Business Unusual
- Challenges & Opportunities

Headwinds in 2020

- 2020 Industry headwinds: COVID-19; Trade & Geopolitical Tensions
- COVID-19 Impact: Negative impact across most end-markets in 2Q20 and 3Q20 except data center.
- New U.S. export restriction to China add new uncertainty to the semiconductor supply chain
- However, as countries/states are starting to lift restriction, we shall expect the recovery of the supply chains and reopening of the markets
- COVID-19 accelerates digital transformation of the many businesses and services throughout the world.

A Mixed Market Outlook

Strong Cloud and Server; Better than expected PC; Weak Smartphone and Automotive

Cloud services, Server and PC demand is boosted by WFH and remote learning

Laptop demand strength is expected to continue into 2Q/3Q while Intel's CPU shortage has alleviated.

Smartphone and automotive markets suffered most from COVID-19.

Memory Market Stable Supported by Server Demand

Cloud/Server memory demand has been strong while mobile demand being soft.

2Q20 ASP trend: DRAM improving while NAND stable. Inventory levels are expected to decline

The key indicator to watch is the recovery of mobile market and the sustainability of cloud/server demand in 2H 2020.

2020 Forecast Revisions

- Current forecast assumes recovery will start in 3Q20 as economy returns to normal ranges
- Electronics and IC sales are now expected to ~~decline to~~ mid-single digits in 2020
- Short-term consumer and industrial demand is dropping dramatically
- For capital equipment
  - 2020 forecasts have been revised downward to remaining stable
  - Wafer Fab Equipment segment likely to see two consecutive years of contraction

	Sales			Growth (%)		
	2018	2019	2020	2018	2019	2020
Electronics Sales ($B)	2,165	2,122	2,020	5%	-2%	-5%
IC Sales ($B)	407	352	337	15%	-13%	-4%
Semiconductor Manufacturing CAPEX ($B)	100	97	98	8%	-4%	-3%
Semiconductor Capital Equipment Sales ($B)	**64**	**59**	**56**	**1%**	**-8%**	**-5%**
- Wafer Fab Equipment	55	51	49	0%	-6%	-6%
- Test Equipment	6	5	5	20%	-11%	-3%
- Assembly & Packaging Equipment	4	3	3	2%	-28%	-3%
Semiconductor Material Sales ($B)	**52**	**52**	**50**	**11%**	**-1%**	**-3%**
EDA Sales ($B)	**9**	**10**	**10**	**4%**	**8%**	**-4%**

Source: VLSI Research, SEMI

Thank you!

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