

BUYSEMI

Co.,Ltd.

COMPANY PROFILE

ONE CONTECT, ONE SOLUTION

Quality

반도체 재료에서부터
공정서비스까지, 최상의 제품으로

Price

Target Price에 맞추어,
Reasonable한 가격으로

Time

최소의 시간으로,
최대의 실험결과를 이끌도록

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- PE & LP CVD
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WAFER & MATERIALS

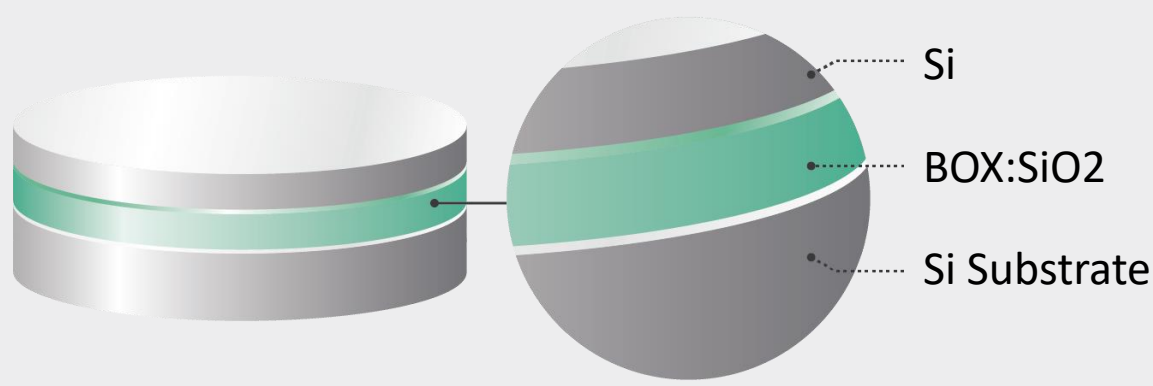
Si Wafer



Size	2" / 3" / 4" / 5" / 6" / 8" / 12"
Type/Dopant	P(Boron) N(Phosphorus, Antimony, Arsenic)
Thickness	Semi Standard & Customized
Orientation	<100> / <110> / <111>
Resistivity	Normal(1-100Ω) Low(<1Ω) High(>1,000Ω)
Surface	Single Side Polished Double Side Polished
Grade	Prime / Test / Dummy
TTV	<15μm

WAFER & MATERIALS

SOI Wafer



Dia	2" / 3" / 4" / 5" / 6" / 8" and Bonded, SIMOX ,Unbonded
Type/Dopant	P(Boron) N(Phosphorus, Antimony, Arsenic) Undoped
Thickness	Depend on Customers
Orientation	<100> / <110> / <111>
Resistance value	Normal (1-100Ω) Low (<1Ω) High (>1,000Ω)
Surface	Single Side Polished Double Side Polished
Application	MEMS, Optical, Power Devices, Switches etc.

WAFER & MATERIALS

Reclaim Wafer



What's the Reclaim wafer?

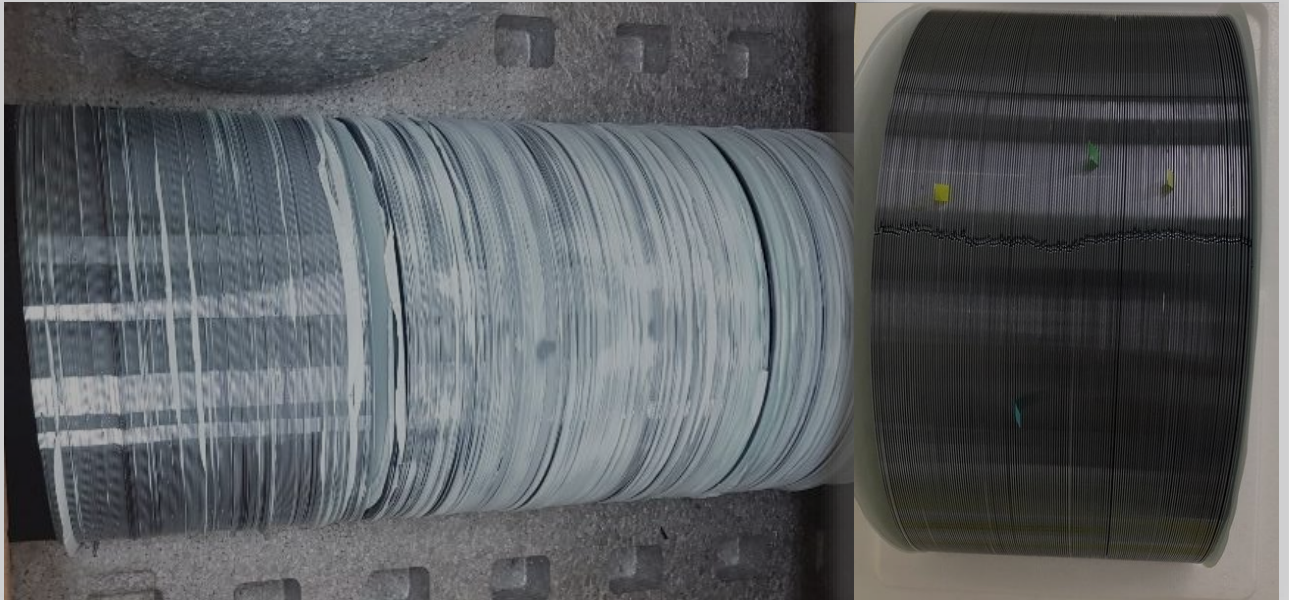
Reclaim wafer means that the thin film on the Surface of the wafer used in the semiconductor process is reproduced into the original Bare state through the special process.



We do not go through all the processes alone, but share experience and information with various business partners, produce them in OEM manufacturing and give you wafer delivery in advance.

WAFER & MATERIALS

Coinroll Wafer



- 4" ~ 12" wafers are available.
- Provides low-cost wafers such as Bare Si, Depoed Si wafers, GOI, Epi, Etched, Lapped, Grinded and etc.
- Can be ordered and delivered by Decap / Polishing process.
- Wafer inspection is available according to customer request.

WAFER & MATERIALS

Glass Wafer

Size	2" / 3" / 4" / 5" / 6" / 8" and Square shape (8" : Flat or Notch)
Type	Sodalime / EagleXG / Borofloat33 / B270 and etc.
Thickness	0.7T (Standard in Sodalime, Display) 0.5T (Standard in EagleXG)
Surface Condition	Single Side Polished Double Side Polished
Grade	UV Grade
Flat	1 Flat, 2Flat, Notch and Round (Depend on Customers)

Quartz Wafer

Size	2" / 3" / 4" / 5" / 6" / 8" and Square Type (ex : 10mm*10mm)
Thickness	0.5T, 1.0T etc.
Surface	Double Side Polished
Grade	UV Grade
Flat	Round 1 Flat 2 Flat

WAFER & MATERIALS

GaAs Wafer

Size	2" / 3" / 4"
Type	SC(Semi Conductor) SI(Semi Insulator)
Surface	Single Side Polished, Double side Polished
Orientation	<100> / <110> / etc.

Sapphire Wafer

Size	2" / 4" / 6"
Thickness	430 / 650 / 1,300um
Crystal Direction	C / A / M / R Plane
Surface Ra	Front <0.2nm Back 0.7~1.1um
TTV	<5um
Surface	Single Side Polished Double Side Polished

*We can process 2", 6" PSS(Patterned Sapphire Substrate) With Sapphire wafer.

WAFER & MATERIALS

Pattern Mask

*Cr Mask

Size	5*5", 7*7", etc.
Substrate	Sodalime, Quartz
Cr Thickness	1,000A

*Film Mask

Material	Polyester
Substrate Thickness	175um
Emulsion	Silver halide
Expansion rate	$1 \times 10^{-3}\%/^{\circ}\text{C}$
Mask size	100 ~ 800 mm
Min line width	0.4mil(10um)
Long size accuracy	$\pm(10 + 0.1L)\text{um}$
Resolution	5,000 ~ 40,000 DPI

*Please fill out the drawing using the program (AutoCAD or ppt).

WAFER & MATERIALS

Pattern Mask

* Shadow Mask

Material	SUS 304
SUS Thickness	>50um
Size	2''~
Min line width	100um

*FCG Mask

Material	Polyester
Substrate Thickness	5um
Emulsion	Silver past
Emulsion thickness	5~7um
Expansion rate	$1 \times 10^{-3}\%/C$
Mask size	5''~10''
Min line width	0.4mil(10um)
Long size accuracy	$\pm(10 + 0.1L)um$
Resolution	25,000 ~ 40,000 DPI

WAFER & MATERIALS

Film

PET(Polyester) Film

PEN Film

PI(Polyimide) Film

We can supply all kinds of film Etc.

Sputter Target & Source

We supply Pure Metal Target, Alloy Target and Oxide Target.

Provide customers with Anoxic copper Cu backing Plate at low price to meet various sputter systems used by customers and

Indium Metallic Bonding and Silver Epoxy Bonding services.

In addition,

We deal with high purity metal materials, oxide and optical coating materials.

There are detailed table *Pure Metal Target next page.



WAFER & MATERIALS

*Pure Metal Target

Material	Formula	Standard Purities, %	Theoretical Density, g/cm^3	Melting Point, °C	Fabrication Method*	Applications
Aluminum	Al	99.999 99.99	2.70	660	1	Conductive film in IC's. High reflectivity front surface mirrors and reflectors on glass. In oxidized form, interference filters.
Antimony	Sb	99.999 99.5	6.62	630.5	1 & 2	Semiconducting films.
Bismuth	Bi	99.999 99.5	9.80	271.3	1 & 2	Ferromagnetic and resistive thin films.
Boron	B	99.5 90-92 94-96	2.34	2030	2	Semiconductor, Diffusion layer.
Cadmium	Cd	99.999 95.5	8.65	320.9	1 & 2	Dielectric thin film. For metallizing paper, etc.
Chromium	Cr	99.95 99.8+	7.19	1875	1,2 & 3	Excellent adhering film on numerous substrates. Deposit on glass for printed circuit base. Co-deposit with SiO for resistor films.

WAFER & MATERIALS

Material	Formula	Standard Purities, %	Theoretical Density, g/cm^3	Melting Point, °C	Fabrication Method*	Applications
Cobalt	Co	99.9	8.90	1495	1 & 2	Ferromagnetic thin films.
Copper	Cu	99.999 99.99	8.96	1083	1	Junction Films in integrated circuits. Contacts.
Germanium	Ge	99.9999 99.999	5.32	937.4	1	High index film in infrared filters.
Gold	Au	99.999 99.99	19.30	1063	1	Contacts. Highly reflecting films.
Graphite	C	99.9 99.5	2.26	3727	2	Lubricant film. Semiconductor applications.
Hafnium	Hf	99.9 (excl. Zr)	13.10	2222	1	Dielectric. Interference layers.
Indium	In	99.999 99.99	7.31	156.2	1	Superconducting films. Transistor contacts, diodes.
Iron	Fe	99.9	7.86	1536	1 & 2	Magnetic and memory elements. Ferromagnetic thin films.
Lead	Pb	99.999	11.40	327.4	1	Semiconducting films. Cryogenic applications.

WAFER & MATERIALS

Material	Formula	Standard Purities, %	Theoretical Density, g/cm^3	Melting Point, °C	Fabrication Method*	Applications
Magnesium	Mg	99.999 99.9	11.40	651	1	Diffusion with bismuth on glass to form ferromagnetic films.
Manganese	Mh	99.95	1.74	1245	1	Contacts for semiconductors Adherence film.
Molybdenum	Mb	99.95	7.43	2610	2	Contacts. Hard, Smooth film. Multilayer circuits.
Nickel	Ni	99.995 99.9 99.97 99.9	8.90	1453	2	Ferromagnetic films. Memory elements.
Niobium	Nb	99.9+	8.40	2468	1	Anodic films for rectification.
Palladium	Pd	99.95 99.9	12.00	1552	1 & 2	Corrosion resistant contacts.
Platinum	Pt	99.95 99.9	21.45	1769	1	Corrosion resistant contacts. Co-deposit with Si.
Rare Earth		99.9 (excl. Ta)	varies	varies	1	Misc. applications.
Rhenium	Re	99.99	20.53	3180	2	Contacts.
Ruthenium	Ru	99.9	12.20	2500	2	Corrosion resistant contacts.

WAFER & MATERIALS

Material	Formula	Standard Purities, %	Theoretical Density, g/cm^3	Melting Point, °C	Fabrication Method*	Applications
Selenium	Se	99.999	4.50	220	1	Photoconductive and rectifier films.
Silicon	Si	99.999	2.33	1410	1	Mechanical and chemical resistant coating. Interference filter.
Silver	Ag	99.99	10.50	960.8	1	Reflective film. Conductive contact. Bonding layer.
Tantalum	Ta	99.95	16.60	2996	1	Thin film capacitor and resistors.
Tellurium	Te	99.99 99.95 99.5	6.25	452	2	Blocking contact in thin film devices.
Tin	Sn	99.999	7.30	231.9	1	Cyrogenic switching devices.
Tungsten	W	99.95	19.30	3410	2	Contacts. Hard, adherent films.
Vanadium	V	99.5-99.7	5.96	1900	1 & 2	Co-evaporate with SiO for resistor films.
Zinc	Zn	99.999 99.9	7.14	419.5	1	Capacitor dielectric films. For metalizing paper, etc.
Zirconium	Zr	99.9 (Excl. Hf)	6.49	1852	1	Interference filter. On tungsten field emitters to alter emission characteristics.

WAFER & MATERIALS

Etc.

- LN wafer
- LT wafer
- Solar wafer
- Ceramics wafer
- MgO, STO and We can provide all other single crystal substrates.

PROCESS

Etching & Patterning



Size	4" ~ 8" and 12"
Type	Wet Etching Dry Etching
Mask CD	>1um
Mask size	5*5" / 7*7", etc.
Exposing	Light source with CD resolution >1um
Etching Material	Metal / SiO2
Dry etching Thickness	500A ~ 2um
Dry etching Plasma source	MICP
GAS	Cl2, BCl3, SF6, CF4, N2, O2, Ar, He and etc.

Bonding

SOI (Si-Si Wafer Bonding)
SOG (Si-Glass Wafer Bonding)
Etc.

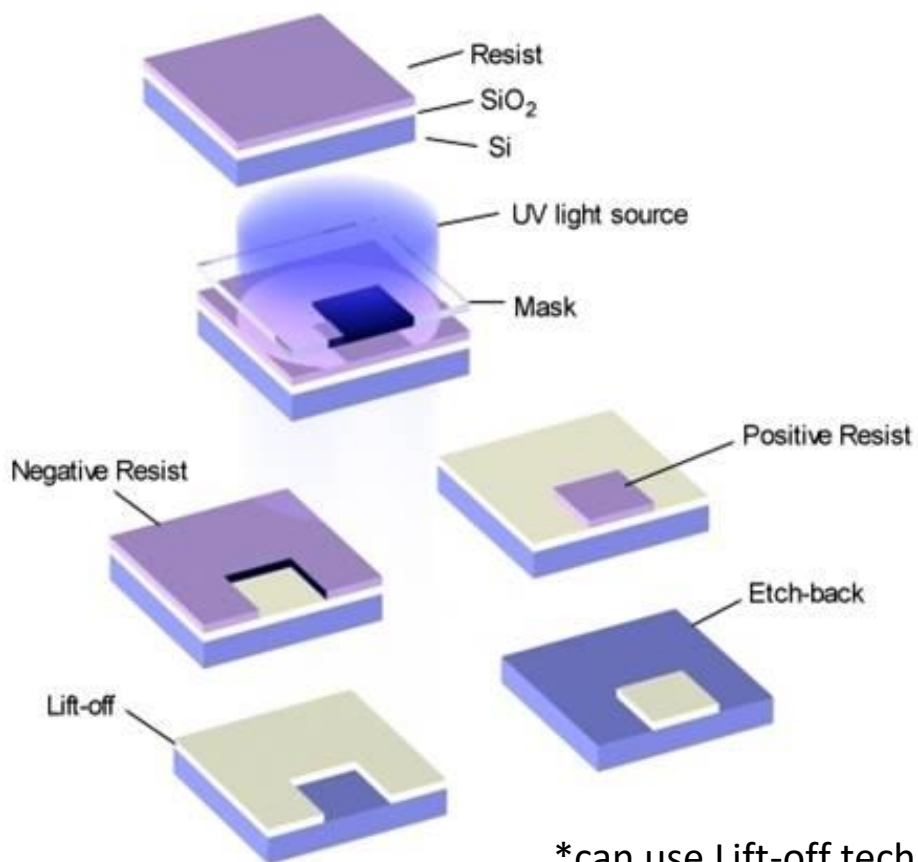


PROCESS

Etching & Patterning

*Patterning process

Deposition(Sputtering, CVD) → PR Coating(Positive, Negative) → Exposure → Developing → Etching(Wet, Dry) → PR Strip



*Preparations for requesting the patterning process

- Process Flow Chart
- Patterning Mask (Mask is productionable)
- Types of metal to be deposited and Thickness
- CD Width : > 1um
- Deep Si etching OR Glass Etching is available

PROCESS

CMP & Dicing Sending



*CMP

Substrate	Si, Glass, Quartz, Sapphire, MgO, Al ₂ O ₃ and etc.
Materials	Si, SiO ₂ , Poly Silicon, Metal(Ni, Cu, Al, Au) and etc.
Specification	Step Tolerance among Hetero-structures : Min<1000Å TTV : ±1um

*Micro-sanding

Materials	4" ~ 6" Glass, Quartz, Silicon
Specification	Min 100um Side angle : 75 ~ 80°

*DFR Process

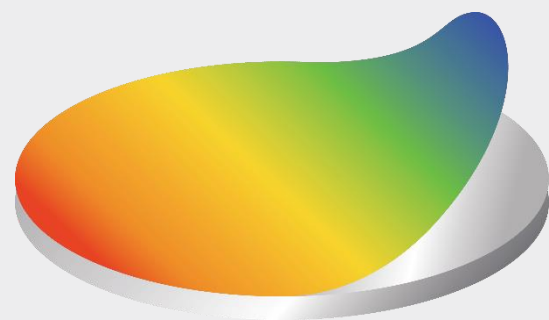
Materials	50, 100um thick DFR
Specification	Min : 100um Line width

*Dicing/Sawing Process

Materials	Si, Glass, Quartz, SOI, SOG, Ceramic and etc.
Tolerance	±5um, Back Side Chipping <30um

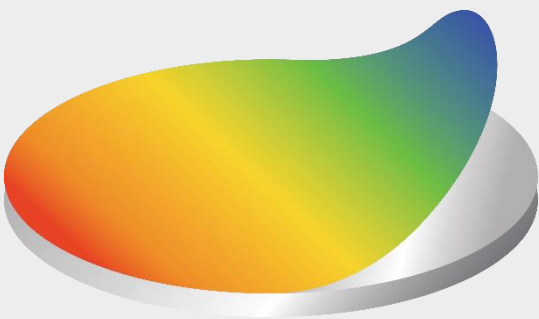
PROCESS

Thermal Oxidation



Substrate	Si
Size	2" ~ 12"
Min order	25 sheets
Uniformity	±3% ±7% for 2" or 3" substrate
Method of growth	Wet Dry
Thickness of SiO2	Wet : 2,000A ~ tens of um Dry : 40A ~ 3,000A

Metal Deposition



Process	DC/RF Sputtering e_Beam Evaporation
Uniformity	4" Sputtering : 3% Evaporation : 5% 6" Sputtering : 7% Evaporation : 10%
Size	2" ~ 12"
Metal (4" ~ 12")	Pt, Au, Ni, Cu, Ni+Cr, 1%Si+Al, W, Cr, Ti, Si, Ag, Al, TiO2, ITO, IZO, SiO2, TiN, TaN, Mo+1%W etc.
Process Flow Chart	Wafer appearance check Clean before process Metal Deposition Taping Test Air Zero Packing

PROCESS

CVD

SiO₂ and Si₃N₄ Deposition by LPCVD or PECVD (1,000Å~)

*PECVD

Substrate	Si, Glass, Quartz and All kinds of etc.
Min order	4 sheets
Uniformity	±5%

*LPCVD

Substrate	2" ~ 12" Si wafer
Min order	25 sheets
Uniformity	±5%
Si ₃ N ₄ Low stress	100-200Mpa

*TEOS

Substrate	4" ~ 12" Si wafer
Min order	25 sheets
Uniformity	±5%
Thickness of SiO ₂	1,000Å ~ 2µm

Quartz & Glass Etching (Micro Lens Array 제작)

Silicon Deep Etching

PROCESS

Si wafer process

Thickness control	CMP (2" ~ 12") Minimum processable thickness >80um
TTV control	TTV manufactured from general maker is <15um, But can work up to $\pm 1\mu\text{m}$ through CMP process.
Size control	Customize through Dicing process : 5*5, 10*10 and etc.
Si Oxide Deposition(SiO₂)	Thermal Oxidation (2" ~ 12", 200A ~ Tens of um) PECVD (2" ~ 12") RF&DC Sputtering (2" ~ 12") : All Kinds of metals
Si₃N₄ Deposition	LPCVD (2" ~ 12") Low stress : 660Mpa Thickness : 1,000A ~ 2um
Metal Deposition	RF&DC Sputtering (2" ~ 12") Evaporation (2" ~ 12")
Patterning	Dry Etching Deep Si Etching Lift off (4", 6", 8" and 12")
Bonding	SOI Wafer SOG (Silicon On Glass)
Sandblaster	Hole & Step Make (4" or 6")

PROCESS

SOI wafer process

Size control	Customize through Dicing process : 5*5, 10*10 and etc.
Si Oxide Deposition(SiO2)	Thermal Oxidation (200A ~ Tens of um) PECVD RF&DC Sputtering : All Kinds of metals
Metal Deposition	RF&DC Sputtering Evaporation
Si3N4 Deposition	LPCVD Standard Si3N4 Low stress Thickness : 1,000A ~ 2um
Patterning	Dry Etching Deep Si Etching Lift off

PROCESS

Glass wafer process

Thickness control	CMP (2" ~ 12") Minimum processable thickness >80um
TTV control	TTV manufactured from general maker is <10um, But can work up to ±1um through CMP process.
Size control	Customize through Dicing process : 5*5, 10*10 and etc.
Si Oxide Deposition(SiO2)	PECVD (2" ~ 12") RF&DC Sputtering (2" ~ 12") : All Kinds of metals
Metal Deposition	RF&DC Sputtering (2" ~ 12") Evaporation (2" ~ 12")
Patterning	Dry Etching Lift off (2" ~ 12")
Bonding	SOG(Silicon On Glass)
Sandblaster	Hole & Step Make(4" or 6")

PROCESS

Quartz wafer process

Thickness control	CMP (2" ~ 12") Minimum processable thickness >80um
TTV control	TTV manufactured from general maker is <10um, But can work up to ±1um through CMP process.
Size control	Customize through Dicing process : 5*5, 10*10 and etc.
Si Oxide Deposition(SiO2)	PECVD (2" ~ 12") RF&DC Sputtering (2" ~ 12") : All Kinds of metals
Metal Deposition	RF&DC Sputtering(2" ~ 12") Evaporation (4", 6", 8")
Si3N4 Deposition	LPCVD (4", 6", 8") Low stress Thickness : 1,000A ~ 2um
Patterning	Dry Etching Lift off (2" ~ 12")
Sandblaster	Hole & Step Make (4" or 6")

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