TIDA-00424 – H_Ref to TOF Delay Test Report

TIDA-004240 H_Ref to TOF Test report describes measurement result of delay between reference input H_REF and LMH1983 top of frame output when using different video frame formats. The LMH1983 PLL1 pulls the 27MHz VCXO to lock to the reference input H_REF signal. LMH1983 uses V_REF and F_REF to detect video format and aligns Vsync with TOF. Given the number of 27MHz clock within one H_REF period and V_REF and F_REF signal, the device determines the incoming frame format. Once the frame format has been detected, the LMH1983 gen-locks the divided down 27MHz and H_REF input to drive control voltage of the VCXO to get these two signals locked to one another. The loop filter has very low loop bandwidth and thus it will often takes a long time to get locked.

Once the LMH1983 is locked, H_REF input signal drives the VCXO control voltage. The LMH1983 TOF is locked to the incoming H_REF. The following TIDA-00424 test report shows LMH1983 H_REF to TOF delay under different frame formats

Summary

Table 1 Delay(ns) from H_REF pulse to the LMH1983 TOF:

Frame Format	H_REF-TOFx Delay (ns)
480i29.97 (TOF2)	51.2
576i25 (TOF2)	51.2
720p59.94 (TOF3)	55.2
720p50 (TOF2)	51.2
1080p29.97 (TOF3)	55.2
1080p30 (TOF2)	51.2
1080i29.97(TOF3)	55.2
1080p25 (TOF2)	51.2

Figure 1. Test setup

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Results

Figure 2 shows the duration of TOFx. TOFx is asserted for one horizontal period at the start of the output video.

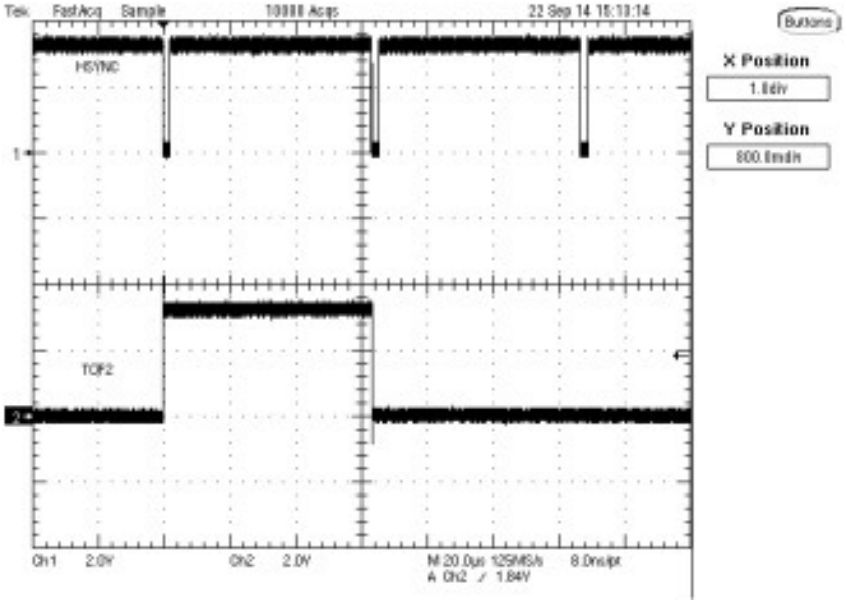

Figure 2. TOFx Duration.

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Figure 3 through Figure 10 show the measured results using 480i59.97, 576i25, 1080p29.97, 1080p30, 720p59.94, 720p50, 1080i29.97 and 1080i25 frame formats.

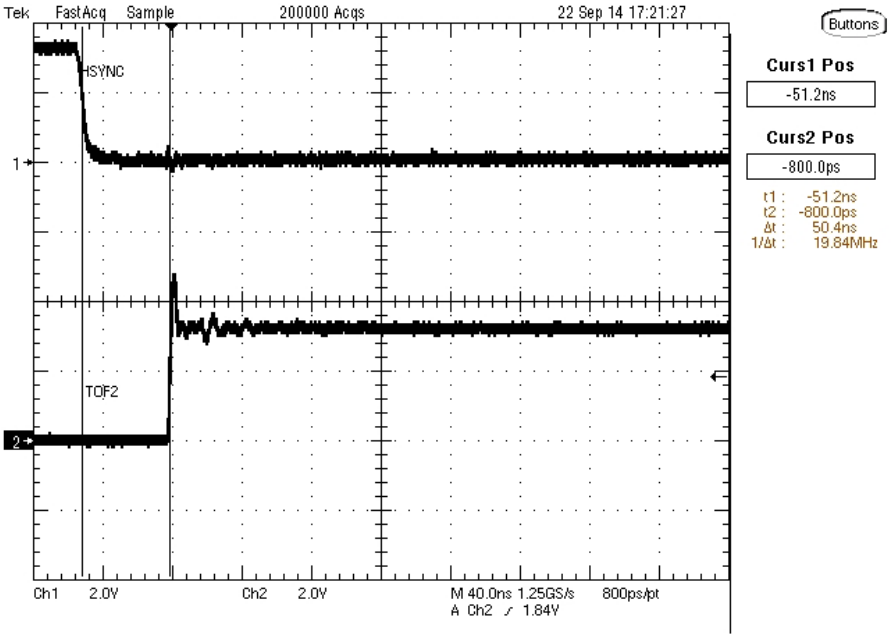

Figure 3. H_REF-TOFx Delay at 480i59.97.

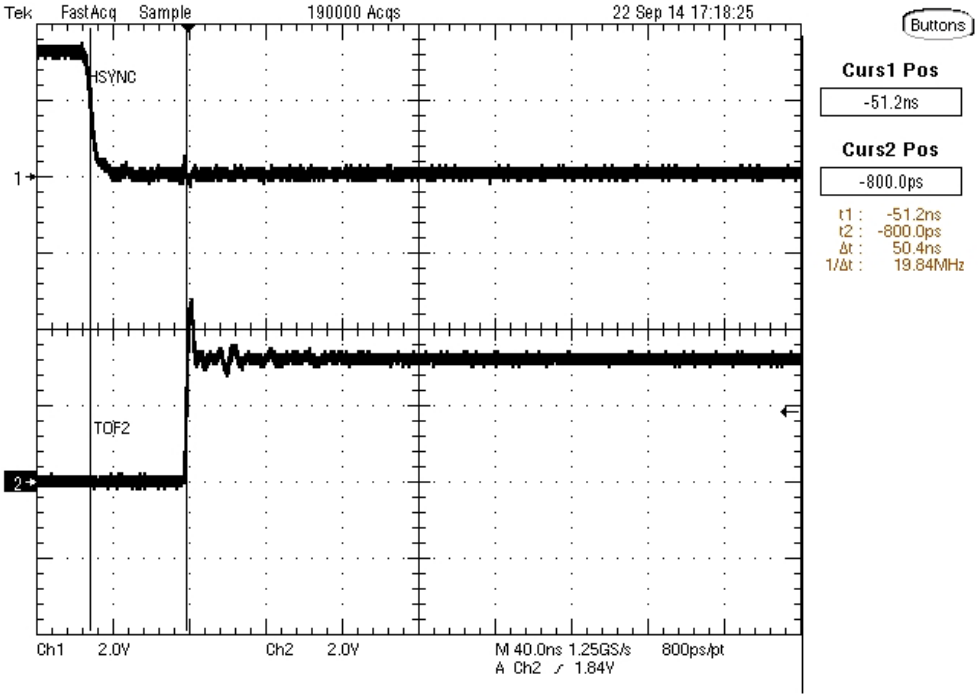

Figure 4. H_REF-TOFx Delay at 576i25.

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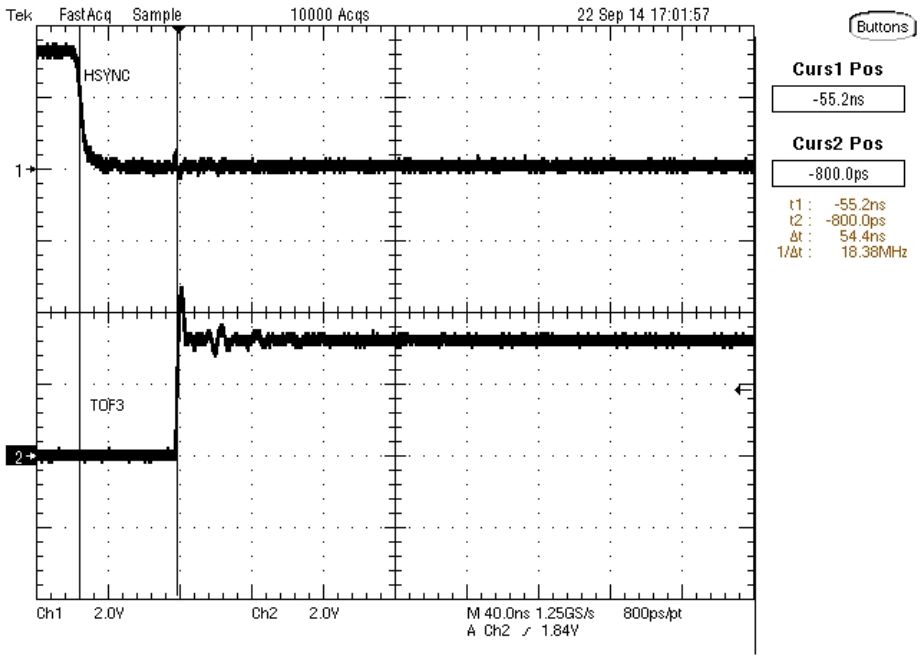

Figure 5. H_REF-TOFx Delay at 1080p29.97.

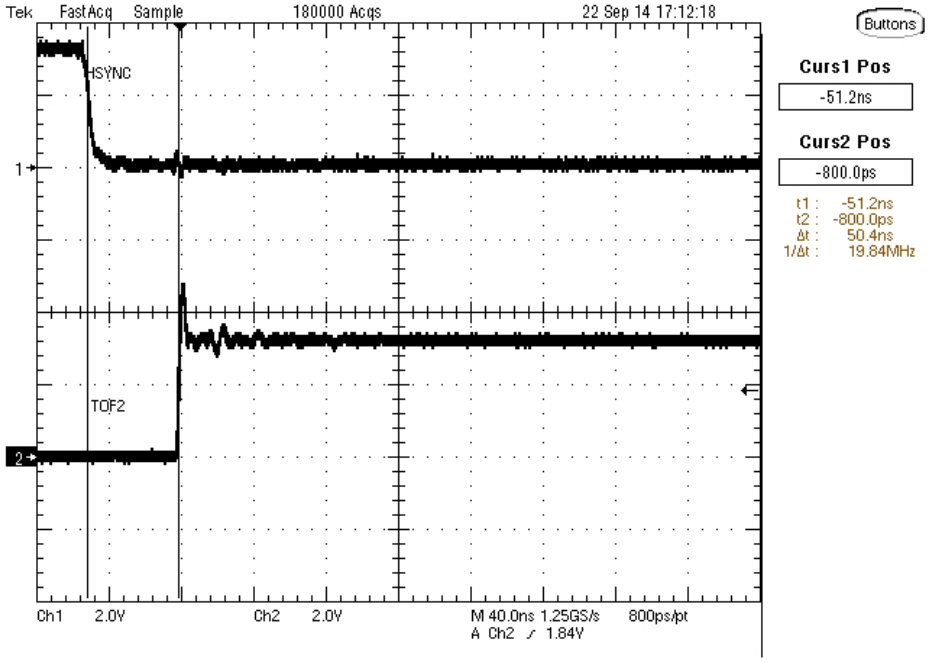

Figure 6. H_REF-TOFx Delay at 1080p30.

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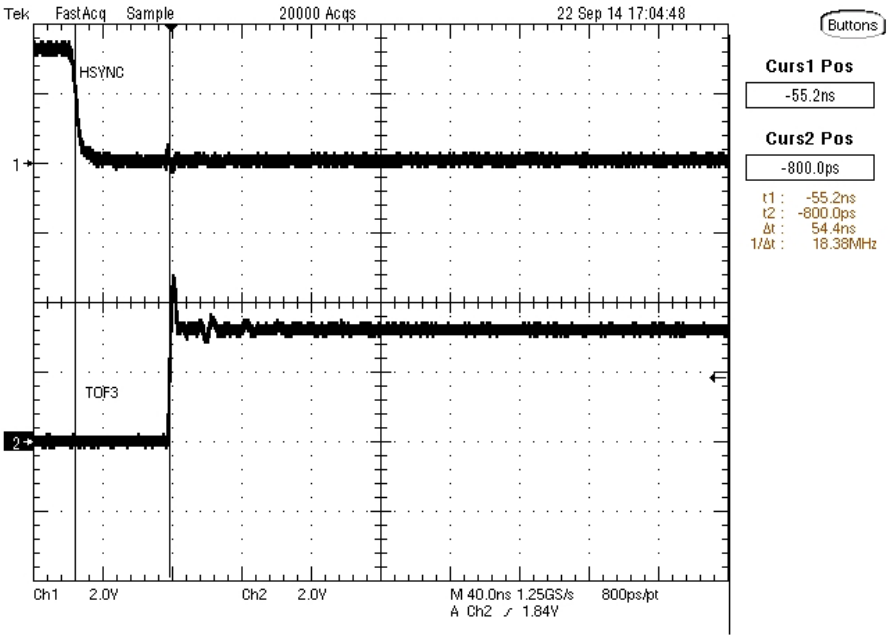

Figure 7. H_REF-TOFx Delay at 720p59.94.

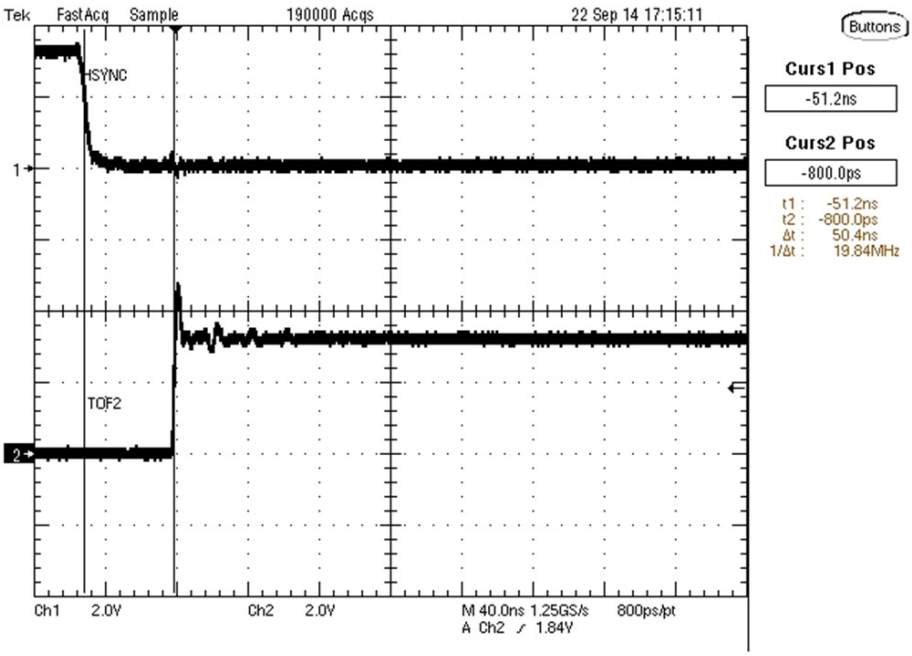

Figure 8. H_REF-TOFx Delay at 720p50.

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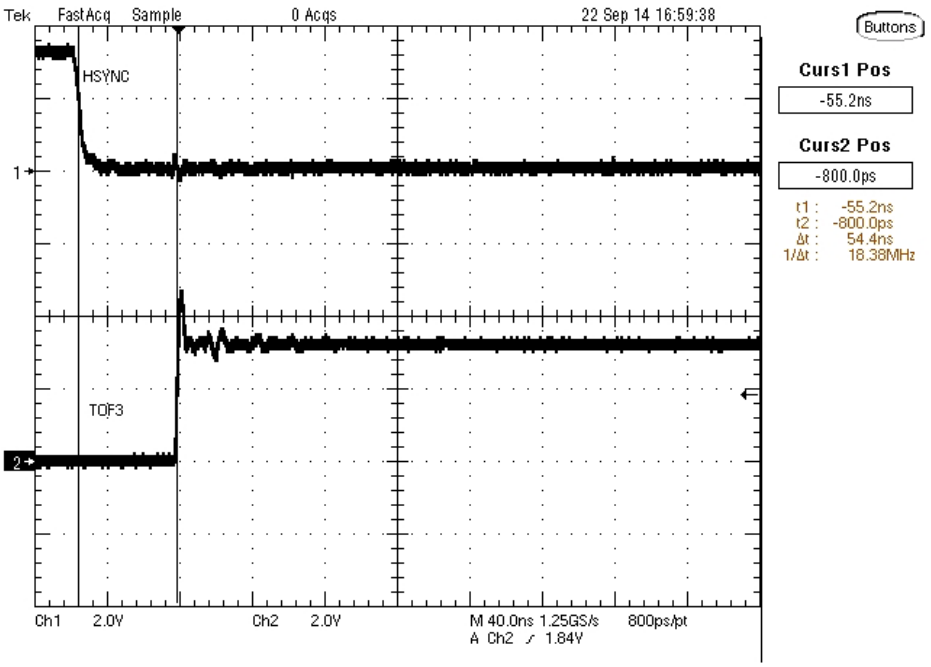

Figure 9. H_REF-TOFx Delay at 1080i29.97

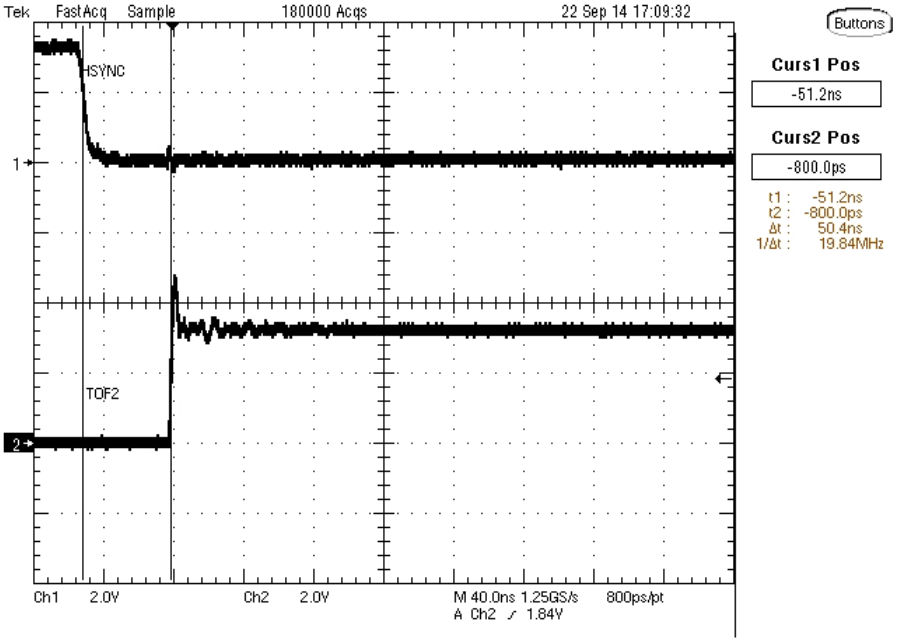

Figure 10. H_REF-TOFx Delay at 1080i25

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