# Supporting information

## High-Performance Broadband Photodetectors Based on All-inorganic Perovskite $CsPb(Br/I)_3$ Nanocrystal/CdS-Microwire Heterostructures

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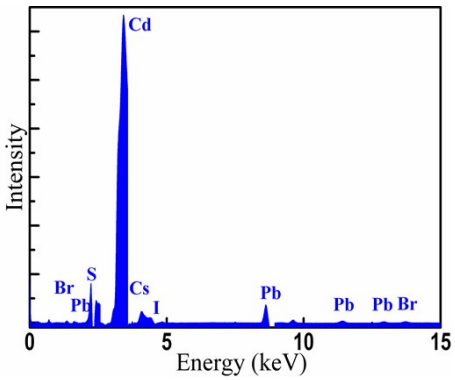


Figure S1: Energy-dispersive spectroscopy (EDS) analysis was used to assess of the fabricated $CsPb(Br/I)_3$ NC/CdS MW heterostructure.

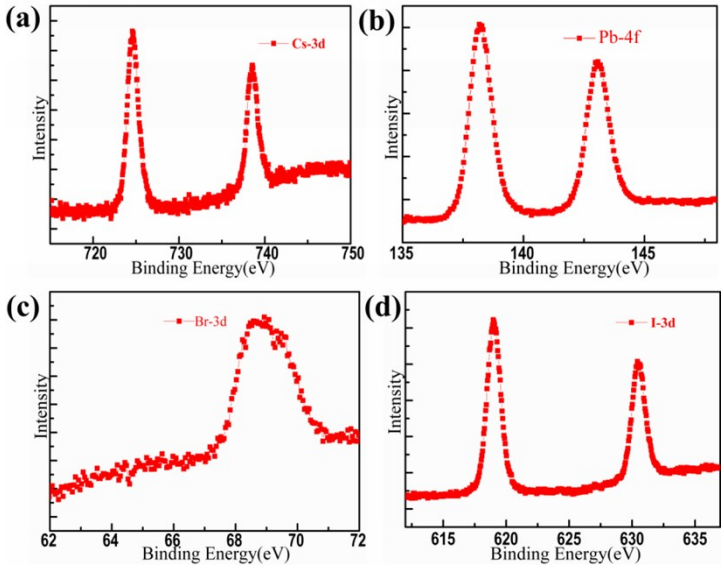


Figure S2 : The high-resolution XPS spectra of Cs-3d,Pb-4f, Br-3d, and I-3d in $CsPb(Br/I)_3$ NCs were observed at 725.55, 136.15, 69.90, and 619.95 eV, respectively.

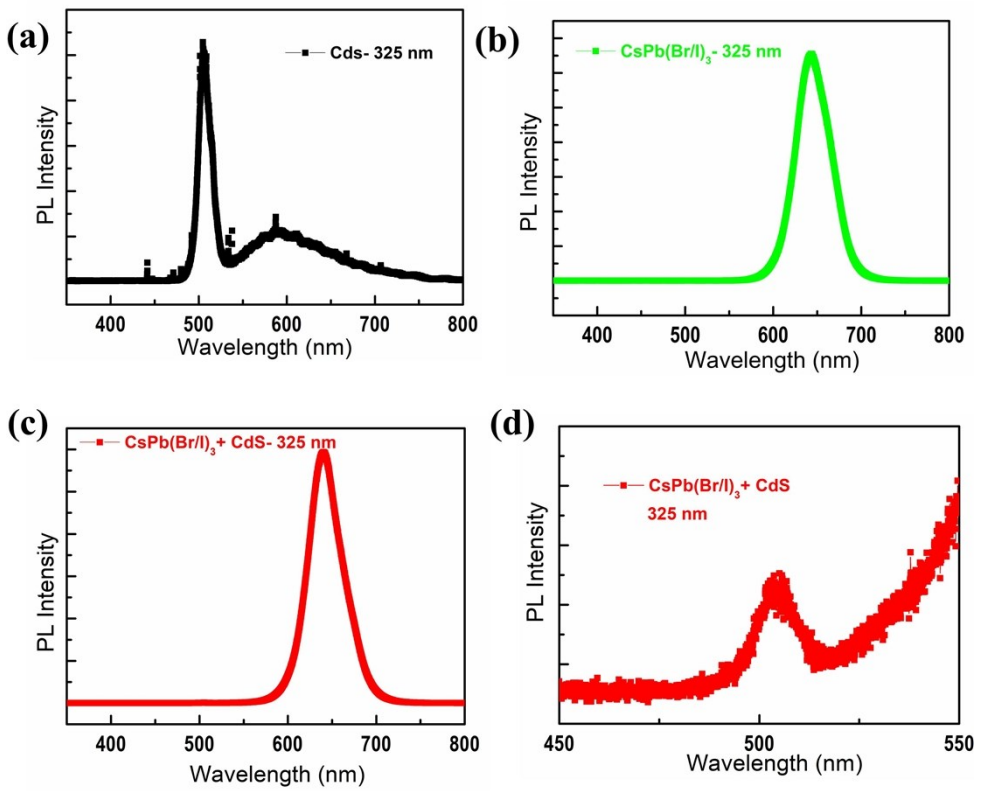


Figure S3: The individual spectra of (a):CdS MWs, (b):CsPb(Br/I)3 NCs,(c) :$CsPb(Br/I)_3$ NC/CdS MW-hybrid structures,(d)The magnified view of the PL spectra of $CsPb(Br/I)_3$ NCs.

Table S1: The parameters (R, EQE, D*) for the $CsPb(Br/I)_3$-NC/CdS-MW- and CdS-MW-based photodetectors under illumination of 365 nm (the applied bias = 5 V).

| | $I_{on}/I_{off}$ | Rise/decay time | R(A/W) | EQE | D* (Jones) |
|---|---|---|---|---|---|
| **CdS** | $1.75\times10^3$ | 0.2 s/0.2 s | 6.28 | 2137% | $3.93\times10^{10}$ |
| **CdS/CsPb(Br/I)$_3$** | $3.93\times10^3$ | ＜0.1 s/＜0.1 s | 14.07 | 4789% | $8.81\times10^{10}$ |

Table S2: The parameters (R, EQE, D*) for the $CsPb(Br/I)_3$-NC/CdS-MW- and CdS-MW-based photodetectors under illumination of 530 nm (the applied bias = 5 V).

| | $I_{on}/I_{off}$ | Rise/decay time | R(A/W) | EQE | D* (Jones) |
|---|---|---|---|---|---|
| **CdS** | $4.78\times10^2$ | 0.2 s/0.2 s | 2.29 | 537% | $1.43\times10^{10}$ |
| **CdS/CsPb(Br/I)$_3$** | $1.9\times10^3$ | ＜0.1 s/＜0.1 s | 9.11 | 2136% | $5.71\times10^{10}$ |

Table S3: The parameters (R, EQE, D*) for the $CsPb(Br/I)_3$-NC/CdS-MW- and CdS-MW-based photodetectors under illumination of 660 nm (the applied bias = 5 V).

| | $I_{on}/I_{off}$ | Rise/decay time | R(A/W) | EQE | D* (Jones) |
|---|---|---|---|---|---|
| **CdS** | $2.4\times10^2$ | 0.2 s/0.2 s | 0.73 | 137% | $4.57\times10^9$ |
| **CdS/CsPb(Br/I)$_3$** | $1.1\times10^3$ | 0.1 s/0.1 s | 3.36 | 632% | $2.11\times10^{10}$ |

Table S4: The parameters (R, EQE, D*) for the $CsPb(Br/I)_3$-NC/CdS-MW- and CdS-MW-based photodetectors under illumination of 760 nm (the applied bias = 5 V).

| | $I_{on}/I_{off}$ | Rise/decay time | R(A/W) | EQE | D* (Jones) |
|---|---|---|---|---|---|
| **CdS** | 54 | 0.3 s/0.3 s | 0.125 | 20% | $7.80\times10^8$ |
| **CdS/CsPb(Br/I)$_3$** | 189 | 0.1 s/0.1 s | 0.436 | 71% | $2.73\times10^9$ |

Table S5: The parameters (R, EQE, D*) for the $CsPb(Br/I)_3$-NC/CdS-MW- and CdS-MW-based photodetectors under illumination of 810 nm (the applied bias = 5 V).

| | $I_{on}/I_{off}$ | Rise/decay time | R(A/W) | EQE | D* (Jones) |
|---|---|---|---|---|---|
| **CdS** | 16 | 0.3 s/0.3 s | 0.233 | 36% | $1.46\times10^9$ |
| **CdS/CsPb(Br/I)$_3$** | 41 | 0.1 s/0.1 s | 0.597 | 91% | $3.74\times10^9$ |