Operational Description
AV Shadow

January 19, 2009

1 Overview

The AV Shadow is a Bluetooth enabled hardware capable of receiving Bluetooth packets from select models of Bluetooth enabled BlackBerry™ smart phones and converting it into IR waveform to control the operation of audio video components in a home theatre environment.

2 Basic Blocks

The AV Hub consists of 4 building blocks, these are

- Bluetooth Controller
- IR Engine
- Audio Switch
- Accessories Interconnect

3 Theory of Operation

3.1 Bluetooth Controller

The Bluetooth controller (BC5MM) is configured to receive Bluetooth packets through a 2.4GHz RF link being transmitted from a paired and connected BlackBerry™ smart phones. The Bluetooth packets received by the BC5MM contains either the equivalent IR data corresponding to a specific audio/video component code set and/or compressed music data in the form of streaming mp3 or AAC. Once the Bluetooth packets are received and processed, the BC5MM then communicates through an on board serial protocol to the IR engine and/or to the analog switch.

3.2 IR Engine

Once the BC5MM processes the Bluetooth packets, it then communicates with the IR engine through a UART protocol with the IR waveform code set. The IR Engine will then commence firing the IR LED's with the appropriate IR waveform as per instructions from the BC5MM.

3.3 Audio Switch

In the event that the BlackBerry™ smart phone is streaming compressed music data in the form of MP3 or AAC to the AV Hub, the BC5MM built-in audio codec will decode the compressed data into an analog 1Vpp signal capable of driving a 32Ω load directly without the need of an auxiliary amplifier. The 1Vpp signal is fed into an analog switch, which is controlled by a general purpose IO coming from the BC5MM. The output of the analog switch is fed into a 3.5mm stereo jack that is filtered and protected against ESD.

The analog switch is also connected to the accessories interconnect, in the event that an Apple iPod is connected. The line out from the iPod is connected to a 2nd channel of the analog switch,

and the BC5MM will select which output is active, either streaming music from the BlackBerry™ smart phone or line out from the iPod.

3.4 Accessories Interconnect

The accessories interconnect is a 10 position connector, allowing additional accessories to be attached to the AV Hub. The interconnect accepts audio line out from the iPod, general purpose UART transmit and Receive, 5V DC, ground and audio ground.