

# PTC04-DB-90316

Daughter Board for Melexis PTC devices

## Features and Benefits

PTC04 interface board for testing devices:

- MLX90293
- MLX90316
- MLX90324
- MLX90333
- MLX90360
- MLX90364
- MLX90365
- MLX90367

## Applications

Experimental tool for Lab and Prototyping  
Production Equipment for Serial Programming

## Ordering Information

**Part No.**

PTC04-DB-90316

**Description**

Default Daughter Board (Board + rear panel PTC04)

## Accessoires

**Part No.**

DLL's for all supported products

User Inter Faces for supported products

**Description**

## 1. Functional Diagram

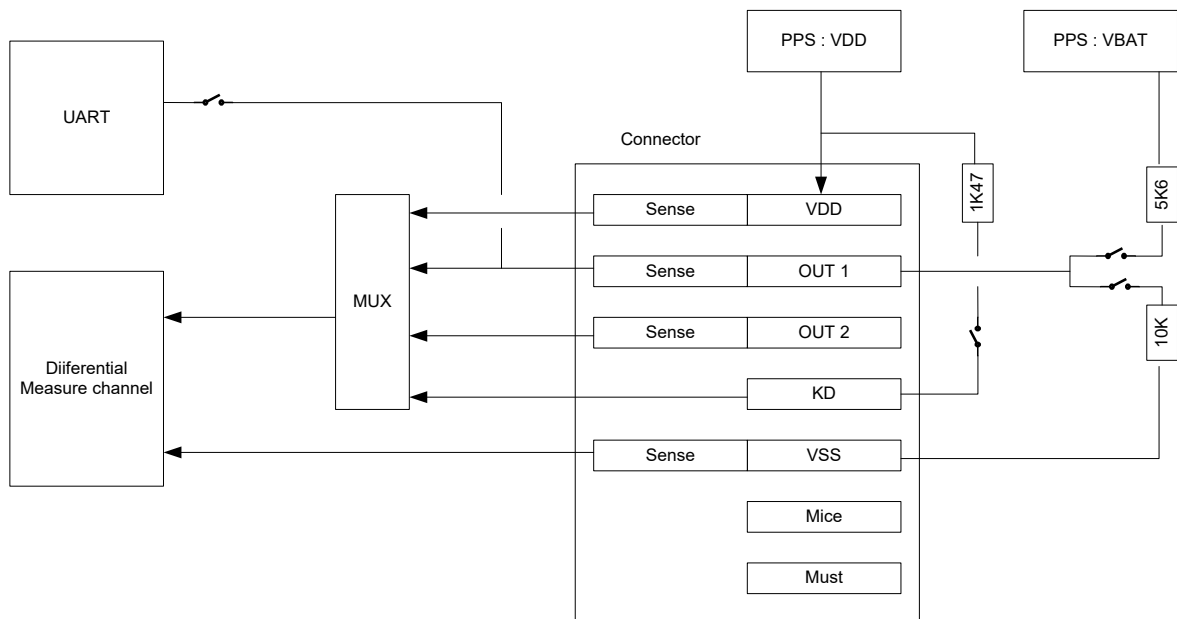


Figure 1: Functional diagram

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## 2. Board description

### 2.1. Board Layout

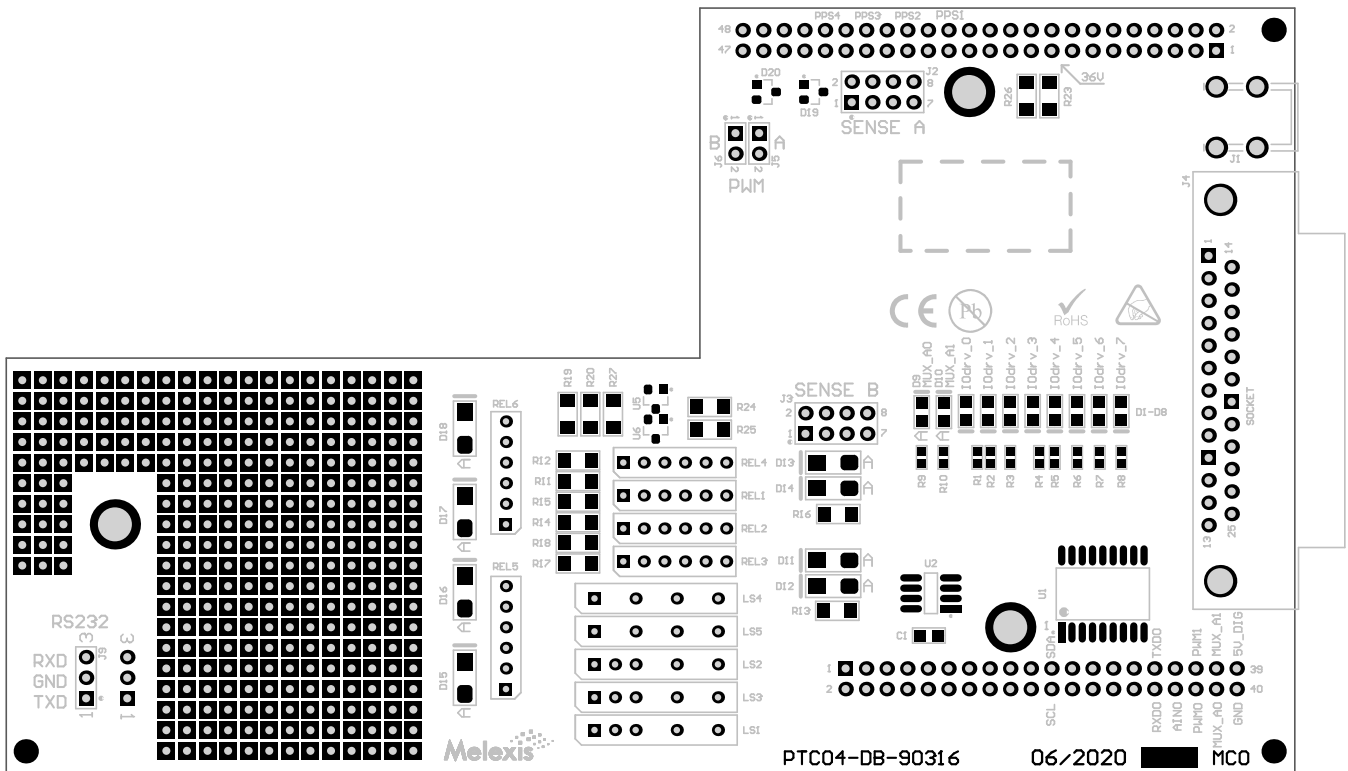


Figure 2: Top layer

- J5, J6: Connect PWM0 and PWM1 channels to OUT1A\_Sense and OUT1B\_Sense through relays LS2 and LS3. These jumpers are needed when PWM mode of MLX90316 is used.
- J2, J3: Jumpers to connect the measurement sense lines immediately to the force lines. These jumpers are needed when no force and sense is used.
- U2: This EE memory keeps a few initial variables in mind. It allows for example to detect what DB is connected to the programmer and if the DB is not expired.
- Analog and Digital connector: See below for a detailed description
- DB Connector: Connector to the application. See below for details
- J9: RS232 lines. Used for connecting a scope during debug, measurements, etc.
- J1: GND connection to back panel.

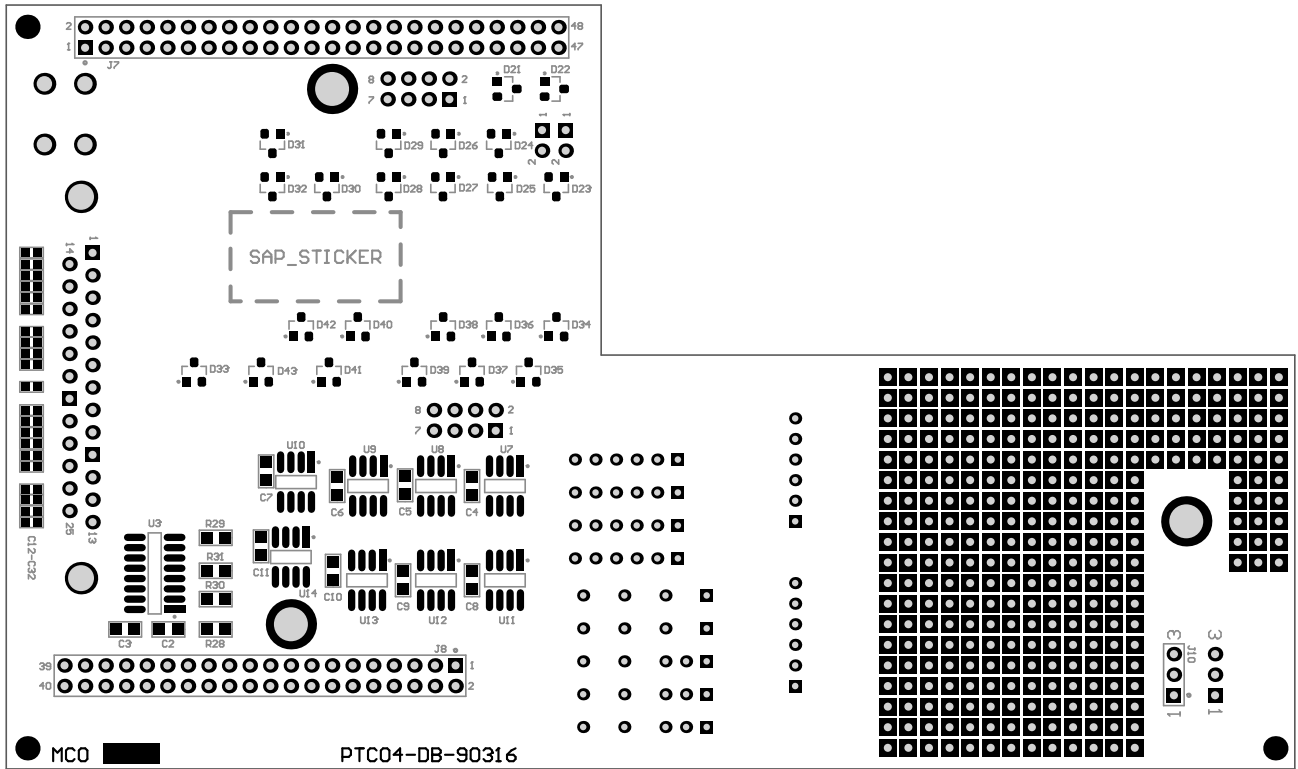


Figure 3: Bottom layer

## 2.2. Board Schematic

### 2.2.1. Main circuit

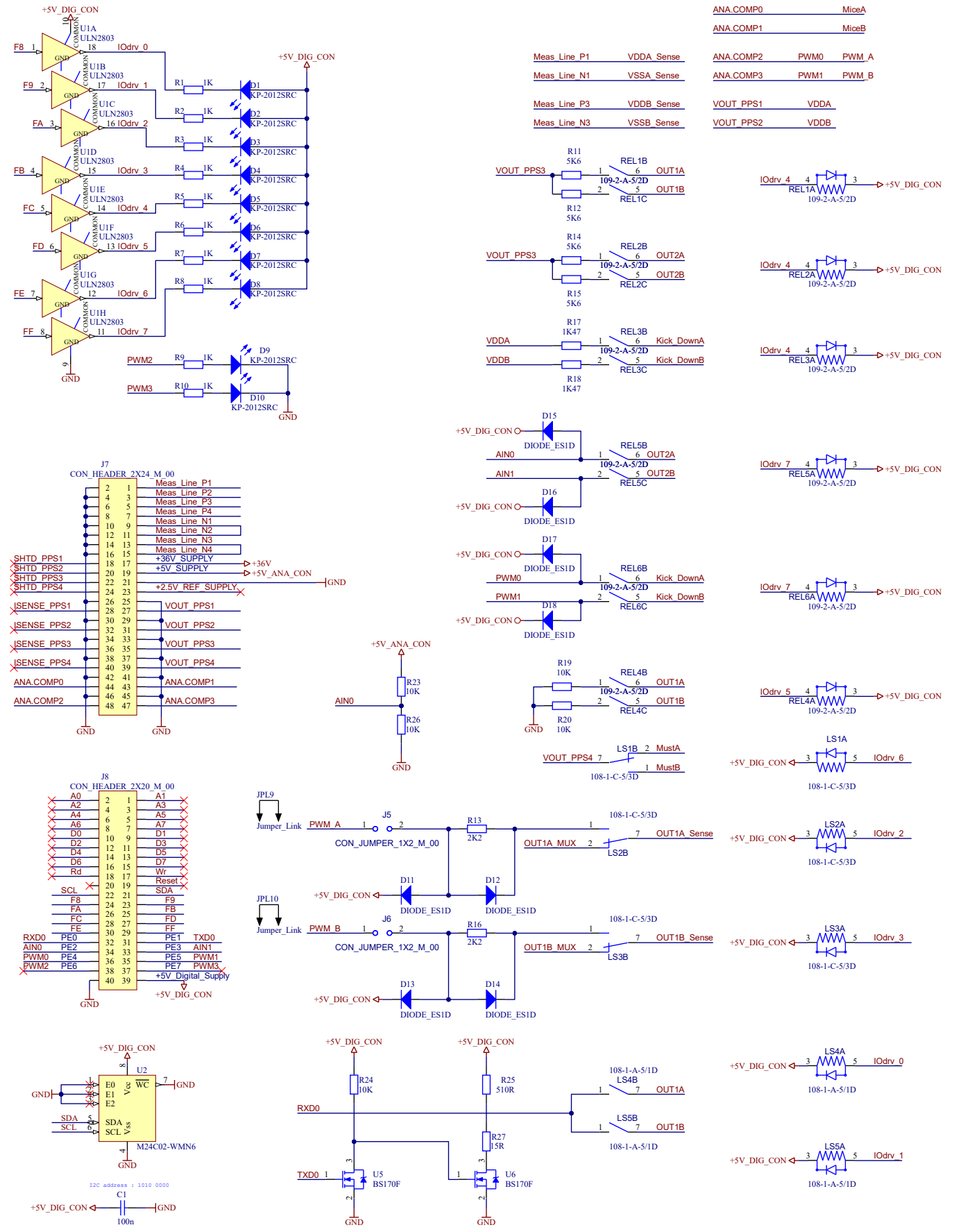


Figure 4: Main Circuit part 1

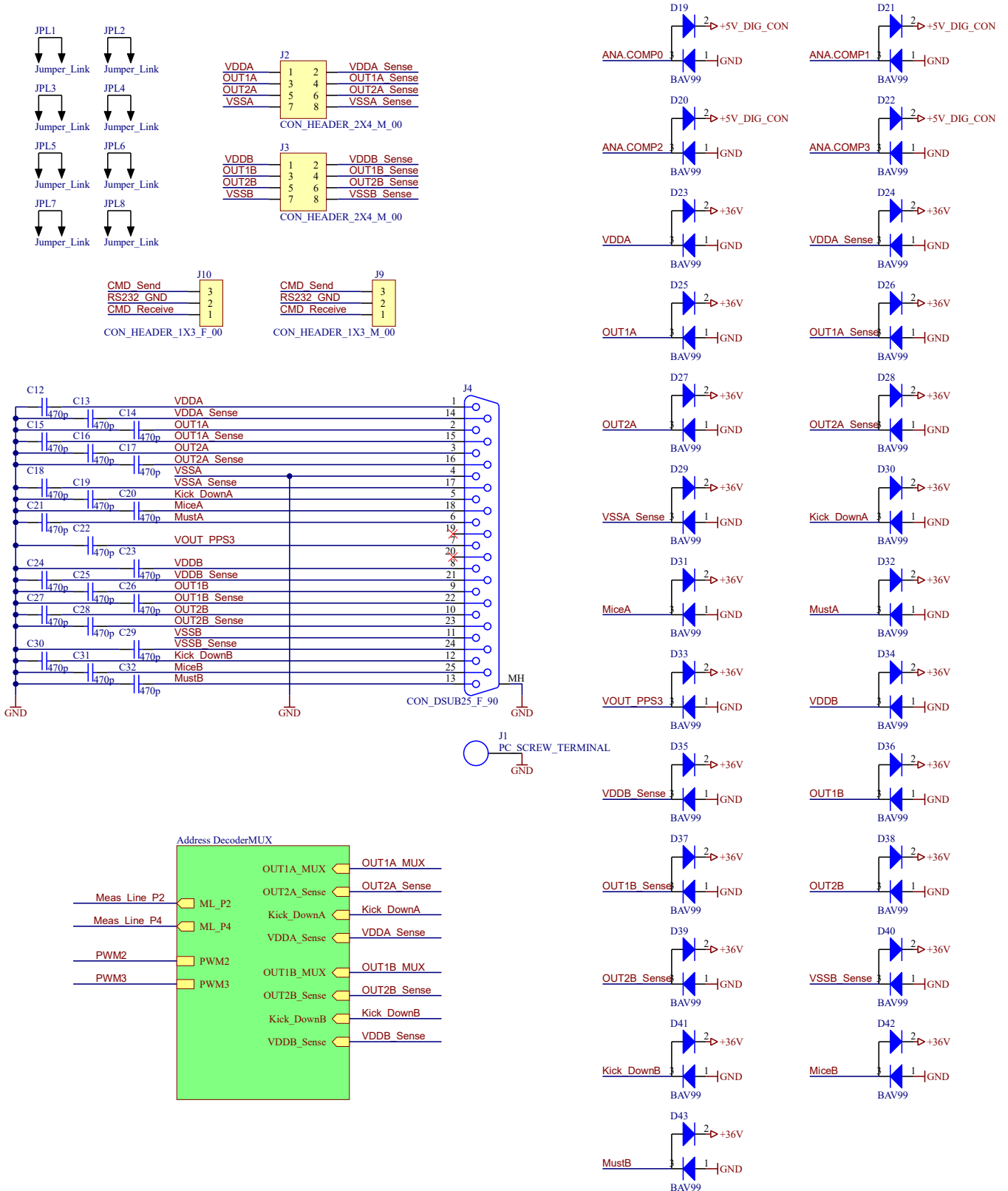


Figure 5: Main Circuit Part 2

### 2.2.2. Address Decoder MUX circuit

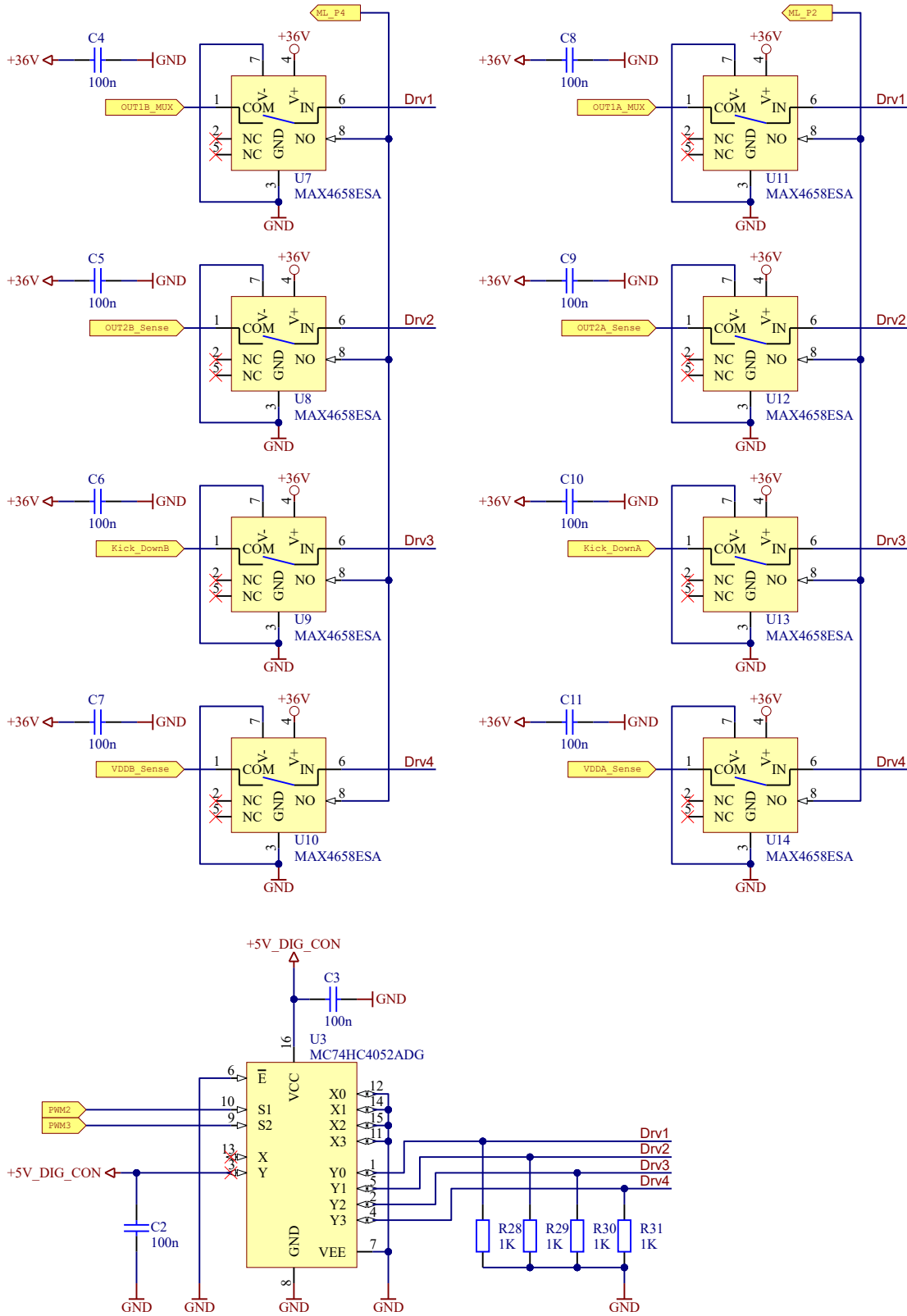


Figure 6: Address Decoder MUX circuit

### 2.3. Daughter board Connectors

The main board has two connectors to the interface with the application. The PTC allows adding a full PCB in between. This daughter board can be mounted on the two connectors. In some exceptional cases, a daughter board contains only a few wires from the Analog connector to the application connector. The pins on of the connectors are described below.

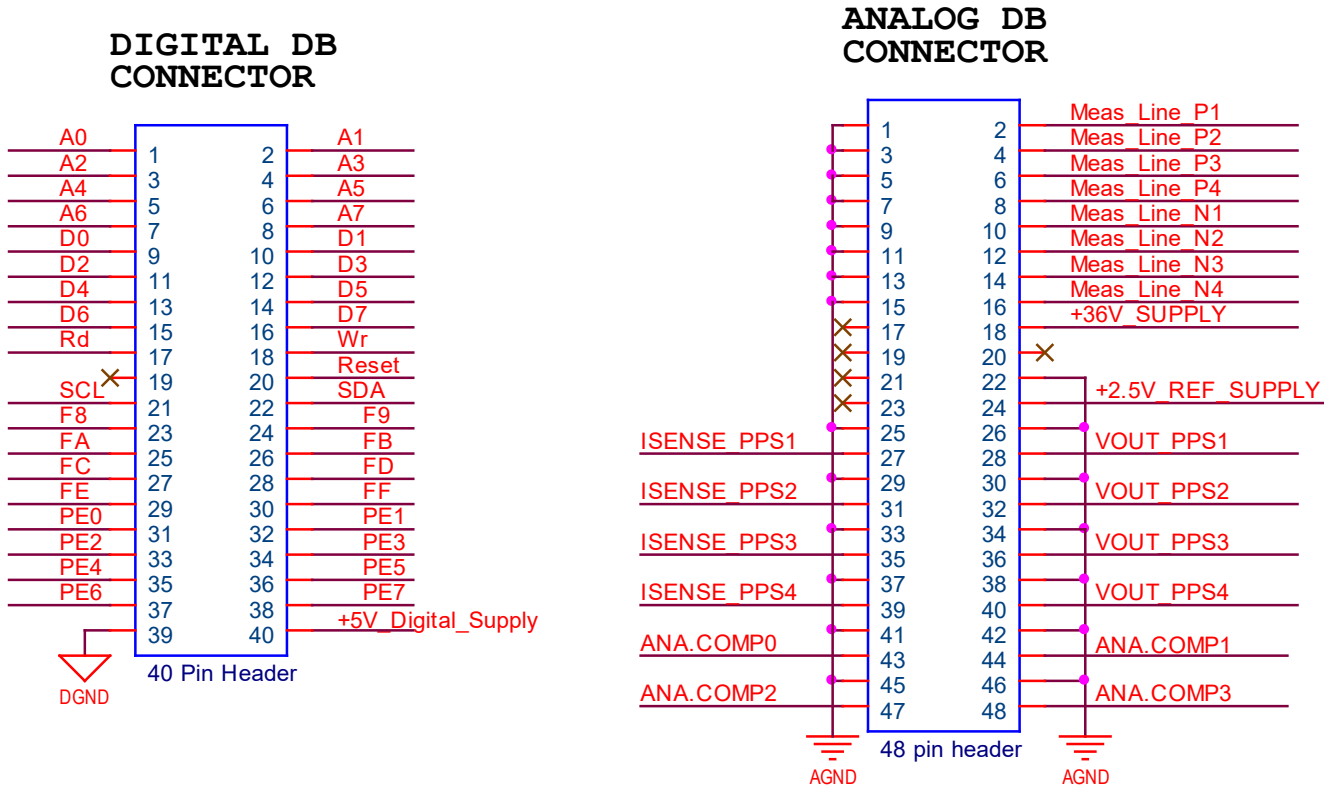


Figure 7: Daughter Board Connectors



### 2.3.1. Digital DB Connector (40 Pins)

Mainly, the digital connector is meant to expand the programmer to extra needs. Address lines A0-A7 together with the Map Select Lines F8-FF allows to direct access an area of 2 K. Examples would be adding a simple addressed I/O register by using the selection lines. If more complexity is needed, a full FPGA can be mounted on the DB board

Pins	Names	Description
1 – 8	A0 – A7	Address lines
9 – 16	D0 – D7	Data Lines active during Rd or Wr signals
17	Rd	Read: A negative pulse will indicate a sampling of the data on the Data Bus
18	Wr	Write: A Negative pulse will indicate when data is available on the Data Bus
20	Reset	This signal goes low by powering the PTC or by pressing the reset button. This line can be pulled low by application. Check firmware documentation for resetting by software.
21-22	SCL / SDA	I2c Bus
23-30	F8,F9,...,FF	CS lines when the address areas are accessed
31-38	Port E	Note: These pins are limited to 5 Volt input\output!!!! The full Port E of the Atmega core is mounted to these pins. This allows us to use advanced features like PWM, UARTS, Time Measurements, etc.... By using firmware that supports these, functions, application specific requirements can be fulfilled.
39	DGND	Digital Ground
40	+5V Digital	5 Volt Digital Supply. Maximum current to get out of this supply: 250mA

*Note: All the pins are limited to 5 Volt input\output!!!! However, there are Protections, please take precautions in order to avoid damage of the main board.*

### 2.3.2. Analog DB Connector (48 Pins)

Mainly, the analog connector provides all the analog signals and measure possibilities.

Pins	Names	Description
28,32,36	PPS 1-3	Output of the Programmable Supplies
40	PPS 4	Output of the Fast DAC Programmable Power Supply
27,31,35,39	Isense_PP1-4	Outputs (Driver outputs before Rsens) for current evaluations. These outputs could be used to connect to the analog comparators in order to create fast digital signals based on current.
2,4,6,8	ExtMeas1-4Pos	There are 4 differential inputs for making measurements
10,12,14,16	ExtMeas1_4Neg	The negative inputs of ExtMeas1-4Pos
17,19,21,23	Shtd_PPS1-4	Outputs that shows the status of the Drivers. Signals are meant to connect LED's to put the front panel
43,44,47,48	AnaComp0-3	Input (limited to 5V) See *Note. Fast Level comparators in order to remove time consuming measurement
18	+35V_Supply	Supply to extend the daughter board with some extra drivers
24	+2.5V Ref	Output of internal reference
All other	AGND	Analog Ground

*Note: All the pins are limited to 35 Volt input\output!!!! However, there are Protections, please take precautions in order to avoid damage of the main board.*

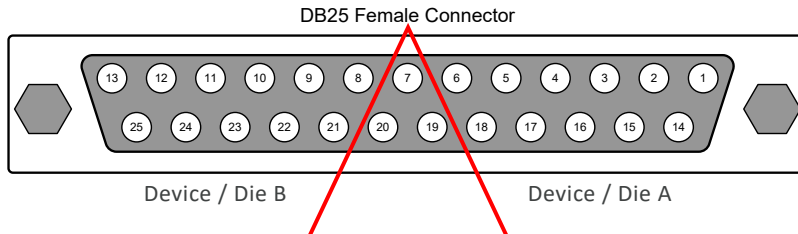
*\* Note: Some pins are protected and limited to 5 Volt!!!! However, there are Protections, please take precautions in order to avoid damage of the main board.*

## 2.4. Application Connector

The figure and table below shows the connections as provided by the daughterboard PTC04-DB-90316.

The view of the connector is **front view** for the **female** connector of the PTC04-DB-90316 which corresponds to the **solder side** of the **male** connector.

The right side of the connector is used for device / die A, the left side of the connector is used for device / die B.



# PTC04-DB-90316

Daughter Board for Melexis PTC devices



PTC04			90316 90324		90333 90316BCS		90364	90293 90360 90365 90367	
D-SUB 25			SO	TSSOP	SO	TSSOP	DMP	SO	TSSOP
Pin	Names	Description	Pin	Pin	Pin	Pin	Pin	Pin	Pin
1	VDDA	Supply Device A (Minimum required single die connection)	1	3	1	3	2	1	3
2	OUT1A	Output 1 Device A (Minimum required single die connection)	5	15	5	15	3	5	15
3	OUT2A	Output 2 Device A			4	14			
4	VSSA	Analog Ground Device A (Minimum required single die connection)	8	2	8	2	4	8	2
5	Kick_DownA	Test Signal Device A							
6	MustA	Test Signal Device A							
7	VOUT_PPS3	Programmable Power Supply 3							
8	VDDDB	Supply Device B (Minimum required dual die connection)		11		11			11
9	OUT1B	Output 1 Device B (Minimum required dual die connection)		7		7			6
10	OUT2B	Output 2 Device B				6			
11	VSSB	Analog Ground Device B (Minimum required dual die connection)		10		10			10
12	Kick_DownB	Test Signal Device B							
13	MustB	Test Signal Device B							
14	VDDA_S	Sensing Supply Device A	1	3	1	3	2	1	3
15	OUT1A_S	Sensing Output 1 Device A	5	15	5	15	3	5	15
16	OUT2A_S	Sensing Output 2 Device A			4	14			
17	VSSA_S	Sensing Analog Ground Device A	8	2	8	2	4	8	2
18	MiceA	Test Signal Device A							
19	NC	Not Connected							
20	NC	Not Connected							
21	VDDDB_S	Sensing Supply Device B		11		11			11
22	OUT1B_S	Sensing Output 1 Device B		7		7			6
23	OUT2B_S	Sensing Output 2 Device B				6			
24	VSSB_S	Sensing Analog Ground Device B		10		10			10
25	MiceB	Test Signal Device A							

## 2.5. Jumper Selection

### 2.5.1. J2 and J3 – short measuring lines

The D-SUB DB-25 connector of the daughter board is equipped with a sensing line for each analog device pin.

The top row is the force line of the device pins. The bottom row is the sensing line of the device pins.

Between each force and sense line there is a jumper to short the sense line at the DB-25 connector on the daughter board.

The jumper is placed when the external sensing is not required. For example: an application with a digital or PWM output.

In other words, they are used to select single wire or double wire connection to the pin of the module / sensor.

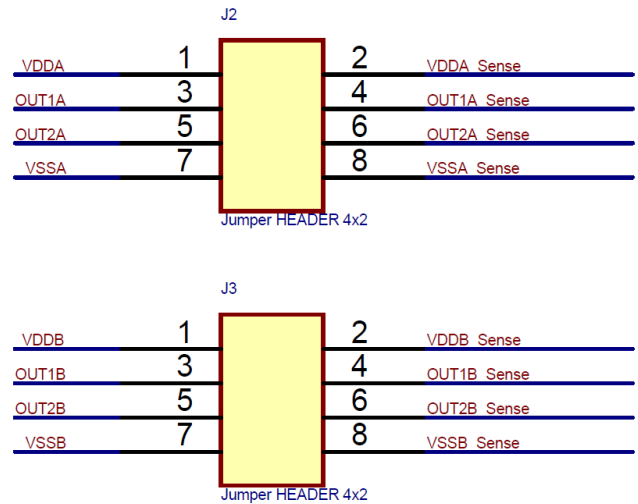


Figure 8: Jumper between force and sense line.

J2 and J3 are used to short the force and sense line of the analog device pins.

- J2 → Device / Die A
- J3 → Device / Die B

#### Single wire connection

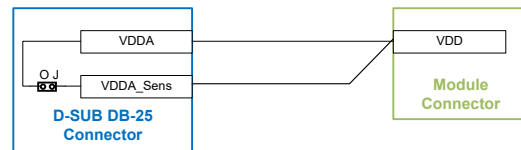


When the jumper is closed, only one wire is required **per pin** between the PTC-04 and the module or sensor.

In the table above these pins are marked as “Minimum required single/dual die connection”.

In this configuration the measurement of VDD, OUT1 or OUT2 is done at the D-SUB DB-25 connector of the PTC04-DB-90316.

#### Double wire connection



When the jumper is open, two wires are required **per pin** between the PTC-04 and the module or sensor.

With two wires connected at the module side, the measurement of VDD, OUT1 or OUT2 is done on the module or sensor connector.

The external sensing line per pin is only required for applications with an analog sensor output and where a higher measuring accuracy is required.

### 2.5.2. J5 and J6 – PWM measurement

J5 and J6 are required for PWM measurements on OUT1A\_Sense and OUT1A\_Sense.

### 3. Contact

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