

# STMicroelectronics ToF Proximity Sensor & Flood Illuminator in the Apple iPhone X

## Patent-to-Product Mapping

August 2018

REPORT  
SAMPLE

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# SCOPE OF THE REPORT

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### INTRODUCTION

#### Scope of the Report

This report provides a **patent-to-product** mapping study for the **STMicroelectronics** for the **iPhone X** of Apple.

**The patent-to-product mapping study is focused on following features**

- ✓ **SPAD design**
- ✓ **VCSEL design and manufacturing**
- ✓ **Packaging:** Housing, Optical filters, SiP architecture, etc.

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### INTRODUCTION

#### Key Features of the Report

- **Essential IP analysis** of patents related sensors and components found in **Apple iPhone X**, including: :
  - STMicroelectronics **Time of flight** (ToF) sensors and **SPAD** detector
  - Lumentum **VCSEL**
  - Philips **VCSEL**
- **IP overview of each assignee portfolio:**
  - Time evolution of patent publication
  - Current legal status of patents
  - Citation network and competitive landscape
- **Deep insight on technology data**, including components including Philips and Lumentum

**Disclaimer :** This report does not provide any individual patent. Knowmade and System Plus. The research, technical analysis and/or work covered in this report is for informational purposes only.

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### INTRODUCTION

#### Why you should get the report

This report provides key information to understand the roles, dynamics and IP strategies of players involved in the manufacturing of Apple iPhone X proximity sensor and flood illuminator.

- To know the product key features covered by **enforceable patents**
- To know the most **valued patents** covering a market product
- To evaluate the **risks to infringe** someone else's key patents
- Identify **free technologies** which can be used safely
- Make evidence of **patent infringement**

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# UNDERSTANDING THE CONTEXT

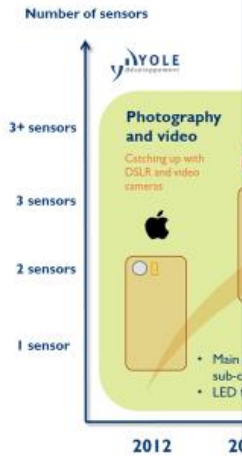
## Market dynamic and players' profiles

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### INTRODUCTION

#### Market trends

Since 2012, mobile phones have become multi sensor interfaces. Indeed, we are rapidly evolving from photography and video to enhanced video call, security, face recognition and even 3D imaging.



### INTRODUCTION

#### Market trends

We are still in the early stage of 3D imaging and the cost of the solution the wave has started on the sensing/imaging solutions will be available in the next 5 years is 89% CAGR, with revenue growth of 10%.

#### Applications vs. Yole's expertise



### INTRODUCTION

#### Company Profile

The company was founded in 1987 as SGS-Thomson Microelectronics is a global semiconductor company.

- Automotive and Discrete Group
  - comprised of dedicated automotive solutions
- Analog, MEMS and Sensors Group
  - comprised of low-power high-end connectivity solutions (both wireless and wired)
- Microcontrollers and Digital ICs Group segment
  - comprised of general purpose and application-specific standard products for various services.

The company offers a range of products, in application-specific standard products for various services.



### INTRODUCTION

#### Company Profile

#### STMicroelectronics product line includes 3 types of time of flight sensors:

##### The proximity sensor VL6180X:

- Combining an IR emitter, a range sensor and an ambient light sensor in a three-in-one ready-to-use reflowable package, the VL6180X is composed of:
- Proximity sensor
  - Ambient Light Sensor
  - VCSEL light source

##### The ToF ranging sensor VL53L0X:

- The VL53L0X is a Time-of-Flight (ToF) laser-ranging module housed in a small package, providing accurate distance measurement whatever the target reflectances. It can measure absolute distances up to 2m.
- The VL53L0X integrates:
- A leading-edge SPAD array (Single Photon Avalanche Diodes)
  - An embedded ST's second generation FlightSense™
  - A 940 nm VCSEL emitter (Vertical Cavity Surface-Emitting Laser) coupled with internal physical infrared filters

##### The ToF ranging sensor VL53L1X:

- The VL53L1X is a state-of-the-art, Time-of-Flight (ToF), laser-ranging sensor, enhancing the ST FlightSense™ product family. It is the fastest miniature ToF sensor on the market with accurate ranging up to 4 m and fast ranging frequency up to 50 Hz.
- The VL53L1X integrates:
- Fully integrated miniature module (Size: 4.9x2.5x1.56 mm)
  - A 940 nm laser
  - SPAD (single photon avalanche diode) receiving array with integrated lens
  - Low-power microcontroller running advanced digital firmware

<https://www.st.com/en/imaging-and-photonics-solutions/proximity-sensors.html?querycriteria=productid=SC1934>



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#### VL6180X 3 in 1 proximity sensor Based on FlightSense™





# TEAR DOWN ANALYSIS

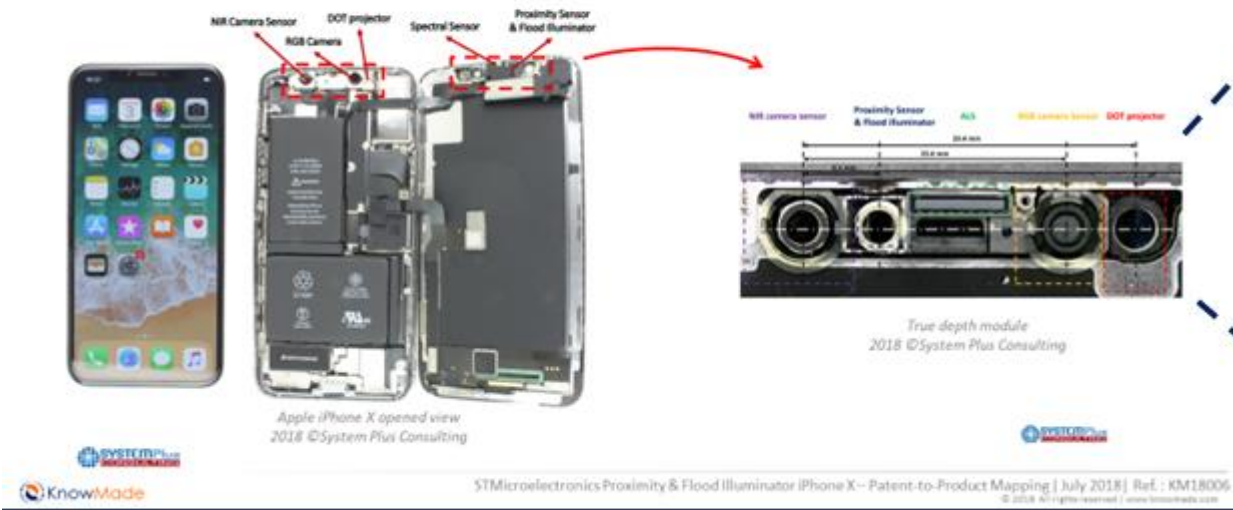
What are the product main characteristics and key features?

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## TEAR DOWN

### STMicroelectronics proximity sensor in Apple iPhone X

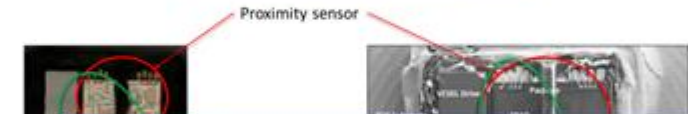
Our partner **System Plus Consulting** analyzed the proximity sensor and flood illuminator included in the **Apple iPhone X** launched in November 2017. The smartphone contains 5 optical sensors : 1 NIR camera, 1 DOT projector, 1 RGB camera, 1 spectral sensor and 1 proximity sensor. The four modules (NIR camera, DOT projector, RGB camera and proximity sensors) are aligned.



## TEAR DOWN

### STMicroelectronics proximity sensor in Apple iPhone X

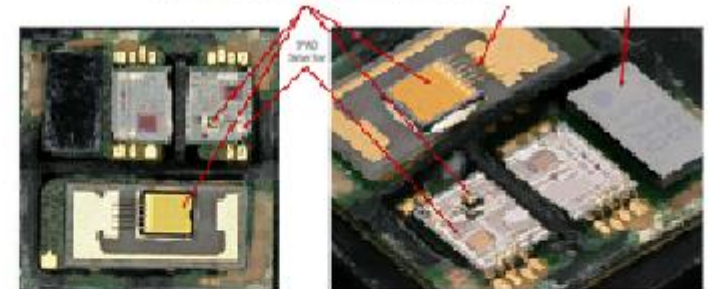
#### Proximity sensor and flood illuminator overview



## TEAR DOWN

### STMicroelectronics proximity sensor in Apple iPhone X

#### Proximity sensor and flood illuminator overview

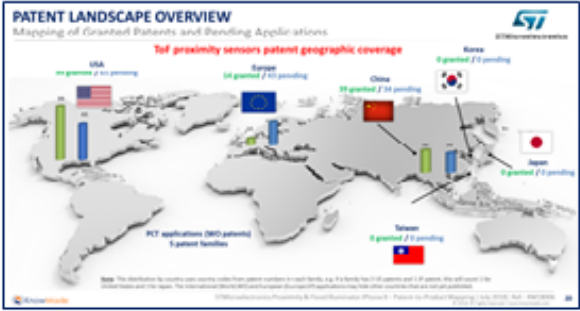
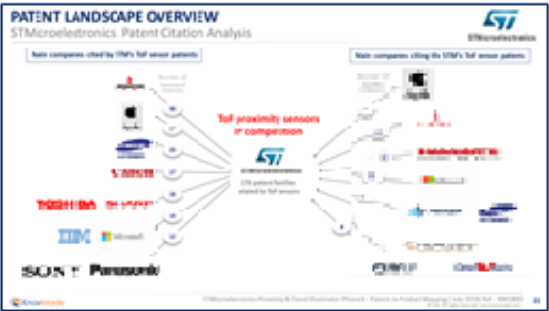
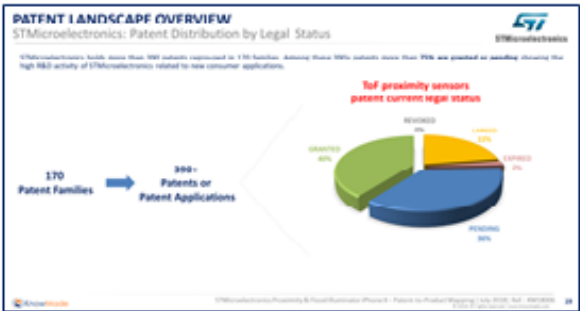
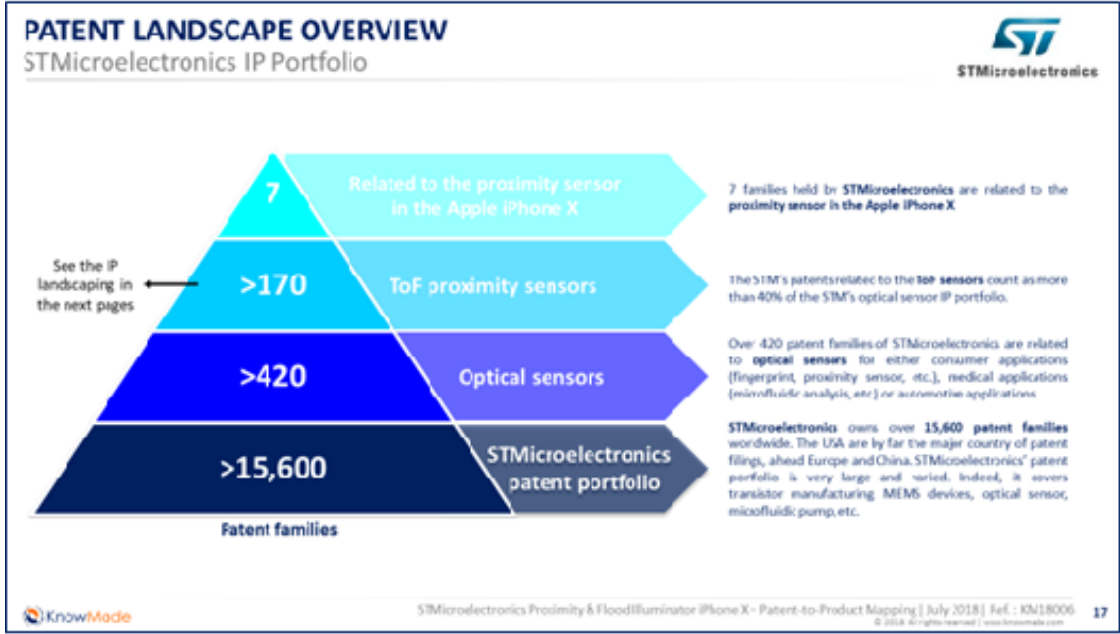


Proximity sensor and flood illuminator overview

# IP PLAYERS PORTFOLIO ANALYSIS

IP position, trends and dynamics of each player

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# PATENT TO PRODUCT ANALYSIS

Understanding the product features and characteristics asserted by patents

REPORT  
SAMPLE

### PACKAGING

Main features of STM's proximity sensor package in Apple iPhone X

STMicroelectronics' proximity sensor is remarkable by its small size and low cost. One key feature of STMicroelectronics is related to the proximity sensor architecture. Indeed, System Plus Consulting tear down analysis shows that the compactness of the sensor is due to the VCSEL and SPAD stacking.

1. As shown fig. 1, the VCSEL is fluid to the SPAD detector with a conductive adhesive layer (here a silver filled adhesive).
2. The second noticeable feature of STMicroelectronics packaging is the optical blocking layer that unites the laser sensor and the SPAD detector.
3. Last, the two openings are formed in the package. Each opening is closed with a glass fiber that is directly glued on the package.

Package Cross-Section – Optical View

VCSEL adhesive process– SEM View

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### PACKAGING

STM's patent related to the proximity sensor packaging of the Apple iPhone X

IDENTIFIED PATENT FAMILIES

Patent family	Description
US2017023493	Proximity sensor, electronic apparatus and method for manufacturing proximity sensor
Int publication year	2017
Status	US: Pending CN: Pending

**Claims**

Claim 1: A proximity sensor, comprising: a sensor chip including a sensor region; a light-emitting device located on the sensor chip and electrically coupled to the sensor chip; the light-emitting device including a light-emitting surface; a transparent molding material covering the light-emitting surface of the light-emitting device; and a non-transparent molding material covering the transparent molding material from the sensor region of the sensor chip.

Fig. 3G

2 - Sensor chip  
3 - Light-emitting device  
4 - Non-transparent molding material  
5 - Filtering component  
7 - Transparent adhesive

201 - Sensor region  
3000 - Carrier substrate  
1001 - Adhesion

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### PACKAGING

IP competition for the US2017023493 of STMicroelectronics

STMicorelectronics  
US2017023493  
Proximity sensor, electronic apparatus and method for manufacturing proximity sensor  
Related patents held by STM

US2017023493  
US2017023494  
US2017023495  
US2017023496  
US2017023497  
US2017023498  
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# ORDER FORM

## STMicroelectronics ToF Proximity Sensor & Flood Illuminator in the Apple iPhone X

Patent to product mapping – August 2018

Ref.:KM18006

### SHIP TO

Name (Mr/Ms/Dr/Pr):

Job Title:

Company:

Address:

City:

State:

Postcode/Zip:

Country:

VAT ID Number for EU members:

Tel:

Email:

Date:

### PAYMENT METHODS

#### Check

To pay your invoice using a check, please mail your check to the following address:

KnowMade S.A.R.L.  
2405 route des Dolines  
06902 Valbonne Sophia Antipolis  
FRANCE

#### Money Transfer

To pay your invoice using a bank money wire transfer please contact your bank to complete this process. Here is the information that you will need to submit the payment:

Payee: KnowMade S.A.R.L.  
Bank: Banque Populaire Méditerranée, CAP 3000 Quartier du lac, 06700 St Laurent du Var, France  
IBAN: FR76 1460 7003 6360 6214 5695 139  
BIC/SWIFT: CCBPFRPPMAR

#### Paypal

In order to pay your invoice via PAYPAL, you must first register at [www.paypal.com](http://www.paypal.com). Then you can send money to the KnowMade S.A.R.L. by entering our E-mail address [contact@knowmade.fr](mailto:contact@knowmade.fr) as the recipient and entering the invoice amount.

### RETURN ORDER BY

**E-mail:** [contact@knowmade.fr](mailto:contact@knowmade.fr)

**Mail:** KnowMade S.A.R.L., 2405 route des Dolines, 06902 Valbonne Sophia Antipolis, FRANCE

### PRODUCT ORDER

☐ €6,490 – Corporate license

☐ €5,990 – Single user license\*

For price in dollars, please use the day's exchange rate. For French customer, add 20% for VAT.

All reports are delivered electronically in pdf format at payment reception.

*\*Single user license means only one person at the company can use the report. Please be aware that our publication will be watermarked on each page with the name of the recipient and of the organization (the name mentioned on the PO). This watermark will also mention that the report sharing is not allowed.*



*I hereby accept Knowmade's Terms and Conditions of Sale*

**Signature:**



# Terms and Conditions of Sales

## DEFINITIONS

“Acceptance”: Action by which the Buyer accepts the terms and conditions of sale in their entirety. It is done by signing the purchase order which mentions “I hereby accept Knowmade’s Terms and Conditions of Sale”.

“Buyer”: Any business user (i.e. any person acting in the course of its business activities, for its business needs) entering into the following general conditions to the exclusion of consumers acting in their personal interests.

“Contracting Parties” or “Parties”: The Seller on the one hand and the Buyer on the other hand.

“Intellectual Property Rights” (“IPR”) means any rights held by the Seller in its Products, including any patents, trademarks, registered models, designs, copyrights, inventions, commercial secrets and know-how, technical information, company or trading names and any other intellectual property rights or similar in any part of the world, notwithstanding the fact that they have been registered or not and including any pending registration of one of the above mentioned rights.

“License”: For the reports and databases, 2 different licenses are proposed. The buyer has to choose one license:

1. One user license: a single individual at the company can use the report.

2. Multi user license: the report can be used by unlimited users within the company. Subsidiaries are not included.

“Products”: Reports are established in PowerPoint and delivered on a PDF format and the database may include Excel files.

“Seller”: Based in Sophia Antipolis (France headquarters), Knowmade is a technology intelligence company specialized in the research and analysis of scientific and technical information. We provide patent landscapes and scientific state of the art with high added value to businesses and research laboratories. Our intelligence digests play a key role to define your innovation and development strategy.

## 1. SCOPE

1.1 The Contracting Parties undertake to observe the following general conditions when agreed by the Buyer and the Seller. ANY ADDITIONAL, DIFFERENT, OR CONFLICTING TERMS AND CONDITIONS IN ANY OTHER DOCUMENTS ISSUED BY THE BUYER AT ANY TIME ARE HEREBY OBJECTED TO BY THE SELLER, SHALL BE WHOLLY INAPPLICABLE TO ANY SALE MADE HEREUNDER AND SHALL NOT BE BINDING IN ANY WAY ON THE SELLER.

1.2 This agreement becomes valid and enforceable between the Contracting Parties after clear and non-equivocal consent by any duly authorized person representing the Buyer. For these purposes, the Buyer accepts these conditions of sales when signing the purchase order which mentions “I hereby accept Knowmade’s Terms and Conditions of Sale”. This results in acceptance by the Buyer.

1.3 Orders are deemed to be accepted only upon written acceptance and confirmation by the Seller, within [7 days] from the date of order, to be sent either by email or to the Buyer’s address. In the absence of any confirmation in writing, orders shall be deemed to have been accepted.

## 2. MAILING OF THE PRODUCTS

2.1 Products are sent by email to the Buyer:

- within [1] month from the order for Products already released; or

- within a reasonable time for Products ordered prior to their effective release. In this case, the Seller shall use its best endeavours to inform the Buyer of an indicative release date and the evolution of the work in progress.

2.2 Some weeks prior to the release date the Seller can propose a pre-release discount to the Buyer.

The Seller shall by no means be responsible for any delay in respect of article 2.2 above, and including in cases where a new event or access to new contradictory information would require for the analyst extra time to compute or compare the data in order to enable the Seller to deliver a high quality Products.

2.3 The mailing of the Product will occur only upon payment by the Buyer, in accordance with the conditions contained in article 3.

2.4 The mailing is operated through electronic means either by email via the sales department. If the Product’s electronic delivery format is defective, the Seller undertakes to replace it at no charge to the Buyer provided that it is informed of the defective formatting within 90 days from the date of the original download or receipt of the Product.

2.5 The person receiving the Products on behalf of the Buyer shall immediately verify the quality of the Products and their conformity to the order. Any claim for apparent defects or for non-conformity shall be

sent in writing to the Seller within 8 days of receipt of the Products. For this purpose, the Buyer agrees to produce sufficient evidence of such defects.

2.6 No return of Products shall be accepted without prior information to the Seller, even in case of delayed delivery. Any Product returned to the Seller without providing prior information to the Seller as required under article 2.5 shall remain at the Buyer’s risk.

## 3. PRICE, INVOICING AND PAYMENT

3.1 Prices are given in the orders corresponding to each Product sold on a unit basis or corresponding to annual subscriptions. They are expressed to be inclusive of all taxes. The prices may be reevaluated from time to time. The effective price is deemed to be the one applicable at the time of the order.

3.2 Payments due by the Buyer shall be sent by cheque payable to Knowmade, PayPal or by electronic transfer to the following account:

Banque Populaire Méditerranée, CAP 3000 Quartier du lac, 06700 St Laurent du Var, France

BIC or SWIFT code: CCBPFRPPMAR

IBAN: : FR76 1460 7003 6360 6214 5695 139

To ensure the payments, the Seller reserves the right to request down payments from the Buyer. In this case, the need of down payments will be mentioned on the order.

3.3 Payment is due by the Buyer to the Seller within 30 days from invoice date, except in the case of a particular written agreement. If the Buyer fails to pay within this time and fails to contact the Seller, the latter shall be entitled to invoice interest in arrears based on the annual rate Refi of the «BCE» + 7 points, in accordance with article L. 441-6 of the French Commercial Code. Our publications (report, database, tool...) are delivered only after reception of the payment.

3.4 In the event of termination of the contract, or of misconduct, during the contract, the Seller will have the right to invoice at the stage in progress, and to take legal action for damages.

## 4. LIABILITIES

4.1 The Buyer or any other individual or legal person acting on its behalf, being a business user buying the Products for its business activities, shall be solely responsible for choosing the Products and for the use and interpretations he makes of the documents it purchases, of the results he obtains, and of the advice and acts it deduces thereof.

4.2 The Seller shall only be liable for (i) direct and (ii) foreseeable pecuniary loss, caused by the Products or arising from a material breach of this agreement

4.3 In no event shall the Seller be liable for:

a) damages of any kind, including without limitation, incidental or consequential damages (including, but not limited to, damages for loss of profits, business interruption and loss of programs or information) arising out of the use of or inability to use the Seller’s website or the Products, or any information provided on the website, or in the Products;

b) any claim attributable to errors, omissions or other inaccuracies in the Product or interpretations thereof.

4.4 All the information contained in the Products has been obtained from sources believed to be reliable. The Seller does not warrant the accuracy, completeness adequacy or reliability of such information, which cannot be guaranteed to be free from errors.

4.5 All the Products that the Seller sells may, upon prior notice to the Buyer from time to time be modified by or substituted with similar Products meeting the needs of the Buyer. This modification shall not lead to the liability of the Seller, provided that the Seller ensures the substituted Product is similar to the Product initially ordered.

4.6 In the case where, after inspection, it is acknowledged that the Products contain defects, the Seller undertakes to replace the defective products as far as the supplies allow and without indemnities or compensation of any kind for labor costs, delays, loss caused or any other reason. The replacement is guaranteed for a maximum of two months starting from the delivery date. Any replacement is excluded for any event as set out in article 5 below.

4.7 The deadlines that the Seller is asked to state for the mailing of the Products are given for information only and are not guaranteed. If such deadlines are not met, it shall not lead to any damages or cancellation of the orders, except for non-acceptable delays exceeding [4] months from the stated deadline, without information from the Seller. In such case only, the Buyer shall be entitled to ask for a reimbursement of its first down payment to the exclusion of any further damages.

4.8 The Seller does not make any warranties, express or implied, including, without limitation, those of

saleability and fitness for a particular purpose, with respect to the Products. Although the Seller shall take reasonable steps to screen Products for infection of viruses, worms, Trojan horses or other codes containing contaminating or destructive properties before making the Products available, the Seller cannot guarantee that any Product will be free from infection.

## 5. FORCE MAJEURE

The Seller shall not be liable for any delay in performance directly or indirectly caused by or resulting from acts of nature, fire, flood, accident, riot, war, government intervention, embargoes, strikes, labor difficulties, equipment failure, late deliveries by suppliers or other difficulties which are beyond the control, and not the fault of the Seller.

## 6. PROTECTION OF THE SELLER’S IPR

6.1 All the IPR attached to the Products are and remain the property of the Seller and are protected under French and international copyright law and conventions.

6.2 The Buyer agreed not to disclose, copy, reproduce, redistribute, resell or publish the Product, or any part of it to any other party other than employees of its company. The Buyer shall have the right to use the Products solely for its own internal information purposes. In particular, the Buyer shall therefore not use the Product for purposes such as:

- Information storage and retrieval systems;

- Recordings and re-transmittals over any network (including any local area network);

- use in any timesharing, service bureau, bulletin board or similar arrangement or public display;

- Posting any Product to any other online service (including bulletin boards or the Internet);

- Licensing, leasing, selling, offering for sale or assigning the Product.

6.3 The Buyer shall be solely responsible towards the Seller of all infringements of this obligation, whether this infringement comes from its employees or any person to whom the Buyer has sent the Products and shall personally take care of any related proceedings, and the Buyer shall bear related financial consequences in their entirety.

6.4 The Buyer shall define within its company point of contact for the needs of the contract. This person will be the recipient of each new report in PDF format. This person shall also be responsible for respect of the copyrights and will guaranty that the Products are not disseminated out of the company.

## 7. TERMINATION

7.1 If the Buyer cancels the order in whole or in part or postpones the date of mailing, the Buyer shall indemnify the Seller for the entire costs that have been incurred as at the date of notification by the Buyer of such delay or cancellation. This may also apply for any other direct or indirect consequential loss that may be borne by the Seller, following this decision.

7.2 In the event of breach by one Party under these conditions or the order, the non-breaching Party may send a notification to the other by recorded delivery letter upon which, after a period of thirty (30) days without solving the problem, the non-breaching Party shall be entitled to terminate all the pending orders, without being liable for any compensation.

## 8. MISCELLANEOUS

All the provisions of these Terms and Conditions are for the benefit of the Seller itself, but also for its licensors, employees and agents. Each of them is entitled to assert and enforce those provisions against the Buyer.

Any notices under these Terms and Conditions shall be given in writing. They shall be effective upon receipt by the other Party.

The Seller may, from time to time, update these Terms and Conditions and the Buyer, is deemed to have accepted the latest version of these terms and conditions, provided they have been communicated to him in due time.

## 9. GOVERNING LAW AND JURISDICTION

9.1 Any dispute arising out or linked to these Terms and Conditions or to any contract (orders) entered into in application of these Terms and Conditions shall be settled by the French Commercial Courts of Grasse, which shall have exclusive jurisdiction upon such issues.

9.2 French law shall govern the relation between the Buyer and the Seller, in accordance with these Terms and Conditions.



**[www.knowmade.com](http://www.knowmade.com)**

[contact@knowmade.fr](mailto:contact@knowmade.fr)

KnowMade S.A.R.L., 2405 route des Dolines, CS 10065, 06902 Sophia Antipolis, France

## Technology Intelligence and IP Strategy consulting company

Compound Semiconductors | Power & RF/microwave Electronics | LED/OLED Lighting & Display | Photonics | Memories | Solid-state Sensors, Actuators and Microsystems | Manufacturing & Advanced packaging | Batteries & Energy management | Biotechnology | Pharmaceuticals | Medical Devices | Medical Imaging | Agri-Food & Environment.

### Executive team



**Dr. Nicolas Baron**  
CEO and co-founder of Knowmade.

He manages the development and strategic orientation of the company and personally leads the Electronics & Telecom department. He holds a PhD in physics from the University of Nice Sophia-Antipolis, and a Master degree in Intellectual Property Strategies and Innovation from the European Institute for Enterprise and Intellectual Property (IEEPI Strasbourg), France.



**Dr. Brice Sagot**  
CTO and co-founder of Knowmade.

He manages the development of IP analysis tools and methodologies, and personally leads the Life Sciences & Healthcare department. He holds a PhD in molecular biology from the University of Nice Sophia-Antipolis, France.

### Analyst team

7 full time analysts with PhD degree and in-depth knowledge in Intellectual Property and Scientific Information.

**Founded in 2009**

**Headquartered in Sophia Antipolis FRANCE**



Sophia Antipolis



**JEI since 2013 (Innovative New Company)**

**CIR accreditation since 2012 (Research Tax Credit)**

### PARTNERS



+ expert network (Industrial & Academics)

# WHAT WE DO

## From Patent to Business Intelligence

*Turning patent data into business intelligence tools*

Knowmade helps customers to understand the **competitive landscape**, follow the **technology trends**, and find out **opportunities** and **threats** in terms of **technology** and **patents**.

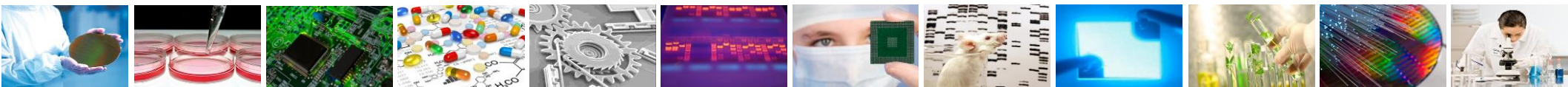
- We interpret the **competitive landscape** and **technology developments** throughout **patents** and **scientific information**.
- We offer our customers the capability to:
  - Understand the **competitive landscape**
  - Follow the **technology trends**
  - Identify patent/technology **opportunities**
  - Assess patent/technology **risks**
  - Strategize **IP** and **R&D**
  - Monetize **technologies** and know-how
  - Defend the **business**
- We combine a strong **technology expertise** with an in-depth **knowledge of patents**.

Patents  
Technologies  
Prior art  
Scientific findings  
Opportunities  
Partners  
Competitors  
Newcomers  
M&A targets



Patent landscape analysis  
Scientific review  
IP portfolio assessment  
Patent valuation  
Freedom-to-operate analysis  
Litigation & licensing support  
Patents linked to products  
Technology scouting  
Technology trends  
Competitive IP landscape  
Market trends  
Reverse engineering

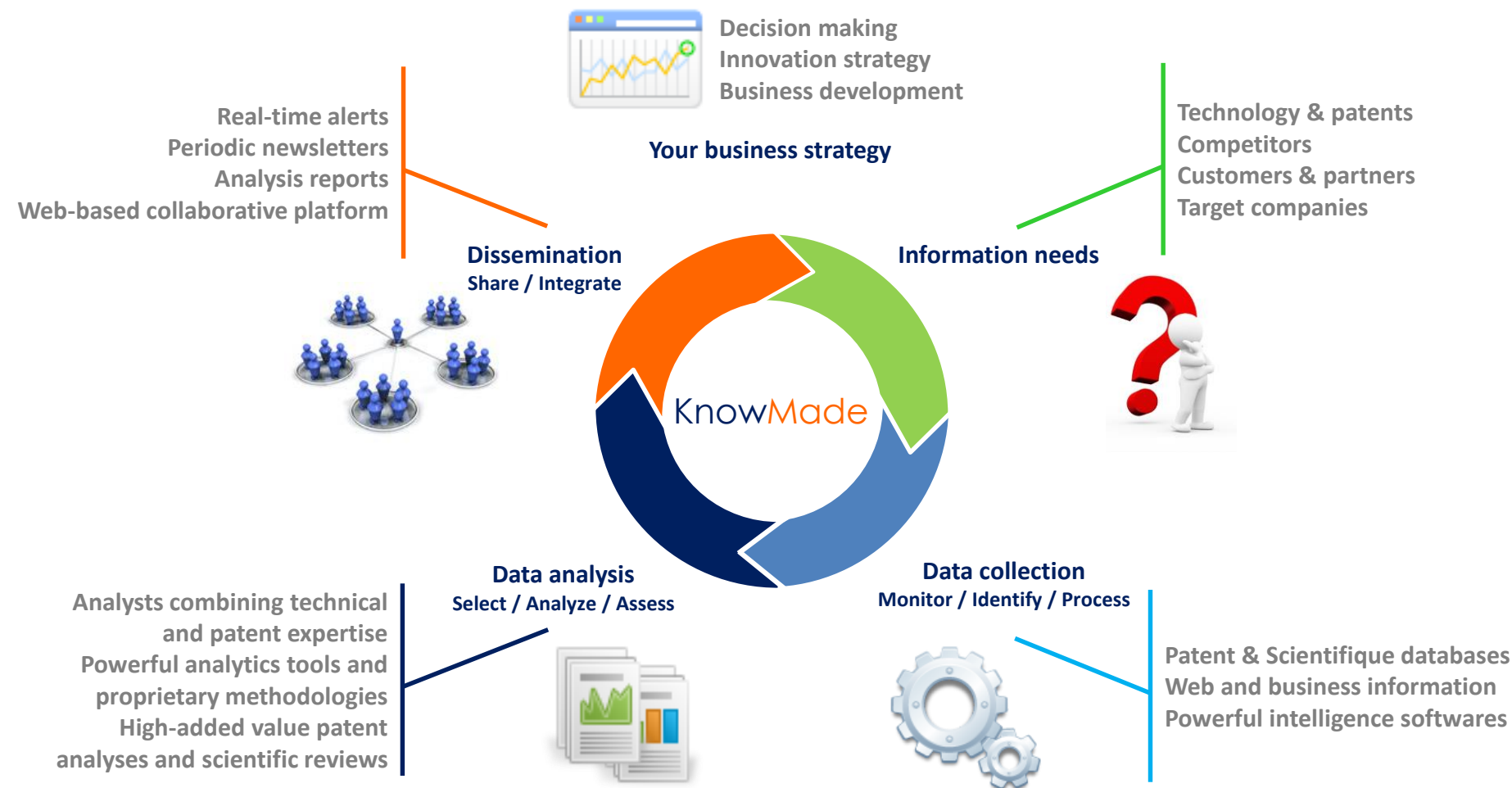
Make strategic decisions  
Sustain competitive advantages  
Speed R&D and enhance innovation process  
Align R&D and IP with key business objectives  
Strengthen IP portfolio and acquire technologies  
Anticipate risks and defend core businesses  
Explore new opportunities and monetize IP



Compound Semiconductors | Power & RF Electronics | Solid-State Lighting & Display | Photonics | Memories | Batteries | MEMS Sensors & Actuators | Manufacturing, Packaging and Assembly | Medical Devices | Medical Imaging | Biotechnology | Pharmaceuticals | Agri-Food

# INTELLIGENCE CYCLE

Tracking key technologies and competitors' R&D activities in order to anticipate changes, early detect business opportunities, mitigate risks, and make strategic decisions





# CLIENT BENEFITS

## Understand

*your competitive environment from technology and patent perspective*

- Identify risks & opportunities
- Understand technology & market from a patent perspective
- Discover new markets & technology direction
- Understand the competitive landscape
- Know where your competition is headed
- Identify your current and future competitors
- Understand your competitors' strategic direction and future product offerings
- Determine your competitors' strengths and weaknesses
- Identify strategic partnerships
- Identify untapped areas and opportunities to direct R&D and patenting activity

## Strategize

*your R&D and IP portfolio*

- Speed your R&D and enhance your innovation process
- Sustain competitive advantages
- Protect your core technologies from competitors
- Anticipate the risks
- Assess your IP portfolio and competitive positions
- Realize the full value of your IP portfolio
- Explore new opportunities
- Strengthen your IP position
- Align your R&D and IP portfolio with key business objectives
- Leverage your IP portfolio to make strategic business decisions
- Identify new revenue opportunities
- Mitigate litigation risks

## Build

*an effective R&D and IP portfolio*

- Strengthen your IP portfolio
- Acquire technologies and know-how
- Optimize your patent prosecution budget
- Improve your patent application process

## Defend

*your business*

- Protect key markets and products by leveraging your IP to address competitive threats
- Defend your position in licensing negotiations or patent litigation

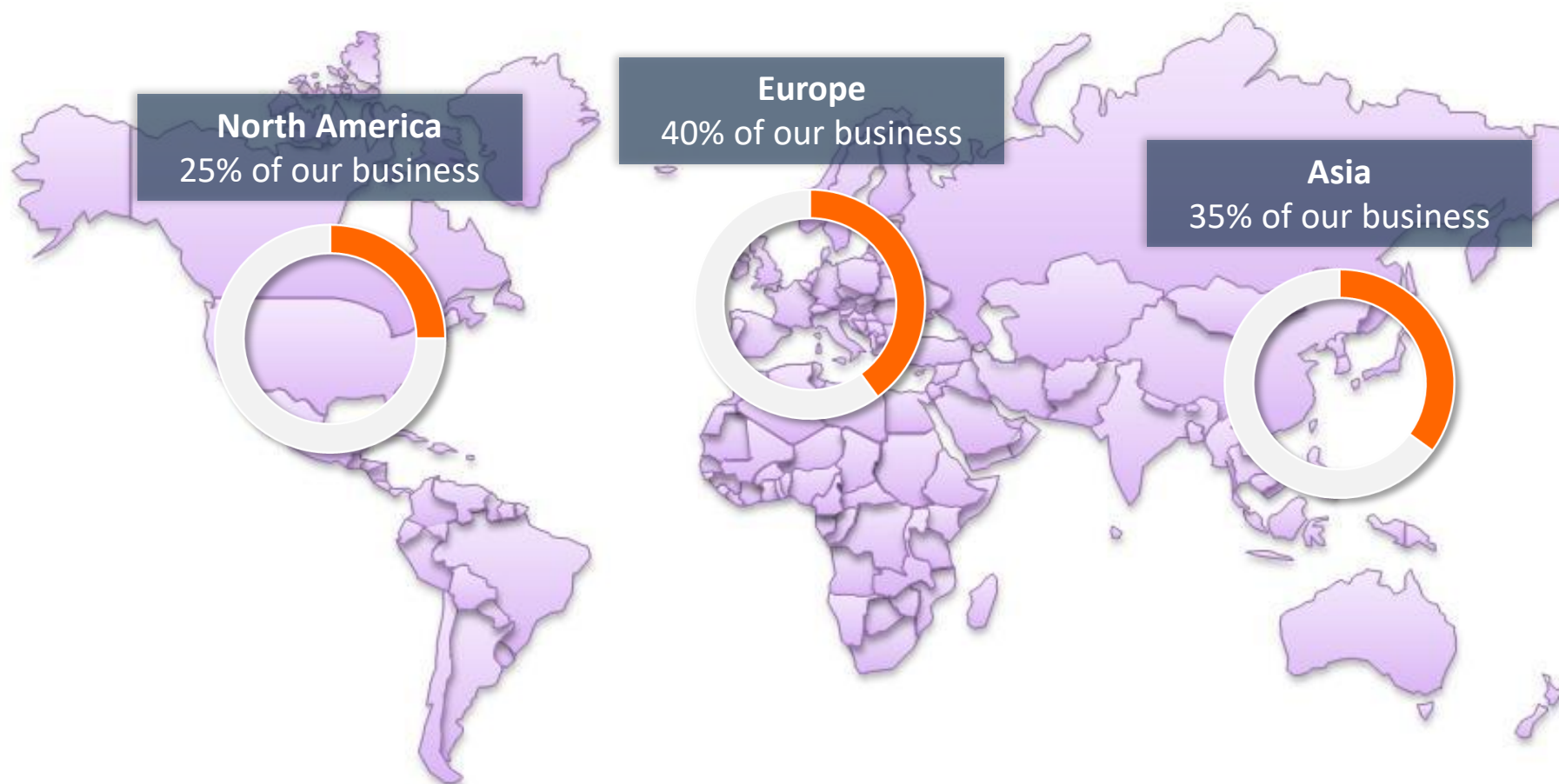
## Monetize

*your IP portfolio*

- Turn your IP portfolio into valuable asset
- Assert your patent rights
- Develop successful patent sales or licensing program
- Improve your position in licensing negotiations or patent litigation

# OUR GLOBAL ACTIVITY

- With an established base of more than 100 customers worldwide, Knowmade benefits from a global perspective of innovative technologies.
- Headquartered in Sophia Antipolis, France, our services are offered worldwide with the support of distributors.



# PARTNERS

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## YOLE DEVELOPPEMENT

Market, technology and strategy consulting

Yole Développement is a strategy consulting and market research company. The company provides marketing, technology and strategy analysis, with a strong focus on emerging applications using silicon and/or micro manufacturing.

[www.yole.fr](http://www.yole.fr) | [www.i-micronews.com](http://www.i-micronews.com)



## SYSTEM PLUS CONSULTING

Manufacturing costs analysis - Teardown and reverse engineering

System Plus Consulting is specialized in technology and cost analysis of electronic components and systems. Cost models and technology expertise are combined to provide customers with an accurate and objective estimation of manufacturing costs and selling prices.

[www.systemplus.fr](http://www.systemplus.fr)



## BLUMORPHO

Innovation accelerator

Blumorpho drives the last mile to turn innovative technologies into successful business. The company focus on reducing the technological, market and financial risks of adopting or exploiting innovation. Blumorpho's market place stores a portfolio of 200 innovations, 44.000 corporate contacts, 7.400 startups and 800 investors, as well as 20 years' technology and market expertise.

[www.blumorpho.com](http://www.blumorpho.com)



## PISEO

Qualification of smart optical systems

PISEO is an independent technical center dedicated to LED based light systems covering the UV, visible and IR spectrum. It brings together in a single entity high skilled engineers and advanced technical testing equipment.

[www.piseo.fr](http://www.piseo.fr)



KnowMade SARL  
2405 route des Dolines  
06902 Sophia Antipolis, France

[www.knowmade.com](http://www.knowmade.com)  
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