MEETING 4 Minutes:

Attendees: Edgar, Gary, Ignatius, Bob, Anand and Paul

Call to Order UPAMD Power Subgroup meeting – Paul Panepinto 7am Pacific 18 November 2010

I. Introductions/Attendance

II. Approval of 11/04/2010 Power Subgroup Meeting Notes

Bob corrected the notes to say the Apple product showed "a plethora" of power rails, perhaps 12 or more and not just 5 as was recorded. Gary added that the many coils do not count the LDO's to step down voltages. There are up to 20 different voltages on some notebook PCs.

Other comments on the many power rails in products include:

- Memory alone takes 3 power rails
- There is a cost/efficiency tradeoff between stepping down voltages using switching regulators or LDOs
- Especially for audio applications and high speed links, LDOs are used where reduced noise is important.

A comment was made that active compensation for voltage drop across the cable will add complexity and cost.

Bob Motioned, Ignatius Seconded and approved.

III. Approval of Agenda

The purpose of this meeting was to begin drafting the voltage criteria in three dimensions: voltage level, measurement method and cable loss compensation. The group had a very productive discussion as noted below, and concluded that a state diagram should be developed prior to attempting to draft the criteria.

Gary Motioned, Edgar Seconded and approved.

IV. IEEE Call for Patents. See http://standards.ieee.org/board/pat/pat-slideset.ppt

V. Draft criteria for voltage requirements and restrictions

Gary said the spec must be written to handle another voltage, should more than one voltage or the standard input voltage change in time. Someone said the system can establish the "default" voltage, unless changed through communication with the load.

Someone said that if the communication line fails, that should not break the system. There are at least 2 cases: (a) communication never succeeds after device connection is made with the UPAMD, and (b) communication is made and power negotiated; then, subsequently, communication is lost. As long as a single voltage standard is made, continuing after communication is lost is no less safe than conventional power adapters today. A state diagram must be developed.

Bob reminded the group that the standard must comply with 60601 (http://grouper.ieee.org/groups/msc/upamd/private/OtherStandards/60601-1-2003.pdf) UL-60601 compliance would mean the UPAMD power source, and cable, plus 2 connectors, must have a total stored energy of less than 8uJ and a voltage of less than 17V. We should define the UPAMD requirement to operate safely below that. The inductance requirement will be a composed of the inductances in the cable, device input, and the source output. This should probably be specified at less than 10mH @ 20mA. Current will have to be dissipated prior to disconnect.

CAN bus was discussed as a viable candidate for the communication PHY layer. Some ARM processors embed CAN bus in them (only 11k gates.) A question was raised about steadily lower processor voltages, now at 5V and 3V and expected to be lower as process geometries shrink. How can CAN-bus be supported on-chip as processor voltages go down?

A discussion was had about whether or not CAN-bus has an isolation spec.

Bob moved to adjourn the meeting at 8:20am Pacific.

VI. Other requirements to discuss:

1. Grounding (example of two pieces of equipment connected across hospital floor with 0.7V difference)
2. How to measure voltage and current
3. Voltage and power requirements for communications channel

VII. Adjourn

1. Goal Name Power Range

1.1 Criterion Voltage Requirement

1.1.1 Required

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*

1.2 Criterion Requirement at Sink

1.2.1 Required

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:

c) *List of pros for the criterion*

d) *List of cons against the criterion*

1.3 Criterion Cable Loss Compensation

1.3.1 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:

e) *List of pros for the criterion*

f) *List of cons against the criterion*