

TDK-InvenSense EV_IIM-42351 Evaluation Board (EVB) User Guide

1 PURPOSE

This document describes the hardware and circuitry on the TDK-InvenSense EV_IIM-42351 evaluation board for TDK motion sensor IIM-42351.

This user guide also covers the key signals, circuit functions, hardware jumper settings, and interface connections.

1.1 USAGE

The IIM-42351 is a 3-axis accelerometer packaged in a small 2.5 mm x 3 mm x 0.91 mm (14-pin LGA) package.

The host interface can be configured to support I3CSM slave, I²C slave, or SPI slave modes. The I3CSM interface supports speeds up to 12.5 MHz (data rates up to 12.5 Mbps in SDR mode, 25 Mbps in DDR mode), the I²C interface supports speeds up to 1 MHz, and the SPI interface supports speeds up to 24 MHz.

The EV_IIM-42351 may be connected to a TDK-InvenSense DK board (development kit MCU host board) to use the TDK-InvenSense MotionLink software.

The EV_IIM-42351 evaluation board is lead-free and RoHS compliant.

1.2 RELATED DOCUMENTS

Please refer to the product specification of the IIM-42351 for mechanic, electrical characteristics, pinout, sensor configuration registers, and applications details. The datasheet can be found at [invensense.tdk.com](https://www.invensense.tdk.com).

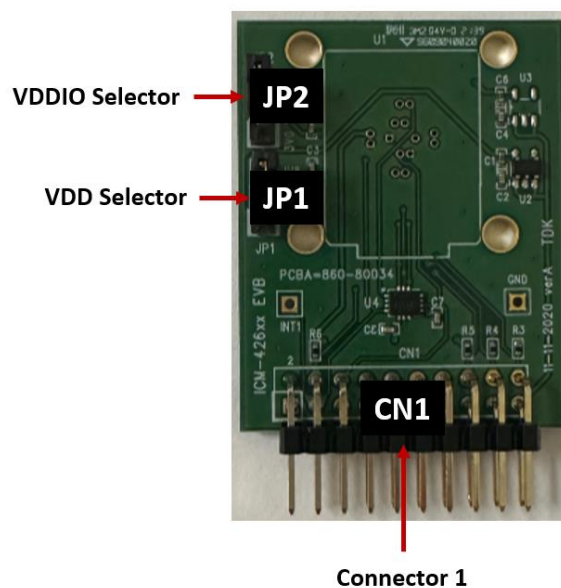


Figure 1. IIM-42351 EVB

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2 EV_IIM-42351 EVALUATION BOARD OVERVIEW

The EV_IIM-42351 evaluation board hosts the IIM-42351 TDK-InvenSense motion sensor which is in a small 2.5 x 3 mm 14-pin LGA package.

The digital signal IO voltage (VDDIO) and chip operation voltage (VDD) can be selected between 1.8V and 3.0V.

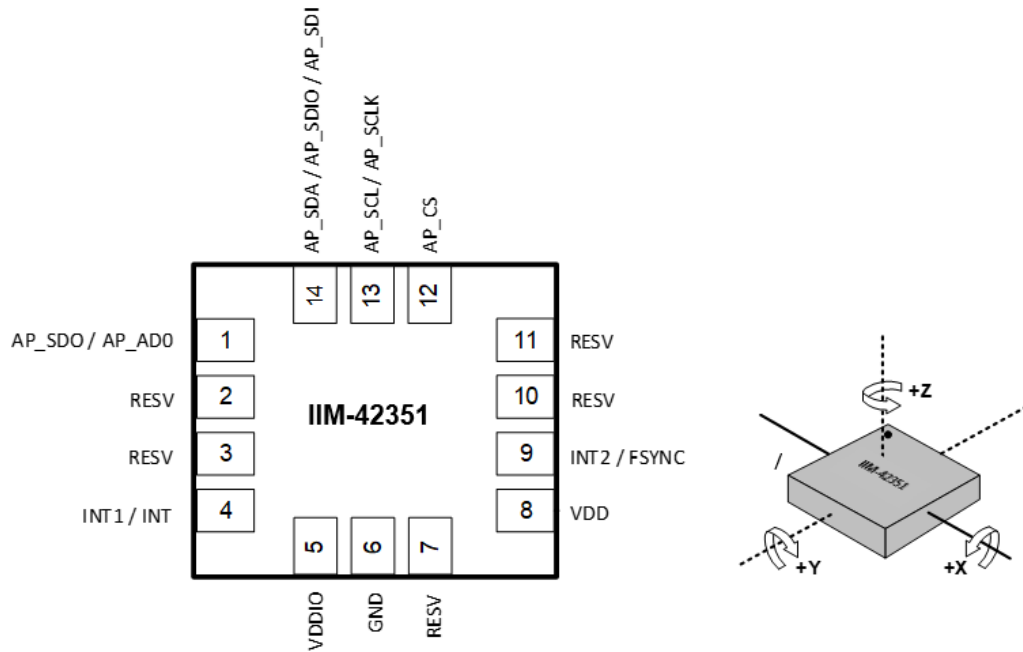


Figure 2. Pin Out Diagram for IIM-42351 2.5x3.0x0.91 mm LGA

The EV_IIM-42351 evaluation board is populated with components only on its top side to achieve ease of jumper setting access. Board name, code, and date are printed on the top side too. There is no component and silkscreen print on the bottom side.

Please note, the same PCB fab may be used for TDK-InvenSense other motion sensors.

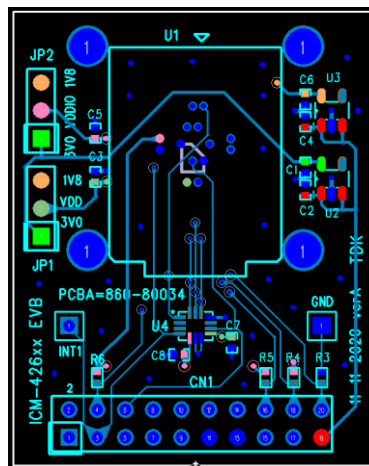


Figure 3. Evaluation board top side

3 EV_IIM-42351 EVALUATION BOARD SCHEMATICS

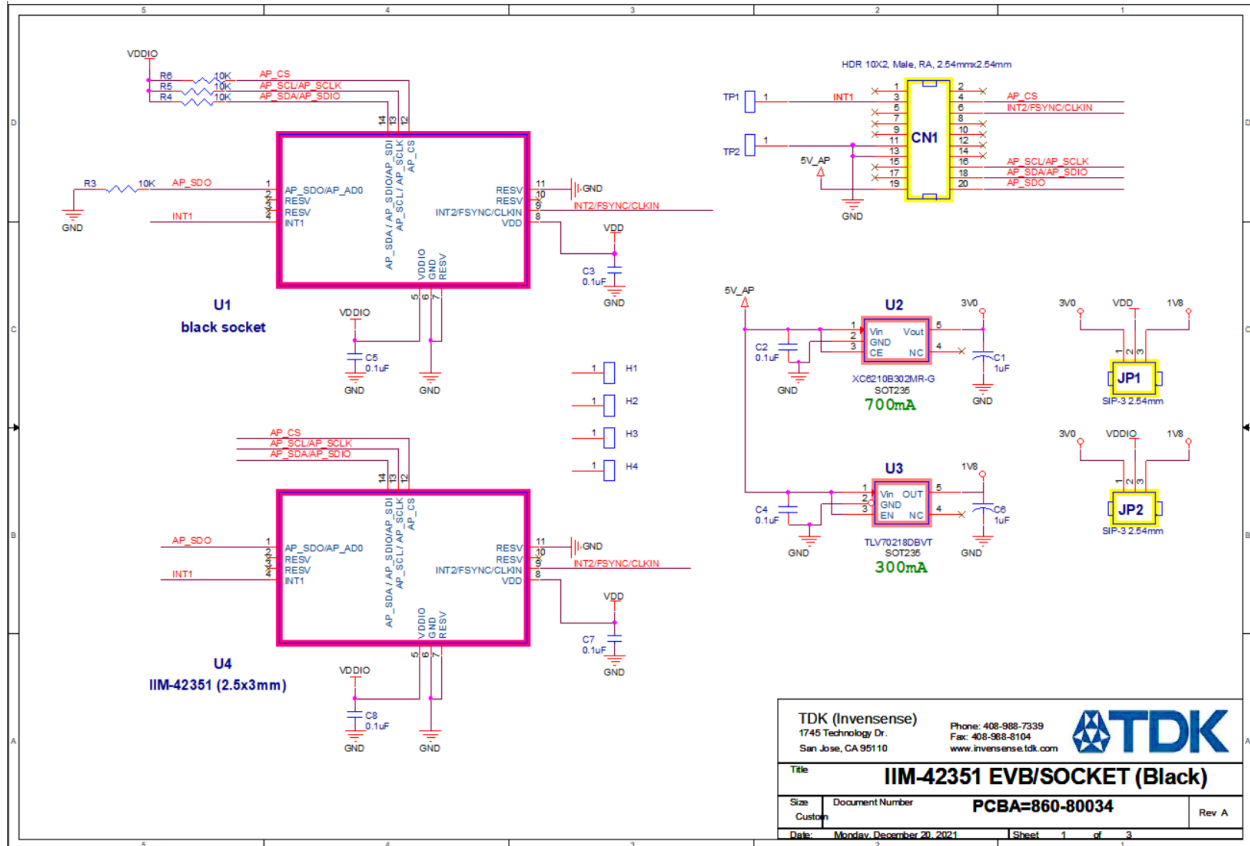


Figure 4. EV_IIM-42351 Evaluation Board Schematics

4 BILL OF MATERIALS (BOM)

The BOM the evaluation board is provided below for reference.

QUANTITY	REFERENCE	PART	MANUFACTURER	MANUFACTURER'S PART NUMBER
1	CN1	HDR 10X2, Male, RA, 2.54mmx2.54mm	Würth	61302021021
2	JP1,JP2	SIP-3 2.54mm	FCI	68000-103HLF
2	C1,C6	1uF	Murata	GRM155R61A105KE15D
6	C2,C3,C4,C5,C7,C8	0.1uF	Yageo	CC0402KRX5R6BB104
4	R3,R4,R5,R6	10K	Yageo	RC0402JR-0710KL
1	U1	Socket – Not Mounted	N/A	N/A
1	U2	XC6210B302MR-G	Torex	XC6210B302MR-G
1	U3	TLV70218DBVT	TI	TLV70218DBVT
1	U4	IIM-42351 (2.5x3mm)	TDK	YOK-C1 LGA

Table 1. Bill of Materials

5 CONNECTOR AND JUMPERS

CN1 is used for I²C/I³C/SPI host communication, IRQ, and power supply connection.

CONNECTOR REF. NAME	PIN #	SIGNALS
Connector 1 (CN1)	3	INT1
	4	AP_CS
	6	INT2/FSYNC/CLKIN
	11,13	GND
	16	AP_SCL/AP_SCLK
	18	AP_SDA/AP_SDIO
	19	5V_AP
	20	AP_SDO
	1,2,5,7,8,9,10,12,14,15,17	NC

Table 2. CN1 Signals

JP1 and JP2 are jumpers to select VDD and VDDIO voltage level.

CONNECTOR REF. NAME	PIN #	SIGNALS	DESCRIPTION
VDD Selector (JP1)	1	3.0V	Jumper short on pin 1/2: VDD = 3.0V
	2	VDD	
	3	1.8V	Jumper short on pin 2/3: VDD = 1.8V
VDDIO Selector (JP2)	1	3.0V	Jumper close on pin 1/2: VDDIO = 3.0V
	2	VDDIO	
	3	1.8V	Jumper close on pin 2/3: VDDIO = 1.8V

Table 3. JP1 and JP2 Signals

6 HOST INTERFACE OPTIONS

EV_IIM-42351 sensor data can be read using the jump wires or by soldering the required pins from CN1 to the external host CPU.

The evaluation board can be directly plugged in via CN1 to a TDK InvenSense SmartMotion Host Interface board (e.g., DK-UNIVERSAL-I) ordered separately.

7 ELECTROSTATIC DISCHARGE SENSITIVITY

The IMU sensor can be permanently damaged by electrostatic discharge (ESD). ESD precautions for handling and storage must be taken to avoid damage to the devices.

8 REVISION HISTORY

DATE	REVISION	DESCRIPTION
08/20/2024	1.0	Initial release
09/25/2024	1.1	Updated Figure 2 with correct package height
10/10/2024	1.2	Updated schematics, BOM, board picture, and connection descriptions

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