Supplementary Materials

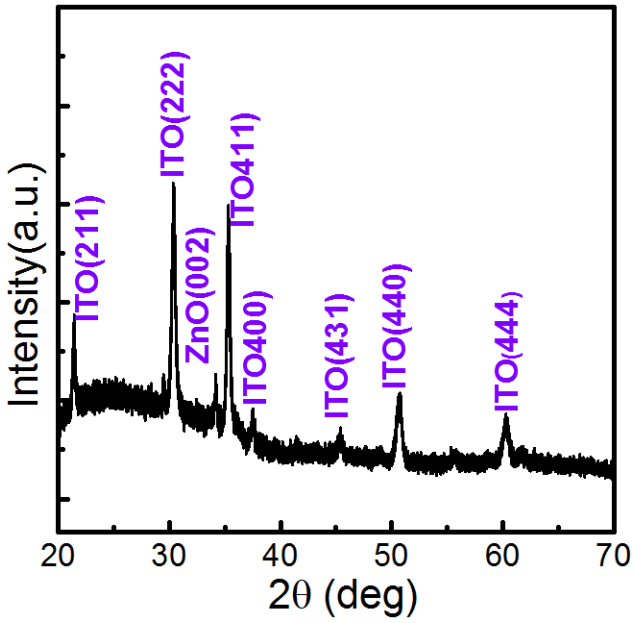

Figure S1. XRD pattern of ZnO/ITO/glass structure

Section S1. LTspice Codes

According to the mathematical model and the *I-V* characteristic data obtained from the experiment, optimizing parameters were obtained, and the LTspice code of memristor in this work can be listed as follows:

```
// TE: Top electrode      BE: Bottom electrode
.subckt MEM_LAIHO_WINDOW TE BE
.param a1=3e-5 b1=2 a2=0.25e-5 b2=2 c1=8.15e-3 d1=2.73
  +c2=0.6e-4 d2=3.8 x0=0.01 p=1 t=1
.func IVRel(V1,V2) = IF(V1>=0,a1*V2*sinh(b1*V1),a2*V2*sinh(b2*V1)) // Hyperbolic sine IV relationship
.func SV(V1) = IF(V1>=0,c1*sinh(d1*V1),c2*sinh(d2*V1)) // Equation for state variable
.func f(V2) = t*(1-pow((pow((V2-0.5),2)+0.75),p)) // Prodromakis window function
Gmem TE BE value = {IVRel(V(TE,BE),V(XSV,0))} // Current source representing memristor
Gxsv 0 XSV value = {SV(V(TE,BE))*f(V(XSV,0))} //Circuit to determine value of state variable
Cx XSV 0 {1}
.ic V(XSV) = x0
.end MEM_LAIHO_WINDOW
```