Supporting Information

Broadband all-fiber integrated graphene photodetector with CNT-enhanced responsivity

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† Electronic Supplementary Information (ESI) available. See DOI: 10.1039/x0xx00000x

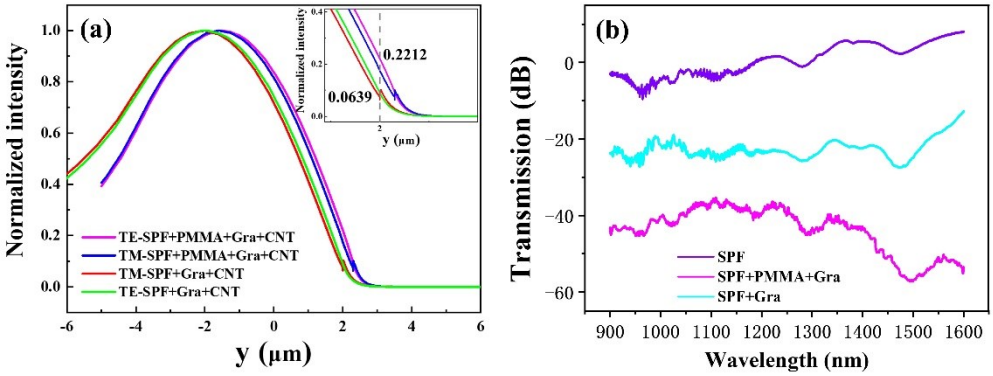

Fig. S1 (a) Normalized intensities along the y-axis for the cases with and without PMMA by using Comsol Multiphasic. Insets show the enlarged intensity distribution at position of graphene. (b) Transmission spectra of bare SPF (purple line), SPF covered with PMMA/graphene film (pink line) and remove the PMMA (blue line).

The simulated result is shown in Figure S1(a). In TE mode, the normalized field intensity at graphene location is 0.0639 when without the PMMA. With the aid of PMMA film, the fiber mode is dragged from the fiber core. And the normalized field intensity increases to 0.2212 at graphene location, with an enhancement factor of 3.5. The comparative experimental result is shown in Figure S1(b). We compared the transmission spectra of the SPF covered with graphene and PMMA/graphene film before CNT deposition. The light absorption is greatly enhanced by PMMA over the whole bandwidth ranging from 900 to 1600 nm.

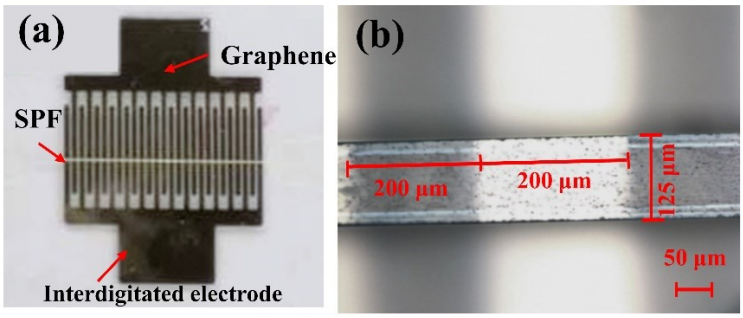

Fig. S2 The photographic image (a) and microscope image (b) of real device with the electrodes on.