1. Constitution of the Radio Frequency Keyless Entry System with Door Lock Controller for vehicle

The radio frequency keyless entry is a system that it controls locking and unlocking the door by 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, and 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 (the driver side first, then all doors)
PANIC	The horn is beeped, and the headlight and flasher are blinked

This receiver also controls wired operation. It is available to control the door lock status by using the silicon switch or the remote door control switch (both driver's and passenger's side).

Transmitter
f =313.85MHz

4. Specification

4.1 CPU

Type	uPD754244GS-xxx-BA9 (4bit) Manufacturer: NEC Corporation
ROM	4K bytes
RAM	128 bytes
EEPROM	16 bytes
Clock frequency	4.19MHz
Clock frequency generation	Ceramic resonator
Package	20pin SOP

4.2 RF block

Carrier frequency	313.85MHz
Frequency generation	SAW resonator
Modulation	FSK
Bit transmission rate	1000bps or 500bps
Bandwidth	120KHz
RF output power (field strength)	2000 μ V/m at 3m

4.3 Others

Dimension	58.2mm × 30.7mm × 12.6mm
Weight	20g
Battery	Lithium cell (CR2025) Manufacturer: TOSHIBA Battery corporation
Operation Voltage	DC 3V, 20mA
Operation temperature	-20℃ ~ +60℃

5. Features

5.1 Transmission frame

The transmission begins immediately in case of LOCK or UNLOCK button is pressed.

The transmission frame consists of the synchronous frame and the data frame. The synchronous frame has 33 synchronous codes that it will be used for the receiver to wake up. The data frame consists of 28-bit length identification code, 16-bit security code and function code. 256 million different identification codes are available. The security code is always changed in case of any of the buttons is pressed. The transmission time is typically 600 milliseconds.

5.2 Battery saving

To prevent the battery exhaustion, the microcomputer of the transmitter is usually inactive. When the button will be pressed, the microcomputer wakes up immediately and judges which button is pressing. Then the microcomputer constructs the transmission frame and radiates it from the antenna. After transmitting, the microcomputer switches stand-by mode by itself.