Supporting Information

Enabling ambipolar to heavy n-type transport in PbS quantum dot solids through doping with organic molecules

Mohamad Insan Nugraha, [†,‡] *Shohei Kumagai,* [‡] *Shun Watanabe,* [‡,δ] *Mykhailo Sytnyk,* [ξ] *Wolfgang Heiss,* [ξ] *Maria Antonietta Loi,* [†,*] *Jun Takeya*[‡,*]

[†]Zernike Institute for Advanced Materials, University of Groningen, Nijenborgh 4, Groningen 9747AG, the Netherlands

[‡]Department of Advanced Materials Science, School of Frontier Sciences, the University of Tokyo, 5–1–5 Kashiwanoha, Kashiwa, Chiba 277–8561, Japan

[δ]JST, PRESTO, 4-1-8 Honcho, Kawaguchi, Saitama, 332-0012, Japan

[ξ]Materials for Electronics and Energy Technology (i-MEET), Friedrich-Alexander-Universität Erlangen-Nürnberg, Martensstraße 7, 91058 Erlangen, Germany and Energie Campus Nürnberg (EnCN), Fürther Straße 250, 90429 Nürnberg, Germany.

Corresponding Author

***E-mail**: m.a.loi@rug.nl, takeya@k.u-tokyo.ac.jp

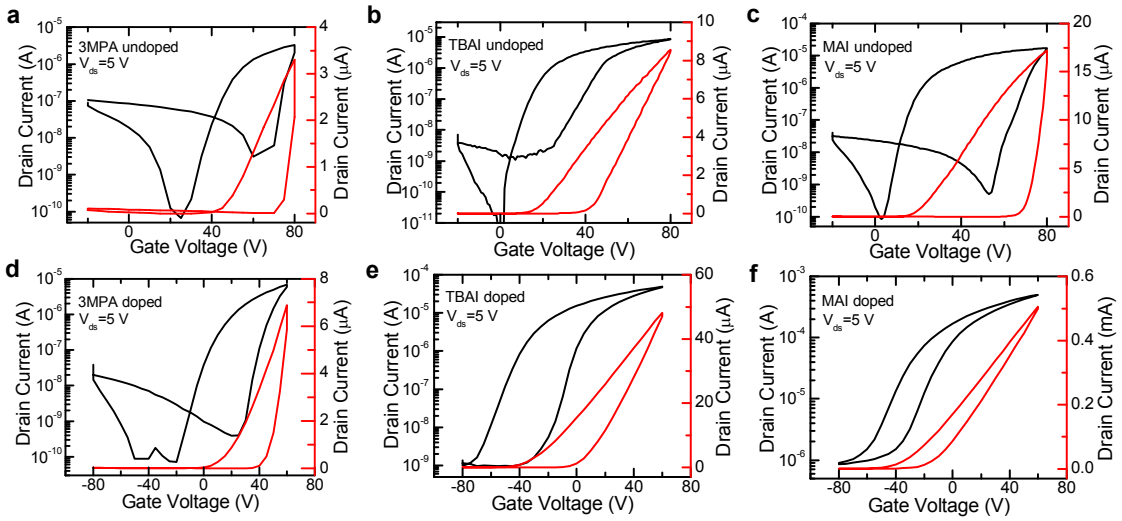

Figure S1. The hysteresis profile in the transfer characteristics of the devices with different capping ligands before (a-c) and after BV doping (d-f).

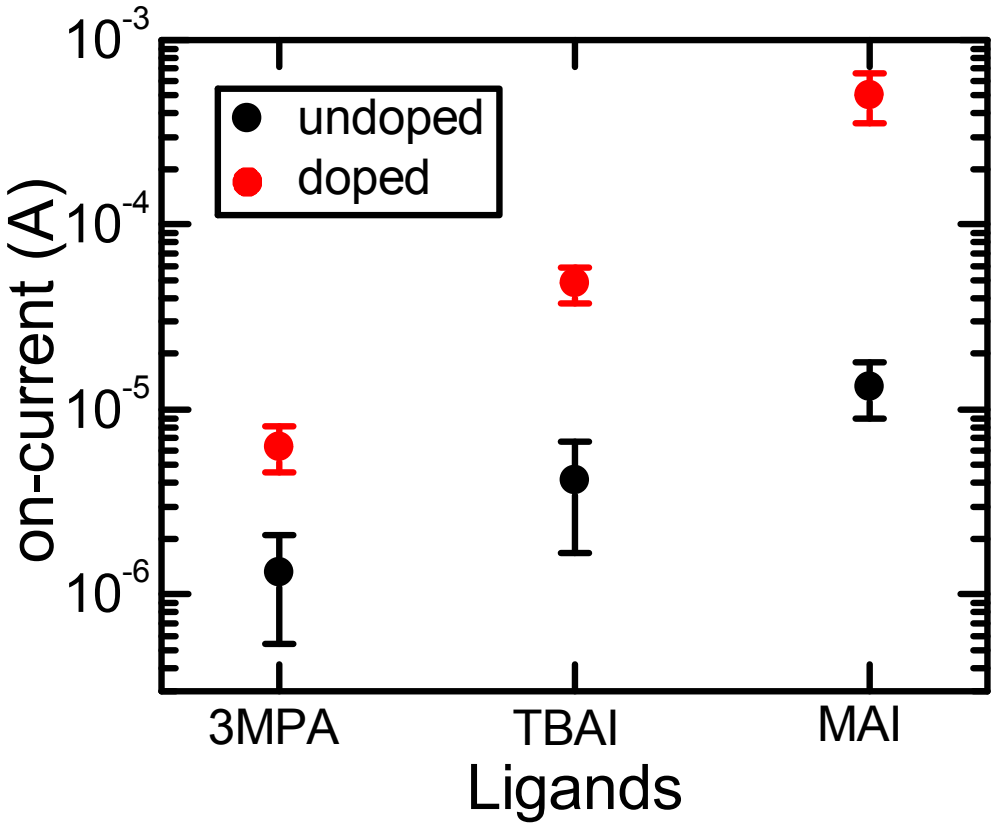

Figure S2. Comparison of on-current before and after BV doping treatment with given standard deviation.

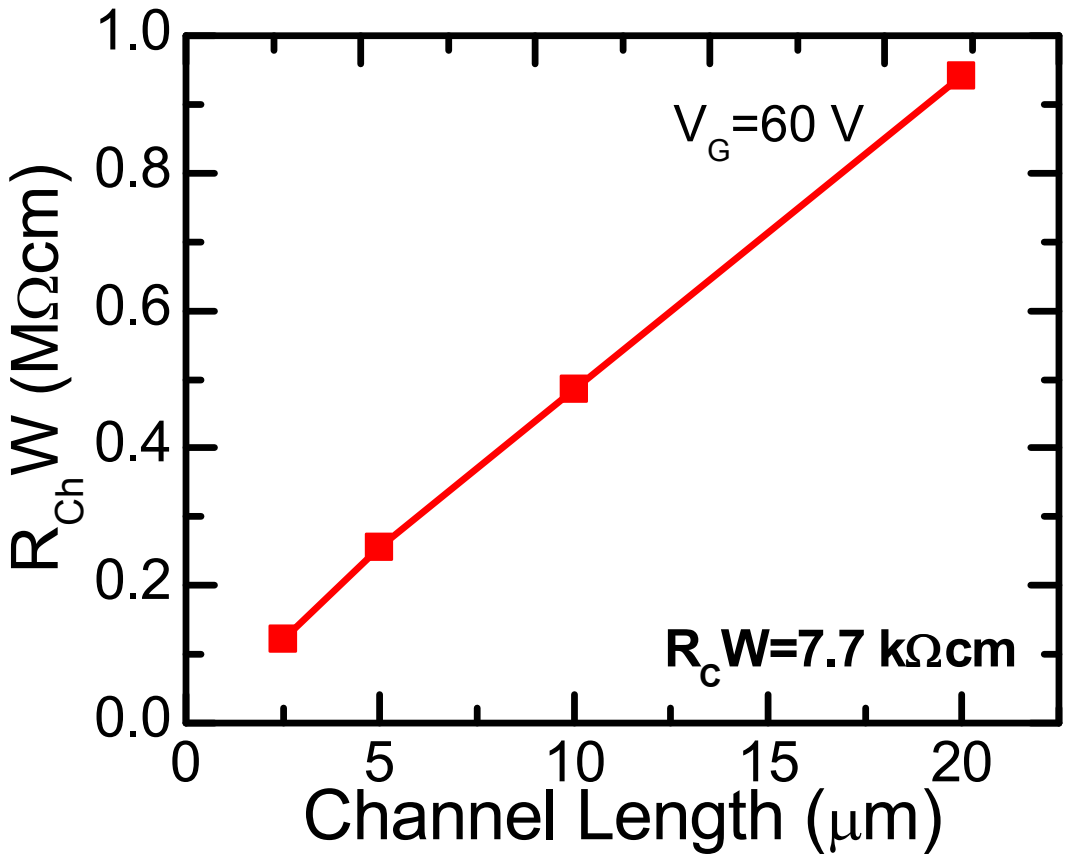

Figure S3. Channel resistance of the pristine FET devices. The calculated contact resistance is 7.7 kΩcm.

TABLE S-1. Electrical properties of PbS FETs with different capping ligands before and after BV treatment. The standard deviation of mobility and threshold voltage is given in parentheses.

Ligands	2T Mobility ($cm^2V^{-1}s^{-1}$)		Threshold Voltage (V)		n (10^{12} cm^{-2})
	Pristine	BV-treated	Pristine	BV-treated	
3MPA	2.6×10^{-3} (8.6×10^{-4})	5.1×10^{-3} (2.1×10^{-3})	36 (3.7)	18.8 (4.4)	1.6
TBAI	5.3×10^{-3} (9.5×10^{-4})	1.4×10^{-2} (7.7×10^{-4})	16.5 (5.8)	-17.1 (5.1)	3.2
MAI	0.03 (0.01)	0.32 (0.11)	12.2 (3.9)	-35 (5.7)	4.4