

# Electrically Programmable Active Filter

## Data Sheet

### Description

The MSEPAP integrated circuit provides a continuous time 4th order filter whose corner or center frequencies can be programmed using a 10 bit word serially loaded and stored in on-chip EEPROM. The MSEPAP can be set as a lowpass or a bandpass to 18 MHz from 500 kHz with one external component. The device operates from 4.5V up to 5.5 VDC. The accuracy of the MSEPAP is better than 1%. Temperature stability is better than discrete solutions using resistors, capacitors and op amps.

The EEPROM technology for setting the frequency requires 20V, which can be generated by the system, and the device programmed in the field, if desired.

The MSEPAP is available in a 16 pin bench or system programmable SOIC.

### Features

- Up to 18 MHz Lowpass or Bandpass filtering
- Continuous time filter: NO sample clock
- Low Noise
- 16-pin bench programmable

### Applications

- Instrumentation filtering
- Anti-alias filter for Data Acquisition
- Video Filtering

### Absolute Maximum Ratings

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

MSEPAP

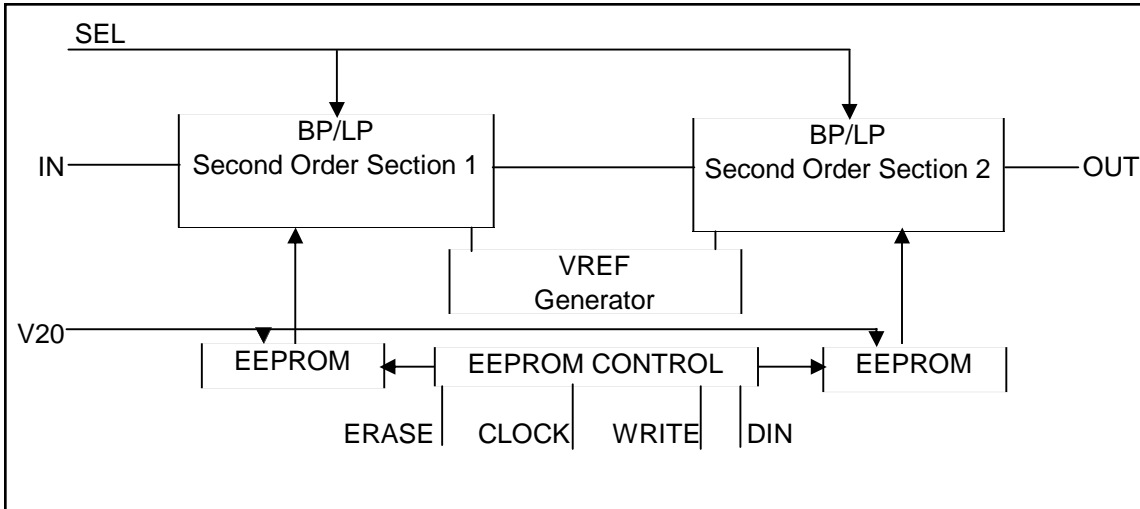


Figure 1 Simplified Block Diagram

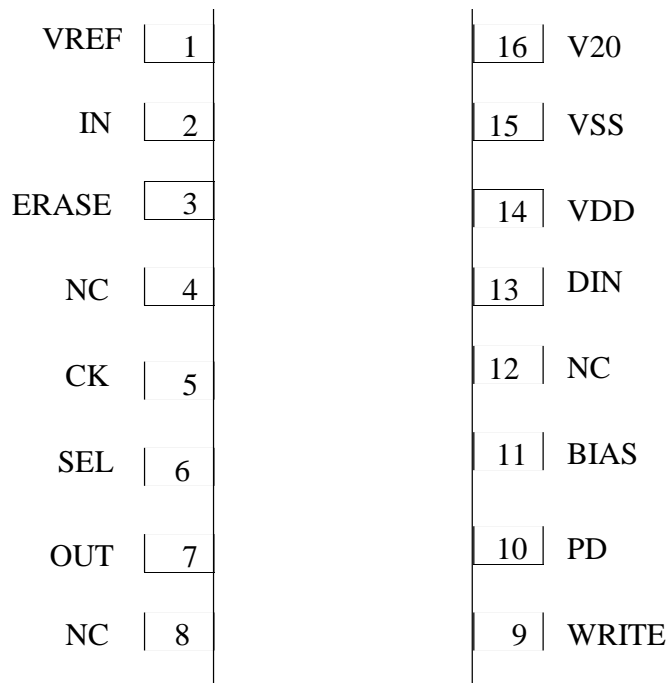
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### Pin Description

| Pin | Description  | Pin | Description  |
|-----|--|-----|--|
| 1   | VREF Internally Generated Ground Reference; Nominally 2.5VDC                     | 12  | NC No Internal Connection  |
| 2   | IN Filter Input  | 13  | DIN Serial Data Input for Programming EEPROM and filter position   |
| 3   | ERASE EEPROM Erase Control   | 14  | VDD Positive Power Supply; Typically 5.0VDC  |
| 4   | NC No Internal Connection  | 15  | VSS Negative Power Supply; Typically 0VDC  |
| 5   | CK Serial Data Clock   | 16  | V20 EEPROM Programming voltage. When erasing or programming; voltage is set at 20 VDC. For filter operation, voltage is 5.0VDC |
| 6   | SEL Selects Lowpass or Bandpass; Lowpass is selected at 0V                       |     |  |
| 7   | OUT Filter Output  |     |  |
| 8   | NC No Internal Connection  |     |  |
| 9   | WRITE Write Control  |     |  |
| 10  | PD Power Down Control  |     |  |
| 11  | BIAS Resistors from Bias Pin to VDD controls IDD and maximum frequency response. |     |  |

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# Selectable Programmable Active LP/BP Filter Data Sheet

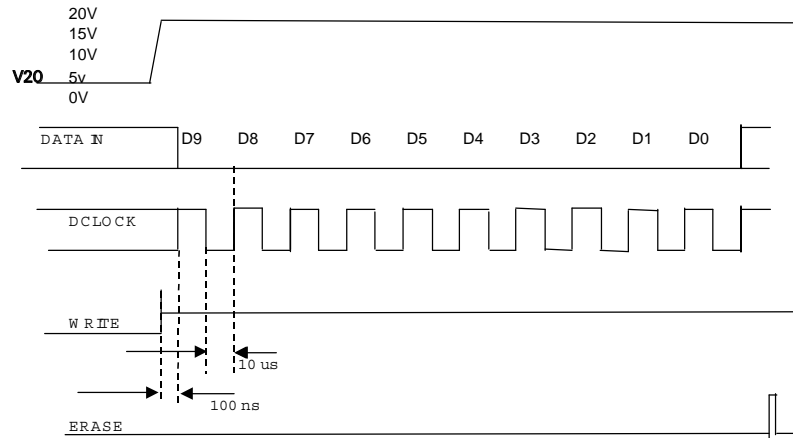


Figure 2a. ERASE CYCLE

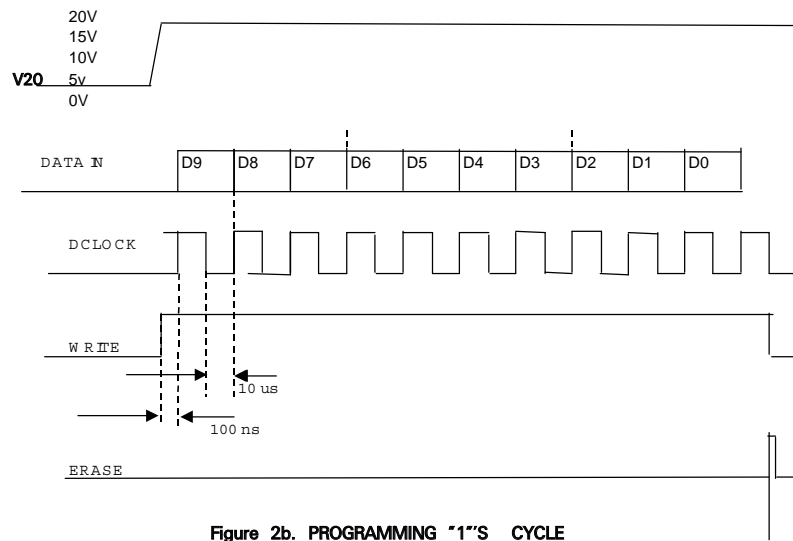


Figure 2b. PROGRAMMING "1'S" CYCLE

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Figure 2 Programming Timing Diagram

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## STANDARD PRODUCTS

|                    |  |
|--------------------|--|
| MSGEQ5A            | Five Band Graphic Equalizer                                  |
| MSGEQ7             | Seven Band Graphic Equalizer                                 |
| MSHFS1-6           | Selectable High Frequency LP/BP Filter                       |
| MSFS1-6            | Selectable Lowpass/Bandpass Filter                           |
| MSCAHF             | Selectable High Frequency Active 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/C5L/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                                  |

MSEPAF

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