

### Semiconductor Chips that Support RI

for Smart Sensors and IoT





About POLYN Technolo	-	Financial Summary								
			In Thousands	2023 F	2024 F	2025 F	2026 F	2027 F	2028 F	
			Revenue	\$1,080	\$4,900	\$39,133	\$67,800	\$155,000	\$270,400	
	A company that designs		COGS	\$0.038	\$1,659	\$17,343	\$23,438	\$57,852	\$98,310	
	application specific silicon		Gross Profit	\$1,042	\$3,240	\$21,790	\$44,361	\$97,147	\$172,089	
	chips that support AI for smart		GP Margin %	97%	66%	56%	65%	63%	64%	
"To create the future of neuromorphic technologies."	sensors and lol.		SG&A Expenses	\$7,124	\$11,611	\$22,922	\$42,624	\$67,221	\$97,690	
			EBIT	(\$6,082)	(\$8,370)	(\$1,132)	\$1,737	\$29,926	\$74,399	

<ul> <li>Current Business and Operations</li> </ul>			- The Ask	
Year of Incorporation	2019 <u>Website</u>		<b>Capital Required</b>	Post Transaction Expectations:
Industry	Application Specific Semiconductors			Three product chips in three major
Headquarters	England, United Kingdom		looking to raise \$12mn	<ul> <li>Three product chips in three major markets.</li> </ul>
Number of Employees	38		in Series A round in preferred stock	<ul> <li>\$10mn in sales contracts.</li> <li>Technology platform completed with</li> </ul>
Product	True Parallel Neural Network Chips			~50 patents.
Business Model	Fabless manufacture and sale of application specific silicon chips			<ul> <li>NASDAQ IPO-ready.</li> </ul>

# **Commercial Overview**



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# **The Problem**

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Exponential growth of sensors overwhelms all existing computer resources: data processing, networks transmission capacity, and energy consumption.

**Electronic Sensors** 0 Digital F **Big Data** Ø

Processing of a raw data tsunami from sensors is the bottleneck, unless new technologies appear.

- In a world of an AI Gold Rush, computers need more and more electronic sensors to be ٠ effective.
- By 2032, there will be ~45 trillion sensors (that is 6,000 sensors per living human) most of which are analog sensors<sup>(1)</sup>.

- The Semiconductor Industry Association (SIA) calls the processing of raw sensor data "The Analog Grand Goal" for the next decade<sup>(1)</sup>

- The Automotive industry calls it a "Holy Grail" <sup>(2)</sup>
- The growth of AI and IoT directly depends on its success

Use of digital operations is a barrier for energy efficiency.

Biological systems are **100,000** times more energy efficient<sup>(3)</sup> than digital computer systems.

Semiconductor Industry Association Decadal Plan: https://www.src.org/about/decadal-plan/

(2) The Wall Street Journal: https://www.wsi.com/articles/where-the-rubber-reads-the-road-tire-makers-aim-for-real-time-data-streams-for-autonomous-vehicles-f025a441

<sup>(3)</sup> Landauer's principle defines theoretical limit of energy consumption of computations: <u>https://en.wikipedia.org/wiki/Landauer%27s principle</u>

# **The POLYN Solution**



**True parallel neural-network chips** that extract and further transmit only **<u>useful</u>** information from a variety of sensors. \*Artificial neural networks are computing systems inspired by the biological neural networks found in animal brains.

"During the gold rush its a good time to be in the pick and shovel business"

— Mark Twain

(That's what **NVIDIA** does)



- ....at a fraction of the speed (microseconds).
- ....at a fraction of the size (millimeters).
- ....and a fraction of the cost.



An Application-Specific Neuromorphic Analog Signal Processor (NASP) chip that mimics bio-sensors.

\*Artificial neural networks

# **POLYN Technology Platform**

The POLYN technology platform enables conversion of any digital neural network into a tailor-made silicon chip and is **protected by over 30 patents**.





POLYN starts generating revenue from first customer development phase to global market expansion and chip sales.



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#### NEXT-GENERATION SMART TIRE CONCEPT FOR GOODEYAR AS LEAD CUSTOMER



Current technology can measure pressure, temperature, and mileage of the tire, and can establish a communication between the driver, the tire, and the various in-car supporting systems.

This concept is successfully implemented in first generation of TPM — Tire Pressure Monitoring sensors. Today set a standard for US, EU and China market.

#### NEXT-Gen TPM Sensor:

Extracts much more information from accelerometer inside the tire. This signal can enrich your data and create new capabilities:



- Detect surface conditions in real time
- Detect tire' structural problems
- Detect loss of the wheel mounting bolt[s]
- Detect low level of tire tread



#### PROOF OF CONCEPT METRICS AND RESULTS - FIRST STAGE PROOF OF CONCEPT

#### • Average accuracy ~ 0.92.

- In physically different classes, like "snow" and "ice" accuracy ~0.99.
- The border between "dry" and "wet" is not always detectable with optical sensors.







VIDEO



#### INFINEON SP40/49 INTEGRATION BENEFIT [Infineon-provided slide]



#### **Technical Feasibility**



#### SENSOR NODE AND VIBROSENSE CHIPLET INTEGRATION CONCEPT WITH INFINEON [Infineon-provided slide]

SiP package





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2025	Infinion	10K unit	GY	1M unit				
2026	Infinion IFM	500K unit	GY	5M unit	QST	100K	Bridgestone	1M unit
2027	Infinion IFM, TBD	1M Unit	GY, Continental, +	15M unit	QST, +	500K	BS, Yokohama, +	5 M unit

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# Vibrosense<sup>™</sup> Pipeline

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		2024	2025	2026	2027	
Traction	Estimated Units Goodyear Bridgestone QST Infineon Total		1M - - 0.01M <b>1.01M</b>	5M 1M 0.1M 0.5M <b>6.6M</b>	15M 5M 0.5M 1M <b>21.5M</b>	_
Focused New Targets	IFM Siemens Schneider Honeywell Rockwell Continental Michelin Yokohama Hankook					
Assumed in 7YP	Total Conversion % (Traction Only)	-	0.4M 40%	2.6M 40%	14.6M 68%	

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#### NEUROVOICE<sup>TM</sup> CHIP

#### **VOICE PROCESSING CHALLENGES**

We all want to hear well when communicating in noisy places and it becomes vital with hearing loss.



"Market experts confirm that neural networks are optimal for AI-enabled voice processing"

#### **COMMON PROBLEMS**:

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Noise cancelation systems do not work properly with irregular noise and do not support bi-directional communication (incoming calls with noise)

Most of the state-of-the-art devices are based on digital signal processing and have high power consumption

Voice processing features like voice activation, keyword spotting, etc. should operate in always-on mode and work poorly in noisy conditions

NeuroVoice<sup>TM</sup> Chip addresses all of the above to ensure intelligent voice processing from one microphone. Power consumption within microwatts is enabling for offline use cases



#### $\mathbf{NEUROVOICE}^{\mathrm{TM}}\,\mathbf{USE}\,\,\mathbf{CRSES}$

#### NeuroVoice enables several new product opportunities

#### Smart Microphone



Existing methods for detecting human voice using microphone and digital MCU are inefficient due to issues with power, size, and latency.

**Solution**: Smart microphone powered with AI to efficiently recognize and transmit only voice.

#### Smart Voice Control



In order to function well, especially in noisy environment, voice control systems currently rely on cloud connection, which users dislike for privacy reasons and it is not nergy-efficient.

**Solution**: Combine of AI voice extraction with keyword recognition. Always-on offline KWS module.

#### Hearing support for TWS/DTC products



Deafness and hearing difficulties are common today. Mild to moderate hearing problems often coincide with challenges in hearing in noisy environments.

**Solution**: TWS earbuds with enhanced voice processing by extracting voices from noisy audio environment.



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			Model, D-I F	NVP ready, and p irst product Chip The first reven	rese 9 VAC Je co	nted to leading ) is going FAB 20 ontract is signe	customers 223 ed			FIRST	
	US (and others)					Asia PROL					
	VE for OTC		Voice C	Voice Control		VE for OTC			Voice C	ontrol	
Trac Logi Dem NXP Next reac New for Time Mar	VETOROTC Traction: Starkey, TDK US, Logitech, Huawei EU, HearX, Eargo, Demant, Sonova, Sonion, WSR, 6N, NXP Next step: waiting for first chip ready New Targets: Find first partner for ref design Time opportunity: 2025 Markets: DTC, HR		Traction: TDK, DoD [Stacato], Next step: wai chip-ready New Targets: 1. Goermicro Infineon. 2. New biz do generatio the market Time opportun Markets: Voice Assets, Home, Wearables	Israel, and US Eltex ting for a, Knowles, ev and lead n according to ets. ity: ASAP control for Factory,	VE for OTC Traction: TDK Jap, 1more [Taiwan], Edifier, Ausounds Xaomi [China] Next step: ICIA[China] active promotion. China TWS vendors market New Targets: 1. Huawei, Audio-Technica, Aviot 2. Add Okaya.co for bd Time opportunity: 2025 Markets: DTC, HA		Traction: Simbury the Contract signed. Xaomi Next step: waiting for chip-rea New Targets: 1. Find sensor maker [like In 2. Mostly interesting Japan Target opportunity: RSAP Markets: Voice Control for Ass Home, Factory, Wearables		ry the Contract is ng for chip-ready maker (like Infineon). eresting Japan hity: ASAP Control for Assets, Wearables		
2025			ELTEX	10K unit		1more, Edifier	100K unit		Xaomi	10K unit	
2026	STARKEY	500K unit	Infineon, ELTEX, Stacato	500K unit		птоге, Edifier Huawei	1M unit		Xaomi, Huawei 1More	1 M unit	
2027			Infineon, ELTEX, Stacato, +	2M unit		ımore, Edifier Huawei, +	3M unit		Xaomi, Huawei 1More. +	5M unit	

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# NeuroVoice<sup>™</sup> Pipeline



		2024	2025	2026	2027	
	Estimated					
Traction	Starkeys Xaomi Huawei	-	- 0.01M ?	0.5M 1M ?	? 5M ?	
	Simbury Eltex Stacato	-	? 0.05M 0.05M	? 0.1M 0.4M	? 0.5M 1.0M	
	TDK Edifier Total	 TBC	? 0.1M TBC	? 1M TBC	? 3M TBC	
Focused New Targets	Goermicro Knowles Infineon Huawei Aviot					
Assumed in 7YP	Audio-Technica Total Conversion % (Traction Only)	4.5M -	20.3M TBC%	35.8M TBC%	60.7M TBC%	

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Public support : BPI

DEVICES

# **Immediate Multi-Billion Unit Markets**



The POLYN Technology platform delivers enabling solutions for various applications.

**VibroSense**<sup>™</sup>



- VibroSense is a standalone chip that • extracts relevant information from vibration sensors.
- It significantly reduces data and power needs for condition monitoring and predictive maintenance.
- This **enables** widespread use of wireless transmission, wireless power, and energy-harvesting solutions.

#### **NeuroVoice**<sup>™</sup>



- NeuroVoice is a standalone chip ٠ providing ultra low-power voice detection and voice extraction.
- It can be used in the most challenging ٠ noise environments.
- It cuts out ambient noise and isolates ٠ a single voice.

#### NeuroSense<sup>™</sup>



🕨 YouTube <u>2 min</u> video

#### Always-ON monitoring for wearables

- NeuroSense is a standalone chip providing ultra low-power always-on solution for continuous detection and monitoring of human activity.
- It is revolutionizing wearables • functions and user experiences through its multiple bio-parameters.
- Offers new opportunities for app level monitoring not available today from any of potential offerings.

#### Paid PoC now

**TAM:** ~4bn units by 2027

**Sales contract** 

#### **TAM:** ~2bn units by 2027

#### **TAM:** ~1bn units by 2027

# **The Markets**





TAM : total available market (2021-2022) | SAM: serviceable available market | SOM: serviceable obtainable market

# Competition





Roadmap





# Leadership Team



A team of professionals experienced in implementing and commercializing new technologies.



# **Financial Overview**



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## **Revenue and Margin Analysis**





- Forecasted revenue will begin through the sales of NeuroVoice<sup>™</sup> in 2023 and scale in 2025.
- Forecasted sales of NeuroSense<sup>™</sup> and VibroSense<sup>™</sup> will develop steadily over time and are forecast to become a major contributing factor to revenue by 2027.
- Gross margins are high in 2023 and 2024 as most costs for proof-of-concept revenues are collected as R&D and written off as expenses as occurred.
- Gross margins are forecasted to reach long-term stability at 64%.

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Analysis

# **Profitability and Cost Analysis**





# Positive EBITDA forecasted by 2026. EBITDA margins for 2027 and 2028 are 19% and 28%, on EBITDA of \$30mn and \$74mn, respectively. EBITDA margins will increase due to economies of scale reducing the marginal operational expenses.

Analysis

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- The largest portion of labor cost is made up of the product development and research team to drive innovation leading to revenue growth.
- Sales and marketing will contribute towards a larger portion of operational expenses over time to fund international sales.



#### THANK YOU!



## Contact us:







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