Supporting Information for

Hierarchically Multifunctional Polyimide Composite Films with Strongly Enhanced Thermal Conductivity

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Supplementary Figures and Table

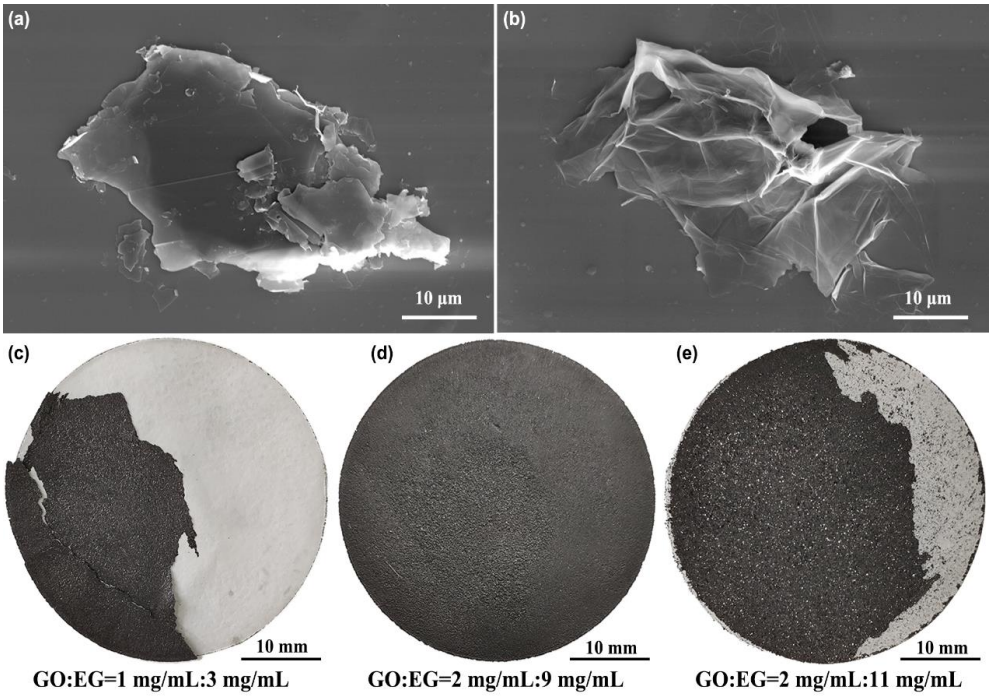

Fig. S1 SEM images of EG (**a**) and GO (**b**), photos of GO/EG films with different mass ratio of GO and EG (**c, d**)

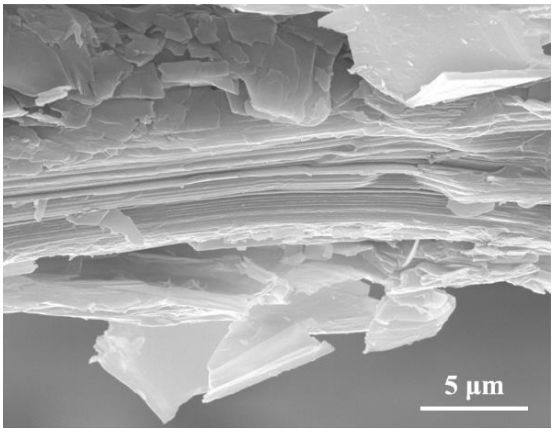

Fig. S2 SEM image of cross-section for uncompacted GO/EG films

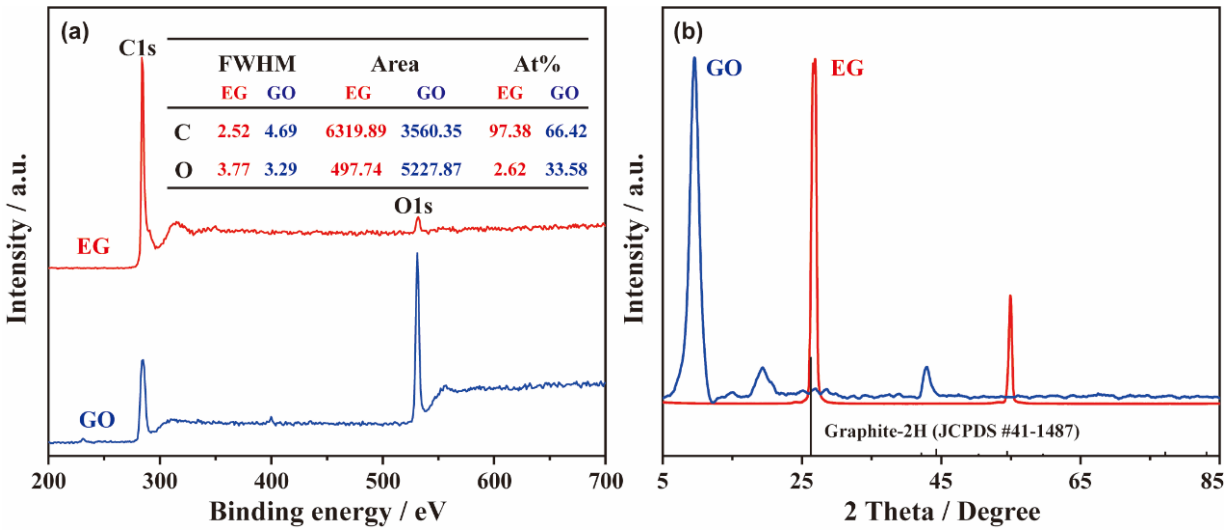

Fig. S3 Characterization of EG and GO. XPS (**a**), XRD (**b**)

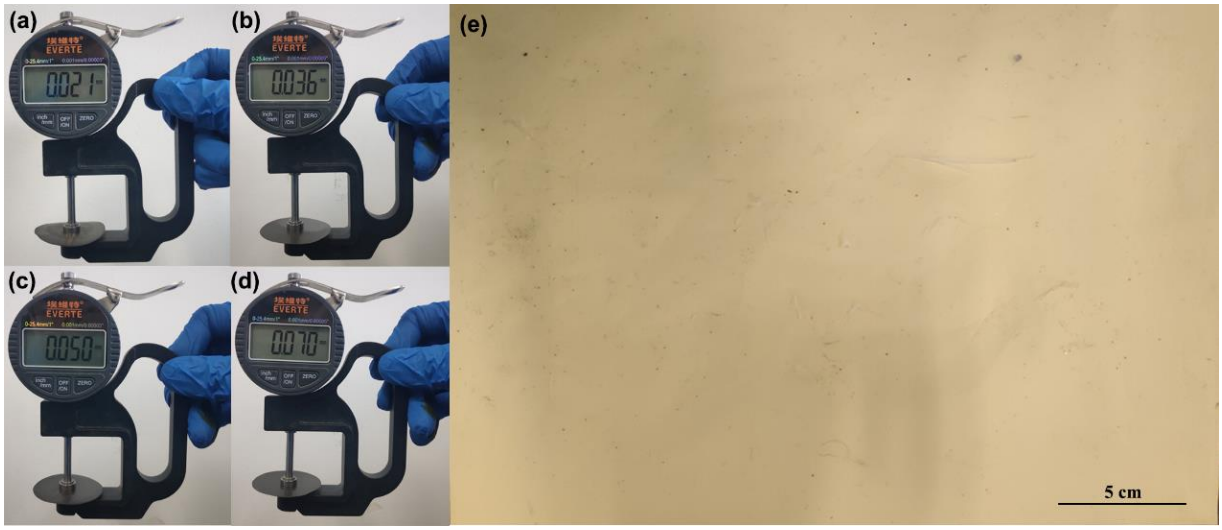

Fig. S4 Photos of GO/EG films with different thickness (**a-d**) and PI fibers (**e**)

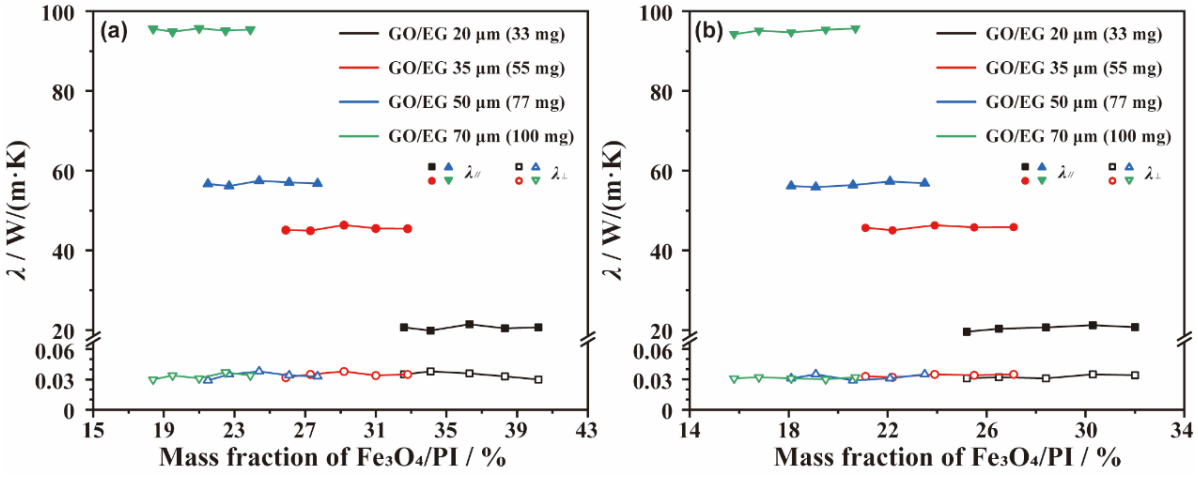

Fig. S5 Influence of GO/EG, Fe_3O_4/PI and PI fibers on the thermal conductivity of PI composite films. The mass of PI fibers in PI composite films is about 25 mg (**a**) and 50 mg (**b**)

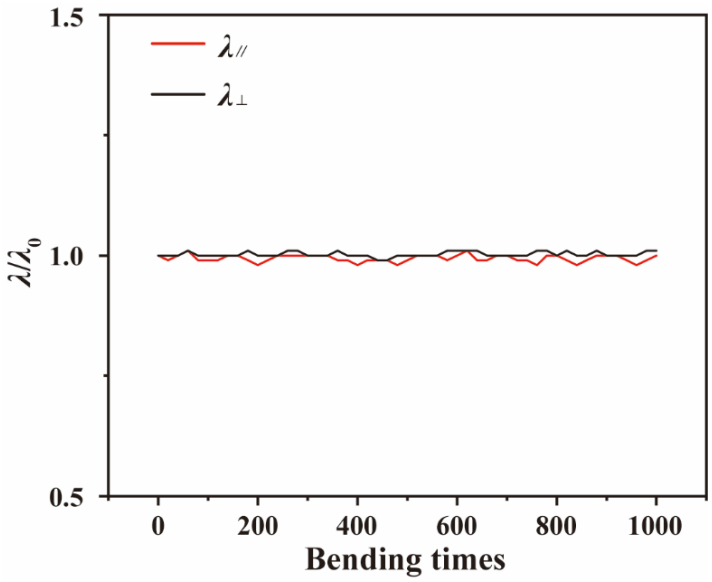

Fig. S6 Relative thermal conductivity coefficients of PI composite films upon repeated bending and stretching

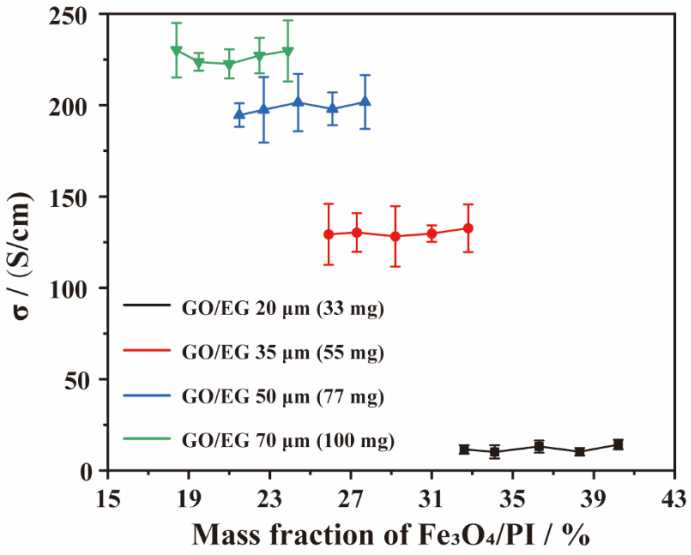

Fig. S7 Influence of GO/EG and Fe_3O_4/PI on the surface electrical conductivity of PI composite films with 25 mg of PI fibers

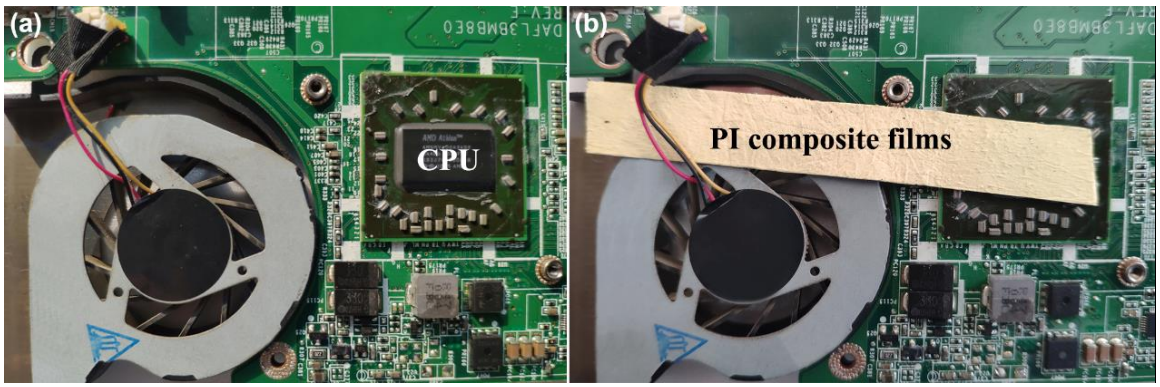

Fig. S8 Photos of bared CPU (**a**) and CPU integrated with PI composite films (**b**)

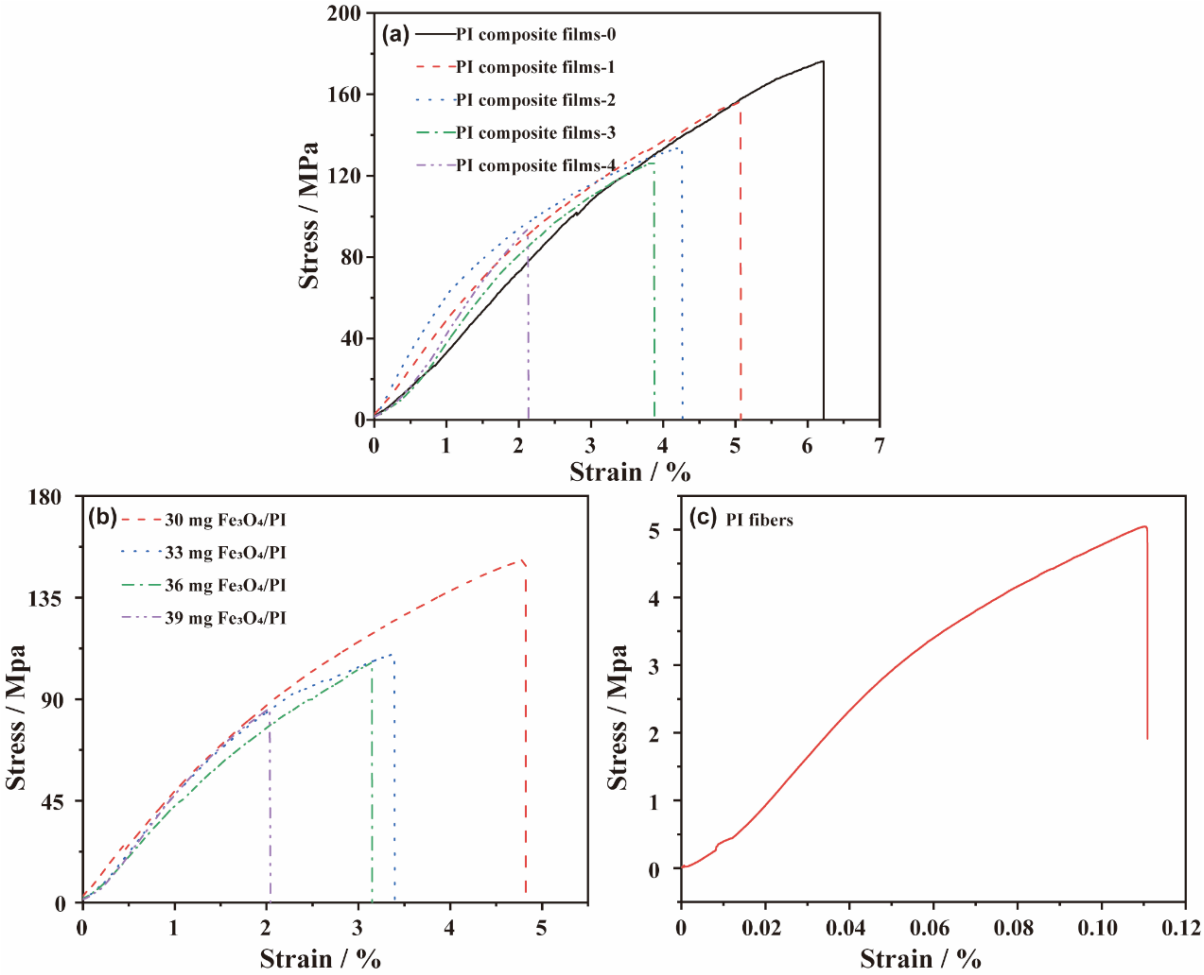

Fig. S9 The stress-strain curves of PI composite films (**a**), Fe_3O_4/PI films (**b**) and PI fibers mat (**c**)

Table S1 The amount of component in PI composite films

Top layer: GO/EG		Middle layer: Fe_3O_4/PI*			Substrate layer: PI fibers	
Thickness (μm)	Mass (mg)	Thickness (μm)	Mass (mg)	Mass fraction of Fe_3O_4 (%)	Thickness (μm)	Mass (mg)
20±2	33±3		28±3	0	160±10	25±2
35±2	55±3		30±4	10	320±10	50±2
50±2	77±3	16±2	33±4	20	--	--
70±2	100±3		36±4	30	--	--
--	--		39±5	40	--	--

*Label PI composite films with 28 mg, 30 mg, 33 mg, 36 mg and 39 mg of Fe_3O_4/PI as PI composite films-x (x=0, 1, 2, 3, 4), respectively.