Issue #293 — December 2014

PROJECT FILES

All of the project files for this issue are available at: **ftp://ftp.circuitcellar.com/pub/Circuit_Cellar/2014/293/**

ARTICLE MATERIALS

Got Power?: Smart Energy Harvesting for Small Electronic Systems, By Jeff Bachiochi

SOURCES

EnerChip CC CBC3150

Cymbet | www.cymbet.com

LTC3330 Buck-Boost with energy-harvesting battery life extender

Linear Technology | www.linear.com

MAX17710 Energy-harvesting charger and protector

Maxim Integrated Products | www.maximintegrated.com

MCP73831/2 Li-Ion, Li-Polymer Charge Management Controller

Microchip Technology | www.microchip.com

NXQ1TXA1 Charger controller

NXP Semiconductors | www.nxp.com

SPV1050 Energy harvester and battery charger

STMicroelectronics | www.st.com

BQ25504 Boost converter

Texas Instruments | www.ti.com

Essential Electromagnetic Compliance (Part 1): An Introduction to EMC, by George Novacek

RESOURCES

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O. Hartal, Electromagnetic Compatibility by Design, R&B Enterprises, 1995.

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Estimating Your Embedded System's Project (Part 1): The Challenges of Planning Software Projects, by Bob Japenga

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Experimenting with Metastability and Multiple Clocks on FPGAs, by Colin O'Flynn

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Run With It: Build a Wireless Pedometer and Pace Tracker, by Ellen Chuang and Julie Wang

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ATmega1284P microcontroller
Atmel | www.atmel.com

MMA2260D Accelerometer
Freescale Semiconductor | www.freescale.com

Do You Speak I/Q?: The Fundamentals of I/Q Signals, by Robert Lacoste

RESOURCES

M. Q. Kuisma, "I/Q Data for Dummies," Ping Research, 2014, http://whiteboard.ping.se/SDR/IQ.

B. Locher, I/Q Experimentation Applet, 2011, www.fourier-series.com/IQMod/flashprograms/IQFFT.html.

R. Lyons, "Quadrature Signals: Complex, But Not Complicated," 2008, www.ieee.li/pdf/essay/quadrature_signals.pdf.

SOURCES

AD9957 Quadrature digital up-converter and ADL5375 modulator

Analog Devices | www.analog.com

Calc

Libreoffice | www.libreoffice.org/

Scilab Software

Scilab Enterprises | www.scilab.org

Frequency-Hopping System, by Israel Schneiderman, Binyamin Helman, and Yehonatan Kali

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Analog Devices, "CMOS 180 MHz DDS/DAC Synthesizer," Rev D, AD9851, 2004, www.analog.com/static/imported-files/data_sheets/AD9851.pdf.

———, "Fundamentals of Direct Digital Synthesis (DDS)," Rev. 0, 2009, www.analog.com/static/imported-files/tutorials/MT-085.pdf.

K. Gentile, "Direct Digital Synthesis (DDS) with a Programmable Modulus," Rev A, AD953, 2010, www.analog.com/static/imported-files/application_notes/AN-953.pdf.

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AD9851 DDS Chip

Analog Devices | www.analog.com

Air Quality Mapper, by Raul Alvarez Torrico

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FatFs — Generic FAT File System Module, http://elm-chan.org/fsw/ff/00index_e.html.

Matplotlib1, http://matplotlib.org/.

MySQL-python2, http://sourceforge.net/projects/mysql-python/.

Numpy3, www.numpy.org.

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MG-811 Sensor and MQ-7

Hanwei Electronics Co.| www.hwsensor.com

MCP6022 Op-amp

Microchip Technology, Inc. | www.microchip.com

Polstar PMB-648 GPS Module

Parallax | www.parallax.com

R5F100LEA and YRDKRL78G13 Development board

Renesas Corp. | www.renesas.com