

> Kaiwa VOX

Have your MCU speak Japanese Romaji, the robotic way.

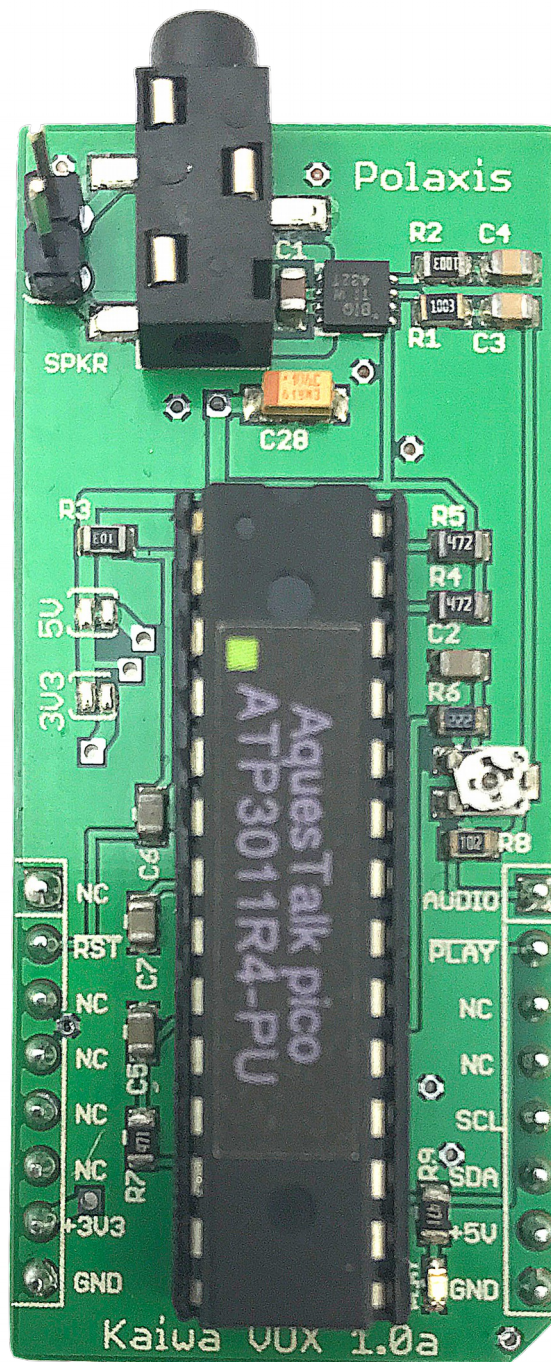


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1 Short description

Kaiwa Vox is text-to-speech add-on board with a Japanese robotic voice. It just needs to receive an ASCII string of Romaji Japanese to start speaking.

The speech engine recognizes text and various speech modifiers to improve prosody. The chip can also vary the speed, the pitch and the accent to the speech.

The hardware is compatible with the mikroBUS™ standard, allowing rapid prototyping and easy integration into existing projects.

The on-board class-d amplifier can drive a small 8 ohms speaker. A led turns on when the chip is done talking and ready to proceed.

2 Technical Specifications

- I2C operation
- 8 Khz PWM, low pass filtered un-amplified audio output
- On board 1.4W into 8 ohms class-D amplifier
- 3.5 mm mono jack or 2.54 mm header speaker connections
- Trim pot to adjust volume
- Powered with 3.3V or 5V by cutting a trace or soldering another (5V is set by default)
- Green LED on when ready
- Hardware reset signal possible to reset the speech chip

3 Connecting

3.1 Speaker output

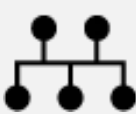
The speaker can be connected either via the 3.5 mm jack or the 2 pins header.



When using the 3.5 jack, the speaker should be connected before applying power, to avoid shortcircuiting the amplifier output when inserting it. The amplifier has an internal protection and will shut-down until next power-up.

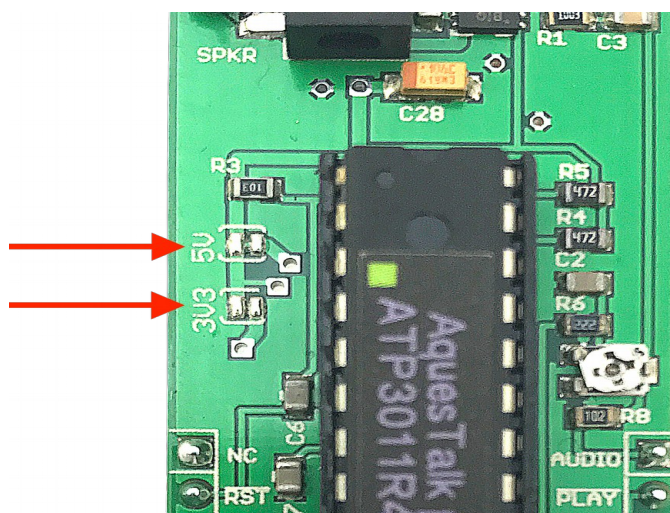
This is not a line level output but a 250 Khz PWM signal, designed to directly drive a small 8 ohms speaker.

3.2 Microcontroller connections

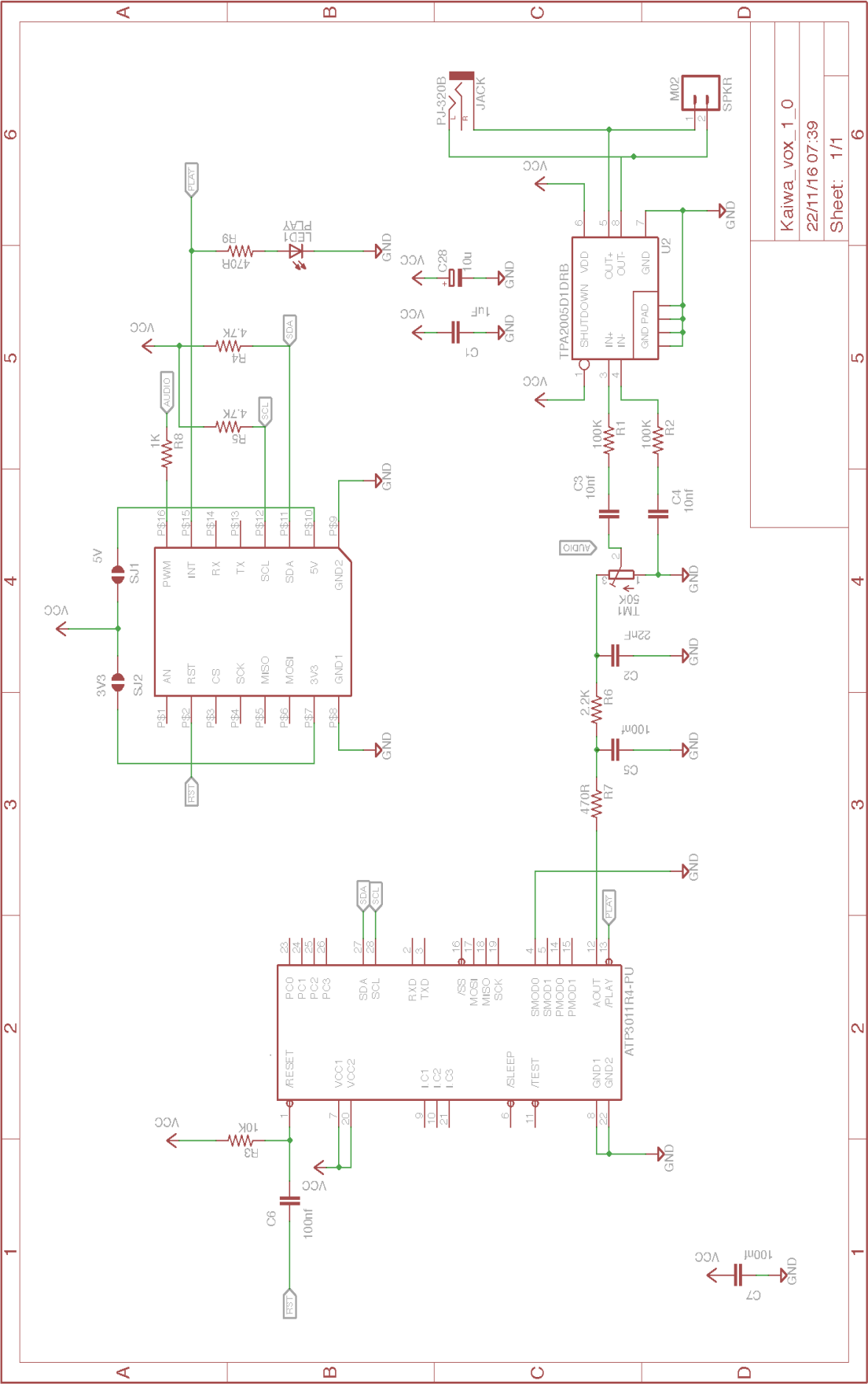
Notes	Pin	 mikroBUSTm				Pin	Notes
	NC	1	AN	PWM	16	OUT	8 Khz PWM, low pass filtered (un-amplified)
Reset signal	RST	2	RST	INT	15	!PLAY	High when ready to speak
	NC	3	CS	TX	14	NC	
	NC	4	SCK	RX	13	NC	
	NC	5	MISO	SCL	12	SCL	SCL signal
	NC	6	MOSI	SDA	11	SDA	SDA signal
+3.3V power input	+3.3V	7	+3.3V	+5V	10	+5V	+5V power input
Ground	GND	8	GND	GND	9	GND	Ground

3.3 Power

The board can be powered either with 3.3V or 5V by soldering or cutting the appropriate jumper. The 5V jumper is connected by default.



4 Schematic



5 Syntax

5.1 Text

The text has to be in lower case.

5.2 Punctuation

.	0x2E	Pause. Indicate the end of sentence
?	(0x3F)	End of sentence pause + pitch raise for question
space	(0x20)	Blank pause
,	(0x2C)	Shorter pause
;	(0x3B)	Longer pause
/	(0x2F)	Normal accent
+	(0x2B)	
- Hyphen		
_ Underscore		Devoicing
'	0x27	Accent

6 Library Commands

"#V" version

"#J" first chime

"#K" second chime

"\$" Suspend the output

Speed 50-300 (default 100)

atp.SetSpeed

Accent: 0-255 (default 64)

atp.SetAccent

(more on Japanese accent here : https://en.wikipedia.org/wiki/Japanese_pitch_accent)

Pitch: 0-255 (default 64)

atp.SetPitch

7 Libraries

http://www.a-quest.com/download/package/Arduino_AquesTalk_Library.zip

8 Ressources

<http://nihongo.j-talk.com/>

http://www.a-quest.com/download/manual/atp3011_datasheet.pdf

<http://cdn.sparkfun.com/datasheets/BreakoutBoards/tpa2005d1.pdf>

Revisions

- January 2017 rev0 : initial release