

# Hua Hong Semiconductor Ltd

Bloomberg: 1347 HK Equity | Reuters: 1347.HK

Refer to important disclosures at the end of this report

DBS Group Research . Equity

3 Jan 2022

## BUY

Last Traded Price (31 Dec 2021): HK\$43.00 (HSI : 23,398)  
Price Target 12-mth: HK\$58.90 (37% upside) (Prev HK\$45.00)

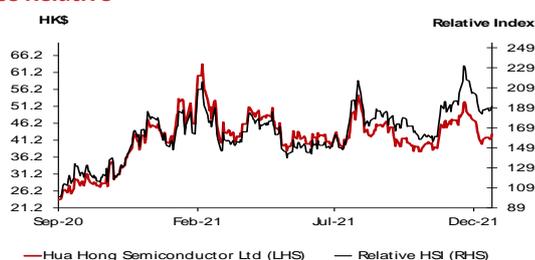
### Analyst

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### What's New

- FY20-23F automotive/ industrial sales CAGR to hit 69% due to demand from unresolved auto chip shortage
- FY22/23F capacity 8%/2% higher than the market due to faster expansion pace, leading to 8%/8% higher revenue
- Potential listing in A-share market under supportive financial policy for the industry
- Reiterate BUY for rebound in FY20-23F ROE, from 4.2% to 14.7%

### Price Relative



### Forecasts and Valuation

FY Dec (US\$m)	2020A	2021F	2022F	2023F
Turnover	961	1,592	2,262	2,622
EBITDA	245	390	617	905
Pre-tax Profit	46	110	277	538
Net Profit	99	93	234	455
Net Pft (Pre Ex) (core profit)	99	93	234	455
Net Profit Gth (Pre-ex) (%)	(38.7)	(6.1)	150.5	94.5
EPS (US\$)	0.08	0.07	0.18	0.35
EPS (HK\$)	0.60	0.55	1.39	2.70
EPS Gth (%)	(39.1)	(8.4)	152.5	94.4
Diluted EPS (HK\$)	0.59	0.55	1.39	2.70
DPS (HK\$)	0.00	0.00	0.00	0.73
BV Per Share (HK\$)	15.19	15.82	17.35	23.75
PE (X)	71.7	78.3	31.0	15.9
P/Cash Flow (X)	22.5	14.5	12.4	8.3
P/Free CF (X)	nm	nm	nm	16.4
EV/EBITDA (X)	31.1	20.9	13.3	8.5
Net Div Yield (%)	0.0	0.0	0.0	1.7
P/Book Value (X)	2.8	2.7	2.5	1.8
Net Debt/Equity (X)	CASH	0.0	0.0	CASH
ROAE (%)	4.2	3.6	8.4	14.7
Earnings Rev (%)		(32)	(16)	New
Consensus EPS (US\$)		0.15	0.19	0.22
Other Broker Recs:		B:22	S:1	H:7

Source of all data on this page: Company, DBS Bank (Hong Kong) Limited ("DBS HK"), Thomson Reuters

## Capitalising on auto chip shortage

### Investment Thesis

Hua Hong Semiconductor specialises in the manufacture of mature node chips which have growing applications in the automotive industry. The shortage of this type of chips is expected to take the longest to be resolved. Revenue from automotive/industrial applications is expected to grow at a FY20-23 CAGR of 68.7%, with revenue share increase from 13.3% to 23.3%.

An expansion to 95K WPM is expected to be achieved early by 3Q22 on the back of 1) abundant supply of foundry equipment; 2) persistently strong demand from end-markets; 3) strong execution ability, and 4) attractive tax incentives to boost capacity expansion. Expected capacity in FY22/23F is 7.7%/2.0% higher than the market, leading to 8.2%/8.3% higher revenue.

Potential listing in A-share market under supportive financial policy for the semiconductor industry after SMIC's debut on Shanghai's STAR Market. Capital replenishment to support future capacity growth can be achieved by listing of A-shares which are currently enjoying a higher valuation than H-shares.

### Valuation:

Our TP of HK\$58.9 is based on 2.7x FY22F PB, 1 SD above its 2-year mean, pegged to its upcycle valuation, based on an increasing ROE in FY21-23F driven by the utilisation rate and yield ramp-up in newly installed capacity.

### Where we differ:

Our expected capacity in FY22/23F is 7.7%/2.0% higher than the market, leading to 8.2%/8.3% higher revenue than the market owing to faster-than-expected expansion pace.

### Key Risks to Our View:

Knockdown of fab intense area due to spread out of new covid-19 variants may delay the capacity expansion or chip production.

### At A Glance

Issued Capital (m shrs)	1,298
Mkt Cap (HK\$m/US\$m)	55,814 / 7,159
Major Shareholders (%)	
Shanghai Huahong (Group) Co., Ltd.	26.9
Shanghai Alliance Investment Ltd.	14.5
China Integrated Circuit Industry Investment Fund Co., Ltd.	13.7
Free Float (%)	44.8
3m Avg. Daily Val. (US\$m)	40.55
GICS Industry: Information Technology / Semiconductors & Semiconductor	



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### WHAT'S NEW

#### Riding on auto chip demand growth with smooth capacity expansion

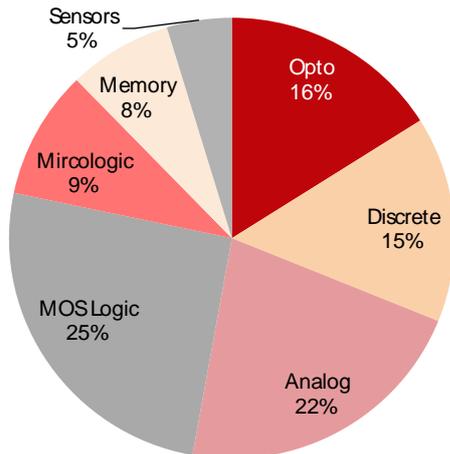
##### Introduction to mature node foundry and Hua Hong SEMI

Hua Hong Semiconductor (Hua Hong SEMI) specialises in mature node foundries. Unlike global foundry peers like TSMC and Samsung which are competing in innovation and mass production of the most advanced technology nodes such as 3nm or less, Hua Hong Semiconductor (Hua Hong SEMI) specialises in the mature technology nodes ranging from 45nm/40 nm to 0.5 Micron and above. Analog, MCU, power management ICs (PMICs) and FR devices, which have wide applications in Automotive and IoT sectors, are among the chips produced in 200mm fabs based on mature processes. Hua Hong SEMI currently ranks sixth globally among foundries in terms of revenue share, at c. 2.8%. Meanwhile, it occupied c. 13.7% of 200mm foundry capacity in China in 2020.

since 2015. Global 200mm fab capacity has been tight as many foundry vendors had already migrated from 200mm to 300mm fabs and face a high barrier for reversal. The pandemic has further worsened the shortage amid a surge in demand for computers and smart devices.

**Global mature nodes (40nm to 0.5 micron and above) semiconductor market is enjoying higher shipment growth than advanced nodes (7-32nm, excluding the most advanced technology nodes),** as rising demand from IoT and automotive has enlarged the application span of current mature node platforms like 200mm foundries, according to Gartner's industrial research. The projected 2020-2027 CAGR for mature node shipment is 6.2% while that for advanced nodes is only 2.4%. We can expect the development of mature node foundries to continue outperforming that of the advanced node foundries in the medium term.

**Fig.1 200mm wafer demand by product category,2018**

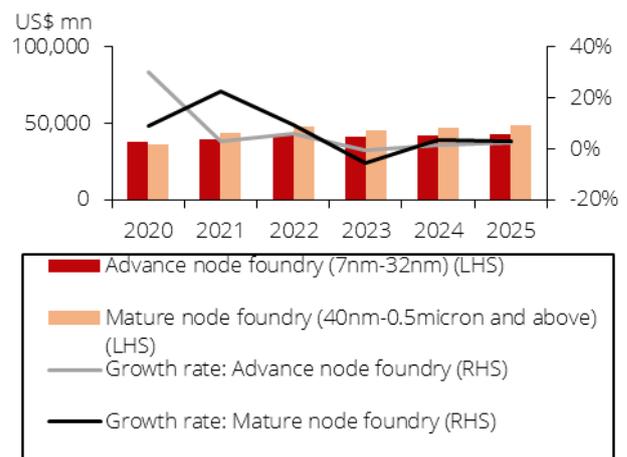


Source: Semico Research

##### Mature node foundry capacity is in severe shortage.

Mature processes chips are mainly manufactured in 200mm wafer foundries, which were expected to be gradually phased out due to the switch to 300mm wafers. However, due to surging demand from end-markets like IoT, automotive and 5G communication, the demand for analog, RF, and MEMS which are manufactured by 200mm foundries has increased again

**Fig.2 Revenue growth of advanced and mature nodes from 2019-2025**



Source: Gartner

We expect Hua Hong SEMI to continue to be the major beneficiary amid mature node chip shortage:

1. Shortage in automotive chips is expected to take the longest time to be resolved as compared with other applications. Chip shortage across different applications

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has boosted semiconductor foundries' sales throughout 2021. Along with the mass capacity expansion, the market expects the shortage in different chip applications to be resolved under different timelines in 2022. According to Gartner's research, chip shortage for automotive could last well into 2022 while shortage for 5G-based application processors and chipsets, PMIC and Wi-Fi and other RF chips are only expected to last until 1Q22/3Q22/3Q22 respectively. A vehicle incorporates a few leading-edge chips, but the vast majority of chips are based on mature nodes.

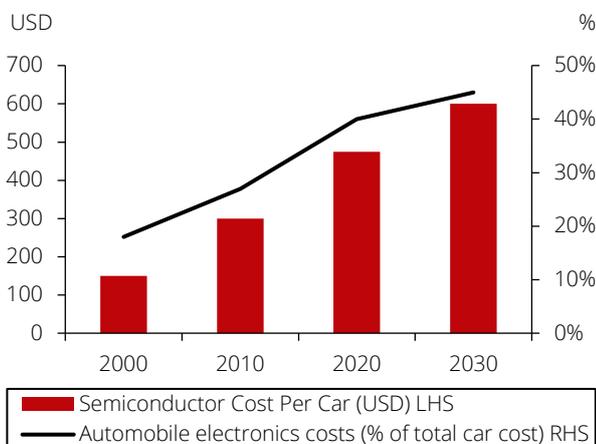
**Fig.3 Estimated chip shortage end-time**

Semiconductor types	Shortage estimated end time
5G-based application processors and chipsets	4Q/21 - 1Q22
PMIC	2Q/22 - 3Q22
Wi-Fi and RF	2Q/22 - 3Q22
Automotives	Last well in 2022

Source: IBS, DBS HK

Auto makers are last in the queue for parts as advanced node chips command a higher margin and smartphone players like TSM and Samsung have larger and more frequent shipments. Hua Hong SEMI specialises in mature node technology chips that are widely utilised in the automotive sector, like CMOS image sensors (CIS), microcontroller units (MCU) and PMIC, and thus can ride on the persistently unfulfilled demand.

**Fig.4 Cost contribution of semiconductors and electronics per car**



Source: HIS, Deloitte.

### Hua Hong SEMI has growing exposure to related applications.

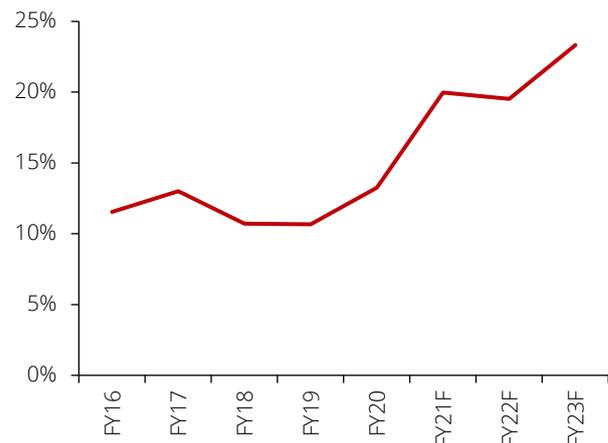
As a result, Hua Hong SEMI has been growing its exposure to automotive applications for the past four quarters. The revenues for automotive/industrial in 4Q20/1Q21/2Q21/3Q21 are US\$47.4/60.0/66.1/90.2mn, with revenue share of 16.9%/19.7%/19.1%/20.0%. We expect Hua Hong SEMI's revenue from automotive/industrial applications to grow at a FY20-23 CAGR of 68.7%, with revenue share increase from 13.3% in FY20 to 23.3% in FY23 due to the strong end-market demand. The rising penetration of autonomous driving and EV continue to boost the cost contribution of semiconductor per car and thus the demand for auto chips.

**Fig.5 Hua Hong SEMI's 9M21 revenue mix**

End Market	Revenue share
Consumer electronics	62.6%
Automotive and Industrial	19.6%
Communications	14.4%
Computing	3.4%

Source: Company data, DBS HK

**Fig.6 growing exposure in automotive/industrial**



Source: Deloitte, DBS HK

### 2. Strong execution ability and good quality control shown in its faster-than-expected capacity expansion.

A faster-than-expected expansion to 95K WPM is expected to be achieved by 3Q22 due to 1) Relatively abundant supply of foundry equipment such as lithography machine of mature nodes; 2) Persistently strong demand from end-markets in 2022; 3) strong execution ability as shown in the past capacity expansion, and 4) strong incentives to boost capacity expansion to

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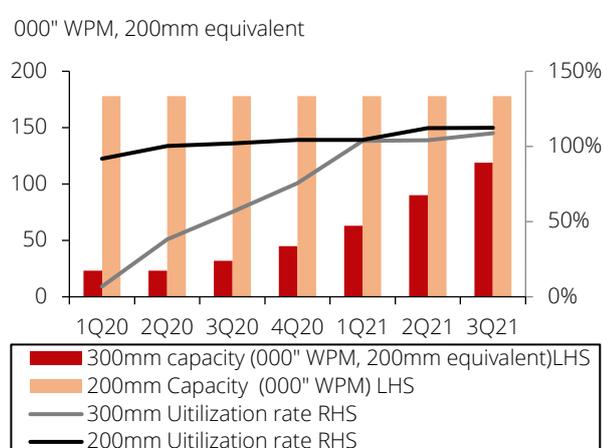
enjoy larger tax reductions under the national 10-year preferential tax policies for semiconductor industry.

**Mature node foundries face lower geopolitical risks and more secured equipment supply.** Biden's administration continues to place sanctions against equipment sales to China for the manufacture of semiconductors with dimensions of under 10nm. Chinese companies like SMIC which are on the US entity list has had their business stymied by the mandated cancellation of ASML's EUV lithography machines which adopts US technology. Hua Hong SEMI's specialisation in mature node foundries shelters it from the chip and equipment embargo which covers advanced node technology. This enables the company to have more secure equipment supply and minimal geopolitical risk.

**Strong execution ability of management and good progress of utilisation and yield ramp-up as evident in past expansions.** Hua Hong SEMI's management announced its first stage of capacity expansion of Hua Hong Wuxi to 65K WPM at end-2020, targeting commercial production by end-2021. The company achieved this ahead of schedule in Oct 2021. A smooth utilisation and yield ramp-up can be seen from the surging utilisation rate in newly installed 300mm foundries, from 6.9% in 1Q20 to 108.7% in 3Q21.

We believe the strong execution ability will be extended to its upcoming capacity expansion.

**Fig.7 Capacity and utilisation rate from 1Q20-3Q21**



Source: Company data, DBS HK

**The development of national foundry industry in China has already been escalated to a national strategic level.** Beijing introduced tax incentives for domestic

semiconductor players in 2020. Qualifying integrated circuit (IC) projects and enterprises that have operated for more than 15 years will be exempted from corporate income tax for up to 10 years if they employ the 28-nm process or more advanced nodes, while projects involving 65nm to 28nm nodes will enjoy five tax-free years and a 50% discount on their corporate tax rate for the five subsequent years. With most of its fab for 65nm to 28nm nodes, Hua Hong SEMI has a strong incentive to boost its capacity expansion to enjoy a larger tax reduction.

**Fig.8 Preferential tax rates for foundries in China based on chip node technology**

Technology nodes	Preferential tax policy
≤28nm	10-year income tax exemption
28nm ≤ X ≤ 65nm	5-year income tax exemption followed by 5-year 50% reduction
65nm ≤ X ≤ 130nm	2-year income tax exemption followed by 3-year 50% reduction + 10-year loss carry forward period

Source: Deloitte, DBS HK

With the above factors, we believe a faster-than-expected capacity expansion can be achieved and expect Hua Hong SEMI's capacity at end-FY22/23F to be 7.7%/2.0% higher than the market, leading to an 8.2%/8.3% higher revenue than the market. We also expect a rebound in FY20-23F ROE, from 4.2% to 14.7%, benefitting from the ramping up of utilisation rate and yield of the newly installed capacity.

### Insights into capital market

**Potential listing of Hua Hong SEMI in A-share market can be expected under the central government's supportive fiscal policy and financial support from the national semiconductor fund** for the whole semiconductor industry after SMIC's debut on Shanghai's Nasdaq-style STAR Market on 16 July 2021.

Backed by heavy subscriptions by mainland investors, the Hong Kong-listed SMIC (981) raised Rmb53bn in a secondary listing on the Shanghai Stock Exchange, the biggest IPO in mainland stock markets. SMIC's A-shares are currently enjoying a FY22 forward PB of 3.46x while its H-shares have a valuation of only 1.15x forward PB.

Ranking second in terms of market share of 200mm foundries in China, we expect Hua Hong SEMI to enjoy similar popularity among mainland investors. Potential capital replenishment can support the group's future capacity growth by dual-listing in the exchange for A-shares, which are currently enjoying a higher valuation

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than H-shares. Any news about its dual listing can be a short-term catalyst for the stock price performance.

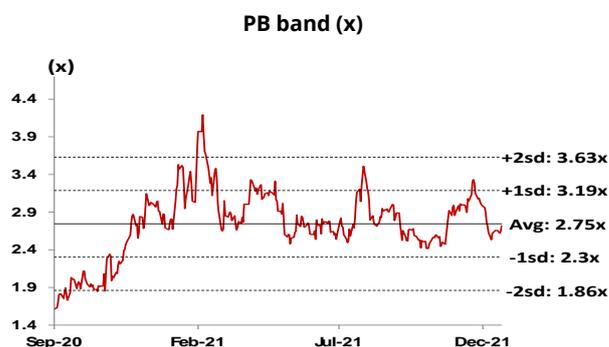
### Valuation

Hua Hong SEMI is currently trading at 1.97x FY22F PB, in line with its two-year average of 1.97x. Our target price of HK\$58.9 is based on 2.70x FY22F PB, c.1SD above its mean, pegged to its upcycle valuation. The premium in value is based on an increasing ROE in FY21-23 because of ramp-up in the utilisation rate and yield of newly installed 300mm capacity. We reiterate our BUY call. News about faster-than-expected capacity expansion and potential dual-listing in A-share market can be a short- to medium-term catalyst.

### Company Background

Founded in 1997 and listed in 2014, Hua Hong Semiconductor is China's second-largest and sixth-largest foundry globally. The company focuses on manufacturing semiconductors on 200mm(8-inch) wafers, with 9% global market share in 2019. It focuses on specialty applications and has the largest power discrete capacity in China. State-owned Assets Supervision and Administration Commission of Shanghai Municipal Government, is Hua Hong Semiconductor's largest shareholder, with a 27% stake.

### Historical PE and PB band



Source: Thomson Reuters, DBS HK

## Hua Hong Semiconductor Ltd

### Key Assumptions

FY Dec	2019A	2020A	2021F	2022F	2023F
Hua Hong 8" wafer Shipment ('000 unit)	2,016	1,965	2,042	2,331	2,340
Gross Margin (%)	34.1%	31.1%	26.3%	32.9%	39.8%
Hua Hong Wuxi shipment ('000 unit)	0	9	149	910	1,790
Gross Margin (%)	0.0%	-5.4%	6.5%	10.0%	21.0%

Source: Company, DBS HK

### Segmental Breakdown (US\$ m)

FY Dec	2019A	2020A	2021F	2022F	2023F
<b>Revenues (US\$ m)</b>					
Hua Hong 8"	909	897	1,158	1,307	1,335
Hua Hong Wuxi	7	64	435	956	1,288
Other	17	0	0	0	0
<b>Total</b>	<b>933</b>	<b>961</b>	<b>1,592</b>	<b>2,262</b>	<b>2,622</b>

Source: Company, DBS HK

### Income Statement (US\$ m)

FY Dec	2019A	2020A	2021F	2022F	2023F
Revenue	933	961	1,592	2,262	2,622
Cost of Goods Sold	(650)	(726)	(1,177)	(1,542)	(1,570)
<b>Gross Profit</b>	<b>282</b>	<b>235</b>	<b>415</b>	<b>721</b>	<b>1,052</b>
Other Opng (Exp)/Inc	(179)	(269)	(410)	(583)	(674)
<b>Operating Profit</b>	<b>103</b>	<b>(35)</b>	<b>5</b>	<b>138</b>	<b>378</b>
Other Non Opg (Exp)/Inc	52	47	77	110	127
Associates & JV Inc	10	26	22	22	22
Net Interest (Exp)/Inc	16	8	6	7	11
Dividend Income	0	0	0	0	0
Exceptional Gain/(Loss)	0	0	0	0	0
<b>Pre-tax Profit</b>	<b>182</b>	<b>46</b>	<b>110</b>	<b>277</b>	<b>538</b>
Tax	(27)	(13)	(17)	(43)	(83)
Minority Interest	7	66	0	0	0
Preference Dividend	0	0	0	0	0
<b>Net Profit</b>	<b>162</b>	<b>99</b>	<b>93</b>	<b>234</b>	<b>455</b>
Net Profit before Except.	162	99	93	234	455
EBITDA	294	245	390	617	905
<b>Growth</b>					
Revenue Gth (%)	0.2	3.1	65.7	42.1	15.9
EBITDA Gth (%)	(11.7)	(16.7)	59.5	58.1	46.7
Opg Profit Gth (%)	(39.1)	(133.4)	(113.5)	2,851.1	173.5
Net Profit Gth (%)	(11.4)	(38.7)	(6.1)	150.5	94.5
<b>Margins &amp; Ratio</b>					
Gross Margins (%)	30.3	24.4	26.1	31.9	40.1
Opg Profit Margin (%)	11.1	(3.6)	0.3	6.1	14.4
Net Profit Margin (%)	17.4	10.3	5.9	10.3	17.3
ROAE (%)	7.4	4.2	3.6	8.4	14.7
ROA (%)	4.8	2.4	1.9	4.4	7.6
ROCE (%)	3.0	(0.7)	0.1	2.8	7.1
Div Payout Ratio (%)	31.3	0.0	0.0	0.0	27.0
Net Interest Cover (x)	NM	NM	NM	NM	NM

Source: Company, DBS HK

## Hua Hong Semiconductor Ltd

### Balance Sheet (US\$ m)

FY Dec	2019A	2020A	2021F	2022F	2023F
Net Fixed Assets	1,801	2,770	3,465	3,988	4,020
Invts in Associates & JVs	73	105	96	96	97
Other LT Assets	242	287	305	330	362
Cash & ST Invts	996	923	557	424	918
Inventory	142	226	375	533	509
Debtors	288	257	226	319	369
Other Current Assets	71	0	0	0	0
<b>Total Assets</b>	<b>3,613</b>	<b>4,569</b>	<b>5,024</b>	<b>5,690</b>	<b>6,274</b>
ST Debt	4	48	48	63	63
Creditors	400	530	857	1,145	1,193
Other Current Liab	71	87	106	212	395
LT Debt	22	518	518	503	504
Other LT Liabilities	34	31	31	31	29
Shareholder's Equity	2,245	2,528	2,638	2,910	3,265
Minority Interests	837	826	826	826	826
<b>Total Cap. &amp; Liab.</b>	<b>3,613</b>	<b>4,569</b>	<b>5,024</b>	<b>5,690</b>	<b>6,274</b>
Non-Cash Wkg. Capital	30	(134)	(362)	(505)	(710)
Net Cash/(Debt)	970	357	(9)	(143)	351
Debtors Turn (avg days)	95.5	103.3	55.3	43.9	47.8
Creditors Turn (avg days)	227.9	326.4	284.1	305.9	358.0
Inventory Turn (avg days)	95.1	129.3	123.2	138.8	159.5
Asset Turnover (x)	0.3	0.2	0.3	0.4	0.4
Current Ratio (x)	3.1	2.1	1.1	0.9	1.1
Quick Ratio (x)	2.7	1.8	0.8	0.5	0.8
Net Debt/Equity (X)	CASH	CASH	0.0	0.0	CASH
Net Debt/Equity ex MI (X)	CASH	CASH	0.0	0.0	CASH
Capex to Debt (%)	3,606.3	211.7	174.8	156.7	76.7
Z-Score (X)	NA	NA	NA	NA	NA

Source: Company, DBS HK

### Cash Flow Statement (US\$ m)

FY Dec	2019A	2020A	2021F	2022F	2023F
Pre-Tax Profit	182	46	110	277	538
Dep. & Amort.	129	206	286	347	379
Tax Paid	(27)	(13)	(17)	(43)	(83)
Assoc. & JV Inc/(loss)	(10)	(26)	(22)	(22)	(22)
(Pft)/ Loss on disposal of FAs	0	0	0	0	0
Chg in Wkg.Cap.	(25)	163	229	143	205
Other Operating CF	(70)	(59)	(84)	(117)	(139)
<b>Net Operating CF</b>	<b>179</b>	<b>317</b>	<b>503</b>	<b>585</b>	<b>878</b>
Capital Exp.(net)	(930)	(1,199)	(989)	(888)	(435)
Other Invts.(net)	148	497	0	0	0
Invts in Assoc. & JV	1	(6)	31	22	21
Div from Assoc & JV	0	0	0	0	0
Other Investing CF	51	50	68	101	120
<b>Net Investing CF</b>	<b>(731)</b>	<b>(658)</b>	<b>(891)</b>	<b>(764)</b>	<b>(294)</b>
Div Paid	(51)	0	0	0	(123)
Chg in Gross Debt	(5)	540	0	0	1
Capital Issues	4	9	9	9	9
Other Financing CF	303	237	14	35	23
<b>Net Financing CF</b>	<b>252</b>	<b>787</b>	<b>23</b>	<b>45</b>	<b>(90)</b>
Currency Adjustments	0	0	0	0	0
Chg in Cash	(301)	447	(365)	(134)	494
Opg CFPS (US\$)	0.16	0.12	0.21	0.34	0.51
Free CFPS (US\$)	(0.58)	(0.68)	(0.37)	(0.23)	0.34

Source: Company, DBS HK

## Hua Hong Semiconductor Ltd

DBS HK recommendations are based on an Absolute Total Return\* Rating system, defined as follows:

**STRONG BUY** (>20% total return over the next 3 months, with identifiable share price catalysts within this time frame)

**BUY** (>15% total return over the next 12 months for small caps, >10% for large caps)

**HOLD** (-10% to +15% total return over the next 12 months for small caps, -10% to +10% for large caps)

**FULLY VALUED** (negative total return, i.e., > -10% over the next 12 months)

**SELL** (negative total return of > -20% over the next 3 months, with identifiable share price catalysts within this time frame)

\*Share price appreciation + dividends

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Sources for all charts and tables are DBS HK unless otherwise specified.

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