

Antenna Specification

P18060; Vista BT in Aftermarket Channel

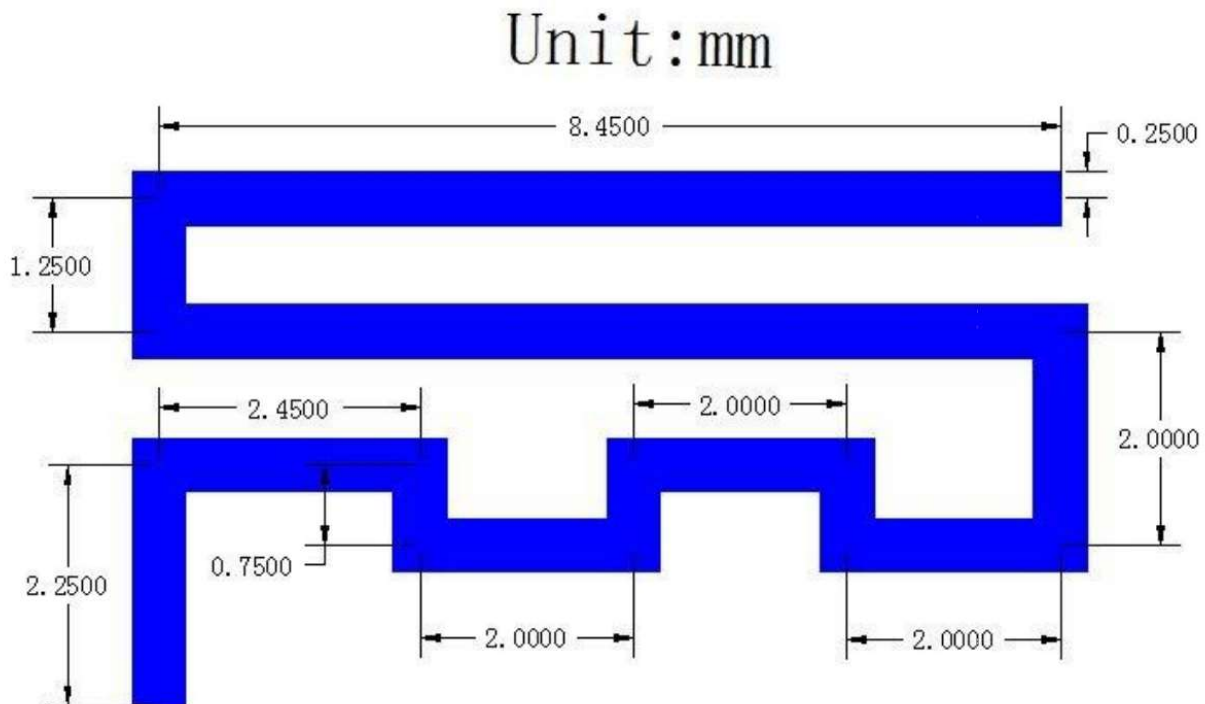
David Geiman
July 24, 2019

This document describes the antenna used in the Bluetooth in Aftermarket Channel product.

The Bluetooth in Aftermarket Channel is a Bluetooth Low Energy Controller for RGB lights. It consists of a rigid circuit board in a potted channel with lead wires for connection to a low side driven Red-Green-Blue light and 12-volt power. The product uses a TeLink TLSR8266 programable system on a chip. This chip contains all the Bluetooth transceiver circuitry, except for an external 12 MHz crystal and the antenna. For this design, a trace antenna was chosen. It is located at the end of the rigid controller board opposite the RGB lead wires.

Construction:

The design of the trace antenna was taken from the TeLink Antenna Design Guide application note (AN-16080500-E2). Due to the small size of the circuit board, especially in the width dimension, the Sample 1, Small-Dimension Antenna design, was chosen (see page 20). The dimensions of the trace layout are shown in figure 1. The circuit board is a double layer, 0.8 mm thick, FR4 board, with 1 oz copper. Ground fill is used on both sides of the board, but it is pulled back from the antenna end of the board on both layers. White solder mask with black silkscreen are used on the board to match the flexible light strip portion of the product.



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Matching

The antenna is matched to the chip with a matching network made up of three inductors and two capacitors (See Figure 2). This network matches the antenna well enough to attain a Standing Wave Ratio of 1.28 (See Figure 3).

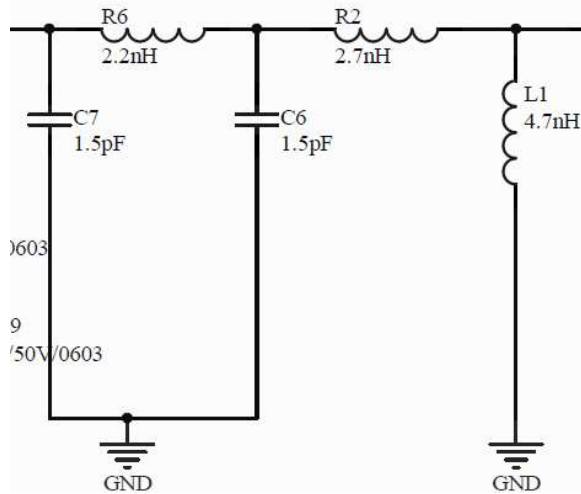


Figure 2, Matching Network Schematic

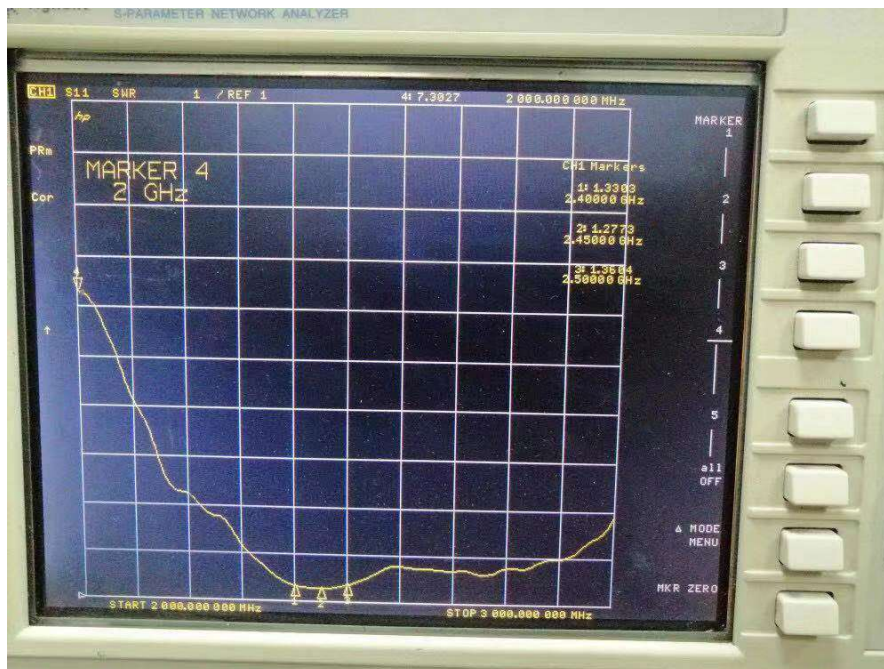


Figure 3, SWR Measurement

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Performance:

The antenna has a maximum gain of 2.1 dBi. The expected radiation pattern is shown in Figure 4. The Z axis is perpendicular to the board and the Y axis is along the length of the board. Impedance plots have not been measured on this design.

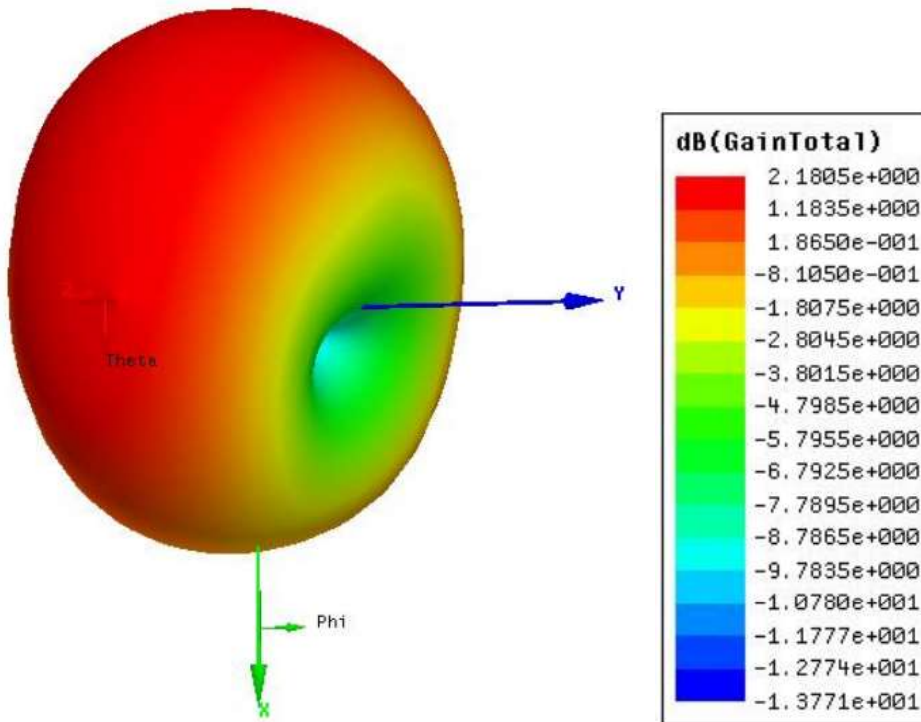


Figure 4, Radiation Figure