

Tire Pressure Generation TIS-10

Wheel Unit

Type

ASK/FSK 315 MHz

1. SYSTEM OVERVIEW

The tire pressure monitoring system (referred as TG for Tire Guard) consists of the following units:

- Tire guard wheel unit type TIS-10 which includes an integrated pressure, temperature and acceleration sensor and a RF transmitter.
- LF receiver unit which includes a LF receiver (not described in this document)

The TG monitors a vehicle's tire pressure whilst driving or stationary. An electronic unit (wheel unit) inside each tire, mounted to the valve stem, periodically measures the actual tire pressure. By means of RF communication, this pressure information is transmitted to the RF receiver.

2. TECHNICAL DESCRIPTION

Carrier frequency:	315 MHz
Number of channels:	1
Type of modulation:	Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK)
Baud rate:	9600bps
Rated Output Power:	< 10mW
Antenna:	Internal
Voltage supply range:	2.1 up to 3.2V

3. TYPICAL USAGE PATTERN

3.1 AVERAGE FACTOR CALCULATION (Standard 47 CFR Part 15C (periodic intentional transmitter))

Maximum transmitting duration in whatever 100ms windows: 10.31ms

$$\Rightarrow \text{Averaging factor} = 20 \times \log(10.31/100) = \underline{\underline{-19.73\text{dB}}}$$

Baudrate := 9600bps ToleranceBaudrate := 1%

Framebyte := 12byte + 2bit

Framebits := Framebyte

Framebits = 98

$$t_{\text{bit}} := \frac{1}{\text{Baudrate} \cdot (1 - \text{ToleranceBaudrate})}$$

$$t_{\text{bit}} = 0.10522\text{ms}$$

tFramebits := tbit · Framebits

tFramebits = 10.31145ms

tFrameFSKbits := tFramebits · 1 due to FSK 100%

$$\text{AveragingFactor}_{t\text{Frame}} := \left| 20 \log \left(\frac{t_{\text{FrameFSKbits}}}{100\text{ms}} \right) \right|$$

Averaging Factor_tFrame = -19.8dB

ASK WUP: 320 bits
Baudrate= 9600bps/s (+/-1%)
ASK: 50% duty cycle

Max WUP duration = 16.83ms

$$\text{AveragingFactor_tWUP} := \left\lceil 20 \log \left(\frac{\text{tWUPFrameASKbit}}{100\text{ms}} \right) \right\rceil$$

Averaging Factor_tWUP = -15.5dB

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

