RP2040/RP2350 rapid development board

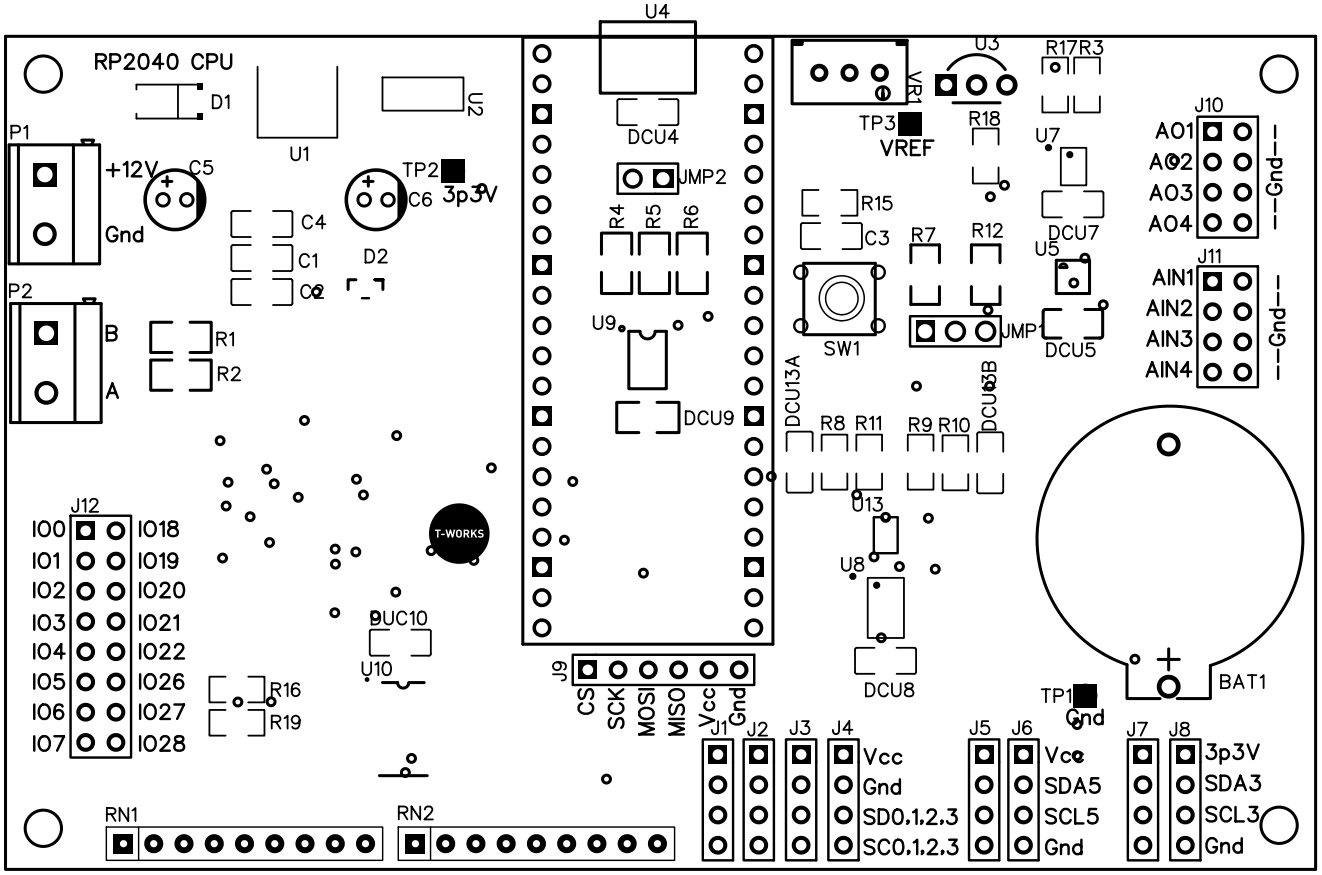
Introduction:

The Pi Pico development board supports both RP2040 & the latest RP2350, it Is the second CPU board designed in the rapid prototyping series. This board was used in the T-Works byte bending Challenge held in November 2023.

The board features onboard voltage regulators for 5V and 3.3V and can take input voltages up to 24V DC, the recommended input voltage can be between 9-24V DC. It has I2C bus for both 5V & 3.3V, the I2C bus (5V) is also available multiplexed through PCA9548, providing a total of 4 interface ports. This can be useful for interfacing multiple I2C devices with a single/same address.

The other I2C devices on board are DS3231, precision RTC with battery backup, 8KB EEPROM, 16 bit 4 channel ADC (ADS1115) and 12 bit 4 channel DAC MCP4728. The ADC & DAC channels are available through on board dedicated 5 x 2 headers.

Note: For this contest the ADC ADS1115 (u5) & the DAC MCP4728 (U7) are not populated. Precision programmable band gap reference TL431 is also provided for the PI PICO on chip AD converter. The board also features RS485 serial interface. 16 spare GPIO's are all level shifted to 5V.



Specifications:

Physical	L x W x H (cm) 11 x 7 x 2
Weight	
Power supply	9-24V DC input, regulated to 5V (1 Amp) & 3.3V (500mA) DC through on board regulators.
Microcontroller	Raspberry Pi Pico RP2040 or RP2350
I2C Bus	5V bus two ports, 3.3V bus two ports 4 port 5V bus, multiplexed by PCA9548
SPI Bus	Dedicated CS line & MISO, MOSI & CLK
EEPROM	8KB I2C bus
Voltage Reference	Precision band Gap , programmable reference TL431 set through a POT
On Chip ADC	12bit, 4 channel, can also be used as GPIO
External ADC	16 bit, 4 channel, ADS1115
External DAC	12 bit, 4 channel, MCP4728
Spare GPIO	16, level shifted to 5V
Serial interface	RS485

Connector Details:

P1 Terminal block 2 Pin	**Board input power**
P1.1	12V DC
P1.2	Gnd

P2 Terminal block 2 Pin	Serial Comm RS485
P2.1	B
P2.2	A

J1-J4 Berg 4 Pin	Multiplexed I2C Ports
J1-J4.1	5V
J1-J4.2	Gnd
J1-J4.3	SD0, SD1, SD2, SD3
J1-J4.4	SC0, SC1, SC2, SC3

J5-J6 Berg 4 Pin	I2C Bus 5V
J5-J6.1	5V
J5-J6.2	SDA
J5-J6.3	SCL
J5-J6.4	Gnd

J7-J8 Berg 4 Pin	I2C Bus 3.3V
J7-J8.1	3.3V
J7-J8.2	SDA
J7-J8.3	SCL
J7-J8.4	Gnd

J9 Berg 6 Pin	SD Card Connector (SPI)
J9.1	CS
J9.2	SCK
J9.3	MOSI
J9.4	MISO
J9.5	5V
J9.6	Gnd

J10 Berg 4 x 2	Analog Outputs (MCP4728 Channels)
J10.1	AO1
J10.2	Gnd
J10.3	AO2
J10.4	Gnd
J10.5	AO3
J10.6	Gnd
J10.7	AO4
J10.8	Gnd

J11 Berg 4 x 2	Analog Inputs (ADS1115 Channels)
J11.1	AIN1
J11.2	Gnd
J11.3	AIN2
J11.4	Gnd
J11.5	AIN3
J11.6	Gnd
J11.7	AIN4
J11.8	Gnd

J12 Berg 8 x 2	GPIO
J12.1	GPIO0
J12.2	GPIO18
J12.3	GPIO2
J12.4	GPIO19
J12.5	GPIO3
J12.6	GPIO21
J12.7	GPIO4
J12.8	GPIO22
J12.9	GPIO5
J12.10	GPIO26
J12.11	GPIO6
J12.12	GPIO27
J12.13	GPIO7
J12.14	GPIO28