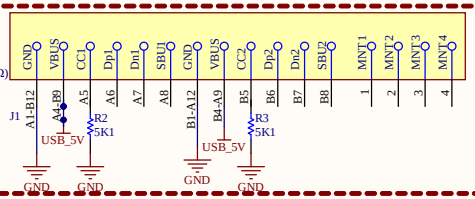
ANALOG SECTION

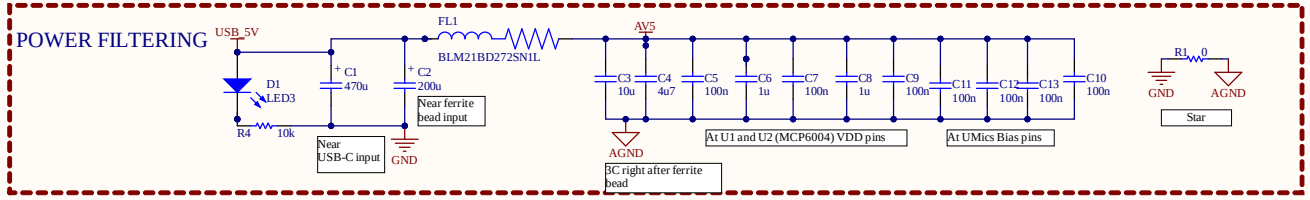
Sound Direction Indicator - Sheet 1 of 2

POWER INPUT

USB-C / CC Pull-downs (5.1kΩ)

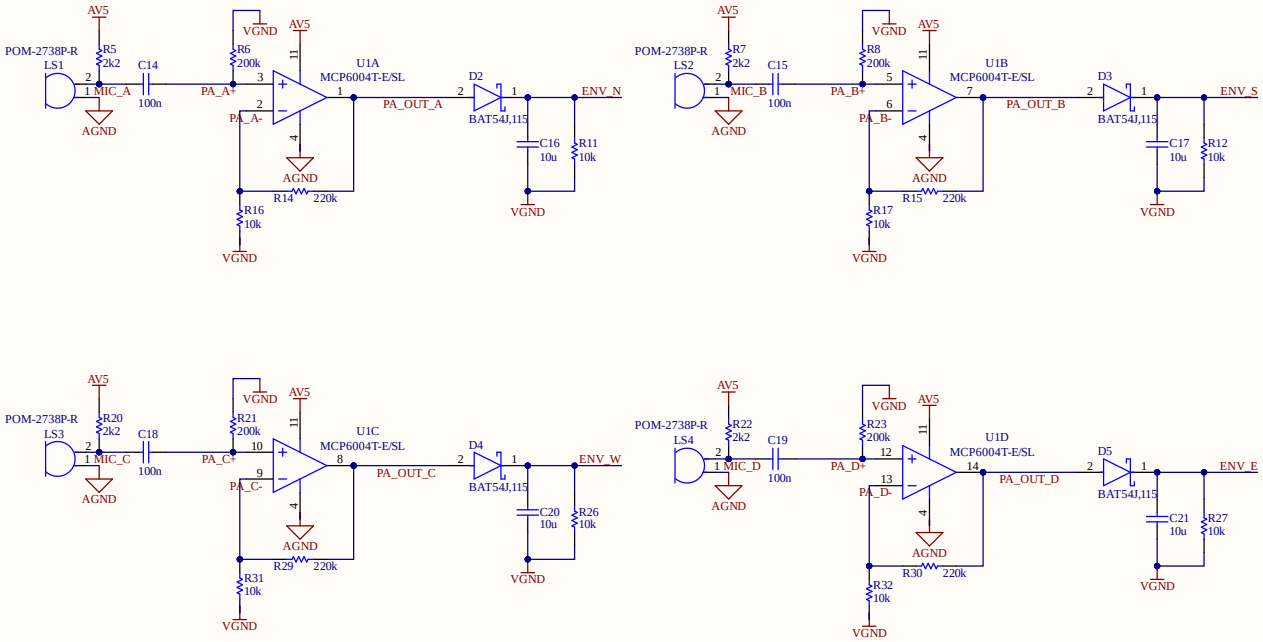


POWER FILTERING



MIC SIGNAL CHAIN (PREAMP + ENVELOPE)

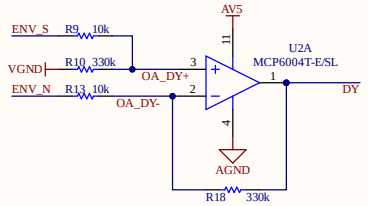
U1 (MCP6004) | Preamp Gain ≈ 23× | Envelope τ ≈ 100ms | Output: ENV_N/E/S/W | Outputs centered at VREF

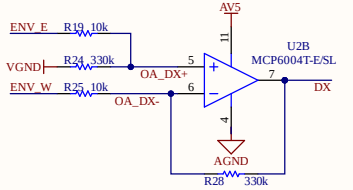


DIRECTION

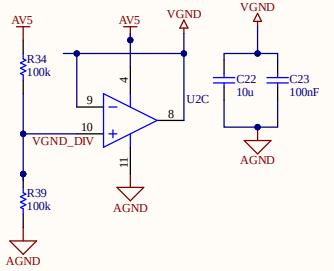
Subtracts opposite envelopes to determine sound source axis

X: East − West | Y: North − South | Gain = 33× | Reference: VREF



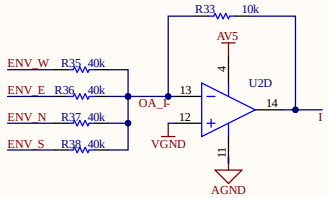


VGND GENERATOR (MID-RAIL)



ANALOG SUMMER

I_OUT = VREF + (ENV_N + ENV_E + ENV_S + ENV_W) / 4



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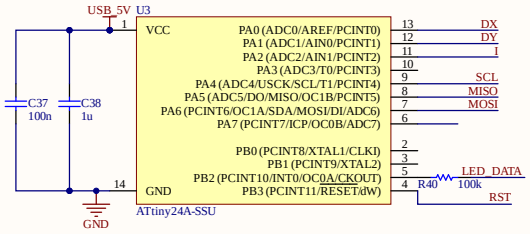
DIGITAL SECTION

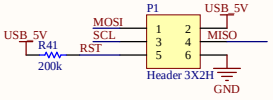
Sound Direction Indicator - Sheet 2 of 2

MICROCONTROLLER

ATtiny24A-SSU | 8MHz Internal RC | 3x ADC inputs (DX, DY, Intensity) | 1x GPIO output (LED data)

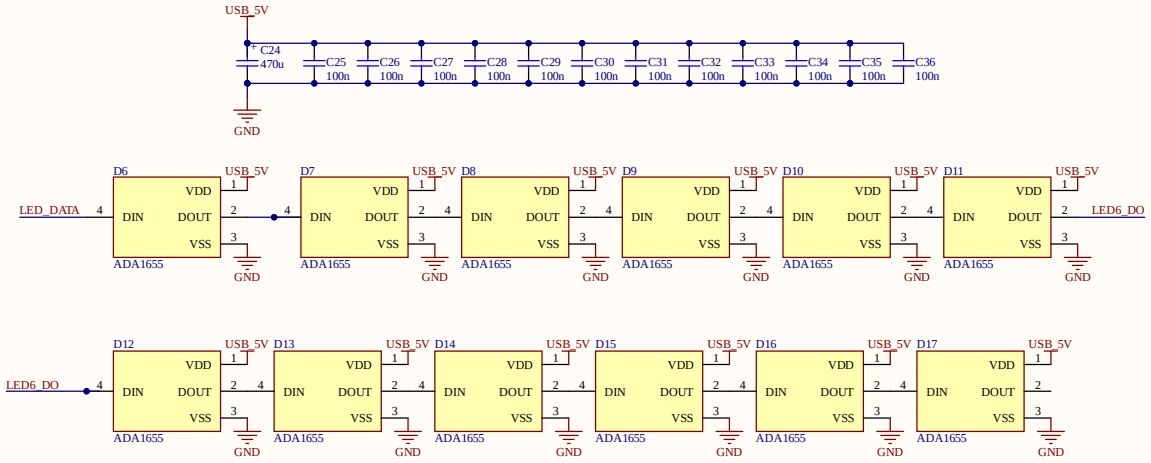


ISP PROGRAMMING



LED RING

12x WS2812B (5050 package) | Single-wire protocol (800kHz) | Accent colors: Blue (moderate), Red (loud)
local 100nF capacitor to suppress high-frequency PWM switching noise | Bulk pass for LEDs low frequency switching noise



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