

XILINX ZYNQ® ULTRASCALE+™ MPSOC POWER AND TIMING: OVERVIEW

One of Xilinx's newer families of SoCs is the Zynq® UltraScale+™ MPSoC. These devices provide 64-bit processor scalability while combining real-time control with soft and hard engines for graphics, video, waveform, and packet processing. Built on a common real-time processor and programmable logic-equipped platform, three distinct variants include dual application processor (CG) devices, quad application processor and GPU (EG) devices, and video codec (EV) devices, creating unlimited possibilities for applications such as 5G wireless, next generation ADAS, and the Internet of Things (IoT).

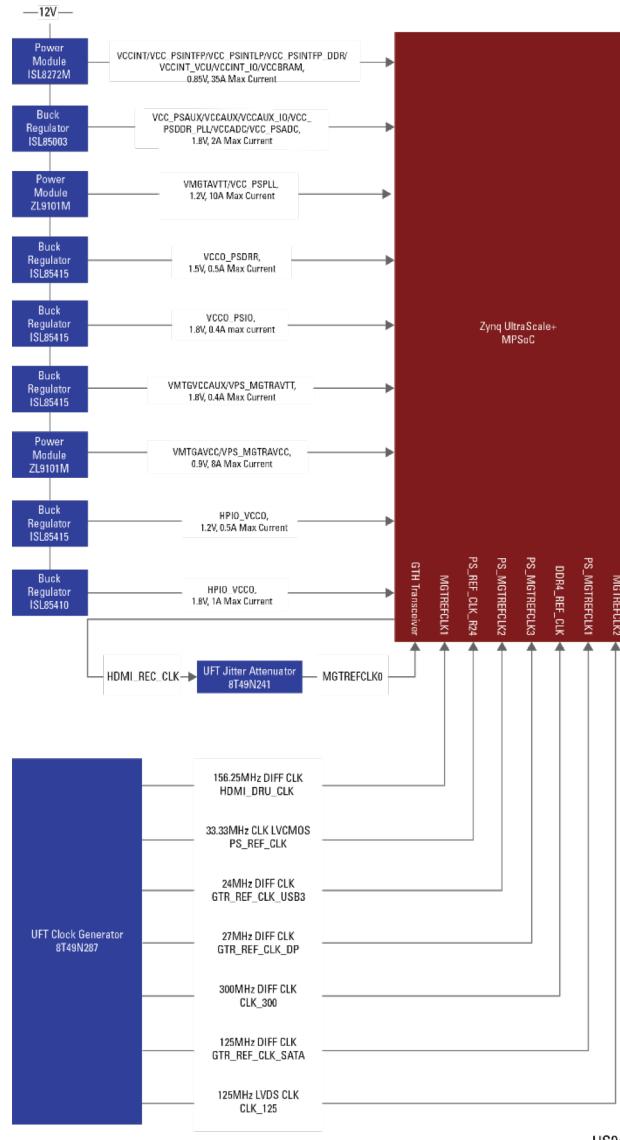
An FPGA with this level of performance demands a high-current power supply with tight regulation and extremely low jitter clock sources. This winning combination highlights the clocking that is on the Xilinx reference design ZCU104 and suggested Renesas power solutions.

Visit the [power supply solutions](#) page to learn more.

Key Features:

- Power modules are complete power solutions that reduce design time, lower cost and save board space for your Xilinx design
- Meets the transient requirements of high-performance processors and memory cards in power supplies
- FemtoClock®NG Universal Translator capable of 1GHz outputs with jitter specs in compliance with Ethernet standards up to 25G

XILINX ZYNQ® ULTRASCALE+™ MPSOC POWER AND TIMING: BLOCK DIAGRAM



XILINX ZYNQ® ULTRASCALE+™ MPSOC POWER AND TIMING: SUMMARY

■ System benefits

- High currents at tight tolerances to meet Xilinx requirements
- Digital power allows high configurability of power outputs
- Multi-output high performance clock ICs allow for low chip count and fewer external devices

Device Category	P/N	Key Features
Power	ISL8272M	50A Digital DC/DC PMBus Power Module
Power	ISL85003	Highly Efficient 3A Synchronous Buck Regulator
Power	ZL9101M	Digital DC/DC PMBus 12A Module
Power	ISL85410	40V, Low Quiescent Current, 150mA Linear Regulator
Power	ISL85415	36V, 500mA buck switching regulator with integrated FETs.
Timing	8T49N241	FemtoClock®NG Universal Frequency Translator (2-in / 1-PLL / 4-out)
Timing	8T49N287	FemtoClock®NG Universal Frequency Translator (2-in/2-PLL/8-out)

ISL8272M – 50A Digital DC/DC PMBus Power Module

Servers, Telecom, Industrial/ ATE and networking equipment.

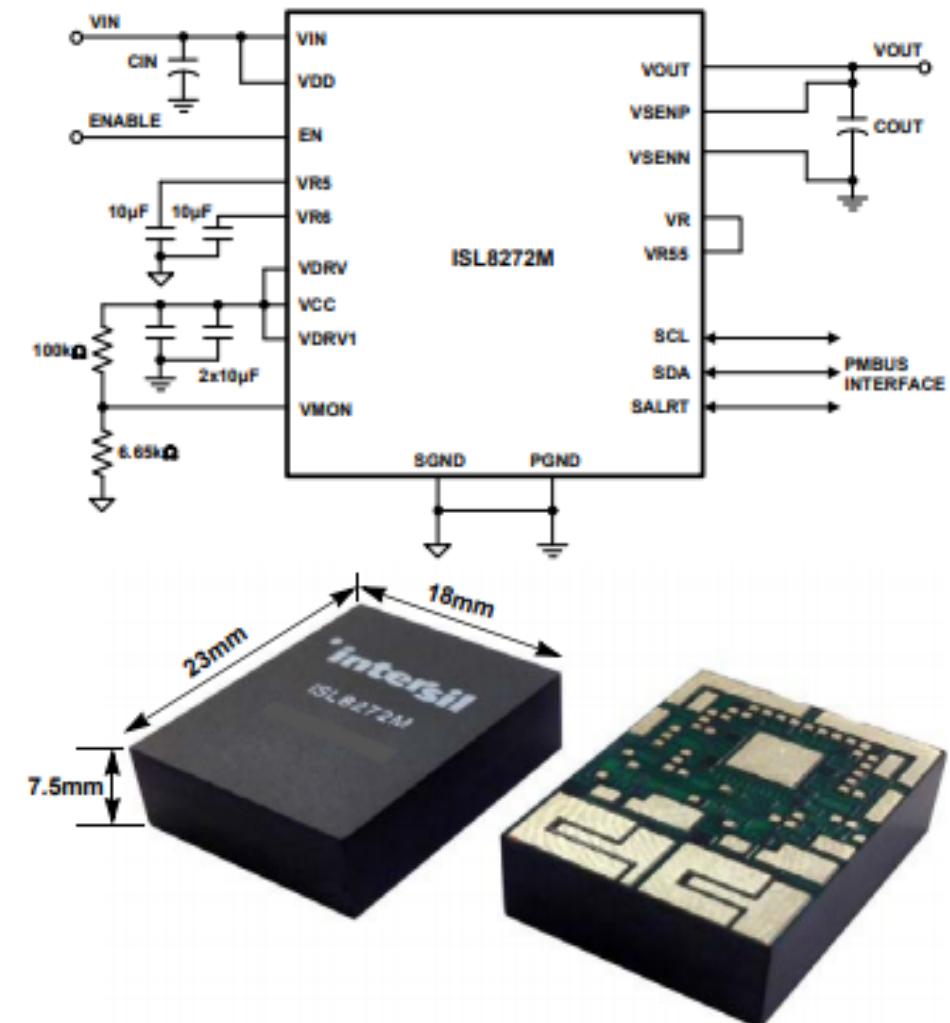
High Current Out

- 50A step-down PMBus compliant digital power module.
- In current sharing configuration, four modules in parallel can deliver 200A continuous current
- Thermally enhanced HDA package
- Monitor of VIN, VOUT, IOUT, temperature, duty cycle, switching frequency, power-good, and faults

Flexibility and Accuracy

- $\pm 1.0\%$ VOUT accuracy over line, load, and temperature
- Wide input voltage range: 4.5V to 14V
- Programmable output voltage range: 0.6V to 5V
- Complete digital switch mode power supply

Part #	Package
ISL8272MBIRZ-T	58L 18x23mm HDA Module
ISL8272MAIRZ-T	58L 18x23mm HDA Module



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, $\pm 1\%$
- DCM/CCM

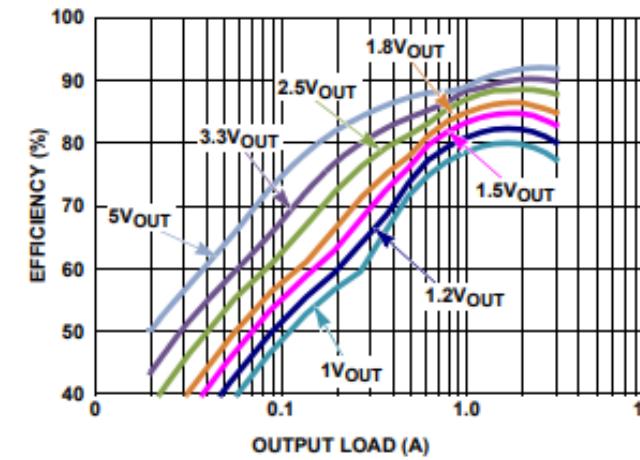
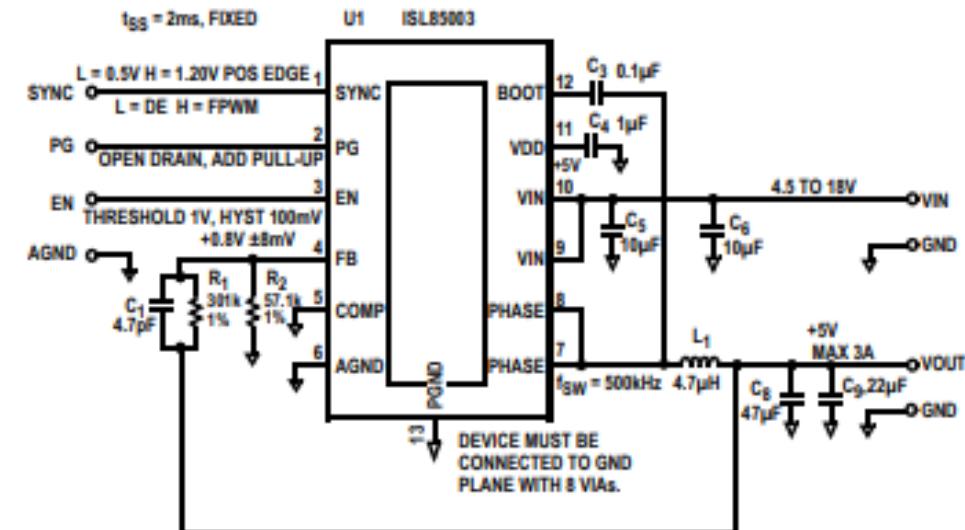
High Efficiency and Accuracy

- Efficiency up to 95%
- high-side NFET is designed to have an $r_{DS(ON)}$ of $65m\Omega$, low-side NFET is designed to have an $r_{DS(ON)}$ of $45m\Omega$.

Built in protection

- Positive and negative overcurrent protection
- Ovvoltage and thermal protection

Part #	Package
ISL85003FRZ	12L 3x4mm DFN (1500)
ISL85003FRZ-T7A	83L 12x11 HDA Module (T&R 250)



ZL9101M – Digital DC/DC PMBus 12A Module

Server, telecom, and datacom, Industrial & medical equipment, General purpose POL

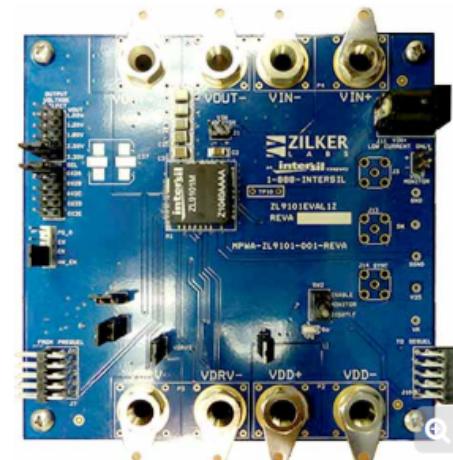
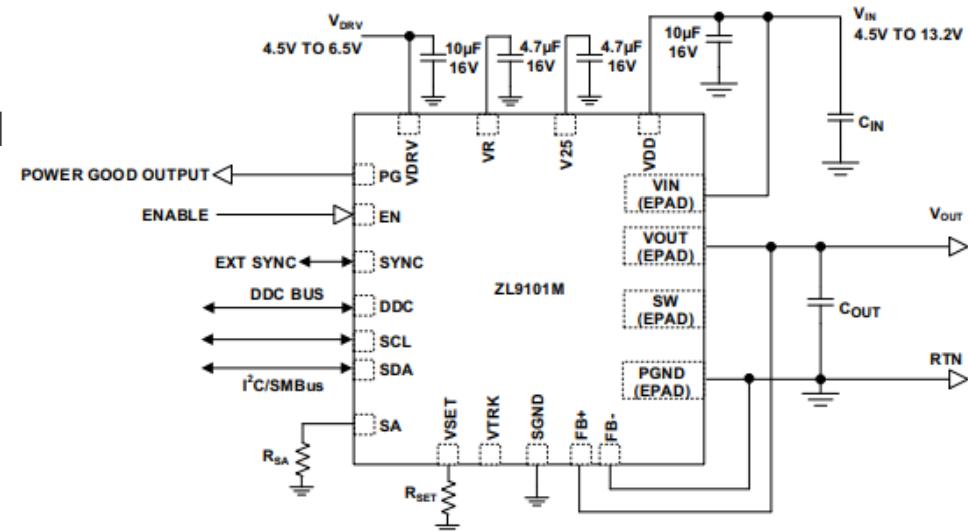
Complete Power Supply

- 12A variable output, step-down PMBus-compliant digital power supply
- Fast transient response
- Output voltage range of 0.6V to 3.6V
- Input voltage range of 4.5V to 13.2V

Robust Solution

- Overcurrent/undercurrent protection
- Auto compensating PID filter
- External synchronization
- Fast transient response

Part #	Package
ZL9101MIRZ	21L 15x15mm QFN
ZL9101MBIRZ	21L 15x15mm QFN
ZL9101MAIRZ	21L 15x15mm QFN



ISL85410 – Wide VIN 1A Synchronous Buck Regulator

Industrial control, Medical, Portable instrumentation and Cloud infrastructure

Flexible Power

- Wide input voltage range: 3V to 40V
- Continuous output current up to 1A
- Internal or external soft-start

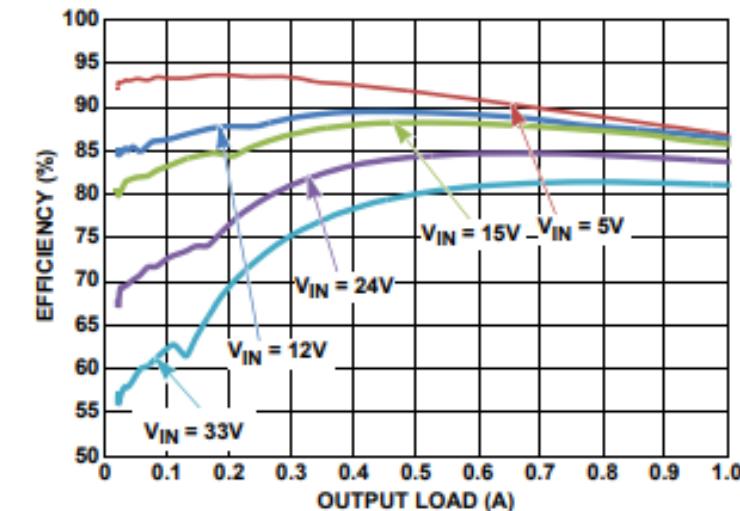
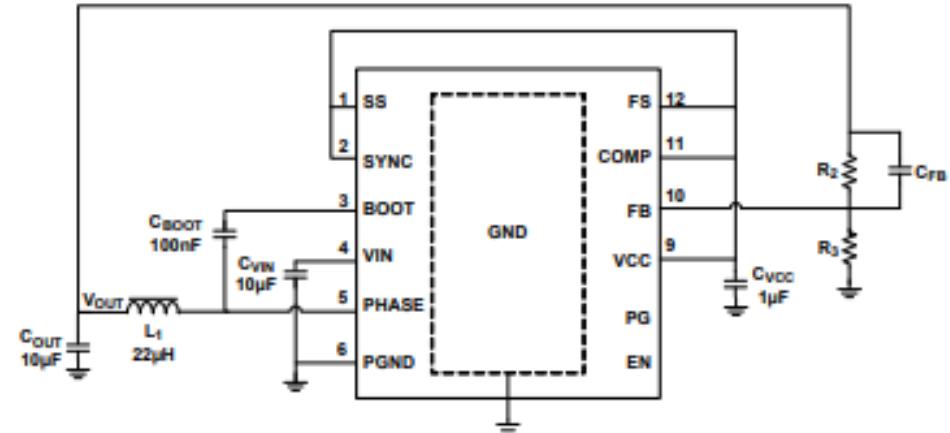
High Efficiency and Accuracy

- Efficiency up to 95%
- Synchronous operation for high efficiency

Fast Design in

- Minimal external components required
- Integrated high-side and low-side NMOS devices

Part #	Package
ISL85410FRZ	12L 3x4mm DFN
ISL85410FRZ-T7A	15L 3.5x3.5 QFN (T&R 250)



ISL85415 – Wide VIN 500mA Synchronous Buck Regulator

Industrial control, Medical, Portable instrumentation and Cloud infrastructure

Flexible Power

- Wide input voltage range: 3V to 36V
- Continuous output current up to 500mA
- Internal or external soft-start

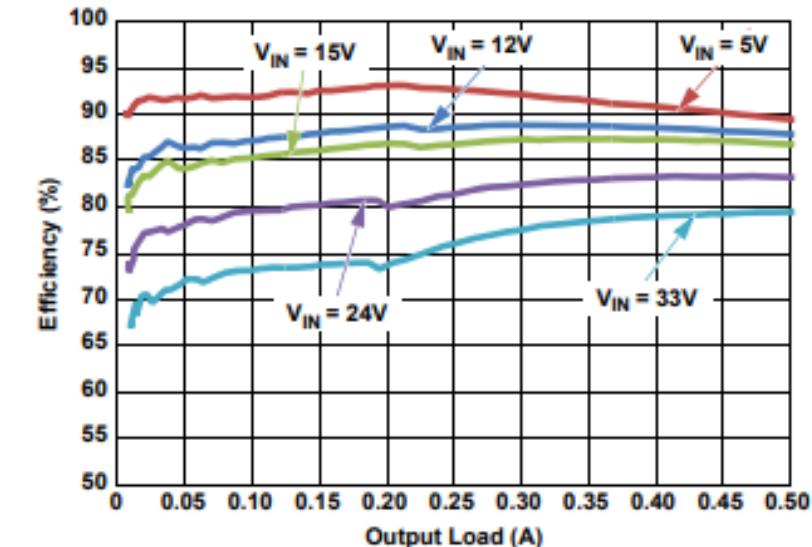
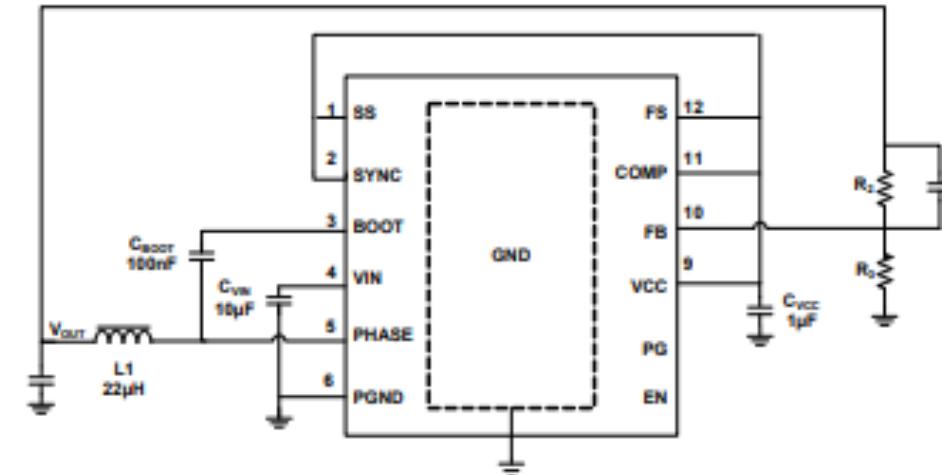
High Efficiency and Accuracy

- No compensation required
- Synchronous operation for high efficiency

Fast Design in

- Minimal external components required
- Integrated high-side and low-side NMOS devices

Part #	Package
ISL85415FRZ	12L 3x4mm DFN
ISL85415FRZ-T7A	15L 3.5x3.5 QFN (T&R 250)



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 LVC MOS output levels

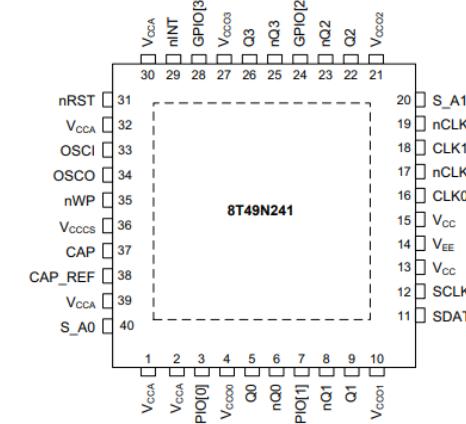
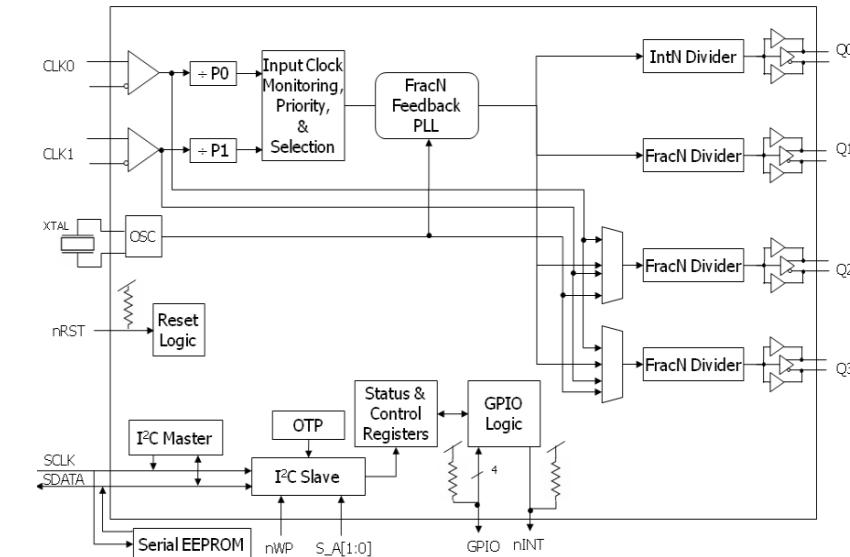
Wide Input Frequency

- Operates from a 10MHz to 50MHz fundamental-mode crystal or a 10MHz to 125MHz external oscillator
- Accepts up to 2 LVPECL, LVDS, LVHSTL or LVC MOS 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



8T49N287 – JITTER ATTENUATION, HIGH-PERFORMANCE

FemtoClock NG Universal Frequency Translator (2-in/2-PLL/8-out)

High Performance Clock

- Eight different output frequencies, ranging from 8kHz to 1GHz.
- All are completely independent of each other
- Generates up to 8 LVPECL / LVDS/HCSL or 16 LVC MOS output clocks

Wide Input Frequency

- Operates from a 10MHz to 40MHz fundamental-mode crystal
- Accepts up to 2 LVPECL, LVDS, LVHSTL or LVC MOS input clocks, frequencies ranging from 8kHz to 875MHz

Jitter Attenuation

- 0.3ps RMS Typical Jitter (including spurs): 12kHz to 20MHz

Part #	Package
8T49N287A-998NLGI	56L 8x8mm VFQFPN
8T49N287A-999NLGI	56L 8x8mm VFQFPN

