

## **Technical Description of the Visual RFID Tag (VT03/VT04/VT07-G3)**

The VT0x visual tag is powered by a 3V Lithium Metal primary battery and designed for securing inventory as well as eliminating paper waste in manufacturing processes. The usage environments are industrial factories, warehouses and commercial locations.

The transmitter will communicate with a gateway device to exchange presence and routing information between the tag and the back-end process control system.

The main oscillator is a crystal operating at 24.00 MHz. The oscillator is used as the reference to a PLL/VCO circuit inside the S2LP transceiver. The frequency is set by a PLL/VCO circuit integrated in the transceiver chip. The RF transmission occurs when the microcontroller sends a data packet to the transceiver portion of the chip. The transceiver GFSK modulates the 433MHz carrier in response to the data packet.

### **Frequency Control Devices Used:**

1. An Internal 32.00 MHz DCO oscillator as the main clock of the microcontroller
2. 24.00 MHz Crystal resonator used as the reference oscillator for the radio
3. 24.00 MHz Crystal resonator used as the reference of the microcontroller DCO

### **RF functions:**

- 433 MHz active radio and passive UHF RFID
- Printed circuit antennas on PCB for both

**Duty cycle correction factor** calculation (From CFR 47 Part 15.35(c))  
(Duty cycle = on time/100 milliseconds or period, whichever is less)

Packet time = 0.88mS every 3s, using 100ms as the shorter of two:  
Factor =  $20 \text{ LOG}(0.88/100\text{ms}) = 20 \text{ LOG}(0.0088) = \mathbf{-41 \text{ dB}}$



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