

Signal evaluation for vibration sensors

Signal-evaluation module

Input quantity: a

Output quantity: U

- Programmable amplification.
- Programmable band pass filter.
- No external calibration required.
- Choice of 4 selectable sensor inputs or 2 symmetrical inputs.
- Integrated programmable frequency divider.
- Analog stage with signal test.
- Suitable for a wide range of micro controller types.
- PLCC28 housing.



Application

Evaluation of analog signals with piezoelectric acoustic pick-ups (vibration sensors)

Design and operation

A circuit integrated into the module evaluates the analog signals. The circuit contains a programmable amplifier, a band pass filter, a rectifier, an integrator and control logic. The use of "SC" circuitry ensures reliable operation without the need for external calibration. The fully programmable circuit can be readily employed for a variety of applications. The start and end of integration are controlled by the "Measurement window" input. A frequency divider programmed by way of three inputs generates the system clock of the analog stage for various externally applied clock frequencies (8 stages from 1...16 MHz) and the test frequencies (9 centre frequencies of 5...16 kHz) depending on the setting of the filter. By altering the frequency, the internal clock frequency can be set from a nominal level of 100 kHz to values between 50 kHz and 150 kHz. The band-filter centre frequencies, the test frequencies and the integration time constant are shifted in parallel with this.

Note

On account of the MOS inputs, the electronic module is to be handled with extreme care:

- No direct contact
- Use MOS workstation
- Only switch on the operating voltage with a rise of $< 1 \text{ V} \cdot \mu\text{s}^{-1}$

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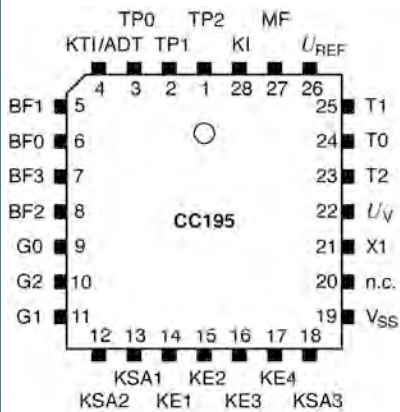
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Pin assignment

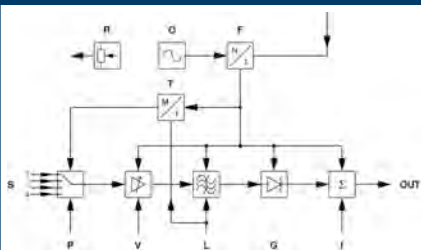


Pin assignment.

- U_{REF} Reference voltage
- $U_V/2$ (output $\pm 0.5\text{mA}$ load capacity)
- U_V Supply voltage 5 V
- V_{SS} Earth
- BF0/BF1/BF2/BF3*) Bandpass centre frequency setting
- G0/G1/G2*) Gain setting
- KE1/2/3/4 Sensor inputs
- KI Signal integral output
- KSA1/2/3*) Sensor selection
- KTI/ADT Controlled input/test output
- FM*) Measurement window
- N.C. not connected
- T0/T1/T2 Clock frequency selection
- TP0/TP1/TP2 For clock purposes
- X1 Clock supply

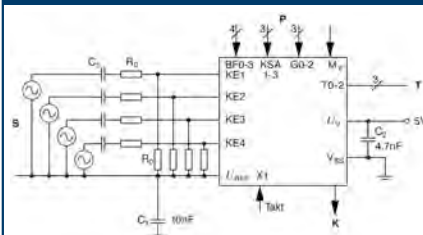
*) TTL-compatible static inputs of microcomputer port driver

Design and operation



- F Frequency divider
- G Rectifier
- L Filter
- I Integrator
- O Oscillator
- P Multiplexer
- R Reference signals
- S Sensor inputs
- T Test pulse divider
- V Amplifier
- OUT Output.

Application circuit (example)



- K Signal integral output
- P From microcomputer port driver
- S Sensors
- T Quartz clock
- C1/C2 Capacitors as close as possible to housing pins