XVF3615 VOICE PROCESSOR

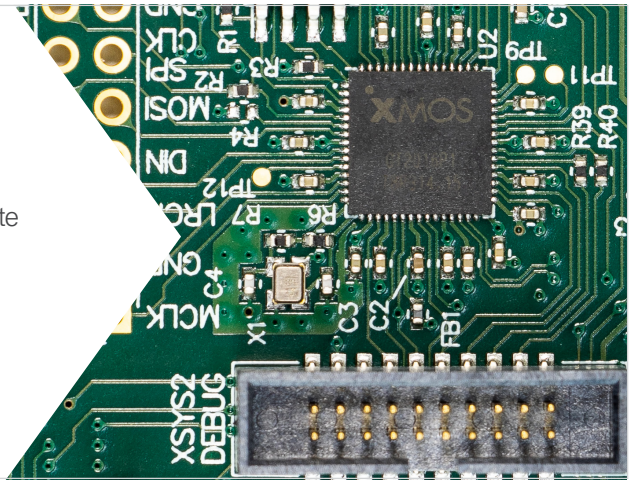
ALEXA KEYWORD & ASSISTANCE WITH HIGH-QUALITY VOICE PERFORMANCE

"HAVING PARTNERS LIKE XMOS BUILDING HARDWARE, MEANS WE HAVE A WAY FOR EVERYBODY TO BUILD A CONSUMER DEVICE THAT YOU CAN TALK TO."
DAVE ISBITSKI, CHIEF ALEXA EVANGELIST, AMAZON

Voice is transforming the way in which we interact with the world around us. Virtual assistants and voice control now proliferate the smart things market - from TVs and set-top boxes, to home appliances and gateway products - our voice is now the master control system for our homes.

With manufacturer demand rising rapidly, there is a pressing need for a high performance voice processor in a cost-effective and easy-to-integrate package. Built on our xcore®.ai chip infrastructure, and requiring just two microphones, our XVF3615 voice processor enables far-field voice capture with close range precision, delivering powerful performance in a cost efficient package.

The XVF3615 also adds embedded Amazon wake word for single pass Alexa enabled systems, allowing manufacturers to offload wake word processing from their host SoC systems.



FEATURE HIGHLIGHTS

The XVF3615 offers two firmware variants: XVF3615-UA supports USB accessory devices and XVF3615-INT is designed to enable built-in solutions. Both contain our purpose-designed algorithms.

AMAZON 'ALEXA' WAKE WORD ENGINE

Embedded 'Alexa' wake word engine detects the keyword in all acoustic environments, allowing designers to create single pass Alexa voice assistant systems.

ACOUSTIC ECHO CANCELLATION (AEC)

Stereo acoustic echo cancellation enables the XVF3615 to detect voice signals even when high-volume audio is playing through the product, enabling barge-in across content. The echo canceller constantly adapts to the room, modeling changes such as people moving, to remove the echoes from the speakers from the microphone input.

INTERFERENCE CANCELLER (IC)

The interference canceller works intelligently to scan the soundscape of the room. It removes static point noise (e.g. from household appliances) and 'ignores' any audio playing from another device. This enables the XVF3615 to capture a clear voice command across a noisy acoustic environment.

NOISE SUPPRESSION

Noise suppression removes stationary and non-stationary diffuse noise sources, for example air-conditioning and road noise, from the received signal. This enables accurate, consistent voice detection.

AUTOMATIC DELAY ESTIMATION CONTROL (ADEC)

Automatic delay estimation control dynamically monitors reference signal latency and adjusts this to maintain optimal AEC performance in situations where the audio output delay is unknown, such as TVs and STBs.

AUTOMATIC GAIN CONTROL (AGC)

Automatic gain control tunes the output channel level for optimum results, whether that's for an automatic speech recognition service (ASR) or communications applications.

SYSTEM CONTROL AND PARAMETERISATION

Parameterisation of XVF3615 algorithm control, system configuration and GPIO in real-time from host interface, or read from flash memory for default start-up behaviour.

APPLICATIONS

XVF3615-UA

TV / SET-TOP BOX ACCESSORY

XVF3615-INT / BUILT-IN

AUDIO VISUAL PRODUCTS

SMART HOME APPLIANCES

HEALTH AND FITNESS

CONFERENCE CALLING

XMOS
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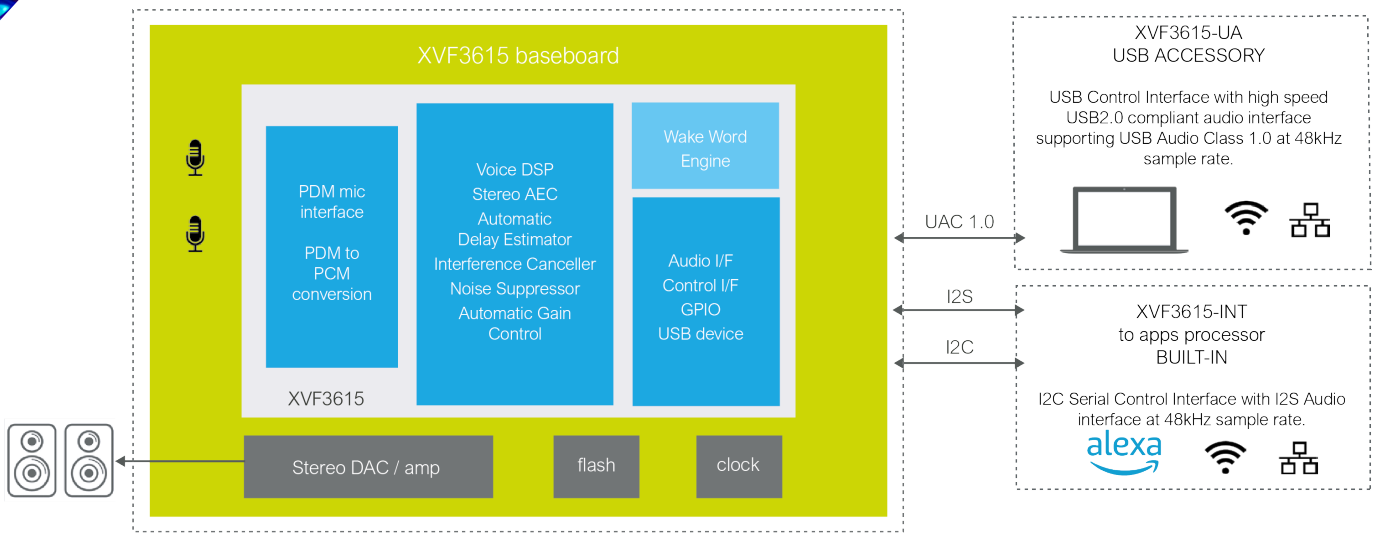
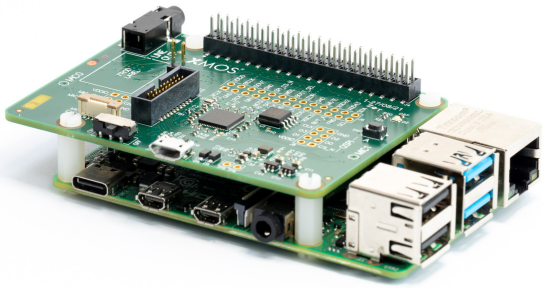
DEV KIT BLOCK DIAGRAM





Shown assembled with Raspberry Pi (not supplied) for full AVS client demonstration.

VOICE PROCESSOR

PACKAGE
60-Pin QFN 7mm x 7mm, 0.4mm pitch
QF60A - 1.8V IO
QF60B - 3.3V IO

VOICE PROCESSING
Full duplex stereo acoustic echo cancellation (225ms tail length)

Automatic delay estimator (+/- 150ms delay adjustment)

Interference canceller

Noise suppression

Automatic gain control

MICROPHONE INTERFACE
2-channel digital PDM microphone interface

Dual microphone array, 71mm spacing

AUDIO INTERFACE
High speed USB2.0 compliant device supports

USB Audio Class 1.0 at 16/48kHZ sample rate

I2S audio interface, 16/48kHz

GPIO
4 x general purpose inputs,

4 x general purpose outputs

CONTROL INTERFACE
USB control interface

I2C control interface

TYPICAL POWER CONSUMPTION
300mW

VOICE PROCESSOR	USB ACCESSORY	BUILT-IN
XVF3615-QF60A-C (1v8)	DEV KIT: XK-VOICE-L71	DEV KIT: XK-VOICE-L71
XVF3615-QF60B-C (3v3)	FIRMWARE: XVF3615-UA	FIRMWARE: XVF3615-INT

xmos.ai/vocalfusion-voice-interfaces/

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