CLAIMS

1. A lead-free, silver-free solder alloy comprising:
0.6 to 0.8 wt. % copper;
1.2 to 1.8 wt. % bismuth;
0.04 to 0.06 wt. % cobalt;
0.02 to 0.08 wt. % antimony; and
~~optionally 0.004 to 0.008 wt. % germanium,~~
~~0.03 to 0.07 wt. % nickel, and~~
balance tin, together with any unavoidable impurities.

2. The lead-free, silver-free solder alloy of claim 1, further comprising 0.001 to 0.01 wt. % germanium.

3. The lead-free, silver-free solder alloy of claim 2, comprising 0.004 to 0.008 wt. % germanium.

~~3~~4. The lead-free, silver-free solder alloy of claim 2, comprising 0.006 wt. % germanium.

~~4~~5. The lead-free, silver-free solder alloy of claim 1, further comprising 0.01 to 0.1 wt. % nickel.

6. The lead-free, silver-free solder alloy of claim 5, comprising 0.03 to 0.07 wt. % nickel.

~~5~~7. The lead-free, silver-free solder alloy of claim ~~4~~5, comprising 0.05 wt. % nickel.

~~6~~8. The lead-free, silver-free solder alloy of claim 1, comprising 0.7 wt. % copper.

~~7. The lead-free, silver-free solder alloy of claim 1 , comprising 1 .2 to 1 .8 wt. % bismuth.~~

~~8~~9. The lead-free, silver-free solder alloy of claim ~~7~~1, comprising 1.5 wt. % bismuth.

~~9~~10. The lead-free, silver-free solder alloy of claim 1, comprising 0.05 wt. % cobalt.

~~10~~11. The lead-free, silver-free solder alloy of claim 1, comprising 0.05 wt. % antimony.