

Low Voltage Microphone Pre-Amplifier with Variable Compression and Noise Gating, Supports Electret and Dynamic Microphone

This is a complete microphone signal conditioning project. Designed primarily for voice-band applications, this project provides amplification, limiting, variable compression, and noise gate. User-adjustable compression ratio, noise gate threshold, and two different fixed gains optimize circuit operation for a variety of applications.

This is a complete and flexible solution for conditioning condenser microphones for personal electronics and computer audio systems. It is also excellent for improving vocal clarity in communications and the public address systems. A low noise voltage-controlled amplifier (VCA) provides a gain that is dynamically adjusted by a control loop to maintain a set compressions characteristic. The compression ratio is set by a jumper and can be varied from 1:1 to over 10:1 relative to the fixed rotation point. Signals above the rotation point are limited to prevent overload and eliminate popping.

A downward expander (noise gate) prevents the amplification of background noise or hum. This results in an optimized signal level prior to digitization, thereby eliminating the need for additional gain or attenuation in the digital domain. The flexibility of setting the compression ratio and the time constant of the level detector, coupled with two values of rotation point, make the SSM2167 easy to integrate into a wide variety of microphone conditioning applications.

Compression Ratio

This project provides four different settings for the compression ratio in the same manner as the noise gate threshold. Experiment with different compression ratios to determine what sounds best in a given system, starting with 2:1 is recommended. A high compression ratio exaggerates the effect of the noise gate because the compression ratio determines the gain at the noise gate. Compression of 10:1 only in systems where the noise floor is well below the noise gate. Most systems require between 2:1 and 5:1 compression for best results. The compression ratio keeps the output steady over a range of source to microphone distances.

Note 1: Do not install Q1, R2, C5, they are optional components, can be used when very low input signal is applied.









Electret Microphone or Dynamic Microphone (Project Supports Electret Microphone and Dynamic Microphone)

- Open Jumper J1 and Electret Microphone to Connect Dynamic Microphone or self-power microphone.
- Close Jumper J1 for Electret Microphone

Setting The Compression Ratio (PCB Solder Jumper) Jumper J2 Compression Ration 10:1

- Jumper J2 Compression Ration 10:1
- Jumper J3 Compression Ration 5:1
- Jumper J4 Compression Ration 2:1
- Jumper J5 Compression Ration 1:1

Setting The Noise Gate Threshold (PCB Solder Jumper) Noise gate keeps the background sounds subdued.

- Jumper J7 Noise Gate (dBV) -55
- Jumper J8 Noise Gate (dBV) -54
- Jumper J9 Noise Gate (dBV) -48
- Jumper J10 Noise Gate (dBV) -40

Features

- Operating Supply 3.3V DC
- On Board Condenser Microphone
- On Board Power LED
- Jumpers to Set Various Noise Gate (J7, J8, J9, J10)
- Jumpers to Set Various Compression Ratio (J2, J3, J4, J5)
- Jumper J1 for Biasing Voltage to Microphone, Open if Biasing Supply not Required
- PCB Dimensions 51.12MM X 16.35MM









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ВОМ						
NO.	SR.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	1	CN1	4 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5317-ND
2	3	C1,C3,C9	10uF/16V SMD SIZE 1210	KEMET	DIGIKEY	399-18766-1-ND
3	2	C2,C8	0.1uF/50V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
4	1	C4	2.2uF/16V SMD SIZE 1206 OR 1210	MURATA/YAGEO	DIGIKEY	
5	3	Q1,R2,C5	DNP		DIGIKEY	DO NOT INSTAL L
6	2	R6,C6	0E SMD 0805 OR SOLDER JUMPER		DIGIKEY	
7	1	C7	1KPF/50V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
8	1	D1	LED RED SMD SIZE 0805	LITE ON	DIGIKEY	160-1427-1-ND
9	10	J1-J10	PCB SOLDER JUMPER		DIGIKEY	
10	1	MK1	MICROPHONE	PUI AUDIO	DIGIKEY	668-1484-ND
11	1	R1	2.2K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
12	1	R3	499K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
13	1	R4	100K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
14	1	R5	175K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
15	1	R7	10K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
16	1	R8	75K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
17	1	R9	15K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
18	1	R10	5K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
19	1	R11	2K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
20	1	R12	1K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
21	1	R13	220E 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
22	1	U1	SSM2167	ANALOG DEVICES	DIGIKEY	SSM2167-1RMZ-R7TR-ND



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SILK SCREEN TOP



