This paper mainly introduces the reliability of the micro solar cell module would be affected by the void ratio and void size of the solder paste layer as the conductive medium. In the -40 °C to 85 °C thermal cycling test, after 600 cycles, there are many breaks occurred on the solder paste layer for the high void ratio test sample, resulting in the solar cells just above those areas failed. The overall output efficiency of such sample is therefore declining by 8% relative to the specification of IEC 62108, while the low void ratio (<10%) test samples are successfully passed the environmental test. Therefore, authors will subsequently utilize the solar cell receiver with the low void ratio of the solder paste layer to make the micro module for the outdoor long-term exposure test.

In outdoor test, Figure 1 depicts the relationship with the intensity of solar radiation and performance ratios (PRs) of these two systems. The field data shows that the PR of PV system greatly decreases with increasing of solar radiation intensity than the one of micro-CPV system. Further the energy yield analysis of micro-CPV system was also higher in high ratio of DNI/GTI(shown in Figure 2),which demonstrated that the solar concentration technology would have better opportunity than conventional plate photovoltaic in those area like desert.