MOSDESIGN SEMICONDUCTOR CORP.
一華半導體股份有限公司

PIR CONTROLLER
FOR DC/AC APPLICATIONS

DESCRIPTION

The M7620 integrated circuit combines all required functions for a single chip Passive Infra Red (PIR) light controller. It is designed for load switching with a transistor or a relay in 3 wire AC and DC systems.

A conventional PIR sensor connects directly to the PIR input. The pull-down resistor and DC decoupling circuitry are integrated on chip.

The PIR signal is converted to a 15 bit digital value. External potentiometers or resistors are used to set the operating parameters for sensitivity, on-time, CDS sensor. The corresponding voltage levels are converted to digital values with a 4 bit resolution all signal processing is performed digitally.

FEATURES

・ Digital signal processing
・ Adjustable PIR sensitivity
・ Adjustable output turn-on time
・ Retrigger/Non-retrigger function
・ RELAY output
・ SOP-8 package

APPLICATIONS

・ PIR light controller, Motion Detector, Alarm system, Auto-door bell

PIN ASSIGMENT
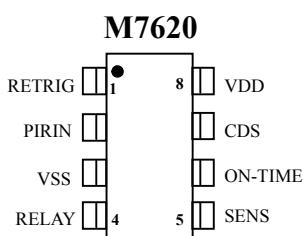
M7620

RETRIG	1	8 VDD
PIRIN		CDS
VSS		ON-TIME
RELAY	4	5 SENS

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BLOCK DIAGRAM
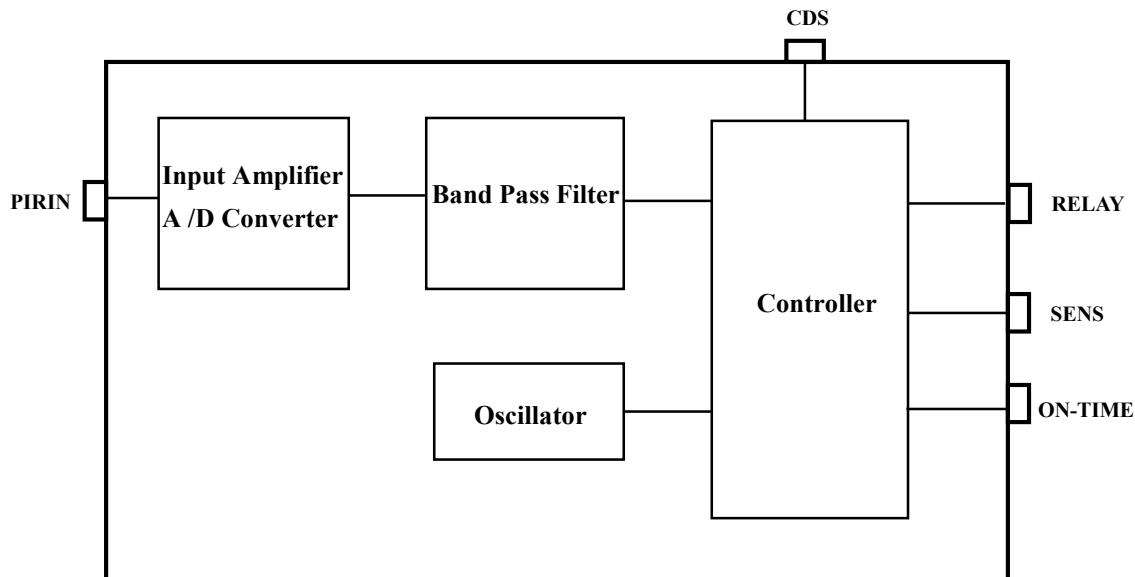
PIN DESCRIPTION

Pin No.	Name	I/O	Description
1	RETRIG	I	Retrigger mode select input. VDD or floating：As long as movement is detected within the on-time, the light will remain on. VSS：The light will first switch off, before it can be switched on again.
2	PIRIN	I	PIR sensor input
3	VSS		Ground
4	RELAY	O	Relay output pin
5	SENS	I	Sensitivity threshold adjustment。Sets the sensitivity threshold required to generate a trigger condition. Refer to **Tble1**
6	ON-TIME	I	Light on-time adjustment. Refer to **Tble1**
7	CDS	I	Connect to the CDS voltage divider for daytime/night auto detecting, VDD：Enable switching of the light VSS：Disable switching of the light
8	VDD	─	Positive power supply

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FUNCTION DESCRIPTION

Power-up Mode

After the device powers on it first enters a warm-up period. The light is switched on for the selected on-time duration. The CDS input is ignored on power-up, to allow the user to verify the installation during daylight conditions.

Trigger Condition

The SENS threshold (refer to table 1) is multiplied, When the filtered PIR signal exceeds this threshold, a trigger condition occurs.

Conditions for Switching the Light ON

If a trigger condition occurs and the CDS input is high, the light will be switched on.

The light and the relay will remain on for the duration set by the ON-TIME input.

Pin Voltage / VDD	On time	SENS Distance
$(13/32) \times VDD \leq Vin < (15/32) \times VDD$	38.4 min	Near distance
$(11/32) \times VDD \leq Vin < (13/32) \times VDD$	19.2 min	
$(9/3)2 \times VDD \leq Vin < (11/32) \times VDD$	9.6 min	
$(7/32) \times VDD \leq Vin < (9/32) \times VDD$	4.8 min	
$(5/32) \times VDD \leq Vin < (7/32) \times VDD$	2.4 min	
$(3/32) \times VDD \leq Vin < (5/32) \times VDD$	72 sec	
$(1/32) \times VDD \leq Vin < (3/32) \times VDD$	36 sec	
$0 \leq Vin < (1/32) \times VDD$	9 sec	Long distance

Table 1：**On-time, SENS distance**

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ABSOLUTE MAXIMUM RATING

(TA = 25℃)

Parameter	Sym.	Min.	Max.	Unit	Remarks
Operating Voltage	VDD	-0.3	5	V	
Voltage On Any Pin		-100	100	mA	
Operating Temperature		-25	70	℃	
Storage temperature	T**st**	-45	125	℃	

ELECTRICAL CHARACTERISTICS

(TA = 25℃ ,VDD=4.4V)

Characteristics	Sym.	Min.	Typ.	Max.	Unit	Conditions
Operating Voltage						
Supply voltage	VDD	3.3	4.4	5.0	V	
Supply current	IDD	—	—	200	μA	VDD=4.4V (outputs unloaded)
Oscillator and Filter						
LPF cutoff frequency		—	5	—	Hz	
HPF cutoff frequency		—	0.3	—	Hz	
Clock frequency	F_{CLK}	—	64	—	KHz	
Analog Inputs						
Input leakage current (ON-TIME、SENS)		-1	—	1	μA	
PIRIN resistance to VSS		—	70	—	KΩ	
PIRIN input AC voltage		—	—	50	mV	Peak-to-Peak
PIRIN input DC voltage		0.2	—	1.5	V	
Digital Inputs, Schmitt Triggers (RETRIG、CDS)						
Input low voltage	V_{IL}	80	—	—	%VDD	
Input high voltage	V_{IH}	—	—	20	%VDD	
Pull up current on RETRIG		—	70	—	μA	input to VSS
Leakage current on CDS		—	—	±1	μA	input to VSS or VDD
Digital Outputs						
Relay Source Current	I_{RS}	—	—	10	mA	

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APPLICATION CIRCUIT

AC Application Circuit
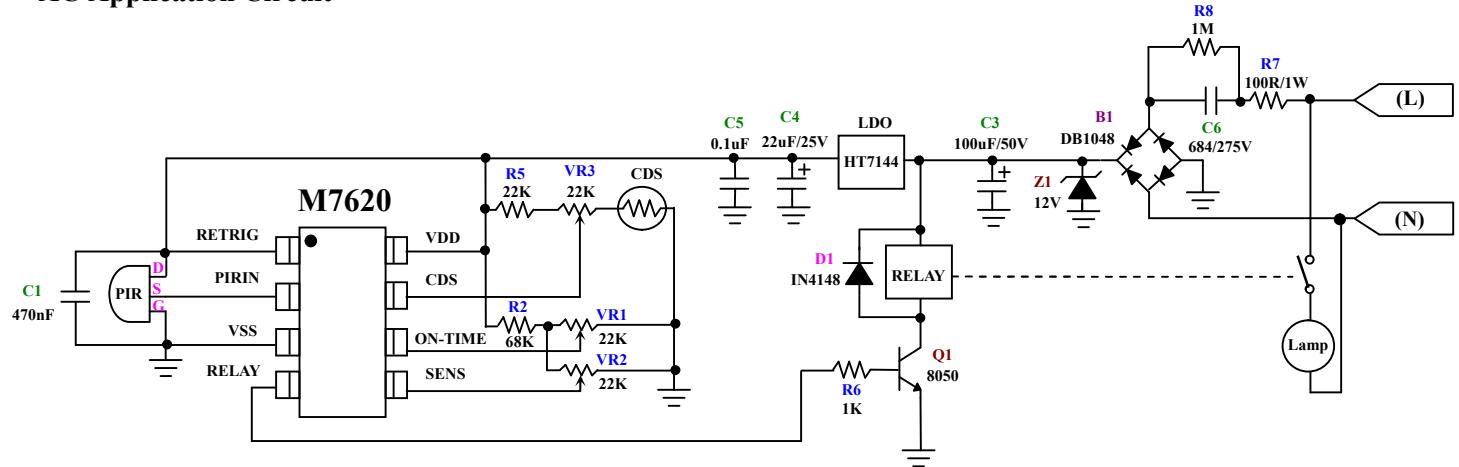
RETRIG = VDD：Retrigger

= VSS：Non-Retrigger

DC Application Circuit
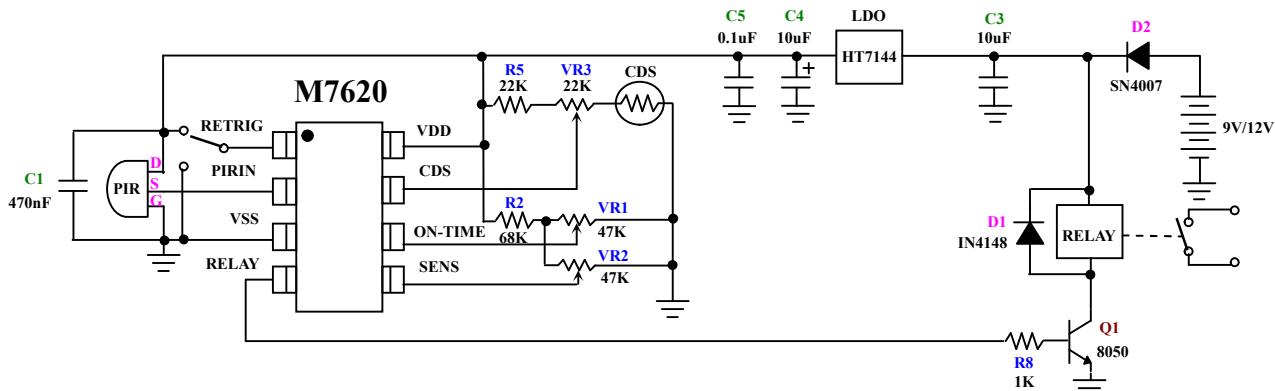
RETRIG = VDD：Retrigger

= VSS：Non-Retrigger

* All specs and applications shown above subject to change without prior notice.

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PACKAGE OUTLINE

SYMBOLS	MIN	MAX
A	0.053	0.069
A1	0.004	0.010
A2		0.059
D	0.189	0.196
E	0.150	0.157
H	0.228	0.244
L	0.016	0.050
θ	0	8

Unit : INCH

SOP-8