Digital Processing - Line Replaceable Unit (DP-LRU)

PRODUCT DESCRIPTION
Digital Processing - Line Replaceable Unit (DP LRU) is used in aerostat for electronic warfare application.

The project involved design, development and validation of the hardware along with qualification. The rugged chassis receives signals from external world through the SMA connectors. QDR board extracts IF data from these RF inputs. This IF data is further processed by RPB and ESMP board. ESMP board send the processed data to external world through Gigabit Ethernet interface. The VPX Controller card is used for health monitoring & control plane communication.

KEY FEATURES
- Rugged conduction cooled chassis
- 14 slot-space VPX-VME hybrid backplane
  - 4 VME (double width), 3 VPX slots, 1 Spare Slot and 2 slots for Power Supply
- Health monitoring (temperature, voltage and interfaces) and reset for
  - VPX Controller Board
  - Receiver Processor Board (RPB)
- Optical transceivers working @ 3.125 Gbps
- XILKERNEL ported on VPX controller board and RPB
- SRIIO and RapidIO for high speed backplane communication @ 3.125 Gbps
- Connector panel board for interfacing backplane signals with external world
  - Withstand harsh test environments
  - Simplify connectorisation and maintenance

SPECIFICATIONS

Hardware Architecture
The hardware consists of forced air conduction cooled chassis with 14 slot-space VME-VPX hybrid backplane which will house the following boards
- VPX Controller Board
- Receiver Processor Board
- Power Supply Distribution Board
- VME TestJig-1 Board designed using Xilinx Virtex-6 LX130T FPGA. This board is designed to emulate Quad Digital Receiver (QDR) board
- VPX TestJig-2 Board designed using Xilinx Virtex-6 LX130T FPGA. This board is designed to emulate ESM Processor Board

In addition to the above boards, the connectors will be interfacing to backplane through a connector panel board.
Interfaces
- 16 SMA connector for RF input
- High speed optical interface @3.125 Gbps
- Seven Gigabit Ethernet links over
  - Quadrax connector
  - MIL-DTL-38999 circular connector
- MIL-DTL-38999 connectors for interfacing with external world
  - RS422
  - RS485
  - RS232
  - Power supply

Software / IP
- Test software and RTL for validation
  - XILKERNEL ported on VPX controller board and RPB

Expansion slots
- Additional power supply slot for additional power requirement

MECHANICAL
- Custom built conduction cooled chassis
- Aluminum (6061-T6) material
- 14-slot space 6U VME-VPX hybrid backplane
- The system weighs 27 kgs

POWER CONSUMPTION
- The unit consumes 500W
- Input voltage is 28V

ENVIRONMENTAL
- Qualification: MIL-STD-810E
  MIL-STD-461E
- Temperature range: −45°C and +85°C (Storage)
  −40°C and +55°C (Operational)

PART NUMBER(S)

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<tr>
<th>Part Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>CN1080</td>
<td>Digital Processing LRU</td>
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Similar architecture was used to design:

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<th>Part Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>CN1060</td>
<td>Processing Electronics Line Replaceable Unit</td>
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<tr>
<td>CN1070</td>
<td>Line Replaceable unit for Unammaned Aerial Vehicle</td>
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