

## Technical Papers for PCEA Education Web Page

### General

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2. Nickel-Plated Traces, Howard Johnson, [http://www.sigcon.com/Pubs/news/5\\_6.htm](http://www.sigcon.com/Pubs/news/5_6.htm)
3. Nickel-gold plating copper PCB traces, Polar Instruments, <https://www.polarinstruments.com/support/cits/AP171.html>

### High Speed/ Signal Integrity

1. IBIS Output Impedance Made Easy, Bert Simonovich, <https://blog.lamsimenterprises.com/tag/ibis/>
2. A Treatment of Differential Signaling and Its Design Requirements, Lee Ritchey, <https://www.speedingedge.com/PDF-Files/DiffSigDesign.pdf>
3. Anodes Crosstalk Overview (Intel), Item 2 under the Electrical Properties Group at this website: <https://psec.uchicago.edu/library/anodes/>
4. IBIS Models to Investigate Signal-Integrity, Bonnie C. Baker, <http://www.ti.com/lit/an/slyt413/slyt413.pdf>

### EMI

1. Effective Strategies for Choosing and Locating Printed Circuit Board Decoupling Capacitors, Todd Hubing, <https://cecas.clemson.edu/cvel/pdf/EMCS05-632.pdf>
2. 20-H Rule Modeling and Measurements, Hwan W, Shim & Todd H. Hubing, <https://cecas.clemson.edu/cvel/pdf/EMCS01-939.pdf>
3. Effects of 20-H Rule and Shielding Vias on Electromagnetic Radiation From Printed Circuit Boards, Chen & Fang, Dept of Electrical Engineering, University of California at Santa Cruz, <https://ieeexplore.ieee.org/document/895526>
4. 90 Degree Corners: the Final Turn, Doug Brooks, <https://www.ultracad.com/articles/90deg.pdf>
5. BGA Crosstalk, Dr Howard Johnson, [http://www.pldworld.com/xilinx/html/ref/v4advantagecd2/content/si/BGA\\_Crosstalk\\_Report\\_by\\_Howard\\_Johnson-8.pdf](http://www.pldworld.com/xilinx/html/ref/v4advantagecd2/content/si/BGA_Crosstalk_Report_by_Howard_Johnson-8.pdf)
6. Model for Estimating Radiated Emissions from a Printed Circuit Board with Attached Cables, Due to Voltage-Driven Sources, Hwan-Woo Shim & Todd Hubing, [https://www.researchgate.net/publication/3056826\\_Model\\_for\\_Estimating\\_Radiated\\_Emissions\\_From\\_a\\_Printed\\_Circuit\\_Board\\_With\\_Attached\\_Cables\\_Due\\_to\\_Voltage-Driven\\_Sources](https://www.researchgate.net/publication/3056826_Model_for_Estimating_Radiated_Emissions_From_a_Printed_Circuit_Board_With_Attached_Cables_Due_to_Voltage-Driven_Sources)
7. Printed Circuit Board EMI Source Mechanisms, Todd Hubing, <https://cecas.clemson.edu/cvel/pdf/EMCS03-001.pdf>
8. Estimation of Common Mode Radiated Emissions from Cables Attached to High Speed PCB Using Imbalance Difference Model, Ahmed M. Sayegh and Mohd Zazar M. Jenu [http://www.arpnjournals.org/jeas/research\\_papers/rp\\_2015/jeas\\_1015\\_2815.pdf](http://www.arpnjournals.org/jeas/research_papers/rp_2015/jeas_1015_2815.pdf)

### Power Bus

1. Power Bus Decoupling Guidelines for Printed Circuit Boards with Closely Spaced Power Distribution Planes, Todd Hubing, <https://learnemc.com/decoupling-for-boards-with-closely-spaced-power-planes>
2. Power Bus Decoupling Guidelines for Printed Circuit Boards with Widely Spaced Power Distribution Planes, Todd Hubing, <http://learnemc.com/decoupling-for-boards-with-widely-spaced-planes>
3. Power Bus Decoupling on Multilayer Printed Circuit Boards, Hubing, Drewniak, Van Doren & Hockanson, <https://ieeexplore.ieee.org/document/385878>
4. PDN Application of Ferrite Beads, Steve Weir, [https://www.emcfastpass.com/wp-content/uploads/2017/04/PDN\\_Ferrite\\_Beads.pdf](https://www.emcfastpass.com/wp-content/uploads/2017/04/PDN_Ferrite_Beads.pdf)
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### **Switch Mode Power Supplies**

1. The Analysis and Layout of a Switching Mode Power Supply, AIC, <http://www.analog.com.tw/lmgAnalog/an017.pdf>
2. Considerations in Designing the Printed Circuit Boards of Embedded Switching Power Supplies, Marty Brown, <https://pcb1001.blogspot.com/2008/09/considerations-in-designing-printed.html>

### **Flex**

1. Ask the Flexperts, Mark Finstad, PCD&F Magazine column
2. Design and Assembly Process Principles for Flexible and Rigid Flex Circuits, Solberg, PCB West 2015

### **HDI**

1. Design and Construction Effects on PWB Reliability, Paul Reid, <https://smtnet.com/library/files/upload/PWB-Reliability.pdf>
2. HDI's Beneficial Influence on High-Frequency Signal Integrity, Happy Holden, <http://pcb.icconnect007.com/index.php/article/106966/hdis-beneficial-influence-on-high-frequency-signal-integrity/106969/?skin=pcb>
3. The Future of HDI Via Structures, Power Delivery, and Thermal Management in Next Generation Printed Circuits, Tom Buck, [https://www.smta.org/chapters/files/Carolinas\\_Viasystems\\_SMTA\\_1-23-2014.pdf](https://www.smta.org/chapters/files/Carolinas_Viasystems_SMTA_1-23-2014.pdf)

### **DFM**

1. Problems and Promises of BTCs Bottom Terminated Components <http://www.rayprasad.com/problems-and-promises-of-btcs-bottom-termination-c>
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