

Data Sheet BSS-D50.8-T3.5

THz Beam Splitter



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1 General

THz beam splitter ([BSS-D50.8-T3.5](#)) made from silicon for single pass applications.

2 Specification

Diameter	50.8 ± 0.05 mm
Thickness [T]	3.5 ± 0.05 mm
Parallelism	30"
Material	Silicon
Refractive index	3.41
Transmittance	> 53 % (@ 0.1 - 3.0 THz)

3 Application Note

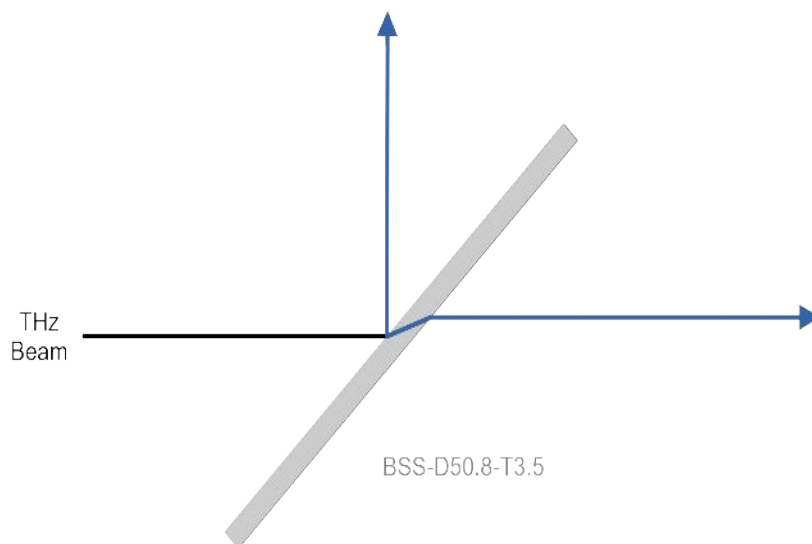


Figure 1: [BSS-D50.8-T3.5](#)

The THz beam splitter ([BSS-D50.8-T3.5](#)) is designed for single-pass applications. A THz beam splitter for multi-pass applications is available on request.

3.1 Transmittance and Reflectance

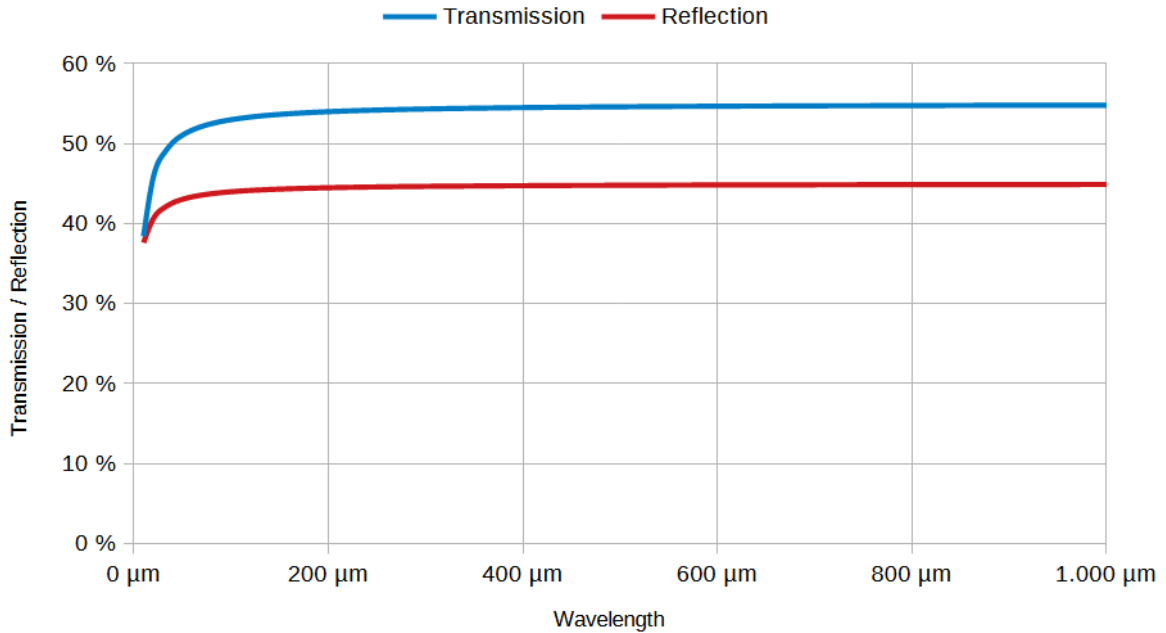


Figure 2: Transmittance and Reflectance of Silicon (T 3.5 mm)
Randomly polarized (AOI 45°; Uncoated)
RBW = ∞

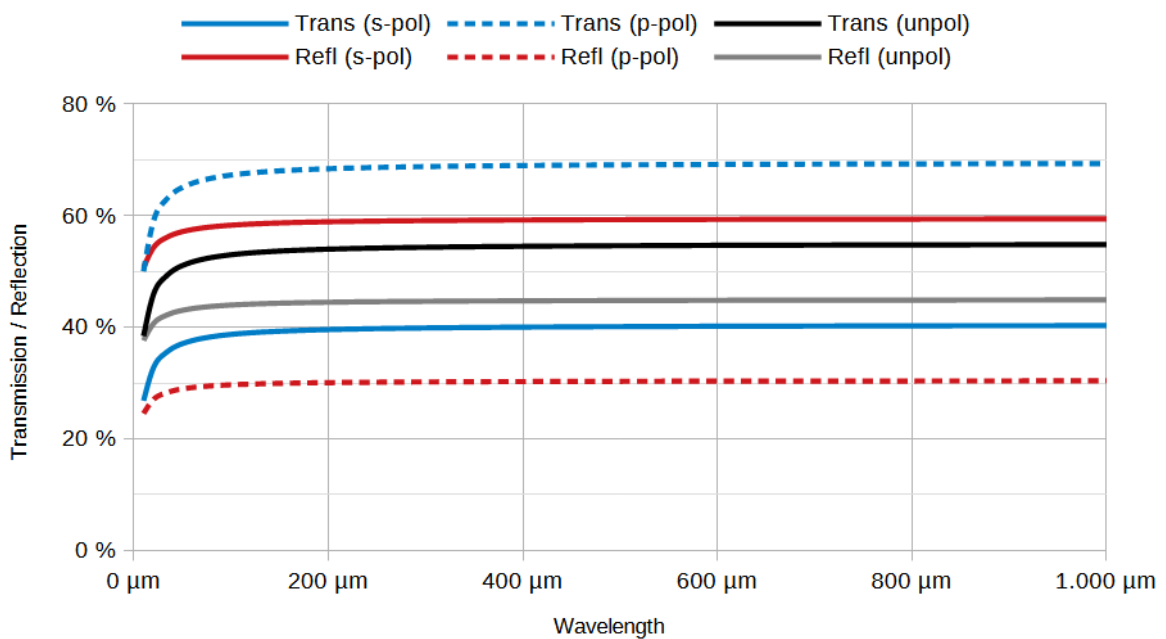


Figure 3: Transmittance and Reflectance of Silicon (T 3.5 mm)
s- & p-polarized (AOI 45°; Uncoated)
RBW = ∞

3.2 Resolution Bandwidth

The resolution bandwidth (rbw) has a major impact on the measurement results. At a certain level, the interference between the reflection of the first and second surface of the THz beam splitter becomes visible as "ripples" as shown in figure 4.

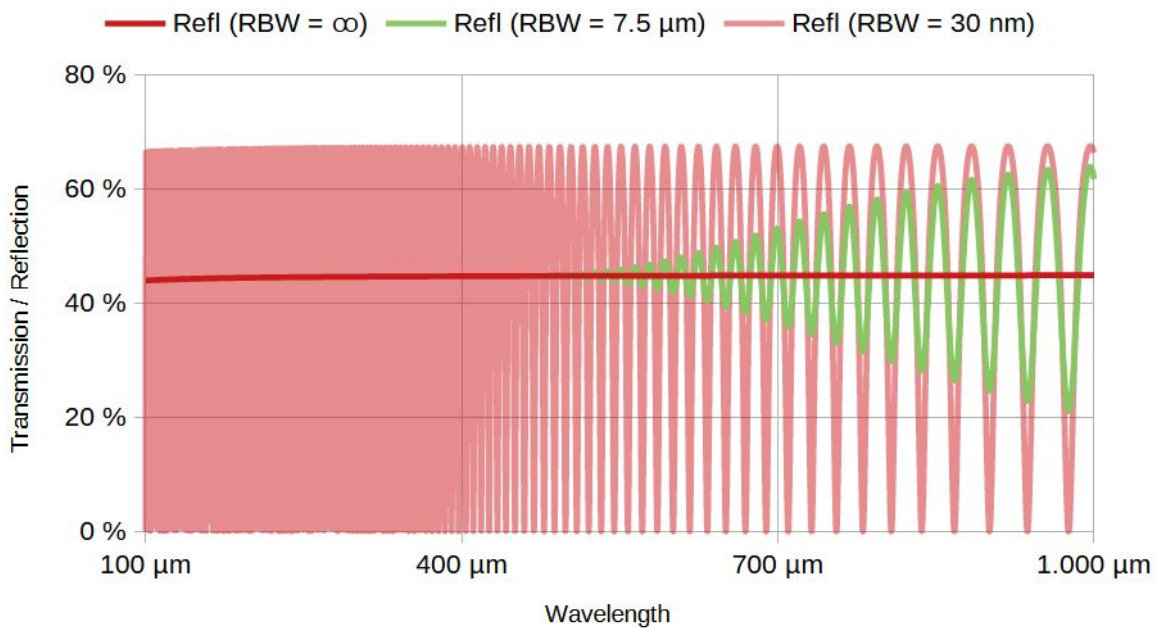


Figure 4: Impact of the resolution bandwidth on Silicon (T 3.5 mm)
Randomly polarized (AOI 45°; Uncoated)

To avoid this behaviour, we recommend to meet the following criteria for the minimum resolution bandwidth:

$$\frac{\Delta\lambda}{\lambda} > \frac{1}{40}$$

The influence of resolution bandwidth can be reduced with our optional anti-reflex coating (⇒ section 3.3).

3.3 Anti-Reflex Coating

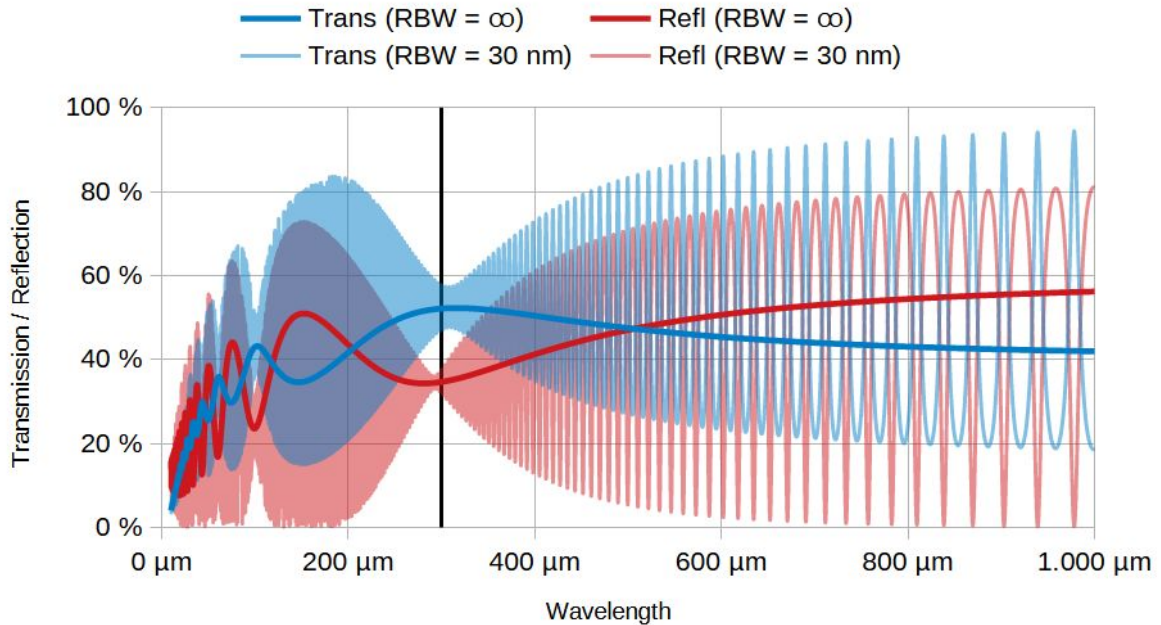


Figure 5: Transmittance and Reflectance of Silicon (T 3.5 mm)
Coated to minimize the ripple @ 300 μm / 1 THz
s-polarized (AOI 45°)

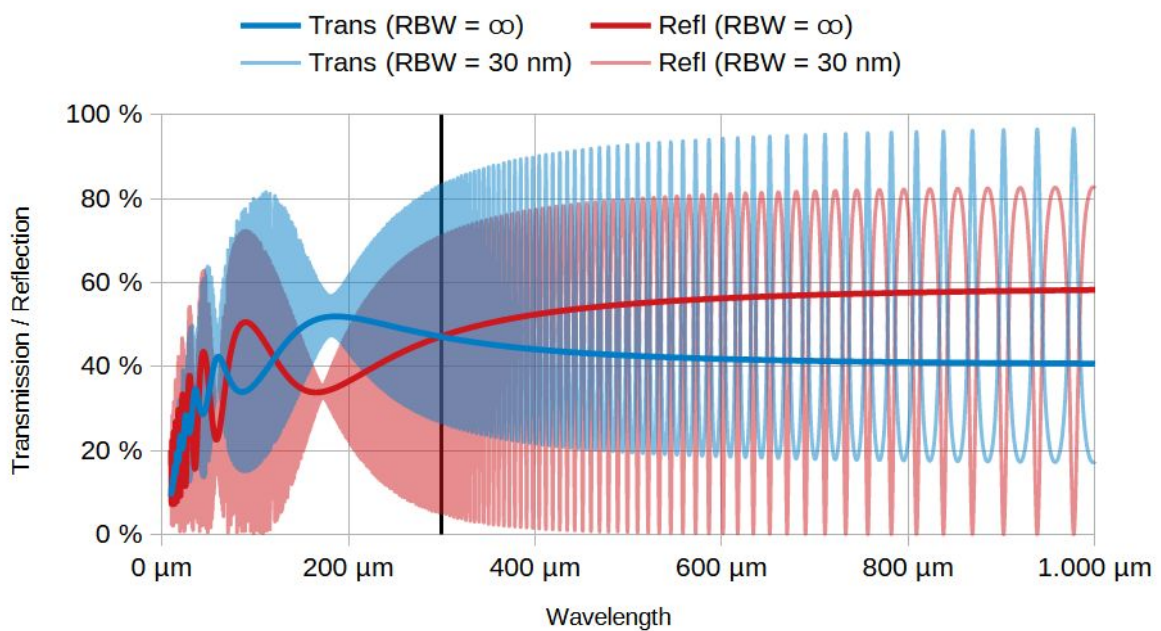


Figure 6: Transmittance and Reflectance of Silicon (T 3.5 mm)
Coated to equal transmission and reflection @ 300 μm / 1 THz
s-polarized (AOI 45°)

4 Contact Details

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