

Microsemi Clock Generators for Xilinx FPGAs

Introduction

Today's FPGA offerings address requirements across a wide set of applications including wireless and wired networks, software-defined networking, video, industrial networking and cloud computing. Furthermore, as a result of an FPGA's ability to incorporate standards-based IP, high speed serial transceivers, low power dissipation and system level integration, FPGA's are quickly replacing alternative ASIC and ASSP solutions. As the capabilities of an FPGA increase so do the performance requirements of the reference clocks used by an FPGA. Microsemi offers several synthesis and rate conversion/jitter attenuation devices that exceed reference clock requirements. The following pages of this document provide Microsemi solutions for the various FPGA products surveyed.

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Microsemi devices listed in Table 1 easily meet the phase noise requirements needed by the FPGA's reference clock. To be a valid Ref Clock source, the clock generator's jitter performance must be better than the FPGA's Ref Clock jitter requirement. This occurs when the clock generator's jitter value is less than the Ref Clock jitter requirement.

Table 1. Microsemi Phase Jitter Performance vs. Xilinx Phase Jitter Requirements

Family	Ref Clock Freq (MHz)	Phase Noise (dBc/Hz) @				Calculated (Required) Phase Jitter from Mask Data (ps RMS)	Microsemi Jitter Performance over same Jitter Mask Points, typical (ps RMS)		
		10 kHz	100 kHz	1 MHz	10 MHz		ZL30250/1 ZI30244/5	ZL30252/3 ZI30255	ZL30262/3 ZL30266/7
Spartan-6 GTP	100	-112	-130	-130	-135	2.22	0.193	0.277	0.245
Virtex-6 GTP	125.0	-120	-128	-139	-142	0.833	0.182	0.263	0.202
Virtex-6 GTP	156.25	-120	-128	-139	-142	0.666	0.180	0.266	0.185
7 Series GTX, GTH QPLL	100	-126	-130	-134	N/A	0.63	0.193	0.277	0.245
7 Series GTX, GTH QPLL	125	-123	-129	-133	N/A	0.590	0.182	0.263	0.202
7 Series GTX, GTH QPLL	156.25	-122	-127	-132	N/A	0.568	0.180	0.266	0.181
7 Series GTX, GTH QPLL	250	-119	-126	-131	N/A	0.419	0.172	0.254	0.189
7 Series GTX, GTH QPLL	312.5	-115	-124	-130	N/A	0.447	0.169	0.254	0.207
Virtex-7 GTX, GTH QPLL	625	-110	-116	-120	N/A	0.527	0.160	0.249	0.165
7 Series GTX, GTH CPLL	100	-126	-132	-136	N/A	0.522	0.193	0.277	0.245
7 Series GTX, GTH CPLL	125	-123	-131	-135	N/A	0.497	0.182	0.263	0.202
7 Series GTX, GTH CPLL	156.25	-121	-129	-133	N/A	0.500	0.180	0.266	0.181
7 Series GTX, GTH CPLL	250	-119	-126	-132	N/A	0.412	0.172	0.254	0.189
7 Series GTX, GTH CPLL	312.5	-116	-124	-131	N/A	0.424	0.169	0.254	0.207
Virtex-7 GTX, GTH CPLL	625	-110	-119	-127	N/A	0.388	0.160	0.249	0.165

Table 1 Notes:

1. N/S – Not specified
2. 7 Series includes Kintex-7, Virtex-7, Artix-7, and Virtex-7 HT

If you do not find the information you are looking for here please contact clocktree@microsemi.com

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