Abstract

Several packaged FPC1010-sensors with 25mm thick protective polymer coating have been ESD-tested and found to withstand voltages up to and including 15kV tested according to the human body model. The sensors are packaged with a conductive frame, to which discharge generally occurs for voltage of 8kV and over (at normal RH).

Introduction

The work at Fingerprint Cards AB has been concentrated on developing a coating, which would not break down by electrostatic discharges up to 15kV. By selecting such a solution, it is ensured that the sensor will withstand multiple discharges without any degradation in performance.

The applied 25µm protective layer on the FPC1010 fingerprint sensors gives a very good conformal coating free from pin-holes and is applied in a cost-effective batch-process.'

Tests and Results

Equipment

The ESD tests have been performed on the sensor module FPC10C, see Figure 1, using a MiniZAP ESD tester from KeyTek and following the document Electrostatic Discharge Immunity Test IEC 61000-4-2. The test set-up can be seen in

Figure 2. All terminals of the sensor module were grounded through a 10Mohm resistor to simulate conditions during actual operation.

Figure 1 Sensor module FPC10C

Result

24 sensor modules were tested with several discharges up to and including 15kV. On all of these sensors, the discharges took place between the tip of the test equipment and the frame surrounding the sensor. The function of the evaluated sensors was unchanged after 15kV discharges, as can be seen in Figure 3.

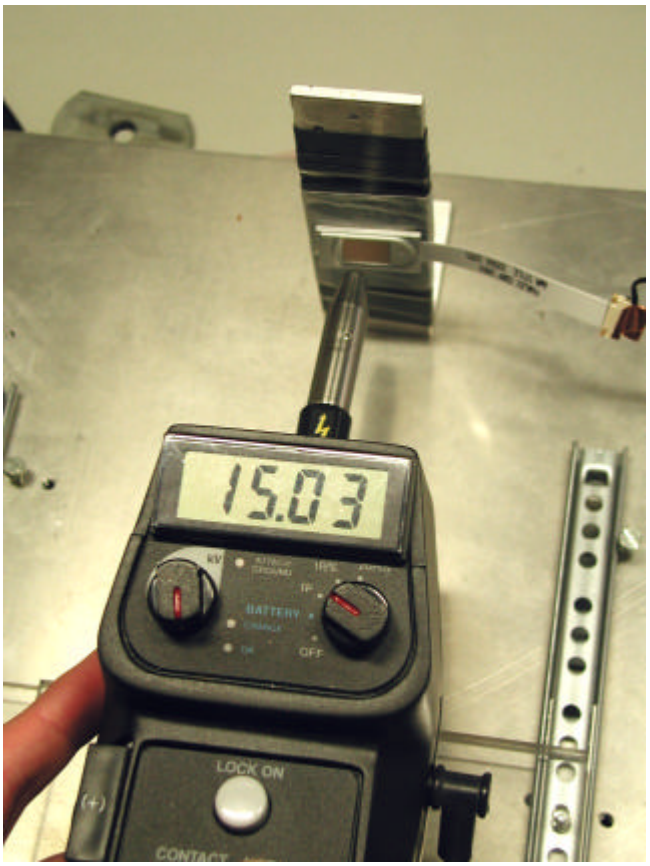

Figure 2 Test set-up for the ESD tests of FPC10C (Packaged FPC1010).

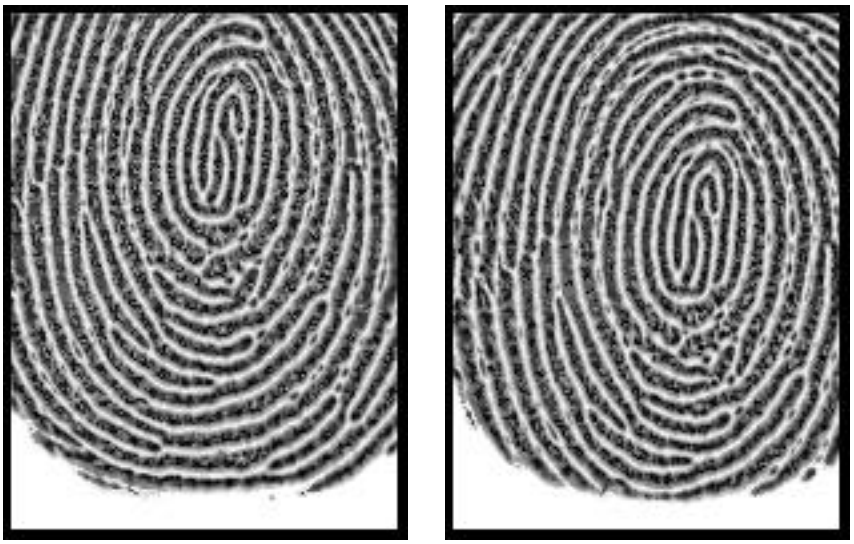

Figure 3 Fingerprint image before (left) and after (right) multiple exposure to 15kV ESD.

Conclusions

The conclusions made based on the tests described in this report is that the fingerprint sensor FPC1010, in the package FPC10C (Figure 1) with a 25µm polymer coating can withstand at least 15kV, tested according to IEC 61000-4-2.