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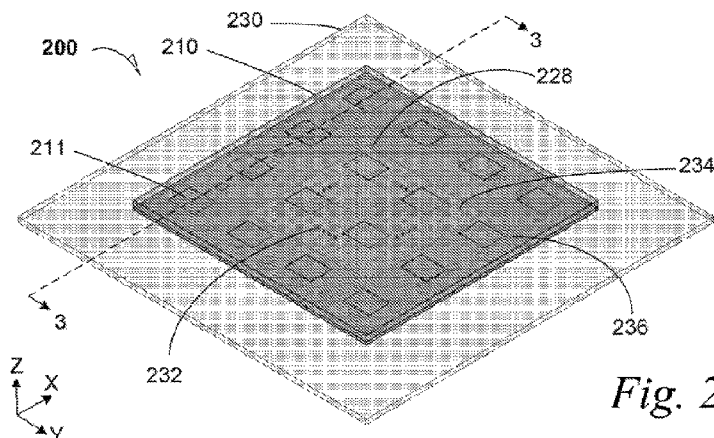


Fig. 2

(57) Abstract: An apparatus includes a die with through-silicon vias and radio frequency integrated circuit capabilities and it is vertically integrated with a phased-array antenna substrate. The through-silicon via and a radio frequency integrated circuit is coupled to a plurality of antenna elements disposed on the phased-array antenna substrate where each of the plurality of antenna elements is coupled to the through-silicon vias and radio frequency integrated circuit through a plurality of through-silicon vias. A process of assembling the through-silicon vias and radio frequency integrated circuit to the phased-array antenna substrate includes testing the apparatus.

