CLAIMS

What is claimed is:

1. An acoustic wave filter comprising:

at least a parallel resonator, wherein

at least one of the parallel resonator includes a first piezoelectric substance, a first IDT (Interdigital Transducer) located on the first piezoelectric substance, and first reflectors located on the first piezoelectric substance so as to sandwich the IDT, and

G is less than 0 and greater than or equal to $-0.05\lambda_{IDT}$ where $D1=0.25(\lambda_{ref}+\lambda_{IDT})+G$, a distance between a center of a first electrode finger that is an electrode finger closest to the first reflector among electrode fingers of the first IDT and a center of a second electrode finger that is an electrode finger closest to the first IDT among electrode fingers of the first reflector is D1, a period of the electrode fingers of the first IDT is λ_{IDT}, and a period of the electrode fingers of the first reflector is λ_{ref}.

2. The acoustic wave filter according to claim 1, further comprising:

a series resonator coupled to the parallel resonator.

3. The acoustic wave filter according to claim 1, wherein

$\Delta\lambda$ is less than 0 and equal to or greater than -1, where $\Delta\lambda=100(\lambda_{ref}-\lambda_{IDT})/\lambda_{IDT}$.

4. The acoustic wave filter according to claim 1, wherein

the first electrode finger is narrower than the electrode finger of the first IDT other than the first electrode finger.

5. The acoustic wave filter according to claim 1, wherein

the second electrode finger is narrower than the electrode finger of the first reflector other than the second electrode finger.

6. The acoustic wave filter according to claim 1, wherein

the distance between the center of the first electrode finger and the center of the second electrode finger is less than $0.24375(\lambda_{IDT}+\lambda_{ref})$.

7. The acoustic wave filter according to claim 1, further comprising:

a multimode filter coupled to the parallel resonator.

8. A duplexer comprising:

the acoustic wave filter according to claim 1.

9. A module comprising:

the acoustic wave filter according to claim 1.

10. The acoustic wave filter according to claim 2, wherein:

the at least a parallel resonator is connected in parallel between an input terminal and an output terminal;

the series resonator is connected in series between the input terminal and the output terminal;

the series resonator includes a second piezoelectric substance, a second IDT located on the second piezoelectric substance, and a second reflectors located on the second piezoelectric

substance so as to sandwich the second IDT, and

G2 is greater than or equal to 0, where $D2=0.25(\lambda_{ref2}+\lambda_{IDT2})+G2$ a distance between a center of a third electrode finger that is an electrode finger closest to the second reflector among electrode fingers of the second IDT and a center of a fourth electrode finger that is an electrode finger closest to the second IDT among electrode fingers of the second reflector is D2, a period of the electrode fingers of the second IDT is λ_{IDT2}, and a period of the electrode fingers of the second reflector is λ_{ref2}.

11. An acoustic wave filter comprising:

at least a parallel resonator, wherein

at least one of the parallel resonator includes a first piezoelectric substance, a first IDT located on the first piezoelectric substance, and first reflectors located on the first piezoelectric substance so as to sandwich the first IDT, and

$\Delta\lambda$ is less than 0 and greater than -1 or equal to -1, where $\Delta\lambda=100(\lambda_{ref}-\lambda_{IDT})/\lambda_{IDT}$, a period of electrode fingers of the first IDT is λ_{IDT}, and a period of electrode fingers of the first reflector is λ_{ref}.

12. A duplexer comprising:

the acoustic wave filter according to claim 11.

13. A module comprising:

the acoustic wave filter according to claim 11.

14. The acoustic wave filter according to claim 11, further comprising a series

resonator is connected in series between an input terminal and an output terminal;

wherein:

the at least a parallel resonator is connected in parallel between the input terminal and the output terminal;

the series resonator includes a second piezoelectric substance, a second IDT located on the second piezoelectric substance, and second reflectors located on the second piezoelectric substance so as to sandwich the second IDT, and

$\Delta\lambda 2$ is greater than or equal to 0, where $\Delta\lambda 2=100(\lambda_{ref2}-\lambda_{IDT2})/\lambda_{IDT2}$, a period of electrode fingers of the second IDT is λ_{IDT2}, and a period of electrode fingers of the second reflector is λ_{ref2}.

CLAIMS

What is claimed is:

1. An acoustic wave filter comprising:

at least a parallel resonator, wherein

at least one of the parallel resonator includes a piezoelectric substance, an IDT (Interdigital Transducer) located on the piezoelectric substance, and reflectors located on the piezoelectric substance so as to sandwich the IDT, and

a distance between a first electrode finger that is an electrode finger closest to the reflector among electrode fingers of the IDT and a second electrode finger that is an electrode finger closest to the IDT among electrode fingers of the reflector is less than $0.25(\lambda_{IDT}+\lambda_{ref})$ where a period of the electrode fingers of the IDT is λ_{IDT} and a period of the electrode fingers of the reflector is λ_{ref}.

2. The acoustic wave filter according to claim 1, further comprising:

a series resonator coupled to the parallel resonator.

3. The acoustic wave filter according to claim 1 or 2, wherein

λ_{IDT} is greater than λ_{ref}.

4. The acoustic wave filter according to any one of claims 1 through 3, wherein

the first electrode finger is narrower than the electrode finger of the IDT other than the first electrode finger.

5. The acoustic wave filter according to any one of claims 1 through 4, wherein the second electrode finger is narrower than the electrode finger of the reflector other than the second electrode finger.

6. The acoustic wave filter according to any one of claims 1 through 5, wherein the distance between the first electrode finger and the second electrode finger is less than $0.24375(\lambda_{IDT}+\lambda_{ref})$.

7. The acoustic wave filter according to any one of claims 1 through 6, further comprising:

a multimode filter coupled to the parallel resonator.

8. An acoustic wave filter comprising:

at least a parallel resonator, wherein

at least one of the parallel resonator includes a piezoelectric substance, an IDT located on the piezoelectric substance, and reflectors located on the piezoelectric substance so as to sandwich the IDT, and

λ_{IDT} is greater than λ_{ref} where a period of electrode fingers of the IDT is λ_{IDT} and a period of electrode fingers of the reflector is λ_{ref}.

9. The acoustic wave filter according to claim 8, wherein

$100\times(\lambda_{ref}-\lambda_{IDT})/\lambda_{IDT}$ is less than -0.25%.

10. A duplexer comprising:

the acoustic wave filter according to any one of claims 1 through 9.

11. A module comprising:

the acoustic wave filter according to any one of claims 1 through 9.