Printed Circuit Board with High Thermal Conductivity and Low Thermal Expansion for the Traction Circuit of Trains

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Recently the technological advance of the electronic equipment including its downsizing and densification has been made, which causes the decrease in the reliability of the printed circuit board due to its temperature rise and difference of the thermal contraction between the board and the parts. We study printed circuit boards with high thermal conductivity and low thermal expansion made of organic fibers with high thermal conductivity and low thermal expansion in the fiber direction. In this study, we have fabricated a printed circuit board using PBO fiber clothes. Resistors are mounted on the surface. We tested its general properties, heat dissipation and thermal expansion. The temperature rise of the resistors is suppressed in comparison with the conventional printed circuit board made of glass fiber clothes under the same conditions. In a heat cycle test, it has been shown that the difference in the thermal contraction between the board and the resistors is smaller than that in the case of the conventional board.