Mounted photoconductive antenna on aspheric focusing silicon substrate lens

Data sheet PCA-l-g-w-λ-a

Photoconductive antenna chip
Substrate semi-insulating GaAs
Chip area 4 mm x 4 mm
Thickness t 600 µm

Elliptic focusing silicon lens
Diameter 20 mm
Focal length 50 mm
Height h 14 mm
Distance d 14.6 mm
Material undoped HRFZ-silicon
Specific resistance ρ >10 kΩcm
Refractive index n 3.4

Terahertz beam
focal length f 50 mm
collection angle α 52.7°
convergence angle β 10°

Airy disc diameter
at 300 GHz 3.6 mm
at 1 THz 1.1 mm
at 3 THz 0.36 mm
**Aluminum mount**  
25.4 mm diameter, 6 mm thick

**Coaxial cable**  
type RG178 B/U, impedance 50Ω, capacitance 96pF/m, 1 m long

**Connector type**  
BNC or SMA

- The PCA chip is optically adjusted and glued on the aspheric silicon lens with thermal conducting glue.
- The silicon lens is fixed on the aluminum mount with thermal conducting glue.
- The two antenna contacts are wire bonded on a printed circuit board, which provides the connection to a 1m long coaxial cable with BNC or SMA connector.
- A central hole in the aluminum mount allows the Terahertz radiation to escape from the aspheric silicon lens as a focused beam with a focus 50 mm away and an Airy disc diameter dependent on the THz frequency.