Microsemi Clock Generators for Altera 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. Microsemi exceeds the phase noise requirements for these FPGAs.

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. Altera Phase Jitter Requirements

Family	Ref Clock Freq (MHz)	Phase Noise (dBc/Hz) @ Or Phase Jitter Requirement					Calculated (Required) Phase Jitter from Mask Data (ps RMS)	Microsemi Jitter Performance over same Jitter Mask Points, typical (ps RMS)		
		100 Hz	1 kHz	10 kHz	100 kHz	≥1 MHz		ZL30250/1 ZL30244/5	ZL30252/3 ZL30255	ZL30262/3 ZL30266/7
Stratix V GX & GS	622	-70	-90	-100	-110	-120	2.81	0.252	0.266	0.187
	100	3 ps (10 kHz to 1.5MHz for PCIe)					3	0.142	0.238	0.167
Stratix IV GT & GX	622	-70	-90	-100	-110	-120	2.81	0.252	0.266	0.187
	100	3 ps (10 kHz to 1.5MHz for PCIe)					3	0.142	0.238	0.167
Arria II GX, ST, SX	622	-70	-90	-100	-110	-120	2.81	0.252	0.266	0.187
	100	3 ps (10 kHz to 1.5MHz for PCIe)					3	0.142	0.238	0.167
Arria 10 GX, ST, SX	622	-70	-90	-100	-110	-120	2.81	0.252	0.266	0.187
	100	4.2 ps (10 kHz to 100MHz for PCIe)					4.2	0.142	0.238	0.167
Cyclone IV GX	622	-70	-90	-100	-110	-120	2.81	0.252	0.266	0.187
	100	3 ps (10 kHz to 1.5MHz for PCIe)					3	0.142	0.238	0.167
Cyclone V GX, GT, SX	100	3 ps (10 kHz to 1.5MHz for PCIe)					3	0.142	0.238	0.167

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

Microsemi Corporate Headquarters
One Enterprise
Aliso Viejo, CA 92656 USA

Within the USA: +1 (800) 713-4113
Outside the USA: +1 (949) 380-6100
Sales: +1 (949) 380-6136
Fax: +1 (949) 215-4996

E-mail: sales.support@microsemi.com

Microsemi Corporation (Nasdaq: MSCC) offers a comprehensive portfolio of semiconductor and system solutions for aerospace & defense, communications, data center and industrial markets. Products include high–performance and radiation–hardened analog mixed–signal integrated circuits, FPGAs, SoCs and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; enterprise storage and communication solutions, security technologies and scalable anti-tamper products; Ethernet solutions; Power–over–Ethernet ICs and midspans; as well as custom design capabilities and services. Microsemi is headquartered in Aliso Viejo, Calif., and has approximately 4,800 employees globally. Learn more at www.microsemi.com.