high concentration (10^9 cfu/mL; Colony Forming Units/mL); both types of bacteria; PB and NB; were used in this case at the same concentration; a voltage around 1.39V for the PB and 0.18 V for NB were detected.

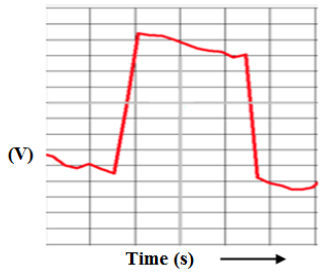

Fig. 8. The profile of fluorescent material detection after encapsulating the optical chip.

The experiment was repeated after the optical chip was encapsulated using Norland Optical Adhesives; NOA60 are clear, colorless, one part adhesives that contain no solvents. When exposed to ultraviolet light, they gel in seconds and full cure in minutes to give a tough, resilient bond. These adhesives are designed for fast, precision bonding where low strain and optical clarity are required; the following experiments have been done. A profile was recorded as a result of flowing DI water through MFC and then fluorescent material; respectively. The profile result as shown in Fig. 8 it is recording no significant difference from the previous experiment results. This means that encapsulating is significant to protect MLoC system without any influence.

V. CONCLUSIONS

Attributable to its compact design and multiplex capability, the CMOS microchip system combined with phototransistors provided high-gain and throughput analysis as tool for the detection of bacteria in medical diagnosis, food-safety inspection and bacterial pathogens DNA microarray analysis. Based on its compactness, low cost, multiplex capability, selective and sensitive method, the integrated CMOS microchip system as a detector is expected to be compatible with conventional micro-fabricated devices. This technique is allowing more rapid and high throughput analysis.

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