Solstice Family: Digital to Analog Converter

I²C D to A

General Description

The SF-5 is a serial interfaced digital to analog converter board. The board is based on Microchip's MCP4725 12-Bit Digital-to-Analog Converter with EEPROM Memory. The board can be powered with between 2.7Vdc and 5.5Vdc. The communication to the board is through two-wire interface and will require pullups on the SDA, SCL lines; 4.99K recommended to start. Actual resistance will depend on the length of the serial cable and the number of devices on the bus.

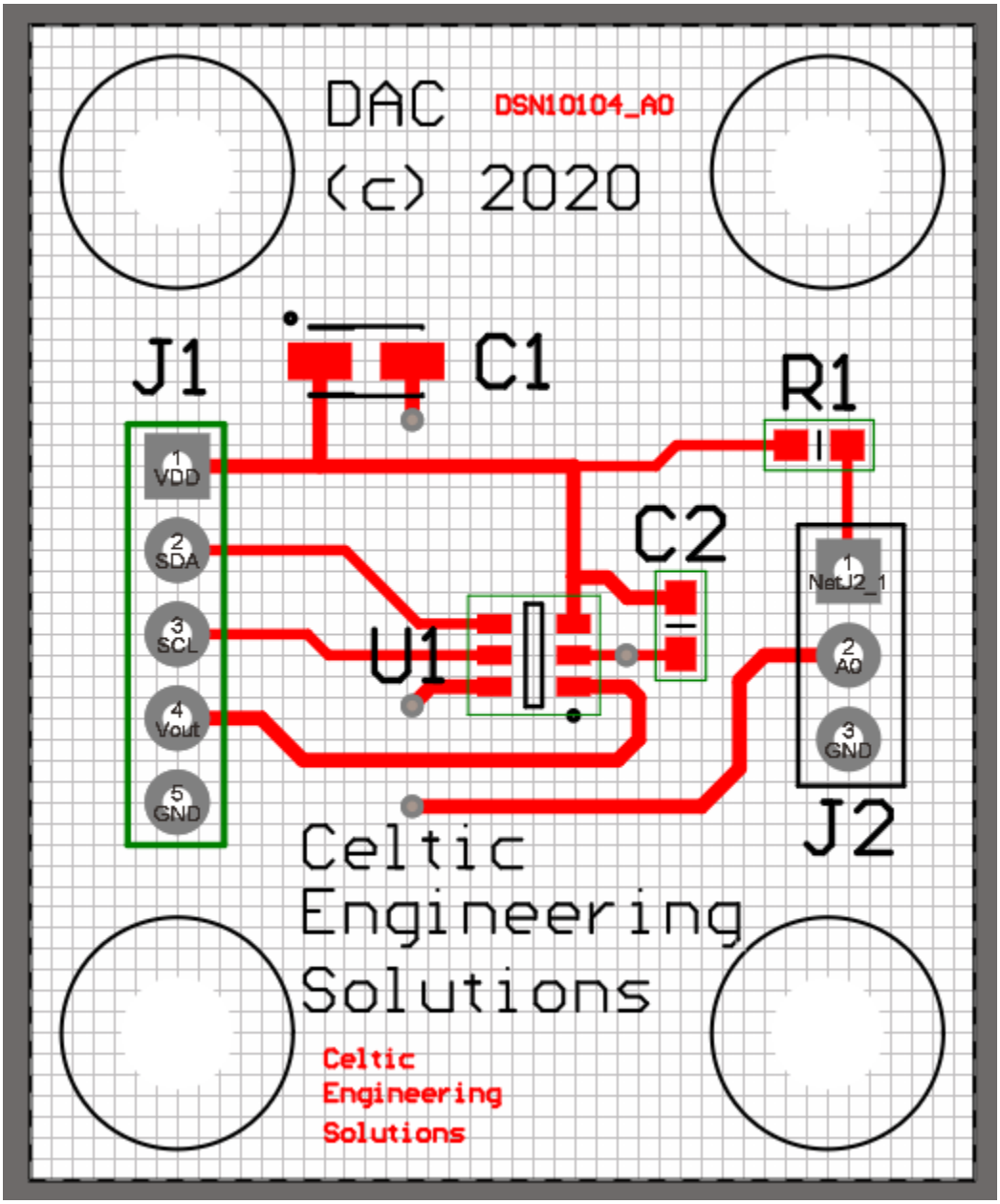
The MCP4725 has a 12 bit resolution and a data rate dependant on the I²C transfer rate. There is a 14 bit EEPROM memory storage to store the 2 configuration bits and 12-bits to store the DAC input Data.

Applications

- Set Point or Offset Trimming
- Sensor Calibration
- Closed-Loop Servo Control
- Low Power Portable Instrumentation
- PC Peripherals
- Data Acquisition Systems

Benefits and Features

- Ultra-Small X2QFN Package:
- 2 mm × 1.5 mm × 0.4 mm
- 12-Bit Noise-Free Resolution
- Wide Supply Range: 2.0 V to 5.5 V
- Low Current Consumption: 150 µA (Continuous-Conversion Mode)
- Programmable Data Rate: 128 SPS to 3.3 kSPS
- Single-Cycle Settling
- Internal Low-Drift Voltage Reference
- Internal Oscillator
- I2C Interface: Four Pin-Selectable Addresses
- Four Single-Ended or Two Differential Inputs
- Programmable Comparator
- Operating Temperature Range: –40°C to +125°C
- Board Size: 1.125" x 1.375"



Pin Configuration (J3)

Pin	Name	Function
1	VDD	Power Supply Input
2	SDA	Bidirectional Serial Data
3	SCL	Serial Clock Input
4	Vout	Voltage output
5	GND	Ground

Absolute Maximum Ratings

VDD, SDA, SCL, Alert/RDY, A0…… 5.5V
Storage temperature…… -65°C to +150°C

Pin Description

Serial Data Pin (SDA)

SDA is a bidirectional input/output pin, used to serially transmit data to and from the host controller. This pin requires a pull-up resistor to output data.

Serial Clock Pin (SCL)

SCL is a clock input pin. All communications and timing are relative to the signal on this pin. The clock is generated by the host controller on the bus.

Analog Output

VOUT is an analog output voltage from the DAC device. DAC output amplifier drives this pin with a range of VSS to VDD.

Power supply Input (VDD)

VDD is the power pin. The operating voltage is between 2.0Vdc and 5.5Vdc.

Ground (GND)

This is the system ground pin

Address Pins

The address pin selects the address of the chip. There are two possible addresses selected by connecting A0 to VDD or GND (0110001x).

Serial Interface

The MCP4725 is written by sending 4 8-bit bytes. The device address is the first byte. The second byte contains the Command Type and the power down mode. The third and fourth bytes contain the 12-bit data to be converted to a voltage on Vout.

For additional information about the performance of the MCP4725 the registers please see Microchip datasheet.

Revision History

NR	New Release