



# AEM Holdings Ltd

(AEM SP/AWX.SI)

## Blue Skies Ahead

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- **AEM's 3Q19 results exceeded expectations.** 9M19 results now form 79% of our initial 2019 sales forecast, and 96% of our initial 2019 PATMI forecast. AEM has also increased revenue guidance to S\$305-315mn for FY2019
- **We researched key customer wallet share** amongst test equipment peers to better understand AEM's revenue sustainability with the key customer
- **We amend our revenue forecast** to include the potential sales of AEM's next generation of test handlers. Our new PATMI forecast is S\$44.6/41.2/45.3 mn for 2019/2020/2021F
- **Maintain OUTPERFORM.** We increase our 12M Target Price to S\$1.80, from S\$1.34. We look forward to 6 November for management's presentation for potential insights

**Keep the beat on.** Results season are underway for the semiconductor sector, with most companies beating analyst estimates. Amongst chipmakers, Intel and AMD both performed well, albeit leading to different investor reactions as forecasts were interpreted as "bright" for Intel and "less bright" for AMD. Meanwhile, Texas Instruments' poor 4Q19 forecast casts a shadow on the sector, signalling that the industry may not be fully out of the trough yet. Amongst equipment makers, front-end players such as Lam Research and ASM International outperformed, while midstream assembly & packaging equipment makers had mixed results (ASM Pacific – miss, BE Semiconductor – beat). Amongst downstream test equipment makers, results were well-received at Teradyne and Advantest, while Cohu's share price has seen positive momentum ahead of earnings.

**AEM's 3Q19 results exceeded expectations.** While core revenue was flat at S\$83.8mn (-1% yoy), margins were strong, resulting in S\$13.7mn PATMI (+20.4% yoy). 9M19 core revenue of S\$234.5mn now forms 79% of our initial 2019 sales forecast, and 96% of our initial 2019 PATMI forecast. Revenue growth was largely driven by orders from the key customer, with Test and Measurement Solutions (TMS, +187% yoy) and System Level Test & Inspection (SLT-i, +12.9% yoy) segments also showing promise.

### OUTPERFORM - Maintain

Price as of 1 Nov 19 (SGD)	1.53	<b>Performance (Absolute)</b>	
12M TP (S\$)	1.80	1 Month (%)	34.2
Previous TP (S\$)	1.34	3 Month (%)	31.0
Upside (%)	17.8	12 Month (%)	81.6
<b>Trading data</b>		<b>Perf. vs STI Index (Red)</b>	
Mkt Cap (S\$m)	413		
Issued Shares (mn)	270		
Vol - 3M Daily avg (mn)	7.6		
Val - 3M Daily avg (\$mn)	9.2		
Free Float (%)	83.1%		
<b>Major Shareholders</b>		<b>Previous Recommendations</b>	
Standard Life Aberdeen	8.1%	11-Oct-19	OP S\$1.34
James Toh Ban Leng	7.8%		
UBS AG	5.4%		

### Financials & Key Operating Statistics

YE Dec (S\$m)	2017A	2018A	2019F	2020F	2021F
Revenue	221.8	262.7	312.0	293.6	318.1
PATMI	32.2	33.5	44.6	41.2	45.3
Core PATMI	32.0	33.2	44.3	40.9	44.9
Core EPS	0.123	0.122	0.163	0.150	0.165
Core EPS grth (%)	0.0	-0.9	33.4	-7.7	9.9
Core P/E (x)	12.1	12.2	9.1	9.9	9.0
DPS (SGCents)	1.2	3.4	4.1	3.8	4.2
Div Yield (%)	0.8	2.3	2.7	2.5	2.8
Net Margin (%)	14.5	12.7	14.3	14.0	14.2
Gearing (%)	-79.7	-65.5	-70.9	-77.3	-80.4
Price / Book (x)	6.8	4.6	3.3	2.7	2.2
ROE (%)	55.7	37.4	36.3	26.8	24.1

Source: Company Data, KGI Research

**Forecasts:** We adjust our test handlers' forecasts after gaining a better appreciation of the use case of the next generation's test handler. Our TH forecast is now 54/38/27 units for 2019/2020/2021F, with an increasing ASP as we think orders for legacy test handlers will eventually stop. Our updated revenue forecast is +5%/15%/6% from our forecast at initiation. Our updated PATMI forecast is +19%/23%/18% from previous forecast.

**Valuation & Action: Maintain OUTPERFORM, with a TP of S\$1.80.** We factor in the key customer's positive forecast and the potential wallet share that AEM can achieve. We also increase our PE peg to 12x 2020F EPS as AEM shrugs off the trade war and grows its margins. 12x PE brings AEM more in-line with top 10 SGX tech manufacturing peers' PE of 12.5x. Our 12x peg yields S\$1.95 and S\$1.98 TP, if applied to 2019F and 2021F results.

**Risks:** Lack of 2020 order wins, trade war affecting customers' willingness to spend on Capex.

**Blue skies ahead**

**Intel’s 3Q19 results** are good for AEM because of **1)** a rise of 2019 estimated gross Capex to US\$16bn, up from US\$15.5bn during July’s guidance. Part of this could be due to the resumption of plans to build the US\$11bn fab at Kiryat Gat, Israel. While initially put on hold in June 2019, recent news coverage indicate that plans are back on track, with construction likely to begin in December.

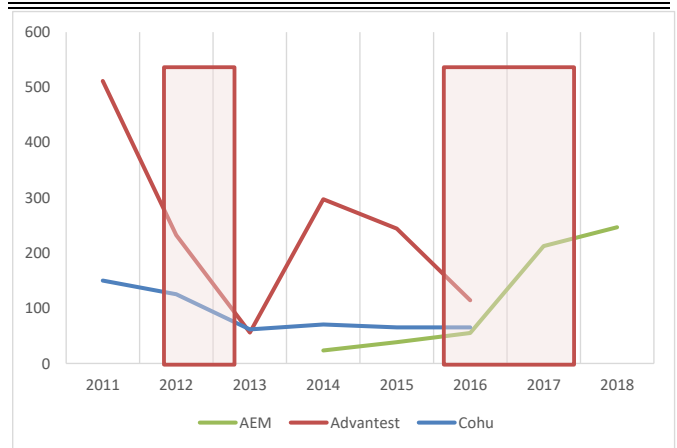
**2)** Improved 2019 sales forecast of US\$71bn from US\$69.5bn, which is a good sign as Intel proves that it is still able to grow sales despite losing market share to AMD. On the flipside, contrarian analysts believe that the increased sales forecast was largely due to rushed orders from the Chinese market ahead of December tariffs, thus leading to a bleaker 2020 outlook. At this point in time, it is difficult to ascertain whether Intel’s future sales will be hampered more by their supply shortages, or tariff-driven demand fall-off. We remain confident that microprocessor demand in the coming 3 - 5 years will still be strong, with the majority still going to Team Red and Team Blue, as the Chinese semiconductor industry is still nascent.

**Give me your wallet:** We researched into key competitors to better understand how AEM has taken the reins for Intel’s test equipment business, and determine its sustainability. Amongst our peer comparison group, only Advantest and Cohu showcase revenue to key customers that we deem to be Intel through deep-diving into years of annual reports. Our data is captured in Figure 1.

2011 was a peak year for semiconductors and also Intel, where they spent a record US\$16bn in Capex. In 2012, AEM rolled out the 2<sup>nd</sup> generation of their test handlers, albeit in a bust year which saw semiconductor sales dip 2.7% yoy(source: WSTS). While AEM does not provide key customer disclosures from 2011 to 2014 (thus the missing datapoints in the figure), we think wallet share was not sufficiently captured yet as AEM also came under business pressure and had to restructure to stay competitive.

In 2015, Intel introduced AEM’s 3<sup>rd</sup> generation of test handlers, marketed as HDMT, as part of their Custom Foundry solutions. Intel’s Custom Foundry was a business strategy by Intel to lend out their manufacturing, assembly and test expertise to other IC designers, in hopes of taking market share from other players like TSMC and Samsung. However, there was little to no customer interest, with Intel eventually shuttering this initiative in late 2018. Regardless, AEM entered high-volume production of HDMT from late 2016 till today, with test handlers serving for Intel’s own chip business. Consequently, we observe that Advantest and Cohu stopped reporting Intel as a key customer from 2017 and on, as Intel now contributes <10% to their total sales. While they, and potentially Teradyne, are still likely supplying to Intel, **we think AEM is at worst a “main supplier” of test equipment to Intel, and perhaps potentially the “sole supplier” in the future.**

**Figure 1: AEM takes wallet share of Intel from competitors**

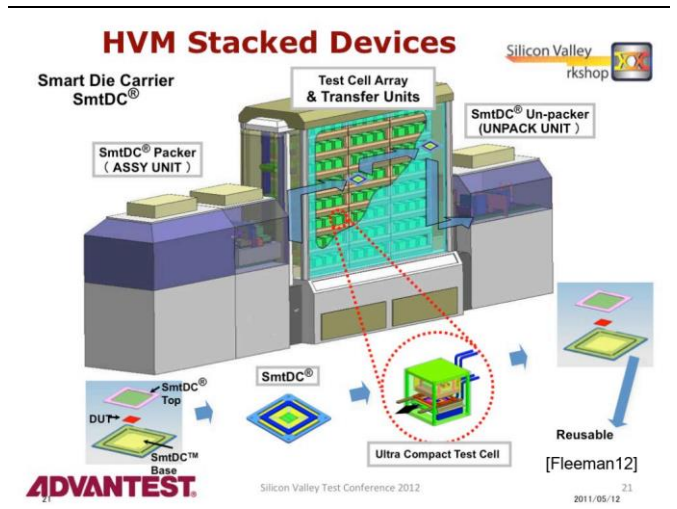


Source: Company reports, KGI Research

Figures in SGD mn. For Cohu, 1 SGD = 0.74 USD. For Advantest, 1 SGD = 80 Yen

Key periods: 2012 & 2016 when AEM produced gen2 & gen3 test handlers

**Figure 2: Advantest’s test equipment set-up in 2012, likely still in use today**



Source: SW Test

**Figure 3: HDMT introduced in 2015 as disruptor to incumbent platforms**

## Intel HDMT

### Introducing High Density Modular Test (HDMT)

Engineering Module

Production Module

- **Common Architecture**
  - Fast TTM Engineering Module
  - >30 sites with parallel, asynchronous operation in production module
- **Flexible Architecture**
  - Enables standard instrumentation integration (PXI)
- **Low Cost**
  - > 2X Cost improvement over conventional test platforms

39
Feldman & Ahlgren June 7-10, 2015 50TH ANNIVERSARY 2015 SW Test Workshop [Rikhi14]

Source: SW Test

From this, we draw rough conclusions that **1)** there is still potential for a bust year for orders, as total Intel wallet spend for 2013 across AEM, Advantest and CoHu is less than S\$175mn, assuming all of AEM’s revenue is from Intel (which is unrealistic), and **2)** we can expect the ESS division to top out around S\$400mn sales/yr, if Intel has a steady spending approach for its back-end test department. S\$400mn represents about 2% of Intel’s total annual Capex. This also assumes that AEM continues to be Intel’s #1 partner in the test equipment space. We are confident that AEM still holds that position, as they are about to launch the 4<sup>th</sup> generation of test handlers and capture more wallet share.

**Shifting up to Gear 4: What gen 4 can do for Team Blue**

Our conversations with management has helped us to understand some basic differences between gen 3 (HDMT) and gen 4’s test handler. While HDMT was supposedly able to perform all 3 package test procedures (Burn-In, Functional Test, System Level Test), it is fundamentally not designed for Burn-in test as it would be a waste of its limited test site space. The 4<sup>th</sup> generation of test handlers are focused on certain unique test functions, and are more catered to do Burn-in testing for semiconductors. AEM believes this will replace incumbent burn-in test equipment at their key customer’s sites. We understand that the machine will be priced slightly above HDMT’s ASP, with comparable margins. The test handler is scheduled for prototype testing in 4Q19, with high volume manufacturing likely to begin next year.

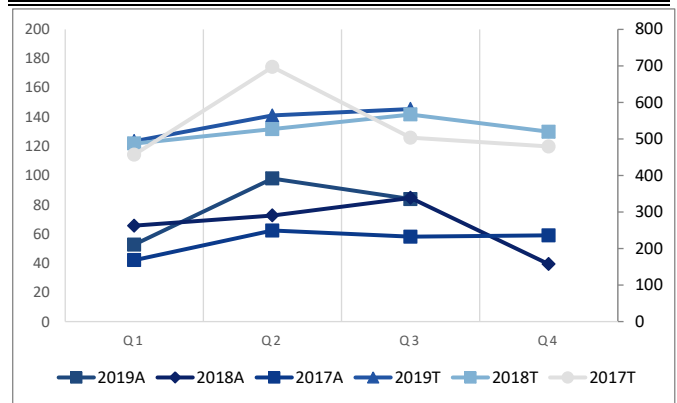
**Forecast changes**

With this knowledge, and after a deep-dive into AEM’s historical results, we adjust our test handler estimates. Our new TH figures are 54/38/27 for 2019/2020/2021F, with an increasing Average Sale Price. This is due to **1)** the likelihood that 1<sup>st</sup> generation legacy test handlers, which saw a resurgence in sales this year, being phased out again as the key customer addresses short-term supply issues **2)** a gradual ramp-down of HDMT into 2020 and 2021, as the key customer likely has sufficient HDMT after 2-3 years of high-volume manufacturing, and **3)** a newly included gen 4 sales count of 1/5/17 test handlers for 2019/2020/2021F. We would like to point out that our test handler estimate does not take into account management’s guidance, as 2020 order book and revenue guidance is still a question mark at this point in time.

We revise our material margin estimates, as newer equipment from all business segments (new pans and kits, Afore’s Aiolos, SLT-i’s AMPS, TMS’s WideOptix & Testpro 100) all command better margins than gen 3’s HDMT. While we cannot be certain that the newer divisions are currently profitable on their own, we think 9M19’s results provide a solid basis that profit margins have returned to the 14 – 15% range.

We expect 4Q19 and 1Q20 to be weaker quarters, similar to last year’s revenue seasonality. Teradyne displays similar revenue seasonality as AEM. Given AEM’s recent share price run-up, we think profit-taking may occur in these quarters, as investors have to deal with the uncertainty of 2020.

**Figure 4: AEM (LHS) and Teradyne (RHS) quarterly revenue seasonality**



Source: Bloomberg, KGI Research  
 LHS: AEM in SGDmn, dark blue lines. RHS: Teradyne in USDmn

**Figure 5: Updated income assumptions**

INCOME ASSUMPTIONS (\$\$mn)	2017A	2018A	2019F	2020F	2021F
Test handlers sold	41	39	54	38	27
TH ASP	2.70	3.13	2.54	3.31	5.00
ESS total revenue	214.8	256.6	298.3	279.6	303.6
SLT-I total revenue	-	-	4.0	4.4	4.8
MEMS total revenue	-	6.9	6.0	6.0	6.0
TMS total revenue	-	-	3.3	3.3	3.3
Total revenue est.	221.8	262.7	312.0	293.6	318.1
Gross material margin (%)	32.9%	34.0%	36.8%	36.8%	36.8%
(Staff+SGA costs) / revenue (%)	14.4%	16.7%	16.8%	17.0%	17.0%
EBITDA	38.3	41.6	58.7	54.5	59.3
Net Profit	32.2	33.5	44.6	41.2	45.3

Source: KGI Research

**Figure 6: Global back-end test equipment peers**

Company Name	BBG Ticker	Price (local curr.)	Market Cap (\$\$ Mn)	P/E (x)			P/B (x)		3y EPS CAGR (%)	EV/EBITDA (x)		Div Yield (%)	YTD Price Performance (%)	1y Price Performance (%)	October Price Performance (%)
				Current	FY19F	FY20F	Current	TTM		FY20F					
AEM HOLDINGS LTD	AEM SP	SGD 1.53	413	10.2	9.3	10.1	3.9	163%	7.1	5.5	1.96	85.5	91.3	29.3	
<b>Semiconductor Back-end Testing Equipment Manufacturers (Average)</b>				<b>26.8</b>	<b>25.4</b>	<b>19.6</b>	<b>4.7</b>		<b>17.0</b>	<b>12.9</b>		<b>0.7</b>	<b>82.2</b>	<b>64.4</b>	<b>7.5</b>
TERADYNE INC	TER US	USD 62.39	14391	27.2	22.8	19.5	7.2	-	16.1	13.6	0.58	98.8	72.4	5.4	
ADVANTEST CORP	6857 JP	JPY 5130	12837	18.8	26.4	20.7	4.8	63%	12.7	13.9	-	128.6	130.6	1.2	
CHROMA ATE INC	2360 TT	TWD 143	2661	31.6	27.2	19.3	4.4	17%	24.7	15.8	-	21.2	23.3	-0.3	
COHU INC	COHU US	USD 17.45	973	-	-	17.1	1.4	-	-	10.2	1.38	8.6	-18.7	27.3	
PENTAMASTER CORP BHD	PENT MK	MYR 4.65	720	29.4	25.4	21.1	5.6	44%	14.4	10.9	0.00	153.6	114.6	4.1	

Updated on 01 November 2019, at market close

Source: KGI Research

**Figure 7: Top 10 SG Tech manufacturing peers by market cap**

No	Name	Price	Market Cap (SGD M)	Price / Earnings (TTM)	Price / NAV	EV / EBITDA (TTM)	Price / Cash	Dividend yield (%)	2 Yr Beta	1 Mth % Chg	52 Wks % Chg
1	Venture Corp Ltd	15.77	4,548.5	13.5	1.91	7.5	6.4	4.57	1.6	2.60	1.34
2	Hi-P International Ltd	1.41	1,133.9	11.0	2.04	2.9	4.0	2.48	2.1	22.61	72.88
3	UMS Holdings Ltd	0.81	431.8	13.4	1.86	6.2	22.8	4.35	1.7	29.84	16.99
4	AEM Holdings Ltd	1.53	412.6	10.2	3.89	3.7	7.0	2.35	1.9	31.90	81.58
5	Elec & Eltek International Co Ltd	1.50	380.6	13.8	0.70	5.0	11.1	#N/A/N/A	0.5	-	16.93
6	Frencken Group Ltd	0.70	296.7	8.2	1.08	2.9	4.4	3.86	1.1	2.19	80.94
7	Valuetronics Holdings Ltd	0.68	295.8	8.6	1.41	3.1	1.8	5.99	1.1	10.57	5.92
8	GP Industries Ltd	0.58	280.7	10.3	0.77	7.3	1.1	#N/A/N/A	0.3	0.87	9.10
9	Micro-Mechanics Holdings Ltd	1.85	257.2	22.0	4.16	8.53	11.8	5.95	0.6	8.82	9.56
10	CSE Global Ltd	0.54	274.3	13.5	1.63	4.8	3.7	5.19	0.8	16.13	27.12
	<b>Average</b>		<b>831.2</b>	<b>12.5</b>	<b>1.94</b>	<b>5.2</b>	<b>7.4</b>	<b>4.34</b>	<b>1.2</b>	<b>12.55</b>	<b>30.42</b>

Updated on 1 November 2019, at market close

Source: KGI Research. Note that Elec & Eltek's share price is in USD

**Financial Forecasts**
**Figure 8: Forecasted financials (2017A – 2021F)**

<b>INCOME STATEMENT (\$\$mn)</b>	<b>2017A</b>	<b>2018A</b>	<b>2019F</b>	<b>2020F</b>	<b>2021F</b>
<b>Core Revenue</b>	<b>221.6</b>	<b>262.3</b>	<b>311.6</b>	<b>293.2</b>	<b>317.7</b>
Change in inventory	13.5	(7.2)	0.0	0.0	0.0
Cost of sales	(162.1)	(166.1)	(196.9)	(185.3)	(200.8)
<b>Gross Profit</b>	<b>73.0</b>	<b>89.1</b>	<b>114.7</b>	<b>107.9</b>	<b>116.9</b>
D&A expense	(0.7)	(1.9)	(5.3)	(5.5)	(5.6)
Other operating income/(expenses)	0.2	0.4	0.4	0.4	0.4
Staff expenses	(25.3)	(32.5)	(39.9)	(38.1)	(41.3)
Selling, general, admin expenses	(9.6)	(15.3)	(16.5)	(15.7)	(16.7)
<b>Profit from Operations</b>	<b>37.6</b>	<b>39.7</b>	<b>53.4</b>	<b>49.0</b>	<b>53.7</b>
Finance income/(expenses)	0.0	0.3	0.3	0.6	0.8
Share of JV results	(0.1)	(0.0)	0.1	0.1	0.1
Exceptionals/Investment income	0.0	0.0	0.0	0.0	0.0
<b>Profit before Tax</b>	<b>37.5</b>	<b>40.0</b>	<b>53.8</b>	<b>49.6</b>	<b>54.5</b>
Income tax	(5.3)	(6.5)	(9.1)	(8.4)	(9.3)
Non-controlling interests	0.0	0.0	0.0	0.0	0.0
<b>PATMI</b>	<b>32.2</b>	<b>33.5</b>	<b>44.6</b>	<b>41.2</b>	<b>45.3</b>
<b>BALANCE SHEET (\$\$mn)</b>	<b>2017A</b>	<b>2018A</b>	<b>2019F</b>	<b>2020F</b>	<b>2021F</b>
Cash and cash equivalents	46.1	58.9	87.2	118.9	151.0
Trade and other receivables	23.6	22.5	32.1	30.2	32.8
Inventory	35.8	27.4	39.4	37.1	40.2
Other current assets	0.0	0.0	0.0	0.0	0.0
<b>Current Assets</b>	<b>105.5</b>	<b>108.8</b>	<b>158.7</b>	<b>186.2</b>	<b>223.9</b>
Property, plant and equipment	3.6	5.7	9.6	12.6	16.1
Intangibles	3.4	17.7	16.4	15.5	14.8
Other non-current assets	4.1	4.2	7.4	20.1	18.0
<b>Non-current Assets</b>	<b>11.2</b>	<b>27.7</b>	<b>33.3</b>	<b>48.2</b>	<b>48.9</b>
<b>Total assets</b>	<b>116.7</b>	<b>136.4</b>	<b>192.0</b>	<b>234.3</b>	<b>272.8</b>
Trade and other payables	52.2	33.1	50.5	47.5	51.5
Borrowings (current)	0.0	0.2	0.0	0.0	0.0
Other current liabilities	6.0	10.4	13.1	12.3	13.7
<b>Current Liabilities</b>	<b>58.3</b>	<b>43.7</b>	<b>63.6</b>	<b>59.9</b>	<b>65.2</b>
Borrowings (non-current)	0.0	0.0	0.0	0.0	0.0
Other non-current liabilities	0.6	3.2	7.0	22.2	21.4
<b>Non-current liabilities</b>	<b>0.6</b>	<b>3.3</b>	<b>7.0</b>	<b>22.2</b>	<b>21.4</b>
Shareholders equity	57.8	89.5	123.0	153.9	187.8
Non-controlling interests	0.0	0.0	0.0	0.0	0.0
<b>Total Equity</b>	<b>57.8</b>	<b>89.5</b>	<b>123.0</b>	<b>153.9</b>	<b>187.8</b>
<b>Total Liabilities and Equity</b>	<b>116.7</b>	<b>136.4</b>	<b>193.6</b>	<b>236.0</b>	<b>274.4</b>
<b>CASH FLOW STATEMENT (\$\$mn)</b>	<b>2017A</b>	<b>2018A</b>	<b>2019F</b>	<b>2020F</b>	<b>2021F</b>
Net income before tax	37.5	40.0	53.8	49.6	54.5
Depreciation & Amortisation	0.7	1.9	5.3	5.5	5.6
Other non-cash adjustments	29.0	(6.9)	(7.3)	0.8	(2.4)
Change in Working Capital	(16.4)	4.3	1.9	(0.4)	0.2
Income Tax Paid	(0.3)	(5.2)	(6.9)	(6.3)	(7.0)
Interest Paid	0.0	0.0	0.1	0.0	0.0
<b>CF from operating activities</b>	<b>50.6</b>	<b>34.1</b>	<b>46.9</b>	<b>49.2</b>	<b>51.0</b>
Purchase/Disposal of PPE	(2.0)	(2.9)	(5.0)	(4.7)	(5.1)
Other CFI	(0.4)	(10.4)	0.4	0.6	0.8
<b>CF from investing activities</b>	<b>(2.4)</b>	<b>(13.2)</b>	<b>(4.6)</b>	<b>(4.1)</b>	<b>(4.3)</b>
Dividends Paid	(4.5)	(8.4)	(11.2)	(10.3)	(11.3)
Debt Raised / (Repaid)	0.0	(0.3)	(0.2)	0.0	0.0
Equity Raised / (Bought Back)	(2.0)	(1.2)	0.0	0.0	0.0
Other Cash from Financing	0.0	0.6	(2.7)	(3.0)	(3.2)
<b>CF from financing activities</b>	<b>(6.4)</b>	<b>(9.2)</b>	<b>(14.0)</b>	<b>(13.3)</b>	<b>(14.6)</b>
Net increase in cash & cash equiv.	41.2	11.6	28.3	31.7	32.2
FX effects	6.3	46.1	58.9	87.2	118.9
Beginning Cash	(1.4)	1.2	0.0	0.0	0.0
<b>Ending Cash</b>	<b>46.1</b>	<b>58.9</b>	<b>87.2</b>	<b>118.9</b>	<b>151.0</b>

Source: KGI Research

**Key Ratios**
**Figure 9: Key ratios (2017A – 2021F)**

<b>KEY RATIOS</b>	<b>2017A</b>	<b>2018A</b>	<b>2019F</b>	<b>2020F</b>	<b>2021F</b>
<b>Profitability</b>					
Core EPS	0.1231	0.1220	0.1627	0.1502	0.1651
Core EPS Growth (%)	–	-0.9%	33.4%	-7.7%	9.9%
DPS (SGD Cents)	1.2	3.4	4.1	3.8	4.2
Dividend Yield (%)	0.8	2.2	2.7	2.5	2.7
<b>Profitability (%)</b>					
Gross margin	33.0%	34.1%	36.9%	36.9%	36.9%
EBITDA margin	17.3%	15.8%	18.8%	18.5%	18.7%
Net margin	14.5%	12.7%	14.3%	14.0%	14.2%
ROE	55.7%	37.4%	36.3%	26.8%	24.1%
ROA	27.6%	24.5%	23.2%	17.6%	16.6%
<b>Financial Structure</b>					
Interest coverage (x)	1,016.2	993.7	472.8	7,002.3	nm
Total Debt/Equity (%)	0.0	0.3	0.0	0.0	0.0
Net Gearing (%)	-79.7	-65.5	-70.9	-77.3	-80.4
<b>Market Valuation (x)</b>					
Price / Earnings	12.4	12.4	9.3	10.1	9.2
Price / Book	6.9	4.6	3.4	2.7	2.2
Price / Sales	1.8	1.6	1.3	1.4	1.3
EV / EBITDA	9.2	8.6	5.6	5.5	4.5

Source: KGI Research



**KGI's Ratings**

<b>Rating</b>	<b>Definition</b>
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<b>Neutral (N)</b>	We take a neutral view on the stock. The stock is expected to perform in line with the expected total return of the KGI coverage universe in the related market over a 12-month investment horizon.
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