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(54) **DIRECT ELECTROPLATING ON MODIFIED POLYMER-GRAPHENE COMPOSITES**

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(57) **ABSTRACT**

Embodiments disclosed herein include a package substrate. In an embodiment, the package substrate comprises a core with a via opening through the core. In an embodiment, the via opening comprises sidewalls. In an embodiment, a composite layer is provided along the sidewalls, and the composite layer comprises carbon. In an embodiment, the package substrate further comprises a via within the via opening, where the via is electrically conductive.