LINE FOLLOWING ROBOT DATASHEET

DESCRIPTION

The Line Following Robot is a two-wheeled robot that traverses mazes by following lines displayed by an overhead projector. It has two operation modes, level 1 and level 2. The two modes can be switched between using switches on the robot. Level 1 uses a DFS algorithm to traverse every single point on a maze. Level 2 utilises an A* algorithm to traverse the shortest possible path to consume a number of food pellets. To use the robot, it must first be programmed with the map, coordinates of the food pellets, and starting point. The robot is designed to reliably detect lines with thicknesses ranging from 15-20 mm. The robot is designed to detect lines from a projector with a frequency of 120 Hz.

FEATURES

- Robot speed between 45 and 69 cms^{-1}
- Wheel speed between 132 and 202.7 rpm
- Powered by six 1.5V AA batteries
- Two operation modes
- Uses A* to find food pellets
- Uses DFS to traverse entire maze
- Has three RF localisation LEDs that allow its position to be tracked. These LEDs can be turned on and off using a switch.
- Uses an array of six light sensors to follow a line and detect corners and intersections.

CHARACTERISTICS

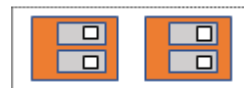| Parameter	Test Condition	MIN	MAX	UNIT
Operating Voltage V_s		7.8	8.3	V
Robot speed	$V_s = 8.0$	45	69	cms^{-1}
Wheel Speed	$V_s = 8.0$	132	202.7	rpm
Corner turning speed	$V_s = 8.0$	1.11	1.72	rads^{-1}
Projector frequency	$V_s = 8.0$	120	120	Hz
Line thickness	$V_s = 8.0$	15	20	mm

($T_{amb} = 25$ °C)

OPERATIONAL MODES

Two Operation Modes
Level 1 = DFS, Level 2 = A*
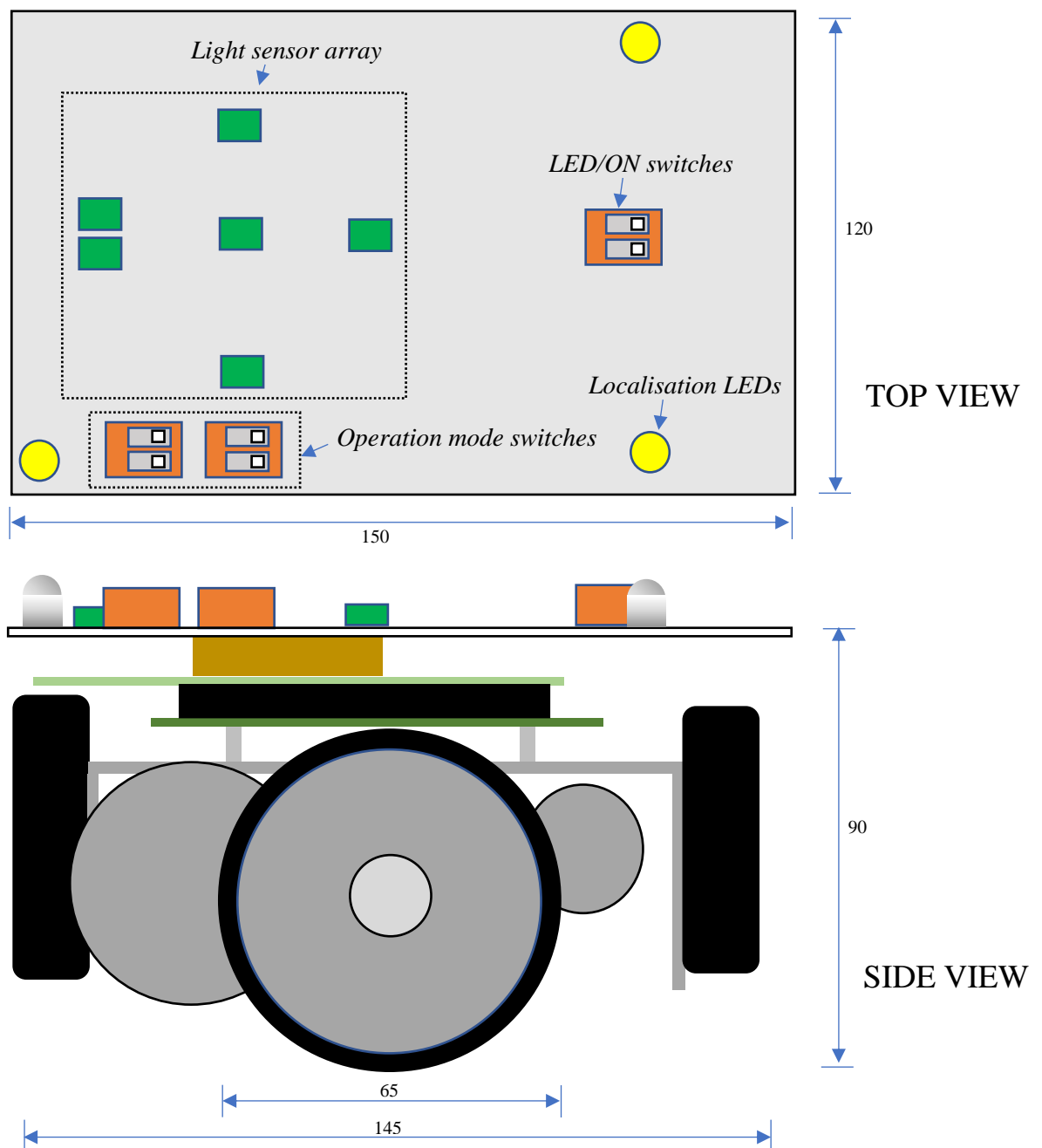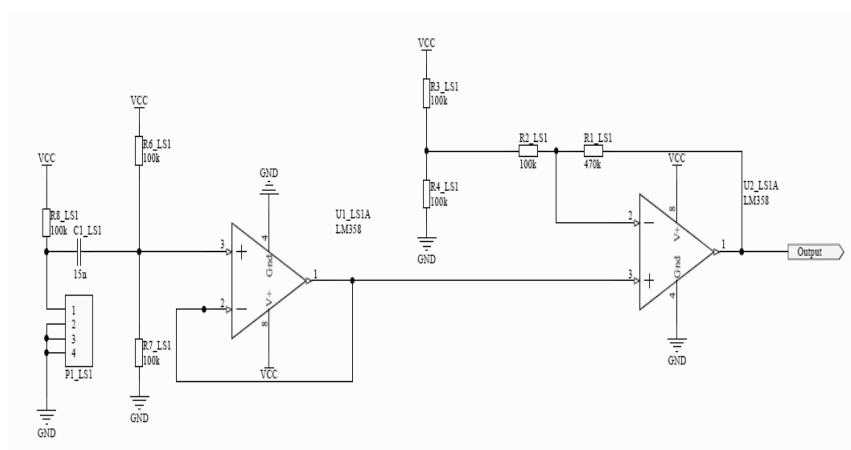
SW2   SW0   Operation mode switches

SW3   SW1

LEVEL	SW0	SW1	SW2	SW3
1	0	0	0	0
2	1	0	0	0

DIMENSIONS (mm)

FRONT

Light sensor array

LED/ON switches

Localisation LEDs

Operation mode switches

TOP VIEW

120

150

FRONT

90

65

145

SIDE VIEW

LIGHT SENSOR CIRCUIT

LIGHT SENSOR PERFORMANCE

Output when sensor is not under the line

Green = Input   Orange = Output

Output when sensor is under the line