



**VS1053B MP3/WAV/OGG/MIDI
Player & Recorder (CODEC) Chip**
PRODUCT ID: 1681

Description

The VS1053 is a multi-format audio codec chip, loved by many for its simplicity and power. CODEC stands for "Coder & Decoder" and that's pretty much what this little chip does - it can *decode* digital audio files such as MP3, FLAC, AAC, OGG and WAV as well as *encode* audio into digital formats (right now only WAV and OGG are supported for encoding). For many small microcontrollers, the mathematical calculations for decoding MP3 files is too much effort. That's where you'd use this chip.

All you need to do is stream it the raw audio file as you have on an SD or other storage and it will magically play the stereo audio. There's some support circuitry needed, so if this is your first project, do check out our VS1053 breakout which comes with a microSD socket, level shifting circuitry, and output audio protection. On the other hand, if you have something custom in mind, and you want to add MP3 playing to your project or product, the raw chip as sold here is what you want

We have example code that works on an Arduino (but is easily ported) as well as a reference schematic for our breakout on the VS1053B breakout tutorial page. But the best place to go for detailed information is the VLSI webpage which has app notes, datasheets, example code and more

There's some cool extras with this chip in addition to plain audio playing & recording: there's a built in MIDI synth with 50 instruments you can play by piping in direct MIDI (we have example code for this in our Arduino library), 8 GPIO pins (we have example code for this in our Arduino library), Bass & Treble adjust, and I2S digital output.

Each order comes with a single chip.

Technical Details

TQFP-48 0.5mm pitch
Dimensions: 9mm x 9mm total (7mm x 7mm body)

Decodes multiple formats:

Ogg Vorbis
MP3 = MPEG 1 & 2 audio layer III (CBR+VBR+ABR)
MP1 & MP2 = MPEG 1 & 2 audio layers I & II optional
MPEG4 / 2 AAC-LC(+PNS), HE-AAC v2 (Level 3) (SBR + PS)
WMA4.0/4.1/7/8/9 all profiles (5-384 kbps)
FLAC lossless audio with software plugin (upto 24 bits, 48 kHz)
WAV (PCM + IMA ADPCM)
General MIDI 1 / SP-MIDI format 0
Encodes three different formats from mic/line in mono or stereo

Ogg Vorbis with software plugin
IMA ADPCM
16-bit PCM

Streaming support
EarSpeaker Spatial Processing
Bass and treble controls
Operates with a single 12-13 MHz or 24-26 MHz clock
Internal PLL clock multiplier
Low-power operation
High-quality on-chip stereo DAC with no phase error between channels
Zero-cross detection for smooth volume change
Stereo earphone driver capable of driving a 30- ohm load
Quiet power-on and power-off
I2S interface for external DAC
Separate voltages for analog, digital, I/O

16.5 KiB on-chip RAM for user code and data
Serial control and data interfaces
Can be used as a slave co-processor
SPI flash boot for special applications
UART for debugging purposes
New functions may be added with software and up to 8 GPIO pins

