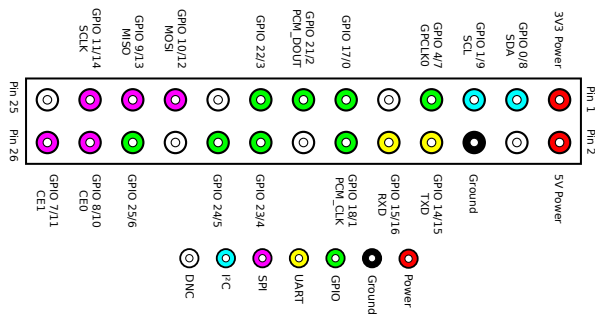


GPIO numbers are Broadcom/WiringPi



MCP 23017																											
Pin Layout																											
A0	A1	A2	Reset (+)	INTB	INTA	GPA0	GPA1	GPA2	GPA3	GPA4	GPA5	GPA6	GPA7	GPB0	GPB1	GPB2	GPB3	GPB4	GPB5	GPB6	GPB7	V _{DD} (+)	V _{S5} (-)	NC	SCL	SDA	NC

Register	Address	Function
IODIRx	00 / 01	IO direction. 0 = output, 1 = input.
IOPOLx	02 / 03	IO input polarity. 0 = normal, 1 = reverse input reading.
GPINTENx	04 / 05	Interrupt-on-change. 0 = disabled, 1 = enabled.
DEFVALx	06 / 07	Default comparison value.
INTCONx	08 / 09	Interrupt comparison. 0 = previous value, 1 = DEFVAL.
IOCON	0A / 0B	Configuration.
GPPUx	0C / 0D	Pull-up resistors. 0 = disabled, 1 = enabled.
INTFx	0E / 0F	Interrupt flag. 0 = no interrupt, 1 = interrupt.
INTCAPx	10 / 11	Interrupt capture. Stores value of pin at time of interrupt.
GPIOx	12 / 13	Value on a port. Use this to perform I/O.
OLATx	14 / 15	Output latch.

Input channels

0 •

1

2

3

4

5

6

7

V_{DD} (+)

V_{REF} (+)

AGND (-)

CLK

D_{OUT} (MISO)

D_{IN} (MOSI)

CS

DGND (-)

Input: bit 0 is 1 (start bit); bit 1 is 1 for single-ended, 0 for differential; bits 2-4 are the input channel.

Output: bit 0 (when the clock is cycled after input bit 4) is arbitrary; bit 1 is 0; bits 2-11 are the analog value, MSB first; bits 11-20 are the analog value, LSB first; all further bits are 0.

Inputs		Outputs	
A	EN	Y	H = high L = low
H	H	H	L = low
L	L	L	X = irrelevant
X	L	Z	Z = high-impedance (off)

V_{cc1} requires 5V. V_{cc2} can be powered from 3V3. The output voltage appears to be slightly lower than V_{cc2} , and independent of the A and EN voltages.

Address	Command
00 ROW	Display data. ROW is 0 to f. Even values correspond to a row on the matrix. Each bit of the register value corresponds to an LED in the row. Bit n corresponds to LED n+1 (mod 8). 1 for on, 0 for off.
20 OSC	System setup. OSC is 1 to turn the oscillator on, 0 to turn it off (standby mode).
80 DISP FREQ	Display setup. DISP is 1 to turn the display on, 0 to turn it off. FREQ is 0 to turn blinking off, 2 for 2Hz, 4 for 1Hz, 6 for 0.5Hz.
e0 ADDR	Display address. Bits 0-6 with 0 value are identical with a register in any way will execute that command. Most registers have multiple addresses. Other registers exist on the chip, but are not relevant for the LED matrix.