

MEETING 3 AGENDA:

Call to Order UPAMD Power Subgroup meeting – Paul Panepinto 7am Pacific 4 November 2010

- I. Introductions/Attendance
Bob Davis, Edgar Brown, CT Chuang, Tom Hildner, Ignatius Lee, Lee Atkinson, Paul Panepinto
- II. Approval of 10/21/2010 Power Subgroup Meeting Notes
Bob Motion, Edgar Second – minutes approved.
- III. Approval of Agenda
Edgar Motion, Bob Second – agenda approved.
- IV. IEEE Call for Patents. See <http://standards.ieee.org/board/pat/pat-slideset.ppt>
- V. Discussion on new Apple notebook design

<http://www.ifixit.com/Teardown/MacBook-Air-11-Inch-Model-A1370-Teardown/3745/1>

The group looked at the web info on the PCB inside the new Apple notebook. It shows at least 9 switching power supplies. Lee, CT and Tom agreed with Bob's comment that this appears to be a popular design for new notebooks and the significant take-away is that the native input voltage from the EPS is never directly utilized inside the box. There are TI and ST Micro chips shown in the graphic that step the input voltage down for the logic. Edgar just went through a design where Ethernet, Microcontroller, Memory, etc. all had different voltages, requiring 5 power rails.

The group discussed a broad range of products, to ensure their new designs would fit a similar model – where there would be no direct use of the input power (meaning every component in the device that uses power goes through a conversion in the device.) Televisions, digital picture frames, external drives, cordless phones, etc. were all expected to fit the model shown in the Apple notebook design, where all components that use power get it after an internal conversion.

The only exception was a printer that takes a native 32V to drive motors. The question was asked, what would it mean to printers if they were given a 21V input, for example? It might require an additional boost converter, affecting cost.

Bob made a comment about the size of the battery connector being the largest, because it will draw a lot of power when the cells are depleted. He also noted that UL limits power for the connectors to 8A.

- VI. Review template responses on voltage options
 - a) Few templates received so far – it's important to get your input
Paul asked for comments on the choice this group faces regarding a single, fixed voltage standard or multiple voltages. CT Chuang felt a programmable voltage system might add complexity and cost. Multiple, fixed voltages might be better, but still more costly than a single fixed solution. Also, while Energy Star is sunsetting EPS as a category, products that use EPS will still need to meet a high efficiency standard. It may be easier to make a single, fixed voltage power supply be more efficient than one that has multiple voltage output capability.

The group discussed the potential for the single voltage standard to be 32V or more to accommodate printers. That was not seen as a good idea, because it would not be efficient for notebooks that typically want about 19V for the battery charger circuit.

Paul asked why giving notebooks 32 volts would have a huge negative impact on efficiency, when giving devices that today want 6.5V, 9V and 12V, for example, was not seen as having a significant impact on efficiency. The reason, the group concluded, is that cordless phones, digital picture frames, WiFi routers draw a small amount of power and the losses in stepping down from 21V are insignificant. Whereas if you give a notebook PC 32V, it has to step down that voltage to as little as 1.1V for the CPU in active mode and 0.3V in sleep mode. Since a notebook PC is a high power device (unlike the other products mentioned above), the effect of stepping down the voltage is much more significant. Therefore, the group concluded it is probably not a good idea to put the standard voltage at 32V.

- b) Will soon vote to determine which voltage option is preferred so we can begin developing criteria

The Power Subgroup is getting close to being able to develop criteria around voltage. The proposed criteria format is as follows:

1. Goal Name (Power Range, Communications Power, Battery / No-Battery Support, Sink / Source Support, etc.)

1.1 Criterion Name

1.1.1 Required or Optional

Criterion Description: *Describes the criterion, its purpose and why it is important.*

Applies to: Lists any exceptions to applicable devices or power adapters.

Consideration For and Against:

- a) *List of pros for the criterion*
- b) *List of cons against the criterion*

References and Details: Any relevant reference material, standards or documents that should be considered for this criterion.

The Next Power Subgroup meeting will discuss:

- Requirements for measuring current, if any
- Requirements for measuring voltage, if any
- Active voltage drop compensation or not
- Requirements for loss of mains power, if any
- Grounding (example was given of 2 pieces of equipment connected, plugged in to different sides of a hospital room having a 0.7V difference in ground) requirements, if any

VII. Begin drafting criteria for voltage requirements and restrictions

VIII. Time permitting, define voltage and power requirements for communications channel

IX. Adjourn

Meeting adjourned at 8:45am – Edgar Motion