

## General Outline

FTL 313 is a sensor use distortion of standing wave to measure the change of state of moving-target.  
FTL 313 is mostly taken to detect intrusion which is fitted in vehicle interior.

FTL 313 has following models that is differing the case shapes depending on the installation locations in vehicles.

- TYPE A (271000-313) ; Shape with not flat bottom(pit shape)
- TYPE B (271000-318) ; Shape with flat bottom
- TYPE C (271000-338) ; Shape with not flat bottom(projection shape)

And, FTL-313 has models, which changes the set value of the low frequency amplification circuit according to the detecting movement speed.

- Version A ; 40~500Hz(speed 0.1-1.5m/s)
- Version B ; 4~300Hz(speed 0.03-1.0m/s)

Sensor operation has two modes, what are intermittent and continuous mode.  
They are controlled by microprocessor.

The Sensor shifts continuous mode to intermittent mode after 30 sec, which is powered ON.  
It ordinary holds intermittent mode, but when the distortion of standing wave over the constant level, it judges intrusion and shifts continuous mode.  
It is on the continuous mode, when distortion of standing wave fluctuate significantly, it outputs the signal of intrusion detection.

## Circuit Description

The circuit of sensor is configured as Power, RF, Low-frequency amplifier, and Control part.

RF circuit configure dielectric resonator fitted in cavity, circum high frequency wave transistor parts and microstrip lines.

The transmitting and receiving antenna shares the 1-array 3-patches antenna became unified oscillation circuit.

The gain of the 1-array 3-patches antenna is 8 dBi.

The occupation bandwidth is 1MHz.

The receiver bandwidth of receiving circuit's is less or equal 500 Hz.

The transmitting frequency will be preset as 24.15GHz which is adjusted the frequency adjustment screw fitted in cavity, and will be shipped.

RF circuit bleeds off the changing distortion of standing wave which causes moving reverberation object occurred near the sensor, by interspaces co-assembly. And then, it outputs to low-frequency amplifier circuit.

The low-frequency amplifier circuit amplifies the monitor signal of distortion of standing wave inputted from RF, and outputs to microprocessor on controller.

The low frequency amplification block is composed of the AC amplification circuit of three steps and has the amplification gain of 70dB.

The low-frequency amplifier circuit 3dB bandwidth is 500Hz (10Hz~500Hz) .

The controller is configured single-tip microprocessor and driver circuit.

The microprocessor analyzes the analog signals and inputted low-frequency amplifier circuit , and detects intrusion.

The controller outputs alarm triggering signals to security system connected external when it detects intrusion.