CHANGE HISTORY

Rev.	Date	Author	Reason for change
A	20/05/03	JL GIGUET	First document

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1. SCOPE

1.1 INTRODUCTION.

This document aims to describe solutions to cure ESD issues.

1.2 REFERENCE DOCUMENTS

- ESD : EMC norm (art. 3.1.b) EN 301489 -1/-7

1.3 GLOSSARY

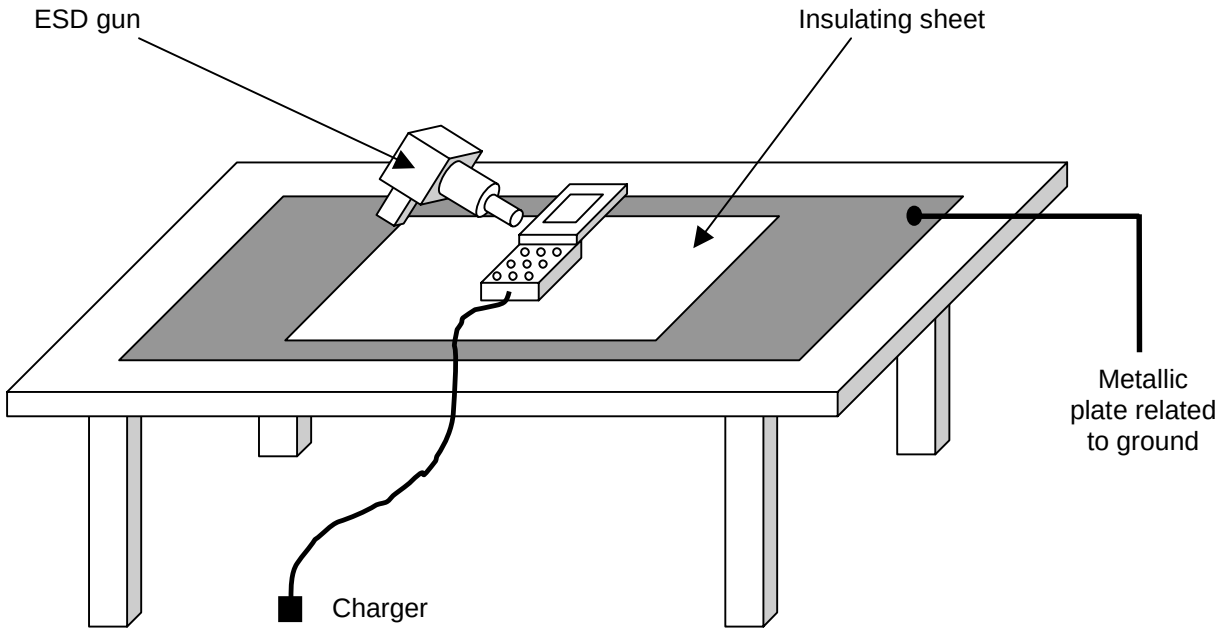
ESD	Electrostatic Discharge
MS	Mobile Station

2. ANALYSIS OF ESD ISSUES

2.1 METHOD OF MEASUREMENT.

2.1.1 Test description

Measurements are carried out in the following configuration :



2.1.2 Norm limits

2.1.2.1 Standard requirement

Norm says that tests have to be done when mobile is in call with its charger. These tests consist to put some ESD impulses of 8 kV maximum everywhere on the mobile. It mustn't lose the call neither other functions and if one of them is lost, the mobile has to come back in its normal configuration without external action.

2.1.2.2 TEST method recommendations

Despite the standard recommendation requests to test the overall mobile configuration (mobile connected to its travel adapter), SAGEM strongly suggests to test the 2 following configurations:

- Whole mobile configuration (mobile + travel adapter)
- Mobile as stand alone

In both idle and communication mode.

2.1.3 Analysis

Esd current can penetrate inside the mobile via the following devices:

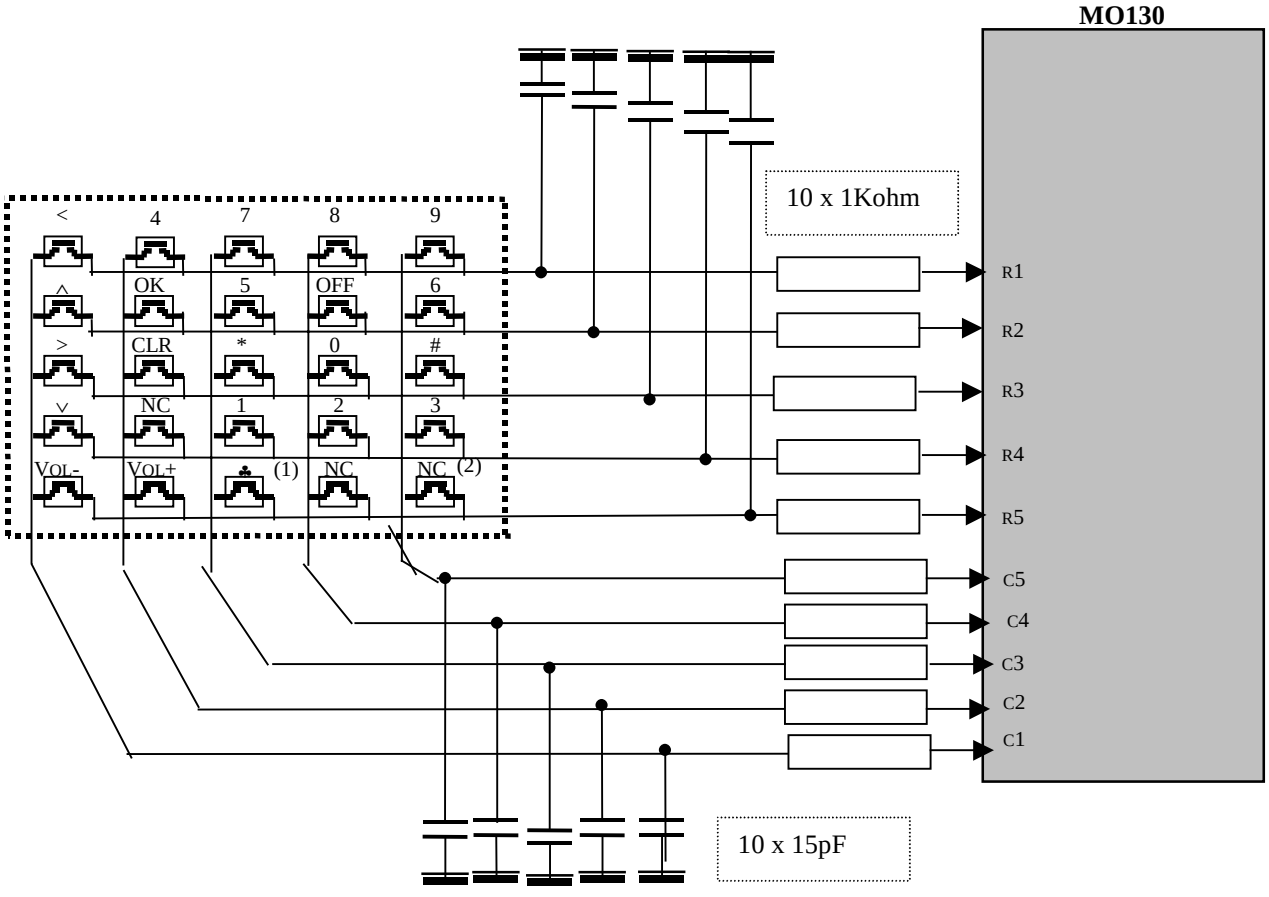
- Keyboard
- Screen
- Microphone
- Speaker
- Battery / data connector
- All pieces with conductive paint (plastron, special keys, etc...)

Therefore, in order to avoid ESD issues, efforts shall be done to decrease the level of ESD current on electronic components located inside the mobile (MMI board, LCD board, input of the module MO130, etc…)

3. SOLUTIONS TO ESD ISSUES

Solutions to ESD issues can be summarised as below:

1. Insulate MMI keyboard from outside, avoid conductive keys on key pad and on lateral key (remove conductive paint)
2. Increase ground connections module MO130-MMI board in using the shield of the module
3. Put capacitor 100nF on battery (not on charger), or better put varistor in parallel on battery and charger wires (and on all wires on bottom connector)
4. Shield charger connector (not only a mechanical link concerning the metallic part around the connector)
5. Uncouple microphone and speaker in putting varistor on parallel on each wire of these devices
6. Put 1 Kohm resitor and 15pF as on the following schematic:



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