Supporting Information

Long-Term Stable Microlens Array-Integrated Quantum Dot/Siloxane Film for Thin White Backlight Units

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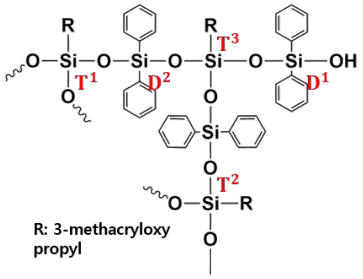
Sample	PL QY (%)
OA-QD (chloroform)	84
MerQD (chloroform)	80
MerQD/oligo-siloxane resin (chloroform)	68
ML/QD-film (3 wt%)	54

Table S1. PL QY of diluted samples of QDs during ligand exchange and fabrication of ML/QD-film.

Species	Glass transition in 20~120℃	C.T.E (ppm K^{-1})	Storage modulus at 25℃ (GPa)	Elastic Modulus (GPa)
H-GFRH	X	9	1.37	5.26
PET	O	58	2.07	5.73
CPI	X	24	1.87	6.45
PU	X	171	0.0049	0.063
PMMA	O	87	0.93	1.9

Table S2. Thermo-mechanical and mechanical properties of H-GFRH and polymer films.



$$\text{DOC} = \frac{D^1 + 2D^2 + T^1 + 2T^2 + 3T^3}{2(D^1 + D^2) + 3(T^1 + T^2 + T^3)} \times 100$$

Equation S1. Calculation method of degree of condensation (DOC).

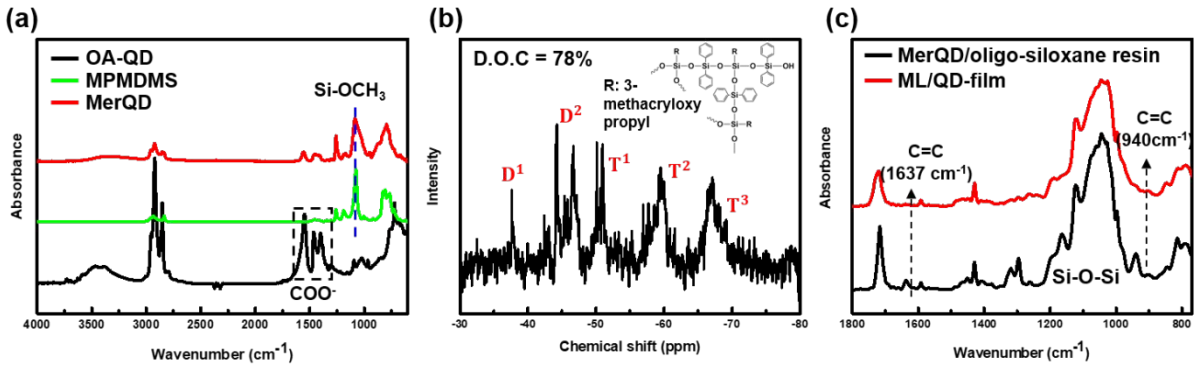


Figure S1. (a) FT-IR spectra at each step during ligand exchange. (b) ^{29}Si-NMR spectra of MerQD/oligo-siloxane resin. (c) FT-IR spectra of MerQD/oligo-siloxane resin and ML/QD-film after polymerization.

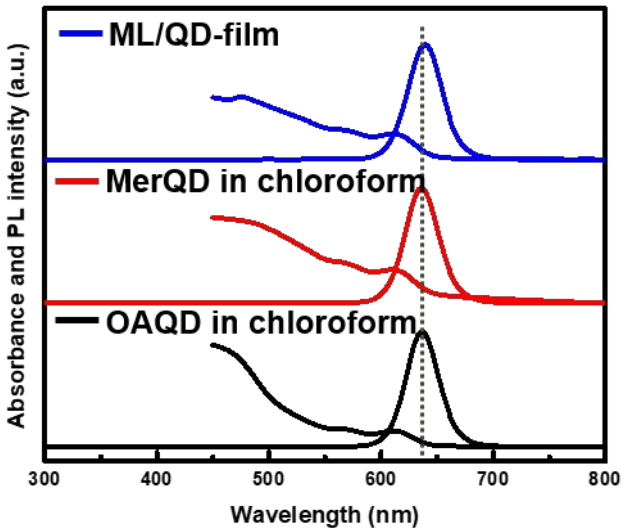


Figure S2. Absorbance and PL spectra of (black) oleic acid-capped QD in chloroform, (red) MerQD in chloroform, and (blue) ML/QD-film.

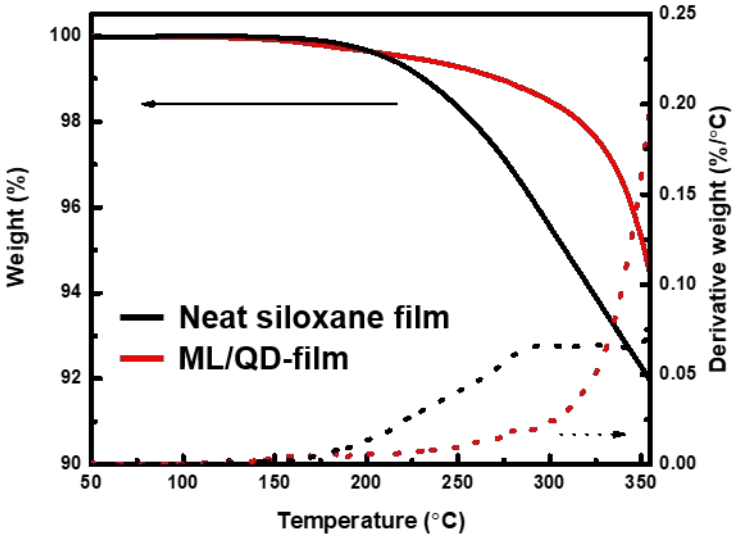


Figure S3. TGA profiles of neat siloxane film and ML/QD-film in a N_2 atmosphere from 50 to 350 ℃.

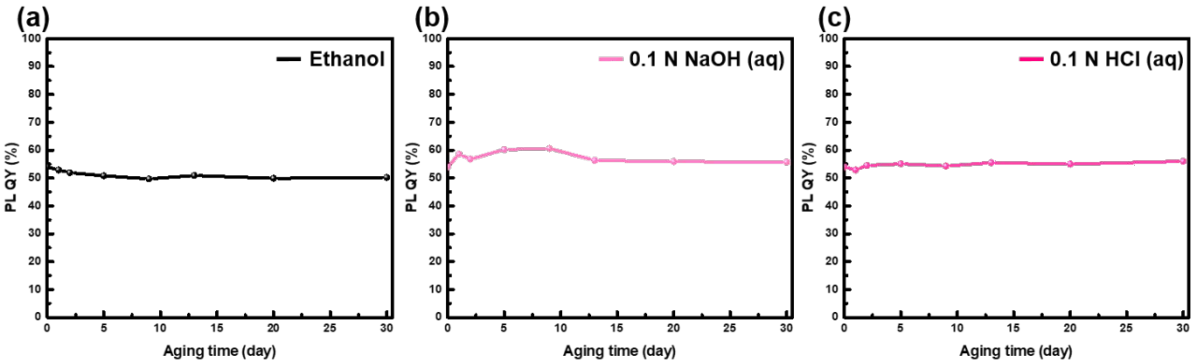


Figure S4. Chemical stability of ML/QD-film. Traces of PL QY in (a) ethanol, (b) 0.1 N NaOH, and (c) 0.1N HCl for 30 days.

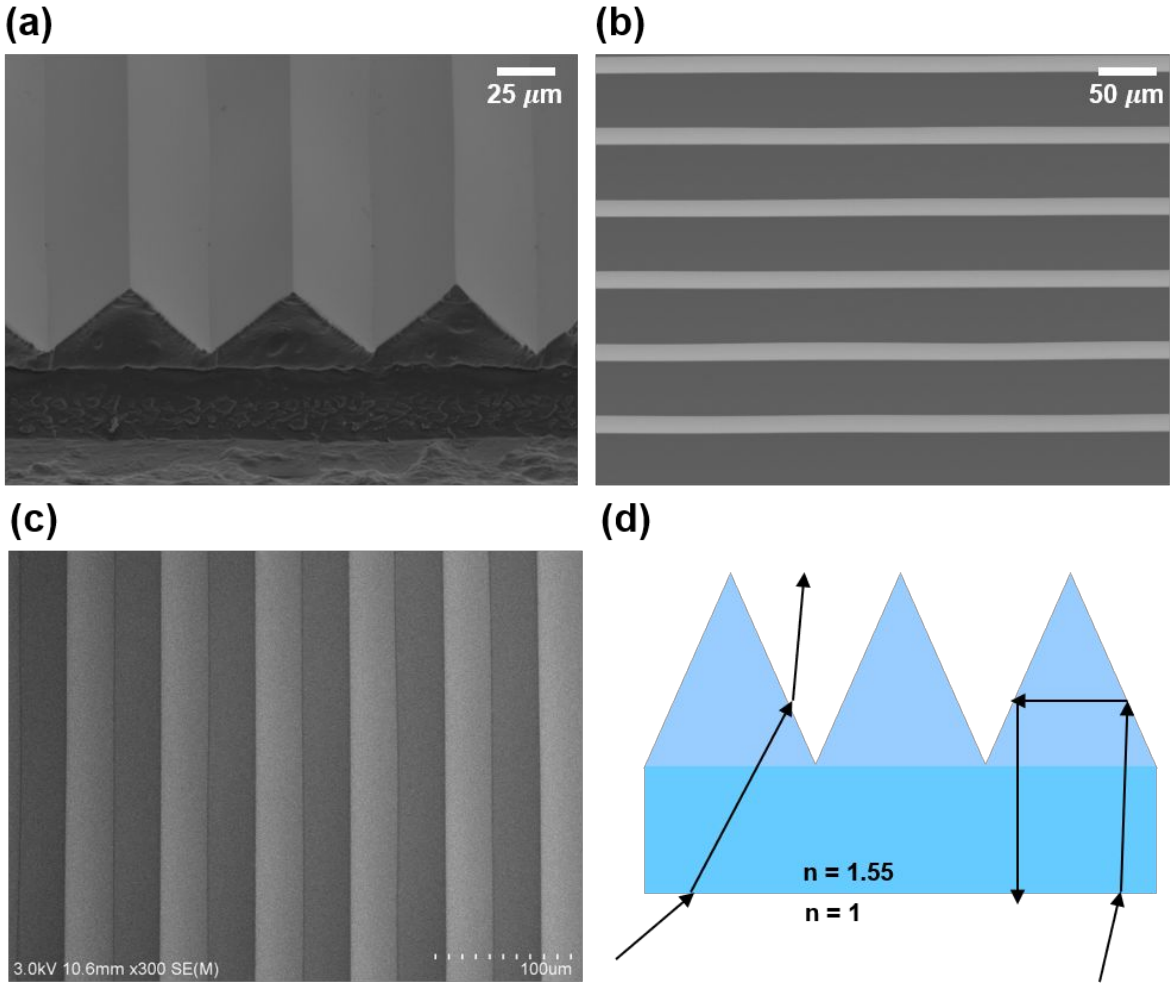


Figure S5. SEM image of fabricated prism sheet using methacrylate-phenyl siloxane hybrid material; (a) tilted side, (b) tilted top, and (c) top view. (d) Light distribution for enhancement of luminance using prism sheet.

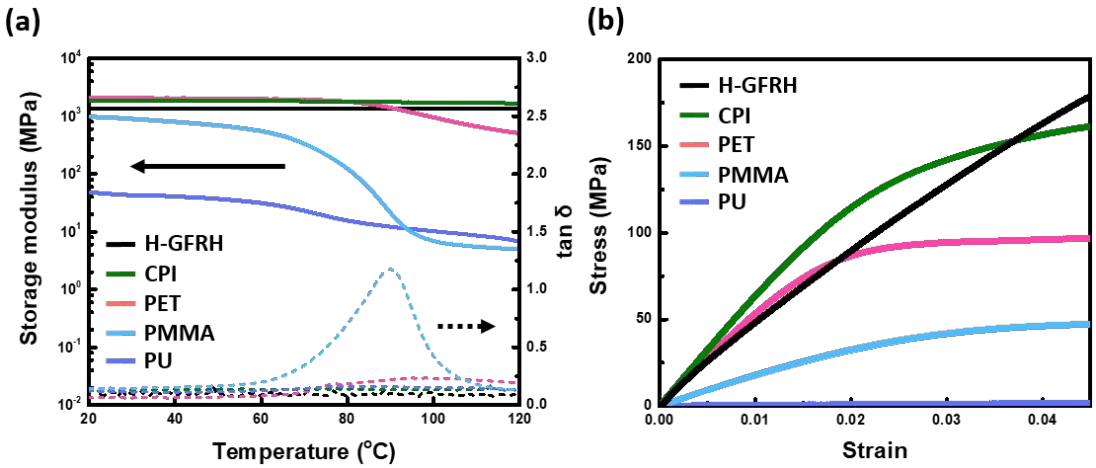


Figure S6. (a) Storage modulus (line) and tan δ (dotted) profiles and (b) stress-strain curves of H-GFRH and polymer films from tensile test.

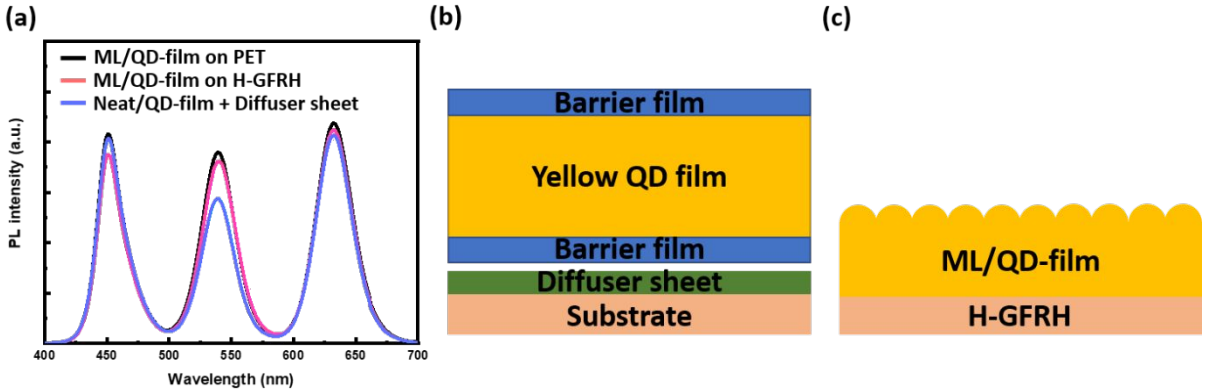


Figure S7. (a) PL intensity of various QD-film system on blue LED chips. Schematics of (b) Neat/QD-film + Diffuser sheet and (c) ML/QD-film on H-GFRH.