PWM_0 — R26 — PWM0
RES 0603 5%
20R

PWM_1 — R27 — PWM1
RES 0603 5%
20R

PWM_2 — R28 — PWM2
RES 0603 5%
20R

PWM_3 — R29 — PWM3
RES 0603 5%
20R

PWM_4 — R30 — PWM4
RES 0603 5%
20R

PWM_5 — R32 — PWM5
RES 0603 5%
20R

PWM_6 — R34 — PWM6
RES 0603 5%
20R

PWM_7 — R35 — PWM7
RES 0603 5%
20R

PWM_8 — R36 — PWM8
RES 0603 5%
20R

PWM_9 — R37 — PWM9
RES 0603 5%
20R

PWM_10 — R38 — PWM10
RES 0603 5%
20R

PWM_11 — R39 — PWM11
RES 0603 5%
20R

PWM_12 — R40 — PWM12
RES 0603 5%
20R

PWM_13 — R41 — PWM13
RES 0603 5%
20R

GND

3V3 — R31 — RES 0603 5% NC
GND — R33 — RES 0603 5% 10k

C37 CAP 0805 X7R 16V 10uF
C38 CAP 0603 X7R 16V 0.1uF
3V3

U10
1 A0   VDD   28
2 A1   SDA   27   SDA
3 A2   SCL   26   SCL
4 A3   EXTCLK 25
5 A4   A5   24
6 A4   OE   23   GND
   LED0   LED15 22
7 LED1   LED14 21
8 LED2   LED13 20   PWM_13
9 LED3   LED12 19   PWM_12
10 LED4   LED11 18   PWM_11
11 LED5   LED10 17   PWM_10
12 LED6   LED9 16   PWM_9
13 LED7   LED8 15   PWM_8
14 VSS

PCA9685PW,112

PWM_0   6
PWM_1   7
PWM_2   8
PWM_3   9
PWM_4   10
PWM_5   11
PWM_6   12
PWM_7   13

GND

This is an electronic circuit schematic showing the connections and components for controlling a robot.

It appears to be part of a Robot Controller project designed using a PCA9685 integrated circuit, which is a

16-channel PWM (Pulse Width Modulation) driver often used for controlling LEDs or servo motors. Here's a breakdown

of the key components and sections:

1. Main IC: PCA9685 (U10)

   - The central component in the circuit is the PCA9685, which provides up to 16 PWM outputs (PWM_0 to PWM_13 in this circuit).

   - Important pins on the IC:

     - VDD (Pin 28) and VSS (Pin 14): Power supply pins (3.3V and ground).

     - A0-A4 (Pins 1-5): Address pins for configuring the I2C address of the chip.

     - SDA (Pin 27) and SCL (Pin 26): I2C communication pins for data and clock signals.

     - OE (Pin 23): Output enable pin to control all PWM channels at once.

     - PWM channels (Pins 16-19, 21-24, etc.): Output channels for driving external devices like LEDs or motors.

2. I2C Communication

   - The PCA9685 uses an I2C interface (SDA and SCL lines) for communication with a microcontroller or processor.

   - Pull-up resistors (R31 and R33) are connected to the SDA and SCL lines to ensure proper signal levels.

3. Power Supply Decoupling

   - Capacitors C37 (1 µF) and C38 (0.1 µF) are placed near the PCA9685 to stabilize the power supply and reduce noise.

4. PWM Outputs

   - Each PWM output (PWM_0 to PWM_13) is connected to a 20Ohms resistor (e.g., R26, R27, etc.) for current limiting.

   These outputs can drive LEDs or signal devices.

5. Address Configuration

   - The address pins (A0-A4) can be tied high or low to set a unique I2C address, allowing multiple PCA9685 chips

   to be connected to the same I2C bus.

6. Project Details

   - The schematic is part of the "Robot Controller v1.0" project.

   - It was designed by Ruchira Thilan Munasinghe for Orise (Pvt) Ltd, based in Sri Lanka.

This circuit can be used in applications requiring multiple PWM outputs, such as controlling servos in a robot or

dimming LEDs in lighting systems.