CUSTOM EMBEDDED LINUX SYSTEMS MADE EASY

WITH BEAGLEBOARD.ORG AND OCTAVO SYSTEMS SYSTEM-IN-PACKAGE
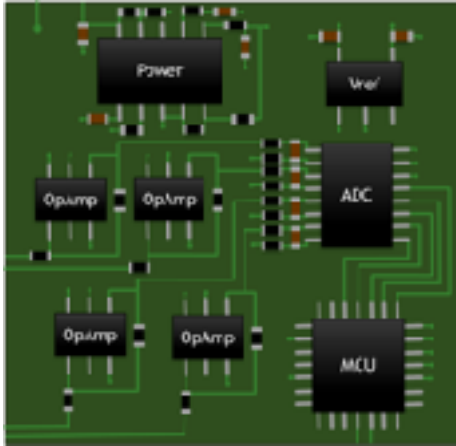
JASON KRIDNER – BEAGLEBOARD.ORG
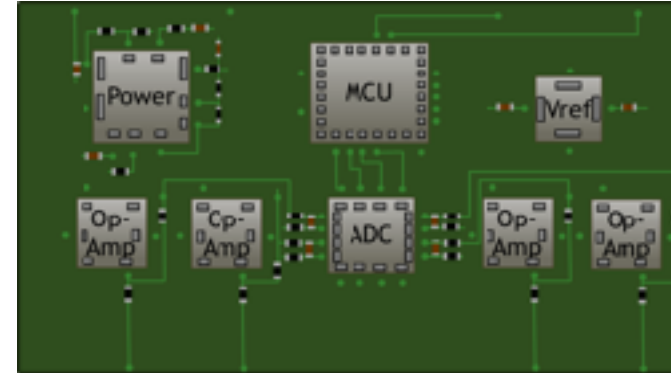GREG SHERIDAN – OCTAVO SYSTEMS

AGENDA

- What is System-In-Package Technology?
  - What is the OSD3358?
- State of Embedded Linux Design
- BeagleBoard.org and Octavo Systems to the Rescue!
- Example Embedded Linux System

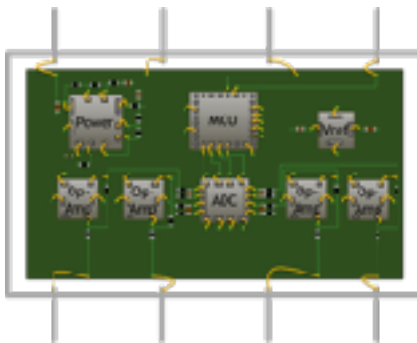# WHAT IS SYSTEM-IN-PACKAGE TECHNOLOGY?
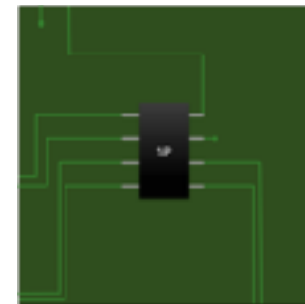
Step 1: Begin with a known design

Step 2: Get Die and Design Substrate

Step 3: Place in an IC package and Bond Out

Step 4: Replace original circuit with SiP

9/28/2016

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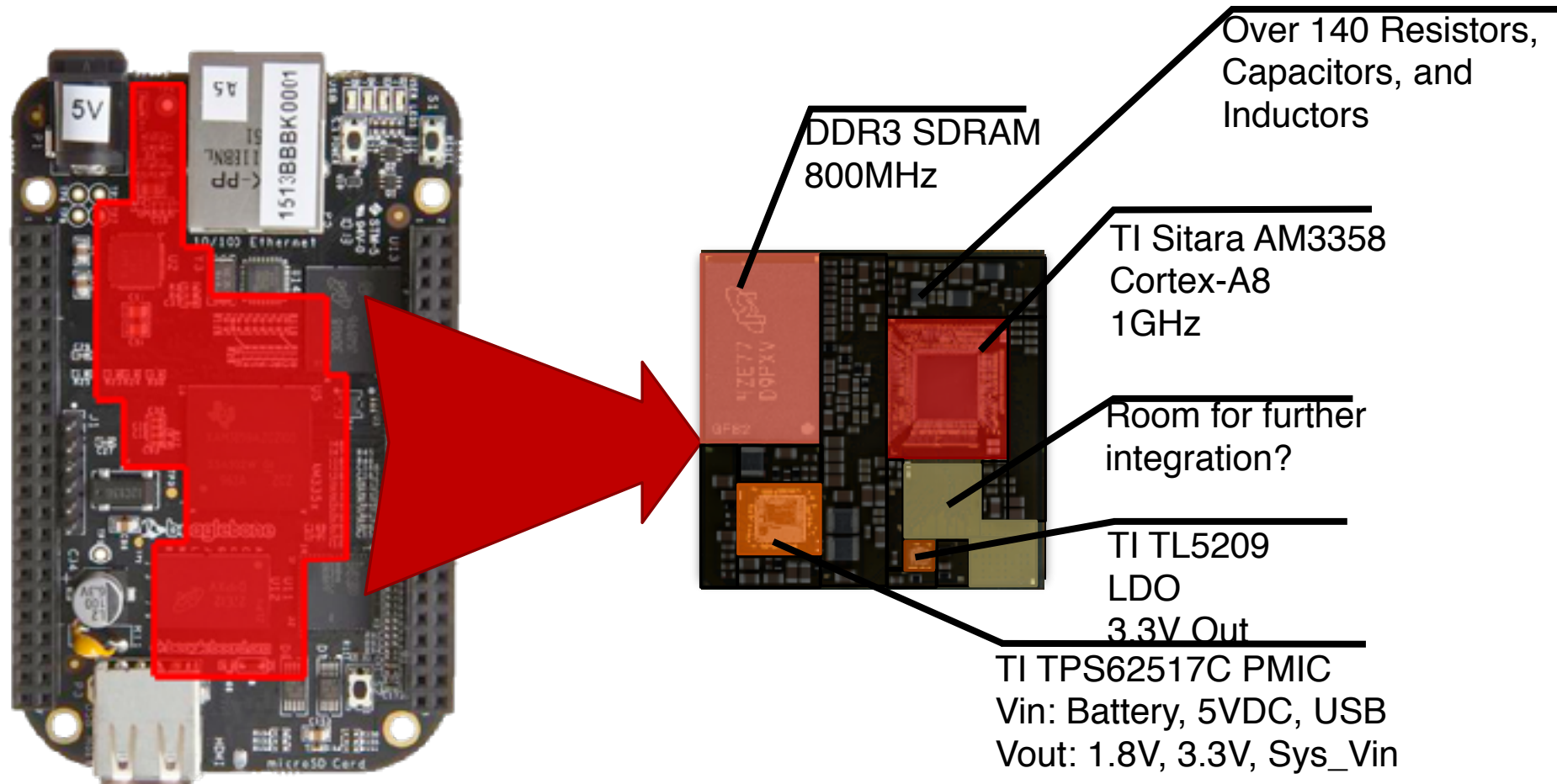
WHAT IS THE OSD3358?

Over 140 Resistors, Capacitors, and Inductors

DDR3 SDRAM 800MHz

TI Sitara AM3358 Cortex-A8 1GHz

Room for further integration?

TI TL5209 LDO 3.3V Out

TI TPS62517C PMIC
Vin: Battery, 5VDC, USB
Vout: 1.8V, 3.3V, Sys_Vin

HOW DOES THIS HELP?

- COMPLEXITY

Microcontroller

Embedded Linux

Increasing Complexity

# of Derivative Board Suppliers

52

7

1

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COMPLEXITY EXPLORED – WHEN DESIGNING A CUSTOM BOARD

Easy |
Medium |
Hard |

	Arduino	BeagleBone ™ Black	Raspberry Pi
Software	Easy	Easy	Easy
Hardware Documentation	Easy	Medium	Hard
Schematic Design	Easy	Medium	Hard
Layout Design	Easy	Hard	Hard
Sourcing	Easy	Medium	Hard
Manufacturing	Easy	Hard	Hard

FIRST: SOFTWARE

SECOND: HARDWARE DOCUMENTATION

THIRD: SCHEMATIC DESIGN

BeagleBone™ Black - Discrete
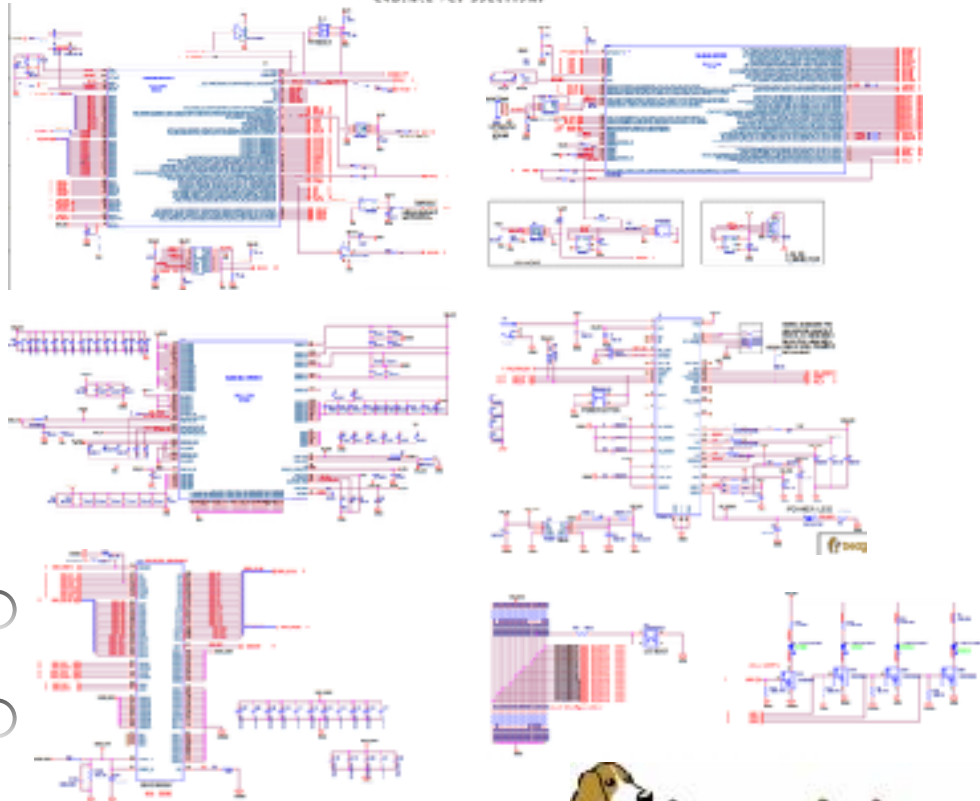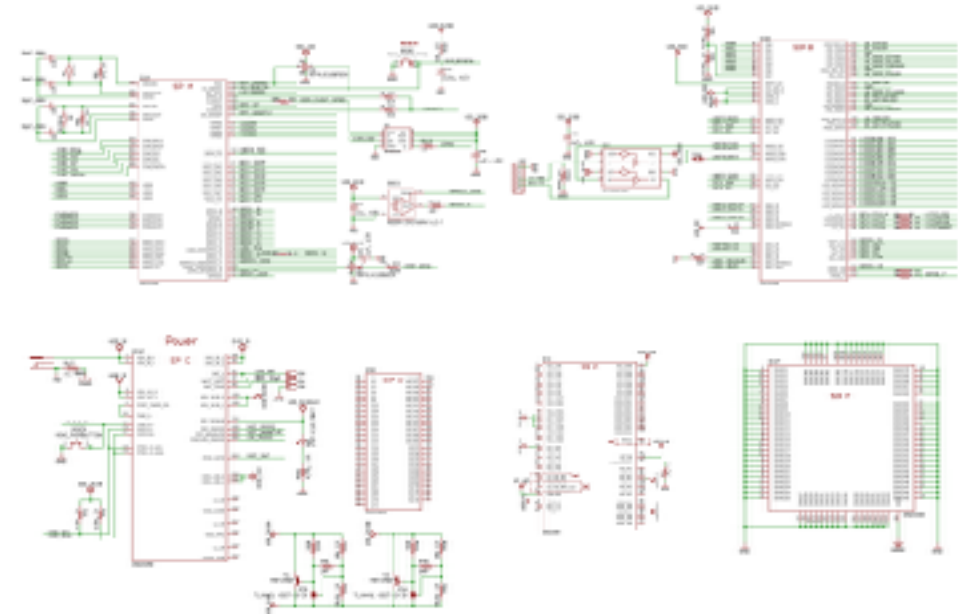
BeagleBone™ Black Wireless - SiP

FORTH: LAYOUT DESIGN

Discrete

OSD3358

DDR3

High Speed
DDR3 Interface   ✗

AM3358

PMIC

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FIFTH: SOURCING

6 Manufacturers

123 Capacitors

4 ICs

12 Resistors

OSD3358

6 Inductors
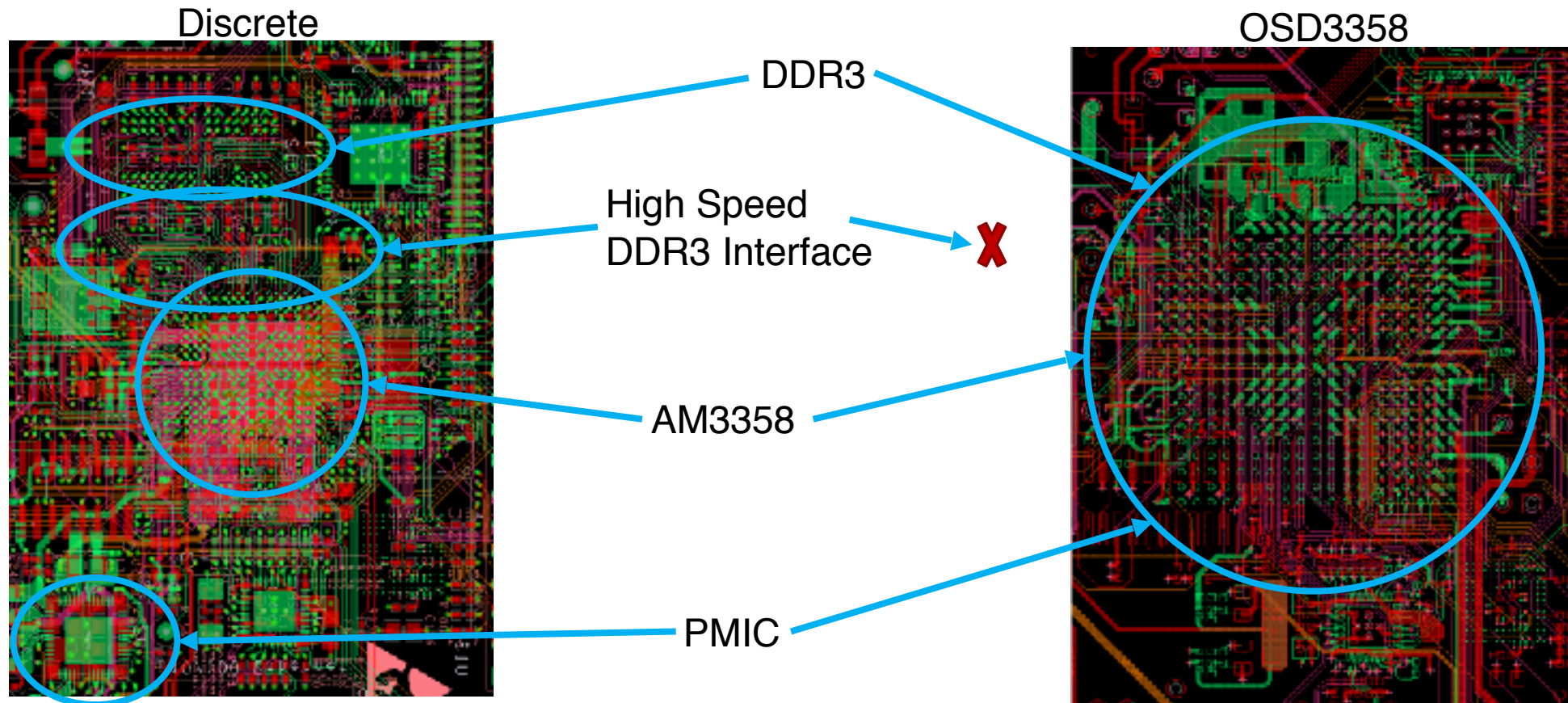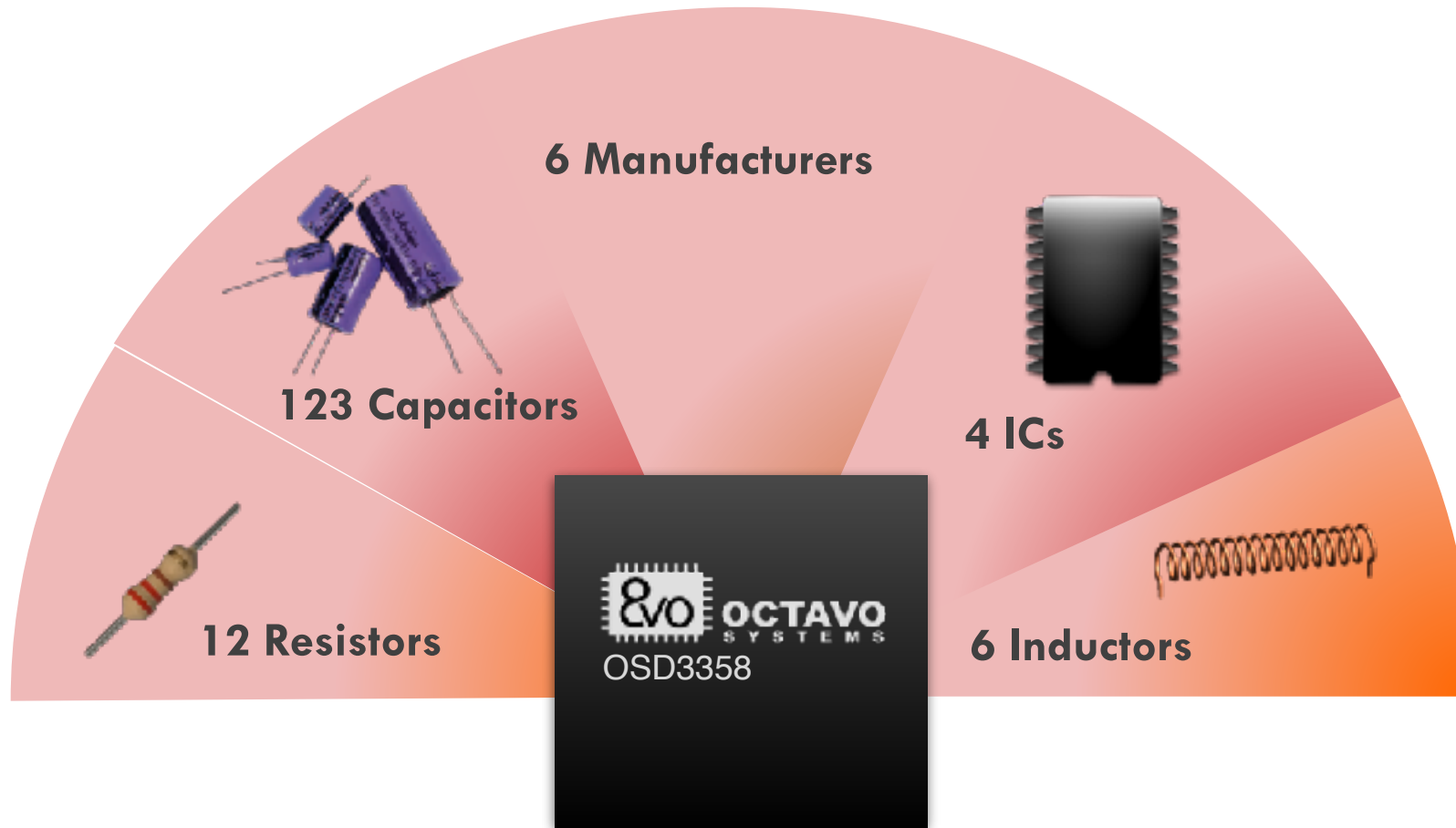
In a Single Device!
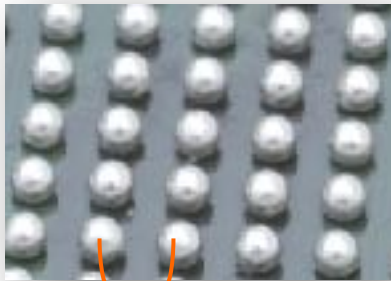
SIXTH: MANUFACTURING

Wide Pitch BGA

1.27mm

Reduced Layers

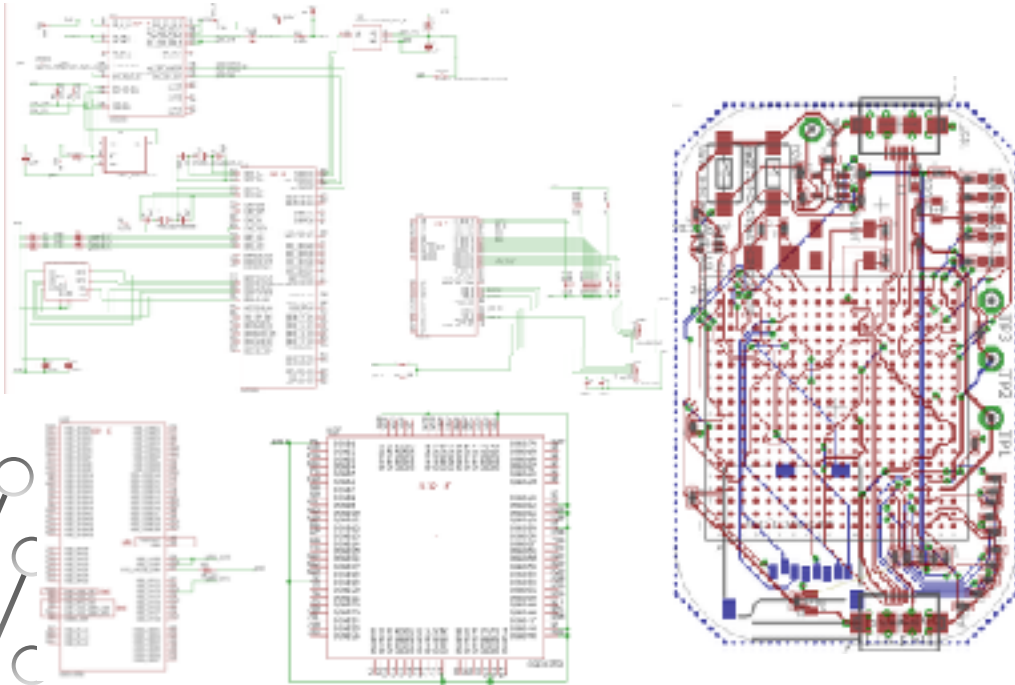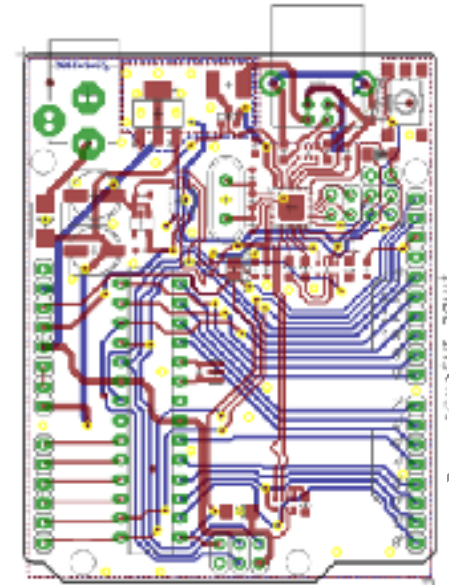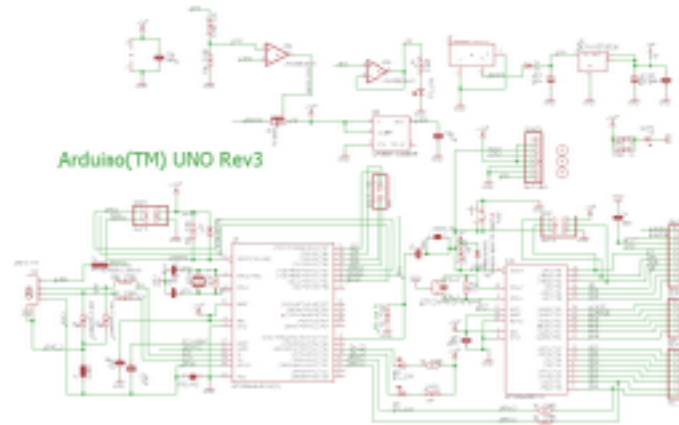More Integration
=
Fewer Layers

Reduced Components

- 140 Fewer Components to place
- 350 Fewer Solder Joints

EXAMPLE: POCKETBONE

PocketBone – Bare Minimum
Embedded Linux System

Arduino Uno – Entry Level 8-bit
Microcontroller

RECAP

-MAKING EMBEDDED LINUX AS EASY AS MICROCONTROLLERS

	Arduino	BeagleBoard + OSD3358	Raspberry Pi
Software	Easy	Easy	Easy
Hardware Documentation	Easy	Medium	Hard
Schematic Design	Easy	Easy	Hard
Layout Design	Easy	Easy	Hard
Sourcing	Easy	Easy	Hard
Manufacturing	Easy	Medium	Hard

Easy
Medium
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START MAKING!

- Visit Us At the BeagleBoard.org Booth!
- BeagleBone™ Black Wireless: https://beagleboard.org/black-wireless
- GHI BeagleBoard Compatible OSD3358 DevBoard: https://www.ghielectronics.com/catalog/product/563
- OSD335x: http://octavosystems.com/octavo_products/osd335x/
- Register Your Project: https://beagleboard.org/project/new/edit_project
- Logo Program: https://beagleboard.org/logo
- Have FUN!