Tsurupica® / High-Resistivity Silicon

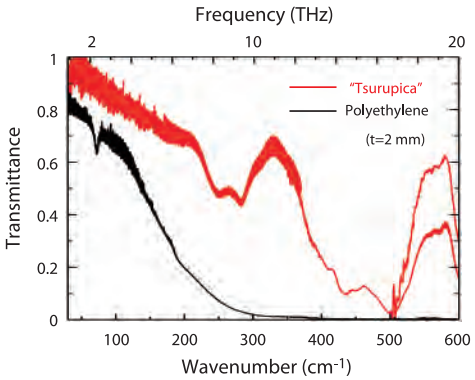
Transparent Optics for THz-wave

Tsurupica® is one of the best transparent material for THz-wave applications. It has advantages over existing materials such as Polyethylene and Silicon. Tsurupica shows high transmission and low loss on surface not only for THz-wave but for visible light.

Material	Tsurupica®	Polyethylene	Silicon	HR-Silicon
THz-wave transmission	Good	Good (Low freq)	Excellent (High freq)	Excellent
Visible transmission	Good	Opaque	No	No
Color	Transparent	White	Metallic	Metallic
Fresnel loss	Low	Low	High	High

FEATURES / SPECIFICATIONS

- Transmission range: 1~12THz
- Refractive index: 1.52 @THz-wave and 633 nm
- Visible laser is applicable as alignment guide.
- Employing Tsurupica® as a detector window, one can confirm the status of sensor element.
- Customized dimensions and finishing available upon request.



Tsurupica transmittance in THz region

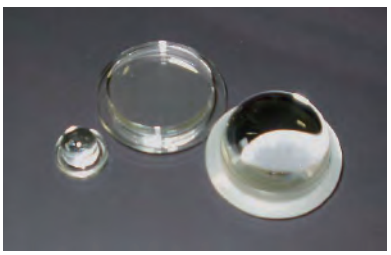
SURFACE FINISH

Choose from 3 types, as requirement of application.

- Type-RR: High-precision polish. Good transparency for visible light.
- Type-R: Semi-transparent polish. Transparent in visible region.
- Type-S: No polish. Opaque in visible.

Type	RR	R	S
Polish	Precise	Easy	No
Visible transmission	Good	Available*1	Opaque
Shaping error	<15 um P-V*2	NA	NA
Surface roughness	<0.05 um	Intermediate	~2 um
Measurement data	Provided	No	No

*1 Not specified.
*2 <10 um for standard items



Type-RR (with high-precision polish)

Type-S (no polish)

ORDERING INFO

For Spherical singlet: (P)-(S)-(A)-(B)-(R)
P: surface finish: R for easy-polish, S for no polish
S: shape: CX for positive singlet, BiCX for positive bi-convex, CC for negative singlet
A: diameter: 10~70 in mm
B: Focal length: in mm
R: rim: place N for no rim

ex. Spherical negative singlet, polished, diameter 50 mm and focal length -100 mm
R-CC-50-100

Below items are standard and always in stock
- Positive aspherical singlet RR-CX-38.1-(B)-SPS, B=30, 50, 100
- Negative aspherical singlet RR-CC-38.1-(B)-SPS, B=40, 60
- Positive aspherical cylindrical RR-SIRI-100-SPS
- Slide glass RR-PP-26-76-SPS-5, 76 x 26 mm2 plane plate, 5 pcs/pack

Delivery 3~5 weeks ARO except for stock items.
Special shape / dimensions available upon request.

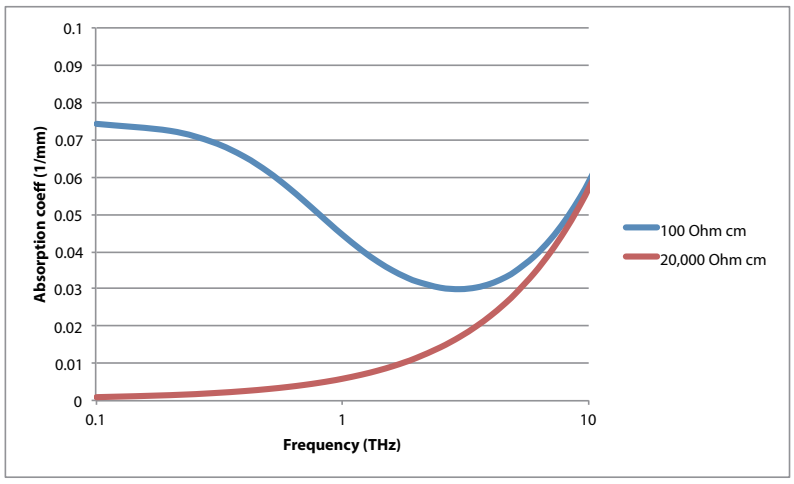
For international orders, please ask Broadband Inc.

ask@bblaser.com / +81-3-5838-0082
ATTN: Kou Sakurai

Tsurupica® is the result of cooperative development of PAX Inc. and Terahertzwave research group of RIKEN.
Also refer the Terahertz database on the RIKEN website for the datailed material information.

- Terahertzwave research group, RIKEN:
  http://www.riken.jp/en/research/labs/rap/thz_wave/
- The RIKEN Terahertz database:
  http://www.riken.jp/THzdatabase/

High-resistivity Silicon (HR-silicon) is pure material without dopant and contaminations, which is grown using a special technique. It shows considerably lower absorption than normal silicon especially in lower THz frequency region and at residual oxygen-related specific absorption peak at 1100 cm^{-1}.



Absorption comparison between Low- and High-resistivity silicon in THz region (calculated result)

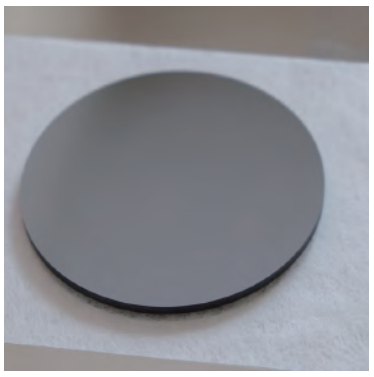
MATERIAL CHARACTERISTICS

HR-silicon shows slight absorption <3 THz while Low-res Si considerably high absorption, 36% at 1 THz for 10 mm-thick window.

Standard item
Material: Intrinsic silicon
Resistivity: >20 kOhm cm
Orientation of ingot: (111) or (100)
Maximum dimensions*1: 3 inch dia x 50 mm

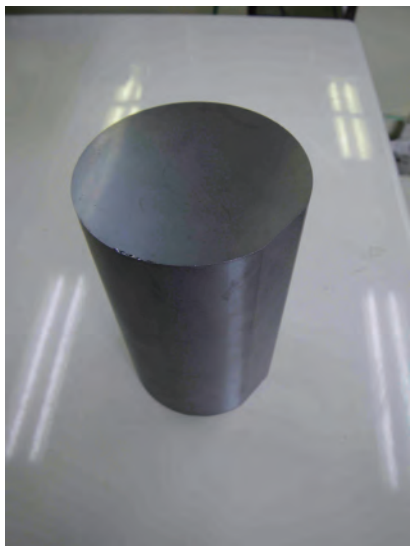
*1 Larger size available upon request

PRODUCTS

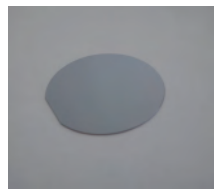


Thick blank (Window)

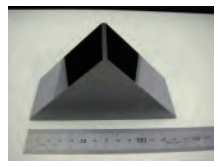
ATR module with Prism



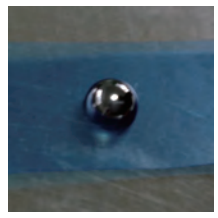
HR-silicon Ingot



Wafer (Beam splitter)



Right angle prism



Ball lens

We can supply various HR-silicon products upon request. Items are cut from premium-grade ingot, and ground and polished precisely.

PHLUXi
Ex oriente LUX

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