

eNews Letter Q2 2013

Advantech Applied Computing Technology Communications

**-Design w/ Intel® Bay Trail
- Healthcare Column**

**Issue: May 2013
By Advantech AC-DMS**

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About the eNews Letter

We, Advantech AC-DMS team, are glad to share with you, our premier customers, our latest technology focus and industry highlight.

Advantech has dedicated in ePlatform and eAutomation for 30+ years. To best serve its outsourcing customers, DMS (Design & Manufacturing Services) team was built focusing on customer-oriented services & cost-effective solutions with domain market knowhow, innovative technology, and solid experiences.

Embracing the company value “Altruism”, AC-DMS see ourselves a long-term partner to help our customers achieve future prospers. Not only do we offer collaborative design, flexible manufacturing and global services, but we also strive to go beyond customers’ expectations. The eNews letter is a practice of our commitment - ***Enabling customers’ success.***

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Bay Trail Platform Overview

Enhanced Visual Experiences



Media Processing
Fast Conversions



Stereoscopic 3D
Full HD over HDMI
Intel Gen7 Graphics



Video HD Technology
Immersive Web browsing
& Spectacular HD playback

Embedded Specific Enhancements

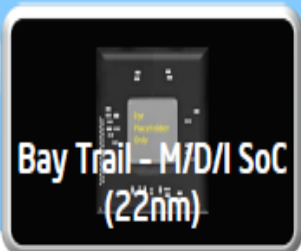
Purpose-fit embedded usages

Embedded OS's

Embedded Linux,
Embedded
Windows, Tizen ‡

**Extended Temp
SKU's**

With enhanced
reliability



System on Chip

TRUE Low Power SoC

Single package, single die
Integrated functions include:

**Leading
Integrated IO's**

(Storage, Display,
Audio, Legacy)

**Integrated
Memory
Controller**

2x channels
DDR3L@1067/1333

**IO Expansion
capabilities**

Gen 2 PCIe*
x4/x2/x1 config

**Re-architected
CPU cores**

Higher
performance Atom
cores

Content Security

AES NI, Blu-Ray*,
HDCP, AACS, PAVP,
Secure Boot

**Outstanding
Visuals &
Imaging**

3D Gfx, Media
Processing, Image
co-processor

‡ Tizen is supported for limited set of customers with explicit IVI usage
Not targeted for broad usage or delivery

Source from: Intel® Documentation

* Above information is for reference only.



Bay Trail Marketing Proposition

Form Factor Flexibility

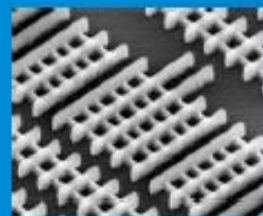
Entry All In One (eAIO)

Ultra Small Form Factor
(e.g. thin client)



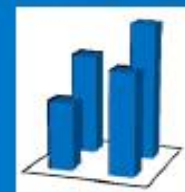
Leading Micro-Architecture

22nm Tri-gate Technology



Quad Core CPU with up to 50-100%
performance over previous generation*
based on 000 architecture

CPU and Graphics
Burst Technology



Experience / OS support



Win 7* / Open Source driver*

*POR not finalize (WIP)

Media / Gfx Experience

Enhanced Intel Gen 7
Graphics architecture
DX11

3X

Over previous
generation**

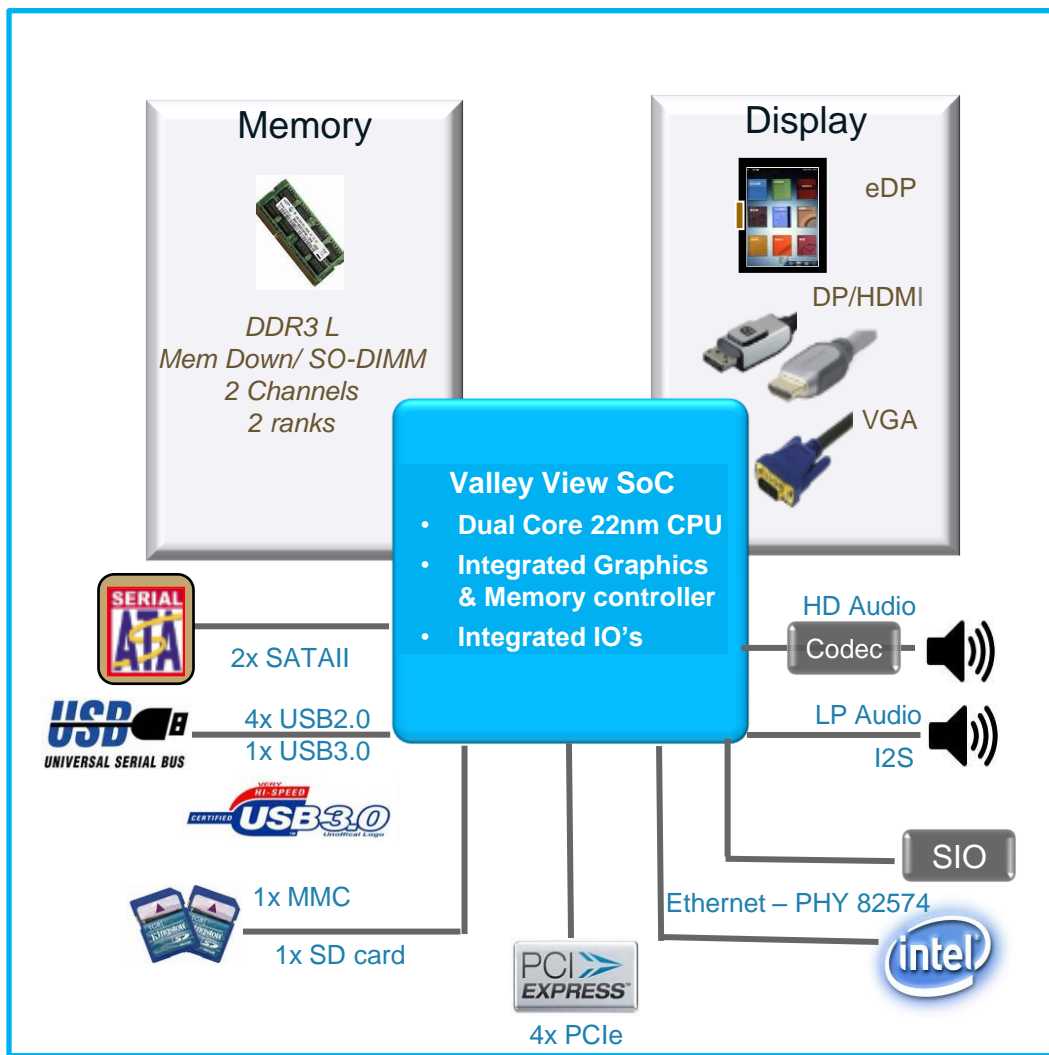


**preliminary pre-silicon estimates, results on production silicon may vary

Source from: Intel® Documentation

*Above information is for reference only.

Bay Trail Platform Block Diagram



Key Messages

- DDR3L memory for 1.35V
- ECC SKU available
- 3 Independent displays
- 1* USB3.0

Source from: Intel® Documentation
* Above information is for reference only.

Bay Trail SoC Family

Bay Trail-D

- D=Desktop
- 4Core @2GHz CPU
- 1333 DDR3L
- TDP 10W
- TJ: 0~100 C

- ✓
- High Performance
- Apply to AIO/PPC above 15"

Bay Trail-M

- M=Mobile
- 4Ccore @ 1.66MHz CPU
- 1333 DDR3L
- TDP 7W
- TJ: 0~90 C

- ✓
- Balance between performance & power consumption
- Apply to tablet (7~12")

Bay Trail-I

- I=Industry
- 1C@1.46GHz, 2C@1.33GHz~1.75GHz, 4C@1.91GHz
Total 5 CPU SKUs
- 1066 ~1333 DDR3L
- TDP 5~10W
- TJ -40~110 C

- ✓
- Wide temp for rugged design

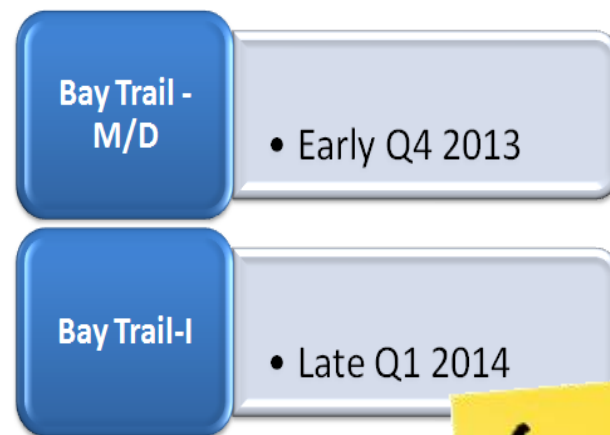
Source from: Intel® Documentation
* Above information is for reference only.

Bay Trail SOC Schedule

✓ Bay Trail EA Program Supports CRB/Sample Schedule

CRB/ Sample	Schedule Plan
ES2 (B0) Silicon	
Bay Trail- I samples (extended temp)	June, 2013
Bay Trail- M samples (Standard temp)	Q 3 2013
Bay Trail- D samples (Standard temp)	Q3 2013
Bayley Bay Fab3 CRB(with A0)	May, 2013
Bakersport FabA CRB(with B0)	Q3 2013

✓ Expected Bay Trail MP schedule




✓ Bay Trail D/M are pin-to-pin compatible

- Bay Trail-M will be the time-to-market choice

Resource from: Intel® Documentation
* Above information is for reference only.

Bay Trail OS Support Timeline

	Now	Q1'13	Q2'13	Q3'13	Q4'13	2014
Windows 8/WES 8 32/64b(DX11/DX10/DX9)			Alpha	Beta		
Windows 7/WES 7 32b(DX11/DX10/DX9)	In Planing	Windows 7 is planned on Intel's OS list				Q2 GOLD
Windows Emb Compact (WEC)7 32b, (OGL ES/ DirectDraw) Bsquare/Adeneo* BSP Support 32b(DX11/DX10/DX9)	In Planing					Q2 GOLD
Linux- Tizen 32b, Community Support			Alpha		Beta	Q1 GOLD
Linux-Fedora 18-based BSP 32/64b, Timesys* support	In Planing		Alpha		Beta	Q1 GOLD
Linux-Yocto based BSP 32/64b, community support	In Planing		Alpha		Beta	Q1 GOLD
WR Linux Wind River* Support	In Planing					TBD
VxWorks Wind River* support	In Planing					TBD

Source from: Intel® Documentation

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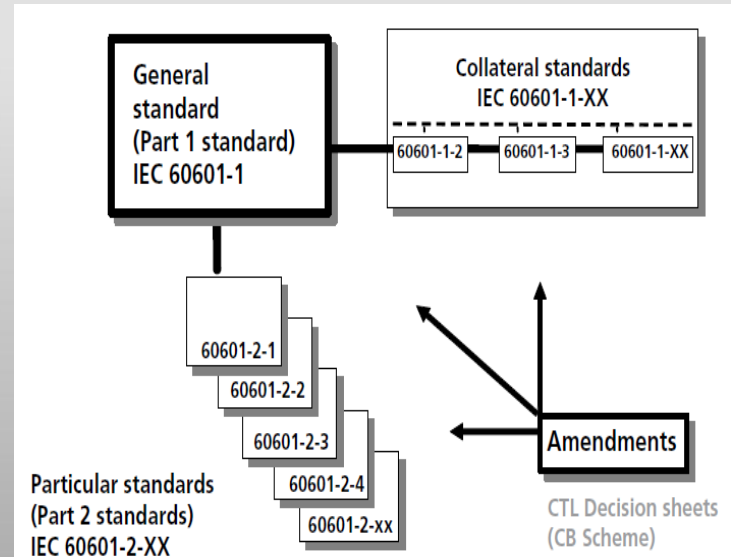
What's IEC 60601-1

✓ **IEC 60601-1** is a series of technical standards for the safety and effectiveness of medical electrical equipment, published by the International Electrotechnical Commission (IEC). First published in 1977 and regularly updated and restructured, as of 2011 it consists of a general standard, about 10 collateral standards, and about 60 particular standards.

➤ **Collateral Standards (60601-1-X)** define the requirements for certain aspects of safety and performance, e.g. EMC(IEC 60601-1-2) or Radiation Protection (IEC 60601-1-3).

➤ **Particular Standards (60601-2-X)** define the requirements for specific products, e.g. MR scanners (IEC 60601-2-33) or Electroencephalograms (IEC 60601-2-26).

Structure of IEC 60601-1



IEC 60601-1 3rd Edition

- ✓ Published in Dec. 2005, the 3rd edition of IEC 60601-1 includes a great emphasis on new philosophy---
Essential performance & Risk management.

- ✓ **Transition Date**

European Union (EU) General Standard Canada General Standard	June 1, 2012
European Union (EU) Particular Standards Canada Particular Standards	Varies*
United States of America (FDA)	July 1, 2013
Brazil	Jan. 1, 2014
Japan	Published on June 1, 2012, expected transition in 2017
Taiwan, Singapore	Recognized, no foreseeable effect date

* Medical devices that fall within the scope of a particular standard are subject to various dates as noted by the Official Journal of the EU for EU and for Canada, a 3 year transition from the date of publication of the particular standard.

New Philosophy: Essential Performance

- ✓ Essential performance is defined as that which the absence or degradation of would result in unacceptable risks.

E.g., a patient hoist can be used to both raise and lower a patient. When it comes to risk management, the risk of failing to lift a patient is acceptable; on the contrary, the risk of failing to lower a patient is not. That said, the function of lowering is an Essential Performance.

- ✓ The appliance of EP requirements might vary for different device applications.

E.g., a laser device used for tattoo removal is subjected to less strict EP criteria than the one used for eye surgery.

New Philosophy: Risk Management

- ✓ A risk management process according to ISO 14971 shall be performed.
- ✓ Although the certification of ISO 14971 is not required, manufacturers have to ensure that those ISO 14971 requirements are met:
 1. Establishment of a risk management process
 2. Proper definition of risk levels
 3. Residual risks controlled to acceptable levels (according to 2).

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Antiseptic Cleaning

- Inadequate or failed sterilization of medical equipment can lead to serious infection.
- A good design plays a critical role in maintaining aseptic practice.



• ID Selection

- Full Flat Design
- Seamless Bezel

• Material Selection

- Anti-bacterial Material
- Chemical Compatibility

• Component Selection

- Glove Acceptance Touch Solution

Ingress Protection

➤ IP Code defines the degrees of protection against the intrusion of solid objects (including fingers, dust and so on) and water. IP54/65 are usually required for professional medical equipment.



• Mechanical protection

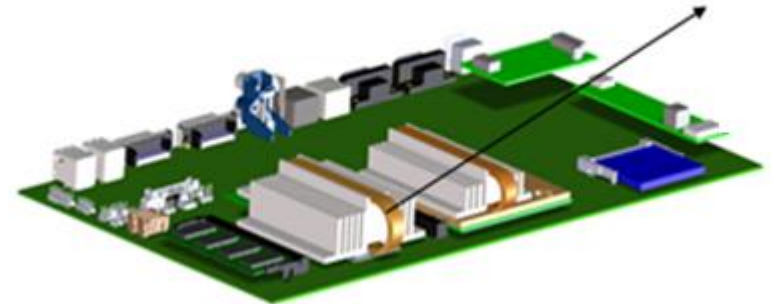
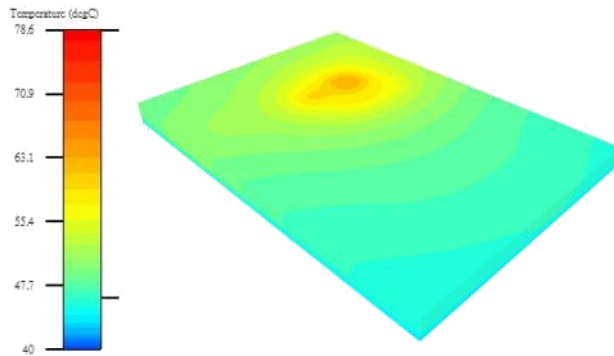
- Over Molding
- IP-friendly Connector Design

• Ind. Grade Component

- Wide-temp IC
- Waterproof Connectors

Fanless Design

➤ Fanless design makes quiet bedside healthcare system possible. It also extends system life, decreasing per year expense.



• Component Selection

- Thermal Simulation from the Beginning Stage
- Multiple Customized Solutions
- Wide Temperature Range Component

Quality System

➤ Any medical device or service provider requires a robust quality management system in order to meet regulation and customer requests.

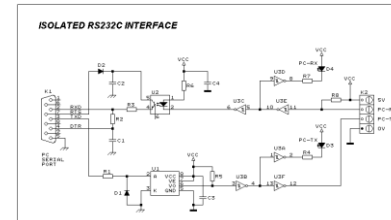
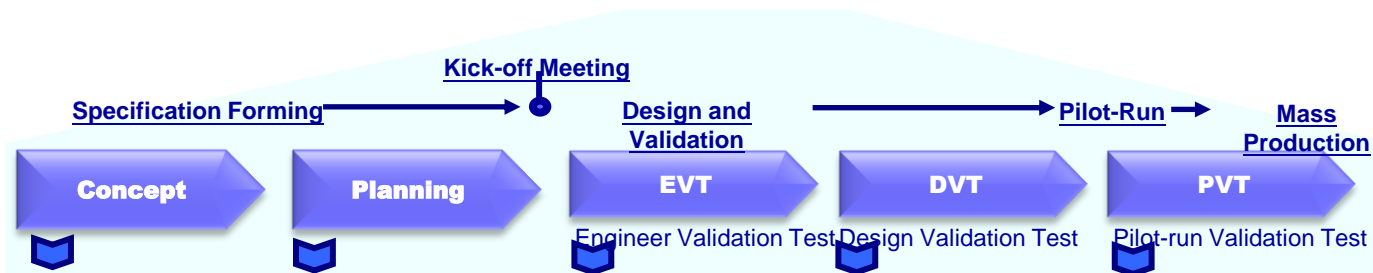


• Certification

ISO 13485:2003 helps facilitate harmonized medical device regulatory requirements for quality management systems, reducing time to market and cost of certification.

Safety Regulation & Risk Management

➤ IEC 60601 is a series of technical standards for safety and effectiveness of medical electrical equipment. It is a widely accepted benchmark and compliance with IEC60601-1 has become a must before launching electrical medical equipment on the market.



• Update to the latest IEC 60601-1 3rd edition

- Comprehensive reviews to ensure latest philosophies and standards, essential performance & risk management are well adhered to
- Solid Implementation reduces risk of current leakage, excessive temperature or fire, mechanical hazard, entry of liquids and so on
- Solid risk management process embedded into NPI by ISO14971 framework

To ensure safe medical design, AC-DMS Service includes

- ✓ Medical product NPI (New Product Introduction) flow
- ✓ ISO 13485 certified team and factory
- ✓ Medical product design and review rule
- ✓ HALT test equipment for product life acceleration validation



ISO 13485



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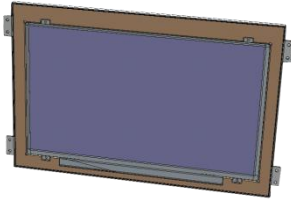








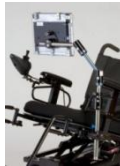






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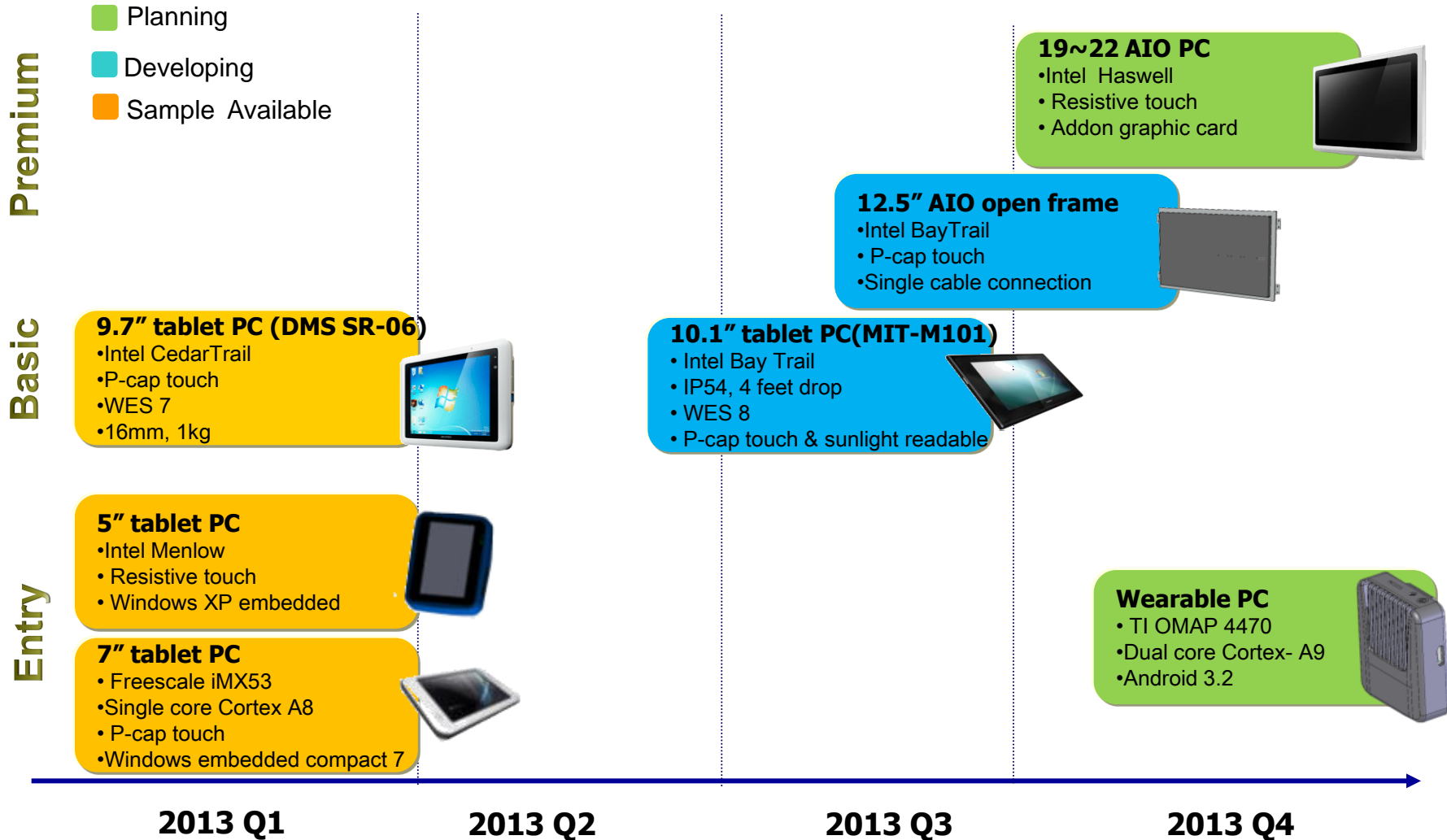
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Product Focus Area

	Computing System	Open Frame PC Module	Medical Panel PC	Medical Tablet PC
MODEL	 			
APPLICATION	    		   	   

Technology Roadmap



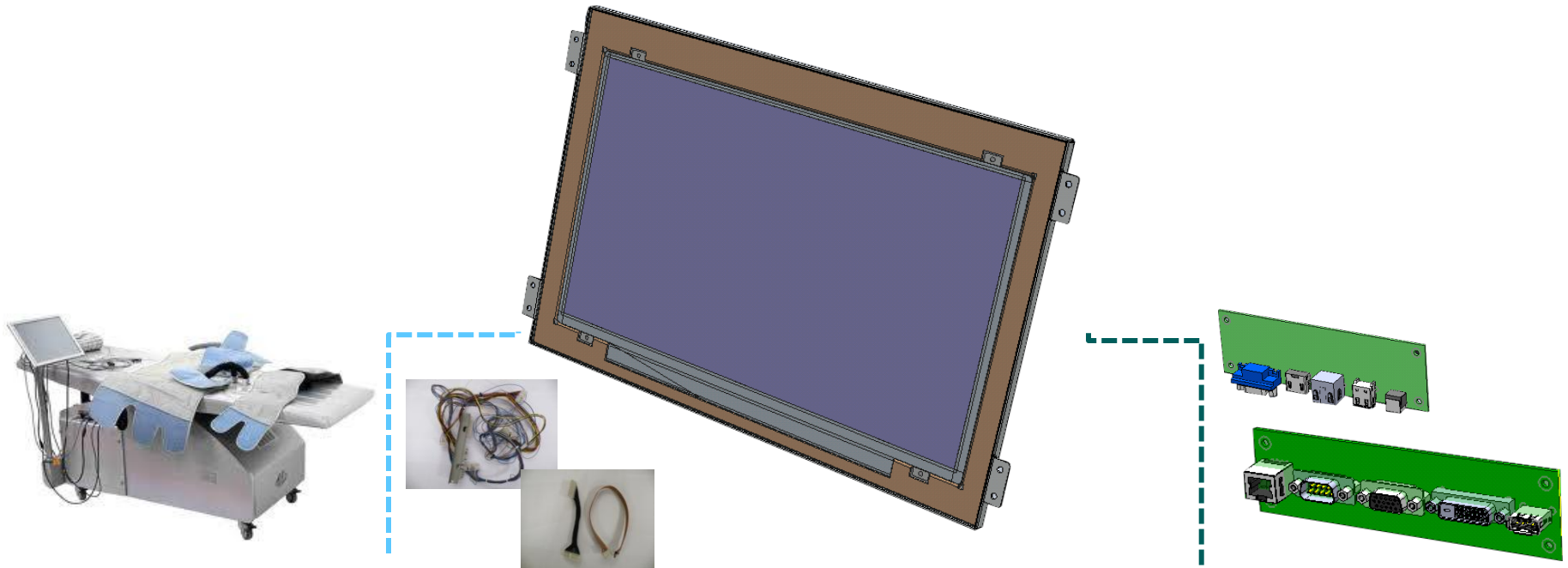
Concept of AIO Open Frame I

- ✓ **A compact & integrated solution:**
 - Touch, LCD, & computing platform integration
 - Module size: *323x213x20mm
- ✓ **Flexible: can customize IO board or cable**
- ✓ **Benefit:**
 - Shortens product development cycle
 - Tailors hardware to suite application exactly
- ✓ **Application:**
 - Control interface



*thickness subject to change based on IO board

Concept of AIO Open Frame II



A Single Cable Solution

- Eliminate cable chaos

B Module I/O Solution

- Time to Market
- Flexibility

Available Evaluation Kit: Tablet DMS-SR06

Item	Description
LCD/Touch	9.7" LCD P-cap w/0.7mm cover glass
Battery	Up to 7 hrs
CPU	Intel® Cedar Trail N2600
Storage	mSATA SSD 32GB; up to 64G
Communication	Wi-Fi 802.11 b/g/n; BT 4.0
External I/O	USB2.0x1, Smartcard readerx1, SD card slotx1, Docking connectorx1
IP Rating	IPX1
Dimensions & Weight	270mmx199mmx 16.5mm 905g



For more product information, please visit
<http://www.advantech.com.tw/products/search.aspx?keyword=DMS-SR06>

Next Generation Tablet: Tablet MIT-M101

Item	Description
LCD/Touch	10.1" LCD, sunlight readable P-cap
Battery	Up to 8hrs
CPU	Intel® Bay Trail SoC
Storage	mSATA SSD 32GB; up to 128GB
Communication	Wi-Fi 802.11 b/g/n; BT 4.0 Build in GPS & WWAN 3.75G, LTE
External I/O	USB2.0x 1; USB 3.0 x1, Micro HDMI x1, Audio combo x 1
IP Rating	IP65; 4-ft drop
Dimensions & Weight	300x 196 x 25 mm 2.5Lbs(33.6Whrs) ~3Lbs (67Whrs)



Tower Chassis in Medical Use

Model	Optima
Form Factor Support	ATX
Drive Bay	
5.25" bays	2
3.5" bays	5
Front I/O	
USB	2
Power Button	1
Reset Button	1
Cooling	
No. of Fans	1 (8cm)
Power Supply	400W - 600W ATX/PFC
Add-in card slots	7
Dimension	
H * W * D (mm)	410 * 190 * 457 (mm)
Environment	
Acoustic (dBA)	To be update
Dust Proof	Y
EMI spec	Class B <6dB



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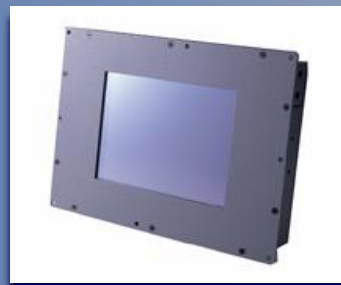
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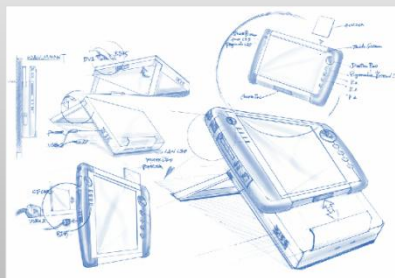
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System Design Capability

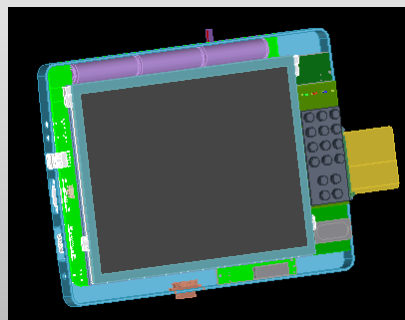
- Thermal design on special enclosures
- Power design on various systems
- System qualification & failure analysis
- Peripheral integrations
- IP requirement compliance
- Ruggedized / Semi-ruggedized requirements



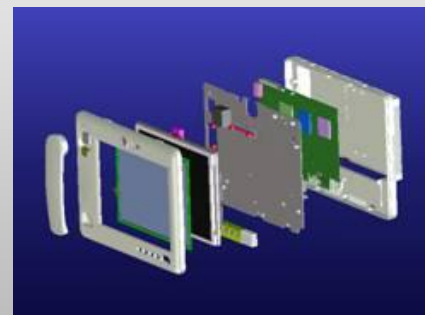
ME & System Design Flow



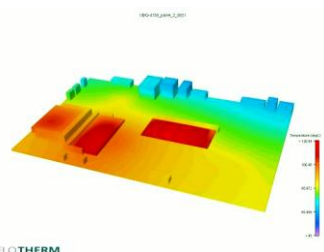
Ideas Development



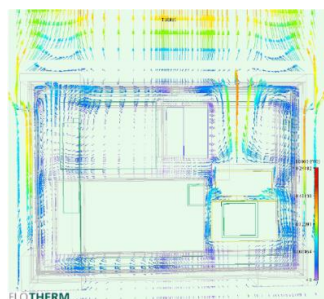
Check Realization



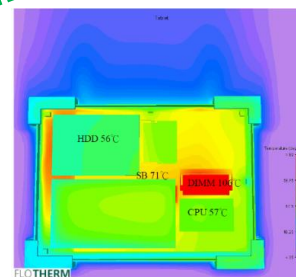
3D ME Drawing Design



Board Thermal
Simulation



Airflow Simulation



System Thermal
Simulation



Rendering/Mockup

- [illegible]



Integrated ID Capability

- ID design capability as our special niche
 - Rapid response to customer needs
 - Flexibility on any possibilities that customer required
 - Knowledge of vertical market and user requirements
 - Ability in design- for- test, manufacturing & cost
 - The ability to integrate EE & ME with ergonomics

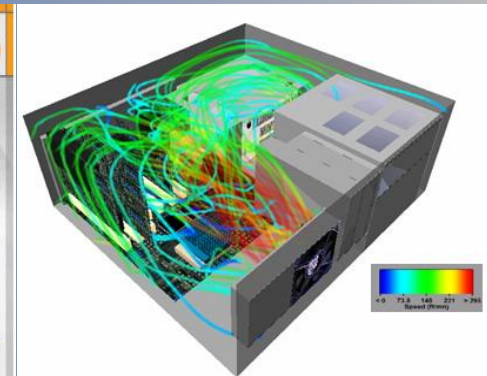
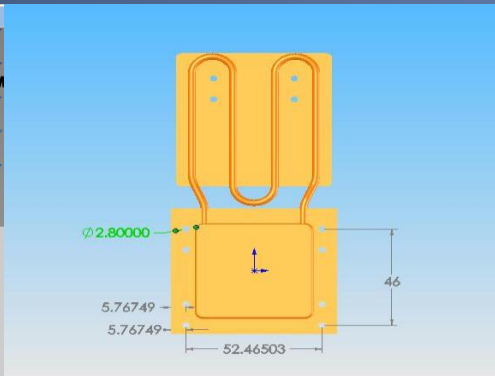
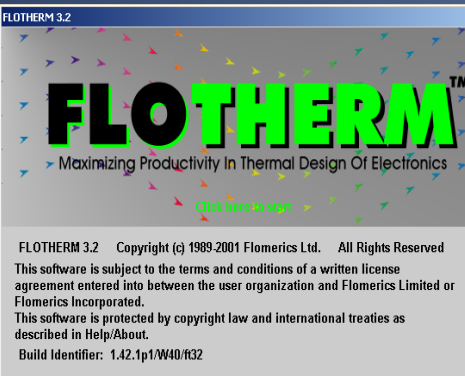


Mechanical Design Tools

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- Software

- Simulation : Flotherm V6.1
- 3D Placement : SolidWorks 2006; Pro-Engineering; Solid Designer
- Auto CAD



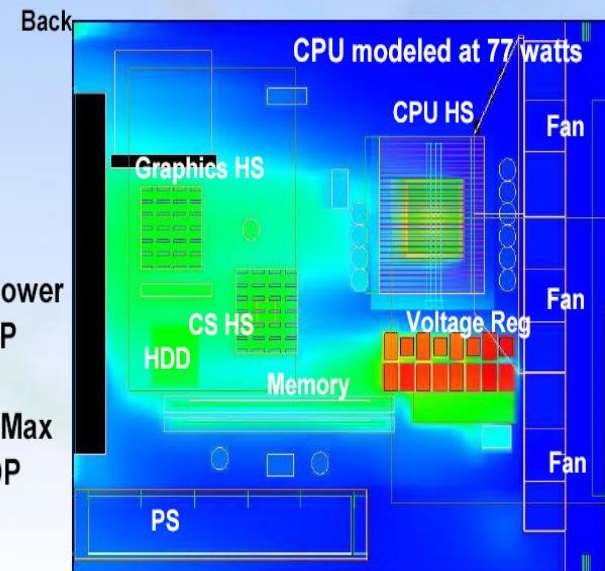
Thermal Design Considerations

These system designs are verified using CAE :

- Processor power dissipation
- Fan speed variations
- Thermal interface material
- Local ambient temperature
- Processor heat sink design
- Computer placement
- Other heat generating components
- Chassis design
- Venting area

System Level Thermal Modeling

- Multiple simulations should be evaluated
 - CPU TDP
 - CPU Low Power
 - Chipset TDP
 - AGP TDP
 - Hard Drive Max
 - Memory TDP



Advantech Tooling Eng. Service

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- New service in 2013
- Metal tooling focus
- Competitive cost reduction & efficiency

• Tooling Design

- Assessment of tooling design
- Quotation for new tooling & tool modification
- Standardization of design flow
- Management of drawings

Tooling Engineering

- * Analysis of in-house & outsourcing
- * Execution of tooling improvement
- Review of new outsourcing pieces

• Tooling Processing

- Introduction of WEDM-LS
- Precision CNC center
- Increasing precision of tool processing

• Tooling Assembly

- Tooling improvements, modification & maintenance
- Tooling and jig buildup
- New tooling processing & testing

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AC-DMS BU Head
Kenny.Deng@ Advantech.com.tw

Medical DMS

Pablo.Lin@advantech.com.tw

+886 2 2792 7818 ext.8008

Medical KA Services
Medical Tablet, Medical Portable
Medical Server Application
Ultrasound, Patient Monitor

Embedded & Vehicle Computing

Jason.Lu@advantech.com.tw

+886 2 2792 7818 ext.1482

Embedded Computing
Mobile POS
Vehicle & Transportation Application

Portable

Alexyc.Chen@advantech.com.tw

+886 2 2792 7818 ext.8016

Portable KA Services
Portable & Tablet Devices
Rugged, Warehousing, Field Application

Gaming

Jimmy.Hsu@advantech.com.tw

+886 2 2792 7818 ext.1430

Gaming KA Services
Gaming Portable & Server Application
Arcade, AWP, Casino, Pachislot &
Recreation Application

China DMS

Hawaii.Tseng@advantech.com.tw

+86 512 5777 5666 ext.7038

Embedded Computing
Mobile POS
Vehicle & Transportation Application

Applied Computing

Selena.Wang@advantech.com.tw

+886 2 2792 7818 ext.8013

Applied Computing KA Services
eHealthcare & Fitness
HMI Panel PC Application



Enabling an Intelligent Planet

Enabling an Intelligent Planet

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