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Supporting information for

Enhancing thermal conductivity via conductive network conversion from high to low thermal dissipation in the polydimethylsiloxane composites

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Table S1: The detailed data of density, specific heat, and thermal diffusivity used for the calculation of thermal conductivities.

Filler contents (wt%)		Thickness (mm)	Compression ratio	Density (g/mm^3)	Specific heat (J/(g·K))	Thermal diffusivity (mm^2/s)	Thermal conductivity (W/mK)
SCF	GB						
30	0	0.1	20	1.225	1.173	7.949±0.033	11.423±0.047
	1			1.208	1.164	8.917±0.020	12.532±0.028
	2			1.190	1.155	9.460±0.018	13.004±0.025
	3			1.174	1.146	8.405±0.055	11.302±0.074
	4			1.157	1.137	7.639±0.021	10.050±0.028
	8			1.096	1.101	7.384±0.063	8.912±0.076
30	0	0.2	10	1.225	1.173	7.450±0.029	10.706±0.042
	1			1.208	1.164	8.124±0.021	11.417±0.030
	2			1.190	1.155	6.619±0.014	9.098±0.019
	3			1.174	1.146	6.629±0.012	8.914±0.016
	4			1.157	1.137	6.927±0.016	9.113±0.021
	8			1.096	1.101	6.489±0.053	7.832±0.064
30	0	0.4	5	1.225	1.173	5.725±0.049	8.227±0.070
	1			1.208	1.164	6.327±0.032	8.892±0.045
	2			1.190	1.155	5.689±0.008	7.820±0.011
	3			1.174	1.146	5.443±0.016	7.319±0.022
	4			1.157	1.137	5.722±0.041	7.528±0.054
	8			1.096	1.101	5.545±0.025	6.693±0.030
30	0	0.6	3.33	1.225	1.173	4.169±0.027	5.991±0.039
	1			1.208	1.164	4.568±0.014	6.420±0.020
	2			1.190	1.155	4.684±0.016	6.439±0.022
	3			1.174	1.146	5.117±0.034	6.881±0.046
	4			1.157	1.137	4.610±0.047	6.065±0.062
	8			1.096	1.101	5.152±0.012	6.218±0.014
30	0	2	1	1.225	1.173	0.733±0.120	1.053±0.172
	1			1.208	1.164	1.131±0.146	1.589±0.205

2	1.190	1.155	0.760±0.104	1.045±0.143
3	1.174	1.146	1.018±0.058	1.369±0.078
4	1.157	1.137	0.712±0.069	0.937±0.091
8	1.096	1.101	0.209±0.037	0.252±0.045

Table S2: Mechanical properties (tensile strength and elongation of break) of PDMS/SCF/GB composites with different filling contents.

Sample number	**Composition**	**Tensile strength**	**Elongation at break**
Sample 1	Pure PDMS	4.51	115
Sample 2	PDMS/SCF(30 wt%)	2.35	66.56
Sample 3	PDMS/SCF(30 wt%)/GB(1 wt%)	2.21	64.28
Sample 4	PDMS/SCF(30 wt%)/GB(2 wt%)	1.87	60.16
Sample 5	PDMS/SCF(30 wt%)/GB(3 wt%)	1.76	52.84
Sample 6	PDMS/SCF(30 wt%)/GB(4 wt%)	1.67	51.34
Sample 7	PDMS/SCF(30 wt%)/GB(8 wt%)	1.16	41.16