Supporting information

Electron-Selective Epitaxial/Amorphous Germanium Stack Contact for Organic-Crystalline Silicon Hybrid Solar Cells

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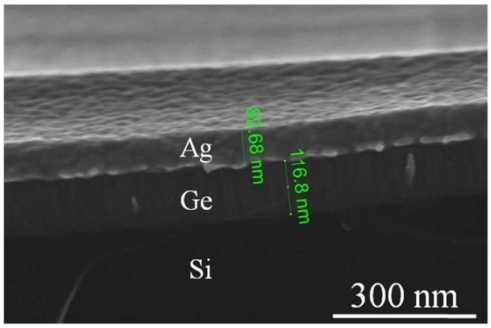

Figure S1 Cross-sectional SEM image of the Si/Ge/Ag heterostructure.

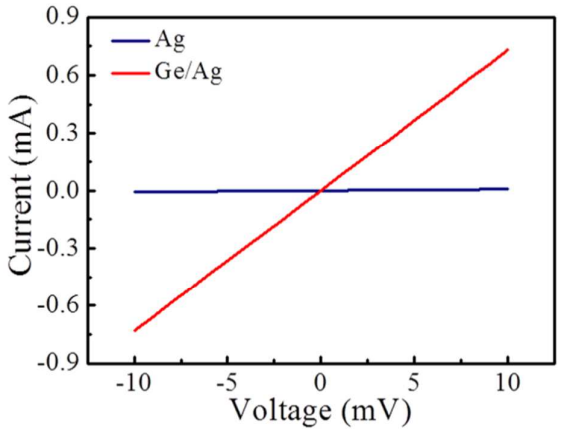

Figure S2 Current-voltage measurements between Ag fingers with and without the Ge thin layer.

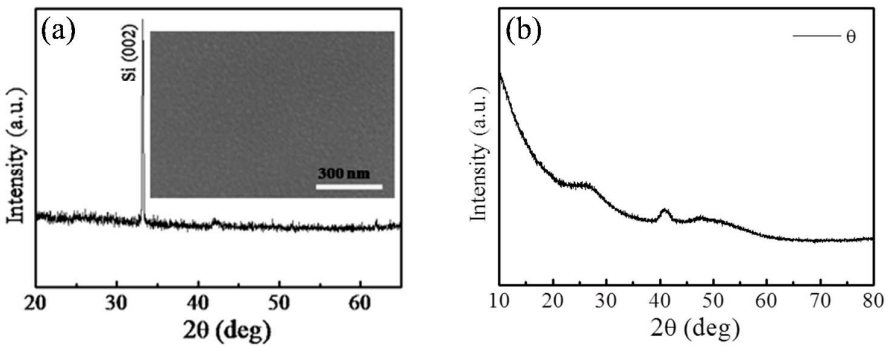

Figure S3 Different methods of X-ray diffraction pattern for Ge thin film on Si substrate. (a) is the general method, and (b) is the result using a small angle (2°) X-ray scattering. The peak of Ge is not observed by both methods, implying that the Ge film is amorphous. The inset in (a) is top-view SEM image of the a-Ge thin film on Si substrate, which shows the uniform and compact distribution for grains.

Table S-1 Carrier density and mobility of materials.

	Resistivity (Ω·cm)	Carrier density (cm^{-3})	Mobility ($cm^{-2}\cdot V^{-1}\cdot s^{-1}$)	
a-Ge(120 nm)	867	2.4×10^{12}	2982	This work
c-Ge	50	2.4×10^{13}	3900	Ref. [S1]
n-Si	0.1~10	1×10^{15}~1×10^{18}	1500	Ref. [S1]
Ag	1.65×10^{-10}	-	-	Ref. [S2]

Reference

[S1] Sze S. M. *Physics of Semiconductor Devices,* 2nd ed; Wiley Publications: New York, 1981.

[S2] Matula R. A. Electrical Resistivity of Copper, Gold, Palladium, and Silver. *J. Phys. Chem. Ref. Data*. **1979**, 8, 1147-1298.