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Code: 60

1)

- **Voltage Reference: voltage references are an IC or a small circuit that gives a constant voltage as a reference to compare it other voltages.**
- **It can do as same as voltage regulators, but voltage regulators designed to give power, voltage reference used to give a fixed voltage also but as references.**
- **Voltage references have a limited input voltage but voltage regulators have a wider range so they can stand with high voltage input.**
- **Voltage regulators can stand and deal with heat dissipation and still give the same fixed read unlike voltage references that can give inaccurate and wrong reads.**

- **With varying loads Voltage regulators still gives the same accurate and fixed output unlike voltage references may give inaccurate outputs and cannot stand with varying loads.**

2)

- **Reference designators: reference designators are very important as it helps your printed board to be clear, it identify each component with an abbreviation**
- **reference designators made it easy in troubleshooting problems to look for your component easily and fix the problem simply.**
- **it makes it easily also in assembly process in putting THT just looks for the component with its reference and you will know its place and you can place it.**
- **And it made it easier in machining as it reduced errors for machines of putting wrong components in wrong places.**

- **ALSO, it is not a problem if you don’t have a place for them, you can make another assembly and put the reference designators on a silk board and place your printed board components, their outlines and your reference Designators on a pdf file and send them with your project that will be manufactured.**

3)

- **GERBER FILE: Gerber file is a file that have your pcb design, layers and, drills, components and every layout of your printed circuit that will be send to the manufactured company then they upload the file on the CAD to analyze images and set data for the manufacture process.**

4)

- **Copper pours is places that filled with copper metal in your printed board, they take small spaces, and they have a lot of advantages like they increase current conducting as they have a low impedance and copper is a good conductor.**

- **Copper pours can isolate a specific component from other components, and they also can connect them together in the board.**
- **Copper pours can be used as a ground for electricity and for your components to take current from through vias.**
- **Copper pours have two different types: grid and larger copper pour.**
- **larger copper pour is for increasing current conduction and shield from magnetic field problem that helps in reducing noises.**
- **grid copper pour is for heat dissipation and make a large area for the pcb in cases of large temperature of you board.**