|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Test Writer: | | | | | | | |
| Test Case Name: | | Ultrasonic Sensor Unit test #1 | Test ID: | | | | UltraS-UT-01 |
| Description: | | Checks the maximum detection range of cars for the Maxbotix ultrasonic sensor in the rain | Type: | | | | White box  Black box |
| Test Information | | | | | | | |
| Name of Tester: | |  | Date: | | | |  |
| Hardware Ver: | | Ultrasonic Module – Ultrasonic version 1.1 | Time: | | | |  |
| Setup: | | Ultrasonic sensor module should be connected to the power pins on the Blind Spot Detector board with a voltage supply connected. Measurements will be taken either outside on a rainy or in a weather chamber that mimics rainy conditions. | | | | | |
| Step | Action | Expected Result | Pass | Fail | N/A | Comments | |
| 1 | Apply power to board | A voltage of 5V should be able to be read across the power pins of the ultrasonic sensor |  |  |  |  | |
| 2 | Connect Voltmeter to read voltage on AN pin of Ultrasonic sensor | Depending on the distance of object detection, voltmeter should have a voltage reading between 2.5V – 0V |  |  |  |  | |
| 3 | Ensure sensor is working by detecting a near by object | For a near by object, voltmeter should read a lower voltage between 1V – 0V depending on distance. |  |  |  |  | |
| 4 | Using a measuring tape, measure the max distance the Ultrasonic sensor will detect a car | Voltmeter should read a voltage of ~2.5V at “Enter Feet Value” |  |  |  |  | |
| Overall test results | | |  |  |  |  | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Test Writer: | | | | | | | |
| Test Case Name: | | Blind Spot Detector Stress Test #1 | Test ID: | | | | BSD-ST-01 |
| Description: | | Checks if the Blind Spot Detector will operate correctly at a max temperature of 85 degrees Celsius | Type: | | | | White box  Black box |
| Test Information | | | | | | | |
| Name of Tester: | |  | Date: | | | |  |
| Hardware Ver: | | Blind Spot Detector 1.0 | Time: | | | |  |
| Setup: | | The Blind Spot Detector should powered and placed in a weathered chamber set to 85 degrees Celsius with an object set exactly 6 feet away. | | | | | |
| Step | Action | Expected Result | Pass | Fail | N/A | Comments | |
| 1 | Apply 12 volts to both VCC and TSIG pins | Blind Spot Detector will start up and begin detecting objects within its detectable range |  |  |  |  | |
| 2 | Insert device into weathered chamber | Temperature of room should be approximately 85 degrees Celsius. |  |  |  |  | |
| 3 | Connect a voltmeter to the AN pin of the Blind Spot Detector | Depending on the distance of object detection, voltmeter should have a voltage reading between 2.5V – OV |  |  |  |  | |
| 4 | Place a person sized object 6 feet away from device | Voltmeter should read a voltage of ~(voltage value for 6 feet) |  |  |  |  | |
| 5 | Leave device in chamber for 2 hours and check voltmeter reading | Voltmeter should have approximately same reading from step 4 |  |  |  |  | |
| Overall test results | | |  |  |  |  | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Test Writer: | | | | | | | |
| Test Case Name: | | AVR Distance Measurement Unit test #2 | Test ID: | | | | AVR-UT-02 |
| Description: | | Checks the accuracy of the max detectable distance set on the ATtiny85 | Type: | | | | White box  Black box |
| Test Information | | | | | | | |
| Name of Tester: | |  | Date: | | | |  |
| Hardware Ver: | | BSD Processor Module – Processor version 1.1 | Time: | | | |  |
| Setup: | | Blind Spot Detector should be connected to power, including the TSIG input and an using a tape measure, an object approximately the size of a person will be placed 7 feet in front of the device’s sensor. | | | | | |
| Step | Action | Expected Result | Pass | Fail | N/A | Comments | |
| 1 | Apply power to board and TSIG input | Board should start up and begin detecting objects within detectable range |  |  |  |  | |
| 2 | Using a tape measure, a human sized object will be placed 7 feet from the device’s sensor | If object is exactly 7 feet away, LED should be on |  |  |  |  | |
| 3 | Move object forward if LED is off or move object backwards if LED is on | When moved further from sensor, LED should turn off |  |  |  |  | |
| 4 | Measure distance of object again | Measurement should be approximately 7 feet |  |  |  |  | |
| Overall test results | | |  |  |  |  | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Test Writer: | | | | | | | |
| Test Case Name: | | BSD Current Consumption Parametric Test#1 | Test ID: | | | | BSD-PT-01 |
| Description: | | Measures the power consumption of the whole device with 0V on the TSIG input and no object within detectable range | Type: | | | |  |
| Test Information | | | | | | | |
| Name of Tester: | |  | Date: | | | |  |
| Hardware Ver: | | BSD 1.0 | Time: | | | |  |
| Setup: | | Apply power to VCC pin on the Blind Spot Detector and connect a multimeter to between the input voltage and the VCC pin of the Blind Spot Detector | | | | | |
| Step | Action | Expected Result | Pass | Fail | N/A | Comments | |
| 1 | Connect multimeter to the 12V voltage source and VCC of BSD | Should read approximately zero amps until voltage source is turned on |  |  |  |  | |
| 2 | Turn on 12V voltage supply | BSD will start up and begin taking measurements |  |  |  |  | |
| 3 | Read multimeter current measurement | Current consumption should be approximately 12mA |  |  |  |  | |
| Overall test results | | |  |  |  |  | |