Lecture 11

Reference Design Inverter Layout: Power Electronics & Controller Circuits

Objectives:

- Discuss placement of components in circuit subsections and discuss the overall placement to isolate weak and strong electrical signals.
- Discuss considerations for routing high-current traces in the PCB to minimize copper losses and the loop area.
- Discuss using separate ground planes to isolate noisy circuits, and consider the current return paths of traces crossing over the planes.
- Discuss using vias to make a thermal connection to other layers, as well as to build a Faraday cage around the board or certain signals for integrity.

Keywords:

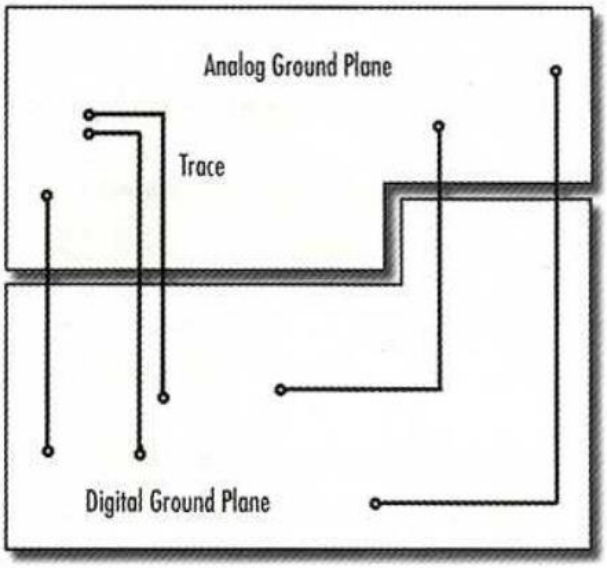
Through-hole via
Blind via
Buried via
Via tenting
Solder mask
Faraday Cage
Polygon pours
Layer Stack Manager
Ground loop
Multi-Channel Design

Overview of Inverter Power Layout

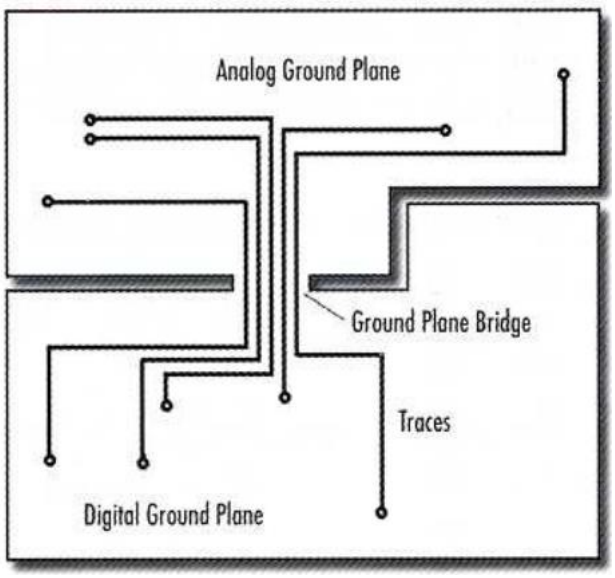
Discuss the different sections of the layout

Separating Digital from Analog (or Power from Control)

BAD DESIGN



GOOD DESIGN



Consideration of the Return Current Path

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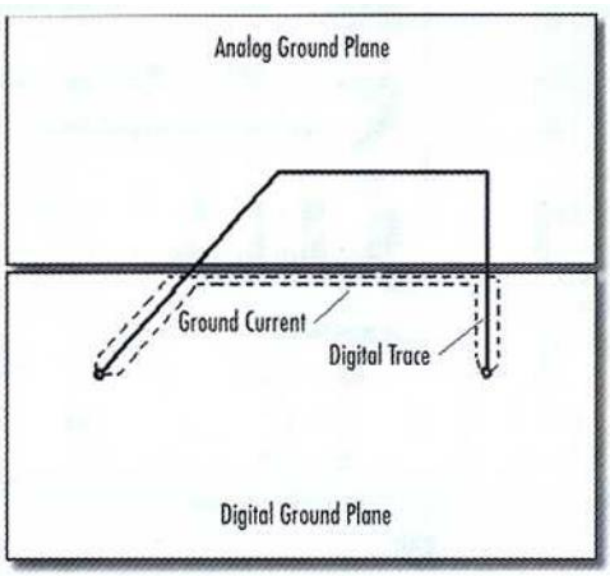

GOOD DESIGN