

Board design has a various aspects from design functionality, high speed signal routing in layout, PCB design, signal integrity, multi-layer, engineering & product form-factor, EMI/EMC considerations and design for manufacturability.

### Aftek's Board Design Expertise Includes:

- Analog mixed signal PCB design.
- SoC, ASIC, ASSP based PCB design.
- High speed memories, complex processors, FPGA/CPLD based hardware and PCB design.
- RF- proprietary RF, Zigbee, WLAN, GSM complex audio/video based system and PCB design.
- Different types of audio gateways involving GSM and bluetooth audio. speakerphone designs which are more sensitive to noise echo related issues. GSM based audio designs which are prone to TDMA noise. Various noise reduction techniques in PCB design for all above

### Aftek's PCB Design Skill Includes:

- High speed memory interface and routing on board
- High speed interfaces like USB 2.0 and PCI
- Routing of various signals USB differential pair and PCI clk
- High frequency clock signal routing on board
- Ground bounce and noise issues via SI analysis
- Signal length matching and impedance matching
- Impedance control boards
- High speed ethernet differential signal routing
- Board layer stack-up
- Analog mixed signal layout
- Special layout considerations for audio for TDMA noise in GSM and speaker phone applications, routing GSM voice over bluetooth module
- Stereo codec interface and play on speakers. Special design considerations for analog audio routing on board for noise reduction and removal of ground bounce

### Aftek's Hardware Design Expertise:

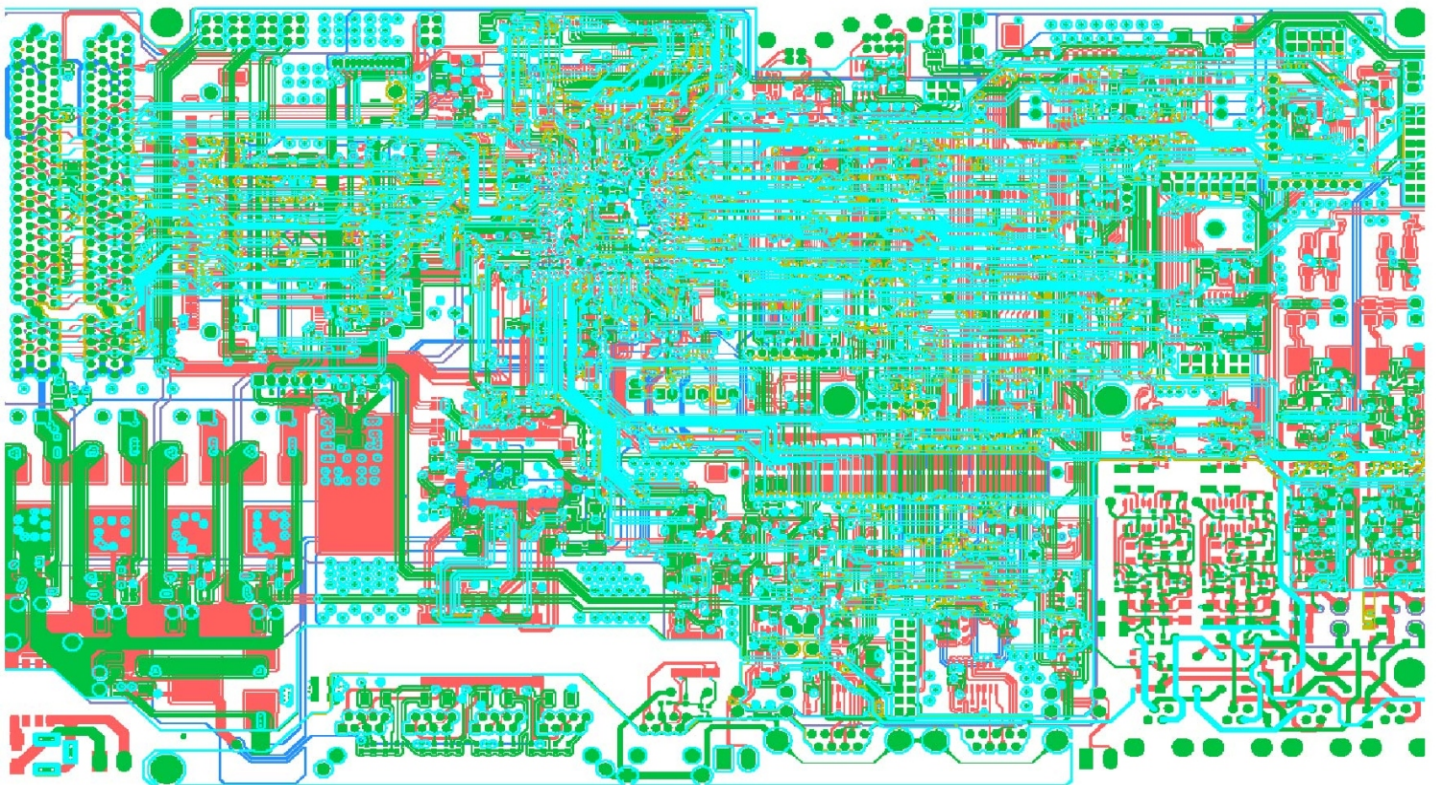
- High speed board design
- Logic design
- Low level driver development
- Board bring up and debug
- Hardware architecture development
- EMI/EMC analysis and test
- Hardware integration and test

## Case Studies:

## Six layer PCB I specifications:

This is a PCB for one of our gateway device. This is intended to use in home automation and intelligent home gateway device. This has the all required interfaces required for communication in home to make it truly digital home. It involves analog mixed signal design as well as high speed

- Core frequency 533MHz
- Maximum I/O frequency 133 Mhz
- 2 PCI, 2 MiniPCI, 1 ADSL, 2 channel FXS/FXO, 5 port ethernet, CF card and HDD interface
- 4 signal, 1 split power plane & 1 ground plane
- Incorporated buried, plugged vias
- 492 ball PBGA
- Board size 302 X 182.1 mm

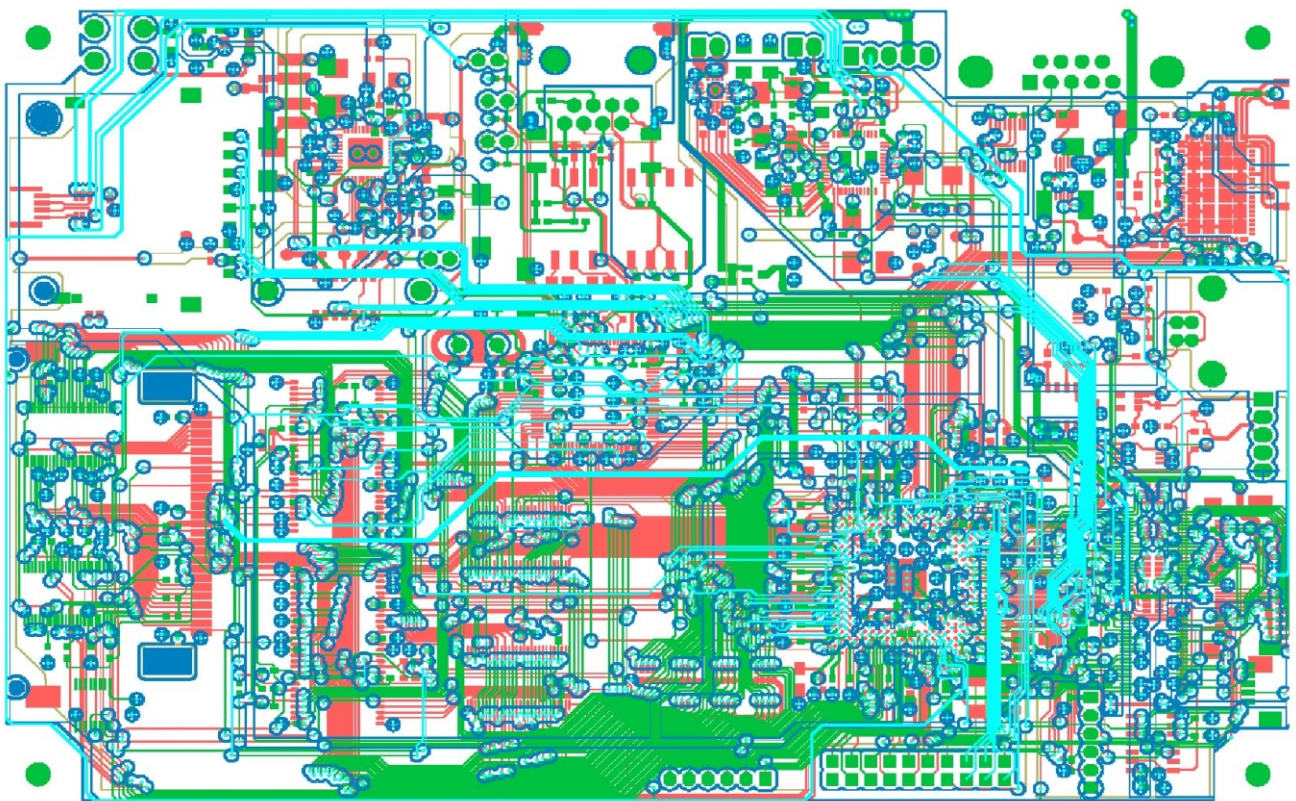


## Case Studies:

## Six layer PCB II specifications:

This is a PCB for one of our subsystem of intelligent home solution. This is acting as a console in a digital home acting as GUI interface for automation, safety, security, information and communications aspects of the digital home. This has the all required interfaces required for human interaction. It involves analog mixed signal design as well as high speed board design part.

- Core frequency 524 Mhz
- Maximum I/O frequency 104 Mhz
- 10/100 ethernet, TFT/STN LCD panel, touch panel, CF, USB, WiFi, audio codec interface
- Stereo codec interface and subsequent amplifier stage for speakers. Complete digital audio played in stereo fashion over speakers with excellent sound quality and no noise
- 3 signal, 2 split power plane & 1 ground plane
- Incorporated buried, plugged vias
- 360 ball PBGA & 48 pin QFN package
- Board size 172 X 113 mm

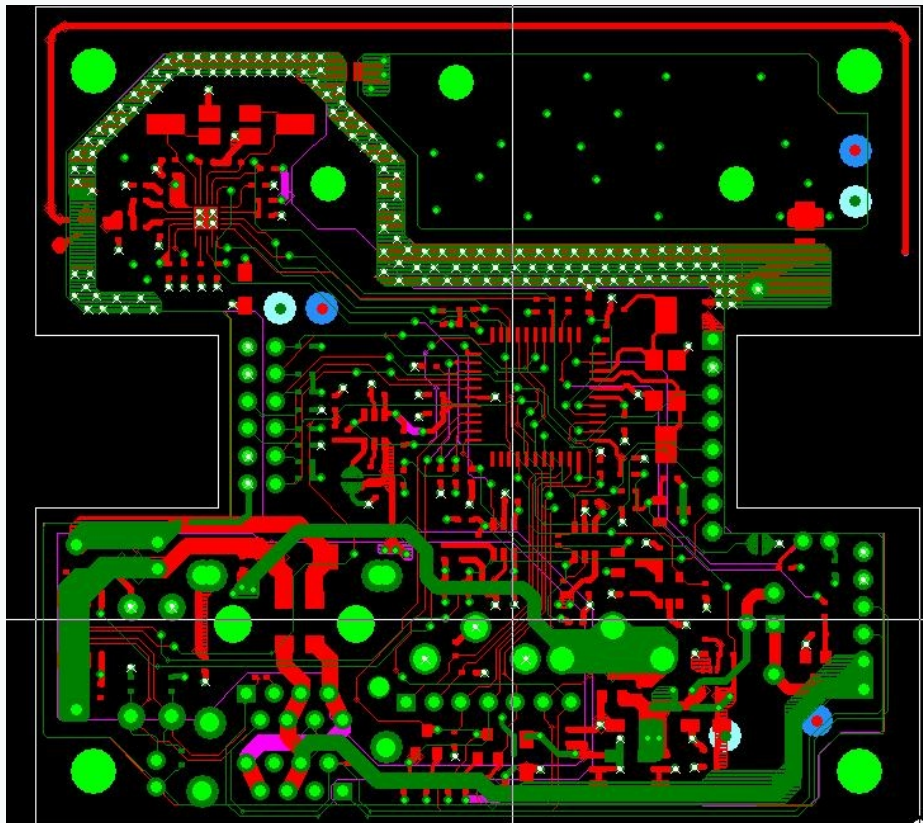


## Case Studies:

**Four layer PCB I specifications:**

This is a PCB for one of our subsystem of intelligent home solution. This is a RF coordinator board that will coordinate commands / request received from various other RF devices like RF based remote control, RF keyFOB and RF pendant. This involves wired as well as wireless interface for gateway board and RF devices respectively

- PIC microcontroller core frequency 40 Mhz
- RF frequency 433MHz
- The board has incorporated PCB antenna.
- The board has connector for wired interface to central gateway board.
- Maximum RF range is 50~60 meters LOS. The maximum output power of transceiver is 10dB.
- 2 signal, 1 power plane & 1 ground plane
- Incorporated buried, plugged vias
- 20 pin QFN package & 44 pin TQFP
- Board size 76 X 80 mm

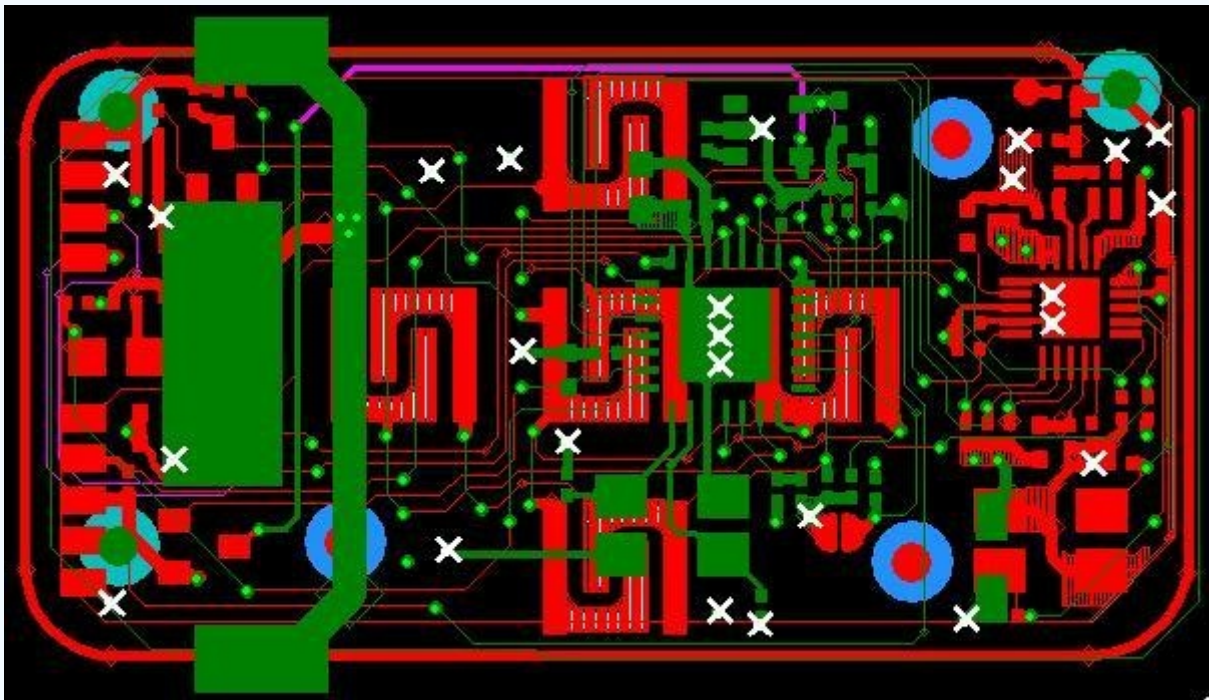


## Case Studies:

## Four layer PCB I specifications:

This is a PCB for one of our subsystem of intelligent home solution. The will act as a RF keyFOB or RF pendant board. The board will request RF coordinator for some defined set of action. This is a battery operated board.

- PIC microcontroller core frequency 10 Mhz
- RF frequency 433MHz
- The board has incorporated PCB antenna.
- Maximum RF range is 50~60 meters LOS. The maximum output power of transceiver is 10dB.
- 2 signal, 1 power plane & 1 ground plane
- Incorporated buried, plugged vias
- 20 pin QFN package & 44 pin TQFP
- All passive components are of 0201 package.
- Board size 27 X 45 mm



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