Operational Description

1. Organization and summary

1) Included : a. Transmitter
b. Receiver

2) Summary

This products is for keyless entry for vehicle and use 433.92MHz.
Main function is including remote engine start, automatic/manual door lock/unlock, door open/shock detect, panic siren, trunk open, engine start kill, arm/disarm.

2. Circuit

1) Transmitter

When Pin 24 of IC03 provides "High" signal and "Low" signal comes out from Pin 25, Base Bias is supplied to Q14, and X02 is oscillated and transmitting frequency(433.92MHz) is generated by Q14 and the surrounding elements.

At this moment, when Pin 24 of IC03 is converted to "Low" signal, transmitting frequency is OFF. Again, when Pin 24 of IC03 is converted to "High" signal, transmitting frequency is ON.
By using this method, it generates "A1A" frequency and transmit the data.

Transmitting frequency(433.92 MHz) oscillated by Q14 and X02 comes out through C20, and then the transmitter power goes through R32 and Forward Bias is filtered by D11 and then the current flow to L04.
Due to short status of inside of D11, the transmitting frequency came through C14 passes by D11, and goes through C27 and then come to be discharged through Antenna.

2) Receiver

When Pin 25 of IC03 provides "Low" signal, Receiving signal caused from Antenna comes into through C27 and Forward Bias is filtered at D11 by the power supplied to Pin 25 of IC03 at R33 and current flows to L04.
Receiving signal comes into C31 through D11, only the required substitute receiving frequency goes through by tuning circuit of L05, C32 and then entered to Pin 9 of IC05 through C33.

The receiving signal entered to Pin 9 of IC05 is amplified by the internal amplification circuit and come out to Pin 7, and then, it is filtered by the tuning circuit of L06 and C35, and go into Pin 6 through C36.
At this moment, receiving frequency(F_R) generates F_L+F_R and F_L-F_R through Local frequency (F_L) and Mixer, and only F_L-F_R (1.8 MHz) goes through internal IF Filter, and output to Pin 4.

And Local Frequency(F_L) is Phase locked loop(PLL) method and Local Crystal is made by F_R -

0.27MHz ÷ 64.
The receiving signal came out from Pin 4 goes into Pin 3 through C45 and then converted to Audio Signal through internal AMP and Filter and then comes out to Pin 11 through internal Comparator of IC.
Again, it is entered to Pin 21 of IC03 through R40 and analyze.

3) General Descriptions
The 1st receiving signal entered to receiving part includes the signal goes into Pin 21 of IC03 through IC05 and the signal goes into Pin 2 of IC03 through IC06.
The signal of Pin 21 of IC03 is the received data signal and signal goes into Pin 2 is the signal amplified Auto Gain Control(AGC) signal of IC05 at IC06.

When the 2nd signal of above becomes a level of specified size by converting A/D of inside of IC03, it verify the received data and ID registered at EEROM(IC04).
When it coincides with the registered ID, the response signal is transmitted to receive the 2nd confirming signal at the fixed time.

When the 2nd confirming signal is received at the fixed time, data is analyzed and lock system is released.
Also, when the signal by the button of Remote Controller is entered at Receiving part, the signal come out from IC06 is disregarded and the ID registered at internal EEROM(IC06) is inspected. If correct, the related function of the button is performed.

4) Other Descriptions
The selection value of Dip switch is set, when the first power is supplied.
Surrounding elements of Q01-Q05 connected to J101 is used to transmit the input status of the outside to IC03.
Surrounding elements of Q08, Q06 connected to J106 is used to transmit to IC03 after receiving the signal of shock sense.
Shock Sensor senses the load added to the vehicle.

IC02 is operated by receiving data from IC03, and the signal come from here is connected to the outside by J102 and J103 through IC01 and Buffer of Q11.
And Output is made to Pin 5, 6 of J102 through the surrounding elements of Q9, Q10, and the signal is used to operate Door Lock/Unlock of vehicle.
And output is made to 2, 3 of J102 passed through RY01 and D05, 06, and the signal is used to operate Parking Light.

And Q12, Q13 operate the Siren connected to the outside through Pin 4 of J102. The signals connected to J103 is used to control the engine start through Relay Unit.
Q11 is used to operate the trunk located at outside through Pin 7 of J102.
Q07 is used to sense the vehicle key and to transmit the status of key input to IC03.

J105 corresponds with JC103 and Expansion Controller located at the outside for the data, and

this equipment can operate the additional functions and the actual main status.
R26, R27, C11 control to sense the battery status of vehicle by using internal A/D of IC03 and display to user if sensed abnormals.
R19, R20, D10, C08 prevent the power noise occurred from power, and it is the reset circuit to prevent the wrong operation of IC03.

Surrounding elements of IC07, IC08 is used to reduce the noise of vehicle as 1st step,
and also reduce the noise caused from power by separating the power of Digital and Analog circuit.