SPI Programmable-Gain Amplifier with Input VOS Trim and Output Op Amp - Board

The project presented here is an SPI programable Gain Amplifier using MAX9939. The MAX9939 is a general-purpose, differential-input programmable-gain amplifier (PGA) that is ideal for conditioning a variety of wide dynamic range signals such as those found in motor current-sense, medical instrumentation, and sonar data acquisition applications. It features SPI-programmable differential gains from 0.2V/V to 157V/V, input offset-voltage compensation, and an output amplifier that can be configured either as a high-order active filter or to provide a differential output.

The PGA is optimized for high-signal bandwidth and its gain can be programmed to be 0.2V/V, 1V/V, 10V/V, 20V/V, 30V/V, 40V/V, 60V/V, 80V/V, 119V/V, and 157V/V. Precision resistor matching provides extremely low gain tempco and high CMRR. Although the MAX9939 operates from a single supply VCC between 2.9V to 5.5V, it can process signals both above and below ground due to the use of an input level-shifting amplifier stage. Furthermore, its inputs are protected to ±16V, allowing it to withstand fault conditions and signal overranges. The output amplifier is designed for high bandwidth and low-bias currents, making it ideal for use in multiple-feedback active filter topologies that offer much higher Qs and stopband attenuation than Sallen-Key architectures. The MAX9939 draws 3.4mA of quiescent supply current at 5V, and includes a software-programmable shutdown mode that reduces its supply current to only 13µA.

Note: This is a general-purpose SPI programable gain amplifier, all components are user defined, capacitors and resistors value as per application. Refer data sheet of the Chip for more information.

Key Features

- Operating Power Supply 3V to 5V DC
- SPI-Programmable Gains: 0.2V/V to 157V/V
- Extremely Low Gain Tempco
- Integrated Amplifier for R/C Programmable Active Filter
- Input Offset-Voltage Compensation
- Input Protection to ±16V
- -40°C to +125°C Operating Temperature Range
- 10-Pin µMAX Package
- Amplification
- Differential to Single-Ended Conversion
- Differential-Input, Differential-Output Signal
- Medical Signal Conditioning
- Sensor Interface and Signal Processing
- Sensorless Motor Control
- Sonar and General-Purpose Data Acquisition
- PCB Dimensions 37.94 x 15.72mm





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ВОМ						
NO	QNTY.	DESC.	REF.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	1	CN1	5 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5318-ND
2	1	CN2	5 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5318-ND
3	1	CN3	5 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5318-ND
4	8	C1,R2,R3,C4,R5,C5,C7,C8	DNP			USER DEFINED
5	1	C2	10uF/25V SMD SIZE 1206	MURATA/YAGEO	DIGIKEY	
6	2	C3,C10	0.1uF/50V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
7	1	C6	4K7PF/50V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
8	1	С9	220PF/50V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
9	1	D1	LED SMD SIZE 0805	LITE ON INC	DIGIKEY	160-1427-1-ND
10	3	R1,R7,R10	0E SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
11	2	R4,R8	66.5K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
12	1	R6	121K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
13	1	R9	1.21K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
14	1	R11	1K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
15	1	U1	MAX9939AUB	ANALOG DEVICE	DIGIKEY	MAX9939AUB+CT-ND
C1, C2 AND C8 = SMD SIZE 1206, OTHER ALL RESISTORS AND CAPACITORS SIZE 0805						







07005



SILK SCREEN TOP





TOP LAYER

PCB DIMENSIONS 37.94MM X 15.72MM

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