Precision Timing Solutions

NVIDIA DRIVE Orin Reference Design

Precision Timing in the NVIDIA Drive Platform

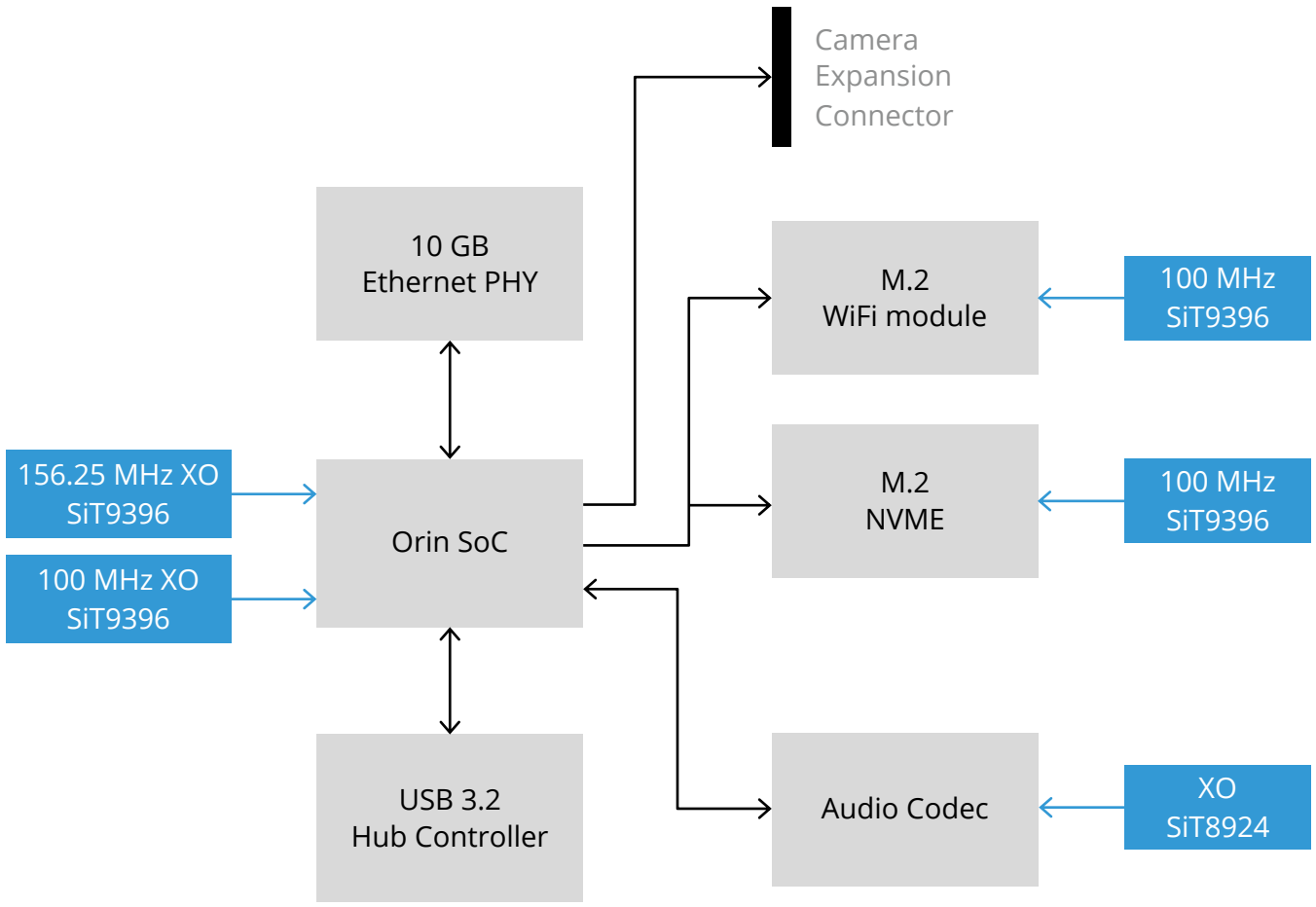
Newer models of vehicles now offer ADAS levels 1 and 2 driver assistance, with some offering higher levels. NVIDIA has released its NVIDIA DRIVE autonomous vehicle (AV) platform, based on the NVIDIA Orin SoC, to implement these functions. It is capable of 254 TOPS of processing power needed for intelligent vehicles. This platform is intended to help OEMs deliver Level 2+ to 5 capable vehicles.

Key Considerations

- Reliability, functional safety
- Low jitter
- High temperature
- Fast system start-up
- EMI

The NVIDIA DRIVE platform serves as a reference design for automotive systems makers and OEMs. Given the obvious complexity of such a platform, it features a complex and varied clocking environment. SiTime is one of the vendors selected for this reference design set.

The block diagram below shows the various functional blocks of the reference design, along with potential SiTime clocking solutions.



SiTime

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Featured products – please refer to the Selector Guide for more options.

Type	Product	Frequency	Key Features	Key Values
Single-ended oscillator	SiT8924	1 to 110 MHz	• Up to -55°C to +125°C • ±20 ppm stability • 2016, 2520, 3225 packages	• High reliability • Extended temperature range • Small footprint
	SiT9025	1 to 150 MHz	• Up to -55°C to +125°C • Spread spectrum • Configurable rise / fall times • 2016, 2520, 3225 packages	• High reliability • Extended temperature range • EMI Reduction
Differential oscillator	SiT9386A-B240001	100 MHz	• ±25 ppm stability • -40°C to 85°C • 3225 package • For PCIe clocking	• High reliability • Low jitter • Enables interfaces with demanding jitter requirements, such as PCI-Express and 10 GB Ethernet
	SiT9396	1 to 220 MHz	• Low jitter: < 150 fs RMS[1] • ±30 ppm or ±50 ppm stability • LVPECL, LVDS, HCSL, Low-power HCSL, FlexSwing™ • -40°C to +125°C • 2016, 2520, 3225 packages	
	SiT9397	220 to 920 MHz		

[1] 12 kHz to 20 MHz integration range

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Why SiTime Timing Solutions

More robust in harsh environments:

- 4x better vibration resistance — 0.1 ppb/g typical
- 20x better shock survivability

Better stability over a wide temperature range

- Up to -55 to +125°C operation
- Airflow and thermal shock resistant — 1 ppb/°C

Programmability for flexible design

- Any frequency, any stability, any voltage within a wide range
- Qualify once for multiple parts

High reliability

- 50x better quality and reliability — over 2.2-billion-hour MTBF
- Lifetime warranty

Unique features

- EMI reduction — up to 30 dB lower
- Low power for longer battery life
- Smaller size — packages as small as 1.5 mm x 0.8 mm

Learn more about Automotive solutions from SiTime

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