

HESAI

Nasdaq: HSAI



Hesai Technology

LIDARS - THE ACTIVE SEAT BELT TO SAVE LIVES

November 2023



Situation Analysis: Ouster's Attempt to Disparage Hesai and Curb Fair Competition

Ouster and its agents have attempted to discredit Hesai's technology and business practices and ban Hesai products from U.S. markets relying primarily on false IP infringement claims and China- U.S. geopolitical tensions. Ouster's claims are unsubstantiated and Hesai denies all allegations and innuendos by Ouster.

- Allegations of IP infringement from Velodyne began in 2019-2020 as Hesai was in the midst of a fundraising exercise. It is noteworthy that Velodyne also sued Ouster at that time. These IP disputes were fully settled in 2020 in the Litigation Settlement and Patent Cross-Licensing Agreement (the "Agreement"). The Agreement contained a broad patent IP cross-licensing provision that entitled each party to use the other party's existing and future lidar patents and IP for ten years until 2030. However, IP infringement allegations resurfaced in 2023 following Hesai's U.S. IPO in February 2023 and contract wins with leading U.S. OEMs.
- In 2023 **Ouster filed a suit** with the ITC claiming infringement on five patents and seeking to bar Hesai's competing products from use in the US markets. ***The case has been terminated and is in breach of the Patent Cross-Licensing Agreement.***
- As Hesai becomes a larger competitor in the U.S. market, Ouster has launched a media smear campaign that directly targets Hesai, appealing to geopolitical tensions between China and the United States. ***Hesai believes these false allegations are xenophobic fear-mongering.***
- Hesai remains the global leader in lidar technology with 47% global automotive lidar market share (independently verified).

Hesai believes Ouster's media smear campaign and attempts at patent litigation are tactics being used to distract from Ouster's underperformance in capital and lidar markets, where it has not been able to compete effectively with Hesai.



Hesai and Ouster: Comparative Analysis – for the First 9 Months of 2023

- **Hesai's revenue and shipments far outpaced Ouster's**, by 200+% and 1,300+% respectively.
- Hesai's independently verified global automotive lidar market share of 47% shows its industry leadership

Statistics (for first 9 months of 2023)	Hesai	Ouster
Revenue (mn USD)	180	59
Shipments	134,380	9,300
Global Automotive Lidar Market Share ¹	47% in 2022	1% in 2022
ADAS Customers	14 OEMs and Tier 1 suppliers (including the Top 5 OEMs in China) across over 50 vehicle models	No ADAS client announced
Autonomous Mobility Market Share ¹	67% in 2022	2% in 2022
Gross Margin (Group Blended)	33%	5%
Operating Cash Flow (mn USD)	+17	-114

Source: public filings

Note:

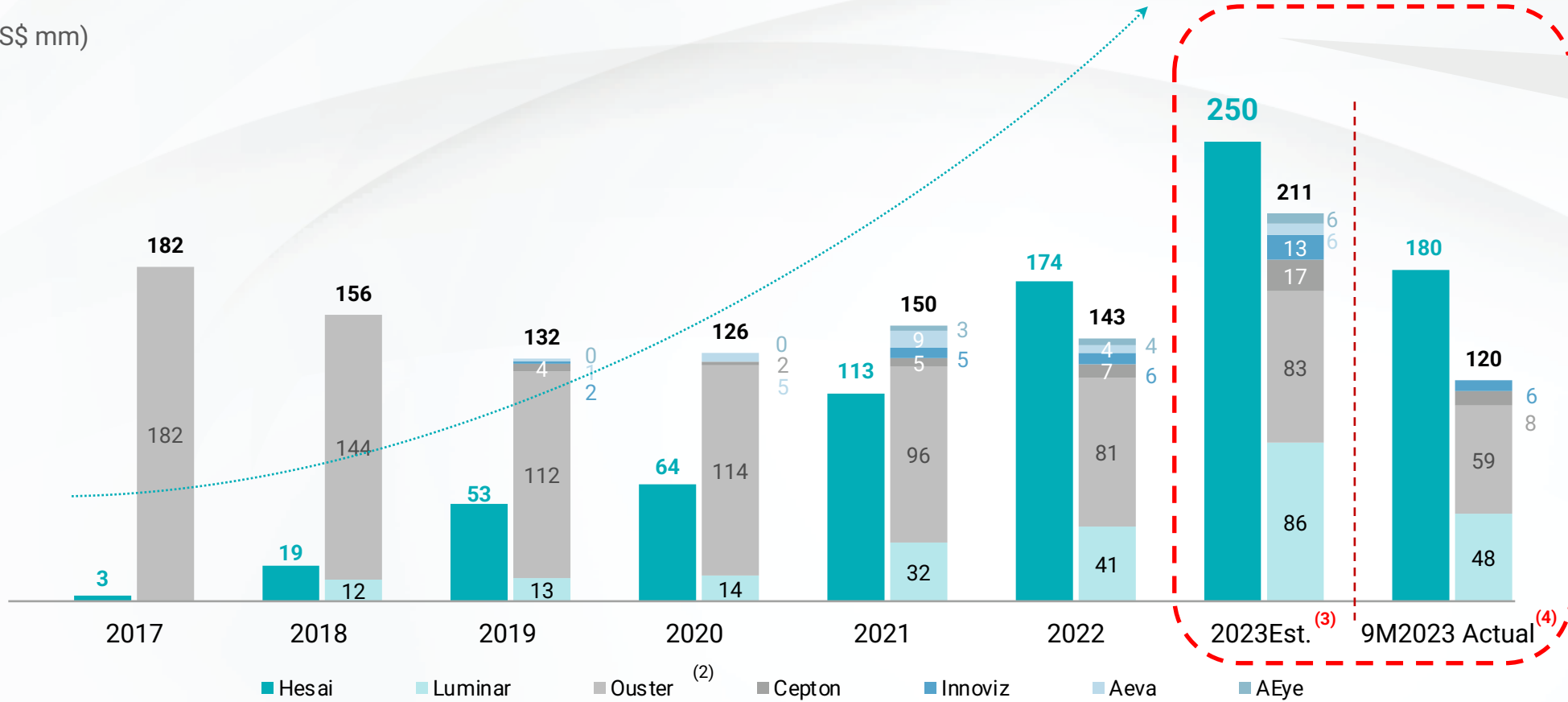
(1) Yole Intelligence, Lidar for Automotive 2023: <https://www.yolegroup.com/product/report/lidar-for-automotive-2023/>



Lidar Companies Revenues Comparison

Revenue (2017 - 2023E)⁽¹⁾

(US\$ mm)



Hesai 2017-2023E
Revenue CAGR:
>100%

Ouster's Performance since 2020

Declining Revenues:

- \$114 mm in 2020 to
- \$96 mm in 2021 to
- \$81 mm in 2022 to
- \$59 mm 9M23

Source: Management forecast, public filings, broker reports

Exchange rate: 2017 1 US\$ = 6.5342 RMB, 2018 1 US\$ = 6.8632 RMB, 2019 1 US\$ = 6.5250 RMB, 2020 1 US\$ = 6.5249 RMB, 9M2021 1 US\$ = 6.3726 RMB, 2021 1 US\$ = 6.3726 RMB; 2022 1 US\$ = 6.8646 RMB; 20230929 1 US\$ = 7.2960 RMB

(1) The 2022 revenue are actual data and 2023E revenue are based on latest consensus from FactSet

(2) The revenue data of Ouster are based on combined financials of Ouster and Velodyne; on November 7, 2022, Ouster and Velodyne announced that they have entered into a definitive agreement to merge in an all-stock transaction. On February 10, 2023, Ouster and Velodyne announced the completion of the proposed merger and delisting of Velodyne

(3) Based on research analyst report for peers

(4) Exclude AEye and Aeva, as their numbers are negligible

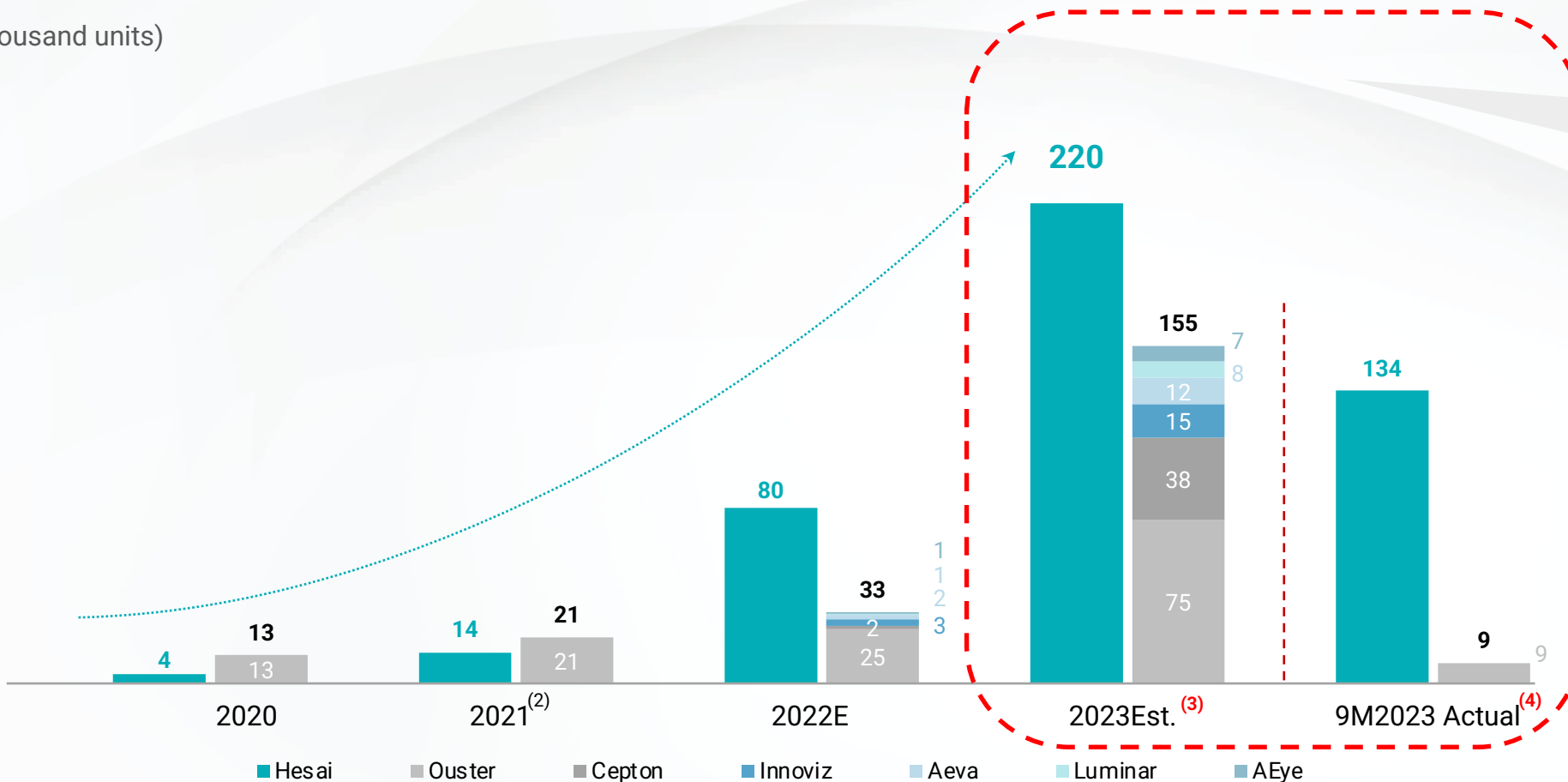
Disclaimer: The estimates provided are for informational purposes only, and no liability is assumed for their accuracy or use in making any decisions



Lidar Companies Shipments Comparison

LiDAR Shipments (2020 - 2023E)⁽¹⁾

(Thousand units)



Hesai 2020-2023E Shipments CAGR:
~300%

Ouster's Performance since 2021

Declining Deliveries:

- 21K in 2021, to
- 25k in 2022, to
- 9k in 9M23
- Unlikely to meet the market consensus of 75k deliveries for 2023

Source: Management forecast, public filings, broker reports

(1) The 2022 LiDAR delivery units of Hesai, Luminar Cepton and Ouster (excluding Velodyne) are actual data; 2022E and 2023E units of other companies are calculated based on the average of estimated annual delivery volume from available broker reports

Luminar, Innoviz, Aeva, Cepton and AEye are in pre-mass-delivery stage in 2020-2021; therefore, they did not disclose their delivery data in 2020 and 2021. Quarterly delivery volumes of AEye and Aeva are not included in 2023E total volumes as they are immaterial

(2) The LiDAR delivery data of Ouster are based on combined delivery units of Ouster and Velodyne; on November 7, 2022, Ouster and Velodyne announced that they have entered into a definitive agreement to merge in an all-stock transaction. On February 10, 2023, Ouster and Velodyne announced the completion of the proposed merger and delisting of Velodyne

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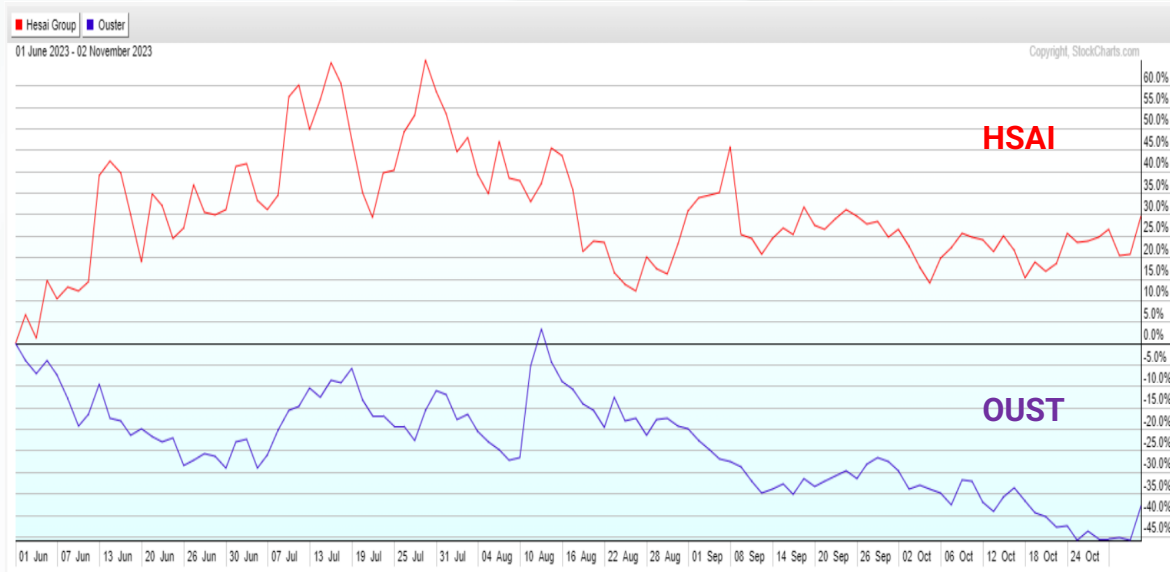
(4) Peers' LiDAR delivery in 9M23 is based on peers' earnings release

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Hesai and Ouster: Capital Market Performance since June 2023

- Lidar industry as a whole had a challenging 1Q23; recovery has been bumpy



- From June 1 to October 31, 2023, **Hesai's capital markets performance outpaced Ouster's** by a wide margin. During the same time period, **Ouster's stock price dipped over -40%**.



- **Ouster's** decline in stock price within a **two-year time span** was even higher at **>95%**



Hesai and Ouster/Velodyne's IP Litigation 2020

Background on Patent Cross-Licensing Agreement

- In 2019, Velodyne sued Hesai for patent infringement. Hesai then also sued Velodyne for patent infringement. Velodyne also sued Robosense and then **sued Ouster** for patent infringement, which led to the **Ouster-Velodyne merger of equals** in February 2023.
- In 2020, Hesai was in the midst of a capital market fundraising exercise and the Velodyne litigation was hampering that effort. For that sole reason, Hesai entered into the **Litigation Settlement and Patent Cross-Licensing Agreement** with Velodyne.

Key takeaways of the Patent Cross-Licensing Agreement

- The Agreement binds the original parties **AND** future affiliates, i.e., Ouster.
- **The parties agreed to a full lidar patent cross-license and use of each other's lidar IP, existing and future patents, for 10 years until 2030.**
- Hesai's position is that the Agreement gives Hesai a license to use Ouster's lidar patents until 2030. Ouster is bound by the Agreement, as Ouster is an affiliate of Velodyne via merger of equals.
- All disputes under the Agreement are to go to arbitration and the parties shall **refrain from litigation against each other. Ouster is in direct breach of its contractual obligations by bringing the ITC Action and Delaware action.**



Hesai and Ouster/Velodyne's IP Litigation 2023

Timeline of Legal Developments

- On April 11, 2023, Ouster filed a complaint with the ITC alleging that Hesai infringed on its lidar IP and seeking to enjoin the import of Hesai lidars into the U.S.
- On June 22, 2023, Hesai filed a motion to terminate the ITC Action.
- On August 24, 2023, the presiding ITC Administrative Law Judge granted Hesai's motion to terminate the ITC Action.
- On appeal on October 10, 2023, the ITC Commissioners affirmed the ruling terminating the ITC Action.
- The ITC ruled that **Ouster is bound by the Litigation Settlement and Patent Cross-Licensing Agreement ("the Agreement") entered by Velodyne and Hesai in 2020**, as Ouster is an affiliate of Velodyne via merger of equals in February 2023, and must abide by its contractual obligations therein. These obligations state Ouster's legal recourse for disputes is arbitration as set forth in the Agreement. Hesai welcomes arbitration as that dispute resolution forum will address the same legal issues addressed in the ITC final ruling, upon which Hesai has already prevailed.
- Hesai has also filed five actions with the USPTO Patent Trial and Appeal Board to invalidate Ouster's five patents and claims that Ouster invented digital lidar. Digital lidar was invented and in widespread use prior to Ouster's patent applications, which Hesai believes are overly broad and unsupported.



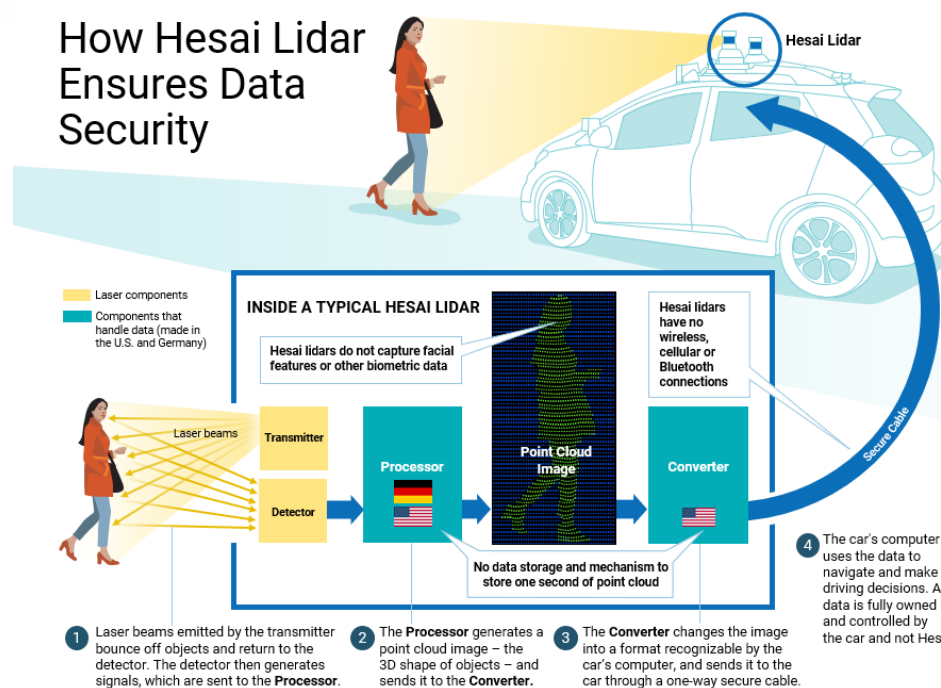
Hesai Ensures Data Security and Privacy

Ouster's allegation: Hesai's lidars pose a national security risk to the U.S. and can be used to spy on Americans by the Chinese government.

The truth is:

Hesai lidars:

- **Cannot** store images
- Do not have **wireless or cellular or Bluetooth** capabilities
- Transmit data directly to vehicle's onboard computer with a **one-way secure cable** (data is owned and controlled by vehicle)
- Are **fully certified** by:
 - Cybersecurity (ISO 21434)
 - Functional Safety (ISO 26262)
 - Information Security (ISO 27001, TISAX)






Independent Certifications that Hesai Lidar Cannot Store or Transmit Data Outside the Vehicle

Two independent testing organizations certify that Hesai lidars:


- **Cannot store** point cloud images
- **Cannot transmit** data wirelessly

Cybersecurity Assessment by **TÜV Rheinland** - a world-renowned, independent German technical testing organization with expertise in safety, efficiency and quality – on Hesai's main product sold in the U.S. market (Pandar128).

Product Teardown Assessment by **DEKRA** – the world's largest independent non-listed expert organization in the Testing, Inspection and Certification sector, founded in Berlin, Germany in 1925 – on Hesai's main robotaxi product (Pandar128) and ADAS product (AT128).



TÜV Rheinland
Precisely Right.



2 / 12 Report No.:FS18102023V1AT128

Statement of

Product Cybersecurity Assessment

Customer/ Manufacturer Hesai Technology Co., Ltd.
Building L2-B, Hongqiao World Center, 201702 Shanghai,
P.R. China

Order No. 245760956

Related Project Certificate No. 962/CSP 1000.00/23

Product Mechanical LIDAR Pandar128 (P128)

Type designation

Regarding the Product Cybersecurity Assessment on the Mechanical LIDAR Pandar128 (P128) from Hesai Technology Co., Ltd., hereby we TÜV Rheinland declare that:

- The review of documents (including CSM relevant documents, concept phase cybersecurity design, system phase cybersecurity design, detail design, V&V cybersecurity relevant documents and user manuals, etc.) by TÜV Rheinland side, the Mechanical LIDAR Pandar128 does not have the capability to store point cloud data or send any point cloud data out of vehicle.

See the appendix for details.

Confirmation of the Assessment Results


This document is an extract of the overall assessment report and only summarizes the results. The detailed results can be read in the overall report No.:FS18102023V1AT128.

Based on lidar disassembly and subsequent analysis results, the evaluated product satisfies the following three assessment items:

1. The lidar has no wireless point cloud data transmission capabilities.
2. The lidar is not capable of storing point cloud images.
3. The lidar's key components are supplied by US/EU manufacturers.


Related product information:

Product	S/N Serial Number	Product Version
AT128	AT00057225AAAAAG	29100033600



Edward Li


Author name




Gerhard Rieger

Reviewer name

2023-10-19
Date




TÜV Rheinland
Industrial Services & Cybersecurity



Fancy Guo

Assessment authority:
DEKRA Testing and Certification (Shanghai) Ltd.
No.250, Jiangchangan Road,
200436, Shanghai, China



授权人 (签字)

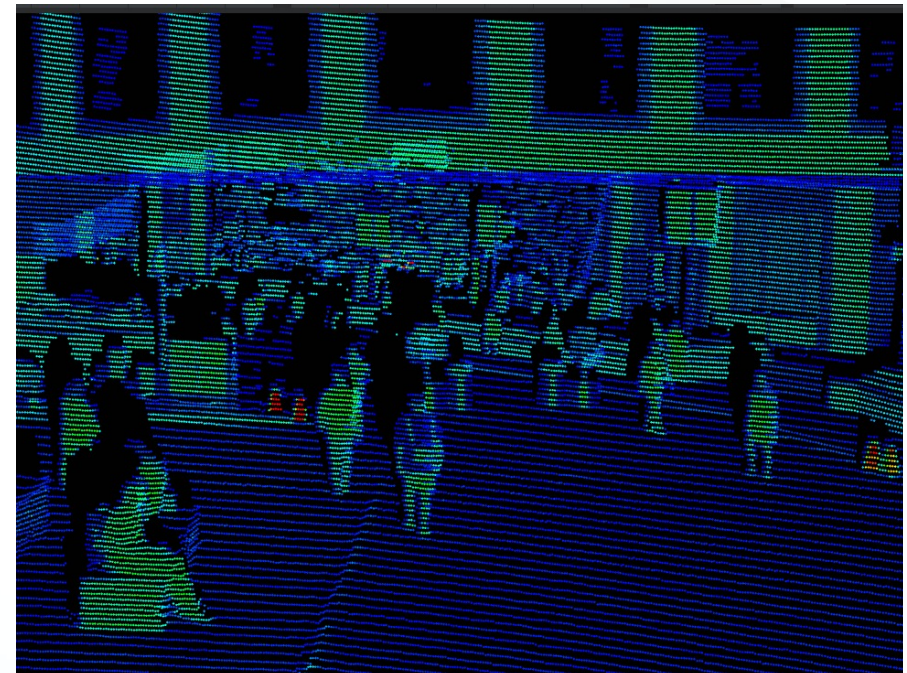
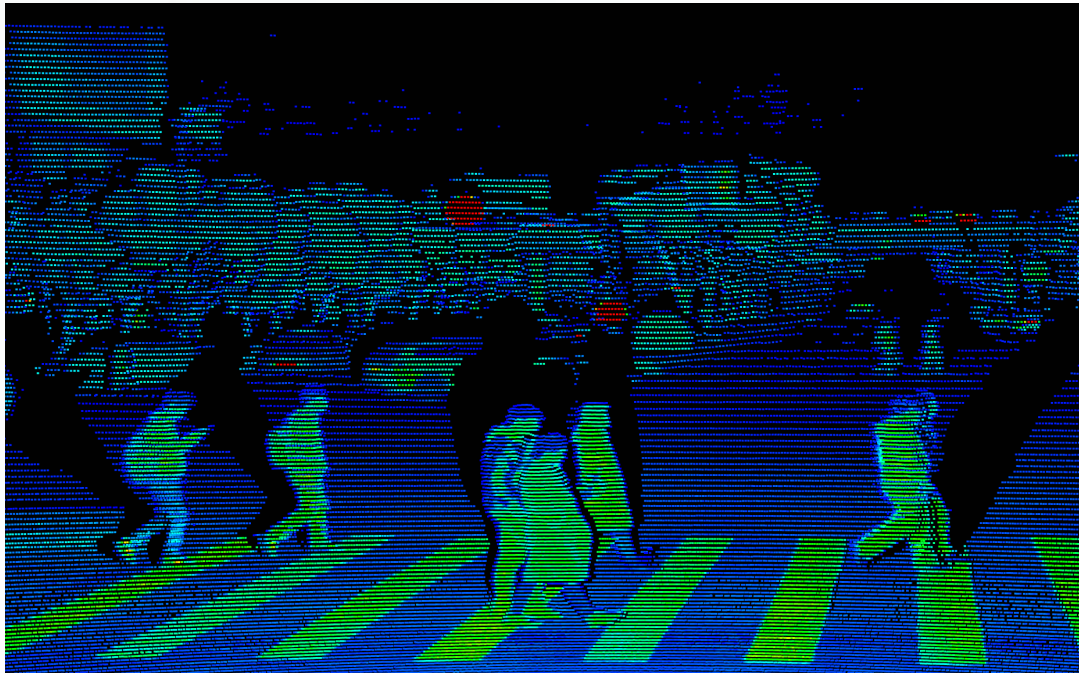


Hesai Lidars Preserve Human Anonymity

Ouster's allegation: Hesai's lidars can be used to spy on people or conduct government surveillance.

The truth is:

- Hesai lidars **do not capture human facial features** or any other identifying biometric data.
- Their images **cannot be used for facial recognition** or personal information identification.
- Lidars **protect privacy** much better than cameras.



Real point cloud images taken by Hesai lidar



Hesai Lidars are Designed Exclusively for Civilian Use

Ouster's allegation: Hesai's lidar is being used by China's military.

The truth is:

- Hesai lidars **have never been designed, evaluated or validated** to military specs.
- All Hesai's products are **classified as EAR99**, meaning they are not suitable for military applications.
- Hesai's sales agreements with new customers **prohibit the sale of Hesai lidars to the military.**



Pandar128



AT128

	Hesai Lidar (EAR99)	Typical Military Standard
Internal Component Temperature Range	-40 C° ~ 125 °C	-55 C° ~ 150 °C
Vibration/Shock Endurance Requirement	Medium	High
Water/Dust Proof Requirement	Medium	High
Erosion Proof Requirement	Medium	High
Excessive Margin of Design	NO	YES
Withstand Battlefield EM Environment	NO	YES
Radiation Proof	NO	YES
Full Performance Under Handicapped Condition	NO	YES



Hesai's Business is not Directed by the Chinese Government

Competitors and their agent's allegation and innuendo: The Chinese government controls and invests in Hesai.

The truth is:

- We are a **U.S.-listed company** (Nasdaq) in compliance with **ALL** applicable rules and regulations.
- Our Form F-1 and subsequent amendments filed prior to our February 2023 IPO **clearly disclose any risks related to doing business in China**. These are common to all companies based in the PRC.
- Our shareholder register is **public information**.
- To the best of our knowledge, the **Chinese government does not hold shares** in Hesai.
- Hesai is **audited by Deloitte**, one of the Big 4 accounting firms.
- Hesai is transparently controlled by **its founders, international board of directors, and senior management team**.
- The Chinese government has **not exerted influence on management team** or company operations.



Hesai is an Ethical Player in the Lidar Market

Ouster's allegation: Hesai has stolen Ouster's IP and is undercutting its competitors through unethical means.

"There is an ongoing track-record of IP theft by Chinese companies that should not be tolerated. It diminishes U.S. innovation and weakens our domestic industry, particularly for critical and emerging technologies like lidar. Ouster intends to enforce its patents until all imported products that infringe are barred."

- Ouster CEO, Angus Pacala commenting on the subsequently dismissed ITC case against Hesai ¹

The truth is:

- Hesai does **not steal or infringe** on any parties' IP and has **over 1,300 worldwide patents** issued and pending.
- Hesai spends **over 60% of its annual budget on R&D and manufacturing** to develop its proprietary lidar technology.
- Hesai prices are **higher** than those of most competing products. We have captured market share by offering **better-performing, higher-quality products** and **reliable deliveries** (over 60,000 ADAS lidars in 2022; on track for **200,000 superior performing ADAS lidar deliveries** in 2023).
- Hesai is **the first lidar maker to begin shipping mass production**, high-performance ADAS lidars to the marketplace; Competitors have won bids with leading global automakers **but have not yet delivered ADAS SOP suitable lidars** to their OEM customers.

¹ **Source:** Ouster publicly issued press release: <https://investors.ouster.com/news/news-details/2023/ITC-Institutes-Investigation-into-Hesais-Unlawful-Use-of-Ousters-Patents/default.aspx>



Summary

- **Hesai lidars are not a data security or privacy risk.** Hesai lidars **do not store and cannot wirelessly transmit data.** All images are transmitted through a secure one-way cable to a vehicle's onboard computer. All data is owned, stored and controlled by the vehicle owner and vehicle manufacturer. At no point does Hesai have access to that data. Two renowned global engineering testing companies, TÜV Rheinland and DEKRA, have separately certified to these facts.
- **Lidar images are not a privacy threat.** Lidar images are **not suitable for surveillance and do not pose a privacy threat.** Hesai's lidar images cannot discern identifiable facial features or biometric data. Lidar images measure 3-D shapes and distance to avoid collisions, making lidars ideal for collision avoidance in autonomous vehicles while safeguarding individual privacy.
- **Hesai lidars are expressly for civilian use.** Hesai lidars are **designed and built for civilian commercial use in vehicles to save lives.** Hesai lidars are not sold to the military and use in military applications is expressly forbidden in Hesai contracts. Furthermore, they do not meet the strict military standards of fitness, endurance and performance.
- **The Chinese government does not direct Hesai's business.** To the best of Hesai's knowledge, the Chinese government **does not own shares** in Hesai, nor has it sought to influence Hesai's business or management.
- **Hesai develops its own IP.** Hesai **does not steal or infringe on any parties' IP.** Hesai spends over 60% of its annual budget on R&D and manufacturing to develop its proprietary lidar technology for which it holds over 1,300 worldwide patents and pending patents.