

**Novel Programmable Shape Memory Polystyrene Film: A  
Thermally Induced Beam-power Splitter  
(Supplementary Information)**

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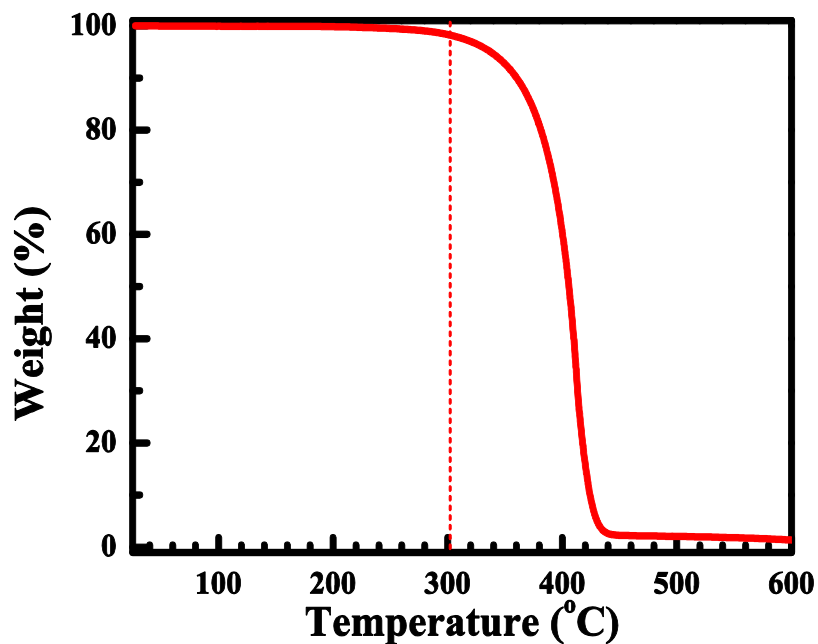
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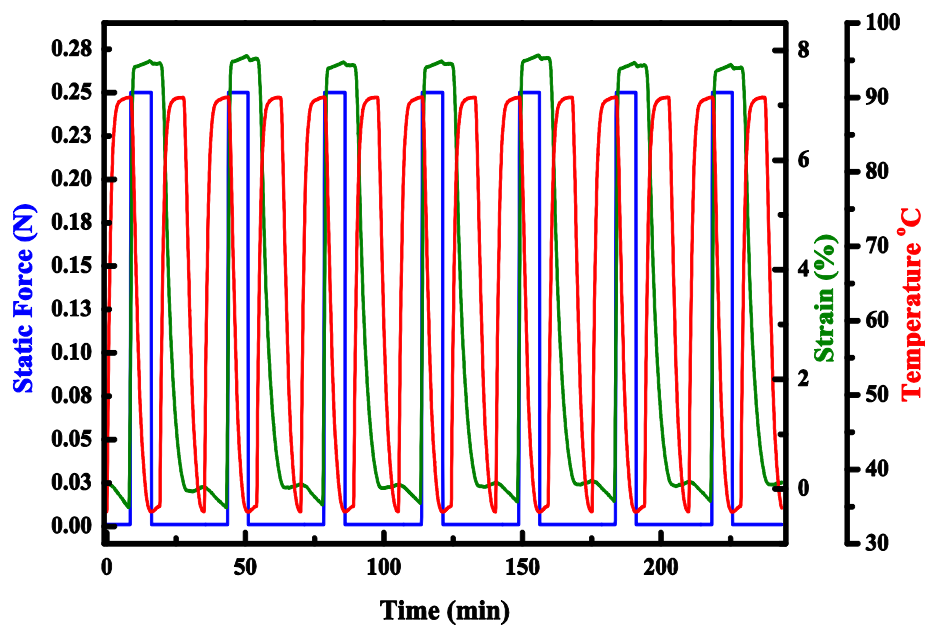
Here, for additional clarification, we provide more detailed discussions and further  
data for which there was no space in the main text of our manuscript.

### Thermal Gravimetric Analysis (TGA)



**Figure S1.** The thermal gravimetric analysis (TGA) curve of the polystyrene based shape memory polymer sample.

### Dynamic Mechanical Analysis



**Figure S2.** Stress-controlled cyclic thermo-mechanical testing curves of the polystyrene based shape memory polymer sample.

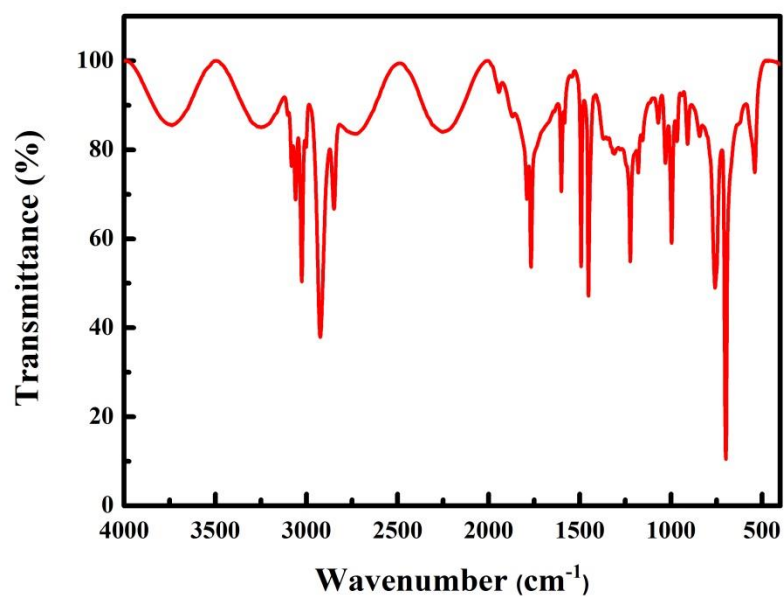


Figure S3. FTIR spectra of styrene-based SMP film

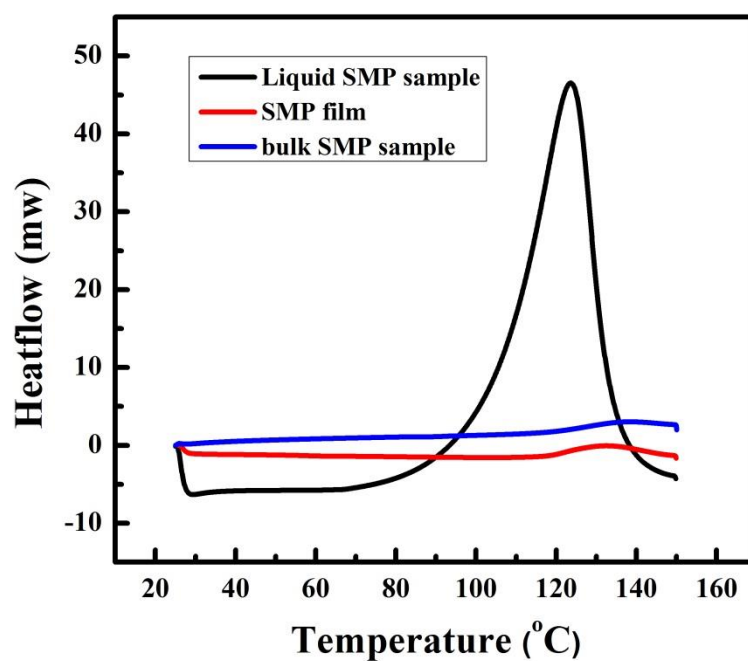


Figure S4. Engineering stress-strain curves of SMP samples

## **Supplementary Movies:**

### **Supporting Movie S1:**

The switchable variation in the diffraction pattern distributions of the SMP samples during the reheating process from the original beam to a different single direction.

### **Supporting Movie S2:**

The switchable variation in the diffraction pattern distributions of the SMP samples during the reheating process from two directions to the original beam.

### **Supporting Movie S3:**

The switchable variation in the diffraction pattern distributions of the SMP samples during the reheating process from two directions to one direction.