LeddarTech®

LeddarEngine

Leddar CORE

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**SoC and Software for the
Auto and Mobility LiDAR Platform**

LeddarEngine
The Power Driving Automotive and Mobility LiDARs

At the core of our LiDAR platform, the LeddarEngine™ sets a new standard for integrated and customizable solid-state LiDAR solutions that are optimized for high-volume production.

LeddarEngine enables Tier-1 suppliers and system integrators to design their own differentiated LiDAR solution by providing the technology, tools, and resources they need to meet the specific requirements of various advanced driver assistance systems (ADAS) and autonomous driving applications (AD).

VERSATILE

Comprised of the LeddarCore™ system-on-chip (SoC) and LeddarSP™ signal processing, the LeddarEngine supports multiple LiDAR architectures and technologies, including solid-state flash and hybrid flash designs.

SCALABLE

The LiDAR development platform enables our customers to design a variety of solid-state LiDARs (SSL) that are optimized for specific active safety and ADAS/AD applications. Leveraging affordable, readily available technologies, the platform shortens development cycles and accelerates the path to high-volume manufacturing to meet expected mass-market demand ramp-up.

PATENTED, AUTOMOTIVE-GRADE TECHNOLOGY

The LeddarEngine integrates LeddarTech's® proprietary signal acquisition and processing algorithms. The powerful software, which has been perfected by over a decade of dedicated R&D and multiple commercial deployments in the most demanding environments, enhances LiDAR's detection range and accuracy for optimized performance-to-cost ratios. Developed to meet the automotive industry's stringent requirements, the LeddarEngine allows Tier-1 suppliers to design and mass-produce automotive-grade SSLs that meet functional safety requirements (ISO 26262 ASIL-B) and high reliability (AEC-Q100).

ADAS/AD Target Markets

Passenger cars

Trucks & buses

Autonomous shuttles

Autonomous delivery vehicles

Robotaxis

LeddarEngine: At the Core of Your Solid-State LiDAR Design

The LeddarEngine is the advanced software and hardware core that enables the development and industrialization of multiple LiDAR architectures and technologies, including solid-state flash and hybrid flash designs. Various components and software that are part of LiDAR design and integration such as emitters, receivers, micromirrors, microprocessors, and software development tools, are available from the Leddar™ Ecosystem partners, which are prequalified for integration with LeddarEngine.
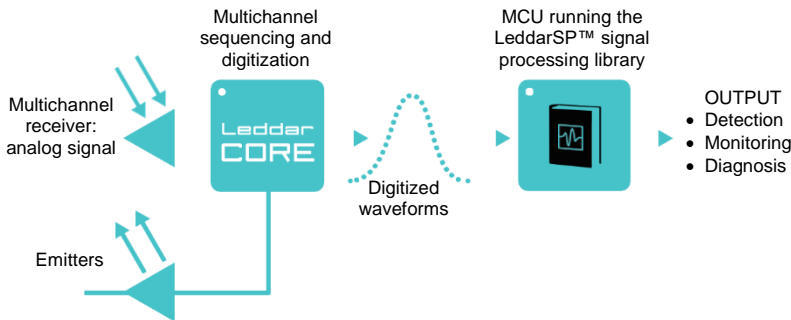

LiDAR Block Diagram
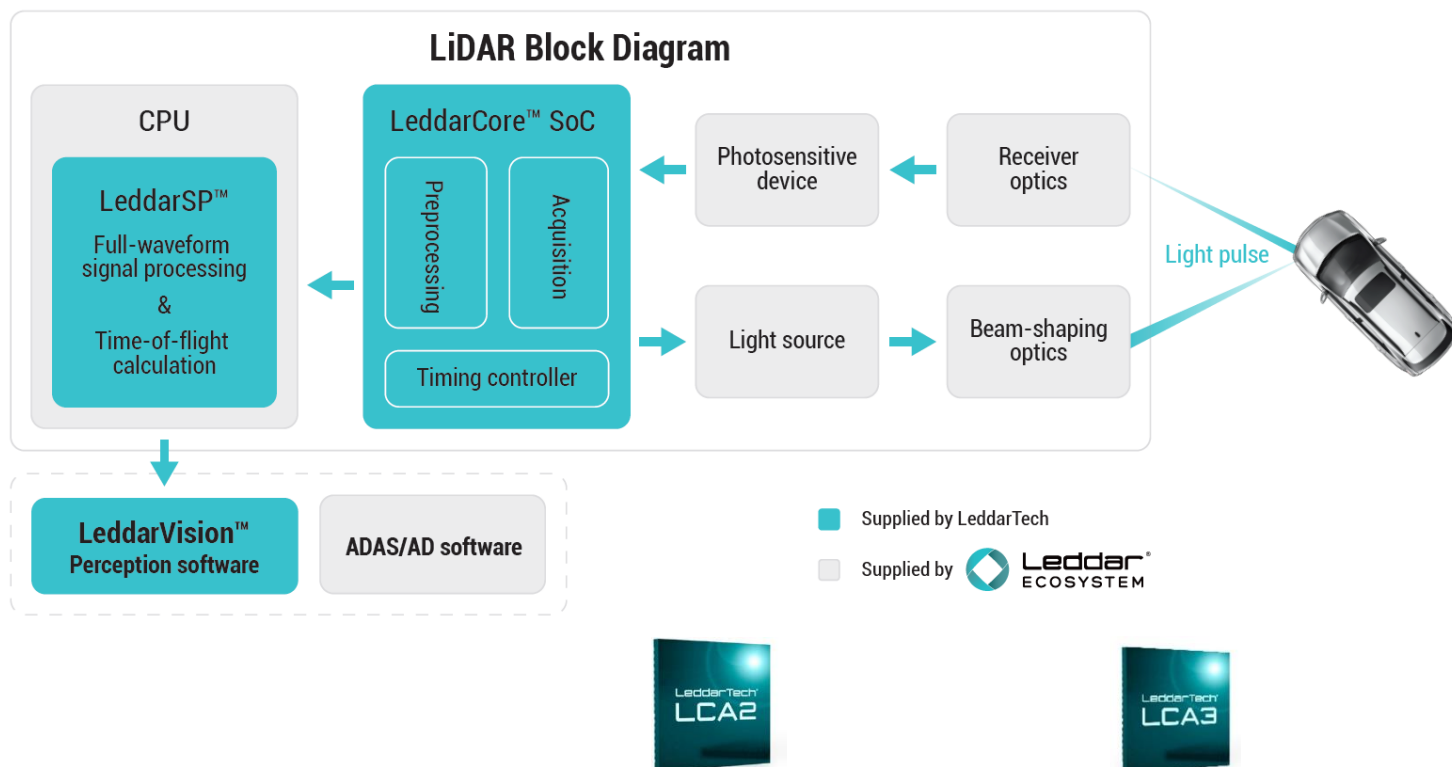
LeddarEngine Specifications	LeddarCore LCA2 SoC	LeddarCore LCA3 SoC
Target applications	Short-to-medium range LiDARs	Medium-to-long range LiDARs
Number of input channels	32	64
Waveforms per second	Up to 48 k	Up to 935 k
Data interface	200 MBps Quad SPI	10 GBps MIPI CSI-2
Instrumented range (typical)	200 m	300 m
Distance accuracy	As low as 5 cm	
Distance precision	As low as 1 cm	
Reliability and safety	AEC-Q100, ISO 26262 ASIL-B	
Package type	QFN-72	225-FCCSP
Package dimensions	10 mm x 10 mm	12 mm x 12 mm

Complete product data sheet available upon request

Powered by Leddar™ Technology

Covered by more than 95 patents (granted or pending), Leddar is LeddarTech's proprietary technology that generates a higher range-to-power ratio, which enables lower detection thresholds for significantly increased range and sensitivity over other solid-state LiDAR methods.

Multichannel
sequencing and
digitization

MCU running the
LeddarSP™ signal
processing library

Multichannel
receiver:
analog signal

Leddar
CORE

Digitized
waveforms

OUTPUT
• Detection
• Monitoring
• Diagnosis

Emitters

KEY DIFFERENTIATORS

✓ Leddar samples the received echo for the complete detection range of the sensor, rather than working directly on the analog signal.

✓ Through patented methods, Leddar iteratively expands the sampling rate and resolution of the sampled signal.

✓ Using sophisticated software algorithms, Leddar analyzes the resulting discrete time signal and recovers the distance for every object.

Leddar Benefits

Higher sensitivity and range for unmatched performance

Leddar's cleaner, digitized signal enables detection of weaker signals for significantly increased range using existing standard technology/ components.

Standard LiDAR   Leddar-based LiDAR
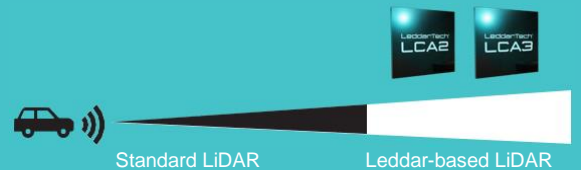
Less signal degradation, providing high robustness in inclement weather and changing light conditions

Multi-pulse measurement method statistically increases quality of measurements and full-waveform processing ensures high adaptability of sensors in all conditions.

No interference from sensors' overlapping fields of view or from other light sources

Multi-pulse measurement method combined with low duty cycle and spectrum spreading minimizes mutual sensor interference. Additional intelligent interference rejection enabled by full-waveform processing.

Enabling enhanced object detection, classification, and tracking

Detection segments provide complete sensing of the environment and better long-range object detection, classification, and tracking and with less data compared to point-based methods.

Affordable solid-state LiDAR suited to large-scale deployment

Leveraging affordable components and designed with no moving parts, Leddar-based sensors are designed for large-scale automotive-grade production and deployment.

Auto and Mobility LiDAR Platform

The most scalable, versatile solid-state LiDAR platform to enable ADAS and AD applications

The auto and mobility LiDAR platform provides Tier-1 suppliers and selected Tier-2s the key components and tools to develop and produce differentiated SSL solutions tailored to the specific ADAS, AD, and mobility application requirements of OEMs.

Customers developing with the LeddarEngine have access to:

- A comprehensive set of development tools that include LiDAR architecture
- Design files and documentation
- LiDAR evaluation kits to benchmark the technology against application requirements and to begin development and integration
- Technical support: throughout the entire development process, customers have access to engineering and training services, ongoing support, and a comprehensive team of Leddar Ecosystem partners, who serve as integral elements of the platform offering.

LeddarTech also offers off-the-shelf modules for specific mobility projects such as R&D, proof of concept, and field validation, and for platform seeding.

LeddarEngine	Development Tools	Support and Services
LeddarCore SoC **LeddarSP** **Signal processing software**	• Architecture, design files, documentation • LiDAR development tools • Evaluation kits & off-the-shelf modules • Perception software kit	• LiDAR development services • ADAS/AD development services • Training services
Leddar® ECOSYSTEM	Supplier network of key components, software tools, and complementary products qualified by LeddarTech for the auto and mobility LiDAR platform	

⊘ SCALABLE
- Single architecture enables solutions across the ADAS/AD performance range from L2 to L5
- Ability to meet high-volume production requirements
- Ecosystem partnerships enable rapid deployment and ramp-up of core technologies

⊘ VERSATILE
- Directly compatible with a wide variety of LiDAR architectures and technologies
- Allows Tier-1s and OEMs to meet various use cases with single platform
- Architecture and software compatibility enable central architecture or local processing

⊘ AUTOMOTIVE-GRADE
- SoC architecture and software library designed to meet ISO 20262 functional safety standard
- Ecosystem partners developing core components to meet automotive-grade requirements
- Roadmap supports multiple generations of automotive integration – meeting AEC-Q100

⊘ OPTIMAL COST/PERFORMANCE
- Disruptive business model allows to select building blocks and components according to market needs
- Platform developed to enable highest performance leveraging lower-cost, standard components
- Modular approach allows volume aggregation from multiple end customers to reduce production costs

Leddar® ECOSYSTEM

The Leddar Ecosystem™ comprises a select group of world-class partners, suppliers, and collaborators that support the customer development of automotive sensing solutions for ADAS and AD applications.

In tandem with LeddarTech, the Ecosystem provides technical expertise, components, software, tools, and services, leveraging a hardware-agnostic platform that is both open and scalable.

STRATEGIC PARTNERS

RENESAS · APTIV · MARELLI · flex · ON (ON Semiconductor)

OSRAM · ST (Authorized Partner) · First Sensor (is now part of) · TE connectivity · SUNNY OPTICAL TECHNOLOGY

STRATEGIC SUPPLIERS

BlackBerry QNX · clarion · HAMAMATSU PHOTON IS OUR BUSINESS · RENESAS

ECOSYSTEM COLLABORATORS

Ansys · EXCELITAS TECHNOLOGIES · VIAVI Viavi Solutions · AKKA PASSION FOR TECHNOLOGIES

INTEMPORA · LASERTEL a LEONARDO company · ALP.Lab · dSPACE

TRILUMINA · POLYSYNC · AUTONOMOUSTUFF Bringing Together the World's Best Technologies™ · dhBOWLES · SEOUL ROBOTICS · arm

About LeddarTech

LeddarTech is a leader in environmental sensing platforms for autonomous vehicles and advanced driver assistance systems. Founded in 2007, LeddarTech has evolved to become a comprehensive end-to-end environmental sensing company by enabling customers to solve critical sensing and perception challenges across the entire value chain of the automotive and mobility market segments. With its LeddarVision™ sensor-fusion and perception platform and its cost-effective, scalable, and versatile LiDAR development solution for automotive-grade solid-state LiDARs based on the LeddarEngine™, LeddarTech enables Tier 1-2 automotive system integrators to develop full-stack sensing solutions for autonomy level 1 to 5. These solutions are actively deployed in autonomous shuttle, truck, bus, delivery vehicle, smart city/factory, and robotaxi applications. The company is responsible for several innovations in cutting-edge automotive and mobility remote-sensing applications, with over 95 patented technologies (granted or pending) enhancing ADAS and autonomous driving capabilities.

For more information: sales@leddartech.com

LeddarTech®

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