

## SC6621 & SC6622

## REMOTE CONTROL TRANSMITTER

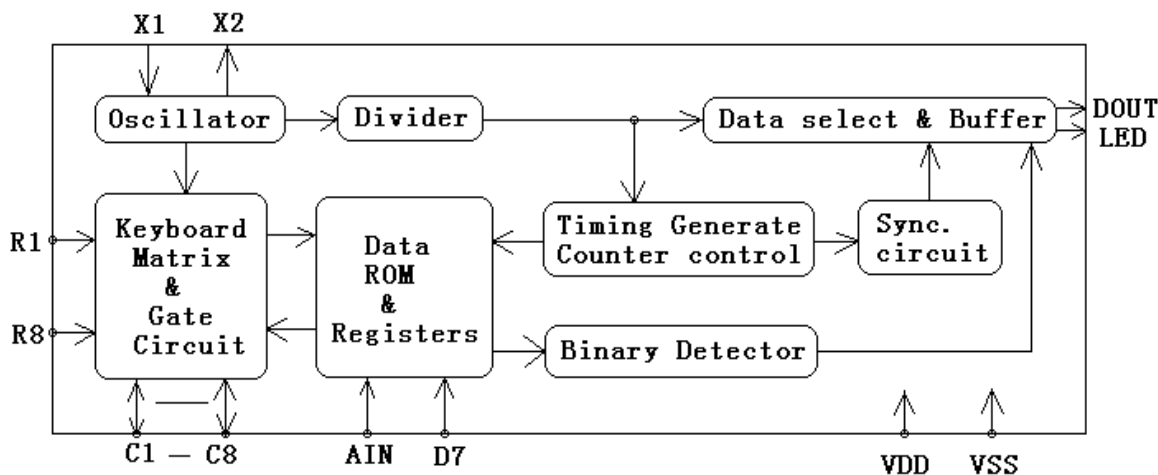
### General Description:

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”.

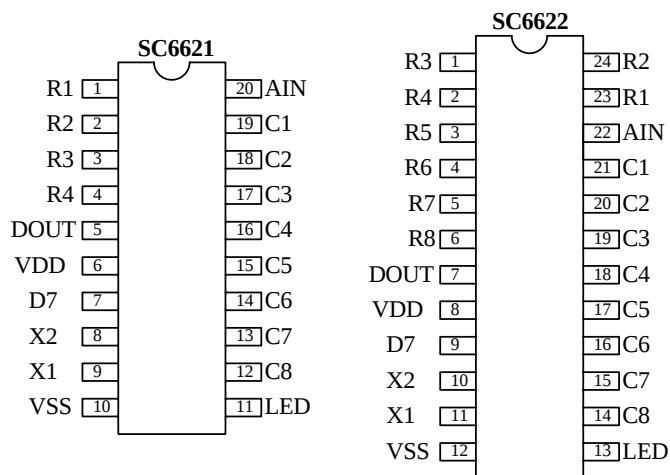
### Feature Description:

- ◆ 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 frequency 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:



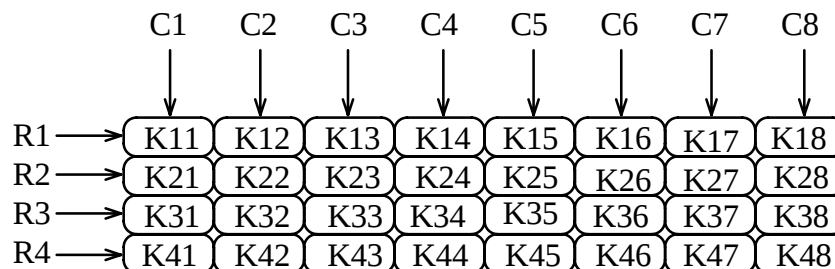
**Pin Description:**

| SC6621<br>PIN No. | SC6622<br>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) |

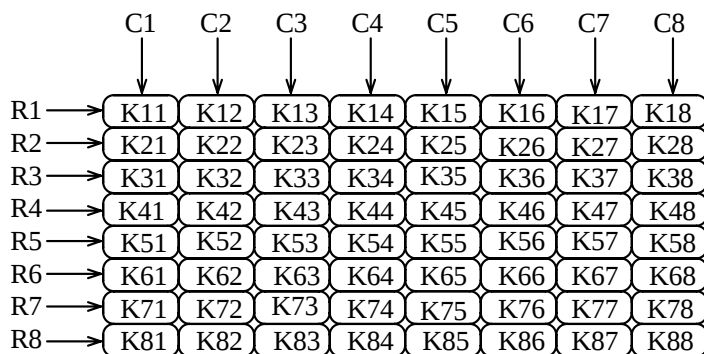
**Functional Description****Keyboard scan**

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:

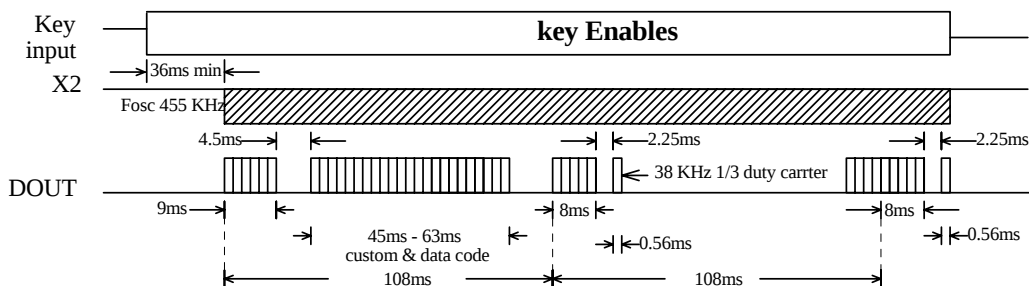


## Transmission codes

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 ).

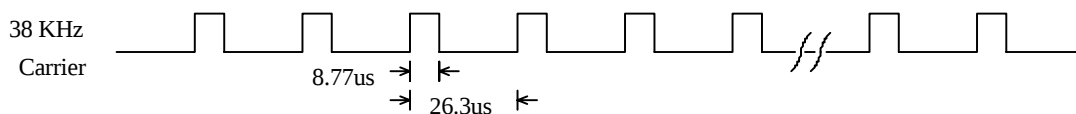
After the pressed key is held for 108ms, if the key is still held down, the transmission codes turn out to be a composition of header code ( 9 ms )and off code ( 2.5ms )only.

The following is an illustration of the transmission codes:



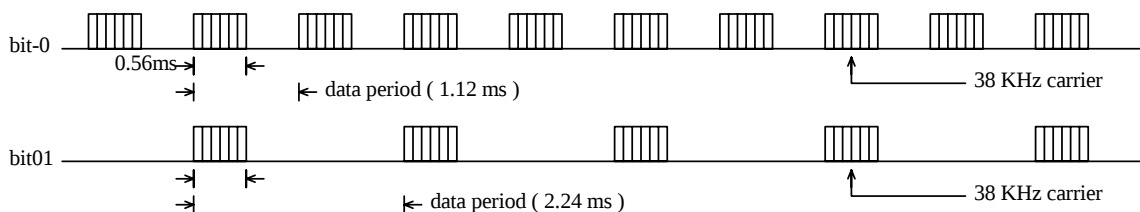
**Output format for the DOUT**

The output carrier ( 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)**

SC6621 & SC6622

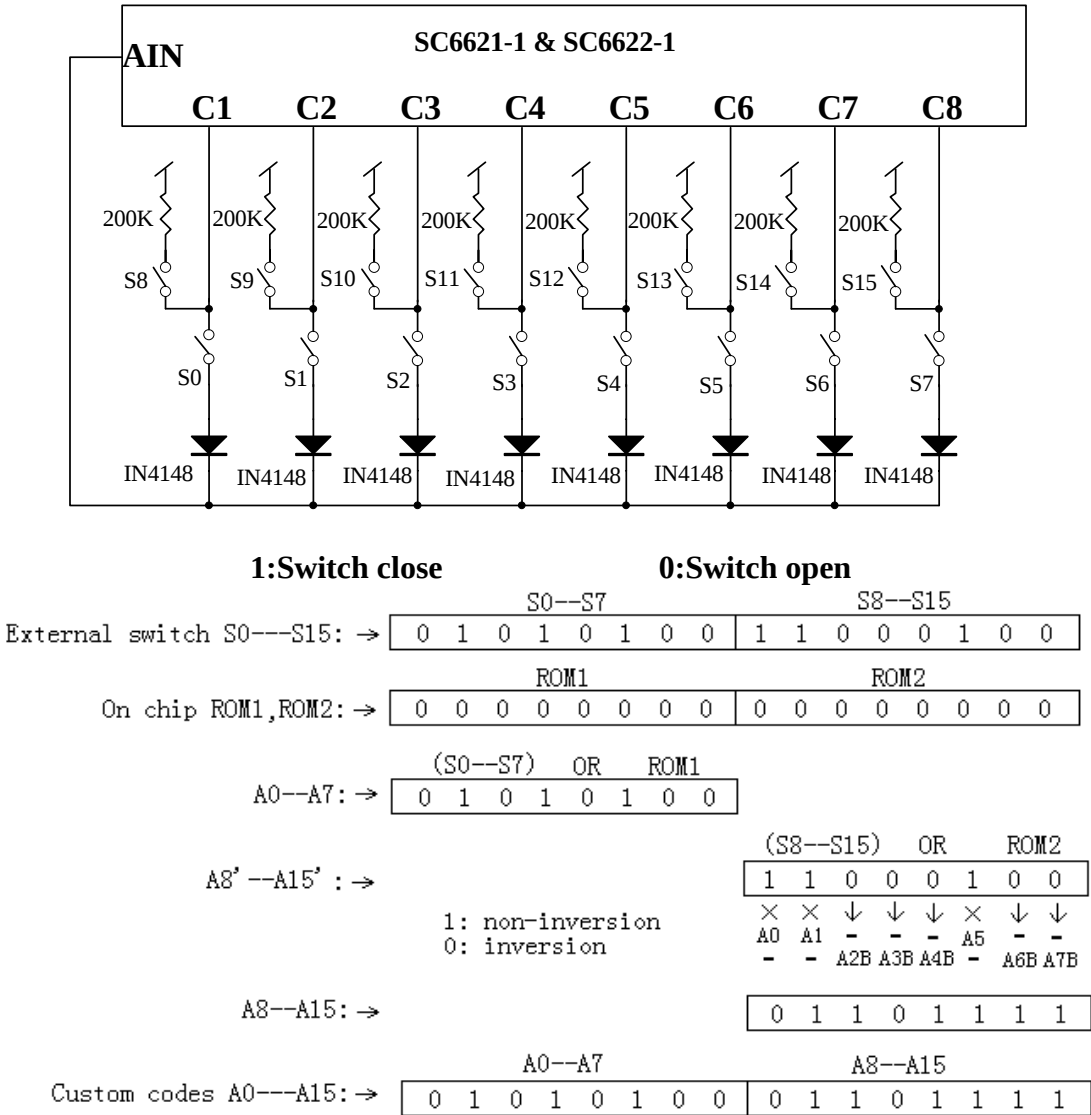
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The algorithm rule of the custom codes (A0...A15)can be selected by mask option and the user can choose the SC6621-1 & SC6622-1 or the SC6621-2 & SC6622-2.

◆ 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:



◆ 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 |  |

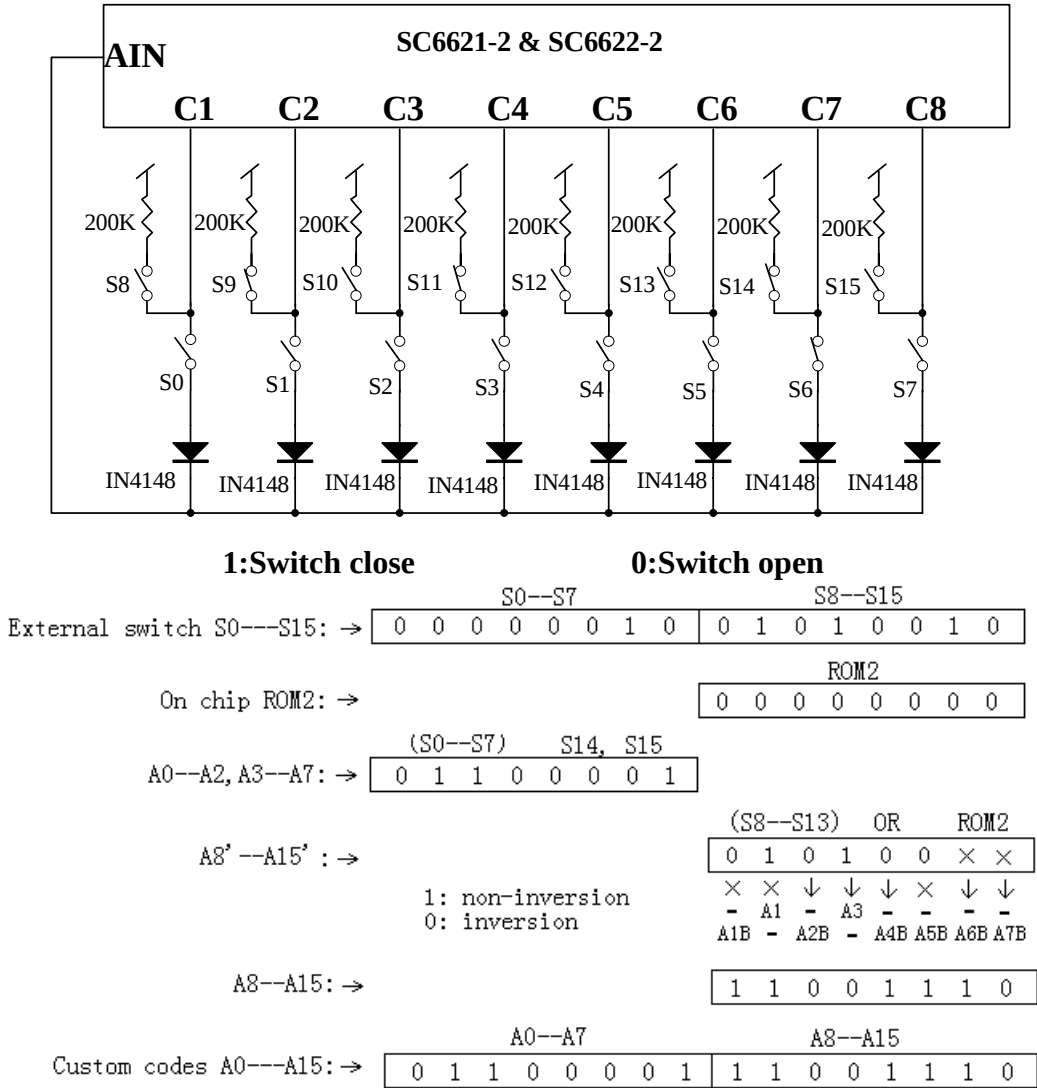
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|      |   |   |   |   |   |   |   |   |   |   |   |        |
|------|---|---|---|---|---|---|---|---|---|---|---|--------|
| S0=1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ROM3-0 |
| S1=1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | ROM3-1 |
| S2=1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | ROM3-2 |
| S3=1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | ROM3-3 |
| S4=1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |        |
| S5=1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |        |
| S6=1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |        |
| S7=1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |        |

S0--S7 are closed must only one.  
Note: priority S7>--->S0 (AO--A2 option table)

For example:



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        | KEY NAME | DATA CODES        |
|----------|-------------------|----------|-------------------|
|          | D0-----D6 D7      |          | D0-----D6 D7      |
| K11      | 0 0 0 0 0 0 0 0/1 | K15      | 0 0 0 0 1 0 0 0/1 |
| K21      | 1 0 0 0 0 0 0 0/1 | K25      | 1 0 0 0 1 0 0 0/1 |

## SC6621 & SC6622

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|         |   |   |   |   |   |   |   |     |
|---------|---|---|---|---|---|---|---|-----|
| 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<br>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<br>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

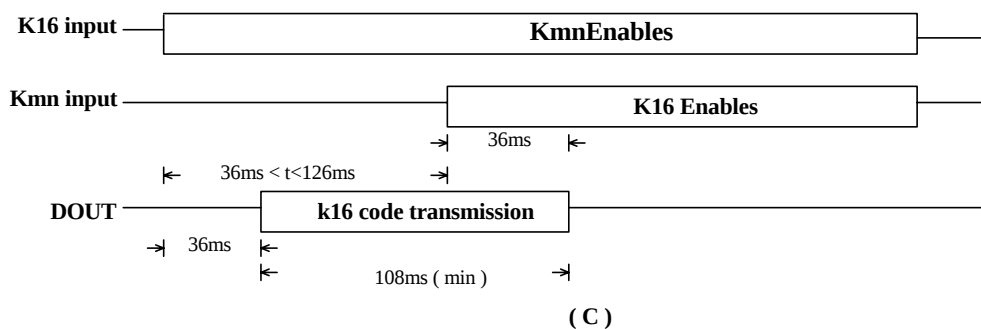
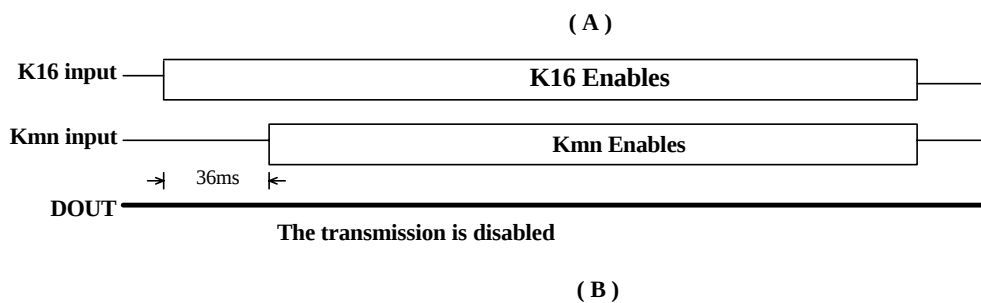
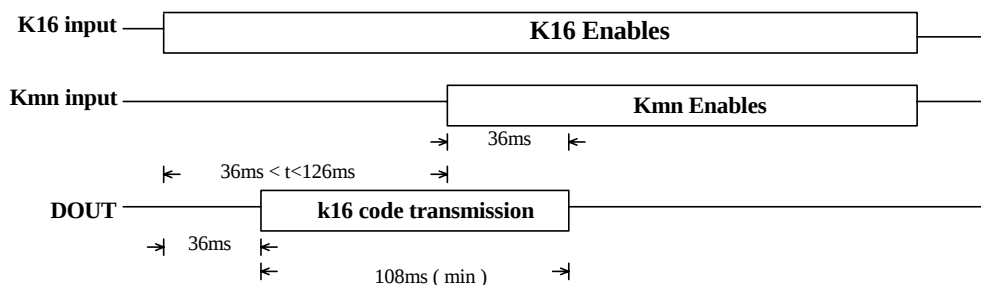
code D7=1 -> connect to VSS

## Function keys control

If two or more keys are depressed simultaneously ( except 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 (  $\pm 36$  ms ) transmission is disabled and first depressions, later remainder priority is used.

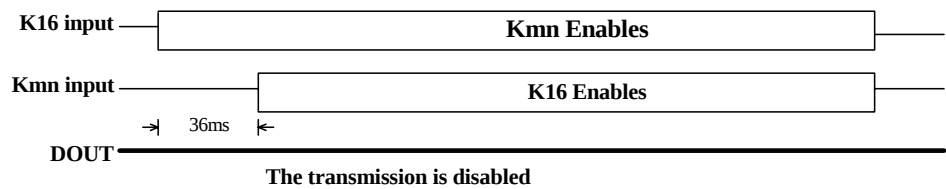
When a key is pressed, teading of the custom code and key data code is started, and DOUT output begins 36 ms later, so that if the key is begin depressed during this 36 ms interval one transmission is performed. If a key is held down for 108ms or longer , consecutive transmissions of the leader code 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 )

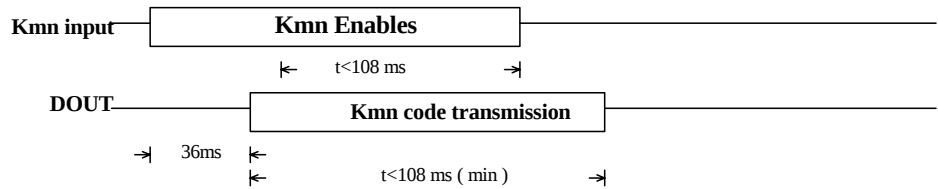


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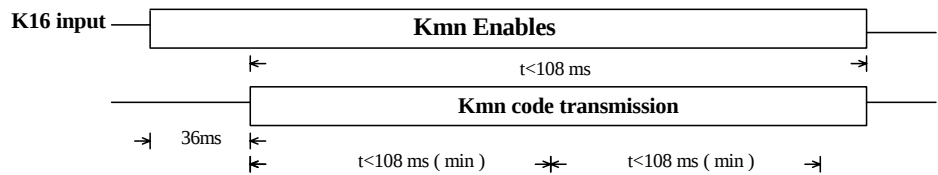
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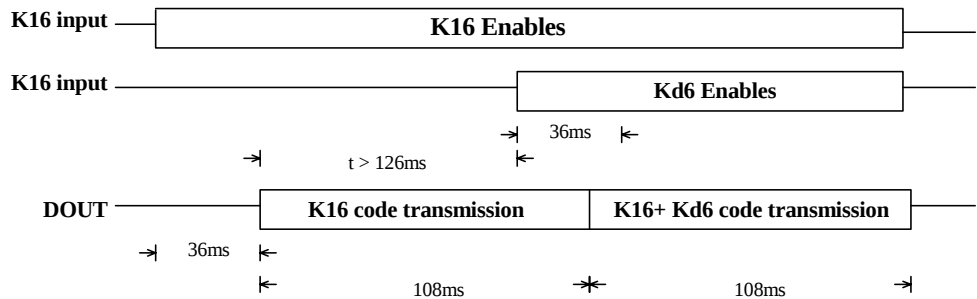
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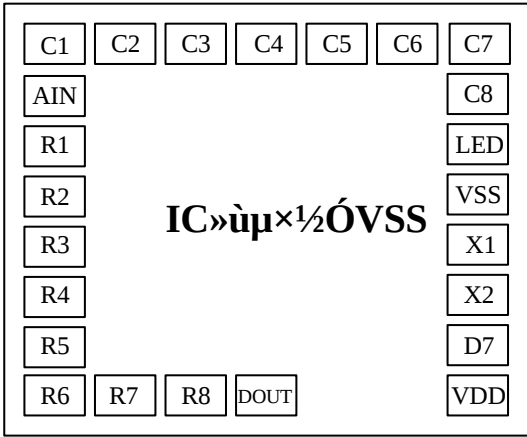
( F )

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



**SC6621 & SC6622****REMOTE CONTROL TRANSMITTER****Absolute maximum ratings:**

| ITEM DESCRIPTION      | SYMBOL | RATINGS | UNIT |
|-----------------------|--------|---------|------|
| Supply voltage        | VDD    | 2.0~3.3 | V    |
| Operating temperature | Topr   | -20~70  | °C   |
| Storage temperature   | Tstg   | -50~125 | °C   |

**Electronic characteristics:**

| ITEM                              | SYMBOL CONDITION |                     | MIN.       | TYPE       | MAX.       | UNIT     |
|-----------------------------------|------------------|---------------------|------------|------------|------------|----------|
| <b>Supply voltage</b>             | <b>VDD</b>       |                     | <b>2.2</b> | <b>3.0</b> | <b>5.5</b> | <b>V</b> |
| Stand-by current (Oscillator OFF) | ISB              | VDD=3.0V            | -          | -          | 5.0        | uA       |
| Operating current (Oscillator ON) | IOP              | VDD=3.0V<br>No load | -          | 60         | 100        | uA       |
| Driving current (DOUT)            | IOH1             | VDD=3.0V<br>VO=1.5V | -          | 250        | -          | uA       |
| Sinking current (DOUT)            | IOL1             | VDD=3.0V<br>VO=0.3V | -          | 800        | -          | uA       |
| Driving current (LED)             | IOH2             | VDD=3.0V<br>VO=2.7V | -          | -70        | -          | uA       |
| Sink current (LED)                | IOL2             | VDD=3.0V<br>VO=0.3V | -          | 3.8        | -          | mA       |
| Driving current (C1/C8)           | IOH3             | VDD=3.0V<br>VO=2.7V | -1.0       | -2.0       | -          | mA       |
| Sinking current (C1/C8)           | IOL3             | VDD=3.0V<br>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 frequency (X2)             | Fosc             | Resonator 455 KHz   | -          | 455        | -          | KHz      |

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