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**Highly sensitive PMOS photodetector with wide band responsivity assisted by nanoporous anodic aluminum oxide membrane**[1] YUNG TING CHEN, YANG FANG CHEN, National Taiwan University, SEMICONDUCTOR LABORATORY TEAM — A new approach for developing highly sensitive PMOS photodetector based on the assistance of AAO membrane is proposed, fabricated, and characterized. It enables the photodetector with the tunability of not only the intensity but also the range of the response. Under a forward bias, the response of the PMOS photodetector with AAO membrane covers the visible as well as infrared spectrum; however, under a reverse bias, the near-infrared light around Si band edge dominates the photoresponse. Notably, the response at the optical communication wavelength of 850 nm can reach up to 0.24 A/W with an external quantum efficiency of 35%. Moreover, the response shows a large enhancement factor of 10 times at 1050 nm under a reverse bias of 0.5 V comparing with the device without AAO membrane. The underlying mechanism for the novel properties of the newly designed device has been proposed.

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