What is claimed is:

1. A semiconductor processing adhesive tape comprising a base, a buffer layer provided at least on one surface of the base, and an adhesive layer provided on an other surface of the base, wherein

a Young's modulus at 23°C of the buffer layer is 10 to 63 MPa and a breaking energy at 23°C of the buffer layer is 1 to 9 MJ/m^3, and

a Young's modulus at 23°C of the base is larger than the Young's modulus at 23°C of the buffer layer.

2. The semiconductor processing adhesive tape according to claim 1, wherein a Young's modulus at 23°C of the base is 1000 MPa or more.

3. The semiconductor processing adhesive tape according to claim 1 or 2, wherein the buffer layer is a cured product of a buffer layer forming composition including an energy ray polymerizable compound.

4. The semiconductor processing adhesive tape according to any one of claims 1 to 3, wherein a thickness of the adhesive layer is less than 100 μm.

5. A method for producing a semiconductor device including steps of;

cutting the semiconductor processing adhesive tape according to any one of claims 1 to 4 along an outer circumference of a semiconductor wafer which is adhered with the semiconductor processing adhesive tape;

forming a groove from a front surface side of the semiconductor wafer or forming a modified region inside the semiconductor wafer from the front surface or a back surface of the semiconductor wafer;

dicing the semiconductor wafer, of which the adhesive tape is adhered on the front surface and the groove or the modified region is formed, using the groove or the modified region as a starting point for forming a plurality of chips by grinding from the back surface; and

releasing the semiconductor processing adhesive tape from the plurality of chips.