

Minutes
iNEMI HFR-Free Technology Envelope Project
February 18, 2009

General Session

Attendees: Pegatron, Apple, HP, Dell, Cisco, Hitachi, Intel, Nan Ya, Huawei, Panasonic, Tech Circuits, Ciba, On-Demand Circuit Services.

A brief review of the overall project was completed prior to outlining the expectations for the project participants. Some excellent discussions occurred around what these expectations should/should not include. The group finally bottomed out on the following participant expectations:

- **Establish a viable material supply base by 2011 (set test methods, characterize materials, publish results).**
 - Possibly by application/market segment.
 - Full BOM enabling will be driven by OEM/ODM. (This is due to the complexity of business models.)
- **Agree to commit appropriate resources to meet accelerated project timeline and targeted end dates.**
 - Weekly calls, face-to-face meetings when appropriate.
 - Provide key electrical/mechanical parameter requirements by market segment to generate appropriate stack up definitions, test plans and identify appropriate material candidates.
 - Intel to provide the initial strawman.
 - Agree to provide materials, components, test vehicles, design capability, modeling capability, PCB fabrication, PCB assembly, test capability, FA capability as required by test plan.
- **Collaborate on input to final report.**
- **Provide recommendations for industry standards to IPC/JEDEC to generate and publish a Specification (if applicable).**

A brief review took place for both the Signal Integrity and PCB Materials Subteam plans and information requirements. The group then reviewed the key company participant list to determine which companies may need to be engaged to join the project. The consensus was that there was a clear need to pull in some of the major mobile and desktop ODM/EMS companies and possibly some of the PCB fabricators. In reviewing the next steps, it was noted that each subteam would be looking for a Co-Chair to help lead the team, and that there would be meetings starting the beginning of March at an agreed upon time for each group. It was also noted that

there is a planned face-to-face meeting at IPC/APEX (Las Vegas, Nevada) on April 1, 2009 from 1:30-5:00 pm. After a review of the subteam members, each group broke into their separate rooms.

BREAKOUT SESSIONS

Signal Integrity Breakout Session

Attendees:

Dell, Cisco, Intel

In order to gain critical mass from an electrical point of view, we need more participants. Nonetheless, general agreement was made on a strategy.

It was decided that the idea of a common envelope is not practical since different companies will likely have different requirements. Trying to fit all requirements into a single envelope may be unrealistic. Instead, it was decided that each company would provide a list of critical parameters along with the ranges that are applicable to that company's bus designs. Based on that input, the team would publish the minimum number of envelopes necessary to ensure all needs are met.

The final strategy was divided into 5 steps:

1. Perform simulations to define the values and the ranges of the critical electrical parameters. Intel and Cisco have committed to do this. (Since Intel provides the design guidelines to Dell, Intel's parameters will be identical to Dell's.)
2. Come to agreement on a common measurement methodology to characterize the critical parameters defined in step 1. Cisco has agreed to take the lead in this area.
3. Characterize the materials the consortium members are using with the methodology in step 2. This is important to ensure all consortia members are speaking the same language. Ideally, we will be able to identify a 3rd party test house to perform the test. Dell has agreed to interface with material suppliers and PCB manufacturers to align them with this methodology.
4. Validate the ranges and values defined in step 1 and characterized in step 3 by designing functional halogen-free platforms and comparing the bus margins on DDR and PCIe against an FR4 baseline. Dell and Intel have agreed to present validation data to the consortium, although Dell's commitment is contingent on the willingness of other companies (other than Intel) to present similar data.
5. The final requirements of material property limits will be communicated to the material suppliers based on a specific construction (i.e., a glass to resin ratio), allowing the required properties of other constructions to be extrapolated. (For example, if we define the limits on the electrical properties of a 50% resin material, then the limits on any other construction such as 1080, 2116 or 2113 can be calculated based on the glass to resin ratio.)

Next steps:

1. Organize and initiate a weekly meeting.
2. Choose a co-chairman of the work group (subject of the first teleconference).

The working group will hold a series of teleconferences starting at the beginning of March, and continue to hold weekly meetings over the next few weeks to continue discussion on the strategy and begin the development of a definitive plan of action prior to the face-to-face meeting at APEX. Separate meeting notifications will be sent for this series of meetings with the dates and times for the calls as soon as they have been established. The call-in numbers for the Signal Integrity teleconferences are listed below.

Call in numbers:

North America	1-888.839.0965 or 1-617.597.4110
Taiwan	00 801 14 8745 (toll-free)
Japan	033 570 8283 (local)
Singapore	6823 2165 (local)
Northern China (Beijing, Tianjin, etc.)	10 800 720 1947 or 10 800 713 0972 (toll-free)
Southern China (Shanghai, Shenzhen, etc.)	10 800 120 1947 or 10 800 713 0973 (toll-free)
South Korea	00308131685
Click to find more Global Access Numbers	
Passcode:	67302663 then #

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PCB Material Breakout Session

Attendees: Pegatron, Apple, HP, Dell, Cisco, Hitachi, Intel, Nan Ya, Huawei, Panasonic, Tech Circuits

The team decided to focus on the Desktop and Mainstream notebook market sectors. Servers were dropped since they are still dealing with the Lead-Free transition.

The team voted 8 to 2 to adopt the "system based" test vehicle strategy to generate the initial Technology Envelope. This strategy involves developing two market specific Test Vehicles (TV) with the associated test methods that will be used to define the Technology Envelope for each market sector and monitor the improvements to the HF laminates. The results from the TV's will be the basis for the Technology Envelope and changes to the laminator data sheets. The team agreed that it needed to get EMS and PCB fabricators on the team to complete the team. This will be the first point of discussion for the first teleconference.

It was requested that all references to "Cost" be struck from the slides along with any hard timeline data for introduction.

The team will hold a series of teleconferences starting on 03 March 2009 at 4 pm Pacific time, and then every other week over the next few weeks to review the Test Vehicle and Test Methods options prior to the face-to-face meeting at APEX. Separate meeting notifications will be sent for this series of meetings. The call-in numbers for the PCB Materials team teleconferences are listed below.

Call in numbers:

North America	1-888.839.0965 or 1-617.597.4110
Taiwan	00 801 14 8745 (toll-free)
Japan	033 570 8283 (local)
Singapore	6823 2165 (local)
Northern China (Beijing, Tianjin, etc.)	10 800 720 1947 or 10 800 713 0972 (toll-free)
Southern China (Shanghai, Shenzhen, etc.)	10 800 120 1947 or 10 800 713 0973 (toll-free)
South Korea	00308131685
Click to find more Global Access Numbers	
Passcode:	89215508 then #

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