

SI. Meas .Report For Foxconn T99X171T00 (DDR4 K4A8G165WC-BCTD)

Jun, 2019 | SET Memory FAE

1.1 System View

Proprietary

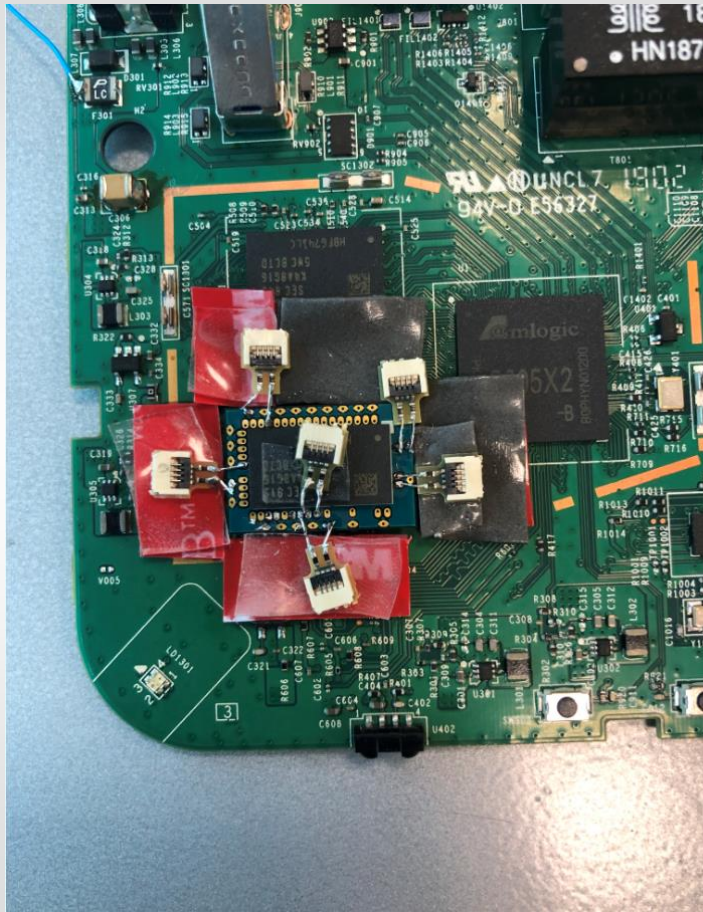
TOP View



BOTTOM View



SI Measure



[Table 1] Revision History.

Revision No.	History	Date	Remark
0,0	- First Draft	2019-06-04	First Proposal

[Table 2] Test Location

Location	Test Start	Test End	By	Remark
Taiwan(SET)	2019-05-29	2019-06-04	Jyun Chen	SI measure

[Table 3] Test Memory Information

Part ID	Memory Type	Quantity	Date Code
K4A8G165W C -BCTD	DDR4	2	913

[Table 4] Platform Information.

Chipset Maker / Name / Version	Amlogic / S905X2
Board Maker / Name / Version	Foxconn/ T99X171T00
Measure Point	U503
ROM Code Version	-
Number of Memory in platform	2EA (DDR4 8Gb C-die)
Memory Frequency(Avg)	1333MHz
Memory topology (p2p..)	p2p

[Table 5] Test Condition.

Temperature	25° C
VDD / VDDQ	1.2V / 1.2V
Platform design stage	Reference design

■ **Clock**

- All items meet the Spec.

■ **Command / Address**

- All items meet the Spec.

■ **Write**

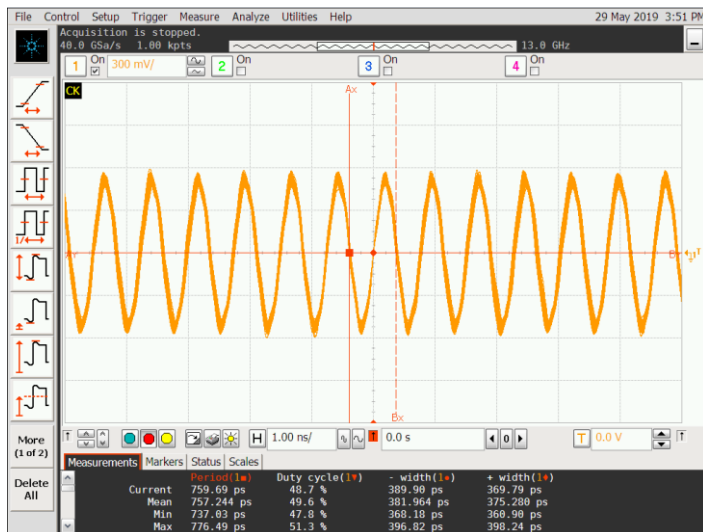
- All items meet the Spec.

■ **Read**

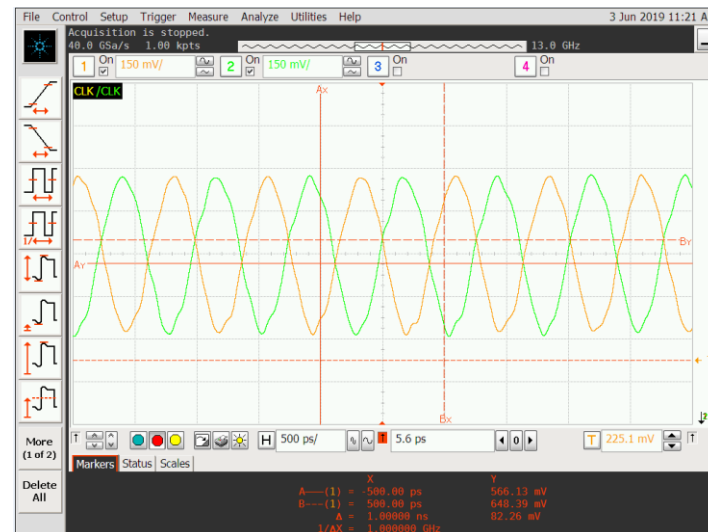
- All items meet the Spec.

3. SI Measure - Clock

Proprietary



tCK_Duty_tCH_tCL_Jitter

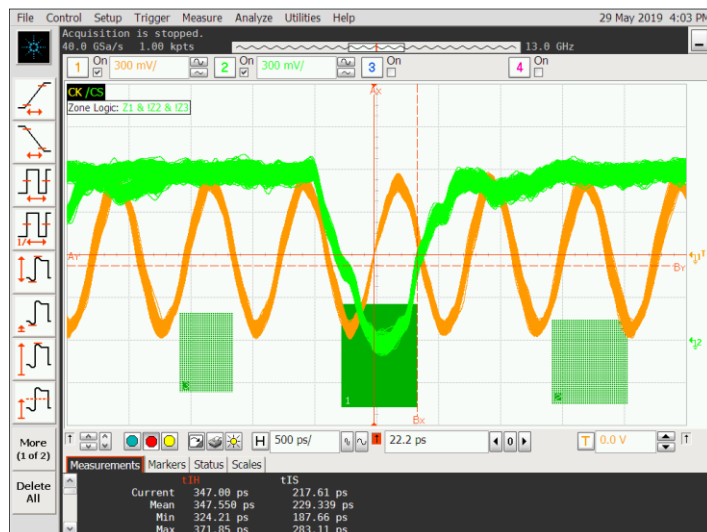


VIX

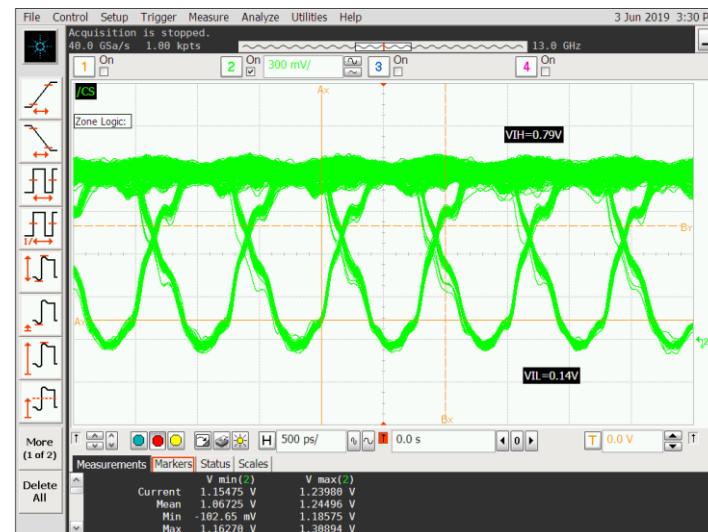
Signal name	Symbol	Parameter	Spec value		Result	Units	Remark
CLK with Diff Probes	tCK(avg)	Clock cycle time	Mean		757.24	ps	OK
	Duty ratio	-	Min	48	49.6	%	Spec In
			Max	52	47.8	%	Spec In
	tCH(avg)	0.48 * tCK	Min	363.48	375.28	ps	Spec In
		0.52 * tCK	Max	393.76		ps	
	tCL(avg)	0.48 * tCK	Min	363.48	381.96	ps	Spec In
		0.52 * tCK	Max	393.76		ps	
CLK With Single Probe	VSEH	Min : (VDD/2) + 0.1	Min	0.694	0.837	V	Spec In
	VSEL	Max : (VDD/2) - 0.1	Max	0.494	0.360	V	Spec In
	VIX	Min : (VDD/2) - 0.12	Min	0.474	0.566	V	Spec In
		Max : (VDD/2) + 0.12	Max	0.714	0.648	V	Spec In

3. SI Measure - /CS

Proprietary



/CS_tIS_tIH

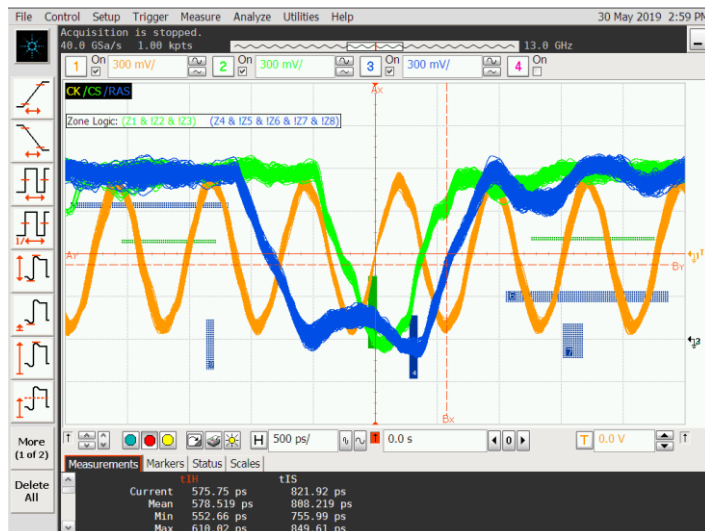


/CS_VIH_VIL_Overshoot_Undershoot

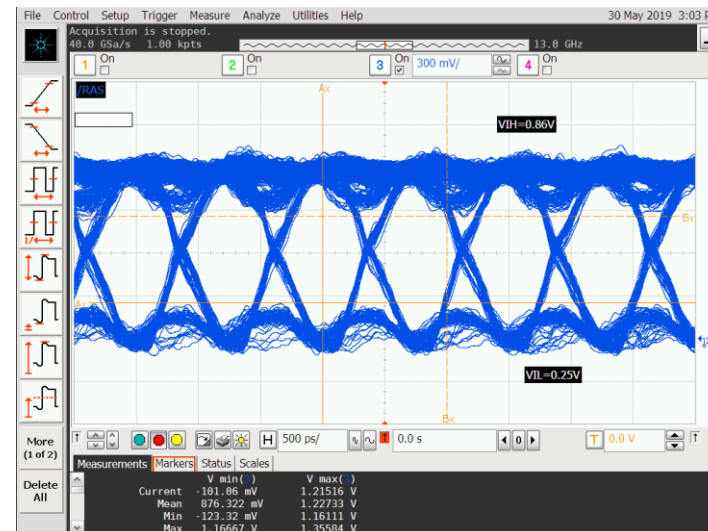
/CS						
Signal name	Symbol	Parameter	Spec value		Result	Units Remark
/CS	tIS		Min	62	187.66	ps Spec In
	tIH		Min	87	324.21	ps Spec In
	VIH(AC100)	Vref + 0.1	Min	0.68	0.79	V Spec In
	VIL(AC100)	Vref - 0.1	Max	0.48	0.14	V Spec In
	Overshoot	-	Max	0.24	0.11	V Spec In
	Undershoot	-	Max	0.3	0.10	V Spec In

3. SI Measure - /RAS

Proprietary



/RAS_tIS_tIH

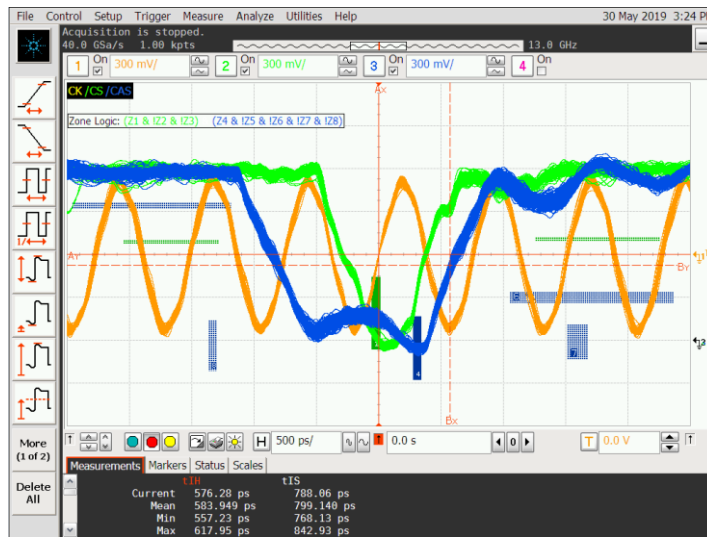


/RAS_VIH_VIL_Overshoot_Undershoot

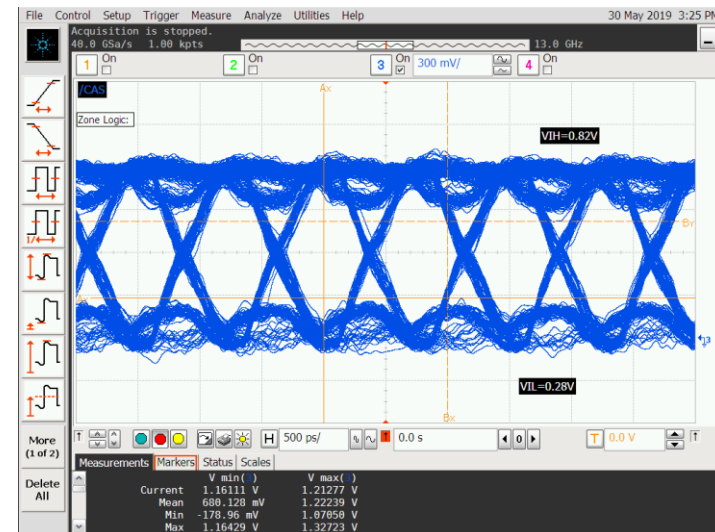
/RAS						
Signal name	Symbol	Parameter	Spec value		Result	Units Remark
/RAS	tIS		Min	62	755.99	ps Spec In
	tIH		Min	87	552.66	Ps Spec In
	VIH(AC100)	Vref + 0.1	Min	0.68	0.86	V Spec In
	VIL(AC100)	Vref - 0.1	Max	0.48	0.25	V Spec In
	Overshoot	-	Max	0.24	0.16	V Spec In
	Undershoot	-	Max	0.3	0.12	V Spec In

3. SI Measure - /CAS

Proprietary



/CAS_tIS_tIH

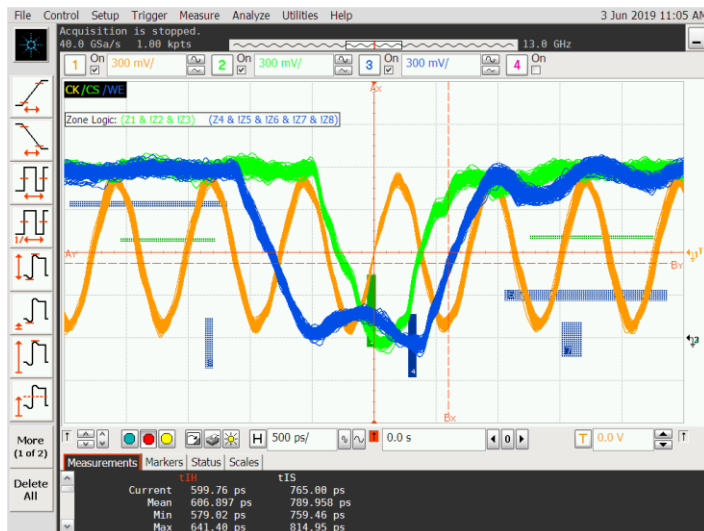


/CAS_VIH_VIL_Overshoot_Undershoot

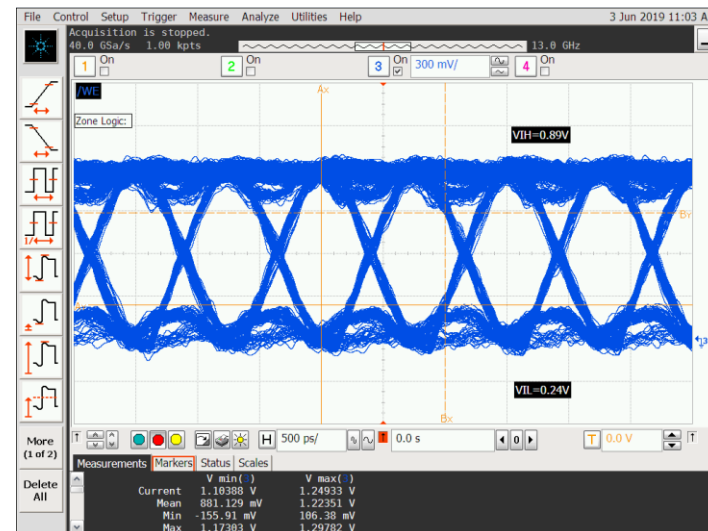
/CAS						
Signal name	Symbol	Parameter	Spec value		Result	Units Remark
/CAS	tIS		Min	62	768.13	ps Spec In
	tIH		Min	87	557.23	Ps Spec In
	VIH(AC100)	Vref + 0.1	Min	0.68	0.82	V Spec In
	VIL(AC100)	Vref - 0.1	Max	0.48	0.28	V Spec In
	Overshoot	-	Max	0.24	0.13	V Spec In
	Undershoot	-	Max	0.3	0.19	V Spec In

3. SI Measure - /WE

Proprietary



/WE_tIS_tIH

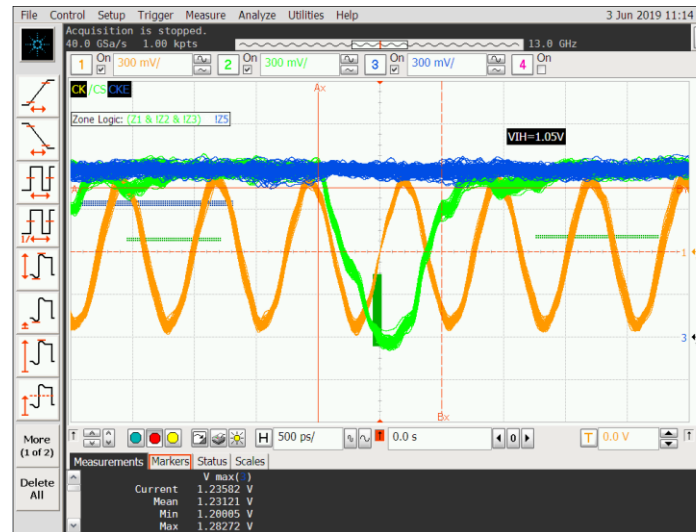


/WE_VIH_VIL_Overshoot_Undershoot

/WE						
Signal name	Symbol	Parameter	Spec value		Result	Units Remark
/WE	tIS		Min	62	759.46	ps Spec In
	tIH		Min	87	579.02	ps Spec In
	VIH(AC100)	Vref + 0.1	Min	0.68	0.89	V Spec In
	VIL(AC100)	Vref - 0.1	Max	0.48	0.24	V Spec In
	Overshoot	-	Max	0.24	0.10	V Spec In
	Undershoot	-	Max	0.3	0.16	V Spec In

3. SI Measure - CKE

Proprietary

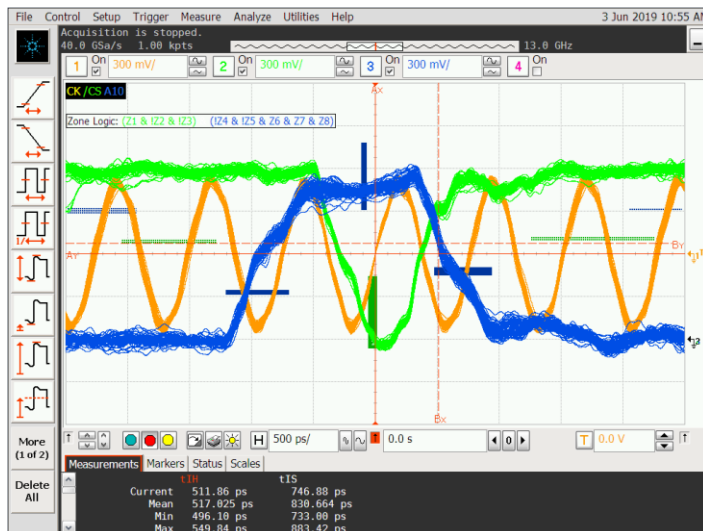


CKE_Always High

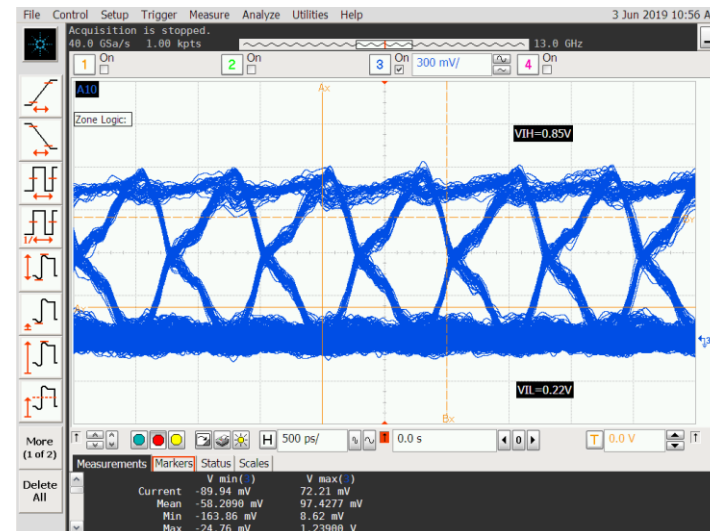
CKE						
Signal name	Symbol	Parameter	Spec value		Result	Units Remark
CKE	tIS		Min	62	Always High	ps SKIP
	tIH		Min	87	Always High	ps SKIP
	VIH(AC100)	Vref + 0.1	Min	0.68	1.05	V Spec In
	VIL(AC100)	Vref - 0.1	Max	0.48	Always High	V SKIP
	Overshoot	-	Max	0.24	0.08	V Spec In
	Undershoot	-	Max	0.3	Always High	V SKIP

3. SI Measure – A10

Proprietary



A10_tIS_tIH

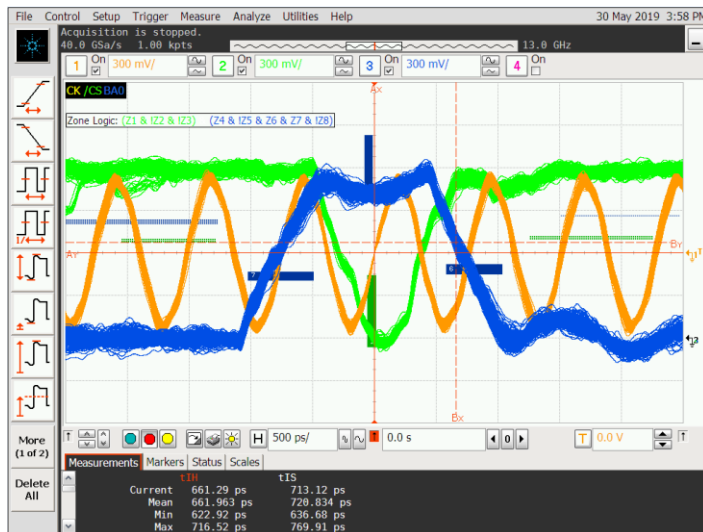


A10_VIH_VIL_Overshoot_Undershoot

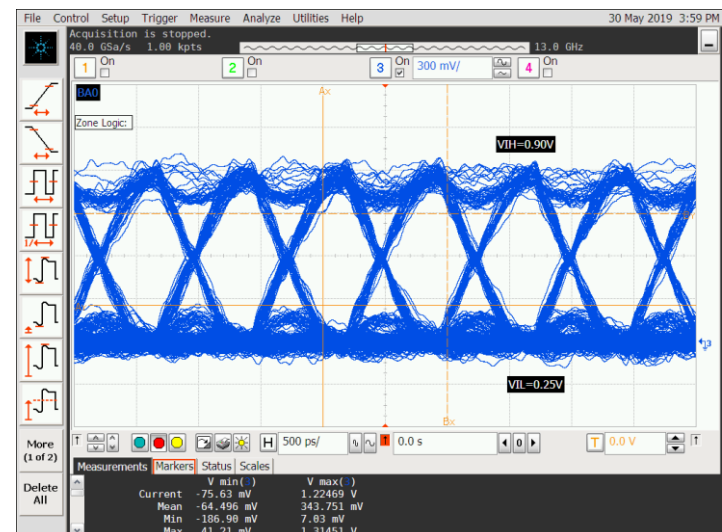
AP(A10)							
Signal name	Symbol	Parameter	Spec value		Result	Units	Remark
AP(A10)	tIS		Min	62	733.00	ps	Spec In
	tIH		Min	87	496.10	ps	Spec In
	VIH(AC100)	Vref + 0.1	Min	0.68	0.85	V	Spec In
	VIL(AC100)	Vref - 0.1	Max	0.48	0.22	V	Spec In
	Overshoot	-	Max	0.24	0.14	V	Spec In
	Undershoot	-	Max	0.3	0.16	V	Spec In

3. SI Measure – BAO

Proprietary



BAO_tIS_tIH

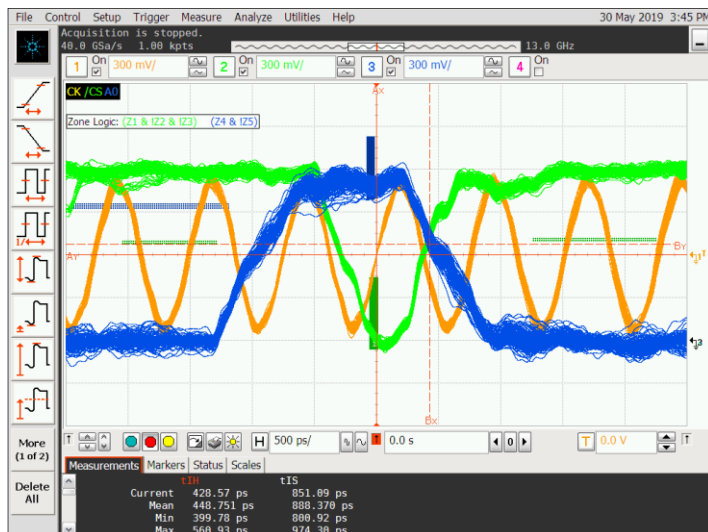


BAO_VIH_VIL_Overshoot_Undershoot

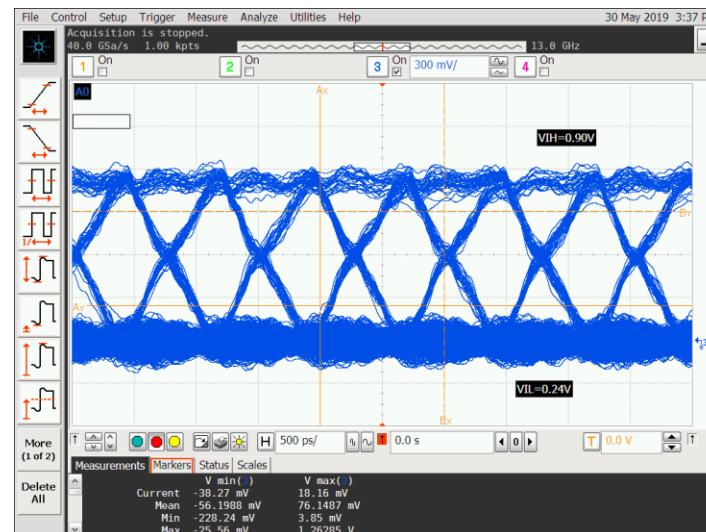
BAO						
Signal name	Symbol	Parameter	Spec value		Result	Units Remark
BAO	tIS		Min	62	636.68	ps Spec In
	tIH		Min	87	622.92	ps Spec In
	VIH(AC100)	Vref + 0.1	Min	0.68	0.90	V Spec In
	VIL(AC100)	Vref - 0.1	Max	0.48	0.25	V Spec In
	Overshoot	-	Max	0.24	0.12	V Spec In
	Undershoot	-	Max	0.3	0.19	V Spec In

3. SI Measure - ADD(0)

Proprietary



A0_tIS_tIH

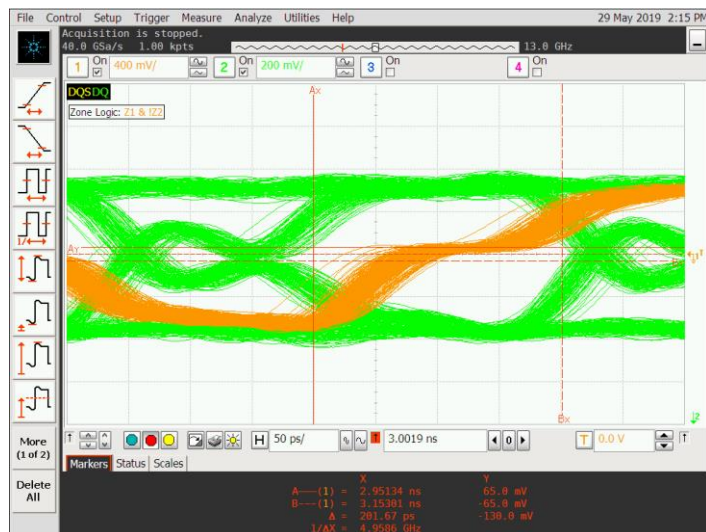


A0_VIH_VIL_Overshoot_Undershoot

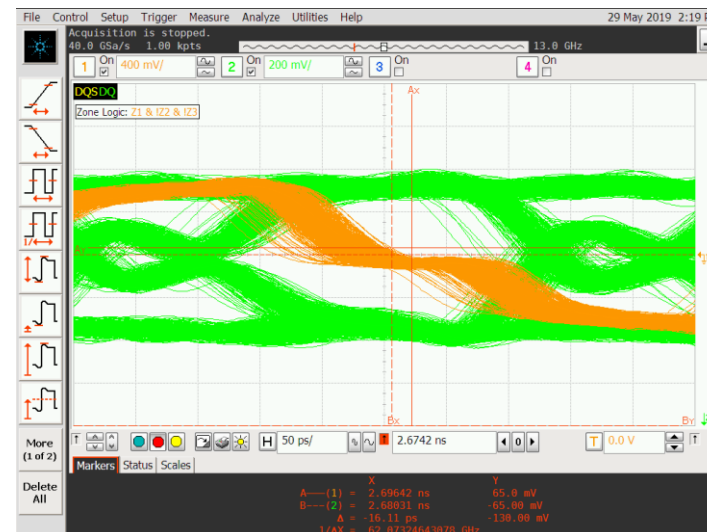
A0						
Signal name	Symbol	Parameter	Spec value		Result	Units Remark
A0	tIS		Min	62	800.92	ps Spec In
	tIH		Min	87	399.78	ps Spec In
	VIH(AC100)	Vref + 0.1	Min	0.68	0.90	V Spec In
	VIL(AC100)	Vref - 0.1	Max	0.48	0.24	V Spec In
	Overshoot	-	Max	0.24	0.06	V Spec In
	Undershoot	-	Max	0.3	0.23	V Spec In

3. SI Measure - WRITE

Proprietary



TdIVW

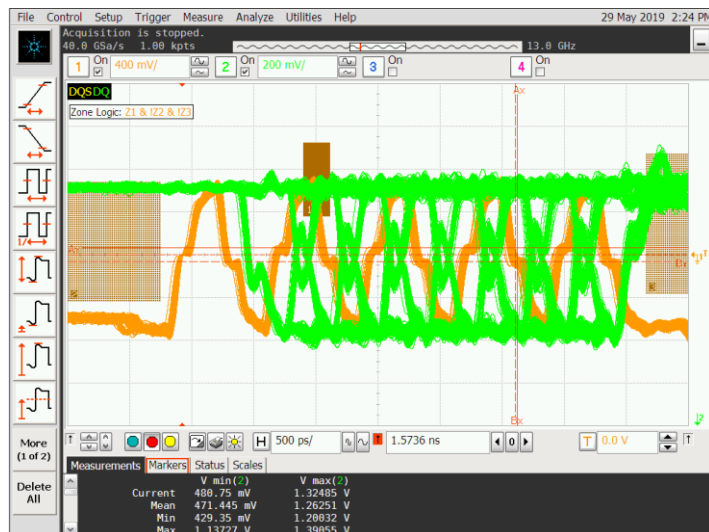


tDQS2DQ

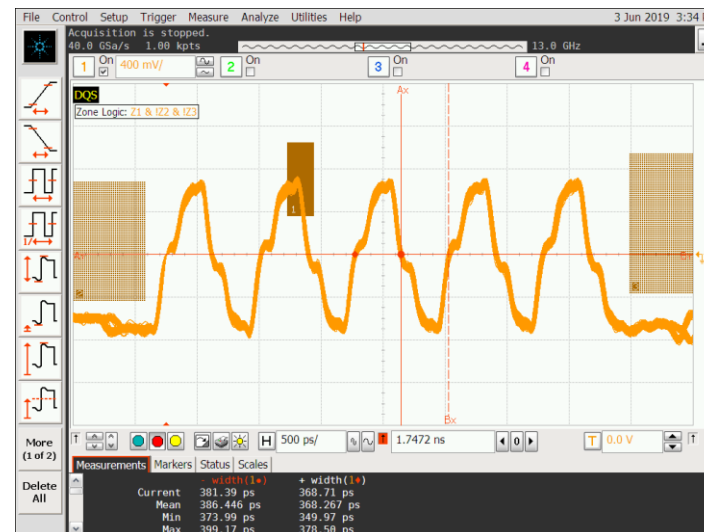
DQS / DQ WRITE						
Signal name	Symbol	Parameter	Spec value		Result	Units Remark
WRITE	TdIVW	$(tCK/2) * 0.2$	Min	83.30	201.67	ps Spec In
	tDQS2DQ	$(tCK/2) * (-0.17)$	Min	-71.94	-16.11	ps Spec In
		$(tCK/2) * 0.17$	Max	71.94		ps Spec In

3. SI Measure - WRITE

Proprietary



DQ_VIH_VIL_Overshoot_Undershoot



tDQSH_tDQSL

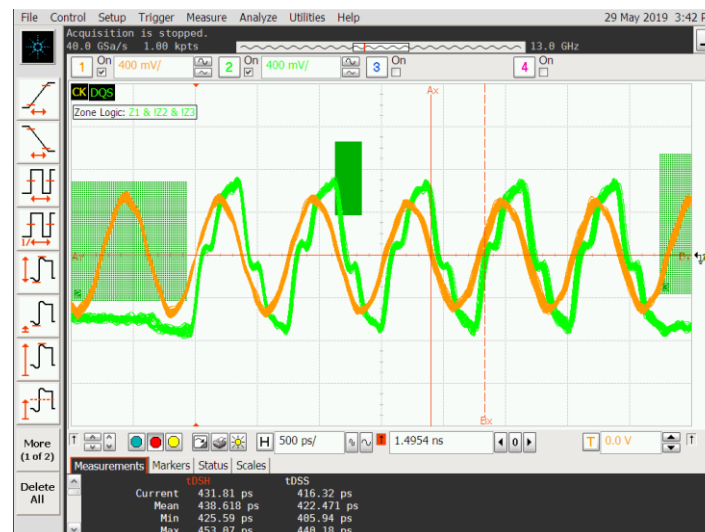
DQS / DQ WRITE						
Signal name	Symbol	Parameter	Spec value		Result	Units Remark
DQ	Overshoot	-	Max	0.24	0.19	V Spec In
	Undershoot	-	Max	0.3	0	V Spec In
DQS (Write)	tDQSH	0.46 * tCK	Min	348.33	349.97	ps Spec In
		0.54 * tCK	Max	408.91	378.50	ps Spec In
	tDQSL	0.46 * tCK	Min	348.33	373.99	Ps Spec In
		0.54 * tCK	Max	408.91	399.17	ps Spec In
	tWPRE	0.9 * tCK	Min	681.52	744.44	ps Spec In
	tWPST	0.33 * tCK	Min	249.89	655.55	ps Spec In

3. SI Measure - WRITE

Proprietary



tDQSS

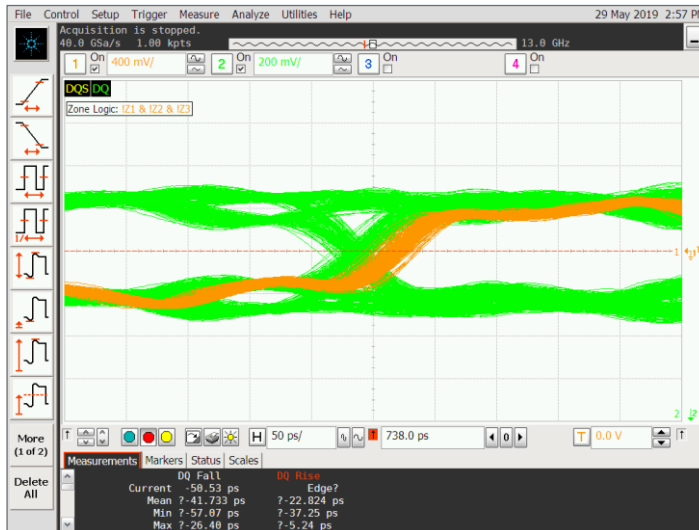


tDSS_tDSH

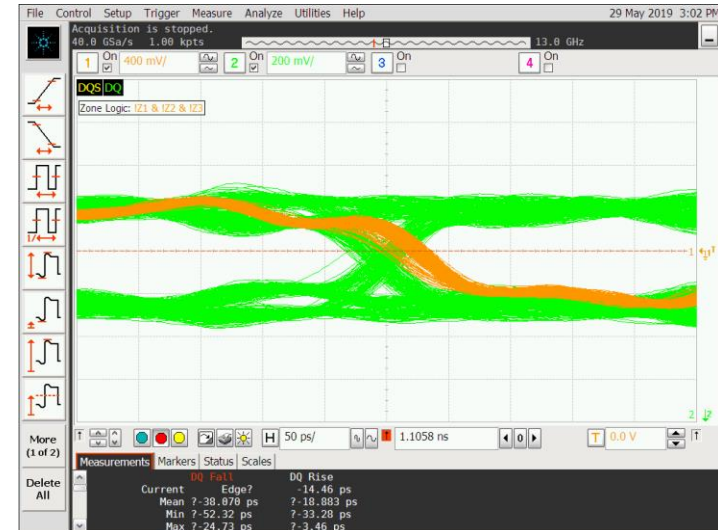
DQS WRITE						
Signal name	Symbol	Parameter	Spec value		Result	Units Remark
DQS (Write)	tDQSS	-0.27 * tCK	Min	-204.45	32.17	ps Spec In
		0.27 * tCK	Max	204.45	70.39	ps Spec In
	tDSS	0.18 * tCK	Min	136.30	405.94	ps Spec In
	tDSH	0.18 * tCK	Min	136.30	425.59	ps Spec In

3. SI Measure - READ

Proprietary



DQS Rise – DQ Rise , DQS Rise – DQ Fall

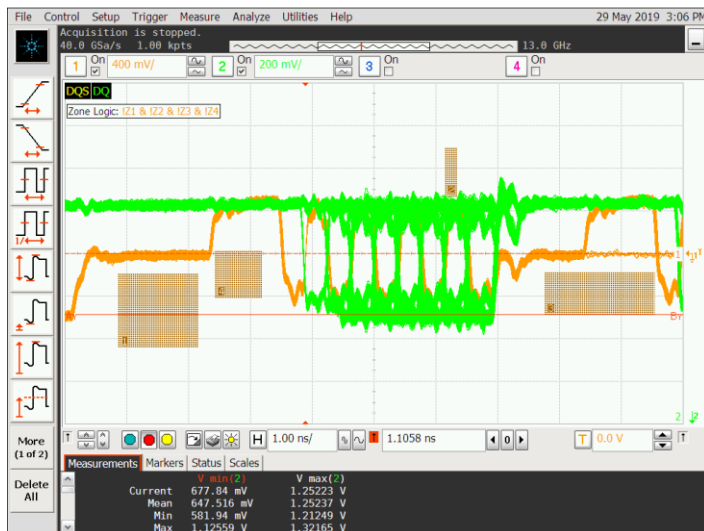


DQS Fall – DQ Rise , DQS Fall – DQ Fall

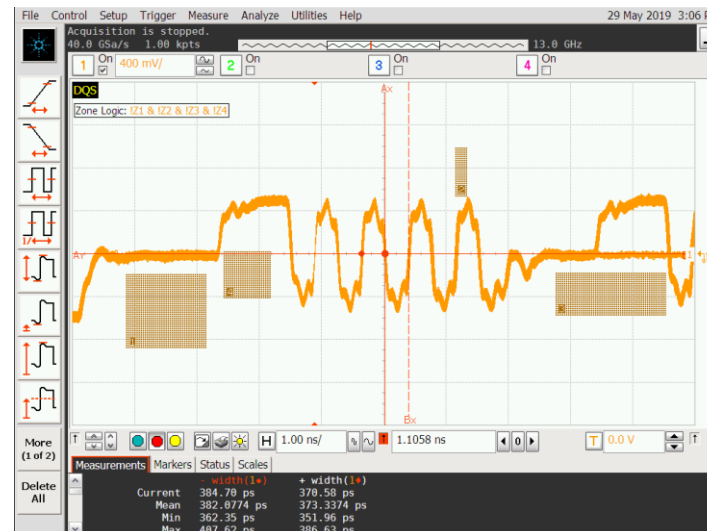
DQS READ						
Signal name	Symbol	Parameter	Spec value		Result	Units Remark
DQS Rise	tDQSQ(DQ Rise)	$(tCK/2) * 0.18$	Max	68.15	5.24	ps Spec In
	tDQSQ(DQ Fall)	$(tCK/2) * 0.18$	Max	68.15	26.40	ps Spec In
DQS Fall	tDQSQ(DQ Rise)	$(tCK/2) * 0.18$	Max	68.15	3.46	ps Spec In
	tDQSQ(DQ Fall)	$(tCK/2) * 0.18$	Max	68.15	24.73	ps Spec In

3. SI Measure - READ

Proprietary



DQ_VOH_VOL_Overshoot_Undershoot

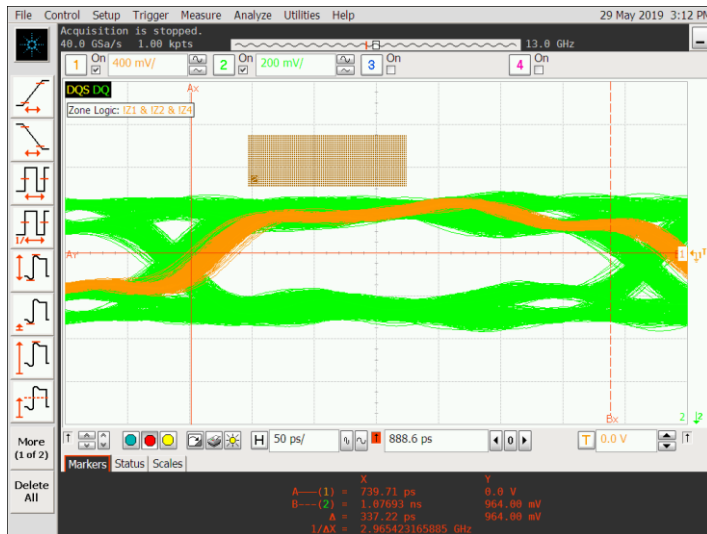


tQSH_tQSL

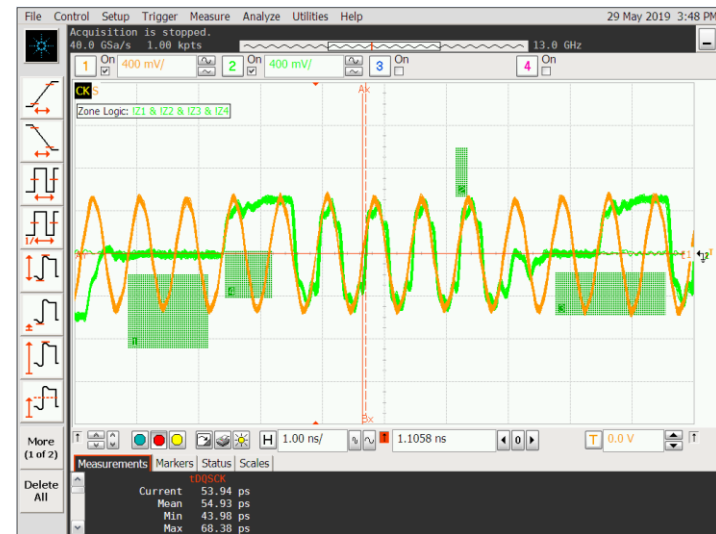
DQS / DQ READ							
Signal name	Symbol	Parameter	Spec value		Result	Units	Remark
DQ	Overshoot	-	Max	0.24	0.12	V	Spec In
	Undershoot	-	Max	0.3	0	V	Spec In
DQS (Read)	tQSH	0.4 * tCK	Min	302.90	351.96	ps	Spec In
	tQSL	0.4 * tCK	Min	302.90	362.35	ps	Spec In
	tRPRE	0.9 * tCK	Min	681.52	1566.67	ps	Spec In
	tRPST	0.33 * tCK	Min	249.89	344.44	ps	Spec In

3. SI Measure - READ

Proprietary



t_{QH}



t_{DQSCK}

DQS READ						
Signal name	Symbol	Parameter	Spec value		Result	Units Remark
DQS (Read)	t _{QH}	$(t_{CK}/2) * 0.74$	Min	280.18	337.22	ps Spec In
	t _{DQSCK}	-170	Min	-170	43.98	ps Spec In
		170	Max	170	68.38	ps Spec In

Thank You!

