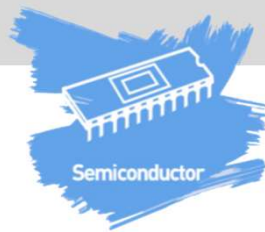


World 1st Technology
Only 1 In The World

회사 소개

May. 2021



JUSUNG
ENGINEERING

Headquarter : 240 Opo-ro, Opo-eup, Gwangju-si, Gyeonggi-do, Korea
Yongin R&D Center : 79, Sinjeong-ro, Giheung-gu, Yongin-si, Gyeonggi-do, Korea

www.jusung.com

1. Vision

2. Mission

3. Culture

4. Company Overview

Innovate Technology!
Develop New Markets!
Make Happiness!

World's 1st Technology
First Mover & Market Developer

Only 1 in the World
Semiconductor, Display, Solar Cell Technology Integration

1. 창조·혁신적 **사람**

Think for the First !
Work for the No.1 !
Make New Records !

2. 성공 공유의 **문화**

고객의 성공을 통한
동반성장과 행복 창출

4. Company Overview



4-1. Campus Map

Gwangju Campus



Gwangju Campus

대지 : 16,974평
건물 : 12,068평

Gyeonggi-do Gwangju-si JUSUNG ENGINEERING Headquarter

Yongin R&D Center



New R&D Center

대지 : 7,789평
건물 : 7,922평

Gyeonggi-do Yongin-si JUSUNG ENGINEERING Yongin R&D Center

Innovation → Success → Happiness

4-2. 주성의 세계 최초 기술

	Year	Technology	Applications		Remark
			Industry	Process	
World's 1 st I	1993 ~	Single Tube Vertical LPCVD	Semiconductor	Electrode, Dielectrics, Insulators	
World's 1 st II	1994 ~	Warm Wall Type UHV PE CVD			
World's 1 st III	1997 ~	Vaporized MO-CVD & ALD			Semiconductor, Display
World's 1 st IV	1998 ~	Selective Epi Growing Tech	Semiconductor	Transistor	
World's 1 st V	1998 ~	Parallel Resonance Antenna	Semiconductor	HDP- CVD ICP-Etcher	
World's 1 st VI	2000 ~	Space divided Tech	Semiconductor, Display		
World's 1 st VII	2001 ~	SD-ALD & CVD	Semiconductor, LED	Electrode, Dielectrics, Insulators	
World's 1 st VIII	2002 ~	Local Space Plasma Tech	Semiconductor, Display, Solar		
World's 1 st IX	2003 ~	Space divided Plasma – ALD & CVD			
World's 1 st X	2004 ~	Time Space Divided Tech	Semiconductor, Display	Channel, Electrode, Dielectrics, Insulators	
World's 1 st XI	2005 ~	Time Space Divided (ALD&CVD)			
World's 1 st XII	2005 ~	Time Space Divided Plasma Tech			
World's 1 st XIII	2006 ~	ALD IGZO TFT Tech			
World's 1 st XIV	2007 ~	Time Space Divided-PE CVD / ALD			
World's 1 st XV	2008 ~	Time Space Divided-HDP			
World's 1 st XVI	2013 ~	Time Space Divided-Etcher		Insulators & Metal	
World's 1 st XVII	2014 ~	SDP-PEALD (Revolution & Rotation)	Semiconductor, Power Device	Insulators	
World's 1 st XVIII	2016 ~	Time Space Divided – ALG	Semiconductor, Display	Transistor, Electrode, Dielectrics, Insulators	

18개 세계 최초 기술 개발

4-3. 세계 최초·1등 기술로 고객과 성공 공유

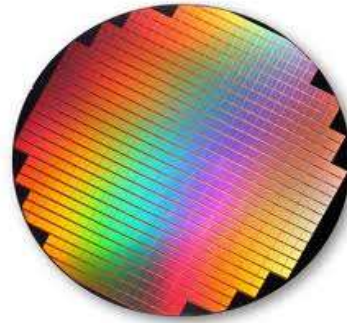


78 Worldwide Customers with World's First Technology



Outstanding Contribution Award	Best Partner Award	Appreciation Plaque	2014 Best Partner Award	Appreciation Plaque	Best Supplier Award	Best Supplier Award	Outstanding Contribution Award	Appreciation plaque	Outstanding Contribution Award	Appreciation Plaque

1. Semiconductor (Core Technologies)



3. Solar Cell



2. Display(LCD & OLED)

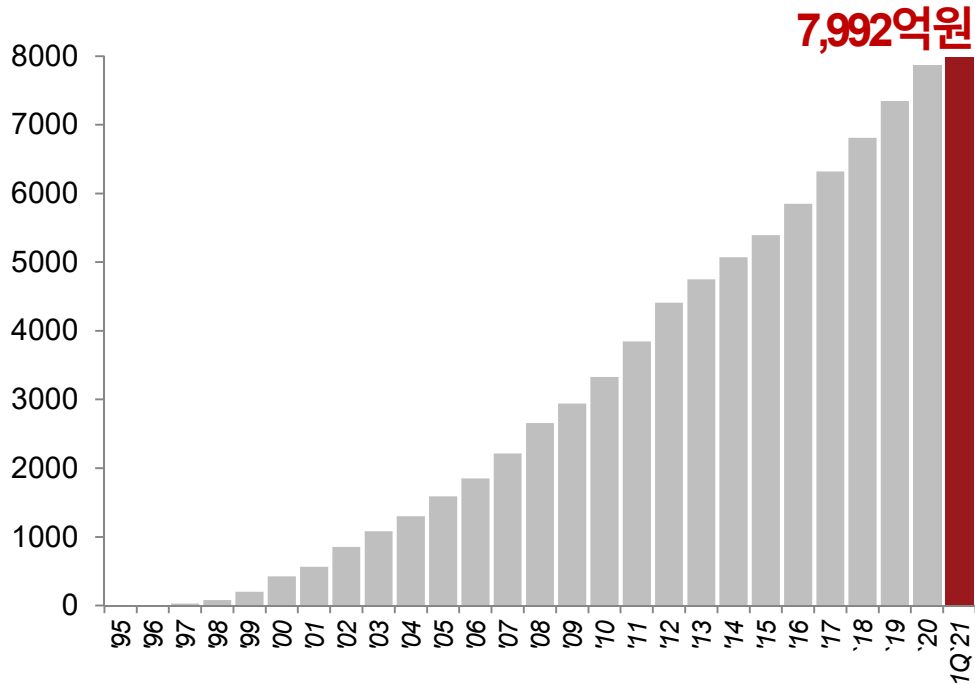


JUSUNG
ENGINEERING

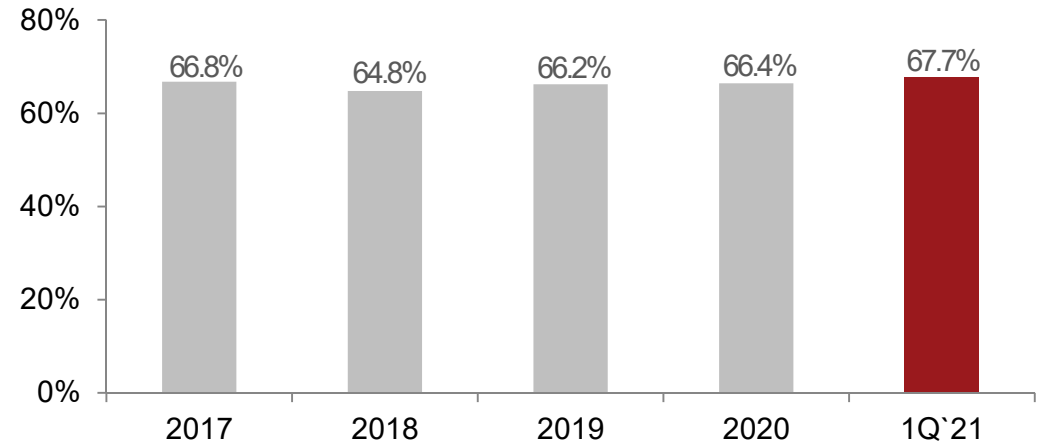
3대 핵심 산업의 융합 기술 경쟁력

4-5. 성장 동력

R&D 투자 금액(누적 합계)



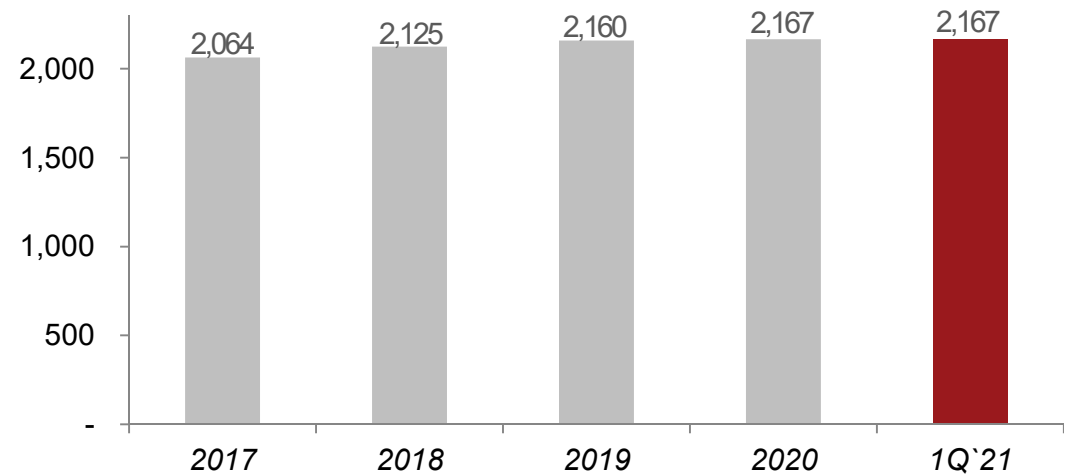
R&D 인원 비율



R&D 투자금액(Infra 비용 포함)

R & D		광주 본사 투자	Total
R&D 투자 (~1Q'21)	용인 R&D Center 건축		
7,992억	1,200억	1,720억	10,912억

주성 특허 수



지속 성장 동력 = 창조적 R&D

4-6-1. 반도체 기술

UHV-CVD & OEC (Warm Wall Type)



MO-CVD



SD-CVD



LSP Technology

SDP-CVD/ALD



TSD-CVD/ALD



TSD-Etcher



ICP Etcher



Future Transistor Tech.

- Si SEG ; Elevated Source Drain
- SiGe, SiC
- a-Si, Poly Si
- **OEC**
(Oxide Elimination Chamber)

- High-K
- Metal

- High-K
- Metal
- ULTO

Defect Free Tech.

- High-K
- Metal
- SiO / SiOC / SiON
- SiN / SiBN
- Oxidation
- Nitridation

Defect Free Tech.

- High-K
- Metal
- SiO / SiOC / SiON
- SiN / SiBN
- Oxidation
- Nitridation

Defect Free Tech.

- DPT Partition Etch
- STI & Gate Etch
- Hard Mask Etch
- Poly Etch Back
- MTJ Etch

Defect Free Tech.

- DPT Partition Etch
- STI & Gate Etch
- Hard Mask Etch
- Poly Etch Back
- MTJ Etch

Hidden Champion → First Mover

4-6-2. 디스플레이 & 조명 기술

LCD



OLED



LED



	a-Si	LTPS	Oxide
G.I	- SiN	- SiN - SiO	- SiN - SiO
Active	- a-Si	- a-Si	- IGZO
ILD		- SiO - SiN	
Passivation	- SiN		- SiN - SiO

	LTPS	Oxide	TSP
Barrier/ Buffer	- SiO/SiON - SiN - AlO/TiO		- Index matching (SiN, SiO, SiON, TiO)
Active	- a-Si - SiO	- IGZO - SiO	- Metal layer (ITO, ZnO, Metal Mesh)
ILD	- SiO - SiN		- ILD (SiN, SiON)
Passivation	- SiN		- Prevent Scratch (AlO)
Encapsulation	- AlO/TiO - SiO / SiON / SiN / SiOX		
Organic	- HIL / HTL / EML / ETL / EIL		

- LED (GaN on Sapphire) (GaN on Si)
- Power Device (GaN on Si) (SiC)

First Mover & Market Developer

4-6-3. 태양광 기술

Thin Film Solar Cell



Turnkey Solution

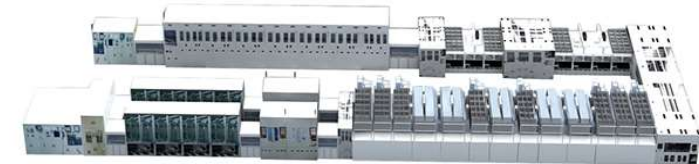
- BIPV
(See Through, Semi Transparency)
- VIPV
- Wearable Solar Cell
(Munition & Civilian)
- DIPV

c-Si Solar Cell



- PE CVD
(SiN, SiO, SiON, AlO)
- RIE
(Plasma Texturing Etching)

High Efficiency Solar Cell



Turnkey Solution

- Hetero Junction Solar Cell
- Bi-facial Cell
- a-Si:H/B,P Doped a-Si:H
- TCO

Technology Developer ➡ **Market Developer**

1

세계 최초 및 유일의 기술과 혁신적인 제품으로 신시장 선도

2

핵심산업 & 1등 기술융합의 경쟁력
(반도체, 디스플레이, 태양광, OLED)

3

주성과 고객의 동반 성공

World **1st** Technology
Only **1** in the World

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Appendix. Glossary of Technical Terms

약어	기술 용어	약어	기술 용어
ALD	Atomic Layer Deposition	PE-CVD	Plasma Enhanced Chemical Vapor Deposition
BIPV	Building Integrated Photovoltaic	RIE	Reactive Ion Etching
CVD	Chemical Vapor Deposition	SD-CVD	Space Divided Chemical Vapor Deposition
ITO	Indium, Tin, Oxide	SDP-CVD	Space Divided Plasma Chemical Vapor Deposition
IGZO-CVD	Indium, Gallium, Zinc, Oxide Chemical Vapor Deposition	SEG	Selective Epitaxial Growth
J-Cell	JUSUNG High Efficiency Cell	TSD-CVD	Time Space Divided Chemical Vapor Deposition
LCD	Liquid Crystal Display	TSD-ALD	Time Space Divided Atomic Layer Deposition
LED	Light Emitting Diodes	TSD-Etcher	Time Space Divided Etcher
LSP	Local Space Plasma	STI	Shallow Trench Isolation
MO-CVD	Metal Organic Chemical Vapor Deposition	TCO	Transparent Conductive Oxide
MTJ Etch	Magnetic Tunnel Junction Etch	TF	Thin Film Solar Cell
OLED	Organic Light Emitting Diodes	TFT	Thin Film Transistor
ULTO	Ultra Low Temperature SiO	TSP	Touch Screen Panel
VIPV	Vehicle Integrated Photovoltaics	UHV-CVD	Ultra High Vacuum Chemical Vapor Deposition
ILD	Inter Layer Dielectric	DPT	Double Patterning Technology
		DIPV	Device Integrated Photovoltaics

■ Yellow Color means JUSUNG's Technical Terminology Made with World's Best & First Technology.