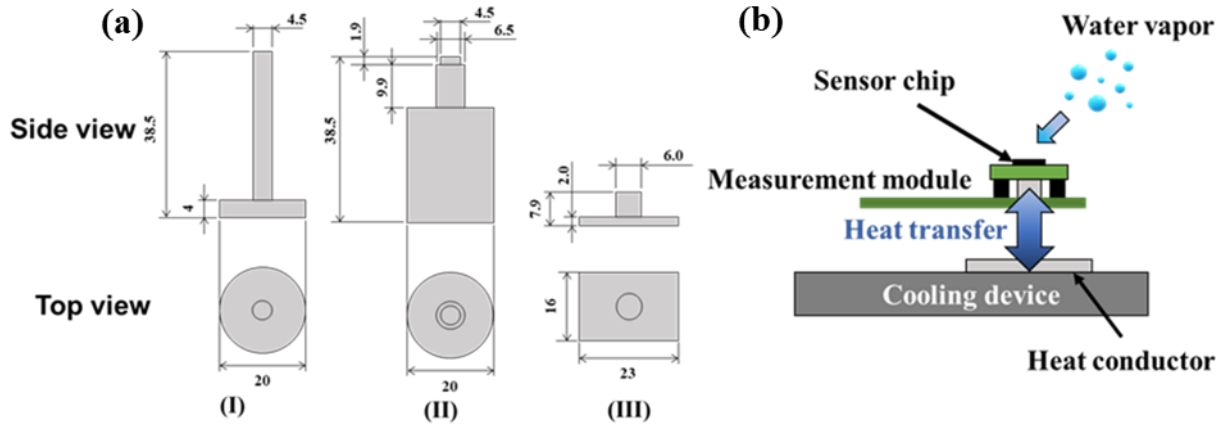

Figure 1. Geometrical shapes of aluminum heat conductors used in this study to control the temperature of sensor chip surface via heat conduction mechanism (a). Schematic diagram for the experimental setup (b).

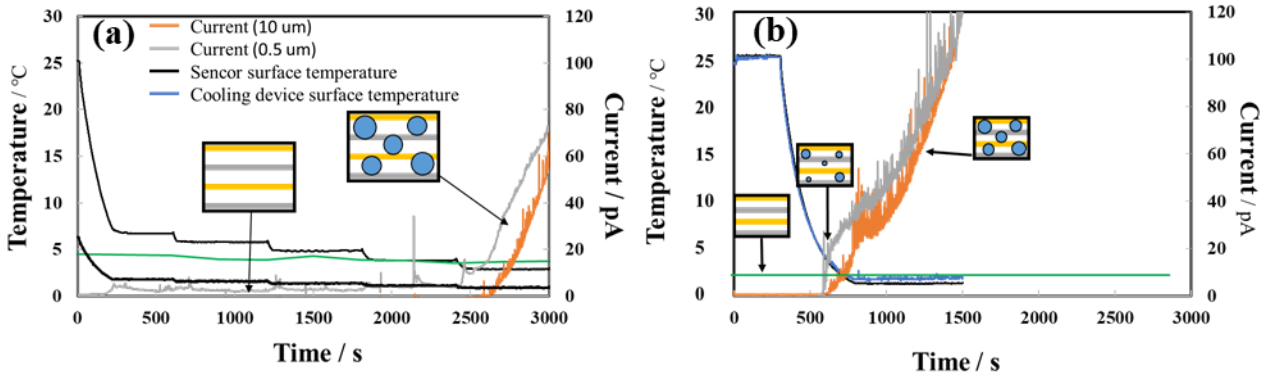

Figure 2. A typical model of step-wise (a) and direct (b) temperature-cooling mechanism between sensor surface and heat conductor III indicating the minimum detected temperature difference between both solid surfaces during the heat conduction process along with the faster heat conduction rate detected while using direct temperature-cooling mechanism.

Table 1. Estimated numerical values of surface area excluding the contact area (S), volume (V) and thermal resistivity (R) for each geometrical shape of used heat conductor.

	S (mm^2)	V (mm^3)	S/V	R (K/W)
I	445.3	1692.2	0.2632	11.31
II	2019.5	8633.4	0.2339	2.61
III	156.1	654.7	0.2387	1.26