Infineon Alarm System (IAS) Mounting Recommendation

Instructions for placement of the IAS in a room

About this document

Scope and purpose

The document describes the placement of the Infineon Alarm System (IAS) within a room. It also describes the sensitivity settings and minimum/maximum ratings for relevant parameters. All information refers to product-level devices on a PCB. The potential impact of the manufacturer's housing on product performance should be considered by the manufacturer.

Intended audience

Manufacturers of IAS PCBs.

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1 Introduction

The Infineon Alarm System (IAS) is a true two-sensor alarm system. It monitors acoustic patterns captured by a microphone and pressure patterns captured by a pressure sensor. Only when both sensors detect the target pattern is an alarm initiated. This dual-sensor principle enables users to develop alarm systems that are highly robust against false alarms.

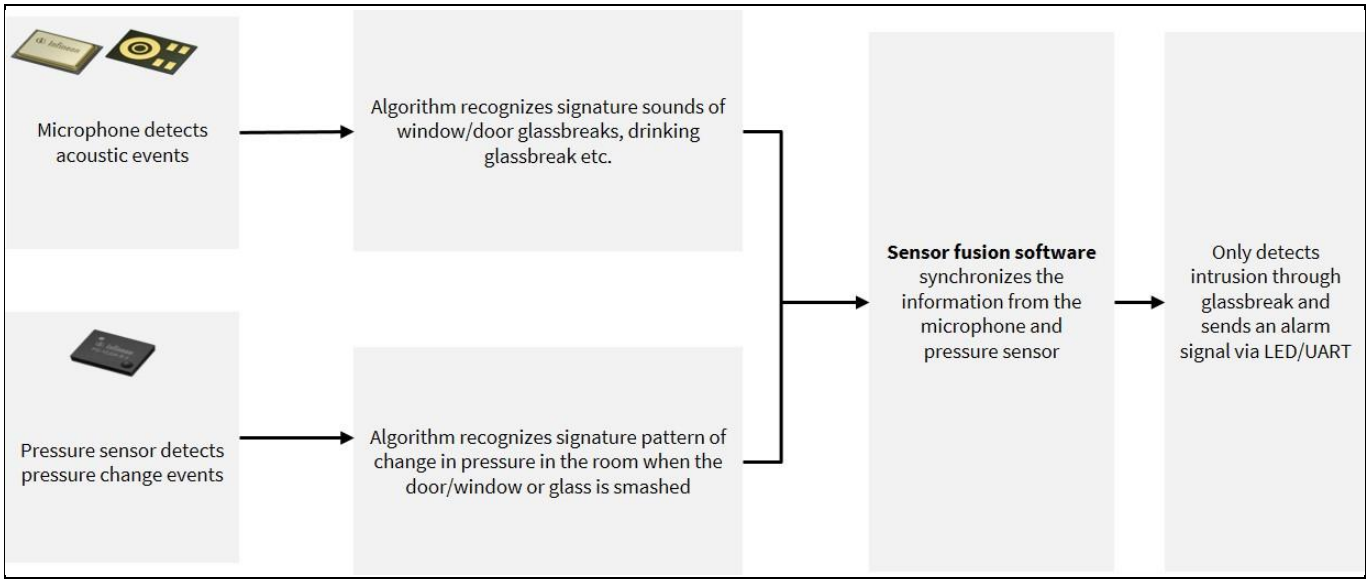

Figure 1 Building blocks of IAS software

2 Sensitivity setting for the IAS

The IAS enables users to adjust the alarm system sensitivity to a level that is most suitable for the specific environment where the system is used. In its initial state of delivery the system is pre-set to the maximum sensitivity (sensitivity = 1). This setting provides maximum reception distance, and there can even be objects* in the line of sight between the alarm system and the window/door to be protected.

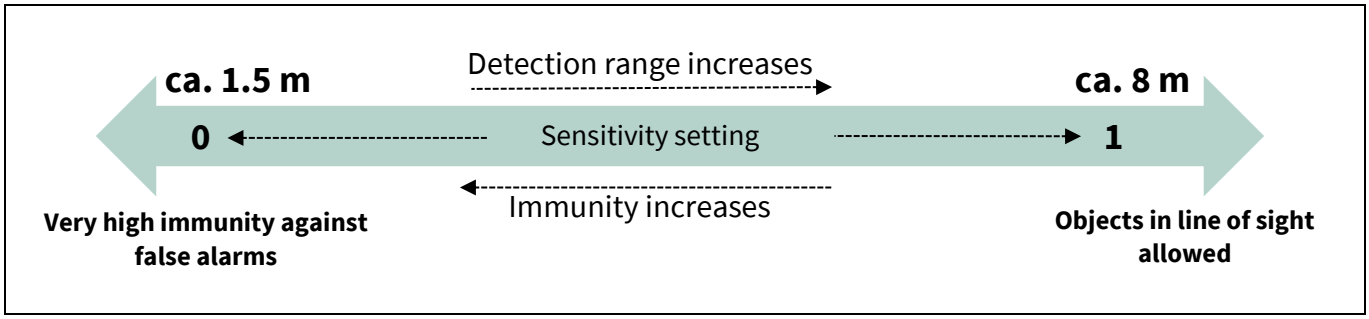

Figure 2 Relationship between sensitivity setting and detection range

Even with the sensitivity set to maximum, the IAS is immune to typical audio triggers, for example from TV, music (stereo speakers) or alarm clocks. By reducing the sensitivity, the IAS provides additional immunity against very loud sounds, which makes it suitable for use when occupants are in the house.

Note: *Reducing the sensitivity also reduces the maximum detection distance and the ability to tolerate objects in the line of sight.*

**Always keep a distance between the IAS and objects in the line of sight e.g. a chair, of at least the size of the object (Figure 6).*

3 Mounting locations

3.1 Preferred mounting locations

The alarm system produces best results when mounted on the wall opposite the window (Figure 3) that is to be protected/monitored. For mounting on the adjacent walls (refer to Figure 4), the distance of the IAS to the corner of the wall should be equal to or greater than the distance from the center of the window to the corner of the wall. A similar distance rule applies to mounting on the ceiling. Mounting the system in other locations, especially on the same wall as the window, may reduce reception performance.

Note: *There is no restriction on the minimum distance from the ground; for example, the alarm system can be installed at the same level as power sockets.*

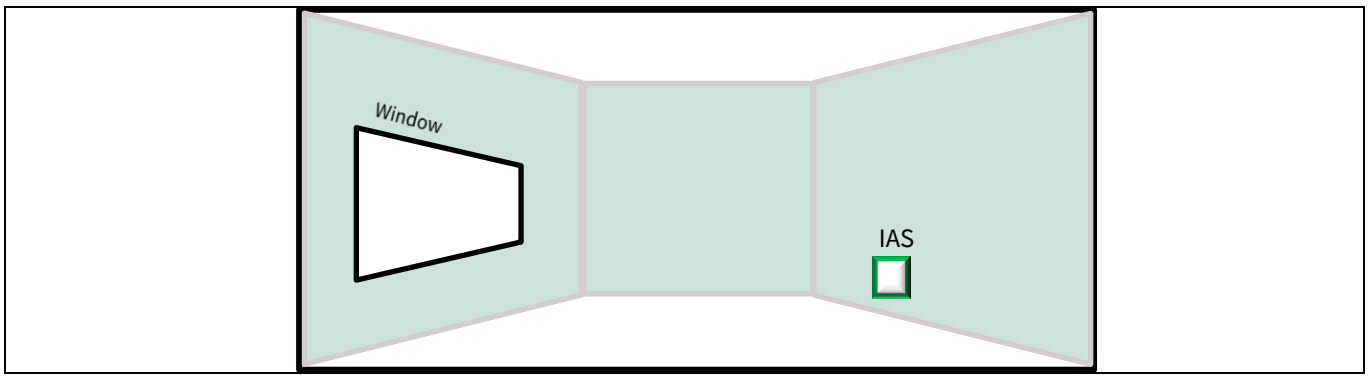

Figure 3 **Preferred mounting location: opposite wall**

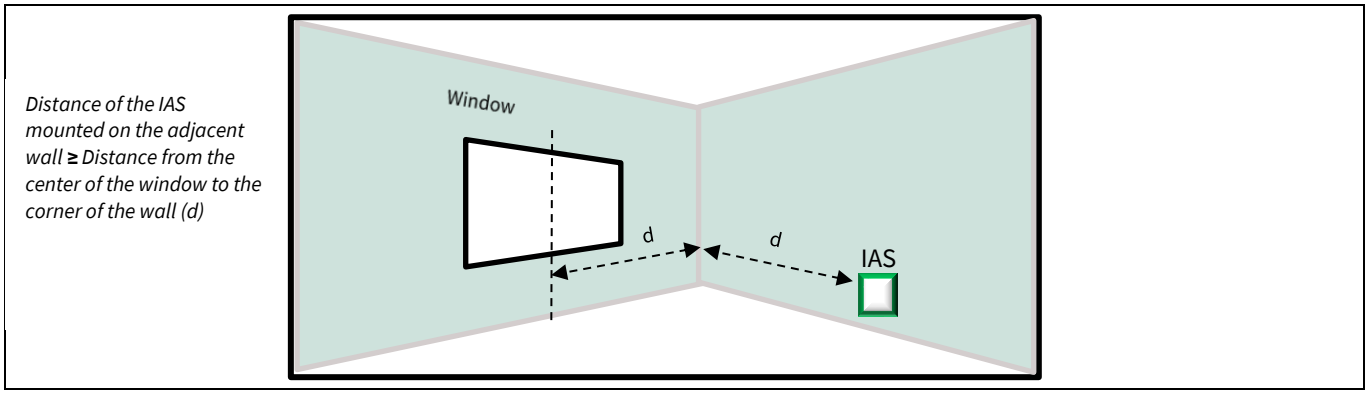

Figure 4 **Mounting location: adjacent wall, same distance rule applies for ceiling mounting**

4 Testing of alarm system

Once the system has been placed in the desired location, it is recommended to test the alarm system with a glass break simulator (recommended: Risco ViTRON glass break tester RG65) to verify that it correctly detects glass break:

- Go to the window to be protected/monitored.
- Strike a tabletop with the palm of your hand or stamp your foot down on the floor (to create a low-frequency thud) + initiate glass break sound from simulator device and open the window fast at the same time (to simulate the right pressure profile).

If the simulated glass break is not detected, a more appropriate location should be selected (Chapter 3) and/or the sensitivity should be increased (Chapter 2).

Note: *The glass break sound from the simulator is very loud; therefore, avoid positioning the simulator device close to your ear or another person's ear. For more information see the user manual for your glass break simulator.*

5 Use Case Conditions

For optimal performance of the IAS, follow the recommendations below:

Room size	Min. 22 m^3 (e.g. 3 m x 3 m x 2.5 m), Max. see Figure 5
Window size	Between 0.5 m x 0.5 m and 3 m x 2 m
Distance to the window (depending on sensitivity setting)	Between 1 m and 8 m
Thickness of glass	Between 2.5 mm and 6.5 mm
Type of glass	Plate glass

Table 1 Use case conditions for the IAS

Note: All windows and doors to the outside must be closed. It is also recommended to keep doors to adjacent rooms closed, as leaving them open increases the effective room area, which cannot exceed the maximum specified area (Figure 5).

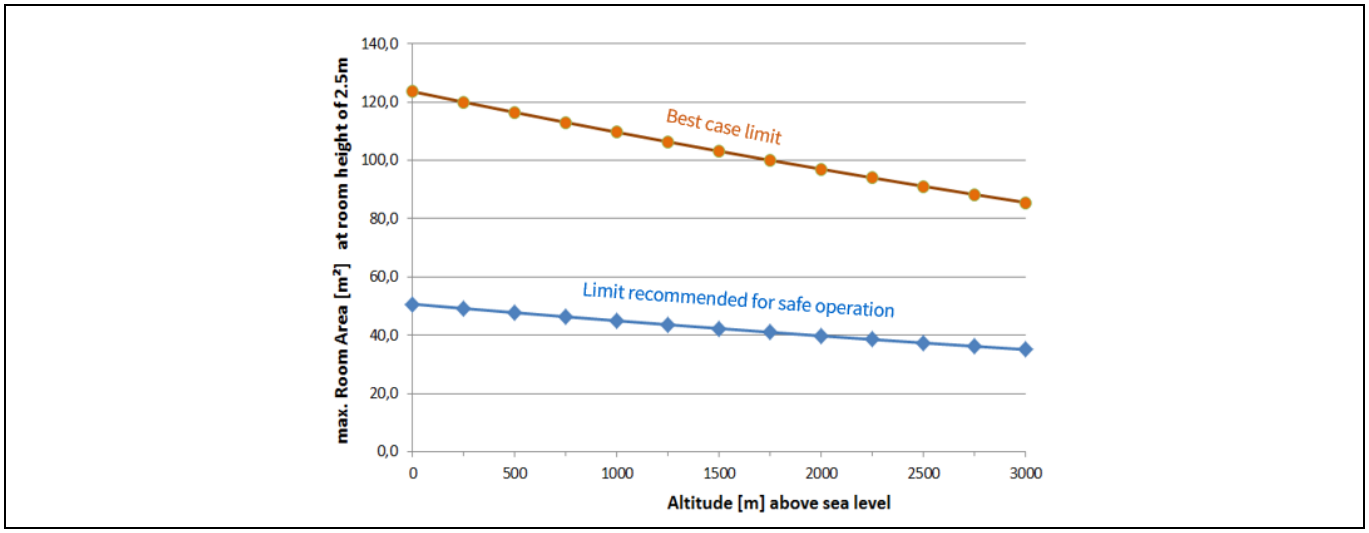

Figure 5 Expected maximum room area vs. altitude (above sea level)

Figure 5 shows the expected maximum room area vs. altitude. The curves depicted in Figure 5 are an extrapolation of real measurements. The maximum room area depends on various window parameters and is expected to vary for the specified windows (Table 1) between the blue and the orange curve.

Note: For the safest operation the room area should be below the blue curve.

Use Case Conditions

The room area is shown for a ceiling height of 2.5 m. To calculate the room area for a different ceiling height follow these calculations:

$$area_h = area_{2.5} * \frac{2.5}{h}$$

- The alarm system was tested with plate glass; performance might be lower for other glass types.
- Room conditions can differ substantially (e.g. due to sound-absorbing material such as carpets, drapes, etc.) and can reduce the detection range of the alarm system. Therefore it is recommended to make a test if the system detects glass break in the desired location (Chapter 4).
- The IAS should not be installed in environments enclosed on more than one side, e.g. cupboards.
- Always install the IAS such that pressure sensor opening is at least 1 m from the vent, drafts or fans and the pressure sensor is not directly exposed to the airflow of these devices.
- When mounted close to the ground, e.g. close to power outlets, the IAS microphone port opening should not be facing downward. The opening can be on the top or either side of the device.
- Always keep a distance between the IAS and objects in the line of sight, e.g. chairs, of at least the size of the object (Figure 6).

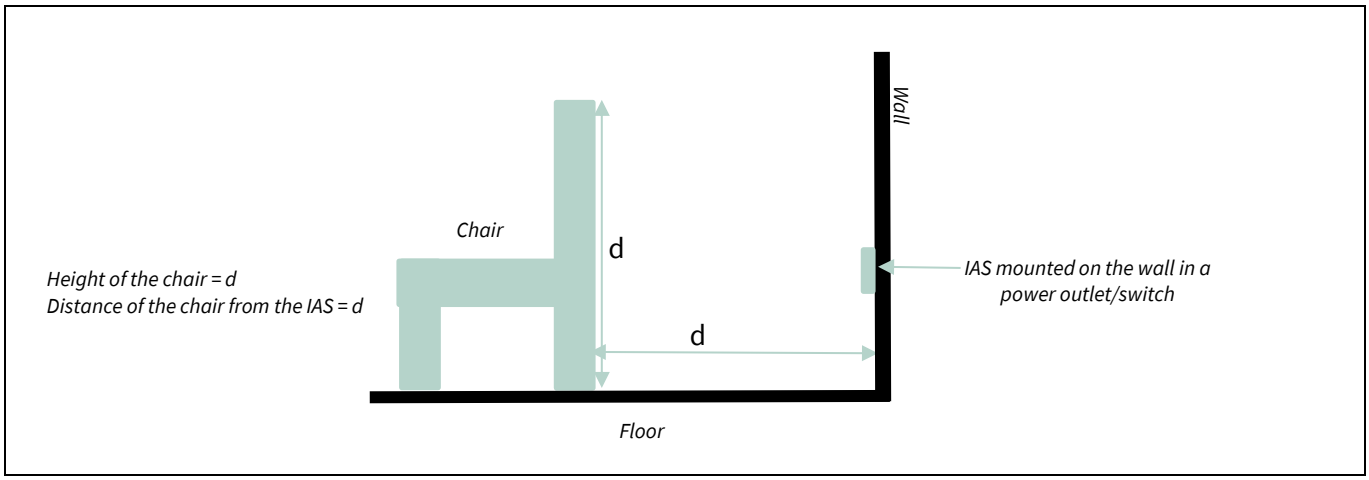

Figure 6 IAS installation recommendation when objects are placed in the line of sight

Warning:

Installation and performance optimization may be affected by the product casing, depending on the casing design and placement of microphone and pressure sensor inside the casing.

Revision history

Document version	Date of release	Description of changes
1.0	30.04.2019	Initial release
2.0	09.10.2019	Productive Release Version

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