

Data Sheet PCA-44-16-16-1040

Photoconductive THz antenna for laser excitation wavelength ~ 1040 nm
and Butterfly structure



PCA – Photo Conductive Antenna

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1 Mounting Options

PCA-44-16-16-1040-0	Unmounted PCA chip
PCA-44-16-16-1040-h	Mounted on hyperhemispherical Si lens
PCA-44-16-16-1040-c	Mounted on collimating aspheric Si lens
PCA-44-16-16-1040-a	Mounted on aspheric focusing Si lens

Nomenclature

PCA-44-16-16-1040-X

PCA-44-16-16-1040-X-Y	Antenna design	Butterfly
PCA-44-16-16-1040-X-Y	Antenna length	44 μm
PCA-44-16-16-1040-X-Y	Gap distance	16 μm
PCA-44-16-16-1040-X-Y	Gap width	16 μm
PCA-44-16-16-1040-X-Y	Excitation wavelength	1040 nm
PCA-44-16-16-1040-X-Y	Mounted Si lens	0 / h / c / a

2 PCA Specification

2.1 PCA-44-16-16-1040-0

- Unmounted PCA chip

Table 1: Specification PCA-44-16-16-1040-0

Parameter		Min	Recommended	Max
Laser source	Wavelength	1030 nm	1040 nm	1050 nm
	Avg. optical power	-	30 mW	40 mW
	Avg. power density	-	-	12 000 W/cm ²
	Fluence	-	-	200 μJ/cm ²
	Pulse duration	-	100 fs	200 fs
	Repetition rate	70 MHz	80 MHz	-
	Spot diameter	16 μm	20 μm	-
Bias source	Voltage [V _e]	-	-	50 V
	Modulation frequency	0 Hz (Dc)	10 kHz	10 MHz
Dark resistance [R _d] ¹		> 5 GΩ	-	-
Parameter		Typical		
PCA chip	Width	2 mm ± 0.2 mm		
	Depth	2 mm ± 0.2 mm		
	Height	625 μm ± 25 μm		
THz Beam	Focal length	Dot source		

¹ Measurement conditions: room temperature & measuring voltage of 3.3 V

2.2 PCA-44-16-16-1040-h

- Mounted on hyperhemispherical Si lens (LSH-D12-T7.13)

Table 2: Specification PCA-44-16-16-1040-h

Parameter		Min	Recommended	Max
Laser source	Wavelength	1030 nm	1040 nm	1050 nm
	Avg. optical power	-	30 mW	40 mW
	Avg. power density	-	-	12 000 W/cm ²
	Fluence	-	-	200 μJ/cm ²
	Pulse duration	-	100 fs	200 fs
	Repetition rate	70 MHz	80 MHz	-
	Spot diameter	16 μm	20 μm	-
Bias source	Voltage [V _e]	-	-	50 V
	Modulation frequency	0 Hz (Dc)	10 kHz	10 MHz
Dark resistance [R _d] ²		> 5 GΩ	-	-
Parameter		Typical		
Package		Max. diameter 25.4 mm Min. length 9.5 mm		
THz Beam	Virtual focal length ³	26.5 mm		
	Divergence angle	17°		

² Measurement conditions: room temperature & measuring voltage of 3.3 V

³ Measured from the apex

2.3 PCA-44-16-16-1040-c

- Mounted on collimating Si lens (LSA-D20-T13.77)

Table 3: Specification PCA-44-16-16-1040-c

Parameter		Min	Recommended	Max
Laser source	Wavelength	1030 nm	1040 nm	1050 nm
	Avg. optical power	-	30 mW	40 mW
	Avg. power density	-	-	12 000 W/cm ²
	Fluence	-	-	200 µJ/cm ²
	Pulse duration	-	100 fs	200 fs
	Repetition rate	70 MHz	80 MHz	-
	Spot diameter	16 µm	20 µm	-
Bias source	Voltage [V _e]	-	-	50 V
	Modulation frequency	0 Hz (Dc)	10 kHz	10 MHz
Dark resistance [R _d] ⁴		> 5 GΩ	-	-
Parameter		Typical		
Package		Max. diameter 25.4 mm Min. length 16.0 mm		
THz Beam	Focal length ⁵	∞		
	FWHM ⁶	11.0 mm		

⁴ Measurement conditions: room temperature & measuring voltage of 3.3 V

⁵ Measured from the apex

⁶ Full Width at Half Maximum

2.4 PCA-44-16-16-1040-a

- Mounted on focusing Si lens (LSA-D20-T14-F50)

Table 4: Specification PCA-44-16-16-1040-a

Parameter		Min	Recommended	Max
Laser source	Wavelength	1030 nm	1040 nm	1050 nm
	Avg. optical power	-	30 mW	40 mW
	Avg. power density	-	-	12 000 W/cm ²
	Fluence	-	-	200 µJ/cm ²
	Pulse duration	-	100 fs	200 fs
	Repetition rate	70 MHz	80 MHz	-
	Spot diameter	16 µm	20 µm	-
Bias source	Voltage [V _b]	-	-	50 V
	Modulation frequency	0 Hz (Dc)	10 kHz	10 MHz
Dark resistance [R _d] ⁷		> 5 GΩ	-	-
Parameter		Typical		
Package		Max. diameter 25.4 mm Min. length 16.0 mm		
THz Beam	Focal length ⁸	50.0 mm		
	Convergence angle	10°		

⁷ Measurement conditions: room temperature & measuring voltage of 3.3 V

⁸ Measured from the apex

3 Application Note

3.1 Measurement Setup

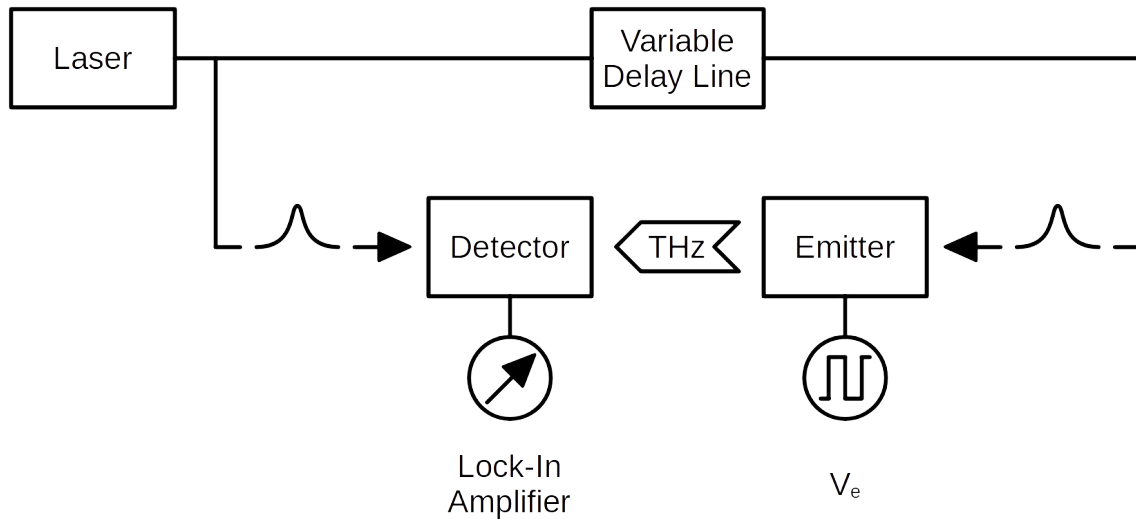


Figure 1: Setup for THz measurements

3.2 PCA Design

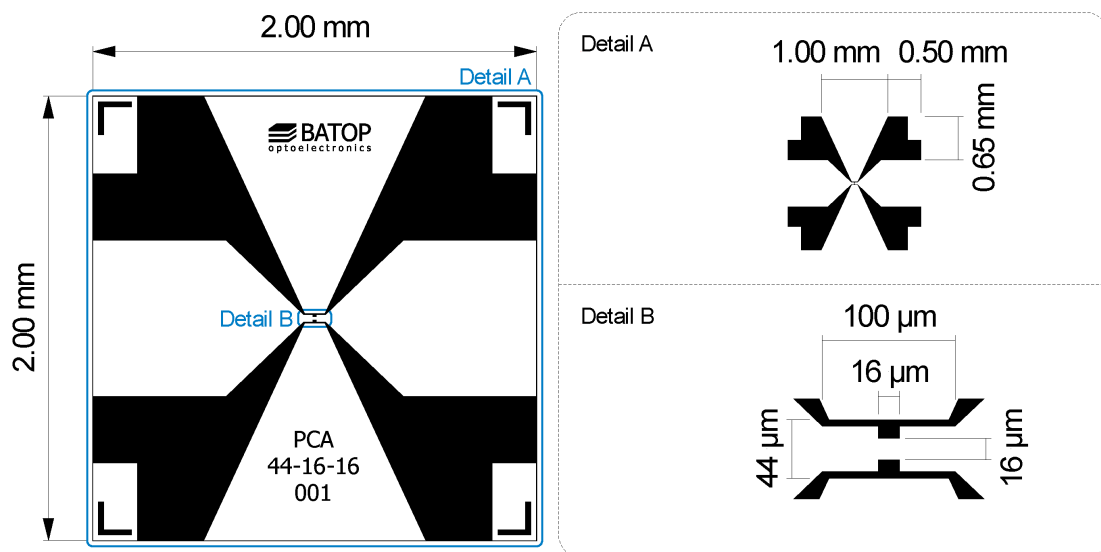


Figure 2: PCA dimensions

Antenna length = 44 μm / Gap distance = 16 μm / Gap width = 16 μm

4 Contact Details

BATOP GmbH
Stockholmer Straße 14
07747 Jena
Germany

E-Mail: info@batop.de (Sales)
 thz@batop.de (Support)
Phone: 0049 3641 634009 0