

## Supplementary Materials

A palmtop PCR system with a disposable polymer chip operated by the thermosiphon effect

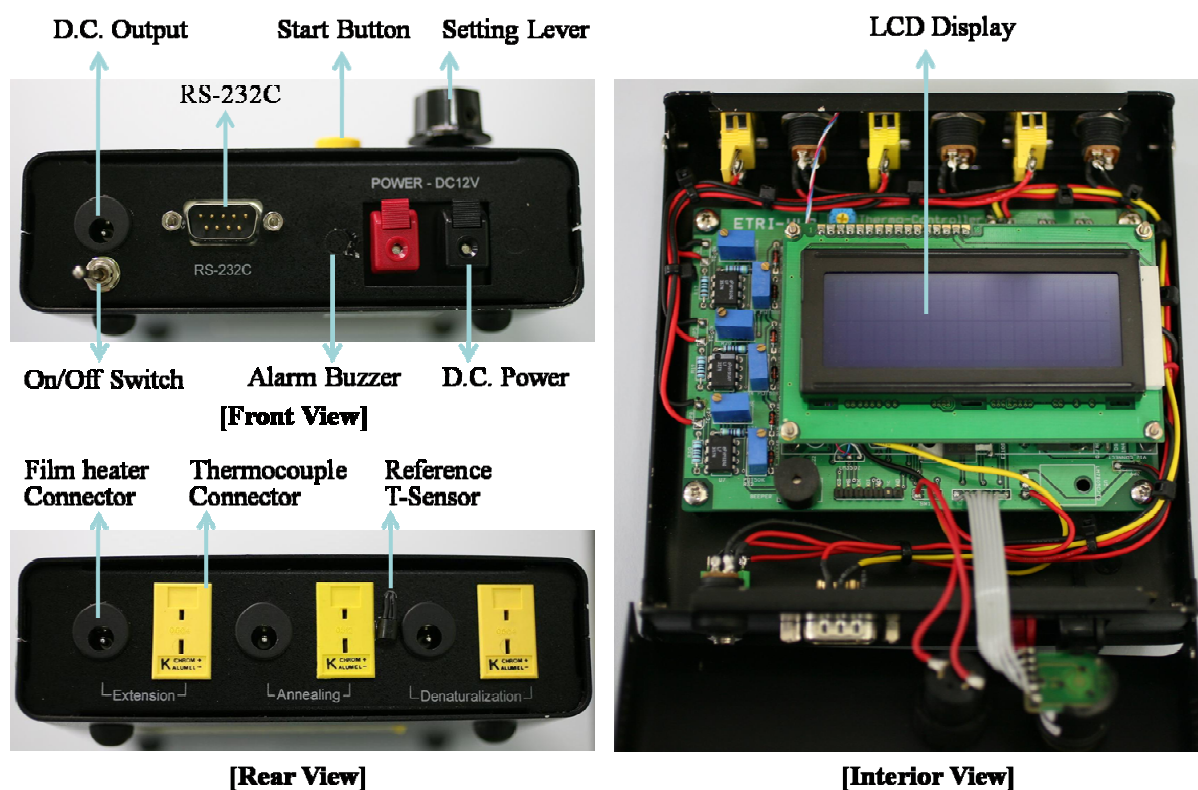
Kwang Hyo Chung,<sup>a</sup> Se Ho Park,<sup>b</sup> and Yo Han Choi<sup>a\*</sup>

<sup>a</sup> BioMEMS Team, Electronics and Telecommunications Research Institute (ETRI),  
138 Gajeong-no, Yuseong-gu, Daejeon 305-700, Republic of Korea

<sup>b</sup> Nanomedicine and Biomaterial Laboratory, Gwangju Institute of Science and Technology (GIST),  
261 Cheomdan-gwagiro, Buk-gu, Gwangju 500-712, Republic of Korea

### 1. Temperature controller

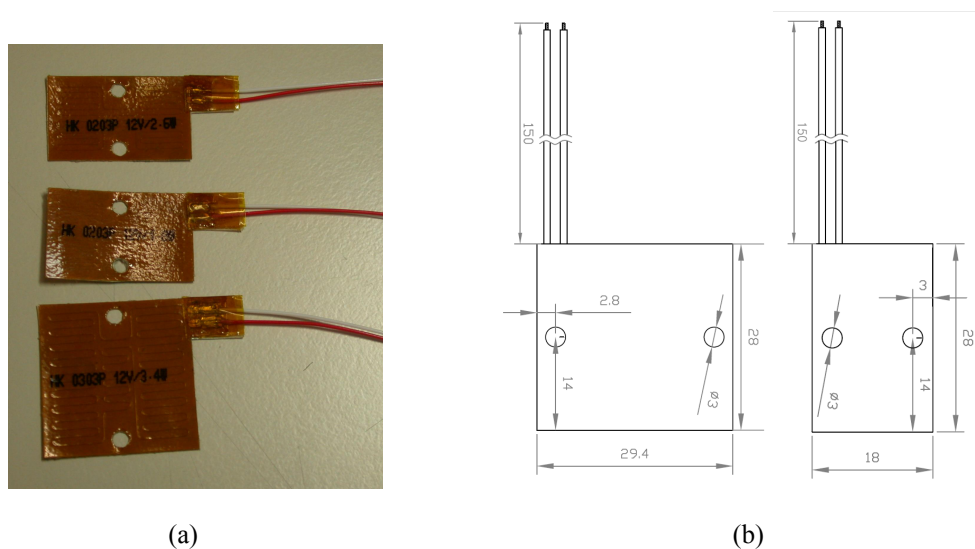
Detailed views of the front, rear and interior parts of the temperature controller (TC) are shown in Fig. S1. On the front wall of the TC, an On/Off switch, a setting lever, a start button, an alarm buzzer, a 12-V DC input / output and an RS-232C interface are positioned. On the rear wall of the TC, there are a reference temperature sensor and connectors for three thermocouples and three film heaters. In the interior of the TC, electronic control boards for components such as a microprocessor and a four-line LCD are placed.



**Fig. S1** The front, rear, and interior views of the temperature controller with a detailed functional description.

## 2. Film heater

Flexible film heaters of three different power grades (1.5–3.4 W, 300  $\mu\text{m}$  thick) were fabricated with polyimide Kapton film over which resistor lines were wound. Film heaters of 1.5 W, 2.6 W and 3.4 W were used for the heating of the annealing, the denaturation and the extension parts, respectively (Fig. S2 (a)). A plan view of the heater design was shown in Fig. S2 (b). The holes inside the film heaters were made to fix the aluminum blocks and the PEEK block with fixing screws. Each film heater was attached on the bottom of each aluminum block with double-side adhesive tape.



**Fig. S2** The film heaters: (a) The fabricated film heaters of three different power grades, and (b) the geometry of design.