Figure S1.

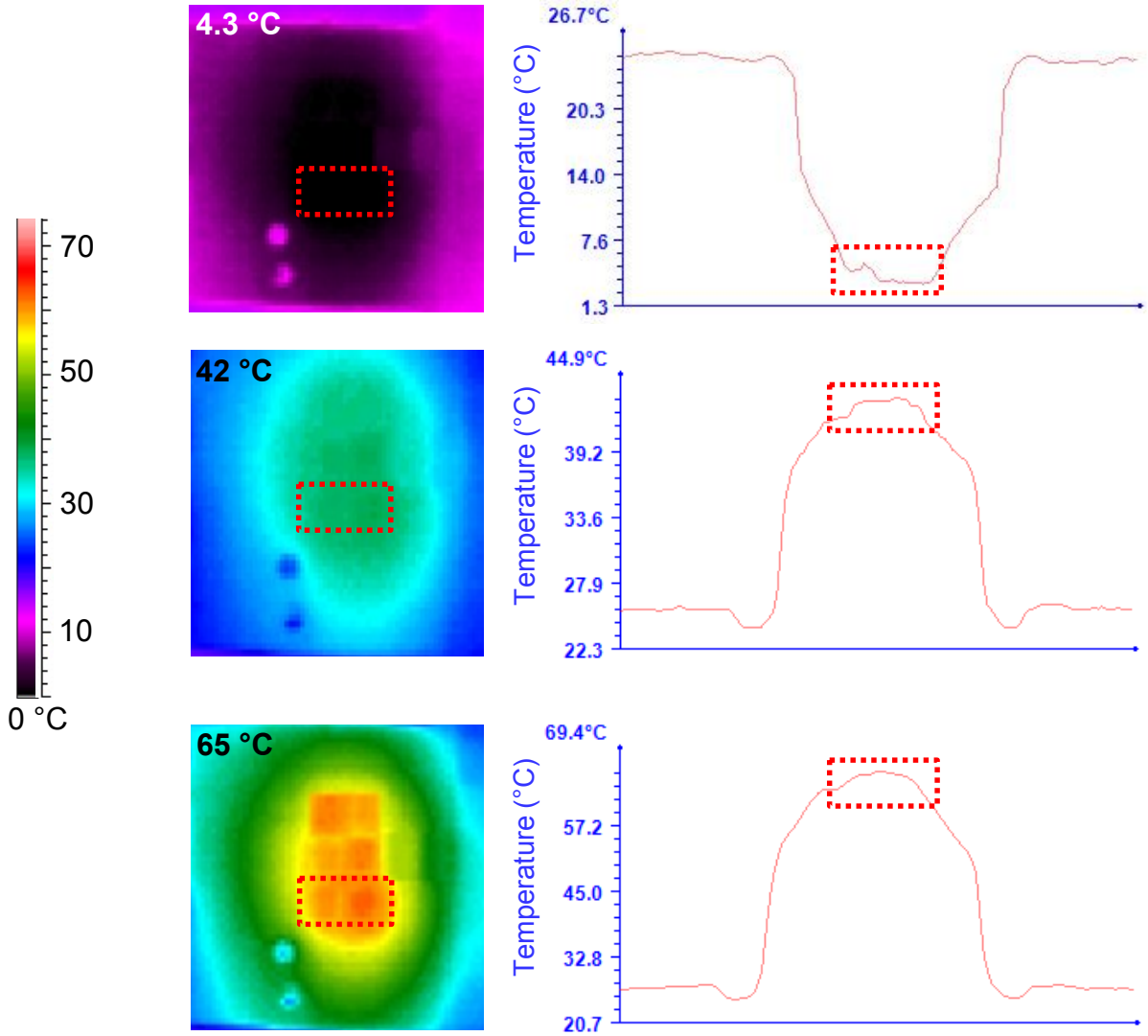

Figure S1. Thermal images (left) and temperature profile (right) of an on-chip thermal zone set at three different temperatures. Each thermal zone spans six actuation electrodes; temperature measurements were collected by lateral sweep across the bottom row of electrodes (periphery demarked by red dotted lines).

Figure S2.

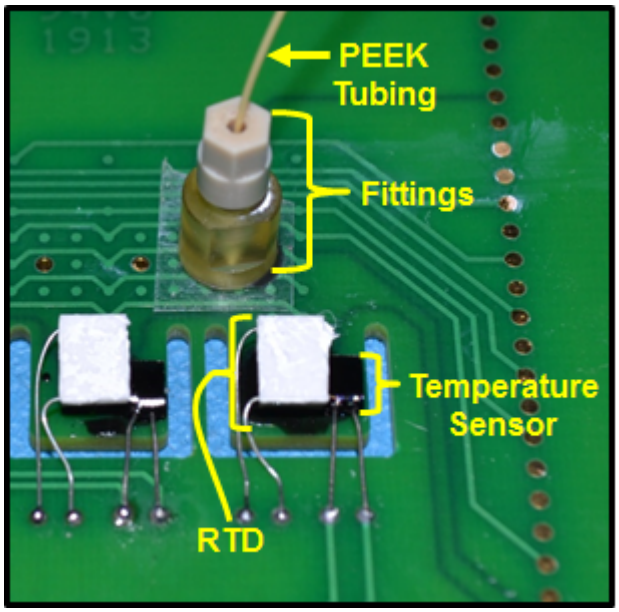

Figure S2. A back-side view of the air-matrix DMF device, highlighting its integrated thermoelectric modules, resistive temperature detectors (RTD), and a microcapillary interface for introduction of replenishing droplets onto the DMF surface *via* a drilled through hole.

Figure S3.

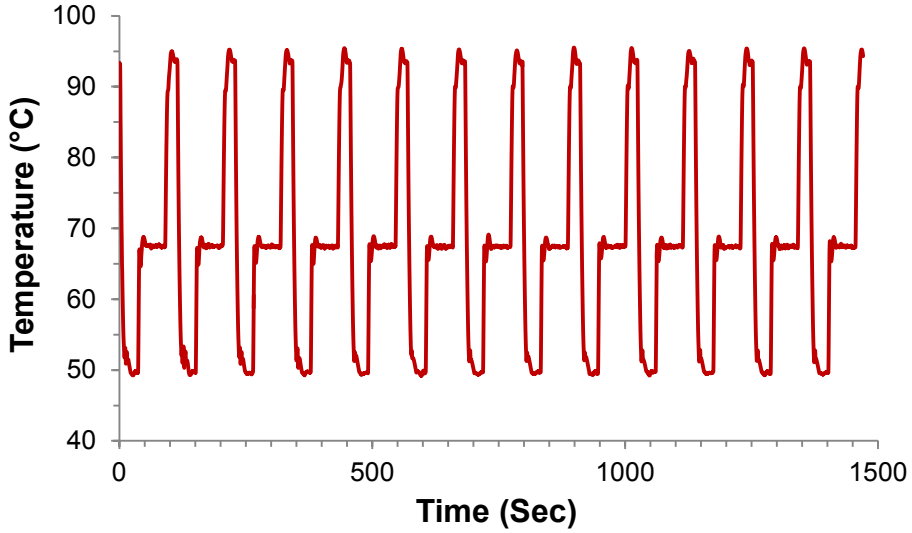

Figure S3. Temperature cycling trace of thermal zone over time.

Table S1.

Target Temperature (°C)	Temperature (°C) Decrease of Reaction Droplet After Replenishment (Average ± Standard Deviation)
35	0.7 ± 0.15
55	0.5 ± 0.11
75	0.4 ± 0.08
95	0.2 ± 0.19