

Issue # 281

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Kyle Granat: Low-Cost SBC: A Revolution in STEM and Robotics Education**VIDEO**

YouTube, "ArduinoPI Web-Based Controller Using Raspberry Pi and Arduino,"
<http://www.youtube.com/watch?v=JBz5lfTh3Eo>

J. Bachiochi: Unleash Your Android Device's Potential**RESOURCES**

Arduino, <http://arduino.cc>

Future Technology Devices International, Ltd., "FT31xD Demo APK User Guide," Application Note 208, 2013

www.ftdichip.com/Support/Documents/AppNotes/AN_208_FT31xD_Demo_APK_User_Guide.pdf

———, "Software Application Development FT31xD Android Programmers Guide," Application Note FT_000532, 2013

[www.ftdichip.com/Support/Documents/ProgramGuides/FT31XD_Android_programmer_guide\(FT_000532\).pdf](http://www.ftdichip.com/Support/Documents/ProgramGuides/FT31XD_Android_programmer_guide(FT_000532).pdf)

SOURCES

FT311D USB Android host IC

Future Technology Devices International, Ltd. | www.ftdichip.com

HMC5843 Digital compass IC

Honeywell International, Inc. | www.honeywell.com

L923D Quadruple half-H driver and DRV8835 motor driver

Texas Instruments, Inc. | www.ti.com

G. Novacek: Impedance Matching**RESOURCES**

J. Wetherall, University of San Diego, "Impedance Matching Network Designer," 2001
<http://home.sandiego.edu/~ekim/e194rfs01/jwmatcher/matcher2.html>

Wikipedia, "Square Wave Frequency Spectrum Animation,"

http://en.wikipedia.org/wiki/File:Square_wave_frequency_spectrum_animation.gif

YagiCAD, Antenna Design Software, www.yagicad.com

Bob Japenga: Embedded File Systems (Part 2): File System Integrity**RESOURCES**

eLinux.org, "Flash Filesystem Benchmarks 3.1"
http://elinux.org/Flash_Filesystem_Benchmarks_3.1

Yaffs, open-source file system, www.yaffs.net

Colin O'Flynn: Connecting FPGA Hardware to Virtual Test Benches**RESOURCES**

C. O'Flynn, "Using Internal Logic Analyzers for FPGAs," *Circuit Cellar* 279, 2013

www.ProgrammableLogicInPractice.com

Xilinx, Inc., "ISim Hardware Co-Simulation Tutorial: Accelerating Floating Point FFT Simulation," Application Note UG817, 2012,
www.xilinx.com/support/documentation/sw_manuels/xilinx14_4/ug817_fft_sim_tutorial.pdf

———, "ISim Hardware Co-Simulation Tutorial: Interacting with Spartan-6 Memory Controller and On-Board DDR2 Memory," Application Note UG818, 2011,
www.xilinx.com/support/documentation/sw_manuels/xilinx13_1/ug818_ddr2_mem_tutorial.pdf

SOURCES

ISE Design Suite, ISE WebPACK design software, PCI Express IP, Avnet Spartan 6LX9 MicroBoard, Platform Cable USB, ChipScope ILA/ILC, and Spartan-6 FPGA SP601 Evaluation kit
Xilinx, Inc. | www.xilinx.com

Robert Lacoste: Amplifier Classes From A to H**RESOURCES**

S. C. Cripps, *RF Power Amplifiers for Wireless Communications*, 2nd Edition, Artech House, 2006

Devialet, "D-Premier White Paper," <http://en.devialet.com/assets/Uploads/D-Premier-White-Paper-Munich.pdf>

E. Gaalaas, "Class-D Audio Amplifiers: What, Why, and How," Analog Devices, Inc., 2006,
www.analog.com/library/analogdialogue/archives/40-06/class_d.pdf

J. Honda and J. Adams, "Class-D Audio Amplifier Basics," International Rectifier, Application Note AN-1071, 2005, www.irf.com/technical-info/appnotes/an-1071.pdf

R. Lacoste, "Bipolar Transistor Biasing" *Circuit Cellar* 279, 2013

Linear Technology, Corp., www.linear.com

K. Mcknight, "Doherty Amplifier Design," Microwave Monolithic Integrated Circuit (MMIC) Course, Johns Hopkins University, 2009, K. Mcknight, "Doherty Amplifier Design," Microwave

Monolithic Integrated Circuit (MMIC) Course, Johns Hopkins University, 2009,
www.apl.jhu.edu/Notes/Penn/Cover09_files/MMIC_reportPA2.pdf

D. Self, Audio Power Amplifier Design Handbook, 5th Edition, Focal Press, 2009

N. O. Sokal, "Class-E RF Power Amplifiers," QEX magazine, 2001,
www.eel.ufsc.br/~lci/siteramo/documentos/mestres/artigos/classe.pdf

H. Theiler, H. Lenhard, and H. Gether, "Class-G/H Amplifiers: How Well Do They Deliver on Their Promise of High Audio Quality and Low Power Consumption?" ams AG,
https://shop.austriamicrosystems.com/eng%20/content/download/163207/793905/file/TA_Audio_HeadphoneAmplifiers_AS3561_e.pdf

Wikipedia, "Amplifier," <https://en.wikipedia.org/wiki/Amplifier>

———, "Class T amplifier," http://en.wikipedia.org/wiki/Class_T_amplifier

Yamaha Corp., "Yamaha Power Amplifier White Paper," 2008,
http://download.yamaha.com/api/asset/file?language=en&site=countrysite-master.prod.exp.yamaha.com&asset_id=53052

SOURCES

D-Premier amplifier and ADH technology
Devialet | <http://en.devialet.com>

MAX98090 Ultra-low-power stereo audio codec
Maxim Integrated, Inc. | www.maximintegrated.com

David Cass Tyler: Calibration (Part 2): Polynomial Curve Fitting

PROJECT FILES

To download the code, go to ftp://ftp.circuitcellar.com/pub/Circuit_Cellar/2013/281

REFERENCES

[1] Wikipedia, "Spline interpolation," http://en.wikipedia.org/wiki/Spline_interpolation

[2] Freescale Semiconductor, Inc., "MCF5282 and MCF5216 ColdFire Microcontroller User's Manual," 2009, http://cache.freescale.com/files/32bit/doc/ref_manual/MCF5282UM.pdf

RESOURCES

I. Miller and J. E. Freund, Probability and Statistics for Engineers, 3rd Edition, Prentice Hall, 1985

W. H. Press, S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, Numerical Recipes in C: The Art of Scientific Computing, Second Edition, Cambridge University Press, 2002,
<http://apps.nrbook.com/c/index.html>

Faiz Rahman: Emerging Memory Technologies**RESOURCES**

Buffalo Technology, Inc., www.buffalotech.com

Elpida Memory, Inc., www.elpida.com

Fujitsu, www.fujitsu.com

Hynix Semiconductor Inc., www.hynix.com

IMEC, www.imec.be

Micron Technology, Inc., www.micron.com

Panasonic Corp., www.panasonic.com

Samsung Electronics America, Inc., www.samsung.com

Sharp Electronics Corp., www.sharppusa.com

Sony Corp., www.sony.com

Taiwan Semiconductor Manufacturing Company, Ltd., www.tsmc.com

Toshiba Corp., www.toshiba.com

SOURCES

FM28V100 and FM6124-QG FRAM
Cypress Semiconductor Corp. | www.cypress.com

EMD3D064M MRAM
Everspin Technologies, Inc. | www.everspin.com

MSP430FR5969 Wolverine mixed-signal microcontroller
Texas Instruments, Inc. | www.ti.com

Steffen Mauch: UDP Streaming on an FPGA**PROJECT FILES**

To download the code, go to ftp://ftp.circuitcellar.com/pub/Circuit_Cellar/2013/281

RESOURCES

P. J. Ashenden, The Designer's Guide to VHDL, 3rd Edition (Systems on Silicon), Morgan Kaufmann, 2008

J. Blanchette and M. Summerfield, C++ GUI Programming with Qt4, 2nd Edition, Prentice Hall, 2008

dSPACE GmbH, www.dspace.com

GitHub, Inc., "UDP Network with a Tri-Mode MAC on a Spartan-6 FPGA,"
<https://github.com/steffenmauch/udp-spartan6-impl>

C. M. Kozierok, The TCP/IP Guide: A Comprehensive, Illustrated Internet Protocols Reference, 1st Edition, No Starch Press, 2005

D. Molkenntin, The Book of Qt 4: The Art of Building Qt Applications, 1st Edition, No Starch Press, 2007

OpenCores, "10_100_1000 Mbps Tri-Mode Ethernet MAC: Overview,"
http://opencores.org/project.ethernet_tri_mode

———, "UDP/IP Core: Overview," http://opencores.org/project.udp_ip_core

Trenz Electronic GmbH, "FPGA Boards," www.trenz-electronic.de/products/fpga-boards.html

Wikipedia, "Address Resolution Protocol,"
http://en.wikipedia.org/wiki/Address_Resolution_Protocol

———, "Management Data Input/Output,"
http://en.wikipedia.org/wiki/Management_Data_Input/Output

———, "User Datagram Protocol," http://en.wikipedia.org/wiki/User_Datagram_Protocol

Wireshark, free network protocol analyzer, www.wireshark.org

SOURCES

88E1111 Ultra gigabit Ethernet transceiver
Marvell Technology Group, Ltd. | www.marvell.com

LabVIEW Software
National Instruments Corp. | www.ni.com

TE0600 FPGA Micromodule
Trenz Electronic GmbH | www.trenz-electronic.com

Tri-Mode Ethernet Media Access Controller (TEMAC) core, AXI Ethernet Lite MAC, Embedded Development Kit (EDK), and Spartan-6 LX FPGA
Xilinx, Inc. | www.xilinx.com