

Theory of Operation

Vocabulary

CS	=Cellular System
CDMA	=Code Division Multiple Access
HW	=Hardware (drivers)
RAM	=Random-Access Memory
ROM	=Read-Only Memory
SPEC	=Specification
SW	=Software

Technical Summary

The GMLNSD-5FX is a radio transceiver unit for the CDMA 1900 networks. It is a power class II at 1900 MHz providing power from -50 to +23.7 dBm in CDMA. The transceiver is a true 3 V transceiver. Transceiver has 15733 (13.3 kbps) and IS127 (EVRC) speech codes.

The transceiver consists of system/RF module, that is called Engine, and User interface module and assembly parts.

The transceiver has full graphic display and soft key based user interface.

The antenna is fixed. External antenna connection is provided by bottom RF connector.

The transceiver has leak tolerant earpiece OMNI type microphone.

Circuit Description

The engine consists of a Baseband/RF module with connections to a separate user interface module. Baseband and RF modules are interconnected with PCB wiring. The phone can be connected to accessories via the bottom

System connector and the Intelligent Battery Interface (IBI) connector.

The RF sub-module receives and demodulates radio frequency signals from the base station and transmits modulated RF signals to the base station. It consists of functional sub-modules Receiver, Frequency Synthesizer and Transmitter.

The Baseband module contains audio, control, signal processing and power supply functions. It consists of functional sub-modules MAD4, MCU, DSP, logic and memories, CCONT, regulators and charging and CAFÉ.



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Basic Specifications:

Table 2. Basic Specifications

Parameter	CDMA 1900
Cellular system	J-STD-018, J-STD-008
TX frequency band	1850-1990 MHz
RX frequency band	1930-1990 MHz
Duplex spacing	80 MHz
Number of RF channels	1150
Channel spacing	50 kHz
Output power	234.4 mW (+23.7 dBm)
Power levels	-50 to +23.7 dBm CDMA
Method of frequency synthesis	Three digital phase locked loops VHF 416.2 MHz for Tx VHF 256.2 MHz for Rx UHF 2058.1 – 2118.1 MHz for Tx & Rx
Frequency control	19.2 MHz VCTCXO: AFC used
Receiver type	Linear, single IF
Modulator type	OQPSK



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Technical Specifications

Modes of Operation

GMLNSD-5FX operates in Cellular PCS mode and a local mode for service:

- PCS mode: phone controlled by Cellular System SW and partly by basestation
- Local mode: used by Production and Aftersales

Power Off

In the power-off mode, only CCONT is active. Power-off mode can be left by pushing the PWR- key, connecting charger to the phone, real time clock interrupt or intelligent battery interrupt.

Idle/standby

The phone is in Idle in CDMA, listening to the network and waiting for the page.

Call

The phone call is going on and during most of the time all RF and Baseband parts are on. Separate parts are turned off when they are not needed in order to save power.

Local Mode

Local mode is used for testing purposes by the Nokia Product Development group, Nokia Production and Service Providers. The Cellular Software is stopped (no signaling to basestation), and the phone is controlled by MBUS/FBUS messages by the controlling PC.