# PART 1 COMPANY PROFILE

# COMPANY PROFILE

Hong Kong Nico Electronics Technology Co., Ltd.

Founded in 2022, Hong Kong Nico Electronics Technology Co., Ltd. is a high-tech enterprise specializing in the R&D, production, and sales of optoelectronic devices, infrared detection, and photoelectric systems, based on III-V semiconductor technology.

The company possesses full-core technologies in China, including semiconductor laser chip epitaxial design, chip fabrication, packaging, and characterization testing. We provide the market with high-performance, high-reliability high-power semiconductor laser chips and laser module products & services, with power ranging from milliwatt to hundreds of watts and wavelengths covering 780nm–4600nm, achieving world-leading performance. Notably, in the 1500nm–2100nm wavelength range, we are one of the very few global suppliers capable of delivering such products and solutions.

Our products are widely used in industrial processing, LiDAR, medical aesthetics, laser display, environmental detection, scientific research, and other fields.

## Factory scale

The total area of cleanroom space exceeds 13,000 square meters.

## Investment in equipment

Equipment investment: ~USD 47 million

## Talent team

180 employees

8 senior specialists  9 PhDs

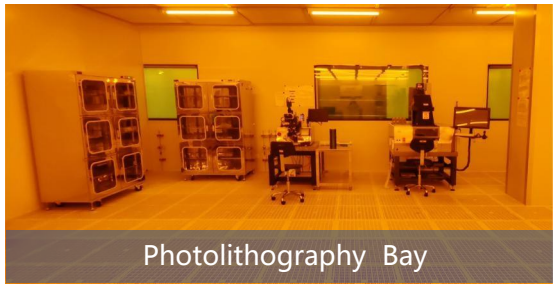
**Precision in Laser Diodes • Innovation in Photonics • Illuminating Futures**

# PART 2 COMPANY FUNDAMENTALS

Complete III-V semiconductor process technology and specialized packaging solutions

# Full-scale Fab process capabilities supporting diverse semiconductor materials, enabling scalable production for high-volume demands

Lapping & Cleaning Equipment


Photolithography Bay

Etching & Deposition Equipmen Bay

Infrared Focal Plane Array (IRFPA) Test System

Integrated Test Bay

Flip-Chip Bonding & Underfill Dispensing Systems

13,000-square-meter Class 100 cleanroom with fully automated III-V semiconductor production lines and support utilities

| | | |
|---|---|---|
| Class II superlattice materials (T2SL) **InAs, GaSb** | Ternary Compound Semiconductor **InGaAs and InAsSb** | Second generation semiconductor **N1, InP, InSb** |

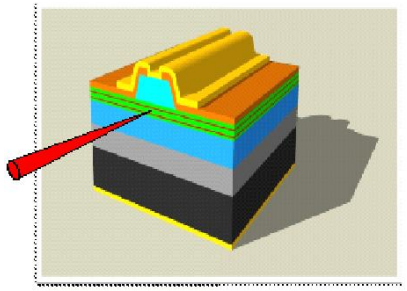
Multi-Material Semiconductor Capabilities

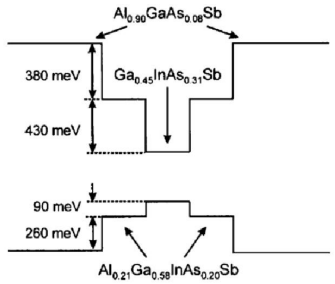
# **TECHNOLOGY** STRENGTH

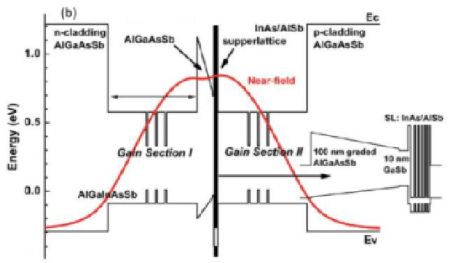
## Semiconductor Device Design & Simulation with Advanced Bandgap Engineering

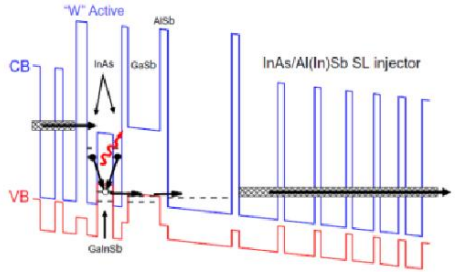
**Quantum Well Light-Emitting Materials: Advancing 2-4µm Band**

Structures with Enhanced Hole Confinement for Superior Emission Efficiency



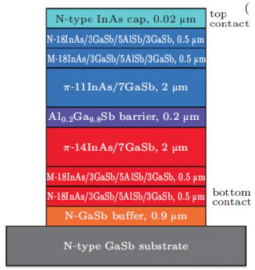


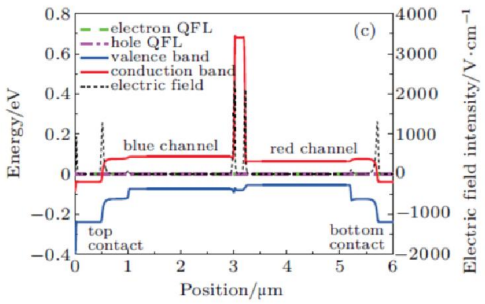



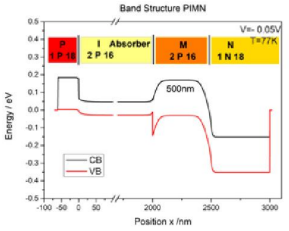




**Superlattice Detection Materials: Advancing 3-5µm / 8-12µm / 14-20µm Single/Dual-Band LWIR Architectures through Band Structure Engineering**

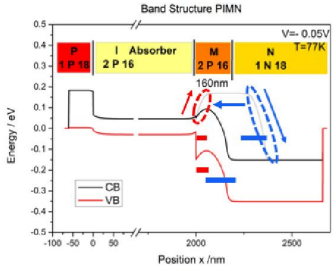
Advanced LWIR Detection: Suppressing Bulk Dark Current & Auger Recombination Noise for Enhanced Minority Carrier Lifetime and Quantum Efficiency




M区
500 nm




M区
160 nm

Homojunction Barrier

Heterojunction Barrier Lowering

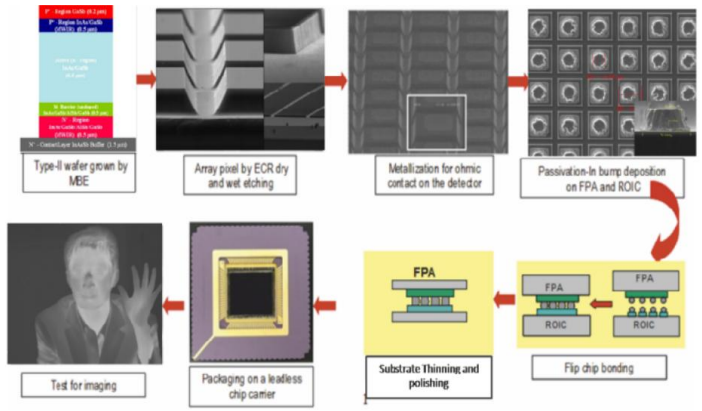
Depletion Region $d_1$

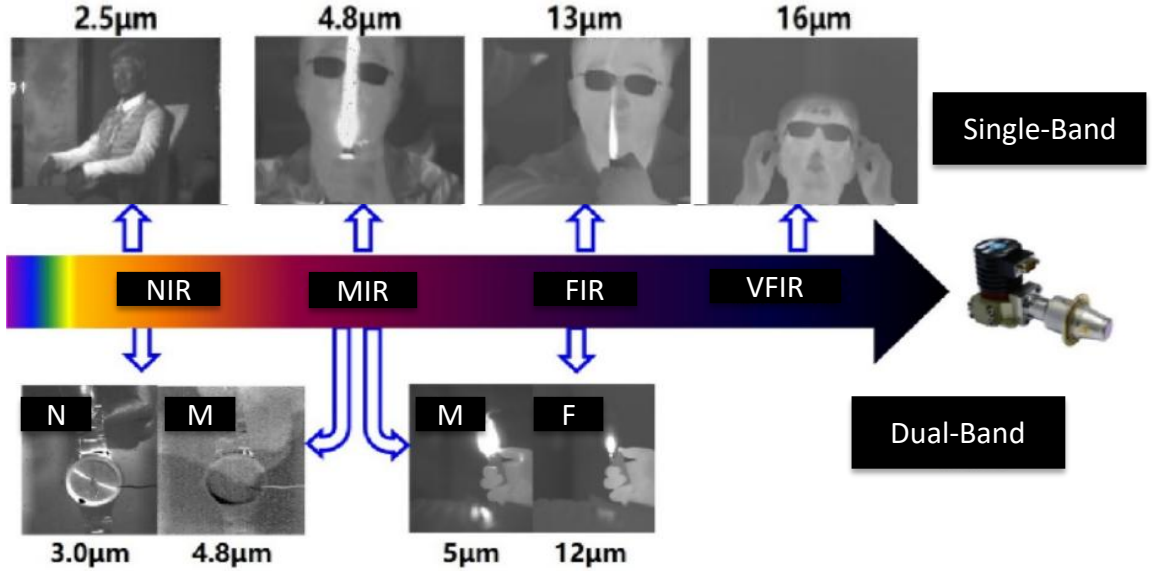
Depletion Region $d_2$

The heterostructure's thickness reduction leads to a decrease in the homojunction barrier height

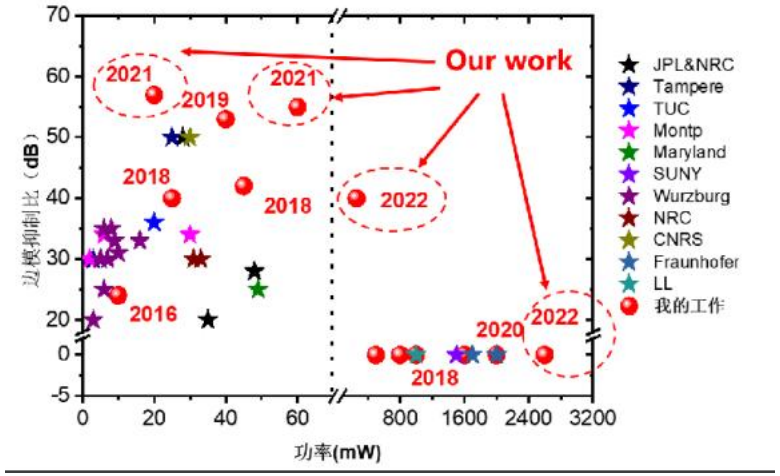
# **TECHNOLOGY** STRENGTH

Multi-Spectral Detector Solutions:
Single/Dual-Band Technology
Covering 16μm and Beyond




Lasing at 1.9–3.5 μm with Record-Breaking Output Power and Quantum Efficiency



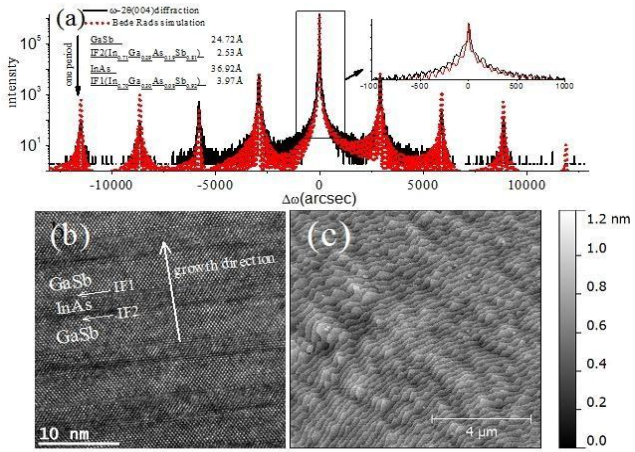

Ecord-Breaking Laser Power Performance
Exceeding Export Control Limits"

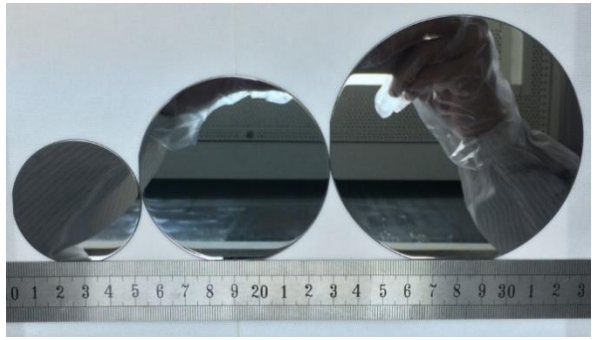
Single Emitter：**>2.6 W** (Current International Benchmark: 2.0 W)
Laser Bar：**>18.4 W**
(Module-Level：**>172 W** (Highest Reported in Open Literature)

# Antimonide Wafer Material MBE (Molecular Beam Epitaxy) Core Technology

(MBE) Technology for High-Performance Semiconductor Devices"

- Pre-Processing
- Growth Temperature
  - Calibration
  - Buffer Layer
- V/III Ratio Optimization
  - Laser Waveguides/Detector Absorbers/Barrier LayersContact Layers
- Growth Rate
  - InGaAsSb/InAs/GaSb
  - AlInGaAsSb/ InAs/GaSb/AlSb/GaSb
- Shutter Sequence
  - Growth Interruption
  - Surface Mobility Enhancement Technique



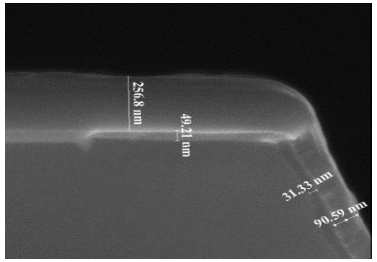
2- to 4-inch Antimonide-Based Epitaxial Wafers

# Critical Device Fabrication Processes

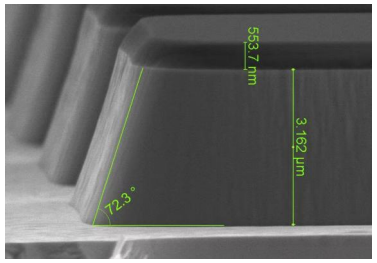
## Antimonide FPA Micro/Nano Fabrication

**Antimonide FPA Passivation Technology**
Sulfur Passivation + $SiO_2$ Capping, Surface Leakage Current Suppression Technology

1. Chemical passivation layer of 20~30nm neutralizes dangling bonds
2. Physical passivation layer of 200~300nm isolates from air

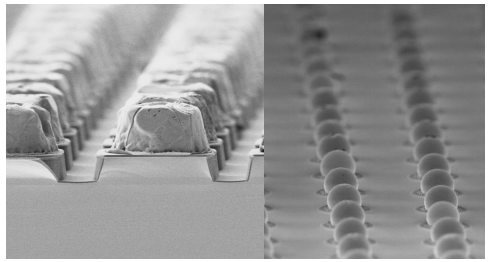



Antimonide Etching Technology
Mesa Isolation via ICP-RIE Plasma Etching with High Pattern Transfer Fidelity, High Etch Rate, and Low Surface Damage

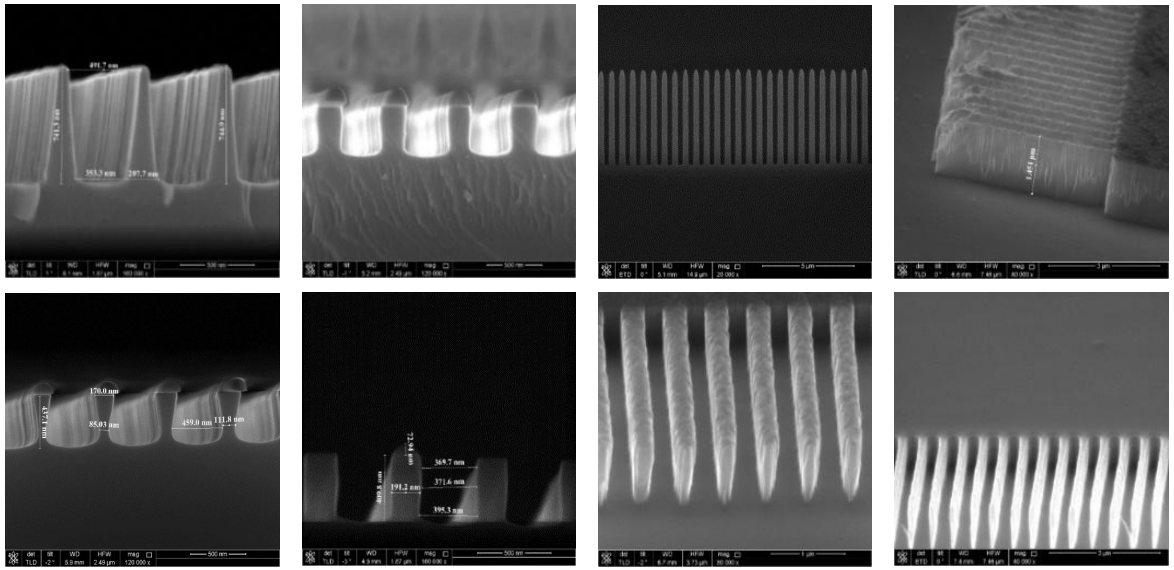



High-Fidelity Pattern Transfer, High Speed Etching with Controllable Byproducts and Minimal Surface Damage

Indium Bump Thick Photoresist Process Using NR26-1200PY Negative Resist for Enhanced Process Reliability"



## Laser Material Etching Process Optimization for Enhanced Surface Performance



Optimization of ICP Parameters for Multi-Morphology Etching (Positive Mesa, Negative Mesa, Rectangular Gratings

# The antimonide detector leads the international advantage, and the laser breaks through the blockade to achieve transcendence.

## Detector: leading the world in technical capability with remarkable advantages

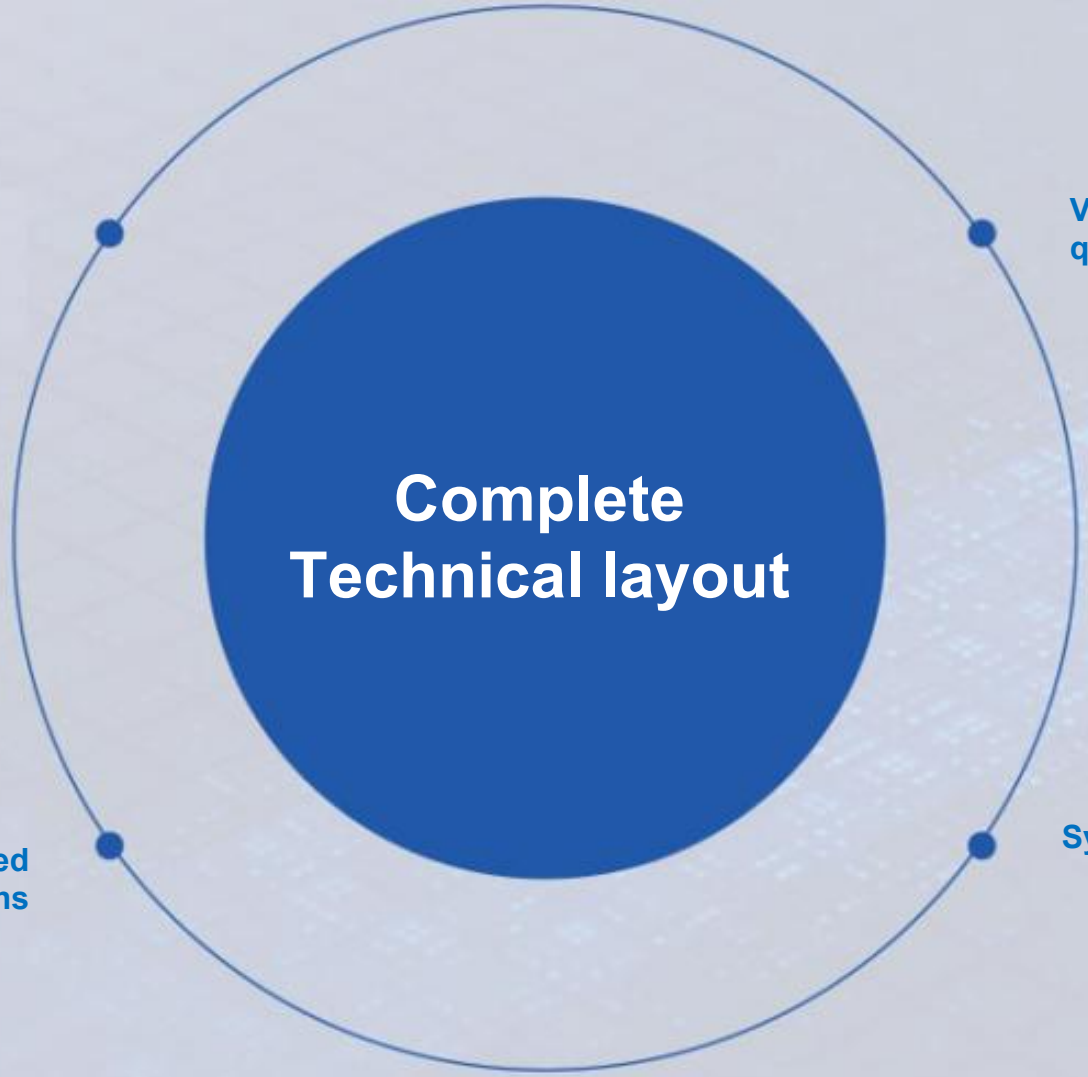
| | |
|---|---|
| 1024 × 1024 development and production capacity of resolution large pixel refrigerating detector, movement and complete machine | **Very few in China** |
| Medium/short wave two-color detector<br>Technical Index of hyperlattice focal plane | **International same gear** |
| Medium wave high operating temperature infrared detector<br>The working temperature of the background noise limit is> 195K | **International Advanced** |
| Long Wave, very long wave antimonide superlattice detector<br>Cut-off wavelength: long wave> 11 μm; Very long wave> 16 μm | **International first** |

**Imaging and optical capabilities**

- Thermal imaging image enhancement technology based on scene optimization
- Research on optical system design of new Ryukyu glass infrared material

# PART 3

## COMPANY ADVANTAGES




The whole industry chain coverage from core devices to the whole machine system

Vertical integration ensures product quality and supply chain stability

Able to provide complete customized solutions

Synergy between business units

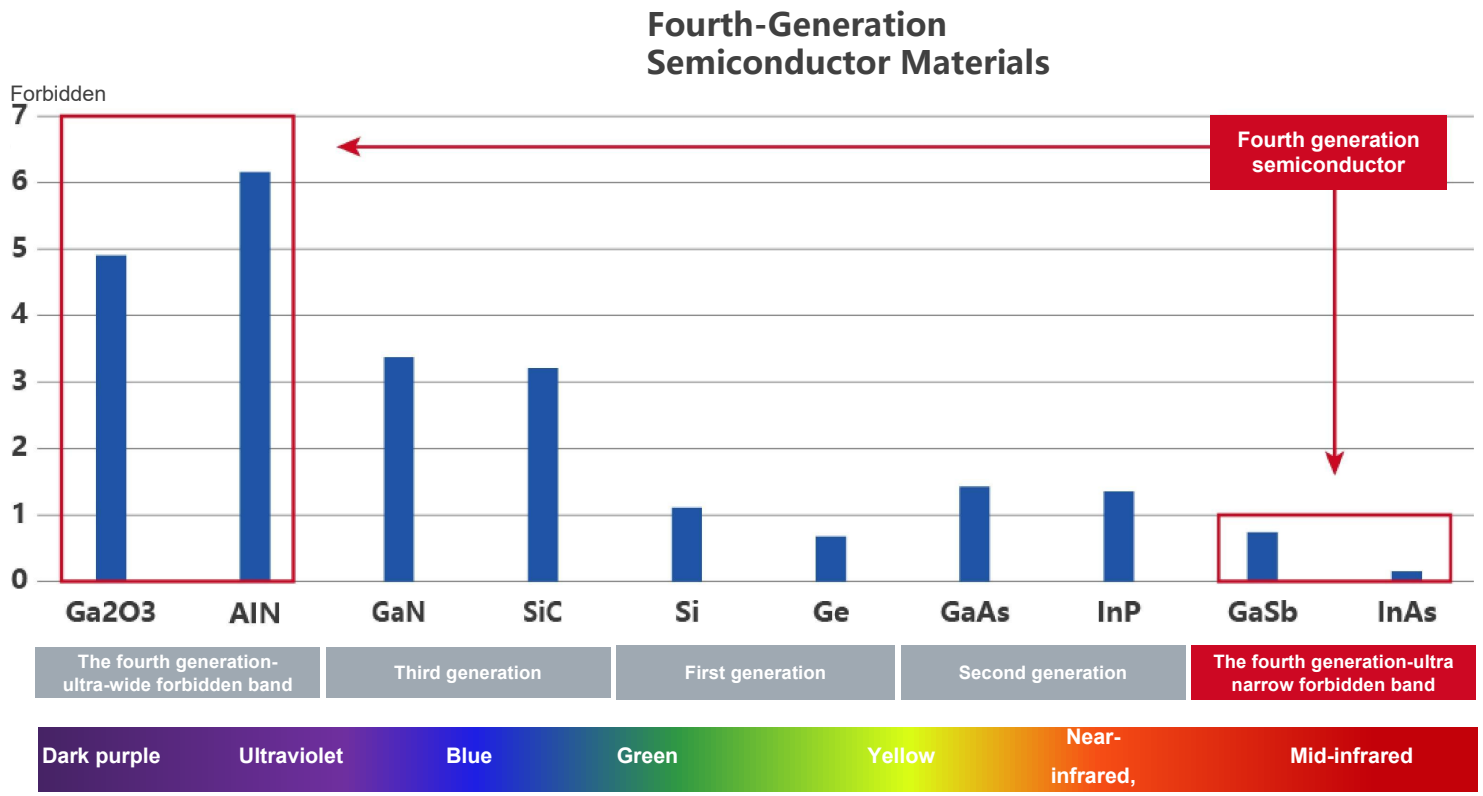
# As a fourth-generation semiconductor, antimonide-based ultra-narrow bandgap materials also hold significant strategic value

## Fourth-generation semiconductors: Two paths forward — ultra-wide and ultra-narrow-

Fourth-generation semiconductor materials refer to semiconductors with extreme bandgap characteristics, divided into two categories: ultra-wide bandgap (UWBG) and ultra-narrow bandgap (UNBG) materials.

Ultra-wide bandgap semiconductors include diamond, gallium oxide ($Ga_2O_3$), and aluminum nitride (AlN).
Ultra-narrow bandgap semiconductors include gallium antimonide (GaSb) and indium arsenide (InAs)

Narrow-bandgap semiconductors like antimonides are primarily used in infrared applications, while ultra-wide-bandgap materials operate at the ultraviolet end of the spectrum - representing opposite extremes of the electromagnetic spectrum.



# Laser: the efficiency and performance break through the blockade and achieve transcendence

**Antimonide-based high-power laser achieves technological breakthrough despite export restrictions**

| | Industry-leading power performance |
|---|---|
| Single tube laser power ≥ **2.6W** | **2W** |
| Bar laser power ≥ **18.4W** | **17W** |
| Module laser power ≥ **172W** | **140W** |

**Far beyond the embargo target:**
single tube power ≥ 1W

**Bar power ≥ 10W**

**Antimonide-based single-mode laser achieves breakthrough performance**

Cavity Surface uncoated 10℃ single-sided

power **40mW** SMSR maintenance at 40MW

power**40dB** SMSR breakthrough 53dB,

external quantum efficiency**43%**

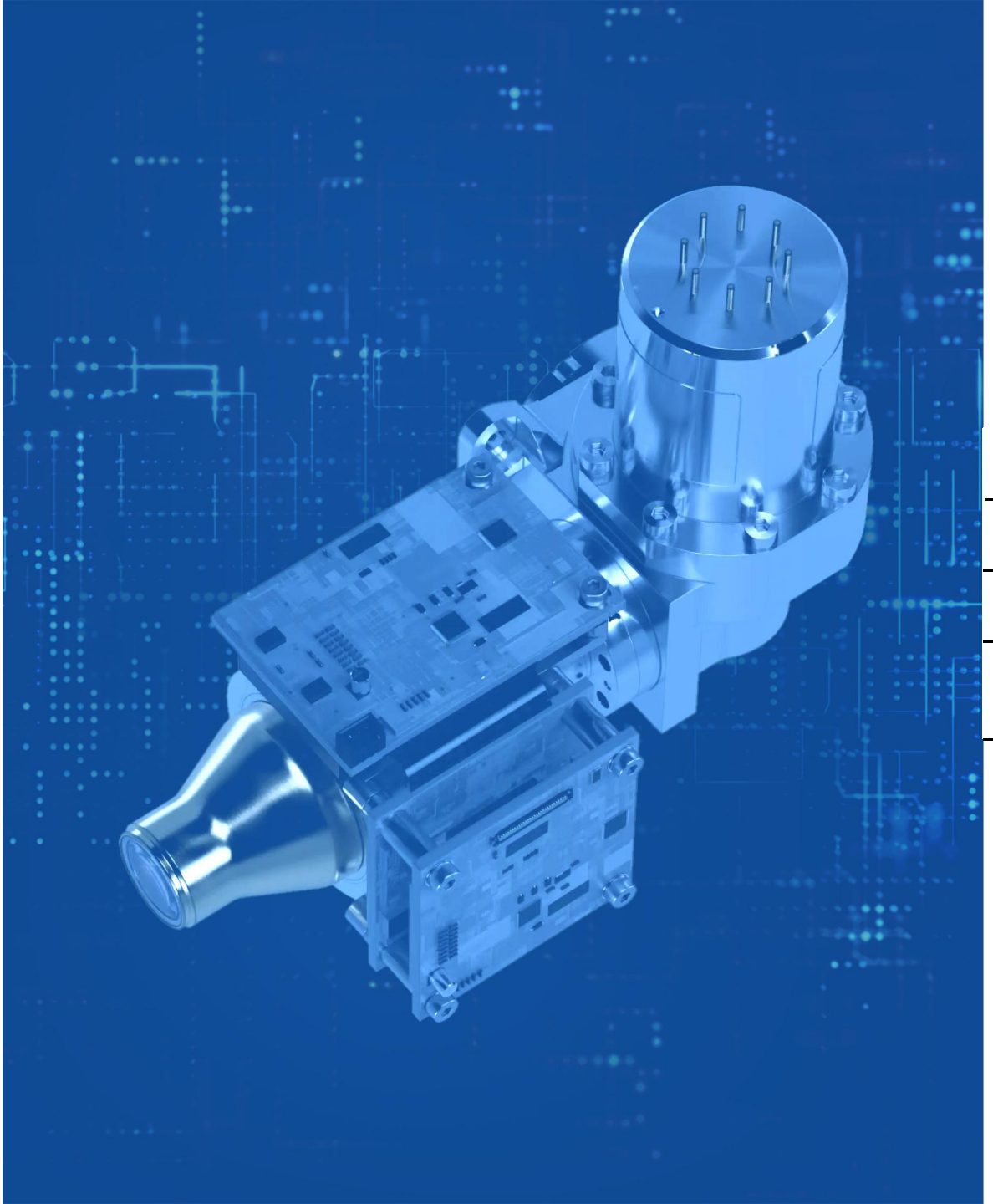
**2-3 μm semiconductor laser** international leading

# PART 4 COMPANY PRODUCTS AND SERVICES

## Core products

# Semiconductor Laser

| | 125W | 2W | 0.8W |
|---|---|---|---|
| Material | GaAs | inP | GaSb |
| Spectrum | 905nm | 1550nm | 1940nm |
| Chip cycle | 500 μ m | 500 μ m | 500 μ m |
| Chip cavity length | 1000 μ m | 1000 μ m | 1000 μ m |
| Chip bar width | 200 μ m | 100 μ m | 100 μ m |
| Operating current | <40A | <3A | <2.0A |
| Operating voltage | <11V | <2V | <1.8V |
| Mode of operation | Pulse | Continuous | Continuous |



## Core products

# Infrared detector and system

| | | | | |
|---|---|---|---|---|
| Array specifications | 640x 512 | 640x 512 | 640x 512 | 320x 256 |
| Pixel spacing | 15 μ m | 25 μ m | 25 μ m | 30 μ m |
| Spectral range | 3.7-4.8 μ m | 9.5 μ m | 3.7-4.8 μ m\7.7-9.5 μ m | 6.5-8.5 μ m\8.5-10.5 μ m |

# Laser module and system

**Infrared pickoff**

methane detection (mine, household gas leakage) carbon dioxide monitoring (Environmental Protection, carbon monitoring) carbon monoxide detection (mine, fire monitoring)

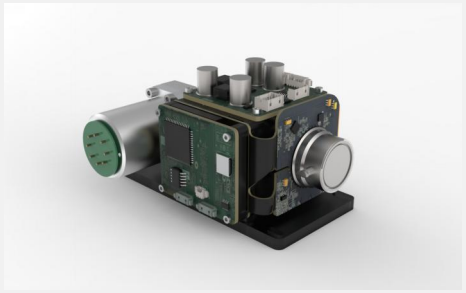
Other gases (oxygen, hydrogen, hydrogen sulfide, etc.)

**Laser Medical devices**

Laser hair removal laser

Medical Beauty Laser

Medical Imaging



**Infrared movement**

Uncooled Long wave infrared movement

Refrigerating medium wave infrared movement

**Infrared camera**

Uncooled Long wave infrared camera

Refrigerated medium wave infrared camera

## 2-4um high power semiconductor single tube chip

➢ **Product Introduction**

The key parts of this product adopt AuSn solder package, AuSn solder

Good welding performance, wettability and high thermal conductivity

The consistency and reliability of the product are proved.

➢ **Field of application**

This product can be used for laser medical treatment, laser pump source, plastic materials

Engineering, laser radar and gas detection, etc.

### ➢ Main technical indicators

| Project | Parameter | Company | M-2100-1w-B | | |
|---|---|---|---|---|---|
| | | | Minimum | Typical value | Maximum |
| Optical parameters | Output power | W | | 1 | |
| | Laser wavelength | nm | 2080 | 2100 | 2120 |
| | Spectral width | nm | | 25 | 30 |
| | Luminous size width | M m | | 90 | |
| | Temperature Drift coefficient | nm/℃ | | 2.5 | 3 |
| | Slow axis divergence angle | deg | | 20 | 25 |
| | Fast axis divergence angle | deg | | 60 | 70 |
| Electrical parameters | Slope efficiency | W/A | 0.25 | 0.32 | |
| | Operating current | A | | 4.00 | 4.50 |
| | Operating voltage | V | | 1.30 | 1.60 |
| | Threshold current | A | | 0.15 | 0.20 |
| Other parameters | Storage temp | ℃ | -10 | 25 | 60 |
| | Operation temperature | ℃ | 10 | 30 | 50 |

## 4-5um high power semiconductor single tube chip

➢ **Product Introduction**

Single-tube series products of photoelectric laser diode of Nico Electronics

SE(SingleEmitters) is based on quantum cascade structure epitaxial growth,

Fabry-Perot cavity semiconductor laser with ridge waveguide structure design,

The product provides rich wavelength selection, multi-mode high-power laser output,

And provide customized services such as beam shaping.

➢ **Properties of product**

COS-AuSn encapsulation form;

Center wavelength 4600nm;

Single tube continuous output power 1.0W.

### ➢ Main technical indicators

| Project | Parameter | Company | Test results | | |
|---|---|---|---|---|---|
| | | | Minimum | Typical value | Maximum |
| Optical parameters | Output power | W | | 1.0 | |
| | Laser wavelength | nm | 4300 | 4600 | 4800 |
| | Spectral width | nm | | 10 | |
| | Temperature Drift coefficient | nm/℃ | | 1.0 | |
| | Slow axis divergence angle | deg | | 30 | 45 |
| | Fast axis divergence angle | deg | | 10 | 15 |
| Electrical parameters | Slope efficiency | W/A | 0.40 | 0.5 | |
| | Operating current | A | | 3.0 | 3.5 |
| | Operating voltage | V | | 12 | 16 |
| Other parameters | Recommend operating temperature | | | | |
| | Storage temp | ℃ | | 15-50 | |
| | | ℃ | | -10-60 | |

| Dimensions | Company | Minimum | Typical value | Maximum |
|---|---|---|---|---|
| Light window width | M m | | 10 | |
| Period | M m | | 500 | |
| Cavity length | M m | | 4000 | |
| Thickness | M m | 120 | 125 | 130 |

## 808nm high power semiconductor bar chip

➢ **Product Introduction**

The 808nm conduction cooling single bar bar of the Nico Electronics has high efficiency and service life. Features of long and high reliability.

➢ **Field of application**

It is generally applied to laser systems, laser equipment, industrial processing, etc. Multi-domain,

### ➢ Main technical indicators

| Project | Parameter | Company | Test results | | |
|---|---|---|---|---|---|
| | | | Minimum | Typical value | Maximum |
| Optical parameters | Output power | W | | 50 | |
| | Laser wavelength | nm | 804 | 808 | 812 |
| | Spectral width | nm | | 3 | |
| | Temperature Drift coefficient | nm/℃ | | 0.28 | |
| Electrical parameters | Slope efficiency | W/A | 1.10 | 1.20 | |
| | Threshold current | A | | 5 | 6 |
| | Operating current | A | | 50 | 55 |
| | Operating voltage | V | | 1.95 | 2.15 |
| Other parameters | Recommend operating temperature | ℃ | | 15~30 | |
| | Storage temp | ℃ | | -10~60 | |

| Shape | Company | Minimum | Typical value | Maximum |
|---|---|---|---|---|
| Number of light emitting units | Number | | 19 | |
| Fill factor | % | | 30 | |
| Light window width | M m | | 150 | |
| Luminous point period | M m | | 500 | |
| Cavity length | M m | | 1000 | |
| Thickness | M m | 120 | 125 | 130 |

## 905nm high power semiconductor single tube chip -- 25W

➢ **Product Introduction**

Nico Electronics 905nm-25w single tube is a kind of lasing wavelength An edge-emitting laser with a peak power of about 905nm. Have Small working current, small Far field divergence angle, long service life and high reliabilityAnd other features.

➢ **Field of application**

It is generally applied to laser radar, laser equipment, industrial processing, etc.Multi-domain. Chips or single tubes can be provided according to customer requirements.

### ➢ Main technical indicators

| Project | Parameter | Company | Test results | | |
|---|---|---|---|---|---|
| | | | Minimum | Typical value | Maximum |
| Optical parameters | Output power | W | | 25 | |
| | Laser wavelength | nm | 895 | 905 | 915 |
| | Spectral width | nm | | 6 | |
| | Temperature Drift coefficient | nm/℃ | | 0.28 | |
| | Slow axis divergence angle | deg | | 25 | |
| | Fast axis divergence angle | deg | | 8 | |
| Electrical parameters | Threshold current | A | 0.5 | 0.75 | 1.0 |
| | Operating current | A | | 25 | 30 |
| | Reverse Voltage | V | | 3 | |
| | Pulse width | ns | | 200 | |
| | Duty cycle | % | | 0.1 | |
| Other parameters | Recommend operating temperature | ℃ | | 15~50 | |
| | Storage temp | ℃ | | -10~60 | |

| Chip size | Company | Minimum | Typical value | Maximum |
|---|---|---|---|---|
| Light window width | M m | | 200 | |
| Period | M m | | 500 | |
| Cavity length | M m | | 800 | |
| Thickness | M m | 120 | 125 | 130 |

## 905nm high power semiconductor single tube chip -- 50W

➢ **Product Introduction**

Nico Electronics 905nm-50w single tube is a kind of lasing wavelength An edge-emitting laser with a peak power of about 905nm. Have Small working current, small Far field divergence angle, long service life and high reliability And other features.

➢ **Field of application**

Mainly used in laser medical treatment, laser pump source, plastic materials Engineering, laser radar and gas detection, etc.

### ➢ Main technical indicators (25℃)

| Project | Parameter | Company | Test results | | |
|---|---|---|---|---|---|
| | | | Minimum | Typical value | Maximum |
| Optical parameters | Output power | W | | 50 | |
| | Laser wavelength | nm | 895 | 905 | 915 |
| | Spectral width | nm | | 7 | |
| | Temperature Drift coefficient | nm/℃ | | 0.28 | |
| | Slow axis divergence angle | deg | | 25 | |
| | Fast axis divergence angle | deg | | 10 | |
| Electrical parameters | Threshold current | A | 0.3 | 0.5 | 0.7 |
| | Operating current | A | | 30 | 35 |
| | Reverse Voltage | V | | 3 | |
| | Pulse width | ns | | 200 | |
| | Duty cycle | % | | 0.1 | |
| Other parameters | Recommend operating temperature | ℃ | | 15~50 | |
| | Storage temp | ℃ | | -10~60 | |

| Chip size | Company | Minimum | Typical value | Maximum |
|---|---|---|---|---|
| Light window width | M m | | 200 | |
| Period | M m | | 500 | |
| Cavity length | M m | | 800 | |
| Thickness | M m | 120 | 125 | 130 |

## 905nm high power semiconductor single tube chip -- 75W

➢ **Product Introduction**

Nico Electronics 905nm-75w single tube is a kind of lasing wavelength An edge-emitting laser with a peak power of about 905nm. Have Small working current, small Far field divergence angle, long service life and high reliability And other features.

➢ **Field of application**

It is generally applied to laser radar, laser equipment, industrial processing, etc.

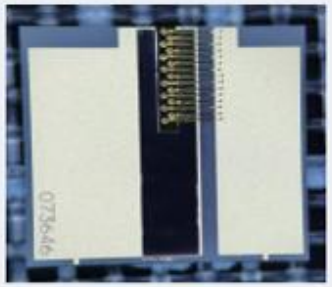
Multi-domain. Chips or single tubes can be provided according to customer requirements.

### ➢ Main technical indicators (25℃)

| Project | Parameter | Company | Test results | | |
|---|---|---|---|---|---|
| | | | Minimum | Typical value | Maximum |
| Optical parameters | Output power | W | | 25 | |
| | Laser wavelength | nm | 895 | 905 | 915 |
| | Spectral width | nm | | 7 | |
| | Temperature Drift coefficient | nm/℃ | | 0.28 | |
| | Slow axis divergence angle | deg | | 30 | |
| | Fast axis divergence angle | deg | | 10 | |
| Electrical parameters | Threshold current | A | 0.2 | 0.3 | 0.4 |
| | Operating current | A | | 30 | 35 |
| | Reverse Voltage | V | | 6 | |
| | Pulse width | ns | | 200 | |
| | Duty cycle | % | | 0.1 | |
| Other parameters | Recommend operating temperature | ℃ | | 15~50 | |
| | Storage temp | ℃ | | -10~60 | |

| Chip size | Company | Minimum | Typical value | Maximum |
|---|---|---|---|---|
| Light window width | M m | | 160 | |
| Period | M m | | 500 | |
| Cavity length | M m | | 800 | |
| Thickness | M m | 120 | 125 | 130 |

## 1270nm high power semiconductor single tube chip -- 002W



GKLD-1270-002W-19

➢ **Product Introduction**

High thermal conductivity aluminum nitride ceramic heat sink package is adopted to realize laser The chip of the device and the heat dissipation device have rich electrical insulation and ultra-high thermal conductivity.Yes, which makes the performance of the packaged product more stable.

➢ **Field of application**

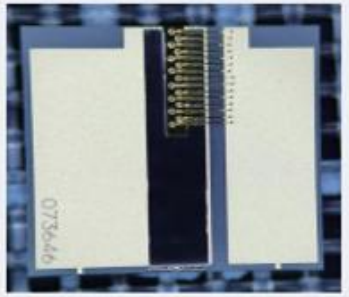
Mainly used in laser medical treatment, laser pump source, plastic materials Engineering, laser radar and gas detection, etc.

### ➢ Main technical indicators (25℃)

| Project | Parameter | Company | Test results | | |
|---|---|---|---|---|---|
| | | | Minimum | Typical value | Maximum |
| Optical parameters | Output power | W | | 2 | |
| | Laser wavelength | nm | 1260 | 1270 | 1280 |
| | Spectral width | nm | | 11 | |
| | Temperature Drift coefficient | nm/℃ | | 0.30 | |
| | Fast axis divergence angle | deg | | 25 | 30 |
| | Slow axis divergence angle | deg | | 10 | 15 |
| Electrical parameters | Slope efficiency | W/A | | 0.35 | 0.5 |
| | Threshold current | A | | 1.0 | 1.2 |
| | Operating current | A | | 8 | 9 |
| | Operating voltage | V | | 1.6 | 1.8 |
| Other parameters | Recommend operating temperature | ℃ | | 15~50 | |
| | Storage Temperature | ℃ | | -10~60 | |

| Chip size | Company | Minimum | Typical value | Maximum |
|---|---|---|---|---|
| Light window width | M m | | 200 | |
| Period | M m | | 500 | |
| Cavity length | M m | | 3000 | |
| Thickness | M m | 120 | 125 | 130 |

## 1270nm high power semiconductor single tube chip -- 003W



GKLD-1270-003W-19

➢ **Product Introduction**

High thermal conductivity aluminum nitride ceramic heat sink package is adopted to realize laser The chip of the device and the heat dissipation device have rich electrical insulation and ultra-high thermal conductivity.Yes, which makes the performance of the packaged product more stable.

➢ **Field of application**

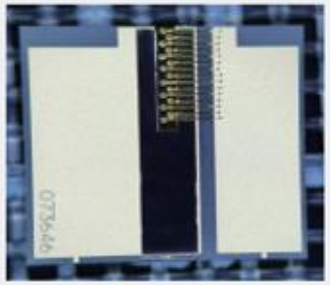
Mainly used in laser medical treatment, laser pump source, plastic materials Engineering, laser radar and gas detection, etc.

### ➢ Main technical indicators (25℃)

| Project | Parameter | Company | Test results | | |
|---|---|---|---|---|---|
| | | | Minimum | Typical value | Maximum |
| Optical parameters | Output power | W | | 3 | |
| | Laser wavelength | nm | 1260 | 1270 | 1280 |
| | Spectral width | nm | | 11 | |
| | Temperature Drift coefficient | nm/℃ | | 0.30 | |
| | Fast axis divergence angle | deg | | 25 | 30 |
| | Slow axis divergence angle | deg | | 10 | 15 |
| Electrical parameters | Slope efficiency | W/A | | 0.35 | 0.5 |
| | Threshold current | A | | 1.0 | 1.2 |
| | Operating current | A | | 8 | 9 |
| | Reverse Voltage | V | | 1.6 | 1.8 |
| Other parameters | Recommend operating temperature | ℃ | | 15~50 | |
| | Storage Temperature | ℃ | | -10~60 | |

| Chip size | Company | Minimum | Typical value | Maximum |
|---|---|---|---|---|
| Light window width | M m | | 200 | |
| Period | M m | | 500 | |
| Cavity length | M m | | 3000 | |
| Thickness | M m | 120 | 125 | 130 |

## 1470nm high power semiconductor single tube chip -- 001W




➢ **Product Introduction**

High thermal conductivity aluminum nitride ceramic heat sink package is adopted to realize chip and The heat dissipation device is electrically isolated, with ultra-high thermal conductivity, and is produced after packaging.Product performance is stable.

➢ **Field of application**

It is mainly used in medical cosmetology, scientific research and other fields.

### ➢ Main technical indicators (25℃)

| Project | Parameter | Company | Test results | | |
|---|---|---|---|---|---|
| | | | Minimum | Typical value | Maximum |
| Optical parameters | Output power | W | | 1 | |
| | Laser wavelength | nm | 1460 | 1470 | 1480 |
| | Spectral width | nm | | 12 | 17 |
| | Temperature Drift coefficient | nm/℃ | | 0.30 | |
| | Fast axis divergence angle | deg | | 35 | 45 |
| | Slow axis divergence angle | deg | | 7 | 15 |
| Electrical parameters | Slope efficiency | W/A | | 0.4 | 0.5 |
| | Threshold current | A | | 0.5 | |
| | Operating current | A | | 3 | |
| | Operating voltage | V | | 1.3 | 1.4 |
| Other parameters | Recommend operating temperature | ℃ | | 10~50 | |
| | Storage Temperature | ℃ | | -10~60 | |

| Chip size | Company | Minimum | Typical value | Maximum |
|---|---|---|---|---|
| Light window width | M m | | 100 | |
| Period | M m | | 500 | |
| Cavity length | M m | | 2000 | |
| Thickness | M m | 120 | 125 | 130 |

## 1470nm high power semiconductor single tube chip -- 002W

➢ **Product Introduction**

High thermal conductivity aluminum nitride ceramic heat sink package is adopted to realize chip and The heat dissipation device is electrically isolated, with ultra-high thermal conductivity, and is produced after packaging. Product performance is stable.

➢ **Field of application**

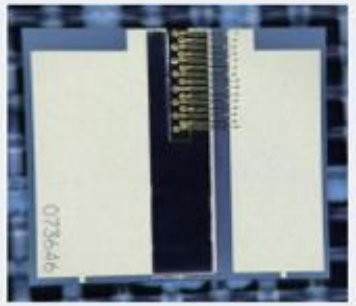
It is mainly used in medical cosmetology, scientific research and other fields.

### ➢ Main technical indicators (25℃)

| Project | Parameter | Company | Test results | | |
|---|---|---|---|---|---|
| | | | Minimum | Typical value | Maximum |
| Optical parameters | Output power | W | | 2 | |
| | Laser wavelength | nm | 1460 | 1470 | 1480 |
| | Spectral width | nm | | 12 | 17 |
| | Temperature Drift coefficient | nm/℃ | | 0.30 | |
| | Fast axis divergence angle | deg | | 35 | 45 |
| | Slow axis divergence angle | deg | | 8 | 15 |
| Electrical parameters | Slope efficiency | W/A | | 0.5 | 0.55 |
| | Threshold current | A | | 0.6 | |
| | Operating current | A | | 5 | |
| | Reverse Voltage | V | | 1.4 | 1.45 |
| Other parameters | Recommend operating temperature | ℃ | | 10~50 | |
| | Storage Temperature | ℃ | | -10~60 | |

| Chip size | Company | Minimum | Typical value | Maximum |
|---|---|---|---|---|
| Light window width | M m | | 150 | |
| Period | M m | | 500 | |
| Cavity length | M m | | 2000 | |
| Thickness | M m | 120 | 125 | 130 |

## 1470nm high power semiconductor single tube chip -- 003W




➢ **Product Introduction**

High thermal conductivity aluminum nitride ceramic heat sink package is adopted to realize chip and The heat dissipation device is electrically isolated, with ultra-high thermal conductivity, and is produced after packaging. Product performance is stable.

➢ **Field of application**

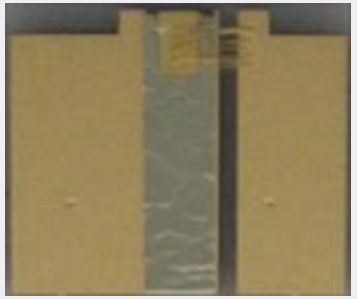
It is mainly used in medical cosmetology, scientific research and other fields.

### ➢ Main technical indicators (25℃)

| Project | Parameter | Company | Test results | | |
|---|---|---|---|---|---|
| | | | Minimum | Typical value | Maximum |
| Optical parameters | Output power | W | | 3 | |
| | Laser wavelength | nm | 1460 | 1470 | 1480 |
| | Spectral width | nm | | 12 | 17 |
| | Temperature Drift coefficient | nm/℃ | | 0.30 | |
| | Fast axis divergence angle | deg | | 35 | 45 |
| | Slow axis divergence angle | deg | | 8 | 15 |
| Electrical parameters | Slope efficiency | W/A | | 0.35 | 0.45 |
| | Threshold current | A | | 0.6 | |
| | Operating current | A | | 9 | |
| | Operating voltage | V | | 1.75 | 1.8 |
| Other parameters | Recommend operating temperature | ℃ | | 10~50 | |
| | Storage Temperature | ℃ | | -10~60 | |

| Chip size | Company | Minimum | Typical value | Maximum |
|---|---|---|---|---|
| Light window width | M m | | 150 | |
| Period | M m | | 500 | |
| Cavity length | M m | | 2000 | |
| Thickness | M m | 120 | 125 | 130 |

## High power semiconductor laser device (COS)



➢ **Product Introduction**

The key parts of this product are packaged with In solder, which is good In welding. Welding Performance, wettability and high thermal conductivity ensure production Product consistency and reliability.

➢ **Field of application**

This product can be used for laser medical treatment, laser pump source, plastic materials Engineering, laser radar and gas detection, etc.

### ➢ Main technical indicators

| Project | Parameter | Company | M-1940-001w-B | | |
|---|---|---|---|---|---|
| | | | Minimum | Typical value | Maximum |
| Optical parameters | Output power | W | | 1 | |
| | Laser wavelength | nm | 1920 | 1940 | 1960 |
| | Spectral width | nm | | 13 | 16 |
| | Luminous size width | M m | | 100 | |
| | Temperature Drift coefficient | nm/℃ | | 1 | 3 |
| | Slow axis divergence angle | deg | | 18 | 25 |
| | Fast axis divergence angle | deg | | 55 | 60 |
| Electrical parameters | Slope efficiency | W/A | 0.25 | 0.32 | |
| | Operating current | A | | 4.00 | 4.20 |
| | Operating voltage | V | | 1.20 | 1.70 |
| | Threshold current | A | | 0.15 | 0.25 |
| Other parameters | Storage temp | ℃ | -10 | 25 | 60 |
| | Operation temperature | ℃ | 10 | 30 | 50 |

## High power semiconductor laser device (microchannel)

➢ **Properties of product**

Compact structure

Low thermal resistance

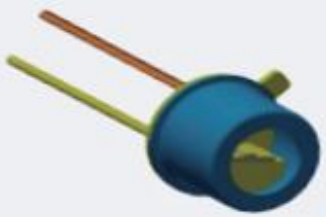
Can work with CW and QCW

Can be customized according to customer needs

### ➢ Main technical indicators

| Project | Parameter | Company | Test results |
|---|---|---|---|
| **Mode of operation** | **CW** | | |
| Optical parameters | Number of bars | Article | 1 |
| | Output power Po/Bar | W | 10 |
| | Center wavelength λ c | nm | 1960±25 |
| | Spectral width λ | nm | <25 |
| | Fast axis divergence angle θ | deg | <135 |
| | Slow axis emission angle θ_S | deg | <25 |
| Electrical parameters | Operating voltage Vr/Bar | V | <2.0 |
| Thermal parameters | Maximum inlet pressure | psi | 65 |
| | Cooling Flow rate/Bar | 1/min | ≥ 0.3 |
| | Cooling medium particle size | M m | ≤ 15 |
| | Cooling medium conductivity | M s/cm | 5~10 |
| | Recommend operating temperature | ℃ | 15~25 |
| | Storage temperature T_s | ℃ | -10~60 |

## High power semiconductor laser device (TO)



➢ **Product Introduction**

This product adopts multi-epitaxial light-emitting layer stacking structure and multi-chip stacking Stack, metal airtight package, with small volume and emission power

High characteristics.

➢ **Properties of product**

Pulsed laser power is 50W, emission wavelength is 905nm, Luminous area 120 umx10um, internal optical collimation.

### ➢ Main technical indicators

| Parameter | Sigillum | Company | Test results | |
|---|---|---|---|---|
| | | | Minimum | Maximum |
| Peak power | Ppeak | W | | 60 |
| Forward current | IF | A | | 25 |
| Pulse width | tp | ns | | 250 |
| Duty cycle | D. C. | % | | 0.13 |
| Reverse Voltage | VR | V | | 6 |
| Operation temperature | TOP | ℃ | -40 | +85 |
| Storage temp | Tstg | ℃ | -40 | +100 |
| Welding temperature (10s, pin lead-out end at least 2mm) | Ts | ℃ | | 280 |

# Human eye safety laser ranging module

➢ **Product Introduction**

Human eye safety laser range finder uses erbium glass laser with a wavelength of 1535nm as the distance measuring light source, which can be used in vehicle-mounted, shipborne, airborne, Accurate ranging and positioning are carried out on photoelectric platforms such as elastic loading.

➢ **Properties of product**

Human eye safe wavelength output, small volume, light weight, low power consumption

## 3km laser range finder

➢ **Main technical indicators**

| | |
|---|---|
| Operation wavelength | 1535 ± 5nm |
| Range | 50 m-3 km |
| End and aim | 2.3m × 2.3m vehicle target, 0.3 diffuse reflection rate, visibility≥6km |
| Ranging accuracy | ± 2mm |
| Ranging frequency | 1-10Hz adjustable |
| Test rate | ≥ 98% |
| Diverging angle | ≤0.5mrad |
| Communication Interface | RS422 |
| Power supply voltage | DC18-32V |
| Operating power consumption | ≤ 1.5W(@ 1Hz) (normal temperature test) |
| Standby power consumption | ≤ 0.5W (normal temperature test) |
| Size | ≤ 49mm x 37mm x 24mm |
| Weight | ≤ 60g |
| Temperature envelope | -40℃ - 65℃ |
| Heat dissipation mode | Transfer to heat dissipation |

## 5km laser range finder

➢ **Main technical indicators**

| | |
|---|---|
| Operation wavelength | 1535 ± 5nm |
| Range | 50 m-5 km |
| End and aim | 2.3m × 2.3m vehicle target, 0.3 diffuse reflection rate, visibility ≥ 6km |
| Ranging accuracy | ± 2mm |
| Ranging frequency | 1-10Hz adjustable |
| Test rate | ≥ 98% |
| Diverging angle | ≤0.5mrad |
| Communication Interface | RS422 |
| Power supply voltage | DC18-32V |
| Operating power consumption | ≤2w (@ 1Hz) (normal temperature test) |
| Standby power consumption | ≤ 0.5W (normal temperature test) |
| Size | ≤ 65mm x 44mm x 37mm |
| Weight | ≤75g |
| Temperature envelope | -40℃ - 65℃ |
| Heat dissipation mode | Transfer to heat dissipation |

## 8km laser range finder

➢ **Main technical indicators**

| | |
|---|---|
| Operation wavelength | 1535 ± 5nm |
| Range | 50 m-8 km |
| End and aim | 2.3m × 2.3m vehicle target, 0.3 diffuse reflection rate, visibility ≥ 6km |
| Ranging accuracy | ± 3mm |
| Ranging frequency | 1-10Hz adjustable |
| Test rate | ≥ 98% |
| Diverging angle | ≤ 0.3mrad |
| Communication Interface | RS422 |
| Power supply voltage | DC18-32V |
| Operating power consumption | ≤1.5W(@ 1Hz) (normal temperature test) |
| Standby power consumption | ≤0.5W (normal temperature test) |
| Size | ≤86mm x 66mm x 46mm |
| Weight | ≤140g |
| Temperature envelope | -40℃ - 65℃ |
| Heat dissipation mode | Transfer to heat dissipation |

## 12km laser range finder

➢ **Main technical indicators**

| | |
|---|---|
| Operation wavelength | 1535 ± 5nm |
| Range | 50 m-12 km |
| End and aim | 2.3m × 2.3m vehicle target, 0.3 diffuse reflection rate, visibility ≥6km |
| Ranging accuracy | ± 3mm |
| Ranging frequency | 1-10Hz adjustable |
| Test rate | ≥98% |
| Diverging angle | ≤ 0.3mrad |
| Communication Interface | RS422 |
| Power supply voltage | DC18-32V |
| Operating power consumption | ≤ 2w (@ 1Hz) (normal temperature test) |
| Standby power consumption | ≤ 0.5W (normal temperature test) |
| Size | ≤ 90mm x 63mm x 82mm |
| Weight | ≤ 350g |
| Temperature envelope | -40℃ - 65℃ |
| Heat dissipation mode | Transfer to heat dissipation |

# Refrigeration infrared thermal imager movement module

Refrigeration infrared thermal imager movement (SCP640)

➢ Main technical indicators

| | |
|---|---|
| Product Model | SCP640C |
| Detector type | Cadmium telluride Mercury |
| Resolution | 640x 512 |
| Pixel spacing | 15 μ m |
| Frames per second | 50Hz |
| F number | F4 |
| Response Spectrum | 3.7 μ m-4.8 μ m |
| NETD | ≤ 28mk |
| Weight | ≤ 800g |
| Size | 140mm x 80mm x 70mm |
| Power supply voltage | DC24V |
| Communication Interface | RS422 |
| Video output | Cameralink/PAl |
| Operation temperature | -40℃ - + 60℃ |

Refrigeration infrared thermal imager movement (LEO640)

➢ Main technical indicators

| | |
|---|---|
| Product Model | LEO640C |
| Detector type | Cadmium telluride Mercury |
| Resolution | 640x 512 |
| Pixel spacing | 15 μ m |
| Frames per second | 50Hz |
| F number | F2/4 |
| Response Spectrum | 3.7 μ m-4.8 μ m |
| NETD | ≤ 25mk |
| Weight | ≤ 500g |
| Size | 120mm x 80mm x 55mm |
| Power supply voltage | DC12V |
| Communication Interface | RS422 |
| Video output | Cameralink/PAL |
| Operation temperature | -40℃ - + 60℃ |

Refrigeration infrared thermal imager movement (TC640)

➢ Main technical indicators

| | |
|---|---|
| Product Model | TC640C |
| Detector type | Antimony imprison |
| Resolution | 640x 512 |
| Pixel spacing | 15 μ m |
| Frames per second | 50Hz |
| F number | F2 |
| Response Spectrum | 3.7 μ m-4.8 μ m |
| NETD | ≤ 28mk |
| Weight | ≤ 800g |
| Size | 141mm x 80mm x 70mm |
| Power supply voltage | DC24V |
| Communication Interface | RS422 |
| Video output | Cameralink/PAL |
| Operation temperature | -40℃ - + 60℃ |

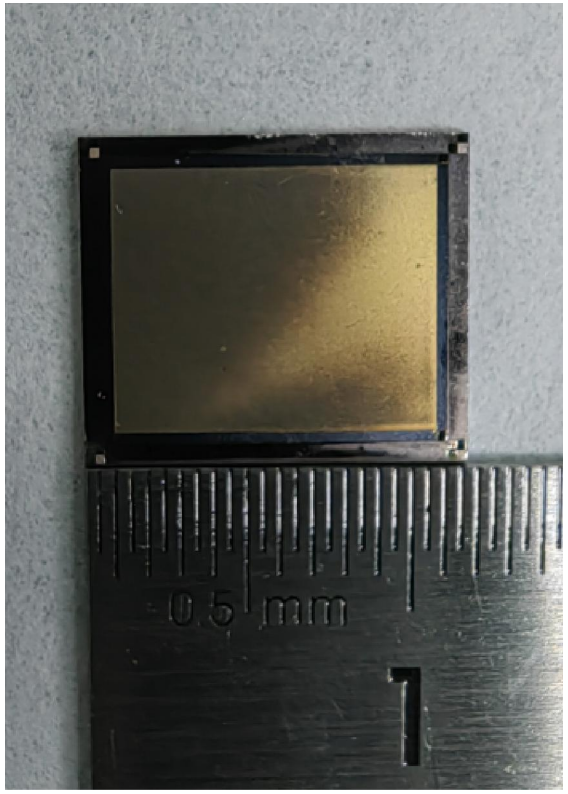
Refrigeration infrared thermal imager movement (LEO320)

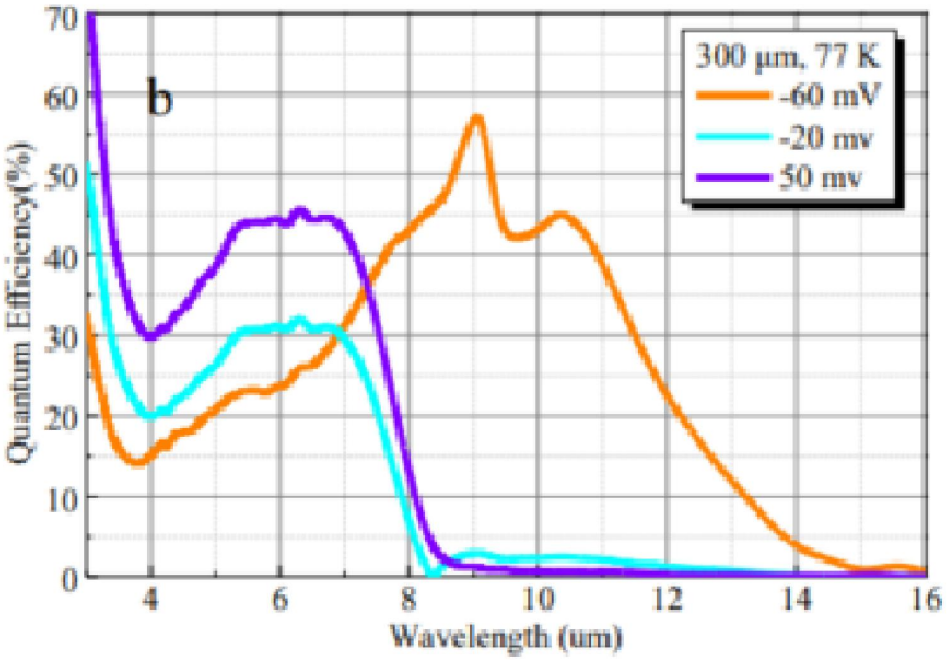
➢ Main technical indicators

| | |
|---|---|
| Product Model | LEO320C |
| Detector type | Cadmium telluride Mercury |
| Resolution | 320x 256 |
| Pixel spacing | 30 μ m |
| Frames per second | 50Hz |
| F number | F2/4 |
| Response Spectrum | 3.7 μ m-4.8 μ m |
| NETD | ≤ 25mk |
| Weight | ≤ 600g |
| Size | 130mm x 88mm x 60mm |
| Power supply voltage | DC12V |
| Communication Interface | RS422 |
| Video output | Cameralink/PAl |
| Operation temperature | -40℃ - + 60℃ |

# **CUSTOMER** CASES

**Customized development of long and long wave epitaxial and detector chips**



# THANKS

Precision in Laser Diodes • Innovation in Photonics • Illuminating Futures