SYNTIANT®
Making Edge AI a Reality™
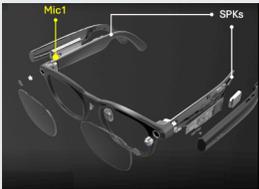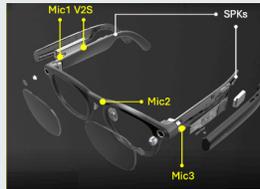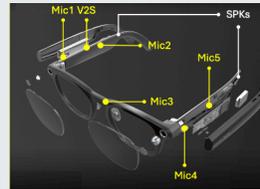
SYNTIANT SOLUTIONS GUIDE
SMART FRAME TECHNOLOGY

Smart Frame Features

Smart glasses are emerging as the next major personal computing platform, integrating audio, AI and advanced sensors into lightweight eyewear that enables hands-free calling, voice assistants, notifications and real-time access to information. Rapid advances in edge AI, low-power processors, microphones and wireless connectivity are accelerating adoption across entry-level, mainstream and premium devices, shifting the category from experimental to mass-market.

For users, the most critical features include clear voice quality in noisy environments, reliable wake-word activation, all-day battery life, comfort and seamless, natural voice interaction. As a result, always-on, on-device intelligence and advanced noise suppression are emerging as key competitive differentiators, shaping both the user experience and product positioning in an increasingly crowded market.

Category	ENTRY-LEVEL Mass Market	MID-LEVEL Mainstream Retail	PREMIUM Flagship
Primary Positioning	AI ENC glasses with wake word	Always-on glasses with context-awareness	Flagship AI audio glasses with spatial AI
Audio Features	• Calling • Wake word • AI-based environmental noise cancellation	• Calling • Wake word • Voice commands • AI-based environmental noise cancellation • Passive speaker validation (V2S) • AI-based Acoustic Echo Cancellation (AEC), aka "Barge in"	• Calling • Wake word • Voice commands • AI-based environmental noise cancellation • Passive speaker validation (V2S) • AI-based Acoustic Echo Cancellation (AEC), aka "Barge in" • Live Translation (directional sound pickup) • Spatial AI / premium AI
Voice Quality and ENC	Good calling with ENC	ENC+ wind noise cancellation	Best-in-class voice isolation, Spatial ENC + speech isolation
Always-On Voice	Limited: wake-only (commands processed on phone or cloud)	Yes: wake word and local commands	Yes: natural language understanding
Hours of use	All-day	All-day	All-day
Microphones	1	2	4 +
V2S (Vibration Sensor)	No	Optional	Yes
NDP	NDP115	NDP120	NDP120 or future NDP
Configuration			

SOFTWARE MODELS

Syntiant's deep-learning models for always-on audio and speech applications deliver world-leading inference speed and minimized memory footprints. Their unparalleled performance on a Syntiant NDP processor enables customers to rapidly deploy edge AI and deliver a natural, hands-free interface. This approach reduces latency and improves the overall user experience, while enhancing privacy through on-device processing and significantly lowering cloud-related operating costs.

Environmental Noise Cancellation (ENC) model
Syntiant's industry-leading edge AI environmental noise cancellation (ENC) technology completely removes background noise from the caller's voice during a phone call.

Always-on listening Wake word and commands
Always-on wake-word detection running on the NDP115 consumes less than $280\mu W$, preserving battery life without compromising performance. Customers can easily port their existing wake words and voice commands to the NDP115 using Syntiant's model conversion tools. If a wake word or command set is not yet available, Syntiant can develop a custom wake word tailored to the customer's product and user experience requirements.

160+
Noise profiles suppressed

Examples include:
Background chatter
Vehicle noise
Wind noise
Air conditioners
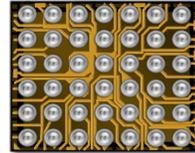Keyboard clicks
Door slams
and many more!

Up to
85dB
Rejection of environmental noise

NEURAL DECISION PROCESSORS

Syntiant's family of Neural Decision Processors™ (NDPs) are specifically designed to run deep learning models, providing 100x the efficiency and 30x the throughput of existing low-power MCUs, such as Arm A53.

NDP115
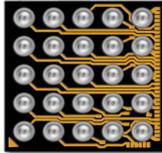
NDP120

Syntiant Core 2™ @ 32 Mhz = Arm A53 @ 1 Ghz using 1% of the energy*

	NDP120	Arm A53	Syntiant Advantage
Inferences per million cycles	1.346	0.0471	~ 30x
µJ per inference	166	16,131	~ 100x

*Identical MobileNet V1 0.25 int8 network on A53 & NDP200 (Syntiant Core 2) tinyMLPerf-style test mechanics: single, identical input vector

	NDP115	NDP120
Target Use Case	Audio & Speech, Sensors	Audio & Speech, Sensors
Neural Layer Types Supported	All (GRU, Convolutional, etc.)	All (GRU, Convolutional, etc.)
Embedded MCU	M0 (48KB)	M0 (48KB)
Neural RAM	0.5 MiB neural RAM [sharable with HiFi & MCU]	1 MiB neural RAM [sharable with HiFi & MCU]
Neural throughput	6.4 GOPS	6.4 GOPS
On-Chip DSP	Xtensa HiFi3, 0.2 MiB RAM, up to 100MHz, secure boot & host communication	Xtensa HiFi3, 0.3 MiB RAM, up to 100MHz, secure boot & host communication
Audio I/O	48kSPS @ 16-bit/channel, 1 stereo PDM/I2S/TDM audio in, I2S/TDM audio out	48kSPS @ 16-bit/channel, 2 stereo PDM/I2S/TDM audio in, I2S/TDM audio out
GPIO	13 GPIO pins	26 GPIO pins
Package	2.1mm x 2.1mm BGA @ 0.4mm 3.2mm x 2.8mm eWLB @ 0.4mm	2.1 x 3.5 mm BGA @ 0.4 mm 5 x 5 mm QFN @ 0.5 mm

MEMS MICROPHONES

With more than 20 billion units shipped and a globally diversified supply chain, Syntiant is the world leader in MEMS microphones. These microphones are ideal for always-on listening in smart frames due to their digital interface, ultra-compact form factor and low power consumption.

Syntiant also offers a broad portfolio of microphone options. Learn more by visiting: **www.syntiant.com/mems**

MICROPHONE	DESCRIPTION	SIZE	SNR*	1% THD | 10% THD*	POWER	
Titan 1.2V SPH88R1LM4H-1 On flex: KAS-700-0185	High SNR Lowest power consumption 1.2V$_{IO}$ and 1.8V$_{IO}$Compatible Low Latency	3.50 × 2.65 × 0.98mm	68.5 dB(A)	125 dBSPL | 129.5 dBSPL	305µW @ 768kHz, 675µW @ 2.4MHz, AVDD = 1.8V, DVDD = 1.2V	
SPV Digital SPV01R9LM4H-1 On flex: KAS-700-0198	Smallest PDM mic 1.2V$_{IO}$ and 1.8V$_{IO}$Compatible	2.75× 1.85 × 0.80mm	64.5dB(A)	130 dBSPL | 132 dBSPL	432µW @ 768kHz, 1170µW @ 2.4MHz, VDD = 1.8V	
Helix SPS11R1LM4H-1 On flex: KAS-700-0184	Lowest power consumption 1.2V$_{IO}$ and 1.8V$_{IO}$ Compatible	3.25 × 2.25 × 0.80mm	64.8 dB(A)	127 dBSPL | 132 dBSPL	305µW @ 768kHz, 665µW @ 2.4MHz, AVDD = 1.8V, DVDD = 1.2V	

SNR and THD specs apply to normal mode. For low power mode specs, refer to the datasheet.

SYNTIANT®
Making Edge AI a Reality™

Elevate the user experience by integrating a Syntiant V2S sensor into a smart frame technology. Vibrations from the user's speech are coupled to the V2S, allowing it to capture voice clearly while rejecting background noise.

BENEFITS:
- Clear speech in windy/noisy environments
- Environmental robustness (no meshes or membranes needed to prevent particle or liquid ingress)
- Rejects outside talkers

Learn more about the Syntiant V2S portfolio by visiting:
www.syntiant.com/v2s

Speaker validation through voice vibrations
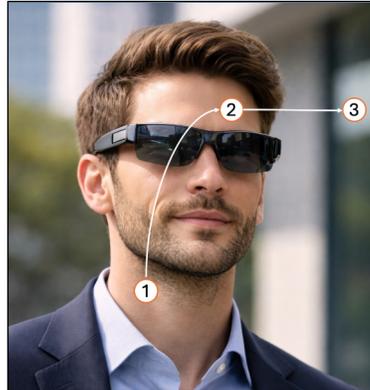
1. Throat/mouth/vocal cords represent vibration sources during speech
   Vibrations travel to the nose and skull
2. V2S vibration sensor placed inside glasses nose bridge or nose pads
   V2S captures body vibrations generated
3. Speaker voice can be selectively captured

SENSOR	DESCRIPTION	SIZE	NOISE DENSITY	BANDWIDTH	POWER	
V2S200DZ On flex: KAS-700-0190	Low profile Vibration Sensor - PDM output - IPx7 waterproof rating	3.30 × 2.30 × 0.70mm	$9\mu G/\sqrt{Hz}$	10kHz	290µA @ 768kHz 700µA @ 2.4MHz	

SYNTIANT'S ENTRY-TIER TURN-KEY AUDIO FRAMES REFERENCE DESIGN (MODEL SYN-T08N)

A production-ready, ultra-low-power embodied AI platform for always-on voice, crystal-clear calls and advanced noise suppression in smart eyewear.

Features
- Bluetooth calling with Syntiant's crystal-clear environmental noise cancellation
- Music playback
- Voice assistant

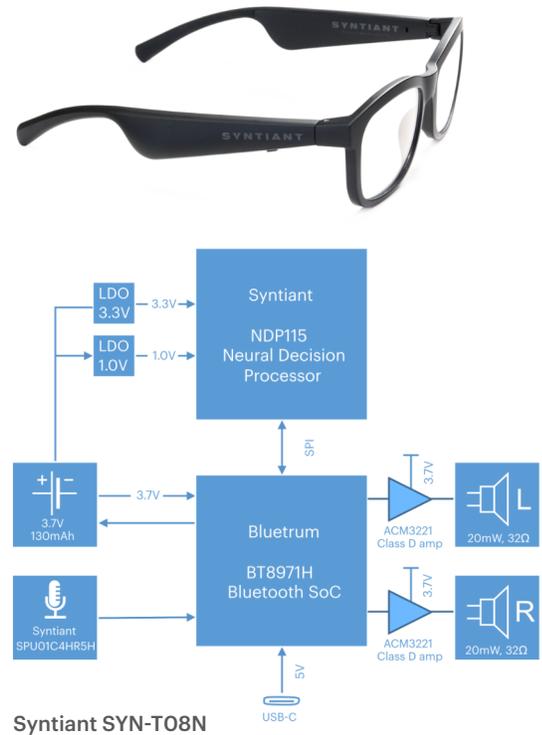|	
Chipset	Bluetrum BT8971H, BT 6.0 /BLE
Neural Processor	Syntiant NDP115
Microphone	Syntiant SPU01C4HR5H-1
Amplifier	2x ACME ACM3221 3W Class D
Loudspeakers	2x 20mW, 32Ω
Battery	Li-Poly 130mAh
Battery Life	8-10hrs (usage), 200days (standby)
Battery Charging	USB Type-C (2hrs charge time)
Weight	34g

ADDITIONAL RESOURCES
NDP115 Datasheet: www.syntiant.com/ndp115
NDP120 Datasheet: www.syntiant.com/ndp120
MEMS Microphones: www.syntiant.com/mems
Vibration Sensors: www.syntiant.com/v2s
Syntiant Smart Frame Technology at CES 2026: youtu.be/LRy686UYoRw

Syntiant SYN-T08N