MCP4728 — 4-channel 12-bit I2C DAC (makes CV out)

Microchip · MSOP-10 · I2C · ~$2

WHAT IT IS

The opposite of the ADC: a Digital-to-Analog Converter turns a number into a voltage. 4 channels, 12-bit, with an on-chip 2.048 V reference and EEPROM (remembers its setting through power cycles). We use it to generate Eurorack CV out.

KEY SPECS (what matters to us)

4 channels · 12-bit (4096 steps) · I2C
Internal 2.048 V ref, ×2 gain option → 0–4.096 V full scale
EEPROM stores power-on value · ~6 µs settling

SIGNALS / PINS WE USE

SDA/SCL = I2C · VOUTA–D = the 4 outputs · ~LDAC (tie low) · VDD 3.3 V

ELECTRICAL · GOTCHAS

Internal ref drifts ~0.5% + tempco → fine for glitch CV, not 1V/oct-grade without per-channel cal. Its 0–4.096 V needs a gain stage (the LM324 ×2.44) to reach Eurorack 0–10 V.

WHY IT'S IN OUR SYSTEM

Danny already had one on the bench — it let us test the "DAC vs PWM" fork early and prove carrier-free = flicker-free. Now it's the CV-OUT generator: 4 clean voltages → buffered up to 0–10 V. (The 16-ch CR drive went to the PCA9745B instead, but the DAC lives on for true analog CV output where a sink chip can't help.)