50J1

Transmitter, RF Keyless Entry System

50J1NP

Table of contents

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 MODE	Flush the light, flush the small light, and beep the horn. （it continues 30 seconds）

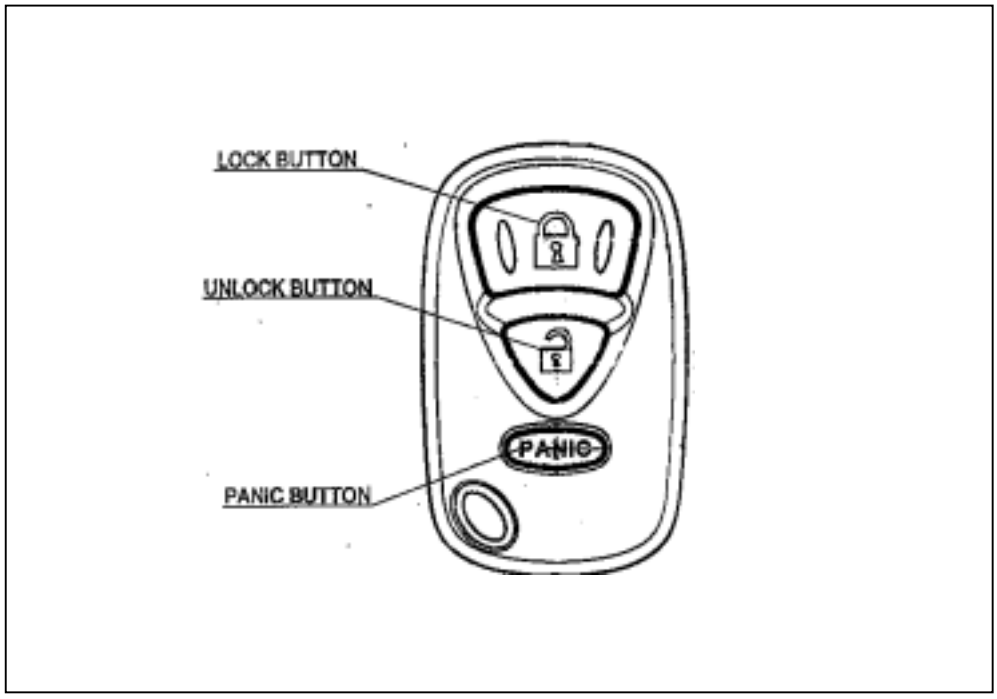
This receiver also controls wired operation. When the key is in the driver's side key cylinder, all doors will Unlock if the key is turned to UNLOCK and hold more than one second. In case of the operation time is shorter, the only driver's side door is mechanically unlocked. It is also available to control the door lock status by using the remote door control switch (both driver's and passenger's side).

Transmitter
f =315.1MHz

-

2. User’s manual (provisionally)

REMOTE TRANSMITTER



You can lock and unlock your vehicle with the remote transmitter.

LOCK

When you push the LOCK button, all the doors will lock.

You cannot lock any of the doors with the remote transmitter if any door is open or the key is in the ignition switch.

UNLOCK

When you push the UNLOCK button once , only the driver’s door unlocks. The remaining door unlock when you push the button a second time. If you unlock the doors with the remote transmitter, but do not open any of the doors within 30 seconds, the doors will automatically relocked.

You cannot unlock any of the doors with the remote transmitter if the key is in the ignition switch.

PANIC MODE

Panic mode allows you to remotely sound your vehicle’s horn to attract attention. To activate this mode , press and hold the PANIC button for about one seconds. Your vehicle’s horn will beep for about 30 seconds.

To cancel Panic mode before 30 seconds , press any button on the remote transmitter. You can also turn the ignition switch is in ON.

-

3. Block diagram

This is the block diagram concerning to the transmitter

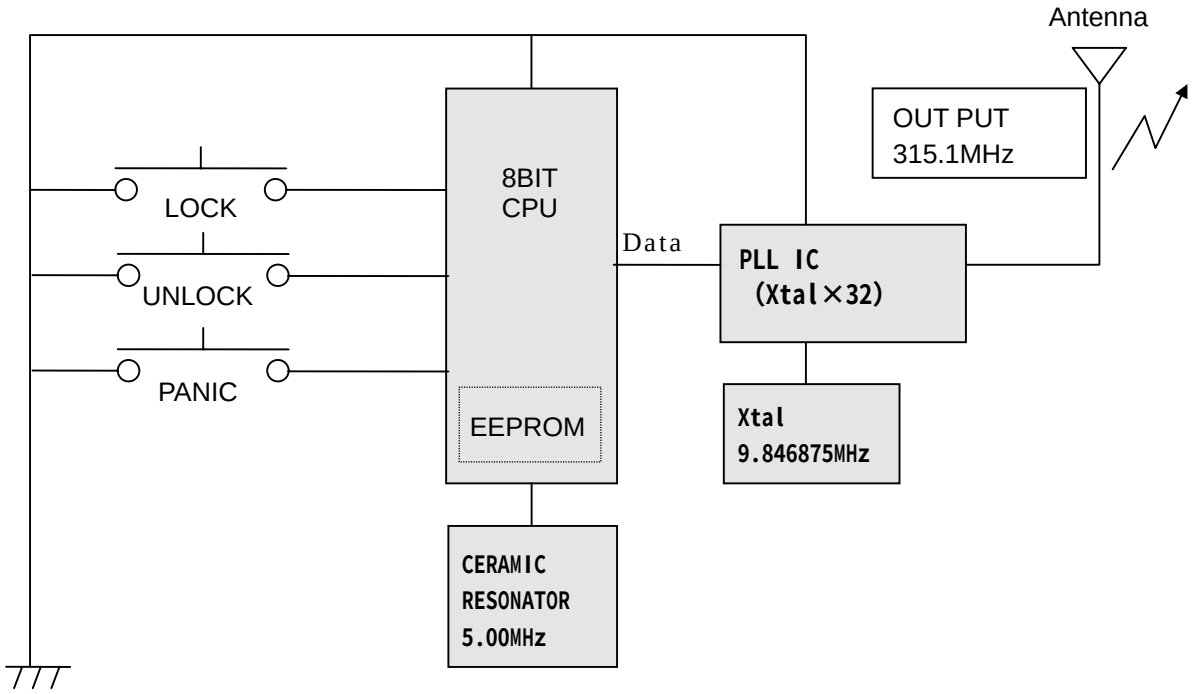


Figure 3.1 block diagram of the transmitter

Switch combination

MODEL NAME	SW QTY	LOCK	UNLOCK	PANIC
G8D-246S-A(50J1)	3	○	○	○
G8D-246S-A-NP(50J1NP)	2	○	○	×

-

4. Specification

4.1 CPU

Type	uPD789860　(8bit) Manufacturer: NEC Corporation
ROM	4K bytes
RAM	128 bytes
EEPROM	16 bytes
Clock frequency	5MHz
Clock frequency generation	Ceramic resonator
Package	20pin SOP

4.2 RF block

Carrier frequency	315.1MHz
Frequency generation	Crystal resonator
Modulation	FSK
Bit transmission rate	1000bps or 2000bps
Bandwidth	120KHz
RF output power (field strength)	10.8uW（6000μV/m）　at3m　max

4.3 Others

Dimension	55.7mm×33.8mm×11.8mm
Weight	18.0g
Battery	Lithium cell (CR2032) Manufacturer: Maxell or Panasonic
Operation Voltage	DC 3V, 220mAh
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 81 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. 1600 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 370 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.

-

6. PCB

6.1 Circuit diagram

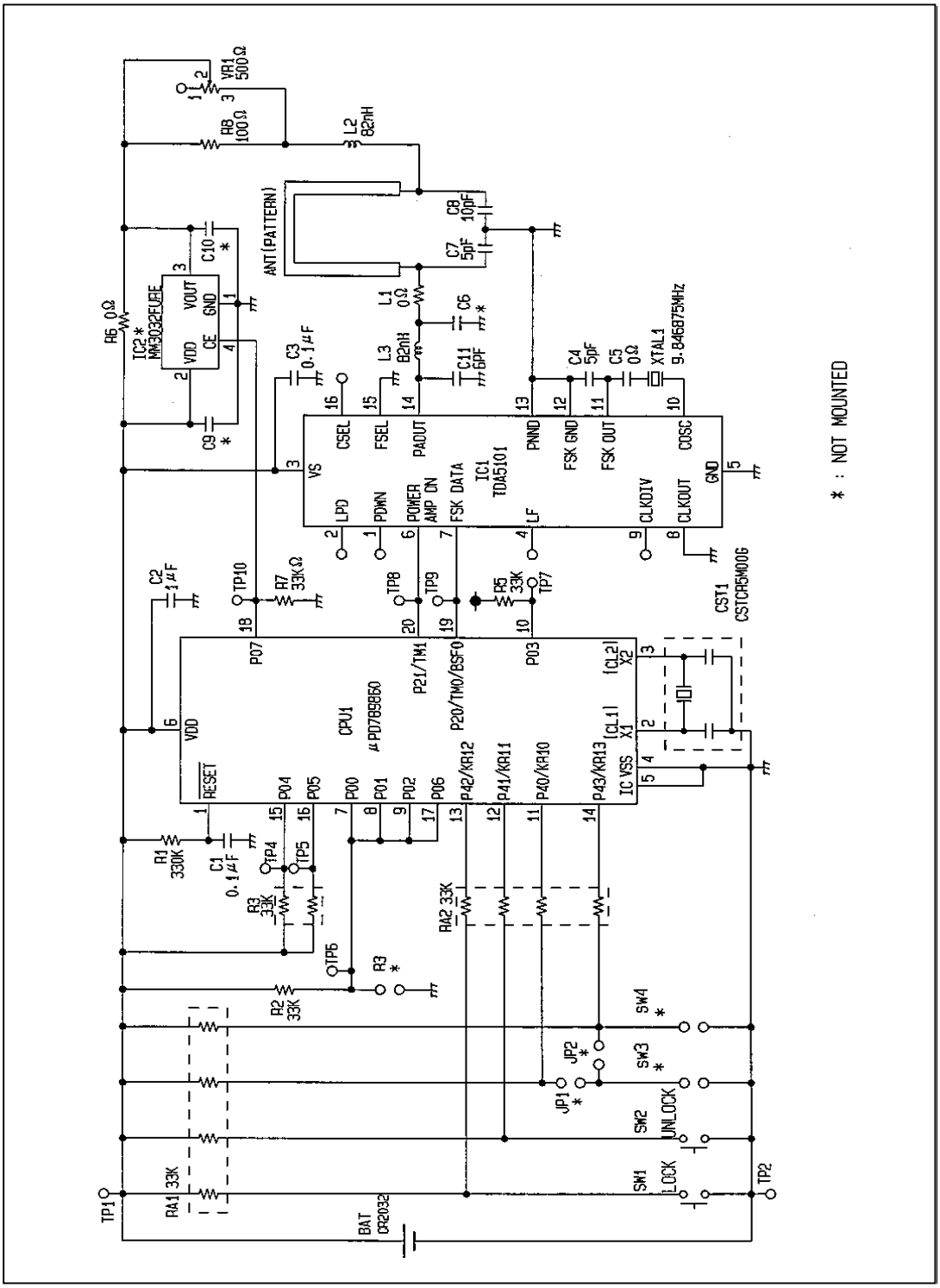


Figure 6.1.1 Circuit diagrams

-

6.2 Parts layout

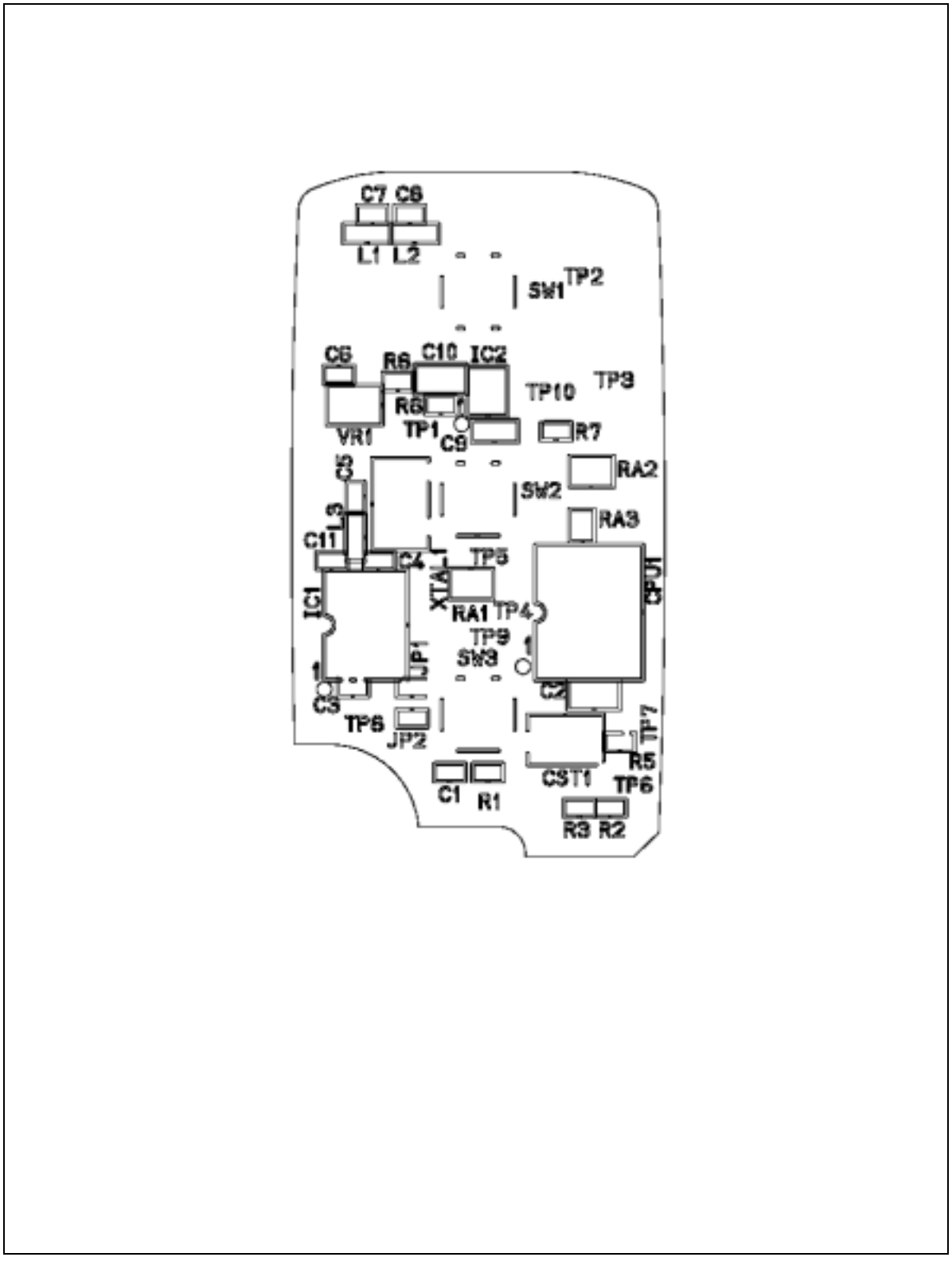


Figure 6.2.1 Parts layout (front)

-

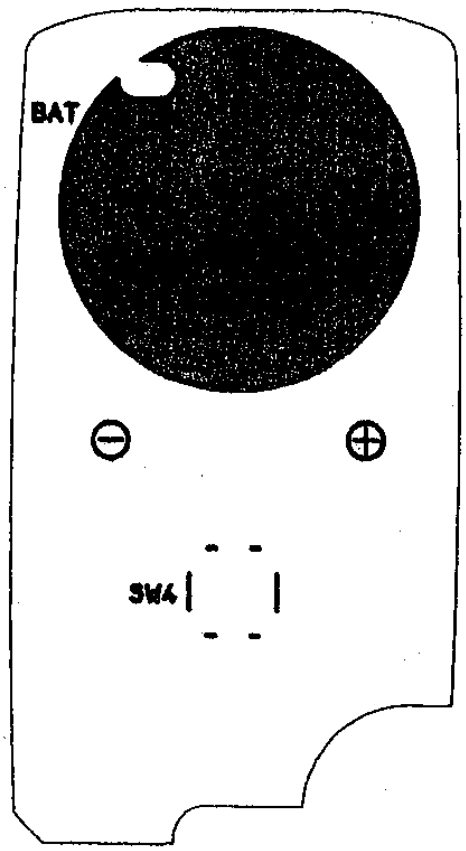


Figure 6.2.2 Parts layout (back)

6.3 Pattern layout

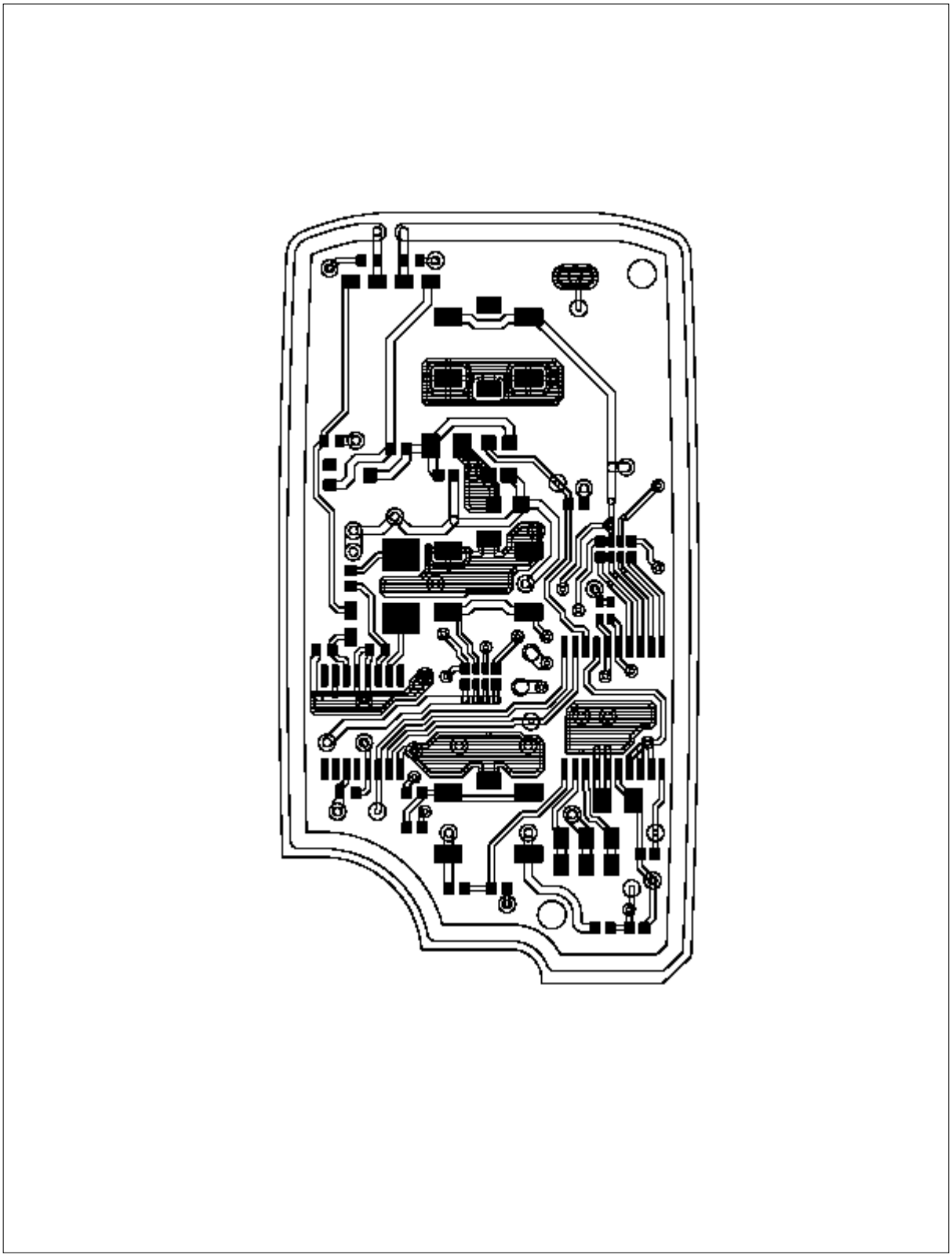


Figure 6.3.1 Pattern layout (front)

-

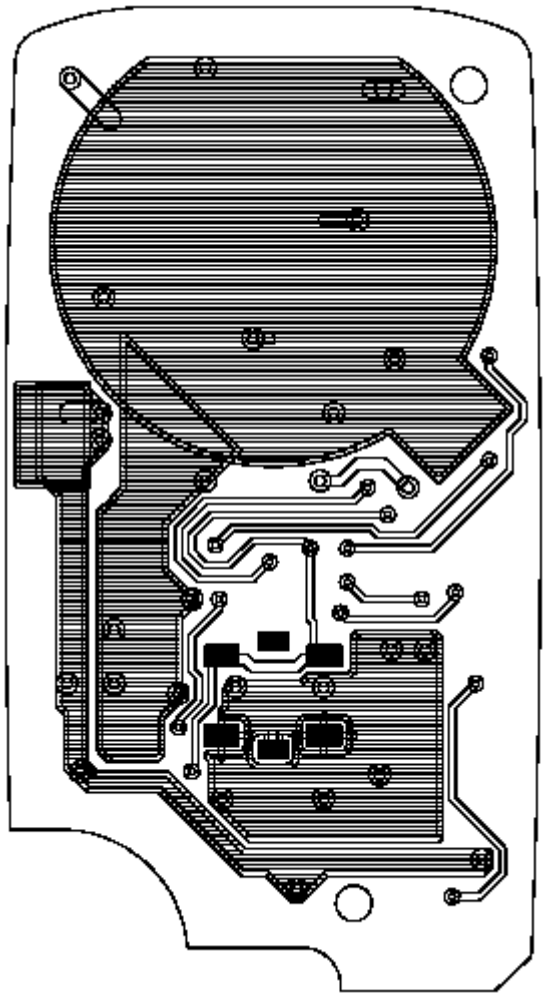


Figure 6.3.2 pattern layout (back)

-

6.4 Parts List

No	PARTS NAME	MANUFACTURE	QTY	MATERIAL/MODEL	APPEARANCE /SPECIFICATION	REMARKS
1	PWB	*	1	FR4	t=0.8	Double Sided Board
2	CPU	NEC	1	μPD789860MC	20pin SSOP	CPU1
3	IC1	INFINEON	1	TDA5101GEG	16pin PLL IC	IC1
4	CERAMIC RESONATOR	MURATA	1	CSTCR5M00G53A-R0	5.00MHz +0.5%	CST1
5	X TAL	RIVER	1	FCX-03 9.846875MHz	9.846875MHz	XTAL1
6	SMT POT	MURATA	1	POZ2AN-1-501N-T00	500 ohm 1/16W	VR1
7	RESISTOR ARRAY	PANASONIC	2	EXB28V333JX	33k ohm×4 Resistors	RA1,RA2
8	RESISTOR ARRAY	PANASONIC	1	EXB24V333JX	33k ohm×2 Resistors	RA3
9	SMT RESISTOR	*	1	RK10CAZ330KJ-T1	330k ohm 1/16W	R1
10	SMT RESISTOR	*	3	RK10CAZ33KJ-T1	33k ohm 1/16W	R2,5,7
11	SMT RESISTOR	*	1	RK10CAZ100J-T1	100 ohm 1/16W	R8
12	CERAMIC CAPACITOR	MURATA	2	GRM36B104K10PT	0.1μF 10V	C1,C3
13	CERAMIC CAPACITOR	MURATA	1	GRM40F105Z16PT	1μF 16V	C2
14	SMT RESISTOR	PANASONIC	2	ERJ2GE0R00X	0 ohm	R6,C5
15	CERAMIC CAPACITOR	MURATA	2	GRM36CG050B50PT	5pF 50V(±1%)	C4,C7
16	CERAMIC CAPACITOR	MURATA	1	GRM36CG060B50PT	6pF 50V(±1%)	C11
17	CERAMIC CAPACITOR	MURATA	1	GRM36CG100B50PT	10pF 50V(±1%)	C8
18	SMT INDUCTOR	MURATA	2	LQP11A82NG00	82nH	L2,L3
19	SMT RESISTOR	*	1	RK16CAY00-T1	0 ohm	L1
20	TACT SWITCH	PANASONIC	2~3	EVQPL5A15	350gf	*1 SW1,2,3

(KEYLESS TRANSMITTER)
G8D-246S-A-CHN SHEET No (1/2)
PARTS LIST

No	PARTS NAME	MANUFACTURE	QTY	MATERIAL/MODEL	APPEARANCE /SPECIFICATION	REMARKS
21	Battery Terminal (+)	Shoushin Seimitsu	1	C5210R-H	t=0.15	
22	Battery Terminal(-)	Shoushin Seimitsu	1	C5210R-H	t=0.15	
25	KNOB,LOCK/UNLOCK	F-PLAS	1	ABS	DOUBLE INJECTION	
26	CASE, UPPER ASSY (2SW)	F-PLAS	1	ABS	BLACK	
27	CASE LOWER	F-PLAS	1	ABS	BLACK	
28	Lithium Button Battery	PANASONIC	1	CR2032		
29	SEAL, RUBBER	F-PLAS	1	SILICON		
30	KEY RING	CPM	1	PBW	NICKEL PLATING	
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						

IC2,JP1,JP2,R3,C6,C9,C10,SW3,SW4,ARE NOT MOUNTED

※1.As for NO.20 , the number of use is different each model.

MODEL NAME	QTY	REMARKS
G8D-246S-A	3	SW1,2,3
G8D-246S-A-NP	2	SW1,2

(KEYLESS TRANSMITTER)
G8D-246S-A-CHN SHEET No (2/2)
PARTS LIST