

**Development of a Traction Circuit for Battery-powered and AC Dual Source EMU
and the Running Test Evaluation of the On-board Battery Performance**

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We have converted an existing AC electric train into the battery-powered and AC dual source EMU (test train). The dual source EMU is helpful for the interoperable service from the AC electrified line to the non-electrified line. In this paper, features of the developed traction circuit are described, and the evaluation results of the on-board battery performance are also reported as follows, 1) one charge running distance was approx. 20-30 km fed by on-board lithium-ion battery (1382V-83kWh), 2) the maximum temperature of the battery was 51.5°C with enough margin for the upper limit 65°C, 3) it should be noted that the time required for the quick charge can be extended under the condition of low battery temperature. Based on the running test results, it has been evaluated that the on-board battery has sufficient performance required for the interoperable service between the AC electrified line and the non-electrified line.