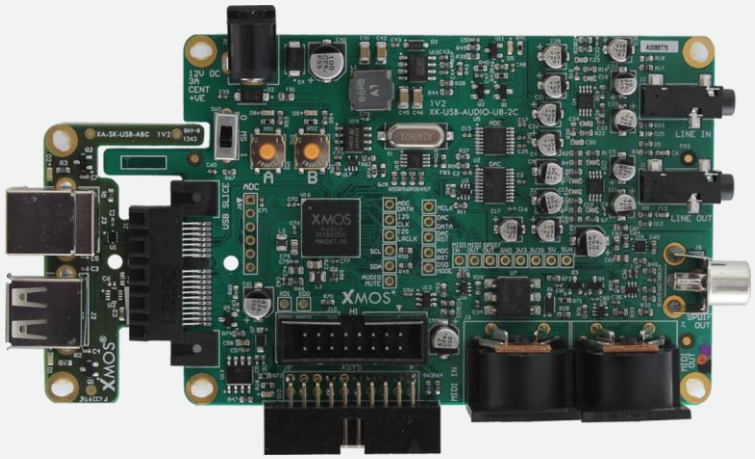
MULTI-FUNCTION AUDIO REFERENCE DESIGN

Stereo USB Audio Class 2 reference design for PC, Mac and Android



FEATURES

- **Complete hardware and software USB audio reference design**
  - Stereo analog input and output
  - S/PDIF output
  - MIDI input and output
- **USB compliant device**
  - High-Speed USB device
    Optional Full-Speed fall-back
  - USB Audio Class 2.0 device
    Optional Audio Class 1.0 fall-back
  - Self- or bus-powered
- **Bit perfect USB audio transfer**
  - Asynchronous Isochronous from host
  - Adaptive Isochronous to host
  - PCM ≤384kHz at 16, 24 or 32bits
  - Native DSD64 and DSD128
  - DoP64 and DoP128
  - Local crystal low-jitter audio clocking
- **Multiple OS support**
  - Windows
  - Mac OS X
  - Android
- **Royalty free software stack**
  - Provided as source code

The Multi-Function Audio (MFA) Reference Design is a complete stereo USB audio device reference design for high-resolution audio applications.

The MFA reference design is based around the XS1-U6 multicore microcontroller; an XMOS xCORE-USB™ device with an integrated High Speed USB 2.0 PHY and 6 logical cores delivering 500MIPS of deterministic and responsive processing power.

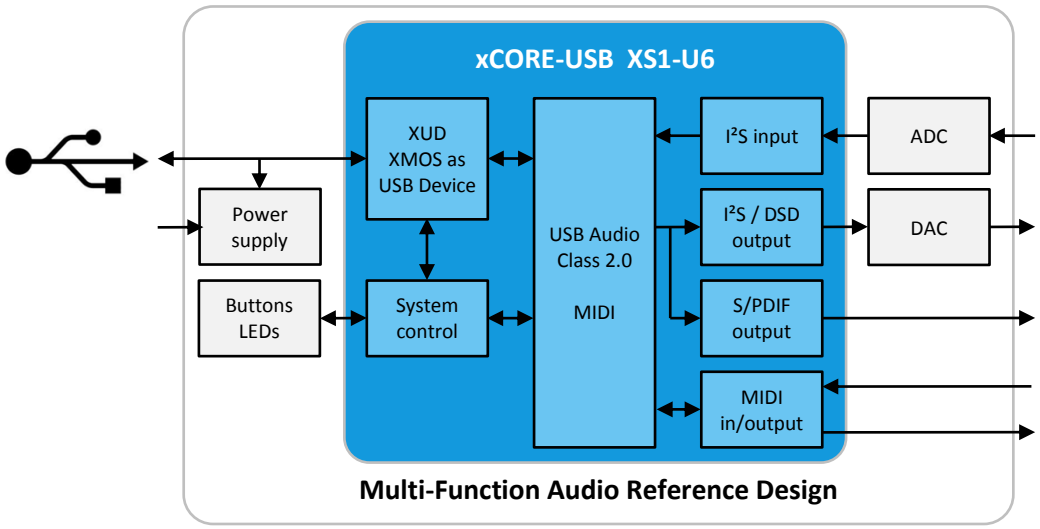
Exploiting the flexible programmability of the xCORE™ architecture, the MFA reference design supports multiple USB audio streaming formats (PCM, DSD & DoP) at the high sampling rates (PCM up to 384kHz, DSD up to x128) and bit depths (PCM up to 32bits) demanded by the audiophile market.

The guaranteed Hardware-Response™ times of xCORE technology always ensure low latency (round trip as low as 3ms), bit perfect audio streaming to and from the USB host.

Delivered as source code, the reference software provides a fully featured production ready solution, including support for: Full- and High-Speed USB operation, USB Audio Class 2.0 & 1.0, MIDI, HID and DFU classes.

The XMOS xTIMEcomposer™ Studio development suite and tools then allow for quick and easy software development and customization to add additional application specific features.

MULTI-FUNCTION AUDIO REFERENCE DESIGN BLOCK DIAGRAM



	Feature	Benefit
	High-speed USB 2.0 device	Plug-and-play operation Bus- or self-powered
	USB Audio Class 2.0 compliant	Driverless operation with Mac OS X[4] and Android[4] Multiple driver vendors for Windows[6]
Hi-Res AUDIO	PCM up to 384kHz[1] 32bits[2] DSD up to x128 DoP (DSD over PCM) up to x128[3]	High resolution stereo audio playback
	Local clocking Asynchronous USB audio transfer	Low jitter, high quality audio capture and playback
	Powered by xCORE-USB multicore microcontroller	Flexible, deterministic and responsive processing power Low audio USB round trip latency (<3ms achievable)
	Flexible hardware & software platform	Predefined feature set reference design Easily customisable to meet specific product requirements
xTIMEcomposer	Source code reference software Integrated development tools suite	Rapid development and code reuse Royalty-free deployment Fast time to market

1, 2, 3: The MFA reference software supports PCM audio up to 384kHz at 16, 24 or 32bits. The MFA hardware (DAC) supports 24bit PCM audio at up to 192kHz. Support for 384kHz PCM, 32bit PCM and DoP128 is therefore disabled in the reference software by default.
4: Mac OS X v10.6 and later provides native USB Audio Class 2.0 support.
5: Android USB host devices with USB Audio Class 2 drivers are supported. Tested against: Samsung Galaxy S3, S4, Note, Sony Xperia Z1, HTC One.
6: USB Audio Class 2.0 support under Windows requires a 3rd party driver.

ORDERING INFORMATION

For a list of XMOS distributors, please visit www.xmos.com/support/distributors.

Part number	Contents
XK-USB-AUDIO-U8-2C-AB	MFA core board: XP-USB-AUDIO-U8-2C USB AB slice: XA-SK-USB-AB xTAG debugger: XA-XTAG2 12V PSU, USB cable