

## SD7017 / SD7018

### 2-state Encoder / Decoder

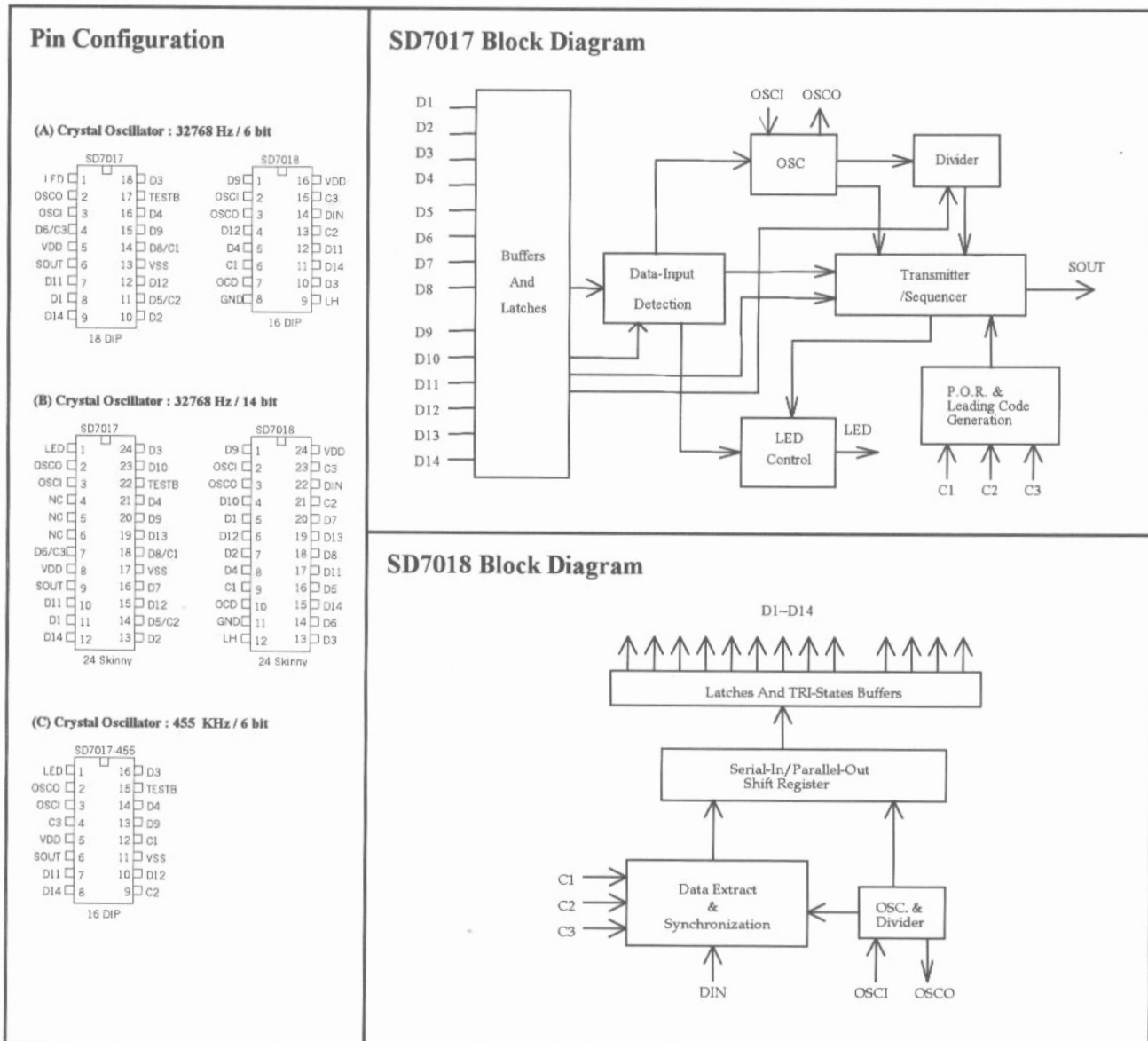
#### Features

- Built-in leading code and trailing code for high noise immunity.
- Maximum 14 bits transmission.
- LED indication during transmission.
- Low power consumption.
- Latch/Momentary data output available.
- SD7017 power supply range : 2.0V ~ 5.0V.
- SD7018 power supply range : 3.5V ~ 9.0V.
- 32768Hz/455KHz crystal oscillator for SD7017.
- 32768Hz crystal oscillator only for SD7018.

#### General Description

SD7017/SD7018 is a pair of encoder/decoder (transmitter/receiver) ICs, both fabricated with low power CMOS technology. The SD7017 is the encoder (transmitter) and the SD7018 is the decoder (receiver). The SD7017 accepts 14 bits of input data, upon a triggering signal, serially sends out 14 bits of data in

encoded format. The SD7018 receives data from the SD7017. A wide range of applications, such as home security, smoke and fire detection, remote door control, cordless telephone system, etc., can be found for this pair of ICs. Either infrared, ultrasonic or radio wave can be used as transmission medium.



**Pin Description**
**(1) SD7017**

| Pin No.                          | Symbol   | Description                |
|----------------------------------|----------|----------------------------|
| 1                                | LED      | LED indication output.     |
| 2                                | OSCO     | Crystal oscillator output. |
| 3                                | OSCI     | Crystal oscillator input.  |
| 4~6                              | NC       | No connection.             |
| 8                                | VDD      | Positive power supply.     |
| 17                               | VSS      | Negative power supply.     |
| 9                                | SOUT     | Serial data output.        |
| 7, 10 ~ 16<br>18 ~ 21<br>23 ~ 24 | D1 ~ D14 | Transmitted data input.    |
| 22                               | TESTB    | Test pin.                  |

**(2) SD7018**

| Pin No.             | Symbol     | Description  |
|---------------------|------------|--|
| 2                   | OSCI       | Crystal oscillator input.  |
| 3                   | OSCO       | Crystal oscillator output.   |
| 9, 21, 23           | C1, C2, C3 | Leading code setting.  |
| 10                  | OCD        | (Momentary, NMOS open drain)/(Latch, PMOS open drain) selection.<br>OCD = Low/Floating ; Momentary mode & NMOS open drain.<br>OCD = High ; Latch mode & PMOS open drain. |
| 24                  | VDD        | Positive power supply.   |
| 11                  | GND        | Negative power supply.   |
| 12                  | LH         | For testing.   |
| 22                  | DIN        | Serial data input pad.   |
| 1, 4 ~ 8<br>13 ~ 20 | D1 ~ D14   | 14 bits parallel data output.  |

**Absolute Maximum Ratings**
**(1) SD7017**

| RATING                | VALUE                 |
|-----------------------|-----------------------|
| DC Supply Voltage     | <6.5V                 |
| Input/Output Voltage  | VSS-0.3V to VDD+ 0.3V |
| Operating Temperature | -10° C to 60° C       |
| Storage Temperature   | -25° C to 125° C      |

**(2) SD7018**

| RATING                | VALUE                  |
|-----------------------|------------------------|
| DC Supply Voltage     | < 9V                   |
| Input/Output Voltage  | GND-0.5V to VDD + 0.5V |
| Operating Temperature | -10° C to 60° C        |
| Storage Temperature   | -25° C to 125° C       |

**Notice:** Stress greater than those listed under **Absolute Maximum Ratings** may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied, Exposure to absolute maximum rating conditions for extended period may affect reliability.

**Electrical Characteristics**
**(1) SD7017**

( VDD = 3.3V, VSS = 0V, Ta = 25°C, unless otherwise specified)

| Parameter                    | Symbol            | Min. | Type.  | Max.  | Condition |
|------------------------------|-------------------|------|--------|-------|-----------|
| Operating Voltage            | Vdd               | 2.0V | 3.3V   | 5.0V  |           |
| Standby Current              | Istb              | ---  | 5 μA   | 12 μA | No load   |
| Operating Current            | Iop               | ---  | 200 μA | 3mA   | No load   |
| Crystal Oscillator Frequency | F <sub>req.</sub> | ---  | *      | ---   |           |

\* : 32768Hz / 455KHz by option

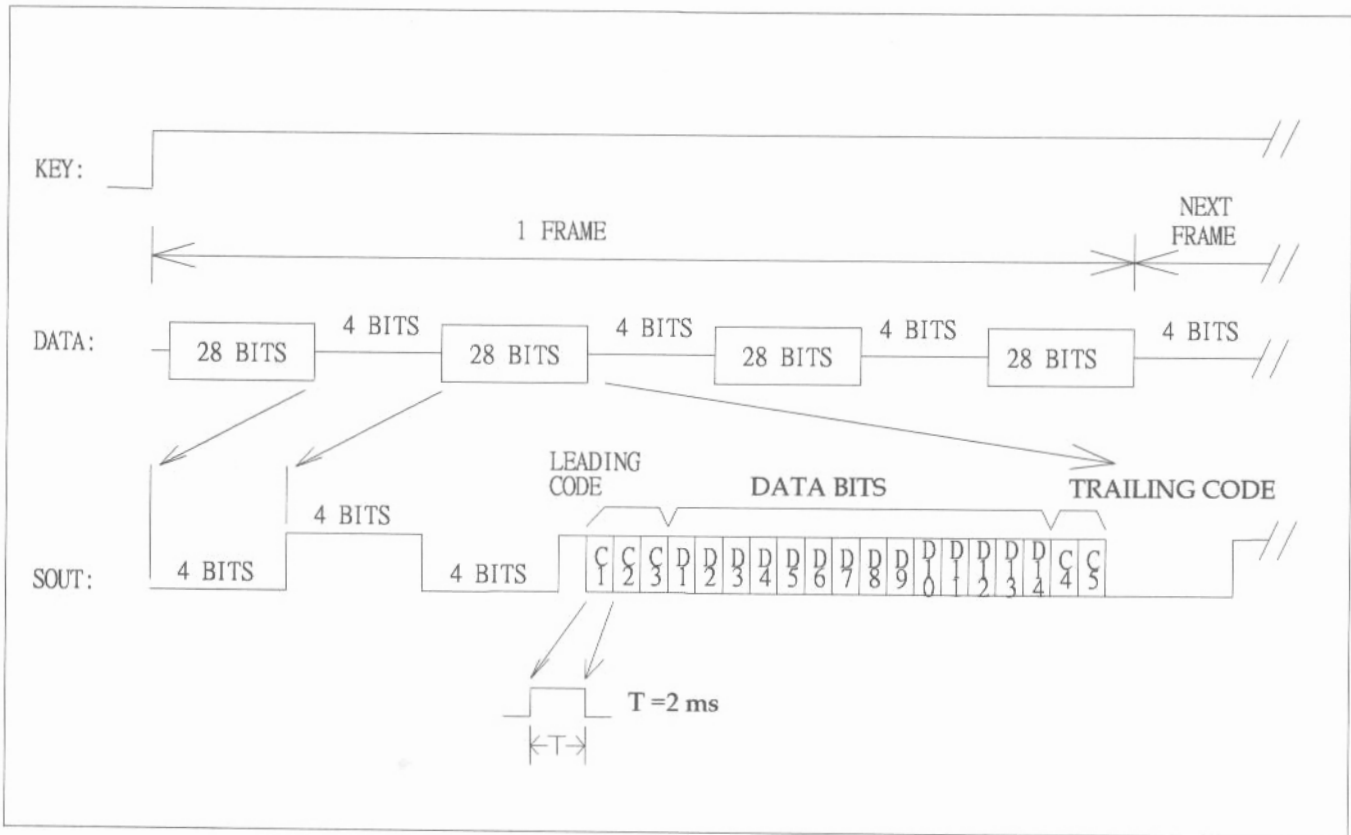
**(2) SD7018**

( VDD = 5V, GND = 0V, Ta = 25°C, unless otherwise specified)

| Parameter                    | Symbol            | Min. | Type.    | Max.  | Condition |
|------------------------------|-------------------|------|----------|-------|-----------|
| Operating Voltage            | Vdd               | 3.5V | 5.0V     | 9.0V  |           |
| Standby Current              | Istb              | ---  | 5 μA     | 12 μA | No load   |
| Operating Current            | Iop               | ---  | 1mA      | 3mA   | No load   |
| Crystal Oscillator Frequency | F <sub>req.</sub> | ---  | 32768 Hz | ---   |           |

**Operation Function**

**. Transmitter Output Data Frame**



**. Mode Table**

**(1) SD7017**

**Momentary/Latch Mode**

| Pin | Power On State | Operation Mode |
|-----|----------------|----------------|
| D1  | Floating/ Low  | Momentary      |
|     | High           | Latch          |

**Leading Code**

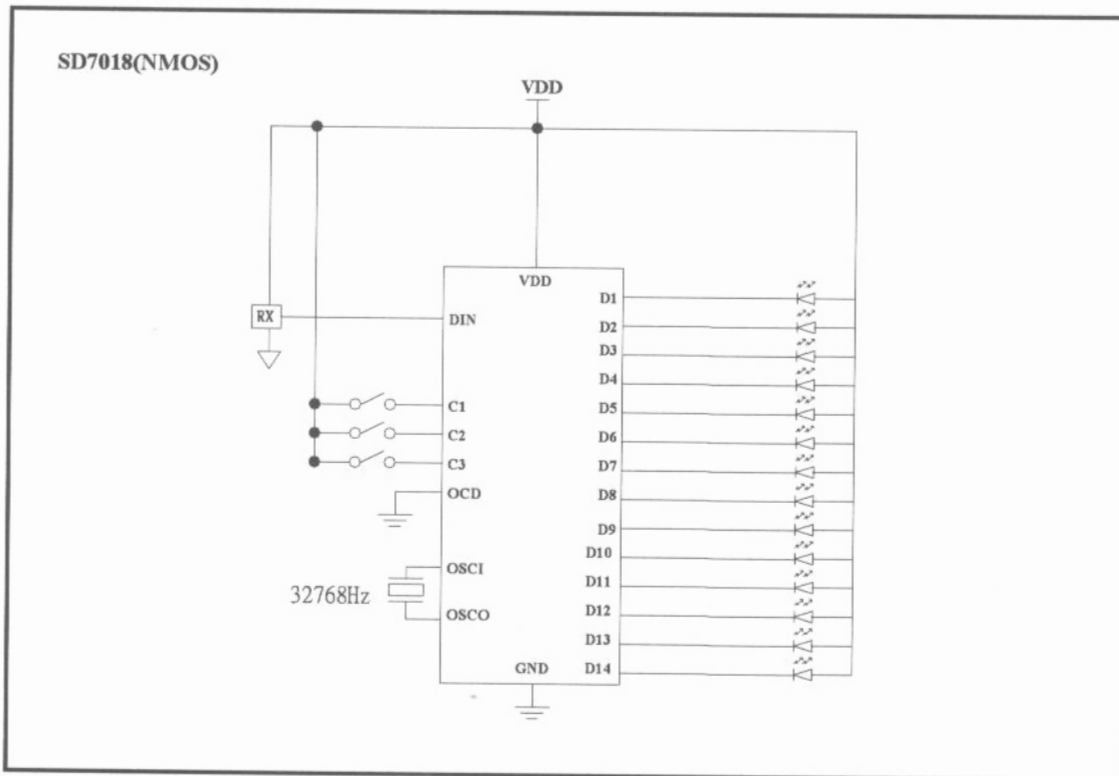
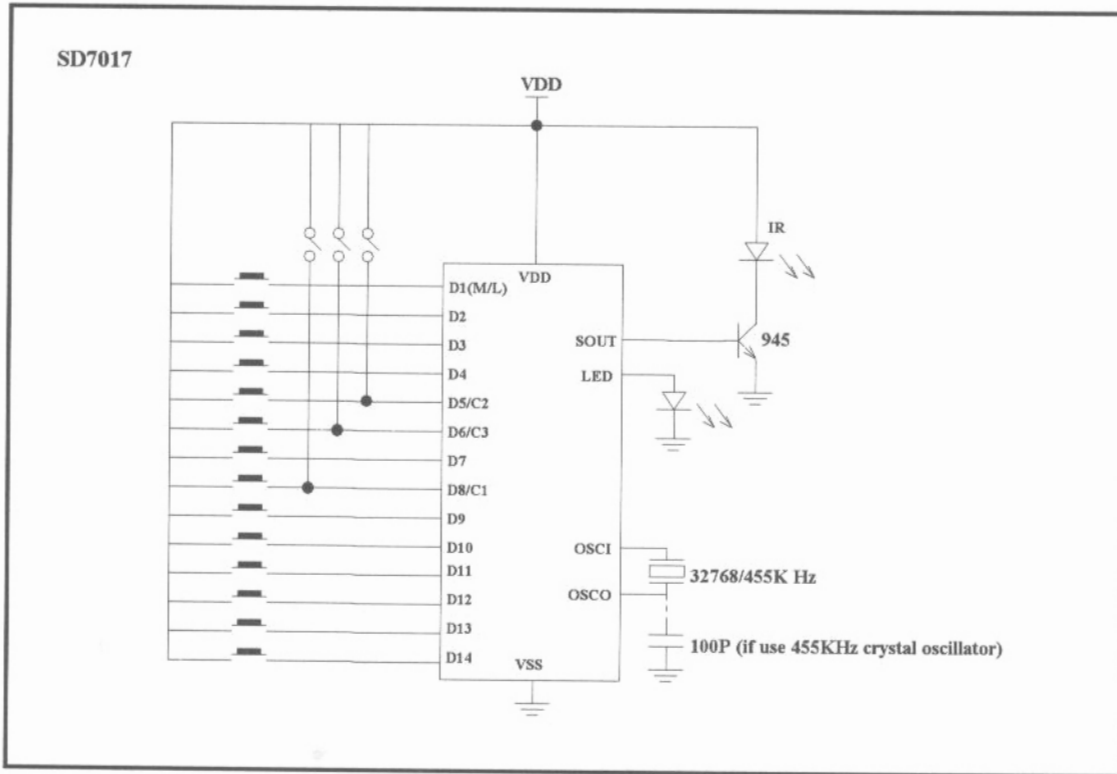
| Pin | Power On Mode | Leading Code |
|-----|---------------|--------------|
| D8  | Floating/Low  | C1 = 0       |
|     | High          | C1 = 1       |
| D5  | Floating/Low  | C2 = 1       |
|     | High          | C2 = 0       |
| D6  | Floating/Low  | C3 = 0       |
|     | High          | C3 = 1       |

**.Trailing Code**

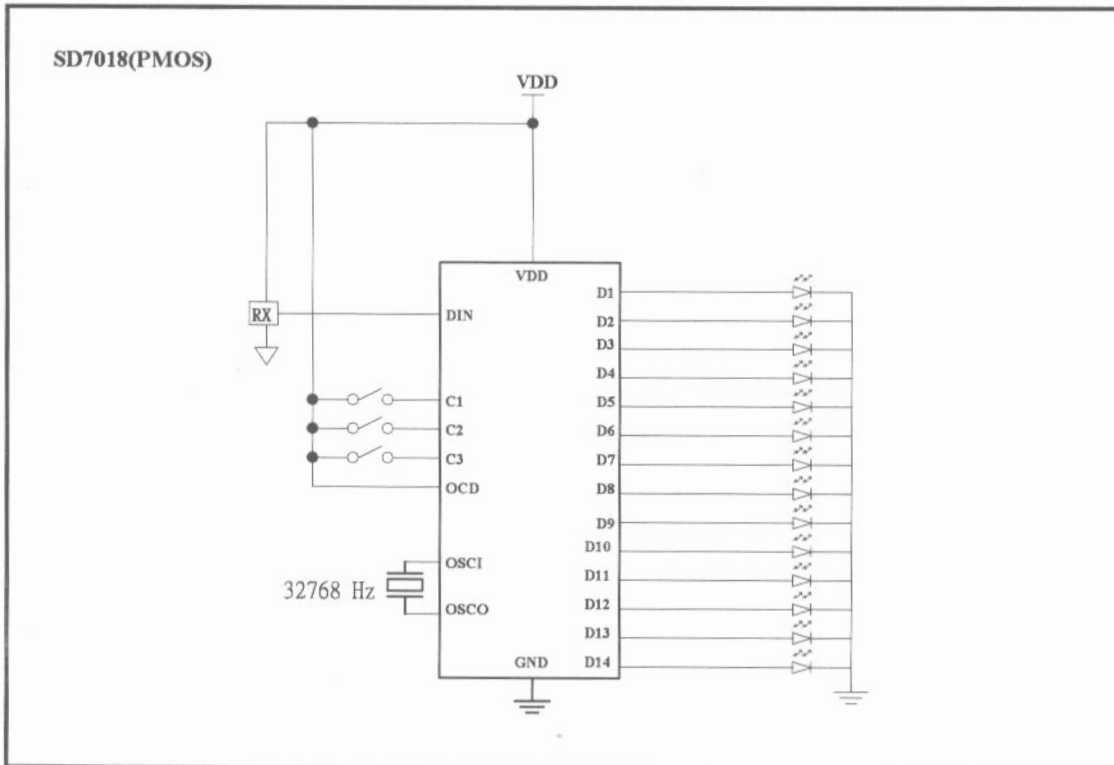
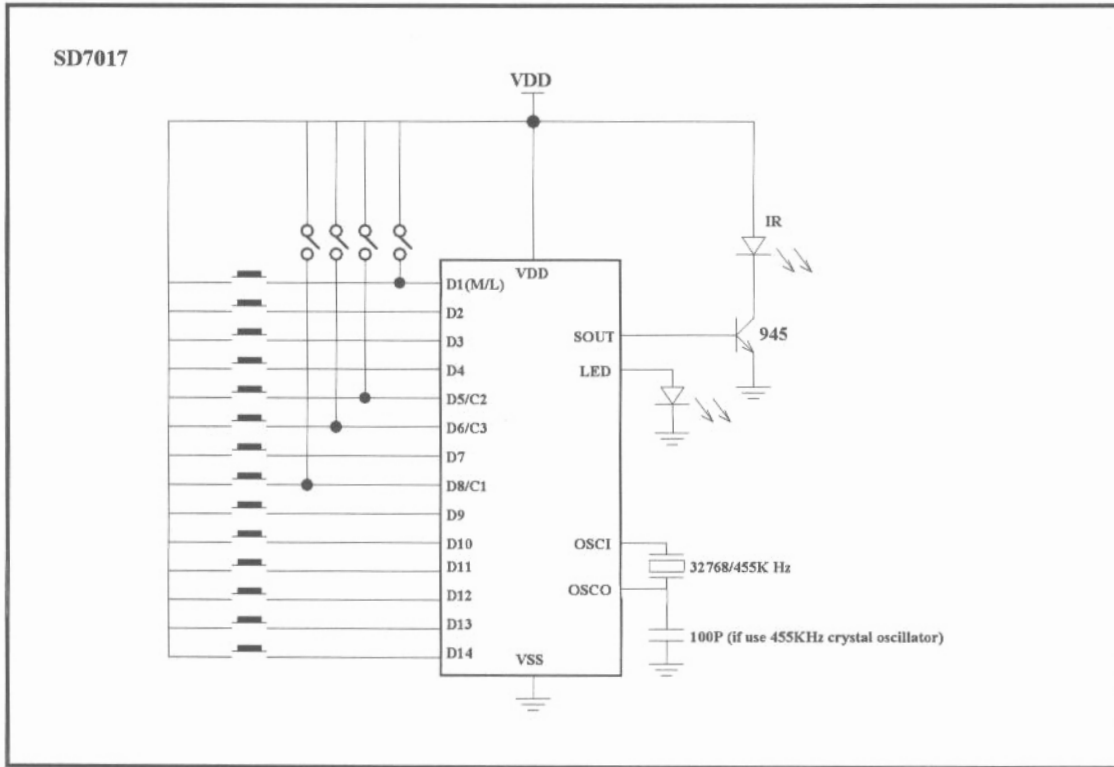
Metal mask option for trailing code (C4 & C5), default value for C4,C5 = 0,1.

Application Circuit

(1) Momentary Mode



(2) Latch Mode



**Bonding Diagram**
