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Semicustom Subsystems Series — Central Office-Class Shelf

The "Semicustom Subsystems" design concept allows the System Designer to concentrate in developing the core aspects of his/her technology. "Farming out" non-core aspects of the design allows a higher degree of parallelism in the product development. Marketing can also benefit by being able to have detail definition of the “Semicustom Subsystems” portion of the product specs very early in the product development process.

Product Description & Target Applications

It consists of the mechanical components of a Central Office class shelf typically used in Telecom and Datacom products. This approach can produce very quickly the mechanical specifications for cards, backplane, connectors and adapters.

Standard & Customizable Features

The design is generally based on cPCI and VME shelf dimensions. The custom adaptations to the basic design result in unique combination of features to fit the exact needs of the System Developer for a shelf with vertically positioned cards. These are some examples of its adaptability:

1) Material: Aluminum or steel.
2) Finishing: Aluminum in several choices (raw, brushed, clear alodine, anodized). Several choices of non-corrosion finishings for steel.
3) Card height: any height from 2 RU to 12 RU
4) Faceplate design: fully custom or off-the-shelf vendor designs, such Elma, Rittal, etc. The faceplates may include features like hot-insertion switches, protected reset push button, etc.
5) Card width: mix and match any card width to a practical maximum of about 16 HP (3.2")
6) Card depth: from 3" to 20", depending on card height.
7) Ventilation options: forced air or natural convection. The chassis may include fan tray and air deflectors.
8) Chassis width: Any width up to the standard 23" telecom sub-rack.
9) Mounting options: rack center mount, rack flush mount, wall mount.
10) I/O options: front access, backplane rear access or direct access to rear of the cards.
11) Low cost: a typical six RU chassis in medium quantities, with local manufacturing will cost between $380 and $900 ea., depending on specific features and configuration.

Customization Process

The customer chooses the mechanical elements that interface the chassis with the outside world (i.e.: connectors, LED's, special mounting brackets, etc.). Optionally, the customer may also specify those components for the boards. Once the customer decides about features and options, our mechanical designers produce the chassis 3-D model and the basic drawings for the electrical boards. These drawings are then used by the customer to design the PCB's. It is also possible to produce realistic electronic models of the finished chassis for Marketing purposes. The chassis prototype design proceeds in parallel and is eventually built and delivered to the customer.

Thermal Simulation

Optionally, thermal simulations are run based on the approximate expected heat generation and airflow resistance of the customer boards. This allows to predict the heat dissipation characteristics and to identify possible hot spots. These analysis can simulate different conditions of heat generation, ambient temperature and altitude over the sea level.

Characterization

The full product characterization is performed after the prototyping. This characterization can be performed with the actual customer cards if available.

Agency Approvals

Since this is a Semi-custom product the approval process needs to be done in a case-by-case basis. Depending on the application and specific configuration, the design will be approvable for NEBS, UL, TUV, CSA, FCC and other leading world agencies. The agency approval process can be handled by ComSysDes or directly by the customer.

Production

The customer can purchase the non-exclusive manufacturing rights and full documentation for this product. Usually we can work with the manufacturing facility of customer' s choice. Alternately, we can provide coordination with the different vendors and act as the customer's agent to deliver turn-key units. The designs are optimized for medium size manufacturing runs, from tens to many hundreds of units. For even larger volumes, additional optimizations are advisable in order to adapt to the machinery and practices of the chosen manufacturing facilities.