LEXENT TECHNOLOGIES

CERTIFICATION PACKAGE

COMPANY PRODUCT NAME

Lexent Technologies, Inc
iSpy Detector Unit
FCC ID: NQW267-26

FCC Part 15 Subpart 15.231 Periodic Operation in the Band 40.66-40.70 MHz and above 70MHz Compliance

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CORPORATE INFORMATION

A. Company Name

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Email: mdangelo@lexent.com
Point of contact: Michael R. D'Angelo, President

B. Product Name

iSpy

Also know as:

iSpy Detector Unit
iSpy Laptop Unit
iSpy PC Radar
iSpy 2000
iSpy Laptop Security System

C. Model Number

3000

D. Additional Names

None

E. Manufacturing Location

Artisan Industries Inc.
73 Pond Street
Waltham, Massachusetts 02254-9193
Phone: (781) 893-6800; Fax: (781) 647-0143
Point of contact: Joseph E. Qualitz, Vice President, Engineering

Function of the iSpy Detector Unit

The iSpy Detector Unit is used to interact with the iSpy Control Unit to form a system which protects laptop computers from theft. The companion iSpy Control Unit is being certified at the same time as this application under FCC ID: NQW267-21.

The iSpy Detector Unit is carried in a laptop computer carrying case to protect the computer from theft. It allows for the user to press an arming button on the companion Control Unit which sends a signal to the Detector Unit placing it in a ready mode where it scans for unauthorized motion of the laptop computer. If unauthorized motion if the laptop computer is found, the iSpy Detector Unit either sends a control signal back to the iSpy Control Unit or sounds an alarm. The alarm is made with a piezo-electric wafer. There is also a small LED which illuminates. The iSpy Control Unit is intended to be carried on the user's keychain. The iSpy Owner's Manual provides a more detailed description of the functionality.

Description of RF Circuitry

The iSpy Detector Unit uses individual transmitter and receiver chips manufactured by Linx Technologies, Inc., located at 575 S.E. Ashley Place, Grants Pass, Oregon 97526, (800) 736-6677.

Transmitter

The Linx Technologies TXM-418-LC transmitter chip was designed for unlicensed operation under FCC Part 15. The chip module is a surface mount device. It operates at 418 MHz. The chip is surface acoustic wave based carrier-present carrier-absent transmitter capable of sending serial control data at up to 5,000 bits/second. The power consumption of the transmitter is 1.5mA. Because the Linx TXM-418-LC was designed with an architecture achieving low harmonic content, no external filtering components were used. The antenna is a helical wire coil made from either steel, copper or brass. There is no external system clock. The transmitter is powered by a 9 volt transistor battery with a voltage regulator delivering a nominal 3-5 volts to the transmitter. The system ground plane is embedded in the circuit board substrate beneath the transmitter chips.

Because the transmitter chips are totally self contained, Lexent does not have the specific details of the Linx design including specifications on the Phase Shift Network SAW Oscillator, the RF Amplification Stage, or the Output Isolation & Filter Stage. However, since Linx Technologies has had many consumer products using their chips undergo FCC approval, they did submit a block diagram referencing the necessary elements. This block diagram is attached.

Receiver

In a manner similar to the transmitter chip, we use a Linx Technologies receiver module, totally self-contained within a small surface mount package.

The Linx Technologies RXM-418-LC receiver chip was similarly designed for unlicensed operation under FCC Part 15. The chip module is a surface mount device. It operates at 418 MHz. The chip is surface acoustic wave based carrier-present carrier-absent receiver capable of receiving serial control data at up to 5,000 bits/second.

The Linx design of the RXM-418-LC utilizes a single-conversion superhet design which incorporates a SAW device, high IF frequency and multi-layer ceramic filters. The use of SAW devices in the receiver allows the receivers pass opening to be quite narrow, thus increasing sensitivity and and reducing susceptibility to near-band interference. The two stages of internal Bandpass Filtering operate at 10.7 Mhz.

The antenna is a helical wire coil made from either steel, copper or brass. There is no external system clock. The receiver is powered by a 9 volt transistor battery regulated down to a nominal 3 volts. The system ground plane is embedded in the circuit board substrate beneath the receiver chip and is tied into the ground plane for the transmitter chip.

Similar to the situation with the transmitter chip, because the receiver chip is totally self-contained, Lexent does not have the specific detail of the Linx Technologies design including specifications on Band Select Filter, Pre-amplifier, SAW Oscillator, Gilbert Cell Mixer/Amp, the First Stage 10.7 MHz Bandpass Filter, the Limiting Amplifier, the Second 10.7 MHz Ceramic Filter, the AM Detector or the Data Slicer. However, a block diagram submitted to Lexent for containment within this application is attached.

Microprocessor Control

The self-contained Linx Technologies transmitter and receiver modules on the Detector Unit are controlled by a Microchip PIC16C56 microprocessor. When the user presses a control button on the companion Control Unit a signal is transmitted. When this signal is receiver by the Detector Unit it is the microprocessor turns on the receiver and commands it to accept the carrier-present carrier-absent serial stream then shuts off. In response to an incoming signal appropriately decoded, the microprocessor will either sound the alarm on the Detector Unit or do nothing. The duty cycle is never greater that 50%.

The microprocessor also periodically checks the motion sensor and if motion if found to exist, one of three actions is taken depending on how the user has set the two switches on the Detector Unit.

If the Mode Switch is in Position 1 or 2 and the Sensor Switch is in Position 1, upon detecting motion the microprocessor commands the transmitter to send out a proximity check signal. Upon receiving this proximity signal, the companion Control Unit will acknowledge its proximity by sending back a low power signal to the Detector Unit.

If the Mode Switch is in Position 2 and the Sensor Switch is in Position 0 the microprocessor commands the transmitter to send out an alert control signal. Upon receiving this alert signal the Control Unit will sound a small piezo-electric alert device and illuminate a LED.

If the Mode Switch is in Position 1 and the Sensor Switch is in Position 0, when motion is detected the microprocessor commands the alarm to sound.

The duty cycle during transmission is never greater than 50%.