

7. Technical Overview

L5ACMDM4 is a dual-band portable cellular phone which supports both analog Advanced Mobile Phone System (AMPS) FM mode and digital Code Division Multiple Access (CDMA) mode. The cellular phone is designed to meet the requirements of the AMPS portion of TIA/EIA IS-95-A Mobile Station-Base Station Compatibility Standard for Dual-Mode Wideband Spread Spectrum Cellular System, J-STD-008 Personal Station-Base Station Compatibility Requirements for 1.8 to 2.0 GHz Code Division Multiple Access (CDMA) Personal Communications Systems, the AMPS portion of TIA/EIA IS-98-A Recommended Minimum Performance Standards for Dual-Mode Wideband Spread Spectrum Cellular Mobile Stations and J-STD-018 Recommended Minimum Performance Requirements for 1.8 to 2.0 GHz Code Division Multiple Access (CDMA) Personal Stations.

The cellular phone operates under Cellular Radiotelephone Service specified in FCC CFR 47, Part 22 and Part 24.

Transmitter Frequency Range

AMPS mode: 824-849 MHz

PCS CDMA mode: 1850-1910 MHz

Receiver Frequency Range

AMPS mode: 869-894 MHz

PCS CDMA mode: 1930-1990 MHz

Nominal Transmitter Output Power

AMPS mode: 600 mW

PCS CDMA mode: 420 mW

Battery Voltage: 7.2 V

The input audio signal is sampled and processed digitally for necessary filtering, amplitude limiting, and compression and expansion. The device fully supports the AMPS and CDMA PCS standards. All necessary signaling tones are digitally generated.

The transmit power level is constantly monitored by a detector circuit and microprocessor.

A method of look-up table, frequency offset correction table, and temperature

compensation is used to tightly control the transmit power levels. All spurious and harmonic signals from the transmitter and receiver circuits are suppressed by filters and mechanical shields, and the device fully complies with the standards.

14. Frequency Stabilization and Suppression Circuits

14.1 Frequency Stabilization

A voltage-controlled temperature-compensated crystal oscillator (VCTCXO) is employed as a frequency reference for all the transmitter and receiver local oscillators. The frequency tolerance of the VCTCXO is specified to remain within ± 2.5 ppm over operating temperature range and operating voltage range. The VCTCXO frequency is locked to the base station transmit frequency during the operation in both FM and PCS CDMA modes. The lock indicator signals of all frequency synthesizers are monitored and an out-of-lock condition will inhibit transmission.

14.2 Description of Suppression Circuits

Spurious and harmonic suppression is obtained by design through a proper use of filters and shielding materials. Factory assembly instructions, board level and unit level factory testing, and quality acceptance procedures ensure that such compliance is maintained for all manufactured units.

In CDMA PCS operation, its chip rate for PN sequence is 1.228 Mcps (per J-STD-018 standard), and its 3 dB bandwidth is approximately 1.25 MHz. Channel spacing for PCS CDMA channels is therefore normally set at 1.25 MHz. The baseband design is in compliance with the filtering requirements described in J-STD-018 for I and Q transmitter signals (within 1.5 dB ripple up to 590 kHz, and more than 40 dB suppression above 740 kHz). These I and Q baseband signals are combined at 90 degree phase to form the transmitter output signal.