



Single Chip Spectrum Analyzer Data Sheet

Description

The MSSCSA is a single chip 1/6th octave 6 band spectrum analyzer whose center frequencies are controlled by a single master clock. The center frequencies are set at 1.12246, 1.2599, 1.4142, 1.5874, 1.78179 and 2 (normalized). The sample to corner is 25:1 for the 2 Hz normalized output and 44.545:1 at the 1.122 Hz normalized output. The MSSCSA's 1.178179 Hz output is 2 MHz (Clock at 25 MHz). Multiple MSSCSA can be connected for spectrum analysis by taking the master clock of the high frequency filter and dividing by 2.

The MSSCSA includes two uncommitted op amps for adding additional fixed gain for microphone or other low level applications. A digitally programmable gain stage provides 0, 10 or 20 dB of gain. The PD pin selects power down, low power for ultrasonic applications and regular power for operation at 2 MHz center frequency.

The MSSCSA is fabricated in 0.6 um CMOS process for low power consumption and operation from 3.0 to 5.5 VDC

Features

- Selectable Power Modes
- Regular Power Consumption: 17 mA at +5V
- Low Power Consumption: 6 mA at +5VDC
- Powerdown Mode
- Operates from 3.0 V to 5.5 VDC
- 6 Six pole Bandpass filters in one package
- Digitally controlled gain stage
- Two Uncommitted Op Amps
- No Microprocessor Needed

Applications

- Real-Time Spectrum Analysis
- Audio and Ultrasonic Analysis
- Vibration Analysis

Ordering Information

Part Number	Package	Operating Temperature
MSSCSA N	SOIC-16N	-40° to +85° C

The package is 150 mil wide (Narrow SOIC)

Absolute Maximum Ratings

Power Supply Voltage	+6V
Storage Temperature Range	-60 to +150°C
Operating Temperature Range	-40 to +85°C

MSSCSA

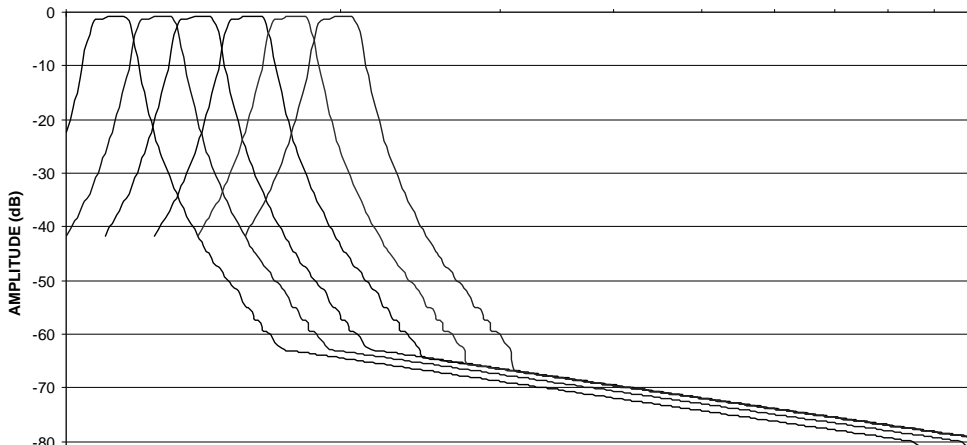


Figure 1: Normalized Frequency Response





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Electrical Characteristics _____

(VDD = +5.0V, T = 25 C)

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PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
DC Specifications						
Operating Voltage	VDD		3.0	5.0	5.5	V
Supply Current	IDD	PD=0V		15		mA
Output Current	IO	RL = 100 KΩ		1.0		mA
Supply Current	IDD	PD=0.5VDD		6.3		mA
Output Current	IO	RL = 100 KΩ		1.0		mA
Power Down Current	I _{PD}	PD=VDD		400		μA
AC Specifications						
Output Impedance	Z _o			500		Ω
Clock to Corner Ratio	fclk/fcnr	Filter 1		22.27		Hz/Hz
Clock to Corner Ratio	fclk/fcnr	Filter 2		19.84		Hz/Hz
Clock to Corner Ratio	fclk/fcnr	Filter 3		17.68		Hz/Hz
Clock to Corner Ratio	fclk/fcnr	Filter 4		15.75		Hz/Hz
Clock to Corner Ratio	fclk/fcnr	Filter 5		14.03		Hz/Hz
Clock to Corner Ratio	fclk/fcnr	Filter 6		12.5		Hz/Hz
Maximum Center Frequency	fcenter	Filter 6 Output		2		MHz
Maximum Center Frequency	fcenter	Filter 6 PD=1/2 VDD		0.5		MHz
Ripple				0.2		dB
Output Offset Voltage	VOS			100		mV
40 dB Bandwidth		Normalized Fo	0.76		1.32	
Filter Q	Q			9		





Single Chip Spectrum Analyzer Data Sheet

Block Diagram

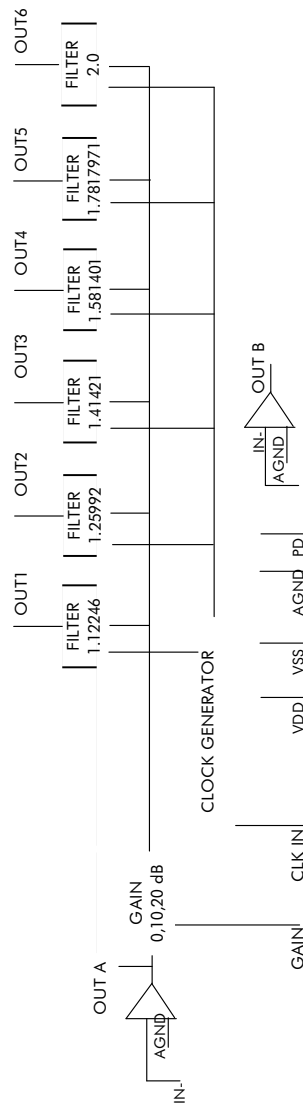


Figure 2: MSSCSA BLOCK DIAGRAM

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Pin Description

MSSCSA

- | | | | |
|---------|--|----------|--|
| 1. INB | Inverting Uncommitted Op Amp Input B | 8. PD | Power Down; When CMOS high, device is powered down.
1/2 VDD Low Power
VSS Medium Power |
| 2. OUTA | Op Amp Output A | 9. OUT1 | 1.12X Filter Output |
| 3. INA | Inverting Op Amp Input A | 10. OUT2 | 1.26X Filter Output |
| 4. AGND | Analog ground, Connect to 1/2 VDD | 11. OUT3 | 1.41X Filter Output |
| 5. CLK | Clock input, CMOS Level, Clock frequency determines position of band pass filter outputs | 12. OUT4 | 1.59X Filter Output |
| 6. VSS | Negative Supply; Tie to OVDC | 13. OUT5 | 1.78X Filter Output |
| 7. GAIN | Tertiary Control: 0V, 0 dB, 1/2 VDD 10 dB, VDD 20 dB | 14. OUT6 | 2X Octave Filter Output |
| | | 15. VDD | Positive Supply, Typically 5.0 VDC |
| | | 16. OUTB | Uncommitted Op Amp B Output. |

INB	1	16	OUTB
OUTA	2	15	VDD
INA	3	14	OUT6
AGND	4	13	OUT5
CLK	5	12	OUT4
VSS	6	11	OUT3
GAIN	7	10	OUT2
PD	8	9	OUT1

Figure 3: MSSCSA Pinout





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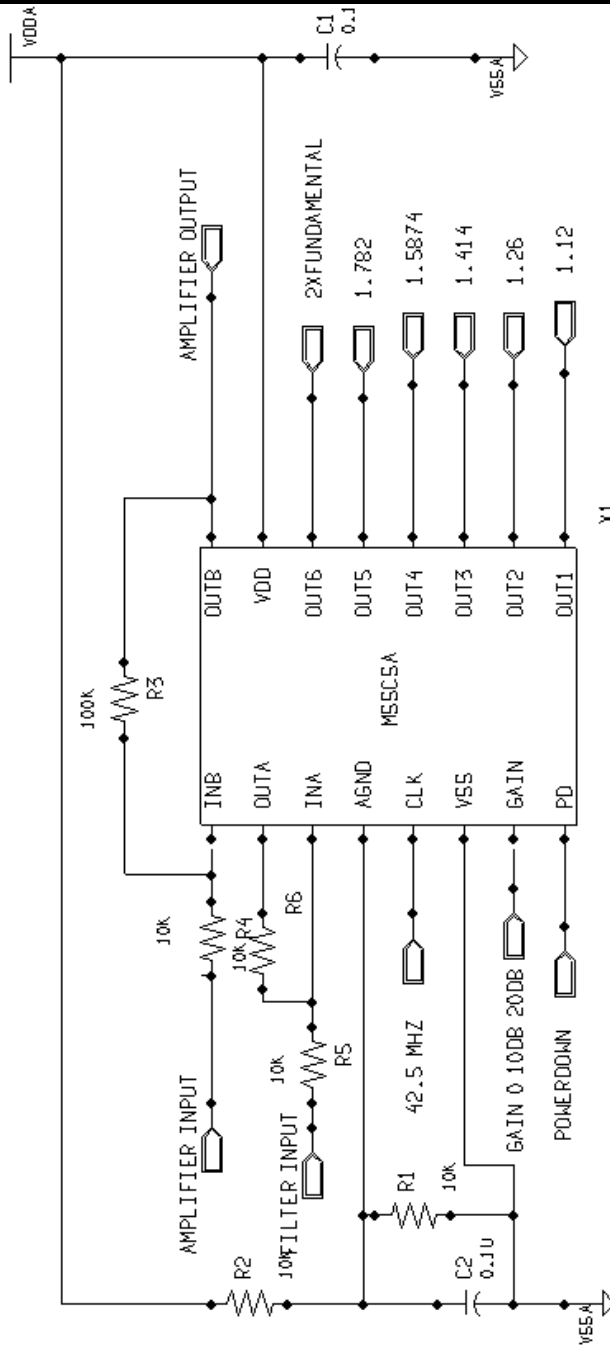


Figure 4: MSSCSA Application Schematic

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STANDARD PRODUCTS

MSGEQ5A/MSGEQ7	Five Band /Seven Band Graphic Equalizer
MSVHFS1-6	Selectable Very High Frequency LP/BP Filter
MSHFS1-6	Selectable High Frequency LP/BP Filter
MSFS1-6	Selectable Lowpass/Bandpass Filter
MSU1F1-4, MSU2F1	Resistor Programmable Universal Active Filter
MSU1HF1-4, MSU2HF1	High Frequency Resistor Programmable Universal Active Filter
MSELP	Switched Capacitor Elliptic Lowpass Filter with Op Amps
MSNBLP	Switched Capacitor Butterworth Lowpass Filter
MSLE/B/5L/M	Switched Capacitor General Purpose Lowpass Filter
MS2LFS	Dual Selectable Low Voltage Lowpass/Bandpass Filter
MSLFS	Selectable Low Voltage Lowpass/Bandpass Filter
MSHN1-6	Selectable High Pass/Notch Filter
MSRAAF	Resistor Programmable Active Audio Filter
MSRAHF	Resistor Programmable Active High Frequency Filter
MSDET	Tone Detector
MSEPAF	Electrically Programmable Active Filter
MSCBT	Communications Baseband Transceiver
MSLV14	14 MHz Video Lowpass Filter
MSSPSI	Smart Programmable Sensor Interface
MSCPSI	Computer Programmable Sensor Interface
MSTHDA	Total Harmonic Distortion Analyzer
MSSCSA	Single Chip Spectrum Analyzer
MSFIPS	FIP-140 Level 4+ Security Supervisor
MSLSA	Low Power Single Chip Spectrum Analyzer
MSRFIF	Radio Frequency Interface Front-End

MSSCSA





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