## pixelworks

### **CORPORATE OVERVIEW**

May 2017



### **Cautionary statements and other disclosures**

This presentation includes forward-looking statements regarding Pixelworks' business outlook.

These forward-looking statements involve risks and uncertainties and actual results may vary significantly from those suggested here. Additional information concerning risk factors that could cause actual results to vary from these forward looking statements can be found in our Form 10-K for the fiscal year ended December 31, 2016 and subsequent SEC filings.

To the extent this presentation includes non-GAAP financial measures, the most directly comparable GAAP information and a reconciliation between the non-GAAP and GAAP figures is provided in our Q1 2017 press release which has been furnished to the SEC on Form 8-K.



### At a Glance

### (NASDAQ: PXLW)

#### **Company Overview**

- Fabless semiconductor company
- Headquartered in San Jose
- Founded in 1997
- Fundamental IP video processing
- Pioneer in Projectors (#1 mkt share)
- Strategic expansion into Mobile

#### **Recent Developments**

- Announced acquisition of ViXS
- \$8M Co-Development Agreement
- Shipping 3<sup>rd</sup> generation Iris processor
- End-of-life non-strategic products
- Profitability attained in 4Q16 & 1Q17
- Implemented restructuring in 2Q16



#### **Products & Markets**

- SoCs & software for Digital Projectors
  - 3LCD & DLP
- Video processors for Mobile devices
  - Tablets & Smartphones



### Pixelworks' Global Footprint





### **Video Processing IP**

#### 20 Year History of Image Processing Innovation 155 patents across Display Processing

**Fundamental patents** for image processing in projectors and other displays, enabling:

- Keystone Correction & Image Warping
- Image Scaling
- Frame Rate Conversion

**Broad IP portfolio** across the display processing pipeline, including:

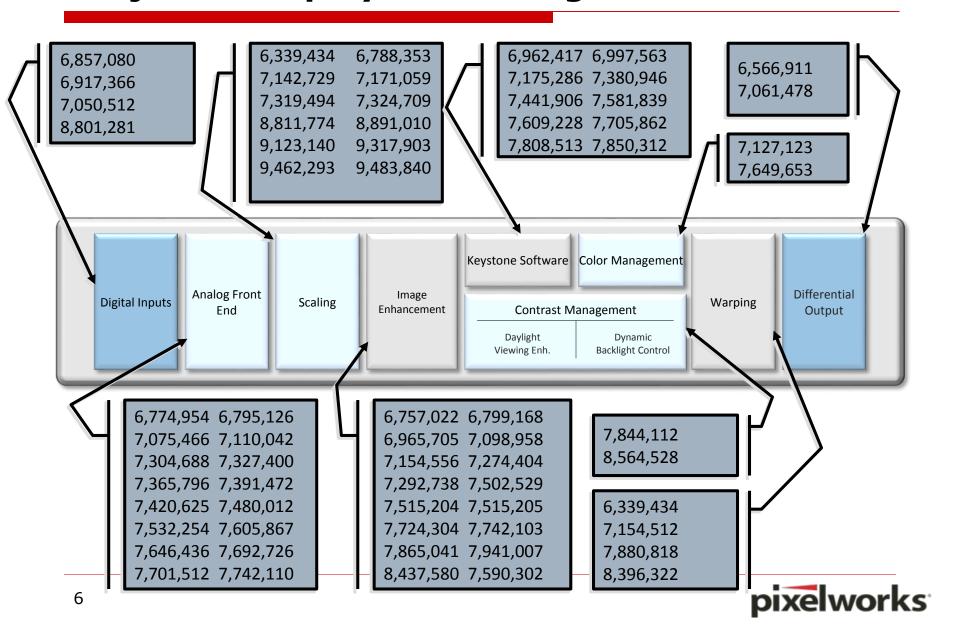
- Motion Estimation / Motion Compensation
- Color Processing
- Image Sharpness
- Image Contrast
- Memory Compression



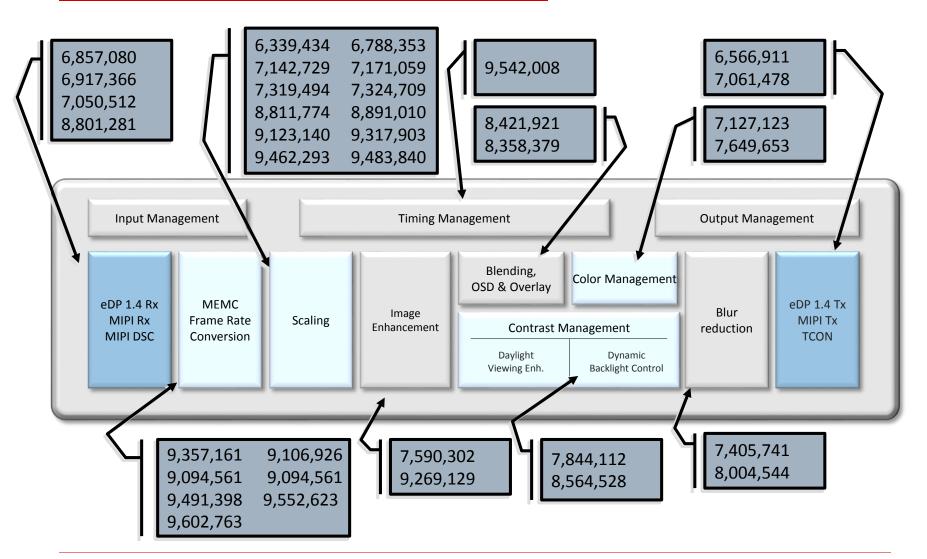




### **Projector Display Processing**



### **Mobile Display Processing**





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### FINANCIAL OVERVIEW

Financial results and financial outlook data provided in the following slides is presented on both a GAAP and non-GAAP basis. Our non-GAAP financial results and non-GAAP financial outlook exclude restructuring charges and stock-based compensation expense, both of which are required under GAAP. We use non-GAAP measures internally to assess our operating performance, and believe non-GAAP measures provide meaningful perspective on our underlying cash flow dynamics. However, we caution users to consider these measures in addition to, not as a substitute for, nor superior to, our consolidated financial results presented in accordance with GAAP.



### Foundation for Growth & Profitability

#### **Solid Foundation**

- Fundamental technology for visual processing solutions
- Stable, profitable projector business
- Strong balance sheet growing stronger

#### **Announced Growth Initiatives**

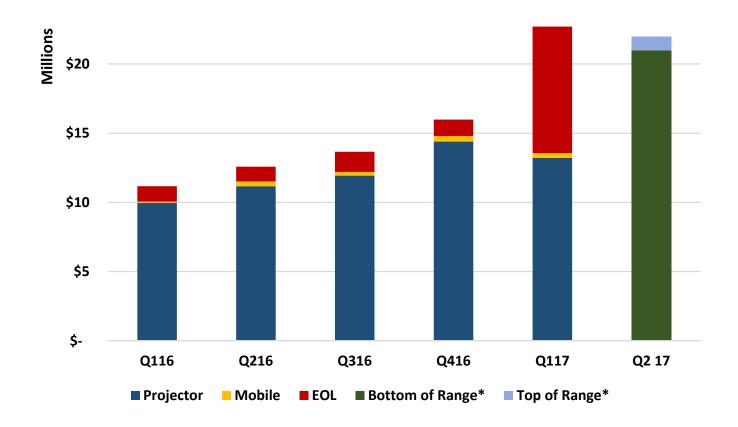
- Co-funded development of future projector product
- Mobile initiative bringing TV quality visual performance to smaller screens
- IP initiatives for the longer term success of PXLW technology

#### **Recent Event**

Definitive agreement to acquire ViXS Systems



### **Revenue Trend**



\*Q2 2017 Guidance provided 4/27/17



### **P&L Trend**

					_
	Q1 '16 A	Q2 '16 A	Q3 '16 A	Q4 '16 A	Q1 '17 A
Revenue	\$11,167	\$12,581	\$13,655	\$15,987	\$22,710
Gross Margin	\$5,359	\$6,488	\$6,633	\$8,561	\$12,445
Gross Margin %	48.0%	51.6%	48.6%	53.6%	54.8%
R&D	5,246	4,112	4,041	4,036	4,477
SG&A	3,973	2,910	2,739	3,276	3,833
Total Opex	9,219	7,023	6,780	7,312	8,310
Income/(Loss) from Operations	(3,860)	(535)	(147)	1,249	4,135
Other Income/(Expense)	(99)	(106)	(100)	(101)	(93)
Tax Provision/(Benefit)	59	113	193	(9)	278
Net Income/(Loss)	(4,018)	(754)	(440)	1,158	3,764
_					
EBITDA	(2,870)	297	670	2,078	4,974
Net Income/(Loss) per share	(\$0.14)	(\$0.03)	(\$0.02)	\$0.04	\$0.12
Weighted shares	27,936	28,167	28,313	30,244	31,145



### **Balance Sheet Trend**

	Q4 '16 A	Q1 '17 A
Assets		
Cash and investments	\$ 19,622	\$ 19,642
Accounts receivable	3,118	9,608
Inventories	2,803	2,478
Property, plant and equipment	3,793	5,528
Prepaid expenses and other assets	 1,521	6,017
Total assets	\$ 30,857	\$ 43,272
Liabilities		
Accounts payable	\$ 1,734	\$ 1,225
Other liabilities	8,054	15,427
Income taxes payable	2,020	2,304
Line of credit	-	-
Shareholders' equity	19,049	24,316
Total liabilities and shareholders' equity	\$ 30,857	\$ 43,272



### Q2 2017 Outlook

#### **Guidance for Q2 2017, as of April 27th, 2017:**

■ **Revenue:** \$20M - \$21M, including ~\$5.0M from EOL products

• **Gross Margin:** 53% - 55%

• **GAAP OpEx:** \$8.5M - \$9.5M **non-GAAP:** \$7.5M - \$8.5M

GAAP EPS: \$0.01 - \$0.08
 non-GAAP: \$0.04 - \$0.11



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### DIGITAL PROJECTION MARKET



### **Digital Projection Market**

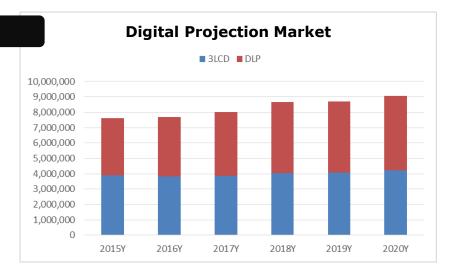
#### **Market Profile**

#### **Primary Market Drivers**

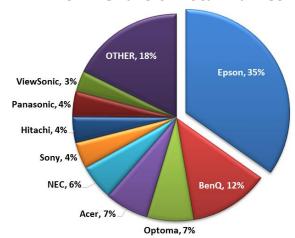
- Education in emerging markets
- Enterprise in developing markets
- Connectivity and interactivity applications

#### **Market Characteristics**

- Mature market
- Limited competition
- Long product life cycles
- Increasing dependence on software enhancements



#### **OEM Share of Total Market**





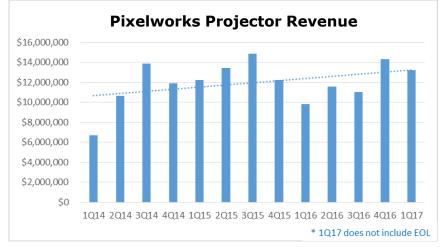
### **Market Performance – Digital Projection**

#### **FY 2016**

- Revenue and units suppressed due to industrywide inventory correction and earthquake disrupted Sony's 3LCD panel supply
- Customer order patterns normalized 4Q16

#### **PXLW Outlook**

- Last time buys to benefit 1H 2017
- Core business growth outside of EOL
- \$8M co-development agreement with large projector customer
- Richer 2017 product margin mix after EOL
- Healthy market channel inventories





### **Projector Business Outlook**

#### **FY 2017**

Healthy projector revenue growth over 2016

- Increasing adoption at our largest customer
- Recovery from Kumamoto earthquake
- Stable Topaz volumes

#### **FY 2018**

Continued growth in core business

Healthy adoption at key customers

### **Market Opportunities**

- New co-development project started
- Pixelshift 4K projection
- Cost reduced mainstream projection
- DLP adjacent markets: MEMC, Keystone



### **Digital Projection Technologies**



Large Venue 10,000 Lumens Best image quality



Business
Best value
Connectivity, I/O



Home Theatre Image enhancement Contrast management



**Education Keystone, Warping, Connectivity** 

#### Pixelworks advantage

Image scaling Image enhancement Screen alignment & warping Color Keystone Software Management Digital Analog **Image** Differential Scaling Warping Inputs Front End Enhancement Contrast Management Output Dynamic Daylight Viewing Enh. **Backlight Control** 

#### IMAGE PROCESSING PIPELINE



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### **IP OVERVIEW**



### **IP Programs – Background**

 Pixelworks is an image/video processing company that supports ASIC and IP products

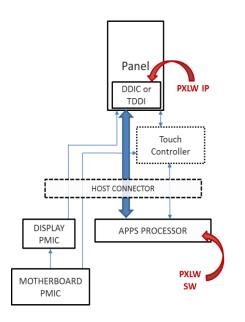
- Rich video and image processing IP portfolio
  - Looking to leverage into ASIC or IP applications to support customer value add propositions
- Target IP markets include:
  - Mobile Handsets
  - Projection
  - Notebook PC
  - Television
  - Automotive Imaging
  - Virtual Reality/Augmented Reality
- Company benefit from several key market macro trends:
  - Large scale introduction of OLED panels
    - Visual artifacts become obvious with fast switching, responsive and high resolution panels
  - Significant increase in mobile content consumption
  - Mobile OTT service proliferation and expansion, esp HDR services
    - Video services on mobile devices creating demand for quality video

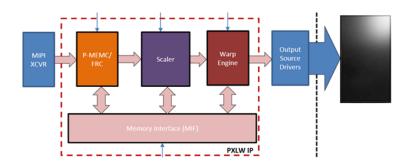




### **IP Programs – Target Customer Breakdown**

- Tier 1 Companies
  - US companies with significant global footprint
  - Both end-consumer and device suppliers
- Mobile Handset Companies
  - DDIC/TDDI suppliers
  - Apps Processor
  - LCM panel manufacturers
  - OEMs
  - Have been largely seeding the market for post-IRIS engagements for size/cost/power reduction
- Projection
  - Projection reference design and OEMs
- Adjacent Markets
  - Camera/ISP suppliers
  - Notebook PC suppliers
  - VR/AR headset and handset suppliers







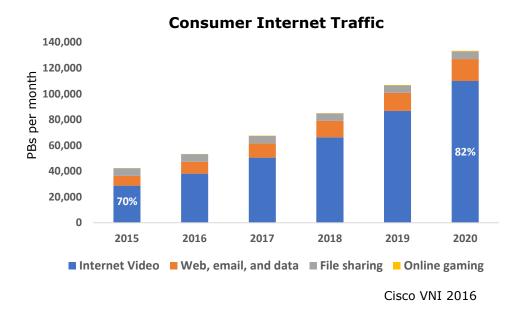
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### MOBILE MARKET



### Video Consumption - Driving Need in Mobile

#### **Massive Growth in Internet Video**



#### **Video is Mobile Now**



of all streaming video views in Q316 were on **mobile devices** 

Global Video Index, Q316

In 2020...

4x growth in Internet video

10x increase in Mobile video

233% increase since Q313
34% watch full TV shows



### **Bringing TV Equivalent Viewing to Mobile**

5" smartphone at 10-inches has the same field of view as Advances in displays, processing, 60" TV at 10-feet bandwidth and content delivery technology 5" Smartphone are enabling Mobile devices to deliver a TV-quality viewing experience Mobile Panel Display Processing 10-inches ·X<sub>2</sub>-Mobile HDR 10-feet Wide Gamut Displays Large Panel Display Processing 2K Resolution 8K Resolution **FHD** Resolution Super Res, HDR Retina Displays 4K Ultra HD Halo free video **LED** Local dimming 120Hz MEMC Variable Frame Rate



### **Near-term Trends in Mobile Displays**

#### **High Dynamic Range (HDR)**

- UHDA announced mobile HDR certification
- First mobile devices supporting HDR released
- Netflix, Amazon Video streaming mobile HDR





Samsung Galaxy S8

LG G6

#### **Auto Adaptability**

"With their new Iris processor, Pixelworks is providing important new technology and tools that will allow device manufacturers to significantly improve their display's on-screen color and contrast image quality for consumers in real world ambient light viewing conditions."

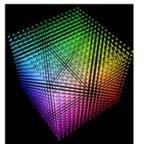
- Raymond Soneira, DisplayMate

#### Device Geolocation Based on the Based on where device display the device is at Blur-free video Sharp, vibrant pictures User **Ambient Light** Based on use Blue-light filter Based on the LUX preferences Auto-adaptive Mobile HDR Content Time of day Based on the Based on natural display content ight intensity

#### **Wide Color Gamut & Color Accuracy**

- DCI-P3 is the Hollywood color gamut standard
- 25% more colors than traditional sRGB
- Growing expectation of better color accuracy







### **Longer-term Trends in Mobile Displays**

#### **Smooth, Blur-Free Motion**

"..If you're watching videos, nothing is more annoying than watching your image break up while trying to keep up with a panning video.. Asus has included a 4K TV processor inside the phone...I'm impressed with just how much smoother panning video becomes..." Zenfone 3 Ultra Hands-on



**ASUS Zenfone 3 Ultra** 

#### **HDR videos need MEMC**

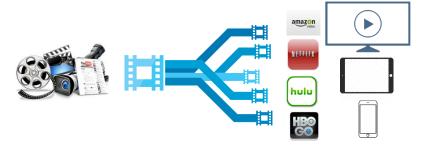
- HDR videos have higher contrast
- Judder perception increases with higher contrast
- Problem acknowledged by industry experts

# Contrast Level

Judder perception  $\infty$  Judder x Contrast

#### **End-to-End Display Processing**

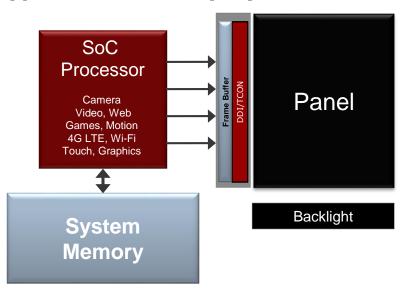
- Mobile video is not controlled end-to-end
- Need for bandwidth optimization
- Need for better picture quality





### **Bottlenecks in Today's Display Architecture**

#### **Typical Mobile Display Architecture**



#### **Existing Mobile Architecture**

- · Limited video processing
- · Discrete memory
- Frame buffer in panel
- · Increased panel costs
- · Complex supply chain

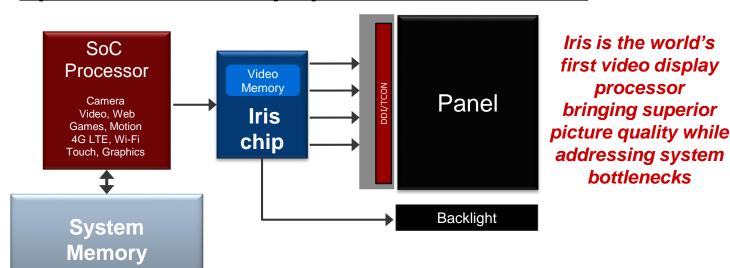
#### **Bottlenecks**

- System memory
- SoC performance



### **Architecture with Iris**

#### **Optimized Mobile Display Architecture with Iris**



#### **Existing Mobile Architecture**

- Limited video processing
- Discrete memory
- Frame buffer in panel
- Increased panel costs
- Complex supply chain

#### **Bottlenecks**

- System memory
- SoC performance

#### **Pixelworks Iris Solution**

- High-end TV HDR processing
- Integrated Video Memory
- Optimized space and power
- Cost-effective panels
- Simplified supply chain

#### **Benefits**

- · Video frame buffer
- SoC off-load



Iris is the world's

processor

bringing superior

bottlenecks

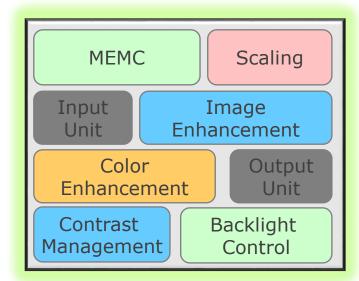
### **3rd Generation Mobile Processor**



Rich, Vibrant, Accurate Colors



Dynamic Range Enhancement





Clear, Blur-free Video



Sharp, Life-like Detail

DNX® = True View™ + True Clarity™ + HDR

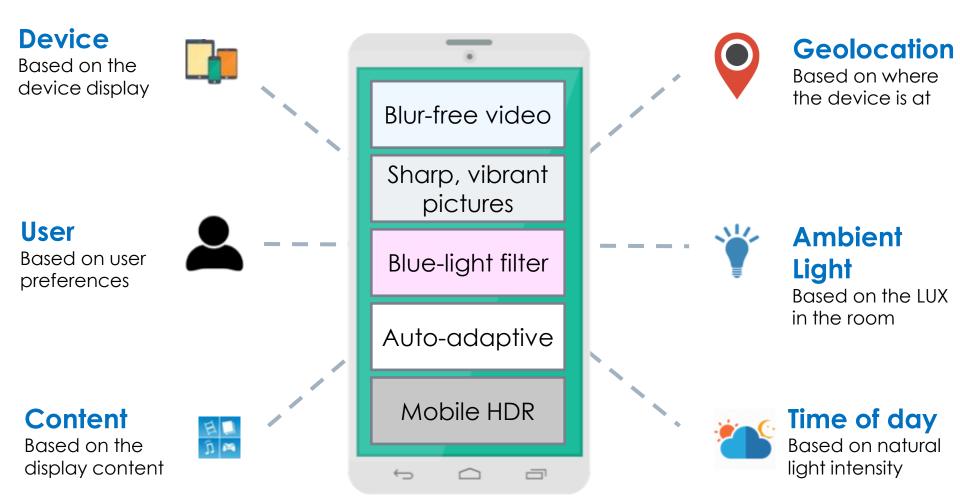
True View: Ambient light and color temperature adaptability

True Clarity: Smooth, blur-free video

HDR: High-Dynamic Range for mobile



### **True View® - Auto Adaptive Displays**





### **True Clarity™ - TV Quality for Mobile Devices**

Clear, Blur Free Video

Sharp Life-Like Detail

Dynamic Range Enhancement

Rich, Vibrant, And Accurate Colors

Clearer Outdoor Viewing Experience





### **Mobile HDR – Certified, Differentiated Quality**







SDR (Without Iris) HDR (With Iris)

#### **Faster, Easier certification**

- Current HDR enabled phones use proprietary solutions to achieve certification
- Iris enables OEMs to achieve certification at even higher quality levels

#### **Segmentation**

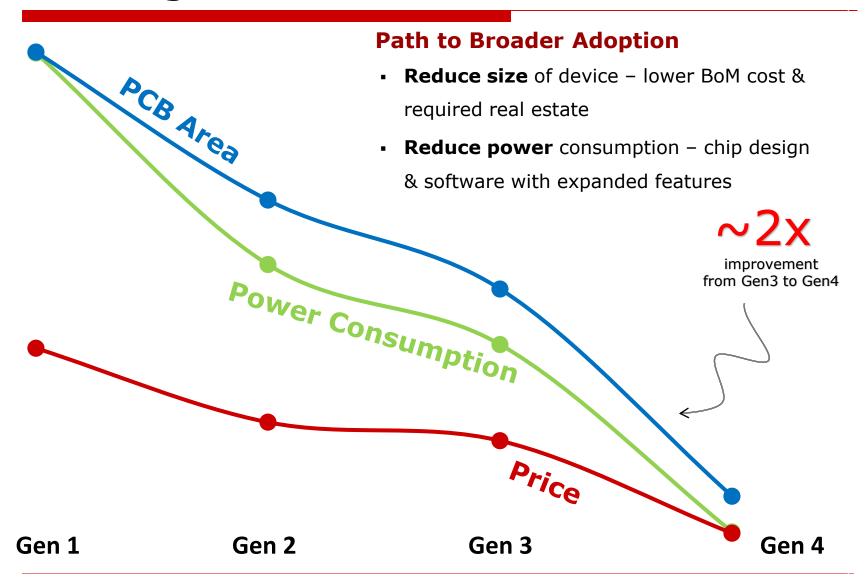
- Iris enables HDR on mid-tier smartphones
- Iris enables HDR on a broader range of LCD and OLED panels

#### **Differentiation**

- Iris has features like MEMC that are considered "essential technologies" for HDR
- True View and ambient light adaptability enhances the viewer's HDR experience



### **Iris Progression**





### **Advanced Development**

- Mobile video development
  - Continuing R&D investment
  - Aligned with premium video feature roadmap from market leaders
  - Lower power, smaller footprint, lower cost, and higher quality
  - Engineering our migration to smaller geometries
  - Developing mobile analog IP for silicon integration
  - Optimizing algorithms and design
- 4th generation mobile processor
  - Our highest video quality yet
  - ~2x improvement in power, footprint, cost
  - Broader support for mobile application processors and displays
  - Taping out shortly for samples in Q4



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### VIXS SYSTEMS



### **ViXS Acquisition – Terms of Transaction**

- All-stock offer of approximately 3.7 million shares of Pixelworks, valued at approximately \$20.2 million
- Based on 60-day trailing average stock price of \$4.65 for PXLW and C\$0.21 (US\$0.15) for ViXS, transaction represents a premium of ~47.7%
- Pixelworks will assume ViXS outstanding debt at closing
  - Comerica line of credit
  - Convertible debentures +70% of holders waived CoC provision prior to the definitive agreement
- At the effective closing date, each share of ViXS to be exchanged for 0.04836 of a share of PXLW common stock
- ViXS's shareholders will hold ~11% of Pixelworks' outstanding shares
- Expected to close in calendar 3Q 2017, subject to closing conditions



### **ViXS Acquisition – About ViXS Systems**

- Pioneer and market leader in designing advanced media processing solutions
  - Roughly 90 employees (85% engineers)
- Sold legacy MoCA business to MaxLinear for \$5 million in April 2017
- Renewed strategic focus on core video business video over IP, over-the-air (OTA) "Cord Cutter" and media streaming applications
  - Recently announced a UHD/BD product with Sharp
- Best-in-class adaptive bit rate video transcoding/compression technology
  - Design wins for UHD/HDR decoder and transcoder products
  - 12-bit High Dynamic Range (HDR) technology
- More than 470 patents granted or pending worldwide



### **ViXS Acquisition – Transaction Rationale**

Combines Visual Display Processing and Comprehensive End-to-End Delivery To Create Industry Leader of High-Quality Video Streaming Solutions

- Both companies have a long heritage in video processing solutions and deep domain expertise in visual display and video solutions
- Together, combined company will have over 170 engineers and over 600 patents granted and pending
- Broadens Pixelworks' product offerings with accretive revenue across new adjacent end markets
- Enables incremental R&D to pursue expanded technology development
- Unique opportunity to accelerate development of enhanced visual display products and comprehensive end-to-end video streaming solutions
- Expected to be accretive to Pixelworks' diluted non-GAAP EPS in FY2018





ViXS Overview May 2017

### ViXS: Leading Pure-Play in Video Processing Technology

#### **Markets**

- Disruptive Trends: 4K UHD, HDR, 10/12-bit, OTA, IP infrastructure
- Consumer (OTA, UHD Blu-Ray); Infrastructure (Transcoding) vs. Set Top Box Focus

### Technology & IP

- Leader in Transcoding, adaptive bit-rate streaming, content protection, video analytics
- Rich IP Portfolio: ~470 patents; Independently assessed by ROL and BlackStone IP

#### **Financial**

Sold low-margin MoCA business for +\$5 million

### Company

- HQ in Toronto; R&D in Hong Kong; Sales in Asia, Europe,
   N. America
- Experienced: 90 full time employees, > 85% of employees are engineers



### Anywhere, Anytime, Any Device

"A new generation of media consumers has risen, demanding content delivered when they want it, how they want it and very much as they want it."

Rupert Murdoch

Current infrastructure built on 20 year old technology that is not optimized to handle today's video traffic





### ViXS Product Families: Enabling the Delivery of Video

#### **Markets:**

### Consumer

UHD BD & Streaming in the Home





**ViXS Chips:** 

XCode<sup>®</sup>

XC51xx XC64xx

XC55xx XC68xx

TAM:

OTA / OTT *\$250M* 

UHD BD *\$110M* 

### **Video Delivery**

Video Processing and Distribution



### **XCode®Pro**

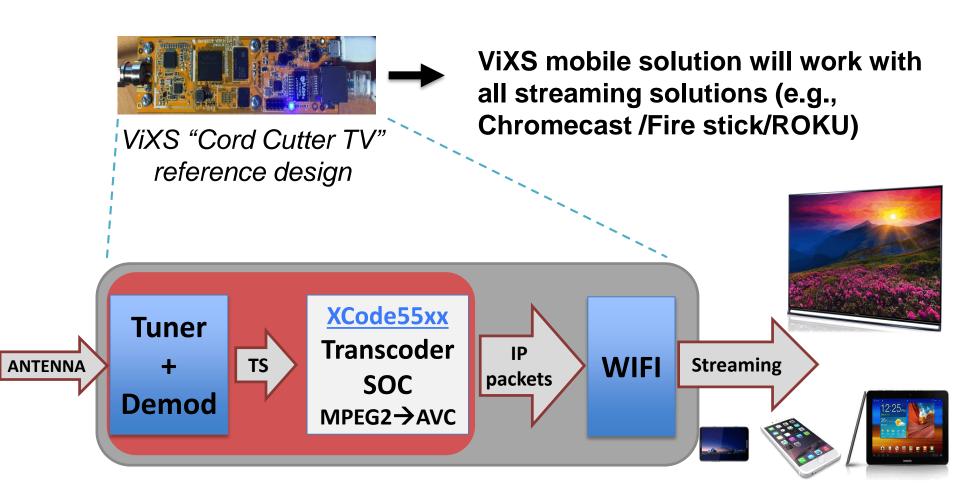
XCP100 XCP300 XCP200 XCP370

Professional Decode/IRDT \$130M

Dense Encode/ Transcode \$345M

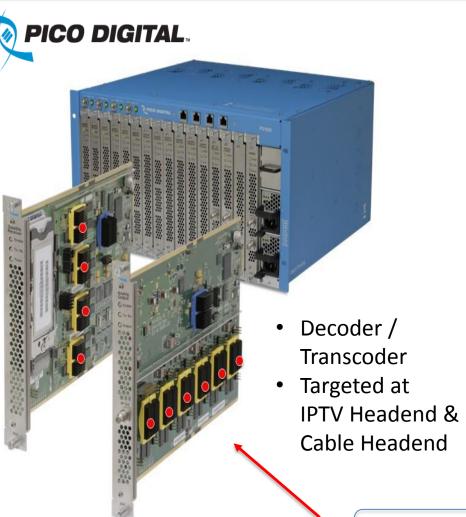


### **Cord Cutter Solution – OTA**





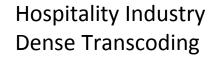
### **Infrastructure Solutions**





**Terrace QAM** 

**Hospitality Gateway** 



• 2RU platform









### **Diversified Customers Base**

























































THANK YOU