

Intelligent Sensor

Dear client

We compliment you for buying our intelligent sensor

With this product you decided yourself about a high precision engineering part.



You benefit from following properties

- low power consumption (< 1 W)
- directly useful for TTL or CMOS controller circuits
- self adjustable sensitivity
- triggered by external events
- usable for real time applications.

Source: TB-Möller

The intelligent sensor consists of two piezoelectric structures between three conducting layers and connecting pads or flaps. One piezoelectric plate acts as a transmitter and the other act as a receiver. The sensor is connected to a signal shaping unit – transmitter part – and to a signal processing unit – receiver part. For standalone applications both units can be integrated in one signal processor. The operation of the sensor defines the signal form and the frequency. In a lot of principles applications the frequency broadband reaches from 20 kHz till 20 MHz.

The sensor sensitivity depends mainly on the following conditions and his signal behavior is adjustable to

- the material properties of the substrate or ambient structure
- the electromechanical interface sensor to structure – comparable with strain gauge
- the boundary conditions and measurement issues.

There are a lot of results available corresponding investigations academically on test structures.

The conclusion is, that the intelligent sensor confirms to the requirements of a stress sensor.

Technologieberatung Möller	Inh. Silvia Möller	
Mozartstrasse 10 D-73763 Westhausen Deutschland	phone + 49-7363-9196-49 www.tb-moeller.de	Fax + 49-7363-9196-50 info@tb-moeller.de

Data Sheet

Environmental Conditions

T	20 - 80	° C
CTE	-4 - -6	ppm/K
rel. Humidity	20 - 90	%
p	700 - 1100	mbar

Other conditions available on request

Mechanical Data

stat. pressure resistance	> 600	MPa
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Electrical Data

resistance	R _i	> 1 in other cases depending on frequency	MOhm (< 100 Hz)
capacitance transmitter	C _a	5,0	nF +/- 1,5 %
capacitance receiver	C _s	5,0	nF +/- 1,5 %
excitation frequency	f	0.1 – 20.000 typ. 250	kHz
current consumption	A _a	> 20 typ. 80 in other cases depending on integrated circuit	mA
voltage	U _a	0.5 – 200 typ. 2.5	Vp
offset-voltage		receiver independent from this	
power consumption (transmitter)	P _a	0.1 – 300 typ. 0.3	W
power output (receiver)	P _s	0.001 – 30 typ. 0.5	W

Operating Parameters

response time	t _a	<< 1	ms
repeatability		< 5 %	
resolution		10	ppm

operating time is due to application issues and structure lifetime behavior
hysteresis is due to application issues and structure behavior
degradation is due to application issues and structure behavior

EMV

emission	E-Feld	under progress	V/m
	M-Feld	under progress	A/m
immission	E-Feld	under progress	V/m
	M-Feld	under progress	A/m

Dear Client,

Please do not hesitate and ask for more details

Application notes

application for bimorph structures

- bending and internal stress detection in the case of structural health monitoring

