

## Supplementary Information

### Voltage Controlled Polarity Switching of Photoresponse in Graphene oxide-based Memristor

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### Supplementary Results

Active layer	Electrodes (structure)	V <sub>Read</sub> (V)	V <sub>SET</sub> (V)	ON/OFF current ratio	Endurance cycles	Retention time (s)	Reference
GO	Au/Au (planar)	0.7	-----	~21	60	10 <sup>4</sup>	This work
GO	ITO/ITO (planar)	-----	+2~-2	~3.5	1000	-----	[38]
GO	Al/Al (planar)	-----	0.7	~10 <sup>3</sup>	-----	-----	[39]
PVA-GO	Ag/Ag (vertical)	-----	0.42	~7.20	>2.5 × 10 <sup>3</sup>	>3.36 × 10 <sup>3</sup>	[24]
GO	Cu/Pt (vertical)	-0.1	0.3~1	~20	100	10 <sup>4</sup>	[10,22]
GO	Ag/Pt (vertical)	-----	0.5~1	~50	100	10 <sup>5</sup>	[10]
GO	Au/Pt (vertical)	-----	0.6~0.8	~50	100	10 <sup>5</sup>	[10]
GO-cellulose	Al/Al (vertical)	-----	7	~10	-----	-----	[25]
GO	Ag/ITO (vertical)	0.14	-----	5~10 <sup>4</sup>	2000	-----	[38]
GO	Al/p-Ge (vertical)	-1.7	-8.7	~76	100	10 <sup>3</sup>	[12]
GO	Al/ p-Si (vertical)	-1.2	-5.4~-5.5	~110	100	10 <sup>3</sup>	[12]
TiO <sub>2</sub> -GO	Ag/ITO (vertical)	-----	-0.5	~110	100	10 <sup>4</sup>	[26]
GO	Al/Al (vertical)	-0.5	-2.5	~10 <sup>3</sup>	100	10 <sup>5</sup>	[27]

Table S1: A summary of the reported Graphene oxide-based memristor, both in planar and vertical configurations.

Table S2: Summary of the observed negative photoresponse in Graphene oxide-based devices.

Active layer	Negative Photoresponse at bias voltage (V)	References
GO thin film	+3V to +4V	This work
GO thin film	+5V	[35]
GO/TiO <sub>2</sub> composites (Wavelength ( $\lambda$ )>400nm)	0V	[54]

