

INITIATE COVERAGE

AEM Holdings (AEM SP)

Strong And Sustained Rebound In Orders To Drive Share Price Gains

We expect aggressive capex by Intel and the set-up of the new Intel Foundry Services business to lead to sustained demand for consumables for older machines, while new fabs will lead to more orders for test equipment. We have not factored in new customers from whom AEM expects more meaningful contributions from 2022 onwards, while the acquisition of component manufacturer CEI Limited will drive meaningful cost savings. Initiate coverage with BUY and target price of S\$5.60.

- System-in-Package design shift to revolutionise semiconductor manufacturing.** Key customer Intel Corporation's (Intel) March IDM 2.0 strategy is a major bet that future demand and profitability lie in the packaging of modular dies (or chips), known as "tiles", which can squeeze more compute within a single package. Driving towards that goal, Intel intends to build new fabrication plants (fabs) for these new "tiled" chips, and is expected to outsource the production of certain modules. Existing capacity has also been earmarked for the foundry services market.
- Sustained demand for AEM's total portfolio.** Intel's decision to maintain old fabs and build new ones means that AEM will enjoy: a) steady demand for its consumables and services, b) recurring but cyclical demand for equipment upgrades at Intel's old fabs, and c) demand for new equipment to test the new "tiled" chip products. That said, AEM provides mainly backend test equipment, where demand typically comes 6-9 months following the installation of front-end equipment at the new fabs. Additionally, management expects engagements with 10 of the top 20 global semiconductor companies to result in meaningful revenue contributions in 2H22 and beyond.
- Acquisition of CEI to lead to cost savings.** We further estimate AEM to generate meaningful cost savings at the gross level of S\$5.6m-9.0m a year, by in-sourcing some of its production activities to CEI Limited (CEI). At the entity level, CEI is expected to also contribute S\$4.0m a year of incremental net profit to the overall group. We believe our estimates are conservative as we have not factored in further upside from capacity expansion in CEI's box-build business.
- Initiate coverage with BUY.** We value the company at S\$5.60/share, implying 15.6x 2022F earnings. Our valuation is at a premium to the Singapore peer average forward PE of 10.1x. More direct competitors listed in the US and Japan trade at an average of 18.8x forward earnings.

KEY FINANCIALS

| Year to 31 Dec (S\$) | 2020 | 2021 | 2022F | 2023F | 2024F |
|-------------------------------|--------|--------|--------|--------|--------|
| Net turnover (S\$m) | 519.0 | 565.5 | 719.9 | 809.7 | 834.0 |
| EBITDA (S\$m) | 121.6 | 126.3 | 148.4 | 173.5 | 178.4 |
| Operating profit (S\$m) | 113.2 | 111.8 | 136.3 | 161.4 | 166.3 |
| Net profit (rep./act.) (S\$m) | 97.6 | 92.2 | 111.6 | 133.1 | 137.9 |
| Net profit (adj.) (S\$m) | 97.6 | 92.2 | 111.6 | 133.1 | 137.9 |
| EPS (S\$ cents) | 35.49 | 31.77 | 35.8 | 42.7 | 44.3 |
| PE (x) | 13.5 | 14.3 | 13.3 | 11.1 | 10.8 |
| P/B (x) | 6.2 | 3.3 | 3.2 | 2.6 | 2.2 |
| EV/EBITDA (x) | 10.03 | 9.79 | 9.0 | 7.7 | 7.5 |
| Dividend yield (%) | 2.12 | 3.07 | 1.8 | 2.1 | 2.2 |
| Net margin (%) | 18.8 | 16.3 | 15.5 | 16.4 | 16.5 |
| Net debt/(cash) to equity (%) | (58.4) | (33.5) | (28.8) | (37.7) | (47.1) |
| Interest cover (x) | n.a. | 95.3 | 62.1 | 103.2 | 241.4 |
| ROE (%) | n.a. | 30.0 | 25.6 | 25.6 | 22.2 |
| Consensus net profit (S\$m) | 97.6 | 92.0 | 122.8 | 140.3 | 164.7 |
| UOBKH/Consensus (x) | | | 0.91 | 0.95 | 0.84 |

Source: AEM, Bloomberg, UOB Kay Hian

BUY

| | |
|--------------|---------|
| Share Price | S\$4.76 |
| Target Price | S\$5.60 |
| Upside | +17.7% |

COMPANY DESCRIPTION

AEM prides itself on being a global leader in test innovation and provides comprehensive test solutions for the semiconductor and electronics industries, spanning test handlers, testers, consumables and data analytics.

STOCK DATA

| | |
|--------------------------------|-------------------------|
| GICS sector | Semiconductor Equipment |
| Bloomberg ticker: | AEM SP |
| Shares issued (m): | 309.2 |
| Market cap (S\$m): | 1,471.9 |
| Market cap (US\$m): | 1,062.3 |
| 3-mth avg daily t'over (S\$m): | 9.3 |

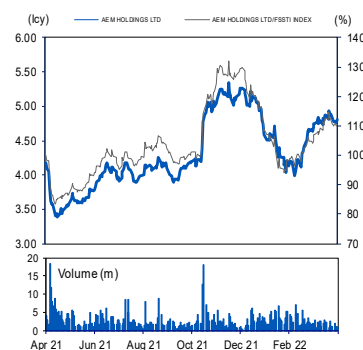
Price Performance (%)

| | | | | |
|------------------|-------------------|-------------|------------|------------|
| 52-week high/low | S\$3.38 – S\$5.35 | | | |
| 1mth | 3mth | 6mth | 1yr | YTD |
| 1.9 | 3.7 | 13.6 | 15.5 | (9.5) |

Major Shareholders

| | % |
|----------------------------|-------|
| Temasek Holdings | 16.07 |
| Standard Life Aberdeen plc | 6.57 |
| James Toh Ban Leng | 5.04 |
| FY22 NAV/Share (S\$) | 1.50 |
| FY22 Net Cash/Share (S\$) | 0.46 |

PRICE CHART



Source: Bloomberg

ANALYST(S)

Clement Ho
 +65 6590 6630
 clementho@uobkayhian.com

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This report uses the closing prices of 28 April 2022

Investment Highlights

System-in-Package design shift to revolutionise semiconductor manufacturing. Intel's March IDM 2.0 strategy is a major bet that future demand and profitability lie in the packaging of modular dies (or chips), known as "tiles", which can squeeze more compute within a single package. Driving towards that goal, Intel intends to build new fabrication plants for these new "tiled" chips, and is expected to outsource the production of certain modules. Existing capacity has also been earmarked for the foundry services market.

Under the new strategy, the microprocessor veteran has entered the foundry business with the set-up of a new standalone business unit known as Intel Foundry Services. The objective is to be a major provider of US- and Europe-based foundry capacity to serve what it claims to be "incredible global demand" for semiconductor manufacturing.

"Tile" production at foundries is expected to drive demand for new equipment. Intel's strategy means that it plans to retain certain packaging and "tile" production activities in-house, while outsourcing less critical "tiles" and components to third parties. This will likely create new testing needs as the "tiles" have to be tested before they can be shipped, leading to higher industry demand for testing equipment from foundries and their testing partners. The paradigm shift in how chips are to be made effectively opens up a new market for AEM, which has traditionally relied on one key customer, ie Intel.

Further, the stacking of multiple tiles to form a single product means a reorganisation of the supply chain. In the front-end vs back-end division of the manufacturing process, companies are often defined as either foundries or assembly & testing companies. Intel has traditionally been an integrated device manufacturer (IDM) and does all the fabrication, assembly and testing. The new tiles approach suggests that foundries will likely be segmented into additional tiers in the future. Brand owners or IDMs such as Intel will emphasise more on system level tests (SLT) which take place after the final product has been assembled. This suggests the sustainability of a ramp-up in demand for the test equipment of AEM, which successfully rolled out its previous-generation asynchronous modular parallel smart (AMPS) platform for Intel in 2019.

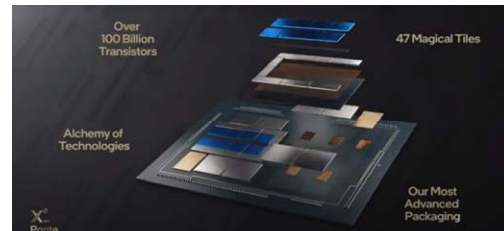
Sustained demand for AEM's total portfolio. AEM is a leading developer and manufacturer of test equipment used in the testing of semiconductor chips. Its key customer is a top global supplier of microprocessor chips used in personal computers, laptops, servers, data centres and other computing devices. Amid the current shortage of semiconductors and production capacity, stiff competition among semiconductor companies is expected to benefit AEM as they embark on capacity expansion.

AEM has provided guidance for 2022 revenue to be between S\$670m and S\$720m, an 18-27% increase from 2021 revenue of S\$565.5m. The demand ramp-up is expected to continue from 2H21 into 2022 as its client begins the deployment of its next generation of test handlers. We are excited about AEM's outlook over the next 3-5 years as major semiconductor manufacturers expand capacity, leading to increased demand for downstream packaging and testing capex in the industry.

Engagements with other semiconductor companies further raise the odds of growth. In a bid to reduce reliance on Intel, AEM has also spent the last few years engaging 10 out of the top 20 semiconductor companies across applications such as automobiles, mobility, memory and high performance computing. For instance, its AMPS platform secured a memory customer in 2018 with the first commercial delivery taking place in 2019. Following its acquisition of 26.6% in Korean test handler company ATECO Inc in Mar 21, we believe AEM has strengthened its position in the memory market and this could be a second key source of revenue going forward.

Other moves to expand AEM's addressable market include the acquisition of companies such as InspiRain Technologies (InspiRain) and Afore Oy (Afore). The former sells cable and network testers to enterprises and infrastructure companies such as Huawei Technologies Co (Huawei) and is a good candidate with which to target the expanding 5G market. Afore is a specialist in micro-electro-mechanical systems (MEMS) test equipment and gives AEM access to a different segment of applications, eg sensors and IoT equipment.

FIGURE 1: EXAMPLE OF INTEL'S TILE-BASED TECH



Above: This picture shows Intel's XPU product for Exascale Computing and AI (artificial intelligence) called Ponte Vecchio, currently in the process of system validation and to be released in 2022. It utilises 47 tiles stacked together and contains over 100b transistors in a single package.

Source: Intel, UOB Kay Hian

New semiconductor designs to spur demand for new testing equipment

Revenue upturn began in 2H20 and will carry on into 2023 as next-generation products are rolled out at key customer's sites

Management revenue guidance suggests 18-27% yoy increase for 2022

AEM has been working to secure new customers since 2019, with M&A being one of its strategies

Acquisition of CEI to add more than S\$10m in net profit each year. Test equipment, as with many equipment products, essentially is involved in the assembly of printed circuit boards (PCB) and other associated components within an enclosure. AEM's acquisition of CEI is synergistic as it allows the company to in-source manufacturing and reduce reliance on third parties – shortening lead times and improving the fulfilment process. We estimate that the in-sourcing of just 10% of AEM's manufacturing activities will result in savings of S\$5.6m-9.0m from 2021-23. These cost savings will reduce AEM's cost of raw materials from 60.8% in 2020 to 46.0% of revenue by 2023 which, combined with CEI's own net profit of about S\$4.0m a year, will make the acquisition of CEI a value-accretive deal.

Acquisition of CEI gives more control over supply chain; likely to lead to cost savings from in-sourcing of production

Valuation

Fair value estimated at S\$1.50b, or S\$5.60/share. The target price is pegged to 2022F earnings of 15.6x, or +2SD to its historical five-year range, supported by a forward ROE of 25.6%. This compares to the Singapore peer average forward PE of 10.1x and forward ROE of 20.6%. We estimate AEM's earnings to come in at S\$112m, S\$133m and S\$138m for 2022, 2023 and 2024 respectively (average of S\$128m).

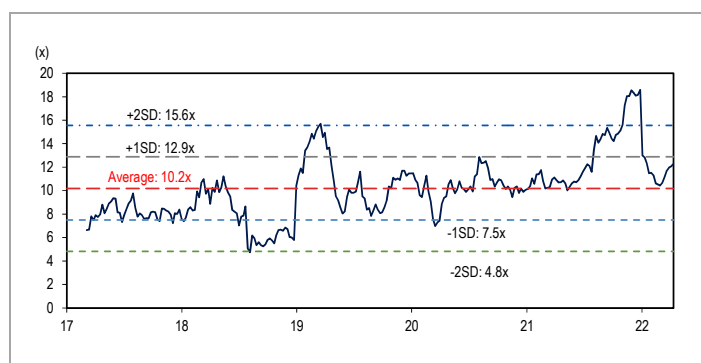
Our fair value is based on 15.6x 2022F earnings, at +2SD to AEM's historical five-year range

The valuation peg is supported by the positive outlook for AEM from 2022 onwards and the anticipated cyclical upturn of AEM's business.

Direct peers trade at 18.8x forward PE. AEM's global direct competitors such as Teradyne, Inc (Teradyne) and Advantest Corporation (Advantest) trade at higher multiples of 21.7x and 15.8x respectively, averaging 18.8x forward PE and providing support for our +2SD valuation peg for AEM.

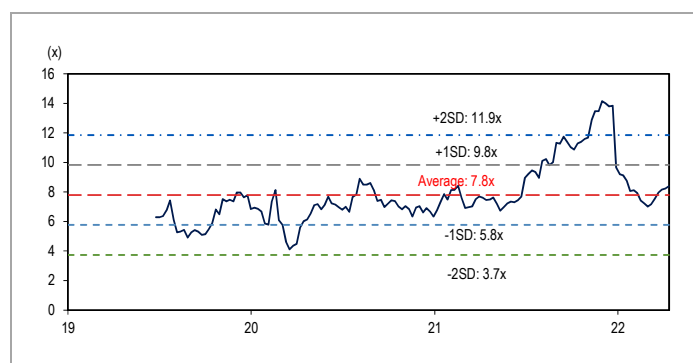
Valuation unstretched in no-synergy scenario. Should AEM fail to extract any synergies from its acquisition of CEI, our valuation would be reduced to US\$1.3b, or S\$4.62/share. This equates to a minimal downside scenario of 2.9% from the last closing price of S\$4.76.

FIGURE 2: HISTORICAL PE RANGE



Source: AEM, UOB Kay Hian

FIGURE 3: HISTORICAL EV/EBITDA RANGE



Source: AEM, UOB Kay Hian

FIGURE 4: PEER COMPARISON

| Company | Bloomberg Ticker | Trading Curr | Price @ 28 Apr 22 (lcy) | Market Cap (US\$m) | PE | | | P/B | | | EV/EBITDA | | | Yield 2022F (%) | ROE 2022F (%) |
|----------------------|------------------|--------------|-------------------------|--------------------|----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------------|---------------|
| | | | | | 2021 (x) | 2022F (x) | 2023F (x) | Curr (x) | 2022F (x) | 2023F (x) | 2021 (x) | 2022F (x) | 2023F (x) | | |
| AEM Holdings | AEM SP | S\$ | 4.76 | 1,090 | 15.0 | 13.3 | 11.1 | 3.3 | 3.2 | 2.6 | 14.3 | 13.4 | 11.2 | 1.8 | 25.6 |
| UMS Holdings | UMSH SP | S\$ | 1.20 | 593 | 15.1 | 11.0 | 10.2 | 2.9 | 2.5 | 2.2 | 7.8 | 7.6 | 6.5 | 3.8 | 24.5 |
| Frencken Group | FRKN SP | S\$ | 1.43 | 452 | 10.4 | 9.2 | 8.0 | 1.6 | 1.4 | 1.3 | 5.2 | 4.6 | 3.8 | 2.9 | 16.7 |
| ISDN Holdings | ISDN SP | S\$ | 0.585 | 190 | 10.0 | 8.5 | 7.5 | 1.3 | 1.2 | 1.0 | 5.1 | n.a. | n.a. | 2.5 | 14.4 |
| Grand Venture | GVTL SP | S\$ | 1.00 | 251 | 17.0 | 8.7 | 7.4 | 2.9 | 0.5 | 0.5 | 1.8 | 23.1 | 23.0 | 0.5 | 14.7 |
| Avi-Tech Electronics | AVI SP | S\$ | 0.34 | 43 | 16.7 | 11.3 | 11.3 | 1.1 | 1.1 | 1.1 | 3.5 | n.a. | n.a. | 2.2 | 9.3 |
| Singapore average | | | | | 13.8 | 9.7 | 8.9 | 2.0 | 1.3 | 1.2 | 4.7 | 11.8 | 11.1 | 2.4 | 15.9 |
| Teradyne | TER US | US\$ | 106.32 | 17,181 | 19.4 | 21.7 | 16.0 | 6.9 | 7.3 | 6.4 | 14.3 | 14.6 | 11.6 | 0.4 | 31.4 |
| Advantest Corp | 6857 JP | ¥ | 8990 | 13,960 | 20.0 | 15.8 | 15.1 | 5.8 | 4.8 | 4.1 | 10.8 | 10.3 | 9.6 | 1.3 | 34.2 |
| Cohu Inc. | COHU US | US\$ | 25.48 | 1,237 | 10.7 | 9.3 | 7.9 | 1.4 | n.a. | n.a. | 5.2 | n.a. | n.a. | n.a. | 13.7 |
| Hirata Corp | 6258 JP | ¥ | 4800 | 402 | 11.3 | 13.9 | 11.5 | 0.9 | 0.9 | 0.9 | 8.7 | 7.8 | 7.1 | 1.4 | 6.9 |
| Astronics Corp | ATRO US | US\$ | 10.00 | 320 | n.a. | n.a. | 15.9 | 1.2 | n.a. | n.a. | 16.4 | 16.5 | 6.2 | n.a. | n.a. |
| Global average | | | | | 15.3 | 15.2 | 13.3 | 3.3 | 4.3 | 3.8 | 11.1 | 12.3 | 8.6 | 1.0 | 21.5 |

Source: Bloomberg, UOB Kay Hian

Earnings Outlook

Expect revenue of S\$720m in 2022 vs S\$566m in 2021. AEM reported revenue of S\$373.2m for 2H21, driven by the volume ramp-up for new-generation SLT handlers as well as burn-in testers, and the consolidation of CEI which was acquired in 1H21. We believe 2H21 is the inflection point for test handlers to contribute more meaningfully to AEM going forward. Assuming flat consumables and services sales, we expect 2022 full-year revenue to come in at S\$720m – at the top end of the range guided by AEM.

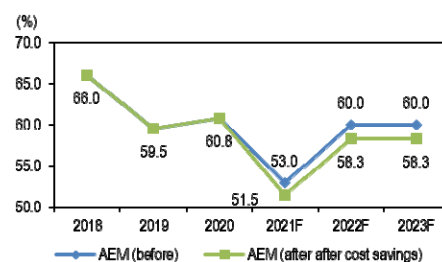
We expect revenue growth of 33% for the test cell solutions (TCS) segment in 2022, followed by 15% in 2023. For all the other segments, 3% annual revenue growth is estimated for 2022 and 2023, including that of CEI. Hence, we have only factored in demand recovery from Intel, but have not included gains from the addition of any new customer. As mentioned, AEM is engaged with 10 out of the 20 top semiconductor companies and the clinching of any major orders will have a positive impact on forecasts. Currently, our estimates point to revenue of S\$810.0m in 2023, or S\$672.2m after excluding the revenue contribution from CEI.

Target 19.8% pre-tax margin in 2023 from integration synergies. In 2019 and 2020, AEM's cost of raw materials as a percentage of revenue averaged 60%. For 2022 and 2023, we assumed flat cost of raw materials (excluding CEI's cost of sales). We next assumed about 10% of these costs, or S\$49m-54m of works, would be handed over to CEI and lead to cost savings based on CEI's projected gross margin of 22% across the forecast horizon. This led us to derive cost savings of S\$10.8m in 2022 and S\$11.8m in 2023. Based on these assumptions, we derived a group-level pre-tax margin of 18.7% and 19.8% for 2022 and 2023 respectively.

We take the position that AEM is acquiring CEI to extract margin synergies and do not expect group-level pre-tax margin to be eroded far from 20% post-acquisition. Otherwise, there may be the risk of goodwill impairment. AEM has disclosed a goodwill amount of S\$26.8m arising from the transaction. We do not forecast additional in-sourcing as the larger group (AEM and CEI combined) may be affected by capacity limitations. We expect the group to maintain property, plant, and equipment capex at S\$5m-10m per year, in line with historical trends.

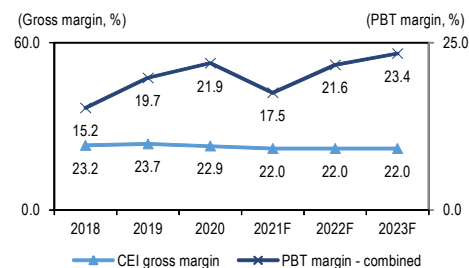
AEM's engagement efforts with top semiconductor companies have upside potential

FIGURE 5: RAW MATERIAL AS % OF REVENUE



Source: AEM, UOB Kay Hian

FIGURE 6: PRE-TAX MARGIN ASSUMPTIONS



Source: AEM, UOB Kay Hian

Risk Factors

We see the following as the key risks, among others.

Intel production roadmap delay may be a risk to AEM's guidance. Production of Intel's latest data centre processor, Xeon Sapphire Rapids, entered production only in 1Q22 vs the planned launch in 4Q21. Any future delays in Intel's roadmap may lead to a pushback in orders for AEM, which would have a negative impact on revenue guidance. Currently, AEM has guided for revenue of S\$670m-720m in 2022. That said, this is a short-term risk as testing equipment orders to AEM would subsequently come in and be added to its chip production schedule.

Engagements with new customers may take longer than expected to pan out. AEM has deep technical engagements with 10 out of the top 20 semiconductor companies, spanning mobility, memory, and high-performance computing; it aims to achieve meaningful revenue from these engagements in 2022. Some of these endeavours may succeed. However, there is no certainty they will translate to revenue opportunities in 2022. Moreover, technical challenges may lead to delays.

Supply chain pressures. Tightness in the supply of materials such as substrate and packaging materials may also force customers to focus on production and supply chain management over capacity expansion.

Execution challenges. The company has been actively carrying out M&As since 2017, the most recent being the acquisition of CEI. There is the risk that AEM fails to integrate these businesses and be unable to extract the expected synergies out of these investments.

Competition. The largest risk to AEM's long-term growth is that of competition whereby technological advancements at competitors erode its competitive edge. AEM's emphasis on SLT is not unique and our review of materials by competitors suggests they are advocating similar developments, such as customisable test environments and multi-site testing.

Financial Statements

FIGURE 7: PROFIT & LOSS

| Year to 31 Dec (\$m) | 2020 | 2021 | 2022F | 2023F | 2024F |
|-------------------------------|--------------|--------------|--------------|--------------|--------------|
| Revenue, net | 519.0 | 565.5 | 719.9 | 809.7 | 834.0 |
| Operating expenses | (405.8) | (453.6) | (583.7) | (648.3) | (667.7) |
| EBIT | 113.2 | 111.8 | 136.3 | 161.4 | 166.3 |
| Associate contributions | 0.2 | 0.6 | 0.6 | 0.6 | 0.6 |
| Net interest income/(expense) | 0.4 | (1.3) | (2.4) | (1.7) | (0.7) |
| Pre-tax profit | 113.8 | 111.1 | 134.5 | 160.4 | 166.2 |
| Tax | (16.2) | (19.1) | (22.9) | (27.3) | (28.2) |
| Minorities | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Net profit(rep./act.) | 97.6 | 92.2 | 111.6 | 133.1 | 137.9 |
| Net profit(adj.) | 97.6 | 92.2 | 111.6 | 133.1 | 137.9 |
| Deprec. & amort. | 8.4 | 14.5 | 12.1 | 12.1 | 12.1 |
| EBITDA | 121.6 | 126.3 | 148.4 | 173.5 | 178.4 |

Source: UOB Kay Hian

FIGURE 8: BALANCE SHEET

| Year to 31 Dec (\$m) | 2020 | 2021 | 2022F | 2023F | 2024F |
|--|--------------|--------------|--------------|--------------|--------------|
| Cash/Near cash equiv. | 134.8 | 216.2 | 196.4 | 255.3 | 337.3 |
| Accounts receivable/debtors | 47.6 | 127.9 | 180.0 | 202.4 | 208.5 |
| Stocks | 79.7 | 204.9 | 163.2 | 180.8 | 186.3 |
| Other current assets | 4.4 | 1.1 | 1.1 | 1.1 | 1.1 |
| Current assets | 266.4 | 550.1 | 540.6 | 639.7 | 733.2 |
| Fixed assets | 17.6 | 43.9 | 46.9 | 45.0 | 43.0 |
| Investments | 4.7 | 18.5 | 19.1 | 19.8 | 20.4 |
| Other financial assets | 46.8 | 98.0 | 92.8 | 87.6 | 82.5 |
| Total non-current assets | 69.1 | 160.4 | 158.9 | 152.4 | 145.9 |
| Total assets | 335.5 | 710.5 | 699.5 | 792.1 | 879.1 |
| Accounts payable/creditors | 83.7 | 181.0 | 122.4 | 135.6 | 139.7 |
| Short-term debt/borrowings | 5.0 | 20.5 | 20.5 | 20.5 | 19.8 |
| Other current liabilities | 22.2 | 35.1 | 35.1 | 35.1 | 35.1 |
| Current liabilities | 110.8 | 236.6 | 178.0 | 191.2 | 194.6 |
| Long-term debt | 6.3 | 60.8 | 40.3 | 19.8 | 0.0 |
| Deferred tax liability | 3.1 | 8.0 | 8.0 | 8.0 | 8.0 |
| Other non-current liabilities | 3.9 | 2.5 | 2.5 | 2.5 | 2.5 |
| Total non-current liabilities | 13.3 | 71.3 | 50.8 | 30.3 | 10.6 |
| Total liabilities | 124.1 | 308.0 | 228.8 | 221.6 | 205.1 |
| Shareholders' equity | 211.4 | 402.5 | 470.7 | 570.5 | 673.9 |
| Liabilities and shareholders' funds | 335.5 | 710.5 | 699.5 | 792.1 | 879.1 |

Source: UOB Kay Hian

FIGURE 9: CASH FLOW

| Year to 31 Dec (US\$m) | 2020 | 2021 | 2022F | 2023F | 2024F |
|---------------------------------------|---------------|---------------|---------------|---------------|---------------|
| Operating cashflows | 86.3 | 52.1 | 56.6 | 119.4 | 142.7 |
| Pre-tax profit | 97.6 | 92.1 | 111.6 | 133.1 | 137.9 |
| Tax | 16.2 | 19.1 | 22.9 | 27.3 | 28.2 |
| Deprec. & amort. | 8.4 | 14.5 | 12.1 | 12.1 | 12.1 |
| Associates | (0.2) | (1.3) | (0.6) | (0.6) | (0.6) |
| Working capital changes | (29.2) | (55.1) | (69.0) | (26.9) | (7.4) |
| Others | (6.5) | (17.2) | (20.5) | (25.6) | (27.5) |
| Cash from investing activities | (29.8) | (85.2) | (9.4) | (4.4) | (4.2) |
| Capex (growth) | (3.2) | (4.3) | (10.0) | (5.0) | (5.0) |
| Investments | 0.0 | (2.6) | 0.0 | 0.0 | 0.0 |
| Proceeds from sale of assets | 0.0 | 1.9 | 0.0 | 0.0 | 0.0 |
| Others | (26.5) | (80.2) | 0.6 | 0.6 | 0.8 |
| Cash from financing activities | (25.9) | 113.4 | (67.0) | (56.0) | (56.5) |
| Dividend payments | (22.2) | (18.6) | (43.5) | (33.3) | (34.5) |
| Issue of shares | 0.0 | 103.1 | 0.0 | 0.0 | 0.0 |
| Proceeds from borrowings | 1.0 | 57.1 | 0.0 | 0.0 | 0.0 |
| Loan repayment | (0.6) | (0.5) | (20.5) | (20.5) | (20.5) |
| Others/interest paid | (4.0) | (27.8) | (3.0) | (2.3) | (1.5) |
| Net increase/(decrease) in cash | 30.6 | 80.3 | (19.8) | 59.0 | 82.0 |
| Beginning cash | 107.7 | 134.8 | 216.2 | 196.4 | 255.3 |
| Changes due to forex impact | (3.5) | 1.1 | 0.0 | 0.0 | 0.0 |
| End cash | 134.8 | 216.2 | 196.4 | 255.3 | 337.3 |

Source: UOB Kay Hian

FIGURE 10: KEY METRICS

| Year to 31 Dec (%) | 2020 | 2021 | 2022F | 2023F | 2024F |
|---------------------------|--------|--------|--------|--------|--------|
| Growth | | | | | |
| Turnover | n.a. | 9.0 | 27.3 | 12.5 | 3.0 |
| EBITDA | n.a. | 3.9 | 17.5 | 17.0 | 2.8 |
| Pre-tax profit | n.a. | (2.3) | 21.0 | 19.2 | 3.6 |
| Net profit | n.a. | (5.5) | 21.0 | 19.2 | 3.6 |
| Net profit (adj.) | n.a. | (5.5) | 21.0 | 19.2 | 3.6 |
| EPS | n.a. | (7.5) | 7.1 | 19.2 | 3.6 |
| Profitability | | | | | |
| EBITDA margin | 23.4 | 22.3 | 20.6 | 21.4 | 21.4 |
| EBIT margin | 21.8 | 19.8 | 18.9 | 19.9 | 19.9 |
| Gross margin | 32.3 | 33.0 | 32.0 | 33.0 | 33.0 |
| Pre-tax margin | 21.9 | 19.7 | 18.7 | 19.8 | 19.9 |
| Net margin | 18.8 | 16.3 | 15.5 | 16.4 | 16.5 |
| ROE | n.a. | 30.0 | 25.6 | 25.6 | 22.2 |
| ROA | n.a. | 17.6 | 15.8 | 17.8 | 16.5 |
| ROIC | n.a. | 26.3 | 22.3 | 24.5 | 23.4 |
| Leverage | | | | | |
| Interest cover (x) | n.a. | 95.3 | 62.1 | 103.2 | 241.4 |
| Debt to total capital | 5.1 | 16.8 | 11.4 | 6.6 | 2.8 |
| Debt to equity | 5.3 | 20.2 | 12.9 | 7.1 | 2.9 |
| Net debt/(cash) to equity | (58.4) | (33.5) | (28.8) | (37.7) | (47.1) |
| Current ratio (x) | 2.4 | 2.3 | 3.0 | 3.3 | 3.8 |

Source: UOB Kay Hian

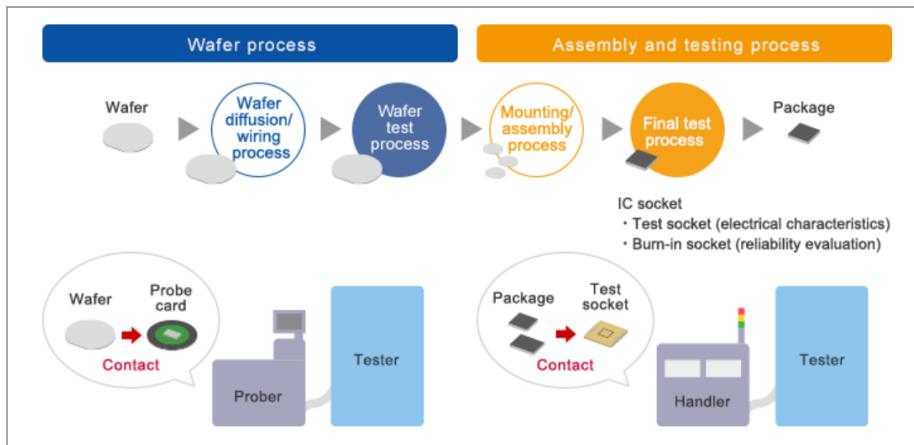
Appendix I – Technical Overview

FRONT-END AND BACK-END TESTING

Semiconductor manufacturing can be broken down into two main phases – front-end and back-end. Front-end work refers to wafer fabrication whereby electronic circuits are etched on a wafer while back-end production refers to the assembly and packaging of each die on a wafer into a chip. A completed integrated circuit (IC), or chip, thus comprises a silicon die with a package that protects and holds the die.

This segregation between front-end and back-end phases can be observed in the industry whereby clients may order foundries, such as TSMC, to produce dies and use a separate assembly and testing company, such as ASE Technology Holding Co, for back-end processing. Some foundries also perform assembly and testing in-house, especially for chips that require more advanced techniques like 3D packaging and assembly of multi-die components. Depending on the manufacturer’s process design, traditional front-end processes such as wafer inspection, wafer probing or testing may also be outsourced to a back-end processor.

IC MANUFACTURING FLOW CHART

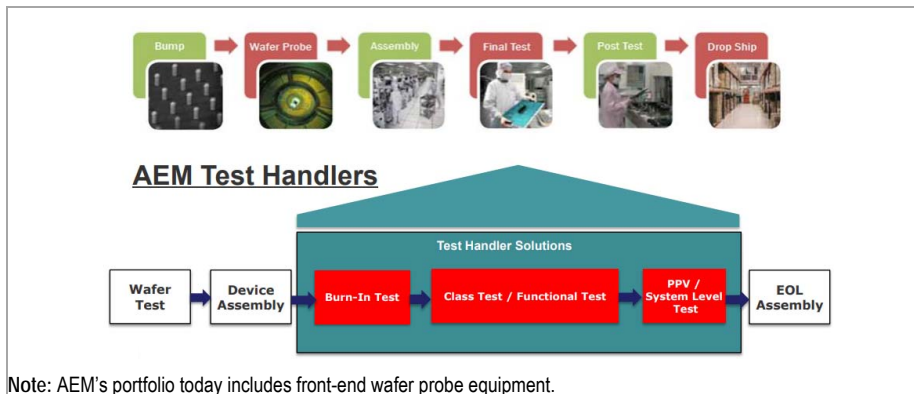


Source: https://www.mjc.co.jp/en/technology/column/package_probe.html

After wafer probing, a wafer is typically diced into individual dies and bumped or bonded onto a substrate or package. Testing is hence split into two main steps: a) wafer probing – after wafer fabrication, and b) final test – after assembly and packaging.

Wafer probing refers to the verification of the functionality of individual dies on a silicon wafer and malfunctioning or bad dies are marked out on the wafer to be discarded after dicing.

AEM'S TEST HANDLERS ARE USED IN BURN-IN, CLASS AND SYSTEM BACK-END TESTS



Note: AEM's portfolio today includes front-end wafer probe equipment.

Source: AEM

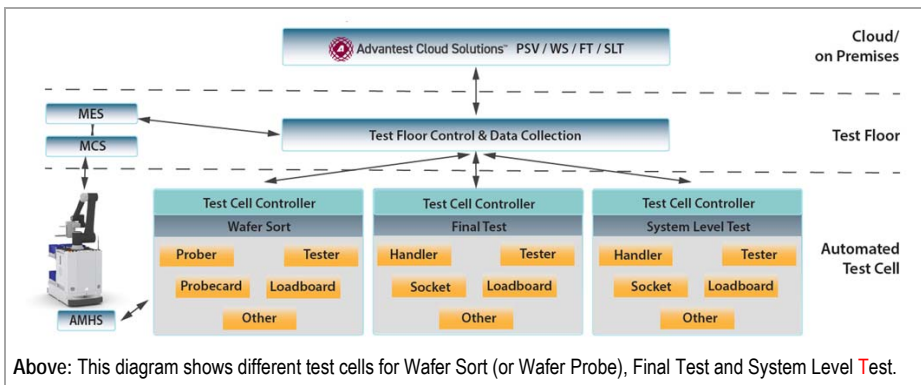
Final test refers to a series of tests, including burn-in, functional test and SLT. During burn-in, the component endures extreme operating conditions, including extreme temperatures, high use cycles and high voltages. Functional test, or class test, refers to the verification of various requirements based on the specifications of a component.

SLT refers to the emulation of the final user environment, in order to test software, validate connections and other aspects. SLT is seen as increasingly relevant, as complex semiconductors play a growing role in safety-critical markets such as automobiles, industrial tools and medical equipment.

TEST EQUIPMENT

The nature of semiconductors is such that their testing requires highly precise complex equipment. A test cell refers to a complete suite of test equipment, including a tester, test handler, device-under-test (DUT) interface board or load board, and test contactor or test socket, to conduct one or more tests.

A SIMPLIFIED HIGH-LEVEL VIEW OF TEST FLOOR WITH TEST CELLS

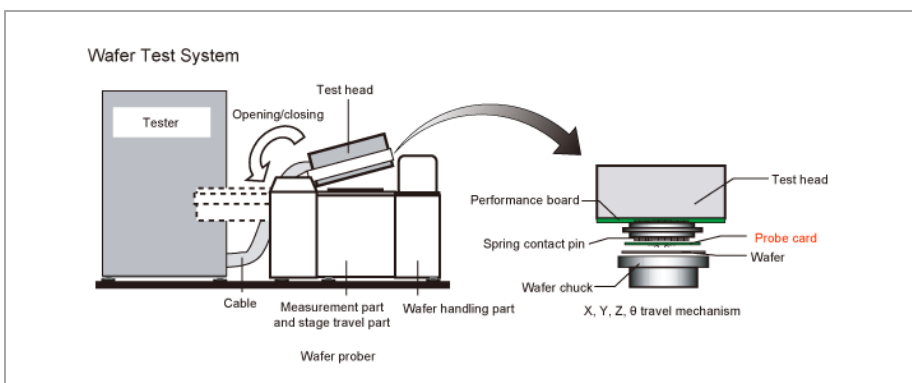


Source: <https://www.advantest.com/products/TCAS/TCAS.html>

A test cell may comprise a tester, also called automated test equipment (ATE); a prober or handler; and a probe card or test socket. The tester is a system that tests if a device works as designed. It usually incorporates a controller or a computer that synchronises testing and can be broadly classified into several types such as logic testers, memory testers and analogue testers. A DUT interface board, also called a load board, may be attached to the tester or handler to configure it to the specific needs of the DUT.

In wafer probing, a probe card is docked to a wafer prober machine to connect the DUT and the tester. The wafer prober handles the wafer to make contact in the designated position on the DUT. In back-end testing, a handler sorts and places the packaged chips for testing using test sockets that connect the DUT to the tester. In general, the handler or prober can be seen as an automated placement tool and the ATE interacts with the handler or prober to test the DUT.

A WAFER TEST SYSTEM



Source: https://www.mjc.co.jp/en/technology/column/probe_card.html

CHALLENGES AND TRENDS

Given the testing process, the challenge for companies such as AEM is how their technologies can help testing companies and semiconductor companies reduce their cost-of-test, as semiconductors become more complex both in terms of design and transistor density. For instance, a System-in-Package device may require 4-5 tests before shipment, including testing of the memory, power management IC, microprocessor unit and system test.

INCREASINGLY COMPLEX IC DESIGNS

The image contains three diagrams. On the left, an 'Inset of an IC' shows a 21mm x 21mm Standard IC Package with components like DDR3L Memory, 4KB EEPROM, TL5209 LDO, TPS65217C PMIC, AM335x ARM@ Cortex®-A8, and 256 Ball BGA 1.27mm Pitch. In the center, a diagram compares 'SOC complete system on one chip' (opto IC + digital IC + RF IC + RAM on a substrate) with 'SIP stacked chips or packages' (SIP-IC and SIP-PACKAGE). On the right, a cross-section of a chip-on-wafer package shows HBM DRAM Dies, 75V Silicon interposer, Option of multistate logic dies, μBumps, Base Die, C4 Cu Bumps, Package Substrate, Short Wiring, and Circuit Board.

Inset of an IC

SOC complete system on one chip

SIP stacked chips or packages

Difference between System-on-Chip ("SOC") and System-in-Package ("SIP")

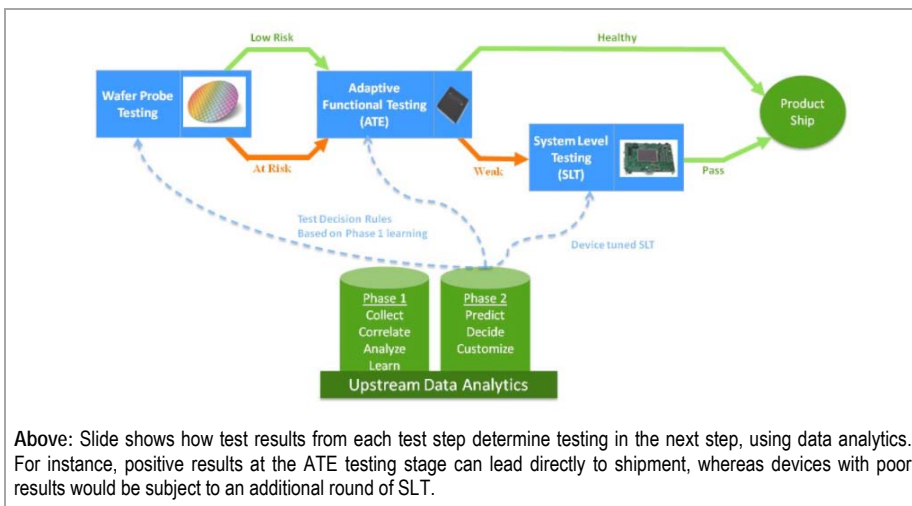
An example of a chip-on-wafer which uses multi-chip packaging technology to achieve better interconnect density and performance

Source: <https://techpp.com/2019/03/18/what-is-sip-vs-soc/>, <https://en.wikichip.org/wiki/tsmc/cowos>, AEM

Increasing transistor density also means exponentially more transistors are untested given the same test coverage, while semiconductors are increasingly being used in mission-critical or safety-critical applications such as automobiles.

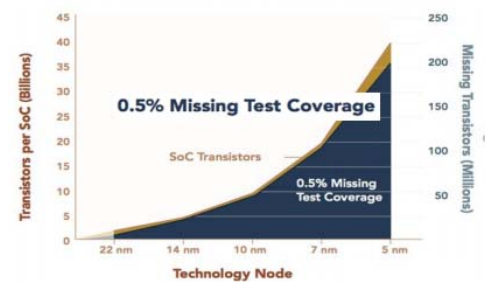
In the case of AEM, it has taken the position that more extensive SLT, the integration of multiple test steps and the use of smart data analytics can lead to more optimal testing (as opposed to the cost of achieving 100% test coverage).

HOW DATA ANALYTICS CAN LEAD TO OPTIMAL TEST FLOWS



Source: <https://aem.com.sg/system-level-test/test-paradigm-shift-with-system-level-test/#>

TEST COVERAGE VS TRANSISTOR DENSITY



Above: With increasing transistors on a chip, the same 0.5% missing test coverage leads to exponentially more transistors being untested.

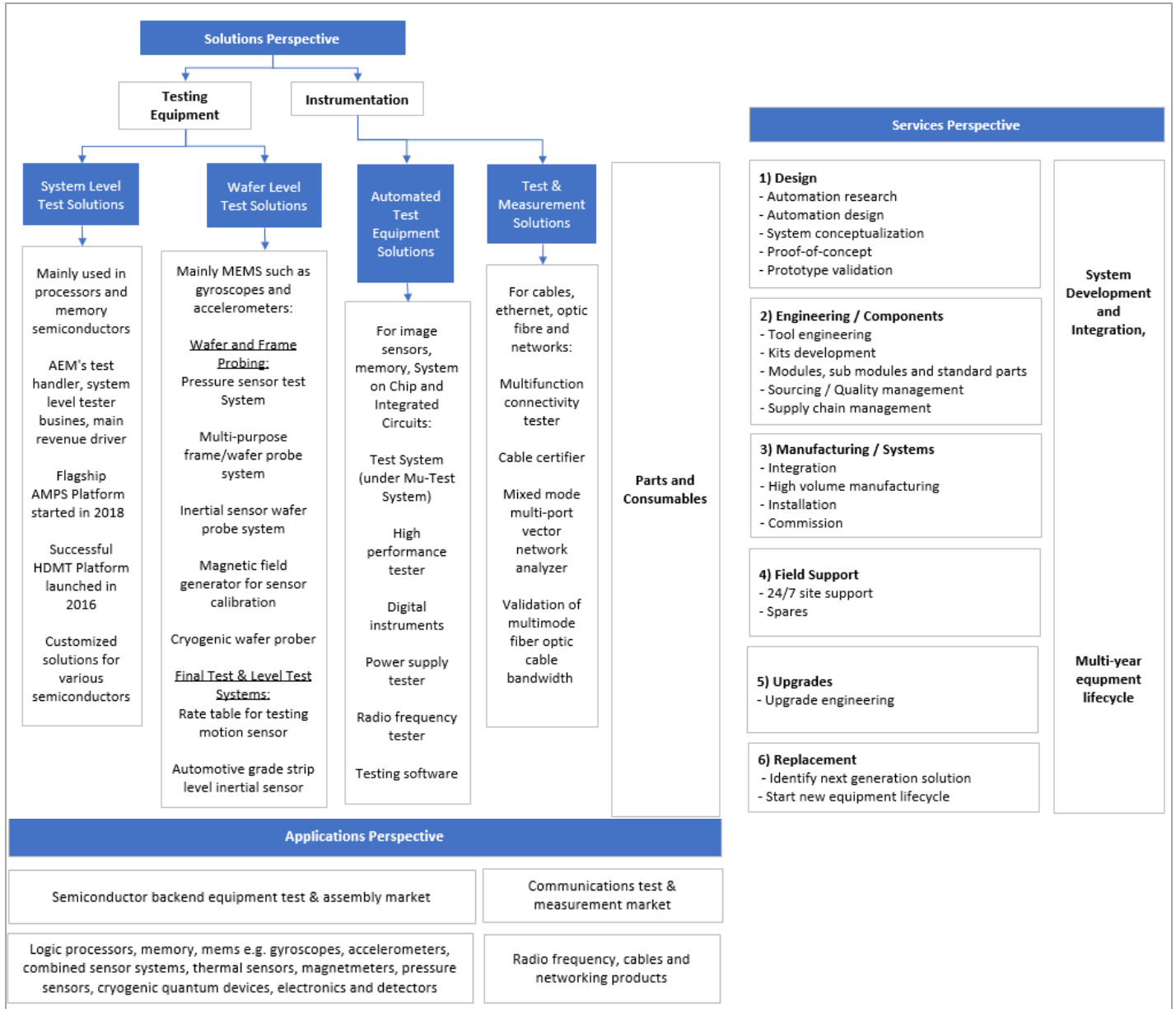
Source: AEM

Appendix II – Company Background

PRINCIPAL BUSINESSES

AEM prides itself on being a global leader in test innovation and provides a comprehensive set of test solutions for the semiconductor and electronics industries, spanning test handlers, testers, consumables and data analytics.

GOODS AND SERVICES PROVIDED BY AEM AND ITS SUBSIDIARIES



Source: AEM, UOB Kay Hian

Decades of relationship with marque customer spanning four platform generations.

AEM was listed on the SGX Mainboard in 2000 and was initially focused on the delivery of customised automation solutions, primarily test handlers and certain auxiliary equipment in verticals such as logic semiconductors, solar cells and smart cards. Emphasis was placed on services and lifecycle support such as design and tool development and field service engineering support. It boasts a decades-long history with marque customer Intel, spanning four platform generations.

Appendix III – Business Segments

BACKGROUND

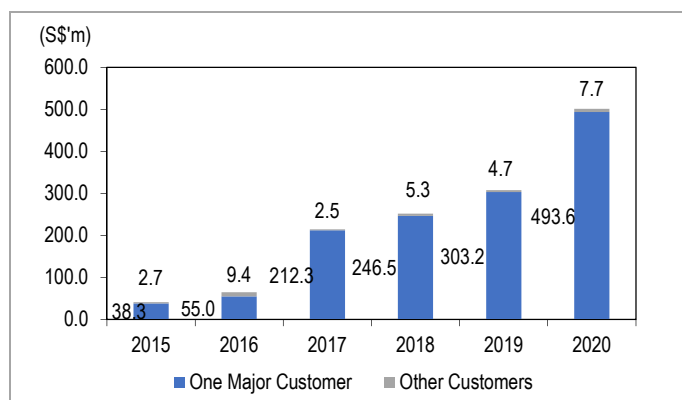
AEM had previously organised its business along three reportable segments – equipment systems solutions (ESS), precision component solutions (PCS) and plating & others (PLT, or “Others” after the sale of the plating business in 2016). Following its foray into more testing and engineering capabilities, AEM reorganised its businesses into five segments in 2019 – ESS, system level test & inspection (SLT-I), micro-electro-mechanical systems (MEMS), test and measurement solutions (TMS) and “Others”.

REPORTABLE SEGMENTS

| Segment | Definition |
|---|--|
| Equipment systems solutions (ESS) | Provides customised system solutions involving precise high-speed motion and innovative mechanical designs to both mass volume manufacturers and new technology development laboratories. |
| System level test & inspection (SLT-I) | Provides solutions that bridge the growing gap between user applications and standard ATE coverage with complex IC designs and advanced packaging techniques. Enables testing complex devices in their real end-user environment including extreme temperature range. |
| Micro-electro-mechanical systems (MEMS) | Provides test solutions for MEMS and special wafer probing needs ranging from the R&D phase to high volume production and SLT, enabling manufacturers to achieve the lowest cost-of-test, reduced time to market, effective process cycle, accurate stimulus and high production yields. |
| Test and measurement solutions (TMS) | Engages in the research, development and production of advanced communications and industrial test solutions. |
| Others | Non-allocated, dormant companies and other activities. |

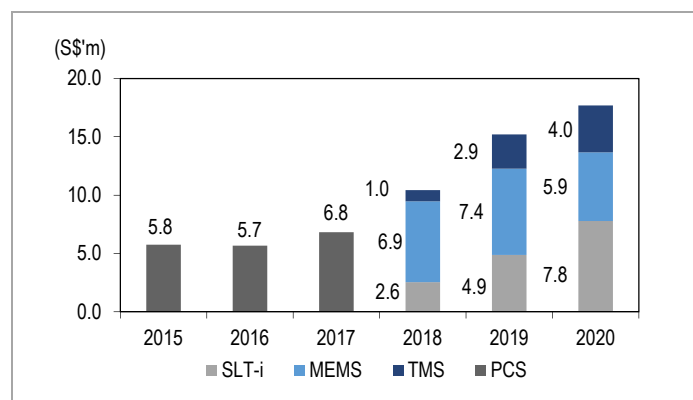
Source: AEM, UOB Kay Hian

ESS SEGMENT REVENUE



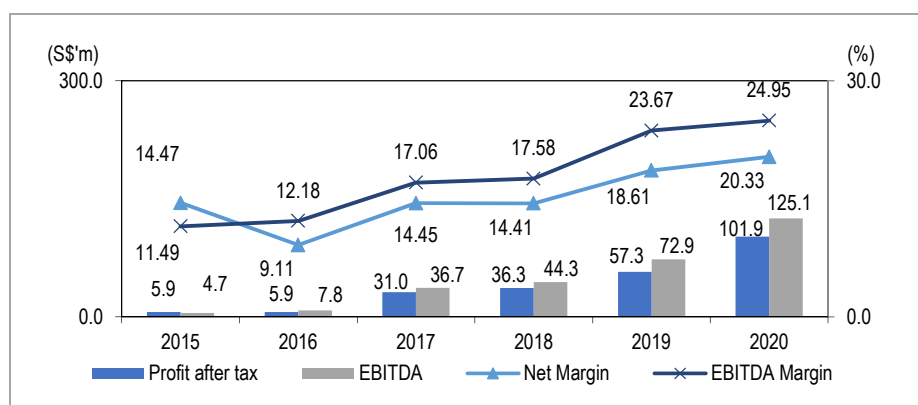
Source: AEM, UOB Kay Hian

REVENUE BY SEGMENT, EXCLUDING ESS



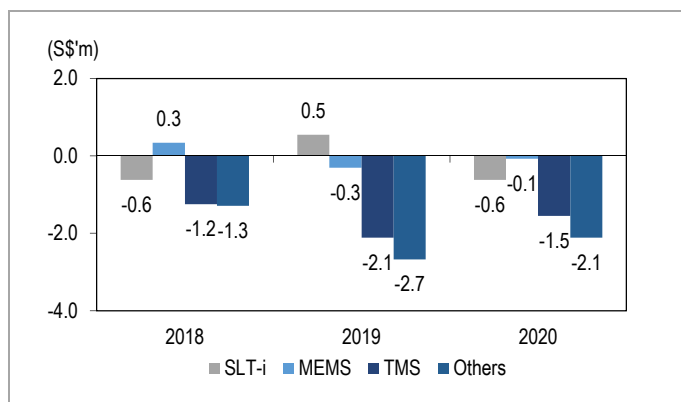
Source: AEM, UOB Kay Hian

ESS SEGMENT PAT, EBITDA AND MARGINS



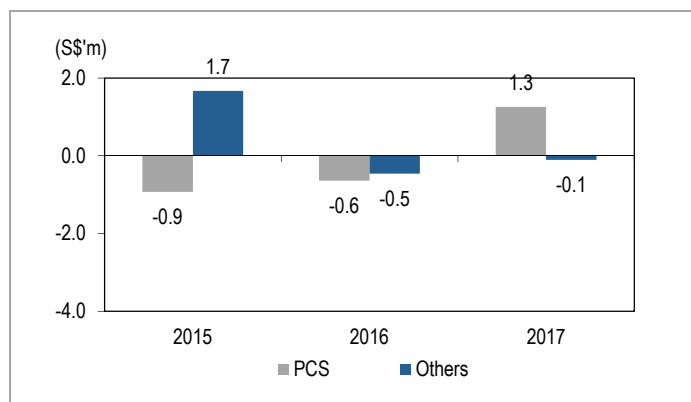
Source: AEM, UOB Kay Hian

PAT BY SEGMENT, EXCLUDING ESS



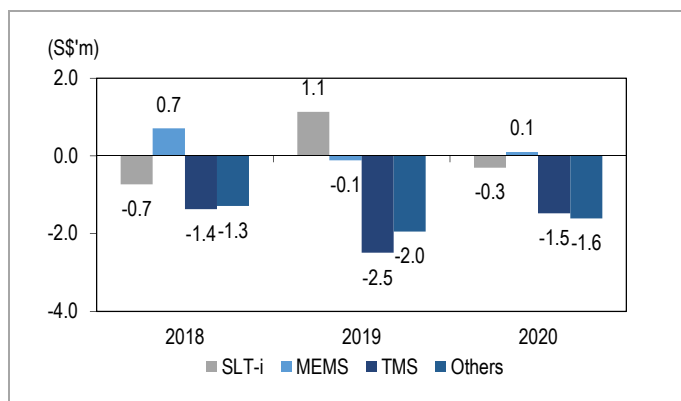
Source: AEM, UOB Kay Hian

PAT BY SEGMENT, EXCLUDING ESS



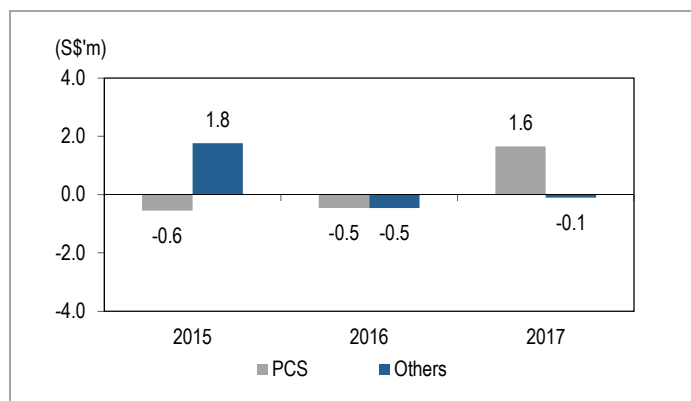
Source: AEM, UOB Kay Hian

SEGMENT EBITDA, EXCLUDING ESS



Source: AEM, UOB Kay Hian

SEGMENT EBITDA, EXCLUDING ESS



Source: AEM, UOB Kay Hian

ESS SEGMENT IS KEY REVENUE DRIVER

Proven ability to build test platforms for large-scale global customers. AEM records the sale of its successful high density modular test (HDMT) platform, related parts and consumables to Intel mainly under the ESS segment, which is the company's core revenue and profit driver. The success of its HDMT platform led ESS revenue to grow by 57% in 2016 to S\$64.4m and by 233% in 2017 to S\$214.8m. Likewise, ESS share of total group revenue grew from 88% in 2015 to 97% in 2020, while group revenue expanded from S\$47m to S\$519m in the same period. The ESS segment accounted for S\$501.3m of revenue in 2020 whereas all the other segments combined accounted for only S\$17.7m.

The profitability of this segment has progressively increased over the years as AEM sells more higher-margin consumables and parts to Intel following the completion of the initial rollout in 2019.

The MEMS and TMS segments were set up after the acquisition of companies in these fields in 2017. The SLT-I segment refers to the sale of system level equipment, mainly its AMPS platform and Mu-TEST's tester products. Mu-TEST is a company acquired in 2020.

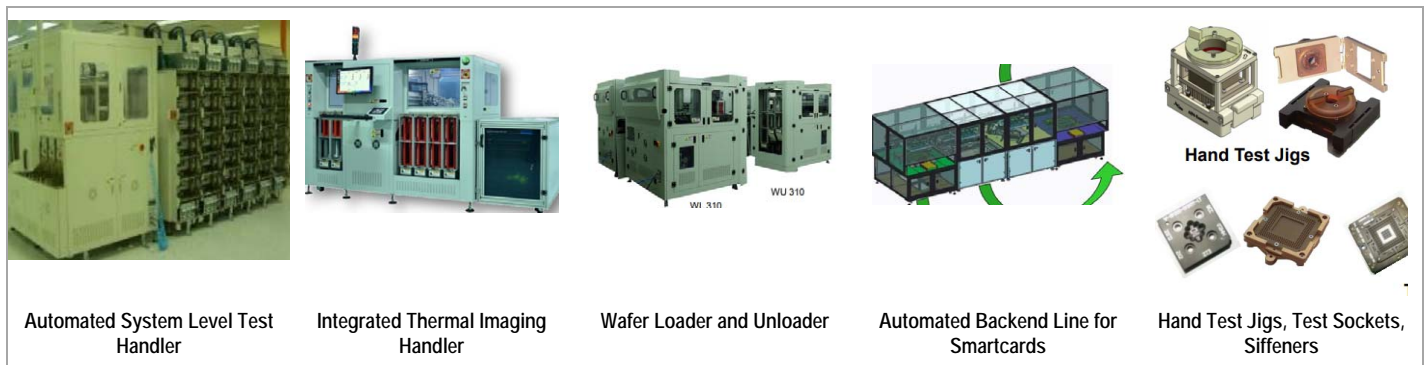
The success of the HDMT platform with Intel demonstrates AEM's core competency in developing next-generation test handlers for deployment at large global customers.

Appendix IV – Key Products: HDMT And AMPS Platforms

BACKGROUND

Before the launch of the HDMT platform, AEM's legacy products included an older generation of test handlers; an integrated thermal imaging handler to test and grade solar cells; a highly-customised wafer loader and unloader that can be integrated with its thermal imaging handler; and a smartcard backend handler that could load, vision inspect, test, print, cut, punch, sort and unload chips. In addition, the company has designed and manufactured parts such as test sockets and kits for semiconductor OEMs.

A LEGACY REPRESENTATION OF AEM'S PRODUCTS



Source: AEM, UOB Kay Hian

FULL TURNKEY INTEGRATED TEST SOLUTIONS

HDMT platform led to significant growth from 2016-19. The development of AEM's successful HDMT generation semiconductor handling platform can be traced to the beginning of 2014 when the company received a S\$7.2m non-recurring engineering purchase order from a customer that eventually expanded to S\$13.6m by end-Jun 14. Development was completed in 2015, and the high-volume manufacturing machine achieved commercial readiness in 4Q15, was launched in 2016 and entered mass volume production in 2H16.

A HIGH DENSITY MODULAR TEST MACHINE



Source: Intel

HOW AEM'S COMPLETELY MODULAR HIGH DENSITY HANDLER PLATFORM CHANGED TESTING

AEM's equipment automated the entire Back-end Test process, and transformed the Cost-of-Test and Time-to-Market performance for Customer

THE BIG DEAL - Automating the entire back-end test process eliminates re-correlation and enables big data analytics to optimize test flows for different devices under test.

Back-end Test process

AEM's Equipment System Solutions

BI Handlers: **ASTRONICS**

Interface: **Hirata**

ATE: **ADVANTEST**, **LTXcredence**, **TERADYNE**

Handlers: **COHU**, **ADVANTEST**

SLT Handlers: **AEM**, **ASTRONICS**, **TERADYNE**

CONSOLIDATION

Near future

AEM has been providing automated SLT solutions since 2002

Left: This slide is obtained from an AEM presentation in 2019. It shows that traditionally different processes require different handlers and test equipment and that AEM was previously in the space of providing SLT handlers.

Its HDMT and AMPS platforms are able to consolidate these processes and perform various pre-heat, class test, burn-in and system level tests, using various testers. This removes the need for multiple interfaces and handlers and accelerating the test process.

Automation also allows the optimisation of test flows for different devices under test.

18

Source: AEM, UOB Kay Hian

The HDMT platform was game changing with its ability to perform multiple processes in a parallel manner that used to be deployed across multiple platforms, and incorporates the company's knowledge base in various processes such as integrating complex systems, operating in tri-temp environments and applying advanced thermo and fluid dynamics. Through active thermal control, the HDMT platform is able to achieve higher yields and has been reported to significantly reduce cost-of-test by more than two times at its key semiconductor customer. This platform is in full commercial deployment at Intel. Other than equipment replacement and the sale of consumables and kits, AEM successfully installed the beta unit of a next-generation hybrid solution for Intel in 2019.

AMPS SYSTEM TEST PLATFORM

Moving on to AMPS and SLT. Improving on its experience in developing the HDMT platform, AEM has developed an AMPS platform – a SLT handler or “Singular Test Framework” that supports the co-existence of different testers or programmes. Through its modular and asynchronous design, the AMPS platform allows for common and configurable test environments for both functional tests and SLT. Its modular handler structure supports various test capabilities including intelligent vision inspection; individual device active thermal control from -40°C up to 150°C, which enables burn-in and stress test within the same system; and other system level functional test capabilities, in a “all-in-one” framework (rather than the typical sequential process).

Being completely asynchronous in operation, the AMPS platform can be customised and reconfigured as required for specific device applications while allowing each test to be completely stand-alone in operation, thus facilitating the ability to reconfigure systems without taking a line down and enabling smart individual device tests. Multiple different devices or modules can be tested at the same time to support applications with a higher mix of products for users such as outsourced semiconductor assembly and testing vendors.

Testing can be scaled from individual devices for engineering debug to up to 480 parallel sites, allowing for parallel testing on a massive scale in a fast-paced environment.

The platform also facilitates data collection and big data analytics. For instance, system level data can be used with functional test and wafer test results to enable smart knowledge-based adaptive test decisions to be made between wafer, functional and system level tests, further reducing the overall cost-of-test. AEM secured a memory manufacturer as a client in 2018 and delivered the first commercial AMPS solution in early-19.

SUMMARY OF AMPS PLATFORM

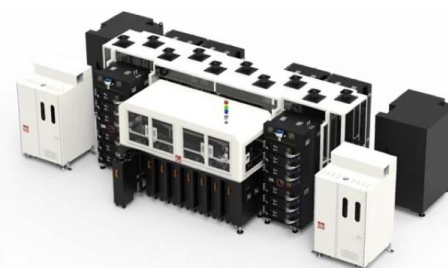
Asynchronous Modular Parallel Smart platform

- **Singular Test framework** that support for different testers or same testers/different-programs to coexist.
- **Common, configurable** test environment for both functional and system level test.
- **Modular handler** structure with advanced support for ATC & intelligent vision.
- **Scalability** that enable rapid high parallelism for fast pace environment.
- **Tester Ecosystem** 3rd party partners or customer in-house solutions
- **Customized** to your specific needs.

Note:- ATC means active thermal control

Source: AEM

AN AEM AMPS SYSTEM



Source: <https://aem.com.sg/system-level-test/test-paradigm-shift-with-system-level-test/#>

Left: Sales of AMPS platform are recorded under the SLT-I segment based on disclosures by AEM. Revenue at this segment expanded from S\$2.6m in 2018 to S\$7.8m in 2020, with positive EBITDA of S\$1.1m in 2019 and a marginal loss before interest, taxation, depreciation and amortisation of S\$0.3m in 2020.

Growth will be driven by engaging new semiconductor and memory customers and collaborating with eco-system partners, targeting the North America and China markets.

Appendix V – Mergers And Acquisitions

BACKGROUND

Operating cash flows jumped from negative S\$1.7m in 2016 to S\$49.9m in 2017. From 2017 to 2020, AEM garnered positive operating cash flows totalling S\$237.9m. Leveraging on its strong cash flows, the company has made seven acquisitions and one investment since Sep 17, for a cumulative consideration of about S\$163.8m, of which S\$122.3m has been paid in cash, S\$28.9m in shares and a remaining S\$12.6m is outstanding – deferred payments or contingent consideration based on milestones or targets.

SUMMARY OF ACQUISITIONS AND INVESTMENTS – INTEGRATION STRATEGY

| New Markets | | | New Capabilities | |
|----------------------------|---------------------------|--------|---|-----------------------------------|
| Radio Frequency and Cables | MEMS | Memory | Testing and Inspection Technology | Supply Chain Integration |
| InspiRain (TMS segment) | Afore Oy (MEMS segment) | ATECO | IRIS Solution (Machin vision inspection) | DB Design (Consumables) |
| <-interconnect testers-> | <-Non-digital probers-> | | Mu-TEST (FPGA based testers, under SLT-I segment) | CEI (Manufacturing and box build) |
| | <-----Test handlers-----> | | Lattice Innovation (Thermal control) | |

Source: AEM, UOB Kay Hian

Left: Field programmable gate array (FPGA) is an integrated circuit whereby the hardware circuitry is programmable and is useful when a chip needs to be optimised for particular workloads. When prototyping application specific integrated circuits (ASIC), an FPGA can be reprogrammed until the ASIC or processor design is final.

Source: <https://www.prowesscorp.com/what-is-fpga/>

In the case of Mu-TEST, its testers or ATE solutions are FPGA-based and are thus highly customisable and low-cost, with the potential to replace ASIC testers and complement the AMPS platform.

The above list excludes partnerships. In May 20, AEM announced a plan to jointly develop next-generation complementary metal-oxide semiconductor (CMOS) image sensor testing systems and solutions with UTAC Holdings – a Singapore-based assembly and test services provider which has been offering CMOS image sensor assembly and testing services for years. This cooperation is to create application-specific test solutions that may generate revenue for AEM in the future.

It also excludes a related-party transaction – a US\$3.04m investment in NT Thor Holdings, which serves as an investment holding company that invested in an entity engaged in the business of rendering semiconductor engineering services. This investment was made in 2021 and comprised of a loan that is convertible into shares upon the meeting of certain undisclosed conditions. Upon conversion, AEM shall own 7.5% of NT Thor Holdings. This investment was made with other investors including Novo Tellus PE Fund 2, L.P.

The list also includes an investment of 26.59% in ATECO Inc, a South Korean memory test handler company, for US\$3.8m. This investment opens AEM to the Korean memory test market and AEM has the right to raise its shareholdings to 65% at an additional cost of US\$13.3m. This investment shall be accounted as an associated company of AEM. The remaining acquisitions all relate to the purchase of 100% of the respective companies.

These acquisitions added various capabilities to the group and allowed AEM to both expand its testing capabilities and enter new markets. Smaller acquisitions such as IRIS Solution in Mar 18 and DB Design Group Inc (US\$3.3m) in Jul 20 added capabilities such as machine vision and consumables supply to the company. In the case of DB Design Group Inc, its acquisition can be seen as an extension of AEM's supply chain.

LIST OF ANNOUNCED MERGERS, ACQUISITIONS AND MAJOR INVESTMENTS SINCE 2017

| Company | Date of Completion | Consideration | Company Description |
|--|--------------------|----------------|--|
| InspiRain Technologies (100%) | Sep 17 | S\$7.89m | Research, development (R&D) and production of advanced communications and industrial test solutions for cables, including ethernet and fibre cables. |
| <p>AEM's TMS segment revenue, which is mainly driven by InspiRain Technologies, grew from S\$1.0m in 2018 to S\$4.0 in 2020. Losses before depreciation, amortisation, interest and taxation totalled S\$1.4m, S\$2.5m and S\$1.5m respectively. AEM has set up a worldwide sales channel to drive the growth of this business unit which has launched several new products after the acquisition by AEM. The transaction was paid for through a mix of upfront, deferred, contingent cash and share consideration:</p> <ul style="list-style-type: none"> - S\$1.5m of upfront share consideration (settled), S\$0.5m of deferred cash payment (paid), S\$1.9m of three tranches of deferred share consideration (fully settled) - Four tranches of contingent share consideration (two tranches of S\$1.2m settled, with one 2020 tranche of S\$1.64m settled in May 21 and one tranche to be based on 2021 performance) <p>The contingent consideration is payable in tranches over four years up to 2021 for the meeting of revenue targets of up to S\$4m and achieving gross margin of at least 30%. Two tranches of S\$2.74m fair value were outstanding as of 31 Dec 20.</p> | | | |
| Afore Oy (100%) | Mar 18 | S\$12.6m | Finland-based industry pioneer and leader in wafer level MEMS testing and handling solutions. |
| <p>Afore contributed revenue of S\$6.9m and net profit of S\$0.46m for the 10 months ended 31 Dec 18. At the segment level, the MEMS segment contributed revenue of S\$6.9m, S\$7.4m and S\$5.9m in 2018, 2019 and 2020 respectively. Segmental EBITDA was S\$0.7m, negative S\$0.1m and S\$0.1m respectively. Its growth strategy is similar to that of InspiRain, whereby new products are being launched, in tandem with penetration into new markets, namely the US and China.</p> <p>The transaction was paid for via a mix of S\$8.1m in cash and S\$4.5m of shares. Shares paid to one of the vendors were subject to a 36-month moratorium which has since expired.</p> | | | |
| IRIS Solution (100%) | Mar 18 | S\$1.5m | R&D and integration of advanced machine vision solutions to manufacturers in the electronics, semiconductor, medical, optical and MEMS devices manufacturing; robotics and logistics; precision parts and solar industries. Complements AEM's portfolio of tester capabilities. |
| <p>IRIS Solution contributed revenue of S\$1.3m and net profit of S\$0.5m for the 10 months ended 31 Dec 18. The consideration of S\$1.5m entailed an upfront payment of S\$0.5m, followed by four equal tranches of S\$250,000 every 12 months after the acquisition. AEM has thus far paid S\$576,000 for the acquisition of IRIS Solution, which has been recorded as S\$188,000 of net identifiable assets and S\$388,000 of goodwill. As at end-20, goodwill for the machine vision solutions unit remained unchanged at S\$388,000. IRIS Solution complements AEM's expertise in machine vision inspection, and also due to its size relative to the larger group, post-acquisition data such as the financial performance and the payment of the remaining tranches are not separately reported.</p> | | | |
| Mu-TEST (100%) | Mar 20 | €7.5m | France-based provider of highly customisable, application-specific, FPGA-based ATE testers for medium and high-end ICs, to complement AMPS products. |
| <p>Mu-TEST contributed revenue of S\$2.3m and a loss of S\$0.99m for the nine months ended 2020. The consideration comprised of an upfront cash payment of €4.9m, followed by a one-year holdback of €0.9m, a three-year performance earn-out of €1.7m (by way of cash or shares at the option of the vendor) and a further incentive bonus of €0.34m if certain revenue targets are achieved in 2021 and 2022. As at end-20, AEM had paid cash of S\$9.78m and recorded a contingent consideration of S\$3.0m.</p> | | | |
| DB Design Group Inc (100%) | Jul 20 | US\$3.3m | California-based supplier of automation fixtures, device kits and other test-related products. More than 30 years' experience supplying virtually all major semiconductor testing and handling systems. Complements AEM's consumables business. |
| <p>DB Design contributed revenue of S\$1.7m and a loss of S\$0.25m for the six months ended 2020. The consideration comprised of an upfront cash payment of US\$1.9m and AEM shares of US\$0.6m, followed by a one-year holdback of US\$0.2m and a three-year performance earn-out of US\$0.6m based on milestones and targets. As of end-20, AEM had recognised deferred consideration of S\$0.16m for DB Design, but no contingent consideration for DB Design.</p> | | | |
| Lattice Innovation, Inc (100%) | Dec 20 | US\$15.2m | California-based company with design, simulation and process services in the active thermal control space. Complements AEM's capabilities in thermal management, vision inspection and deep automation solutions. Solutions are used in laser diode and semiconductor IC thermal management. |
| <p>Lattice was acquired in stages – 47.7% in Nov 20 and 52.3% in Dec 20. For the one month ended Dec 20, Lattice contributed revenue of S\$0.4m and net profit of S\$0.1m. The consideration comprised of upfront cash of US\$11m, a one-year holdback of US\$1.2m and a three-year performance earn-out of US\$3.0m. As of end-20, AEM had recognised deferred consideration of S\$1.4m, but no contingent consideration for Lattice.</p> | | | |
| ATECO Inc (26.59%) | Mar 21 | US\$3.8m, cash | South Korea-based designer and developer of memory test handler solutions. |
| <p>Has the rights to subscribe for convertible preferred shares for US\$2.3m and to purchase additional shares for US\$11m to raise its cumulative stake to 65% on a fully-diluted basis.</p> | | | |
| CEI Limited (100%) | Apr 21 | S\$99.7m | A contract manufacturer, designer and manufacturer of equipment. Services include: a) assemblies of PCB, box-build, prototype and equipment; and b) value-added engineering works such as circuit layout and functional design. Also designs and makes own brand of semiconductor equipment. Has operations in Singapore, Indonesia and Vietnam. |
| <p>CEI reported revenue of S\$123.5m and net profit of S\$6.0m for 2020. The offer was initially announced on 11 Jan 21 and closed on 26 Apr 21. AEM received valid acceptances of 92.09% from other shareholders at close of the offer and exercised its right to compulsorily acquire the remaining shares of CEI on 30 Jun 21. On completion, CEI will be delisted. Cash consideration amounts to about S\$82.7m based on 4.8m new consideration shares issued at an issue price of S\$3.55 each (S\$17.0m) to date.</p> | | | |

Source: AEM, UOB Kay Hian

OVERVIEW OF MAJOR OR SELECTED ACQUISITIONS

First acquisition in 2017 led to award winning products. The acquisition of InspiRain for S\$7.9m in Sep 17 opened up radio frequency and advanced networking testing markets for AEM. Synergies include integration of the two companies' R&D departments to combine testing and automation expertise.





Solutions include vector network analysers (VNA) and portable network cable testers. Leveraging on the inherent VNA technology and AEM's automation expertise, several post-acquisition achievements were made, including the launch of new products, award winning testers, the securing of new account Huawei in late-18 (5G infrastructure) and expansion into the automobile sector.

Most recently, "innovative" test solutions for the automated testing of passive communication devices such as connectors have been developed and have been deployed at two customer sites, marking expansion into a new application.

Second acquisition opened doors to MEMS market and quantum computing. Afore was acquired in Mar 18 for S\$12.6m. Afore is recognised as the industry pioneer in wafer level MEMS testing, having delivered its first MEMS test cells in 1998, with a vast range of products today for various products (eg gyroscopes and accelerometers) including the world's first commercial test system for Wafer Level Chip Scale Packaged motion sensors and a Cryogenic Wafer Prober capable of operating at cryogenic temperatures of below 4 Kelvin, which is useful in the quantum computing field whereby testing and characterisation are conducted at temperatures near absolute zero.

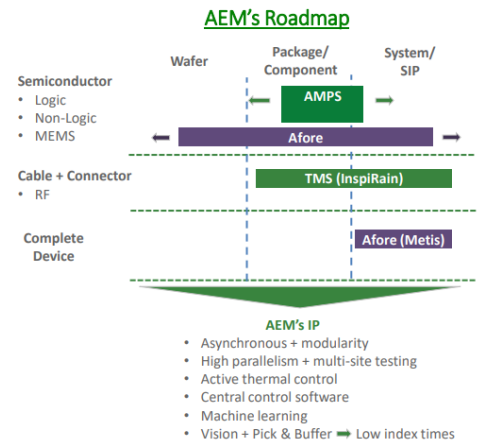
Mu-TEST expands AEM's portfolio to IC testers. Mu-TEST is a provider of ATE solutions, including hardware such as electromechanical structures and a suite of test equipment, and software that covers test program development, advanced debug functionalities, and test operation. Its proprietary technology is based on FPGA rather than application specific integrated circuits (ASIC) and is thus able to deliver high-specification low-cost ATE solutions and help customers reduce their overall cost-of-test. Mu-TEST's solutions are generally applied to systems-on-chip (SOC), digital ICs, memories and sensors, etc.

LIST OF AEM TESTING & MEASUREMENT SOLUTIONS (INSPIRAIN)

|  <p>TestPro CV100 Multifunction Cable Certifier</p> |  <p>Mixed Mode Multi-Port Vector Network Analyzer ("MMVNA")</p> |  <p>WideOptix-SR4 Multimode Fiber Optic Test Solution</p> |  <p>Network Service Assistant</p> |
|---|--|--|---|
| <p>Description</p> <ul style="list-style-type: none"> - Launched in 2018 - World's first multi-gigabit link validator - Award winning product - As of 2019, AEM claims that it has the fastest test speed and widest frequency range in the industry for testing both copper and fibre optic cables <p>Application: Used for certifying network cables in smart building network infrastructure</p> | <p>Description</p> <ul style="list-style-type: none"> - Purpose built for characterising twisted pair cables and components - Supports high volume testing using an innovative measurement architecture - Used by some of the largest automotive cable harness makers today; successfully deployed at a major manufacturing plant in 2018 <p>Application: Used in IoT, specialty sensor connections and automotive wiring harness testing</p> | <p>Description</p> <ul style="list-style-type: none"> - Able to rapidly and accurately test optic cable bandwidth, eg 100GBASE-SR4 cabling - Developed in collaboration with a research institution in China - Chosen by Huawei in Oct 18; first test solution for testing 100Gbps links was delivered in 2019 <p>Application: Used for qualifying high-performance short-reach cabling links in 5G network</p> | <p>Description</p> <ul style="list-style-type: none"> - Launched in 2020 - A multifunction connectivity tester that can both test network connectivity and perform standards-based cable testing <p>Application: Used by enterprise level IT service providers and IT departments</p> |

Source: AEM, UOB Kay Hian




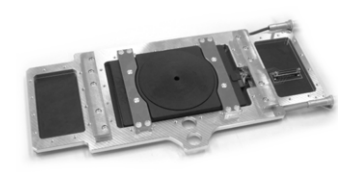
ROLES OF INSPIRAIN AND AFORE IN AEM'S PORTFOLIO



Above: This slide obtained from AEM's presentation in Apr 18 shows how the first two acquisitions expanded the company's footprint along the application x process matrix. Afore (Metis) refers to an Afore system used for testing completed motion sensors.


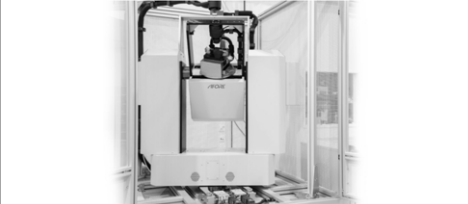

Source: AEM, UOB Kay Hian

LIST OF AEM MEMS SOLUTIONS (AFORE) – FOR WAFER AND FRAME PROBING

| | | | |
|---|--|--|---|
|  |  |  |  |
| <p>AIOLOS BP Pressure Sensor Test System</p> | <p>AFORE MPP Multi Purpose Frame/Wafer Probe System</p> | <p>KRONOS Inertial Sensor Wafer Probe System</p> | <p>MSU10 Magnetic Field Generator for Sensor Calibration</p> |
| <p>Description</p> <ul style="list-style-type: none"> - For probing of diced wafers on wafer-frames - Automated probing – caters up to 200mm wafers; robotic and manual loading - Optional high vacuum and high pressure versions - Offers a range of temperature options for automotive grade testing - Supports pressure levels from standard vacuum to 2.000hPa(abs) | <p>Description</p> <ul style="list-style-type: none"> - For probing of diced wafers on wafer-frames - Automated probing – caters up to 200mm wafers; robotic and manual loading - Offers a range of temperature options for automotive grade testing - Modular design supports testing of a wide range of devices such as thermal sensors - Can also be used for calibrating magnetometers and other devices requiring magnetic fields to test when used with MSU10 Magnetic Stimulus unit | <p>Description</p> <ul style="list-style-type: none"> - Enables probing, testing and stepping in any orientation or during rotation - Handles wafer sizes of up to 8" - High multi-site testing capabilities and optional temperature systems. - Allows fast automatic loading - For precise testing of gyroscopes and accelerometers - Enables calibration of combined sensor systems including accelerometers, gyroscopes and magnetometers using real stimulus when used with MSU10 Magnetic Stimulus unit | <p>Description</p> <ul style="list-style-type: none"> - For test and calibration of magnetic sensors within a 10x10mm homogeneous field inside a wafer probe station - Integrated into Afore's probing platforms, the MSU10 unit can be combined with other custom- designed non-magnetic probe cards in testing |


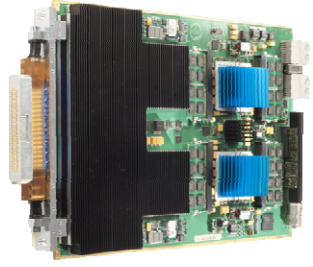
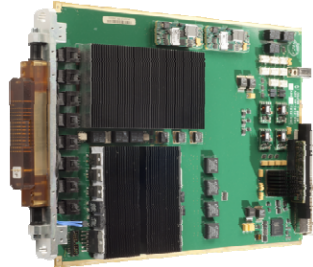
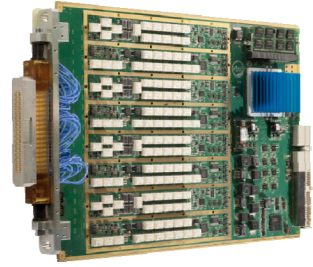
Source: AEM, UOB Kay Hian

LIST OF AEM MEMS SOLUTIONS (AFORE) – CRYOGENIC WAFER PROBERS AND FINAL TEST & LEVEL TEST SYSTEMS

| | | |
|---|---|--|
|  |  |  |
| <p>Cryogenic Wafer Prober Wafer Level QBIT Testing</p> | <p>METIS Rate Table for Inertial Sensor Calibration</p> | <p>APOLLON Automotive Grade Strip Level Inertial Sensor Calibration</p> |
| <p>Description</p> <ul style="list-style-type: none"> - For wafer level testing of cryogenic quantum devices, electronics and detectors - For up to 12" wafers, enabling testing in sub-2K temperatures - Fast sample characterisation with a throughput up to 100 times faster than commonly used cryogenic chambers - Developed as a cooperation between Afore and Bluefors, a Finnish "dry" cryogenic cooling company | <p>Description</p> <ul style="list-style-type: none"> - Designed for a wide variety of test applications from laboratory use to mid-volume production testing of motion sensors - Multiple tooling and measuring instrument options give benefits in numerous applications including: <ul style="list-style-type: none"> - Motion sensor R&D - Sensor post-assembly calibration and - Human motion simulation in IoT and virtual reality device software development | <p>Description</p> <ul style="list-style-type: none"> - Tri-temp strip level testing system for motion sensor calibration - Designed for high-end automotive MEMS gyroscope and accelerometer testing - Tightly-controlled temperatures from -50°C to +150°C - Devices under test are soaked at the desired temperature inside the system's test chamber to facilitate high test capacity |

Source: AEM, UOB Kay Hian

LIST OF MU-TEST PRODUCTS – ATE TESTERS AND INSTRUMENTS

| | | | |
|--|--|--|--|
|  <p>M-5S / M-10S High Performance Tester</p> |  <p>M-D864 / M-D1632 64 Channel @ 800Mb/s Digital Instrument / 32 Channel @ 1600Mb/s Digital Instrument</p> |  <p>M-DPS10 / M-WR48 10 Channel Device Power Supply / 48 Wide Range Universal channel with High Voltage Digital IO up to 10 Mb/s Device Power Supply</p> |  <p>M-MiXW Mixed Signal Test Instrument</p> |
| <p>Description</p> <ul style="list-style-type: none"> - Comes with 5 or 10 universal slots - Up to 256/512 pins for pre-series to conduct volume production tests - Comes with calibration and diagnostic load boards - Desktop compatible for integration into engineering environment - Includes workstation and MuTool software licence for fully-integrated test solutions - Covers all requirements from characterisation and engineering applications to production tests | <p>Description</p> <ul style="list-style-type: none"> - Used with testers for different test configurations - Up to 128Gbits pattern memory and 128Gbits extended capture memory to enable improved test coverage together with higher throughput - Real time array analysis for reduction of engineering efforts and production test time - True differential IOs improve accuracy and IC test yields - FPGA-based controller and onboard reconfigurable memories for unique client customisation | <p>Description</p> <ul style="list-style-type: none"> - Current measurement - Gang capability enables flexible minimum and maximum current choices, to cover wide product range - Truly programmable current clamp provides extended test interface lifetime - Eight channels with 800 mA current capability and two channels with 5A current capability (for M-DPS10) - M-WR48 comes with 48 channels able to switch from digital IO to non-digital source, with FPGA-based controllers and onboard reconfigurable memories for unique client customisation | <p>Description</p> <ul style="list-style-type: none"> - Dedicated to mix-signal device testing such as audio and video converters, audio processors, filters and complex SOC devices - Eight fully independent channels - Large on-board memory for signal generation and acquisition - Linked and synchronised with Mu-TEST digital instruments and MuTool environment |

Source: AEM, UOB Kay Hian

APPLICATIONS OF MU-TEST SOLUTIONS

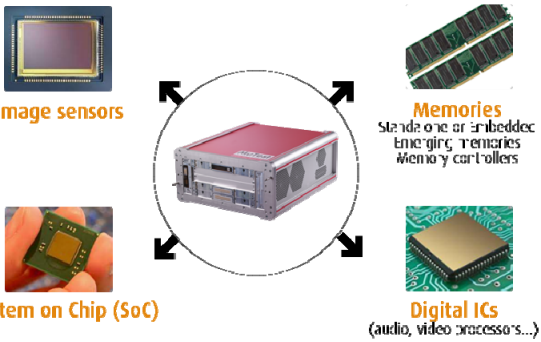


Image sensors

Memories
Standalone or Embedded
Emerging memories
Memory controllers

System on Chip (SoC)

Digital ICs
(audio, video processors...)

Mu-TEST's platform is suited for all digital circuits with data rates and speeds above 50/100/200 Megabits per second and/or requiring large tester memories.

Targeted applications include the full range of digital ICs (microcontrollers, digital signal processors, video and application processors), embedded or standalone memories (flash, SRAM, DDR1/2/3 and their controllers), debug & characterisation and image sensor arrays (consumer, industrial and spatial).

Its mixed signal instrument expands its capabilities to include testing of SOC devices.

Source: AEM

Lattice strengthens AEM's advantage in thermal control. Following the acquisition of Mu-TEST, AEM's next major acquisition can be said to be Lattice Innovation (Lattice) for US\$15.2m. Lattice provides proprietary technology solutions in active thermal control through design, simulation and process services. Lattice's solutions have been applied in laser diode and semiconductor IC thermal management. According to AEM, active thermal management is a vital part of all performance IC test steps ranging from burn-in, sort test and SLT, and the testing of processor ICs (which is AEM's key market) has traditionally been driven by thermal control advancement.

Taken together, AEM's proprietary chiplet-level thermal control technology is massively scalable to test hundreds of parts in parallel. With its innovations in process technology, AEM's customers can efficiently test their entire product portfolios. The unified thermal control platform ensures end-to-end performance coverage and clear economies of scale. Tests show advantages ranging from single-die low-power processors all the way to highly complex multi-chip cloud computing processors. Besides the performance IC or computing market, the combined technology is also applicable to markets such as the automobile, mobile, and optical electronics test markets.

Acquisition of CEI complements AEM's supply chain and opens new markets. CEI provides manufacturing services for PCB assembly, complete box-build assembly, equipment design & manufacturing and cable harness assembly. It also provides value-added services such as materials management; circuit layout; development, engineering and prototyping of samples; metal stamping and precision machining of components. It is focused on the high-mix, low-volume niche segment of contract manufacturing services. For the financial year ended Dec 20, CEI generated revenue of S\$123.5m, gross profit of S\$28.3m and net profit after tax of S\$6.0m. It had a book value of S\$39.0m as at 31 Dec 20.

According to management, CEI expands the manufacturing footprint of AEM and allows it to truly service customers with quick turnaround time (with in-house manufacturing). CEI has factories in Singapore, Malaysia, Indonesia and Vietnam. Prior to the acquisition of CEI, AEM only had factories in Suzhou (China), Penang (Malaysia) and Singapore.

Secondly, CEI provides manufacturing capabilities to AEM's consumables (eg test sockets) business and those of Mu-TEST and the other segments. AEM sees PCB assembly as an important component of the test cell. Testing equipment being high-mix and moderate in volume is a fit with CEI's PCBA and box-build capabilities, especially as AEM acquires a more diverse range of customers with different sizes and different in-house capabilities. With more manufacturing conducted internally, AEM can exercise high control over quality and agility across its supply chain.

Thirdly, CEI serves a diverse range of customers that manufacture products including electroluminescence displays used in industrial, transport and medical applications; medical and healthcare equipment; office automation equipment such as high-speed printers; analytical instruments such as gas and liquid chromatographs and measuring instruments; industrial safety controllers and environmental sensors; semiconductor equipment and surface-mount technology equipment. AEM further sees cross-selling opportunities with CEI, especially in the medical sector to which the company previously had little exposure.

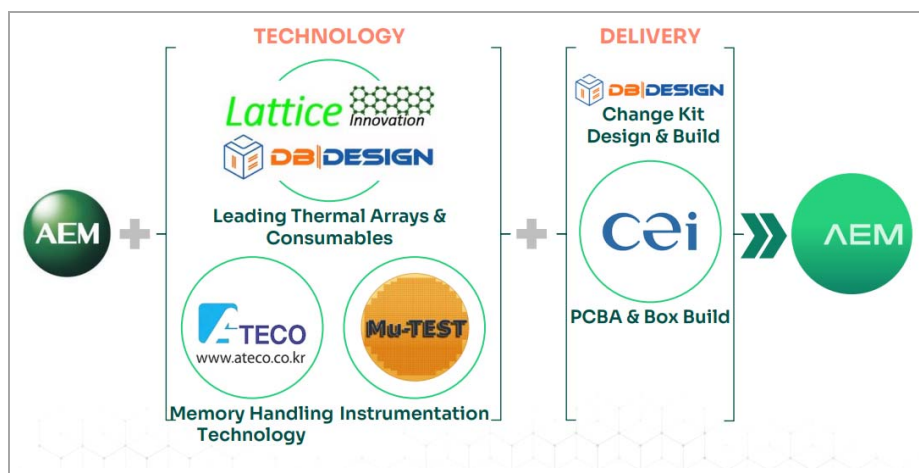
A COMPLETED BOX-BUILD ASSEMBLY



Above: A box-build assembly refers to all the other assembly work involved in an electromechanical assembly, other than PCB production. It includes installation of sub-assemblies and other components, routing of cabling or wire harnesses, and connection of the PCBA to a user interface display, within the enclosure and able to include testing and commissioning services.

Source: <https://versae.com/what-is-included-in-a-box-build-assembly/>

VISUAL REPRESENTATION OF AEM'S ACQUISITION STRATEGY AND OUTCOMES



Source: AEM

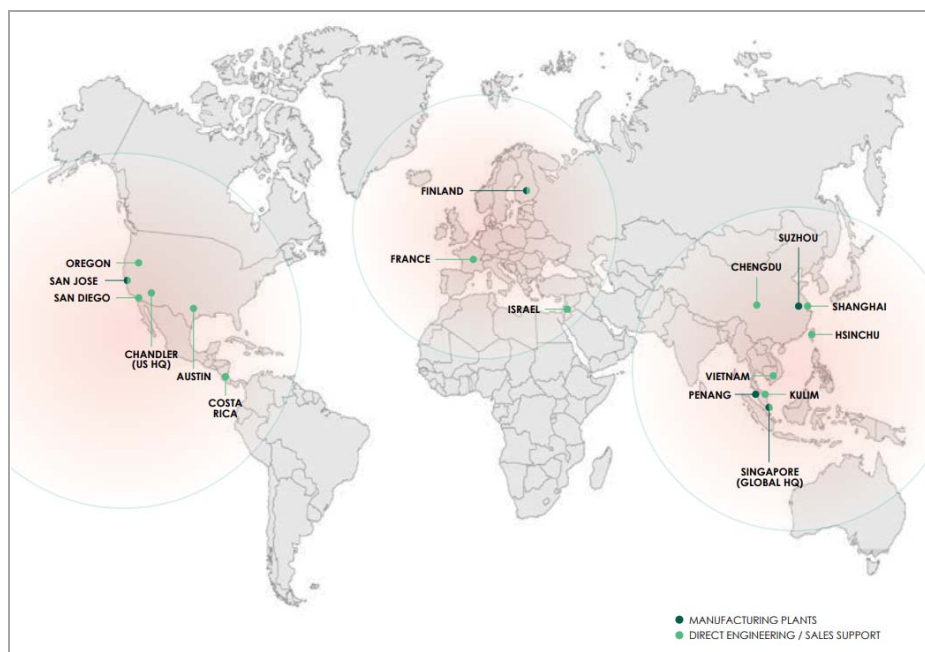
Appendix VI – Geographical Presence

As of end-20, AEM had manufacturing plants in Singapore, Penang and Suzhou and direct engineering or sales support offices in Kulim (Malaysia), Vietnam, Hsinchu (Taiwan), Shanghai and Chengdu (China), Israel, France (after the acquisition of Mu-TEST), Costa Rica, Austin, San Diego, San Jose, Oregon and Chandler (the US).

During 2020, the company expanded its presence in California after acquiring DB Design and Lattice. The Shanghai and Taiwan offices were set up at the end of 2020. The Finland facility covers manufacturing, direct engineering or sales support functions and arose out of the acquisition of Afore. CEI adds Vietnam and Indonesia to the company, in terms of new manufacturing locations.

Non-core businesses such as a semiconductor substrate business in Singapore and a plating business in Suzhou (China) were disposed of in Dec 14 and Mar 16 respectively. A factory in Malacca was also sold in Apr 16.

GLOBAL FOOTPRINT



Source: AEM

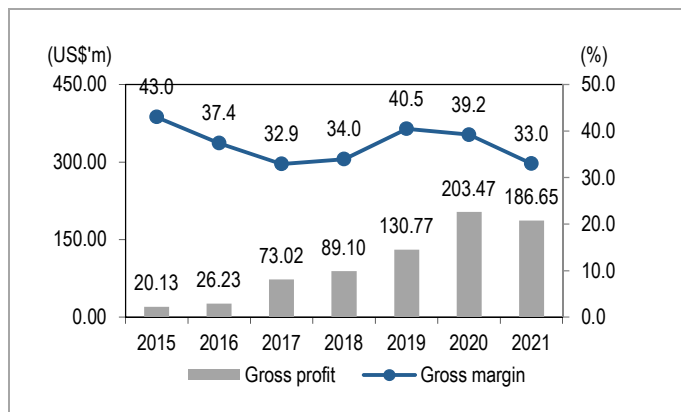
MANUFACTURING FACILITIES AND FIELD ENGINEERING SERVICE SITES

| Country | Activities and Businesses |
|-----------|--|
| Singapore | Corporate headquarters, ESS, SLT-i, TMS, PCBA / Box-Build / Contract Manufacturing (via CEI) |
| Malaysia | ESS, Field Service |
| Indonesia | PCBA / Box-Build / Contract Manufacturing (via CEI) |
| Vietnam | PCBA / Box-Build / Contract Manufacturing (via CEI), Field Service |
| China | ESS, Field Service |
| Finland | MEMS (via Afore) |
| France | SLT-i (via Mu-TEST) |
| US | Field Service / Engineering (via Lattice Innovation) / Consumables (via DB Design) |

Source: AEM, UOB Kay Hian

Appendix VII – Financial Overview

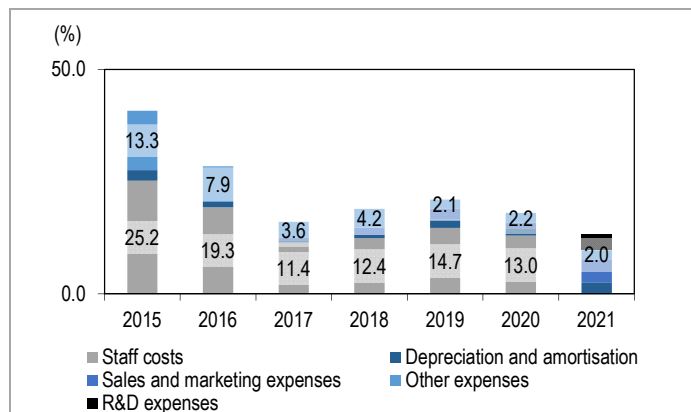
GROUP GROSS PROFIT AND MARGIN



Note: Only includes changes in inventories and raw material & consumables costs. The company reports its financials by nature.

Source: AEM, UOB Kay Hian

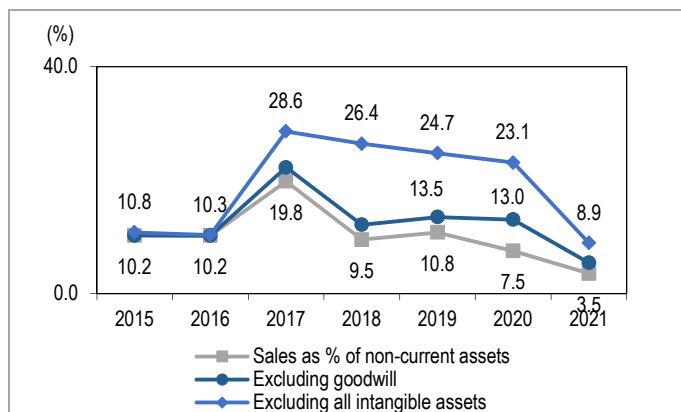
OPERATING EXPENSES AS PERCENTAGE OF REVENUE



Note: Financials reclassified in 2021

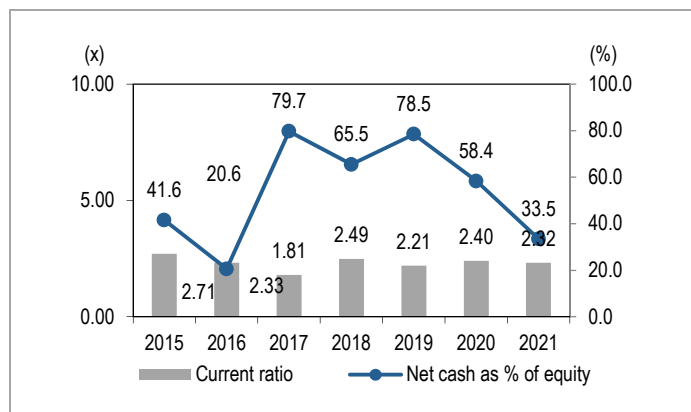
Source: AEM, UOB Kay Hian

SALES AS PERCENTAGE OF NON-CURRENT ASSETS



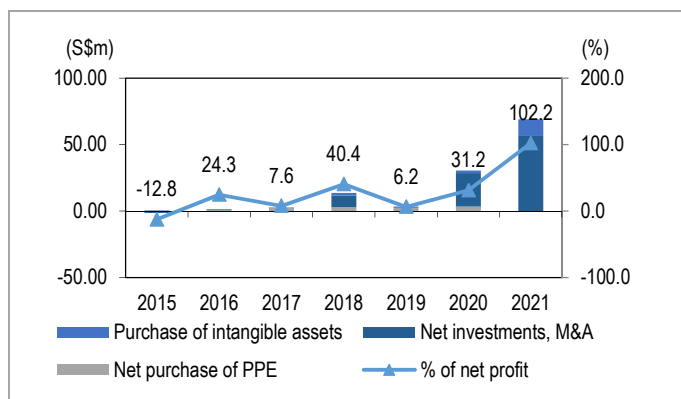
Source: AEM, UOB Kay Hian

CURRENT RATIO AND NET CASH AS PERCENTAGE OF EQUITY



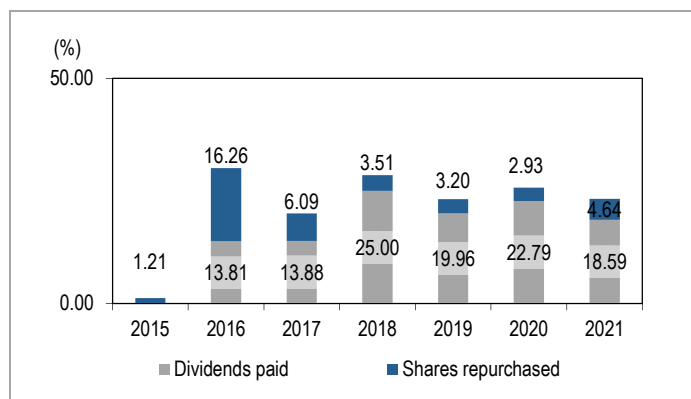
Source: AEM, UOB Kay Hian

INVESTING CASH FLOWS



Source: AEM, UOB Kay Hian

KEY FINANCING CASH FLOWS AS PERCENTAGE OF NET PROFIT



Note: AEM, UOB Kay Hian

Appendix VIII – Industry Overview

Market growth of 12-14% in 2021. Competitor Teradyne estimates its semiconductor test total addressable market to be worth US\$4.9b-5.5b in 2021. Spending on SOC test equipment is estimated at US\$4.0b-4.4b, growing 16% from 2020, while that of memory chips will range from US\$900m to US\$1.1b, growing 5% yoy. On a combined basis, growth is expected to be about 14%.¹ On the other hand, Advantest estimates its SOC tester market to grow 13% from US\$3.0b in 2020 to US\$3.4b in 2021.

New technology and higher speed to drive growth. Teradyne expects SOC market growth to be driven by volume expansion, increasing complexity and new technology adoption while memory test market growth will be driven by bit growth (amount of memory produced), diversity (more applications) and higher speed bandwidth. From Advantest's perspective, SOC market growth is expected to be driven by smartphones and high performance computing, amid active investment in leading-edge semiconductors. Migration to advanced nodes and the resultant complexity of these products and the difficulty of manufacturing them are likely to drive demand. The memory market will be driven by technology investments such as advanced nodes, multilayer NAND and higher speeds/bandwidths.

Profile of Teradyne and guidance. Teradyne offers test platforms for both ICs and memory chips. Its largest customer, TSMC, accounted for 15% of its consolidated revenue, or 20.7% of semiconductor test revenue. However, one undisclosed customer accounted for 25% of consolidated revenue and 35% of semiconductor test revenue in 2020, after combining direct sales and sales to the customer's outsourced semiconductor assembly and testing companies, including TSMC. Both direct sales and sales to Huawei's contractors accounted for only 3% of Teradyne's consolidated revenue. Teradyne's semiconductor test revenue grew 46% in 2020 to US\$2.26b, and 16% in 2021 to US\$2.62b.

Profile of Advantest and guidance. Advantest believes it had a 38% share of the SOC tester market and 56% share of the memory tester market in FY21 ended 31 Mar 21. Market share of memory testers was stable yoy, while that of SOC testers was affected by investments at one North American player who typically purchased from one of Advantest's competitors. Advantest's revenue from SOC and memory test equipment was about US\$1.3b and US\$600m in FY21 respectively. Advantest expects growth of 19.5% and 3.3% to US\$1.5b and US\$618m respectively for FY22. It claimed that its customers are making active tester investments in smartphone-related fields and that demand is expected to continue in 1QFY22. Advantest has reported lead time of three months as at end-April, and that lead time is likely to increase further and orders are based on real demand rather than early orders by customers.

Other competitors echoed similar views. Cohu expects 2Q21 growth of 3.8-10.8% sequentially, guiding revenue of US\$234m-250m in 2Q21 against US\$225.5m in 1Q21. 5G-enabled smartphones, an increase in global data and growing semiconductor content in vehicles (due to the trend of advanced driver assistance systems and electric/hybrid electric vehicles) will drive high-end market growth, leading to robust demand for equipment.² Hirata expects positive growth to continue and a shortage of semiconductors to be seen in every industry, and is convinced large-scale investment plans bode well for demand. Hirata forecasts its semiconductor equipment revenue to grow 5.4% yoy from US\$267m to US\$281m in FY22.³

¹ <https://investors.teradyne.com/static-files/b9f742f2-66e7-4384-b589-b20eeb1d5819>

² <https://cohu.gcs-web.com/static-files/cc44852d-23b8-4d33-ada8-c65da2e3d9d4>

³ https://www.hirata.co.jp/files/optionallink/en_ns_20210514_2.pdf?501389377

Appendix IX – Key Management

SELECTED DIRECTORS/PERSONNEL

| Name | Age | Position | Experience |
|--------------------|------|---|---|
| Loke Wai San | 53 | Non-Executive Chairman and Director | <ul style="list-style-type: none"> * Chairman of AEM since 2011 * Founder and CEO of private equity fund adviser Novo Tellus Capital Partners * >27 years of global technology management and investment experience |
| Chok Yean Hung | 57 | Non-Executive, Non-Independent Director | <ul style="list-style-type: none"> * CEO from Apr 18 to Jun 20 * >30 years of experience in semiconductor industry |
| James Toh Ban Leng | 57 | Non-Executive, Non-Independent Director | <ul style="list-style-type: none"> * CEO from Apr 18 to Jun 20 |
| Adrian Chan Pengee | 57 | Lead Independent Director | <ul style="list-style-type: none"> * Head of corporate department and Senior Partner at Lee & Lee |
| Loh Kin Wah | 67 | Independent Director | <ul style="list-style-type: none"> * Extensive leadership experience in semiconductor companies such as NXP and Infineon |
| Lavi Alexander Lev | 65 | Independent Director | <ul style="list-style-type: none"> * 37 years of experience in Silicon Valley and Asia * Held leadership positions in semiconductor chip design, electronic design automation software, test equipment, contract manufacturing and 3D printing |
| Basil Chan | 71 | Independent Director | <ul style="list-style-type: none"> * Founder and Managing Director of MBE Corporate Advisory * >35 years of audit, financial and general management experience |
| Chandran Nair | 53 | Chief Executive Officer | <ul style="list-style-type: none"> * >30 years' experience in ATE industry * Vice President of APAC for National Instruments * President of the Robotics and Autonomous Systems at ST Engineering |
| Leong Sook Han | 53 | Chief Financial Officer | <ul style="list-style-type: none"> * Previously Group CFO of Hong Leong Asia and Rotary Engineering |
| Samer Kabbani | 48 | Chief Technology Officer | <ul style="list-style-type: none"> * Previously Executive Vice President of Advantest (America) and Astronics Test Systems, with positions at Cohu |
| Mark Yaeger | 56 | President, AEM US | <ul style="list-style-type: none"> * >25 years of experience in sales, marketing and field operations in semiconductor industry |
| Pascal Pierra | 52 | Senior Vice-President, General Manager, SLT-i | <ul style="list-style-type: none"> * >25 years of experience in semiconductor and additive manufacturing in Europe, US and Asia |
| Chua Tat Ming | 60 | Vice-President, Engineering | <ul style="list-style-type: none"> * Highly experienced in product development lifecycle management * Experience in Motorola and Hi-P, mainly in R&D work |
| Goh Meng Kiang | 60 | Vice-President, Operations | <ul style="list-style-type: none"> * >26 years of management and technical experience in companies such as ASE, EEMS and UTAC |
| Vesa Henltonen | 57 | Senior Director, CTO Office | <ul style="list-style-type: none"> * >30 years of experience in R&D and MEMS testing * Founded Afore in 1995 to offer MEMS test cells and handlers |
| Seah Boon Seng | 57 | Senior Director, ESS Business | <ul style="list-style-type: none"> * >30 years of management and varied experience in multinational companies and OSATs |
| Samir Mowla | N.A. | Senior Director, Corporate Development & IT | N.A. |
| Tay Cheng Hoo | N.A. | Director, Human Resources | N.A. |
| Lee Chee Kiong | N.A. | Director, Quality | N.A. |
| Ari Kuukkala | 40 | General Manager, AEM Afore | <ul style="list-style-type: none"> * >14 years working at Afore |
| Harshang Pandya | 50 | General Manager, Test and Measurements | <ul style="list-style-type: none"> * >20 years of experience developing testing and measurement solutions * Co-founded and managed two start-up companies, including InspiRain and Psiber Data; R&D Manager at Agilent Technologies in 2002-09 |

Source: AEM, UOB Kay Hian

SHAREHOLDING STRUCTURE

| Name | Shares (m) | % of Total |
|---|--------------|--------------|
| Directors and Executive Officers | | |
| James Toh Ban Leng | 11.0 | 5.04 |
| Loke Wai San | 7.7 | 3.52 |
| Chok Yean Hung | 1.1 | 0.01 |
| Chandran Nair | NA | NA |
| Samer Kabbani | NA | NA |
| Total | 22.85 | 8.57% |
| Substantial Shareholders | | |
| Temasek Holdings | 35.1 | 16.07 |
| abrdn plc | 14.35 | 6.57 |

Source: AEM, UOB Kay Hian

As of 31 Dec 21, the company had 2.7m options outstanding convertible into shares at exercise prices of up to S\$1.652/share.

The acquisition of CEI was paid for mainly in cash and did not result in any new substantial shareholder.

DISTRIBUTION OF SHAREHOLDINGS

| Size of shareholdings | No of shareholders | % of Total | No. of Shares | % |
|-----------------------|--------------------|------------|--------------------|------------|
| 1 – 99 | 119 | 1.28 | 5,108 | 0.00 |
| 100 – 1,000 | 2,231 | 24.05 | 1,584,671 | 0.51 |
| 1,001 – 10,000 | 5,422 | 58.45 | 23,139,013 | 7.49 |
| 10,001 – 1,000,000 | 1,481 | 15.96 | 62,121,034 | 20.09 |
| Above 1,000,000 | 24 | 0.26 | 222,304,880 | 71.91 |
| | 9,277 | 100 | 275,557,667 | 100 |

Note: As at 17 Mar 22

Source: AEM, UOB Kay Hian

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