sagemcommunications

Spring Contacts

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This document contains some radio hints for using spring contacts or pogo pins for antenna connection with Hilo, instead of the RF connector :

1) Indeed using spring contacts or pogo pins increases the risks to affect the output impedance of the module, and thus to have a bad adaptation. In case of a bad adaptation, not only the output power and the sensitivity are getting worse, but all the other radio performances, like the spurious emission, are impacted too.

2) Another difference with the RF connector solution is that in this second case, the RF cable and the connector are almost perfect 50 ohms, and they are well protected thanks to the shielding of the cable. This means that the RF signal is less sensitive to external or on-board interferers.

That's why when using the springs contacts (or pogo pins), the environment of the module should be clean and free of interferers, more than with the use of a RF cable.

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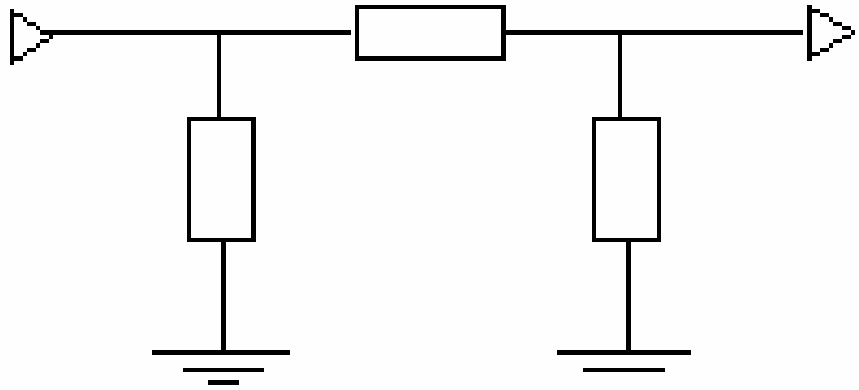
3) It's important to manage some space at the beginning of the 50 ohms microstrip line, for a possible matching circuit. Here is an example of a matching circuit with 3 components :



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4) In addition to the 50 ohms microstrip line needed with the use of the spring contacts or pogo pins, it's needed to design a 50 ohms pads in order to solder the spring contact or the pogo pins on. And this 50 ohms pads is often bad adapted, for example if the ground plane is at the same height for the 50 ohms microstrip line and the 50 ohms pad. So it's important to pay attention to this part.

5) It's recommended to have a 50 ohms microstrip line as short as possible, with a constant ground plane below (meaning no interruptions of the plane). This microstrip line should not cross or be close to potential interferers lines, like digital clock lines.

6) If there is enough space on the product, it can be interesting to design the layout to allow either the use of the spring contacts / pogo pins, either the use of the RF connector as a safety solution if there are too much problems with the spring contacts.

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7) Generally a good way to proceed is to design the layout of the board, create the pcb as a prototype, and test the layout. If there are too much adaptation problems, a second run of pcb will be required.

8) Software tools for designing microstrip line sometimes provide different calculation results, even if the same parameters are used.

AppCAD (from Agilent) tool is recommended to calculate your microstrip lines.

As always, our lab can review your schematic/layout so do not hesitate to send it to the Sagem technical support.

9) As an example, Growith provides spring contacts : part number EXPAN - EXF-0023-02

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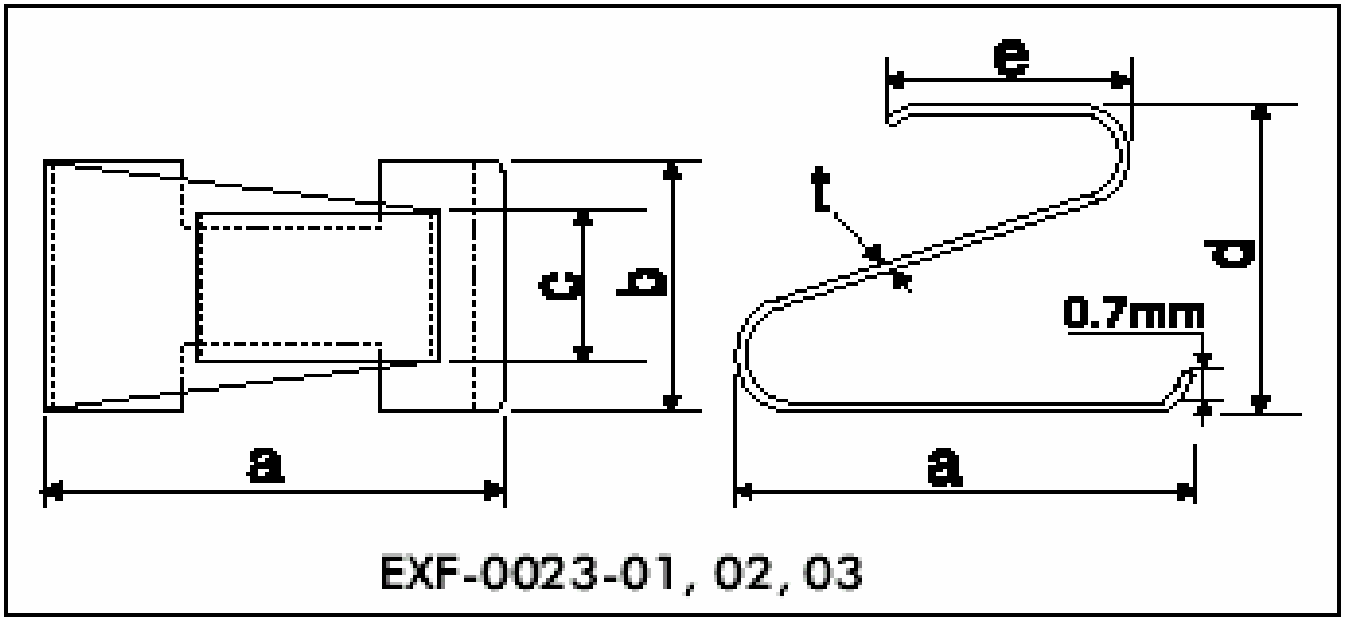

EXF-0023-01, 02, 03