BitBlitz Communications

Some Data on Vout Variation (re CX4)

$Vout_{pk-pk}$

- The $Vout_{pk-pk}$ Specifications for CX4 have been modified as a result of channel performance concerns (#388 et al):
  - $Vout_{pk-pk}$ Range (reduced to 800mV-1200mV)
  - $Vout_{pk-pk}$ Difference between Lanes (new limit, 150mV maximum (1)

(1) Spec Table 54-4 actually says minimum, an Editorial mistake.

Measurement Notes

- XAUI part characterization data analyzed to compare to proposed specifications.
  - Data covers ‘reasonable’ process, temperature and supply voltage variations
- Limitations on data:-
  - Part was designed to meet XAUI specification, 800mV to 1600 mV, rather than CX4 800mV to 1200mV range.
  - Pre-emphasis range in part tested does not reach 50% level (though covers new 30% level as proposed by Ze’ev & Dimitri)

$Vout_{pk-pk}$ Measurement Methods

- The Vout range was measured on each lane, and most results are presented as a ratio to the average of all parts measured in that group.
  - Range/ratio assumed design is perfectly centered on spec.
- The groups are <u>all parts</u> (over process) &:
  - Over temperature and voltage
  - Over temperature
  - Over voltage

$Vout_{pk-pk}$ Measurements

- The full range gave a minimum to mean ratio of 0.76, a maximum to mean ratio of 1.25. The proposed CX4 spec is 0.8 to 1.2
  - The minimum was 912 mV, the maximum 1500 mV, the mean 1198 mV. XAUI spec fit is almost too good to be true!
- Over Temperature but at constant voltage the ratios were 0.86 and 1.12
- Over Voltage but at constant temperature the ratios were 0.75 and 1.24

$Vout_{pk-pk}$ Ratio Measurement Methods

- The Vout range was measured on each lane, and the results are expressed as a ratio to the average of all lanes on that part under the same conditions.
- The groups are <u>all parts</u> (over process) &:
  - Over temperature and voltage
  - Over temperature
  - Over voltage

$Vout_{pk-pk}$ Ratio Measurements

- The full range gave a minimum ratio of 0.931, a maximum ratio of 1.086. The proposed CX4 spec is roughly equivalent to 0.94 to 1.06
- Over Temperature but at constant voltage the ratios were virtually the same
- Over Voltage but at constant temperature the ratios were virtually the same.

Conclusions

- The proposed specification for ratio between the lanes appears reasonable, though there is not much room for tightening it.
- The proposed output level specification appears to be somewhat tight, and many XAUI-compliant designs will require either tighter power supply tolerance or some redesign