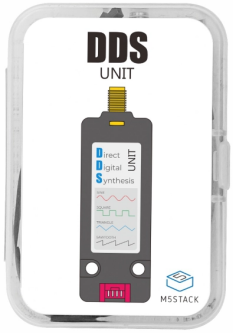
Unit DDS

SKU:U105



Description

Unit DDS is a signal source Unit. It uses the AD9833 programmable waveform generator + STM32F0 control scheme. It provides an I2C communication interface (addr: 0x31) and operates by configuring registers in practical use. It allows easy control of the signal source to output various waveforms (sine wave, triangle wave, square wave output, sawtooth wave, signal output amplitude 0-0.6V), and to adjust frequency and phase. It also supports sleep strategies to further reduce power consumption when idle. This Unit is suitable for use as a signal source in the electronic circuit prototyping of various test instruments.

Features

- Digitally programmable frequency and phase
- Signal output amplitude 0-0.6V
- Sine wave/triangle wave/square wave/sawtooth wave (fixed frequency: 13.6KHz)/DC output
- Output frequency range: 0MHz to 1MHz (10MHz reference clock)
- 28-bit frequency resolution
- 11-bit phase resolution

Includes

- 1 x Unit DDS

- 1 x HY2.0-4P Grove cable (20cm)
- 1 x SMA-2.54mm cable

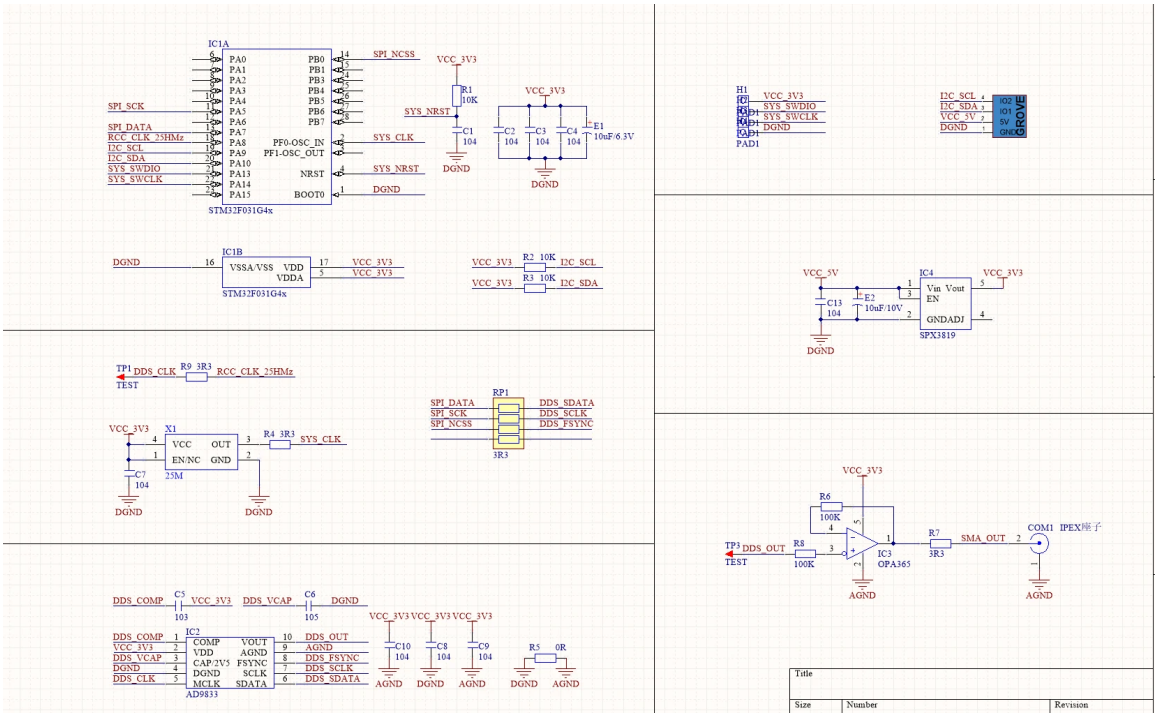
Applications

- Frequency stimulation/waveform generation
- Liquid and gas flow measurement
- Sensor applications: proximity, motion, and defect detection
- Line loss/attenuation
- Testing and medical equipment
- Sweep/clock generator
- Time-domain reflection (TDR) applications

Specifications

Specification	Parameter
MCU	STM32F031G4U6
Communication Interface	I2C @0x31
Supported Waveforms	Sine wave/triangle wave/square wave/sawtooth wave (fixed frequency: 13.6KHz)/DC output
Signal Output Amplitude	0-0.6V
Output Frequency Range	0 MHz to 1MHz (10 MHz reference clock)
Frequency Resolution	28-bit
Phase Resolution	11-bit
Product Size	71.4 x 24.0 x 8.0mm
Product Weight	11.2g
Package Size	88.0 x 60.0 x 21.0mm
Gross Weight	34.0g

Schematics

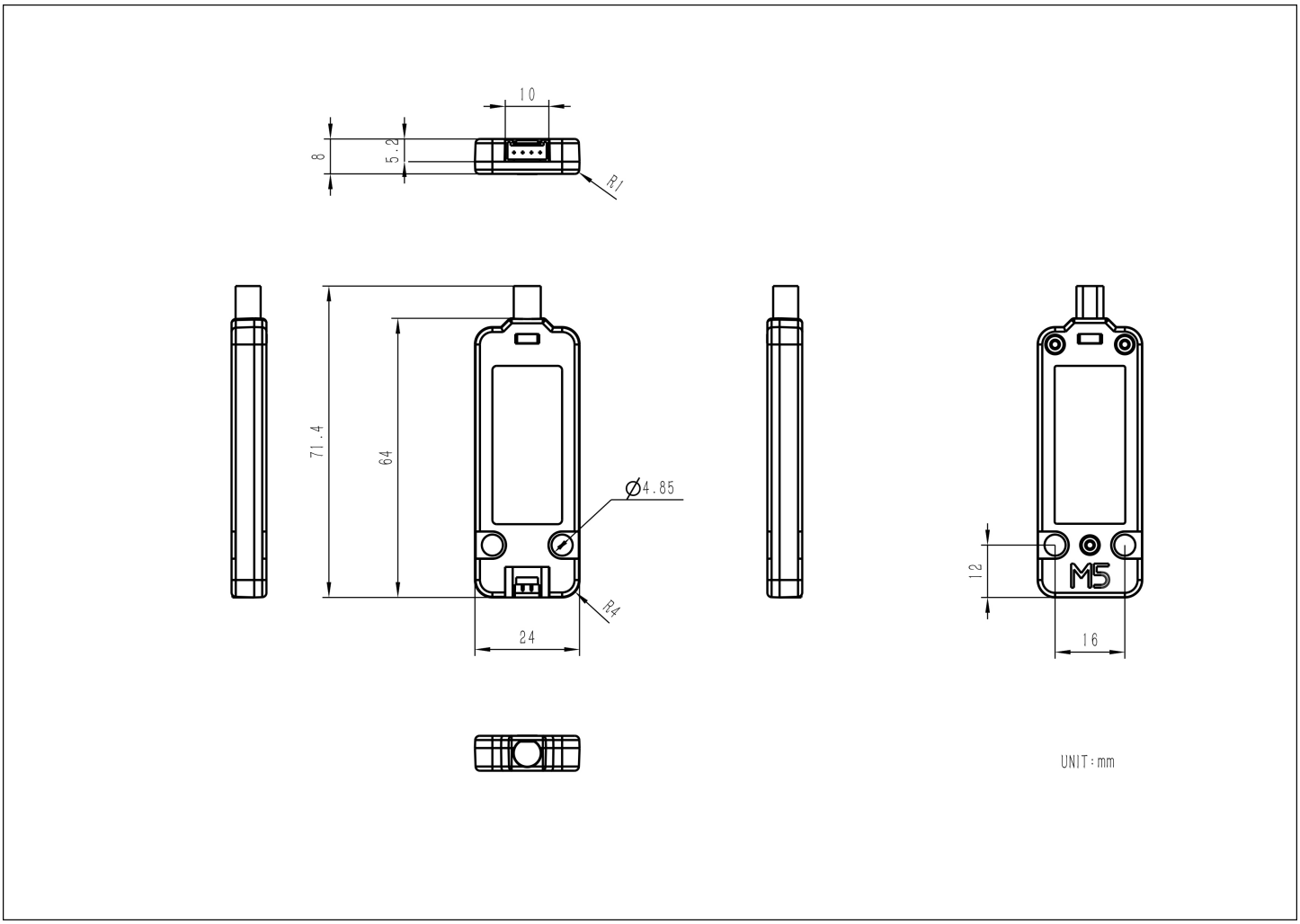


PinMap

Unit DDS

HY2.0-4P	Black	Red	Yellow	White
PORT.A	GND	5V	SDA	SCL

Model Size



Structure

- Unit DDS Structure Files

Datasheets

- AD9833

Softwares

Arduino

- Unit DDS Test Example with M5Core

UiFlow2

- Unit DDS UiFlow2 Docs

Protocol

- Protocol Type: I2C
- I2C Address: **0x31**

Note: When writing to a register, the highest bit needs to be set to 1. Setting msbk to 1 will maintain the last signal amplitude output

Note: When writing to a register, the highest bit needs to be set to 1. Setting mclk to 1 will maintain the last signal amplitude output, and setting DAC to 1 will stop the Unit from outputting.

M5Stack Unit DDS I2C Protocol									V1(FW Version) 5/16/2024
REG MAP (Addr:0x31)		0	1	2	3	4	5	6	note
DDS CTRL REG	0x20 R/W	WAVE_CTL1	WAVE_CTL2						WAVE_CTL1 : | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | W| RESERVED | MODE | MODE: 000 Reserved 001 SINE 010 TRIANGLE 011 SQUARE 100 SAWTOOTH 101 DC WAVE_CTL2: |7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |W| FSELECT | PSELECT | S01 | S12 | RESET |RESERVED| FSELECT: 0 Use FREQ0 1 Use FREQ1 PSELECT: 0 Use PHASE0 1 Use PHASE1 SLEEP01: 1 Disable mclk SLEEP12: 1 Disable DAC
DDS FREQ PHASE REG	0x30 R/W	DDS FREQ REG				DDS PHASE REG			DDS FREQ REG(28bit): | 31 | 30 | 29:28 | 27:0 | | W | FSELECT | RESERVED | freq reg | DDS PHASE REG (12bit): | 15 | 14 | 13:12 | 11:0 | | W | PSELECT | RESERVED | phase reg |

When writing a register, the highest bit must be set to 1. The mclk is set to "1" by default, it will keep the last output signal magnitude. Once the DAC is set to 1, it stops the Unit output.

EasyLoader

Easyloader	Download Link	Note
Unit DDS Easyloader	download	/

Video

Control Unit DDS to output sine wave/triangle wave/square wave/sawtooth wave.

DDS_UNIT.mp4