



Physical Logic

MAXL-OL-2000 Revision 2

MAXL-OL-2000 Revision 2 is based on the well-known MAXL-OL-2000 series. Revision 2 provides sensors with a new package, keeping the ASIC and the MEMS device. The biggest advantage of the new package is the improved pin-out, which makes the integration of the sensor much easier. In addition, we introduce a lid sealing method, which ensures perfect hermetic packaging in fully controlled atmosphere. Sensors' performance datasheet and operation principle have not changed. This document covers the changes in sensors' pin-out and electrical interface.

Features

- ❖ Sensing range from 2 g to 40 g
- ❖ Single-axis sensing
- ❖ High resolution
- ❖ High bias and scale factor stability
- ❖ Low power consumption
- ❖ Hermetic packaging
- ❖ Low profile, Small Form Factor, LCC20 package
- ❖ Low weight
- ❖ RoHS compliant





Physical Logic

Table of Contents

1	Absolute Maximum Ratings	3
2	Packaging information	3
3	Physical specifications.....	4
4	MAXL-OL-2000 pin-out.	5
5	Pin configuration and function description	5
6	MAXL-OL-2000 Typical application	7
7	Electrical specifications	7
8	Temperature Sensor	8

List of figures

Figure 1	Package general dimensions bottom and side view	3
Figure 2	Pinout Description (Top View)	5
Figure 3	Typical accelerometer application	7

List of tables

Table 1	Absolute maximum ratings	3
Table 2	Physical specifications	4
Table 3	Pin description.....	5
Table 4	Electrical specifications	7
Table 5	Temperature Sensor Specifications	8

1 Absolute Maximum Ratings

Stresses above those listed as “absolute maximum ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device under these conditions is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

Table 1 Absolute maximum ratings

Ratings	Unit	Maximum value
Supply voltage (VIN)	V	3 - 3.6
Input voltage on any control pin	V	VIN + 0.3
Operating temperature range	°C	-40 to 85
Storage temperature range	°C	-50 to 90
Electrostatic discharge protection	kV (HBM)	2
Soldering temperature (reflow)	°C	260

2 Packaging information

The packaging is a standard LCC housing with a total of 20 pins. Sealing process is qualified at $5 \cdot 10^{-8}$ atm·cm³/s (requirements MIL-STD-883-E). The precise dimensions are given in the Figure 1. The weight of the product is typically smaller than 0.7 grams.

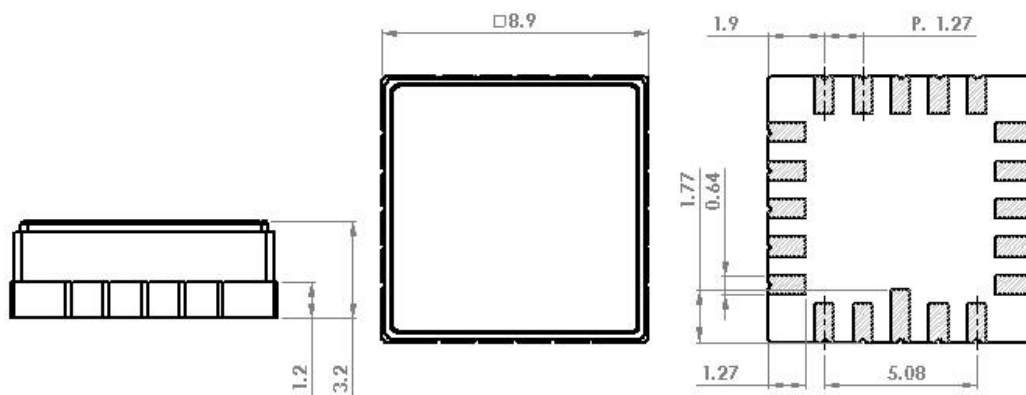


Figure 1 Package general dimensions bottom and side view

3 Physical specifications

Table 2 Physical specifications

Packaging	LCC, 20 pin
Sealing	Hermetically sealed. Sealing process is qualified at $5 \cdot 10^{-8}$ atm·cm ³ /s (requirements MIL-STD-883-E)
Weight	<0.7 gram
Size	8.9X8.9X3.24 mm
Mounting	The bottom plane of the LCC is to be used as a reference plane for axis alignment. Any other way of fixing the sensor on the PCB may degrade the sensor's performance.

4 MAXL-OL-2000 pin-out.



Figure 2 Pinout Description (Top View)

5 Pin configuration and function description

Table 3 Pin description

Pin#	Name	Type/direction	Function
1	NC	NC	
2	NC	NC	
3	NC	NC	
4	VIN	Power	Supply voltage 3.3V.
5	OUTN	Analog output	Negative analog output voltage of the accelerometer.
6	GND	-	GND for IO pads.
7	TEMP	Analog output	Analog output of the temperature sensor
8	OUTP	Analog output	Positive analog output voltage of the accelerometer.
9	NC	NC	
10	NC	NC	
11	NC	NC	
12	NC	NC	

Physical Logic – proprietary

Pin#	Name	Type/direction	Function
13	NC	NC	
14	NC	NC	
15	NC	NC	For internal use. Leave unconnected.
16	GND	-	For internal use. Connect to GND.
17	NC	NC	For internal use. Leave unconnected.
18	NC	NC	For internal use. Leave unconnected.
19	NC	NC	
20	NC	NC	

6 MAXL-OL-2000 Typical application

For the proper and stable MAXL-OL-2000 operation, we recommend connecting the accelerometer with the periphery shown in Figure 3.

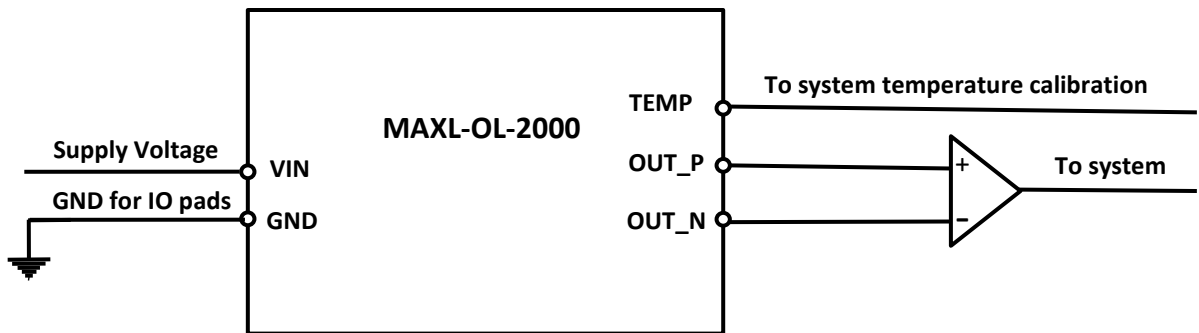


Figure 3 Typical accelerometer application

At power-up, processor (MC) conveys the calibration values to the ASIC and the sensor is ready for normal operation. During this initiation phase (about 50 msec), spikes in current and in the output voltage may appear. Then normal operation current stabilizes at about 13 mA.

7 Electrical specifications

Table 4 Electrical specifications

Supply voltage	3.3 VDC
Output voltage range (OUTP-OUTN)	± 1.5 VDC
Operation current consumption	<13 mA @ 3.3 VDC
Output impedance/load	Min. 800 k Ω load at OUTP and OUTN Max. 0.7 nF load at OUTP and OUTN

8 Temperature Sensor

The temperature sensor installed in the MAXL-OL-2000 accelerometer reflects the sensor’s junction temperature and provides a convenient temperature measurement for system-level characterization and calibration feedback. The calibration of the MAXL-OL-2000 is done during the fabrication process and it is therefore ready for immediate use. The output voltage of the temperature sensor behaves according to the bellow formula:

$$V_0 = K(B + T)$$

Here K- Scale Factor, B- Bias, and T- measured temperature.

Table 5 Temperature Sensor Specifications

Symbol	Parameter	Units	Value
-	Range	°C	-45 to +85
K	Nominal Scale Factor	mV/°C	10.3
-	Nominal Scale Factor Accuracy	mV/°C	0.5
-	Scale Factor Non-Linearity	% of full range	<0.3
B	Nominal Bias	°C	70
-	Nominal Bias Accuracy	°C	2
-	Bias In-run Stability	°C	0.01