Claims

What is claimed is:

1. A method for manufacturing a passive waveguide component, comprising:

~~receiving a design for the passive waveguide component;~~

creating a design mold for the passive waveguide component using a three-dimensional printer;

receiving the design mold;

receiving a non-conductive material;

fabricating a non-conductive structure of the passive waveguide component using a plastic injection molding process, the fabricating the non-conductive structure being based on the design mold, wherein the non-conductive structure comprises the non-conductive material; and

forming a conductive layer on an exposed surface of at least one non-conductive structural feature of the non-conductive structure to create an electrical feature of the passive waveguide ~~components~~ component.

~~2. The method of claim 1, wherein fabricating the non-conductive structure based on the design comprises fabricating the non-conductive structure using three-dimensional printing or plastic injection molding.~~

2.~~3.~~ The method of claim 1, wherein the non-conductive material comprises plastic, ceramic, or wood.

3.~~4.~~ The method of claim 1, wherein forming the conductive layer on the exposed surface of the at least one non-conductive structural feature of the non-conductive structure comprises plating the exposed surface with a conductive material.

4.~~5.~~ The method of claim 1, further comprising trimming or polishing the non-conductive structure or the conductive layer.

5.~~6.~~ The method of claim 1, wherein the conductive layer comprises copper or silver.

~~7. The method of claim 1, wherein the conductive layer has a thickness that enables the electrical feature of the passive waveguide component to function within an accepted parameter.~~

6.~~8.~~ The method of claim 1, further comprising cleaning the non-conductive structure to remove debris left behind by fabrication.

~~9. The method of claim 1, further comprising:~~

~~identifying, in the design, a first structural feature of the passive waveguide component that is not implementable as a non-conductive structural feature of the non-conductive structure; and~~

~~modifying, in the design, the first structural feature to a second structural feature, wherein the second structural feature is implementable as a non-conductive structural feature of the non-conductive structure.~~

7.~~10.~~ The method of claim 1, further comprising:

identifying, in the design mold, a plane through the passive waveguide component along which the passive waveguide component may be split into a plurality of separate structural features, wherein the plurality of separate structural features is adapted for fabrication as a plurality of separate non-conductive structural features of the non-conductive structure and wherein the plurality of separate structural features is adapted for receiving the conductive layer; and

splitting, in the design mold, the passive waveguide component along the plane, thereby resulting in the plurality of separate structural features.

8.~~11.~~ The method of claim ~~10~~ 7, wherein fabricating the non-conductive structure based on the design mold comprises fabricating the plurality of separate structural features of the passive waveguide component as the plurality of separate non-conductive structural features of the non-conductive structure.

9.~~12.~~ The method of claim ~~12~~ 8, further comprising assembling the plurality of separate non-conductive structural features of the non-conductive structure.

10.~~13.~~ The method of claim ~~10~~ 7, wherein the plane is an E-plane of the passive waveguide component or an H-plane of the passive waveguide component.

11.~~14.~~ The method of claim 1, wherein the passive waveguide component is a waveguide filter, a waveguide diplexer, a waveguide multiplexer, a waveguide bend, a waveguide transition, a waveguide spacer, or an antenna adapter.

~~15. The method of claim 1, further comprising:~~

~~measuring performance of the electrical feature of the passive waveguide component; and~~

~~modifying the design of the passive waveguide component based on the performance measured.~~

12.~~16.~~ A waveguide manufactured by the steps of:

~~receiving a design for the waveguide;~~

creating a design mold for the waveguide using a three-dimensional printer;

receiving the design mold;

receiving a non-conductive material;

fabricating a non-conductive structure of the waveguide ~~component~~ using a plastic injection molding process, the fabricating the non-conductive structure being based on the design mold, wherein the non-conductive structure comprises the non-conductive material; and

forming a conductive layer on an exposed surface of at least one non-conductive structural feature of the non-conductive structure to create an electrical feature of the waveguide.

~~17. The waveguide of claim 16, wherein fabricating the non-conductive structure based on the design comprises fabricating the non-conductive structure using three-dimensional printing or plastic injection molding.~~

13.~~18.~~ The waveguide of claim ~~16~~ 12, wherein the non-conductive material comprises plastic, ceramic, or wood.

14.~~19.~~ The waveguide of claim ~~16~~ 12, wherein forming the conductive layer on the exposed surface of the at least one non-conductive structural feature of the non-conductive structure comprises plating the exposed surface with a conductive material.

15.~~20.~~ The waveguide of claim ~~16~~ 12, ~~further comprising~~ wherein the waveguide is manufactured by the additional step of trimming or polishing the non-conductive structure or the conductive layer.

16.~~21.~~ The waveguide of claim ~~16~~ 12, wherein the conductive layer comprises copper or silver.

~~22. The waveguide of claim 16, wherein the conductive layer has a thickness that enables the electrical feature of the waveguide to function within an accepted parameter.~~

17.~~23.~~ The waveguide of claim ~~16~~ 12, ~~further comprising~~ wherein the waveguide is manufactured by the additional step of cleaning the non-conductive structure to remove debris left behind by fabrication.

18.~~24.~~ The waveguide of claim ~~16~~ 12, wherein the waveguide is manufactured by the additional step of identifying, in the design mold, a plane through the at least one non-conductive structural feature, wherein the plane is an E-plane of the waveguide or an H-plane of the waveguide.

19.~~25.~~ A passive waveguide diplexer manufactured by the steps of:

~~receiving a design for the passive waveguide component;~~

creating a design mold for the passive waveguide diplexer using a three-dimensional printer;

receiving the design mold;

identifying, in the design mold, a plane through the passive waveguide diplexer along which the passive waveguide diplexer may be split into a plurality of separate structural features;

splitting, in the design mold, the passive waveguide diplexer along the plane, thereby resulting in the plurality of separate structural features;

receiving a non-conductive material;

fabricating, using a plastic injection molding process, the plurality of separate structural features of the passive waveguide diplexer as a plurality of separate non-conductive structural features of ~~the~~ a non-conductive structure; and

forming a conductive layer on an exposed surface of at least one of the plurality of separate non-conductive structural features to create an electrical feature of the passive waveguide diplexer.

~~26. The passive waveguide diplexer of claim 25, wherein fabricating the plurality of separate structural features as the plurality of separate non-conductive structural features comprises fabricating each of the plurality of separate structural features using three-dimensional printing or plastic injection molding.~~

20.~~27.~~ The passive waveguide diplexer of claim ~~25~~ 19, wherein the non-conductive material comprises plastic, ceramic, or wood.

21.~~28.~~ The passive waveguide diplexer of claim ~~25~~ 19, wherein forming the conductive layer on the exposed surface of the at least one of the plurality of separate non-conductive structural features comprises plating the exposed surface with a conductive material.

22.~~29.~~ The passive waveguide diplexer of claim ~~25~~ 19, ~~further comprising~~ wherein the passive waveguide diplexer is manufactured by the additional step of trimming or polishing at least one of the plurality of separate non-conductive structural features, or trimming or polishing the conductive layer.

23.~~30.~~ The passive waveguide diplexer of claim ~~25~~ 19, wherein the conductive layer comprises copper or silver.

~~31. The passive waveguide diplexer of claim 25, wherein the conductive layer has a thickness that enables the electrical feature of the passive waveguide diplexer to function within an accepted parameter.~~

24.~~32.~~ The passive waveguide diplexer of claim ~~25~~ 19, ~~further comprising~~ wherein the passive waveguide diplexer is manufactured by the additional step of cleaning the passive waveguide ~~component~~ diplexer to remove debris left behind by fabrication.

25.~~33.~~ The passive waveguide diplexer of claim ~~17~~ 19, wherein the plane is an E-plane of the passive waveguide diplexer or an H-plane of the passive waveguide diplexer.

26. The waveguide of claim 12, wherein the waveguide is manufactured by the additional steps of:

identifying, in the design mold, a first structural feature of the waveguide that is not implementable as a non-conductive structural feature of the non-conductive structure; and

modifying, in the design mold, the first structural feature to a second structural feature, wherein the second structural feature is implementable as a non-conductive structural feature of the non-conductive structure.

27. The waveguide of claim 12, wherein the waveguide is manufactured by the additional steps of:

identifying, in the design mold, a plane through the waveguide along which the waveguide may be split into a plurality of separate structural features, wherein the plurality of separate structural features is adapted for fabrication as a plurality of separate non-conductive structural features of the non-conductive structure and wherein the plurality of separate structural features is adapted for receiving the conductive layer; and

splitting, in the design mold, waveguide along the plane, thereby resulting in the plurality of separate structural features.

28. The waveguide of claim 27, wherein fabricating the non-conductive structure based on the design mold comprises fabricating the plurality of separate structural features of the waveguide as the plurality of separate non-conductive structural features of the non-conductive structure.

29. The waveguide of claim 28, wherein the waveguide is manufactured by the additional step of assembling the plurality of separate non-conductive structural features of the non-conductive structure.

30. The waveguide of claim 12, wherein the waveguide comprises a waveguide filter, a waveguide diplexer, a waveguide multiplexer, a waveguide bend, a waveguide transition, a waveguide spacer, or an antenna adapter.

31. The waveguide of claim 12, wherein the waveguide is manufactured by the additional steps of:

measuring performance of the electrical feature of the waveguide; and

modifying the design mold for the waveguide based on the performance.