



AAC COMPANY PROFILE

Create Sensational Experiences

A large, light blue, stylized letter 'A' is centered in the background of the slide. It has a modern, geometric design with a slight curve at the base.

ABOUT AAC



A Leading Provider of Sensory Experience Solutions



AAC Technologies (AAC) is committed to continuous tech innovation while expanding our global presence. We have forged long-term strategic partnerships with global intelligent device clients in China and around the world, based on decades of industry experience. With our dedication to innovation, we have strong capabilities in acoustics, optics, haptics, sensors and semiconductors, and precision manufacturing. We keep innovating sensory technologies to create new interactive experiences, focusing efforts on smartphones, intelligent vehicles, humanoid robots, AI infrastructure, virtual reality, augmented reality and smart homes to help create a new era of sensory experience.

1996

Established in

02018

SEHK

41,600+

Worldwide employees

**CNY
31.82 billion**

of gross revenue in 2025

7%+

of our annual revenue in
2025 invested in R&D

*As of December 31, 2025



AAC Technologies is included in the “Global Top 100 Innovative Institutions” list.



19
Global R&D centers

4,200
R&D engineers and technical personnel

19,000+
Global patent application volume



Simulation Capabilities Across All Disciplines and the Entire Business Value Chain



AAC possesses robust engineering simulation capabilities, serving as a technological mid-platform to empower the entire group. Our simulation expertise spans all disciplines and covers the entire business chain.

Performance

Structure

Process



Acoustics



Mechanics



Thermodynamics



Optics



Electromagnetics

AAC Offers A Diverse Product Catalog Supporting Multiple Platforms



Smartphone



Smart Automotive



XR



Laptop



Tablet



Wearable Devices



TWS



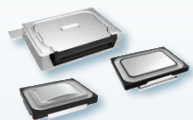
Humanoid Robot



AI Infrastructure



Acoustics



Speakers & Modules



Car Audio System



Software & Hardware



Tuning



Optics



Optical Lens

Camera Modules



Display Optical Machine



Advanced Waveguide Technique



Optical Actuators



Optical Algorithms



Actuators



X-axis Linear Actuator

IC Drive



RichTap® Haptic Solutions



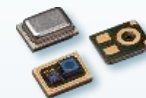
Handles/ Trigger



Motor Actuator



Sensor and Semiconductor



MEMS Mics & Modules



MEMS Inertial Sensors & IMU

Barometric Pressure Sensors



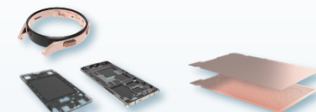
MEMS Speakers



Airflow Sensors



Precision Manufacturing

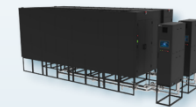


Mechanics

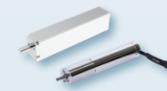
Cooling



Hinge



Liquid Cooling for Data Centers



Finger Actuators



Dexterous Hand Solutions

Through Our Global Presence, We Are Able to Create Sensational Experiences for Our Customers Around the World



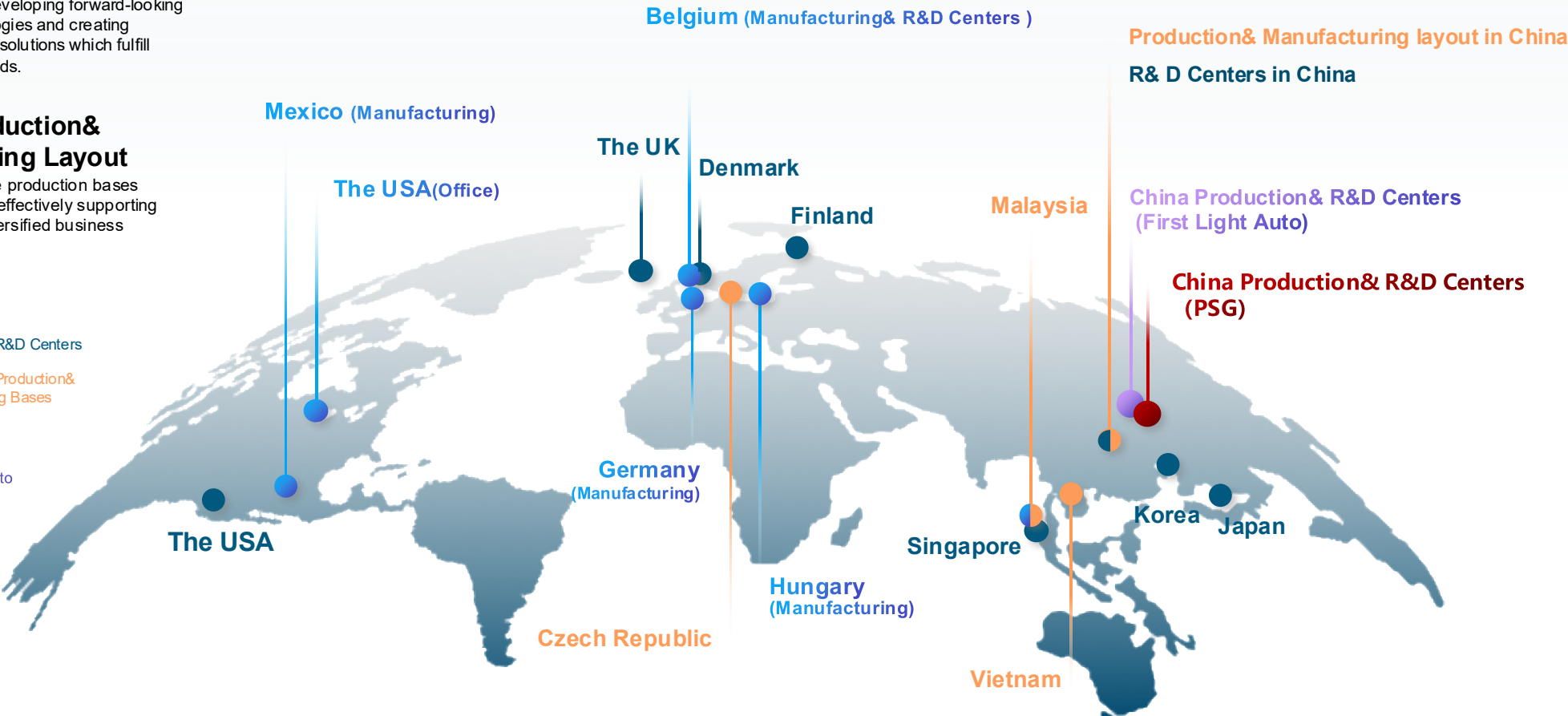
Global R&D Capabilities

AAC focuses on developing forward-looking innovative technologies and creating advanced sensory solutions which fulfill consumers' demands.

Global Production& Manufacturing Layout

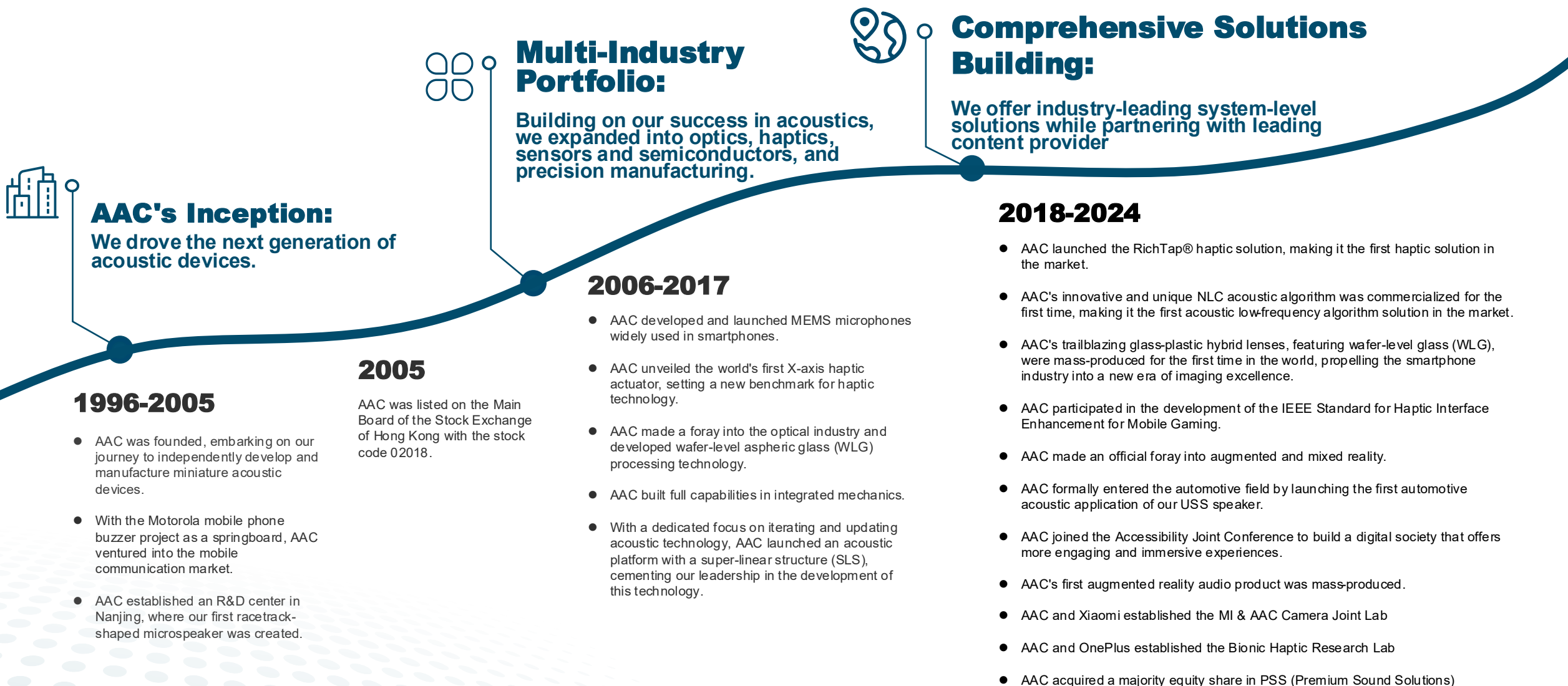
AAC owns multiple production bases around the world, effectively supporting the company's diversified business development.

- AAC Global R&D Centers
- AAC Global Production& Manufacturing Bases
- PSS
- First Light Auto
- PSG



The company's layout has expanded to cover nearly 40 cities across 15 countries, establishing a truly global development framework.

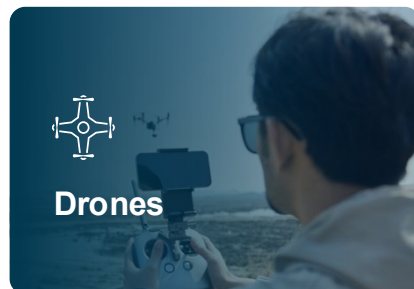
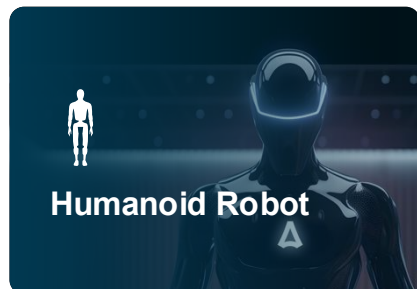
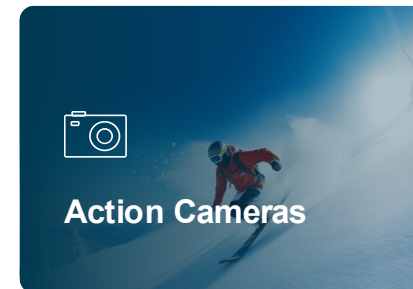
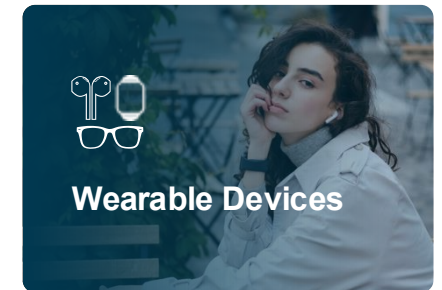
AAC Has Developed from An Acoustic Producer into A Full-fledged Sensory Innovator





Intelligent Device Solutions

Creating Greater Sensory Experiences across Multiple Platforms





Sensory Experience Solutions and Products

Acoustic Solutions: Delivering Great Sound Everywhere

Acoustic Solutions: Delivering Great Sound Everywhere

We provide complete acoustic system design services, based on our unique innovative technologies. Our outstanding hardware and algorithm solutions, as well as tuning services are optimized for intelligent device applications in multiple scenarios, resulting in an immersive audio experience that radiates pure and vivid sound along with a rich spatial experience. Additionally, we provide professional audio branding services and brand customization resources for various devices.



Hardware Solutions

- 01 High-Energy & High-Density Speakers
- 02 Innovative Coaxial Technology
- 03 Ultra-Slim Series
- 04 All-metal encapsulation (AME)

Nearly **30 years** of R&D and manufacturing experience, driving **several industrial transformations for intelligent devices**. We provide an ever-evolving technology platform for multiple high-performance acoustic devices.



Exclusive Audio Algorithms

- 01 Basic tuning algorithms
- 02 Clarity improvement algorithms
- 03 Stereo processing algorithms
- 04 Spatial audio algorithms
- 05 Bass enhancement algorithms

Our Industry-leading **proprietary** algorithms are verified on multiple products.



Professional Tuning Services

- 01 Scientific evaluation system
- 02 Scenario-based rating
- 03 Professional evaluation team
- 04 Customized development

Our experienced evaluation team stands ready to provide **customized exclusive solutions**.



Audio Brand Customization Services

- 01 Audio branding resource
- 02 Brand customization

Utilizing professional branding resources to build **exclusive** audio brands for customers

Hardware Solutions:

Our SLS Speaker Platform is Designed to Cover the Full Spectrum of Customers



SLS Entry-Level



Performance Parameters

- Xmax: 0.4 mm–0.5 mm
- Tmax: 110°C
- The low-frequency equalizer (EQ) SPL is 3 dB–4 dB higher than the SPS SPL.

Technical Features

- Boosts Xmax through the double-diaphragm structure.

Application

- Devices that require robust low-frequency volume and sound quality such as mid- and high-end smartphones, laptops, mid-range tablets, and smart glasses.

SLS Classic-Level



Performance Parameters

- Xmax: 0.55 mm–0.8 mm
- Tmax: 120°C
- The low-frequency EQ SPL is 3 dB–4 dB higher than the entry-level SLS SPL.

Technical Features

- Boosts Xmax through the double-diaphragm structure.
- Increases magnetic energy density thanks to higher magnetic steel content, coil grids, and square voice coil wires.
- Uses a rubber membrane to boost low-frequency sound quality.
- Reduces size by 40% (which is replicable).

Application

- Devices that require excellent performance, sound quality, and audio experience such as high-end smartphones, high-end tablets, and smart glasses.

SLS Master-Level



Performance Parameters

- Xmax: ≥ 0.65 mm
- Tmax: 110°C
- A 50% size reduction yields the same performance as the Classic SLS, or a 50% performance increase for the same size.

Technical Features

- Separate vibration and magnetic circuit systems enhance performance.
- The new magnetic circuit structure and ultra-narrow folding ring diaphragm drive up performance.
- All-metal 3D bass encapsulation increases the equivalent rear cavity space.

Application

- Devices that require outstanding performance, sound quality, audio experience, and spatial stacking, such as flagship smartphones, foldable smartphones, and XR devices.

Hardware Solutions: Innovative Coaxial Technology Combines Tweeter and Bass Unit into One Box for Wide Range Performance



Back-to-Back Laptop Speakers



Performance Parameters

- By utilizing coaxial derivative technology, the speaker produces deep and resonant lows and strong highs. In addition, this technology significantly reduces the impact of device vibration on the speaker.
- The sound can cover a wide range from 200 Hz to 14 kHz.

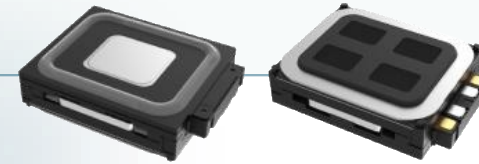
Technical Features

- The special bidirectional diaphragm design makes the device slimmer and lighter.
- The super linear structure of FPCs minimizes rolling.

Application

- Devices that require high sound volume, such as laptops

Back-to-Back Smartphone Speakers



Performance Parameters

- Xmax: 0.3 mm
- Tmax: 110°C
- AAC's back-to-back speaker call privacy solution not only effectively reduces sound leakage in the low pitch range but also achieves an average 10 dB improvement in isolation in the mid-range through the algorithm, thus protecting users' privacy.

Technical Features

- The special bidirectional diaphragm design makes the device slimmer and lighter.
- The super linear structure of FPCs minimizes rolling.

Application

- Smartphones that require exceptional call privacy

Hardware Solution: Next-gen coaxial technology- Ultimate Speaker



Ultimate Speaker



First full-range phone speaker

Parameter

- Xmax: large-amplitude, 0.75 mm
- Tmax: 120°C
- High frequency extension to 20kHz
- 300% increase in low frequency performance

Treble Part



The high-frequency is extended up to 20kHz

Featuring an independent tweeter that gives the sound more penetrating power

Translucent Treble

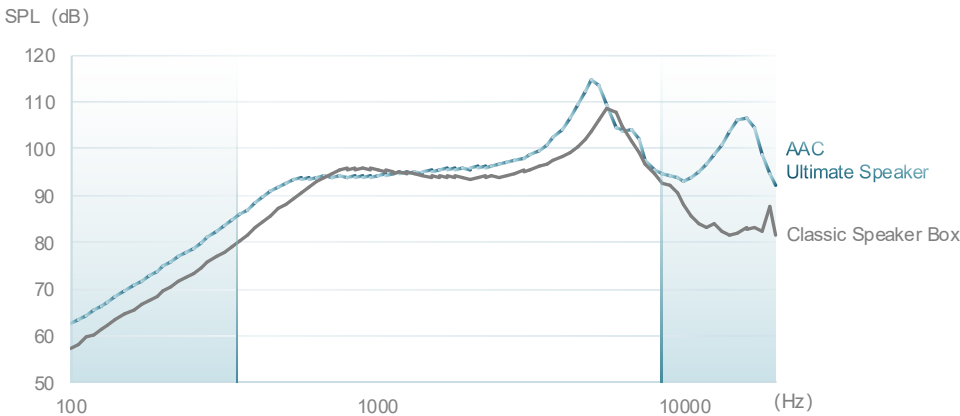
Woofer Part



The low-frequency equalizer (EQ) SPL is increased by 300% compared to classic-level speakers

Master-class magnetic circuit design woofer, Make the bass more powerful and immersive

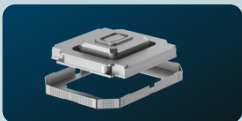
Surging Bass



*Data sourced from AAC Technologies Acoustic Lab

Innovative Structures| Breakthrough Materials | Revolutionary Processes

Clever design of shared magnetic circuits



New ultra-compliance diaphragm material



Aerospace grade ultra-light dome material



Micron-level manufacturing accuracy



Acoustic Algorithm Tuning and Integration:

Restoring Sound Quality to Enhance the Listening Experience



TRUE RESTORATION

Clarity Improvement Algorithm

Dynamically suppresses sudden changes and distortions in volume, improves voice clarity, and broadens distortion in a lower range

- Phase correction algorithm (PhaCo)
- NLC algorithm (created by AAC)
- Airflow noise suppression (ANS) algorithm
- TDC algorithm

Basic Tuning Algorithm

Frequency response and dynamic correction to ensure undistorted sound signals

- EQ balances frequency response
- DRC regulates dynamics
- Limiter protection

Sound
Quality

IMMERSIVE

Stereo Processing Algorithm

Extends stereo imaging and precisely locates the sound source to enhance gaming and movie audio

- Multi-channel sound field reconstruction (SFR) algorithm

Spatial Audio Algorithm

Sound source localization, spatial rendering, simulation of real scenes, realistic immersive experience

- Spatial audio

Bass Enhancement Algorithm

Enhances low frequencies and simulates a subwoofer

- Bass enhancement (Vib)

Architecture Design:

How to Release the Full Potential of an Audio System



Our Golden Ear certified professional evaluation team and scientific evaluation system can quantify and represent subjective feelings with objective data. We perform scenario-based testing to score devices based on the audio characteristics required by different use cases.

- **Experienced Evaluation Team**

Our team consists of professionally trained and “Golden Ear” certified tuners. The team has successfully tuned the audio performance of many flagship phones.

- **All-Round Evaluation**

We evaluate audio systems for timbre, spatialization, dynamics, artifacts, and volume in audio and video playback, gaming, and other applications.

- **Professional Evaluation Method**

Testing takes place in a fully anechoic chamber in both landscape and portrait layouts. Our engineers conduct blind testing, enabling objective comparison with the reference device.

- **Customized Development**

In addition to evaluating sound metrics, we provide our customers with customized development services for different smart devices, such as smart phones, vehicles, XR glasses and etc. We perform simulation evaluations and professional measurements to guarantee excellent audio quality.



Acoustic Brand Customization Services



We provide comprehensive acoustic branding services to help our customers create a recognizable audio brand in the market.

Audio Branding

We utilize our branding resources to provide exclusive brand solutions, including brand authorization, other industry-leading brand resources, and customization services.

- **Authorization of AAC's brands**
- **Other industry-leading brand resources**
- **Brand customization**

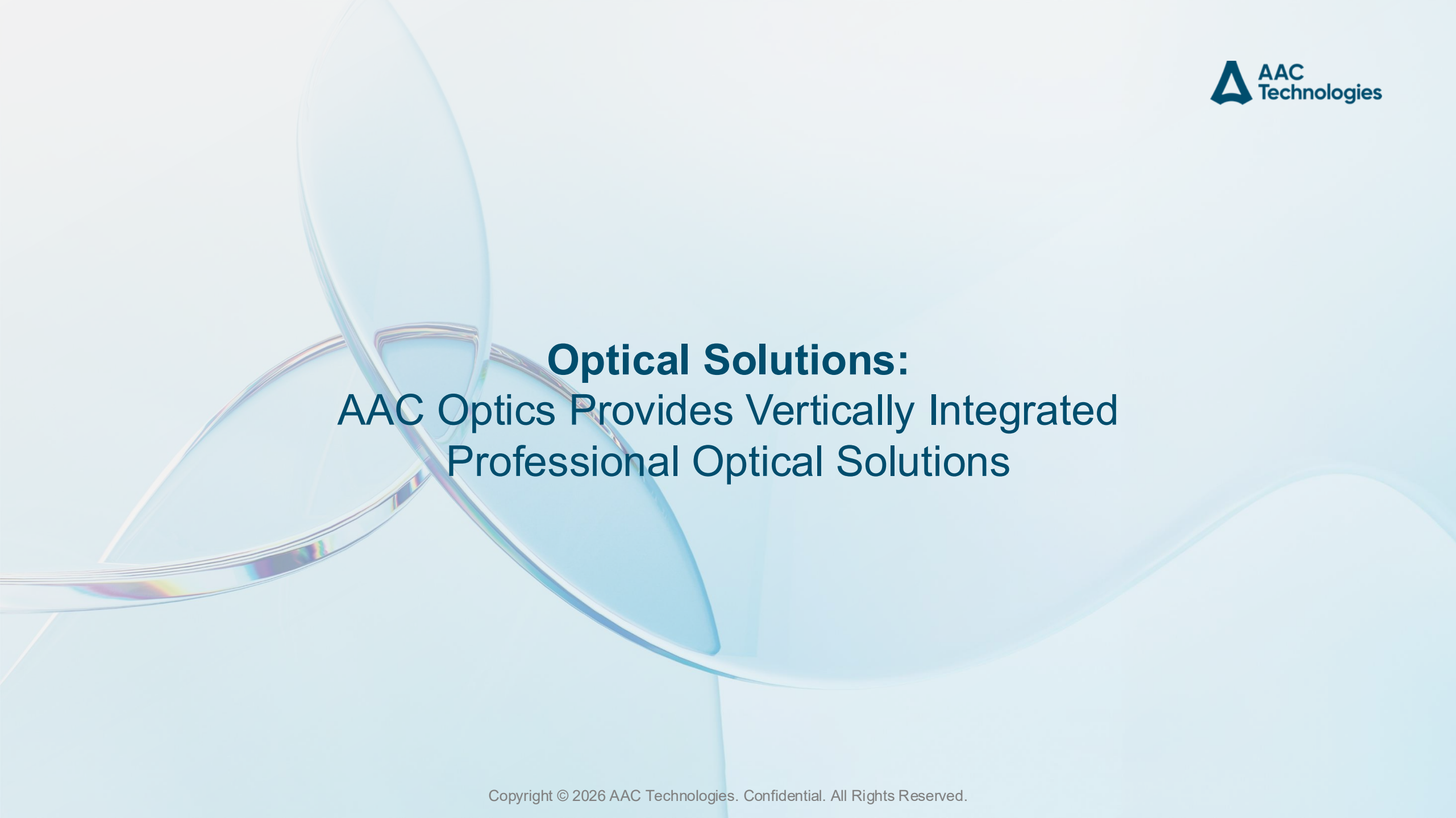


Marketing Services

Based on our knowledge of acoustic solutions and customers' product characteristics, we provide customized services such as product packaging, creative design, marketing resources, and product and solution design services.

- **Unique selling point definition**
- **Creative design**
- **Marketing resources**
- **Product promotion plan development**



The background of the slide features a large, abstract, light blue graphic that resembles a lens or a series of overlapping optical elements, with some internal reflections and a soft gradient. This graphic is positioned behind the main text.

Optical Solutions: AAC Optics Provides Vertically Integrated Professional Optical Solutions

Optical Solutions: AAC Provides Vertically Integrated Professional Optical Solutions

AAC optical solutions include optical lenses, camera modules, and optical actuators. We provide our customers with consumer-grade, high-precision, and miniaturized optical components, as well as flexible and full-stack solutions in very large volumes



WLG Glass Lenses

- Unique WLG (wafer-level glass) technology
- Multi-cavity mold, high output efficiency
- High precision
- More Flexible Structure Design, covering aspheric lenses, collimating lenses, array lenses, free-form mirrors and aspheric prisms, etc.



Optical Lenses

- An integrated solution covering design, development, molding, coating, assembly, and testing
- End-to-end digital simulation
- High-precision automated assembly technology developed by AAC Optics



Camera Modules

- Vertical integration of lenses, voice coil motors (VCM)
- Virtual simulation to shorten the design cycle
- Highly automated production and high-precision assembly



Micro-optics

- Mass production of precision microstructures using polymers
- Lightweight, high safety, short time to market
- Customization possible



Optical Actuators

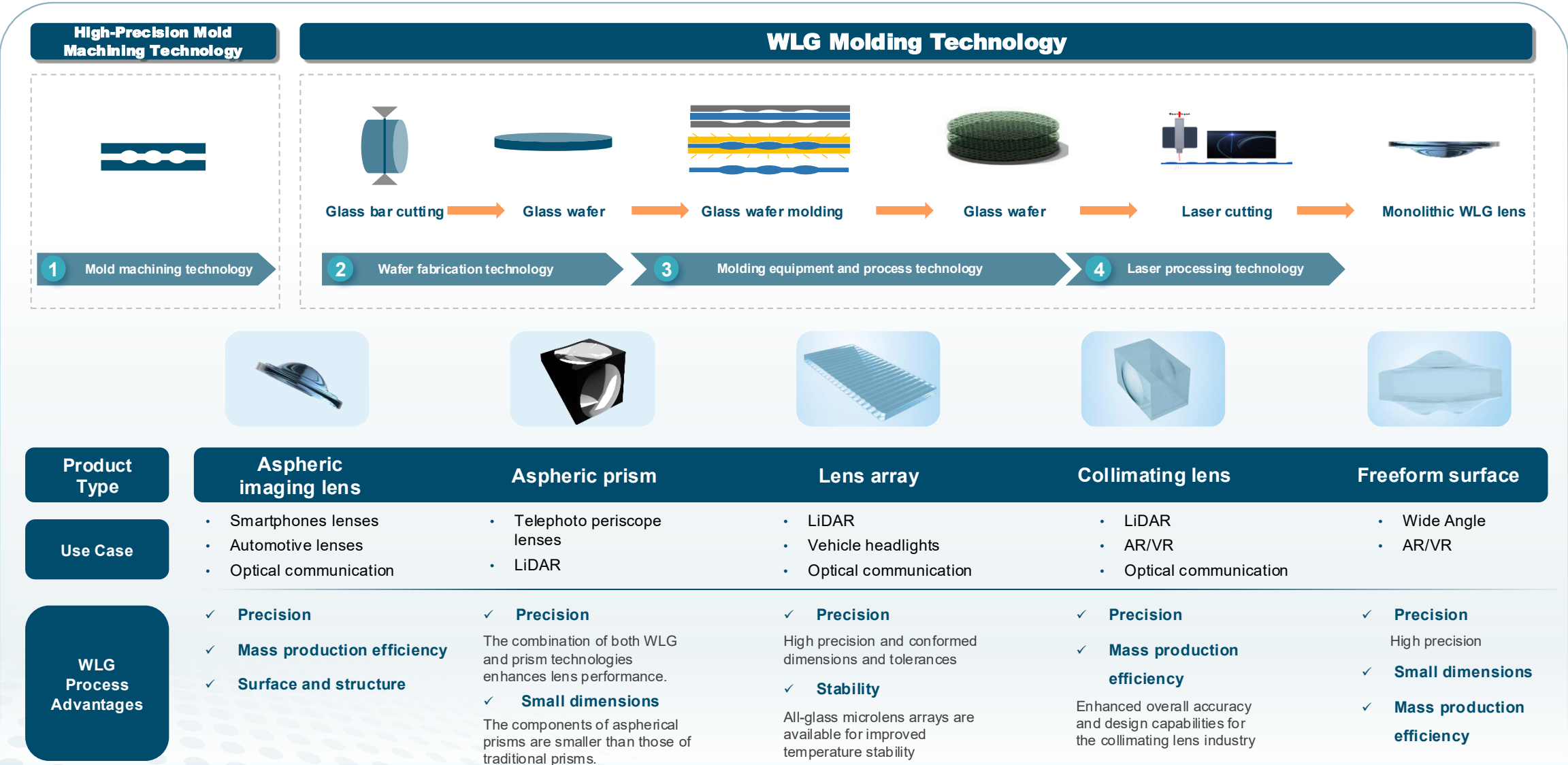
- Independent production of all key components: molding, stamping, FPC, flexure simulation, and coil winding
- Full-stack simulation-based design
- Four major motor R & D centers in Japan, Shanghai, Changzhou, and Nanning
- Test equipment full stack self-developed, testing more efficient



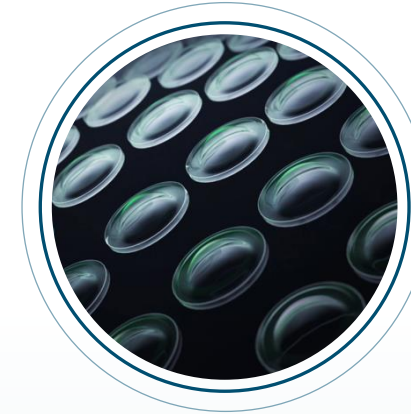
Optical Algorithms

- Based on user experience data and research
- Professional optical image evaluation
- Independently developed software algorithm CISA for imaging quality evaluation without samples

WLG: Unique Wafer-Level Glass Technology



Optical Lenses: Glass-Plastic Hybrid Lenses



Glass-Plastic Hybrid Lenses

- Wafer-level glass + plastic hybrid lens technology
- 1G5P/1G6P/1G7P/2G6P and other glass-plastic hybrid lenses
- Multi-layer anti-reflection coating increases image quality
- Easily handles different environments that are compromised by poor lighting conditions and glare
- Ultra-precision processing technology delivers pin-sharp performance

AAC has successfully mass-produced rear main cameras with glass-plastic hybrid lenses in a diverse range of specifications and models. These cameras offer diverse resolutions, ranging from 48 megapixels to a staggering 100 megapixels. Additionally, their aperture sizes vary from F1.65 to F2.0, while their lens heights range from 5.7 to 7.2 millimeters.

Unique WLG Technology

Advantages of Glass over Plastics

- **A wider aperture**
15%-20% increase in light intake
(1G5P outperforms 6P)
- **Higher resolution**
Increase In Clarity And Definition
- **Slimmer and lighter**
Thinner Lenses
- **Greater stability**
Superb Thermal Stability For All Environments

Optical Lenses: Plastic Lenses



Rear 8P Main Camera with Large Format Lenses

Application

- Currently used as the main camera for high-end flagship smartphones

Core Technology

- Our cutting-edge 8P plastic lens manufacturing technology ensures excellent lens performance



Rear 6P Telephoto Camera

Application

- Currently used as a telephoto camera for high-end smartphones

Core Technology

- Our precision manufacturing techniques fulfill lens' high accuracy requirement during the manufacturing process to enhance the performance of telephoto lenses



Rear 7P Large FOV Ultra-Wide-Angle Camera

Application

- Currently used as an ultra-wide-angle camera for mid-range and high-end smartphones

Core Technology

- Our customized low-reflection coating process efficiently addresses issues such as glare and ghosting



Front 5P Main Camera with Ultra-Small Head Lenses

Application

- Currently used as the front camera for high-end smartphones

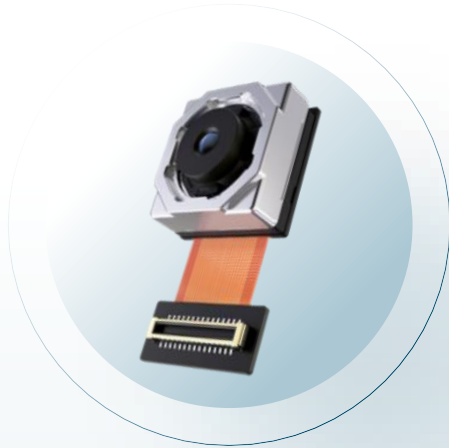
Core Technology

- Our ultra-precision manufacturing process ensures excellent lens performance by overcoming the limitations of ultra small aperture sizes

Camera Modules:

Seamless Integration of Hardware and Software for Ultra-HD Imaging

Capability of integrating fully automated and high-precision assembled optical components such as lenses, voice coil motors, infrared filters, etc. High-pixel and high-definition photography are achieved on the image sensor chip via image calibration algorithm



Smartphone Camera Modules

- Full range of mobile phone camera modules offer
- Pixel coverage from 2 MP to 200 MP
- Optical actuators covers FF, AF, OIS
- Application covers wide, ultra-wide, telephoto, front camera, etc
- Cost-effective with company internal functions vertical integration



Other Camera Modules

- Various camera modules options for emerging fields such as drones, action cameras, ARVR, smart TVs, etc
- Fully automated production, high-precision assembly
- Deep customers engagement for competitive product solutions offering

Micro-optics: Expert for polymer wafer-level optics



AMOT, a subsidiary of AAC can provide micro optical solutions for various markets and applications : It has the ability to design and deliver high-precision polymer micro-optical components from different polymer materials and in small and large quantities

Optical Media Manufacturing



Polymer

Frontend

- Mastering
- Electroplating
- Replication



Wafer

Semi-Conductor Manufacturing

Backend

- Stacking
- Optical Testing
- Singulation
- Pick&Place

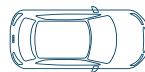


Finished Product



Consumer

- Diffractive polymer wafer level optics for 3D Sensing applications such as Structured Light, ToF and DTof
- Diffractive and reflective polymer waveguides for XR applications



Automotive

- Polymer wafer level optics with single- or double sided structures for HUD, LiDAR, ADAS, DMS and Projection applications
- Various automotive grade polymer materials
- Reliability tests



Industrial

- Diffractive and refractive polymer wafer level optics for 3D Sensing including SLAM and encoders
- Robotics, Automation, Metrology, Machine Manufacturing, Payment Systems and Smart Locks
- Vertical integration by Illumination Module design and assembly

Optical Actuators: Fully Vertically Integrated Process



✓ Independent Production of All Key Components

- Molding, stamping, flexure simulation, and coil winding
- Controllable quality and cost

✓ Four Actuator R&D Centers

- Located in Osaka Japan, Changzhou, Shanghai, and Nanning China
- Our core technical staff has more than 10 years of VCM experience

✓ Integrated Solutions for Design, Simulation, Manufacturing, and Testing

- Matched design of lenses, actuators, and modules
- Simulation-based design
- High-precision, self-developed fully automated assembly line

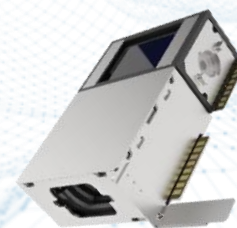
Optical Actuators



Autofocus Actuator



OIS Actuator



Periscope Actuator



Pop-Up Actuator

Better Quality

Lower Price

Greater Capacity

Faster Shipment

Optical Algorithms: Boosting Product Performance to New Level



CISA

- Independent R&D
- Provides a powerful tool for evaluating optics and camera module image quality performance without prototyping
- Simulates the full camera system: lens, sensor and image signal processing pipeline (ISP) to produce the final RGB camera image
- CISA validation results show good agreement with real images captured with several camera modules
- Proven in multiple projects



Automated Lens Tuning Algorithm Solution

- Independent R&D
- Modeling based on the spectral response data of the camera
- Light source data covers additional scenarios
- Lens tuning styles that quickly adapt to customers' needs
- Unlocks the full potential of the Qualcomm platform's image signal processor (ISP), resulting in outputting tuning parameters that reflect peak IQ performance

A background image showing two hands, one from the top right and one from the bottom left, reaching towards each other in a gesture similar to Michelangelo's 'The Creation of Adam'. The hands are illuminated with a blue and red light against a dark blue background.

Haptic Solutions

RichTap[®]: Redefining the Haptic Experience

Haptic Solution: RichTap®, Redefining the Haptic Experience

RichTap® is a world-leading integrated haptic solution for a full range of devices. It allows device manufacturers, as well as game, video, audio, and social content providers, to provide a comprehensive premium haptic experience. Combining audio, visual, and haptic technologies brings users an additional level of interaction. RichTap® features haptic technologies designed and developed for mainstream mobile phone manufacturers and content providers, including vibration design in ringtones, music, games, emojis, audio and video files, and ad animations.



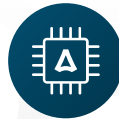
Hardware Solutions

- X-axis linear actuator
- Ultra-wide linear actuator
- Ultra-slim actuator
- Biomimetic haptic actuator
- Active Triggers



IC Drive

- High, medium and normal voltages
- Efficient drive capability
- Lower processor requirements
- Low cost



RichTap Core

- Modular code
- Core rendering algorithm
- Data transmission path



RichTap Creator Suite

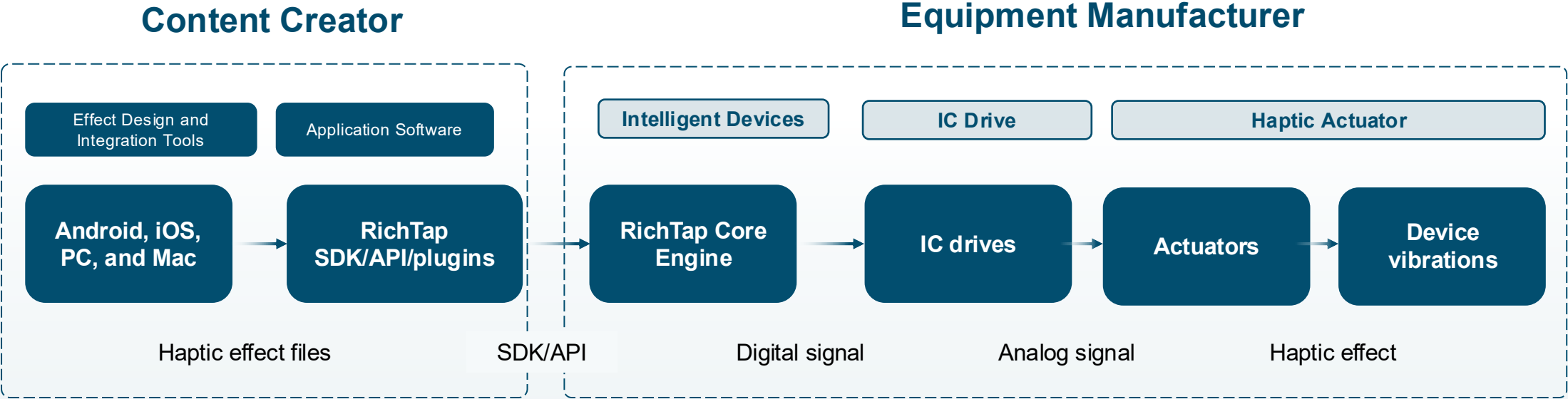
- Haptic design application tools
- Play control SDK
- Extensible plugins
- Haptic effect library



Professional Technology and Experience Design Services

- Technical support
- Reference design
- Effect customization

RichTap[®]: A Comprehensive Haptic Solution



A Diverse Range of Actuators Catering to Meet Broad Market Demands



1. Product Series

- ELA series: Base models of linear actuators
- SSA series: Enhanced models of linear actuators
- SLA series: Advanced models of linear actuators

2. Product Advantages

- Smaller size and stronger vibration compared with competitors
- Higher stability and greater design flexibility
- High mass production capacity guaranteed by an automated assembly line
- Proven in more than 10 mainstream products



1. Product Series

- ESA series: Advanced models of ultra-wide linear actuators
- Magnetic spring actuators

2. Product Advantages

- New technology structure and improved driving power
- Wider vibration range
- Ultra-wide frequency range and more space for effect design

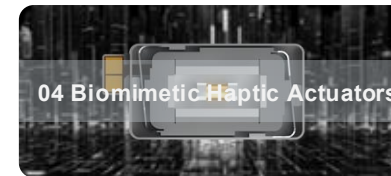


1. Product Series

- Ultra-slim actuator series

2. Product Advantages

- A lightweight design of just 2 mm
- Tailored for slim devices

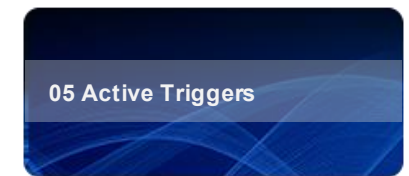


1. Product Series

- CSA series: Biomimetic haptic actuators

2. Product Advantages

- With new materials as well as optimized structures and magnetic paths, this series offers a haptic experience with the strongest vibration on the Android platform



1. Product Series

- Direct drive solution
- Spring-loaded solution
- Unidirectional drive solution
- Electromagnetic drive solution

2. Product Advantages

- Diverse haptic interactive experiences
- Balanced stereo effect
- Excellent, detailed HD effects
- Spatial sense
- Push/pull sensation

Hardware Solutions: Linear Actuator



Lateral Linear Actuator



Product Portfolio:

- Linear actuator entry-level ELA series
- Linear actuator enhanced SSA series
- Linear actuator advanced version SLA series.

Product Advantages:

- Smaller dimensions and stronger vibration compared with peers
- Higher stability and greater design flexibility
- High mass production capacity guaranteed by automated assembly lines
- Proven in more than 10 mainstream products on the market

Application Scenario:

- Smart phones, tablets, IOT devices, large car screens, virtual buttons, etc.

Ultra-wide Linear Actuator



Product Portfolio:

- ESA series: advanced-level ultra-wide linear actuators

Product Advantages:

- New technology structure, driving force enhancement.
- It has a larger vibration experience range, a large frequency range, and a wider effect design space.

Application Scenarios:

- Smartphones, tablets, joypads, VR/AR, etc.

Biomimetic Haptic Actuator



Product Portfolio:

- CSA biomimetic haptic actuator series

Product Advantages:

- By utilizing cutting-edge materials, advanced structural design, and innovative magnetic circuits, an unparalleled vibration experience can be created, outperforming the previous technological platform in every aspect.

Application Scenarios:

- Smartphones, tablets, joypads, VR/AR, etc.

Hardware Solutions: Linear Actuator

Ultra-slim Actuator



Product Portfolio :

- Ultra-slim actuator series

Product Advantages :

- slim and lightweight with a minimum of 2 mm
- Tailored for slim devices

Application scenario:

- Smart folding mobile phone, computer trackpad, etc.

The linear actuator hardware solution brings exquisite and rich feedback, fully displaying the sense of reality and presence of haptic feedback, restoring the vibrational texture intact, and more finely simulating the touch generated by human-computer interaction.

Fast start and stop

With RichTap®, it takes just 1–5 ms to start and stop the actuator

Wide frequency range

A wide vibration frequency range and capacious design produce a rich array of effects

Compatible with various devices

With RichTap®, it takes just 1–5 ms to start and stop the actuator

Quiet

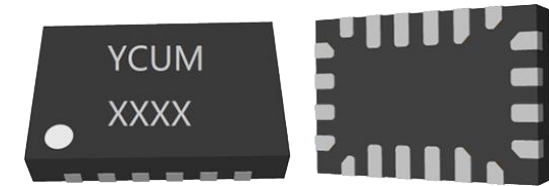
Lower noise and thus less interference

IC Drive: Maximizing Actuator Performance

RT6010: A Class-D high-voltage high-efficiency power amplifier specifically designed for linear actuators

Key Parameters:

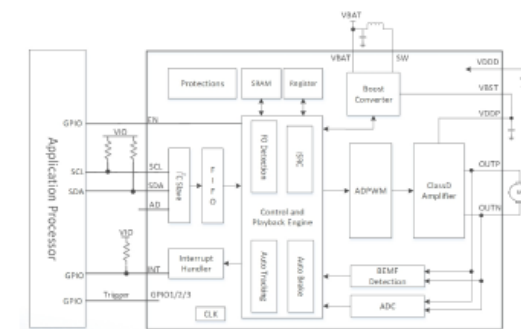
- FCQFN-20 3mm x 2mm x 0.5mm
- IO Voltage Level: >1.1V
- Standby Current: ~8μA
- Input Voltage Range: 3.0 ~ 5.5V
- Peak Output Voltage: 11V (Measured maximum drive output up to 9.5V at 8Ω load)
- Voltage Type: Boost
- Overall Power Conversion Efficiency: 85% (typical)
- Storage Capacity: Up to 250ms waveform data can be stored on-chip
- Fast Startup: 1.2ms (typical)
- Operating Temperature Range: -40°C~85°C



Product Rendering

Product Features:

- Adaptive F0 calibration algorithm
- On-chip phase-jump noise filter
- Waveform adaptive automatic braking algorithm
- Full support for RichTap® algorithm
- Supports multiple playback modes:
 - i. Real-time playback
 - ii. Built-in waveform, triggered playback by register
 - iii. Built-in waveform, triggered playback by GPIO pin
- I²C interface supports 1MHz/400kHz; up to 2 I²C addresses can be configured
- Comprehensive protection mechanisms:
 - i. Automatic short-circuit protection on output
 - ii. OTP/OCP/OVP/UVLO



Chip Architecture & Circuit Diagram

IC Drive:

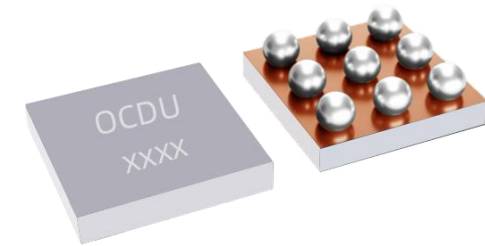
Maximizing Actuator Performance



RT6612: A Class-D constant-voltage high-efficiency power amplifier specifically designed for linear actuators

Key Parameters:

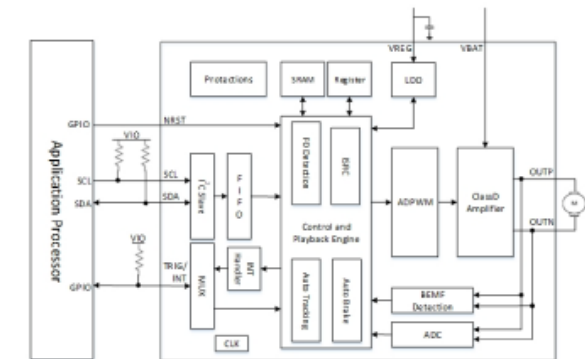
- WLCSP: 1.125mm x 1.125mm x 0.557mm
- IO Voltage Level: >1.1V
- Standby Current: ~3μA
- Input Voltage Range: 3.0 ~ 5.5V
- Peak Output Voltage: 5.5V (Maximum driving output voltage with 4.2V Vbat and 8Ω load is 3.6V)
- Voltage Type: VBat
- Overall Power Conversion Efficiency: 92% (typical)
- Storage Capacity: Up to 1000ms waveform data can be stored on-chip
- Fast Startup: 0.3ms (typical)
- Operating Temperature Range: -40°C~85°C



Product Rendering

Product Features:

- Adaptive F0 calibration algorithm
- On-chip waveform re-synthesis
- On-chip phase-jump noise filter
- Waveform adaptive automatic braking algorithm
- Full support for RichTap® algorithm
- Supports multiple playback modes:
 - i. Real-time playback
 - ii. Built-in waveform, triggered playback by register
 - iii. Built-in waveform, triggered playback by GPIO pin
 - iv. Configurable waveform, F0 auto-tracking playback
- I²C interface supports 1MHz/400kHz; up to 2 configurable I²C addresses
- Battery voltage detection and compensation
- Comprehensive protection mechanisms:
 - i. Automatic short-circuit protection on output
 - ii. Low battery voltage protection
 - iii. Over-temperature protection for the chip



Chip Architecture & Circuit Diagram

RichTap Core:

Connecting Content Creators and Equipment Manufacturers



The RichTap Core haptic rendering engine embodies our deep understanding of haptic experiences and devices. It serves as the central hub that converts haptic parameters into analog signals. The engine consists of a core algorithm library and multiple hardware-based optimization algorithm solutions, working in concert to generate vibration data streams.



Core Algorithms

The core haptic signal decoding and rendering algorithms perform real-time analysis of haptic encoding signals.

- **Rich Pulse**
- **RichTap Core algorithm**
- **Start and stop within just 1 ms**



RTC Advancer:

Contains various optimization algorithm modules to render and modify the original haptic files, producing excellent customized haptic effects, and supports continuous upgrades and modifications.

- **Dynamic parameter adjustment**
- **Multi-channel support and backward compatibility**
- **Multi-mode system switching**
- **Android API**

RichTap Creator Suite:

Tools for Designing and Demonstrating Haptic Vibration Effects



Diverse high-quality presets

Video, audio, and vibration synchronization

The MUSE audio-to-vibration AI algorithm for rapid effect generation and customized parameter tuning

Multi-device real-time comparison and preview

Real-time visual display of vibration waveform

Mixed wave vibration effects





Technical Support

- **Software migration and debugging:** Our focus is on delivering a smooth-running client software solution that maximizes device performance and meets experience requirements.
- **Hardware structure verification:** We conduct a thorough verification of the precision and applicability of the client hardware solution to ensure the optimal outcome in advance.
- **Scenario suggestion and demo production:** Our professional team designs haptic scenes based on the use cases and produces customer demos.



Reference Design

With a deep understanding of haptic feedback, our professional design team will provide references and professional guidance tailored to customer scenarios after research and scenario analysis.



Effect Customization

We can customize comprehensive, detailed, and applicable vibration effects for enterprise users, which can be easily imported for further creation. By utilizing haptic feedback, we enable users to convey their project content to the audience in a precise and engaging way.

Micro Transmission Module Solutions

Micro Transmission Module: Excellent motor empowers new experience

- AAC has been deeply involved in precision electromagnetic drive technology for over 30 years.
- AAC micro stepper motor products have significantly better performance than domestic and foreign products of the same specifications.



Hardware solution

- Micro motor
- Super torque motor
- Linear output module
- Rotary output module



Design and manufacturing integration

- Professional design team
- Leading product performance and advanced automation capacity
- Comprehensive performance testing and evaluation system



Customized solution development

- Collaborate with customers to develop
- Provide innovative solutions

Hardware Solution:

High-performance motor — Full stack self-developed, leading performance



Comprehensive and advanced solutions

Superior performance

- System architecture design
- High precision simulation

Ultra-precision process

- Comprehensive molding assessment
- Ultra-precision manufacturing

Technological innovation

- Nearly 100 motor invention patents

Customization capabilities

- Customized new size and performance specifications
- Motor drive and control algorithm



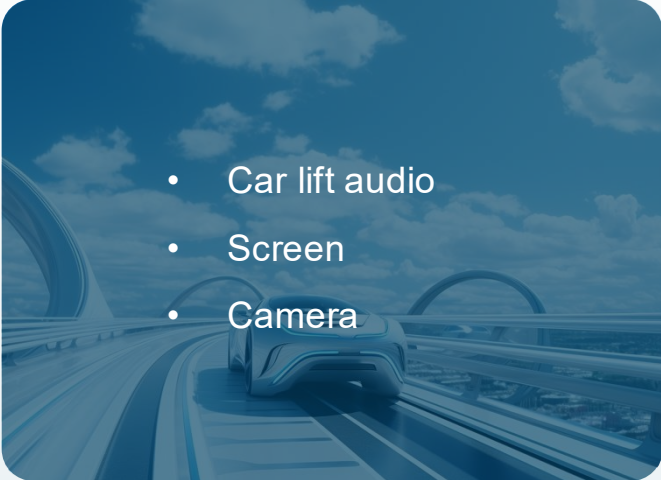
AAC provides customers with superior motors:

- Stepper motor (phi 3.4~ 8mm)
- Brushless coreless motor
- Frameless torque motor

One-Stop Solution



AAC's senior product design team focuses on enhancing the experience of motor and transmission module applications, and striving to open up new sensory enjoyment for users.

- 
- Car lift audio
 - Screen
 - Camera

- 
- IPD drive module

- 
- Rollable Phone
 - Auto Flip
 - Lifting front camera
 - Telescopic lens

Design and manufacturing integration

Professional and experienced R & D team

- The core members have an average of more than 10 years of development experience in the field of micro motors
- High-fitting simulation prediction and evaluation of electromagnetic/mechanics/fluid/multiphysics fields
- Optimal solution for performance and manufacturability

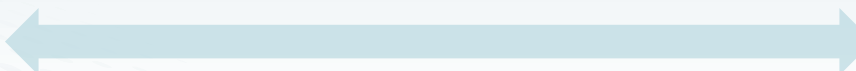
Precision manufacturing and automation

- Injection molding/stamping/MIM/CNC parts complete set manufacturing capability
- Tens of millions of motor & composite module mass production delivery experience
- Advanced automated line design

Comprehensive testing and evaluation system

- Multi-functional testing and evaluation system, supporting multi-project integration
- Self-developed audio analysis algorithm, high human ear correspondence
- Million-level test database

Design and manufacturing integration





Humanoid Robot Solutions

Humanoid Robot : One-stop solutions

- Rich technical reserves in fields such as speakers, microphones, cameras, and heat dissipation.
- Integrating capability that includes high-value components, system-level large modules, and software algorithms.
- Meeting the rapidly changing needs of humanoid robots and reshape the experience of technological change.



Hardware solution

- Linear actuator
- Rotary actuator
- Hollow cup motor
- Gearbox
- Ball rod
- Six-dimensional force sensor
- Speaker
- Microphone
- Camera
- Heat dissipation
- Inertial sensor
- Structural components



System-level solutions

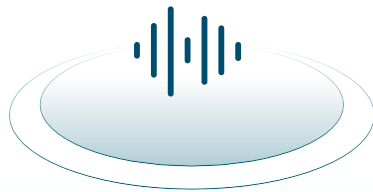
- Dexterous hand
- Electronic control
- Mechanics/Haptic sensing
- Acoustics
- Optics
- Cooling



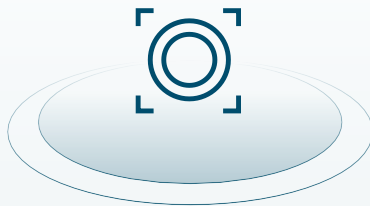
Humanoid robot solution: System-level integration solution



Solution description



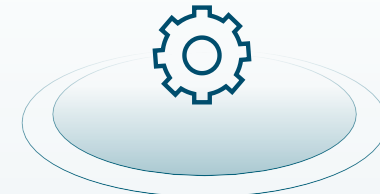
Acoustic system



Optical system



Ultra-high precision sensor



Micron processing technology



Electronic control system



Cooling system

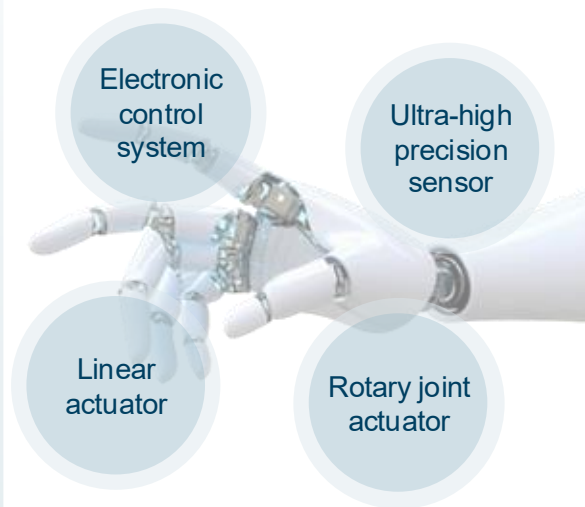
Dexterous hand system-level solution:

Design-to-manufacturing integrated service

Provide dexterous hand system-level solutions:

- Design to manufacturing
- Integrated services of components
- System-level modules, and software algorithms

System integration solutions



Brushless & coreless motor

Technical features:

- Magnetic enclosure, innovative structural windings, and excellent magnetic circuit design
- Starting torque & power consumption leading competing products



Linear actuator



Trapezoidal rod actuator



Ball rod actuator

Technical features:

- Flexible and powerful
- Precise positioning, smooth operation
- Overall, the comprehensive performance is improved and the batch cost is reduced

Robot Solutions:

Linear Motor Actuator for Humanoid Robots



40%[▲]

The increase in torque density
(to reduce the weight)

50%[▼]

Reduction of reverse thrust
(to improve force transparency)

*Compared with other products on the market

Actuator of the forearm motor

System integration solution:
includes planetary roller screws,
brushless motors, absolute
encoders, etc.



Item	Index
Max. Thrust (N)	3460
Rated Thrust (N)	1350
Operating Voltage (VDC)	48
Peak Torque (Nm)	2.76
Rated Torque (Nm)	1.07
Axial Clearance (mm)	≤0.02
Total Stroke (mm)	70
Lead (mm)	3.5
Stroke Accuracy (mm)	±0.02
Repeat Positioning Accuracy (mm)	±0.02
Speed Range (rpm)	0 ~ 4500
Inflection Point Speed (rpm)	2500
Linear Velocity (mm/s)	262.5

Actuator of the calf motor

System integration solution:
includes planetary roller screws,
brushless motors, force sensors,
absolute encoders, The force
sensor adopts an integrated
design with the pull ring etc.



Item	Index
Max. Thrust (N)	850
Rated Thrust (N)	340
Operating Voltage (VDC)	48
Peak Torque (Nm)	0.51
Rated Torque (Nm)	0.2
Axial Clearance (mm)	≤0.02
Total Stroke (mm)	35
Lead (mm)	3
Stroke Accuracy (mm)	±0.02
Repeat Positioning Accuracy (mm)	±0.02
Speed Range (rpm)	0 ~ 4500
Inflection Point Speed (rpm)	2500
Linear Velocity (mm/s)	225

Sensors and Semiconductors: Vast and Varied, Small yet Powerful

Sensors and Semiconductors: Vast and Varied, Small yet Powerful

Over the years, we have mastered core technologies in microelectromechanical systems (MEMS) and application-specific integrated circuits (ASICs), and also do our own in-house design, packaging and testing. Recently, we have successfully localized all of our production processes to secure product development and capacity supply.



Microphones

- MEMS microphones
- Bone conduction microphones
- Microphone and barometric pressure combo
- Smart microphones
- Microphone modules



MEMS Speakers

- MEMS speakers
- MEMS speaker modules



Inertial Measurement

- Voice-pick accelerometer (VACC)
- Accelerometer
- IMU sensor
- IMU module
- Vibration monitor module



Barometric Pressure Sensors

- Standard
- Waterproof



Radio Frequency (RF)

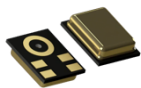
- Switches/Tuners
- LNA
- FBAR filters
- DiFEM modules



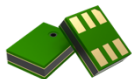
Airflow Sensors

- Airflow sensors (detect the use of e-cigarette)
- Airflow sensor modules

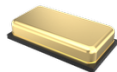
Sensors and Semiconductors: Product Showcase



MEMS microphones



Smart microphones



Microphone and barometric pressure combo sensors



Microphone modules

MEMS Microphones



MEMS speakers



MEMS speaker modules

MEMS Speakers



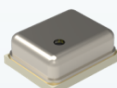
ACC modules



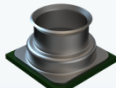
MEMS inertial modules



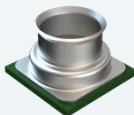
MEMS Inertial Measurement



Barometric pressure sensors



Waterproof barometric pressure sensors



Corrosion-proof barometer

Barometric Pressure Sensors



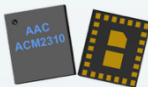
Switches/Tuners



LNA

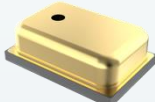


FBAR filters



DiFEM

RF Front-End Devices



Airflow sensors



Airflow sensor modules

Airflow Sensors

Microphones: Small but Powerful

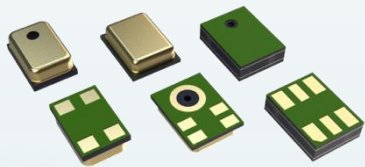


As one of the world's top three manufacturers of MEMS microphones, AAC has delivered over 9 billion units. Leveraging our exceptional in-house capabilities, AAC specializes in developing high-performance microphones and customized voice modules to meet our customers' diverse application requirements.

MEMS Microphones

Product Features

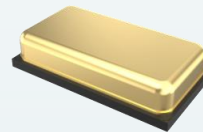
- Analog and PDM output
- High performance, SNR up to 70 dB
- Small size and low power consumption
- High temperature resistance, SMT stability
- High resistance to RF noise and EMI
- Uniformity from part to part in frequency response, high temperature stability



Microphone and Barometric Pressure Combo Sensors

Product Features

- Combine the barometric pressure sensor and microphone in one, enabling a smaller package
- Simplify structural and circuit design
- Reduce the overall cost by improving the device assembly process



Automotive Microphones

Product Features

- Offer microphone voice array modules
- Customizable in size, structures, microphone quantity, and performance
- Impressive consistency
- Strong resistance to interference
- Multi-chip combination



One of the World's Top Three
microphone suppliers by shipments

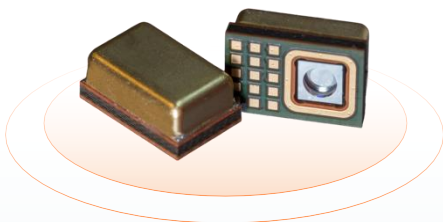
9,000,000,000+ MEMS microphones shipped in total

900+ patents

Microphone:

Studio-Quality Breakthrough Optical Microphone

Innovation from AAC Technologies and sensiBel



80dBA
SNR

146dBSPL
AOP

Breakthrough
Performance

Other
Parameters

PDM, I2s & TDM

Multiple Digital Interfaces

10Hz

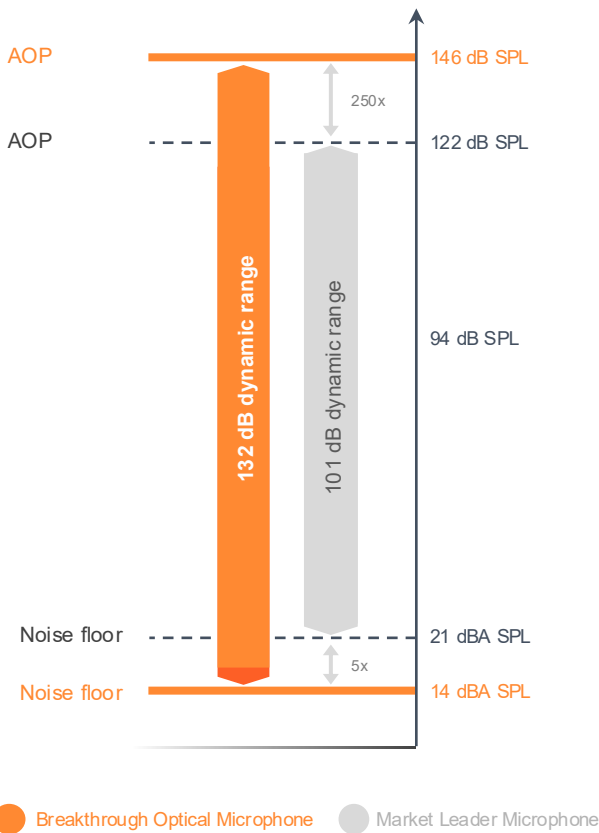
Low Frequency Corner

Multiple

Operating Modes

Typical
Applications

AR/VR, Mobile phone spatial audio processing, True studio-quality audio recording, Headsets for consumer, industrial and enterprise markets



MEMS Speakers: Full-Range HiFi Audio Quality



Based on our extensive development experience and core technologies in our self-developed core MEMS chips, we can provide a groundbreaking speaker solution for wearables such as TWS earphones and smart glasses, delivering a full-range, high-fidelity audio experience.

MEMS Speakers

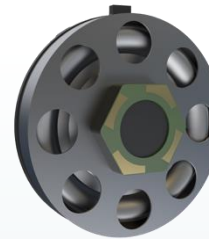


MEMS speakers vs. a regular coin

Product Features

- Prepared using a pure MEMS process to provide superior consistency (± 1 dB)
- Small size: easy to stack ($\Phi 5$ mm $\times$ 1 mm – hexagonal shape)
- Wide frequency band: easily extended to 40 kHz for all high-frequency response needs
- High reliability: shock resistance (10,000 g), dust and water resistance (IP58), etc.
- SPL ≥ 100 dB @ 6 kHz ~ 40 kHz / 1 Vrms
- THD: $\leq 5\%$ @ 6 kHz ~ 10 kHz / 1 Vrms
- Bluetooth chips can directly drive speakers or audio devices without the need for external power amplifiers
- SMT compatibility

Speaker Modules (TWS)



- Moving coil (customizable)
- MEMS speaker: $\Phi 5$ mm $\times$ 1 mm
- Flexible stacking and easy assembly
- A speaker solution for full-range HiFi audio quality, bringing a new experience to TWS earphone users

Hi-Res Audio 认证

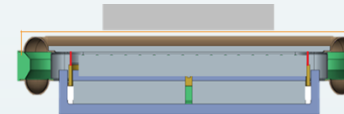
优秀的音频解析力，声音信息量远高于 CD 品质
“听歌要身临其境，玩游戏要听声辨位”



Hi-Res Audio certification



Full and detailed sound



Reduced stacking size



50+ patents

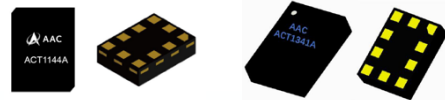
RF Front-End Devices:

Unique tuning tech, Ultra-low NF, Owned-IP filters, Top-level DiFEM



RF front-end devices for smartphones include power amplifiers, filters, low noise amplifiers, tuners, and switches. AAC has launched four product series – Switches/Tuners, LNA, FBAR Filters, DiFEM – to meet the market demand for consumer electronics, wearables, and IoT applications.

Switches/Tuners



ACT1144A

ACT1341A

Product Features

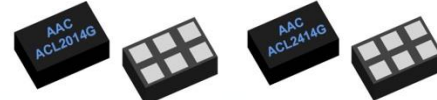
ACT1144A

- Flexible 3 pin GPIO controller
- Broadband frequency range: 0.1G to 3GHz
- Low On-resistance, 1.0Ω
- Low Off-capacitance, 0.13pF
- Low insertion 0.50dB @ 2.7 GHz
- High RF peak-voltage handling, 45V typical
- Very good ESD performance, HBM 2KV

ACT1341A

- MIPI RFFE 2.1
- High RF peak-voltage handling, >45V
- Low FOM, 1.35Ω * 0.16pF
- Very good ESD performance, HBM 2KV

LNA



ACL2014G

ACL2414G

Product Features

ACL2014G

- High Power gain: 19.5dB
- Ultra Low noise figure: 0.5dB
- Very Low current consumption: 5.0mA
- Support GPS L1 & L5
- 2KV HBM ESD protection
- Very Small package

ACL2414G

- Ultra low current consumption: 3.0mA for wearable application
- Ultra Low noise figure @3mA: 0.6dB
- Support GPS L1 & L5
- 2KV HBM ESD protection

FBAR Filters



ACF3445

ACF3340

Product Features

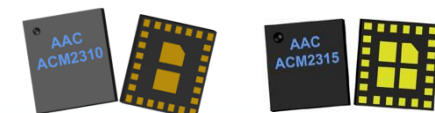
ACF3445

- Coexistence with LTE B7, B40&N41
- Miniature Size: 1.1 x 0.9 x 0.6mm
- Excellent Low IL: 1.5dB
- High Interference Rejection:
- -50dB @ 2370/2500MHz
- High Linearity: -35dBm H2 @25dBm
- High Stability: TCF=-26.5 ppm/°C
- Excellent ESD: 1500V (HBM)

ACF3340

- Low Loss in B40 band
- Excellent WiFi Rejection
- Miniature Size: 1.1x0.9 x 0.6 mm

DiFEM



ACM2310

ACM2315

Product Features

ACM2310

- All AAC designed chips
- 10 LTE band support
- Most CA support and Co-designed excellent CA performance: <1dB rollback
- Effectively reduce matching loss w/o SMD
- Excellent interference rejection: all <32dB

ACM2310

- All AAC designed chips, 8 LTE band support
- Very small package size : 3.2 x 3.0
- Most CA support and Co-designed excellent CA performance: <1dB rollback
- Top level performance: >1.5dB advantage

AAC Tuning Tech

Unique MEMS & SOI tuning tech

90+

patents

AAC Patent BAW

AAC Owned IP

Co-designed DiFEM

Top design, Top flow, Top performance

Barometric Pressure & Airflow Sensors:

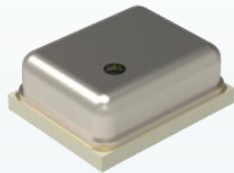
Small Size, High Accuracy, Low Power Consumption, and Excellent Heat Resistance



AAC's barometric pressure sensors feature a high-precision capacitive MEMS structure. These sensors detect changes in external absolute pressure by converting the detected barometric pressure signal into an electrical signal output to measure changes in altitude, water level and airflow in the surrounding environment. They are often used in smartphones, smartwatches, tablets, drones, model airplanes, gas meters, pumps, and robot vacuum cleaners.

AAC's MEMS airflow sensors adopt our self-developed MEMS technology to detect the usage status of e-cigarettes. Airflow change signals are detected by using MEMS sensors. When the capacitance change rate exceeds the threshold value set by the ASIC chip, an electrical signal is generated to identify the user's behavior.

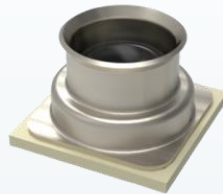
Barometric Pressure Sensors



Product Features

- Small size, high accuracy, and low power consumption.
- Operating pressure range: 300-1200 hPa;
- Relative pressure accuracy: ± 0.06 hPa;
- Absolute pressure accuracy: ± 1 hPa

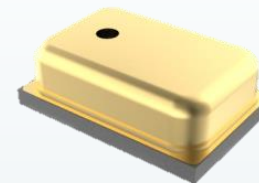
Waterproof Barometric Pressure Sensors



Product Features

- The waterproof gel and waterproof structure enable IPX8 waterproof performance.
- Operating pressure range: 300-1100 hPa;
- Relative pressure accuracy: ± 0.06 hPa;
- Absolute pressure accuracy: ± 1 hPa

Airflow Sensors



Product Features

- Small size and consistent performance in varying conditions, with resistance to high temperature, water and oil.

Waterproof Airflow Sensors



Product Features

- AAC offers PCBA airflow sensor modules with an integrated MCU for detecting e-cigarette usage, which can be adjusted to meet customer requirements for size, function, and performance.

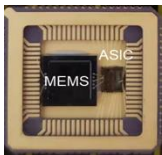
MEMS Inertial Measurement



Inertial Sensor



1-axis sensor



- High precision gyroscope



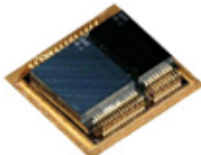
2/3-axis sensors



- Voice-pickup accelerometer (VACC)
- Conventional accelerometer



6-axis sensors



- IMU sensor

Inertial Module



IMU module



- Integrated IMU + MCU
- Full Temperature/Turntable Calibration



Vibration monitor module



- Integrated accelerometer
- Turntable/vibration calibration

Use Cases



IoT



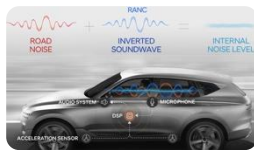
XR



Phone/PC



Vehicle & Industrial Attitude Determination and Navigation



Vehicle & Industrial Vibration Monitor System

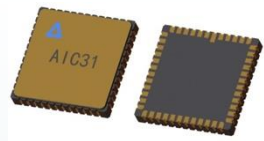
MEMS Inertial Sensors:

Ultra low noise, high bias stability, and high robust



Based on the experienced MEMS and ASIC technologies, AAC provides customers with high-performance IMU, ACC, and Gyro chips to meet the market demands of automotive, consumer electronics, wearable devices, and Internet of Things (IoT) applications.

Z-axis Gyroscope



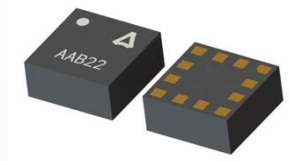
AIC31

Application: Automotive, Industry

Features

- High bias instability: BI 0.3°/hr
- Ultra-low noise: Noise density 1 mdps/rHz
- High temperature stability: Full temperature zero position $\leq 20^\circ/\text{hr}$
- Integrated Self-test function
- Ceramic package with dimensions of 11*11*1.3 mm
- AECQ-100 Grade 1

VACC



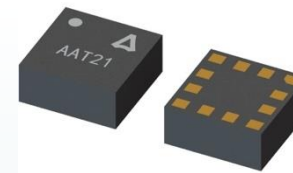
AAB22

Application: Headphones, AR, Industry, Automotive

Features

- Lowest noise in the industry 5 (X) /6.5 (Z) ug/rHz
- High bandwidth: 0 - 2kHz
- Interface types: TDM & I2C
- Integrated Self - test function
- Dimensions: 2mm x 2mm x 0.87mm
- AECQ - 100 Grade 1

Accelerometer



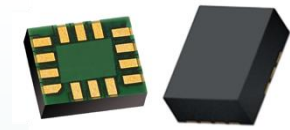
AAT21

Application: Consumer Electronics

Features

- Low noise: 80 ug/rHz
- Ultra-low current: 0.38 ~120uA
- TCO: $\pm 0.5 \text{ mg}/^\circ\text{C}$
- Integrated Self-test function
- Dimensions: 2mm x 2mm x 0.94mm

IMU (Q3 ES)



AIS21

Application: Consumer Electronics

Features

- Ultra-low noise: 5 mdps/rHz (G), 70 ug/rHz (A)
- Low zero-point drift: $\pm 1 \text{ dps}$ (G), $\pm 20 \text{ mg}$ (A)
- High temperature stability: $\pm 0.015 \text{ dsp}/^\circ\text{C}$ (G), $\pm 0.2 \text{ mg}/^\circ\text{C}$ (A)
- Integrated Self-test function
- Dimensions: 3mm x 2.5mm x 0.94mm

MEMS Inertial Sensors:

Small Size, High Consistency, and Excellent Heat Resistance



AAC provides customers with IMU module and ACC module solutions (accelerometer modules) for current applications in the automotive market.

General Features

- Bias and scale factor calibration from -40°C to 85°C
- Core components (sensors & MCU) meet AEC-Q100 or ISO 26262 ASIL-B requirements
- Supports SPI/UART/CAN interface communication
- Operating temperature range: -40°C to 105°C

Use Cases:

- High-precision positioning for L2+ ADAS in passenger and commercial vehicles
- High-precision positioning for robotaxis, unmanned logistics, and sanitation vehicles
- High-precision positioning for construction machinery and precision agriculture
- Road noise cancellation (RNC) for passenger vehicles



GIM316S



AMA600



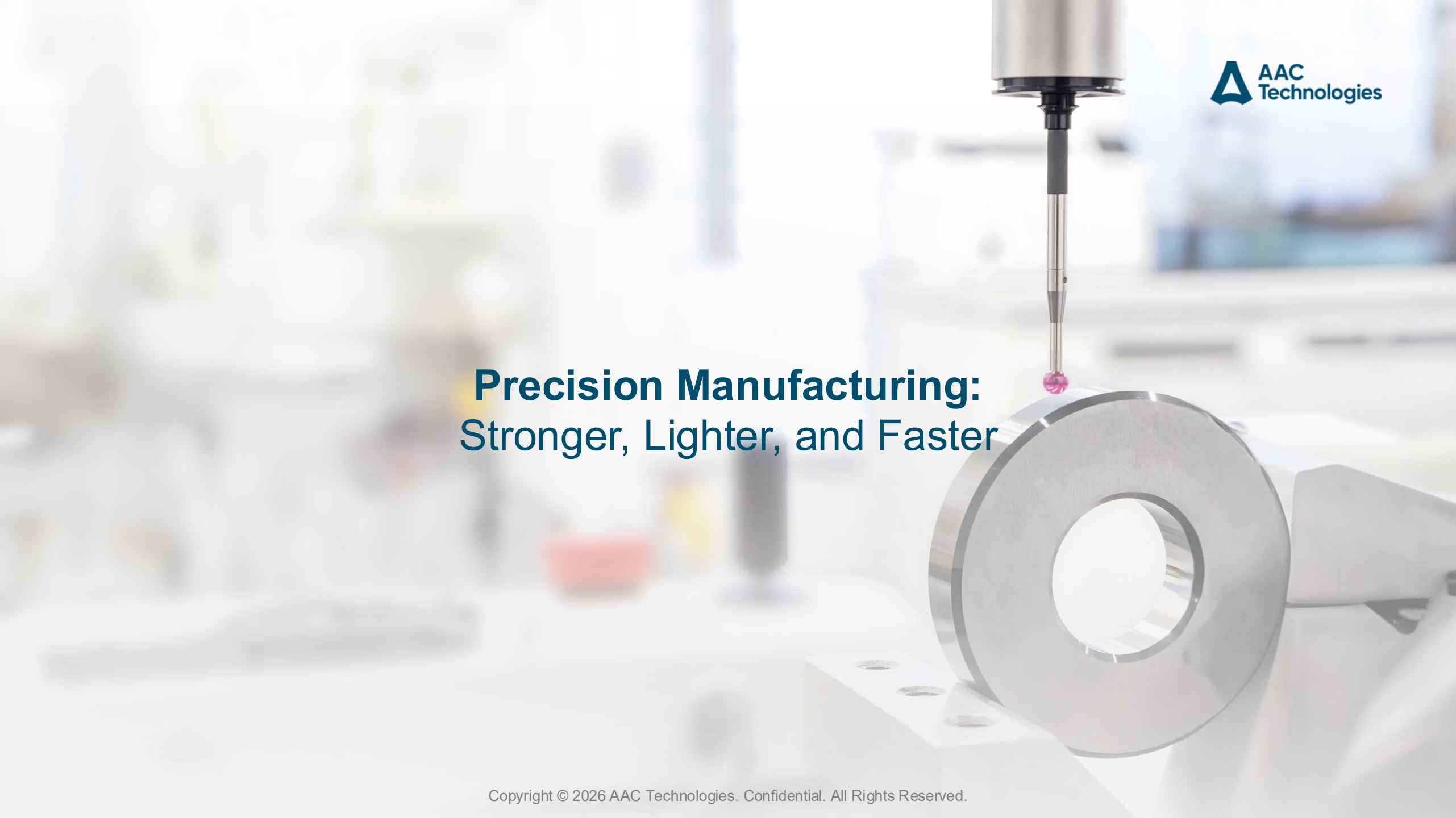
AMA601



AMS602



AMB603

A blurred background of a precision manufacturing facility with various industrial equipment and components.

Precision Manufacturing: Stronger, Lighter, and Faster

Precision Manufacturing: Stronger, Lighter, and Faster

With nearly a decade of dedicated R&D and practical efforts, our Precision Manufacturing Division has diversified its operations and now owns three product lines: mechanics, cooling, and hinges. Our primary objective is to improve the structure of smart devices and enhance the overall user experience. To achieve this goal, we continuously invest in the development of fundamental technology platforms for design, simulation, materials, and processes. These investments are aimed at enhancing our capabilities in tool and equipment machining, as well as increasing the level of automation in our production processes.



Mechanics

- Integrated solutions
- Simulation software development
- Precision manufacturing and processing technologies
- Automated machining



Cooling

- Professional labs and R&D team
- New technology R&D
- Design simulation
- New material development
- Automated production



Hinge

- Design and simulation
- Precision manufacturing
- Reliability testing
- Overall quality control

Our World-Leading All-Encompassing Mechanics Solutions



The increasing number of components in smart devices requires optimal structural design and precision. We combine acoustic, optical, haptic, and mechanical products onto a metal mid-frame platform to enable precise spatial design and rapid technology development. Thus, we can provide customized solutions for a wide range of smart devices.

Integrated Solutions	Material Development	Manufacturing Process Platform	Automation
- Develop solutions in close collaboration with customers - Integrate design and manufacturing based on RF, acoustics, and haptics - Independently design and manufacture rotating shafts for an optimal connection	- Develop composite metals - Develop consumables and reagents - Integrating the processing applications of various materials such as 6-series reinforced aluminum, 7-series aluminum, stainless steel, titanium alloy, magnesium alloy, and carbon fiber, while simultaneously collaborating with the latest additive manufacturing techniques, we have jointly developed a variety of composite materials to meet the diverse needs of our clients.	- Comprehensive vertical integration in mechanics - Customized manufacturing process - Precision manufacturing and processing technologies	- Automated machining - Automated measurement - Automated logistics

Mechanics: Competitive Technologies and Processes



Simulation

We simulate the machining process based on the product development requirements. Then, we can provide design simulation reference data and solutions.



Pilot Development

We conduct pilot development of specific products and verify their feasibility to optimize the design and development.



Product Assessment

Our multi-field and diversified design platform enables design and development to meet market needs and support varied product features.



Product Design

We develop technical solutions and machining procedures based on product features.



Mass Production

We can rapidly ramp up to mass production. We implement a quality management system to provide real-time feedback and support smart manufacturing.

Mechanics: A Diverse Range of Mechanics Catering to Broad Market Demands



Technical Parameters

- Bar phone: 6- and 7-series aluminum + full CNC + NMT + surface finish + assembly
- Foldable phone (top and bottom, left and right): 6-series reinforced aluminum and 7-series aircraft aluminum + full CNC + NMT + surface finish + assembly

Product Advantages

- An integrated solution covering the main and sub frames as well as the hinge cover
- Excellent dimensional stability: overall compartment flatness <0.15 mm
- Aluminum-plastic bonding force >1,500 N
- IPX8 waterproof, single process yield >99.2%

Enclosure for Phones



Technical Parameters

- 7-series aluminum + full CNC + multi-color + NMT
- Stainless steel + forging + CNC + NMT
- Titanium + forging + CNC + surface finish

Product Advantages

- Tailored for slim devices
- Mature stainless steel NMT technology and strong metal-plastic bonding
- Highly automated polishing, single process yield >98%

Enclosure for Wearables



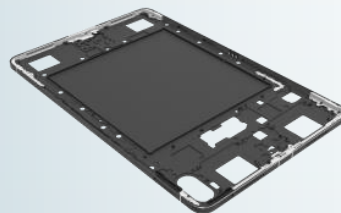
Technical Parameters

- Back panel: 6/7-series aluminum + CNC + stamping/forging + NMT
- Metal frame: 6/7-series aluminum + CNC + NMT + composites

Product Advantages

- Lightweight and flexible structural design
- Tailored for slim devices
- Automatically bonded composites, single process yield 100%

Enclosure for Tablets



Technical Parameters

- Part A: Aluminum + stamping + CNC
- Part A: Aluminum + full CNC machining
- Part C: Aluminum + CNC + stamping
- Part C: Aluminum + full CNC machining

Product Advantages

- Outstanding metallic finish
- Cutting-edge Industry 4.0 system
- AI-based dyeing control, delivering exceptional stability

Enclosure for Laptops



Cooling: Solving Industry Pain Points



How should we address the challenges posed by changes in the industry?

Industry Trends

Design: The thinner the device, the better. A focus on high structural strength, a large size, high performance, an integrated design, and light weight

Performance: Superior heat dissipation and excellent temperature uniformity to make phones cooler

Practical Challenges

The cooling space is getting progressively smaller.

The cooling environment is worsening.

Devices are getting slimmer, further compressing the capillary and vapor space.

Devices are consuming more and more power, which requires larger heat dissipation areas and enhanced temperature uniformity.

Solutions

Capillary technology innovation:
Porous materials such as printed capillary and composite copper mesh

Structural design optimization:
Optimize the vapor flow path and structural design

Raw material selection:
Use stainless steel to enhance strength and lightweight alloys or composite metals to reduce weight

Cooling: All-Encompassing Cooling Solution



Smart devices are operating at increasingly higher power levels. Heat dissipation management is now the key to securing a positive user experience. Meanwhile, consumers desire thin, light, and aesthetically pleasing devices, which require cooling products to become smaller and better shaped. In response to these challenges, we are innovating our vapor chamber capillary technology and optimizing our structural design to keep smart devices cool and fast under heavy load.

Design Simulation

- Technical support for simulation and analysis
- Prior assessment to prevent risks and optimize solutions

Technology Development

- New technology development
- Design and pilot manufacturing capabilities
- Collaborative development with customers

Automated Production

- Automation provides high efficiency, stable quality, and cost advantages
- Strong production resources

Vapor Chambers Products

- Vapor chambers: 0.4, 0.38, 0.35, 0.33, 0.28, 0.25 mm, etc. The material, shape, and size can be customized.
- We are conducting an in-depth study of various materials for VC, including copper, stainless steel, and copper-steel composites, and actively promoting the research and development and mass production of new materials such as FCCL and TI for VC.

Cooling: Our Comprehensive Solutions from Slimness to High Strength



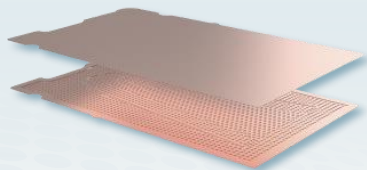
Ultra-Slim VC

1. Technical Parameters

- Ultra-slim copper VC - Maximum 0.27 mm
- Ultra-slim stainless steel VC - Maximum 0.3 mm

2. Product Advantages

- Light, slim, and space efficient
- Increased heat dissipation area
- Excellent temperature uniformity



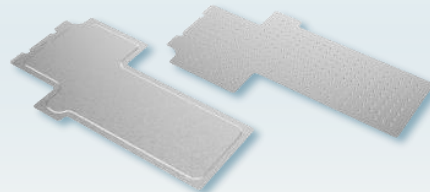
New Material VC

1. Technical Parameters

- Stamped stainless steel VC
- Etched steel-copper composite VC

2. Product Advantages

- A new material with high structural strength
- Allows for a diversified structural design



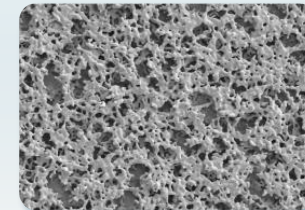
New Capillary Structure

1. Technical Parameters

- Printed capillary

2. Product Advantages

- A new capillary with better water absorption than the mesh capillary
- Suitable for slimmer products



Hinge: Smooth, Seamless, Reliable Connection in Every Joint



As a key component in foldable phones, the hinge connects two adjacent rigid parts, like the screen and middle frame, to smoothly rotate at variable angles. AAC hinge solution features innovative structure design and high-quality materials to ensure lightweight, flexibility, high strength, and durability, thus extending bending life and achieving seamless screen surface in foldable phones.

Inner Folding



Specification

1. Titanium alloy Deco parts, light and reliable
2. Featuring Luban none-gear structure, shield steel, bending life up to 400,000 times
3. Multi-angle hovering support to reduce folding seams, and achieve a flat and smooth surface
4. Supporting hovering angle from 60° to 110°

Outer Folding



Specification

1. "Butterfly wing" hinge with dual damping structure to create smooth rotation
2. Composite metal for stronger support and thinner thickness
3. Screen unfolds flat with smaller creases

AAC Advantages

Thinner and Lighter

- Compact and space-saving
- Seamless folding and unfolding

Reliable and Durable

- Longer bending life
- Stronger support

Customized Design

- Adjustable hovering angle
- Multiple material options

Hinge: Overcome Difficulties and Outperform the Average



Inner Folding

Difficulties	Dimension	Industry average level	AAC level
The titanium alloy Deco requires precise CNC contouring (0.1 or less)	entire shaft contour yield	95%	99%
Slender parts easily deform during processing	straightness	0.15mm	0.1mm
	flatness	0.2mm	0.15mm
Carbon fiber door panels, elastic and hard to shape	entire shaft flatness yield	90%	98%
Low automation due to complex structures	automation ratio	15%	40%



Outer Folding

Difficulties	Dimension	Industry average level	AAC level
Turning screws alters door panel gaps	door panels gap	0.1-0.2mm	0.08-0.15mm
Multi-segment welding lacks stability and precision	straightness	0.2mm or less	0.15mm or less
	flatness	0.25mm or less	0.2mm or less
Low automation due to complex structures	automation ratio	15%	40%

Hinge: Vertical Integration to Meet Different Demands

3 Manufacturing

Injection, de-binding, sintering and post process for MIM parts

2 Tooling

In-house high precision high volume tooling development and manufacturing



4 Assembly

Manufacturing and Testing automation gradually



1 Design

Strong R&D, engineering, quality and production team for hinge



5 Measurement

High precision measurement capabilities and development





XR Solutions: Redefining Immersion

Comprehensive XR Solutions: Leading Sensory Interactive Technologies



Optics

AR/VR Optics

- Diffractive waveguide technique and Micro-LED light engine
- Advanced AR display module
- Pancake optical module

Camera Module

- Self-identification: Iris/ET/expression/gesture
- Environmental perception: SLAM/VST
- Virtual-real reconstruction: Depth perception, 3D reconstruction



Acoustics

Sound Playback System

- High-performance MEMS speakers
- Spatial audio algorithm

Sound Pickup System

- High SNR microphones with noise suppression
- Directional microphones for far and near-field scenes
- Small-sized & highly sensitive



Haptics

Adaptive Trigger Solution

- AAC capstan & gear system

RichTap® Haptic Solution

- X-axis linear actuator
- Haptic design tools
- Play control SDK
- AI-powered automated analytics



Comprehensive FATP Services

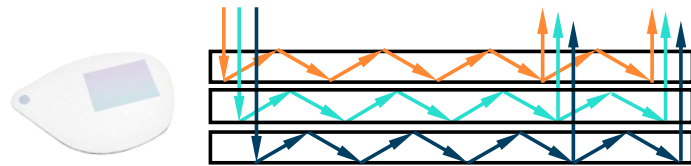
- Comprehensive Engineering Development Support for Customers
- Automated and Intelligent Manufacturing Bases
- Customized Assembly and Testing Lines
- Global Production Networks

Ensure the delivery of high-quality products to customers

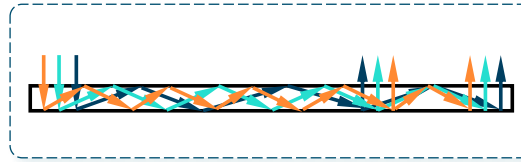
AR Optics: AAC can provide a comprehensive solution for waveguides, light engine and module assembly



- **AR Diffractive Waveguide Technique**



Traditional solution:
multilayer waveguide lens



AAC solution:
single-layer waveguide lens

Better Transparency

Increased Comfort

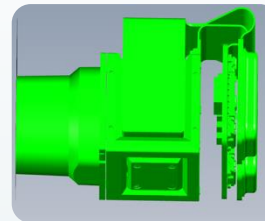
Slimmer And Lighter Lens

Higher Craft Capability

- **μLED Micro- LED Light Engine**



Customized design for customers



AAC design

Ultra-High Brightness

Full-Color Projector

Ultra- Compact

- **Module Design and Integration**



AR Optics: Advanced AR display module

Common BB Solution



Module Dimensions

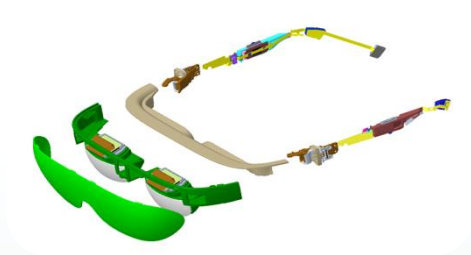
TTL: 20mm

FOV

FOV 45°



AAC Prism BB Solution



Thinner Module

TTL: 13mm

Thickness reduced by

30%

Larger FOV

The FOV can reach 60°

FOV increased by

30%

Diopter Adjustments

Supports myopia adjustment

Large Eyebow

A larger eyebow accommodates a wider range of Inter-Pupillary Distances (IPD)

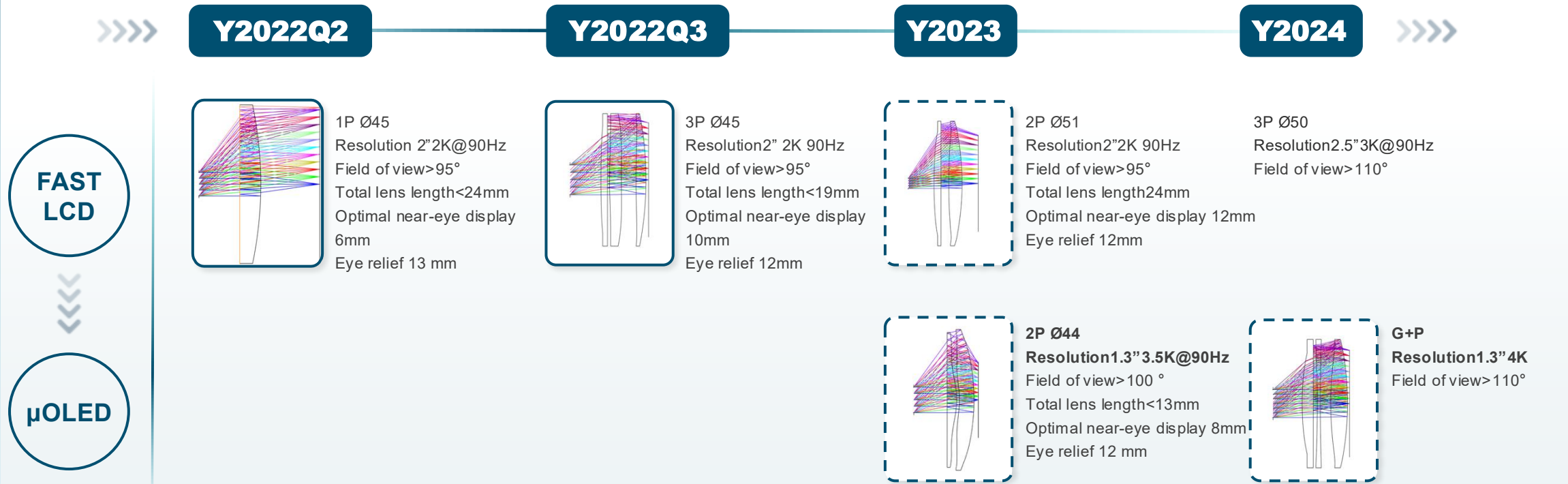


VR Optics: Pancake Module Roadmap



VR Pancake Optical Module Solution

Capture High-quality Image, Stay Slim and Light in Size



Lighter Body
Total lens length reduced to 19mm or less

Broader Vision
Field of view up to 100 degree

Ghosting Suppression
Image smearing down to 3% or less

Comfortable for Myopia
Diopter adjustment up to 800 degree

Clear Image Edge
MTF value up to 0.5 or above

Auto-IPD Adjustment System
Real-time adjustment according to user's interpupillary distance To eliminate visual fatigue and vertigo

Camera Module: Unleash Reality with Immersive Simulation

Cost-Effective | High-end Modules | Agile Development | Robust Delivery

1G3P, 1G5P, 1G6P, 1G7P,
2G6P...
3P/4P/5P/6P/7P...

2M/8M/13M/16M/32M/40M/
48M/50M/64M/108M
rear main camera/ultra-wide-
angle camera/telephoto
camera/periscope/ TOF/Macro
camera/Depth of field/
front camera of ultra small head
sizes / front camera with small
wide angle

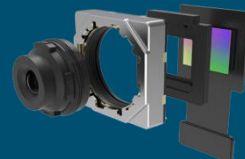
Various Lenses

- Design, mold, injection integrated
- Mechanical simulation
- World-leading WLG technology
- Highly automated production and high-precision assembly

Professional Algorithm

- Advanced user experience study
- Expert optical image evaluation
- Value-added algorithm research

Optics to create immersive simulation



Our solution integrates lens, voice coil motors (VCM) and algorithm to achieve a holistic image immersive simulation via advanced systems.

Electronic Components

- Independent production, including Molding, stamping, coil winding and etching
- Full-stack simulation-based design
- Self-developed automated assembly lines
- Two VCM R&D centers globally

AF / Low Cost OIS
/ Sensor shift OIS /
Folded OIS / POP
UP

Industrial Strategies

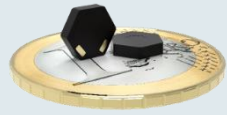
- Invest in SWIR Vision Systems, Ibeo, etc.
- Deploy OIS Driver IC&Algorithm
- Collaborate with global industry partners

Sound Playback System:

Versatile speakers for an exceptional audio experience



MEMS Speakers

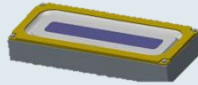


MEMS speakers
vs. a regular coin

Key Specs:

Prepared using a pure MEMS process to provide superior consistency (± 1 dB)
Small size: easy to stack ($\Phi 5$ mm $\times$ 1 mm – hexagonal shape)
SPL ≥ 100 dB @ 6 kHz ~ 40 kHz / 1 Vrms
THD: $\leq 5\%$ @ 6 kHz ~ 10 kHz / 1 Vrms
Bluetooth chips directly drive speakers or audio devices without the need for external power amplifiers
SMT compatibility

Ultra-Slim Speakers(SLS0920)



Key Specs:

Ultra-thin size: 9*20*3.1mm
F0: 230hz
SPL: 94.5dB @ 5cm, 0.24W, 1khz
Waterproof performance: IPX8
For devices with high demands on performance, sound quality and spatial stacking

Better Performance

on both low-frequency and high-frequency sounds, vivid and detailed

Lighter Weight

packaged with ultra-thin metals

Smaller Size

suitable for spatial stacking of XR devices which require a slimmer design

Better Heat Dissipation

with a lower voice coil temperature

Hi-Res Audio Certificate

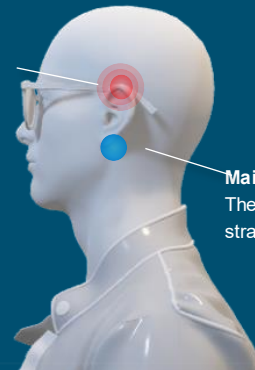
Truly experiencing high quality digital music (94khz 24bit and higher)



Near-Field Acoustic Design

minimizing sound leakage to protect user privacy and for a more intimate audio experience

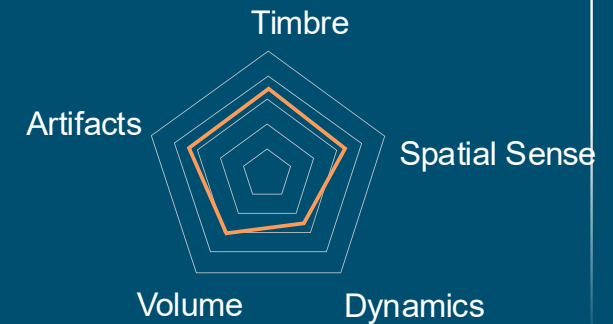
Sound Vent Hole
Invert the sound transmission



Main Sound Outlet
The sound goes straight to ear canals

Professional Tuning Services

offering quantitative evaluation and scenario-based rating for XR devices' audio



Sound Playback System:

Spatial audio algorithms for an immersive 3D audio experience

Immersive Spatial Sound

1. Enhance audio through post-processing technologies to various sound sources for better sound range and ambiance.
2. Identify & distinguish different sound inputs
3. Improve sound localization
4. Restore realistic and detailed environment



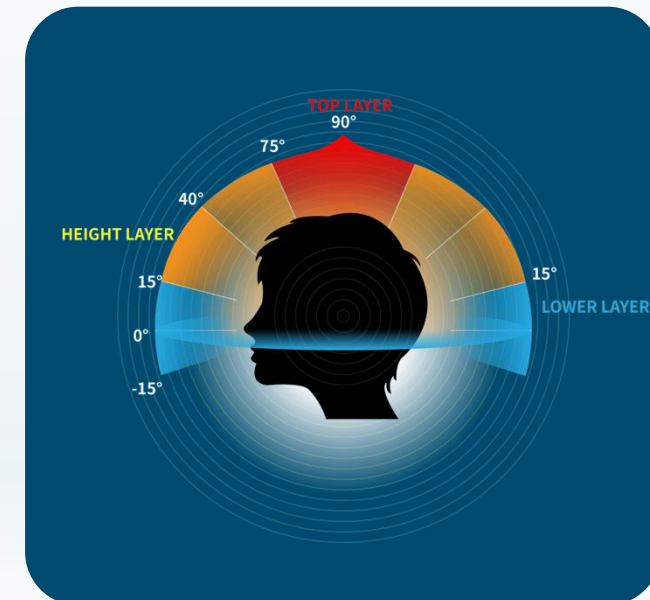
Common Stereo



AAC VR Immersive Audio

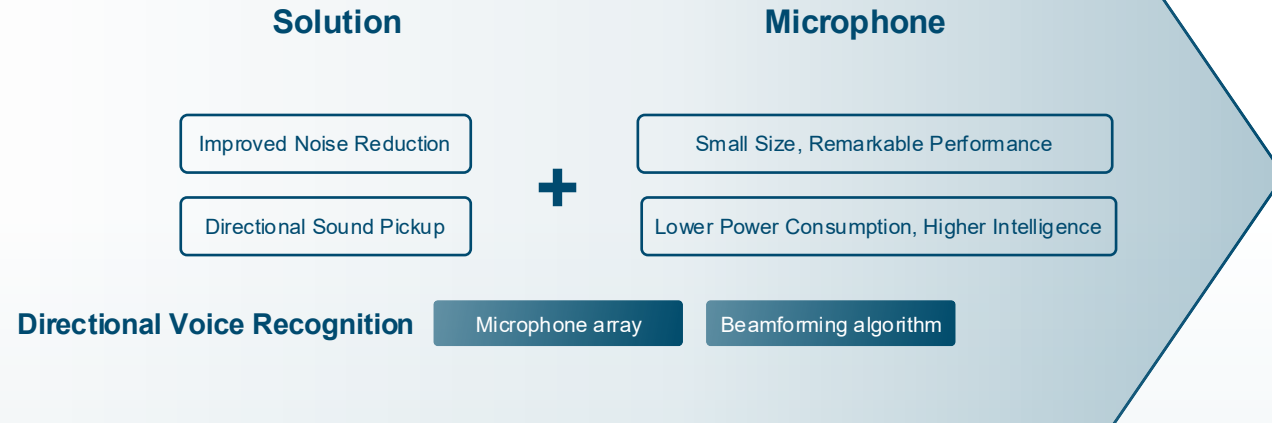
Low Latency 360° Head Tracking

1. Prevent sound localization bias and errors
2. Support 360 ° positioning tracking
3. Support horizontal head movement tracking



Sound Pickup System:

Diverse microphones to capture clear and accurate sound



High-fidelity Sound Pickup

Intelligent Functions

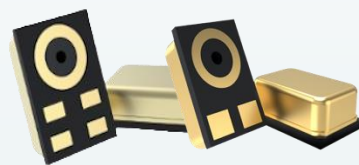
Multi-functional Applications

Highly-compatible with XR Devices

Strong Environmental Adaption

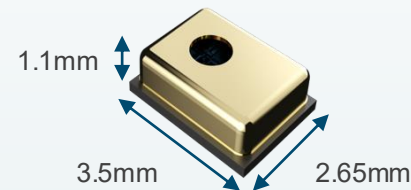
Slim and Light Weight

AAC MEMS Microphones



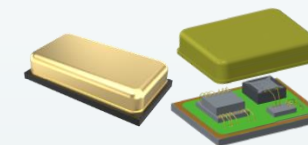
MEMS Microphones

Small size: 2.75x1.85x0.9 mm (1.15 mm)
Sens.: -38 dBV
SNR: 66/68 dBA
AOP: 120/130 dBSPL
Cost-effective, customizable



Directional Microphones

Small size: 3.5x2.65x1.1 mm
Off-axis Rejection: > 20dB
SNR: 64 dBA
AOP: 126 dBSPL
Supports directional sound pickup in an eight-point model



Barometric Pressure and Microphone Combo Sensors

Small size: 4.8x2.6x1.05 mm
SNR: 65 dBA
AOP: 130 dBSPL
Simplifies peripheral circuit design
Reduces stations of process flow
Reduces overall cost

Adaptive Trigger Solution

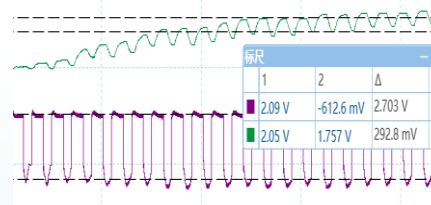


AAC Capstan & Gear System
Offers a clear haptic experience

Unique Specs:

- Simple and compact structure enables **small size and low cost**
- Intricate multi-level gear synchronization, **guarantees minimal noise interference**
- Rapid-response control allows for immediate and accurate feedback from any given position
- Unique and patented structure by AAC

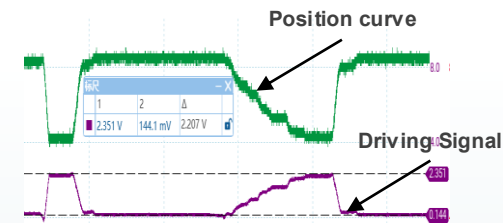
Vibration Mode



Controls DC motors in both forward and reverse, with adjustable frequency and intensity, and a configurable starting point, usually below 300Hz

Provides three basic modes of operation

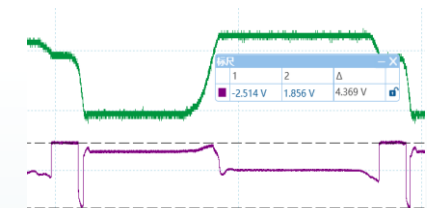
Spring Mode



Control of DC motors to deliver torque in an approximately linear fashion, with a configurable starting point and intensity movement

Satisfies diverse requirements of different settings

Button Mode

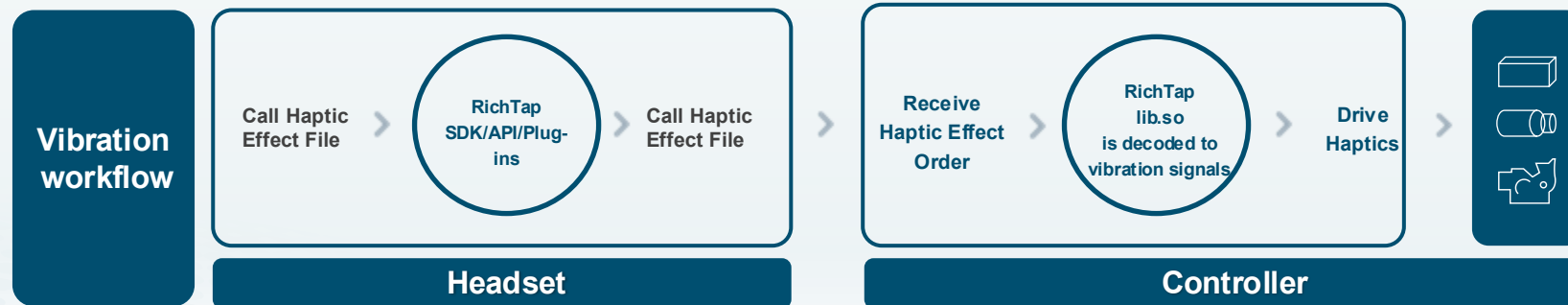


Control of DC motors to produce sudden torque changes to output a mechanical button-like click, with configurable starting and ending points and intensity

Focuses on a better user experience

RichTap[®] Haptic Solution:

Integrated hardware & software to optimize user experience



Strengths

Flexible Customization

RichTap Creator Suite provides design tools and SDKs to customize haptic sensations.

Cross-platform Consistency

RichTap supports Unity, Unreal game engine plug-ins to create a consistent experience.

Real Tactile Sensation

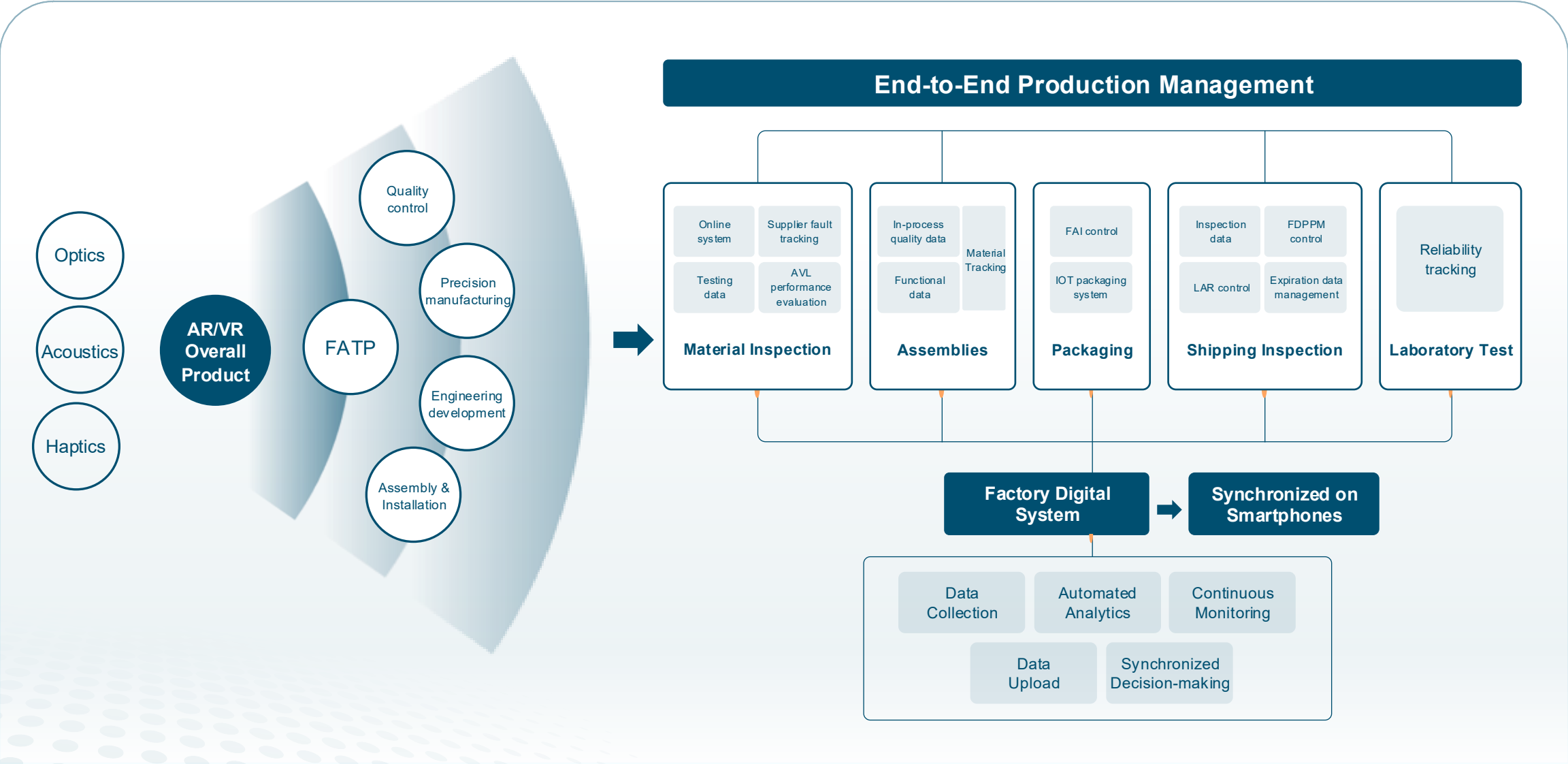
RichTap library provides a large portfolio of appreciable haptic effects.

Intelligent Algorithm

Algorithms are adapted to a wide range of chips and actuators to enhance application experiences.

Comprehensive FATP Services:

A One-stop Solution for Your Product Needs





Smart Automotive Solutions: Next-Gen Super-Sensory Cockpits

Automotive Solutions: Smart Cockpit Sensing Interaction Solutions



Audio System

- Full range of components
- Integrated software and hardware solutions

Personalized, immersive, and premium audio experience



Haptic System

- Comprehensive technical service
- Haptic system design experience

More smart and realistic intelligent surface interactive feedback

More tactile and timely safety reminder

Richer 4D entertainment interactive experience



Optical System

- Various automotive lenses
- LiDAR components
- Optic engine solution

Detection of the external environment, perception of passengers and position inside cockpits



MEMS Sensing and Interaction System

- MEMS microphone and module
- MEMS inertial sensor and IMU module

Enhance smart cockpit multi-scenario voice interaction experience

Accelerate the implementation of various functions such as vehicle positioning requirements, navigation, and ADAS



Motor Actuators System

- Chassis and cockpit brushless motor
- Rare-earth magnetic steel

Light, high power density, low cost, small size

Audio System



Sound Architecture Design

Creating multiple functions such as active noise reduction, independent sound area to cover different demands from entry-level to high-end

Algorithm & Professional Tuning

Providing algorithms to make 3D sound field, panoramic surround and etc. by professional tuners

MEMS Sensor

RANC (Vibration sensor module)

Seat Enhancement

Providing dynamic 4D motion, vibration alerts, augmented bass capabilities

MEMS Sensor

A²B microphone modules

Innovative Speakers

Providing innovative speakers like USS & VFW which are suitable for ceiling, headrest to create multiple scenes

Premium Classic Speakers

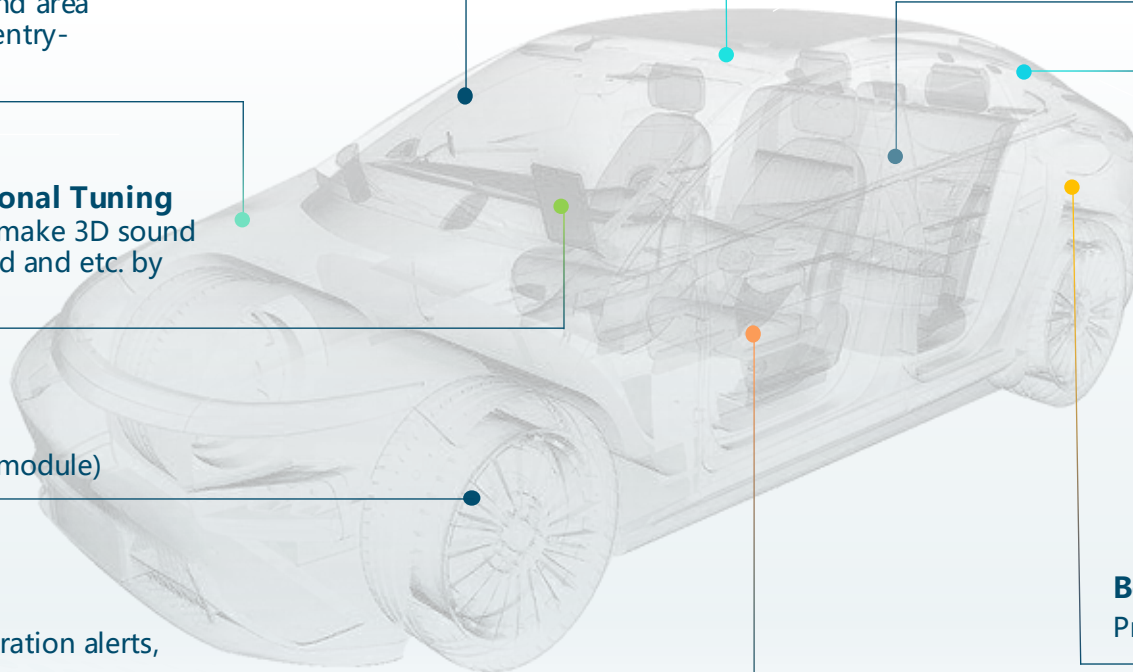
Providing a wide range of high-performance classic car speakers, bringing high-quality audio experience

AMP

Enhancing superior performance and processing capabilities

Booster

Providing different types of boosters



Innovative Speakers



Our USS/VFW speakers are compact, lightweight, and high-performance, seamlessly fitting into various vehicle spaces. Also, they require minimal space to enhance in-car audio for gaming, movies, conferences, etc.

USS (Ultra Slim Speaker)

Advantage

- Light weight
- Wide band
- Space saving
- Flexible integration

Application

- Headrest
- Headliner
- A/B pillar



"2 in 1"
USS + Tweeter = Full-range Speaker

VFW (Vibration Free Woofer/Subwoofer)

Advantage

- Reduce vehicle vibration
- NVH improvement
- Optimize layout to improve sound quality

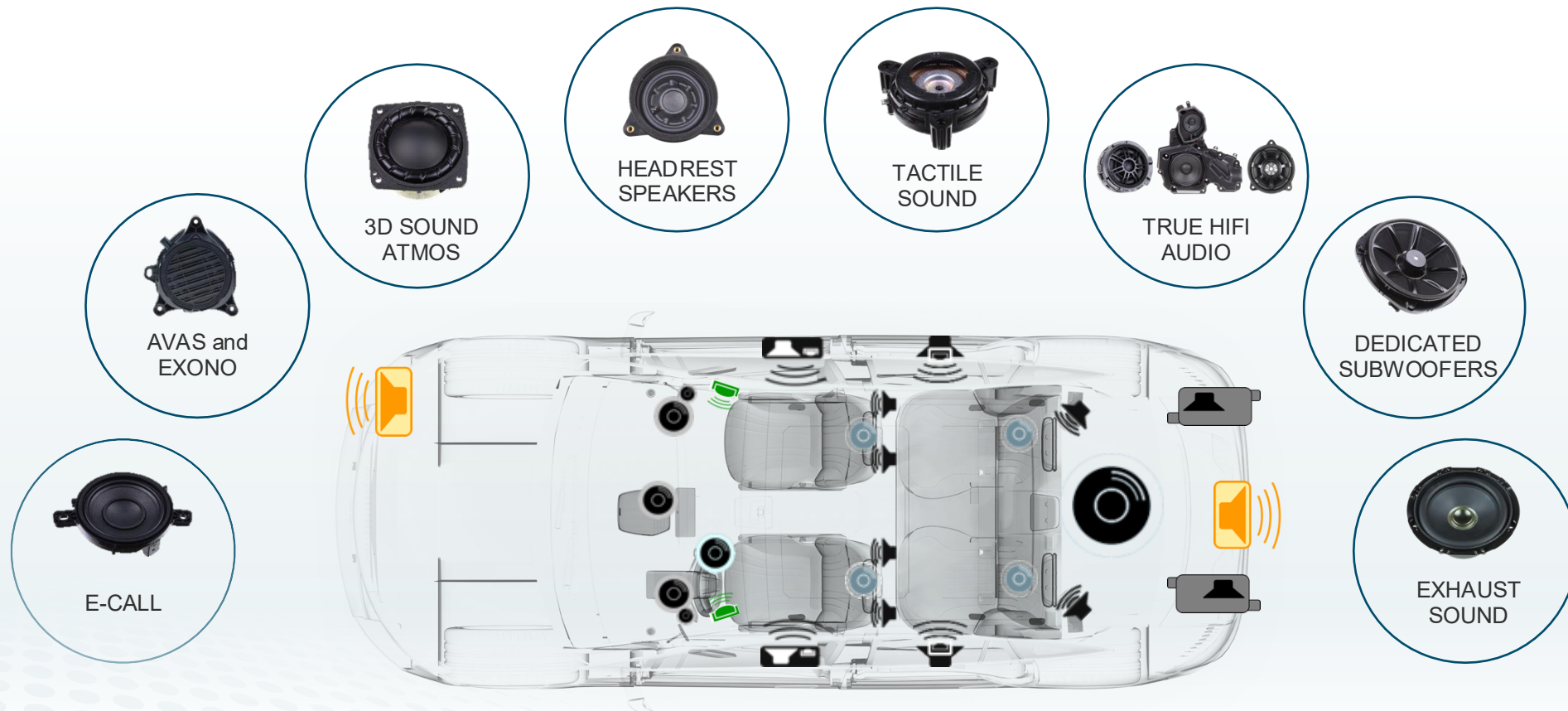
Application

- Door
- The bottom of seat
- Inside the console



Premium Classic Speakers

AAC acquired a majority equity share in Premium Sound Solutions (PSS), a leader in innovative sound products. PSS offers high-performance classic car speakers in various sizes, paired with advanced sound tuning technologies, to deliver an enhanced audio experience for automobiles.



By continuous investing in quality, innovation and new production technologies, PSS owns innovative technologies, such as CosCone™ and Butterfly, which allow the company to deliver unique sound applications to global customers.

CosCone™ Technology

- Up to 50% of height reduction
- Scalable technology
- Stable & linear excursion
- Light weight due to single frame design
- Available in Neodymium and Ferrite



Butterfly™ Technology

- High performance out of a small box
- Low weight topology
- Low distortion
- Force cancelled dual long throw cone design
- Scalable 3" -8"



Both amplifiers and booster, two types of products of AAC are using a lightweight and compact design, while supporting multi-channel output, high power playback, and with a strong heat dissipation function to ensure the stability and high efficiency when the devices are in conditions with a high load.

Entry level

12CH Amplifier

- Rated power 500W
- 8CH Class AB+4CH Class D
- A2B input
- 400MIPS
- HSCAN/CANFD



12CH Booster

- Rate power 620W
- 8CH Class AB+4CH Class D
- A2B input
- I2C Diagnosis
- Algorithms integrated in DHU, cost saving for OEM



Budget

16CH Amplifier

- Rated power 920W
- 8CH Class AB+8CH Class D
- A2B input
- 2000MIPS
- HSCAN/CANFD
- Compatible Design for Booster



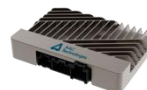
20CH Amplifier

- Rated power 1080W
- 12CH Class AB+8CH Class D
- A2B input
- 2000MIPS
- HSCAN/CANFD



12CH Booster

- Rated power 1360W
- 8CH Class D+4CH Class AB
- A2B input
- With MCU
- I2C Diagnosis
- Algorithms integrated in DHU, cost saving for OEM



Premium

24CH Amplifier

- Rated power 1920W
- Passive heat dissipation
- 24CH Class D
- A2B input
- 4000MIPS
- HSCAN/CANFD



Algorithm & Professional Tuning



**Sound Field
Control**



**Active Sound
Design**



**Intelligent
Sound**



**Sound
Quality**



**Active Noise
Cancellation**



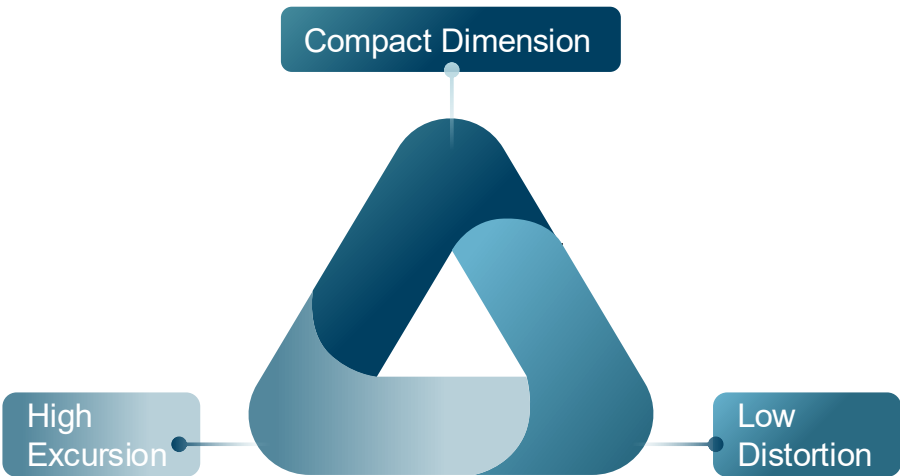
**Immersive
Audio**

Exclusive NLC PRO Algorithm:

Break the “impossible trinity” for further sound quality breakthrough



Challenge: The “Impossible Trinity” of Speakers



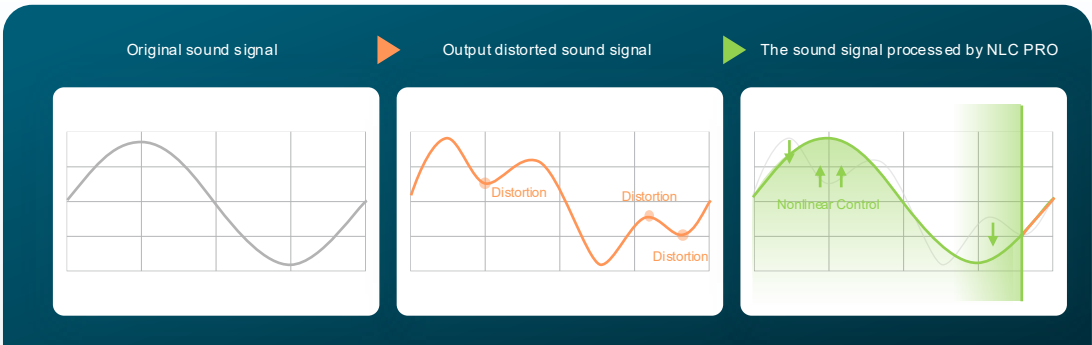
Great challenges in striking a balance among the three ideal characteristics of speakers.

AAC's exclusive NLC PRO algorithm: Reduce distortion and improve sound quality

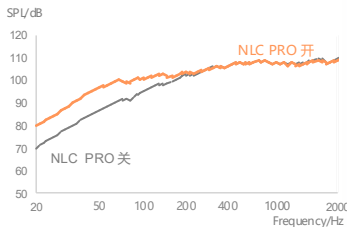
Use an **accurate speaker model** to effectively improve sound clarity and fully release bass performance.

- ✓ Reduce speaker distortion and enhance music and voice clarity
- ✓ Applicable to all car speakers

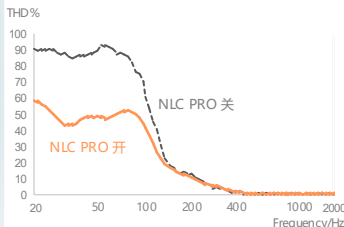
Schematic Diagram of the Working Principle of NLC PRO



Comparison of Bass Performance



Comparison of Distortion



Comparison of Data

	Before	After
Dynamic bass enhancement	No Boost	20dB
Dynamic bass expansion	130Hz	55Hz
Distortion reduction	93%	52%

On USS speaker

Source: Results from AAC Lab's comparison tests of USS speaker before and after applying the NLC PRO algorithm.

High-Quality Product Portfolio



Flexible and Comprehensive Product and Service Portfolio covers all market segments of the automotive industry. Strong lean manufacturing capabilities ensure high-quality delivery.

Entry-level

11 channel &
12 speaker
audio system

Economical and practical
audio solution

Mid-range

20 channel &
23 speaker
audio system

Exceeds customer
expectations

High-end

32 channel &
39 speaker
audio system

Exclusive audio
solution for the
ultimate experience

Customized

Customized number for
channel & speaker
audio system

**Personalized VIP
audio solution
with customized
services**

- Audio System Architecture Development
- Speaker Selection
- Amplifier Development
- Professional Tuning

Haptic System: Beyond the Haptic Experience

Comprehensive Haptic Feedback Solution

Feedback Solution

- High quality **haptic actuators**
- Self-developed high-voltage **haptic driver IC**
- Algorithm and signal design and system debugging services

Sensing Solution

- Capacitive/Ultrasound/Force **sensor fusion** technology
- Suitable for various materials
- Multi-channel sensing support for more keys

Mechanical Support

- Mechanical stack design, simulation and optimization consulting services

Algorithm Solution

- Optional algorithms for multi-channel seat vibration solution

Use Cases



Smart Surface

- Tactile button interaction experience
- Improve user operability, accuracy & minimize distraction



Safety Assistance

- Compensate for the limitations of visual and auditory perception cues
- Improve safe driving experience



4D Entertainment

- Enrich your life by immersing yourself in a 4D cinema or music experience
- The car can transform into an advanced game console with integrated haptics UX

Image Capture System:

Quickly Capture the Environment Inside and Outside the Car



Automotive Lenses

Surround View Lens

- Reducing ghosts and flare
- Increased resolution

Front View Lens

- Reducing ghosts and flare
- Increasing reliability
- Improving thermal stability

Smart Cockpit Lens

- A wide aperture
- Small size
- A wide angle view
- RGB-IR technology

LiDAR Lens

- High thermal stability
- Various specially-shaped glass lenses

Full-stack Independent R&D and Production

AAC Optics is capable of full-stack independent R&D and production of automotive lenses and has outstanding testing, validation, and IQ labs.

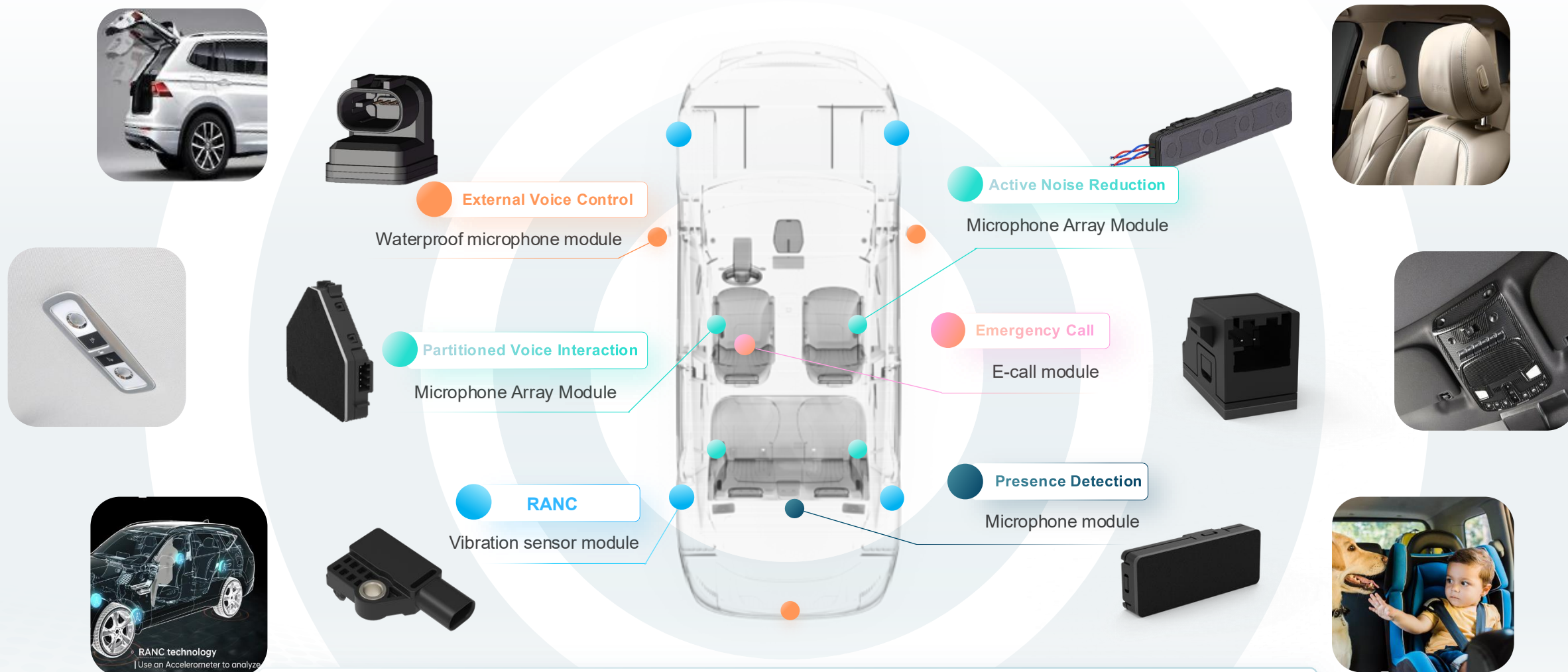
Use Cases

Autonomous driving
environment perception

Low-speed autonomous
driving/parking perception

Smart cockpit
perception

MEMS Sensing and Interaction System



- Features ultra-high consistency, high signal-to-noise ratio, low noise, low distortion, high AOP, flat frequency response, etc.
- Compliant with automotive industry standards and AECQ103 quality requirements and meets the application needs of automotive use cases.

MEMS Sensing Interaction System: Advanced Module Manufacturing Capability



Hebei Chuguang Automotive Parts Co., Ltd. is a subsidiary of AAC Technologies Holdings Inc., mainly engaged in the design, production and sales of pre - installed automotive electronic products, enabling the creation of more competitive system - level solutions.

Products

Audio Acquisition



On-board Charging



Other



Excellent module production and management capabilities

A Tier 1 supplier for many well-known domestic automotive enterprises

The annual production capacity of microphone modules is over 15 million units

Positioning System:

High-precision Positioning, Worry-Free Navigation



In response to the current demands of the automotive market, AAC primarily provides solutions for IMU modules and vibration sensor modules (accelerometer modules) for end customers.

General Characteristics

- Zero deviation across the full temperature range (-40°C to 85°C) and scale factor calibration
- Core components (Sensor & MCU) meet AEC-Q100 or ISO26262 ASIL-B requirements
- Support SPI/UART/CAN interface communication mode
- Operating temperature: -40°C~105°C

Application Range

- High-precision positioning for L2+ autonomous driving in passenger and commercial vehicles
- High-precision positioning for Robotaxi & autonomous logistics & sanitation vehicles
- High-precision positioning for construction machinery & precision agriculture
- Passenger vehicle road and noise cancellation (RNC)



GIM316S



AMA600



AMA601



AMS602



AMB603

Motor Actuator System: : Ingenious Self-Developed Magnetic Steel: Quiet Power, Max Efficiency



AAC's automotive motor system solution covers four major application domains: chassis, cockpit, body, and thermal management. Leveraging the self-developed rare-earth magnetic steel and superior acoustic capabilities, our motor products deliver exceptional value with a high quality-to-price ratio and superior NVH performance. We can provide clients with a robust and stable chassis system, a quiet and comfortable cabin environment, a flexible and intelligent user experience, and a safe and smooth driving experience.

Motor System Assembly Solution

Chassis System

- Brake system
- Steering system
- Semi-active suspension system

Body System

- Brushless Wiper System
- Pedal motor

Cockpit System

- Seat adjustment motor
- Brushless Motor for Long Sliding Rail Seat

Thermal Management System

- Electronic pump assembly

Proprietary Patented Magnets:

100% recycled materials ensure eco-friendly and cost-effective solutions.

Superior NVH Performance:

Enhanced by nearly 30 years of acoustic expertise.

Advanced Simulation and Flexible Production:

Algorithms and automated lines enable rapid customization and deployment.

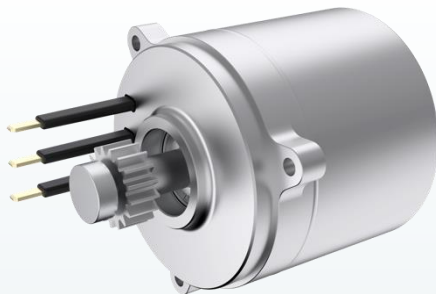
Compact and Faster Response:

Good compatibility with next-generation high-voltage vehicle platforms.

Motor Actuator System

Chassis System

EMB-Brake-by-Wire Motor



Application:

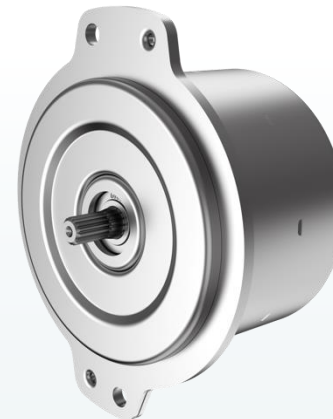
Automotive Braking System

Advantage:

- **High maturity:** Developed in cooperation with industry leaders, and has passed road tests and winter standard tests
- **Favorable price:** Self-made magnetic steel and proprietary patented technology
- **High performance:** Fast response speed in the high-speed range of the motor (system $\leq 90\text{ms}$)

High compatibility: Compatible with the 48V platform

EPS-Steering-by-Wire Motor



Application:

Automotive Steering (Including CEPS/REPS)

Advantage:

- **Excellent NVH performance:** Platform-based products and design, with low cogging torque and torque ripple
- **Favorable price:** Self-made magnetic steel and proprietary patented technology
- **Small size:** Lightweight design, reducing the length of the stator and rotor cores by over 10%
- **High mass production capacity:** Flexible automatic production line, enabling rapid production launch of new projects
- **High compatibility:** Compatible with the 48V platform

We have all the capabilities from the rare-earth supply chain to independent production of rare-earth magnetic steel and differential electromagnetic simulation, and have built laboratories and related testing and validation capabilities.

Motor Actuator System



Body System



Brushless Wiper System

Application:

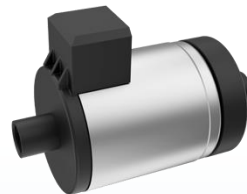
The Intelligent Wiper System

Advantage:

- **Excellent NVH performance:** Low noise, providing high driving comfort
- **High EMC level:** Level 3-5, which is more suitable for intelligent driving of vehicles
- **Intelligent control:** Fast response, enabling precise control of the angle and position of the windshield wiper
- **Long service life:** Low maintenance cost
- **High waterproof and dustproof level:** $\geq$ IP67



Cockpit System



Brushless Motor for Long Sliding Rail Seat

Application:

Automotive Seat

Advantage:

- **Excellent NVH performance:** $\leq$ 30dBA
- **Small size:** Lightweight design with a self-developed high-density magnetic steel solution
- **Highly integrated:** Integrated solution of motor + controller
- **High mass production capacity:** Flexible automatic production line, enabling the rapid launch of new projects for production
- **High compatibility:** Compatible with the 48V platform



Thermal Management System



Brushless Oil Pump System

Application:

Automotive

Advantage:

- **High efficiency:** Brushless and hall-less motor reduces energy loss and improves conveying efficiency.
- **Small size:** Lightweight design.
- **Excellent NVH performance:** Enhances driving comfort.
- **Easy to maintain:** Optimized process reduces costs.
- **High compatibility:** Compatible with the 48V platform.



Corporate Social Responsibility

Corporate Culture



Employee Care

AAC adheres to the core beliefs of value creation and employee care, which mutually reinforce and serve as the foundation for each other. We engage top-tier teams and encourage our entrepreneurial, fast-growing employees to pursue greater excellence. Our employees strongly support our corporate culture and core values through concrete actions. Through their concerted efforts, AAC thrives and flourishes, continuously generating value for our customers and consumers.



Acknowledged by Forbes
as one of the World's Best
Employers (2022)



Great Place To Work®
Certified (2022)

Social Responsibility

AAC is committed to making meaningful contributions to the economic and social development of the local communities where we conduct our business.

- Since 2021, we donated over RMB1 million each year to support the disadvantaged in education, medical services and poverty from various communities in China, including Changzhou, Nanning and Kunshan.
- In 2023, we received “Outstanding Contribution Award” from Changzhou Government for recognition of continuous human resources enhancement efforts, including training and career development initiatives.
- Since 2022, AAC Technologies has been an official member of the Joint Conference on Information Accessibility and a leader in sensory experience solutions. On the International Day of Persons with Disabilities in 2024, we showcased RichTap® haptic solutions that can enhance the accessibility of touch screens for visually impaired users, providing them with various conveniences.



Sustainable Development



At AAC, our business decisions are guided by our core values of safety first, scientific management, and sustainability. We are committed to achieving a harmonious balance between economic performance, environmental management, and corporate social responsibility, going beyond mere business operations. Furthermore, we regularly evaluate the interdependencies among these core values. To strategically shape our future sustainability management policies, we have established four pillars to support our sustainability monitoring with the active involvement of our stakeholders.



Build a competent and future-oriented team



Increase investments to mitigate environmental impact



Innovate to enhance customer experience



Become a responsible and reliable enterprise

ESG Ratings



MSCI ESG rating
BBB



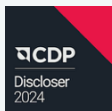
FTSE4Good Index
3.0



Sustainalytics' ESG risk rating
Low risk (17.7)



CDP Scores
**Climate change: C
Water safety: B-
(AAC)**



CDP Scores
**Climate change: B-
Water safety: C
(PSS)**

*Time Period: 2024/1/1-2024/12/31

Managing Environmental Impacts



In support of China and European Union's commitment to achieving carbon neutrality and minimising environmental impact, we have focused on enhancing our comprehensive action plans and environmental management systems. This year, the Group has established a new strategic plan and target, reaffirming its dedication to sustainability. Moving forward, the Group will continue to broaden its initiatives, including increasing the utilisation of renewable energy sources, to further advance its environmental objectives.

4

factories maintained a minimum of 90% waste diversion rate

75% Factories

completed ISO 14001 in the Group

RMB 72.7 Million

environmental protection expenditure

4

sustainability targets and commitments are adopted

34.5

m kWh solar energy generated from 10 of our factories

34.5

m kWh renewable energy used

Zero

non-compliance on environmental violation found

5,001 Tonnes

waste recycled

*Time Period: 2024/1/1-2024/12/31

Supply Chain Traceability



Multi-Dimensional Supplier Evaluation System

The public is placing growing importance on the environment, labor, labor rights, and social well-being. To ensure comprehensive sustainability management, we are committed to fostering sustainable development through our supply chain. Here are five aspects we consider when evaluating suppliers:



Environment

- Environmental management system (aligned with ISO 14001 certification)
- Waste disposal and emissions
- Hazardous materials handling
- Commitment to non-use of restricted/prohibited substances
- Social responsibility agreement



Sustainability

- Waste management and pollution control assessment
- Assessment of the use of hazardous chemicals in the production process
- Green procurement
- Environmental safety materials
- Third party verification



Quality

- ISO 9001 Quality Management System
- Product quality



Logistics and Efficiency

- Just-In-Time delivery
- Internal tracking system
- Transportation and packaging



Society

- Social responsibility agreement

Supply Chain Traceability



Big Data-Powered and Automated Tracing and Evaluation

AAC's management of big data on raw materials, production parameters, shipping labels, etc., is well recognized by customers. Our ongoing use of a quality data management (QDM) system allows us to track production and make timely judgments. In an ongoing effort to improve material traceability, we require suppliers to disclose information on places of origin, and the smelters and refineries used.



Supplier Quality Inspection System

A text message alert will be sent when the material received is non-conforming. Such non-conformities will be linked to supplier performance audits.



IoT

Data support is provided to the production management system to optimize resource allocation.



Interception System

Robotic inspection is applied to production lines. Data is stored and inspected online to improve data traceability.



CNC Foolproof Mechanism

Errors are minimized, enabling a 100% pass rate.

Honors and Awards



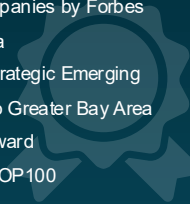
Social Responsibility and Sustainable Development

- The Best GRI Report Commendation Award
- The Environmental, Social, and Governance Reporting Excellence Award
- A Global Philanthropic Enterprise
- A Clean Production Enterprise in Guangdong Province
- Top 10 Chinese Companies by ESG Score
- Best GRI Reporting Award 2024
- Most Sustainable Company/Organization
- The Only H-Share Tech Company Selected in "China ESG Market Outlook" Report.



Government and Institutional Recognition

- The Special Mention for ESG in the Hang Seng Index category - The Best Corporate Governance
- One of the Most Admired Companies by Institutional Investor
- One of the Top 50 Listed Companies in Asia Pacific by Forbes
- One of the World's Top Female - Friendly Companies by Forbes
- One of the Top 500 Private Enterprises in China
- One of the Top 50 Pioneering Enterprises in Strategic Emerging Industries in the Guangdong Hong Kong-Macao Greater Bay Area
- Innovation Economy Enterprise - Leadership Award
- Hurun China Metaverse Potential Enterprises TOP100



Product Excellence

- Global Top 100 Innovative Institutions by Clarivate
- The Annual Innovation Product Award at the China IC Top Awards
- Ranked 2nd among the Top 100 Enterprises by the China Electronic Components Association
- Ranked 50th among the Top 100 Private Enterprises in Guangdong Province
- Top 30 Chinese AR/VR Enterprises 2024
- MEMS Microphones "Champion Enterprise in Manufacturing"
- MIIT 5G Factory 2024



Customer Recognition

- The Best Joint Innovation Award by HUAWEI
- The Best Quality Award by Samsung
- The Best Delivery Award by OPPO
- The Long-term Win-Win Award by OPPO
- The Special Contribution Award by OPPO
- The Best Partner Award by Xiaomi
- The Best Quality Award by Xiaomi
- The Perfect Quality Award by Lenovo
- The Honor Partner Award by Lenovo
- The Quality Benchmark Award by Lenovo
- The Annual Collaboration Award by Honor
- The Best Project Collaboration Award by Geely



Honors and Awards



♦♦ Follow our official account for more information ♦♦



WeChat



Weibo

*Scan QR with Weibo



bilibili



WeChat Channel



rednote



Create Sensational Experiences

www.aactechnologies.com