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# OKA-450R

(P/N:96486309)

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Receiver, Tire Pressure Monitoring System

## FCC Statement

### A. User's Guide

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.

### B. FCC Compliance statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### C. Caution !!!

Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void user's authority to operate the equipment.

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## Appendix Circuit Diagram

# 1. Constitution of the Tire Pressure Monitoring System for vehicle

Tire Pressure Monitoring System is the system that receives the information, from transmitters installed at each tire, about the inflation pressure or temperature of tires detected by the sensor, so that the system can detect the abnormality of tires like fallen inflation pressure. This system consists of transmitter, receiving antenna, and receiver. The transmitter sends information of tire, read by the sensor, in the form of radio wave at constant intervals. The receiver is fixed inside the vehicle. If IG is OFF, it works intermittently to prevent the battery exhaustion. When the receiver detects the synchronous code and IG is ON, it runs continuously to receive the signals completely. If the received code is normal, the system will not inform the user. As shown below, in the case that the transmitter sends information that the tire is in abnormal condition, and that the receiver system has a trouble, the system will inform the user with lighting up Warning bulb.

TPMS Warning bulb is lit by the following situations.
<b>Bulb disconnection detection output</b> ( The warning light is On for 3 sec. when IG=OFF→ON)
<b>Tire air pressure warning output</b> (Warning light is ON)
<b>System warning output</b> (Warning light is blinking)

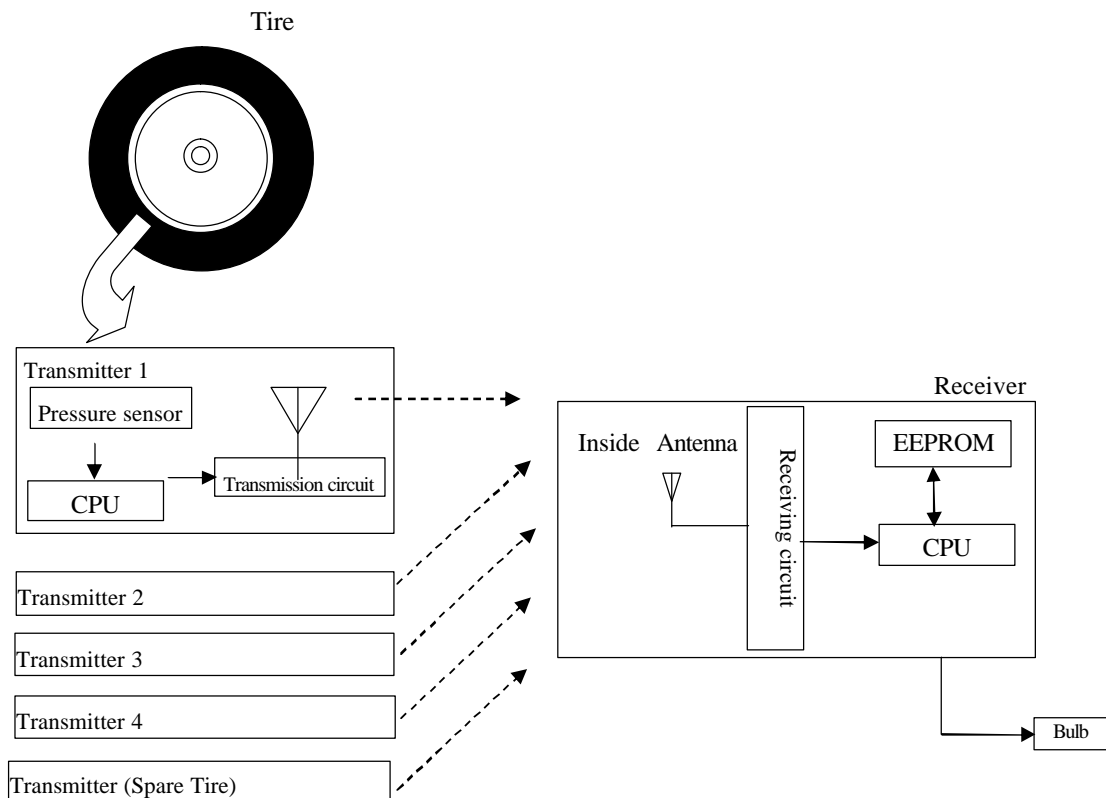
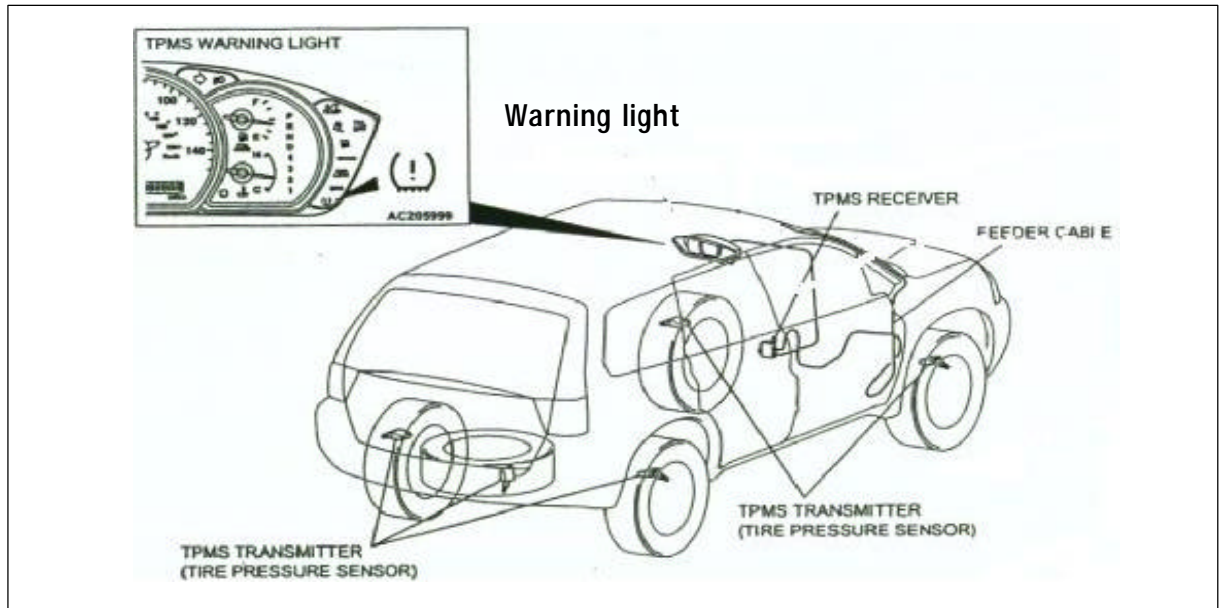


Figure 2-1 System Architecture

## 2. User's manual (provisionally)



### **Tire inflation pressure warning light**

This light illuminates if the inflation pressure of any tire (except for compact spare tire) drops while the ignition key is in the “ON” position. It normally illuminates when the ignition key is turned to the “ON” position and goes off a few seconds later.

### **If the warning light illuminates while driving**

Avoiding hard braking, hard steering, and high speeds, drive to the nearest gas station or authorize car dealer and adjust the tire inflation pressures.(except for compact spare tire)

### **If the warning light blinking while driving**

It is thought abnormality of the device, go to the check to the nearest car dealer as soon as possible.

### **Whenever the tires and wheels are replaced with new ones**

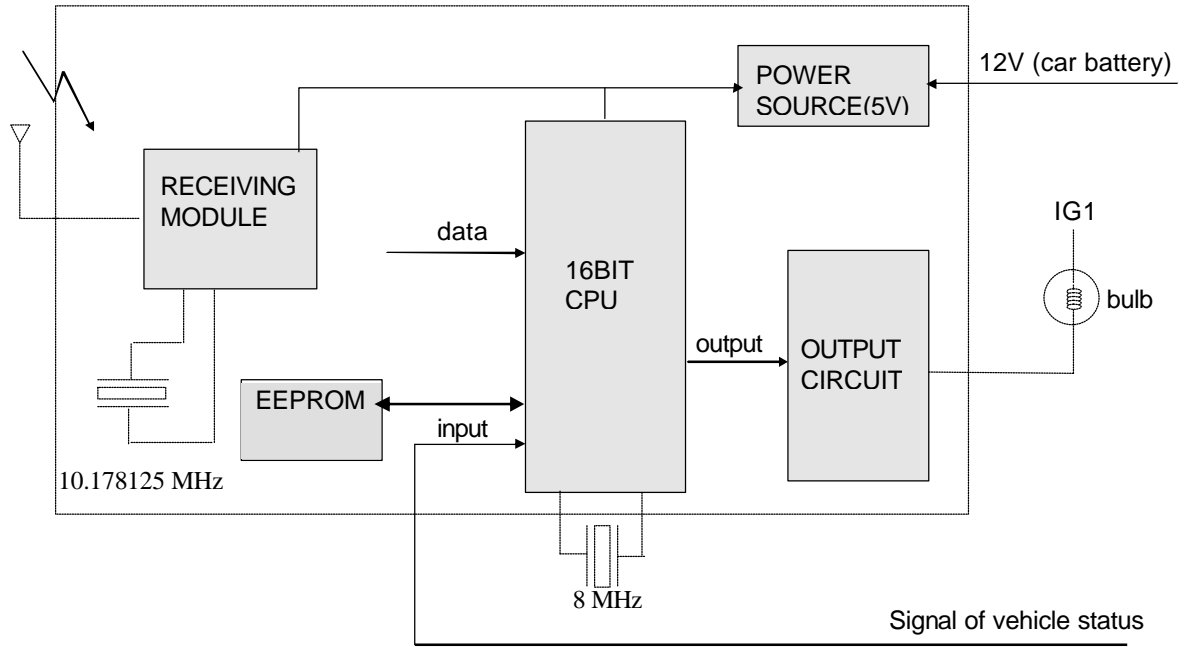
Tire inflation pressure sensors must be fitted on the new wheels and their ID codes must be programmed into the system. Have tire and wheel replacement performed by an authorized car dealer to avoid the risk of damaging the tire inflation pressure sensors.

## **CAUTION**

- If the tire inflation pressure warning-light does not illuminate when the ignition key is turned to the “ON” position the system may be faulty.
- If the tire inflation pressure warning light illuminates while you are driving, avoid hard braking, hard steering, and high speeds. Otherwise, you could make the vehicle unstable and have a serious accident.
- The tire inflation pressure warning light may not illuminate immediately in the event of a tire blowout or rapid leak..

### 3. Block diagram

This is the block diagram concerning to the receiver.



**Figure 3.1** block diagram of the receiver

## 4. Specification

### 4.1 CPU

<b>TYPE</b>	M301N2F8T-FP
<b>Memory type</b>	Manufacture : Renesas Flash memory
<b>ROM (bytes)</b>	64K
<b>RAM (bytes)</b>	3K
<b>Operating voltage (V)</b>	4.2 to 5.5
<b>Operating temperature (°C)</b>	-45 to 85
<b>Operating frequency (MHz)</b>	16
<b>Timer (ch)</b>	16bit x 1 8bit x 4
<b>DMAC (ch)</b>	-
<b>Serial I/O</b>	Clock Sync./UART x 2
<b>A/D converter</b>	10bit x (12 + 2) ch
<b>D/A converter</b>	8bit x 1
<b>External Interrupts (sources)</b>	8
<b>CRC Operation Circuit</b>	-
<b>Watchdog Timer</b>	Avl.
<b>CAN (ch)</b>	1
<b>Special function</b>	CAN SIO Sub clock Serial I/F
<b>Remarks</b>	Automobile

### 4.2 EEPROM

Local clock frequency	315 MHz
Frequency generation	Crystal resonator
Modulation	Single Superheterodyne
Bandwidth	± 200KHz
Sensitivity	30dBuV

### 4.3 RF block

Type	S-93C66AMFN-TB
	Manufacture : ETC
Memory	4Kbit
Package	8pin SOP

### 4.4 Others

Dimension	95mm×85mm×30mm
Weight	180g
Battery	Car Battery (DC 12V)
Operation Voltage	DC 12V, 20mA
Operation temperature	-30? ~ +85?

## 5. Features

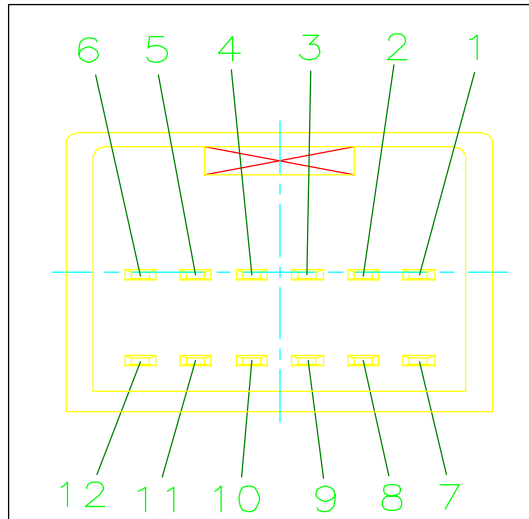
### Battery saving

The receiver works intermittently to reduce the battery consumption. The microcomputer embedded on the receiver controls the power supply for the RF circuit. In case of the microcomputer detects the wake-up signal during the power supplied, the microcomputer continue supplying the power until the data frame will be received.



## 6. Connector

This is the pin assignment of the connector.



**Figure 6.4.1** the shape of the connector

PIN	DESCRIPTION
1	B+
2	VEHICLE SPEED
3	K-LINE(SCAN TOOL)
4	PARK BRAKE SW
5	LIGHT SW
6	TEST MODE
7	ALT'R-L
8	IGN1+
9	CHIP HORN
10	WARNING LAMP
11	GND
12	NC

**Figure 6.4.2** This is the pin assignment of the connector

## 7. Difference between 96486309 and 96486310

96486309 : When OKA-450R Receiver is using with the OKA-210T model which send the data when Tire Pressure is less than 210 kPa, the part number “96486309” is assigned.

96486310 : When OKA-450R Receiver is using with the OKA-220T model which send the data when Tire Pressure is less than 220 kPa, the part number “96486310” is assigned.