



August 9, 2017

To: Verena Radulovic, EPA Manager, ENERGY STAR for Consumer Electronics;
Emma Feldman, ICF International

Re: ITI comments on ENERGY STAR A/V Program Discussion Document Version 4.0

As the global voice of the tech sector, the Information Technology Industry Council (ITI) appreciates the opportunity to provide input on the development of the Version 4.0 Draft 1 ENERGY STAR Audio/Video specification. Our feedback mainly relates to the following topics: (1) amplifier efficiency testing, (2) wireless testing, (3) testing for Dc-powered systems, (4) multi-room speakers, (5) applicability of efficiency requirements in specifications, and (6) Voice activated digital assistants.

1. Amplifier Efficiency Testing:

In reference to Amplifier Testing for multi-channel systems under the Testing Issues category, we tend to agree with EPA's comment that a 1 kHz sine wave input signal may not be appropriate for a multi-channel system. A sine wave test procedure is not representative of real world usage especially for digital audio systems, because the use of a sine wave does not reflect the actual use of a digital signal processing which is used in Multi-Channel systems. However, multi-channel amplifiers behave similar when compared with 2 channel amplifiers. IEC 62087 contains information about how to test 2 channel amplifiers. Amplifiers without speakers are measured with a 1KHz sine wave at 1W/2 channel (Front L and R speakers) where the dummy load is purely resistive and has no inductance component. For amplifiers with loudspeakers, sound pressure is measured instead of efficiency. Sound pressure is measured through the use of a programmed pink noise signal instead of through the use of a sine wave. We recommend further discussions and analysis to determine if this method will aid the EPA in collecting data the better represents actual use of amplifiers.

While the use of a 9dB crest factor Pink noise for digital systems for measuring amplifier efficiency may be an alternative, pink noise presents other issues of concern. Pink noise is difficult to produce with a repeatable crest factor and frequency. Small variations in crest factor have a direct impact on RMS power. Therefore, crest factor must be managed and achieved every time a product is tested. Recent studies of MP3 encoding for pink noise reveal that there are several digital audio encode formats available. Signal performance varies depending on the encode compression ratio. We recommend exploring where the use of pink noise is more likely to provide a good representation of actual use. While there is no reference standard that exists



across industry for Pink Noise, there is a journal paper by Audio Engineering Society on standardizing Pink Noise¹. EPA should investigate and perhaps define a pink noise in the absence of a standardized file.

We also recommend that EPA categorizes Audio Products for different output powers. Further study and data is needed to appropriately categorize the amplifiers.

Tests need to be done for one minute and averaged to get the efficiency of the amplifier (output over input).

ITI also recommends that EPA conduct a more detailed study on the merits of using a sine wave compared to a pink noise for a Multi-channel systems.

2. Wireless Testing:

In reference to Wireless testing under Testing Issues, ITI aligns with EPA on that for consistent and repeatable testing, the manufacturer should call out and define the specific device and routers used for testing that will also align with the "minimum system" specification to best represent a typical end-use configuration.

As for wireless prioritization over wired connections, we also agree that wireless is more prevalent as a connection for audio amplifiers compared to wired.

3. Testing for Dc-powered systems

In reference to EPA's question on whether test method be updated to include testing for Dc-powered product, ITI recommends that all products that are designed to be battery powered continue to be excluded from the scope, as battery powered audio products are already regulated by the California Energy Commission (CEC) battery charger regulations.

4. Multi-room speakers

For Multi-room speakers testing under New-product types, ITI would like to point out that Audio devices capable of playing simultaneously in multiple rooms (multiple of the same product in different rooms), should not be scoped similar to multi-speaker system equivalent to a home audio bridges and routers. Such audio devices should be evaluated as an individual audio device and meet the relevant requirements and not be subject to testing it as an audio bridge or a router.

Hubs and routers are covered in Energy Star for Small network equipment (SNE) and should be

¹ Audio Engineering Society. *New Project – Calibration pink-noise*. Available online here: <http://www.aes.org/standards/blog/2013/3/new-project-pink-noise-x216>



covered in that SNE test procedure category and not in the Audio/ Video test procedure.

5. Applicability of efficiency requirements in specifications

With regards to understanding the power consumption in Active mode, the recommendation is to use a pink noise (see 1.) to better represent the use profile instead of 1/8 MUP.

6. Voice activated digital assistants

In reference to EPA's question on exploring opportunities related to voice activated digital assistants and the impacts they may have on energy use in a home:

In general, voice activated digital assistance makes it more convenient to control connected devices in the home. This means that devices can go to sleep faster and used only when needed. Hence, there are definitely advantages of using voice activated assistance when used with connected devices in the home (e.g. lights and switches, alarms and sensors, heating and cooling).

The implementation of Voice activated digital assistants are different across manufacturers, some are primarily a digital assistant with minimal audio capabilities whilst others provide high quality audio with a digital assistant capability. The proliferation of voice activated digital assistants is at its infancy, we recommend that voice activated devices should be excluded and more data be gathered before adding such devices into the scope of the specification.

If EPA decides to include these voice activated digital assistants into scope, it should be categorized accurately as the capabilities are different.

Sincerely,

A handwritten signature in black ink, appearing to read "AMcBride", is positioned below the text "Sincerely,".

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