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Report: RF Duty Cycle of CEL Microwave Sensor

Prepared For: ITC Prepared by: CEL

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1 Scope

This document details the RF duty cycle of CEL's pulsed microwave sensor.

2 Duty Cycle Determination

In order to determine the RF duty cycle, the PRF frequency and the oscillator on-time of the microwave sensor are measured and using these the duty cycle is calculated.

2.1 PRF Oscillator Period

The pulsed microwave oscillator is turned on/off by the PRF (Pulse Repetition Frequency) oscillator. The pulse repetition frequency is 1.5MHz. (see fig.1 below).

PRF = 1.46MHz Oscillator period = 682ns

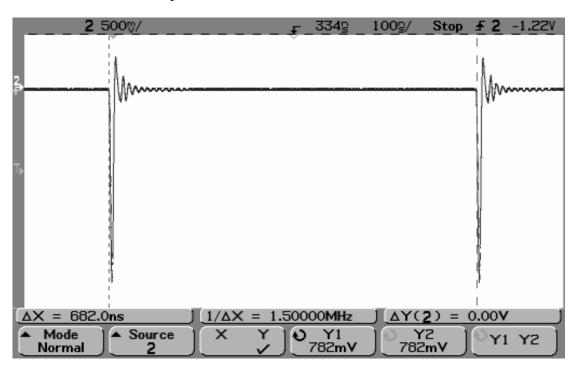


fig.1

2.2 RF pulse width determination:

The range of the SDR is 85cm. Thus using the mathematical formula for RF waves the pulse width can be determined:

Pulse width =
$$(Range*2)/(3x10^8)$$

In the case of CEL's SDR sensor:

Pulse width =
$$1.7/(3x10^8)$$

= 5.66ns

2.3 Duty Cycle Calculation

= (5.66 ns/682 ns) * 100

= 0.83 %