

A decorative grey bar with a notch on the left side, positioned above the title.

Advanced CMOS Essentials Bundled Offerings

A decorative grey bar with a notch on the left side, positioned below the title.

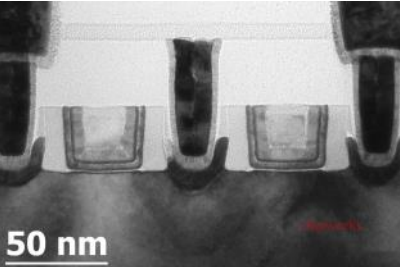
Q4 2015

The Essential Data You Need

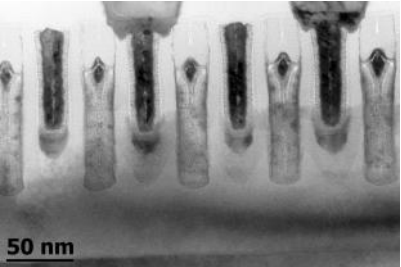
Chipworks Advanced CMOS Essentials (ACE) provide you with the critical data you need – quickly and economically. The ACE folder contains hundreds of SEM and TEM images and is supported by an executive summary highlighting unique features, materials analysis and critical dimensions.

Advanced Logic

Planar transistor

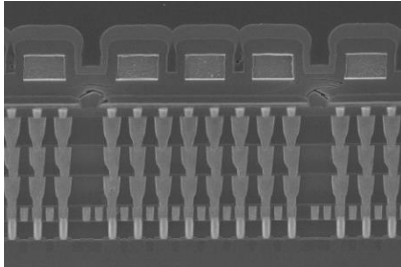


FinFET transistor

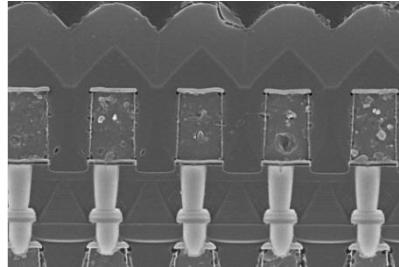


Emerging/Embedded Memory

CBRAM

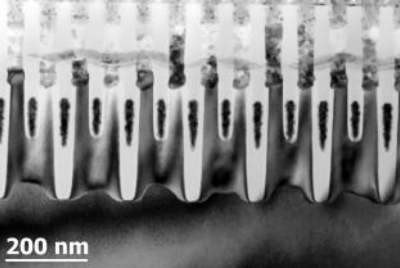


ReRAM

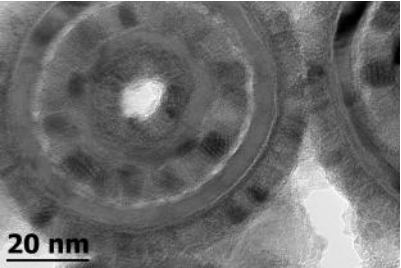


DRAM

Cross section

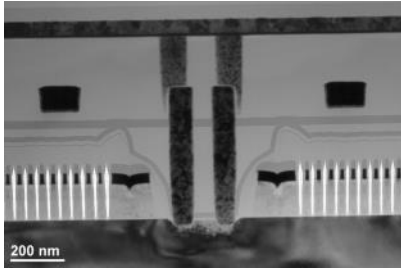


Planar

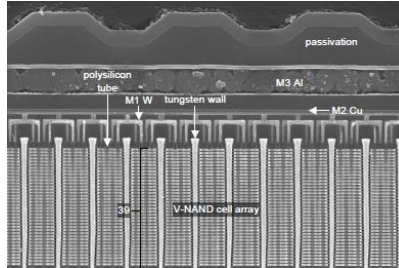


Flash

NAND



VNAND



Completed Analysis



22 nm LPDDR4
DRAM
(ACE-1502-804)



16-nm planar
MLC NAND flash
(ACE-1501-804)



16-nm planar
MLC NAND Flash
(ACE-1502-802)



Exynos 5430
20 nm
(ACE-1501-803)



26 nm LPDDR2
DRAM
(ACE-1502-803)



DDR4 SDRAM
TSV 4-stack
(PKG-1505-801)*



Exynos 7420
14 nm FinFET
(SAR-1504-801)
(ACE-1504-801)



40 nm Planar
Transistor
(ACE-1506-801)



Cherry Trail
14 nm FinFET
SoC
(ACE-1505-801)



20 nm DRAM
(ACE-1501-805)



V-NAND TLC
Flash
(ACE-1503-802)



16-nm planar
MLC Flash
(ACE-1503-801)



Embedded
ReRAM
(ACE-1508-802)



28 nm LP
(ACE-1506-802)



28HP HKMG
(ACE-1508-803)



130 nm CBRAM
(ACE-1508-805)



AMD Fury X + SK
Hynix High
Bandwidth
Memory
(PKG-1507-801) *

Analysis Underway



STT-MRAM
(ACE-1510-801)



FinFET 16FF
(ACE-1509-801)



28 FDSOI
(ACE-1508-801)

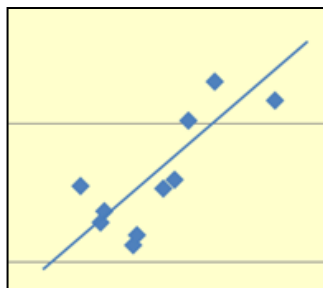


180 nm FRAM
(ACE-1508-804)

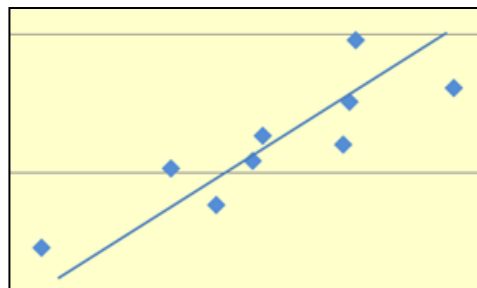
Transistor Characterization Reports

Compare Reality to Foundry Targets and Publications

Chipworks provides universal transistor curves, allowing easy comparison of foundries.



NMOS Universal Curve

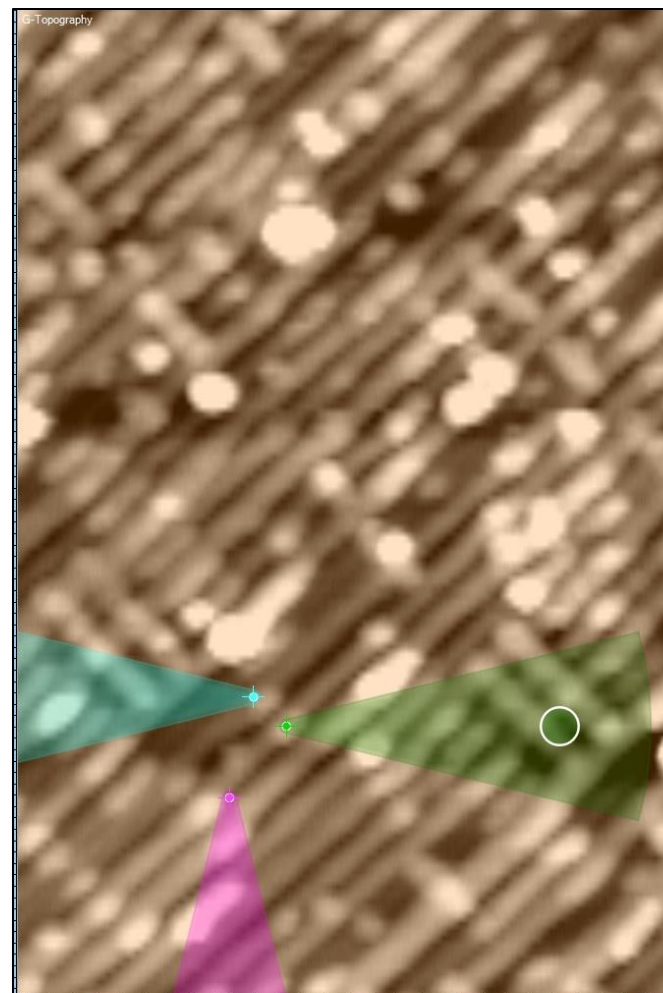


PMOS Universal Curve

Measurements include:

- AFP Image of the Measurement Area for NMOS Transistor 1
- Transfer Characteristics ($V_{DS} = 0.7\text{ V}$)
- Extrapolated Linear V_T ($V_{DS} = 0.05\text{ V}$)
- Transconductance (g_m) ($V_{DS} = 0.7\text{ V}$)
- Subthreshold Swing (S) ($V_{DS} = 0.7\text{ V}$)
- Transfer Characteristics Versus V_{DS}
- DIBL ($\Delta V_{GS}/\Delta V_{DS}$)

Related Transistor Reports	Report Code
TSMC 16 nm FinFET (logic)	TCR-1510-801
Samsung 14 nm FinFET (logic)	TCR-1504-801
Intel 14 nm FinFET (SRAM)	TCR-1409-801



AFP image showing the probe locations for NMOS transistor CPU logic

Next Step: Schedule a Call for a Consultation

For more information on these reports, report bundles, and how we can better suit your needs, we recommend a quick one-on-one call with our Vice President of Competitive Technical Intelligence, Jim Morrison.

[Contact Jim for a consultation](#)

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