



Chroma

2022.4Q Earnings Conference

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23rd February, 2023

Disclaimer

This presentation contains some forward-looking statements that are subject to substantial risks and uncertainties. Typically, these statements contain words such as “anticipate”, “believe”, “could”, “estimate”, “expect”, “intend”, “plan”, “forecast”, “project”, “predict”, “potential”, “continue”, “may”, “should”, “will”, and “would” or similar words. You should consider these forward-looking statements carefully because such statements are only our expectations or projections about future events, and actual results may differ materially from those expressed or implied by such statements. The forward-looking statements in this presentation include, but are not limited to, growth rates for various markets estimated by third party sources, future products and technology development, widespread market acceptance of the hosted delivery model, future revenue growth and profitability. You should be cautioned that the forward-looking statements are no guarantee of our future performance. The forward-looking statements contained in this presentation are made only as of the date of this presentation and we undertake no obligation to update the forward-looking statements to reflect subsequent events or circumstances, except as required by law.

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- **Corporate Profile**
- **Financial Review**
- **Operation Highlights**
- **Q&A**

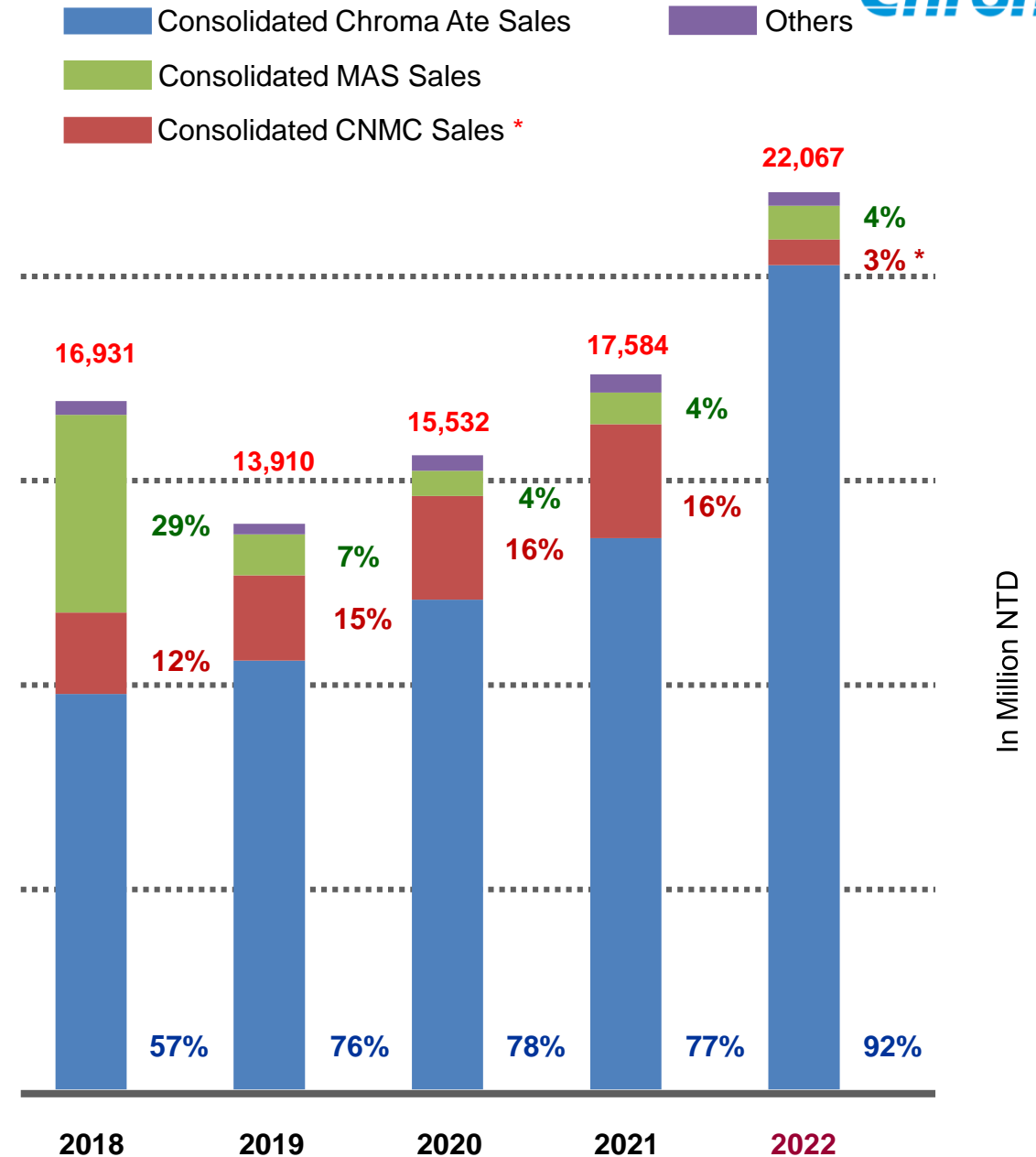
**CORPORATE
PROFILE**



Corporate Profile

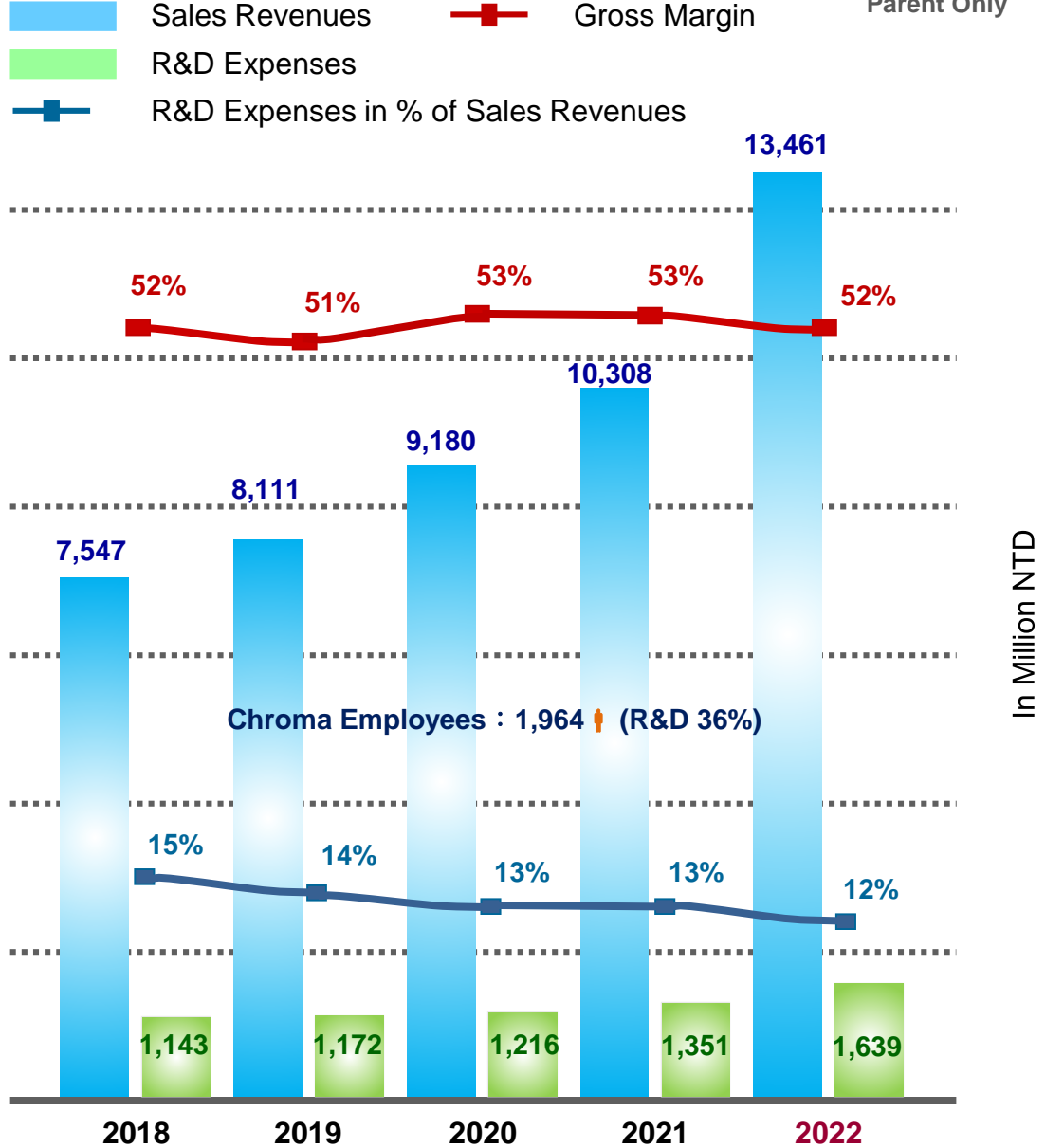
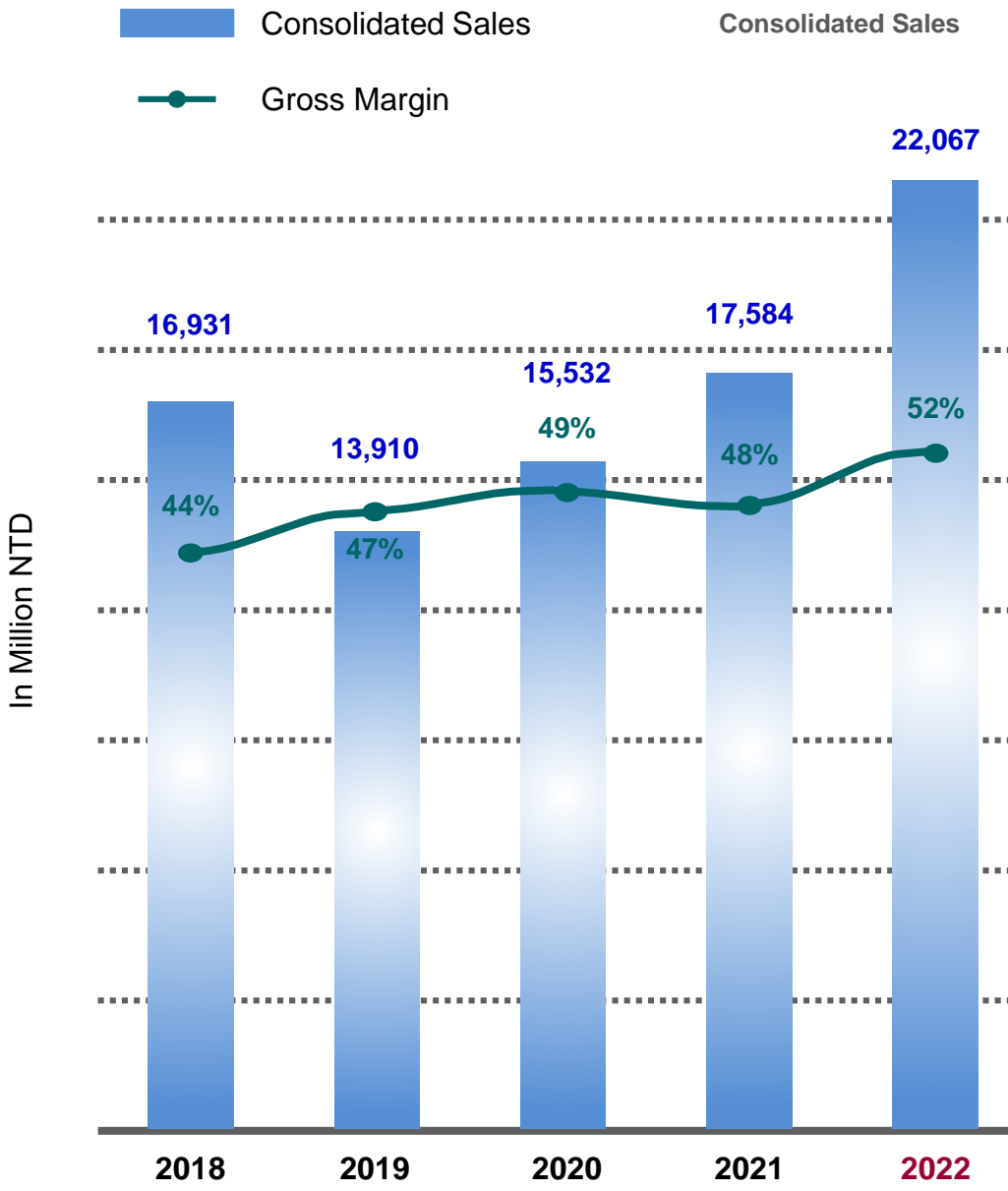


- Chroma Group founded in 1984, a world leading own brand and design of high precision test & measurement instruments, automated test systems, intelligent manufacturing systems and test & automation turnkey solutions provider. Businesses cover test and measurement instruments and ATS for electronics, ICT and cleantech various industries.
- Key success: Precision, Reliability, Innovation
- Chroma group consolidated business units of Chroma Ate Inc., Modular Assembly System (MAS).
- 2022 Consolidated Sales : NT\$ 22.1 billion
- 2022 Net Income: NT\$ 5.1 billion
- Chroma Group total of 3,379 employees (as of December, 2022)



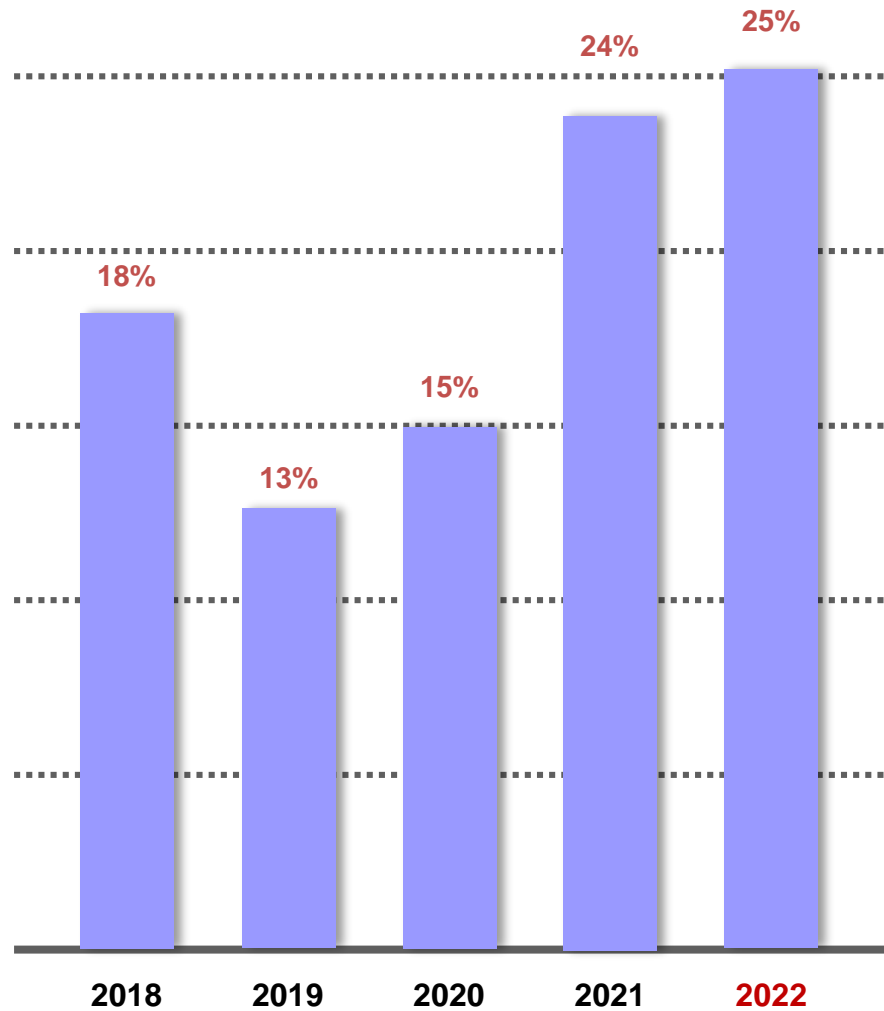
* Chroma New Material Corp. discontinued operation at end of March, 2022.

Financial Performance

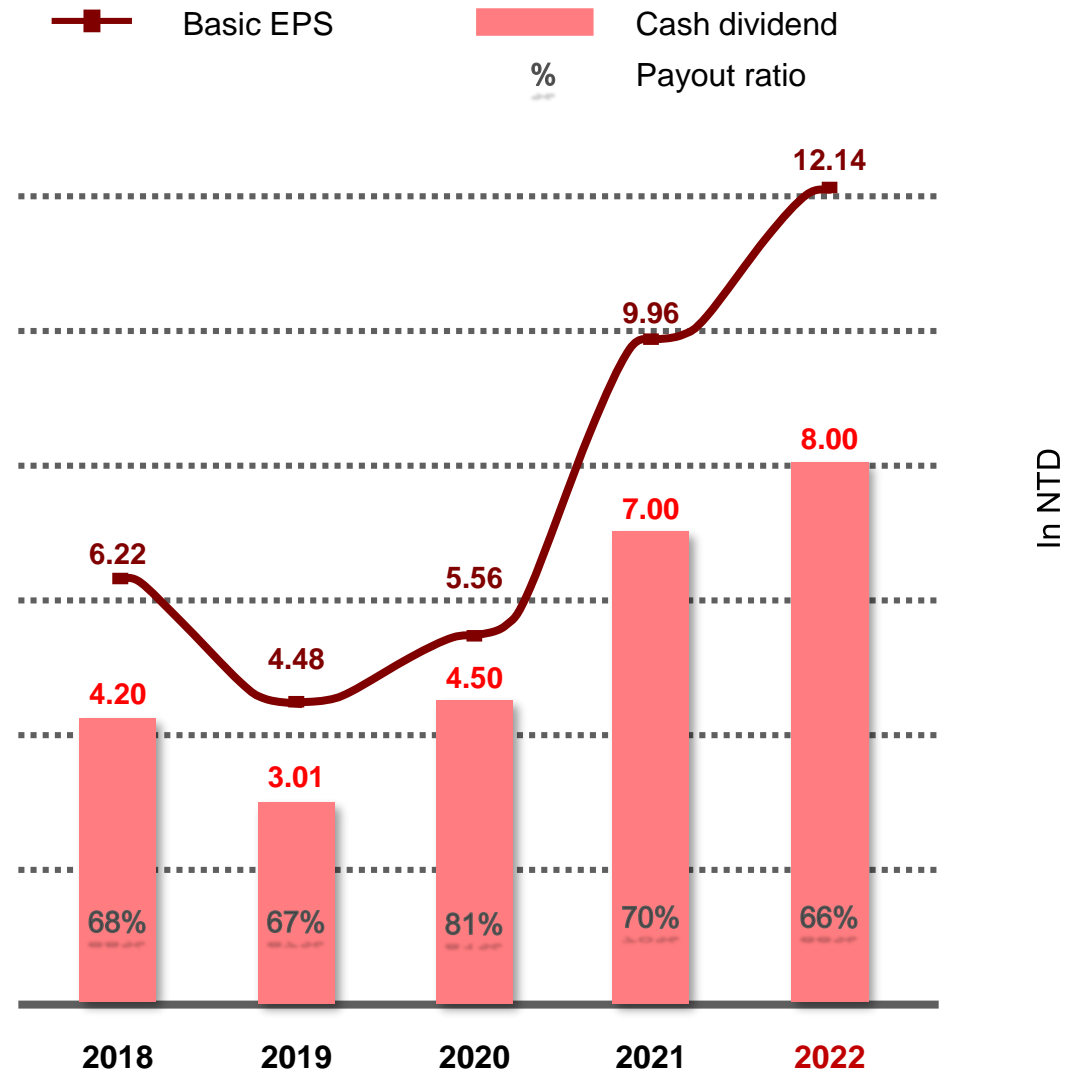


Financial Performance

ROE



Dividend



Global Operation Sites

52

Operation Sites

109

Distributors



1999
Netherlands:
Ede



2017
Germany:
Augsburg



2008
Japan:
Shin-Yokohama/
Osaka



2018
Korea:
Pangyo



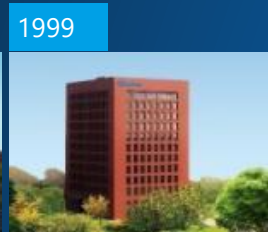
1993
United States:
Irvine, CA
Milpitas, CA
Redmond, WA
Chandler, AZ
Austin, TX
Sherman, TX
Allentown, PA
Albany, NY



2001
United States:
Foothill Ranch, CA
Marlborough, MA
Detroit, MI
Mexico :
Ciudad Juarez
Brazil :
Porto Alegre



1998
China/ Shenzhen



1999
China/ Beijing



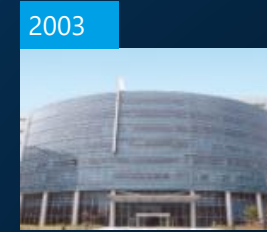
2000
China/ Shanghai



2001
China/ Dongguan



Taiwan: Taoyuan (Headquarters)



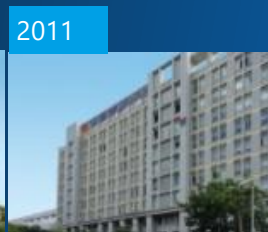
2003
Taiwan: Hsinchu



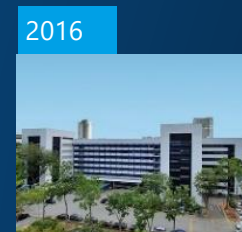
2009
Taiwan: Kaohsiung



2006
China/ Suzhou



2011
China/ Xiamen



2016
Quantel : Singapore

Others:

India: New Delhi/ Mumbai/ Bangalore/Pune

Thailand: Bangkok

Vietnam: Hanoi/ Ho Chi Minh

Malaysia: Kuala Lumpur/ Penang

Philippines: Manila/ Cebu

Indonesia: Jakarta

Others: Qingdao/ Zhengzhou/ Xian/Hefei/ Chengdu/ Wuhan/ Hangzhou/ Changsha/ Hong Kong

FINANCIAL REVIEW



Year 2022 Condensed Consolidated Income Statement



Condensed Consolidated P&L

(In Million NTD, except for EPS in NTD)

	2022	%	2021	%	YoY %
Net Sales	22,067	100%	17,584	100%	25%
Consolidated Sales of Testing Equipment Business	20,269	92%	13,555	77%	50%
Consolidated Sales of MAS	830	4%	780	4%	6%
Consolidated Sales of New Material	635	3%	2,804	16%	(77%)
Others	333	1%	445	3%	(25%)
Cost of Goods Sold	(10,710)	(48%)	(9,134)	(52%)	17%
Gross Profit	11,357	52%	8,450	48%	34%
Operating Expenses:					
General & Administration	(4,401)	(20%)	(3,864)	(22%)	14%
Research & Development	(1,917)	(9%)	(1,511)	(9%)	27%
Operating Income	5,039	23%	3,075	17%	64%
Non-Operating Income (Expenses), net	1,402	6%	2,209	13%	(37%)
Income (Loss) Before Tax	6,441	29%	5,284	30%	22%
Income Tax	(1,219)	(5%)	(979)	(6%)	25%
Net Income	5,222	24%	4,305	24%	21%
Other Comprehensive Income (Losses)	489	2%	106	1%	n/a
Comprehensive Income	\$ 5,711	26%	\$ 4,411	25%	29%
Net Income (Losses) Attributable To:					
Shareholders of the Parent	5,106	23%	4,179	24%	22%
Noncontrolling Interests	116	1%	126	1%	(8%)
	\$ 5,222	24%	\$ 4,305	25%	21%
EPS (Basic)	\$ 12.14		\$ 9.96		22%
EPS (Diluted)	\$ 12.00		\$ 9.89		21%

Year 2022.4Q Condensed Consolidated Income Statement



Condensed Consolidated P&L

(In Million NTD, except for EPS in NTD)

	2022.4Q	%	2022.3Q	%	QoQ %	2021.4Q	%	YoY %
Net Sales	6,074	100%	6,660	100%	(9%)	4,589	100%	32%
Consolidated Sales of Testing Equipment Business	5,810	96%	6,341	95%	(8%)	3,535	77%	64%
Consolidated Sales of MAS	188	3%	233	4%	(19%)	271	6%	(31%)
Consolidated Sales of New Material	0	0%	0	0%	n/a	665	14%	n/a
Others	76	1%	86	1%	(12%)	118	3%	(36%)
Cost of Goods Sold	(3,300)	(54%)	(3,163)	(47%)	4%	(2,456)	(54%)	34%
Gross Profit	2,774	46%	3,497	53%	(21%)	2,133	46%	30%
Operating Expenses:								
General & Administration	(1,170)	(19%)	(1,192)	(18%)	(2%)	(994)	(21%)	18%
Research & Development	(549)	(10%)	(524)	(8%)	5%	(408)	(9%)	35%
Operating Income	1,055	17%	1,781	27%	(41%)	731	16%	44%
Non-Operating Income (Expenses), net	65	1%	475	7%	(86%)	163	3%	(60%)
Income (Loss) Before Tax	1,120	18%	2,256	34%	(50%)	894	19%	25%
Income Tax	(206)	(3%)	(491)	(7%)	(58%)	(179)	(3%)	15%
Net Income	914	15%	1,765	27%	(48%)	715	16%	28%
Other Comprehensive Income (Losses)	(190)	(3%)	229	3%	n/a	69	1%	n/a
Comprehensive Income	\$ 724	12%	\$ 1,994	30%	(64%)	\$ 784	17%	(8%)
Net Income (Losses) Attributable To:								
Shareholders of the Parent	863	14%	1,731	26%	(50%)	658	15%	31%
Noncontrolling Interests	51	1%	34	1%	50%	57	1%	(11%)
	\$ 914	15%	\$ 1,765	27%	(48%)	\$ 715	16%	28%
EPS (Basic)	\$ 2.05		\$ 4.11		(50%)	\$ 1.57		31%
EPS (Diluted)	\$ 2.00		\$ 4.07		(51%)	\$ 1.55		29%

Balance Sheet Highlights & Financial Ratio

<u>Consolidated</u> (In Million NTD)	<u>2022. Dec</u>	<u>2021. Dec</u>	<u>+ / - %</u>
Balance Sheet Highlights			
Cash & Short Term Investments	6,685	4,765	40%
Inventory	4,753	3,916	21%
Short Term Debt	2,024	2,114	- 4%
Long Term Debt	1,165	1,447	- 19%
Shareholders Equity	21,873	18,947	15%
Total Assets	33,828	29,546	14%
Inventory Turnover (Day)	148	139	
AR Turnover (Day)	72	98	
AP Turnover (Day)	101	114	
Net Debt to Equity (%)	Net Cash	Net Cash	
ROE (%) ●	25%	24%	
ROA (%) ●	16%	15%	

Cash Position	<u>2022</u>	<u>2021</u>	YoY
EBITDA	7,180	5,923	21%
Cash Flow from Operation	5,297	2,592	104%
Free Cash Flow ●●	6,198	4,329	43%

● All ROE + ROA has been annualized.

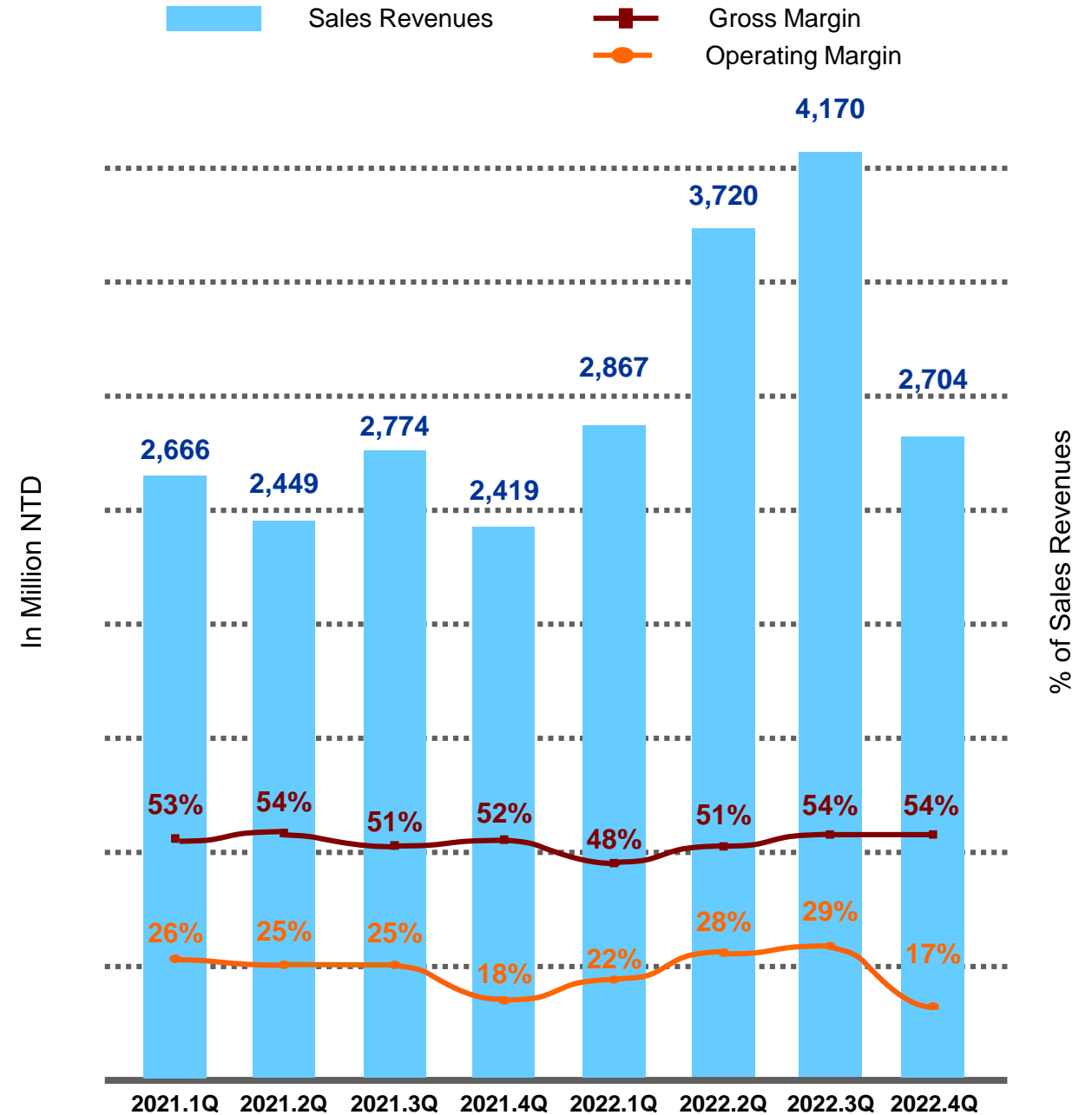
●● Free Cash Flow = Net Cash Provided by Operating Activities + (Net Cash used by Investing Activities)

Quarterly Highlights



2022.4Q Key Points

- Sales Revenue: \$ 2,704 million, down 35% QoQ, up 12% YoY
- Gross Margin: 54%
- Operating Margin: 17%
- Net Income: NT\$ 863 million, down 50% QoQ, up 31% YoY
- 2022.4Q Highlights:
 - The fourth quarter sales revenues were mainly contributed from Test Instruments & ATS, which presented a growth of 24% YoY.



Year 2022 Condensed Income Statement

Condensed P&L – Parent Only (In Million NTD, except for EPS in NTD)	<u>2022</u>	<u>%</u>	<u>2021</u>	<u>%</u>	<u>YoY</u>
					<u>%</u>
Net Sales	13,461	100%	10,308	100%	31%
Cost of Goods Sold	(6,468)	(48%)	(4,890)	(47%)	32%
Gross Profit	6,993	52%	5,418	53%	29%
Operating Expenses:					
Selling and General & Administration	(2,013)	(15%)	(1,621)	(16%)	24%
Research & Development	(1,639)	(12%)	(1,351)	(13%)	21%
Operating Income	3,341	25%	2,446	24%	37%
Non-Operating Income (Expenses), net	● 2,559	19%	2,499	24%	2%
Income (Loss) Before Tax	5,900	44%	4,945	48%	19%
Income Tax	(794)	(6%)	(766)	(7%)	4%
Net Income	\$ 5,106	38%	\$ 4,179	41%	22%
Other Comprehensive Income	458	3%	115	1%	298%
Comprehensive Income	\$ 5,564	41%	\$ 4,294	42%	30%
EPS (Basic)	\$ 12.14		\$ 9.96		22%
EPS (Diluted)	\$ 12.00		\$ 9.89		21%

● 100% owned subsidiaries' income - MAS: NTD 411m.

Balance Sheet Highlights & Financial Ratio

Parent Only (In Million NTD)

Balance Sheet Highlights

	<u>2022. Dec</u>	<u>2021. Dec</u>	+ / - %
Cash & Short Term Investment	2,929	1,274	30%
Inventory	3,370	2,989	13%
Short Term Debt	1,500	1,400	7%
Long Term Debt	950	1,250	- 24%
Shareholders Equity	21,361	18,514	15%
Total Assets	29,233	25,369	15%
Inventory Turnover (Day)	179	199	
AR Turnover (Day)	79	89	
AP Turnover (Day)	85	95	
Net Debt to Equity (%)	Net Cash	8%	
ROE (%) ●	26%	24%	
ROA (%) ●	19%	17%	

Cash Position

	<u>2022</u>	<u>2021</u>	<u>YoY</u>
EBITDA	6,396	5,342	20%
Cash Flow from Operation	3,591	2,030	77%
Free Cash Flow ●●	4,941	4,357	13%

● All ROE + ROA has been annualized.

●● Free Cash Flow = Net Cash Provided by Operating Activities + (Net Cash used by Investing Activities)

**OPERATION
HIGHLIGHT**



2022.4Q & Annual Product Mix and Consolidated Sales Breakdown

(Unit: Million NTD)

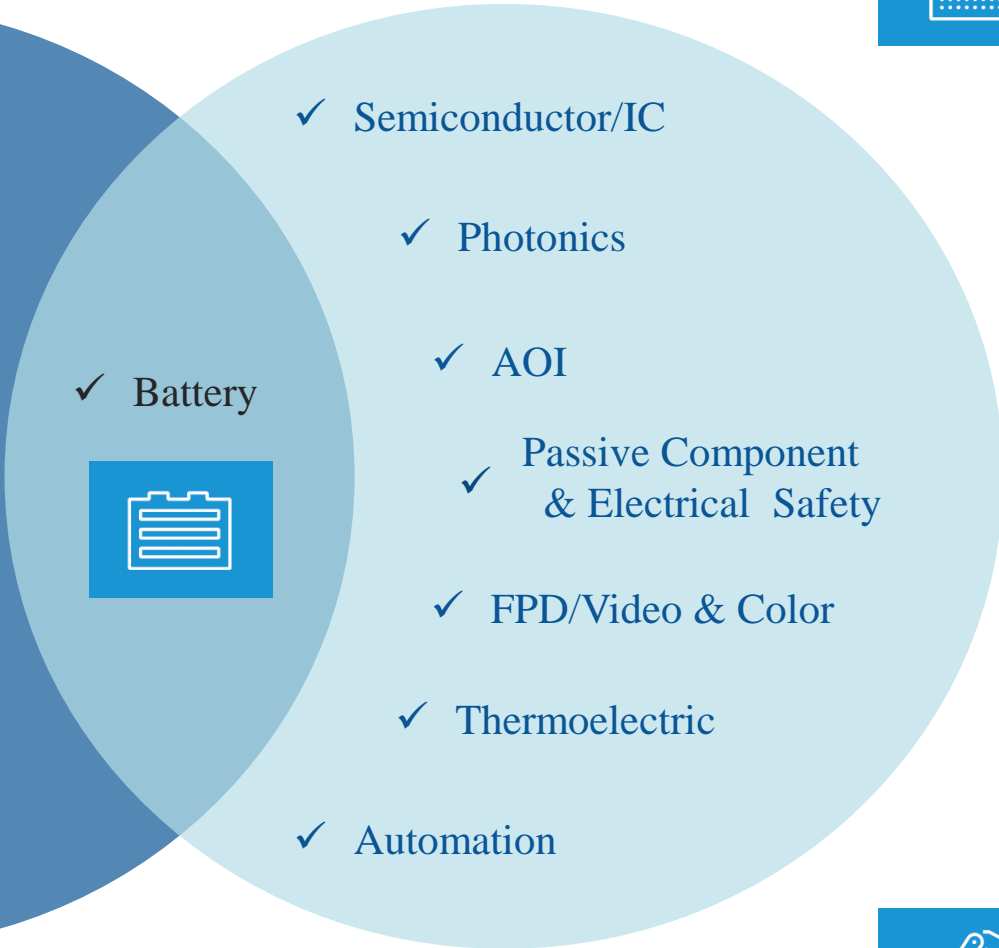
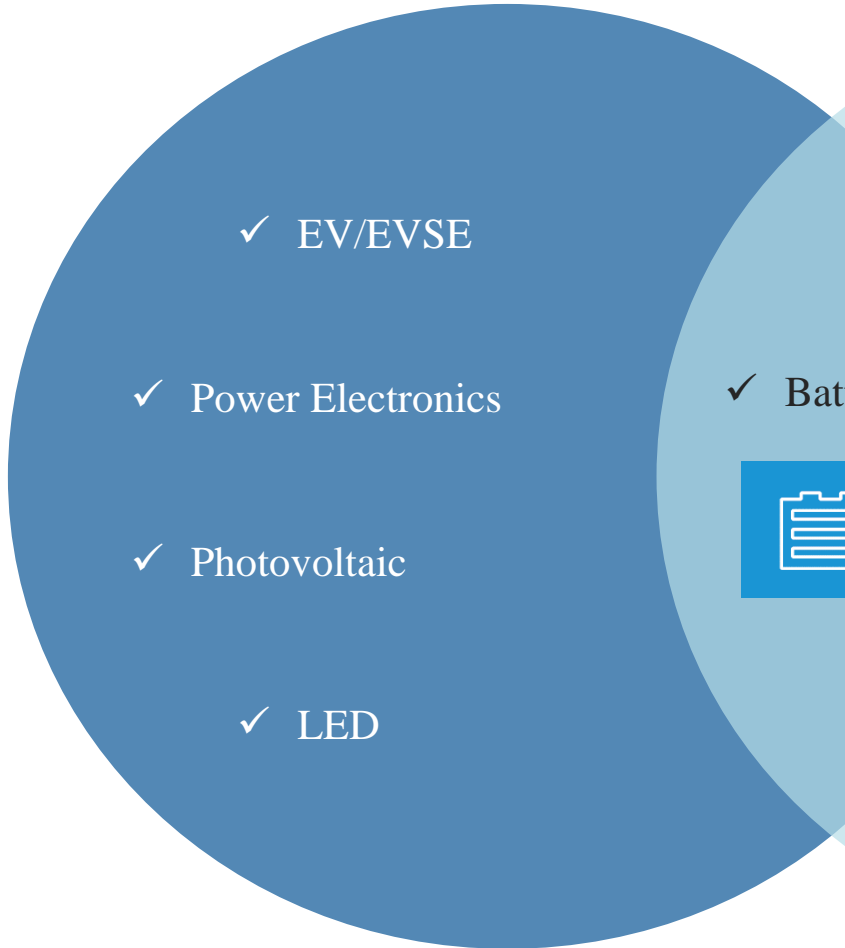
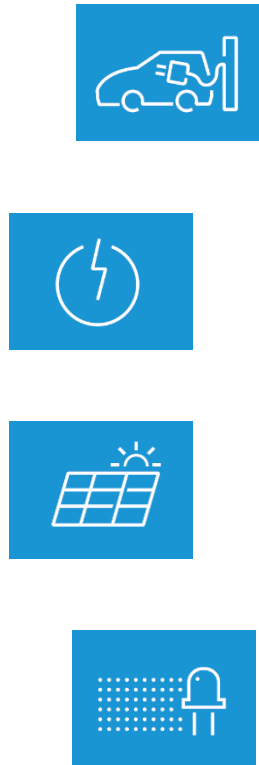
	2022.4Q	%	QoQ	YoY	2022	%	YoY	2021	%
Test Instruments & Automatic Testing System (ATS)	1,846	68%	(9%)	24%	7,052	52%	27%	5,531	54%
Semiconductor / Photonics Test Solutions	541	20%	(67%)	(34%)	4,523	34%	26%	3,589	35%
Turnkey Solutions	65	3%	10%	(13%)	578	4%	67%	347	3%
Service & Others	252	9%	(41%)	n/a	1,308	10%	56%	841	8%
Total of Parent Company Sales	2,704	100%	(35%)	12%	13,461	100%	31%	10,308	100%
+ Sales from Overseas Operations & Related Subsidiaries	3,106		43%	178%	6,808		110%	3,247	
Chroma Consolidated Testing Equipment Business	5,810	96%	(8%)	64%	20,269	92%	50%	13,555	77%
MAS	188	3%	(19%)	(31%)	830	4%	6%	780	4%
Other Subsidiaries	76	1%	(12%)	(36%)	333	1%	(25%)	445	3%
Consolidated Sales (Continued Business Units)	6,074	100%	(9%)	55%	21,432	97%	45%	14,780	84%
New Material – Discontinued Business	0	-	n/a	n/a	635	3%	(77%)	2,804	16%
Consolidated Sales	6,074	100%	(9%)	32%	22,067	100%	25%	17,584	100%

Year 2023 Guidance

- In year 2022, Chroma total consolidated sales revenues hit record high reached 22 billion NTD, presented a growth of 25% YoY. The consolidated testing equipment business was the major growth driver, presented a growth of 50%. The Parent Company sales also hit record high reached 13.5 billion, consecutively second year of double digits growth, increase of 31% YoY, mainly contributed from EV and HPC / Semiconductor industries.
- Year 2023 Business Outlook:
 - ✓ EV industry remained strong, the EV battery cell projects still the major contribution in 2023.
 - ✓ The Test Instruments & ATS for power testing solutions continues benefit from green energy industries, included EV / Energy Storage related components, battery cell / module / pack and micro-grid related power testing.
 - ✓ Conservative view on Semiconductors / Photonics sectors, expects demand to pick up in second half.

High Power

High Precision



Technology & Solution Milestones

High Power Test Solutions

High Power Test Solution – Electric Vehicle Supply Equipment



EVSE ATS



- ✓ 61512 AC Source : 18kVA max./set
- ✓ 63800 AC Load : 4.5kVA max./set
- ✓ Meet full SAE-J1772 test standard



- ✓ 61860 Grid Simulator : 60kVA max./set
- ✓ 63200A/E DC Load : 24kW max./set
- ✓ Test AC & DC EVSE in same ATS



- ✓ 17040 Battery Simulator : 60kW max./set -> 600kW max
- ✓ Test DC EVSE & Battery Pack in same ATS



- ✓ 61800-100 Grid Simulator : 105kVA max./set
- ✓ 17040 Battery Simulator : 360kW*2ch or 180kW*4ch
- ✓ Test Max. 720kW High Power DC EVSE



- ✓ 17040E Battery Simulator : 200kW /set -> 1.2MW max for higher power DC EVSE test capability.



2011



AC EVSE : 19.2kVA

2015



DC EVSE : 50kW

2018



DC EVSE : 250kW

2022



DC EVSE : 360kW

EVSE



High Power Test Solution – Battery Cell Formation

Cylindrical Solution



Battery Cell Formation
Model 17000C-384
5V, 15A

Prismatic Solution



Battery Cell Formation
Model 17000-K007
5V, 60A

Prismatic Solution



Battery Cell Formation
Model 17000-K029
5V, 240A



Battery Cell Formation
Model 17000-480
5V, 20A



Prismatic Solution

Battery Cell Formation
Model 17000-K015
5V, 60A



Pouch Solution

Composite Battery Cell
Formation
Model 17080
5V, 30A



Cylindrical Solution



18650 Cell Test Solution



High precision CDC
Prog. Charge/Discharge Tester
Model 17216M-10-6
5V, 6A

xEV Cell Solution



Energy regen CDC
Prog. Charge/Discharge Tester
Model 17212M-6-100S
6V, 100A

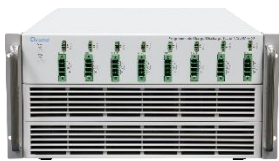
xEV Cell Test Solution



Ultra-high precision CDC
High Precision Prog. Charge/Discharge Tester
Model 17208M-5-12C
5V, 12A



21700 Cell Test Solution



High power CDC
Prog. Charge/Discharge Tester
Model 17208M-6-60
6V, 60A

High Power xEV Cell Test Solution



High power CDC with energy regen
Battery Reliability Test System
Model 17010H
6V, 300A,
600A (peak current)



High Power Test Solution – Battery Module/Pack Test System

Test Solution for E-bike, E-Scooter, BBU, Hybrid E-vehicle Battery Pack and Lead-acid Battery

- Regenerative Battery Pack Test Solution Model 17020
- 600W60V
- 1.25kW20V
- 1.25kW60V
- 2.5kW60V
- 2.5kW100V
- 2.5kW200V
- 2.5kW500V



Test Solution for E-Scooter Battery pack E-vehicle Battery Module

- Regenerative Battery Pack Test Solution Model 17020E
- 10kW60V
- 10kW100V
- 10kW200V



New Generation Developing



Test Solution for E-vehicle Battery Pack

- Regenerative Battery Pack Test Solution Model 17040
- 60kW 1000V 150A
- 120kW 1000V 300A
- 180kW 1000V 450A
- 250kW 1000V 600A



Test Solution for E-vehicle, ESS Battery Pack

- Regenerative Battery Pack Test Solution Model 17040
- 300kW 1000V 750A
- 360kW 1000V 900A
- 500kW 1000V 1200A
- 600kW 1000V 1500A



Test Solution for E-vehicle, ESS Battery Pack

- Regenerative Battery Pack Test Solution Model 17040E
- 200kW 1700V 400A
- 200kW 850V 800A



Battery Module/ Pack



Unidirectional DC Source

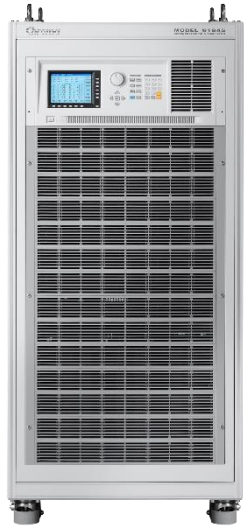


DC Power Source with Solar array simulator
Power rating : 5-15kW/3UH, Eff:87%
Model 62000H Series 40V-1000V, 375A

Bidirectional DC Source



Bidirectional: Source & Load with energy regen
High Power Density: 6-18kW/3UH, Eff:92%
Model 62000D Series 100V-1800V, 540A



Regenerative Grid Simulator

High power AC source with energy regen
Optional regen AC Load
Parallel up to 300kVA
Model 61800 Series 30kVA-60kVA, 400VLN



Regenerative Grid Simulator

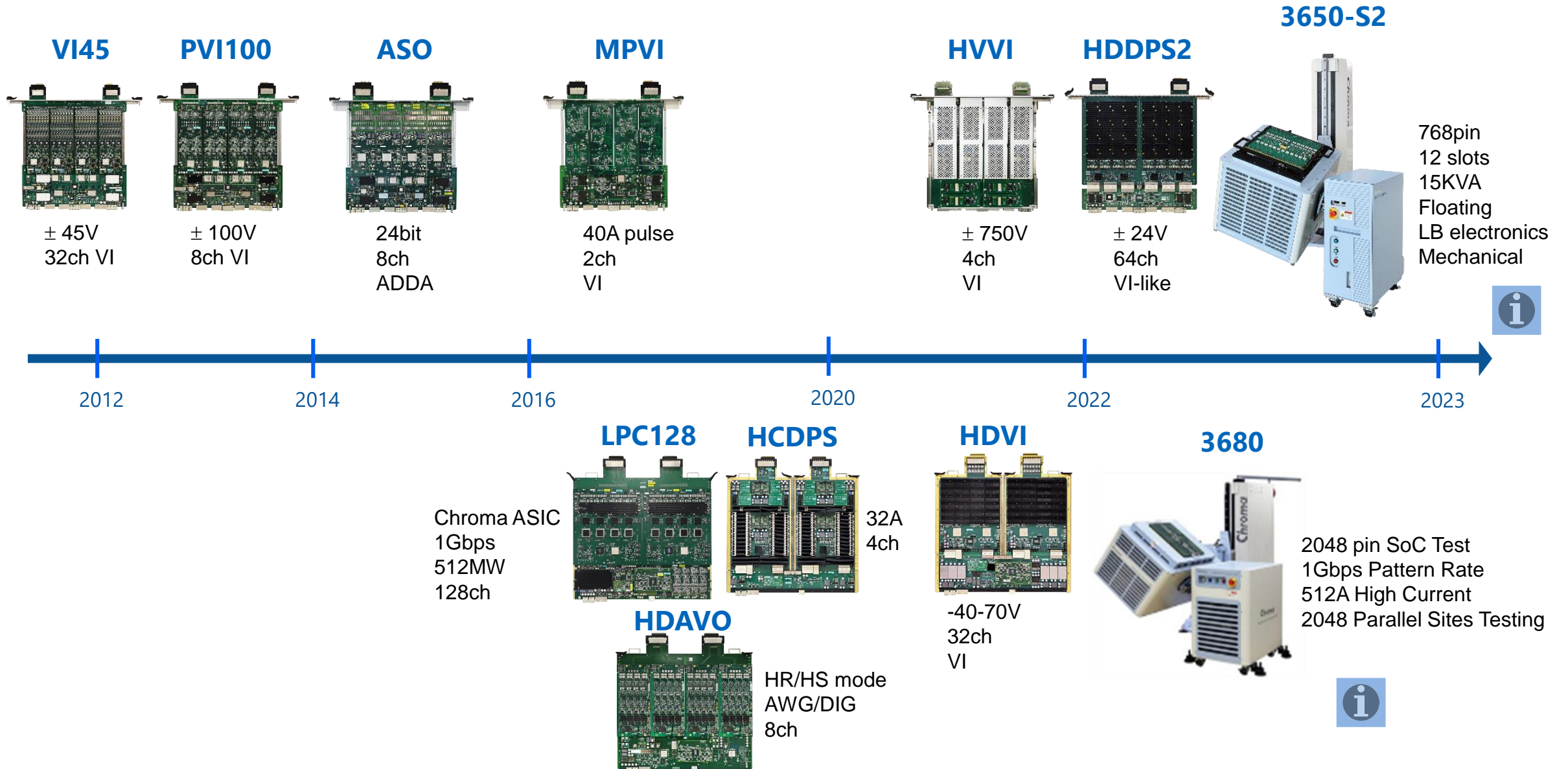
High power AC source with energy regen
Optional regen AC Load
Parallel up to 1MVA
Model 61800-100HV 105kVA, 500VLN-800VLN



Technology & Solution Milestones

High Precision Test Solutions

High Precision Test Solution Milestones – Semiconductor ATE



Analog/Power ICs



Precision

Temperature-forcing Systems



- ✓ 40°C~ 150°C @Tc
- ✓ Up to 1.2 kW power dissipation



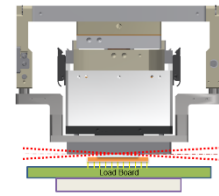
- ✓ -40°C~ 150°C @Tc
- ✓ Up to 1.8 kW power dissipation



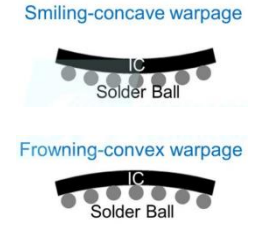
- ✓ -70°C~ 150°C @Tc
- ✓ Up to 800W power dissipation

≤ ± 0.01mm Contact Level

Deviation of ≤ ± 1.75°



> 2 mils Warpage Detection



Single Site Test Handler



- ✓ 3x3~120x120mm
- ✓ -70~+150°C @Tc, 1.2kw dissipation
- ✓ 500 kgf contact
- ✓ TSD (Tj) available

Model 3110 Gen2

Automatic System Function Tester



- ✓ 3x3~70x70mm
- ✓ -40~+150°C @Tc, 1.2kw/site dissipation
- ✓ 150 kgf/site contact
- ✓ TSD (Tj) available
- ✓ OTA integration

Model 3260

FT & SLT Hybrid Test System



- ✓ 5x5~120x120mm
- ✓ RT. ~ +150°C @Tc, 1.5 kw/site dissipation
- ✓ 500 kgf/site contact
- ✓ TSD (Tj) available
- ✓ Warpage detection
- ✓ OHT integration

Model 3200



3D Metrology Measurement System

2D Metrology

- Dimension: > 0.6um
- Sensor: Optical module
- Light Source: Multiple Light Sources

3D Metrology

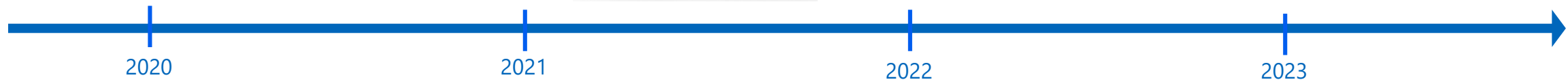
- XY / Z Resolution: 30nm / 0.05nm
- Sensor: WLI module
- Light Source: Multiple Light Sources

2D+3D Metrology

- XY / Z Resolution: 30nm / 0.05nm
- Sensor: Dual modules with auto switch
- Light Source: Multiple Light Sources



Model 7980



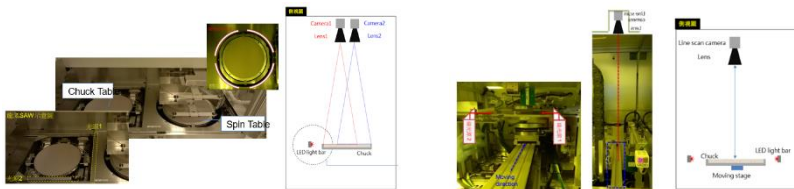
Process Equipment In-situ AOI

Particle Inspection

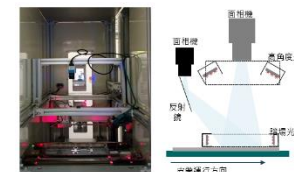
- Particles: >50um
- Sensor: AOI modules
- Light Source: Customized Light Source

Chemical Overflow Inspection

- Overflow: > 500um
- Residue: > 1mm*1mm
- Light Source: Customized Light Source



Process Particle In-situ Inspection
7961



Chemical Overflow In-situ Inspection
7961

High Precision SMU



High Precision SMU
For Photonics/Semiconductor Test
Model
52401-25-200m 25V, 200mA
52405-25-3 25V, 3A

High Output Channel DPS



4 Output Channel DPS
For Photonics/Semiconductor Test
Model 52341e-7-1
7V, 1.0A

Short Pulse SMU



Ultra-fast Short Pulse SMU
For High-power Photonics Test
Model 52403P-25-10
Pulsar Module 5V, 10A with 10uS Pulse Width
SMU Module 25V, 6A



High Current SMU



High Current SMU
For High Power VCSEL Array Test
Model 52405-25-6
25V, 6A

±1uV Level Program/Measure SMU



±1uV Level Program/Measure Capability SMU
For Battery Leakage Current
Model 52401-500m-500m
500mV, 500mA

High Precision Test Solution Milestones - Photonics Sensing Test Solution

Test requirement trend:

- Shorter pulse
- Wider temperature range
- More accurate probing

Pulse width: ms~ hundreds us
Test temperature: 0°~80° C
Probing accuracy: +/- 7 um

Pulse width: <100 us
Test temperature: -20°~80° C
Probing accuracy: +/- 5 um

Pulse width: <10 us
Test temperature: -40°~125° C
Probing accuracy: +/- 4 um



VCSEL Wafer Test System



Model 58635 series
Temp.: 0° ~ 100°C
LIV/ NF/ FF test
Pulse width: ms ~ hundreds us

VCSEL Module Test System



Model 58625
Temp.: -20° ~ 100°C
LIV/ NF/ FF test
Pulse width: ~ 100 us

VCSEL Wafer Test System II



Model 58635 series
Temp.: -20° ~ 100°C
LIV+NF two-in-one
Pulse width: <10 us



High Precision Test Solution Milestones - Photonics Optical Fiber Communication Test Solution

Test requirement trend:

- Smaller Pad size
- Higher Contact Rate
- Wider temperature range

Pad size: $\geq 200\mu\text{m}$
Contact Rate: $\geq 97\%$
Temperature: $45^\circ \sim 125^\circ \text{C}$

Pad size: $\geq 100\mu\text{m}$
Contact Rate: $\geq 98\%$
Temperature: $45^\circ \sim 125^\circ \text{C}$

Pad size: $\leq 100\mu\text{m}$
Contact Rate: $\geq 99\%$
Temperature: $25^\circ \sim 180^\circ \text{C}$

2015

2017

2021

2023

EEL CoC Tester



Model 58620
Automatic test for EEL CoC
Auto fiber alignment test

CoC LD Burn-in System



Model 58604
Temp.: $45^\circ \sim 125^\circ \text{C}$
ACC/ APC burn-in
 $\pm 500\text{mA}$; $\pm 7\text{V}$

PD/APD Burn-in System



Model 58606
Temp. : $40^\circ \sim 180^\circ \text{C}$
DUT pad size $> 70\mu\text{m}$
 $\pm 2\text{mA}$; $\pm 80\text{V}$



Model 7936

Double side inspection
Defect size $3\mu\text{m}$
WPH: 6 wafers/hour



Model 7940

Parallel computing
Defect size $2\mu\text{m}$
WPH: 15 wafers/hour



Model 7945

In-Process Wafer Chip Inspection System

- ✓ **Large die size**
 - die size up to 20mm
- ✓ **High throughput**
 - WPH: 27 wafers/hour
- ✓ **Shared auto wafer loader**
 - 1 loader support maximum 2 inspectors
- ✓ **AI classification**



LED/ PD/ VCSEL/ Discrete power device

Wide Band Gap SEMI/ Quartz Element





Thank You