Electronic Supplementary Information

A luminescent down-shifting and moth-eyed anti-reflective film for high efficient photovoltaic device

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Fig. S1 (a) Schematic structure of GaAs cell covered by patterned QD-embedded PDMS film (b) Cross-sectional TEM images of GaAs cell.



Fig. S2 PL intensities (a) and solar spectra (b) for/through the patterned QD-embedded PDMS film and flat QD-embedded PDMS film, respectively. QDs are embedded in both PDMS films with identical concentration. Inset of (a) shows those PDMS films under UV irradiation.



Fig. S3 Electrical properties as a function of QD concentration for GaAs cell with PDMS films (Reference: 60 nm Si₃N₄-coated GaAs cell).

Table S1 Electrical properties as a function of QD concentration for GaAs cell with PDMS films (Reference: 60 nm Si_3N_4 -coated GaAs cell).

	Reference	Flat	Pattern	0.2wt%	0.3wt%	0.6wt%	1.2wt%
Voc(V)	1.035	1.035	1.035	1.036	1.036	1.036	1.035
Jsc(mA/cm²)	32.673	32.905	33.422	33.620	33.789	33.586	33.480
Fill Factor	0.822	0.821	0.822	0.821	0.820	0.822	0.821
Efficiency(%)	27.809	27.973	28.430	28.586	28.719	28.591	28.475



Fig. S4 Electrical properties of multiple cells for repeatability testing (Reference: 60 nm Si_3N_4 - coated GaAs cell).



Fig. S5 Repeatedly measured EQE through refreshing QD-embedded patterned PDMS film attachment in every measurement. (Reference: 60 nm Si_3N_4 -coated GaAs cell).



Fig. S6 Evolution of PL intensity of QD-embedded patterned PDMS film under continuous UVA (325 nm) irradiation.