Supporting Information

Sequential dual coating with thermosensitive polymers for advanced fiber optic temperature sensors

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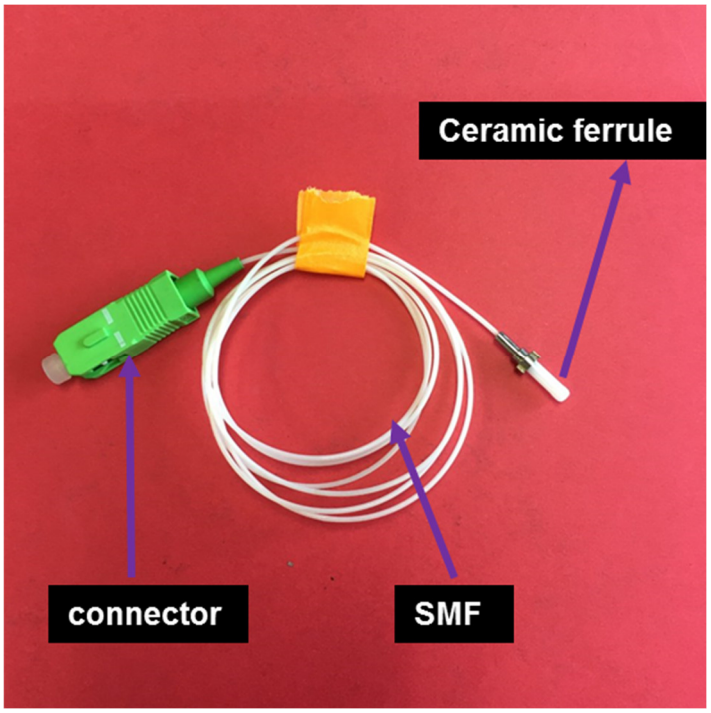

Figure S1. The pictorial image of SMF with the ferrule connector.

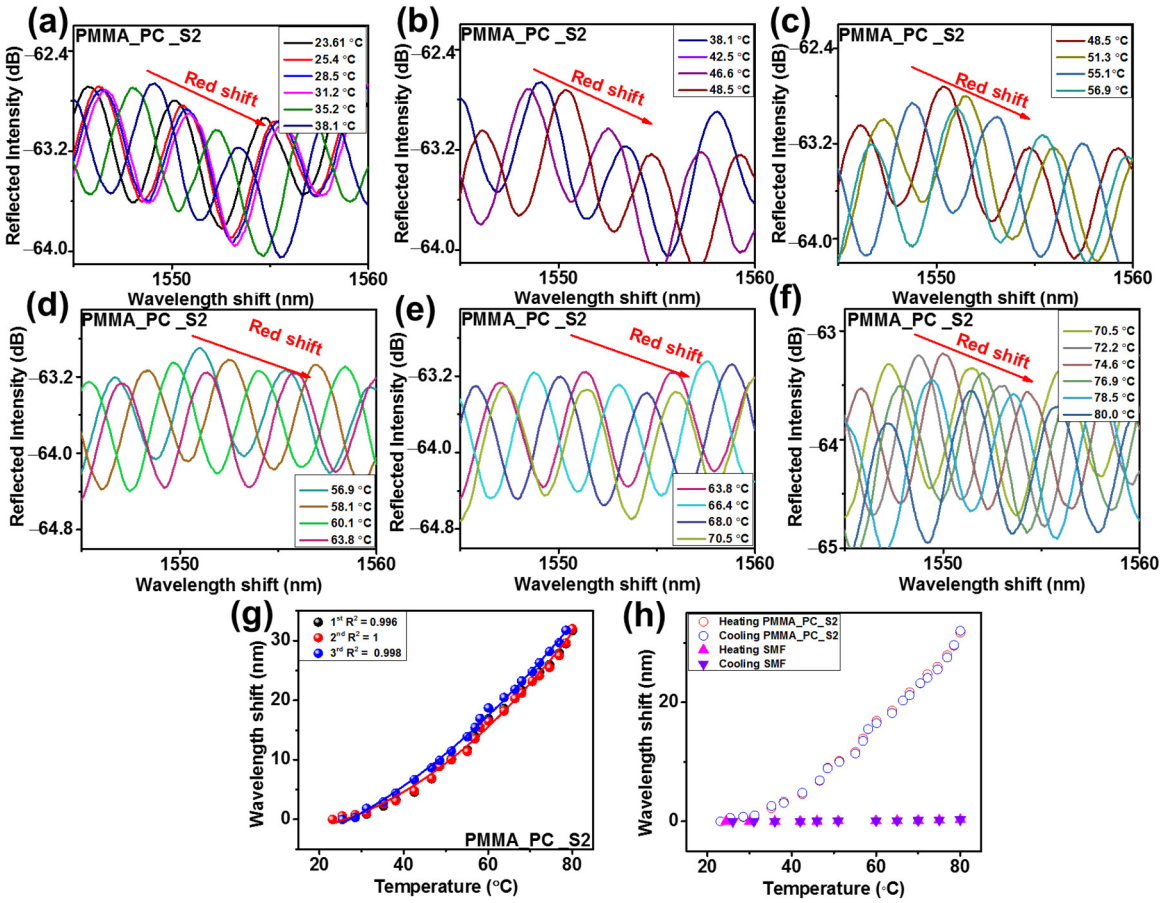

Figure S2. Reflected spectra with increase in temperature (a-f), wavelength shift for 3 measurements (g), and (h) average wavelength shift associated with SMF for PMMA_ PC_S2 DPFPI

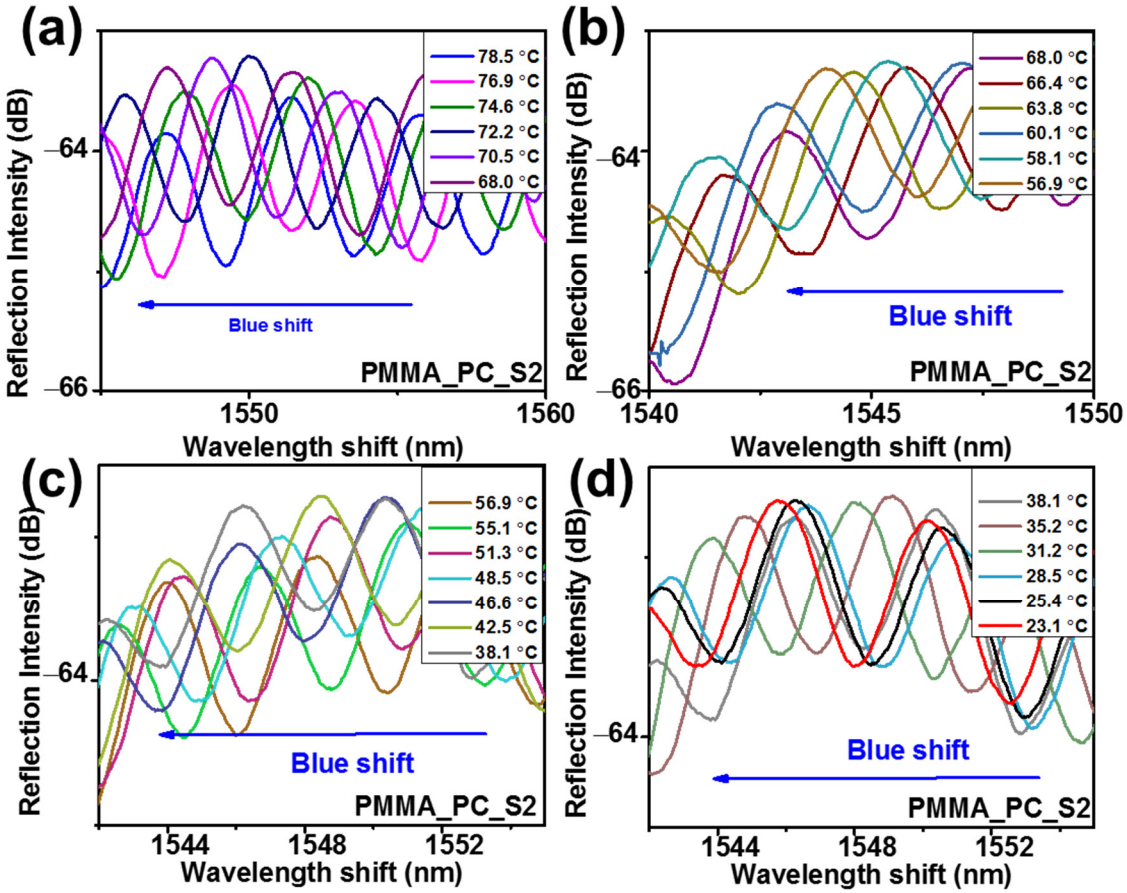

Figure S3. Reflected spectra with decrease in temperature for PMMA_ PC_S2 DPFPI

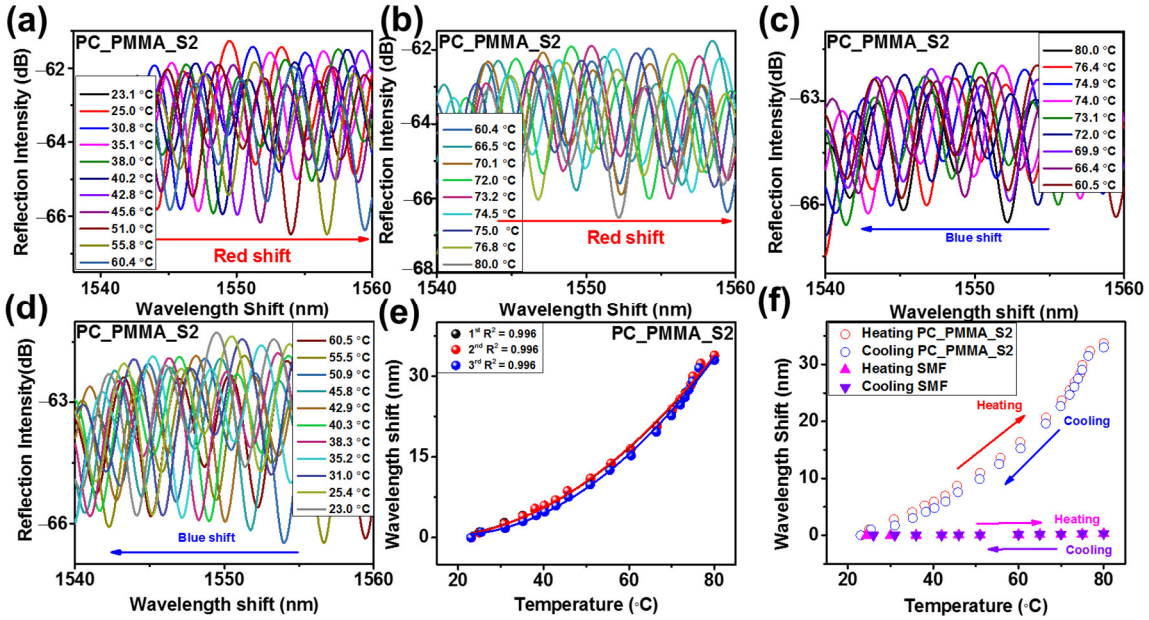

Figure S4. Reflected spectra with increase in temperature (a-b), with decrease in temperature (c-d), wavelength shift for 3 measurements (e), and (f) average wavelength shift associated with SMF for PC_PMMA_S2 DPFPI

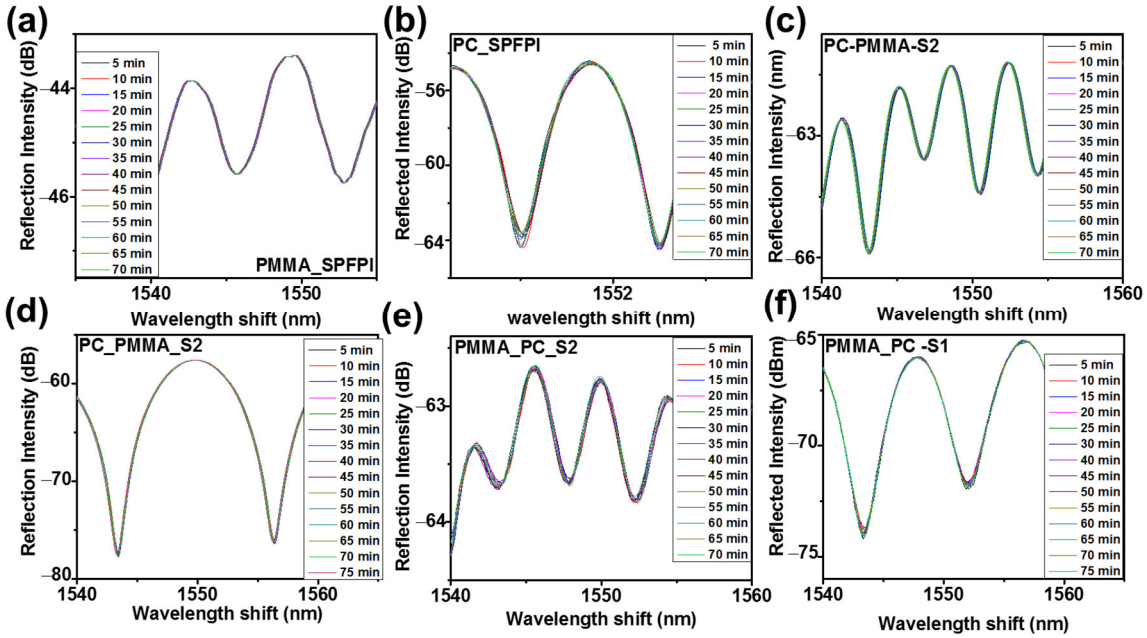

Figure S5. Wavelength of spectral dip response at a constant temperature and at various time intervals of (a) PMMA_SPFPI, (b) PC_SPFPI, (c)PC_PMMA_S1, (d)PC_PMMA_S2, (e) PMMA_PC_S1 and PMMA_PC_S2.

Table S1. The comparison of optical fiber temperature sensors.

Type of fiber	Polymer	T(°C)	Sensitivity (pm °C^{-1})	Method	Ref
Single mode + Hollow core fiber	polydimethylsiloxane	51-70.5	2703.5	Expensive method, poor reproducibility, requires expensive techniques, complex method	[1]
Fabry–Perot Interferometer	Polycarbonate	20-140	245.4	Low sensitivity,	[2]
Microfiber mode interferometer	polydimethylsiloxane	20-48	3101.7	Requires expensive techniques,	[3]
Fabry–Perot Interferometer	Polystyrene	25-100	439.89	Low sensitivity,	[4]
Fabry–Perot Interferometer	step-curing ultraviolet photoresist and polydimethylsiloxane	20-75	689.68	Low sensitivity, UV curing method needed for coating	[5]
Fiber Fizeau interferometer	Norland Optic Adhesive-61	10-50	269.5	Narrow operation temperature range, UV curing method needed for coating polymer	[6]
Fiber Bragg grating	gold-coated shallow-tapered chirped	30-80	9.893	CO_2 laser splicing system, gold layer sputtering, optical backscatter reflectometer interrogator	[7]

Ultra-long period fiber grating + graded index multimode fiber	doping of germanium	30-150	90.77	Splicing by arc discharge, fusion splicer	[8]
Fiber Bragg grating +Single mode +Multimode Fiber	_	0-900	13.4	Femtosecond laser inscription, fusion splicer	[9]
Fabry–Perot Interferometer	Poly (vinyl chloride)	25-60	366.0	Plastic welder used for coating, low sensitivity	[10]
Fabry–Perot Interferometer	PMMA_PS	24.4-80	785.5	Simple dip coating, high sensitivity	[11]
Fabry–Perot Interferometer	polyvinyl alcohol	25-100	~193.3	Low sensitivity, Stepper motor needed for coating	[12]
Fabry–Perot Interferometer	PC_PMMA-S1	25-80	1238.7	Simple dip coating, high sensitivity reproducibility	**This work**

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