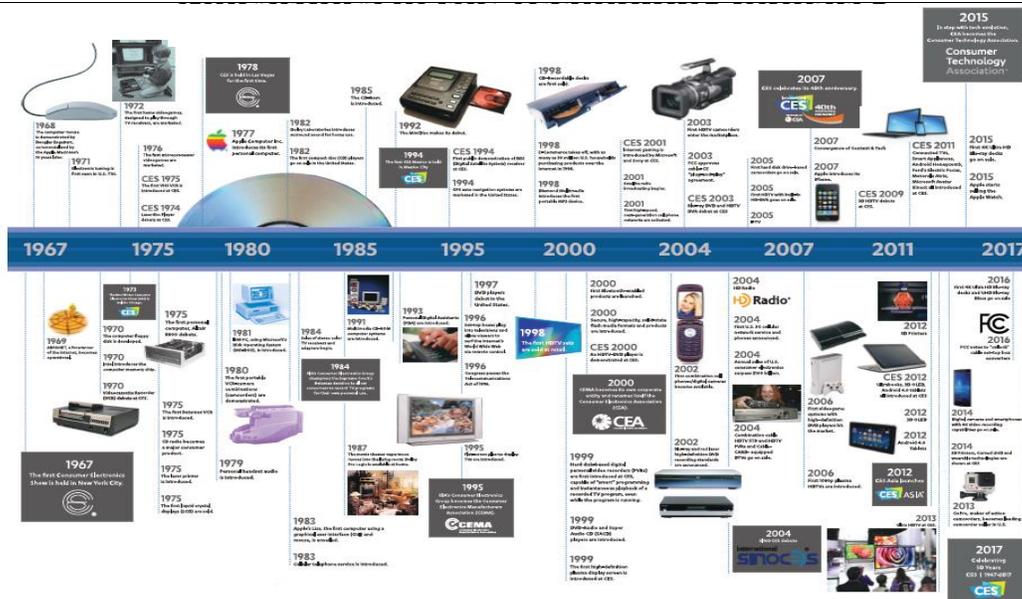




CES – Global stage for innovation

Figure 1: Timeline of technology milestones in CES



Source: CES, AMTD Research

AMTD views: CES is the most high-profile showcase of the world’s breakthrough consumer technologies. It has been the proving ground for innovators and their technologies for over 50 years and a stage that brings next-generation innovations to the global market. This year, CES attracted more than 4,400 exhibiting companies to showcase their new concepts and technologies. At the exhibition, 5G became more subdued, however, applications based on 5G, such as IoT, were trending; AI and autonomous driving were in focus and smart city concepts were introduced; in addition, after successful launches of foldable smartphone, foldable screen was first used on laptop and other smart devices. More details below:

AMTD Research
Brian Li
 +852 3163-3384
 brian.li@amtdgroup.com

AMTD Research
Michelle Li
 +852 3163-3383
 michelle.li@amtdgroup.com

AMTD Research
Roy Wu
 +852 3163-3242
 roy.wu@amtdgroup.com

CES 2020

CES 2020

AI

Amazon

Amazon announced the international launch of Echo Auto

Echo Auto, Amazon's smart speaker designed for automotive use, debuted at CES 2019 and was launched in US market last January. On January 6 at CES 2020, Amazon announced the international launch of the Echo Auto. The device is expected to hit the Indian market on January 15 and other countries later this year. In the meanwhile, Amazon also showcased Alexa built-in to a Lamborghini sports car during CES 2020, a new addition to its auto partner brands including Audi and Toyota. In addition, EV startup Rivian plans to integrate the voice-enabled services - Alexa in its R1T pickup truck and R1S SUV. Amazon has built extensive partnerships with multiple auto manufacturers, signaling its clear intention to expand into automotive sector. (Source: [CES](#))

CES 2020

AI

Qualcomm

Qualcomm announced Snapdragon Ride platform for autonomous vehicles

Qualcomm unveiled at CES 2020 its Qualcomm Snapdragon Ride Platform. Snapdragon Ride consists of three components: a system-on-chip (SoC), a safety accelerator system and software, and an autonomous driving software stack. The company expects its Ride platform to benefit all levels of advanced driver assistance systems (ADAS), from Level 1 and Level 2 systems that brake automatically and recognize traffic signs, through Level 4 and Level 5 systems that will drive autonomously navigate urban environments. Snapdragon Ride is expected to be available for pre-development to automakers and Tier-1 suppliers in the first half of 2020. Snapdragon Ride-enabled vehicles are expected to be in production in 2023. (Source: [CES](#))

CES 2020

AI

Sony

Sony unveils self-driving car for sensors developing

At CES, Sony unveiled a prototype car equipped with the company's own self-driving system which it aims to trial on public roads starting in fiscal 2020 through March 2021. The car is equipped with thirty-three sensors, including image sensors, mounted in the prototype's interior and exterior. The prototype is capable of providing "Level 2" driving support, in which more than one of three functions -- steering, accelerating and braking -- are automated. The company does not plan to commercialize the car, but aims to use it to acquire self-driving-related technologies to help developing the automotive image sensors. (Source: [CES](#))

CES 2020

Display

Samsung

Samsung announced curved gaming monitors Odyssey G7 and G9

Samsung announced the all-new Odyssey G7 and G9, making Odyssey its official product line for gaming monitors. The 27- or 32-inch G7 and 49-inch G9 both come with a rapid 1ms response time, G-Sync compatibility, and so on. Both monitors feature an extremely deep curvature – the first ever monitors to possess a high-performance 1000R curvatures – and stunning QLED picture quality, giving gamers an entirely new and immersive experience. (Source: [CES](#))

CES 2020

Intel revealed a foldable laptop concept at CES

Display

Intel

Intel unveiled the new concept device "Horseshoe Bend," at CES 2020. The 12-inch laptop is seemingly just like any other clamshell laptop. But there's a twist: the inside is almost entirely made up of a foldable OLED display. "Horseshoe Bend" is built around Intel's new 10nm Tiger Lake architecture, which is set to ship in laptops later this year. It allows for a 7mm-thick chassis with a 9W TDP and without any active cooling. (Source: [CES](#))

CES 2020

Intel announced 10nm+ Tiger Lake with Xe graphics architecture

Semiconductor

Intel

Intel introduced its newest Intel Core mobile processors codenamed Tiger Lake. Tiger Lake is built on Intel's 10nm+ process and the new Intel X3 graphics architecture DG1. It also provides 4x the throughput of USB3 with the new integrated Thunderbolt 4. The processor grants thin and light laptops access to high definition gaming and significantly improved processing power. The first Tiger Lake systems are expected to ship later this year. (Source: [CES](#))

CES 2020

Intel teased the 10th gen Comet Lake-H and Ghost Canyon NUC

Semiconductor

Intel

Intel tipped the upcoming 10th gen Comet Lake-H. The 10th gen H-series will be a powerful offering with 8 cores and 16 threads. The new processors are aimed at high-performance NUCs and gaming notebooks which are expected to ship in the coming months. Intel also showed off the Ghost Canyon NUC, which will bring support for Core i9 H-series and discrete GPUs, and allow for CPU upgrades. (Source: [CES](#))

CES 2020

AMD launches Ryzen 4000 series APUs

Semiconductor

AMD

AMD has announced its next generation Ryzen 4000 mobile processors. The new Ryzen 4000 series of chips based on the company's 7nm Zen 2 architecture. The processors are divided into two categories, the H-series for heavy loads like gaming or content creation, and the U-series for ultraportable laptops. U-series are positioned to compete against Intel's Ice Lake products while H-series are intended to compete against Intel's H-series. In multithread performance, AMD claims its new AMD Ryzen 7 4800U is 90 percent faster than the 10nm Intel i7 1065G7—Intel's fastest Ice Lake CPU. The first AMD Ryzen 4000 series laptops will arrive from Acer, Asus, Dell, HP, Lenovo, and other companies starting in Q1 2020. (Source: [CES](#))

CES 2020

Huami debuted new Amazfit products

Wearables

Huami

Huami debuted 6 new Amazfit products in the CES 2020: 1) Amazfit PowerBuds: wireless earbuds that offer heart rate monitoring and real-time motion tracking, and are rated as IP55 water-resistant. The earbuds also support touch controls. PowerBuds will be available in February at US\$99.9; 2) Amazfit T-Rex: outdoor smartwatch series built to meet the U.S. Military Standard certification, and is water, salt and alkali resistant. It has 14 different sport modes, and comes with a 20-day battery life with 20-hour continuous working time. T-Rex will be available in January at US\$139.9; 3) Huami also unveiled Amazfit HomeStudio, a fitness treadmill paired with a 43-inch HD screen and surround sound speakers; Amazfit AirRun, an affordable treadmill which could fold up for storage purposes when not in use; Amazfit Bip S, a more basic smartwatch featuring Huami PAI; Amazfit ZenBuds which help improve sleep quality. (Source: [CES](#))

News update

9 Jan 2020

Module

Sunny Optical

Sunny Optical announced Dec shipments

On 9 Jan, Sunny Optical announced shipment data for Dec. 1) Handset lens shipments reached 127mn, -2.0% MoM/+67.8% YoY (+41.0% YoY the full year of 2019); 2) CCM shipments reached 59.5mn, flat MoM/+79.2 YoY (+28% YoY the full year of 2019); 3) other optoelectronic products shipments were 4.28mn, -34.3%/+399.8% YoY (+386% YoY the full year of 2019), which was mainly driven by 3D structured light and ToF products. 4) Vehicle lens shipments were 4.18mn units, -19.5% MoM/+6.4% YoY (+25.4% YoY the full year of 2019). (Source: [Sunny Optical](#))

AMTD views: we are positive on the outlook for company's handset lens and CCM shipment as the company is well position in the upgrade trend of smartphone camera, such as periscope lens, quad/penta CCM, ToF, etc.; in addition, rising penetration of ADAS will benefit its vehicle lens. For the risk side, Huawei's situation may still be a concern, in our view.

10 Jan 2020

Internet

Investment in Chinese Internet startups 4Q19 down 32% QoQ, 52% YoY

Against a backdrop of increased domestic and international economic pressure, capital markets for Chinese internet startups saw a major tightening in Q4 2019, with the total amount of investment and financing disclosed for the quarter coming to USD 6.84bn (-32.3% QoQ / -51.5% YoY), according to Chinese government data. The Policy and Economics Research Institute of the China Academy of Information and Communications Technology (CAICT), a department of China's Ministry of Industry and Information Technology (MIIT), also reported that the total number of investments during the quarter came to 403(-21.6% QoQ/ -28.5% YoY). (Source: [Marbridgeconsulting](#))

9 Jan 2020

Smartphone

China shipped 13.77mn 5G phones in 2019

According to the China Academy of Information and Communications Technology, China's mobile phone market totaled 389mn units in 2019, down 6.2% YoY, with 4G phones accounting for 92.3% of total shipment and 5G phone shipments to be 13.769mn. 573 new models were rolled out, down 25.0% YoY, including 35 models of 5G phones. Chinese branded mobile phones accounted for 90.7% of total shipment, down 4.9% YoY to 352mn. Smartphone shipment was 372mn, down 4.7% YoY. (Source: [Sina](#))

8 Jan 2020

Semiconductor

Samsung

Samsung Electronics announced upbeat preliminary 4Q guidance

Samsung announced preliminary 4Q guidance. The revenue was guided to KRW59tn, a bit lower than consensus. However, operating profit was guided to KRW7.1tn, ahead of market expectation. Driven by increasing orders and inventory back to normal, NAND prices have bottomed up since 3Q19 and DRAM prices were falling more slowly. Given that the amount of memory required for a 5G smartphone will increase, outlook for global memory market will be more positive in 2020, in our view. (Source: [Samsung](#))

8 Jan 2020

Apple's App Store had gross sales around USD 50bn last year

Smartphone

Apple

Apple announced that Apple Store had a total sale of USD 50bn in 2019. And Apple has paid USD 155bn to developers since 2008, up from USD 120bn disclosed in January 2019. The showed momentum for its services business, which is increasingly seen by investors and analysts as a key segment for Apple. At USD 50bn in total sales per year, the App Store alone would be No. 64 on the Fortune 500. But the annual disclosure also suggests that growth for the App Store is slowing. The USD 35bn Apple paid to developers in 2019 was only 2.9% higher than the 2018 figure of USD 34bn, and a significant slowdown from the payout's 30% growth rate in 2017. (Source: [Bgr](#))

8 Jan 2020

MediaTek faces a shortage in 4G chips

Semiconductor

MediaTek

As the penetration rate of 5G commercial services is still low, brands such as Huawei, OPPO, Vivo and Samsung have placed additional orders with MediaTek. According to reports, the cumulative orders of MediaTek's MT6762 mobile phone chips for 1H20 have exceeded 25 million units. The shortage is likely to last until March. MT6762 is based on TSMC's 12nm process and is suitable for mid- and low-end smartphones. (Source: [Sina](#))

7 Jan 2020

MediaTek announced Dimensity 800 5G series chipsets for 5G smartphones

Semiconductor

MediaTek

MediaTek announced its Dimensity 800 series chipsets with integrated 5G modem to bring flagship features, power and performance to new premium mid-range 5G smartphones. The single chip solutions offer an unrivaled combination of connectivity, multimedia, AI and imaging innovations packed into an ultra-efficient 7nm chip. The first devices featuring Dimensity 800 Series SoCs are expected to come in 1H20. (Source: [MediaTek](#))

7 Jan 2020

Qorvo launched first Wi-Fi 6 iFEM with BAW in industry

Module

Qorvo

Qorvo has launched iFEM QPF7219. Qorvo claims it is the first integrated front-end module (iFEM) that provides reliable, whole-home coverage when designed into Wi-Fi 6 (802.11ax) systems. Qorvo's new QPF7219 iFEM opens up the full 2.4GHz Wi-Fi bandwidth, making it all usable throughout the smart home and delivering more FCC-compliant range than any competing product. The QPF7219 integrates a 2.4GHz power amplifier (PA) with power detector, FCC edgeBoost BAW filter, regulator, transmit-receive switch and by-passable low-noise amplifier (LNA) into a single device. This removes 20 surface-mount components based on a 4x4 configuration, reducing printed circuit board area by 40% compared with standalone solutions.

6 Jan 2020

Samsung Electronics started mass production of 6nm process

Semiconductor

Samsung

Samsung Electronics began mass production of 6nm semiconductors based on EUV technology in Dec 2019. The products are reported to be delivered to the North American market, especially corporate clients like Qualcomm. Samsung rolled out 6nm products only eight months after it started mass production of 7nm chips. The transition to a 6nm EUV process is expected to narrow Samsung's gap with TSMC, the world's No. 1 foundry. Samsung aims to roll out 5nm EUV and 3nm GAA products in 1H20. (Source: [Businesskorea](#))

IMPORTANT DISCLOSURES

Analyst Certification

We, Brian Li, Michelle Li and Roy Wu, hereby certify that (i) all of the views expressed in this research report reflect accurately our personal views about the subject companies and their securities; and (ii) no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed by us in this research report, nor is it tied to any specific investment banking transactions performed by AMTD Global Markets Limited.

As of the date the report is published, Brian Li holds financial interest in the securities of Amazon mentioned in the report.

AMTD Global Markets Limited

Address: 23/F - 25/F, Nexxus Building, 41 Connaught Road Central, Hong Kong

Tel: (852) 3163-3288 **Fax:** (852) 3163-3289

GENERAL DISCLOSURES

The research report is prepared by AMTD Global Markets Limited and is distributed to its selected clients.

This research report provides general information only and is not to be construed as an offer to sell or a solicitation of an offer to buy any security in any jurisdiction where such offer or solicitation would be illegal. It does not (i) constitute a personal advice or recommendation, including but not limited to accounting, legal or tax advice, or investment recommendations; or (ii) take into account any specific clients' particular needs, investment objectives and financial situation. AMTD does not act as an adviser and it accepts no fiduciary responsibility or liability for any financial or other consequences. This research report should not be taken in substitution for judgment to be exercised by clients. Clients should consider if any information, advice or recommendation in this research report is suitable for their particular circumstances and seek legal or professional advice, if appropriate.

This research report is based on information from sources that we considered reliable. We do not warrant its completeness or accuracy except with respect to any disclosures relative to AMTD and/or its affiliates. The value or price of investments referred to in this research report and the return from them may fluctuate. Past performance is not reliable indicator to future performance. Future returns are not guaranteed and a loss of original capital may occur.

The facts, estimates, opinions, forecasts and any other information contained in the research report are as of the date hereof and are subject to change without prior notification. AMTD, its group companies, or any of its or their directors or employees ("AMTD Group") do not represent or warrant, expressly or impliedly, that the information contained in the research report is correct, accurate or complete and it should not be relied upon. AMTD Group will accept no responsibilities or liabilities whatsoever for any use of or reliance upon the research report and its contents.

This research report may contain information from third parties, such as credit ratings from credit ratings agencies. The reproduction and redistribution of the third party content in any form by any mean is forbidden except with prior written consent from the relevant third party. Third party content providers do not guarantee the timeliness, completeness, accuracy or availability of any information. They are not responsible for any errors or omissions, regardless of the cause, or for the results obtained from the use of such content. Third party content providers give no express or implied warranties, including, but not limited to, any warranties of merchantability of fitness for a particular purpose or use. Third party content providers shall not be liable for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including lost income or profits and opportunity costs) in connection with any use of their content. Credit ratings are statements of opinions and are not statements of fact or recommendations to purchase, hold or sell securities. They do not address the suitability of securities for investment purposes, and should not be relied on as investment advice.

To the extent allowed by relevant and applicable law and/or regulation: (i) AMTD, and/or its directors and employees may deal as principal or agent, or buy or sell, or have long or short positions in, the securities or other instruments based thereon, of issuers or securities mentioned herein; (ii) AMTD may take part or make investment in financing transactions with, or provide other services to or solicit business from issuer(s) of the securities mentioned in the research report; (iii) AMTD may make a market in the securities in respect of the issuer mentioned in the research report; (iv) AMTD may have served as manager or co-manager of a public offering of securities for, or currently may make a primary market in issues of, any or all of the entities mentioned in this research report or may be providing, or have provided within the previous 12 months, other investment banking services, or investment services in relation to the investment concerned or a related investment.

AMTD controls information flow and manages conflicts of interest through its compliance policies and procedures (such as, Chinese Wall maintenance and staff dealing monitoring).

The research report is strictly confidential to the recipient. No part of this research report may be reproduced or redistributed in any form by any mean to any other person without the prior written consent of AMTD Global Markets Limited.