CLAIMS:

1. An enclosure for an integrated circuit (IC) assembly, the enclosure comprising:

a composite lid structure having a body portion, and a side portion that extends from the body portion and forms a cavity configured to house the IC assembly, wherein the body portion and the side portion share a contiguous interior material comprising a polymer and share a contiguous exterior material comprising a metal, the contiguous interior material having an opening formed in the body portion such that the IC assembly is thermally coupled with the contiguous exterior material through the opening.

2. The enclosure of claim 1, wherein the IC assembly includes heat-generating elements of a solid-state drive (SSD).

3. The enclosure of claim 1, wherein the opening is one of multiple openings formed in the body portion such that the IC assembly can be thermally coupled with the contiguous exterior material through the multiple openings.

4. The enclosure of claim 1, wherein the polymer is selected from a group consisting of ABS (Acrylonitrile Butadiene Styrene), ABS +PC (ABS +Polycarbonate), Acetal (POM), Acrylic (PMMA), LCP (Liquid Crystal Polymer), PA-Nylon 6 (Polyamide), PA-Nylon 6/6 (Polyamide), PA-Nylon 11 (Polyamide), PBT (Polybutylene Terepthalate), PC (Polycarbonate), PEI (Polyetherimide), PE (Polyethylene), LDPE (Low Density Polyethylene), HDPE (High Density Polyethylene), PET (Polyethylene Terepthalate), PP (Polypropylene), PPA (Polyphthalamide), PPS (Polyphenylene Sulfide), PS (Polystyrene), HIPS (High Impact Polystyrene), PSU (Polysulfone), PU (Polyurethane), PVC (Polyvinylchloride), PVDF (Polyvinylidene Fluoride), SAN (Styrene Acrylonitrile), TPE (Thermoplastic Elastomer) and TPU (Thermoplastic Polyurethane).

5. The enclosure of claim 1, wherein the metal is selected from a group consisting of aluminum (Al), iron (Fe), titanium (Ti), copper (Cu), nickel (Ni), magnesium (Mg), stainless steel and Inconel.

6. The enclosure of claim 1, further comprising: a primer material disposed between the contiguous interior material and the contiguous exterior material to promote adhesion between the contiguous interior material and the contiguous exterior material.

7. The enclosure of claim 6, wherein the primer material comprises a polymer or nano-structured metal oxide.

8. The enclosure of claim 1, further comprising: a base structure configured to couple with the molded lid structure such that the cavity is disposed between the base structure and the molded lid structure when the base structure is coupled with the molded lid structure.

9. The enclosure of claim 1, wherein the molded lid structure has a rectangular profile.

10. A solid-state drive (SSD) comprising:

a composite lid structure having a body portion, and a side portion that extends from the body portion and forms a cavity configured to house an integrated circuit (IC) assembly, wherein the body portion and the side portion share a contiguous interior material comprising a polymer and share a contiguous exterior material comprising a metal, the contiguous interior material having an opening formed in the body portion; a base structure coupled with the molded lid structure such that the cavity is disposed between the base structure and the molded lid structure; and the IC assembly being disposed between the base structure and the molded lid structure, wherein the IC assembly is thermally coupled with the contiguous exterior material of the molded lid structure through the opening.

11. The SSD of claim 10, wherein: the opening is one of multiple openings formed in the body portion; and the IC assembly is thermally coupled with the contiguous exterior material through the multiple openings.

12. The SSD of claim 10, further comprising: a primer material disposed between the contiguous interior material and the contiguous exterior material to promote adhesion between the contiguous interior material and the contiguous exterior material.