

LSM - LVDS Source Module

LVDS source module for 480Mb/s serial data.

Purpose: For testing CPM and JEM processor modules.

- Similar use to DSS, but driving many more LVDS links, possibly 88 per module.
- TTCdec module to provide the clock and synchronisation.
- Cable connectors compatible with our miniature cable assemblies.
- DC/DC converters to provide necessary supplies.
- JTAG connection for assembly testing.

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Some unresolved issues:

Module size?

6U VME Crate or 9U CPM Crate

9U would connect LVDS links through backplane.(tidy)

6U VME must use a front panel connector (messy)

Pattern Generator Memory depth?

$\leq 4k$ depth can be provided within FPGA,(Xilinx XC2v250) reasonable price/bit.

$> 4k$ depth requires memory external to FPGA, occupies more board space , fewer links / board.

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LVDS serialisers?

Discrete LVDS serialisers or Virtex2 with serialisation firmware.

Cable drivers + Cable Pre-compensation

DSS/LVDS use 8mA Current drivers with LR pre-compensation across line.

Pre-processor output via Virtex FPGA outputs with RC pre-compensation.

Cable connectors.

(6U) A front panel connector (as used on the new DSS/LVDS daughter card) is 17mm wide and overhangs the adjacent slot by 1.5mm.

Some choices and their implications:

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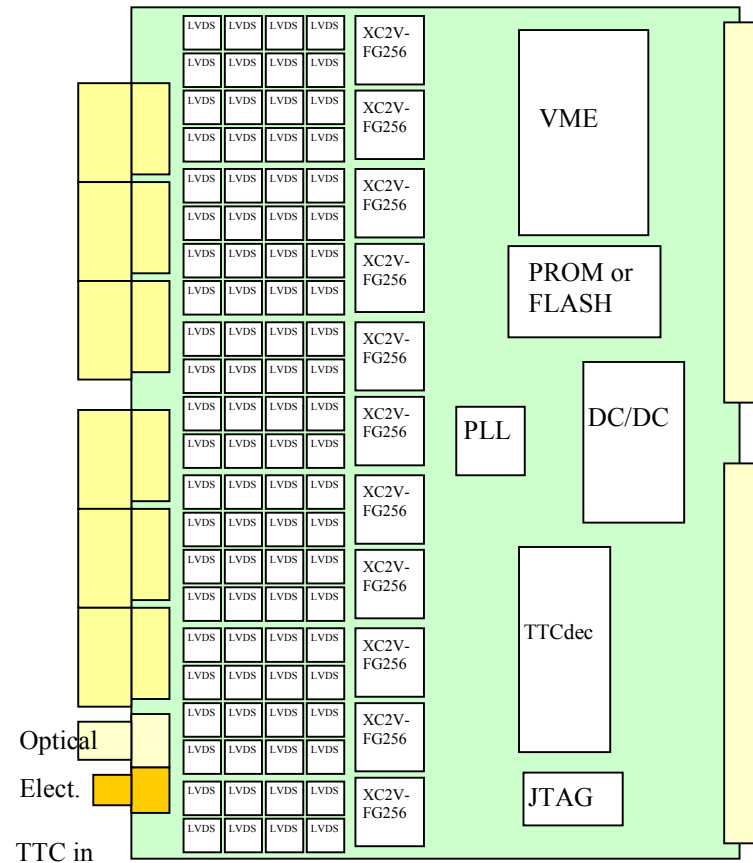
6U Module.

FPGA using internal memory +
JTAG LVDS (SCAN921023)

88 links each with 4k deep pattern
memory

88 LVDS serialisers @40MHz, Total =
4.2 A.

FPGA consumption ?



Estimated Component Cost: \$ 1200

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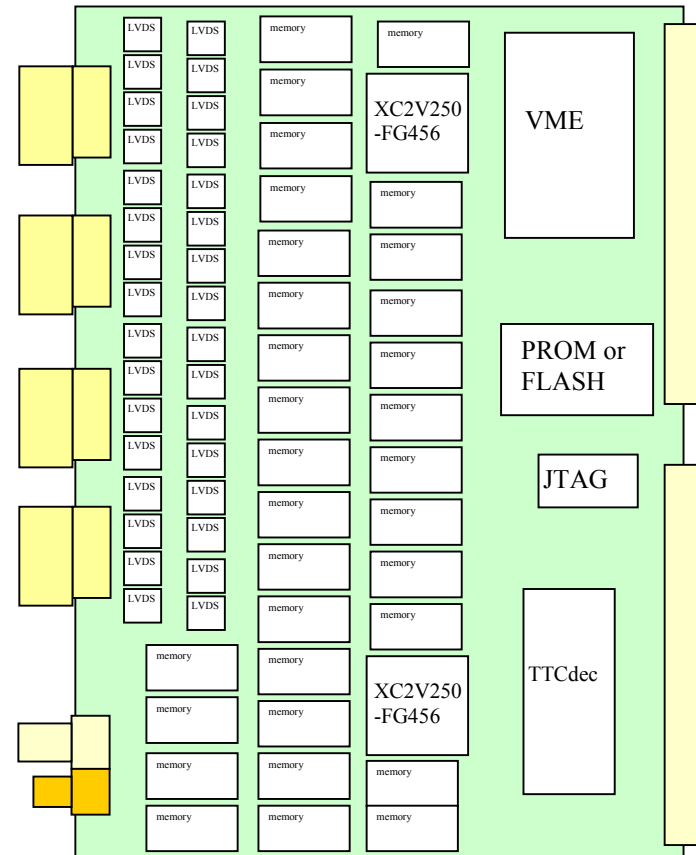


6U Module

Discrete LVDS design:

FPGA with external memory +
JTAG LVDS (SCAN921023)

32 links each with 32k/64k deep memory
(non-BGA package)
(CY7C1021 64k x 16 in TSOP package)



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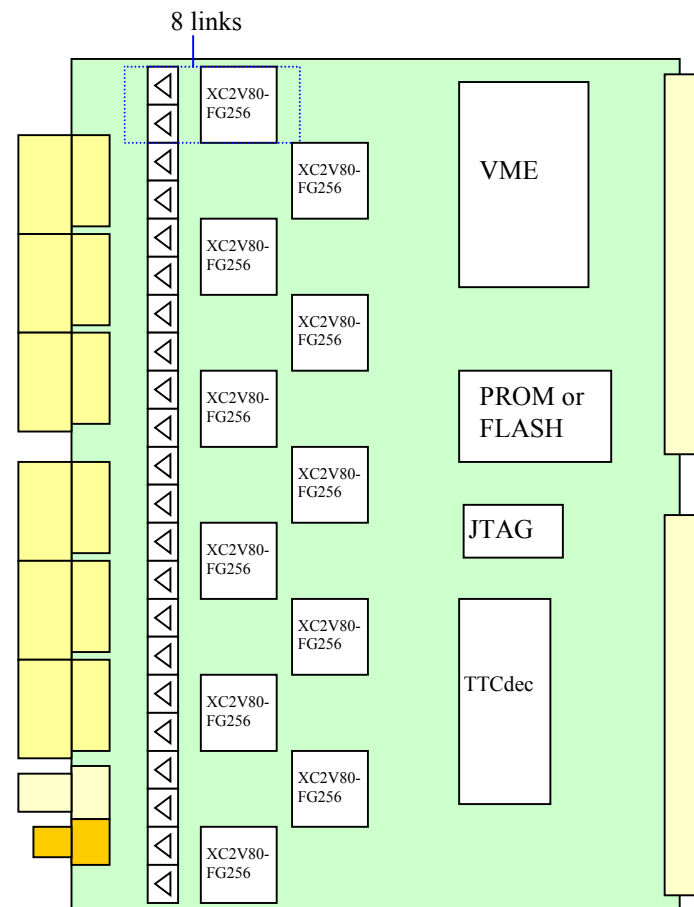
6U Module

Speculative design , FPGAs with
480Mb/s I/O:

FPGA with memory and serialisation +
Cable Drivers (PI90LVB044)

88 links each with 1k deep memory

Estimated Component Cost: \$ 677



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Summary

Need to develop complete specification before we can proceed

6U or 9U ?

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ATLAS Level 1 Calorimeter Trigger Joint Meeting

Birmingham 23/09/2003



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