Fender FMA BT-FTSW-USB PCBA (PN 7710068000)

Circuit Description/Theory of Operation

Referring to the block diagram, there are three main sections of the circuit:

- Bluetooth module (FreeWings FW3817-30), antenna, & audio output circuit
- USB port
- Footswitch port

The USB circuit consists of ESD protection components and a micro AB USB connector. The Footswitch circuit consists of ESD protection components and a ¼" phone jack connector. Both of these circuits are unrelated to the Bluetooth section, and are shared on the PCB for mechanical convenience.

The FreeWings module is a complete Bluetooth implementation with analog audio output. An F-style antenna is connected to the RF output of the module through a test switch and matching network. The module is powered with a 3.3V DC supply and digital ground. The PCB is dual layer with digital ground plane sections stitched together on both sides where possible. The analog stereo audio output from the module is buffered by an op-amp stage before sending back to the host system. The analog audio buffer circuit has a separate power supply and ground system to isolate it from digital noise.

All Bluetooth functionality is controlled by on-board firmware. But the module may be accessed for test through the SPI port to a computer interface module (available from FreeWings). A description of specific commands for Bluetooth is beyond the scope of this document and can be found in documentation from FreeWings or CSR for the CSR8630 chipset.