XILINX KINTEX®-7 POWER AND TIMING: OVERVIEW

Xilinx's family of Kintex®-7 FPGAs provides the best price/performance/watt at 28nm while offering high DSP ratios, cost-effective packaging, and support for mainstream standards like PCIe® Gen3 and 10 Gigabit Ethernet. The Kintex®-7 family is ideal for applications such as 3G and 4G wireless, flat panel displays, and video over IP solutions.

This winning combination highlights the power devices on the reference board for the Xilinx® Kintex®-7 family and suggested timing solutions from Renesas.

Visit the **Kintex-7 power solutions** page to learn more.

Key Features:

- Power modules are complete DC/DC power solutions that reduce design time, lower cost and save board space
- Pre-programmed PMICs specifically designed to meet this use case
- VersaClock® clocks capable of 350MHz outputs and low jitter attenuation

BIG IDEAS FOR EVERY SPACE

RENESAS

XILINX KINTEX®-7 POWER AND TIMING: BLOCK DIAGRAM

BIG IDEAS FOR EVERY SPACE
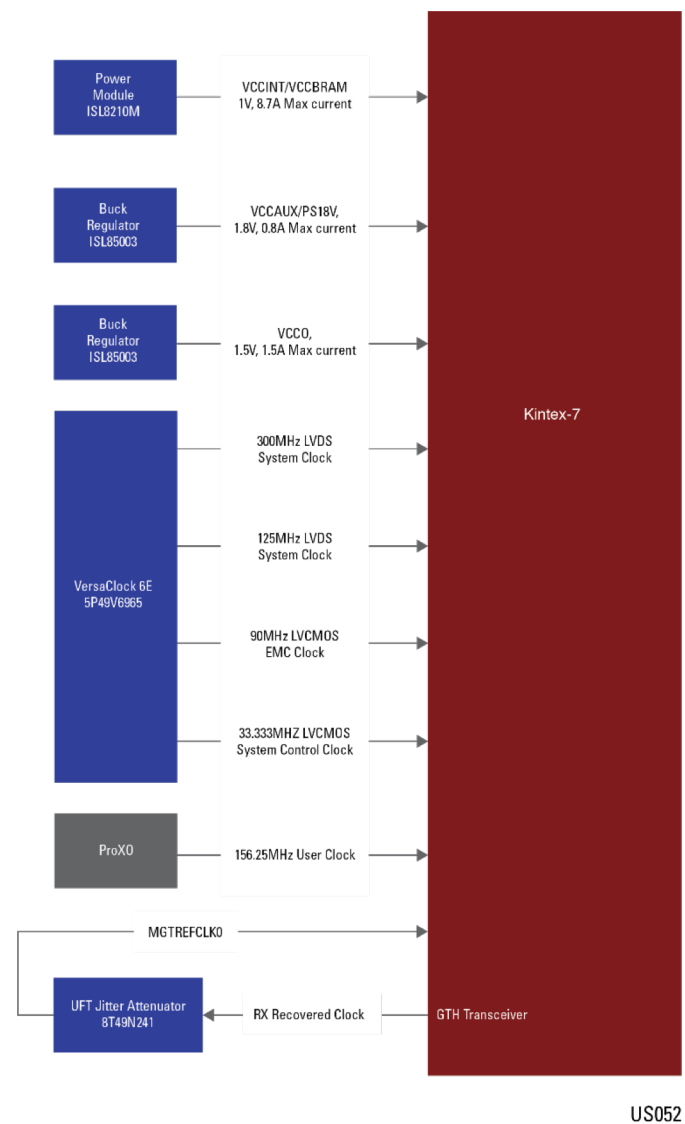
XILINX KINTEX®-7 POWER AND TIMING: SUMMARY

- **System benefits**
  - Complete power solutions that reduce design time, lower cost and save board space
  - Highly efficient and cost effective power tree
  - High performance clocking meets PCIe® Gen1/2/3, USB 3.0, 1/10 GbE clock requirements

Device Category	P/N	Key Features
Power	ISL8210M	10A High Efficiency Step-Down Power Module
Power	ISL85003	Highly Efficient 3A Synchronous Buck Regulator
Timing	5P49V6965	VersaClock® 6E Programmable Clock Generator
Timing	8T49N241	FemtoClock®NG Universal Frequency Translator (2-in / 1-PLL / 4-out)

BIG IDEAS FOR EVERY SPACE **RENESAS**

# ISL8210M – 10A High Efficiency Step-Down Power Module
Servers, Telecom, Industrial/ ATE an networking equipment.

R4 Technology

- Allows lower output caps for fast transient respond and smaller solution size for the output
- Input voltage range: 4.5V to 16.5V
- Output voltage range: 0.5V to 5V

Flexibility and Accuracy

- 256 output voltage levels with a configuration pin
- Seven switching frequency options from 300kHz to 1MHz
- ±1.5% load and line regulation with remote sense
- Integrated LDOs for single input rail solution
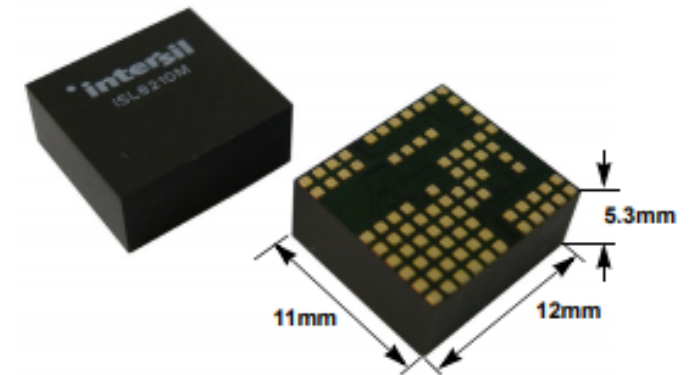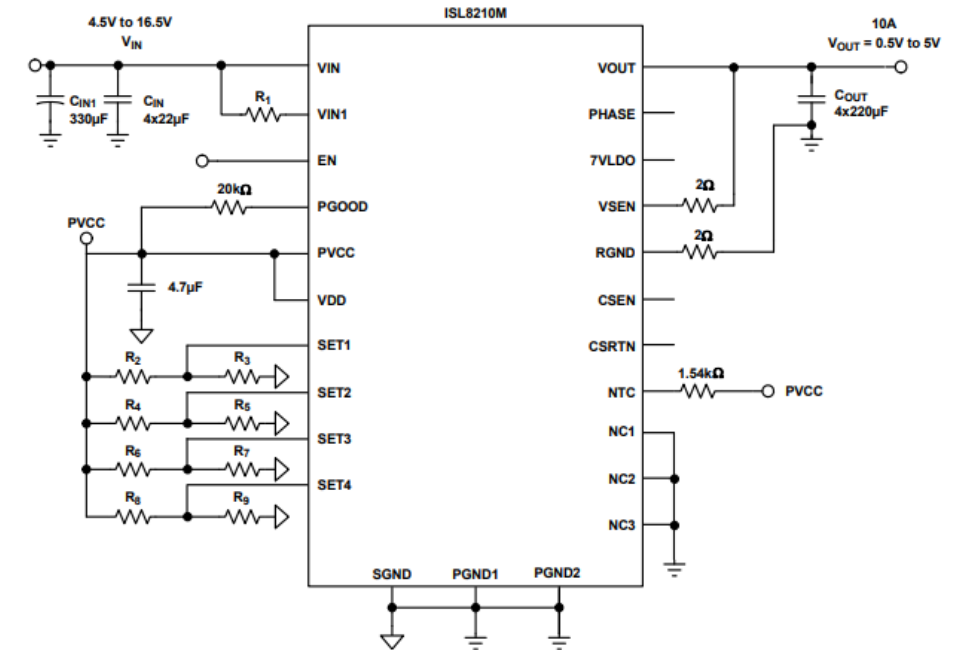
Part #	Package
ISL8210MFRZ	83L 12x11 HDA Module
ISL8210MFRZ-T1	83L 12x11 HDA Module

BIG IDEAS FOR EVERY SPACE

RENESAS

ISL85003 – Efficient 3A Synchronous Buck Regulator
Network and communication equipment, Industrial control, Point-of-load regulators

Flexible power

- Input voltage range 4.5V to 18V
- Output voltage adjustable from 0.8V, ±1%
- DCM/CCM

High Efficiency and Accuracy

- Efficiency up to 95%
- high-side NFET is designed to have an rDS(ON) of 65mΩ, low-side NFET is designed to have an rDS(ON) of 45mΩ.

Built in protection

- Positive and negative overcurrent protection
- Overvoltage and thermal protection

Part #	Package
ISL85003FRZ	12L 3x4mm DFN (1500)
ISL85003FRZ-T7A	83L 12x11 HDA Module (T&R 250)
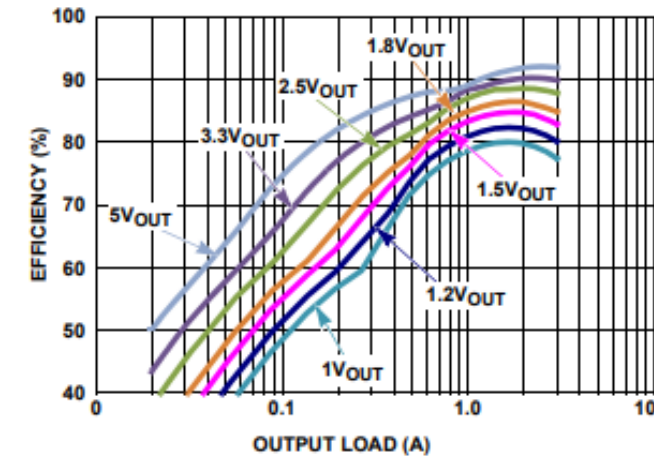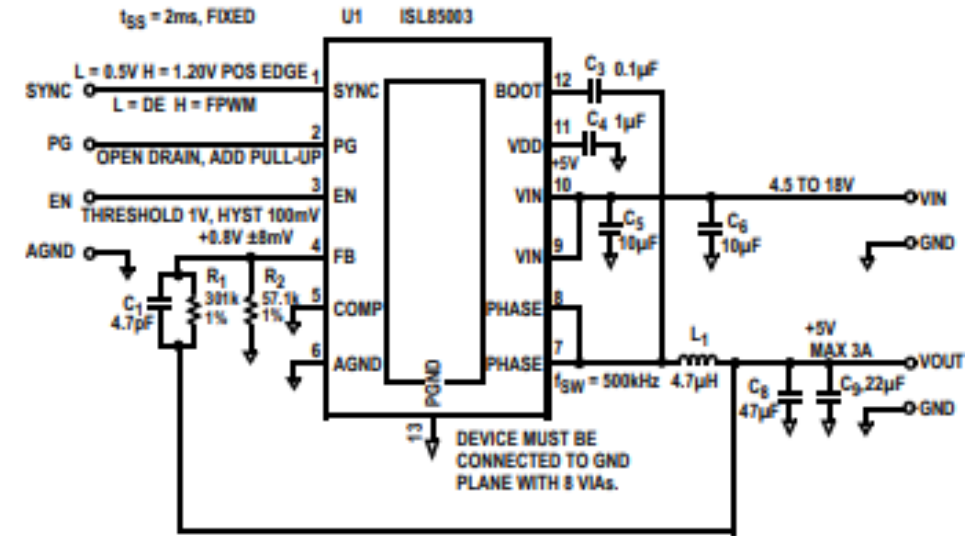
EFFICIENCY vs LOAD, 18VIN DCM

BIG IDEAS FOR EVERY SPACE

RENESAS

5P49V6965 - LOW PHASE JITTER, SMALL SIZE
VersaClock 6E Series – Flexible Programmable Clock

Very Low Phase Jitter

- <500 fs rms phase jitter
- w/o trading off low power, <50mA core current consumption

Wide Support

- Meets PCIe Gen 1/2/3/4, USB 3.0, 1/10 GbE clock
- Flexible 1.8V, 2.5V, 3.3V power-rails
- Supports both crystal (8MHz–40MHz) and external clock input(1MHz–350MHz)

Configurable

- 2 programmable I²C addresses allowing multiple devices to be used in same system.
- 4 independent frequencies with 0.001MHz–350MHz output range

Part #	Pack	Package
5P49V6965A000NLGI	Tray	24L 4x4mm VFQFPN
5P49V6965A000NLGI8	Reel	24L 4x4mm VFQFPN
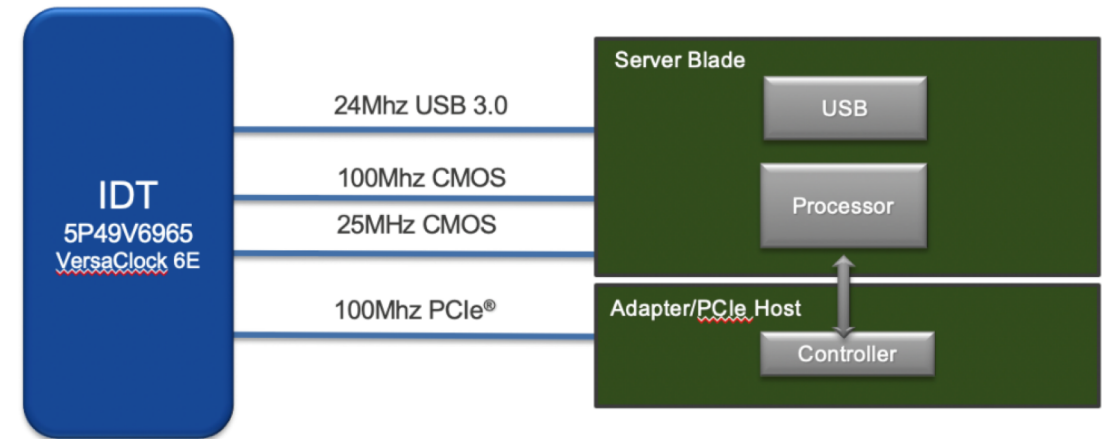
Symbol	Parameter	Conditions	Minimum	Typical	Maximum	Units
J_{CY-CY}	Cycle to Cycle Jitter	LVCMOS 3.3V ±5%, -40°C–90°C.		5	30	ps
		All differential outputs 3.3V ±5%, -40°C–90°C.		25	35	ps
J_{PK-PK}	Period Jitter	LVCMOS 3.3V ±5%, -40°C–90°C.		28	40	ps
		All differential outputs 3.3V ±5%, -40°C–90°C.		4	30	ps
J_{RMS}	RMS Phase Jitter (12kHz–20MHz)	LVCMOS 3.3V ±5%, -40°C–90°C.		0.3		ps
		All differential outputs 3.3V ±5%, -40°C–90°C.		0.5		ps

BIG IDEAS FOR EVERY SPACE

RENESAS

8T49N241 – JITTER ATTENUATION, HIGH-PERFORMANCE
FemtoClock®NG Universal Frequency Translator

High Performance Clock

- Four different output frequencies, ranging from 8kHz to 1GHz.
- All are completely independent of each other
- Outputs may select among LVPECL, LVDS, HCSL or LVCMOS output levels

Wide Input Frequency

- Operates from a 10MHz to 50MHz fundamental-mode crystal or a 10MHz to 125MHz external oscillator
- Accepts up to 2 LVPECL, LVDS, LVHSTL or LVCMOS input clocks, frequencies ranging from 8kHz to 875MHz

Jitter Attenuation

- 0.35ps RMS Typical Jitter (including spurs): 12kHz to 20MHz

Part #	Package
8T49N241-998NLGI	40L 6x6mm VFQFPN
8T49N241-999NLGI	40L 6x6mm VFQFPN

BIG IDEAS FOR EVERY SPACE