

Digital Storage Oscilloscope dual frequency auto-measurements test

V1  
Determines scope horizontal auto-measurements (frequency, period) accuracy with two different frequency signals on same timebase.  
Test idea by MrWolf@EEVblog forum.

Test conducted by:  
Date:

MrWolf@EEVblog forum  
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Oscilloscope under test:  
Production year:  
Calibration date:  
Hardware version:  
Firmware version etc:  
Vertical setting:  
Channels in use:  
Channel coupling:  
Horizontal setting:  
Sampling rate:  
Comments:

Rigol DS1000Z  
2016  
Self-cal after firmware update  
0.1.4  
00.04.04.SP1  
200mV/div (1.6Vpp)  
2  
DC  
20us/div  
500MSa/s  
1024x averaging used, after signal change pressed [CLEAR]

Test waveforms:  
Frequency:  
Risetime:  
Jitter:  
Amplitude:  
Signal generator:  
Comments:

square waves, 50% duty  
6,660Hz...13,639,680Hz in 6,660\*2^n steps  
<=10ns  
<=150ps rms  
1Vpp  
Siglent SDG2000X  
50ohm system, frequency accuracy verified with hardware counter

from generator	reported by DSO	calculated	reported by DSO	from generator	reported by DSO	calculated	reported by DSO	
F-CH1-GEN (Hz)	F-CH1 (Hz)	Period CH1-GEN (ns)	Period CH1 (ns)	F-CH2-GEN (Hz)	F-CH2 (Hz)	Period CH2-GEN (ns)	Period CH2 (ns)	F-CH2 abs error %
6 660	6 650	150 150	150 400	6 660	6 650	150 150	150 400	0.15
6 660	6 650	150 150	150 400	13 320	13 400	75 075	74 800	0.60
6 660	6 650	150 150	150 400	26 640	26 900	37 538	37 200	0.97
6 660	6 650	150 150	150 400	53 280	54 300	18 769	18 400	1.88
6 660	6 650	150 150	150 400	106 560	109 000	9 384	9 200	2.24
6 660	6 650	150 150	150 400	213 120	208 000	4 692	4 800	2.46
6 660	6 650	150 150	150 400	426 240	417 000	2 346	2 400	2.22
6 660	6 650	150 150	150 400	852 480	833 000	1 173	1 200	2.34
6 660	6 650	150 150	150 400	1 704 960	833 000	587	1 200	104.68
6 660	6 650	150 150	150 400	3 409 920	833 000	293	1 200	309.35
6 660	6 650	150 150	150 400	6 819 840	833 000	147	1 200	718.71
6 660	6 650	150 150	150 400	13 639 680	299 000	73	3 383	4 461.77

