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Design of Enclosure for Antel PicocellPlus Radio Transceiver and Tooling for Its Production

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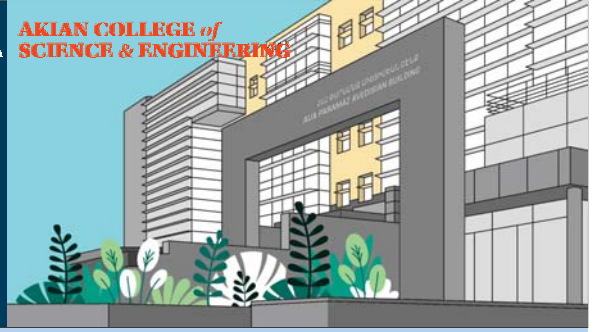
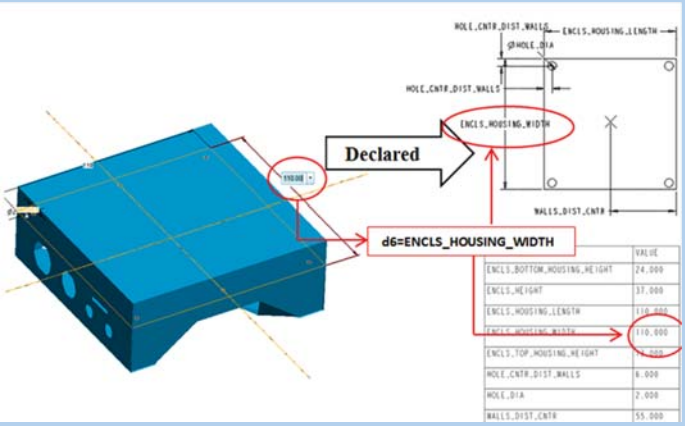
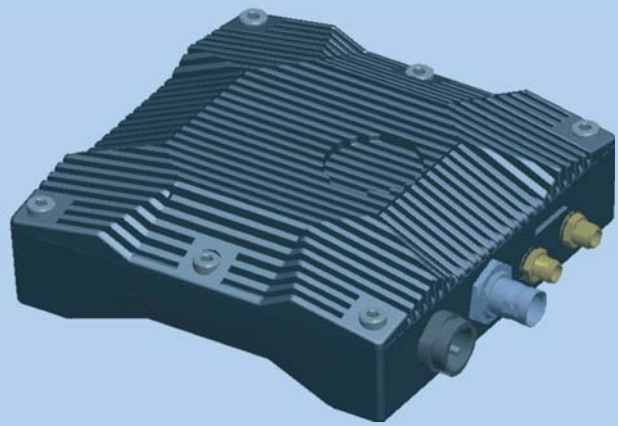


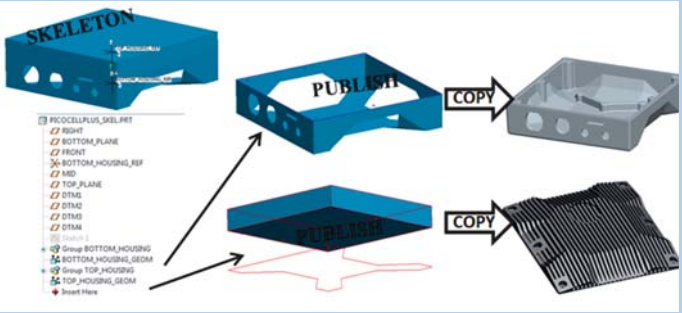
Introduction

Antel PicocellPlus is a high performance 5-Watt transceiver. The problem that the producer faced with the previous design was improper heat dissipation, since the high power amplifier (HPA) was situated near the enclosure wall, and thus, all the heat was accumulated over one side of the enclosure. The main goal of this work was to design a new enclosure for PicocellPlus with improved heat dissipation. Since the company was planning to prepare the product for mass production, another goal of the project was to design a mold for die casting.

Part 1: Design of the transceiver







The Top-Down design technique was used for this project. The design process started from the layout (upper left picture). Layout is an electronic version of the engineer's notebook. It contains sketched geometry, design parameters, tables, and notes. Any component of the model can be linked to the layout to acquire important parameters and dimensions defined there.

Skeletons (lower left picture) are special components of an assembly defining skeletal, space claim and other references used to define the geometry and placement of parts in an assembly. The geometry created in the skeleton can be copied into the components of the product, providing them with the intended design and interface.

The above picture depicts the final assembly of the transceiver.

Part 2: Mold design

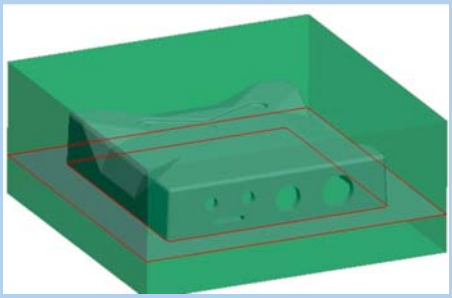
Preparing the model for mold design

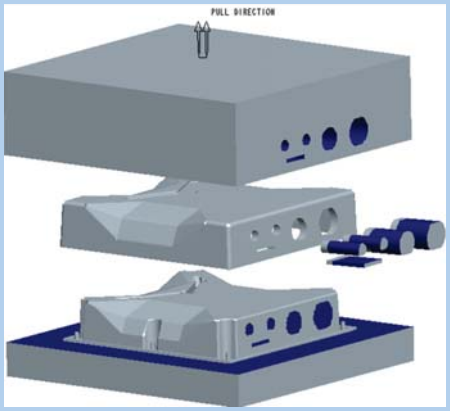
The draft feature facilitates the removal of the part from the mold.

Ribs add strength and rigidity to the molded part.

Shrinkage factor compensates the contraction that occurs in the model during cooling.

Splitting and opening the mold





To model the pieces of the injection mold, rather than creating them from scratch, we can split a workpiece (the green transparent block on the left picture) into one or two volumes. The system then creates mold components resulting from the split as assembly components (picture on the right).