

LIST OF EXHIBITS

CFS8DL5810

- 1) Description of the device
- 2) Circuit description and schematic
- 3) Message Protocol, timing and duty cycle calculation
- 4) Photographs showing FCC ID label.
- 5) Report of measurements
- 6) Test equipment list
- 7) Installation instruction including FCC compliance statement and FCC user's warning

EXHIBIT 1

CFS8DL5810

Functional Description.

The Smoke detector transmitter is part of Ademco's wireless 5800 alarm system, it is battery powered by two 3V Lithium cells, connected in parallel. It is used in conjunction with fixed receivers and a security control system in burglary/Fire alarm applications.

The messages are transmitted at 345Mhz +/-82kHz using on-off keyed AM modulation.

The transmitter also sends a regular supervision or check-in message at a period no shorter than once per hour, which complies with Pt 15.231(a)(3).

EXHIBIT 2

Circuit Description.

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The complete Smoke detector is constructed on three PCBs interconnected via ribbon cable and header. There are three variants of the product, i.e., 5807L is the standard product, 5807LT includes thermal sensors on the main smoke detector PCB, 5807LS includes a sounder and 5807LST includes both the thermal sensors and sounder. The Radio Frequency circuitry is on a separate PCB from the smoke detector and sounder circuitry and is not effected by the addition of the thermal/sounder options.

The main PCB contains only the Smoke alarm processing circuitry, the secondary PCB includes all RF transmitter circuitry, the third PCB includes the sounder option.

The transmitter is a SAW resonator Colpitts oscillator, Q2, Y1 etc. The transmitter is on-off keyed (AM) modulated by a control signal from the ASIC U1 which turns PA Q3 on or off via Q5/Q5, thus modulating the output signal. The RF output signal is connected to a PCB mounted antenna ANT1, tuned via C17/C18.

U1 is an ASIC which generates the alarm and identification messages and controls timing etc. The alarm input from the Smoke detector board is via ribbon cable connected to TB1.

Message protocol, timing and duty cycle calculation.

The data output is phase encoded Manchester which has inherent 50% duty cycle and consists of 64 bits per word.

A supervision transmission is six identical words separated by (start to start) by nominal 125mSec (100mSec min, 150mSec max). Each message has a nominal data rate of 3.7 kB/s (3.2kB/s min to 4.2kB/s max).

Therefore the duty cycle calculation is as follows:

The word format consists of 64 bits,

The duration of each bit is 312.5 uSec max.

The duty cycle over a 100mSec measuring period is calculated as follows:

Duty Cycle = Actual RF transmission ON time / 100mSec (interval)

Actual transmission ON time = 64 bits X 50% X 312.5uSec =
= 10mSec

Therefore Duty cycle = 10 / 100 mSec = .10 = 10%, and peak to average field strength is 20dB.

Total on-air time for a supervision transmission is
 $64 \times 312.5\mu\text{s} + (5 \times 150\text{mS}) = 0.77 \text{ seconds}$

In the case of an alarm transmission, the group of six transmissions is repeated twice, with the second group delayed from the first by a max time of 2 seconds.

The worst case on-air time is $2 \times (\text{supervision time}) + 2$

= 3.54 seconds

Summary :- Duty cycle = 10%
On air time = 3.54 seconds max.