Supporting Information

Na-Doped Ga_2O_3 Electrolyte-Gated Synaptic Transistors for Neuromorphic Computing

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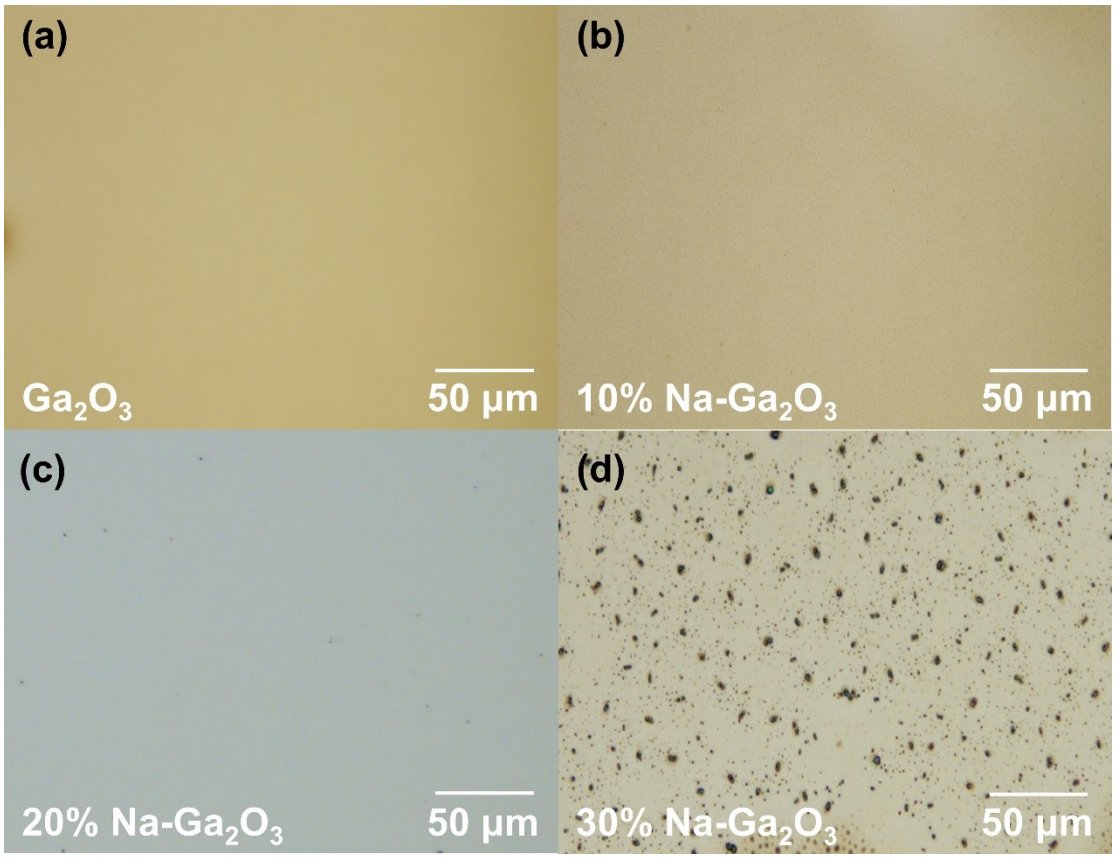

Fig. S1. Optical microscope images of (a) pristine, (b) 10% Na-doped, (c) 20% Na-doped, and (d) 30% Na-doped Ga_2O_3 thin films.

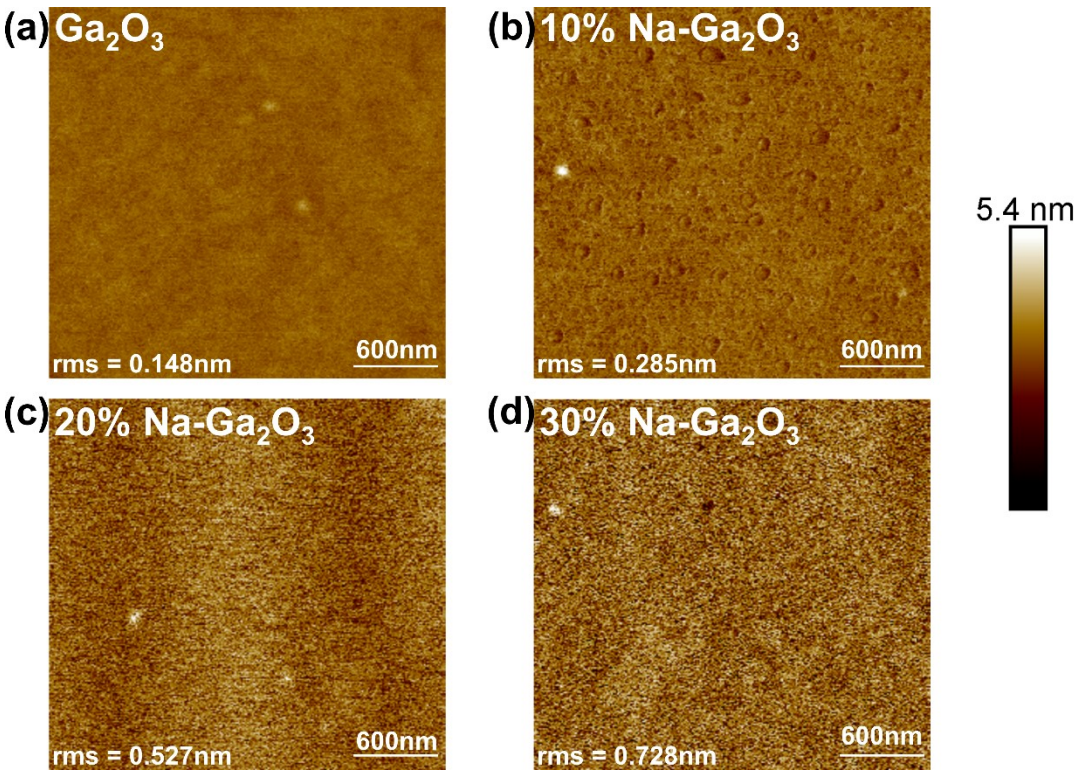

Fig. S2. AFM topography image of Na-doped Ga_2O_3 thin films: (a) pristine, (b) 10% Na-doped, (c) 20% Na-doped, and (d) 30% Na-doped. All scan sizes are 3 μm × 3 μm.

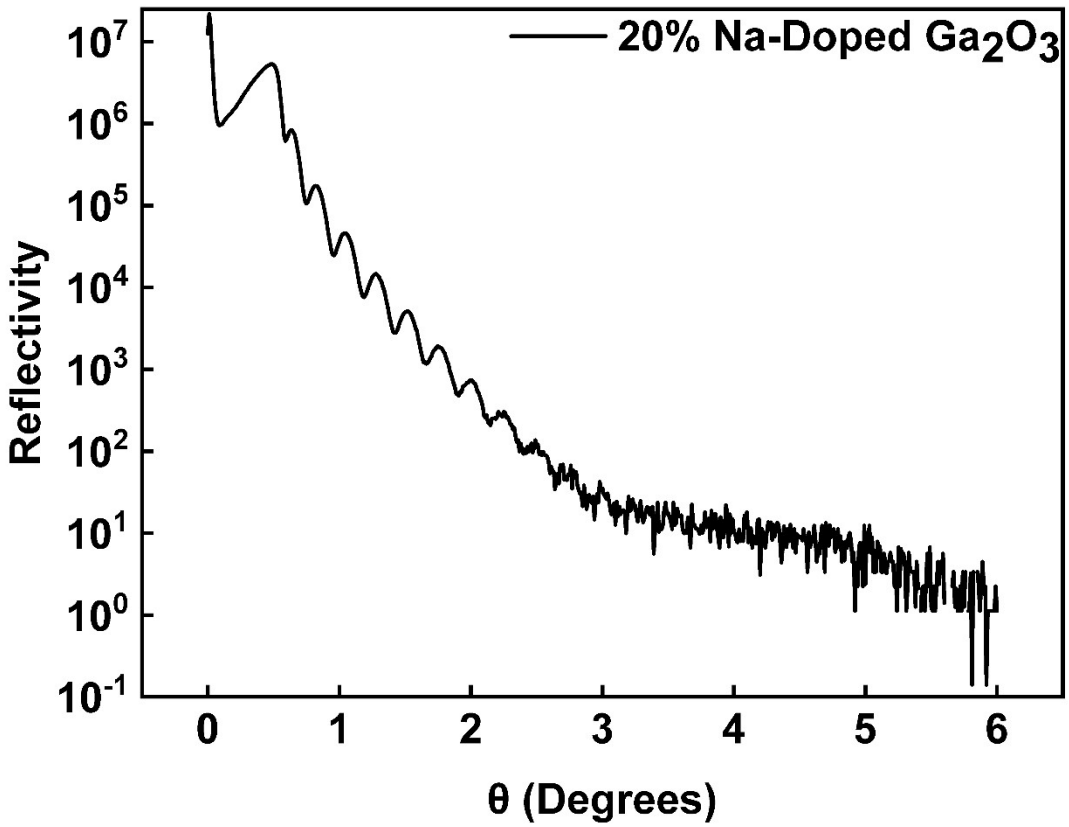

Fig. S3. XRR curve for the 20% Na-doped Ga_2O_3 film.

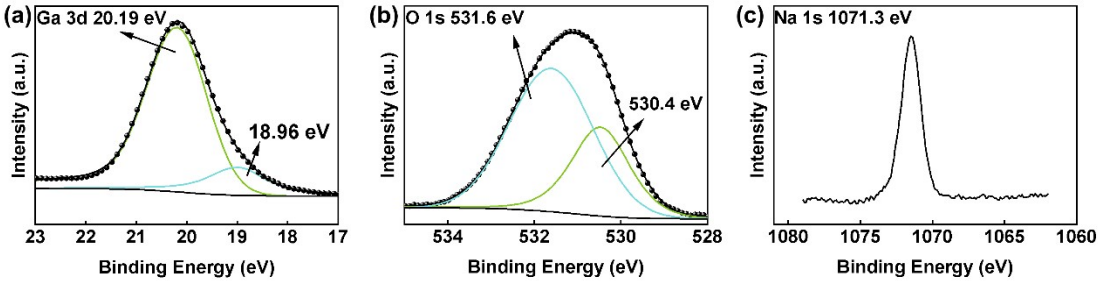

Fig. S4. XPS of Na-doped Ga_2O_3 film. (a) Ga 3d. (b) O 1s. (c) Na 1s.

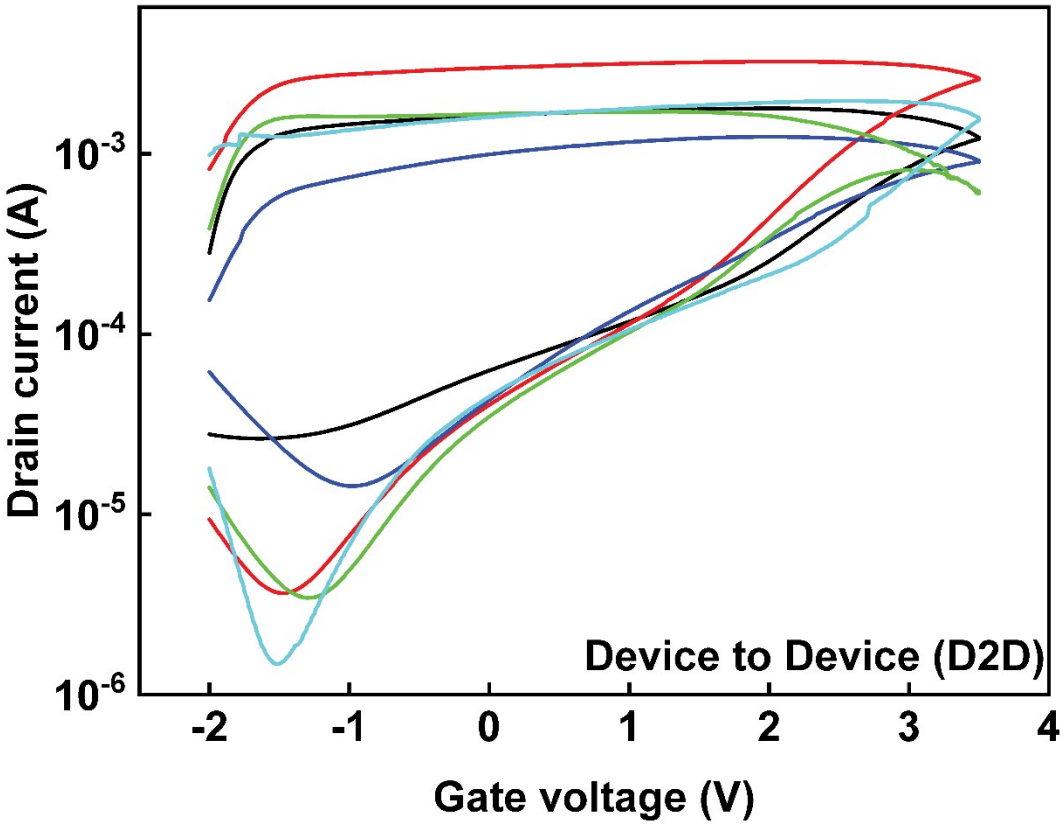

Fig. S5. The double sweep transfer curves of four different 20% Na-doped Ga_2O_3 EGSTs.

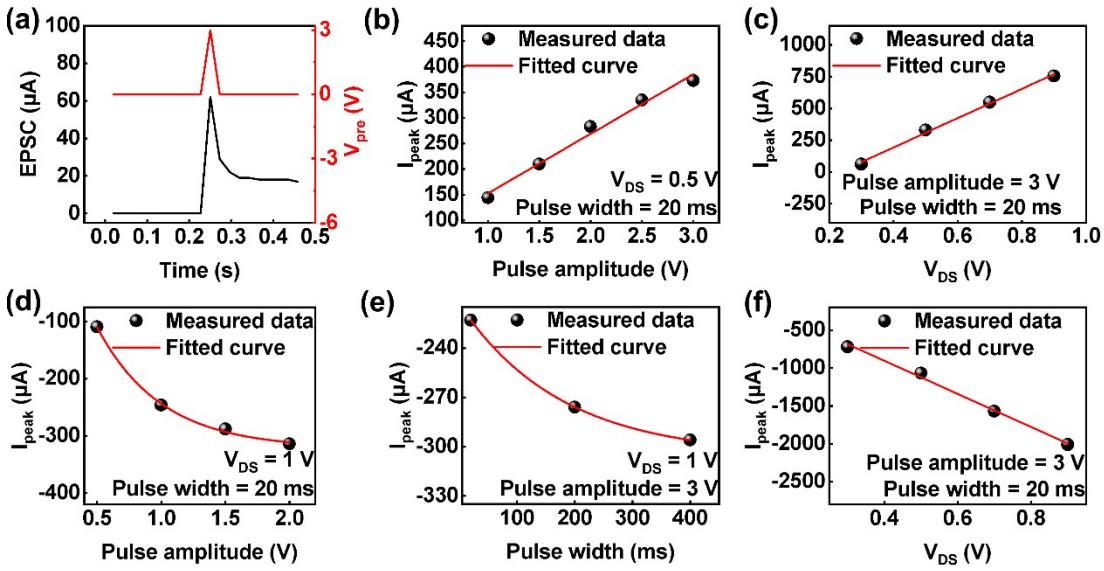

Fig. S6. (a) EPSC triggered by presynaptic spikes. EPSC peak current as a function of (b) pulse amplitude and (c) V_{DS}. IPSC peak current as a function of (d) pulse amplitude, (e) pulse width, and (f) V_{DS}.

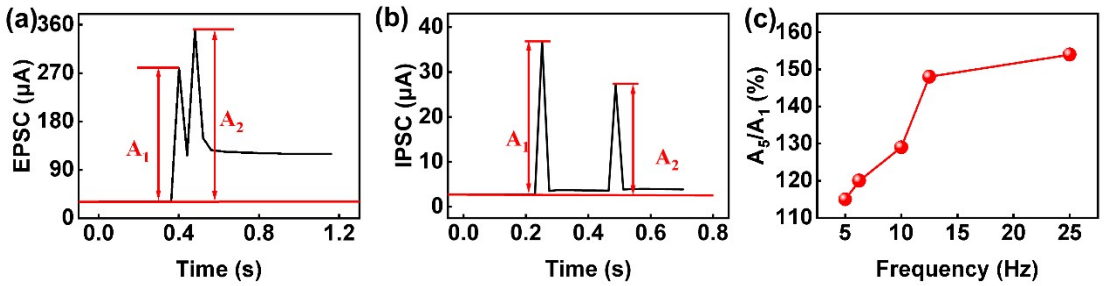

Fig. S7. (a) PPF triggered by a pair of presynaptic spikes. (b) PPD triggered by a pair of presynaptic spikes. (c) The variation of EPSC gain (A_5/A_1) with pulse frequency.

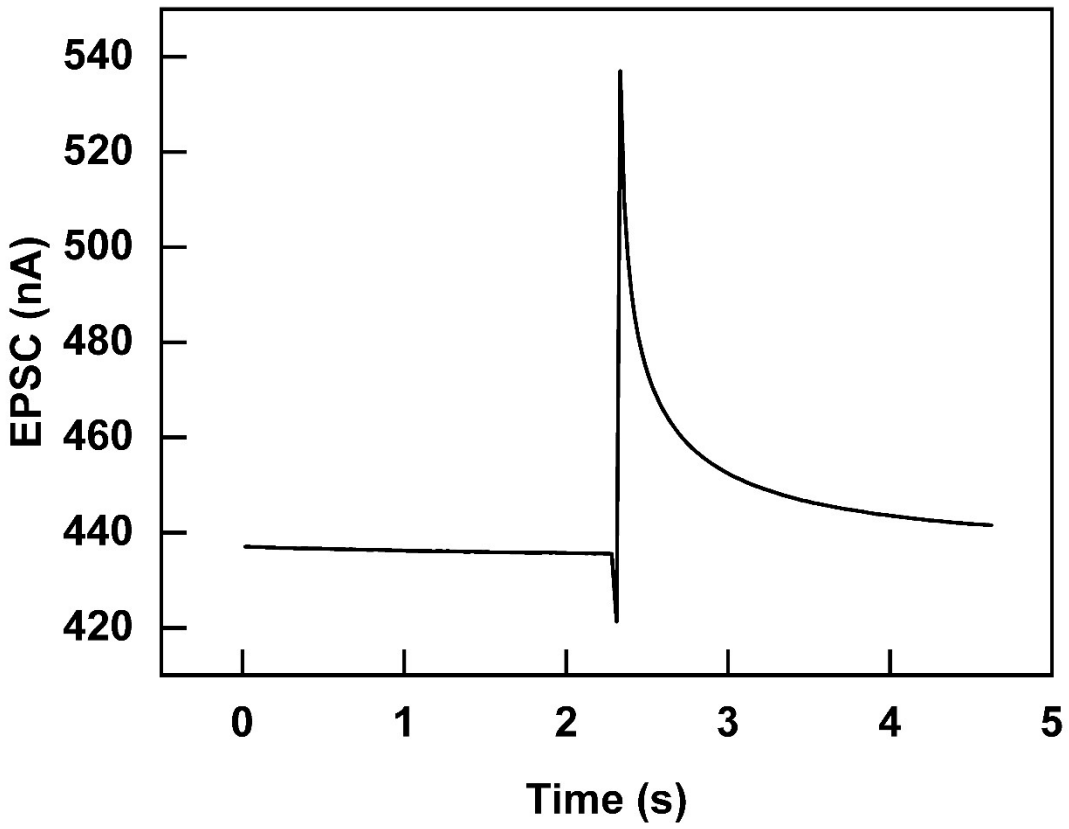

Fig. S8. EPSC stimulated by a single presynaptic pulse (2.5 V, 20 ms) at V_{DS} = 0.01V.

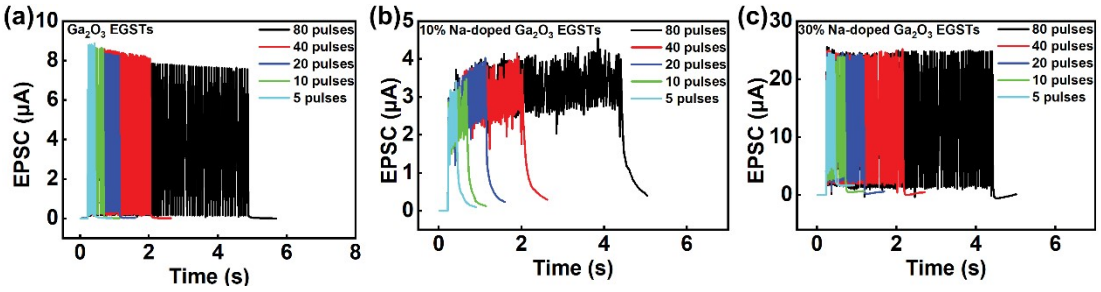

Fig. S9. EPSC response as a function of pulse number for (a) Ga_2O_3, (b) 10% Na-doped Ga_2O_3, and (c) 30% Na-doped Ga_2O_3 EGSTs.