Application Note
Dual SIM connection

Sony Ericsson

CE

The product described in this manual conforms to the TTE directive 91/263/EEC and EMC directive 89/336/EEC. The product fulfils the requirements according to ETS 300 342-1.

First edition (August 2003)

Sony Ericsson

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1 Introduction

The SIM card provides the identity of a particular subscriber to the GSM operator network. The network operator provides a set of services to the subscriber based on his/her identity.

As a result of the varying costs, services, and cell coverage of different GSM operators it may be beneficial to have a choice of GSM operator network at the time of making or receiving a call. This can be achieved in a system which actively selects which one of two SIM cards to activate before attaching to a network.

This application note provides the design of one such “Dual SIM” system when used in conjunction with a GR47 GSM module from Sony Ericsson.

2 Design Overview

The SIM connection signals from the GR47 GSM module consist of:

SIGNAL	DESCRIPTION
SIMVCC	3V or 5V Supply
GND	System Ground
SIMCLK	Synchronous Clock Output
SIMRST	Reset Output
SIMDATA	SIM Data Input/Output
SIMPRESENCE	SIM Presence Detection Input

Each of the output signals and the supply connections can be connected directly to both SIM holders. With a little signal conditioning these signals have enough drive to fan out to two SIM holders without need for signal buffering. For signal conditioning each SIM holder has a supply decoupling capacitor associated with it.

The SIMDATA data input/output signal is the key to successful SIM access. When active, the SIMDATA signal is pulled-up by the GR47. The signal is bidirectional and is pulled-down by whichever side is sending data. In the case of the disabled SIM holder in our dual SIM solution the unused SIMDATA must be pulled-up to SIMVCC. This is a standard idle condition for a SIM.

The method we have used to redirect the SIMDATA signal to whichever SIM has been actively selected is by a dual SPST analogue switch.

The dual SPST analogue switch is part number NLAS325 from “ON Semiconductor™”. This part has a wide operating voltage range and very low quiescent supply current. In addition it has two independent switch enable controls, ideally suited to this application as one is active high, the

other active low, which permit a single control signal to select either SIM1 or SIM2 without additional logic circuitry.

The pull-up resistor value of 82kΩ on SIMDAT1 and SIMDAT2 not only achieves the idle state pull-up but also compensates for the insertion of the analogue switch into the SIMDATA signal.

Note : Due to the relatively high resistance of the pull-up on SIM Data signals, the capacitance of the SIM Data line must be kept as low as possible. Typically SIM circuits will not pass Type-Approval testing if the SIM Data signal has a capacitive load greater than a few picoFarads.

3 Operation

The operation of the dual SIM solution presented has been tested on Type Approval Test equipment and has passed all electrical test requirements with either SIM holder activated.

The selection of SIM1 or SIM2 was performed by mechanical switch connecting IN1/IN2 to a pull-up resistor or SIMGND respectively.

The SIMPRESENCE detection input to the module can be used to trigger a network-detach. A new network connection will be made when the SIMPRESENCE signal is reactivated.

Note : It is not possible with this solution to receive calls on the SIM card which is not activated.

APPENDIX

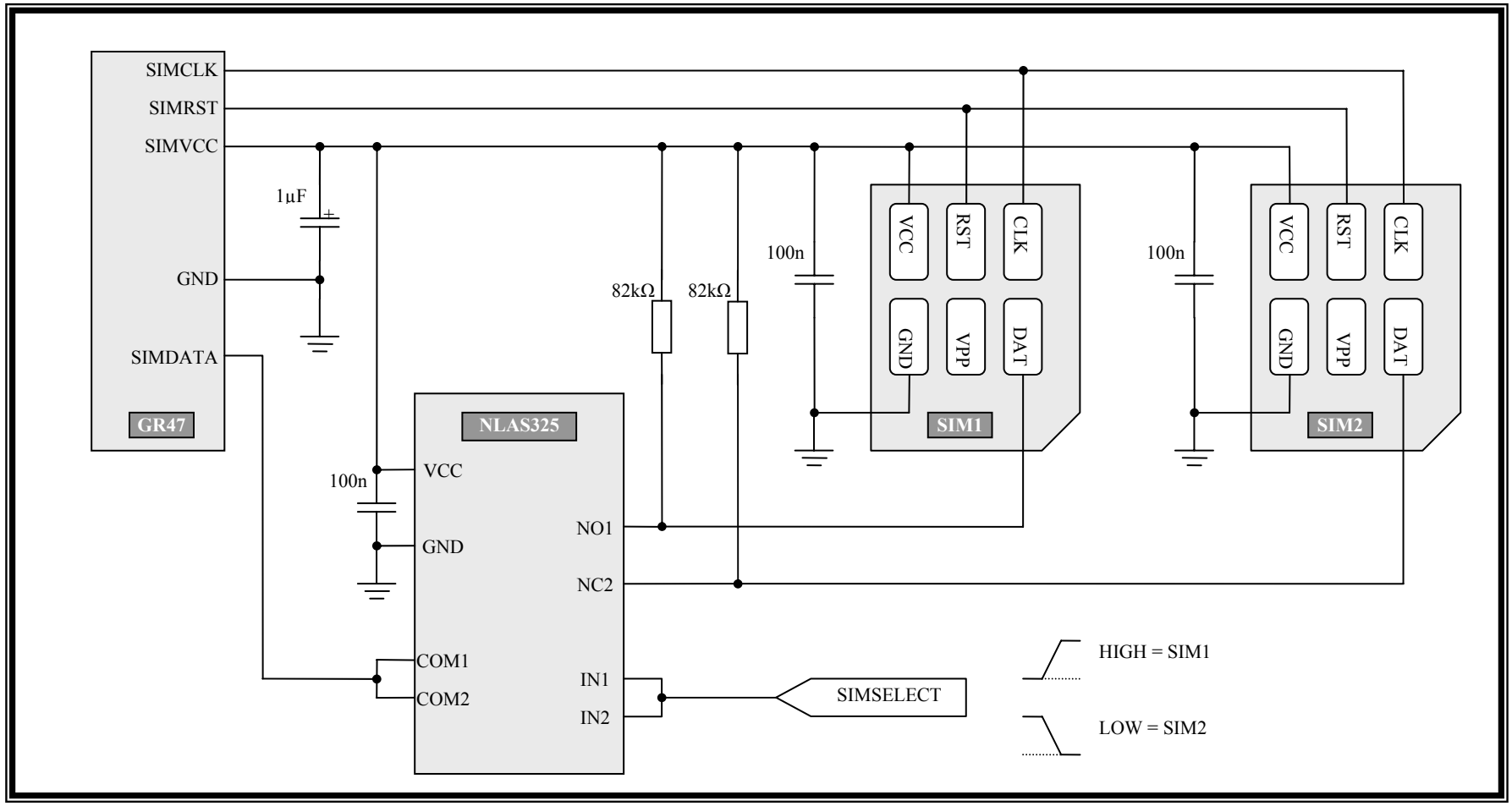

Figure 1. Dual SIM schematic