

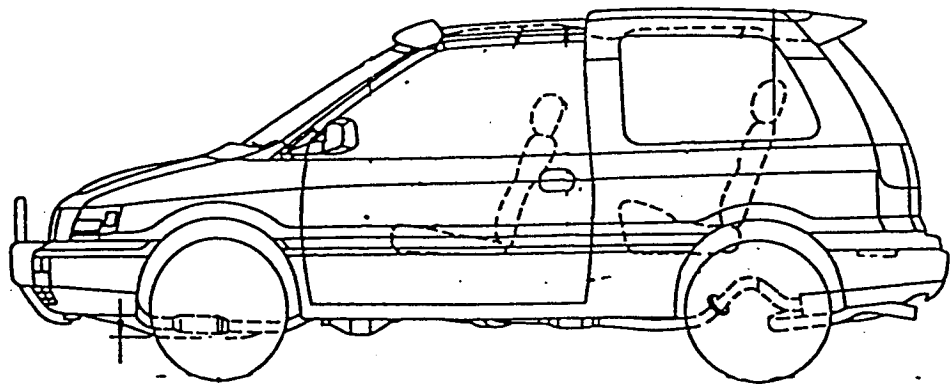
1. Constitution of the Radio Frequency Keyless Entry System for Vehicle

The radio frequency keyless entry is a system that it controls locking and unlocking the vehicle door and anti-theft protection using wireless remote controller. This system consists of two components. The TRANSMITTER is a device that transmits the signal when the button is pressed.

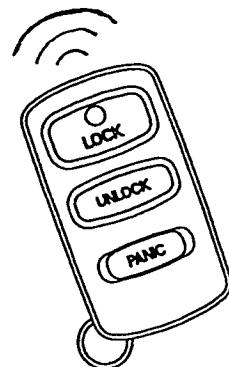
The transmission signal consists of several synchronous codes, unique identification code, security code and function code. The RECEIVER is fixed inside the vehicle. It works intermittently to prevent the battery exhaustion. When the receiver detects the synchronous code, it runs continuously to receive the signals completely.

After receiving the signal, the receiver decides which operation will be performed. The user can select the following operations by pressing the button of the remote transmitter.

OPERATION	ACTION
LOCK	lock the door
UNLOCK	unlock the door
TRUNK	open the trunk
PANIC	Vehicle is disarming will be start sounding the horn and flushing the hazard lamp intermittently



Transmitter
f = 315MHz



4. Specification

4.1 CPU

Type	μ PD750006-xxx(8bit) Manufacturer: NEC Corporation
ROM	4096 $\times$ 8 bit
RAM	512 $\times$ 4 bit
Clock frequency	4.19MHz
Clock frequency generation	Crystal resonator
Package	44pin QFP

4.2 EEPROM

Type	S-29131AF Manufacturer : Seiko Elec.
Memory	1kbit
Package	8pin SOP

4.3 RF Receiver Module

Type	WMF-R15 Manufacturer : Mitsumi Elec.
Local clock frequency	315MHz
Frequency generation	Crystal resonator
Modulation Scheme	AM
Carrier Detect Sensitivity	5 dBuVemf

4.3 Others

Dimension	60mm $\times$ 62mm $\times$ 25mm
Weight	75g
Battery	Car Battery (DC 12V)
Operation Voltage , Current	DC 12V, 10mA
Operation temperature	-30°C ~ +80°C

5. Features

5.1 Door lock control

The receiver sends "LOCK" signal to door-lock controller when LOCK button of transmitter was pressed. receiver also sends "UNLOCK" signal to door-lock controller when UNLOCK button of transmitter was pressed. These facility doesn't work if the key is inserted the key cylinder or the door is open.

5.2 Automatic locking

The receiver sends "LOCK" signal to door-lock controller if the door has not opened within 30 seconds after UNLOCK button of transmitter was pressed. This facility helps accidental pressing the UNLOCK button such the transmitter is a pocket.

5.3 Battery saving

Because of the power source of the receiver is car battery, it is very important problem to minimize a power consumption. The receiver's CPU works intermittently to prevent the battery exhaustion.

5.4 Receiver exercise software

The normal transmission operation of the receiver is conducted by a battery which is installed within a vehicle. For the measurements purpose a regulated DC power supply is used instead the battery of the vehicle. reception of the receiver was conducted by operating intermittently a transmitter with the lock condition. is no difference between the lock and unlock condition regarding the electrical and mechanical functions of a receiver. Also there is no deference between both conditions regarding the frequency of radiated emission. The only difference is the reception time. The following is no explain the difference:

- A receiver received the transmission code from a transmitter when the receiver is the "ON" condition.
- The "ON" condition of the receiver continues until the reception of the transmission code shall complete.
- After the reception of the transmission code shall complete, a door lock actuator shall operate.

