Supporting Information

Dually Crosslinkable SiO$_2$@Polysiloxane Core-Shell Nanoparticles for Flexible Gate Dielectric Insulators

Eunkyung Lee$^{a,c}$, Jiyoung Jung$^a$, Ajeong Choi$^a$, Xavier Bulliard$^a$, Jung-Hwa Kim$^b$, Youngjun Yun$^a$, Jooyoung Kim$^a$, Jeongil Park$^a$, Sangyoon Lee$^a$, Youngjong Kang$^{*c}$

$^a$ Material research center, Samsung Electronics, 130, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-803, Korea.
$^b$ Platform Technology Lab, Samsung Electronics, 130, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-803, Korea.
$^c$ Department of Chemistry, Research Institute for Natural Sciences, Institute of Nano Science and Technology, Hanyang University, 222 Wangsimni-Ro, Seongdong-Gu, Seoul, 133-791, Korea

e-mail: youngjkang@hanyang.ac.kr
Figure S1. FT-IR spectra of PSR, PSR<sub>XL</sub>, SiO<sub>2</sub>@PSR and SiO<sub>2</sub>@PSR<sub>XL</sub>. The peaks at 1637 cm<sup>-1</sup> and 810 cm<sup>-1</sup> assigned to ethylene group of MPTS disappeared after photo-crosslinking process, while the carbonyl peak at 1727 cm<sup>-1</sup> was slightly shifted to 1733 cm<sup>-1</sup> with the same intensity.
Figure S2. The changes of capacitance and dielectric constant as a function of frequency for the MIM devices based on a) PSR$_{XL}$ and b) SiO$_2$@PSR$_{XL}$. The layer thickness of PSR$_{XL}$ and SiO$_2$@PSR$_{XL}$ was 4100 Å and 4500 Å, respectively.
Figure S3. AFM micrograph of SiO$_2$@PSR$_{XL}$ film coated on a glass substrate. The RMS roughness is 4.5 Å.