September 20, 2019

Mr. James Kwon
U.S. Environmental Protection Agency
ENERGYSTAR Program
Washington, DC 20460

RE: Comments on ENERGY STAR Version 1.1 DC EVSE Final Draft Test Method

Dear Mr. Kwon,
Delta Electronics appreciates the opportunity to provide comments and feedback on the proposed ENERGY STAR Version 1.1 DC EVSE Final Draft Test Method. Please find the below feedback from us.

Line 99- Included products
If the DC EVSE is designed to connect directly to the medium voltage(e.g. 13.2kV) instead of connecting directly to the low voltage listed in the Table 1(Line 136), will it be eligible for the Energy Star certification?

Line 409- Partial On Mode (E.g., SAE J1772 State B) and Idle Mode (E.g., SAE J1772 State C, not providing current) Testing
Can we give an example of the charging state that refers to the idle mode in a dc charging cycle to ease the understanding of the definition of the idle mode? As the below note marked in yellow says ”ready to accept current”. Does it mean the converter of the charger is operating and supplying energy to the charger’s output like in the idle mode of the AC EVSE testing? If so, it is suggested to record the output voltage in addition to the input power and the zero output current so that we can confirm easily the converter is operating and the EVSE is ready to accept the current request from the vehicle. The output voltage can be set to the same one as defined in the Table 3 for the load conditions in the operation mode.

[5] This state name refers to SAE J1172. If using a SAE J1772-compliant VEM, switch it to State C by closing switch S2. If testing using another protocol, enter the sate which represents a vehicle connected and ready to accept current.

[6] This state name refers to SAE J1172. If using a SAE J1772-compliant VEM, switch it to State B by opening switch S2. If testing using another protocol, enter the sate which represents a vehicle connected but not ready to accept current.

Can we also give a more specific definition to the partial-on (State B) mode? The above note marked in blue says”not ready to accept current”. Can it be referring to the state when the charging cycle is complete and the connector is still connected?

Besides, it would be helpful to clarify the necessity of doing the idle mode test and the partial-on test. If the partial-on mode or the idle mode does not stay for a long period of time in any charging scenarios, we may consider to remove them from the testing.

Line 474- Table 3 Load Conditions for UUT

For the load condition 6, should we still set the testing voltage at 350Vdc but limit the output power to the maximum available current of the charger at 350V output instead of choosing the mid-point of the available output voltage range? 350V is close to the majority of the charging voltages of the vehicles now in the market. It is more useful to the customers and it is consistent with the testing voltage of the other load condition 1-5. Given an example for a popular 50kW charger(Vo=50-500Vdc; Iomax=125A), if the mid-point is chosen, the testing voltage will be 275Vdc and the maximum available power will be only 34kW for the load condition 6. This might not be suitable. For the chargers that don't support 350Vdc output, they may use the mid-point of the output voltage range instead for the load conditions 1-6.

Besides, it would be more beneficial if the voltage selected for testing is based on the majority of the vehicle charging voltages so that the test result shows the real performance of the charger in the application. A good design of the charger should also try to increase the efficiency particularly at the operation points that the charger will be operating most of the time in the application so that it is really beneficial to the customers. I think for now 350V is good. But in the future when the higher voltage(e.g. 800V) battery vehicles become more, perhaps a second testing voltage would be necessary to be added to evaluate the overall performance of the charger. Depending on the design, the charging efficiency difference can be high between high voltage output and low voltage output in a charger.

Sincerely,

Tony Wu
Technical Manager/EVCS BU
Energy Infrastructure and Industrial Solutions Business Group
Delta Electronics, Inc.