The soldered PCB circuit should be tested in two steps, for the fabrication and the functionality. To achieve both, the test plan below was conducted.

To test the fabrication:

First, the soldered PCB can be tested by plain sight. The observer should keep a close eye on any signs of cold solder joints, catching any rough, tarnished surfaces on the soldered terminals.

Next, the multimeter can be used to test for any shorted components. Having the bench DMM on continuity setting, proceed the following steps.

1. Wire test leads on the voltage terminals of the multimeter.
2. Short the two leads and listen for a beep from the multimeter.
3. Place one of the leads on a common ground (e.g. the PCB board where no traces run).
4. Place the other lead on each terminal. If the multimeter beeps, the component is likely shorted.

Past this step, optionally proceed with the continuity checks for each component, placing the leads on their positive and negative terminals.

To test the functionality:

Once the PCB has been tested for fabrication, move onto this step.

1. Wire the positive and ground terminals to a channel of the power supply.
2. Set the voltage output to 3.3 volts to operate within the manufacturer rating. Higher voltage levels may risk damaging the transistors.
3. Power the speakers using USB and plug in the 3.5 mm TRS connector to the PCB circuit.
4. Output the power supply and listen for a tone. Adjust the volume of the speaker if needed.

The basic functionality of the astable multivibrator has been checked from the speaker output as it was configured to output a frequency in the audio range. To inspect the operation further, use an oscilloscope to conduct a time-domain signal analysis.

Time-domain signal analysis:

There are two test points designed into the PCB, each at the collector of the transistors Q1 and Q2.

1. Connect the probe of CH1 from the oscilloscope to the test point at Q1.
2. Connect the probe of CH2 to the test point at Q2.
3. Set the measurement of CH1 and CH2 to capture the frequency and peak-to-peak voltage.
4. Verify that CH1 and CH2 reads an alternating square wave signal from Q1 and Q2.
5. Check that the Vpp reads 3.3 V.
6. Check that the frequency is around 800 Hz (based on the RC values).
7. Adjust the potentiometer to observe the change in the frequency output.