CLAIMS

1. A lead-free solder alloy comprising:
   3.1 to 3.8 wt. % silver;
   0.5 to 0.9 wt. % copper;
   0.0 to 3.2 wt. % bismuth;
   0.03 to 0.2 wt. % cobalt;
   0.005 to 0.02 wt. % titanium;
   1.0 to 3.0 wt. % antimony and
   balance tin, together with any unavoidable impurities.

2. The lead-free solder alloy of claim 1, further comprising 0.01 to 0.1 wt. % nickel.

3. The lead-free solder alloy of claim 2, comprising 0.05 wt. % nickel.

4. The lead-free solder alloy of claim 1, comprising 3.8 wt. % silver.

5. The lead-free solder alloy of claim 1, comprising either 0.7 or 0.8 wt. % copper.

6. The lead-free solder alloy of claim 1, comprising 1.5 to 3.2 wt. % bismuth.

7. The lead-free solder alloy of claim 6, comprising 1.5 wt. % bismuth.

8. The lead-free solder alloy of claim 6, comprising 3.0 wt. % bismuth.

9. The lead-free solder alloy of claim 1, comprising 0.03 to 0.05 wt. % cobalt.

10. The lead-free solder alloy of claim 9, comprising 0.05 wt. % cobalt.

11. The lead-free solder alloy of claim 1, comprising 0.008 wt. % titanium.

12. The lead-free solder alloy of claim 1, comprising 1.0 wt. % antimony.

13. The lead-free solder alloy of claim 1, comprising 1.5 wt. % antimony.