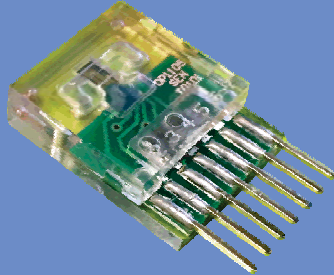


MEMS time-of-flight sensor for microfluidic applications



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TOF1000 series

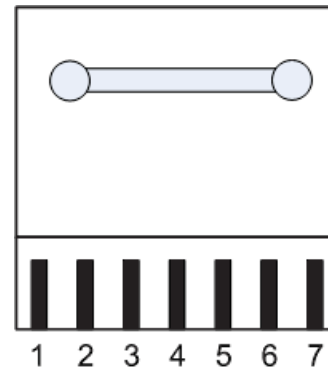
- Precise microfluidic metrology with super dynamic range
- Measurement of both mass and volumetric flow rate
- Small dead volume with customizable package
- Digital linear output with fast response time
- Disposable option with low power consumption

Specifications

Minimum flow speed	±0.008	mm/sec
Maximum flow speed	±2.0	mm/sec
Flow range (0.5x0.8 channel)	±(100~12000), typical	μL/min
Accuracy	±2.0, typical	%
Interface	Linear, I ² C	
Response time	10.0	msec
Power supply	5.0±1%	Vdc
Power consumption	10.0	mA
Maximum pressure rating	0.5	MPa
Temperature range	0~65, typical	°C
Storage temperature	-40 ~ +85	°C
Applicable media	Water based fluid, blood	

This sensor is designed with both thermal time-of-flight (TOF) and calorimetric sensing principle. The TOF sensing is excellent for the metrology of microfluidic flow regime with the option for fully fluid composition independence while the calorimetric sensing provide the mass flow registry without additional pressure and temperature compensation. The sensor also has the capability of detecting any gas bubble inside the fluid for preventing the detrimental effects in particular for some medical applications.

This sensor design is also capable for disposable applications which is crucial for some specific medical applications where cross contamination is very much undesired.



Pin definition

1. VH
2. VU
3. VD
4. GND
5. SCL
6. SDA
7. VCC

The above package is an example for a disposable manifold design where the sensor has an onboard EPROM to store the calibration data for the system level access. In the TOF configuration, the VH shall provide the thermal pulse while VU/VD receive the pulse. SCL/SDA I²C interface provide the communication between the sensor and the system board.

The MEMS TOF sensing chip surface is passivated with inert medical compatible materials and the package has its RoHS and REACH compliance.