CLAIMS

What is claimed is:

1. An acoustic wave device comprising:

a substrate;

a piezoelectric film formed on the substrate;

a lower electrode provided on a first surface of the piezoelectric film;

an upper electrode provided on a second surface of the piezoelectric film opposite to the first surface; and

a mass loading film having a first pattern and a second pattern in a resonance portion in which the lower electrode and the upper electrode face each other through the piezoelectric film,

the first pattern having portions, which are arranged with spaces apart, and the second pattern having portions interlinking the portions of the first pattern,

wherein the portions of the second pattern have a width smaller than that of the portions of the first pattern,

wherein the first pattern and the second pattern in the resonance portion are defined by a single pattern, and a complementary pattern of the first pattern and the second pattern in the resonance portion are defined by a single pattern, and

adjacent portions of the first pattern among the portions of the first pattern are interlinked by one of the portions of the second pattern.

2. The acoustic wave device according to claim 1, wherein the portions of the first pattern are arranged regularly.

3. The acoustic wave device according to claim 1 or 2, wherein the portions of the first pattern have an identical shape.

4. The acoustic wave device according to any one of claims 1 to 3, wherein the portions of the second pattern have an identical width.

5. The acoustic wave device according to any one of claims 1 to 4, wherein

the first pattern and the second pattern are defined by the mass loading film.

6. The acoustic wave device according to any one of claims 1 to 4, wherein the first pattern and the second pattern are defined by openings formed in the mass loading film.

7. The acoustic wave device according to any one of claims 1 to 6, wherein the mass loading film is made of a material different from that of the lower electrode or the upper electrode.

8. The acoustic wave device according to any one of claims 1 to 7, wherein the mass loading film includes films, each of which has the first pattern and the second pattern.

9. The acoustic wave device according to any one of claims 1 to 8, wherein the lower electrode is formed so as to define a dome-shaped cavity between the lower electrode and the substrate.

10. A filter comprising an acoustic wave device according to any one of claims 1 to 9.

11. The filter according to claim 10, wherein the acoustic wave device includes a plurality of resonators, and at least two of the plurality of resonators have different occupying ratios of the first pattern and the second pattern to the resonance portion.

12. The filter according to claim 11, wherein the at least two of the plurality of resonators have an identical thickness of the mass loading film.

CLAIMS

What is claimed is:

1. An acoustic wave device comprising:

a substrate;

a piezoelectric film formed on the substrate;

an lower electrode provided on a first surface of the piezoelectric film;

an upper electrode provided on a second surface of the piezoelectric film opposite to the first surface; and

a mass loading film having a first pattern and a second pattern in a resonance portion in which the lower electrode and the upper electrode face each other through the piezoelectric film,

the first pattern having portions and the second pattern having portions interlinking the portions of the first pattern.

2. The acoustic wave device according to claim 1, wherein the portions of the second pattern has a width smaller than that of the portions of the first pattern.

3. The acoustic wave device according to claim 1, wherein the portions of the first pattern are arranged regularly.

4. The acoustic wave device according to claim 1, wherein the portions of the first pattern have an identical shape.

5. The acoustic wave device according to claim 1, wherein the portions of the second pattern have an identical width.

6. The acoustic wave device according to claim 1, wherein the first pattern and the second pattern are defined by the mass loading film.

7. The acoustic wave device according to claim 1, wherein the first pattern and the second pattern are defined by openings formed in the mass loading film.

8. The acoustic wave device according to claim 1, wherein the mass loading film is made of a material different from that of the lower electrode or the upper electrode.

9. The acoustic wave device according to claim 1, wherein the mass loading film includes films, each of which has the first pattern and the second pattern.

10. The acoustic wave device according to claim 1, wherein the lower electrode is formed so as to define a dome-shaped cavity between the lower electrode and the substrate.

11. A filter comprising an acoustic wave device including:

a substrate;

a piezoelectric film formed on the substrate;

an lower electrode provided on a first surface of the piezoelectric film;

an upper electrode provided on a second surface of the piezoelectric film opposite to the

first surface; and

a mass loading film having a first pattern and a second pattern in a resonance portion in which the lower electrode and the upper electrode face each other through the piezoelectric film,

the first pattern having portions and the second pattern having portions interlinking the portions of the first pattern.

12. The filter according to claim 11, wherein the acoustic wave device includes a plurality of resonators, and at least two of the plurality of resonators have different occupying ratios of the first pattern and the second pattern to the resonance portion

13. The filter according to claim 12, wherein the at least two of the plurality of resonators have an identical thickness of the mass loading film.