CUSTOM EMBEDDED LINUX SYSTEMS MADE EASY

WITH BEAGLEBOARD.ORG AND OCTAVO SYSTEMS SYSTEM-IN-PACKAGE

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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
WHAT IS THE OSD3358?

TI Sitara AM3358
Cortex-A8
1GHz

Over 140 Resistors, Capacitors, and Inductors

TI TL5209
LDO
3.3V Out

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

Room for further integration?
HOW DOES THIS HELP?

- COMPLEXITY

Microcontroller

Embedded Linux

Increasing Complexity

# of Derivative Board Suppliers

52

7

1
## COMPLEXITY EXPLORED – WHEN DESIGNING A CUSTOM BOARD

<table>
<thead>
<tr>
<th></th>
<th>Arduino</th>
<th>BeagleBone™ Black</th>
<th>Raspberry Pi</th>
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FIRST: SOFTWARE
SECOND: HARDWARE DOCUMENTATION
THIRD: SCHEMATIC DESIGN

BeagleBone™ Black - Discrete

OrCAD

BeagleBone™ Black Wireless - SiP

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FORTH: LAYOUT DESIGN

Discrete

DDR3

High Speed DDR3 Interface

AM3358

PMIC

OSD3358
FIFTH: SOURCING

6 Manufacturers
123 Capacitors
12 Resistors
4 ICs
6 Inductors

In a Single Device!
SIXTH: MANUFACTURING

Wide Pitch BGA

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**

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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!