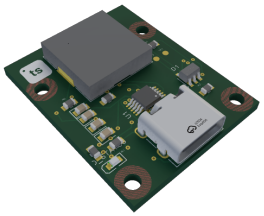
USB-C Variable-Frequency Buzzer

1.1 Description

A USB-powered passive piezo sounder for playing notes and audible alerts.



Assembly view

1.2 Device specifications

Parameter	Specification
Sounder	Passive piezo
Tone range	20–4,000 Hz programmable
Tone duration	1 ms to 10 s
Host interface	USB serial, 115200 baud
PCB dimensions	24 × 30 mm
Mounting holes	4 × Ø2.2 mm for M2 screws; 20 × 20 mm center spacing

1.3 Using the board

Choose **Add device** → **Buzzer**, enter **Frequency (Hz)** and a duration, then choose **Beep**. Try 440 Hz followed by 880 Hz to hear an octave. The default is 4000 Hz, where the sounder is rated. Lower pitches can be quieter. Leave an opening over the sound outlet in your enclosure.

Device guide

2 Protocol reference

USB serial · 115200 baud · DTR on. Send one ASCII command per line, ending in LF (`\n`).

Command	Purpose	Reply
`id`	Identify the device and firmware.	`DEVICE tscircuit buzzer 2.0.0`
`help`	List supported commands.	One line of command syntax.
`?`	Alias for `help`.	Same command list.
`status`	Read the playback state.	`STATUS idle` or `STATUS buzzing`
`beep`	Play the default 250 ms beep.	`OK`
`beep 500`	Play for the given duration in milliseconds (0–10000).	`OK`
`tone 440 750`	Play a 440 Hz tone for 750 ms. Accepts 20–4000 Hz and 1–10000 ms.	`OK`
`stop`	Silence the buzzer immediately.	`OK`
`led on`	Turn the indicator on.	`OK`
`led off`	Turn the indicator off.	`OK`

A new beep or tone replaces the current timer.

Legacy binary commands

Send `A5 5A`, opcode, sequence number, payload length, payload, then CRC-8. The CRC covers the opcode through the last payload byte (polynomial `0x07`, initial value zero). The maximum payload is 48 bytes. The reply is `AC`, the same sequence number, and a status byte.

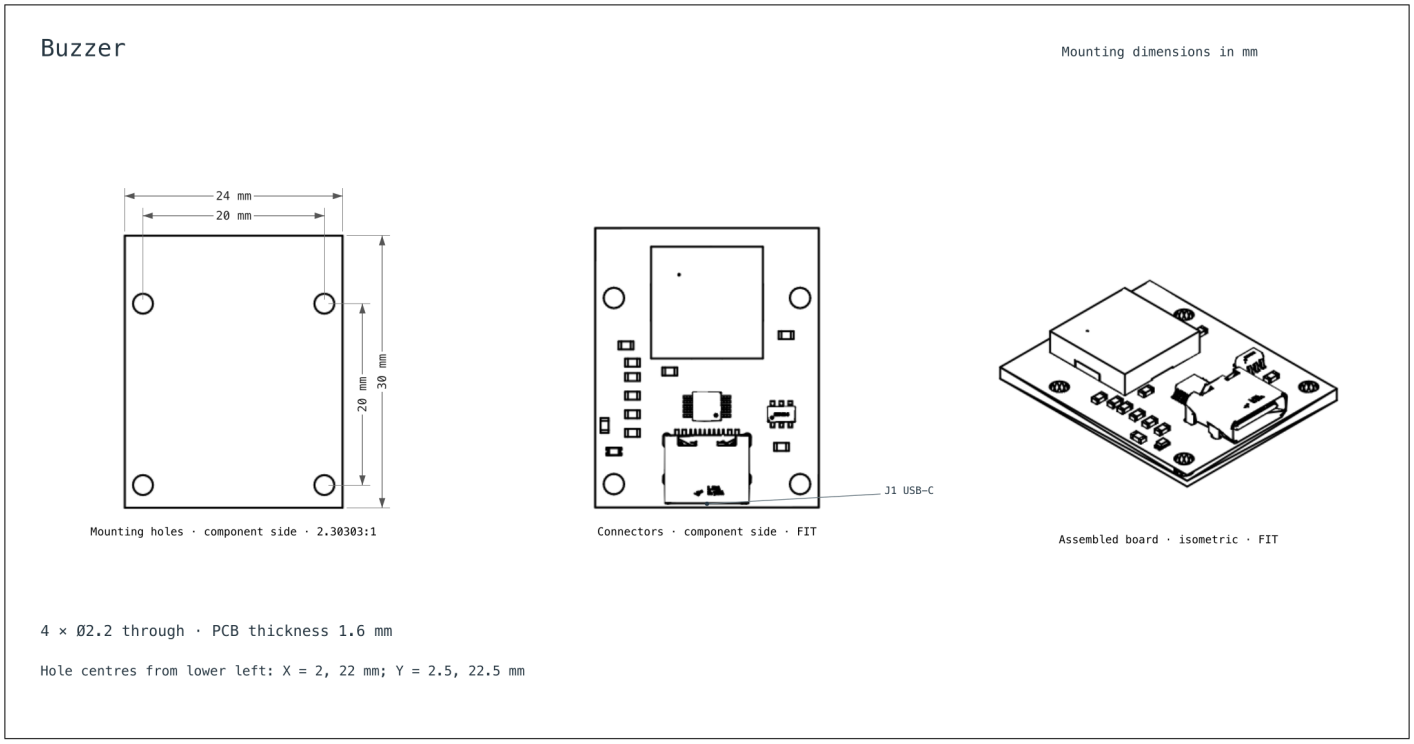
Opcode	Payload	Action
`0x10`	Duration in ms, two bytes, little-endian.	Play for 0–10000 ms.
`0x20`	One byte, `0` or `1`.	Turn the indicator off or on.

Status `0` means success, `2` means CRC mismatch, `3` means excessive length, and `4` means an invalid opcode or argument.

Protocol implementation

3 Mechanical information

3.1 Assembly and mounting



Component-side plan and isometric assembly. Dimensions in millimeters.

3.2 Installation dimensions

The PCB measures **24 × 30 mm**, with **4 × Ø2.2 mm** clearance holes for M2 screws. The centre-to-centre spacing is **20 × 20 mm**. Orient the component side with the **J1 USB-C port at the bottom**. Measure right and up from the **lower-left corner of the PCB** in the component-side view. The hole centres are at X = 2, 22 mm and Y = 2.5, 22.5 mm.

Modeled component height: approximately 3.0 mm above the component-side PCB surface.

3.3 Design resources

Device guide · **Full-size mounting drawing** · **Drawing TSX** · **PCB source**