Supporting Information

Ligand-Directed Growth Control for High-Performance Short-Wave Infrared Quantum Dot Photodetectors

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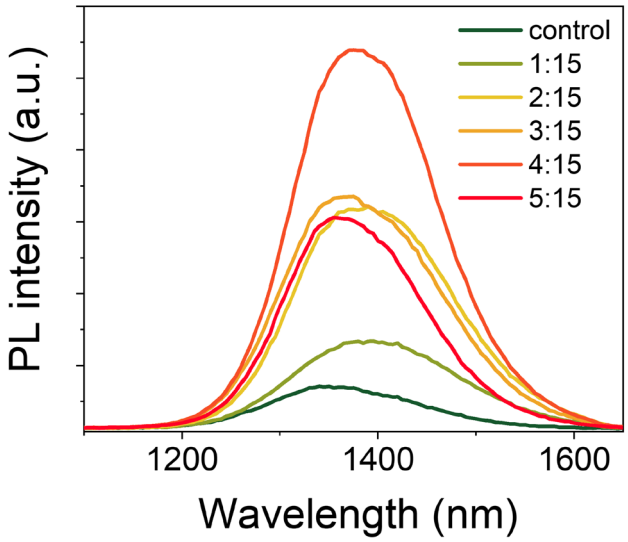

Fig. S1 PL spectra of the QDs in octane (in the same condition).

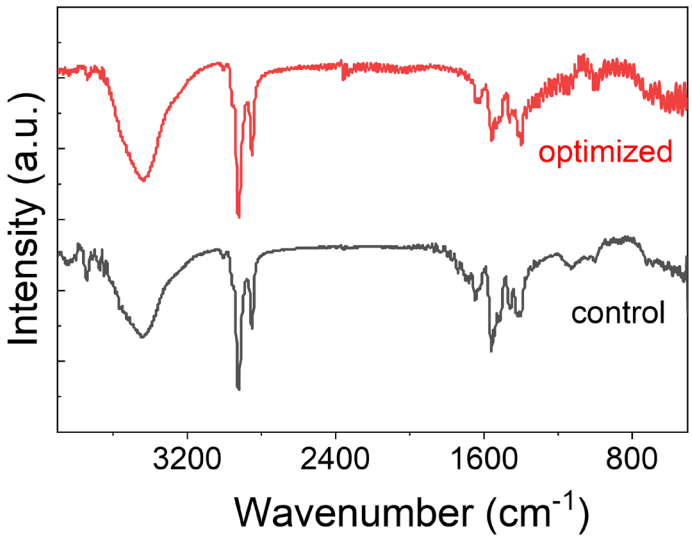

Fig. S2 FTIR spectra of (a) the control QD solid and (b) the optimized QD solid.

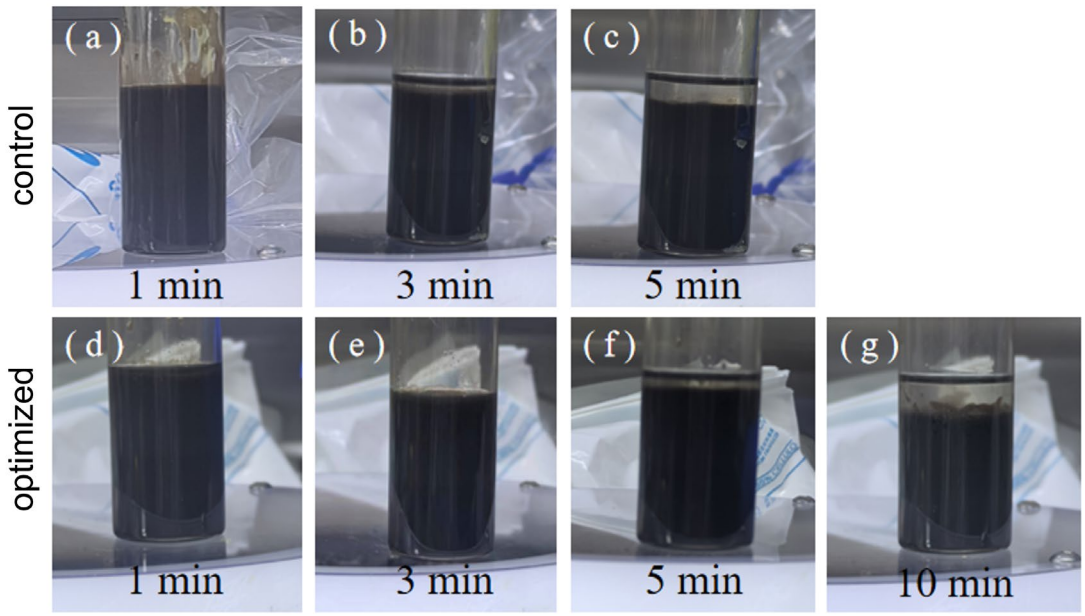

Fig. S3 Photographs of QDs in solutions during the SPLE process (a-c) the control QD solid and (d-g) the optimized QD solid.

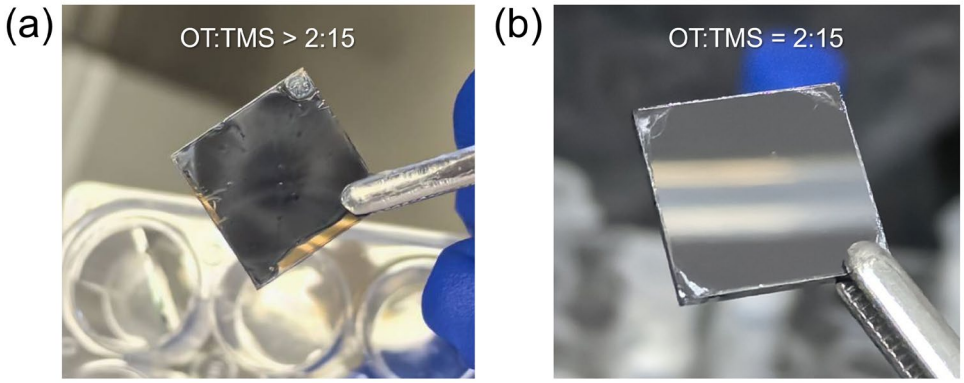

Fig. S4 Photographs of (a) the control QD solid and (b) the optimized QD solid.

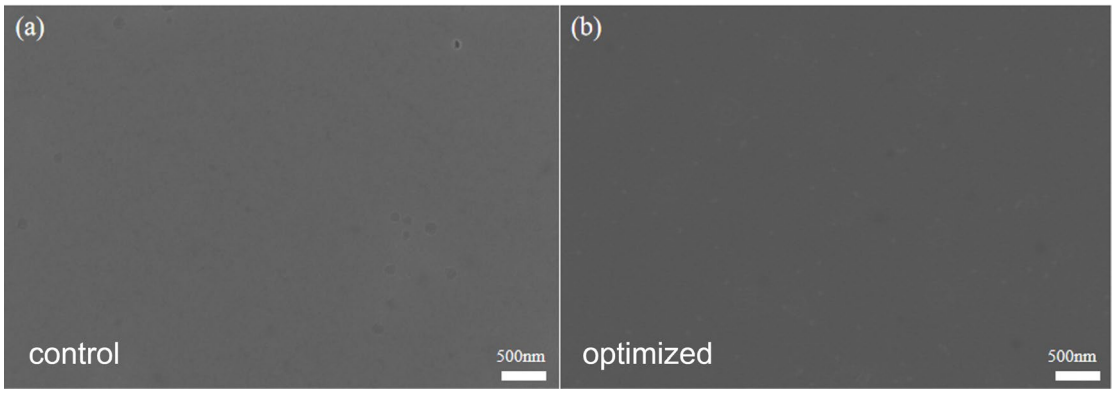

Fig. S5 SEM images of (a) the control QD solid and (b) the optimized QD solid.

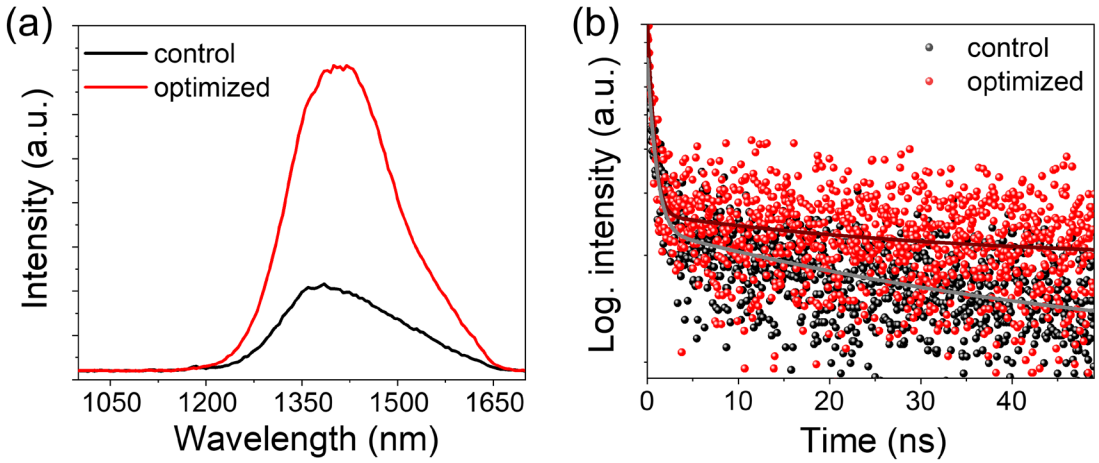

Fig. S6 (a) PL spectra and (b) TRPL data and fitting curves of the QD solids.

Table S1 TRPL fitting parameters

	τ_1 (ns)	A_1	τ_1 (ns)	A_2	τ_{AVG} (ns)
control	0.39	0.76	20.82	0.08	17.55
optimized	0.52	0.53	24.64	0.12	22.89

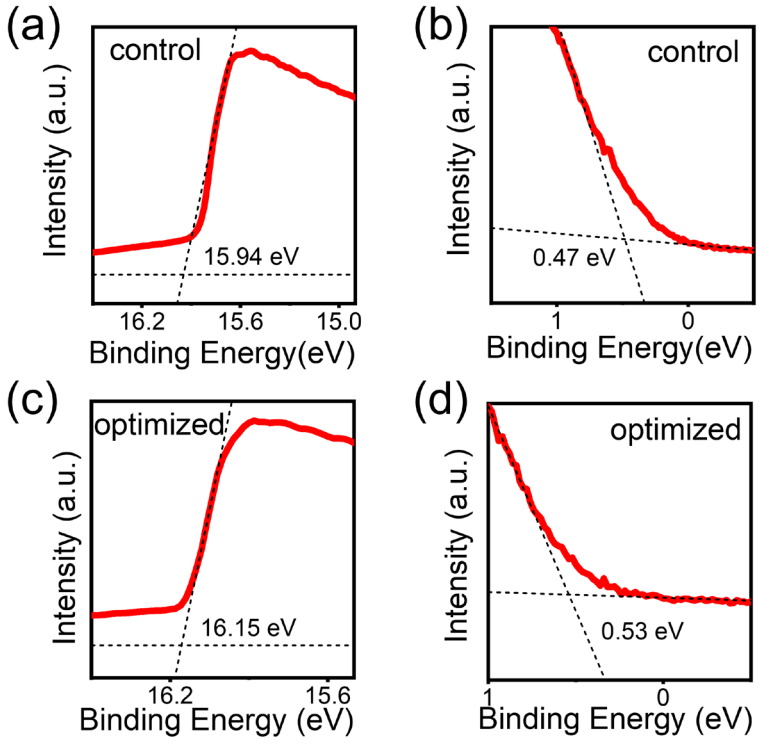

Fig. S7 Ultraviolet photoelectron spectroscopy (UPS) analysis of the QD solids (a-b): control QD solids, (c-d) optimized QD solids.

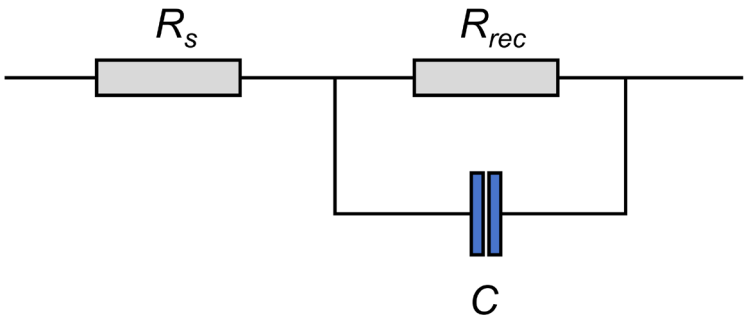

Fig. S8 Equivalent circuit for the EIS analysis.

Table S2 EIS fitting parameters

device	R_s (Ω)	R_{rec} (Ω)	C (μF)
control	137.10	1.00×10^6	1.95×10^{-9}
optimized	52.16	2.62×10^6	1.93×10^{-9}

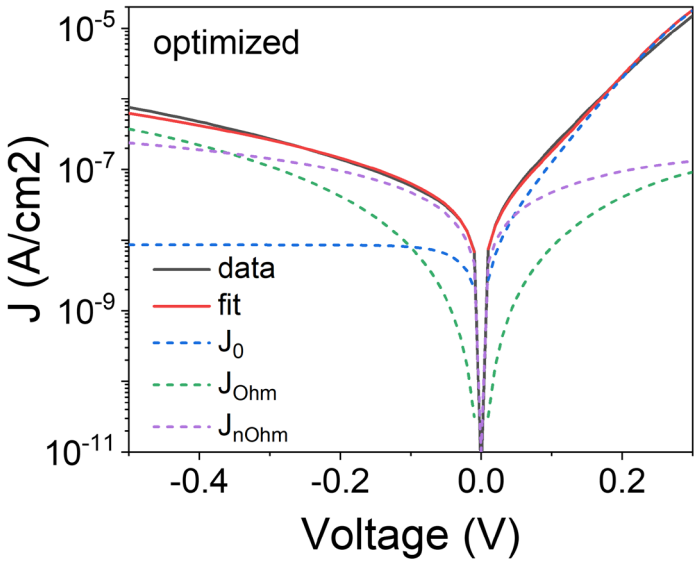

Fig. S9 Fitting curves of the dark *J-V* curves of the control device.

Table S3 *J-V* fitting parameters.

J (nA/cm^2)	J_0	J_{nOhm}	J_{Ohm}
control	20	752	623
optimized	9	377	238

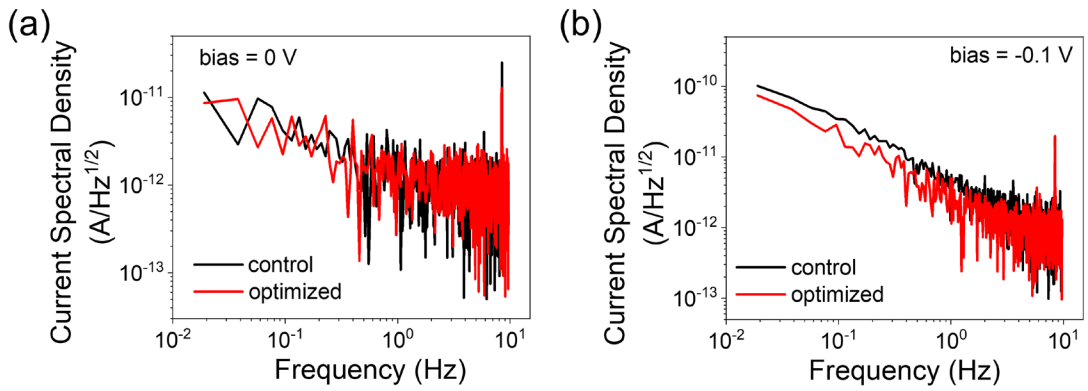

Fig. S10 Noise spectra densities of the devices under (a) bias = 0 V and (b) bias = -0.1 V.