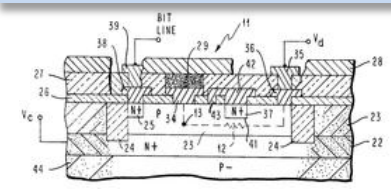
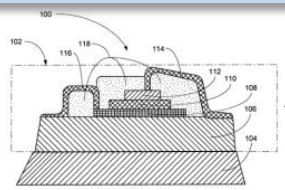
Emerging Non-Volatile Memories

Patent Landscape

February 2014


IBM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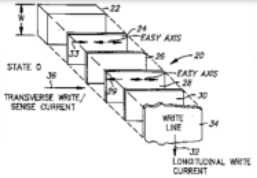
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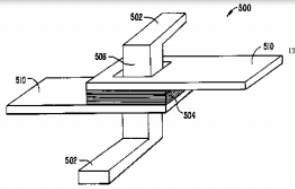
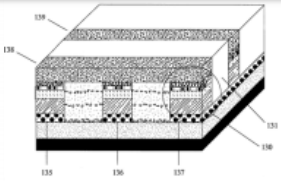
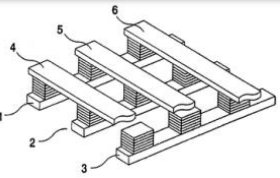

Integrated Magneto Electronics


Macronix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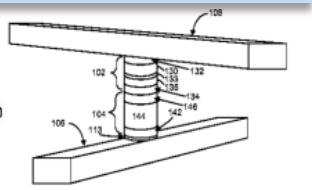
SanDisk

KnowMade

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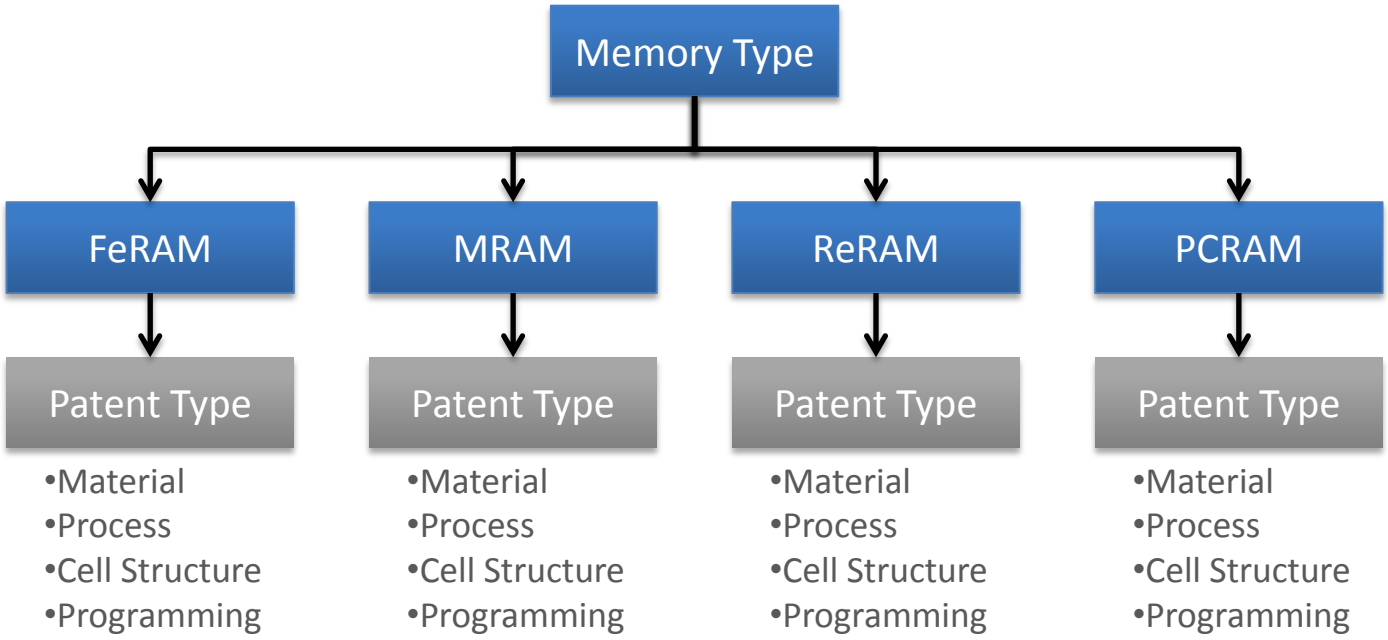
Scope of the Report

• This report provides a detailed picture of the patent landscape for emerging Non Volatile Memories (eNVM). This includes statistical analysis by memory, by type (material composition, cell architecture…) and key players.

• Over the more than 10,000 patent families identified for this project, 8,661 relevant patent families to the scope of this report have been analyzed. These 8,661 patent families have been segmented as follow:



Key Features of the Report

• This report provides for each emerging nonvolatile memory in-depth analysis of key technology segments and key players including:

- Time evolution of patent publications, priority and publication countries
- Breakdown of publication countries for top players
- Legal status of patents
- Ranking of main patent assignees for both industry and academic players
- Identification of main joint developments between main patent assignees
- Overview of key patents and collaboration networks between assignees
- Expiring granted patents with approaching date
- Overview of eNVM related patent litigations
- Relative strength of each company IP portfolio

• A matrix is provided on type of eNVM memories for more than 50 companies.

• The “eNVM IP” profiles of 10 companies are presented, with key patents, litigations, licenses, partnerships and acquisitions.

• The report also provides an extensive Excel database with the 8,661 patent families taken into account in this study. This database allows multi-criteria searches.

Patent information: Patent number, Hyperlink to original document, Priority date, Title, Abstract, Applicants, Legal Status.
Memory Type Segments: FeRAM, MRAM, ReRAM, PCRAM.
Patent Type Segments: Material, Process, Cell structure, Programming.

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Methodology

• The data was extracted from the FamPat worldwide database (Questel-ORBIT) which provides 80+ million patent documents from 95 offices.

• The search for patent was performed in October 2013 hence patents published after this date will not be available in this deliverable.

• The selection of the patents has been done both automatically and manually (all details in next slides).

Number of selected patent families for the emerging NVM IP Investigation:
8,661 over a number of returned results > 10,000

• The statistical analysis was performed with INTELLIXIR analysis software.

• The patents were categorized using keyword analysis of patent title, abstract and claims, in conjunction with expert review of the subject-matter of inventions (all details in next slides).

• The patents were grouped according FamPat's family rules (variation of EPO strict family): A *Patent Family* comprises patents linked by exactly same priority numbers (strict family), plus comparison of priority and application numbers, specific rules by country and information gathered from other sources (national files, legal status …).

Methodology for Patent Screening, Classification and Analysis

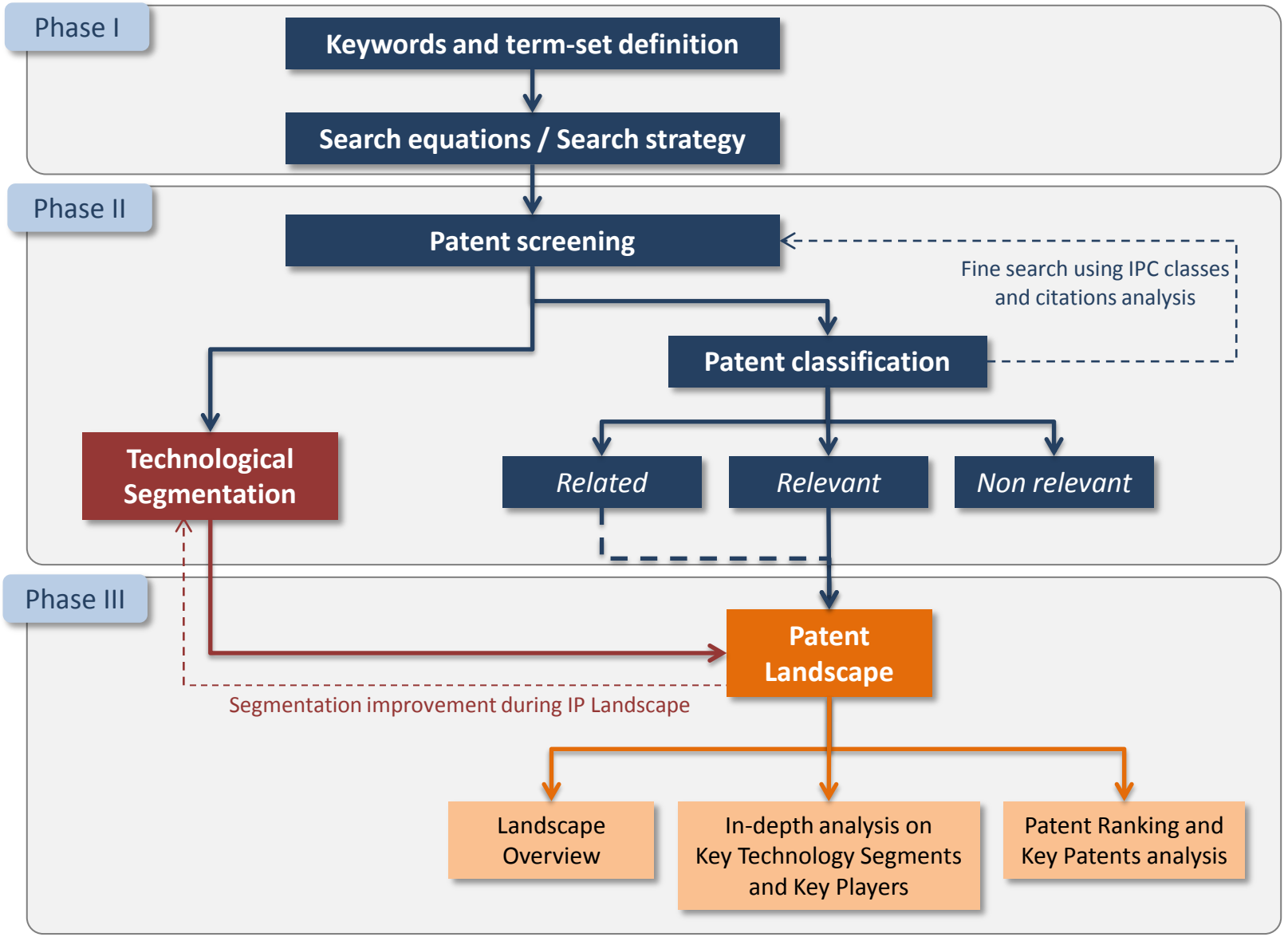


Table of Contents

Executive Summary

The integration limit of flash memories is approaching, and **emerging Non-Volatile Memories (eNVM)** to replace conventional Flash Memories have been proposed. Ferroelectric RAMs (FeRAMs), Magnetoresistive RAMs (MRAMs), Resistive-change RAMs (ReRAMs) or Phase-Change Random-Access Memories (PCRAMs) are promising to change the memory landscape. The field of **eNVM** has shown an intensive patenting activity since early 1990s, with a substantial increase during the past decade.

Currently, there are **more than 8,600 relevant patent families** filed all over the world. Patent families were filed by more than **800 patent applicants** mainly located in **USA**, **Japan**, **Taiwan** and **China**. From a quantitative point of view, the most active companies are **SK Hynix**, **Samsung**, **Toshiba**, **Micron Technology** and **IBM**. In addition, startup firms do not file many patents and their main strategy is to license or sell their intellectual property.

The patents related to **MRAM** technology account for more than **40%** of filings. The main patent applicants are **Toshiba**, **Samsung** and **Renesas Electronics** which represent together almost 30% of the patents. The MRAM technology was growing between 2003-2007 with more than 50% of patents published during these years. Currently, the number of patents filed has remained stable, with about 200 patents filed per year.

About **30%** of patent families are related to **PCRAM** technology. They were mainly filed by **SK Hynix** and **Samsung**, they represent almost 40% of published patents. The PCRAM technology was increasing between 2002 and 2009, with more than 450 patent families published in 2009. Publication patents is decreasing these last 4 years, however more than 200 patents are still published every year. Patent filings will continue on PCRAM technology to further improve memory applications.

The patents dedicated to **FeRAM** technology represent **20%** of filings. They were mainly filed by **SK Hynix**, **Samsung** and **Seiko Epson** which represent almost 50% of published patents. FeRAM is a mature technology, and FeRAM is not an active patent field yet.

Patents related to **ReRAM** technology account for almost **10%** of new patent filings. ReRAM is the newest patented technology and the number of patent publications will continue to increase in the coming years. With over 100 patent families already filed, **Samsung** will play a significant role in this emerging technology development.

Several players are focusing on all types of memories, alone or by joint developments. An overview is given for more than 50 companies. A focus is also realized on main 10 players (**SK Hynix**, **Samsung**, **Toshiba**, **Micron Technology, IBM**…) to summarize all the data set, such as key patents, expiring patents, acquisitions, joint developments and key industrial applications for each eNVM.

Companies Mentioned in this Report

Adesto Technologies, Altis Semiconductor, Avalanche Technology, Beijing University, Crocus Technology, Crossbar, Cypress Semiconductor, Electronics and Telecommunications Research Institute (ETRI), Elpida Memory, Energy Conversion Devices, Everspin Technologies, Freescale Semiconductor, Fudan University, Fujitsu, Grandis, Hanyang University, Hewlett Packard, Hitachi, IBM, Industrial Technology Research Institute (ITRI), Infineon Technologies, Institute of Microelectronics (CAS), Intel, Intermolecular, Macronix International, Magic Technology, Micron Technology, Motorola, Nanya Technology, NEC, New York University, Oki Electric Industry, Olympus, Ovonyx, Panasonic, Powerchip, Promos Technologies, Qimonda, Qualcomm, Rambus, Ramtron International, Renesas Electronics, Rohm, Samsung, SanDisk, Seagate Technology, Seiko Epson, Semiconductor Manufacturing International Corporation (SMIC), Shanghai Institute (CAS), Sharp, SK Hynix, Sony, Spansion, Spin Transfer Technologies, STMicroelectronics, Symetrix, Taiwan Semiconductor Manufacturing (TSMC), TDK, Texas Instruments, Toshiba, Unity Semiconductor, Winbond Electronics

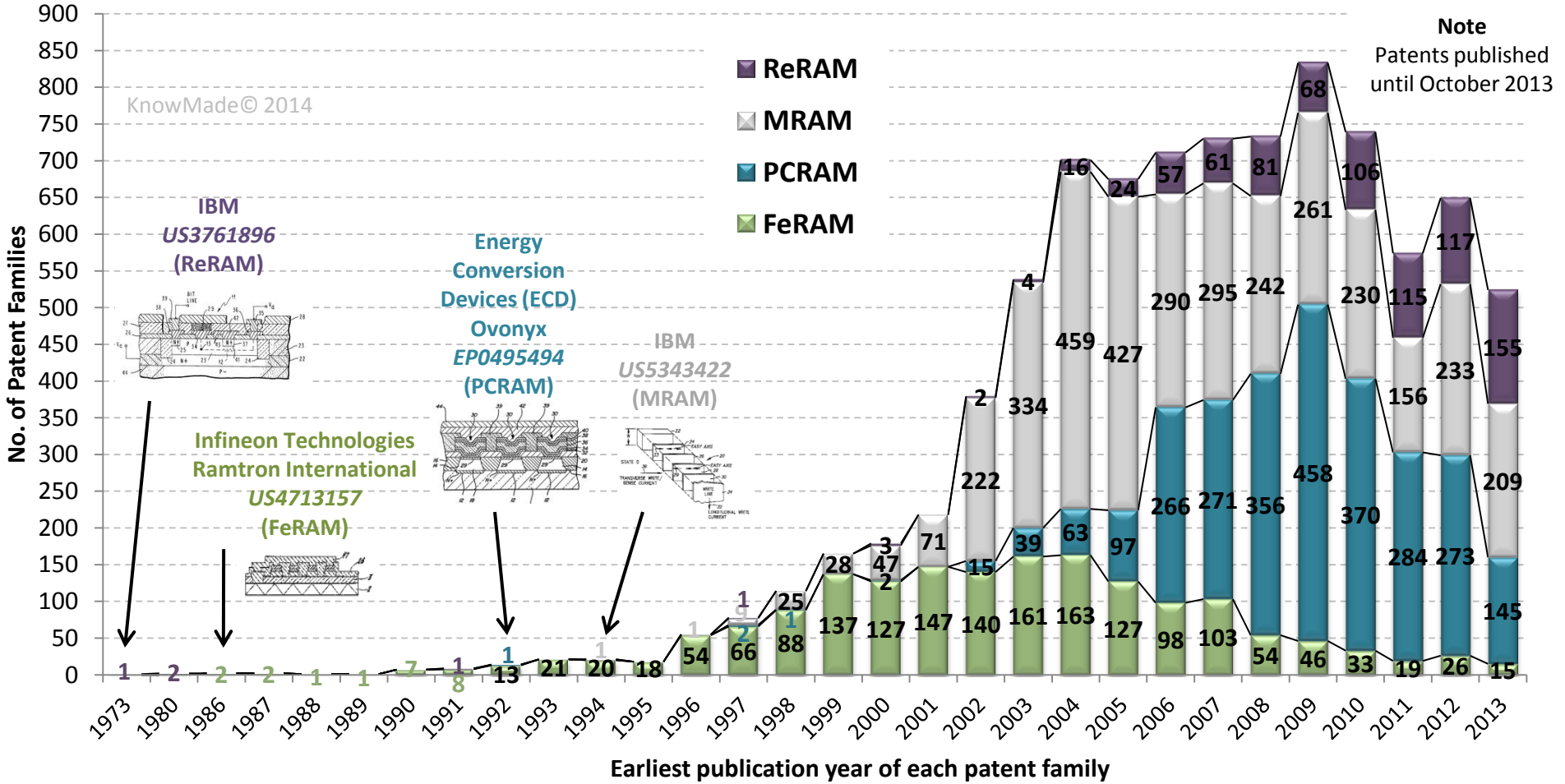
Type of Memories

	Emerging Memories				Established Memories	
	FeRAM *(or FRAM)*	MRAM	ReRAM *(or RRAM)*	PCRAM *(or PRAM, PCM)*	DRAM	Flash NAND
Nonvolatile	YES	YES	YES	YES	NO	YES
Endurance	High (10^{12})	High (10^{15})	Medium (10^{8})	Medium (10^{8})	High (10^{15})	Low (10^{5})
2012 latest technological node produced (nm)	130 nm	130 nm	R&D	45 nm	30 nm	20 nm
Cell Size (cell size in F^2)	Large (15-20)	Large/Medium (6-40)	Medium (6-12)	Medium (6-12)	Small (6-10)	Very small (4)
Write speed	Medium (100ns)	High (10 ns)	Medium (75 ns)	Medium (75 ns)	High (10ns)	Low (10 000 ns)
Power Consumption	Low	High/Low	Low	Low	Low	Very High
Cost ($/Gb)	High ($ 10 000/Gb)	High ($ 1000 – 100 /Gb)	R&D	Medium (few $/ Gb)	Low ($1/Gb)	Very Low ($ 0.1/Gb)

From Yole Dévelopment « Emerging NVM » 2013 Report

PCRAM is part of Resistive Memories. We made the choice here to separate this memory from ReRAM due to the large number of patents in PCRAM technology.

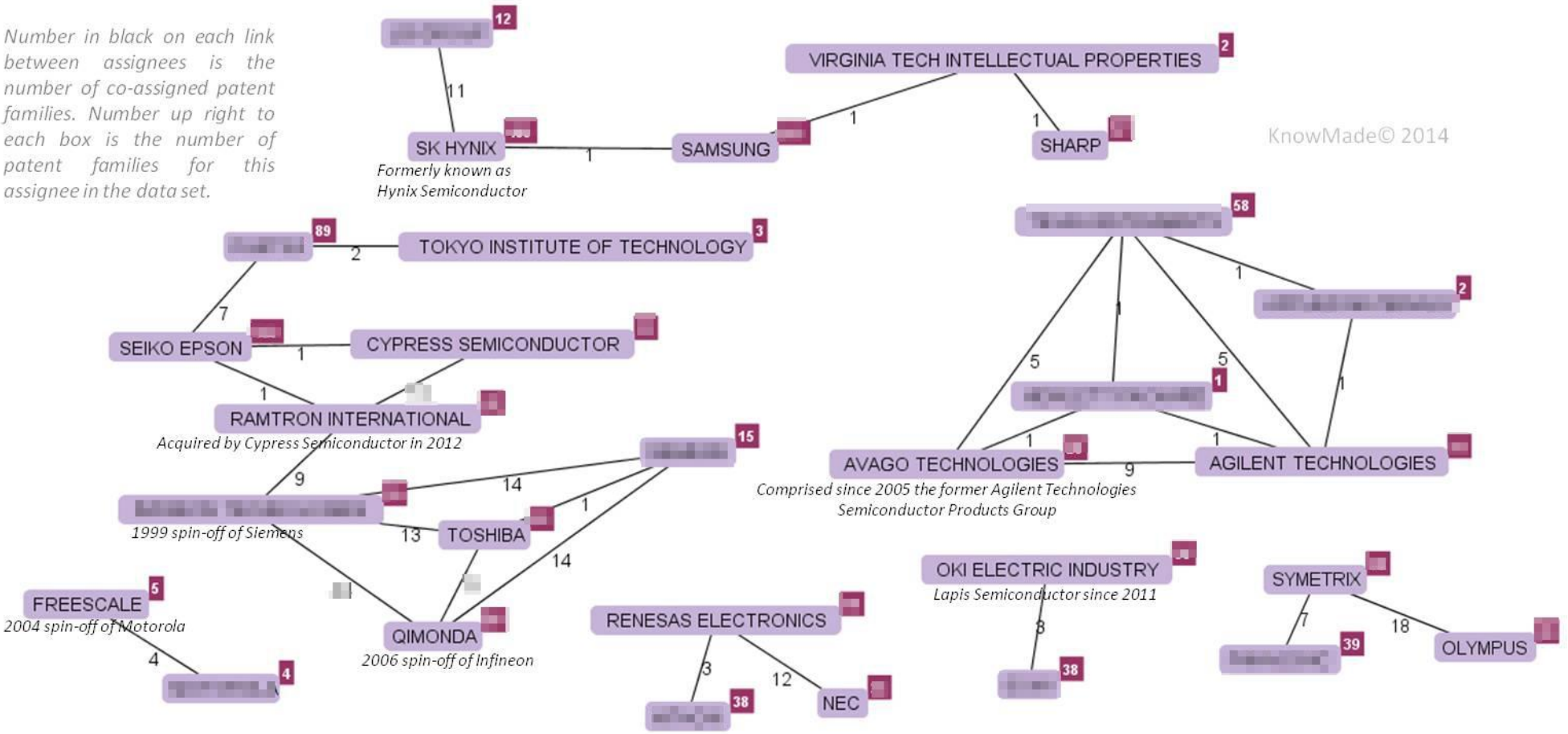
Time Evolution of Patent Publications



8,661 patent families were published from 1973 to 2013 in emerging NVM technology, and 38% of them were published these last 5 years. The publication number of **ReRAM** patents is still increasing with more than 100 patents published every year these last 4 years. With the first patent published by IBM in 1994, the number of **MRAM** patent publications were maximum between 2003 and 2007 with a relative steady number of publications since 2010. The number of **PCRAM** patent publications, with first patent (on electrically programming memory) published by ECD and Ovonyx in 1992, is higher than 250 every year since 2006, with the highest number in 2009 (458). Most of **FeRAM** patents were published between 1999 and 2007 with a number of patent publications decreasing since 2008.

Patent Assignee IP Network

Main assignee collaboration network for patent families



There are only few co-assigned patent families related to FeRAM technology. **Toshiba** and **Infineon Technologies** jointly developed FeRAM for cell phones in 2000. **Qimonda** is a spin-off of **Infineon Technologies** (spin-off of **Siemens** since 1999) since 2006. In 2006, **Qimonda** acquired more than 40 patents (mostly US) of **Infineon Technologies** on FeRAM technology. **Toshiba** co-holds some patents with **Infineon Technologies** or **Qimonda**. Note that **Renesas Electronics** is the merger of **Renesas Technology** (Joint Venture of **Hitachi** and **Mitsubishi** in 2003) and **NEC Electronics** (2002 spin-off of **NEC**) in 2010.

Main Reference Patents

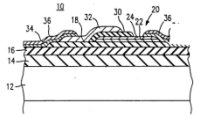
Main reference patents for FeRAM and corresponding main citing applicants

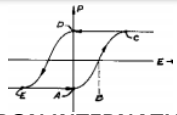
The selection of reference patents is based on both citations analysis and their impact on FeRAM technology.

1987

SYMETRIX
PANASONIC
NANYA TECHNOLOGY

COLUMBINE VENTURE FUND
CROSSPOINT VENTURE II
LOCKHEED
NATIONAL SEMICONDUCTOR
OSCCO III
WEEDEN CAPITAL
US5046043





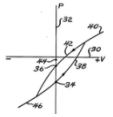
RAMTRON INTERNATIONAL[1]
SILICON VALLEY BANK
EP0278167

SK HYNIX
PANASONIC
TOSHIBA

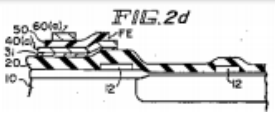
1988

MICRON TECHNOLOGY
TEXAS INSTRUMENTS
CYPRESS SEMICONDUCTOR
SYMETRIX

RAMTRON INTERNATIONAL[1]
SILICON VALLEY BANK
US4888733



1992



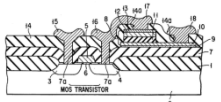
INFINEON TECHNOLOGIES
RAMTRON INTERNATIONAL[1]
US5191510

TEXAS INSTRUMENTS
ROHM
MICRON TECHNOLOGY

1993

NEC
SHARP
FUJITSU
TOSHIBA

OLYMPUS
SYMETRIX
JPH07111318



1996

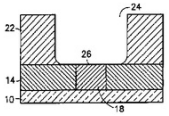
CITIBANK
FREESCALE SEMICONDUCTOR
MOTOROLA
JPH09246497

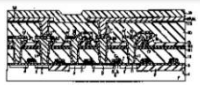
NEC
STMICROELECTRONICS
SYMETRIX

1997

INFINEON
TECHNOLOGIES
MICRON
TECHNOLOGY
QIMONDA

ADVANCED TECHNOLOGY MATERIALS
FELLOWS RESEARCH ALLIANCE
WO9927581





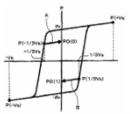
TOSHIBA
JPH10275897

MICRON TECHNOLOGY
TOSHIBA
FUJITSU

2005

FUJIFILM
ZETTACORE

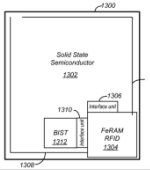
SEIKO EPSON
EP1589566

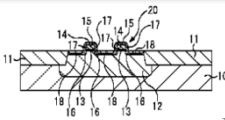


2006

STMICROELECTRONICS

SK HYNIX
WO2007028150

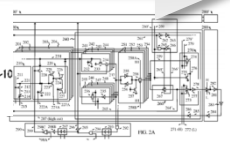




FUJITSU
WO2007116442

SEIKO EPSON

2008



KIM JUHAN
US2010097839

TEXAS
INSTRUMENTS

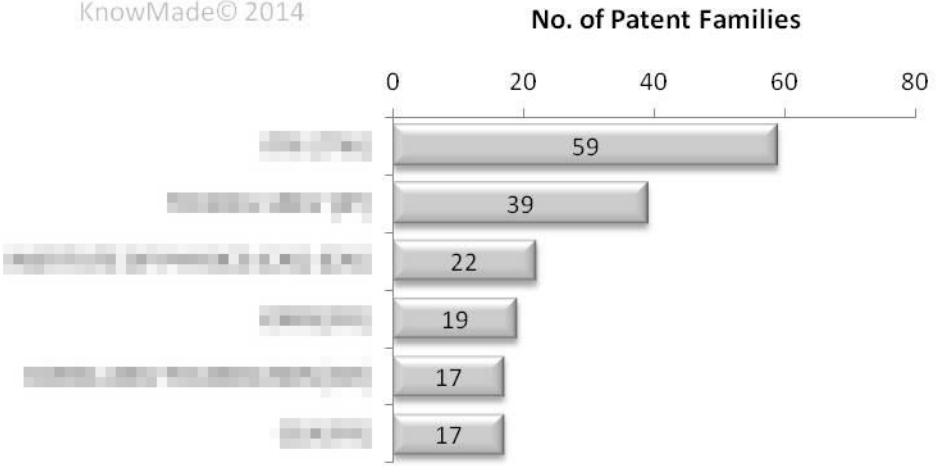
Earliest publication date of the patent family

KnowMade© 2014

[1]Acquired by Cypress Semiconductor in 2012

Main Patent Assignees

Academic Assignees



[redacted] has the highest number of patent families in **MRAM** technology, followed by [redacted]. The top-3 patent assignee represents 30% of patent filings. **IBM** which has developed the current MRAM technology occupies the [redacted] patent families filed on the MRAM. **Samsung** holds [redacted] patent families on MRAM technology and [redacted] with **Grandis** (acquired in 2011). [redacted] the first academic assignee with 59 patents families filed.

Strength of Main Assignee Patent Portfolios

MRAM

	A	B	C	D	E	F
Assignee	**No. of patent families**	**No. of citing patent families** (from FamPat database)	**No. of citing patent families / year** (average)	**No. of citing patent families / patent family** = B / A	**Relative Impact Factor of the patent families** = D / 2.7*	**Strength of the patent portfolio = A x E**
Company A [JP]	512	3179	190.7	6.2	2.3	1164
Company B [KR]	298	2002	129.2	6.7	2.5	733
Company C [JP]	237	1369	101.4	5.8	2.1	501
Company D [JP]	184	879	45.3	4.8	1.7	322
Company E [JP]	182	961	65.5	5.3	1.9	352
Company F [US]	158	1189	73.5	7.5	2.8	435
Company G [US]	154	1743	112.5	11.3	4.1	638
Company H [DE]	148	1305	85.1	8.8	3.2	478
Company I [US]	135	2050	113.4	15.0	5.5	750
Company J [DE]	129	1075	70.1	8.3	3.1	393
Company K [US]	129	1888	104.4	14.6	5.4	691

*9,674 patent families cite the whole of the 3,542 patent families taken into account for the study, then corresponding to an average of 2.7 citing patent families per patent family.

: highest value in column
: lowest value in column

Matrix Applicant/Memory Type

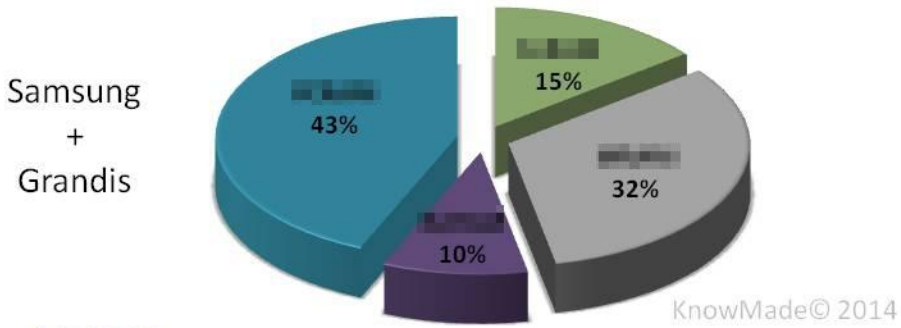
PATENT APPLICANTS	FeRAM		MRAM		ReRAM		PCRAM		Total No of Patent Families
	No of Patent Families	Portfolio Strength Index*	No of Patent Families	Portfolio Strength Index*	No of Patent Families	Portfolio Strength Index*	No of Patent Families	Portfolio Strength Index*	
Company A [KR]	489	266	125		47	11	537	242	1172
Company B [KR]	163	281	298	733	108	127	487	1038	1054
Company C [JP]	93	179	513	1164	25	14	17		645
Company D [US]	9		158	435	24		163	676	354
Company E [DE]	50	68	148	478	50	80	84	357	330
Company F [JP]	23		237	501	2		47		309
Company G [US]	9		124		8		126	270	267
Company H [DE]	70	119	129	393	29	65	34		262
Company I [JP]	36		182	352	5		10		233
Company J [JP]	38		184	322	6		1		229
Company K [TW]	1		59		21		112	128	193
Company L [TW]	6		16		23		146	401	191
Company M [JP]	89	110	75		12		0		176
Company N [US]	1		154	638	4		1		160
Company O [JP]	153	115	2		3		0		158
Company P [JP]	38		68		1		46		153
Company Q [US]	5		137	750	4		5		151
Company R [CN]	1		0		5		125	3	131
Company S [US]	0		129	691	0		0		129
Company T [US]	0		0		0		118	960	118
Company U [CN]	4		11		8		84	1	107
Company V [FR]	8		18		0		75	284	101
Company W [JP]	52	129	15		34	131	0		101
Company X [TW]	1		73		4		20		98
Company Y [US]	0		2		0		85	549	87
Company Z [TW]	0		87		0		0		87
Company AA [US]	2		48		27	43	2		79

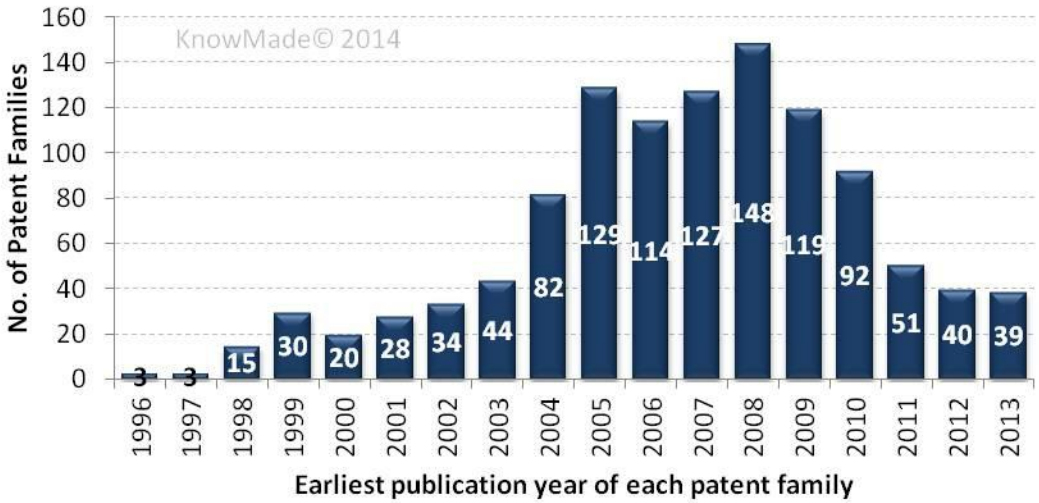
* Portfolio Strength Index is only available for main patent assignees in each memory type segment.

Samsung - Patent Portfolio Analysis

Samsung Electronics – Samsung Electro Mechanics - Grandis (Acquisition in 2011)

[redacted] patents within [redacted] patent families





❖ FeRAM

345 patents within 163 patent families
Legal status: Granted (62%), Pending (3%)
Earlier priority date: 1995-03
Average age of patents: 10 years
Portfolio Strength Index: 281
Commercialized first FeRAM in 1999

❖ ReRAM

[redacted]

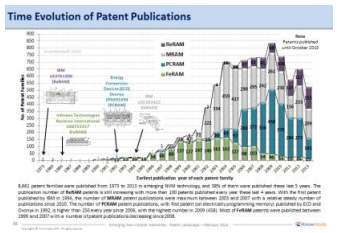
❖ PCRAM

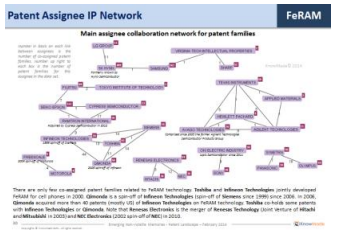
[redacted]
Legal status: Granted ([redacted]%), Pending ([redacted]%)
Earlier priority date: 2002-04
Average age of patents: [redacted]
Portfolio Strength Index: [redacted]
Key industrial player in cache memory for enterprise storage and mobile phones applications

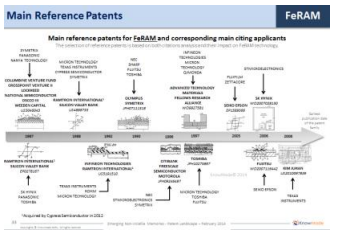
❖ MRAM

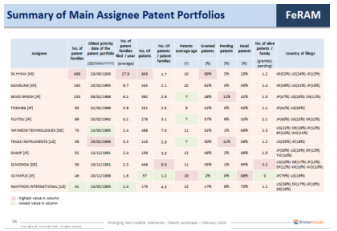
[redacted]
Joint Development: 2008 with **SK Hynix** on STT-MRAM, 2013 new global research on STT-MRAM innovation
Acquisition: **Grandis** in 2011 and 90+ patents (mostly US) of **Hewlett Packard**
Key patents: [redacted]
Expiring Patents: [redacted]
Key industrial player in cache memory for enterprise storage application

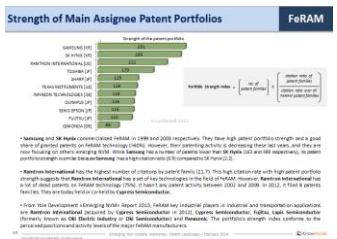
Other Sample Pages

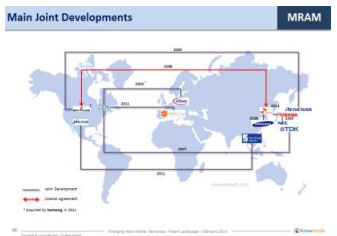


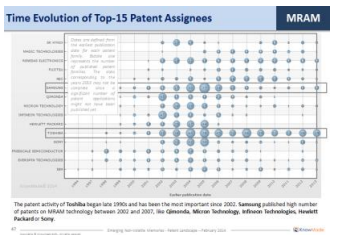


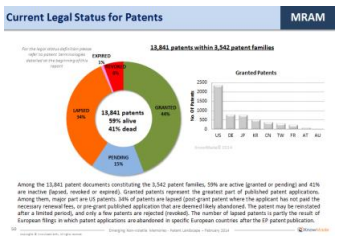


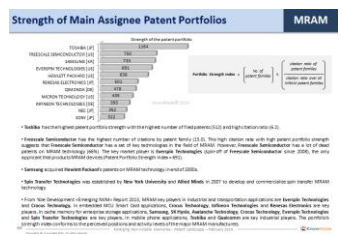


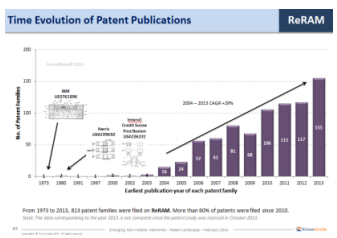


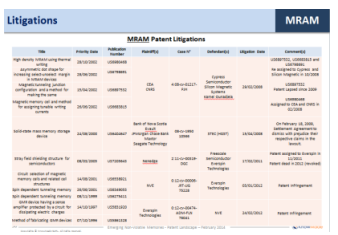


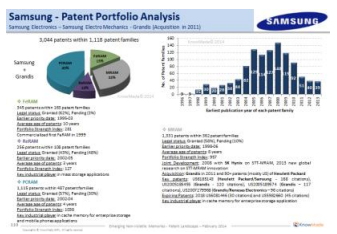


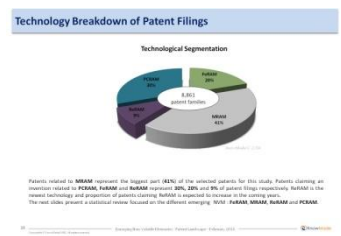


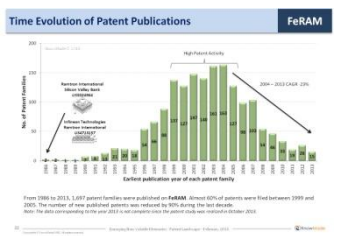


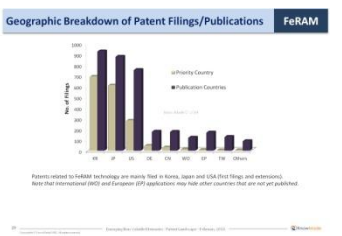


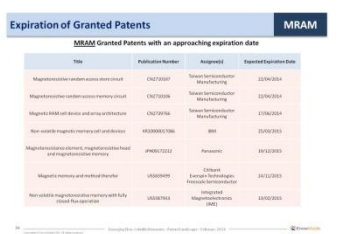












The Authors

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Dr Nicolas Baron
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About Knowmade

Knowmade is specialized in analysis of patents and scientific research findings. We provide patent search, IP landscape, patent valuation, IP due diligence, FTO search, scientific literature landscape, identification of technologies available for transfer/licensing/sale, alerts and updates. Our service offer consists of custom studies, analysis reports, on-demand tracking and strategy consulting. Knowmade combines information search services, scientific expertise, powerful analytics and visualization tools, and proprietary methodologies for analyzing patents and scientific information. With a solid focus on Compound Semiconductors, LED, MEMS, Nanotechnology and Biotechnology, Knowmade supports research laboratories, industrial companies and investors in their business development.

Order Form

Emerging Non-Volatile Memories Patent Landscape (02-2014)

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, BP 65
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 St Laurent du Var CAP 3000 - Quartier du lac- 06700 St Laurent du Var
IBAN: FR76 1560 7000 6360 6214 5695 126
BIC/SWIFT: CCBPFRPPNCE

Paypal

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

RETURN ORDER BY

E-mail: contact@knowmade.fr
Mail: KnowMade S.A.R.L. 2405 route des Dolines, BP 65 06902 Sophia Antipolis FRANCE

PRODUCT ORDER

☐ **Single user license EURO 2990**
☐ **Corporate license EURO 3990**

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

Signature:
I hereby accept Knowmade's Terms and Conditions of Sale

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. Single user license: a single individual at the company can use the report.
2. Corporate 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.

Terms and Conditions of Sales

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 St Laurent du Var CAP 3000 - Quartier du lac- 06700 St Laurent du Var

BIC or SWIFT code: CCBPFRPPNCE

IBAN: : FR76 1560 7000 6360 6214 5695 126

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.

Terms and Conditions of Sales

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.