



CHANGING the industry that's *CHANGING* the world

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Ghassan Zamat – Director, Aerospace and Defense



GLOBALFOUNDRIES®

GlobalFoundries at a glance

- Created in 2009
- Acquired Chartered Semiconductor in 2010, IBM Microelectronics in 2015
- Largest privately held semiconductor company
- World's second largest semiconductor foundry
- More than 250 clients
- 20,000+ patents and applications
- ~16,000 employees worldwide

High growth opportunities



COMMUNICATIONS & DATA CENTERS

- 5G infrastructure / small cells
- DAS/FAS
- Hyper-scale data centers
- Deep neural networks



MOBILITY

- Next-generation / 5G mobile



INTERNET OF THINGS

- Connected home
- Building management
- Consumer medical



AUTOMOTIVE

- ADAS
- Body and powertrain control
- Infotainment



INDUSTRIAL

- Factory automation
- Machine-type communications



AEROSPACE & DEFENSE

- Commercial & government applications

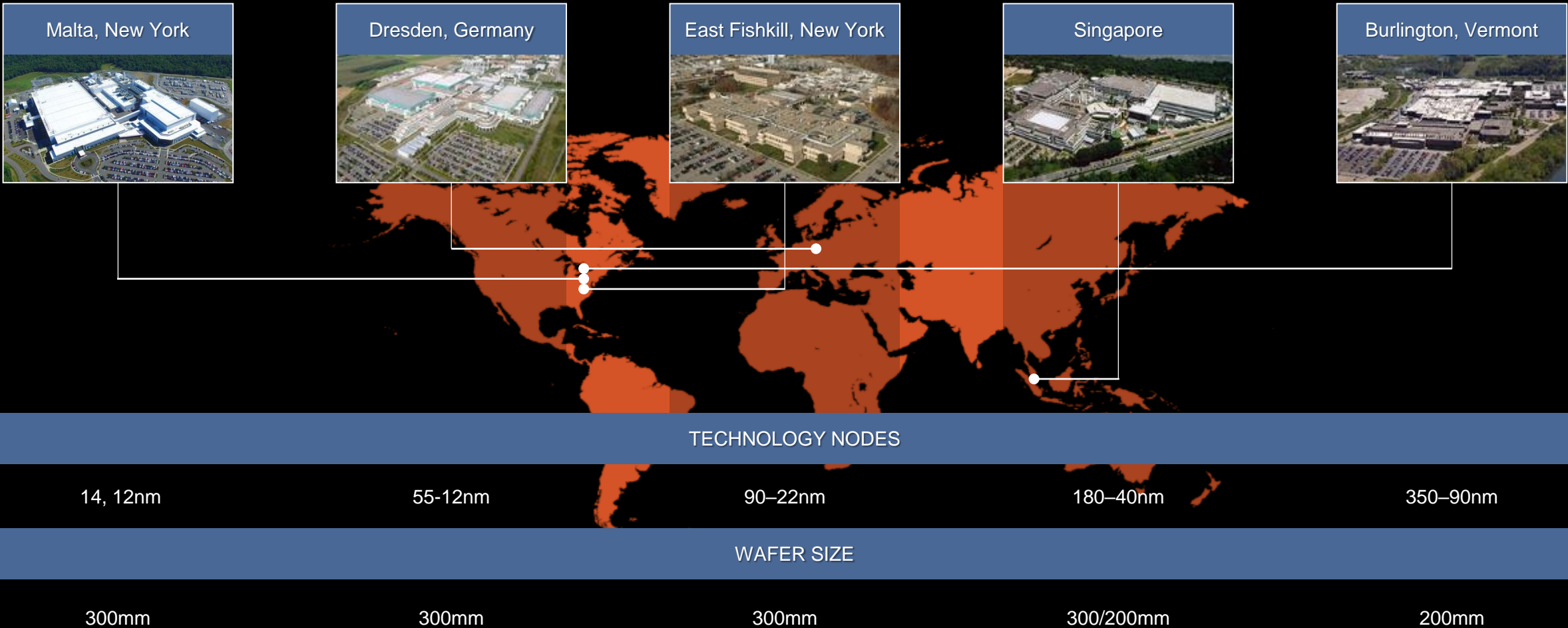
Comprehensive technology portfolio

	Logic	RF CMOS	mmWave RF CMOS	Embedded Memory	BCDLite®/ BCD	High Voltage CMOS	RF SOI	SiGe PA	SiGe HP
12 nm	○								
14 nm	●	●							
22 nm	●	●	●	●					
28 nm	●	●							
45 nm / 40 nm	●	●	●	●			●		
55 nm	●	●		●	●				
65 nm	●	●			●				
90 nm	●								●
110 nm	●	●							
130 nm	●	●		●	●		●		●
180 nm	●	●			●	●	●		●
250 nm	●	●							●
350 nm								●	●

● Available

○ In development

Worldwide manufacturing



CMOS

Broad and differentiated product offerings



Mainstream

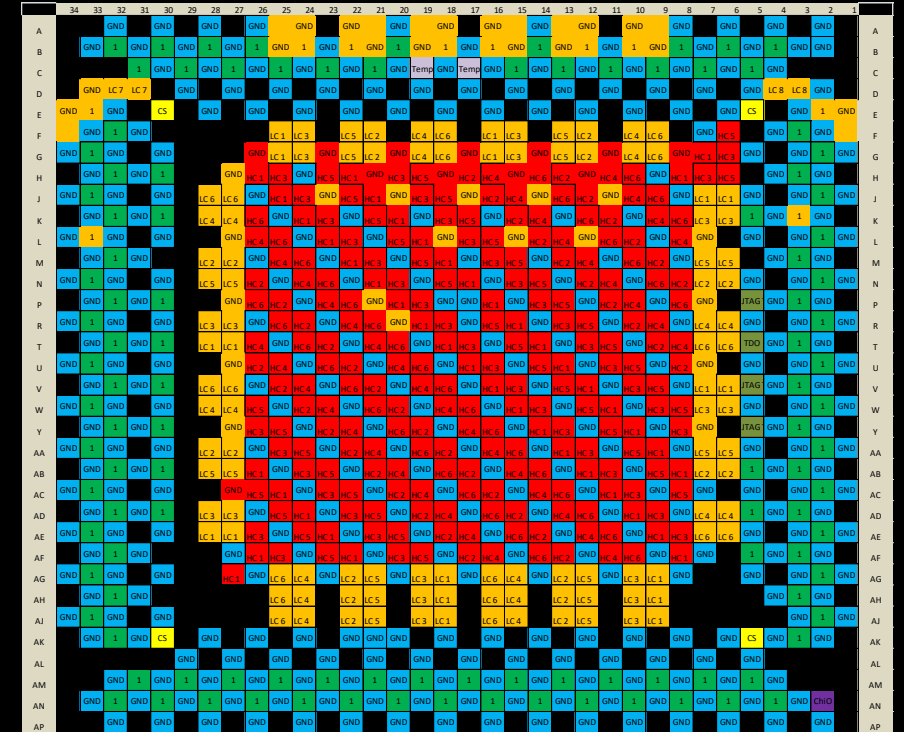
- 180 nm to 28 nm
- 200 mm, 300 mm wafers
- 28 nm HKMG/Poly-Si
 - Industry leader, over 1 million wafers shipped
- Mixed-technology offerings based on proven processes
- Analog/mixed-signal, RF/mmWave, high voltage (power management)
- RF CMOS, embedded memory, display drivers, MEMS

Performance

- FDX™ technology
 - Industry's first FD-SOI roadmap
 - Ideal for IoT, mainstream mobile, RF and power-efficient SoCs
- FinFET technology
 - Industry roadmap for highest performance and density
 - Ideal for high-end mobile, servers, graphics and networking
- Driving rapid migration to RF and embedded memory on leading-edge platforms

22FDX Test Vehicle (TV)

- 128Mb SRAM samples called “RUFUS”
- Flip Chip Package
- Ability to use thinned wafers for assembly of samples (limited to ~250 um)
- Ability to manufacture samples without lid



GF Rad Hard Statement

GLOBALFOUNDRIES (GF) Standard Technology is not designed or modified to develop or produce integrated circuits to be rated to any radiation-hardened thresholds other than soft error rate (SER) single event upset (SEU) tolerance and sensitivities to address common terrestrial background radiation in accordance with industry standard JEDEC specification JESD89A “Measurement and Reporting of Alpha Particles and Terrestrial Cosmic Ray-Induced Soft Error in Semiconductor Devices.”

GF does not test for and does not rate or certify the chips produced from its Standard Technology for radiation-hardness other than with respect to the terrestrial SER SEU thresholds described above and will not provide a radiation-hardened rating for generic integrated circuits developed or produced from its Standard Technology.

If, as a result of independent testing, a party concludes that GFs Standard Technology meets or exceeds export control or other radiation-hardened thresholds, GF will not rate or otherwise certify its process or chips produced using its process for radiation-hardness other than with respect to the terrestrial SER SEU thresholds described above based upon its own testing since GF was not involved in this testing and is unable to confirm the accuracy of the tests or the veracity of the results.



Thank you

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Appendix

Our newest addition — 12LP FinFET for intelligent applications

12LP (12 nm FinFET)

- Up to 15 % improvement in circuit density & more than 10 % improvement in performance over industry 16 nm FinFET solutions
- Market-focused features
 - Automotive
 - RF/analog
- 12LP builds on the GF 14LPP platform, in high-volume production since early 2016
 - Optimized rules and constructs enable logic area shrink while minimizing design effort

12LP
(12 nm)



12FDX™: Industry 1st FD-SOI roadmap

- Integration for connected and interactive systems
- Unparalleled energy efficiency
 - Minimum energy point operation (<0.4 V)
 - Enhanced body-biasing
 - Full Vt mixing
 - 50 % lower power than 16/14 nm FinFET
- Connectivity across wireless protocols
 - Superior RF/analog: high f_T/f_{MAX}
 - Planar devices with lower parasitics
 - Optimized for 1/f noise and RTS
- Smart scaling: no triple- and quad-patterning
 - Full node shrink vs. 22FDX®
 - 40 % fewer masks than 10 nm FinFET
 - Flexible layouts for analog designs

