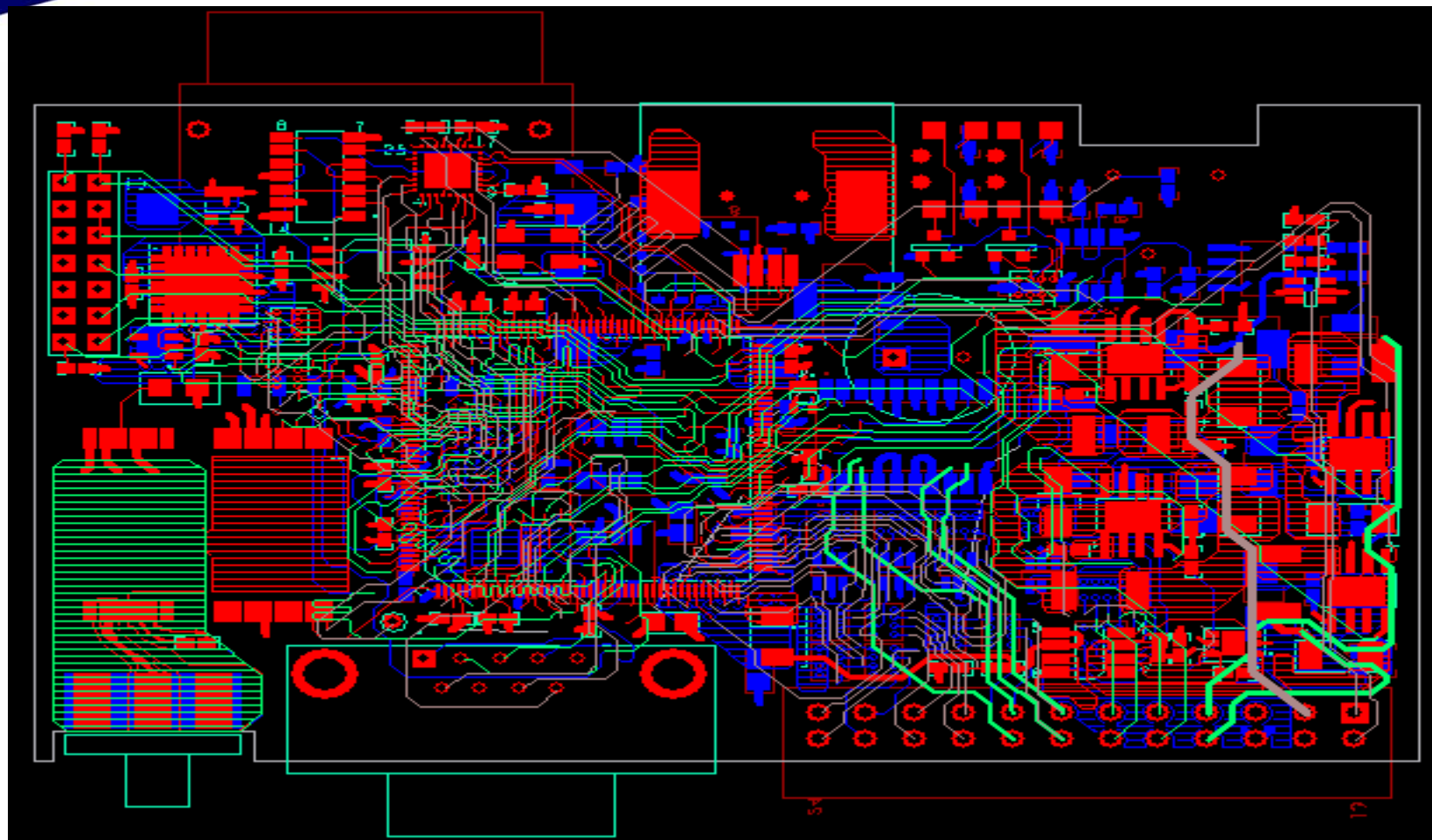


# INTERFACE BOARD FOR DM648 VIDEO CARD - USING GPS

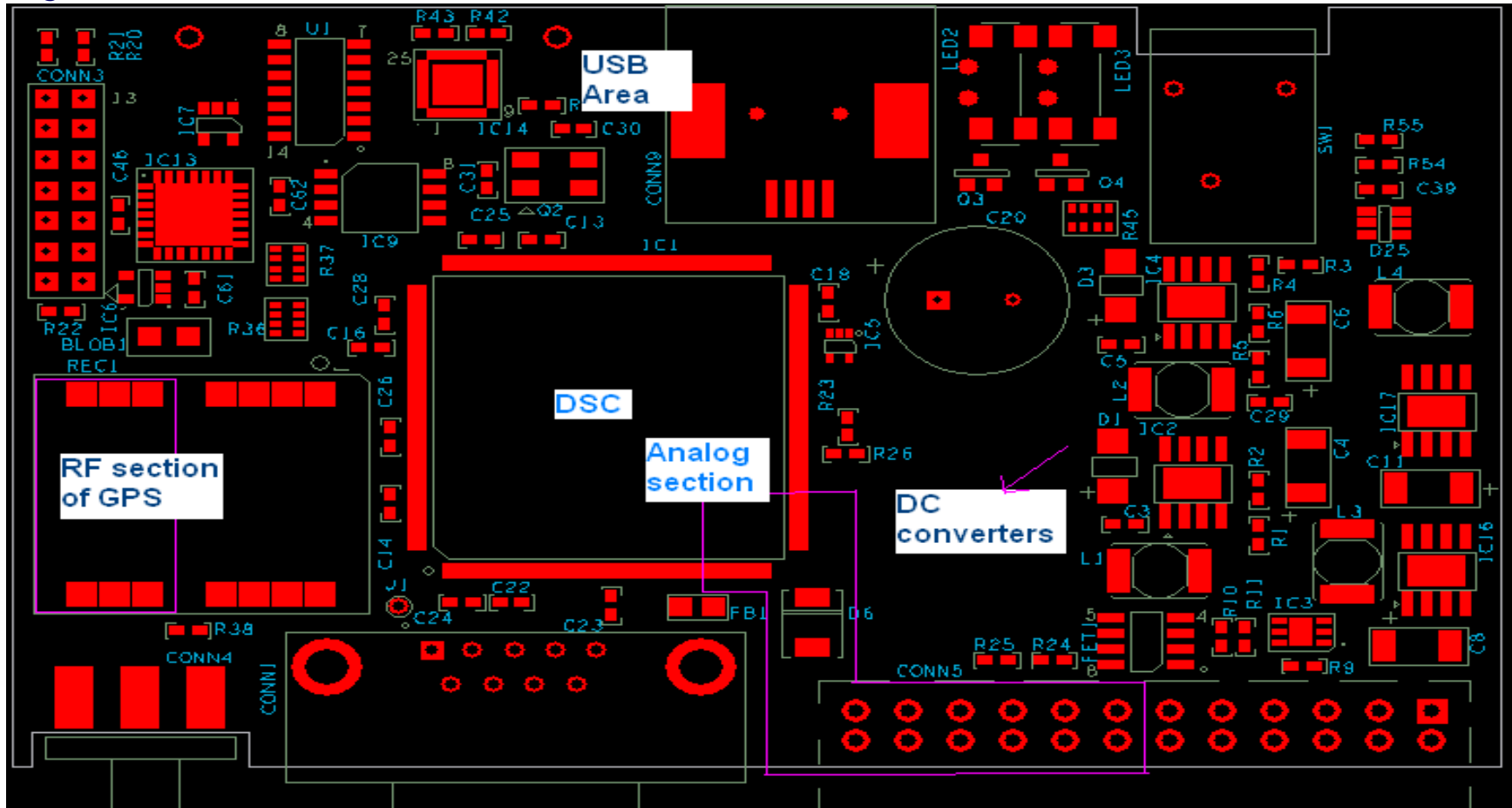


## *Board using GPS module, Digital and Analog section*

- Uses Texas TMS320F28335 Digital Signal Controller (DSC), GPS module Ublox LEA-4T ,USB interface,DC-DC Converter and Analog section.
- The board has RF, Digital and Analog sections. The critical routing guidelines followed in order to ensure good Signal Integrity which is detailed below.
- During layout of this board care is taken to isolate ADC signals from digital components.
- RF signal of GPS routed in “Coplanar waveguide with ground” structure with 50 ohm impedance.
- The ground layers of RF, Analog and digital sections have been isolated to suppress the noise from interfering the critical signals.Fig2 shows the ground segmentation of this design.
- Clock signals routed without via.

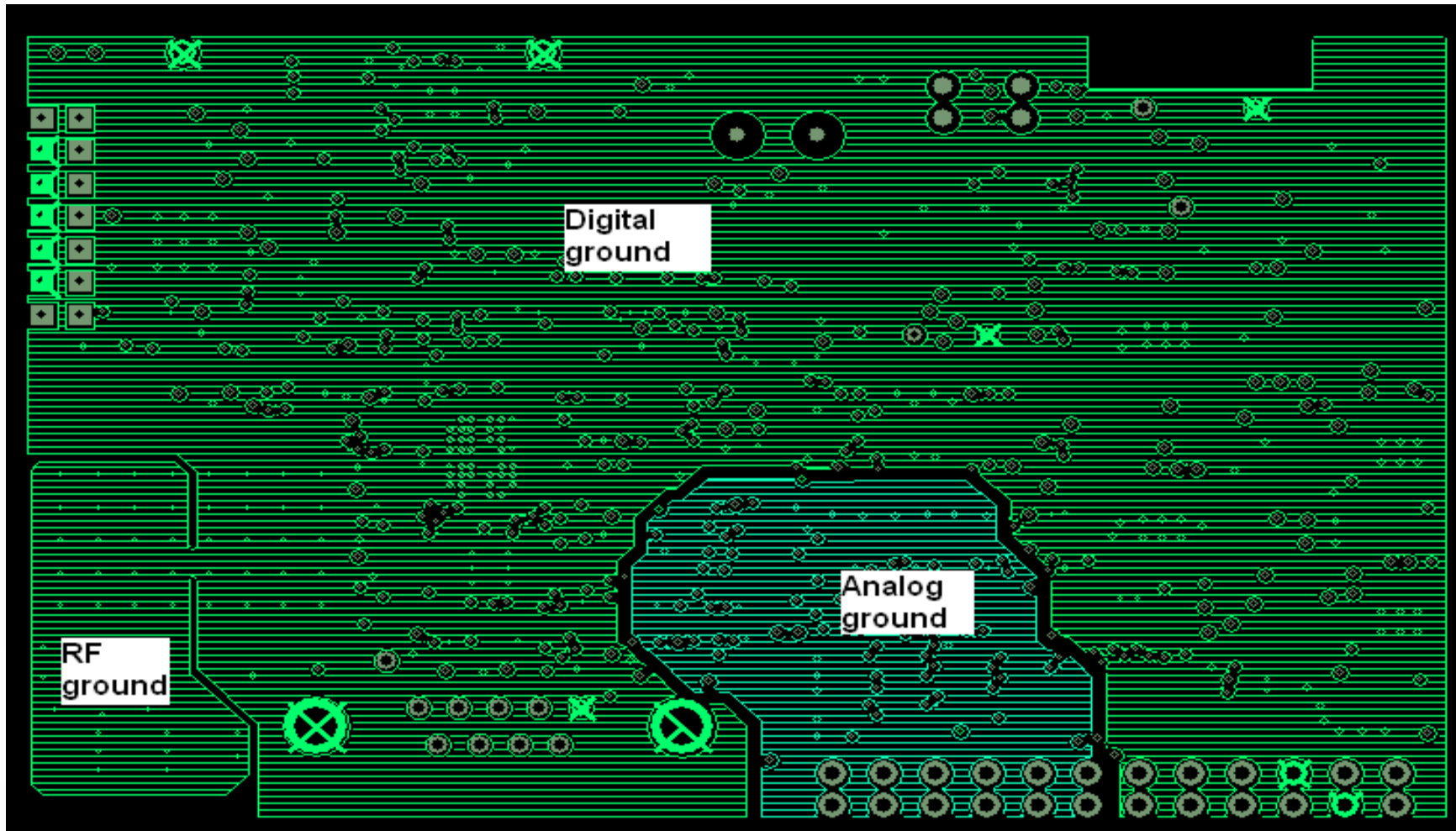
# Top View of Layout

Fig 1

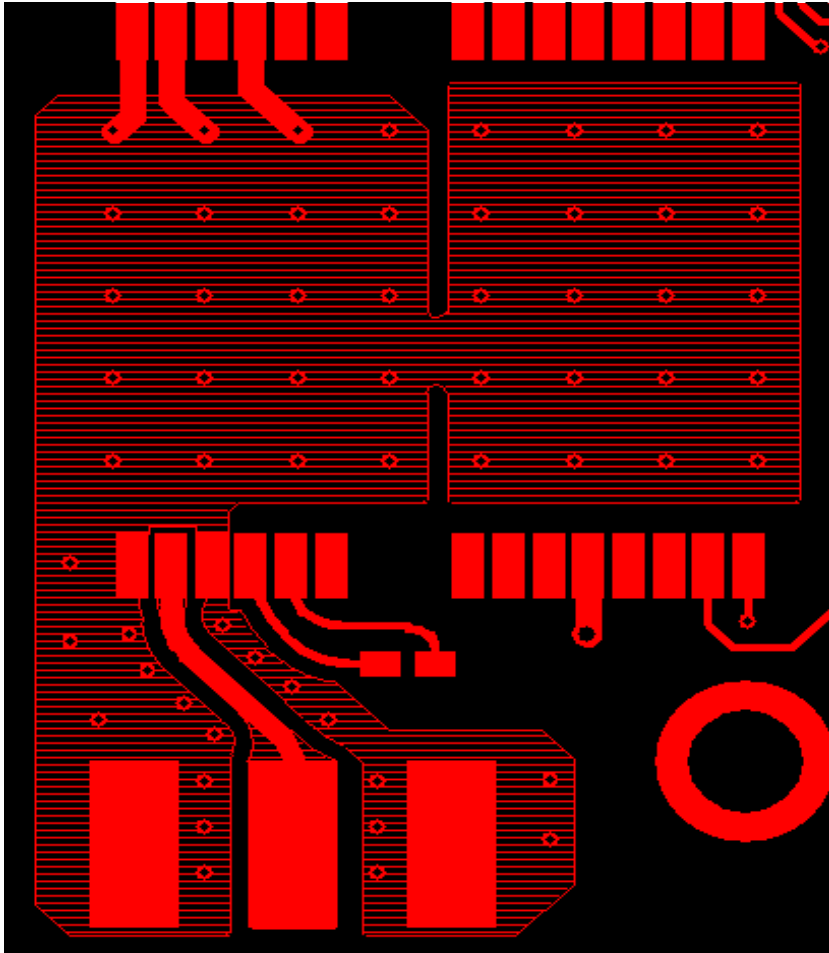


# *RF, Analog and Digital ground*

Fig 2



## *GPS/RF section*

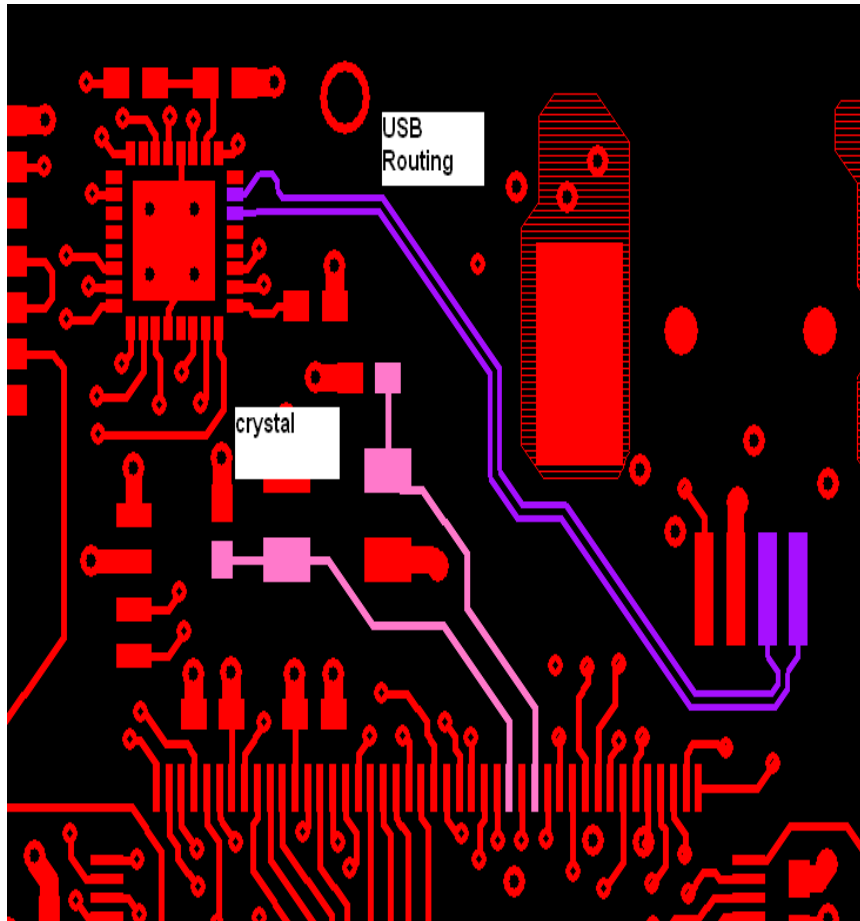


- Stitching vias added for GPS section to suppress RF noise to ground.
- Impedance is varied gradually to give better signal transition from SMA pin to board environment.

## *RF section*

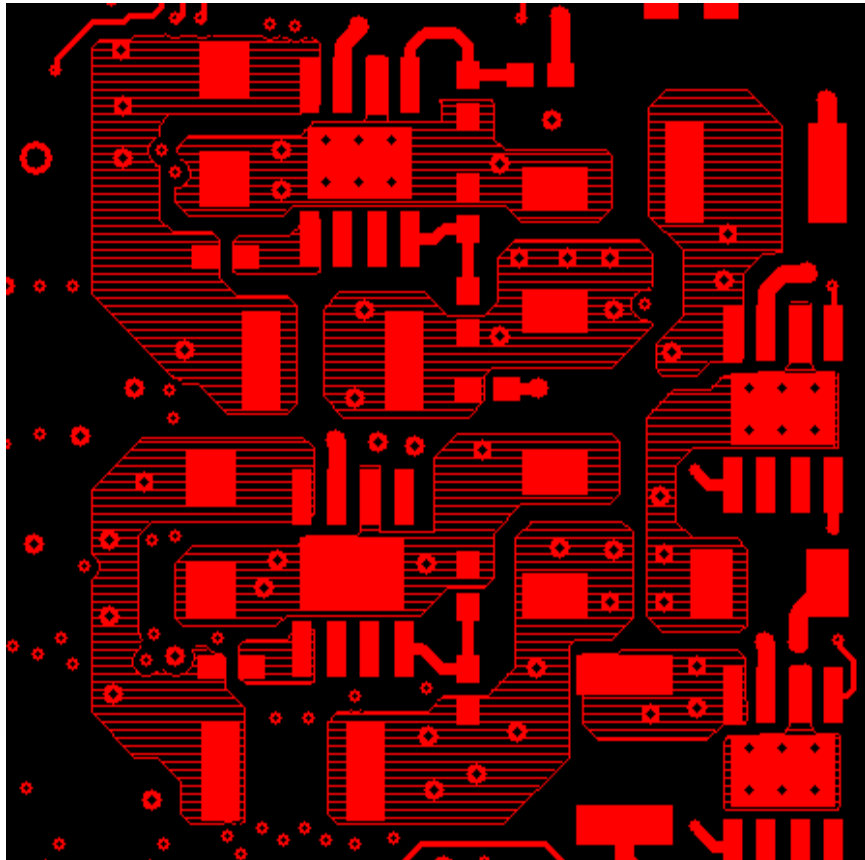
- The RF ground and digital ground are connected at a small area to isolate noise from interfering the signals.
- For RF to have tracewidth same as connector pin, the immediate GND layer is not taken as reference and height from third layer to top is taken for impedance calculation.
- Cut-out is given under the module in power and signal layers.

## *USB and CRYSTAL*



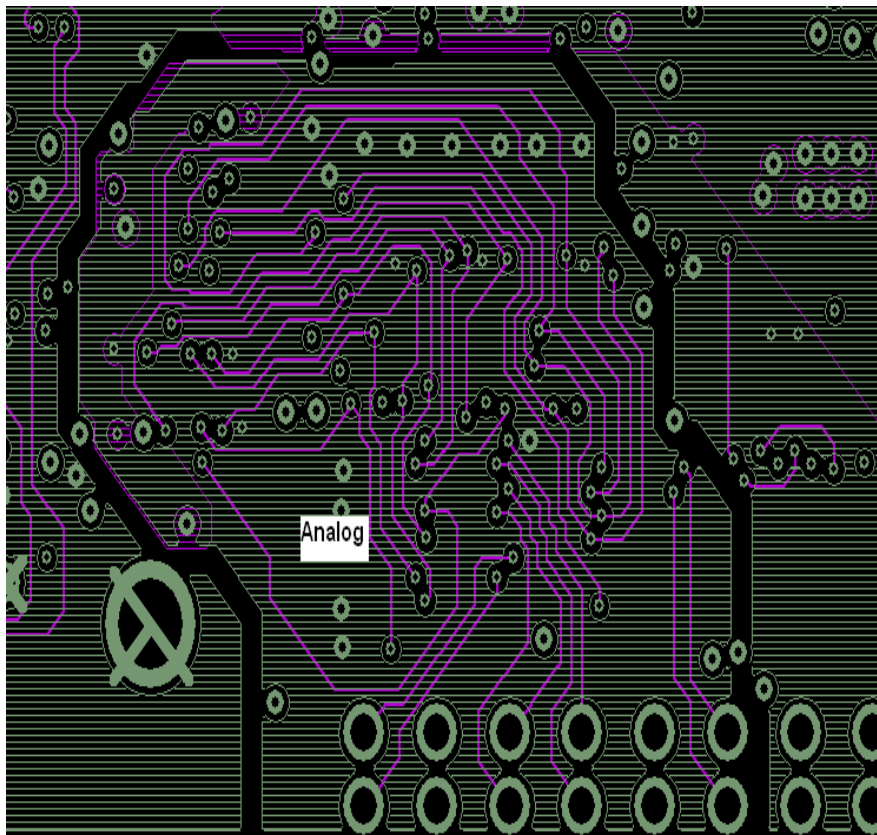
- USB and crystal routing separated by 5x dielectric height.
- USB signals routed with 90 ohm and are closely coupled for better immunity to noise.

## *DC converters-Power Section*



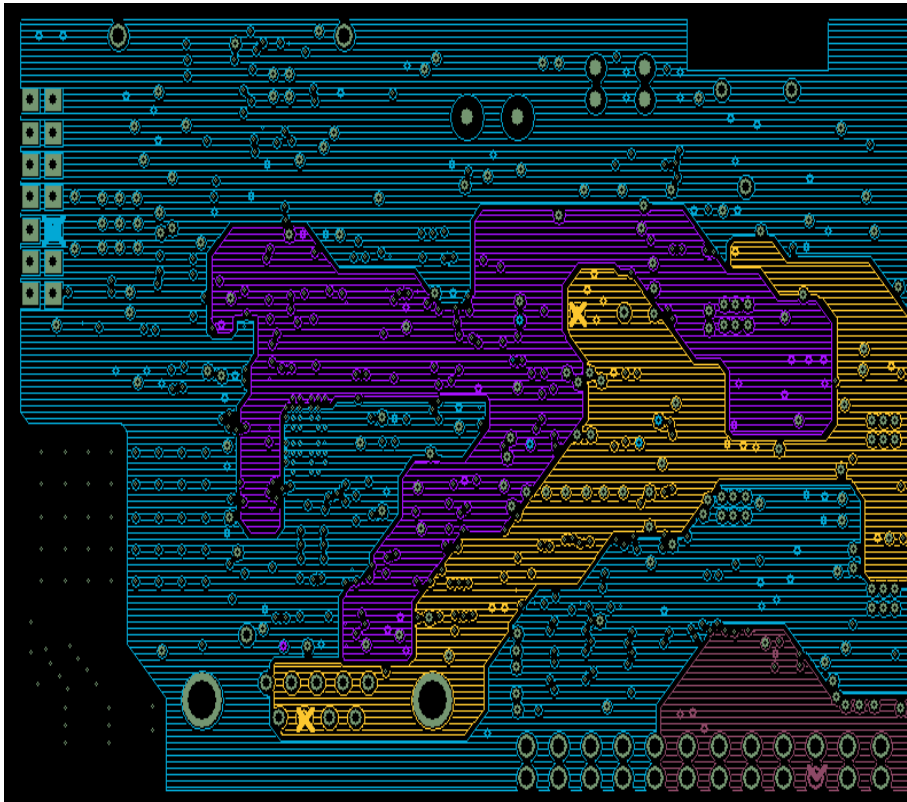
- These are high voltage regulators and layout guidelines are followed as per the regulator datasheet.
- DC-DC converters are high output current switching regulators. Proper care has been taken to route the feedback trace away from the inductors. The bulk and filter capacitors are placed close to the input supply pins to give good bypassing to the power pins.
- Used as many vias as possible for connecting power pins to planes.

## *Analog Ground Section*



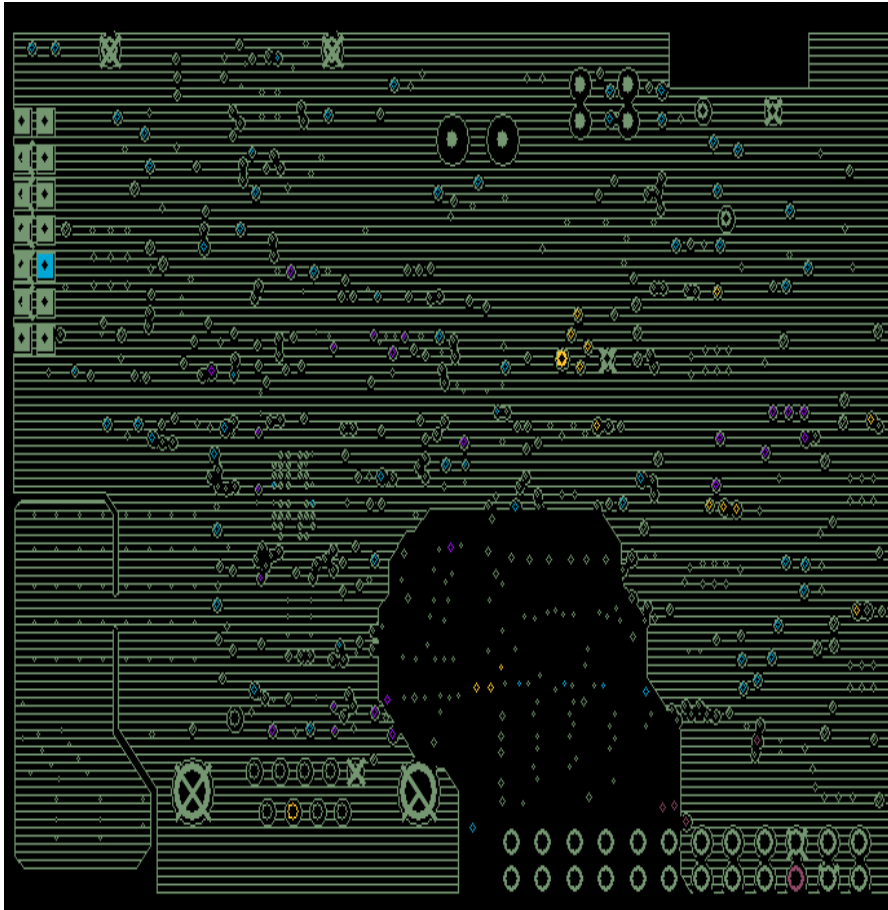
- For analog signals, analog ground is given as reference.
- Analog and digital grounds are separated by 40 mils.
- There is no digital power and ground in the layers adjacent to analog routing and analog plane.

## *Power Plane Segment*

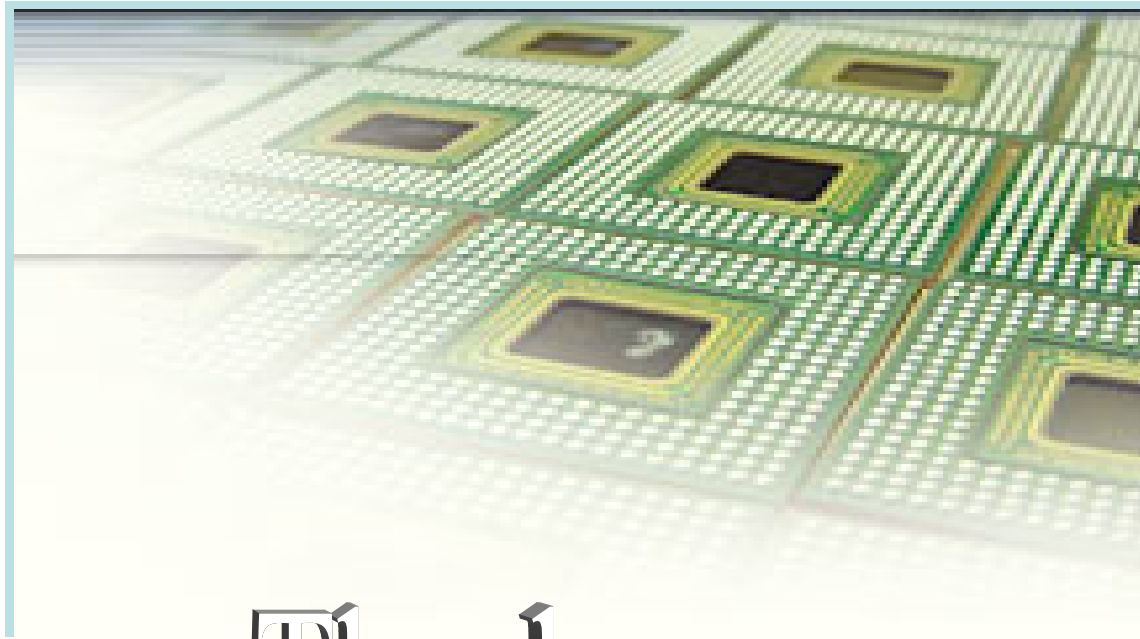


- Cut-out is given under GPS section.
- All the digital power planes are poured in a single plane layer with enough copper flow.

## *Ground Plane Segment*



- Digital ground plane with void above the analog area.



Thank you ....