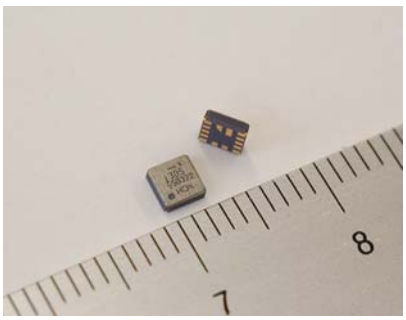
# Digital Output Type 3-axis Acceleration Sensor

## HAAM-385

## ■ Features

- 12-bit digital acceleration signal output
- Serial Interface available (I2C or SPI)
- Low Voltage Drive (2.4V～), Interface block can be driven by as low as 1.7V
- Low Power Consumption ・Standby mode : 2μA Max
  ・Normal mode : 350μA Max. (at 200Hz)
- Various output interrupt signals by preset threshold (Wakeup, Shock detection ,Drop detection)
- Rated Acceleration(±2G, ±4G, ±8G) and Data rate can be set.

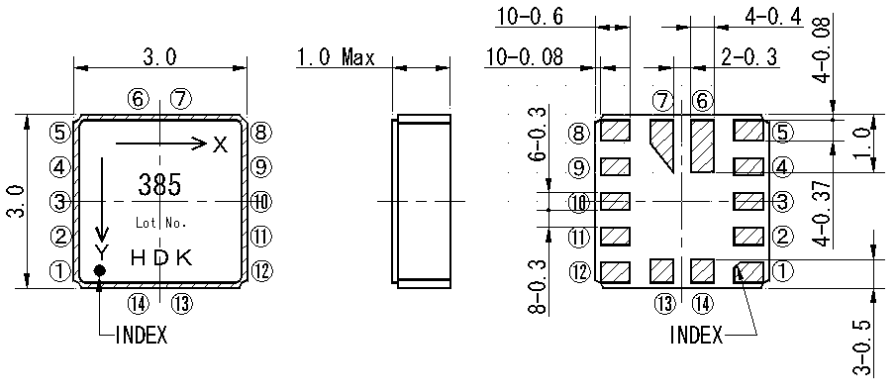


## ■ Additional functions

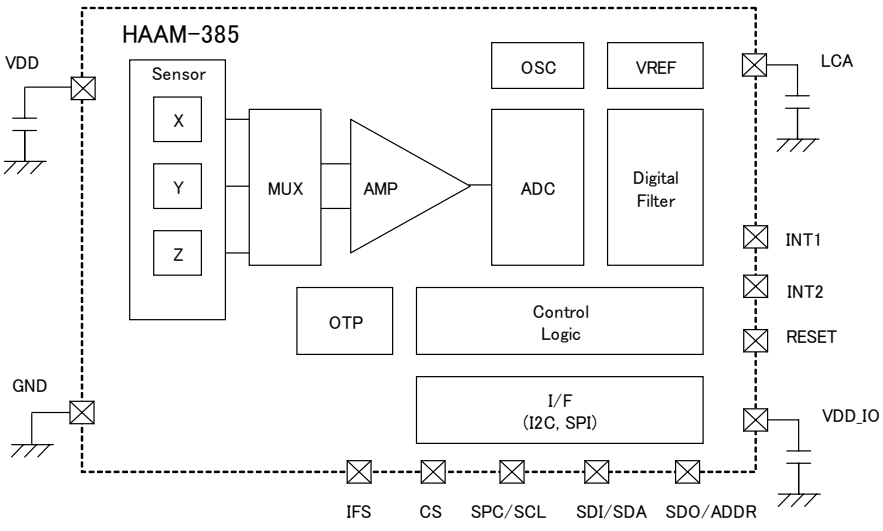
| Item | Function |
|---|---|
| Data rate change | This is a function to change data rate(DR) by register setting<br>Settable data rate（400, 200, 100, 50, 20.4 Hz） |
| Wake-Up output | If detected acceleration change is more than threshold, interrupt signal will be generated. Data rate can be changed after interrupt signal generated. |
| Shock detection output | If acceleration of any selected axis is more than threshold, interrupt signal will be generated |
| Drop detection output | If acceleration of all selected axis go under threshold, interrupt signal will be generated. |
| Data Ready (DRDY) output | This outputs signal to indicate register updating of acceleration data was completed. |

## ■ Outline dimension

Unit : mm




## ■ Block Diagram



## ■ Terminal Assignment & Functions

| No | Terminal | Function |
|---|---|---|
| 1 | SDO/ADDR | When SPI(4-wire) selected: Serial data output terminal<br>When I2C selected: slave address LSB setting (7bit) |
| 2 | INT2 | Interrupt signal output 2 |
| 3 | INT1 | Interrupt signal output 1 |
| 4 | VDD_IO | Power supply input to drive serial interface. If voltage of host side connecting to HAAM-385 is less than +2.4V, communication is possible by supplying power to VDD_IO terminal.<br>Where, please use by keeping VDD (+2.4～+3.6V) ≧ VDD_IO (1.7V～VDD). |
| 5 | GND | Power supply ground |
| 6 | Reserved | Connect GND terminal |
| 7 | LCA | Connect capacitor to stabilize internal reference voltage<br>Please connect 0.1 μF capacitor between LCA and GND. |
| 8 | VDD | Power input to drive sensor |
| 9 | Reserved | Connect GND terminal |
| 10 | IFS | I2C/SPI selection terminal (Lo：SPI, Hi：I2C) |
| 11 | RESET | Reset Signal Input (Active low) |
| 12 | CS | SPI Chip Selection Input .Slave SPI chip selection line. Active low. |
| 13 | SPC/SCL | When SPI(4-wire) selected: Serial Clock Input.<br>When I2C selected: Serial Clock Input/Output. |
| 14 | SDI/SDA | When SPI(4-wire) selected: Serial Data Input.<br>When I2C selected: Serial Data Input/Output. |

## ■ Standard Specification

| Item | | | Rating Min. | Typ. | Max. | nit | Remark |
|---|---|---|---|---|---|---|---|
| Operating Condition | | | | | | | |
| Temperature Range | Storage Temperature Range | | -40 | | 85 | ℃ | |
| | Operating Temperature Range | | -25 | | 85 | ℃ | |
| Power Supply | Operating Voltage Range | | 2.4 | | 3.6 | V | VDD |
| | Interface Voltage Range | | 1.7 | | VDD | V | VDD_IO |
| | Current Consumption | 400Hz | | 560 | | μA | OSR=128, TBD<br>Able to change by register setting |
| | | 200Hz | | 282 | | μA | |
| | | 100Hz | | 142 | | μA | |
| | | 50Hz | | 72 | | μA | |
| | | 20Hz | | 30 | | μA | |
| | | 4Hz | | 7.5 | | μA | |
| Standby Current | | | | | 2 | μA | When standby mode selected |
| Turn On Time | | | | | 5 | ms | Standby→Compentation of first measure |
| Shock Durability | | | 5000 | | | G | |
| Electrical Characteristics | | | | | | | |
| Rated Acceleration | | | | ±2、±4、±8 | | G | |
| Output Resolution | | ±2G | | 0.98<br>1024 | | mg/LSB<br>LSB/G | 12bit output<br>When normal mode selected |
| | | ±4G | | 1.95<br>512 | | mg/LSB<br>LSB/G | |
| | | ±8G | | 3.9<br>256 | | mg/LSB<br>LSB/G | |
| Data Rate | | | | 400, 200, 100, 50, 20, 4 | | Hz | OSR=128, TBD<br>Able to change by register setting |
| Serial Interface Specification | | | | | | | |
| I2C Interface Speed | | | | | 400 | kHz | 400pF |
| | | | | | 1 | MHz | 100pF |
| SPI Interface Speed | | | | | 5 | MHz | 40pF |