STERILIZATION UNIT

Hardware Design

Submitted by Group 95

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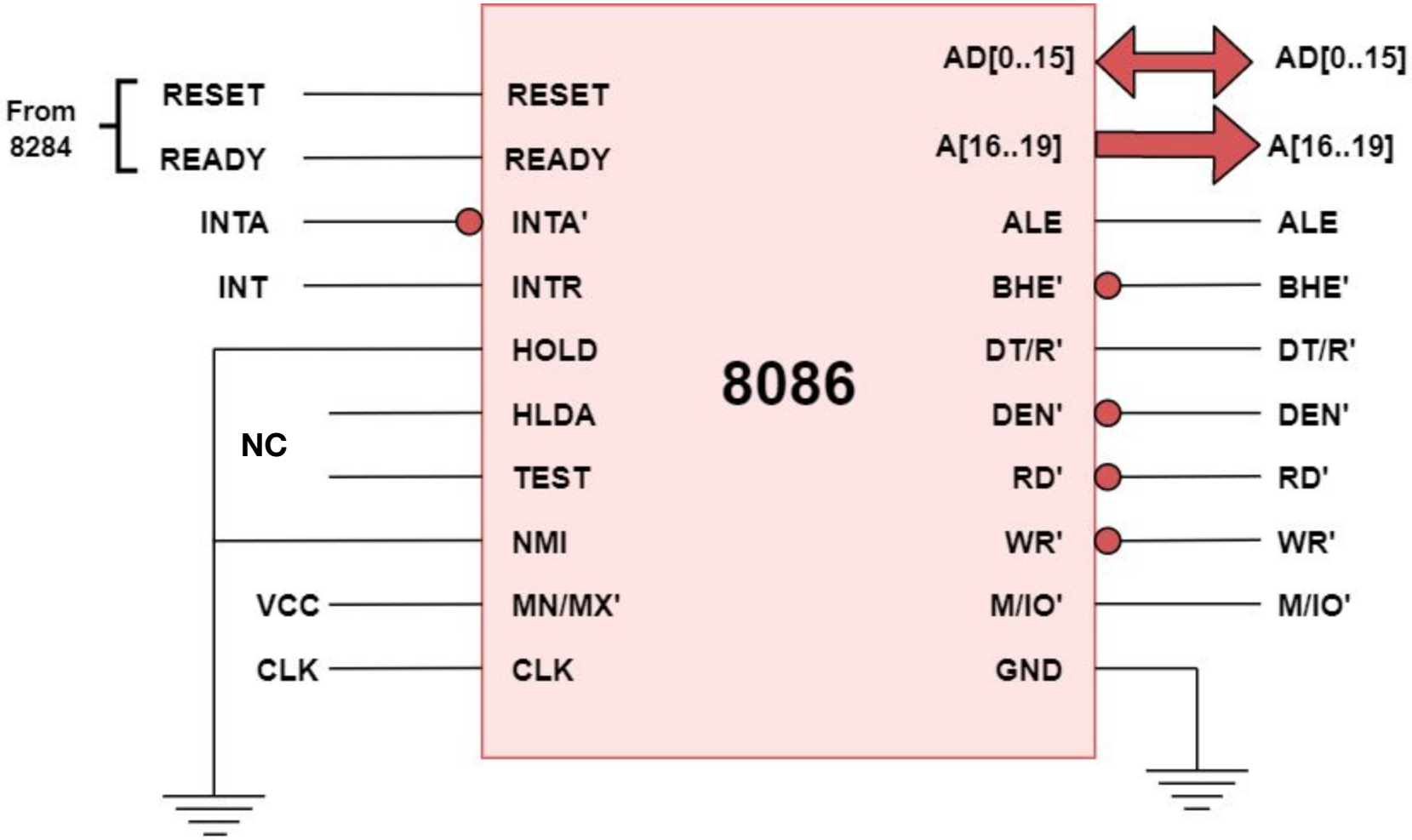
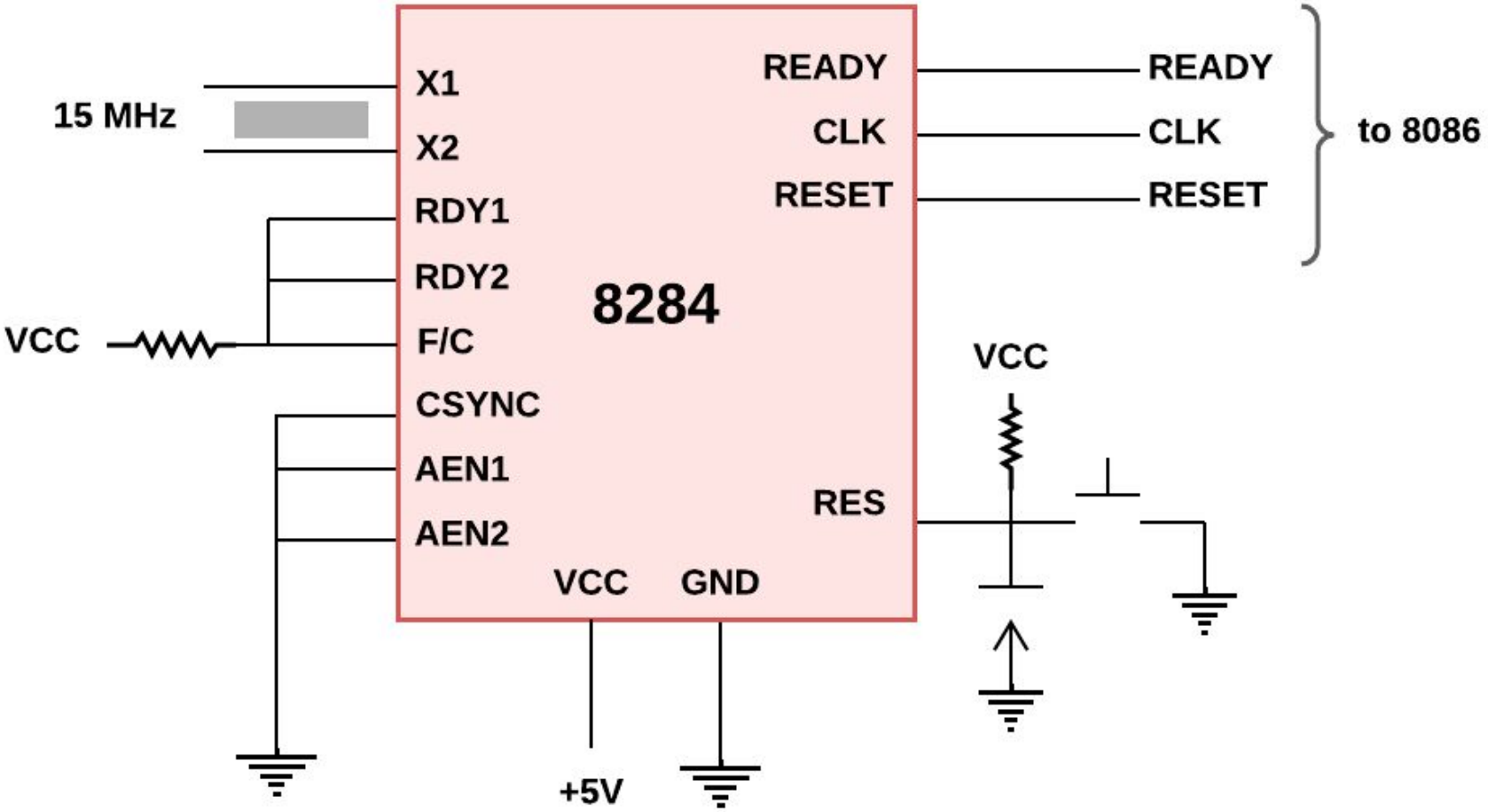
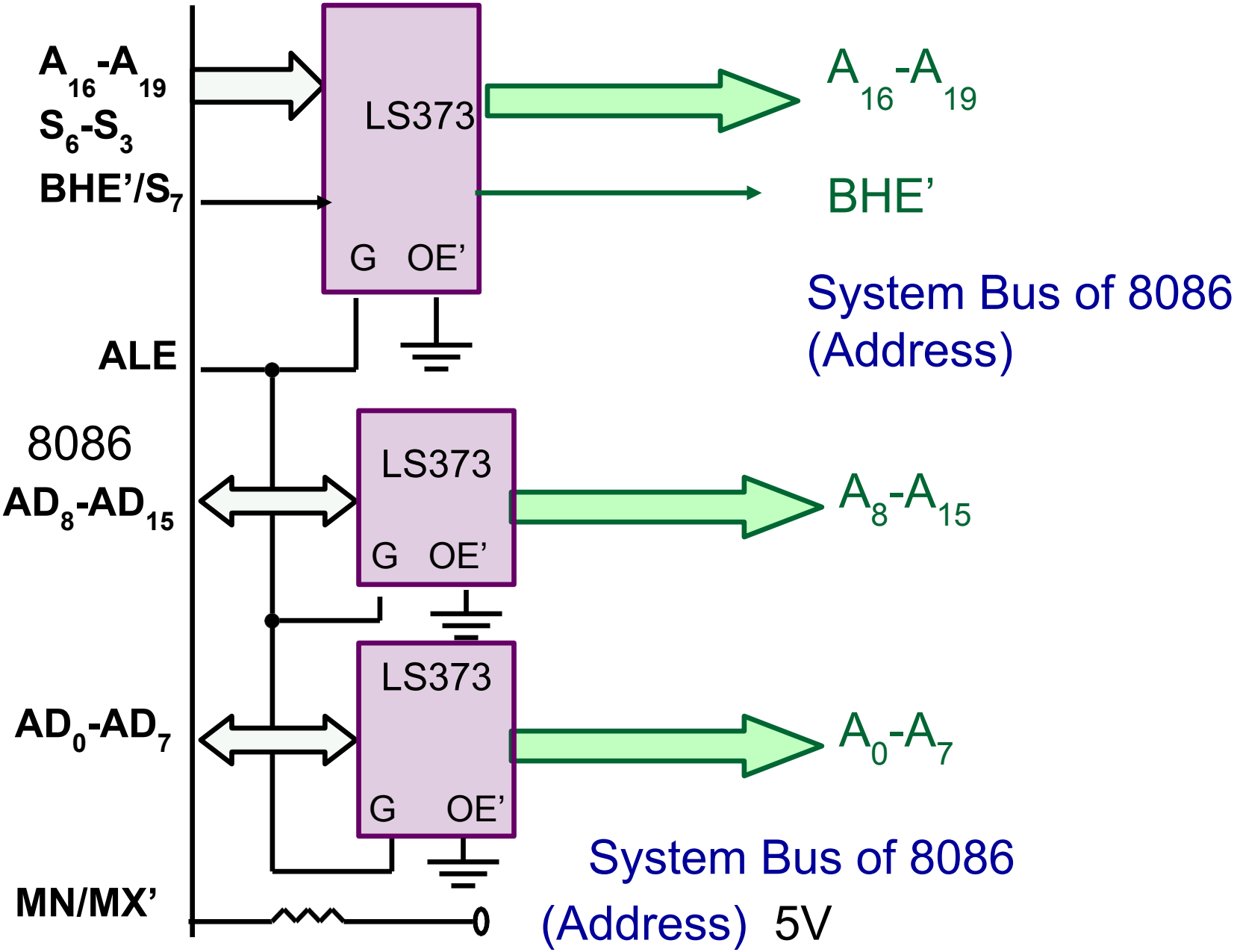
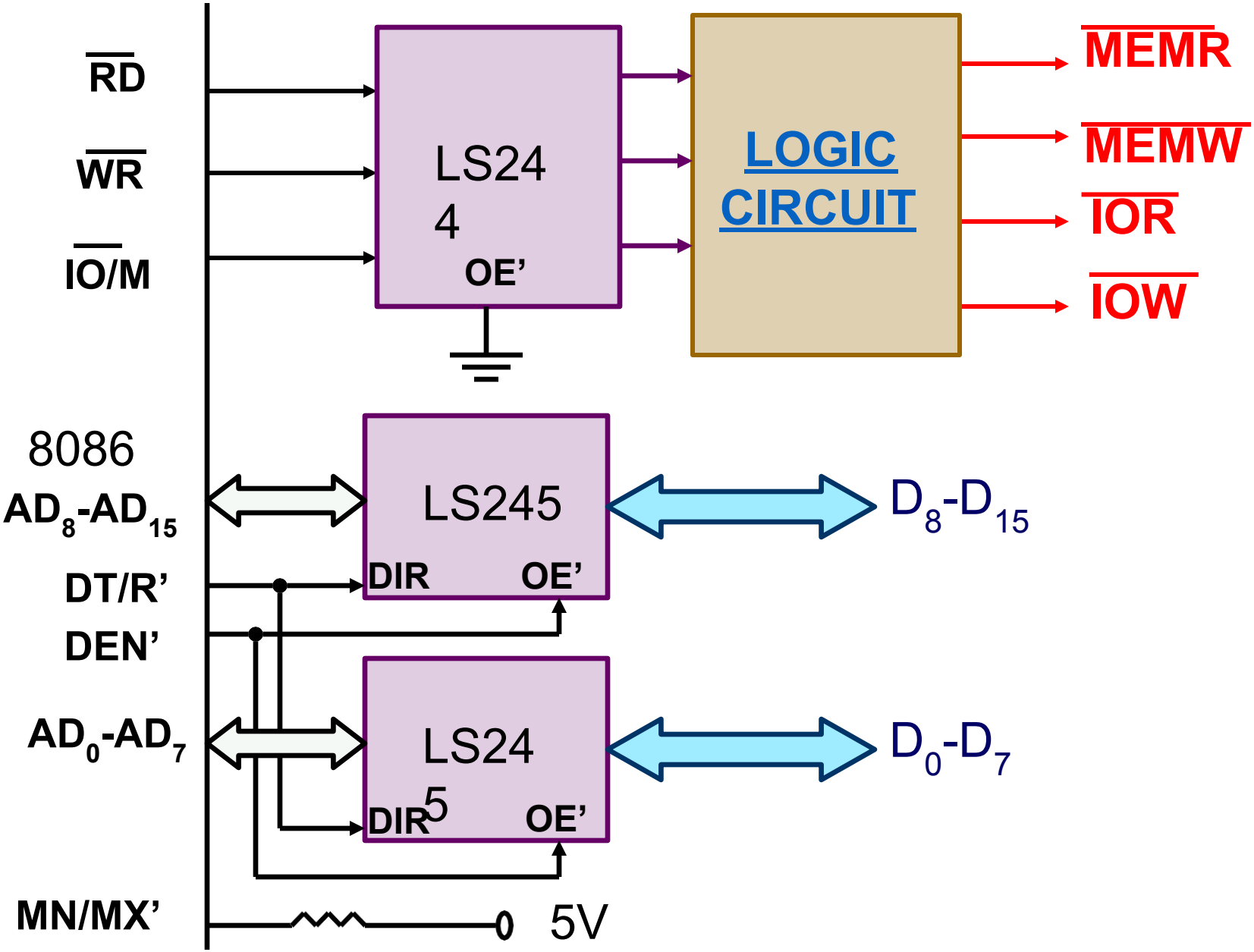
Date: 19/04/2021

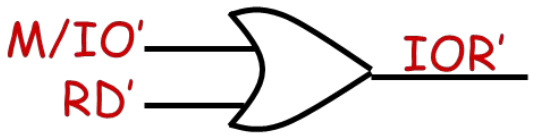

From 8284
RESET
READY
INTA
INT
NC
VCC
CLK
RESET
READY
INTA'
INTR
HOLD
HLDA
TEST
NMI
MN/MX'
CLK
8086
AD[0..15]
A[16..19]
ALE
BHE'
DT/R'
DEN'
RD'
WR'
M/IO'
GND
AD[0..15]
A[16..19]
ALE
BHE'
DT/R'
DEN'
RD'
WR'
M/IO'

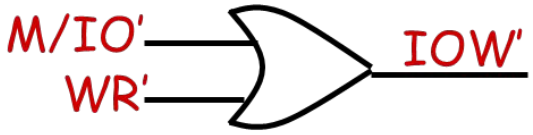

15 MHz
X1
X2
RDY1
RDY2
F/C
CSYNC
AEN1
AEN2
VCC
VCC
GND
+5V
8284
READY
CLK
RESET
RES
READY
CLK
RESET
to 8086
VCC


A16-A19
S6-S3
BHE'/S7
LS373
G OE'
A16-A19
BHE'
System Bus of 8086
(Address)
ALE
8086
AD8-AD15
LS373
G OE'
A8-A15
LS373
AD0-AD7
G OE'
A0-A7
System Bus of 8086
(Address) 5V
MN/MX'

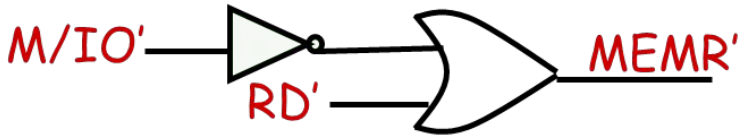


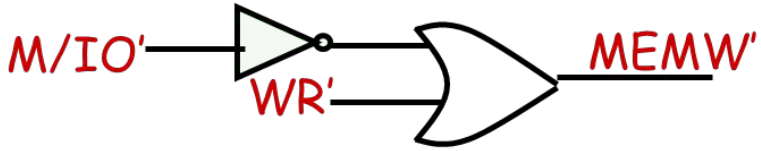
System Bus of 8086(Data + Control)





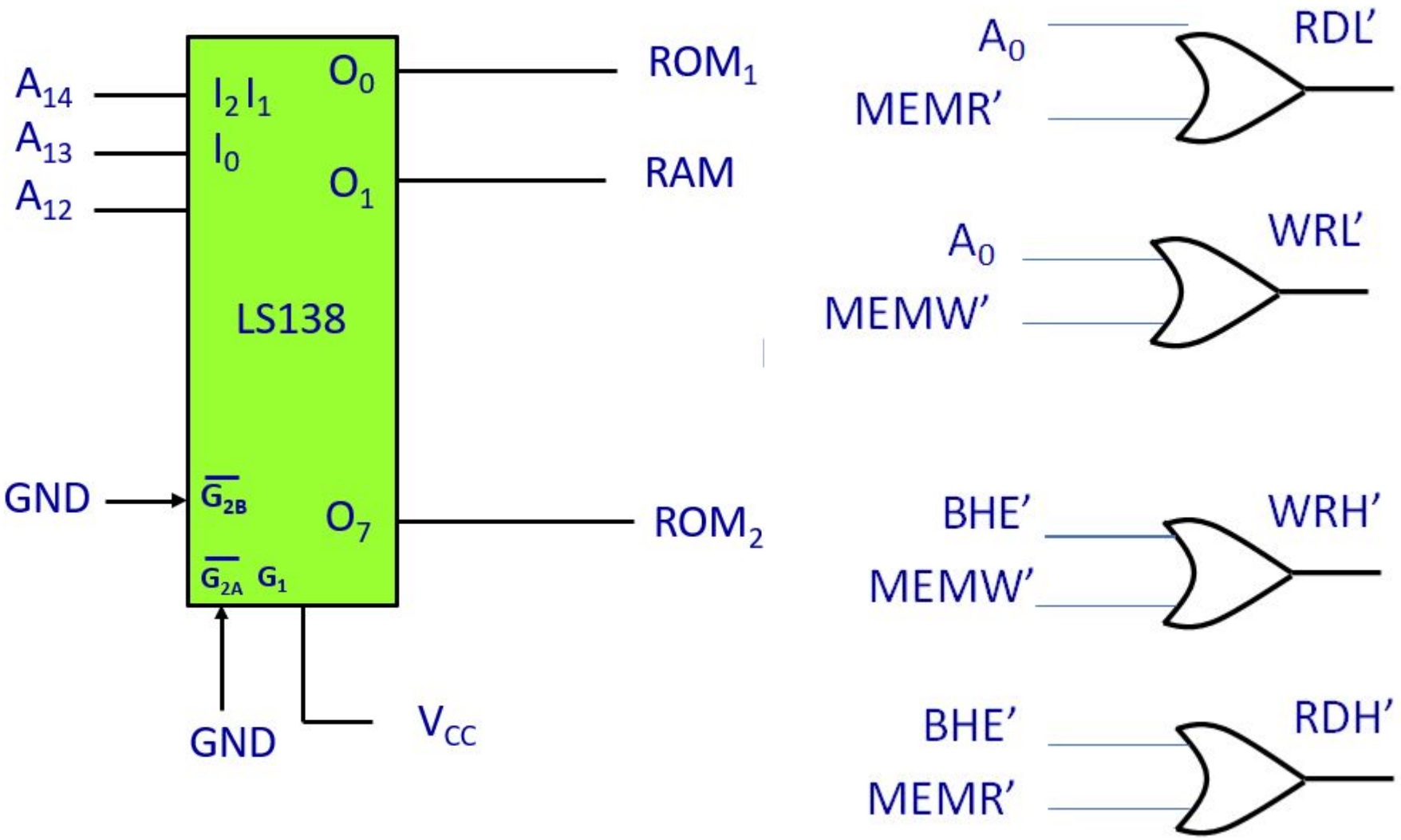
M/IO'	RD'	WR'	Bus cycle
1	0	1	MEMR'
1	1	0	MEMW'
0	0	1	IOR'
0	1	0	IOW'



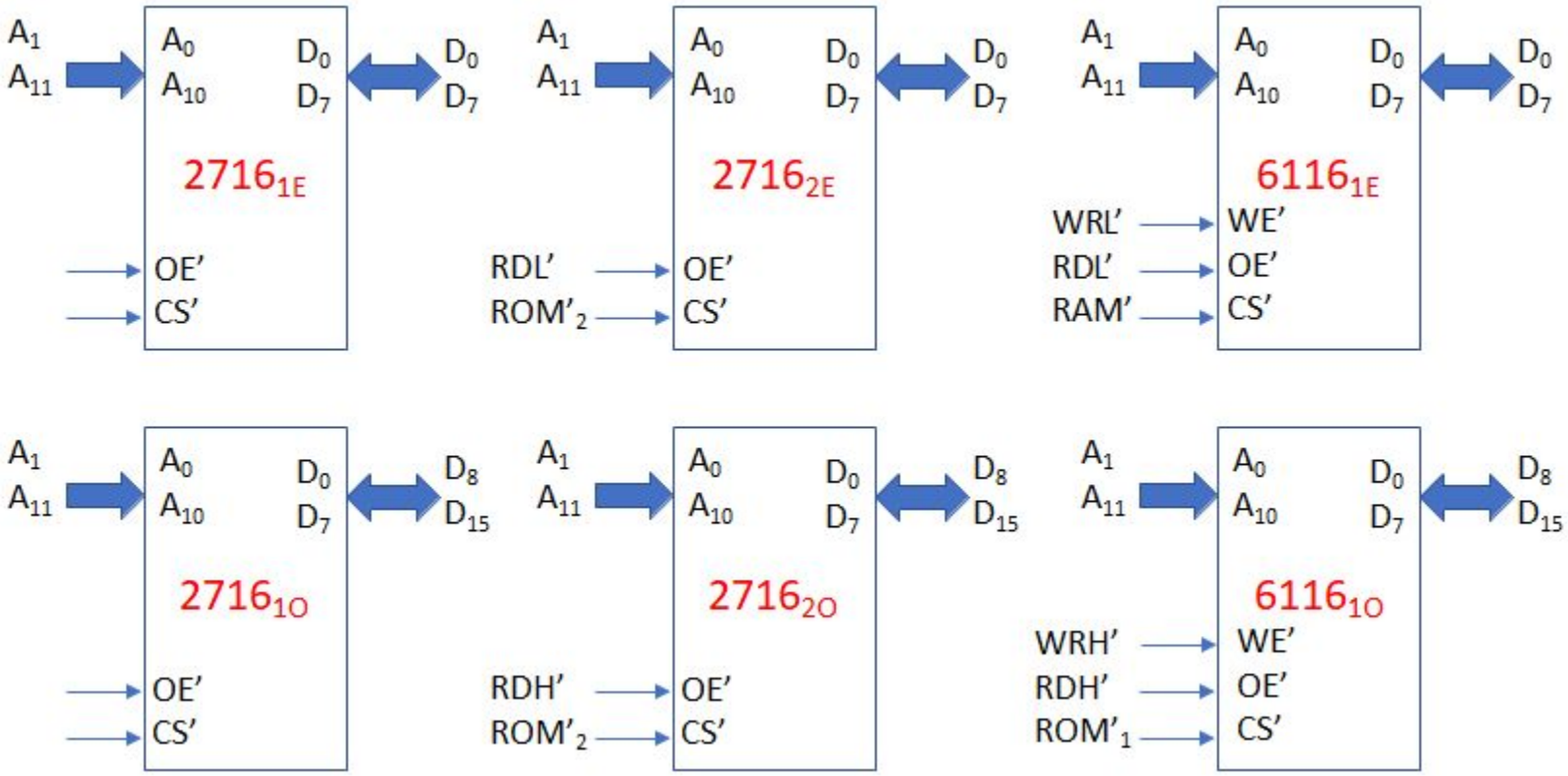


back

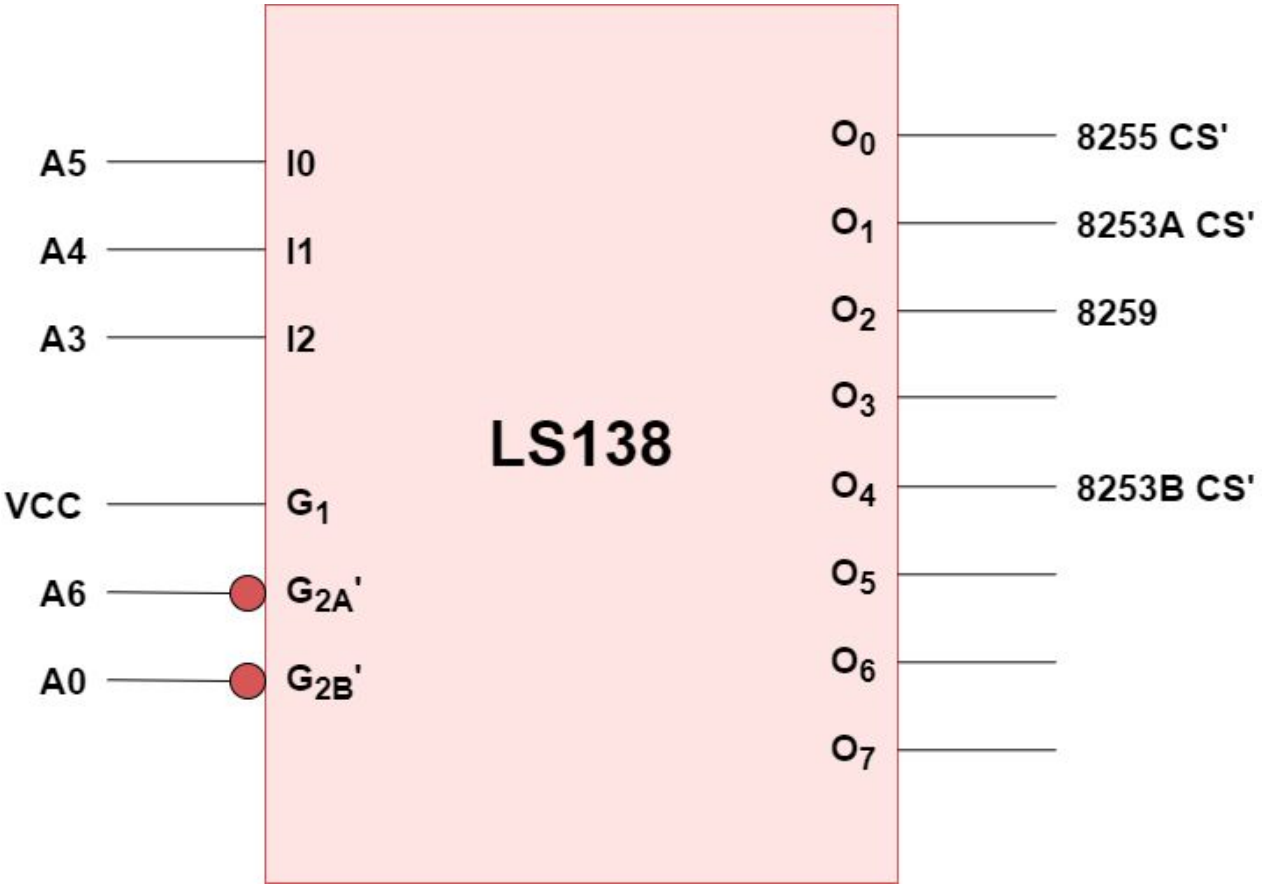
Memory Decoder



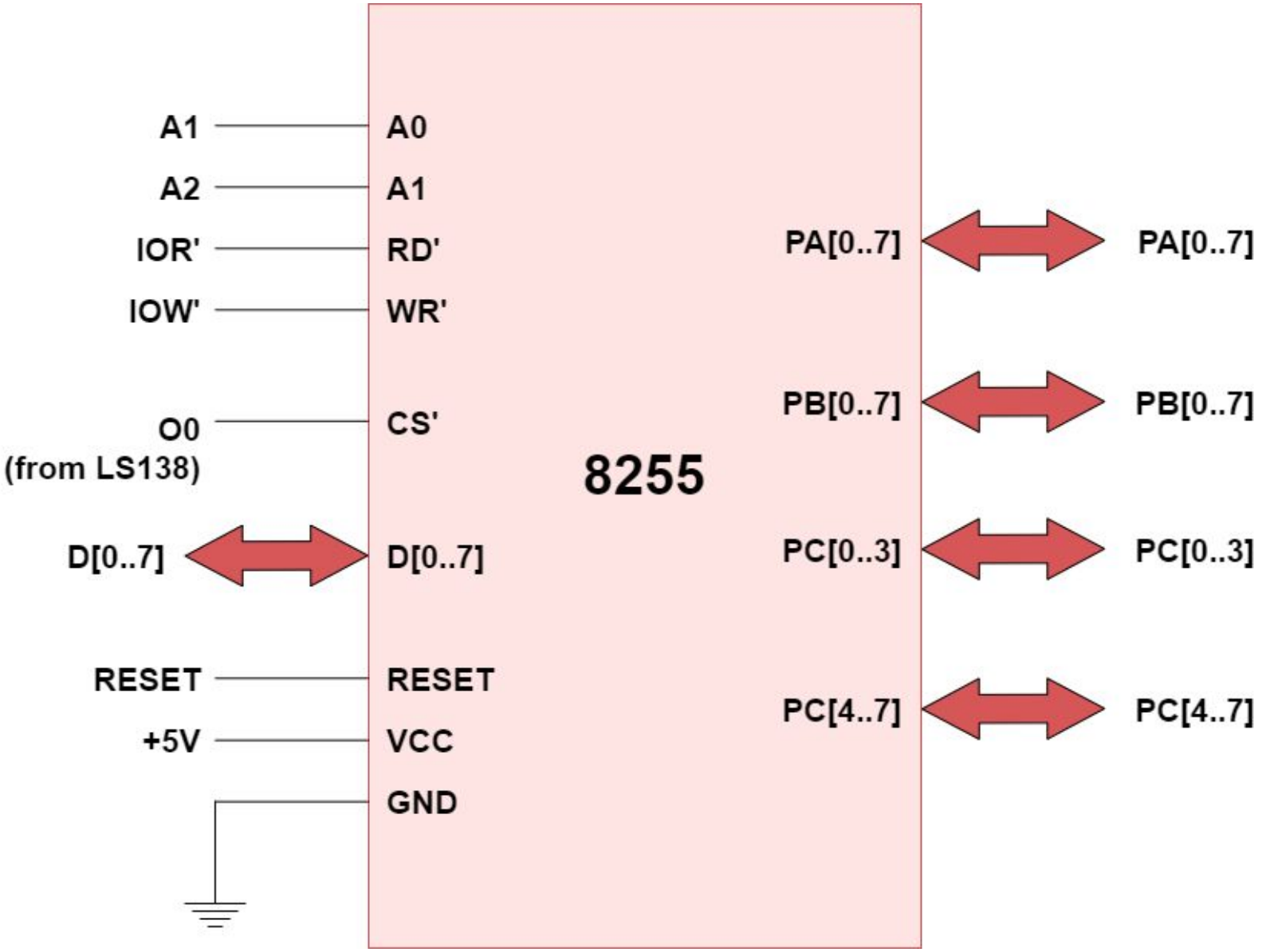
Memory Interfacing



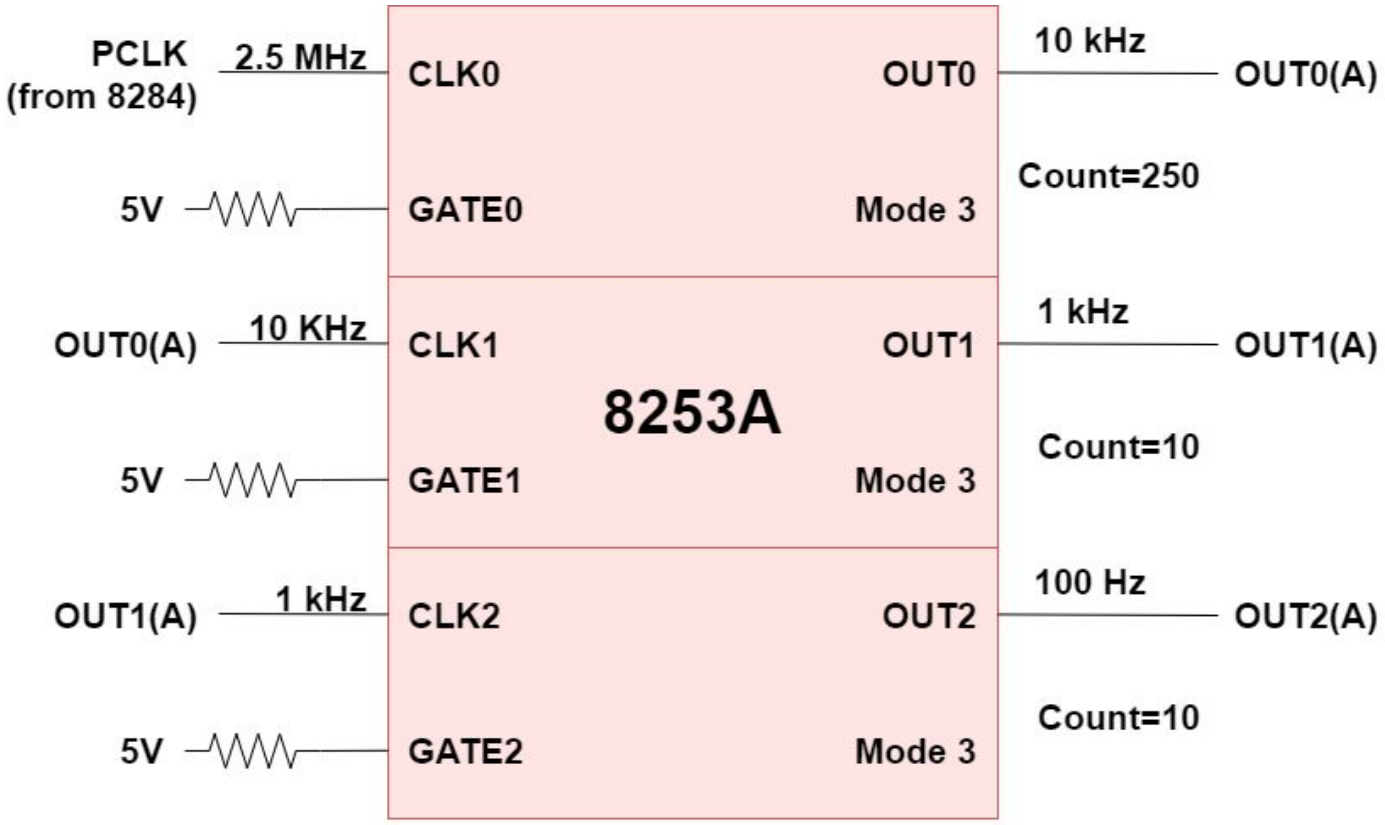
I/O Decoder


A5
A4
A3
VCC
A6
A0
I0
I1
I2
G1
G2A'
G2B'
LS138
O0
O1
O2
O3
O4
O5
O6
O7
8255 CS'
8253A CS'
8259
8253B CS'

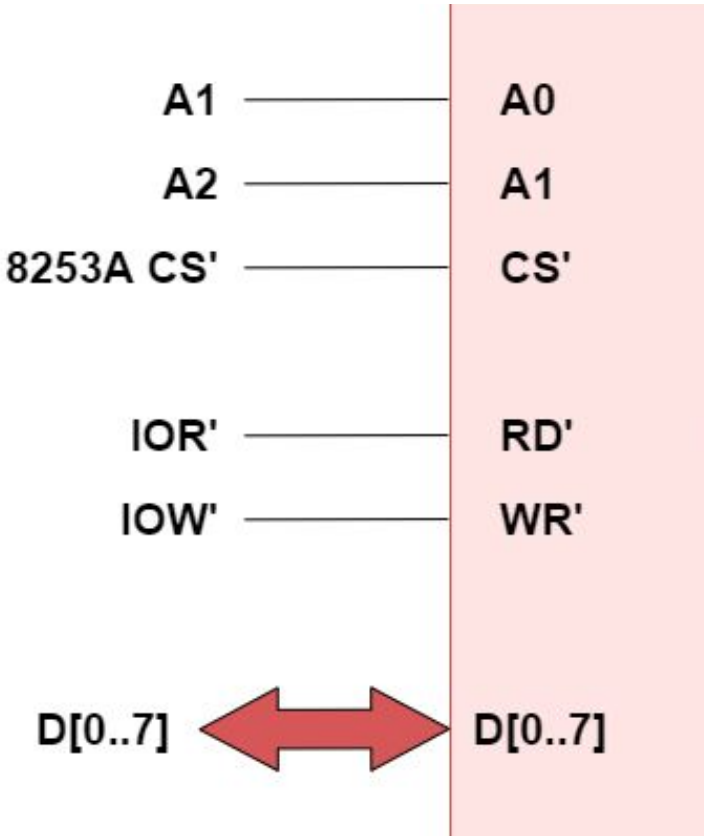
Programmable Peripheral Interface



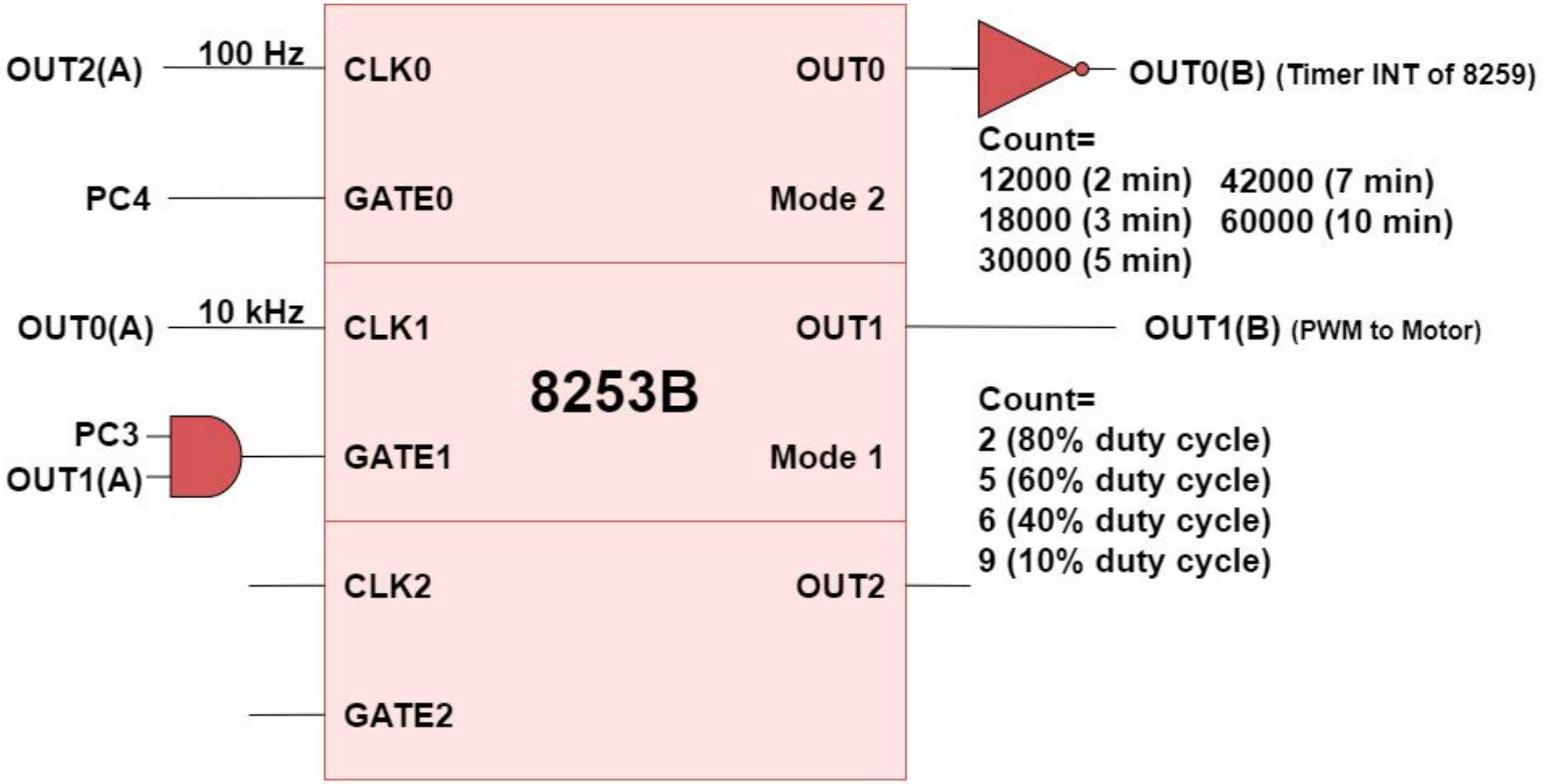
First Programmable Interval Timer



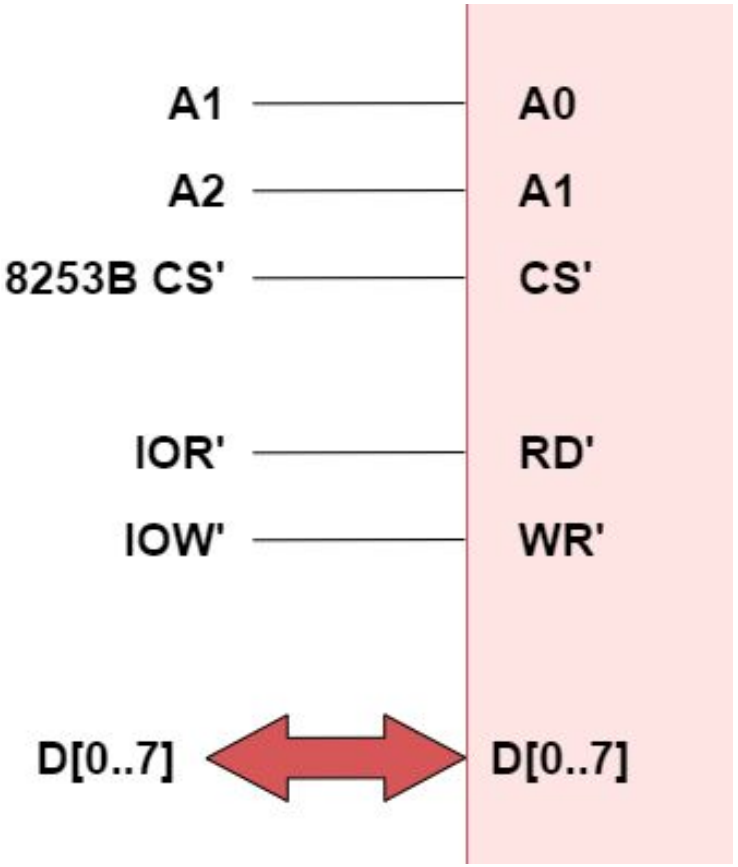
8253A Interface to the Processor



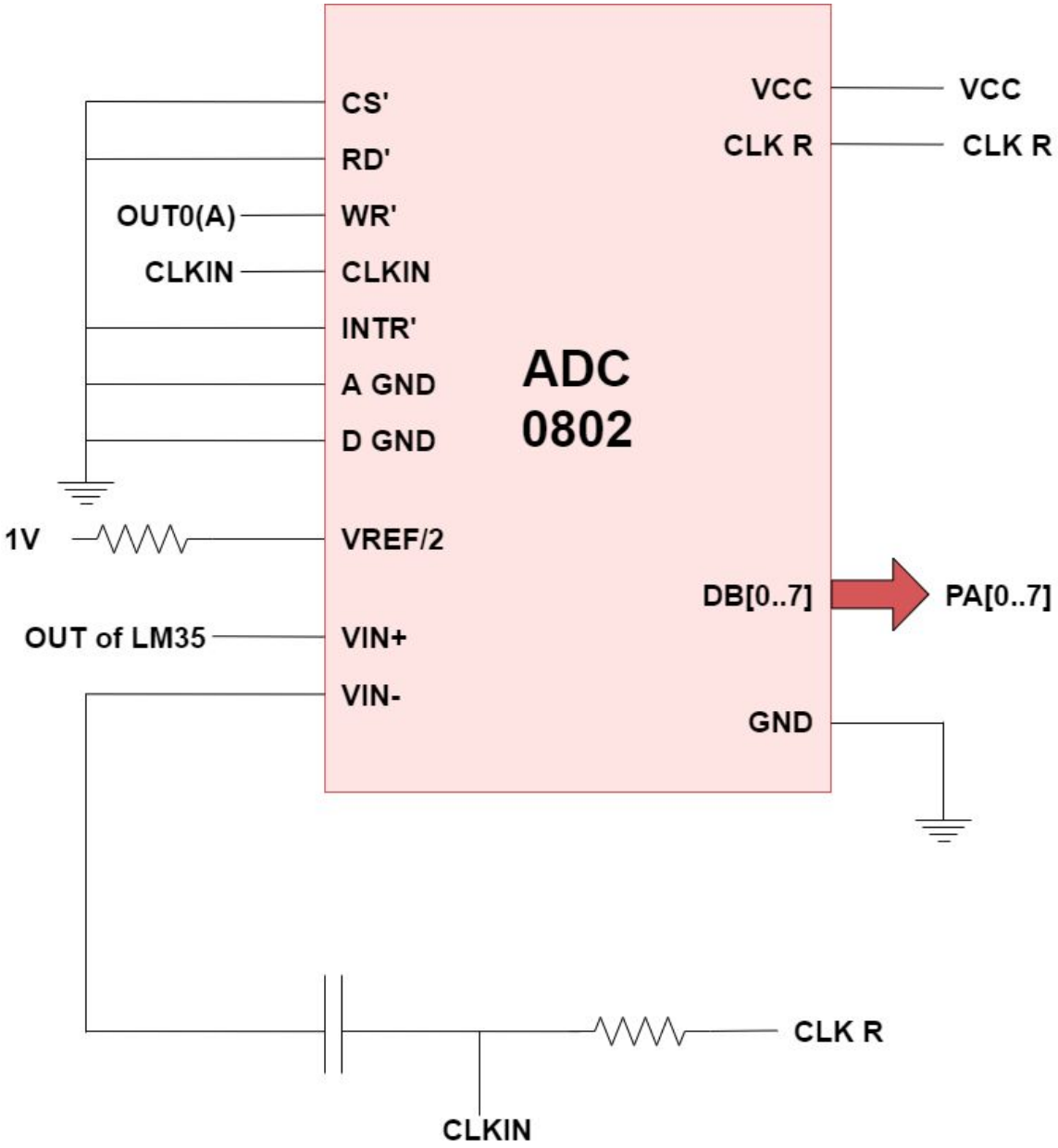
Second Programmable Interval Timer



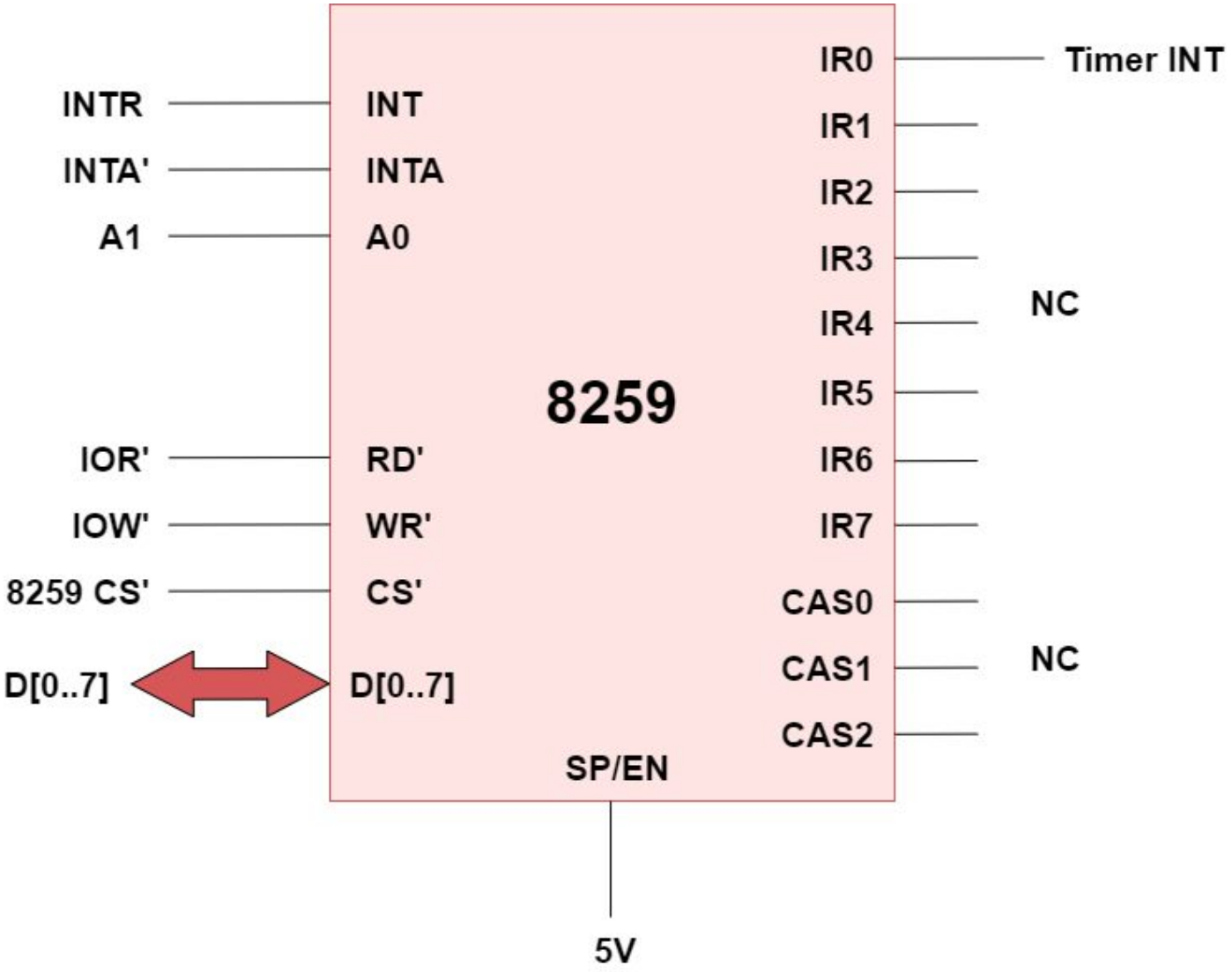
8253B Interface to the Processor



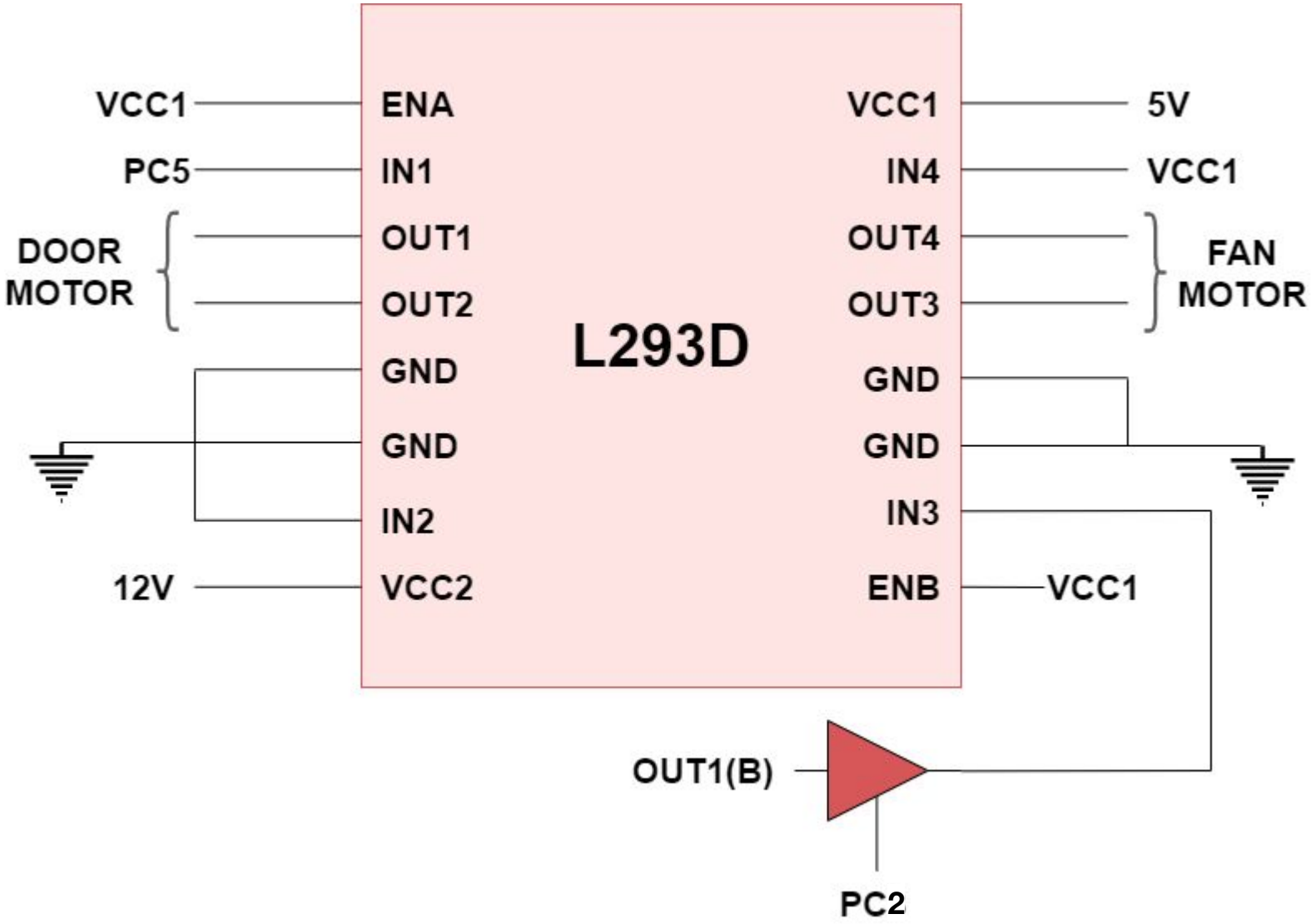
Analog-Digital Convertor



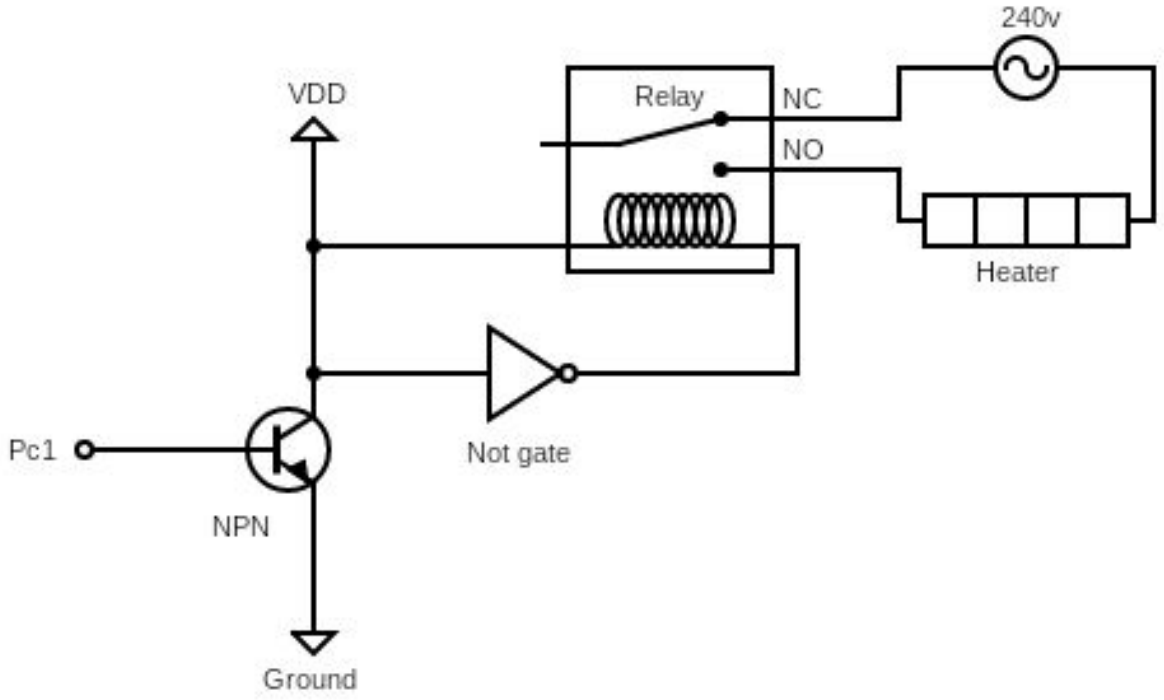
Priority Interrupt Controller



Motor Driver



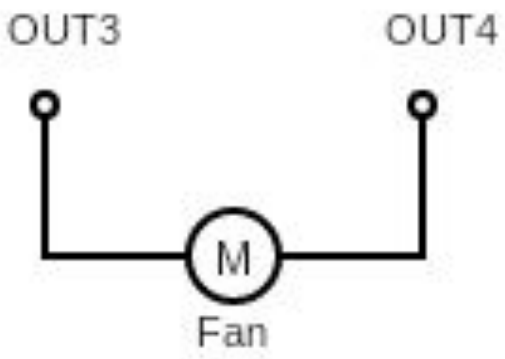
Heater



Heater Model: Heatrex Quartzone Infrared Heater 1154
Max Power consumption: 2000w

Fan

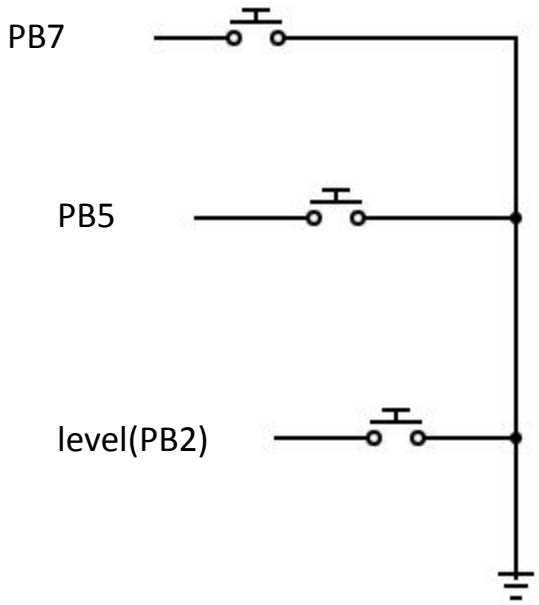
Motor Driver



We are using the RS Pro DC ODB5115-12MB Centrifugal blower/cooler as these type of fans are best for cooling a pre-heated high temperature containers/surfaces.

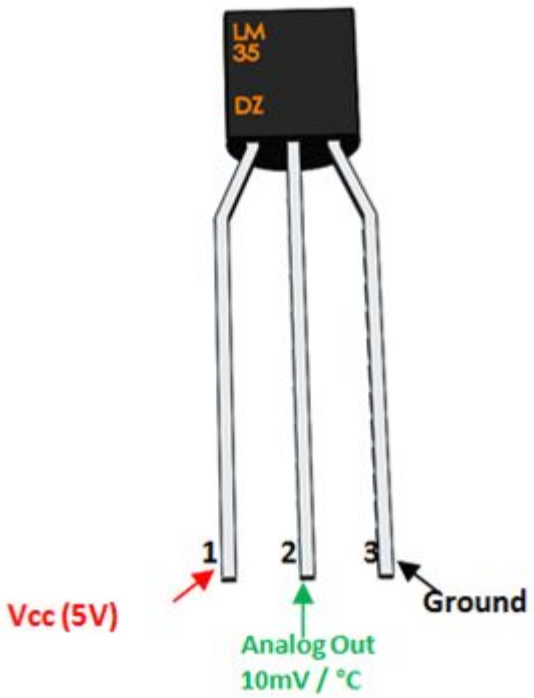
Specifications (At peak usage):
Voltage: 12 VDC
RPM: 4500
CFM: 3.3
Noise level: 37dB
Datasheet: PowerPoint Presentation (rs-online.com)

SWITCHES



LM-35

- **Vcc** : +5V
- **Analog out** : Increase is 10 mV for raise of every 1 ° .Range is from -1V(-55° C) to 6V(150° C)
- **Ground** : connect to the ground terminal of the circuit



for 30 degrees a voltage of 0.3 V is given to the Vin+ ADC0802 and for 140 degrees a voltage of 1.4 V is given to the Vin+ ADC0802

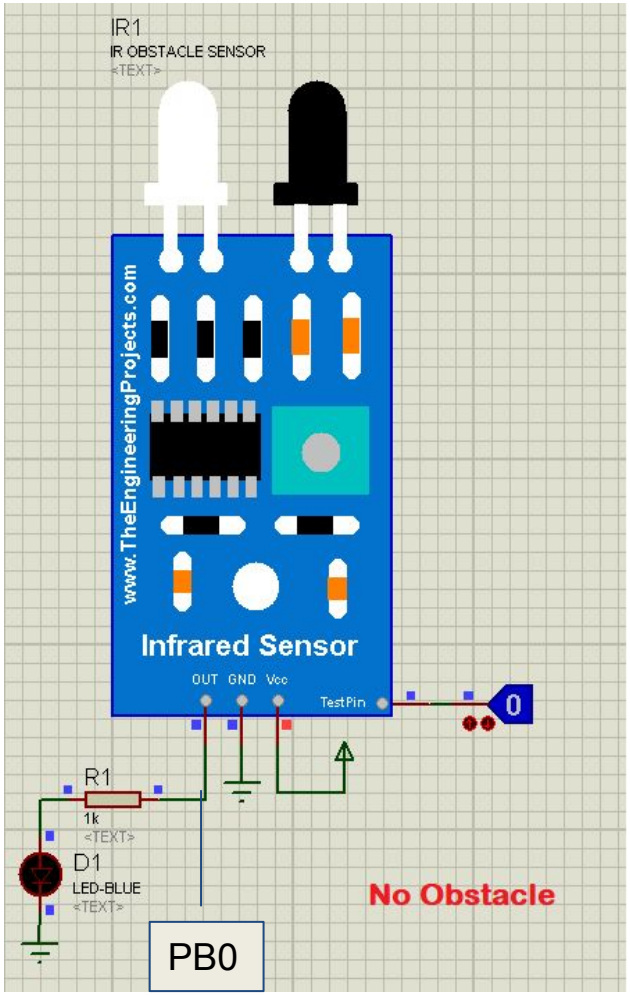
V_{OUT} = 10 mv/°C × T

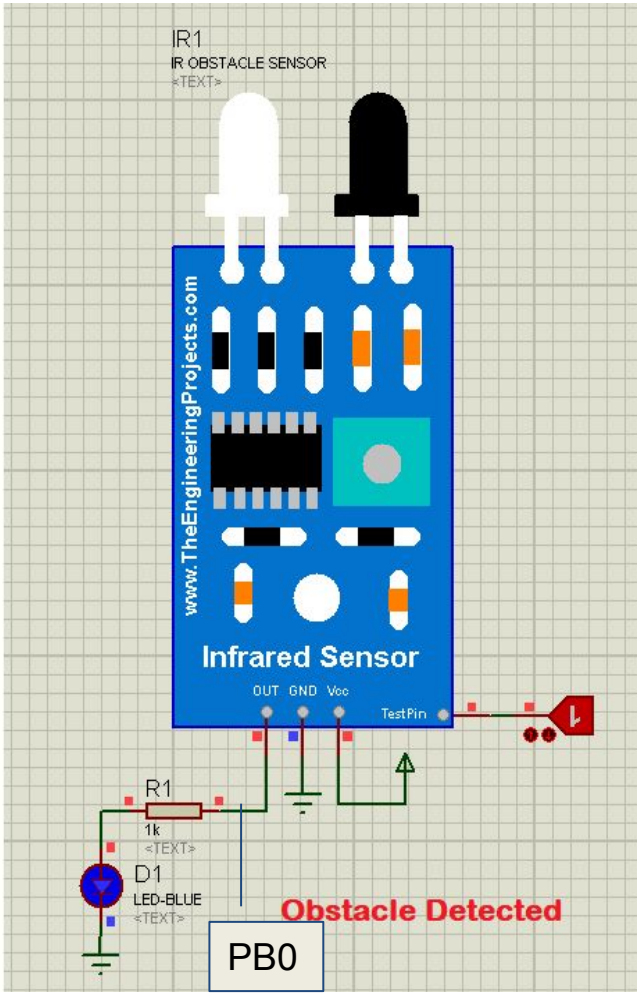
where

- V_{OUT} is the LM35 output voltage
- T is the temperature in °C

IR SENSOR MODULE

It is used to detect if the door is open or closed.The door is treated as an obstacle and hence when the door opens a obstacle is detected in front of the IR sensor and Out Pin goes high and if there is no obstacle(door is closed) then the Out Pin goes low





The OUT signal is connected to PB0 of the 8255 which is used to detect if the door is closed

Door Closing Mechanism

Motor Driver