



FPD-Link Specification

Aireza Razavi-Marvell

arazavimajom@marvell.com

09/05/2024

Motivation and Scope

- Motivation : Answering the question in call of interest
“How to unseat an efficient incumbent?”
 - What is efficient in incumbent solutions ?
- GMSL2 : razavi_dm_08222024_v2.pdf
- This presentation: FPD-LINK
 - Serializer : FPD-LINK III [DS90UB953](#), FPD-LINK IV [DS90UB971](#)
 - Deserializer : FPD-LINK III [DS90UB954](#), FPD-LINK IV [DS90UB9702](#)
- Limited data on FPD-LINK IV

Data Rate and Reach

Product Line	Line rate	Net data rate
FPD-LINK III*	4.16Gbps/50Mbps	3.4Gbps/???
FDP-LINK IV**	7.55Gbps/47.1875Mbps	6Gbps/???

- Reach is not stated in data sheet

* [DS90UB953](#) : the net data rate is more than 3.4Gbps but the actual value is not mentioned in data sheet

** [DS90UB971](#)

Power and Bill of Material

- Power

- [DS90UB953](#), page 7
- No public data on FPD-LINK IV

Data rate	Typical Power	Maximum Power
VDDD	$1.8 * (160) = 288$	$1.8 * (225) = 405$

- Bill of material

- Crystal-free operation
- Single power supply
- 5mm × 5mm VQFN package

Control Signal Latency

- Delay depends on the control signal

	Nominal round trip delay
I2C*	19.7usec

	Serializer to deserializer	Deserializer to serializer
GPIO ** (nominal)	225nsec	1.5usec/3.2usec

Clarification : I2C roundtrip delay is

$(\text{host_bit_time} * 9) + (\text{remote_bit_time} * 9) + \text{forward_channel_delay} + \text{back_channel_delay}$

Assumed 1Mbps for remote and host i2c rate

* [DS90UB954](#), 7.5.3.1 Remote I2C Targets Data Throughput

** [DS90UB953](#), table 6-7

References

<https://www.ti.com/lit/ds/symlink/ds90ub953-q1.pdf?ts=1722871748857>

https://www.ti.com/lit/ds/symlink/ds90ub954-q1.pdf?ts=1725317162968&ref_url=https%253A%252F%252Fwww.mo-user.com%252F

https://www.ti.com/lit/ds/symlink/ds90ub971-q1.pdf?ts=1725336897676&ref_url=https%253A%252F%252Fwww.ti.com%252Fproduct%252FDS90UB971-Q1

https://www.ti.com/lit/ds/symlink/ds90ub9702-q1.pdf?ts=1725396638394&ref_url=https%253A%252F%252Fwww.ti.com%252Fproduct%252FDS90UB9702-Q1



Essential technology, done right™