SC6621 & SC6622 REMOTE CONTROL TRANSMITTER

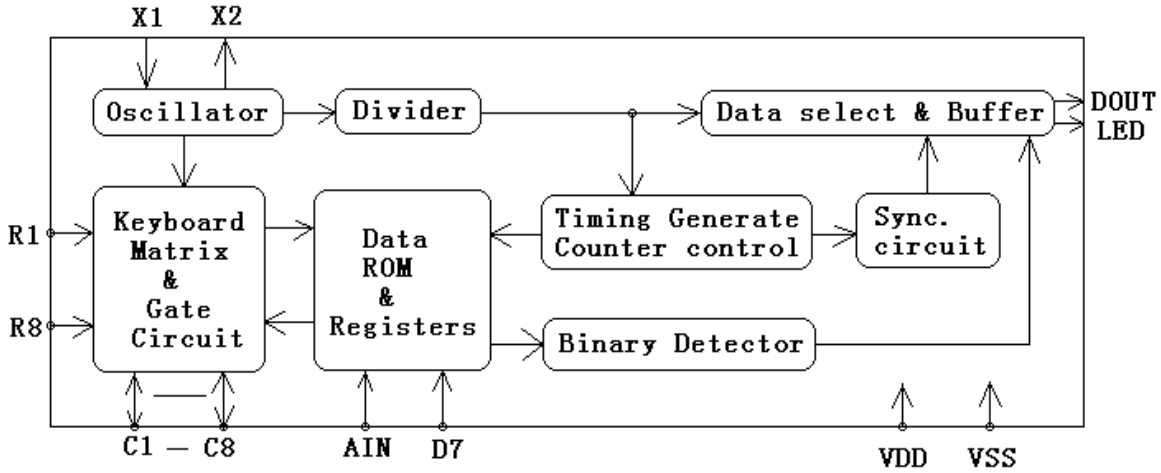
General Description:

SC6621 and SC6622 are high performance remote control transmitter COMS IC, it is specially designed for use on infrared remote control applications. The custom codes (Max.) of SC6621 and SC6622 are available by setting external diodes and resistors. The transmission code consists of “leader pulse “ 、”16 bits custom code “and” 16 bits data code”.

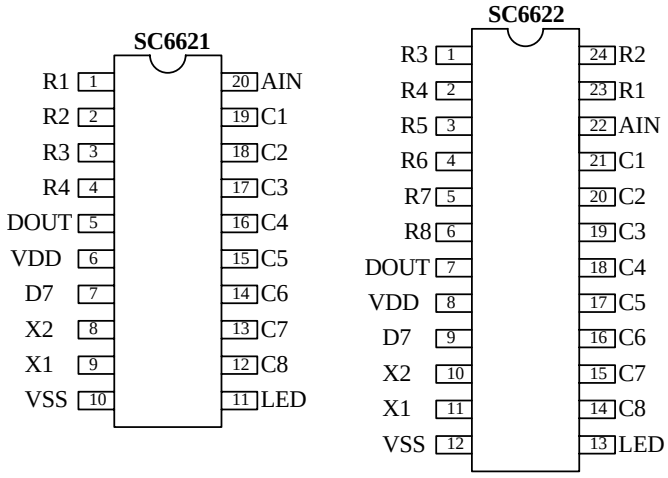
Feature Description:

- High performance CMOS technology
- Low power consumption (VDD=2.2~5.5V)
- SC6621: 32 function keys and 3double action keys
  and 54+6 function codes ate available (Using D7 pin)
- SC6622: 64 function keys and 3 double action keys
  and 128+6 function codes ate available (Using D7 pin)
- PPM(Pulse Position Modulation) code method
- Ceramic resonator frequence 455 KHz
- DOUT with a 38 KHz carrier for IR medium
- Custom codes can be selected (Using external diodes and resistors)
- SC6621-1 & SC6622-1: use the ROM1 & ROM2
- SC6621-2 & SC6622-2: use the ROM2 & ROM3

Block Diagram:



Package configuration:



Pin Description:

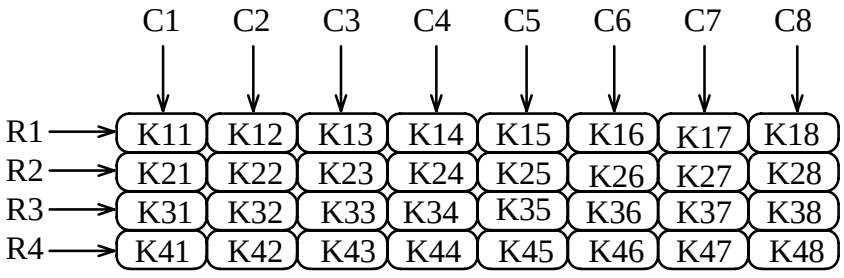
SC6621 PIN No.	SC6622 PIN No.	Pin Name	NO.	DESCRIPTION
3	1	R3	1	Row control for keyboard matrix (active high)
4	2	R4	1	Row control for keyboard matrix (active high)
-	3	R5	1	Row control for keyboard matrix (active high)
-	4	R6	1	Row control for keyboard matrix (active high)
-	5	R7	1	Row control for keyboard matrix (active high)
-	6	R8	1	Row control for keyboard matrix (active high)
5	7	DOUT	O	Serial data output with 38 KHZ carrier
6	8	VDD	P	Positive power supply
7	9	D7	I	Data code D7 setting
8	10	X2	O	455 KHz resonator oscillator output
9	11	X1	I	455 KHz resonator oscillator input
10	12	VSS	P	Negative power supply
11	13	LED	O	Indicator LED output
12	14	C8	I/O	Column control for keyboard matrix
13	15	C7	I/O	Column control for keyboard matrix
14	16	C6	I/O	Column control for keyboard matrix
15	17	C5	I/O	Column control for keyboard matrix
16	18	C4	I/O	Column control for keyboard matrix
17	19	C3	I/O	Column control for keyboard matrix
18	20	C2	I/O	Column control for keyboard matrix
19	21	C1	I/O	Column control for keyboard matrix
20	22	AIN	I	Low byte of custom codes (8 bits) scan input
1	23	R1	I	Row control for keyboard matrix (active high)
2	24	R2	I	Row control for keyboard matrix (active high)

Functional Description

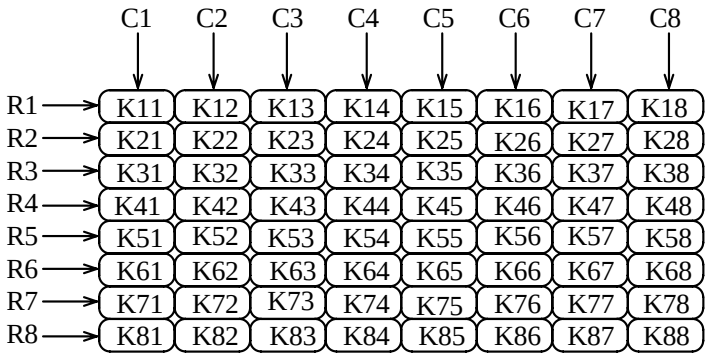
Keyboard scan

SC6621 and SC6622 Stay in the stand-by state, the oscillator is OFF and stand-by current <1uA. The SC6621 consists of 32 function keys and SC6622 consists of 64 function keys. The keyboard form of the SC6621&SC6622 are as shown.

◆ The SC6621 keyboard form:



◆ The SC6622 keyboard form:

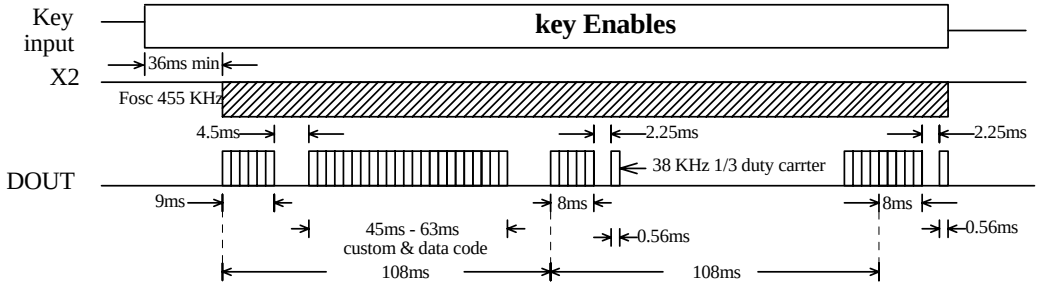


Transmission codes

When one of the keys (32 keys of 64 keys) is triggered over 36 ms, the oscillator is enable and the IC is activated. If the key is pressed and held for 108 ms or less, the 108 ms transmission codes of the SC6621&SC6622 consist of a 9 ms header code, a 4.5ms off code, 16-bits custom codes (18ms-36ms), 8-bits data codes (18ms-9ms).

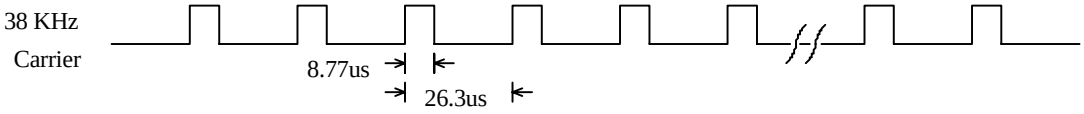
After the pressed key is held for 108ms, if the key is still held down, the transmission codes turn out to be a composition of header code (9 ms)and off code (2.5ms)only.

The following is an illustration of the transmission codes:



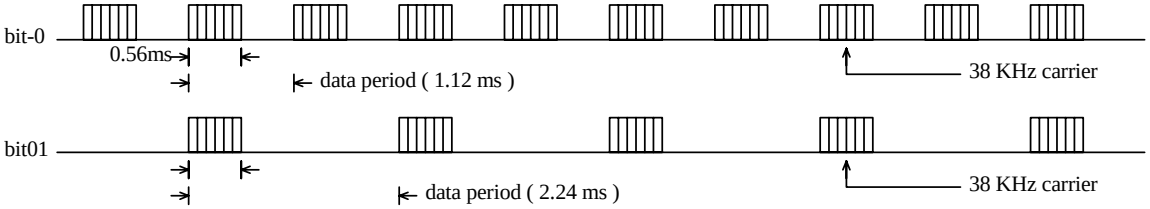
Output format for the DOUT

The output cattier (38 KHz) of the DOUT pin:



38 KHz carrier form

The transmission codes employ the PPM (Pulse Position Modulation) method to represent their two logic states by bit-0 (1.12 ms) and bit-1 (2.24 ms):



bit-0 and bit-1 Logic states form

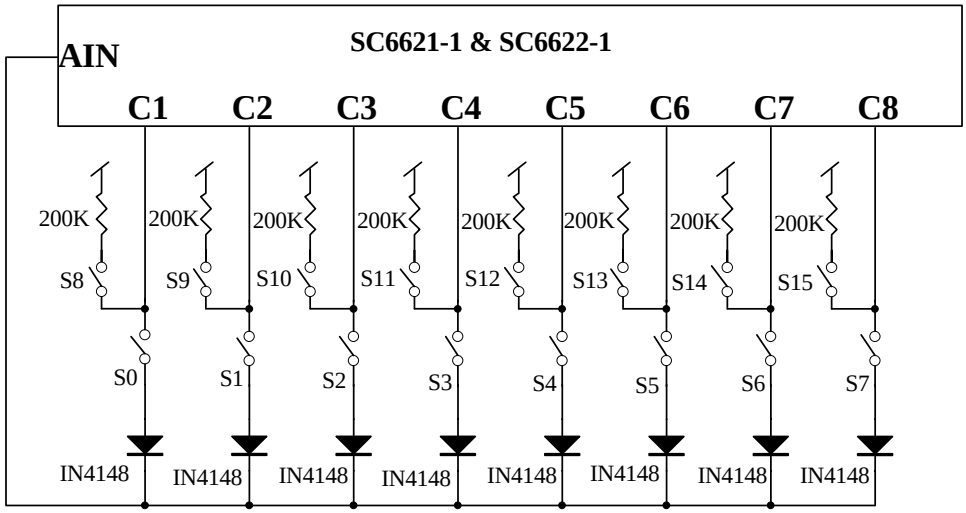
To set the custom codes (A0…A15)

The algorithm rule of the custom codes (A0…A15)can be selected by mask option and the user can choose the SC6621-1 & SC6622-1 or the SC6621-2 & SC6622-2.

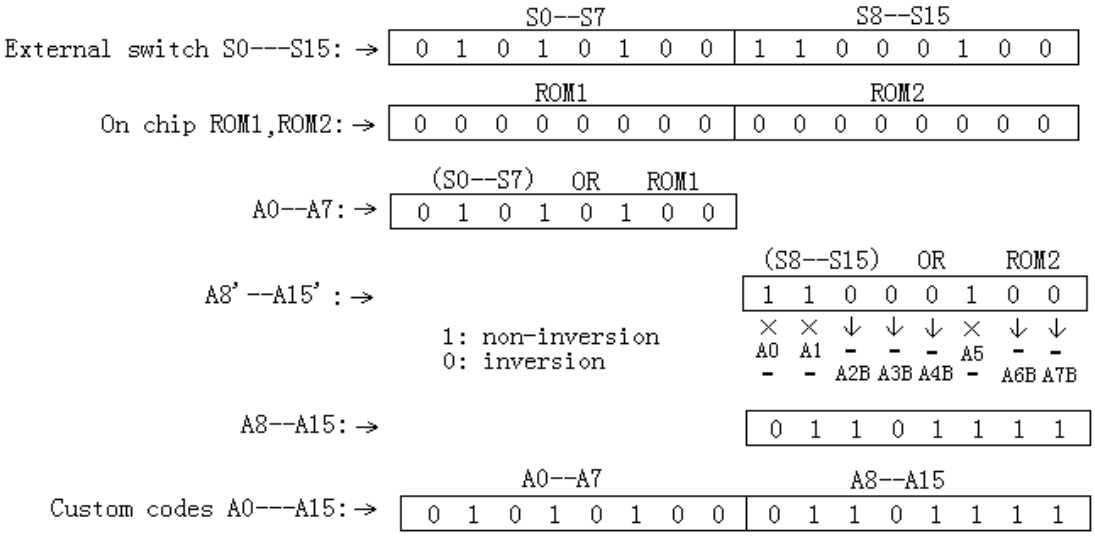
◆ **The SC6621-1 & SC6622-1:**

The value of ROM1 (8bits) & RIM2 (8 bits) are both "00H", and it is decided by one mask layer. The A0--A7 are set by logical OR between the switches (S0--S7) and ROM1.The A8--A15 equal some bits be inverted of A0--A7, the inversion are decided by logical OR between the switches (S8--S15) and ROM2.

For example:



1:Switch close **0:Switch open**



◆ **The SC6621-2 & SC6622-2:**

In this case, the 28 bits on chip MASK ROM (ROM2 &ROM3-0, ROM3-1, ROM3-2 and ROM3-3) is available and it is decided by one mask layer. The value of ROM2 is "00H" and the value of ROM3 is show below "ROM3 option table". The A0--A2 are set by S0--S7("A0--A2 option table").The A3--A7 are set by S14&S15 (" ROM3 option table"). The A8--A15 equal some bits be inverted of A0--A7 and the inversion are decided by logical OR between the switches S8--S13 and ROM2.

A0--A2 option table			
	A0	A1	A2

ROM3 option table							
S14	S15	A3	A4	A5	A6	A7	ROM3

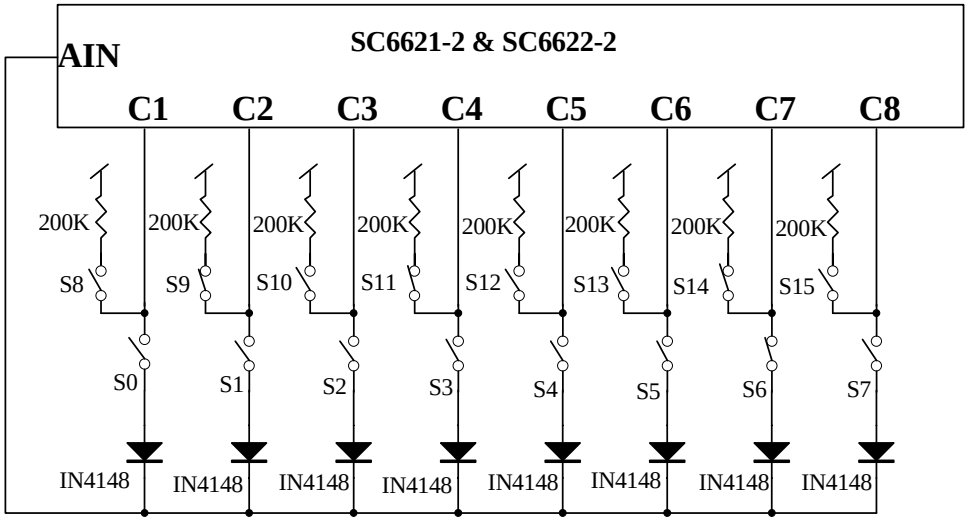
S0=1	0	0	0
S1=1	1	0	0
S2=1	0	1	0
S3=1	1	1	0
S4=1	0	0	1
S5=1	1	0	1
S6=1	0	1	1
S7=1	1	1	1

0	0	0	0	0	0	0	ROM3-0
0	1	1	1	0	0	1	ROM3-1
1	0	0	0	0	0	1	ROM3-2
1	1	1	0	1	1	1	ROM3-3

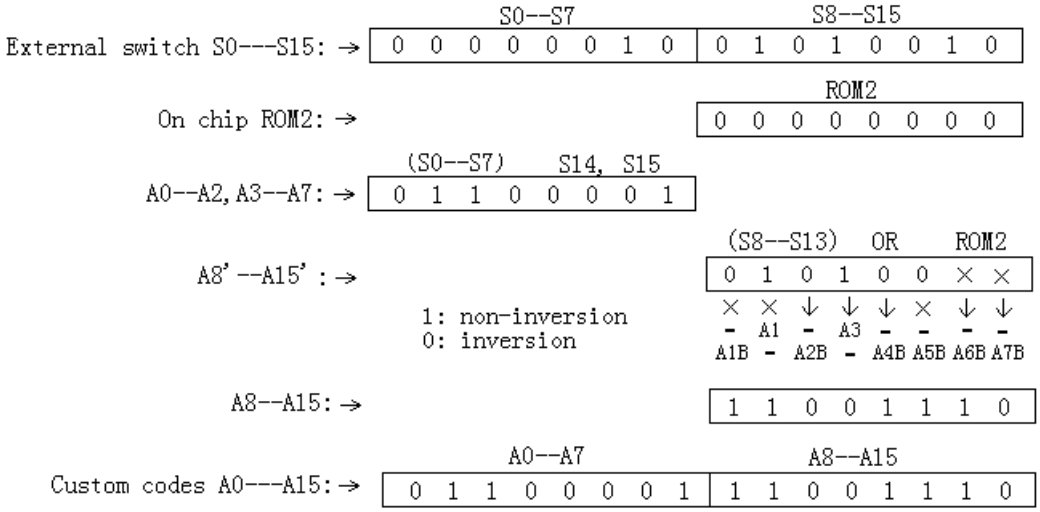
S0--S7 are closed must only one.

Note: priority S7>--->S0 (AO--A2 option table)

For example:



1:Switch close **0:Switch open**



The vaules of the data codes (D0-D7)

The SC6621 contains 32 function keys and the SC6622 contains 64 function keys. Each key corresponds to one data code, The SC6621& SC6622 provide 3 double keys.

◆ The SC6621 data codes:

KEY NAME	DATA CODES D0----------D6 D7
K11	0 0 0 0 0 0 0 0/1
K21	1 0 0 0 0 0 0 0/1

KEY NAME	DATA CODES D0----------D6 D7
K15	0 0 0 0 1 0 0 0/1
K25	1 0 0 0 1 0 0 0/1

K31	0	1	0	0	0	0	0	0/1
K41	1	1	0	0	0	0	0	0/1
K12	0	0	1	0	0	0	0	0/1
K22	1	0	1	0	0	0	0	0/1
K32	0	1	1	0	0	0	0	0/1
K42	1	1	1	0	0	0	0	0/1
K13	0	0	0	1	0	0	0	0/1
K23	1	0	0	1	0	0	0	0/1
K33	0	1	0	1	0	0	0	0/1
K43	1	1	0	1	0	0	0	0/1
K14	0	0	1	1	0	0	0	0/1
K24	1	0	1	1	0	0	0	0/1
K34	0	1	1	1	0	0	0	0/1
K44	1	1	1	1	0	0	0	0/1
K16+K26	1	0	1	0	1	1	0	0/1
K16+K36	0	1	1	0	1	1	0	0/1

K35	0	1	0	0	1	0	0	0/1
K45	1	1	0	0	1	0	0	0/1
K16	0	0	1	0	1	0	0	0/1
K26	1	0	1	0	1	0	0	0/1
K36	0	1	1	0	1	0	0	0/1
K46	1	1	1	0	1	0	0	0/1
K17	0	0	0	1	1	0	0	0/1
K27	1	0	0	1	1	0	0	0/1
K37	0	1	0	1	1	0	0	0/1
K47	1	1	0	1	1	0	0	0/1
K18	0	0	1	1	1	0	0	0/1
K28	1	0	1	1	1	0	0	0/1
K38	0	1	1	1	1	0	0	0/1
K48	1	1	1	1	1	0	0	0/1
K16+K46	1	1	1	0	1	1	0	0/1

◆ The SC6622 data codes:

KEY NAME	DATA CODES D0---------D6 D7							
K11	0	0	0	0	0	0	0	0/1
K21	1	0	0	0	0	0	0	0/1
K31	0	1	0	0	0	0	0	0/1
K41	1	1	0	0	0	0	0	0/1
K12	0	0	1	0	0	0	0	0/1
K22	1	0	1	0	0	0	0	0/1
K32	0	1	1	0	0	0	0	0/1
K42	1	1	1	0	0	0	0	0/1
K13	0	0	0	1	0	0	0	0/1
K23	1	0	0	1	0	0	0	0/1
K33	0	1	0	1	0	0	0	0/1
K43	1	1	0	1	0	0	0	0/1
K14	0	0	1	1	0	0	0	0/1
K24	1	0	1	1	0	0	0	0/1
K34	0	1	1	1	0	0	0	0/1
K44	1	1	1	1	0	0	0	0/1
K51	0	0	0	0	0	0	1	0/1
K61	1	0	0	0	0	0	1	0/1
K71	0	1	0	0	0	0	1	0/1
K81	1	1	0	0	0	0	1	0/1
K52	0	0	1	0	0	0	1	0/1
K62	1	0	1	0	0	0	1	0/1
K72	0	1	1	0	0	0	1	0/1
K82	1	1	1	0	0	0	1	0/1
K53	0	0	0	1	0	0	1	0/1
K63	1	0	0	1	0	0	1	0/1
K73	0	1	0	1	0	0	1	0/1
K83	1	1	0	1	0	0	1	0/1
K54	0	0	1	1	0	0	1	0/1
K64	1	0	1	1	0	0	1	0/1
K74	0	1	1	1	0	0	1	0/1
K84	1	1	1	1	0	0	1	0/1
K16+K26	1	0	1	0	1	1	0	0/1
K16+K36	0	1	1	0	1	1	0	0/1

KEY NAME	DATA CODES D0---------D6 D7							
K15	0	0	0	0	1	0	0	0/1
K25	1	0	0	0	1	0	0	0/1
K35	0	1	0	0	1	0	0	0/1
K45	1	1	0	0	1	0	0	0/1
K16	0	0	1	0	1	0	0	0/1
K26	1	0	1	0	1	0	0	0/1
K36	0	1	1	0	1	0	0	0/1
K46	1	1	1	0	1	0	0	0/1
K17	0	0	0	1	1	0	0	0/1
K27	1	0	0	1	1	0	0	0/1
K37	0	1	0	1	1	0	0	0/1
K47	1	1	0	1	1	0	0	0/1
K18	0	0	1	1	1	0	0	0/1
K28	1	0	1	1	1	0	0	0/1
K38	0	1	1	1	1	0	0	0/1
K48	1	1	1	1	1	0	0	0/1
K55	0	0	0	0	1	0	1	0/1
K65	1	0	0	0	1	0	1	0/1
K75	0	1	0	0	1	0	1	0/1
K85	1	1	0	0	1	0	1	0/1
K56	0	0	1	0	1	0	1	0/1
K66	1	0	1	0	1	0	1	0/1
K76	0	1	1	0	1	0	1	0/1
K86	1	1	1	0	1	0	1	0/1
K57	0	0	0	1	1	0	1	0/1
K76	1	0	0	1	1	0	1	0/1
K77	0	1	0	1	1	0	1	0/1
K87	1	1	0	1	1	0	1	0/1
K58	0	0	1	1	1	0	1	0/1
K68	1	0	1	1	1	0	1	0/1
K78	0	1	1	1	1	0	1	0/1
K88	1	1	1	1	1	0	1	0/1
K16+K46	1	1	1	0	1	1	0	0/1

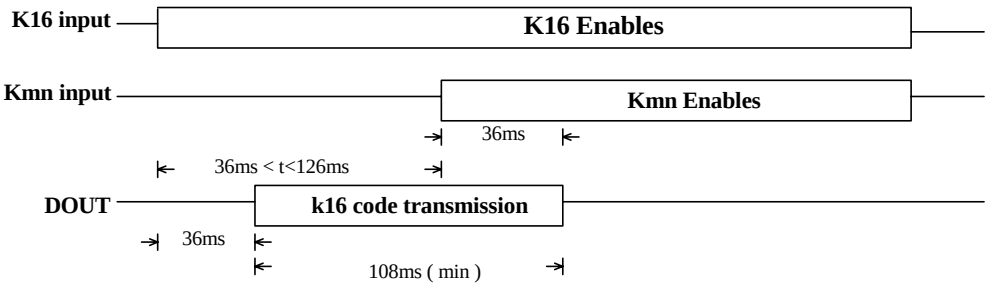
The 8-Bit data codes of will define the inverse codes of the other 8-bit data codes (D8-D15)
D7 is defined by an external switch code D7=0 -> connect to VDD
code D7=1 -> connect to VSS

Function keys control

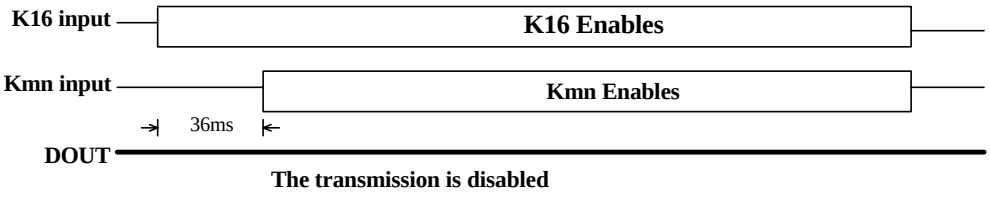
If two or more keys are depressed simultaneously (excapt K16+ K26 &K16+K36&K16+K46), the transmission is disabled by the multi- depression prevention circuit, As regards the key transmission priority in the case of two depressions, with simultaneous depressions (±36 ms) transmission is disabled and first depressions, later remainder priority is used.

When a key is pressed, teading of the custom code and key data code is started, and DOUT output begins 36 ms later, so that if the key is begin depressed during this 36 ms interval one transmission is performed. If a key is held down for 108ms or longer , consecutive transmissions of the leader code only are performed while the key is depressed. As a key interruption operation can handle an interval of up to 126ms (from ON to ON). It is possible to configure a system with an extremely fast response time.

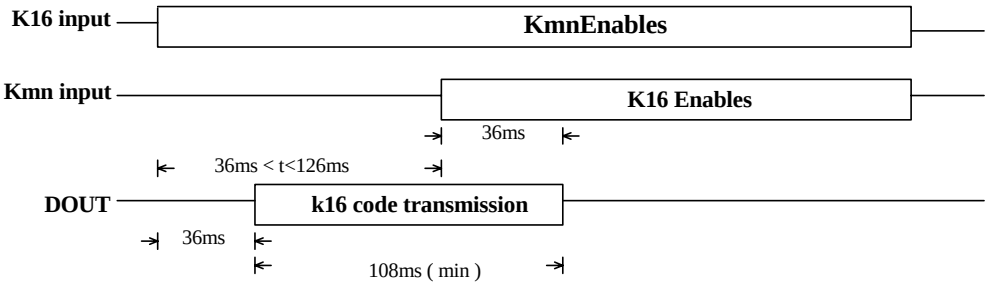
◆ Two or more keys are depressed (except K16+K26 &K16+K36&K16+K46)



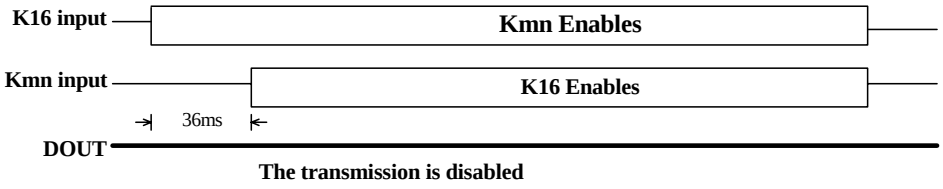
(A)



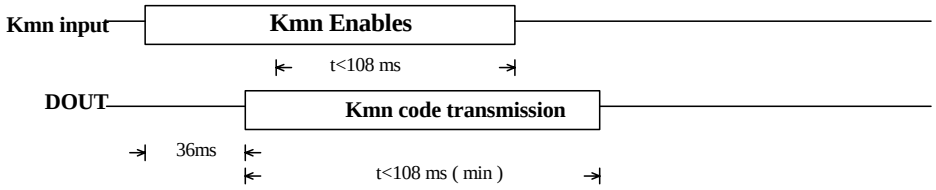
(B)



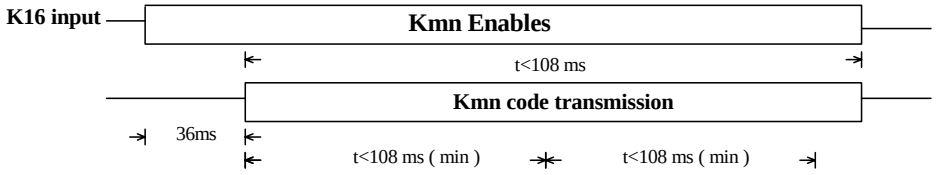
(C)



(D)



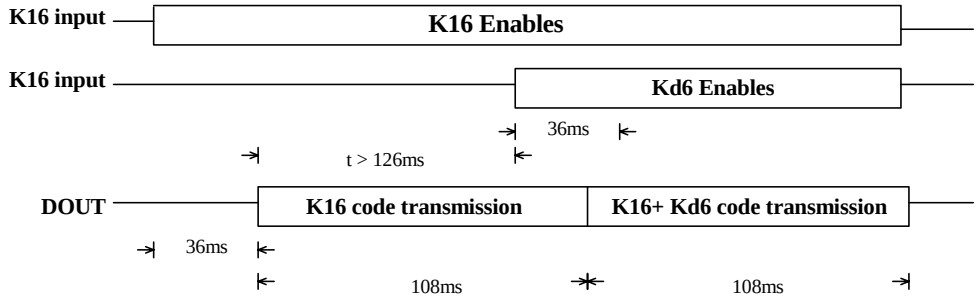
(E)



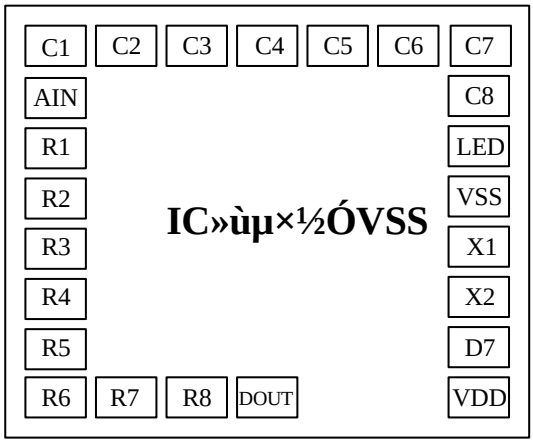
(F)

To avoid the mistakes made by keyboard scanning or simultaneous two-key input, excep 3 double key active function (K16+K26, K16+K36, K16+K46), the SC6621&SC6622 are facilitated with 36ms starting time.

◆ The 3 double keys are depressed (K16+K26& K16+K36& K16+K46):
Kd6: One of (K26 or K36 or K46)



PAD



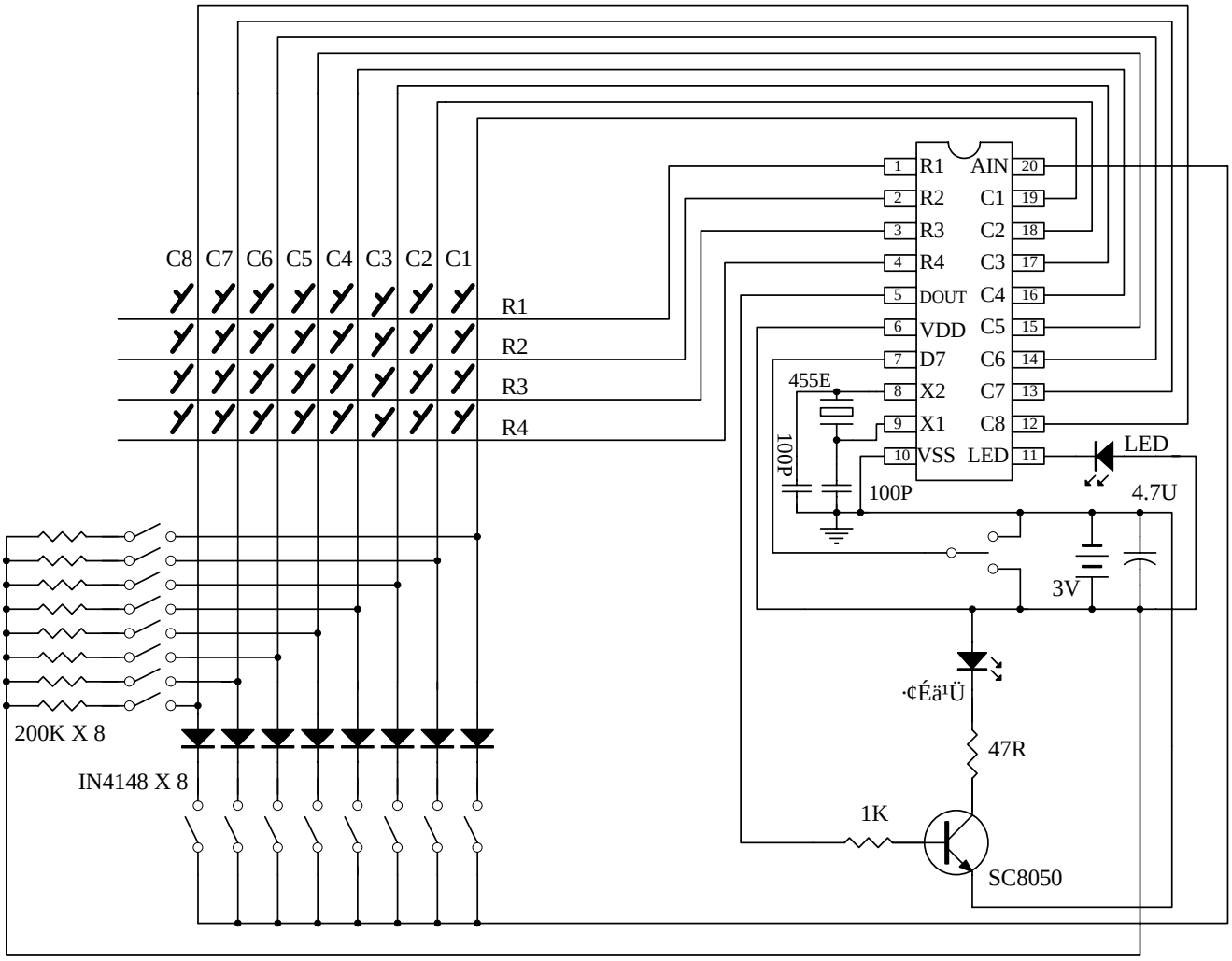
Absolute maximum ratings:

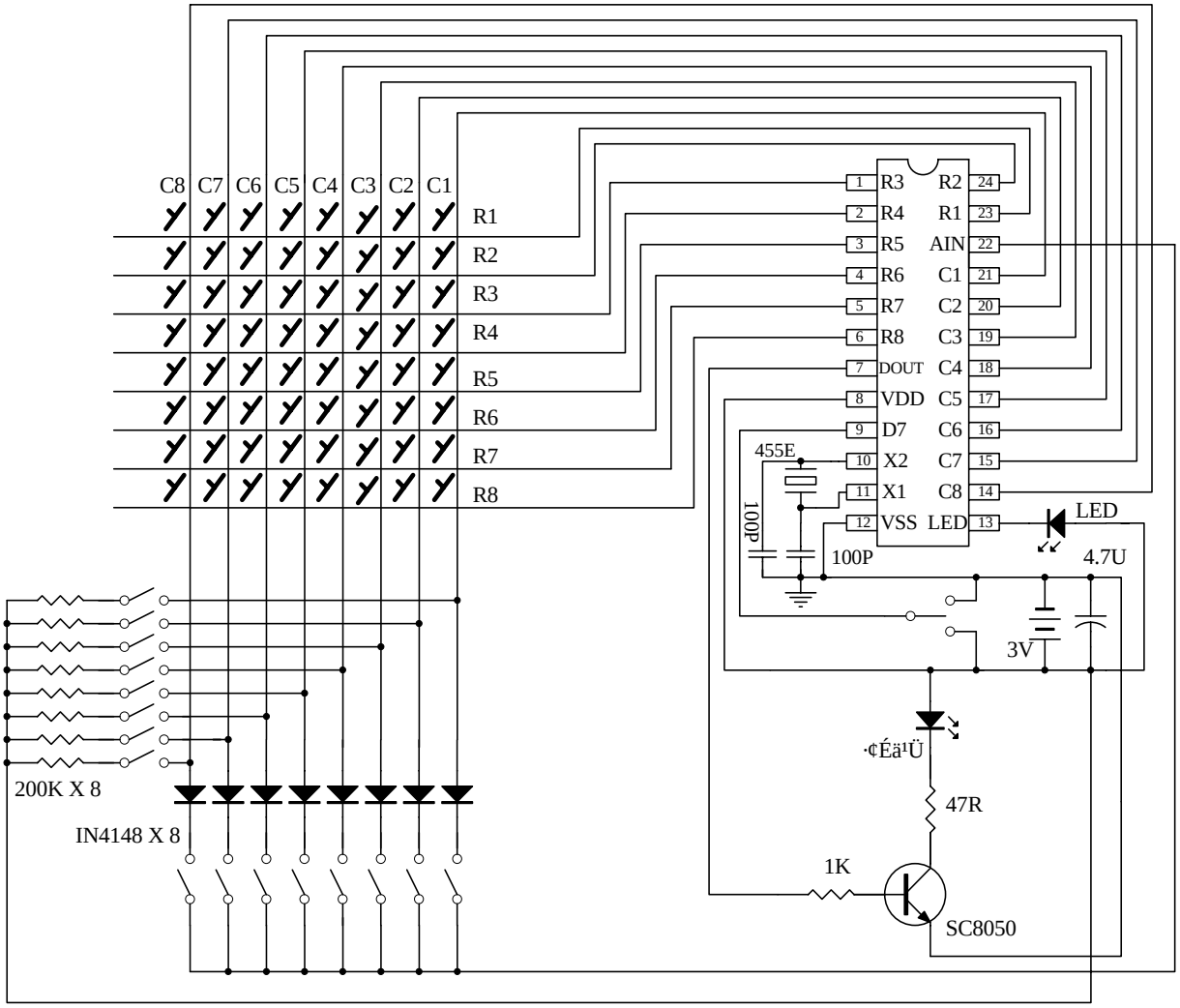
ITEM DECRIPTION	SYMBOL	RAEINGS	UNIT
Supply voltage	VDD	2.0~3.3	V
Operating temperature	Topr	-20~70	℃
Storage temperature	Tstg	-50~125	℃

Electronic characteristics:

ITEM	SYMBOL	CONDITION	MIN.	TYPE	MAX.	UNIT
Supply voltage	**VDD**		**2.2**	**3.0**	**5.5**	**V**
Stand-by currant (Oscillator OFF)	ISB	VDD=3.0V	-	-	5.0	uA
Operating current (Oscillator ON)	IOP	VDD=3.0V No lead	-	60	100	uA
Driving current (DOUT)	IOH1	VDD=3.0V VO=1.5V	-	250	-	uA
Sinking current (DOUT)	IOL1	VDD=3.0V VO=0.3V	-	800	-	uA
Driving current (LED)	IOH2	VDD=3.0V VO=2.7V	-	-70	-	uA
Sink current (LED)	IOL2	VDD=3.0V VO=0.3V	-	3.8	-	mA
Driving current (C1/C8)	IOH3	VDD=3.0V VO=2.7V	-1.0	-2.0	-	mA
Sinking current (C1/C8)	IOL3	VDD=3.0V VO=0.3V	20	25	-	uA
Input HIGH voltage(R1-R8)	VIH1	VDD=3.0V	1.9	-	3.0	V
Input LOW voltage (R1-R8)	VIL1	VDD=3.0V	0	-	0.8	V
Input HIGH voltage(C1-C8)	VIH2	VDD=3.0V	1.0	-	3.0	V
Input LOW voltage (C1-C8)	VIL2	VDD=3.0V	0	-	0.5	V
Input HIGH voltage (AIN)	VIH3	VDD=3.0V	1.25	-	3.0	V
Input LOW voltage (AIN)	VIL3	VDD=3.0V	0	-	0.5	V
Pull LOW resistor (AIN)	RPL1	-	-	240K	-	Ω
Pull HIGH resistor (AIN)	RPH	-	-	290K	-	Ω
Pull LOW resistor (R1-R8)	RPL2	-	-	300K	-	Ω
Pull LOW resistor (C1-C8)	RPL3	-	-	900K	-	Ω
System frequence (X2)	Fosc	Resonator 455 KHz	-	455	-	KHz

APPLICATION CIRCUIT




C8 C7 C6 C5 C4 C3 C2 C1
R1
R2
R3
R4
R5
R6
R7
R8
200K X 8
IN4148 X 8
1 R3
2 R4
3 R5
4 R6
5 R7
6 R8
7 DOUT
8 VDD
9 D7
10 X2
11 X1
12 VSS
24 R2
23 R1
22 AIN
21 C1
20 C2
19 C3
18 C4
17 C5
16 C6
15 C7
14 C8
13 LED
455E
100P
100P
LED
4.7U
3V
·¢Éä¹Ü
47R
1K
SC8050