

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

The radio frequency keyless entry system controls door lock/unlock by wireless remote control. This system consists of 2 components : the TRANSMITTER and the RECEIVER.

The TRANSMITTER, when activated by pressing the appropriate button, sends a signal that consists of several synchronous codes, unique identification code and security code and function code.

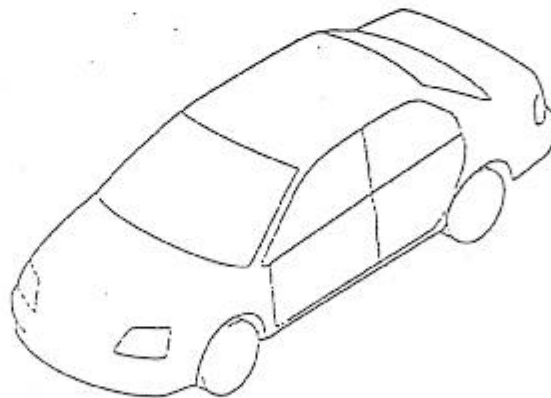
The second component is the RECEIVER, which is installed in the vehicle.

It works intermittently to reduce the battery exhaustion of the car.

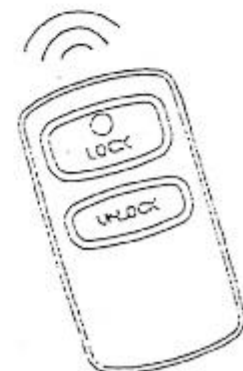
It runs continuously to receive signals completely when it detects the synchronous code.

The user can select the following functions by pressing one of two buttons on the TRANSMITTER.

BUTTON	FUNCTION
LOCK	Lock the door
UNLOCK	Unlock the door



Transmitter
 $f = 313.85\text{MHz}$



4. Specification

4.1 CPU

Type	MB89637(8bit) Manufacturer: FUJITSU
ROM	32K × 8 bit
RAM	1024 × 8 bit
Clock frequency	8.18MHz
Clock frequency generation	Crystal resonator
Package	64pin QFP

4.2 EEPROM

Type	S93C46AMFN Manufacturer: Seiko instruments.
Memory	1Kbit
Package	8pin MSOP

4.3 RF Receiver Module

Type	G8X-26RX Manufacturer: Murata industry
Local clock frequency	313.85MHz
Frequency generation	SAW resonator
Modulation Scheme	FM
Carrier Detect Sensitivity	3 dBuVemf

4.4 Others

Dimension	187.3mm × 80.6mm × 39.5mm
Weight	250g
Battery	Car Battery (DC 12V)
Operation Voltage , Current	DC 12V, 30mA
Operation temperature	-30°C ~ +75°C

5. Features

5.1 Door lock control

The RECEIVER sends "LOCK" signal to the door-lock actuators when LOCK button on the TRANSMITTER is pressed. The RECEIVER also sends "UNLOCK" signal to the door-lock actuators when UNLOCK button on the TRANSMITTER is pressed.

These functions don't work if the key is in the key cylinder.

5.2 Automatic locking

The RECEIVER sends "LOCK" signal to the door-lock actuators if any of the doors are not opened within 30 seconds after UNLOCK button on the TRANSMITTER is pressed.

This function prevents the key from continuing the state of UNLOCK when the UNLOCK button is pressed by accident, such as the key is in user's pockets.

5.3 Battery saving

Because the power source of the receiver is the car battery, it is very important to minimize power consumption. The RECEIVER (CPU: within RECEIVER) works intermittently to reduce the battery exhaustion.

6. SUPPLEMENT

G8C-226M-D is an integrated controller for function of the car, such as door lock (includes the keyless entry), theft alarm, turn signal-light, interior light, power window timer, ignition key illumination, warning buzzer, etc. This controller has many input and output signals, some of them are concerned with the keyless entry system. This document refers only to keyless entry system (not refers to other functions.)

7.5 Connector

This is the pin assignment of the connector on keyless entry.

No.	I/O	Assignment	Memorandum
2		Battery(Door Lock)	For Door Lock Motors
3		GND(POWER)	For Signal Control Circuit
7	INPUT	All Door Switch	All door is opened (Active Low)
8	INPUT	Ignition	
12	OUTPUT	Lock(Door Lock Motors)	(Active High)
13	OUTPUT	Unlock(Door Lock Motors)	(Active High)
30	INPUT	Handle Lock Switch	Ground
50		GND(SIGNAL)	Connects receiver with front ECU
53		SWS DATA	(Active Low)
44	OUTPUT	Normal Horn	For Answer Back

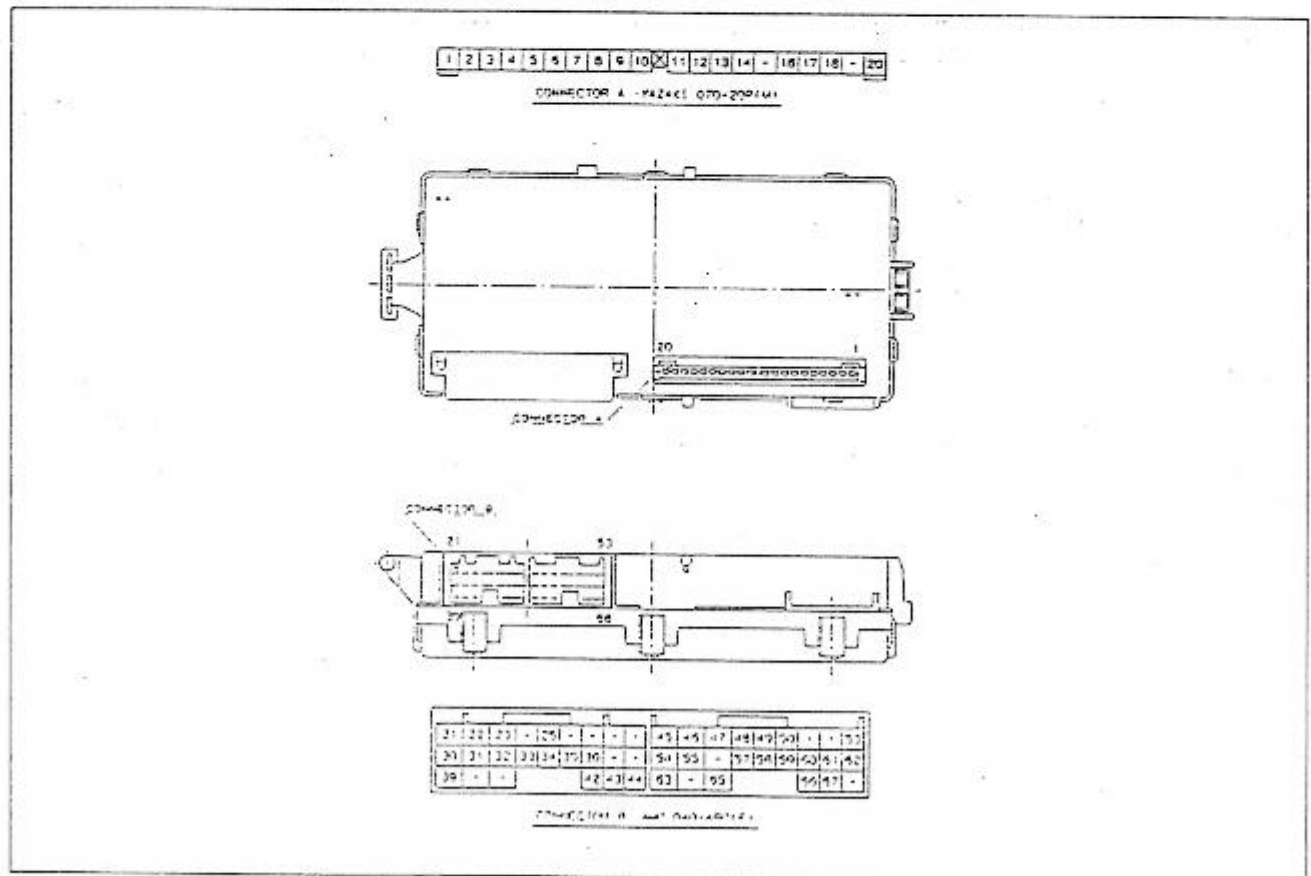


Figure 7.5 Terminal arrangement