IDT
Integrated Device Technology

IDT's family of high-performance jitter attenuator and clock generator solutions optimize customers' applications in key markets. These products are part of a portfolio specifically designed with ultra-low phase noise and jitter performance in mind. This makes them ideal for meeting the stringent timing requirements for Cavium Processors which require a low phase and high reliability clock source in demanding applications, including intelligent networking, communications, storage and video and security.

With products that uniquely complement Cavium designs IDT provides the design expertise, reliability and delivery necessary to achieve design success. IDT's high performance timing products are an excellent choice for use in Cavium-based designs. The IDT portfolio includes devices which feature:

• Translation from virtually any input frequency to any output frequency

• Up to eight independently-programmable clock outputs with the flexibility to generate eight different frequencies

• Ultra-low phase jitter of less than 100 fs RMS (12 kHz to 20 MHz)

Table 1 lists timing solutions that can be used to meet the often stringent timing requirements of Cavium processors and switches.

Part Number	Output Level	Number of Outputs	Support Cavium Core Clock 50 MHz	Frequency Plan (MHz)	Peak-to-Peak Phase Jitter	Phase Jitter (RMS)	Note
8V41N012	HCSL	10	Yes	25, 50, 100, 125, 156, 312.5	< 25 ps	< 0.5 ps	Individual OE pin, 25 MHz reference clock
	LVCMOS	4					
8V41N010	HCSL	8	Yes	50, 100, 156	< 25 ps	< 0.5 ps	Individual OE pin
8T49NS010	LVPECL	10	No	100, 156, 312, 625, 1250	< 12 ps	< 0.1 ps	Sub 100 fs clock
8T49N287	LVPECL/ LVDS/HCSL	8	Yes	8 KHz to 1 GHz	< 25 ps	< 0.3 ps	Jitter Attenuator, Programmable Clock
83PN15639	LVPECL	1	No	156	< 25 ps	< 0.3 ps	5 x 7 compatible footprint
841N254	HCSL LVDS	2	No	100, 125, 156, 250	< 25 ps	< 0.3 ps	Can generate four copies of a selectable frequency: 100 MHz, 125 MHz, 156.25 MHz, 250 MHz
8413S12	HCSL	10	Yes	25, 50, 100, 125, 156, 312.5	< 44 ps	< 0.5 ps	Individual OE pin, 25 MHz reference clock
	LVCMOS	4					
841654	HCSL	4	No	100, 125	< 44 ps	< 0.5 ps	25 MHz reference clock, supports Serial RapidIO®
8413S08	HCSL	9	Yes	25, 33, 50, 100,156	< 70 ps	< 0.5 ps	25 MHz reference clock
	LVCMOS	3					
	LVPECL	3					

Table 1: IDT Timing Solutions for Cavium Processors and Switches

Table 2 defines the timing requirements of Cavium's CN78XX OCTEON® Multi-core MIPS64 Processor. The SerDes reference clock requires jitter performance of less than 25 ps peak-to-peak and 2.25 ps RMS. The 8V41N012 is an ideal timing solution for this application because of its low phase jitter performance and versatility. As outlined in Table 1, the 8V41N012 device meets the jitter requirements over full temperature range with excellent margin.

Parameter	Min	Typ	Max	Units	Comment
Frequency Offset	-100	-	100	ppm	
Duty Cycle	40	-	60	%	
Edge Rate	-	-	700	ps	20% to 80%
V_{IH}	325	700	850	mV	
V_{IL}	-150	0	175	mV	
Phase Jitter (rms)	-	-	2.25	ps	Integrated from 12 kHz to 20 MHz
Phase Jitter (p-to-p)	-	-	25	ps	Measured over 10k samples

Table 2: Cavium CN78XX Octeon Multi-core MIPS64 Processor Requirements

Figure 1 shows an example of a typical dual processor platform clock tree. IDT's 8V41N012 has 10 HCSL outputs and can generate the various clocks for Cavium's CCPI interface, PHY link, PCIe Gen3 peripherals and processor core clock.
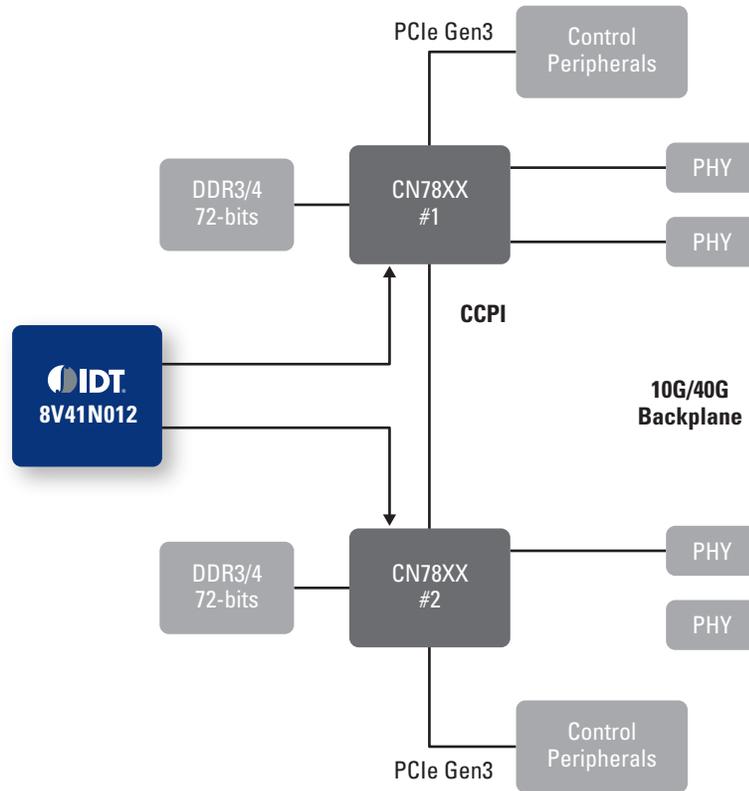

Figure 1: Cavium CN78XX Clock Tree

With a product portfolio 10 times greater and broader than any other and the industry's largest market share, IDT is the world's leader in silicon timing and is in a unique position to address the needs of virtually any application. IDT is the only one-stop-shop for timing, offering products from full-featured system solutions to simple clock building-block devices. IDT's high-performance timing devices deliver the reliable, solid jitter performance required by Cavium processors and switches, while the APLL design implemented in these devices can often help customers exceed requirements, adding margin and reliability to their design. IDT timing products are accompanied by a world-class support team driven by service and responsiveness goals. For more information about IDT's leading portfolio of timing products, please visit idt.com/go/timing.

To request samples, download documentation, or learn more, visit: **idt.com/go/ReferenceDesigns**

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