UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 8-K

CURRENT REPORT

Pursuant to Section 13 or 15(d)
of the Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): **September 24, 2019**

Axcelis Technologies, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**000-30941**	**34-1818596**
(State or other jurisdiction of incorporation)	(Commission File Number)	(IRS Employer Identification No.)

108 Cherry Hill Drive, Beverly, Massachusetts	**01915**
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: **(978) 787-4000**

(Former name or former address, if changed since last report.)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

o Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

o Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

o Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

o Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	**Trading symbol(s)**	**Name of each exchange on which registered**
Common Stock, $0.001 par value	ACLS	Nasdaq Global Select Market

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933(§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

Emerging growth company o

If an emerging growth company, indicate by check mark if registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. o

Item 7.01 Regulation FD Disclosure.

On September 24, 2019, the Company posted a new investor presentation on its Investor website (https://investor.axcelis.com/), which is filed as Exhibit 99.1 to this Form 8-K.

tem 9.01. Financial Statements and Exhibits

(d) Exhibits

Exhibit No.	Description
99.1	Investor Presentation dated September 24, 2019. Filed herewith.

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

Date: September 24, 2019

Axcelis Technologies, Inc.

By: /s/ Lynnette C. Fallon
Lynnette C. Fallon
Executive Vice President HR/Legal and General Counsel

Exhibit 99.1


Axcelis Investor Day 2019
The Next Wave of Purion Innovation
September 24, 2019
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Safe Harbor Statement

This presentation and discussion contain forward-looking statements, including our expectations for future revenues, expense reductions, profits, and other results that are forward-looking statements under the SEC's safe harbor provision. These forward-looking statements are based on management's current expectations, and are subject to the risks inherent in our business. These risks are described in detail in our Form 10-K annual report and other SEC filings. Our actual results may differ materially from our current expectations. We do not assume any obligation to update these forward-looking statements.

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The Future Built on a Strong Purion Foundation

Mary Puma
President and CEO

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Axcelis is Uniquely Positioned with the Capability, DNA, and Unwavering Focus to solve customers' high value, high impact, ion implantation challenges.
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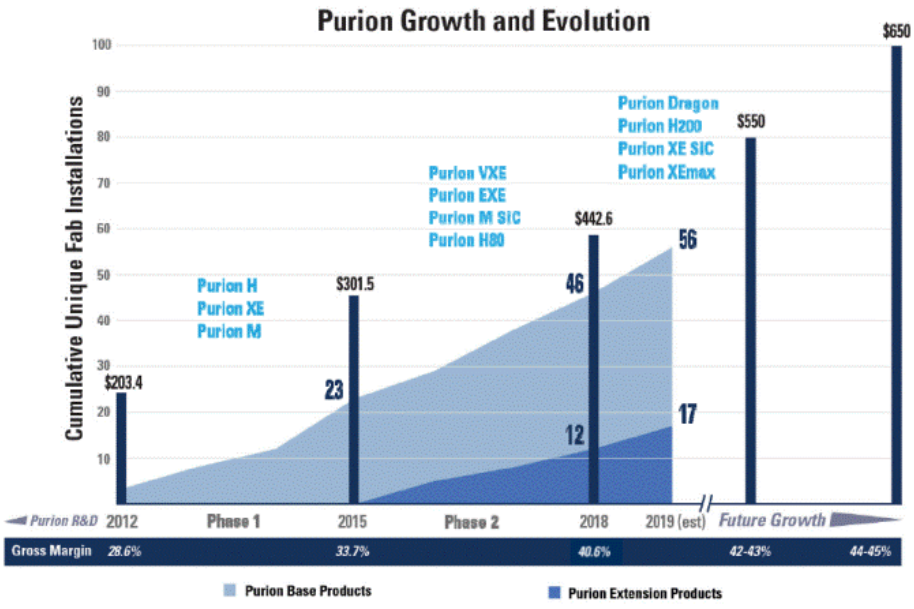
Purion – Fueling Axcelis' Growth



TODAY'S KEY TAKEAWAYS

- New product introductions
- New target business model
- Enhanced marketing & product development

THE BEGINNING OF PURION

- Created the organization required to develop the common platform and base products while under significant financial pressure

FOCUSED MARKET SEGMENTATION

- Established differentiated segment-focused Purion products that deliver high value to customers and Axcelis

THE NEXT WAVE OF PURION

- Accelerate the segment-focused strategy into the high current market that represents 60% of the Ion Implant TAM

UNWAVERING FOCUS

- Solve customer high value, high impact implant challenges that will drive customer, employee and investor satisfaction

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The Benefits of Concurrent Product Development

Russell Low, Ph.D.
Executive Vice President, Engineering

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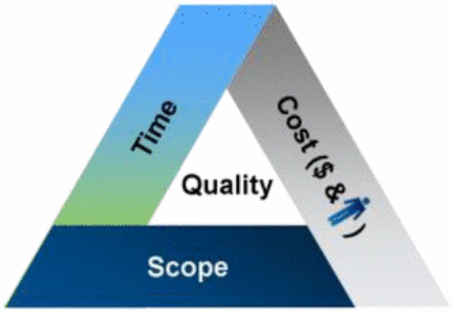
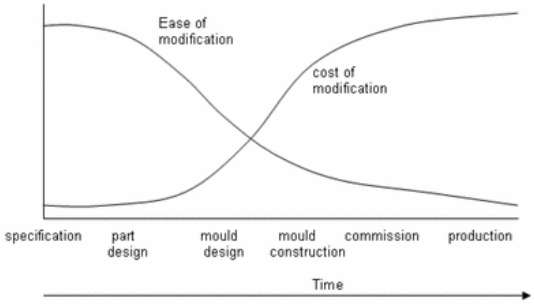
Concurrent Product Development (CPD)

- A work methodology based on the parallelization of tasks; i.e. Performing tasks concurrently
- Simultaneous, upfront engagement by a fully cross-functional, integrated team
  - "The right people at the right time"
  - Spend more time up front, so you spend less time at the end – "Get it right the first time"
- Results in more mature products "out of the box" with Quality as a natural outcome





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Axcelis Implementation of Concurrent Product Development

- All newly announced products have been developed utilizing the CPD methodology

- We kicked-off the CPD initiative in February 2017, surveying 132 employees
  - Benchmark CPD practices in all four SPOT domains (Strategy, Process, Organization & Tools)
  - Identified five key initiatives for development

- Regular re-evaluation of CPD practices is used
  - Similar to the well entrenched Lean/Kaizen approaches used by Axcelis manufacturing
  - In January 2019, full SPOT diagnostic (2nd) administered
  - Measured the progress in five targeted CPD initiatives
  - Offered recommendations on becoming Best in Class; Continuous improvement

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Spotlight: Building Out the DFx Initiative

Design for X (DfX)
"Collaborate Early and Design Once"

- **Design for X or "Excellence" (Also known as DfX) is a general term used during product development that serves as a placeholder for different design objectives**

- **Axcelis is Focusing on these 7 'X's':**
  - **Cost (DfC)**
  - **Supply Chain (DfSC)**
  - **Manufacturability (DfM)**
  - **Service Revenue (DfSR)**
  - **Serviceability (DfS)**
  - **Reliability (DfR)**
  - **Installation (DfI)**

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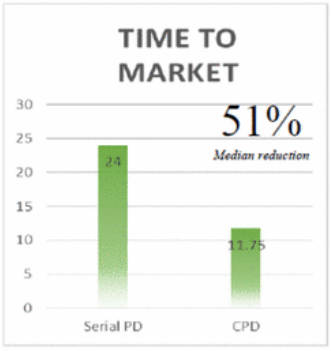
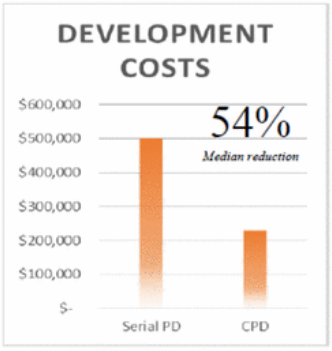
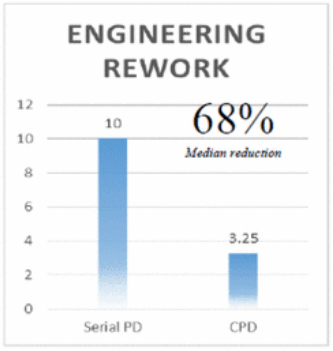
Value of Concurrent Product Development – Higher Customer Satisfaction and Improved Financial Performance



- Increased market share
- Better pricing



- Lower OPEX
- Stronger product pipeline



- Higher Quality
- Improved gross margin

*Grand Median Reductions Based on 25 Studies of the Impact of CPD Among 11 Industry Groups - Leong & Collins, 1997

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The Evolution of Ion Implantation Market Segmentation

Doug Lawson
Executive Vice President, Corporate Marketing and Strategy

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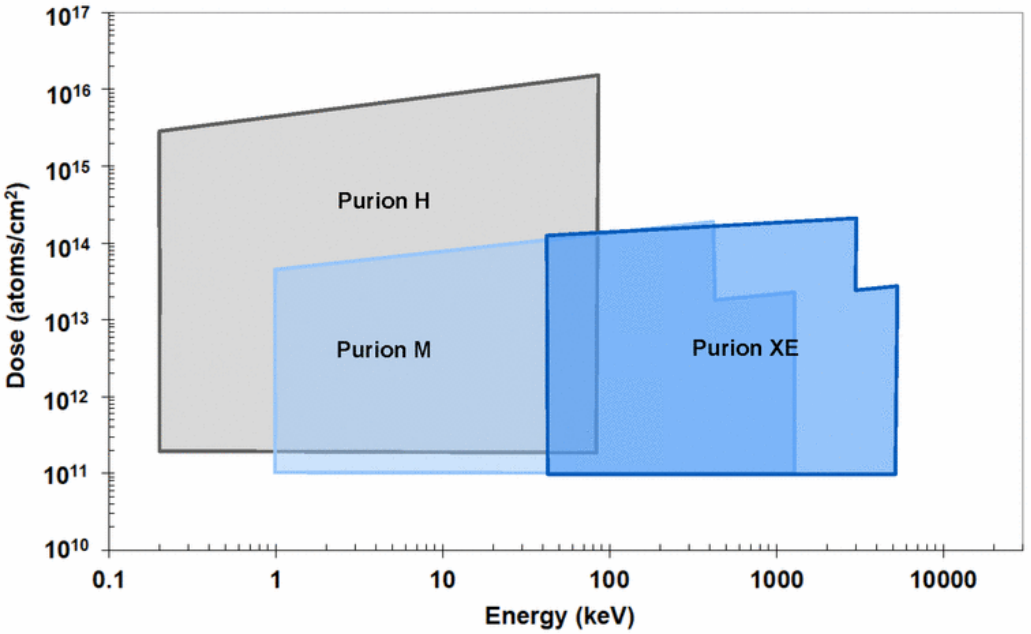
Applications Space Coverage – General Purpose Products Derived through Technical Capability



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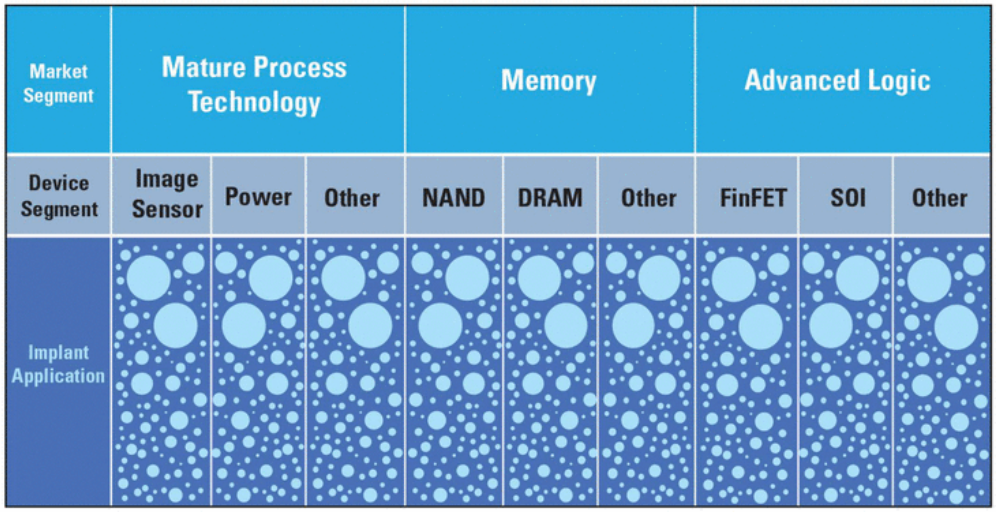
High Level Market Segmentation for Advanced and Emerging Technology



Segment by process technology
- Work with customers and industry peers to identify implant opportunities

Segment by device type
- Work with device engineers to identify implant opportunities

Assess 30-40 implant recipes
- Identify high value/high impact implant recipes for customer.
- Analyze the market opportunity
- Develop Purion product extension using CPD

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The Next Wave of Purion

Bill Bintz
Executive Vice President, Product Development

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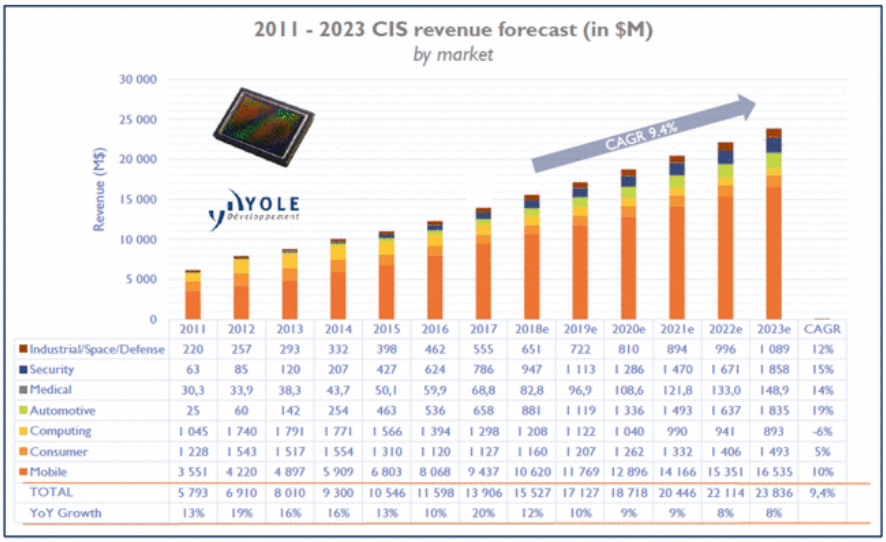
Image Sensors – Strong Market Growth with High Implant Capital Intensity



	2011	2012	2013	2014	2015	2016	2017	2018e	2019e	2020e	2021e	2022e	2023e	CAGR
Industrial/Space/Defense	220	257	293	332	398	462	555	651	722	810	894	996	1 089	12%
Security	63	85	120	207	427	624	786	947	1 113	1 286	1 470	1 671	1 858	15%
Medical	30,3	33,9	38,3	43,7	50,1	59,9	68,8	82,8	96,9	108,6	121,8	133,0	148,9	14%
Automotive	25	60	142	254	463	536	658	881	1 119	1 336	1 493	1 637	1 835	19%
Computing	1 045	1 740	1 791	1 771	1 566	1 394	1 298	1 208	1 122	1 040	990	941	893	-6%
Consumer	1 228	1 543	1 517	1 554	1 310	1 120	1 127	1 160	1 207	1 262	1 332	1 406	1 493	5%
Mobile	3 551	4 220	4 897	5 909	6 803	8 068	9 437	10 620	11 769	12 896	14 166	15 351	16 535	10%
TOTAL	5 793	6 910	8 010	9 300	10 546	11 598	13 906	15 527	17 127	18 718	20 446	22 114	23 836	9,4%
YoY Growth	13%	19%	16%	16%	13%	10%	20%	12%	10%	9%	9%	8%	8%	

- **Image sensor market continues to thrive with CAGR of >9% through 2023**
  - **High growth in most segments including automotive, security and industrial**
  - **Volume to continue to be driven by mobile as more sensors added to smart phone devices**
  - **"Cameras per smart phone" forecast to grow at 6.2% CAGR**

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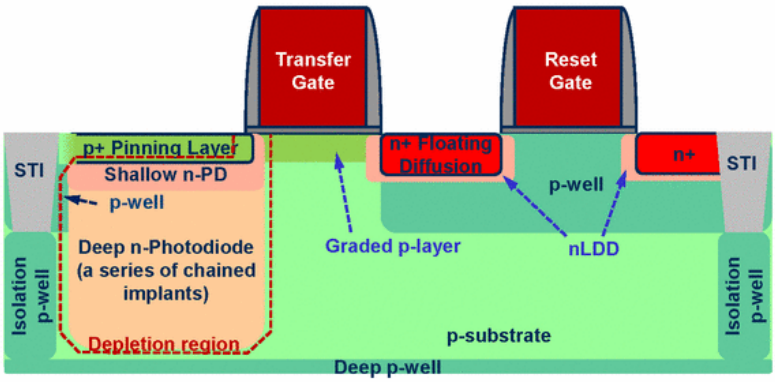
Image Sensors – Operating Principle & Emerging Implant Requirements



High Implant Capital Intensity

- Image sensors utilize a photodiode area to capture photons and convert them to electrical current
- Large number of implant steps required to fabricate an image sensor – particularly high energy implant steps
- Industry moving aggressively towards deeper photodiodes, driving need for higher energy implants
- Challenges associated with reduction of dark current/white pixel count, driving need for reduced metals levels, particularly energetic metals

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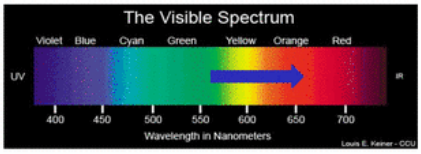
Image Sensors – Emerging Device Fabrication Technical Requirements



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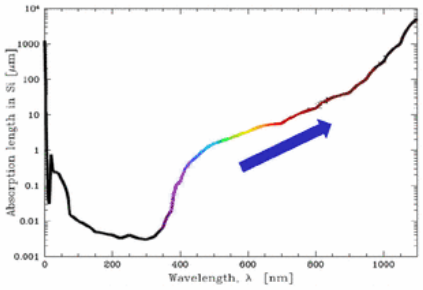

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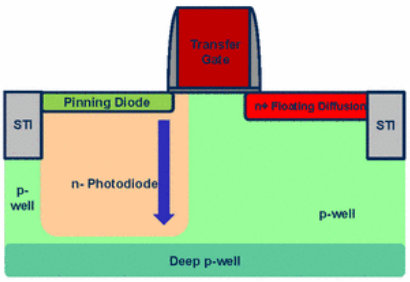

- Drive towards ever improving image sensor (CIS) performance in the deep red to infra-red regions
- Longer wavelengths associated with the red to infra-red region of light spectrum have larger absorption lengths in Si
- In turn, driving requirement for deeper image sensor photodiodes and related isolation well depths
- Ultimately moving max energy requirements to higher MeV levels: >12MeV

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Purion XEmax –
New High Energy Extension Targeting Advanced Image Sensor Applications

- Patented Boost Technology™
- Filters out energetic metals for reduced dark current and white pixel count levels
- Enables energy capability for emerging high performance image sensors
- Strong CoO performance
  - New technology enables a dramatic productivity advantage for customers

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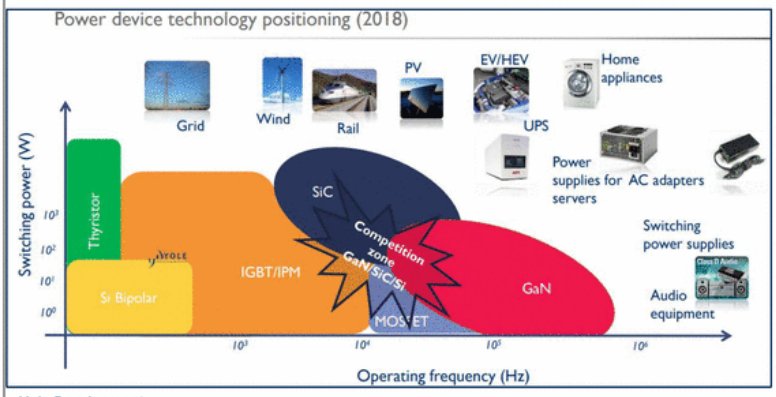
Power Device Market – Strong Market Growth with Increasing Implant Capital Intensity



Yole Development

- Power device market comprised of multiple device technologies
  - Multiple device structures, including MOSFET, IGBT, and Bipolar devices
  - Multiple material types – Si, SiC, GaN
- Device technology of choice driven by specific application requirements
  - Power requirements, max voltage, operating frequency, size constraints, weight constraints, power loss limitations, etc.
- Strong growth in overall power device market driven by industrial and automotive industries
- Growing need for new implant capabilities

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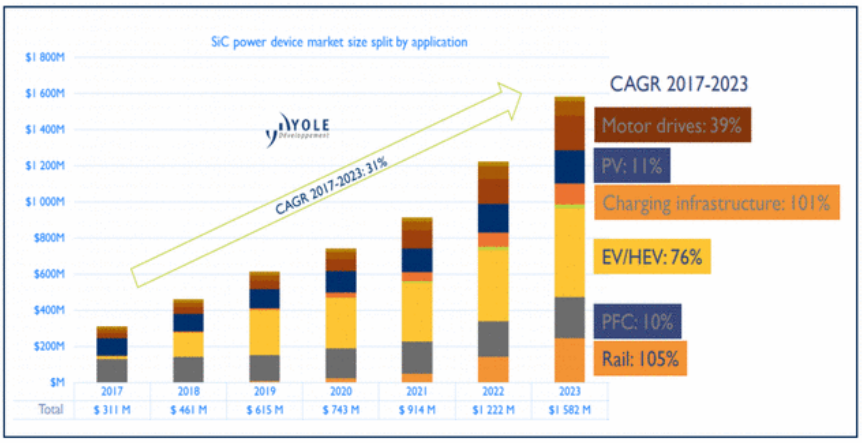
SiC Power Device Market – Very High Growth Rate with High Implant Capital Intensity



- **SiC devices have emerged as a leader in markets requiring high power with high operating frequency**
  - **Strong adoption for EV/HEV market and renewable energy**
- **Driving the need for an expanding set of new implant capabilities**

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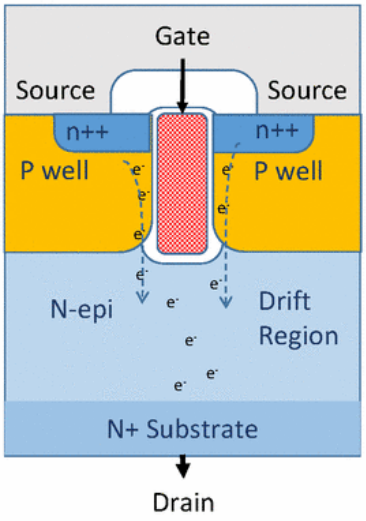
Power Device – Operating Principle & Emerging Implant Requirements

Example: SiC Power Device

Trench MOSFET



- Power Device performance requirements driving development of fundamentally new device technology
  - Reduced R_{on} for lower power consumption and reduced thermal dissipation demands
  - High blocking voltages (100's to 1000's of volts)
  - Fast on-off switching speeds
  - Reduced size & weight of power module
- Above requirements driving need for a wide range of new power device implant capabilities, including
  - Higher than historic max energy capability
  - Need for high dose implants above 60keV
  - Implanting of SiC substrates
  - New implant materials: Use of Aluminum ions for SiC devices
  - Elevated temperature implants for SiC devices (~500 C)

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Purion XE SiC –
New High Energy Extension Targeting Advanced Power Device Applications

- Built off industry leading Purion XE product
- RF Linear Accelerator technology delivers industry's highest productivity and reliability
- Leverages proven Purion M SiC technology
  - Hot implant wafer processing
  - Aluminum source technology

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Purion H200 –
New Extension to the Purion H Family Targeting Power Device Applications

- A unique high current architectural solution for emerging high dose, higher energy applications
- High current architecture enables a large productivity/CoO advantage versus competitive medium current based solutions
- Built off of Axcelis' Purion H60 and Purion H80 products

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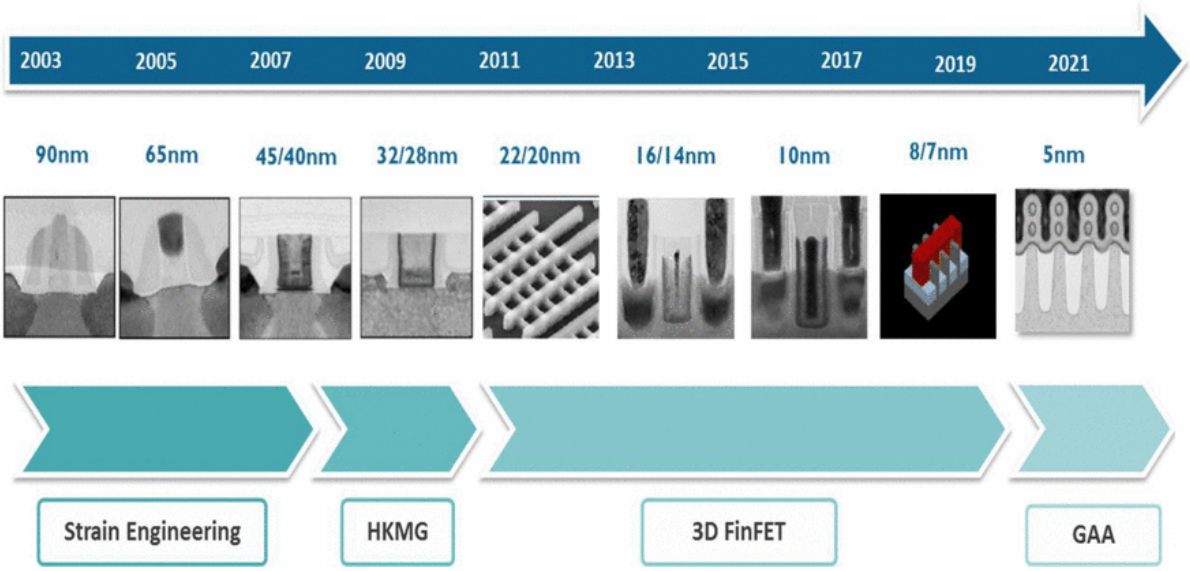
Advanced Memory and Logic/Foundry Markets: Devices Will Continue to Scale Through Creative Means



IC Knowledge, 03/2018

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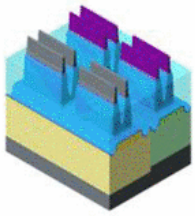
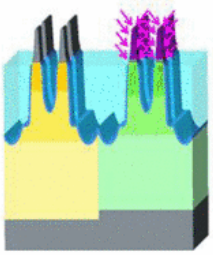
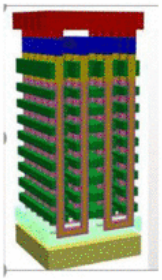
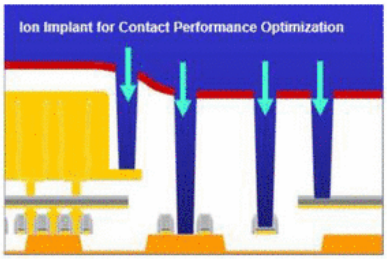
Advanced Memory and Logic/Foundry Devices
Emerging Implant Requirements









- Overall scaling objectives being accomplished through strategies beyond traditional scaling
  - Ever increasing use of 3D architectures
  - Expanding use of new or modified materials
- Implications for ion implant include
  - Increasing use of low energy implants for electrical contact performance optimization
  - Related high aspect ratio and 3D structures require improved angle and dose control
  - Increasing use of material modification implants, often at very low energies
- Cost of ownership(CoO) remains a dominant focus area for customers, driving continued need to improve implanter productivity

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Purion Dragon – Revolutionary New High Current Implanter Architecture

- Purion Dragon orthogonal beam optics advances high current productivity to the next level
- With focus on low energy, high dose applications for advance memory & logic devices
- System's advanced spot beam technology delivers best in class dose and angle control for most challenging high aspect ratio and 3D structure applications
- Product is a result of a Joint Development Program with a leading memory customer and currently in evaluation phase

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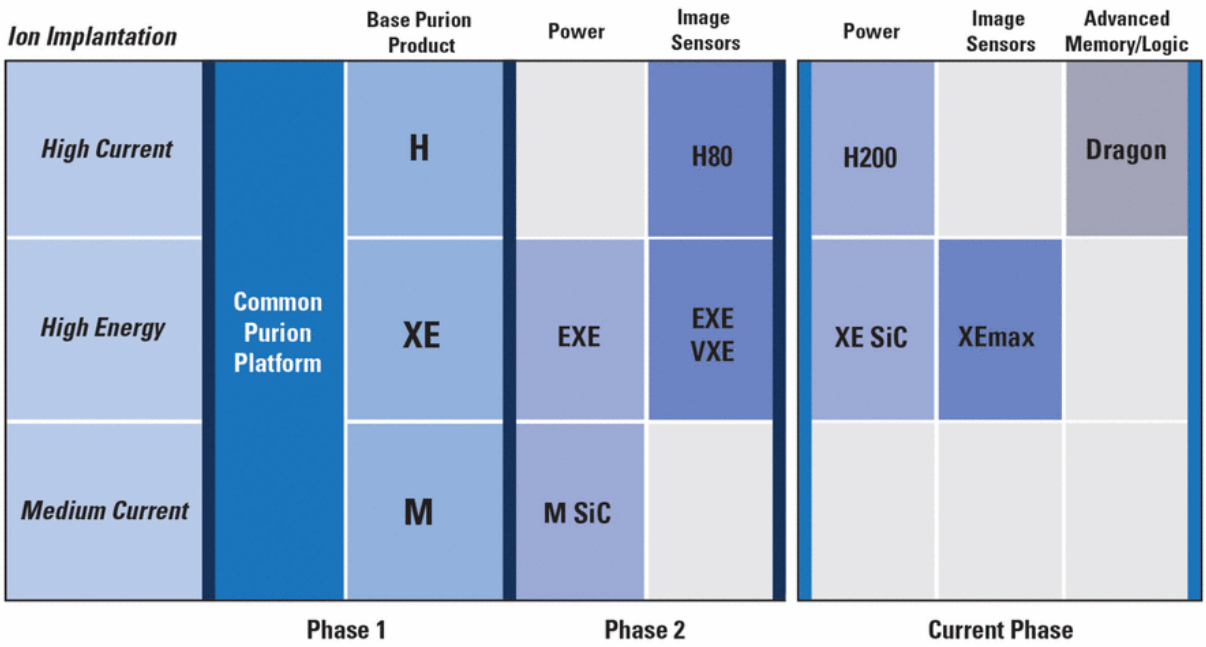
Growing the Purion Product Family in Targeted Market Segments



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The Financial Benefits of the Next Wave of Purion

Kevin Brewer
Chief Financial Officer

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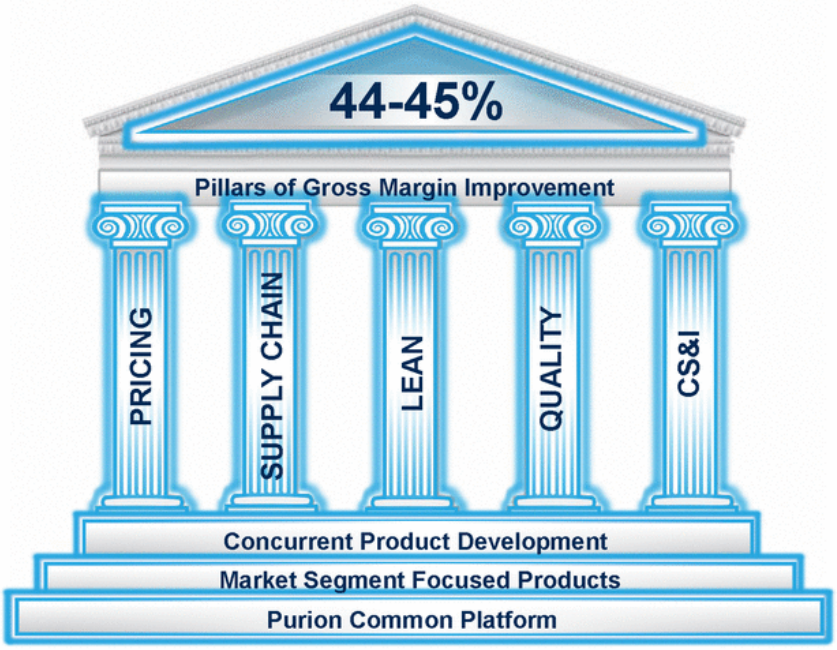
Gross Margin Provides the Fuel for Investment and Profitability



PRICING
- Product extensions
- New products
- High value upgrades

SUPPLY CHAIN
- Make vs Buy decision
- Leverage volume and Purion commonality
- Global sourcing

LEAN
- Cycle improvement
- Labor productivity
- Capacity and resource planning

QUALITY
- Improve customer experience
- Enhance organizational capability and efficiency
- Certified ISO9001, In-process IATF 16949

CS&I
- Accretive to the business
- One stop shopping with unique offerings
- Provides strong customer support

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Target Business Model (GAAP)

Revenue	$301.5M 2015(A)	$267M 2016(A)	$410.6M 2017(A)	$442.6M 2018(A)	$550M Model*	$650M Model*
Gross Margin	33.7%	37.3%	36.6%	40.6%	42-43%	44-45%
Total OPEX	26.8%	31.1%	24.9%	27.0%	~25%	~24%
Operating Profit	6.9%	6.2%	11.7%	13.5%	17-18%	20-21%
Free Cash Flow (Cash From Operations – Capex)	5.5%	(4.1%)	11.9%	9.5%	>15%	>17%**

* The model is not a forecast of results but is intended to be indicative of the annual results Axcelis may achieve based on our strategic objectives
** Assumes our federal net operating loss carryforwards have been consumed and Axcelis is now paying cash taxes

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Axcelis is Uniquely Positioned with the Capability, DNA, and Unwavering Focus to solve customers' high value, high impact, ion implantation challenges.
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