After Sales Technical Documentation
RAE/RAK–1N Series

Chapter 5

– Transceiver GE8/GE9 –
SIM Flex Module

CONTENTS – SIM flex

List of Figures

Introduction

The purpose of the SIM−flex is basically to connect ancillary parts to the CMT. It has no active electronics and the main parts are the audio components, mic, low profile buzzer and speaker plus a SIM−connector.
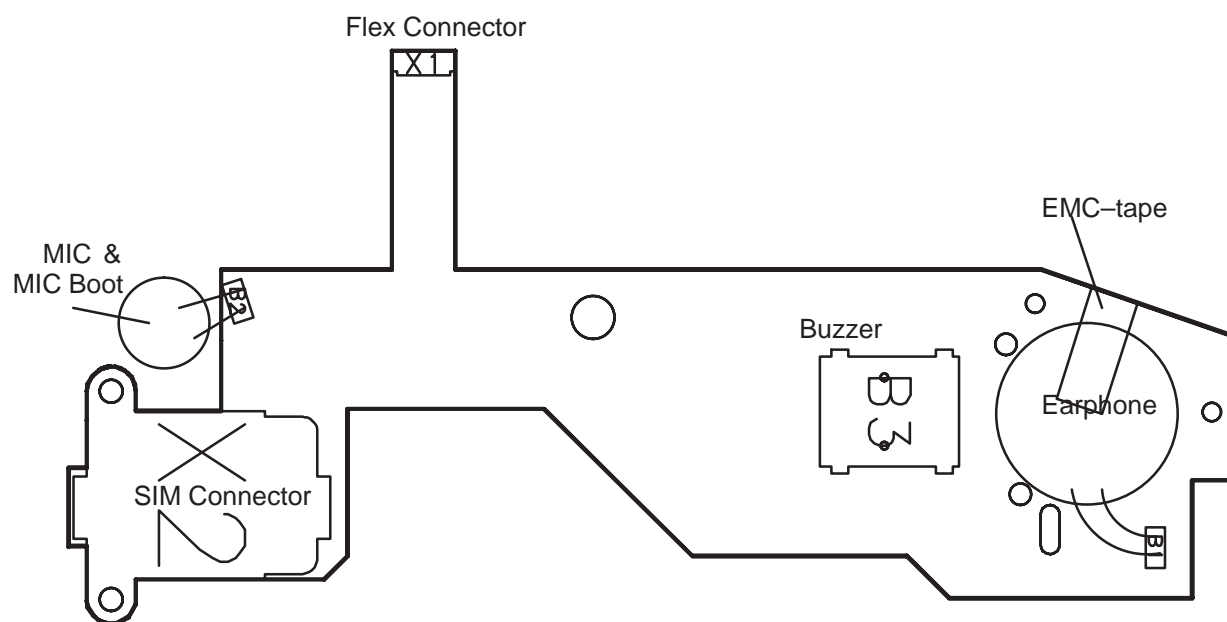

Figure 1. SIM Flex components.

Technical Specification

DC Characteristics

Table 1. Supply Voltages

Pin/ Connec- tor	Line Symbol	Mini- mum	Typi- cal / Nomi- nal (1)	Maxi- mum	Notes	
1 / SIM	BUZZ1	5.5V	7.2V	8.4V		
8 / SIM	VSIM	4.5V	4.8V	4.95V	SIM card reader supply voltage	

Table 2. Digital Control Signals

Pin/ Connec- tor	Line Symbol	Mini- mum	Typi- cal / Nomi- nal (1)	Maxi- mum	Notes	
2 / SIM	BUZZ2	0V		0.7V	Input low, buzzer on	
		5.5V	7.2V	8.4V	Input high, buzzer off	
6 / SIM	SIMCLK	3.6V	4.8V	4.95V	State "1"	Clock for SIM card
		0V	0.2V	0.7V	State "0"	
7 / SIM	SIMRESET	4.5V	4.8V	4.95V	Output high	Reset for SIM card
		0V		0.7V	Output low	
9 / SIM	SIMDATA	3.6V	4.8V	4.95V	State "1"	Data for SIM card
		0V	0.2V	0.7V	State "0"	

External Signals and Connections

Table 3. From CMT Module

Signal Name	Pin / Conn.	Notes
BUZZ1	1	Battery Voltage for buzzer
BUZZ2	2	PWM signal buzzer control
EARN	3	Earpiece (negative node)
EARP	4	Earpiece (positive node)
SIMCLK	6	Clock for SIM data
SIMRESET	7	Reset for SIM
SIMDATA	9	Serial data for SIM
VSIM	8	SIM supply voltage
GND	5, 10	Ground
MICP	12	Microphone (positive node)
MICN	11	Microphone (negative node)

Table 4.   SIM Connector

Signal Name	Pin / Conn.	Notes
SIMCLK	1	Clock for SIM data
SIMRESET	2	Reset for SIM
SIMDATA	6	Serial data for SIM
VSIM	3, 5	SIM supply voltage
GND	4	Ground

AC Characteristics

Table 5. Audio Signals

Pin / Connector	Line Symbol	Minimum	Typical / Nominal	Maximum	Unit / Notes
12 / SIM 11 / SIM	MICP MICN		5 mV$_{rms}$	19 mV$_{rms}$	Differential
3 / SIM 4 / SIM	EARN EARP		124 mV$_{rms}$	1.965 V$_{rms}$	Differential, $R_L = 32\Omega$

Functional Description

Main Components

Audio components

The flex has three audio components: microphone, earphone and buzzer. Buzzer, mic and earphone are wired directly to flex connector without any extra components. Microphone has one capasitor that works as a RF filter.

Connectors

There is a custom design SIM Connector and flex connector shaped area in the flex.

Mecanical components

There is MIC Boot and EMC–tape for earpiece.

SIM interface

The SIM interface is the electrical interface between the smart card used in the GSM and PCN applications and the MCU via the ASIC. Four signals are used between the SIM card and the ASIC:

SIMDATA,

 SIMCLK,

SIMRESET

 VSIM.

Serial data is transferred between the card and the ASIC, the clock frequency is 3.25 MHz. When there is no data transfer between the SIM card and the CMT the clock can be reduced to 1.625 MHz. Some cards allow to stop the clock in that mode. The ASIC also generates the reset for the card and the supply voltage VSIM.

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