

Comparison of MGT Analog Power usage as reported by XPE, Vivado and SysMon on the VC108 with VU095

05-Jul-2016

(0)	MGT Speed Total			Tx Rx	Supply		XPE					Vivado			SysMon		Voltmeter		Maxim	
	Type	Gbps	Chan (N)		Name	Volt	all chan Watts (1)	all chan Amp (2)	per chan Amp (3)	Chip Amp (4)	per chan Amp (5)	all chan Watts (6)	all chan Amp (7)	per chan Amp (8)	Total Amp (9)	per chan Amp (10)	Total Amp (11)	per chan Amp (12)	Total Amp (13)	per chan Amp (14)
0	GTH	9.6	4	Tx + Rx	AVCC 1.000 AVTT 1.200	0.622 0.306	0.622 0.255	0.156 0.064	0.680 0.298	0.170 0.075	0.624 0.308	0.624 0.257	0.156 0.064	1.44 0.68	0.360 0.170	0.8 0.4	0.20 0.10	0.5 0.00	0.13 0.00	
1	GTH	9.6	28	Tx + Rx	AVCC 1.000 AVTT 1.200	4.450 2.145	4.450 1.788	0.159 0.064	4.613 1.875	0.165 0.067	4.448 2.156	4.448 1.797	0.159 0.064	8.07 3.40	0.288 0.121	4.8 2.5	0.17 0.09	4.0 2.0	0.14 0.07	
2	GTH	9.6	28	Rx only	AVCC 1.000 AVTT 1.200		0.000 0.000	0.000 0.000		0.000 0.000		0.000 0.000	0.000 0.000		0.000 0.000		0.00 0.00		0.00 0.00	
3	GTH	4.8	28	Tx + Rx	AVCC 1.000 AVTT 1.200	3.495 2.145	3.495 1.788	0.125 0.064	3.645 1.874	0.130 0.067	3.560 2.156	3.560 1.797	0.127 0.064	6.93 3.33	0.248 0.119	4.0 2.4	0.14 0.09	3.5 2.0	0.13 0.07	
4	GTH	4.8	28	Rx only	AVCC 1.000 AVTT 1.200		0.000 0.000	0.000 0.000		0.000 0.000		0.000 0.000	0.000 0.000		0.000 0.000		0.00 0.00		0.00 0.00	
5	GTH	9.6	16	Tx + Rx	AVCC 1.000 AVTT 1.200	2.526 1.226	2.526 1.022	0.158 0.064	2.664 1.107	0.167 0.069	2.528 1.232	2.528 1.027	0.158 0.064	4.68 2.01	0.293 0.126	2.8 1.4	0.18 0.09	2.0 1.0	0.13 0.06	
6	GTY	9.6	12	Tx + Rx	AVCC 1.000 AVTT 1.200	1.093 4.364	1.093 3.637	0.091 0.303	1.212 3.698	0.101 0.308	1.092 4.368	1.092 3.640	0.091 0.303	2.45 5.36	0.204 0.447	1.4 3.8	0.12 0.32	1.0 3.0	0.08 0.25	
7	GTY	9.6	14	Rx only	AVCC 1.000 AVTT 1.200		0.000 0.000	0.000 0.000		0.000 0.000		0.000 0.000	0.000 0.000		0.000 0.000		0.00 0.00		0.00 0.00	
8	GTY	4.8	12	Tx + Rx	AVCC 1.000 AVTT 1.200	0.706 4.705	0.706 3.921	0.059 0.327	0.824 3.982	0.069 0.332	0.708 4.704	0.708 3.920	0.059 0.327	1.78 5.19	0.148 0.433	1.0 3.7	0.08 0.31	0.5 3.0	0.04 0.25	
9	GTY	4.8	14	Rx only	AVCC 1.000 AVTT 1.200		0.000 0.000	0.000 0.000		0.000 0.000		0.000 0.000	0.000 0.000		0.000 0.000		0.00 0.00		0.00 0.00	
10	GTY	9.6	8	Tx + Rx	AVCC 1.000 AVTT 1.200	0.729 2.910	0.729 2.425	0.091 0.303	0.837 2.485	0.105 0.311	0.728 2.912	0.728 2.427	0.091 0.303	1.74 3.63	0.218 0.454	1.0 2.5	0.13 0.31	0.5 2.0	0.06 0.25	
11	GTY	9.6	4	Tx + Rx	AVCC 1.000 AVTT 1.200	0.364 1.455	0.364 1.213	0.091 0.303	0.462 1.272	0.116 0.318	0.364 1.456	0.364 1.213	0.091 0.303	1.05 1.91	0.263 0.478	0.6 1.3	0.15 0.33	0.5 1.0	0.13 0.25	
12	(A)			HUB/3	AVCC 1.000 AVTT 1.200		0.000 0.000													
13	(B)	12.8	104	gFEX	AVCC 1.000 AVTT 1.200		0.000 0.000		11 19	0.11 0.18						15 29	0.14 0.28			

- (0) = cf. http://www.pa.msu.edu/hep/atlas/l1calo/hub/firmware/vcu108_power_estimation/read.me.txt
- (N) = Number of transceivers in this configuration. This number is referred to as N below
- (1) = Copied from the XPE tab for GTH or GTY for all N channels (using: DFE, QPLL1, 4 Chan per PLL, Tx swing control value 0b1100/0b01100 for GTH/GTY)
- (2) = (1) converted from Watts to Amps
- (3) = (2) / N
- (4) = Copied from XPE summary tab for whole Chip
- (5) = (4) / N
- (6) = Copied from Vivado Power Report after adding all channels
- (7) = (6) converted from Watts to Amps
- (8) = (7) / N
- (9) = Copied from SysMon reported current
- (10) = (9) / N
- (11) = Copied from http://www.pa.msu.edu/hep/atlas/l1calo/hub/firmware/vcu108_power_estimation/measurement_resistor_mgt_vcu108.txt
- (12) = (11) / N
- (13) = Copied from http://www.pa.msu.edu/hep/atlas/l1calo/hub/firmware/vcu108_power_estimation/measurement_maxim_mgt_vcu108.txt
- (14) = (13) / N
- (15) = (8) / (3)
- (16) = (10) / (8)
- (17) = (9) / (4)
- (18) = (11) / (4)
- (19) = (13) / (4)

- (A) = Approximation of one third of HUB MGT usage implementable on the VCU108
- (B) = from 22-Jun-2016 email exchange with Shaochun about the gFEX V2 using a XCVU160 and IBERT on 52 GTH and 52 GTY Rx+Tx at 12.8 Gbps

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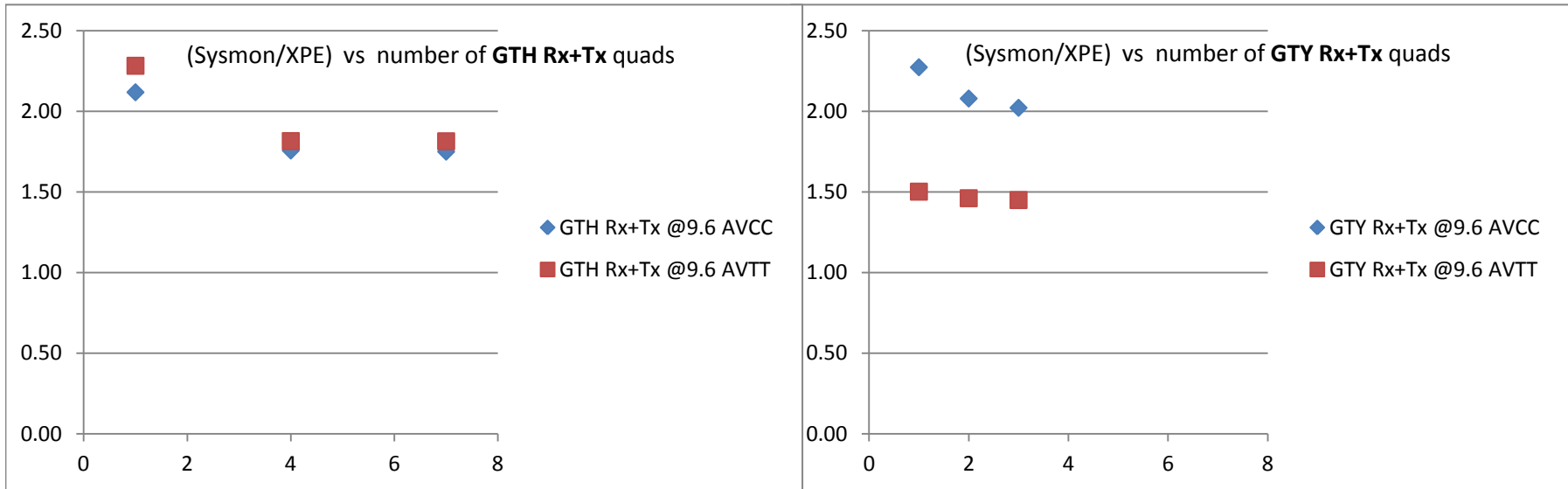
05-Jul-2016					Vivado vs XPE per chan (15)	Sysmon vs Vivado per chan (16)	Sysmon vs XPE Total (17)	Voltmeter vs XPE Total (18)	MAXIM vs XPE Total (19)
cfg (0)	MGT Type	Speed Gbps	Total Chan (N)	Tx Rx					
0	GTH	9.6	4	Tx + Rx	1.00 1.01	2.31 2.65	2.12 2.28	1.18 1.34	0.7 0.0
1	GTH	9.6	28	Tx + Rx	1.00 1.01	1.81 1.89	1.75 1.81	1.04 1.33	0.9 1.1
2	GTH	9.6	28	Rx only					
3	GTH	4.8	28	Tx + Rx	1.02 1.01	1.95 1.85	1.90 1.78	1.10 1.28	1.0 1.1
4	GTH	4.8	28	Rx only					
5	GTH	9.6	16	Tx + Rx	1.00 1.00	1.85 1.96	1.76 1.82	1.05 1.26	0.8 0.9
6	GTY	9.6	12	Tx + Rx	1.00 1.00	2.24 1.47	2.02 1.45	1.16 1.03	0.8 0.8
7	GTY	9.6	14	Rx only					
8	GTY	4.8	12	Tx + Rx	1.00 1.00	2.51 1.32	2.16 1.30	1.21 0.93	0.6 0.8
9	GTY	4.8	14	Rx only					
10	GTY	9.6	8	Tx + Rx	1.00 1.00	2.39 1.50	2.08 1.46	1.19 1.01	0.6 0.8
11	GTY	9.6	4	Tx + Rx	1.00 1.00	2.88 1.57	2.27 1.50	1.30 1.02	1.1 0.8
12	(A)			HUB/3					
13	(B)	12.8	104	gFEX				1.4 1.5	

GTH Rx+Tx @9.6

	AVCC	AVTT
1	2.12	2.28
2		
3		
4	1.76	1.82
5		
6		
7	1.75	1.81

GTY Rx+Tx @9.6

	AVCC	AVTT
1	2.27	1.50
2	2.08	1.46
3	2.02	1.45
4		
5		
6		
7		



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