STMicroelectronics

MEMS Module
STMEMSDQ-EVAL1

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USER MANUAL

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USER MANUAL

MEMS Module STMEMSDQ-EVAL1
Dedicated to uPSD Evaluation Kit DK34XX

Introduction

The MEMS module STMEMSDQ-EVAL1 is designed for the evaluation of a MEMS (Micro-Electro-Mechanical System) application which can be used in a variety of vibration sensor and intelligent movement estimator situations, for example:

- Scrolling of documents, maps and images larger than the display window
- Web page browsing
- Menu navigation
- Gaming
- Context awareness
- Automatic portrait-landscape adaption
- Pedometer
- System wake-up
- Motion control

The MEMS module contains only the most important parts necessary to test the functionality of the MEMS application. The module can be simply connected to the uPSD evaluation kit DK34XX.

The main features of the MEMS module include:

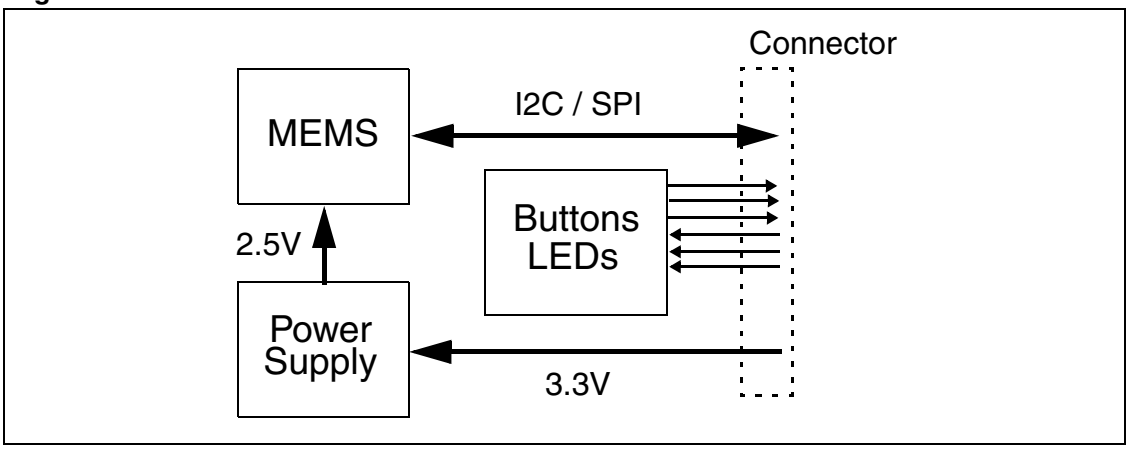
- Three LEDs and buttons for general purpose, driven from the main uPSD board.
- 2.5V regulator on the module.
- LIS3LV02DQ Inertial Sensor chip

Further documentation related to MEMS can be found on the website: http://www.st.com/mems

1 General description

The basic block diagram is shown in *Figure 1*.

Figure 1. MEMS module



1.1 Main features of the LIS3LV02DQ chip

The STMEMSDQ-EVAL1 features an Inertial Sensor chip, LIS3LV02DQ, which is a low-voltage 3-axis vibration and movement sensor. The features of the chip include:

- 2.4V single supply operation, 1.8V compatible IOs, low power operation ~ 1mA
- I2C/SPI Digital output interfaces
- Motion activated interrupt source
- Factory trimmed device sensitivity and offset
- Embedded self test, High shock survivability
- QFN-28, ordering number: LIS3LV02DQ.

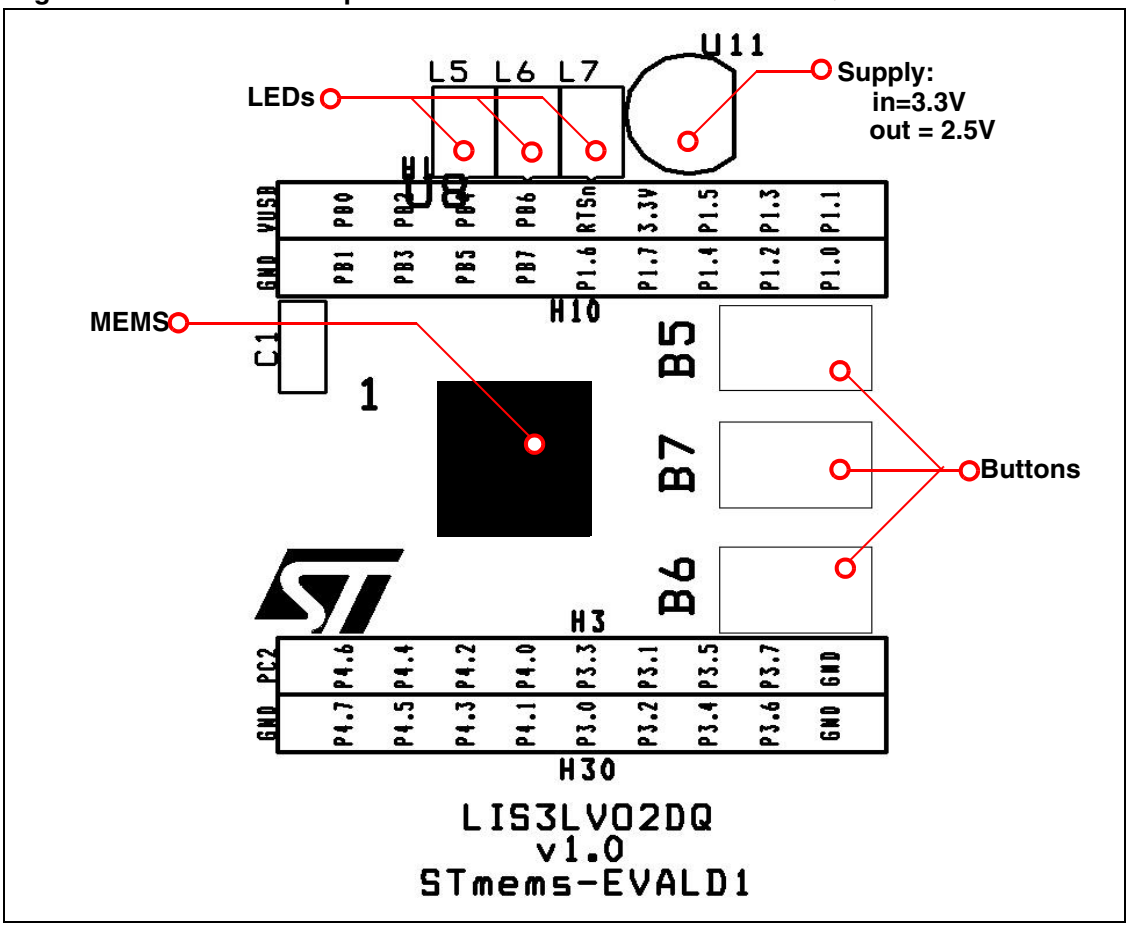
1.2 Main features of DK34XX - uPSD evaluation kit

- uPSD34xx, 3.3V regulator, step-up from batteries and caps, real-time clock.
- Dimensions 3 x 7 cm. USB connector, JTAG connector.

2 Board setup

The top silkscreen of the MEMS Module STMEMSDQ-EVAL1 is shown in *Figure 2*. Real photos of the assembly are shown in the *Section 3*.

Figure 2. Detailed description of the MEMS Module STMEMSDQ-EVAL1



2.1 Buttons

Table 1. Button description

Button	uPSD signal denotation
B5	P15 / Ai5 - port 1, bit 5
B6	P16 / Ai6 - port 1, bit 6
B7	P17 / Ai7 - port 1, bit 7

2.2 LEDs

Table 2. The meaning of the LEDs

LED	uPSD signal denotation
D5	PB5 - port B, bit 5
D6	PB6 - port B, bit 6
D7	PB7 - port B, bit 7

2.3 Connectors

Table 3. The connector H30, H3, H10 and H1 pin out

Position	Signal denotation on the uPSD pin out			
	H30	H3	H10	H1
	H30	H3	H10	H1
1	P4.7	P4.6	PB1	PB0
2	P4.5	P4.4	PB3	PB2
3	P4.3	P4.2	PB5	PB4
4	P4.1	P4.0	PB7	PB6
5	P3.0	P3.3	P1.6	RTSn
6	P3.2	P3.1	P1.7	3.3V
7	P3.4	P3.5	P1.4	P1.5
8	P3.6	P3.7	P1.2	P1.3
9	GND	GND	P1.0	P1.1

3 MEMS module STMEMSDQ-EVAL1 + uPSD DK34XX evaluation kit

3.1 Daughter and mother board images

Both are connected together, however do not exceed the dimensions 7 x 4 cm.

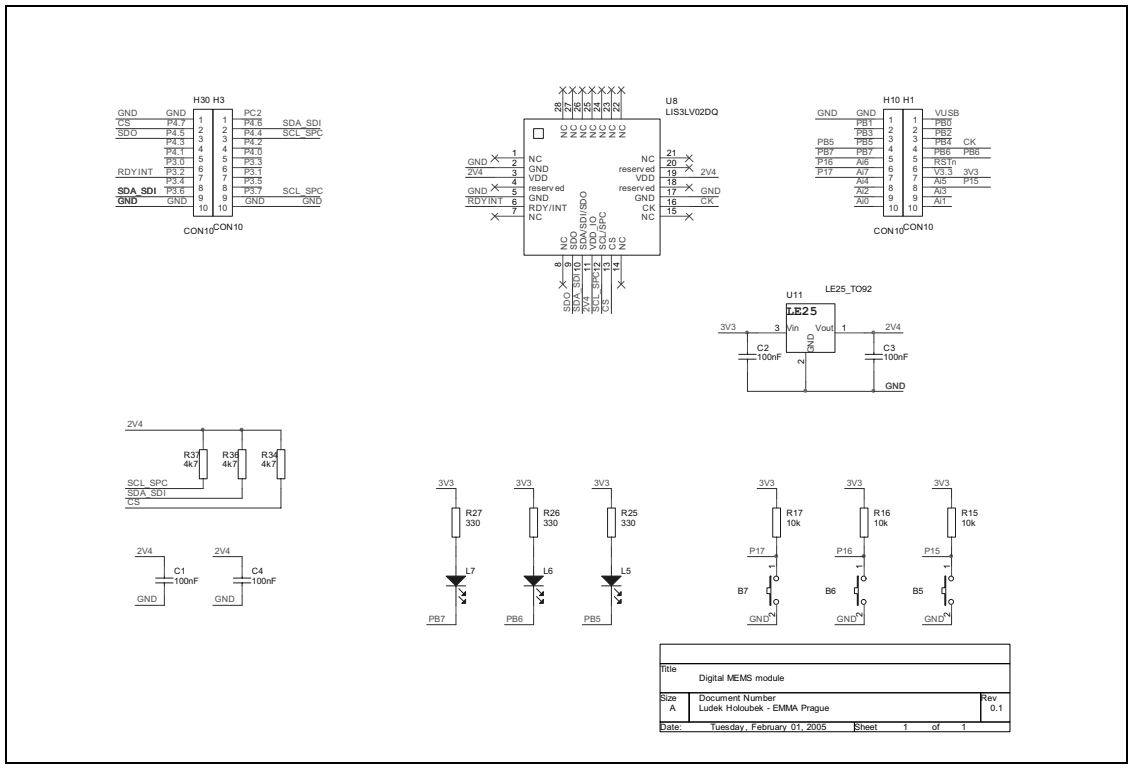
Figure 3. MEMS module STMEMSDQ-EVAL1 + uPSD DK34XX evaluation kit

3.2 Design and layout guidelines

To avoid any stress on the MEMS package or the PCB around it, do not use the central pad under the MEMS. In addition, note that care should be taken with other sources of stress such as the screw holes.

3.3 Schematic

The schematics for the MEMS module STMEMSDQ-EVAL1 are shown below:



3.4 Bill of materials

The Bill of Materials for the MEMS Module STMEMSDQ-EVAL1 evaluation board is as follows:

Item	Quantity	Reference	Part
1	3	B5,B6,B7	Button
2	4	C1,C2,C3,C4	100nF
3	4	H1,H3,H10,H30	CON10
4	3	L5,L6,L7	DPB0
5	3	R15,R16,R17	10k
6	3	R25,R26,R27	330
7	3	R34,R36,R37	4k7
8	1	U8	LIS3LV02DQ
9	1	U11	LE25_TO92

4 Revision history

Date	Revision	Description of changes
13-Sep-2005	0.1	Initial release of document

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