Core64 LED Array V1.3

QC Test Procedure

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| Doc Version | Description | Date | Author |
| A | First draft outlined. Using WS2813C addressable LEDs. | 2023-05-09 | Andy Geppert |
| B | Move good/bad LEDs pics to Manufacturing Instructions. Add Appendix A: Test Firmware Description. | 2023-05-22 | Andy Geppert |
| C | Clarify three test connection points on PCB. | 2023-06-15 | Andy Geppert |

# Introduction

Test procedure to ensure 100% functional LED Array assemblies. Includes illustrations of good and bad LEDs which have been encountered during multiple production runs. This test procedure applies to every LED Array which is assembled.

# Set-up

Functional test requires using an Arduino-compatible development board running test firmware provided from: <https://github.com/ageppert/Core64/tree/master/QC-Test>/LED-Array

Pre-built hex files for specific Arduino models is included and the firmware may be compiled for other Arduino-compatible boards with the Arduino IDE available at <https://www.arduino.cc>

Three connections are required between the Arduino board and the LED Array:

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Description automatically generated

LED Signal LSIG on PCB

+5VDC is 5V0 on PCB

Ground is -BATT on PCB

A test fixture may be constructed with 5 pogo pins. Four pins distributed to each corner of the header rows on the LED Array, and 5th pin as Ground, second down from the upper right. The two rows of headers pins on the left and right edge of the LED array are all on a 0.1 inch grid for compatibility with protoboard.

# Test Procedure

1. Power to Arduino Board is disconnected.
2. Connect LED Array to Arduino Board.
3. Power on Arduino Board.
4. Observe all LEDs are illuminated RED at even brightness for a short period of time.
5. Observe all LEDs are illuminated GREEN at even brightness for a short period of time.
6. Observe all LEDs are illuminated BLUE at even brightness for a short period of time.
7. Observe all LEDs are illuminated WHITE at even brightness for a short period of time.
8. For one unit of every 10 that are manufactured, allow the light cycle to run for 30 minutes and recheck steps 4 through 7.
9. For the remaining 9 units, the test may conclude after step 7.
10. Power off the Arduino Board.
11. Disconnect the LED Array from the Arduino Board.
12. Place a black sharpie mark on the top of any LED which fails any of the color checks.
13. For each LED Array, record the number of failed LEDs in the first test. Record the number of failed LEDs in subsequent tests after the rework procedure is completed.

# Rework Procedure

1. Using a hot plate, heat the bottom side of the LED Array board to 230°C [TODO: double check that temp].
2. Remove failed LEDs.
3. Installed replacement LEDs with a small amount of flux pre-applied to the LED terminals.
4. Let the board cool slowly.
5. Re-test the board.

# Appendix A: Test Firmware Description

Red LEDs 1.5s on.

Green LEDs 1.5s on.

Blue LEDs 1.5s on.

All LEDS 1.5s on.

Repeat.