SENSOR MODULE
with IHM-A-1500

IMS-B-R0001

data sheet, version 2.0

1. Description

The sensormodul IMS-B-R0001 has been designed for all applications in which high currents, voltages and temperatures have to be measured. It contains a 100 µOhm precision resistor, the ISA-ASIC and all analog circuity for a complete 4-channel 16bit data acquisition system. It has been developed as a highly versatile subunit for a simple integration into an external µC system.

2. Electrical characteristics

Power supply	Min.	Max.
Supply voltage	4.7 V	5.3 V
Supply current	4 mA	6 mA
Current measurement		
Rresistance value of the Shunt	100 µΩ	
Range	±1200 / 300 / 150 / 75 A	
Resolution	40 / 10 / 5 / 2.5 mA	
Voltage measurement		
Range	±30 / 15 / 7.5 / 3.75 V	
Resolution	1 / 0.5 / 0.25 / 0.125 mV	
Differential voltage		
Range	±120 / 30 / 15 / 7.5 mV	
Resolution	4 / 1 / 0.5 / 0.25 µV	
Internal temperature		
Range	-40...+125°C	
Resolution	0.1°C	

3. Electrical circuit

See page 3

4. Pin configuration (left to right)

SIL-type connector
12 PINs, spacing 1.27 mm
solder pads with through connections

number	Function
1	EZPRG [1]
2	CLK [2]
3	SCLK
4	SDAT
5	INTN
6	VDDD [3]
7	GND
8	ETS [4]
9	VBAT [4]
10	V_x [5]
11	V_x DC [6]
12	V_x AC [1]

Notes:

1) not used, should not be connected
2) the clock frequency of a 8 Mhz oszillator has to be applied
3) supply voltage input +5 VDC
4) inputs for differential voltage measurement, if not used connect to GND
5) input for the unkown voltage V_x with reference to GND, the voltage will be seen at the ETR input
6) this line is provided for the external µC to switch the unknown voltage on (high signal) and off (low signal) to reduce to current consumption in the active wake-up mode)

5. Photo

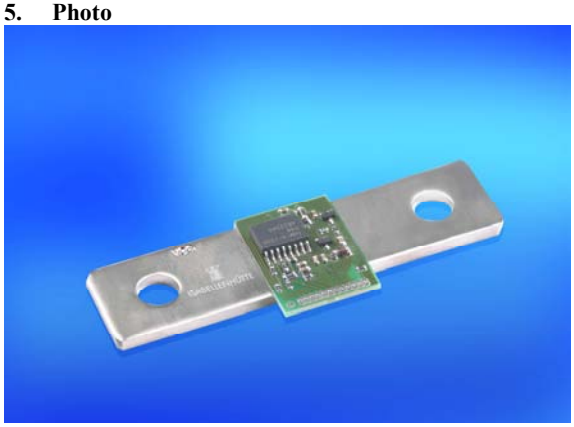


Photo of the sensor module IMS-B-R0001

6. Calibration

The ISA-ASIC on the modul is precalibrated and the calibration constants are written into the ZZR-register which is a OTP-memory. These data are automatically loaded into the RAM register TRR during the power up routine (POR).
The following properties are calibrated:

- offset of the amplifier (TRIMA)
- internal current source (TRIMC)
- absolute value of the reference voltage (TRIMBV)
- TC value of the reference voltage (TRIMBTC)

In addition the ISA-ASIC provides the possibility to calibrate the absolute values of all input channels. The calibration coefficients can also be stored in the ZZR-register (for more details see data sheet of the IHM-A-1500)

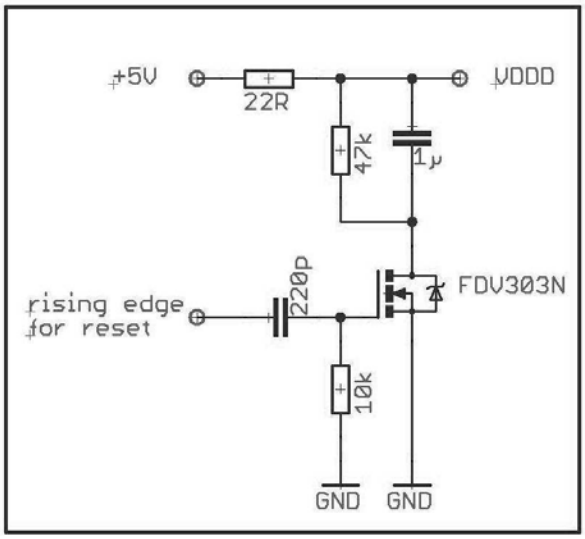
The absolute accuracy depends mainly on the uncertainty of the shunt. For reach the highest accuracy the complete module has to be calibrated on the customer side. For getting a complete calibrated module please have a look on our IMC-A-R0001 data sheet.

7. Shunt drawing

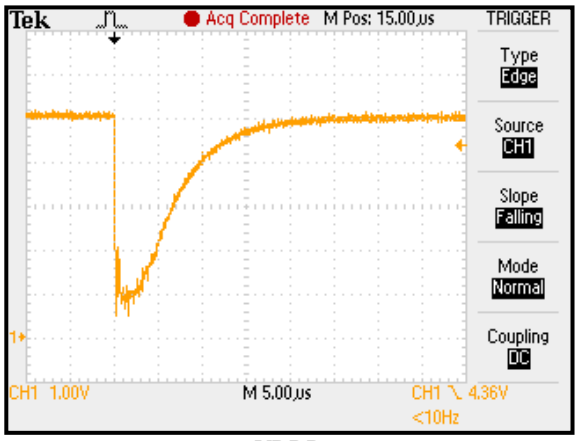
See page 4

8. Reset possibility

To ensure a correct operation over long time it is necessary to supply a possibility to reset the sensormodule from the external µC. To start the ASIC-internal reset procedure the supply voltage has to fall below +3.0 VDC for at least 1 µsec. The electrical circuit shown below can be used to realize this reset. A rising edge at the input will drive VDDD down to nearly 1 VDC for 2 µsec as shown in the screen shot below. After approx. 1 msec the ASIC internal reset procedure is finished and the µC can reprogram the internal registers for the application configuration.



Electrical circuit for reset-possibility

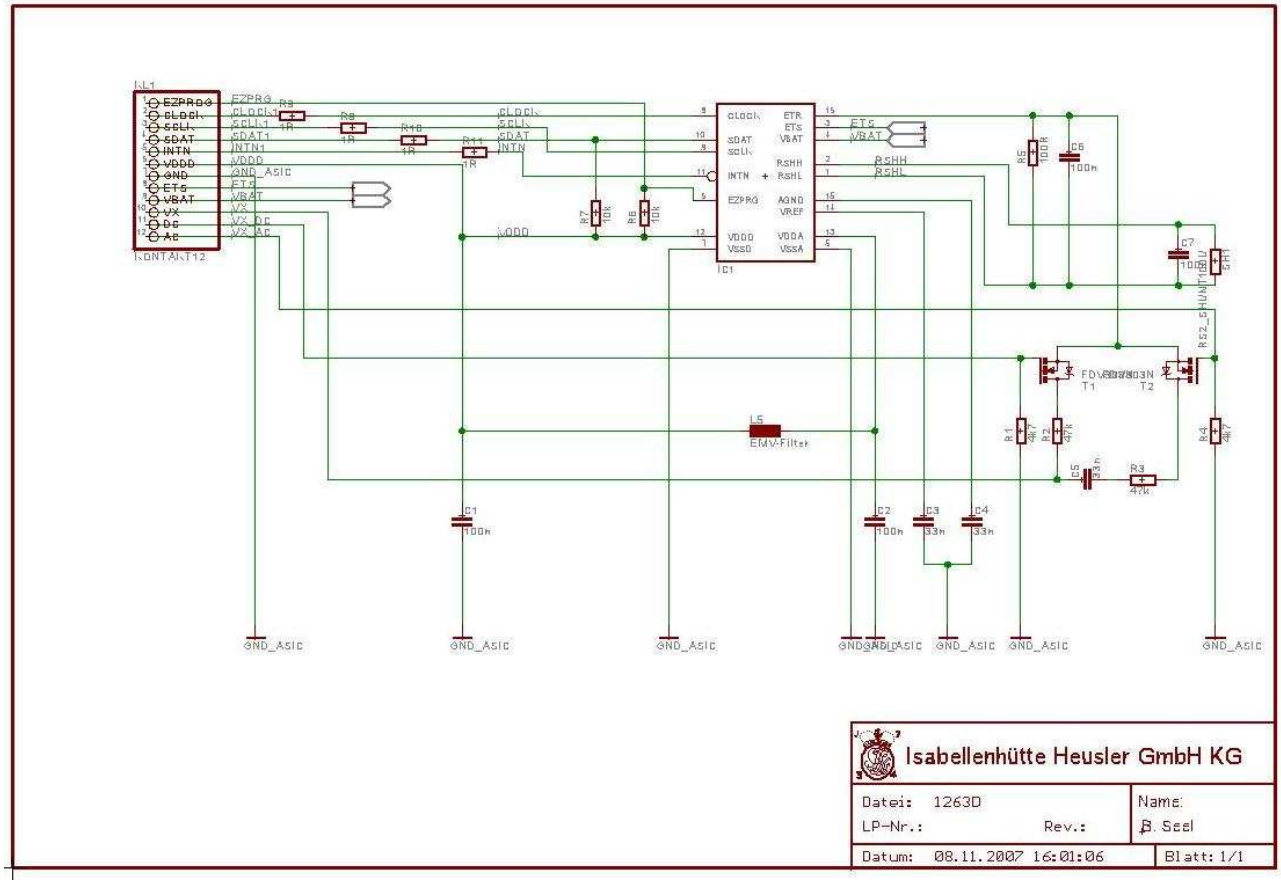


VDDD

9. General

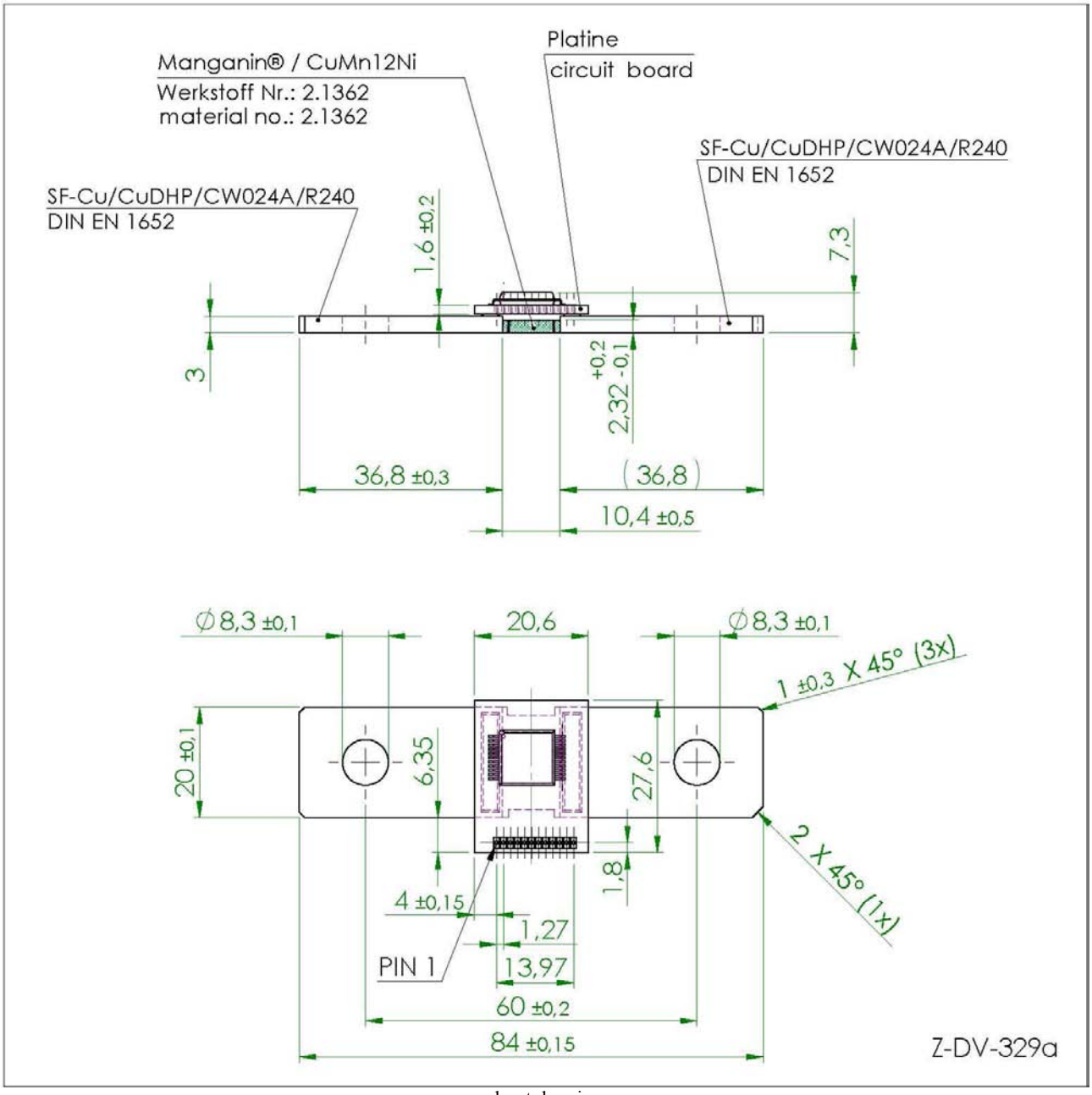
For a fast and easy start with this module the source code for the serial communication between the ISA-ASIC and the external µC can be provided in C-code.
The driving power of the digital output lines of the ASIC is limited, therefore the lenghth of the connector lines to the external µC should be as short as possible. It should never exceed a length of 100 mm to avoid errors due to dropout and interferences.

Electrical circuit



electrical circuit of IMS-B-R0001

drawing-no. Z-DV-329a



shunt drawing