PRODUCT SPECIFICATION AND MANUAL

2018.11

BUYER / PROJECT	SYMC / Y400
BUYER MODEL	PCB PACKAGE ASSY – SMART KEY
PART No.	
COMPANY	MOTOTECH Co., Ltd.
MAKER/NATION	MOTOTECH Co., Ltd./Republic of Korea
DRAFT PART	Research Center/Design 1team
DRAFTER	J.Y.HAM

Table of Contents

1. Contents

TYPE	Wireless controller about wireless electronic equipment of specific

Title	Certification Request Document		
Project Name	C300	Drawn	2018-11-08
Model Name		Released	2018-11-08
		Made by	J.Y.HAM

	low output radio station
MODEL NAME	PCB PACKAGE ASSY – SMART KEY
USAGE	Vehicle of door keyless controller what use 125KHz & 433.92 MHz frequency
SUMMARY	1. This equipment use semiconductor and integrated circuit, so it designs to get high reliability. 2. This equipment use oscillation circuit of crystal, so it designs to satisfy about legally frequency an allowable error and bandwidth of exclusive frequency. 3. The transmitter has each other specific identification code. 4. The power use Li-ion coin Battery (DC 3.0V)
COMPOSITION	1. RF Transmitter part – Pattern Antenna 2. LF Receiver part – 3D LF Antenna

2. ELECTRONIC SPEC

UNIT / List	TRANSMITTER
Rated voltage	DC 3.0V
Voltage range	DC 2.7 ~ 3.3V
Operating Temperature range	-10 ~ +60℃
Storage temperature range	-30 ~ +80℃
Dark current	6.0μA ±0.4uA

3. Specification

TYPE	PCB PACKAGE ASSY – SMART KEY

NAME	Wireless controller about wireless electronic equipment of specific low output radio station
Equipment List	RF Transmitter, LF Receiver
Frequency	RF : 433.920MHz, LF : 125KHz
Antenna composition	Pattern ANTENNA, LF ANTENNA
Oscillation method	Crystal oscillation
Modulation method	FSK
Communication method	Two-Way Communication
Frequency multiplier	32 multiplier
Working voltage	DC 3.0V(Li-ion Battery CR2032 x 1EA)

4. Repair of Unit & Circuit Explanation

4.1 Repair of Unit

- Exchange an old unit.

4.2 Circuit Explanation

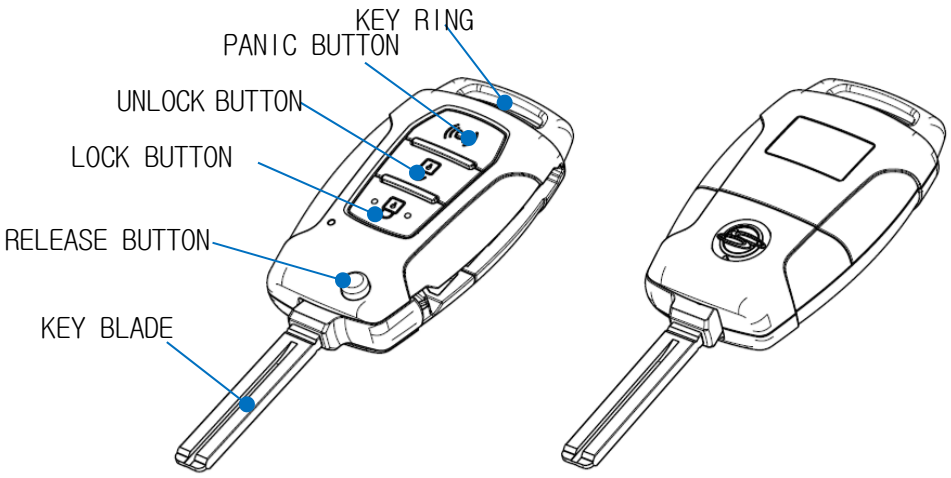
- If User presses specific Switch of transmitter, MCU(U1) makes inherent serial value and encryption value, so it is transmitted to the FSK&ASK pin of TX_IC, at the same time, TX_IC gets to be ENABLE.

- Printing data are falsified into Tx_IC and it synthesize through crystal(X1). synthesized frequency is multiplied and amplified by Tx_IC, it transmits through pattern antenna from output matching circuit.

- FOB receives random data through LF Antenna and prints to encrypt result value from MCU, at the same time TX_IC get to be ENABLE. As following, it transmits pattern antenna how to change falsification, synthesis, and multiplier.

5. The Method of Unit Operating

5.1 REMOTE OPERATING METHOD



[PICTURE OF UNIT]

FUNCTION		SWITCH FUNCTION
LOCK BUTTON	DOOR LOCK	SHORT PRESSING LOCK BUTTON OVER 0.03s - LED flicker once as short time
UNLOCK BUTTON	DOOR UNLOCK	SHORT PRESSING UNLOCK BUTTON OVER 0.03s - LED flicker once as short time
PANIC BUTTON (Non-PTG)	PANIC	LONG PRESSING PANIC BUTTON OVER 1.5s - LED flicker once as short time
Tailgate Open BUTTON (PTG)	TAILGATE STOP	SHORT PRESSING PANIC BUTTON OVER 0.03s
	TAIL GATE OPEN	LONG PRESSING PANIC BUTTON OVER 1.5s - LED flicker once as short time

6. The System of Each Unit Code Discrimination

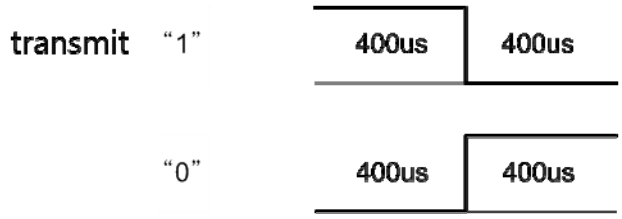
6.1 TRANSMISSION CODE

RKE RF DATA : 12EA Manchester Code(12bits) + 88 bits

- 8 Codes : Preamble
- 8 bit : Runin
- 4 Codes : Sync
- 4 bit : FN
- 16 bit : ID
- 16 bit : SEQ NO
- 32 bit : SEQ RES
- 8 bit : CRC
- 4 bit : Runout

RF ATA after LF received : 8EA NRZ Code(8bits) + 68bits
- 8 Codes : Preamble
- 16 bit : CV
- 7 bit : FLAGS
- 32 bit : AUTH RES
- 8 bit : CRC
- 4 bit : Runout

6.2 DATA STRUCTURE (“1", "0”)



FCC

Part 15.19

This device comply with part15 of FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device & its accessories must accept any interference received, including interference that may cause undesired operation.

Part 15.105

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.

Part15.21

Changes or modifications not expressly approved by the manufacturer (or party responsible) for compliance could void the user's authority to operate the equipment