



**DC PIR CONTROLLER  
WITH REMOTE CONTROL**

**GENERAL DESCRIPTION 功能敘述**

The M7613 is a low power PIR ( passive infra-red ) controller with remote control encoder , paired with M3DB,M3DT,M3D-95 for battery power door bell/alarm application. With special noise immunity technique , M7613 is the most stable PIR controller you can find on the market. More than this , there are few components needed in its application circuit which can reduce material cost and increase competitive.

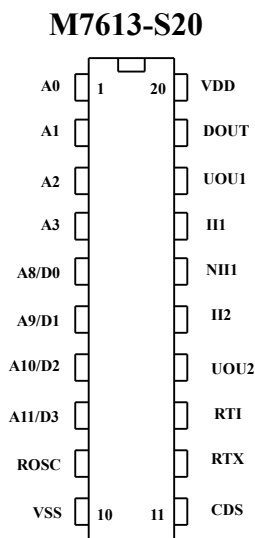
**FEATURES 產品特長**

- High noise immunity.
- Low stand-by current < 90uA
- Drive either remote control
- Adjustable play on duration and latch duration.
- Has 12 bits tri-states address pin up to four data bits.
- On-chip voltage regulator.
- 20 second warm-up.
- CDS input conditionally.
- 18 、 20 pin DIP or SOP package.

**APPLICATIONS 產品應用**

- Motion Detector, Alarm system, Auto-door bell.

**PIN ASSIGNMENT**





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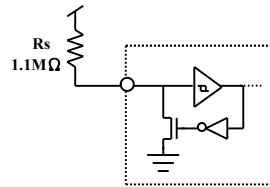
PIN DESCRIPTION

Pin Name	I/O	Description	
A0~A3	I	Code Address pin Nos.0~3. There four tri-state pins are detected to determine the encoded waveform bit 0 ~ bit 3.Each pin can be set to "0","1" or "F"(floating).	1-4
A8/D0~A11/D3	I	Code Address pin Nos.8~11/Data pin Nos.0~3. There four tri-state pins are detected to determine the encoded waveform bit 8 ~ bit 11.When these pins are used as address pins, they can be set to "0","1" or "F"(floating).When these pins are used as data pins, they can be set only to "0"or"1".	5-8
Rosc	I	Encoder system oscillator ( Rosc=1.1Mohm,Typ.=38KHz )	9
VSS		System ground.	10
CDS	I	Connect to a CDS for inhibit , when Vinhi = 0 disable ,Vinhi = 1 enable trigger	11
RTX	I	Delay timer oscillator input The delay time of receiving PIR signal to trigger Encoder or a high signal to trigger relay. The range for : RTX=2 K $\Omega$ ~ 5 M $\Omega$ CTX=100P~0.01UF FOR 100P or 0.01uf delay time=45000 R*C FOR 1000P delay time=35000 R*C Delay Time : 20 ms ~ 2250s Ex : CTX=100p , RTX=680K $\Omega$ , Delay Time=3.1s CTX=1000p , RTX=100K $\Omega$ , Delay Time=3.5s CTX=0.01uf , RTX=10K $\Omega$ , Delay Time=4.5s	12
RTI	I	Latch timer oscillator input The latch time of the range for : RTI=100 K $\Omega$ ~ 1 M $\Omega$ CTI=0.1UF(fix) Contain Time=35 R*C Contain time : > 0.5s ~ Ex : CTI=0.1uf , RTI=1M $\Omega$ , Contain Time=3.5s	13
UOU2	O	2 <sup>nd</sup> stage OP amp output.	14
II2	I	2 <sup>nd</sup> stage OP amp negative input.	15
NI1	I	1 <sup>st</sup> stage OP amp positive input.	16
II1	I	1 <sup>st</sup> stage OP amp negative input.	17
UOU1	I	1 <sup>st</sup> stage OP amp output.	18
DOUT	O	Data Output pin. The encoder waveform is serially outputted to this pin. When PIR is not detecting , DOUT output low (VSS) voltage	19
VDD		Operation voltage : 5V , Stand by current : 80~90uA	20



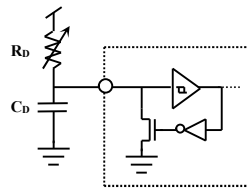
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Encoder oscillator input pin, connect to external R to generate 38KHz Encoder frequency.



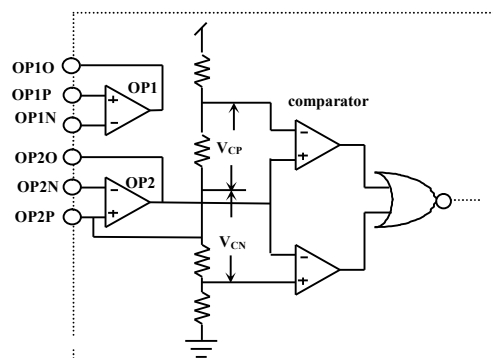
**Fig.1 Encoder Oscillator**

Delay timing and Latch timing oscillator input pin, connect to external RC to obtain desired delay duration.  
Variable delay(latch) duration can be obtained by selecting various values of RC or using a variable resistor.



**Fig.2 Timing Oscillator**

The PIR signal amplifier needs a warm up period after power-on, so during this time the input should be disabled

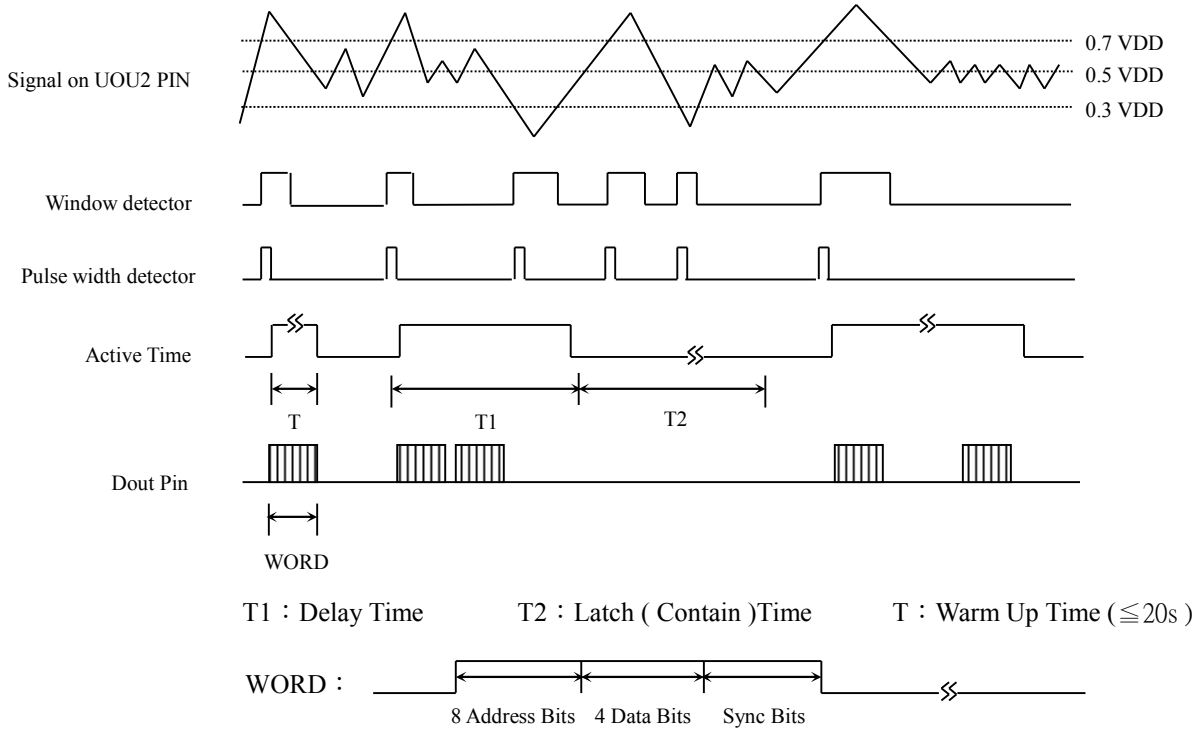


**Fig.3 PIR Amplifier Block Diagram**



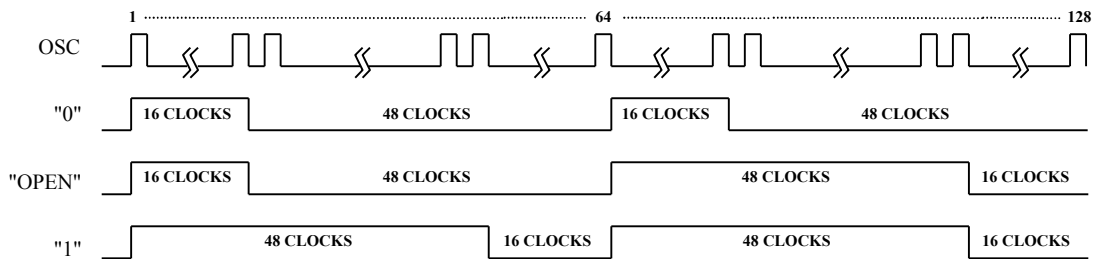
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**TIMING RELATIONSHIP :**



**RF OPERATION**

**Code Bit format**



M7613 has a maximum of twelve (12) Address Bits including the four (4) Address/Data bits. The following diagram shows the code bits with their corresponding pis.

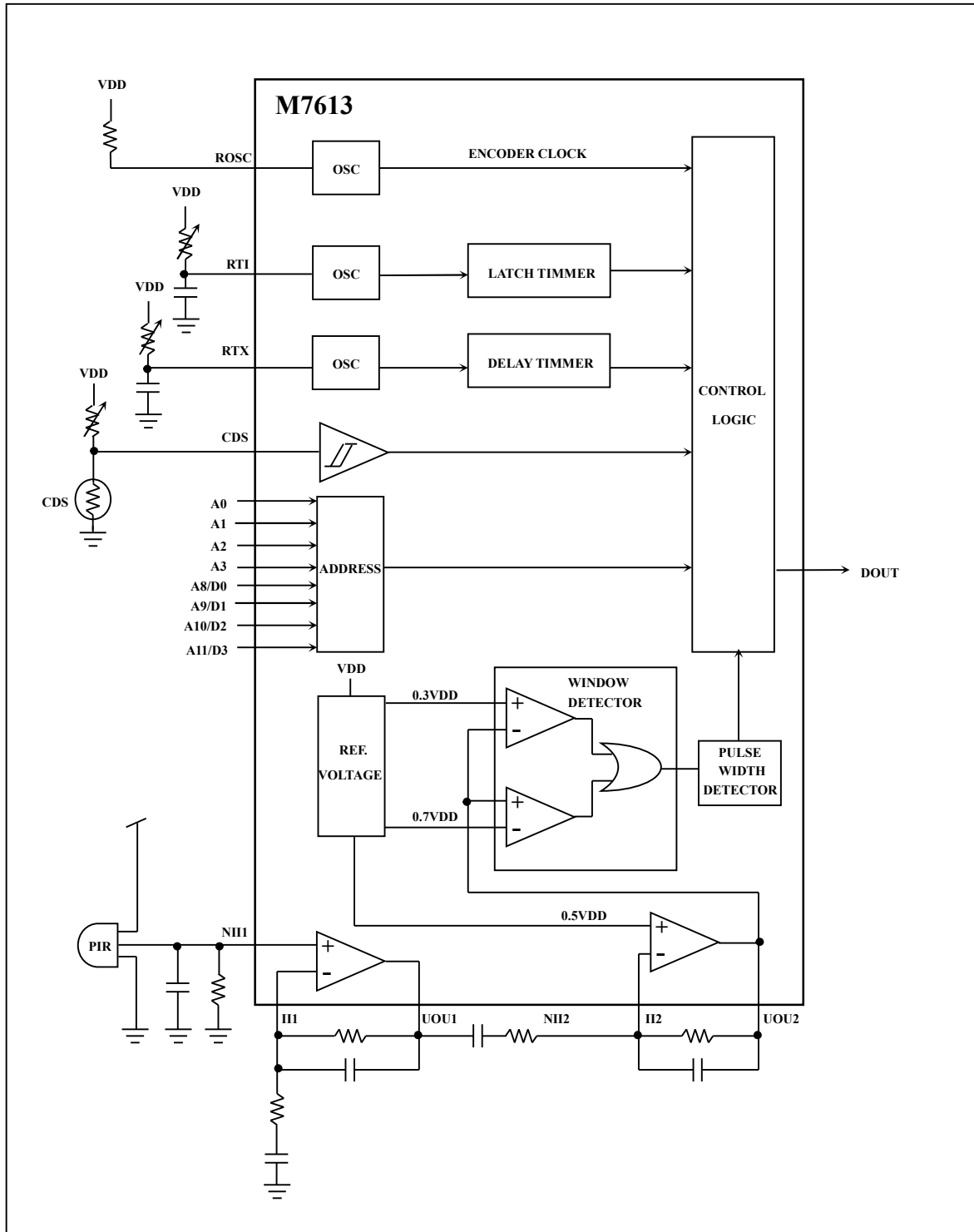
\*\* One complete Code word \*\*

First bit	A0	A1	A2	A3	A4=0	A5=1	A6=0	A7=1	A10/D0	A11/D1	A12/D2	A13/D3	SYNC BIT
0 Data	A0	A1	A2	A3	0	1	0	1	A8	A9	A10	A11	
1 Data	A0	A1	A2	A3	0	1	0	1	A8	A9	A10	D3	
2 Data	A0	A1	A2	A3	0	1	0	1	A8	A9	D2	D3	
3 Data	A0	A1	A2	A3	0	1	0	1	A8	D1	D2	D3	
4 Data	A0	A1	A2	A3	0	1	0	1	D0	D1	D2	D3	



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BLOCK DIAGRAM





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ABSOLUTE MAXIMUM RATING

(TA=25°C)

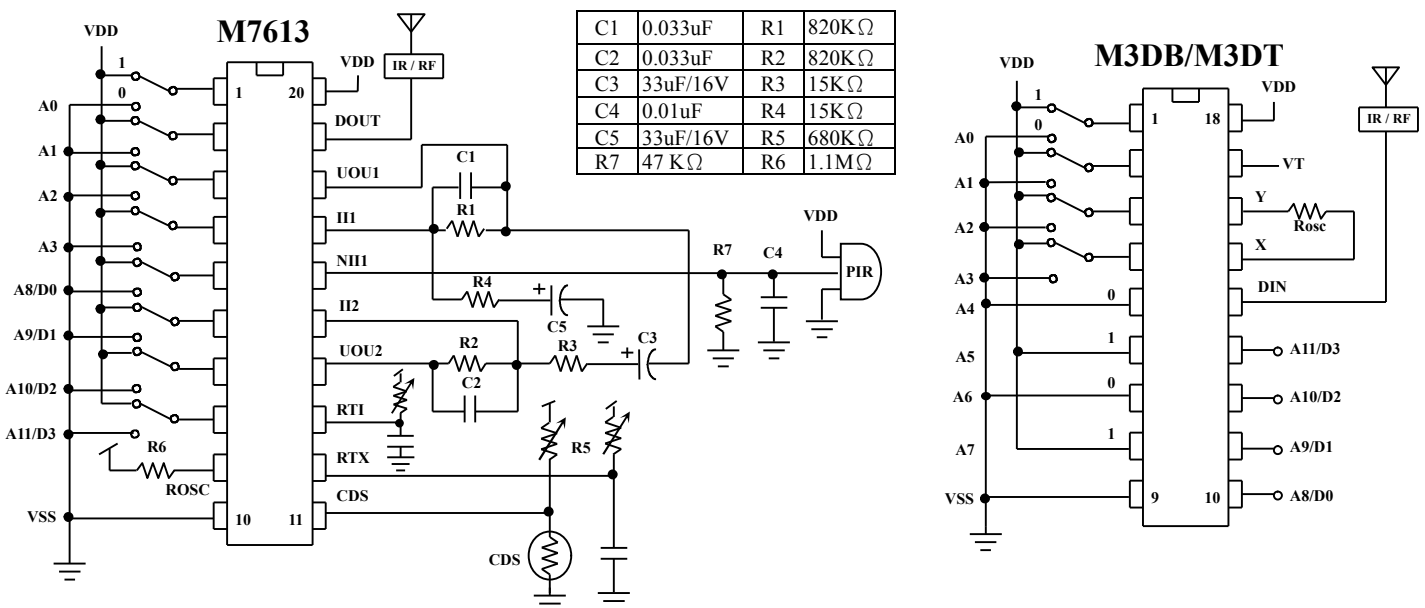
Parameter	Sym.	Rating	Unit
Power Supply V <sub>DD</sub> With Respect to V <sub>SS</sub>	V <sub>DD</sub> - V <sub>SS</sub>	5.6	V
Voltage On Any Pin		-0.3 to 5.6	V
Operating Temperature	Top	-20 to 70	°C
Storage Temperature		-65 to 150	°C

ELECTRICAL CHARACTERISTICS

Characteristics	Sym.	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	V <sub>DD</sub>	4.2	5	5.5	V	
Stand by Current	I <sub>ST</sub>	—	—	100	uA	
Operating Current	I <sub>DD</sub>	1.8	—	2.5	mA	
Stable Voltage	V <sub>REF</sub>	2.1	2.5	2.75	V	V <sub>DD</sub> > 4.2V
Source Current of V <sub>REF</sub>	I <sub>REF</sub>	200	—	—	uA	
Ripple of V <sub>REF</sub>		—	—	0.5	mV	
Input and Output Regulation of V <sub>REF</sub>		—	—	0.3%		
Time Encoder Frequency	F <sub>ROSC</sub>	37	38	39	KHz	
Time Delay Frequency	F <sub>RTX</sub>	15	16	17	KHz	For Delay 3s
Time Latch Frequency	F <sub>RTI</sub>	15	16	17	Hz	For Contain 3s
CDS Operating Trigger	V <sub>T+</sub>	1.3	1.7	2.1	V	
CDS Operating Trigger	V <sub>T-</sub>	0.6	0.9	1.1	V	
CDS Source Current	I <sub>CDS</sub>	2.6	3.5	4.4	uA	
CDS Output Source Current	I <sub>SOURCE</sub>	9	10.4	17.4	mA	
CDS Output Sink Current	I <sub>SINK</sub>	11.6	13	21	mA	

APPLICATION DIAGRAM 參考電路圖

(A) PAIR WITH M3DB/M3DT

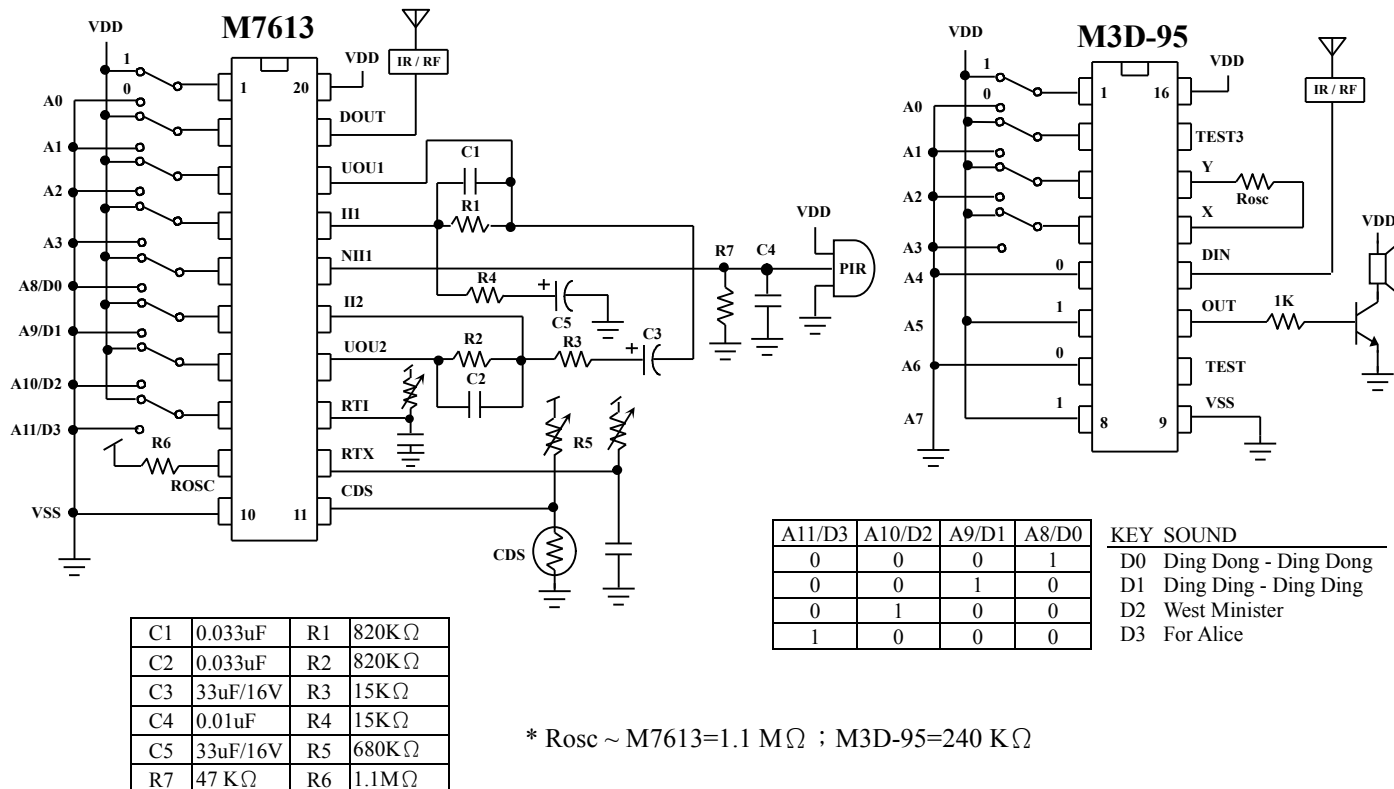


\* Rosc ~ @5V, M7613=1.1 MΩ ; @12V, M3DB=1MΩ ; @5V, M3DT=620KΩ.



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( B ) PAIR WITH M3D-95



\* All specs and applications shown above subject to change without prior notice.  
(以上電路及規格僅供參考,本公司得逕行修正)