Corporate Presentation
Investor Day
June 2021
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Agenda

1. Company Overview
2. Market Trends & Opportunities
Company Overview
Established in 1984 and listed on the Main Board of the Hong Kong Stock Exchange in 2007, issued 1 billion shares. In September 2013, the Company had successfully placed 97,000,000 new shares.

4 production bases in China with strong technical and manufacturing capabilities and new production bases in India and Vietnam.

Strong R&D capabilities, with R&D centers set up in China, South Korea, USA, etc.
Expand Production Bases to Cater to Prosperous Optical Industry

New Production Base in Yuyao City

New Production Base in Vietnam

Phase II Production Base in Xinyang City

New Production Base in India
Leverage on Optical Technology Advantages to Diversify Product Portfolio

### Handset Industry
- **Lens set**
  - Imaging lens set
  - Perceptual lens set
- **Camera module**
  - New packaging module
  - Optical zoom module
  - TOF module
- **Other**
  - Display optical component
  - Diffractive optical component

### Automobile Industry
- **Vehicle lens set**
  - Front lens set
  - Surrounding view lens set
- **Vehicle module**
  - Front module
  - Surrounding view module
- **Other**
  - OMS
  - HUD
  - DMS
  - LiDAR
  - Smart headlight

### Security Industry
- **Visible light security**
- **Infrared security**

### VR/AR
- **Fresnel**
- **Optical engine**

### Robot Industry
- **Recognition area**
- **Positioning area**

### Optical Instrument & Equipment
- **Industrial equipment**
- **Medical equipment**
- **Microscope**
Market Trends & Opportunities
### 1. Mini-notch

- Notch
- Water Drop
- Hole
- Under Screen

#### Ultra Small Head Solution
- Move Forward Aperture Stop + Ultra Small Head

#### Move Forward Aperture Stop Solution
- Continue to Move Forward Aperture Stop

### 2. Under-screen Camera

- Two major problems of the screen:
  ① Transmittance; ② Diffraction
- Impact: image fogging, severe flare, reduced signal-to-noise ratio

### 3. AF + Ultra-wide

To add T-lens between the upper and lower groups can realize the front AF function without VCM

#### Requirement: large aperture, high RI, low TTL

<table>
<thead>
<tr>
<th>First generation</th>
<th>Second generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure: 5P</td>
<td>Structure: 6P</td>
</tr>
<tr>
<td>TTL: 4.45mm</td>
<td>TTL: 4.15mm</td>
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<tr>
<td>FNO.: 2.0</td>
<td>FNO.: 1.8</td>
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</tbody>
</table>

#### 32M φ2.6 78° AF + 8M φ2.6 105° AF

- 32M φ2.5 90~100° AF
- 50M φ2.5 90~100° OIS or T-lens
Expert in Optics

Rear Camera Trend

1 Larger Sensor Trend

Exposure capability improvement
Larger pixel
Sensor size increases
High resolution
More pixels

Variable Aperture

Electromagnetically driven mechanical shading sheet is used to adjust the amount of light going through the lens set to achieve aperture selected for shooting in more complex light environments.

【Advantages】:
Low light: a large aperture increases the amount of light
High light: a small aperture to achieve deep depth of field and obtains more details
The combination of software and hardware reduces the loss of image quality due to algorithm optimization.
Rear Camera Trend

3 Ultra-wide Lens Set

New photography — Fish eye
Perspective distortion — taller
Ultra-wide, EFL 12mm
Wide image 2.35:1

4 Free-form Lens Solution

Free-form effective diameter
Non-rotational symmetry (Different edge heights)
Structure part Three-dimensional design

5 Tele Lens Set

Distance shooting
Portrait shooting

Free-form tech: almost eliminates the distortion of ultra-wide angle
Rear Camera Trend

6 5X Periscope Tele (low cost)

- Motor one-piece design: the device components will be reduced as to simplify the process steps to achieve the cost reduction.

7 Continuous Zoom Tele Lens Set

- 3 lens groups, G2/G3 movable focal length changed when G2/G3 location adjusted by guide rod VCM.

8 GM Lens Solution

- **Main camera lens set**: As the image surface increases, the use of GM lenses can reduce the TTL and improve optical performance; or at the same TTL, a larger aperture can be achieved.
- **Periscope tele/continuous zoom lens set**: 1) Solve the BFL change caused by temperature drift of the lens set; 2) Improve the stress problem of plastic lens after trimming; 3) Improve chromatic aberration and purple fringing.
- **Video lens set**: Solve the performance degradation caused by long-time shooting.
Emerging Optical Products Outlook

VR Large lens and subassemblies

1P (Fresnel, Aspheric)

2P Subassemblies
- Self-designed structure solution
- Self-developed assembling and testing equipment
Emerging Optical Products Outlook

2

VR/UAV/Robot…

- Dual-cam with high resolution
- Dual-cam with ultra-wide angle
- Dual-cam with fish eye

Eye-tracking
Gesture recognition
(Single RGB/multi-cam/TOF/structure lights)

➢ Environmental perception

5P/6P (wide angle)

6P(wide angle)/G(GM)+P
**Emerging Optical Products Outlook**

### Smartphone

- **Under-screen fingerprint**
  - Ultra-thin macro lens set
  - Ultra-thin macro with large aperture lens set

- **Screen**
  - 2K Screen
  - 4K Screen

- **Match 2K screen**
  - Pixel: 188*188
  - Object surface: \( \varnothing 8.68 \text{mm} \)
  - FNO.: 1.8

- **Match 4K screen**
  - Pixel: 188*168
  - Object surface: \( \varnothing 10.19 \text{mm} \)
  - FNO.: 1.2

**Trend**: Large object surface → Full screen

### Others

- **Robot vision**
  - Singe cam/Dual-cam RGB lens set
  - Diffuser
  - DOE
  - Obstacle avoidance perception
  - Monitoring function
  - Face recognition payment
  - ...
Diversified Product Portfolio of Vehicle Cameras

**Front Sensing Camera**

<table>
<thead>
<tr>
<th>Single camera</th>
<th>Multi-camera</th>
<th>IR Camera</th>
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<tbody>
<tr>
<td>1M</td>
<td>1M</td>
<td>VGA</td>
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<tr>
<td>2M</td>
<td>2M</td>
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<td>5M</td>
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<td>8M</td>
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**Outside Viewing Camera**

<table>
<thead>
<tr>
<th>360° View Soc</th>
<th>360° View Raw</th>
<th>Rear Camera</th>
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</thead>
<tbody>
<tr>
<td>VGA</td>
<td>1M</td>
<td>VGA</td>
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<tr>
<td>1M</td>
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**Side View**

<table>
<thead>
<tr>
<th>Streaming Rear-mirror</th>
<th>DVR</th>
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<tbody>
<tr>
<td>VGA</td>
<td>1M</td>
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<tr>
<td>1M</td>
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**Rear Camera**

<table>
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<tbody>
<tr>
<td>1M</td>
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**Sensing/Viewing Camera**

<table>
<thead>
<tr>
<th>CMS</th>
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<tbody>
<tr>
<td>1M</td>
</tr>
<tr>
<td>2M</td>
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<tr>
<td>2.8M</td>
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</tbody>
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Thanks!
Autonomous Driving Developing Rapidly & Great Potential for Optical Application

- Front view (ADAS)
- Interior view
- CMS
- Surround view
- Rear view
- LiDAR optical system
- HUD
- Smart headlight optical system
- Ground projection optical system

Note: New product
1. Attractive Opportunity in Global Automotive Camera Market

Attractive Opportunity in Automotive Camera Market (By application)

- Due to the impact of the COVID-19, the global automotive camera market in 2020Y declines by 3.4% compared with 2019Y. However, Sunny is still achieving growth against the trend. The main reason is that customers choose to give priority to high-end products due to limited production capacity during the epidemic and Sunny has always focused on mid-to-high-end products with a high proportion of mid-to-high-end products. Sunny seizes the opportunities in high-profile products and achieve high-quality development.

- Due to the impact of the COVID-19 is weakening, the global automotive camera market in 2021Y will grow by 10.2% compared with 2020Y. Sunny’s growth is expected to far exceed the market’s average growth rate and will keep No.1 in the automotive lens field and rise further.
2. Attractive Opportunity in Global Automotive LiDAR Market

Attractive Opportunity in Automotive LiDAR Market

- Thanks to several projects between OEM and LiDAR manufacturers, LiDAR volumes are expected to increase from 2021Y.

  LiDAR mass production will enter a hot period in 2022Y-2025Y and LiDAR market size (number and amount) will show a steady upward trend in the next five years.

- Sunny supports more than 20 global leading LiDAR players and Tier-1 customers and provides core components for typical representative enterprises with obtaining multiple mass production projects in 2020Y.

  Sunny will achieve more than 10 projects for mass production and supply more than 7 international well-known auto brands to realize commercial use in 2021Y-2022Y.
2. Improving LiDAR Product Layout & Maximizing Customer Satisfaction

- Providing optical solutions based on customer needs, including but not limited to optical components, lens components, optomechanical modules, etc.

Wide range of product types (lens, windows, scanning components)
3. Global Automotive HUD Market Opportunity

Attractive Opportunity in Automotive HUD Market

- During the period of 2020Y-2030Y, HUD market capacity and adoption rate will increase especially after 2020Y. This growth is driven by the improvement in the level of automated driving and the introduction of EV as well as the continued expansion of HUD installations by OEM.

- Sunny breaks through a new HUD technology route in 2020Y and cooperates with the world's leading HUD manufacturers to develop holographic/optical waveguide products and obtain orders from a number of leading global customers.

( Source: 2020 TSR Report )
Providing optical solutions based on customer needs, including but not limited to PGU, freeform mirror, optical components, etc., to maximize customer satisfaction.
4. Attractive Opportunity in Global Automotive Smart Headlamp Market

• Sunny supports global well-known headlamp players and provides a variety of projection optical solutions with obtaining multiple orders in 2020Y.
• Sunny has successfully developed smart headlamp products covering mega pixels, 10000 pixels and 1000 pixels to achieve diversified layout.

High resolution /Intelligent

Traditional headlamp
• General lighting
• ADB Glare-free lighting

10 ~100 pixels (Matrix LED)
• Different area control
• ADB Glare-free lighting

1000~10000 pixels (Micro LED)
• High precision ADB anti-glare
• Only simple patterns, symbols

Mega pixels (DLP)
• ADB Glare-free with ultra high accuracy
• High resolution intelligent projection interaction (All kinds of pictures, road signs, text)
4. Sunny New Achievements in Smart Headlamp Business Layout

- Sunny successfully lays out the dynamic ground projection lamp product line and develops the first static projection lamp product in 2020;
- Sunny works with global TOP automotive lighting enterprises with substantive progress and more than 5 projects are in cooperation.

Application effects of dynamic ground projection lamp

- Individual Decoration such as welcome light.
- Active safety such as reversing warning light
- V2X interaction such as road signs projection

Different solutions for dynamic ground projection lamp

- Static projection solution (Film)
- Static projection solution (SGP)
- Dynamic projection solution (DLP)

The pictures above show some application examples of projection lamp equipped with Sunny’s core optical components.
Thanks
www.sunnyoptical.com
2021 Overall Smartphone Market Key Words and Countermeasures

- Affected by the oversea pandemic rebound, the overall smartphone demand has declined compared with the original forecast. The Company expected that 2021 global smartphone shipment will reach 1.3 billion, with 1.5% YoY slight growth, 5.8% decline with the original forecast.

- 2021 China smartphone shipment will reach 340 million, similar with last year; Indian market is affected by the second pandemic, its smartphone shipment will reach 130 million, decreased by 13% YoY.

- 5G phone model with homogenization, focus more on the image quality and video; China smartphone vendors focus on building high-end brand, to compete for the market share Huawei left.

- High-end model are with weak shipment, middle-to-low end ones are with fierce competition, with the increasing cost pressure, smartphone camera with configuration degrade, and the camera coefficient declines gradually.
2021 Overall Smartphone Market Key Words and Countermeasures

Target: Continue to Improve Core Competence

- Give full play to technical advantages and increase customer stickiness
- Establish the capacity for R&D and MP of core actuator component, and strengthen the ability of systematic product integration
- Give full play to the advantages of scale, and continuously improve the cost competitiveness of products
- Continue to promote the construction of factory digitalization and intelligentization
- Accelerate the construction of Vietnam Production Base and enhance global supply capacity
Upgrade Trend on Next Generation Camera

1 inch Sensor
1/2” Sensor
1/1” Sensor
Chip performance improves with higher signal-to-noise ratio and dynamic range. Product upgrades towards APS-C and full frames

Pop-out Camera
Ultra large aperture, enhance light input with image clarity improvement
Differentiated products open a new product track

Continuous Zoom Periscope
Optical zoom develops towards continuous zoom, large image size started to be applied
Smartphone camera replaces digital camera

Sensor Shift Product
Increasing demand for better OIS performance, higher OIS accuracy and video application
Gimbal Stabilization, sensor shift, dual OIS come out

3D Application Development
More focuses on 3D, with A’s D-TOF product in mass production. Integration of AR and 3D reach the depth information capture and interaction applications

Hybrid Lens
Liquid lens, G+P lens set, freeform lens technology launched fast
Optimize camera image quality

Pop-out Camera
Normal Camera

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Optimize camera image quality
Core Platform Technology

MOC II Packaging

Advantage:
1. Module height reduction > 0.2mm
2. Better module strength and reliability
3. Better heat dissipation, 3°C cooler than COB

Sunny Ability
Pioneer developed highly reliable camera started mass production

MOC III Packaging

Advantage:
1. Module height reduction > 0.37mm
2. Especially for sensor format > 1/1.3”, to reach module height reduction, beneficial for smartphone thickness reduction

Sunny Ability
Pioneer developed the thinnest camera are available for mass production

High-precision Optical Assembly

Advantage:
Contemporary Adjustment: Peak, Tilt, Field Curve etc. optical performance, makes breakthrough in the bottleneck of optical system assembly and improves mass production of camera with complex optical system

Sunny Ability:
1. Built-in liquid lens, G+P hybrid lens set with MP
2. 1/1.28” and larger image size with MP
3. FNo1.4 and larger aperture with MP
4. Multi-piece, multi-group with high-precision assembly ability to achieve continuous zoom periscope camera in MP

Sunny reserves all the rights of final interpretation for the content above.
Process Capability

**OLA (On-line Assembly)**

1. Fully automatic loading & unloading and material transfer to achieve **automatic** production from COB to AA
2. **Reduce** labor costs and fewer single-line personnel
3. **Reduce** production cycle
4. **Reduce** WIP (Work in progress)
5. Pioneer developed all **in-line** assembly line
6. **Coverage rate ≥8X%**

**OLW-mini (Online Welding)**

1. **Online automatic welding device**, higher process integration (N→1)
2. Self-developed visual inspection algorithm, Industry leading inspection capabilities.
3. Mature MP capability

**WLT-mini (Wafer Level Test)**

1. Fully automatic loading & unloading, 32 modules simultaneous testing
2. Industry leader in output per unit area
3. Industry leaders in output per capita
4. **Widely applied in mass production**, coverage rate ≥6X%
Process Capability

**SAA**
(Sensor Active Alignment)

1. Unique multi-component AA capacity with sensor, prism, mirror, etc.
2. FOV & BFL adjustment of high zoom periscope camera
3. MTF adjustment of high zoom periscope camera, improve module MTF test yield rate
4. Industry-leading mature MP capability

**SV-AOI**
(Automated Optical Inspection)

1. Fully automatic loading & unloading to reach module **full appearance inspection**
2. Self-developed visual inspection algorithms, industry leading inspection capabilities.
3. **Widely applied in mass production, coverage rate ≥8X% in process inspection.**