

# SIM HOLDER DESIGN GUIDES Application Note

80000NT10001a Rev. 4 - 2010-10-04





## DISCLAIMER

The information contained in this document is the proprietary information of Telit Communications S.p.A. and its affiliates ("TELIT").

The contents are confidential and any disclosure to persons other than the officers, employees, agents or subcontractors of the owner or licensee of this document, without the prior written consent of Telit, is strictly prohibited.

Telit makes every effort to ensure the quality of the information it makes available. Notwithstanding the foregoing, Telit does not make any warranty as to the information contained herein, and does not accept any liability for any injury, loss or damage of any kind incurred by use of or reliance upon the information.

Telit disclaims any and all responsibility for the application of the devices characterized in this document, and notes that the application of the device must comply with the SAFETY standards of the applicable country, and where applicable, with the relevant wiring rules.

Telit reserves the right to make modifications, additions and deletions to this document due to typographical errors, inaccurate information, or improvements to programs and/or equipment at any time and without notice.

Such changes will, nevertheless be incorporated into new editions of this document.

Copyright: Transmittal, reproduction, dissemination and/or editing of this document as well as utilization of its contents and communication thereof to others without express authorization are prohibited. Offenders will be held liable for payment of damages. All rights are reserved.

Copyright © Telit Communications S.p.A. 2010





# 1 Introduction

## 1.1 Scope

Aim of this document is to give basic design guide lines to integrate a SIM holder in applications that uses Telit modules.

## 1.2 Audience

This document is intended for Telit customers, who are integrators, about to add SIM holder functionality on their applications.

## 1.3 Contact Information, Support

For general contact, technical support, to report documentation errors and to order manuals, contact Telit's Technical Support Center (TTSC) at:

[TS-EMEA@telit.com](mailto:TS-EMEA@telit.com)  
[TS-NORTHAMERICA@telit.com](mailto:TS-NORTHAMERICA@telit.com)  
[TS-LATINAMERICA@telit.com](mailto:TS-LATINAMERICA@telit.com)  
[TS-APAC@telit.com](mailto:TS-APAC@telit.com)

Alternatively, use:

<http://www.telit.com/en/products/technical-support-center/contact.php>

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

<http://www.telit.com>

To register for product news and announcements or for product questions contact Telit's Technical Support Center (TTSC).

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates feedback from the users of our information.



## 1.4 Document Organization

This document contains the following chapters:

Chapter 1: “Introduction” provides a scope for this document, target audience, contact and support information, and text conventions.

Chapter 2: “Overview” provides a quick SIM contacts explanation.

Chapter 3: “Schematics ” provides connection schematics

Chapter 4: “List of acronyms”

## 1.5 Text Conventions



***Danger – This information MUST be followed or catastrophic equipment failure or bodily injury may occur.***



***Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.***



**Tip or Information – Provides advice and suggestions that may be useful when integrating the module.**

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.







## 2 Overview

In all Telit modules there are five pins for SIM card holder connection  
These lines are:

<b>SIMVCC</b>	(SIM Power supply)
<b>SIMRST</b>	(SIM Reset)
<b>SIMIO</b>	(SIM Data)
<b>SIMIN</b>	(SIM Presence/Absence)
<b>SIMCLK</b>	(SIM Clock)

SIM connection must take in account of **four** key issues:

- 1) **Data Integrity:** standard rules for digital layout and routing must be followed taking in consideration that SIMCLK has frequency of 3.57 MHz and SIMIO has 9600Bps baud rate.
- 2) **EMI/EMC:** this is a key aspect to consider designing an application based on TELIT modules with internal antenna and/or without a proper-shielded box. Some of these conditions may occur:
  - Antenna picks-up digital noise coming from SIM card lines.
  - Antenna radiated field may interfere digital lines.
  - Digital lines (in particular clock) may radiate spurious in the surrounding space.

To overcome all these potential problems, connection lines must be kept as short as possible and shielded.

SIM-holder position has to be as far as possible from antenna.

RF bypass capacitors (10pF...33pF) closed to SIM card SIM-holder are another good care.

When connection is not short, insertion of 10..47ohm resistor with 10..33pF capacitor (RC filter) is a good caution to improve EMI from SIMCLK line.





**SIM HOLDER DESIGN GUIDES Application Note**  
80000NT10001a Rev. 4 - 2010-10-04

On SIMRST and SIMIO lines it is allowed to add insertion of 10..100ohm resistor with 10..33pF capacitor (RC filter) to improve the EMI measurements.

Do not insert resistors on SIMVCC, their use is not supported by SIM electrical interface.

- 3) **ESD:** take standard ESD caution if application based on TELIT module has SIM holder with contacts reachable from human body.
- 4) **SIM supply:** do not connect capacitance greater than 1uF to SIMVCC line.



---

**NOTES:**

SIMIN doesn't require any pull-up resistor. It is built in.

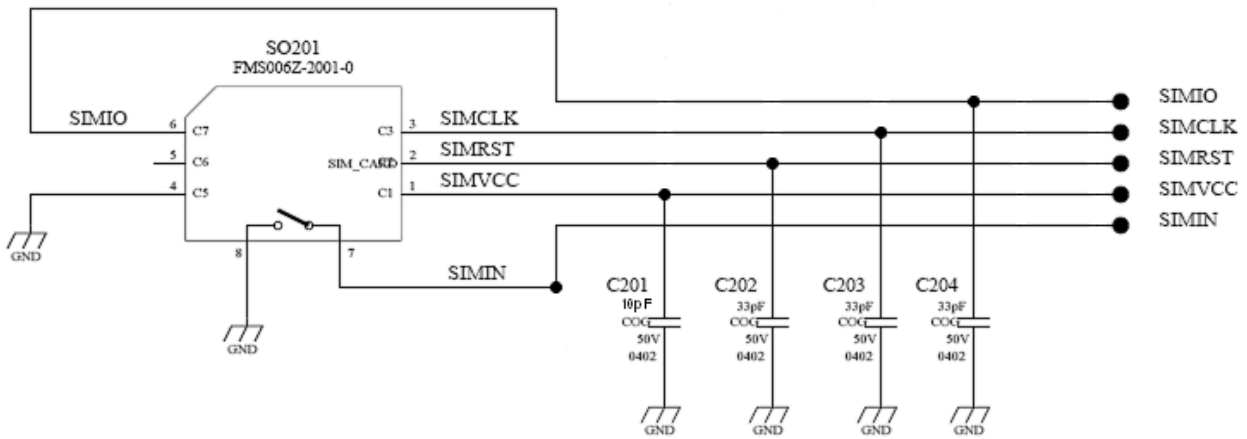
SIM card is detected inserted when this line is short to ground.

If in the application the SIM holder doesn't foresee the switch for the presence/absence of the SIM card, the SIMIN line must be connected to ground.

---



### 3 SCHEMATICS



## 4 List of acronyms

<b>SIM:</b>	Subscriber Identity Module
<b>EMI:</b>	Electromagnetic Interference
<b>EMC:</b>	Electromagnetic Compatibility
<b>ESD:</b>	Electrostatic Discharge

