

CPM Prototype

PDR comments ->

Latest Project Specification, available at:

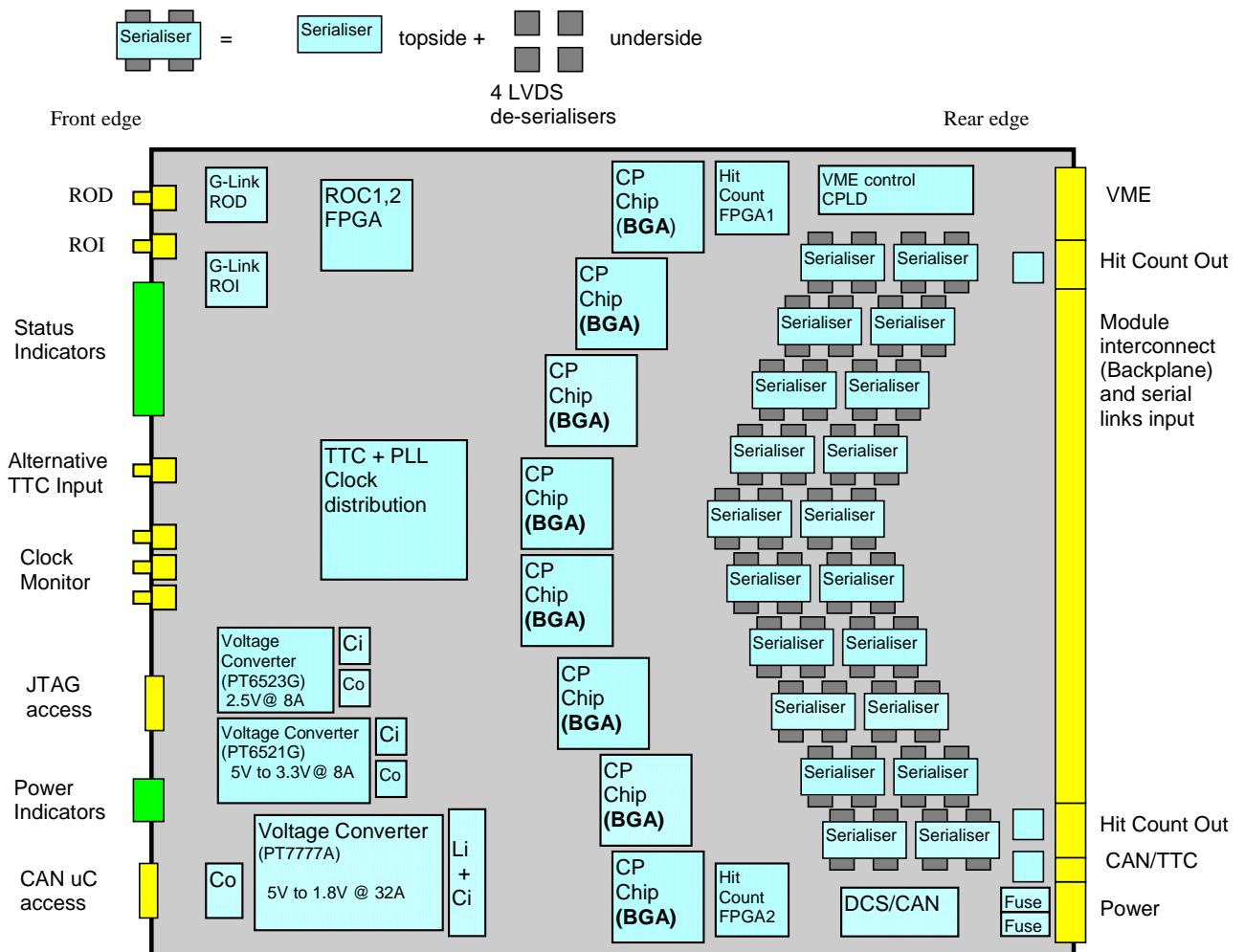
<http://hepwww.rl.ac.uk/Atlas-L1/Modules/CPM/cpmspec103.pdf>

Timescales

	<u>Dates</u>
Schematic Design	Oct. - November 2000
Layout	Dec. 2000 - March 2001
Assembly	April 2001
Module test (B'ham)	May 2001
CP system test	June 2001
Available for Slice Test	July 2001

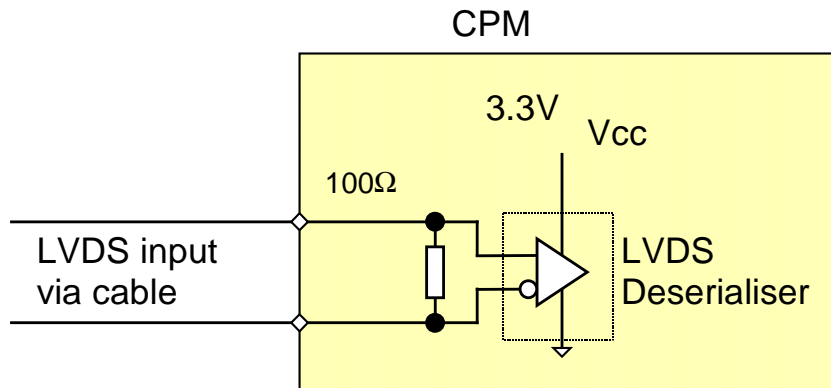
There will be a Final Design Review in late 2001/early 2002 before final production starts.

Approximate CPM layout



9U single width (20mm) module , 400mm long .

LVDS inputs

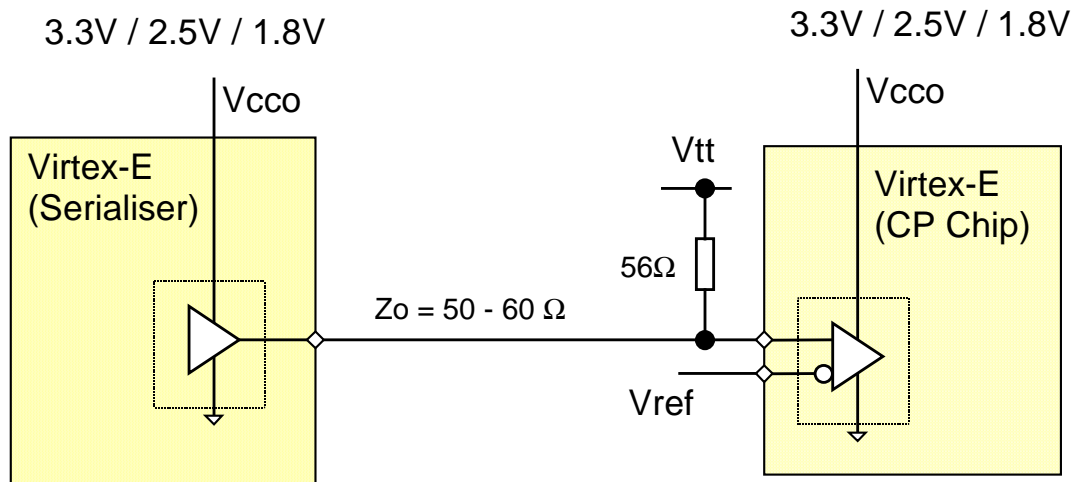


480Mbaud LVDS inputs are terminated by the cable characteristic impedance of 100Ω .

LVDS inputs have threshold of 50mV peak differential, with signal levels of the order of 200mV peak.

The inputs will tolerate applied voltages between -0.3V to $+3.6\text{V}$ (with respect to ground), even when the module is un-powered.

160Mbaud links – Options for Virtex-E I/O

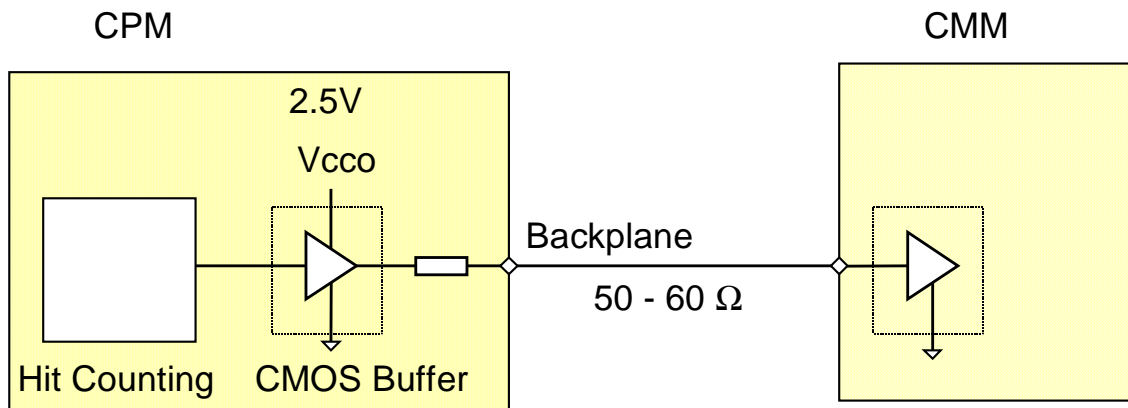


Selectable I/O supply voltage (V_{cco}) for Virtex-E devices, and adjustable line termination voltage (V_{tt}) enables a number of single-ended I/O standards to be investigated:

I/O Standard	V_{cco}	V_{ref}	V_{tt}
LVTTL	3.3V	N/A	1.5V
LVC MOS2	2.5V	N/A	1.2V
LVC MOS18	1.8V	N/A	1.2V
CTT	3.3V	1.5V	1.5V

Not excluding other standards ...

40MHz Hit Count output links to CMM



The Hit Sums are buffered near the connector before being driven off the CPM. Voltage levels will be compatible to Virtex LVCMOS2 levels.

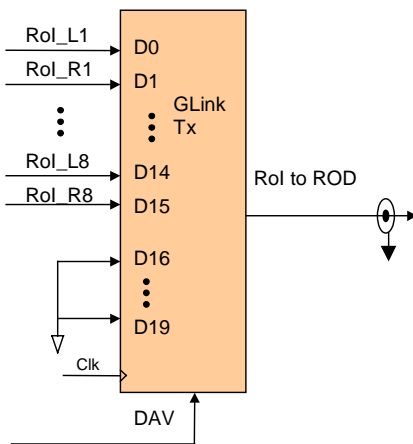
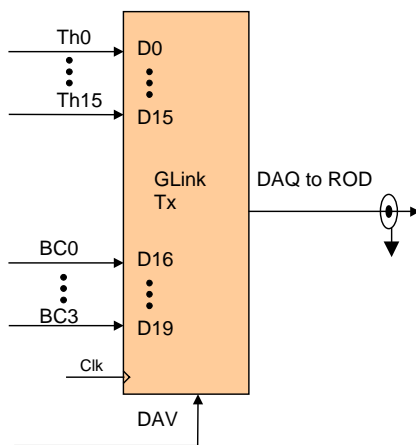
The backplane transmission line will be series terminated at source and have an output impedance of approximately 56Ω.

Use of G-Links in CPM Readout

Device soldered directly onto PCB

- Sockets avoided - 960Mbaud signals present.
- Packages replaced using standard re-work tools

Devices will be fitted with a low-profile heatsink.



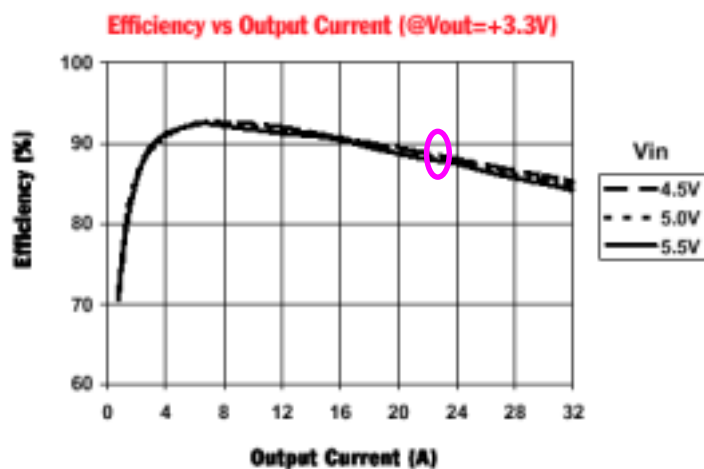
Both G-Links operated in 20-bit mode => 960Mbaud serial output. (even though RoI G-Link serialises only 16bits)

Onboard DC/ DC converters

- Limited number of High Current Power connectors.
- High Current demand -> Switchers

1.8V supply estimated to draw 23A.

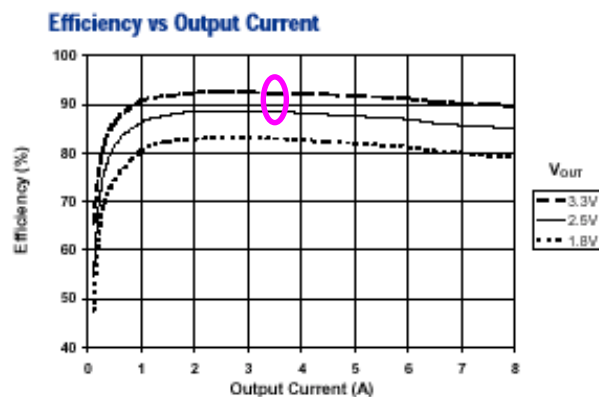
- PT7777A DC / DC converter rated to 32A max



3.3V supply estimated to draw 3.3A.

- PT6521G DC / DC converter rated to 8A max

PT6521, PT6523, PT6526; $V_{IN} = 5.0V$ (See Note A)



Power Requirements

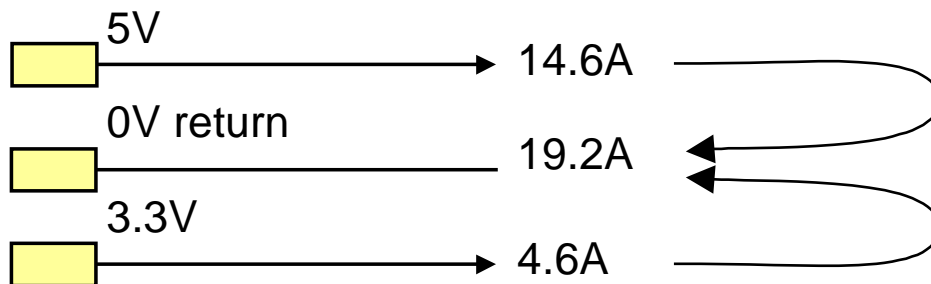
		Conversion	5V drain
1.8V	41W	85% →	9.6A
2.5V	3.3W	85% →	0.8A
3.3V	10.8W	85% →	2.5A
5V	8.5W	→	1.7A

Total 5V current

14.6A

3.3V LVDS	15 W	4.6A
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Power Connectors should be rated well above 20A:



Module Power Consumption Estimated at $\approx 90W$

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