Clean surface to be contacted with cotton bud soaked with isopropyl alcohol (IPA).

Figure 3. Clean contact surface



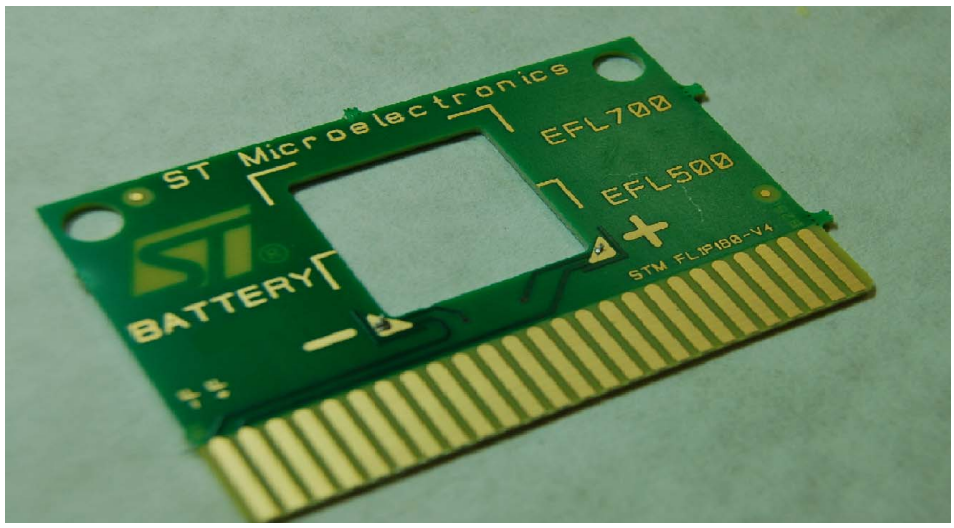
4. Mix equal amounts (1:1) by volume of 2 dots 4 mm diameter only. Mix thoroughly for at least 2 minutes with plastic stick supplied with Conductive epoxy CW 2400.

Figure 4. Dot sizing



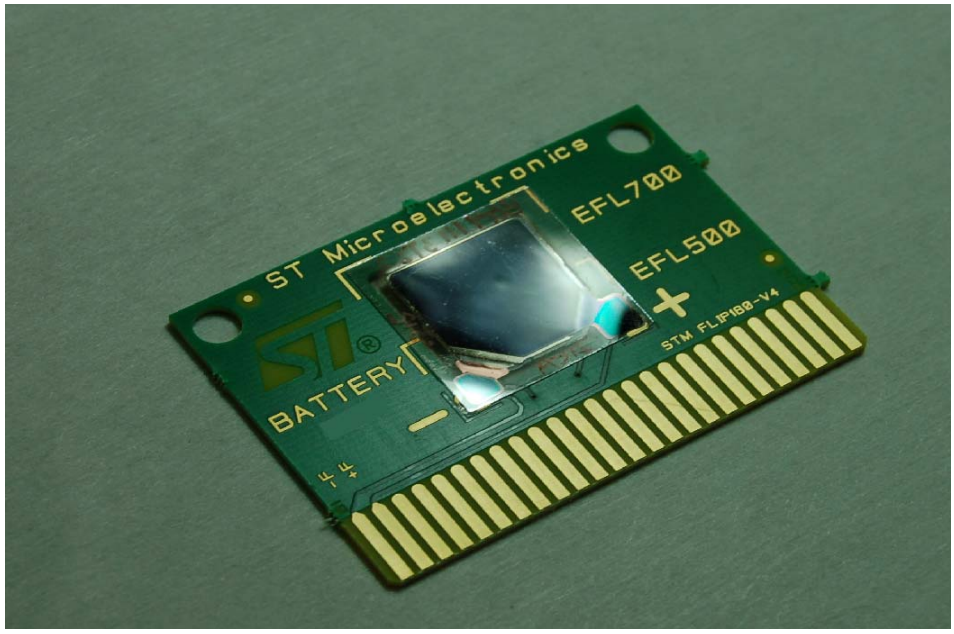
5. Apply a small quantity, 1mm diameter dot, on each contact of PCB maximum 12 dots. Glue pot life is 10 minutes at 24 °C (75°F).

Figure 5. Application of 1mm dot glue



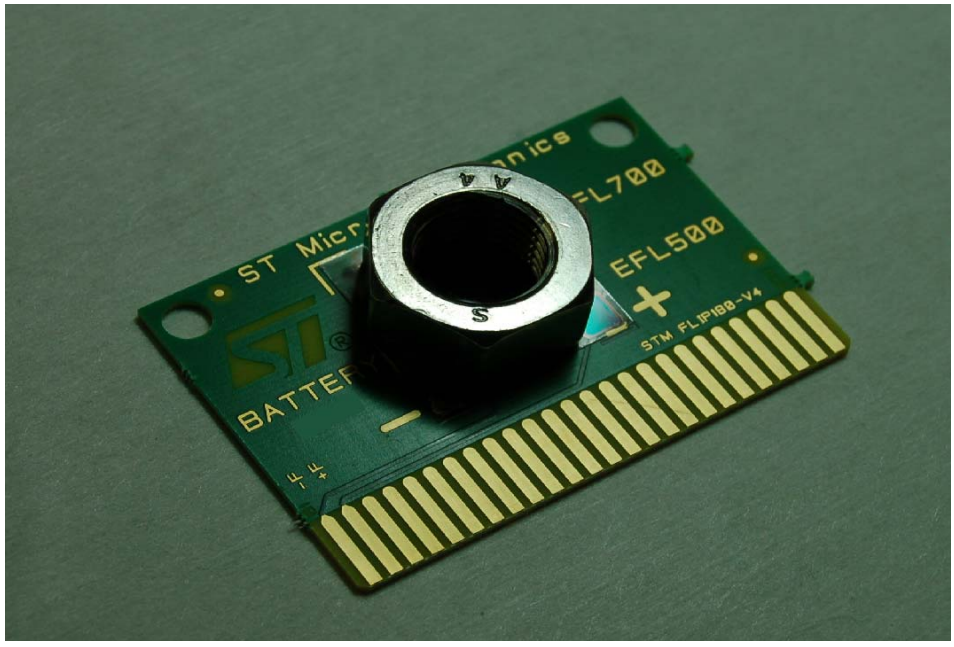
6. Flip the micro battery.

Figure 6. Placement of the micro battery



7. Put a weight of 30 g (for example a nut M16 mm) on the micro battery.

Figure 7. Place a weight on the micro battery



Room temperature curing can be achieved in 4 hours at or above 24 °C (75°F). Do not use temperature higher than room temperature to accelerate curing.

4 Underfilling

Underfilling is not needed.

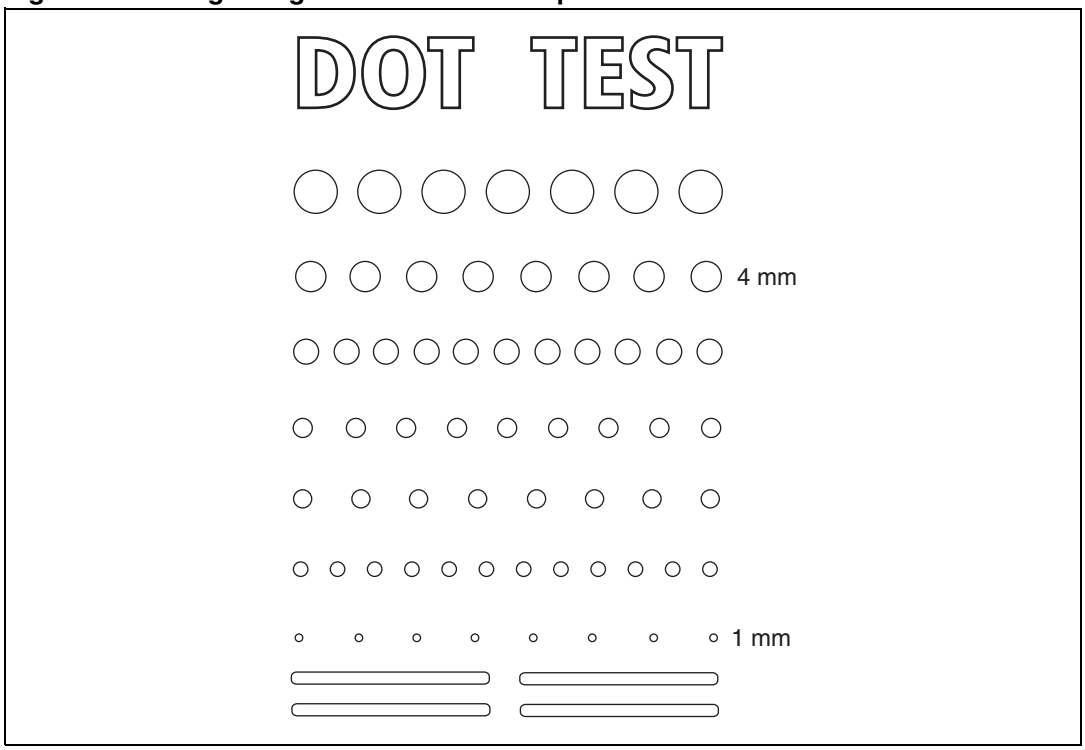
5 Manual rework

The conductive glue doesn’t allow micro battery assembly rework.

Appendix A Gauge for glue dot dimension optimization

Print paper and laminate it with plastic coating.

Figure 8. Gauge for glue dot dimension optimization



Revision history

Table 2. Document revision history

Date	Revision	Changes
15-Mar-2012	1	Initial release.