BiTe modules are the pioneers of thermoelectric (TE) modules that are available on the market and being sold annually in large quantities. BiTe modules have the unique advantage of being most efficient for applications within the temperature regime where the hot side can reach a maximum temperature of up to 250 °C. As a matter of fact, in the temperature range from room temperature to 250°C, the TE performance of BiTe materials is still leading compared to those of other TE materials after so many years of materials development. The TE figure of merit ZT of bismuth telluride had been above 1 at room temperature ever since the discovery of the material, and it is still showing increasing ZT values with advanced knowledge on material science, thus promising further boosting of the module’s performance. In general, the construction of a TE module is the key step to realize the desired theoretical performance of a module.