Plus1 Architecture Introduction

For New, Innovated, and Niche Markets

Smart Computing Program

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Introduction

- Expensive NRE for advanced processes:
  - Main stream market: Mobile phone, GPU, FPGA, …
  - NRE includes: IP license, Pilot Run, Mask, RD cost, CAD tools...

- New, innovated or niche markets:
  - Not market feasible for advanced processes

- Advanced process has good C/P for logic and memory but not for peripheral or analog designs.
  - Sunplus Plus1 architecture provides a solution to combine mature and advanced process for new, innovated and niche markets.
Sunplus Plus1 Architecture

Peripheral (P) chip
Mature Process
GPIO/ RS232/ I2C/ USB UART/ Others

Computing (C) chip
Advanced Process
1-core/ 2-core/ 4-core/
ARM/ DSP

Process
18um 13um 55nm 40nm 28nm 16nm 7nm

Mask cost
<$100K <$200K <$700K <$1M <$2M ~$3M >$7M

Separate Computing and Peripheral by advanced and mature process
C+P to form Plus1 Solution
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C+P thru CIO and PIO

CIO: “Plug” on C chip

PIO: “Socket” on P chip

Connect C and P thru wire bond

All interface singles thru P chip
Ideas

New market and new application

<E.g., Drone>

Current

P corp.

Simple Function

Up/DN/LF/RT/Stop

Con:

a. Few computing power
b. Simple functions

New C+P Model

C corp.

C-chip

Advanced Function

Up/DN/LF/RT/Stop

Intelligent decision and stability

P corp.

P-chip

Pro:

a. Good computing power
b. Ready for Complex algorithm
c. New application style
Plus1 Successful stories: Sunplus + Tibbo

SP7021: The First Plus1 SoC with...
First C-chip Architecture

Retail Computing Chip

- Cortex A7 1GHz
  - L1 32K I$/32K D$

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- 512KB Working SRAM (0.5GHz)
- DMA
- L2 512KB Cache (0.5GHz)
- CPIO

Data Transfer:
- Write: 400MHz * 16 bit * DDR: 1.6GB/s
- Read: 400MHz * 16 bit * DDR: 1.6GB/s
First Plus1 Product: SP7021

New Linux Computing Unit:
Simplicity of a microcontroller
Sophistication of a Linux platform
First Plus1 Product: SP7021

New Linux Computing Unit from Sunplus & Tibbo

- > Raspberry PI 2 Computing Power
- Single 3.3V Power Supply
- Easy for Mass Production
- 64 pins for ANY Function combination
- Extendable FPGA interface
- Self-Sustained Linux System
- Wide Range of Applications

SP7021

4-core ARM Cortex-A7 1.0 GHz

Power Mgm. Unit
- 5 x UART
- 4 SPI / I2C
- 9 x GPIO
- 2 x USB
- ARM926 RTU

Other Features
- DDR3 4Gb
- PWM / Timer
- SDIO / eMMC
- Ethernet SW
- HDMI T x 1.4
- 8051 MCU

Wide Range of Applications
Tibbo Project System with SP7021

Lego approach with Pin Mapping Matrix

- Pin Mapping Matrix Driver co-work with Tibbo engineers
- Built-in DDR3 & DC/DC brings the smallest PCB size
Results: Easy for Mass Production

- Pin Mapping Matrix & LQFP176
- 4Gb DDR Integrated & Single 3.3V Power Supply

TI based design

Plus1 based design

Easy for MP
Value Proposition

Positioning: Overcome the Chasm for Innovation

Chasm for Technology Adoption

Higher Volume

IP License

SoC

ASIC

Low NRE

High NRE

Less Volume

Low Volume

Higher NRE

*P1=FPGA

Lower Cost FPGA

Plus1:C+P

"The Chasm"

Innovators

Early Adopters

Early Majority

NRE

P1=FPGA

ASIC

SoC
Flourish IC Design ECO System
Low Entry Barrier / Easy Startup / School Innovative

C-Chip/PIO (C Company)

Design/System Houses

Startup

Design/ASIC Service

Brite
VeriSilicon
GUC
Faraday
PGC
Open Platform:

SP7021 Online Documents

SP7021 Released Document

Here is

Plus1 SP7021 Document and Information

This is an open space to share the SP7021 technical data for EVERYONE!

Featured Pages

- SP7021 Board Support Package
- SP7021 Datasheet
- SP7021 Software UserGuide
- SP7021 Technical Manual

Blog Stream

Blog stream

Create a blog post to share news and announcements with your team and company.

Create blog post

What’s in the space

- SP7021 Datasheet
- SP7021 Block Diagrams and Application Reference Circuit
- SP7021 Functional Description and Register Table
- SP7021 Specification
- SP7021 Peripheral Support List
- SP7021 EVE User Guide

Recently Updated

7. Real Time Clock (RTC)
yesterday at 11:13 AM • updated by Michael Su • view change
人臉辨識 Demo : SP7021+NN加速棒

1週內自行完成人臉辨識 Demo : SP7021+NN加速棒

參考影片： https://www.youtube.com/watch?v=M0lsRZ5Exaw&feature=youtu.be
Make difference