Window Size in Housings

In Fig. 1 and Fig. 2, the minimum window size in relation to the distance between the window and the transceiver is described.

Generally speaking, a 8% (4 % at each side) transmission loss is caused by standard window materials. This loss of intensity should be considered in the design calculations, by adjusting the emitter output intensity. The window should be placed perpendicular to the transceiver in order to avoid increased reflection of the signal at a larger angle of incidence. The window material should be transparend at 940 nm.

Commonly used plastic materials for infrared window covers are polycarbonate and acrylic materials.

These are known in various trade names, for example Lexan and Makrolon for Polycarbonates and Plexiglas, Acrylite and Acrycast for Acrylics, and are available from different suppliers.

The major difference between the two types of materials is that Polycarbonate is a tougher material (it cannot be punched), and it withstands tougher environmental conditions.

On the other hand, a large Acrylic sheet is easier to cut into small pieces.

Other common plastic materials are Polystyrene, Zeonex, NAS and few others.

The typical index of refraction of these materials is around $n = 1.5$.

Some glasses come with a transmittance > 90 %, some come with > 70 % to 80 % in the area of NIR wavelength (> 750 nm) with lower transmittance for the visible wavelength.

A minimum size of **d1** x **d2** rectangular or elliptical so as not to reduce the IrDA performance.

The following expressions apply to Fig. 1 and Fig. 2.

$d1 = w + 2x = w + 0.54a$

$d2 = h + 2x = h + 0.54a$

where $x = a \tan 15°$

Dimensions of **d1**, **d2**, and **a** are given in mm.

The dimensions for w and h for the different packages are as follows:

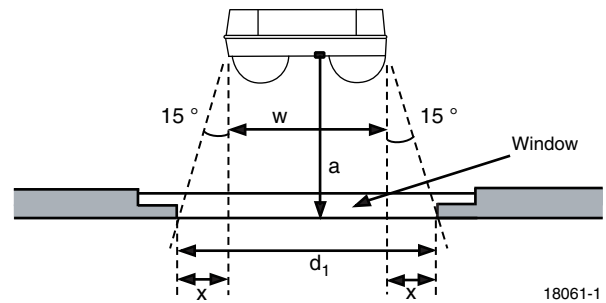| DEVICE PACKAGE TYPE	w (mm)	h (mm)
Baby face (TFDUx1xx) family	9.7	4.0
1.9 mm family (as TFBSx7xx)	6.2	2.0
1.6 mm family (as TFBSx6xx)	7.0	1.7

Fig. 1 - View From Above, Example Baby Face Package
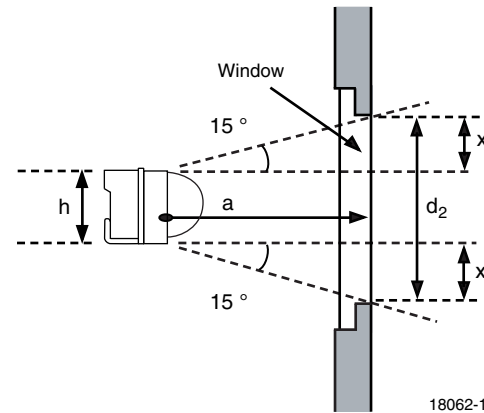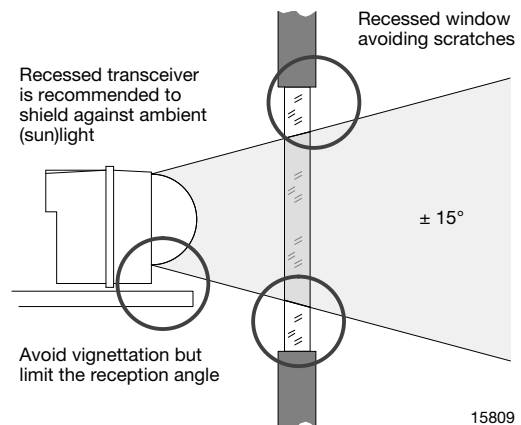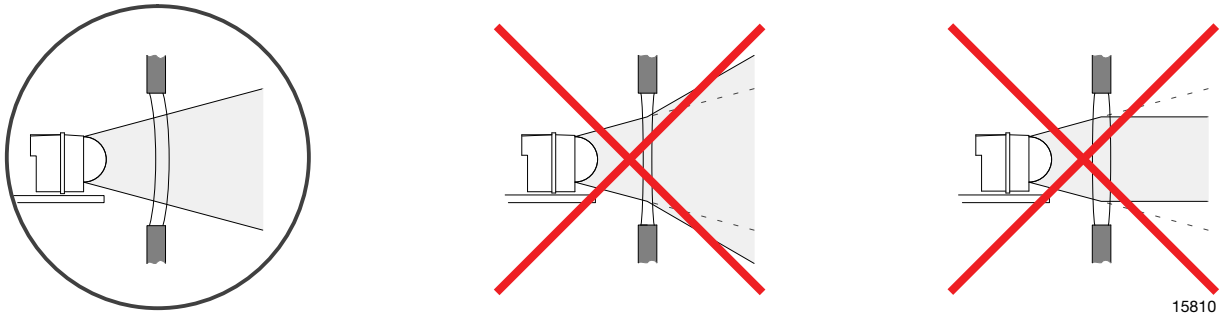

Fig. 2 - View From The Side, Example Baby Face Package

Fig. 3

Some recommendations to enhance robustness of your design:

- The outer window surface may be recessed against the surrounding case material to protect the window from scratches, abrasion, dust, etc. (see Fig. 3)

- Keep the window thickness constant to avoid unintentional lens effects (see Fig. 4)

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Fig. 4 - Avoid an Unintentional Lens Effect of Your Window