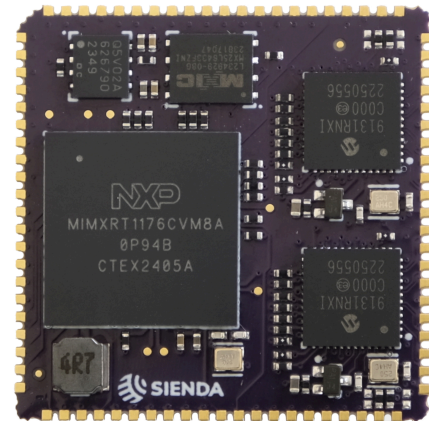


Introduction

VITRA is a tiny but powerful ready-to-go hardware module that enables manufacturers to implement full Milan™ functionality quickly and easily into their products. It implements Sienda's TSN solution, preferred by prestigious names in the pro-audio industry.

This document provides an overview of the key features and basic technical information. A full technical specification will be available in the product datasheet. At the time of writing, VITRA is in development and the contents of this document are subject to change.



Example Applications

| | | |
|---------------------|--------------------------------|--------------------|
| Active speakers | Preamps | Monitoring systems |
| Amplifiers | Intercoms | Effects processors |
| Audio IO interfaces | Option cards | Conference systems |
| Audio recorders | Audio embedders & de-embedders | AV wall plates |
| Mixers | Stage boxes | Switches |

Key Features

Networking

- 2 x 1Gbps Ethernet interfaces
- Dual-port Milan redundancy
- Up to 8 x 8-channel Milan audio streams
- 48kHz, 96kHz and 192kHz stream support
- Integrated Ethernet PHYs

Other Interfaces

- Word clock input and output
- SPI & I2C for external audio codec control
- USB Audio connectivity
- UART control interface
- Configurable GPIO functionality

I2S / TDM Audio

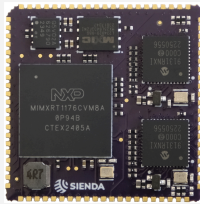
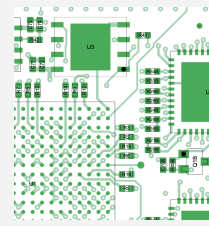
- Up to 32 channels in and 32 channels out
- 48kHz, 96kHz and 192kHz support
- 16, 24, and 32-bit resolution
- 11 audio data pins

Other Highlights

- Integrated clock recovery
- Integrated persistent storage
- Multi-port bridging with external switch IC
- Online configuration tool & firmware generator

Soft-SoM Option

VITRA is available in two formats. All technical specifications besides physical dimensions apply to both.

| System-on-Module (SoM) | Soft-SoM |
|---|---|
|  |  |
| Hardware component | Receive design files and support to integrate the exact same system directly into your product. |
| <ul style="list-style-type: none"> ✓ Minimal time to market ✓ Reduced risk ✓ Confine PCB complexity to SoM | <ul style="list-style-type: none"> ✓ Cost effective for larger volumes ✓ Customisation flexibility ✓ Seamless integration with product |

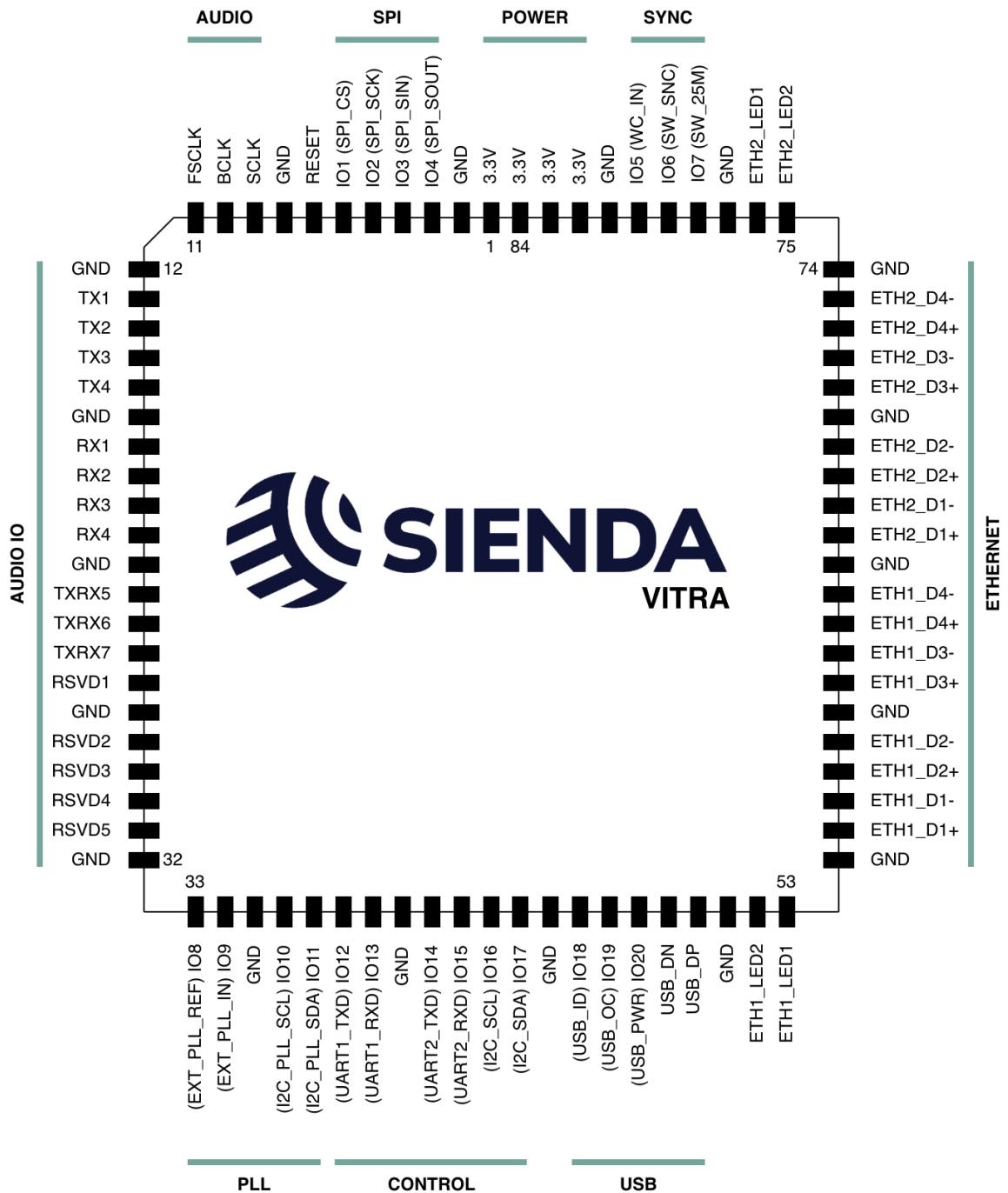
Supported sample rates and channel counts

| Sample Rate | Mode | Max Input Channels | Max Output Channels | Max Total 8-ch Milan Streams |
|-------------|---------------|--------------------|---------------------|------------------------------|
| 48kHz | Non-redundant | 32 | 32 | 8 |
| | Redundant | 32 | 32 | 4 (pairs) |
| 96kHz | Non-redundant | 32 | 32 | 8 |
| | Redundant | 32 | 32 | 4 (pairs) |
| 192kHz | Non-redundant | 28 | 28 | 8 |
| | Redundant | 28 | 28 | 4 (pairs) |

Interface Details

| Interface | Count | Notes |
|--------------------------|-------|--|
| Ethernet | 2 | <ul style="list-style-type: none"> 1Gbps |
| I2S / TDM | 11 | <ul style="list-style-type: none"> Up to 7 Tx audio data pins Up to 7 Rx audio data pins 11 Total audio data pins Shared FSCLK, BCLK, SCLK pins (Additional to 11 data pins) 16 / 20 / 24 / 32-bit Left justified / Right justified 2 Channel I2S 1 / 2 / 4 / 8 / 16 Channel TDM |
| SPI | 1 | <ul style="list-style-type: none"> ADC/DAC/CODEC control 4 x Chip-select pins |
| I2C | 1 | <ul style="list-style-type: none"> ADC/DAC/CODEC control |
| PPS / Word clock input | 1 | |
| PPS output | 1 | |
| Word clock output | 1 | |
| Ethernet LED | 4 | <ul style="list-style-type: none"> 2 per-port Configurable functionality |
| GPIO | 20 | <ul style="list-style-type: none"> Configurable I/O functionality Example 1: Endpoint clock sync status LED Example 2: Identify device button Example 3: Audio output mute button Shared with other interface pins |
| Media clock output | 1 | <ul style="list-style-type: none"> System media clock (System PLL output) |
| USB Device | 1 | <ul style="list-style-type: none"> USB Audio UAC2 |
| Optional External PLL | 1 | <ul style="list-style-type: none"> Optional interface for supporting an external clock recovery PLL Dedicated I2C SDA & SCL Reference clock output PLL input |
| Optional External Switch | 2 | <ul style="list-style-type: none"> Interface for external Marvell switch ICs Adds multi-port bridging capability MDIO bus 25MHz clock See relevant technical note for full switch implementation details |

Pin-out



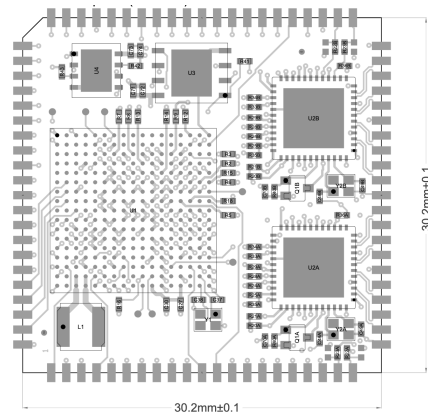
Electrical

| | |
|----------------|---------|
| Supply Voltage | 3.3v |
| Supply Current | < 800mA |
| IO Voltage | 3.3v |

Mechanical

Dimensions

| | |
|-----------------|---------|
| Height | 30.2mm |
| Width | 30.2mm |
| Depth | 5mm |
| Physical Format | PLCC-84 |



Mounting

PLCC-84

The VITRA is designed to fit a PLCC-84 socket. To ensure best fit, please use a Sienda-recommended PLCC socket [TBC].

Direct soldering

Alternatively, VITRA can be soldered directly to a PCB. This requires a cut-out in the carrier PCB to allow room for components on the underside or the SoM. Please see the datasheet for PCB mounting specifics [TBC].

Environmental

| | |
|-----------------------------|----------------|
| Operating Temperature Range | -40°C to +85°C |
|-----------------------------|----------------|

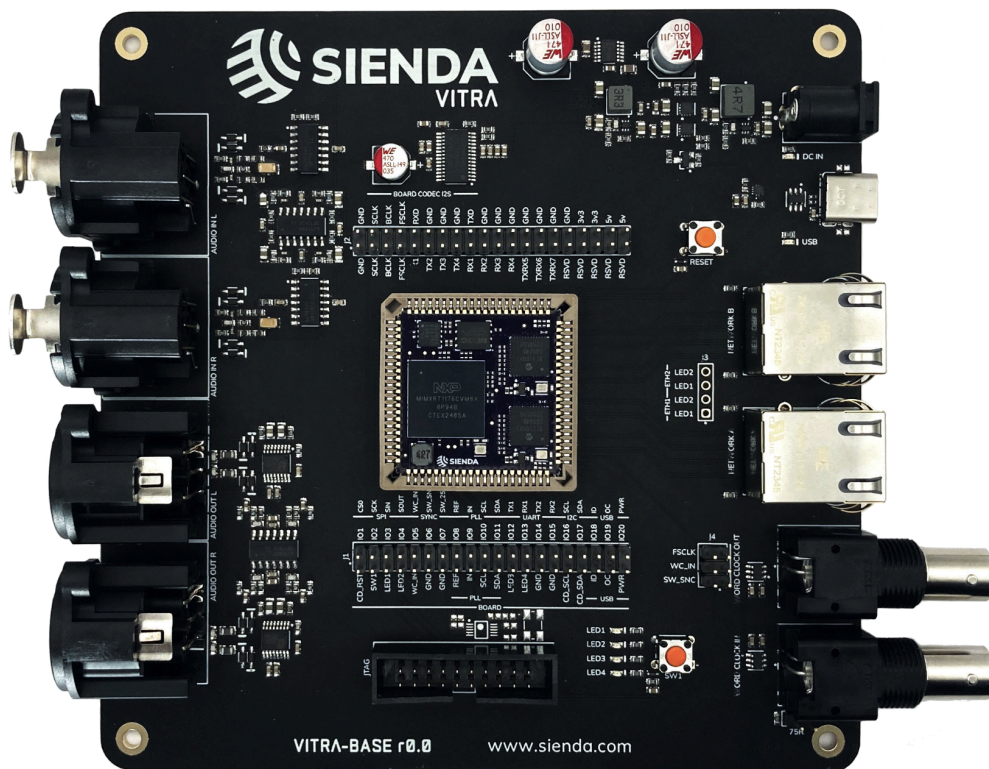
The temperature range is based on the temperature range of the VITRA components

Evaluation Platforms

VITRA-BASE

The VITRA-BASE is an evaluation platform and development tool to kickstart your Milan product design.

- 2 x Gigabit Ethernet interfaces
- 2 x Line-level analogue audio inputs on XLR connectors
- 2 x Line-level analogue audio output on XLR connectors
- CS4272 Audio codec
- Word-clock output and input on BNC connectors
- Pin-headers for all i2s/TDM pins
- Pin-headers for user i2c and SPI interfaces
- Pin-headers for all GPIO and other Module signals
- 4 x general-purpose LEDs which can be jumpered to GPIOs
- A general-purpose button which can be jumpered to GPIOs
- Dimensions: 140mm x 140mm



See the Sienda website for more information about the VITRA-BASE.

VITRA-SWITCH

The VITRA-SWITCH is a compact dual 8-port (16-ports total) AVB switch which is powered by the VITRA Soft-SoM.

It features:

- Single 16-port AVB switch configuration
- Dual 8-port switch for primary and secondary networks
- Embedded Milan endpoint
- Work clock input & output
- Expansion ports for all VITRA features
- Dimensions: 100mm x 120mm



See the Sienda website for more information about the VITRA-SWITCH.

Development Kit

The VITRA development kit consists of:

- 2 x VITRA-BASE evaluation boards with pre-installed Modules, flashed with VITRA-BASE firmware
- 2 x Additional Milan Modules

Contact

For more information please contact Sienda.



| | |
|-----------------------|--|
| Website | https://www.sienda.com |
| Email | enquiries@sienda.com |
| Office Address | Sienda Multimedia Ltd Church Path Workshop Stonepark, Ashburton, Newton Abbot, Devon, UK TQ137RH |