HAMAMATSU
PHOTON IS OUR BUSINESS

THz PMT, THz PMT module

R17201-01, H17362

Left: R17201-01, Right: H17362

Photomultiplier tubes with the metasurface which converts Terahertz (THz) waves to electrons as the photocathode.
Field emission technology is utilized and signal current changes nonlinearly by the electric field intensity of input THz waves, so the THz PMT can intensify and detect a tiny fluctuation of THz waves which had been difficult with linear-response detectors.
H17362 is a photomultiplier tube module containing R17201-01, driving circuit and high voltage power supply. This module can be operated by just connecting to computer via USB. Attachment for fixing on an optical table and C mount adapter for attaching optical parts are included. This unit enables beginners to use photomultiplier tubes.

Features

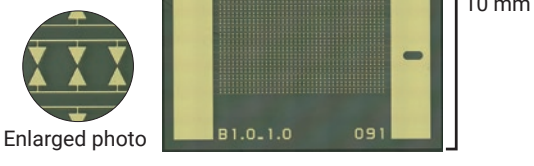
- Super non-linear response makes slight difference of electric field very clear
- Polarization characteristics
- Broad sensitivity for THz region (0.5 THz to 2.0 THz)
- High speed response (nano second)
- Large effective area (6 mm x 6 mm)

Applications

- Electric field measurement of high power THz source
- Spectroscopic measurement

TOPIC A new detector using a metasurface

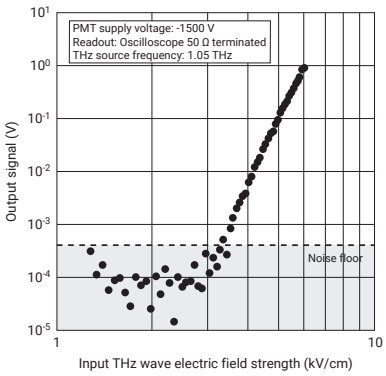
Metasurface is artificially designed fine surface structure and it is utilized for various promising technologies.
This structure has gold antenna patterns on a substrate such as quartz or silicone, and when THz wave is incident on the surface, electrons are emitted according to a priciple of field emission. THz wave is detected by multiplying these electrons.



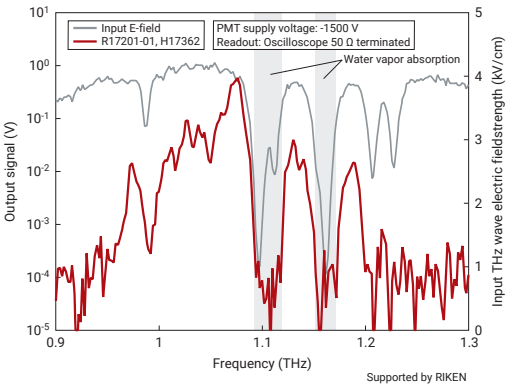
Enlarged photo

Characteristics

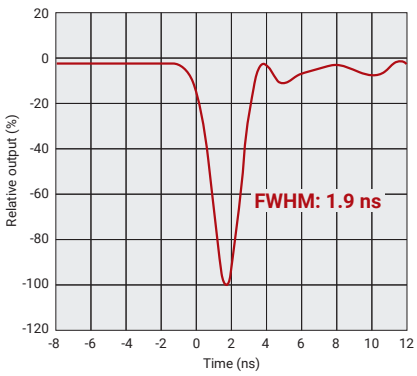
Anode response



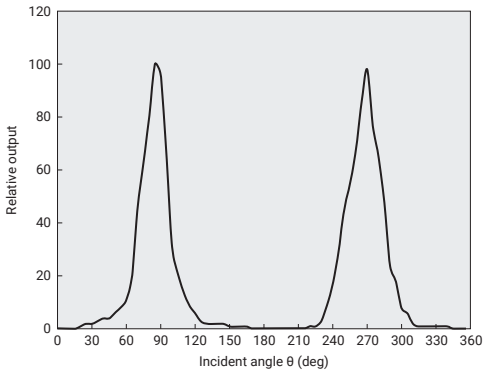
Frequency characteristics



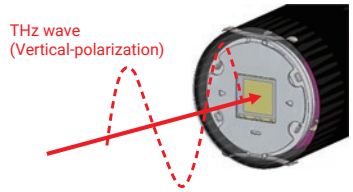
Output waveform



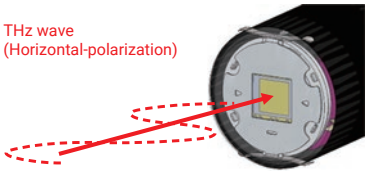
Polarization characteristics



R17201-01

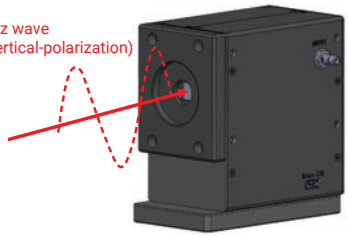


θ = 0 deg

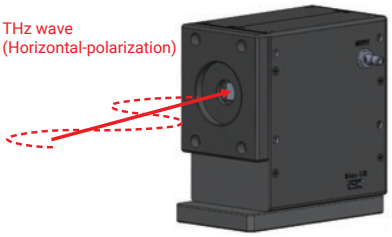


θ = 90 deg

H17362

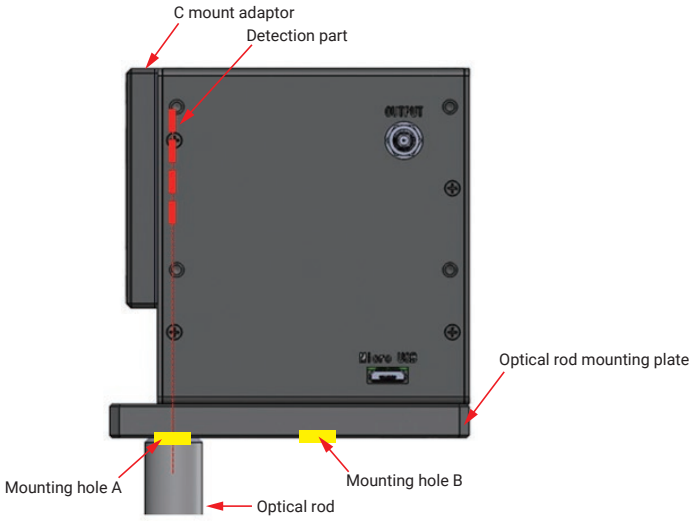


θ = 0 deg



θ = 90 deg

Installation example of H17362



When the optical rod is connected to mounting hole A, the detection part is directly above to the optical rod.
If it is connected to mounting hole B, the center position of module body is directly above to the optical rod.
The rod mounting plate is removable. The plate can be attached any plane of H17362 depending on the polarization of interested THz wave.

Specifications

R17201-01

Parameter		Description/Value	Unit
Photocathode		Metasurface	-
Effective area		6 x 6	mm
Window material		Silica glass	-
Dynode	Structure	Linear focused	-
	Number of stages	10	-
Threshold E-field (typ.) *1		5	kV/cm
Recommended spectral response		0.5 to 2.0	THz
Supply voltage		-1500	V
Maximum supply voltage		-1800	V
Rise time *1		1.6	ns
Operating ambient/storage temperature		-30 to +50	°C

*1: Supply voltage to PMT -1500 V, THz frequency 1.05 THz

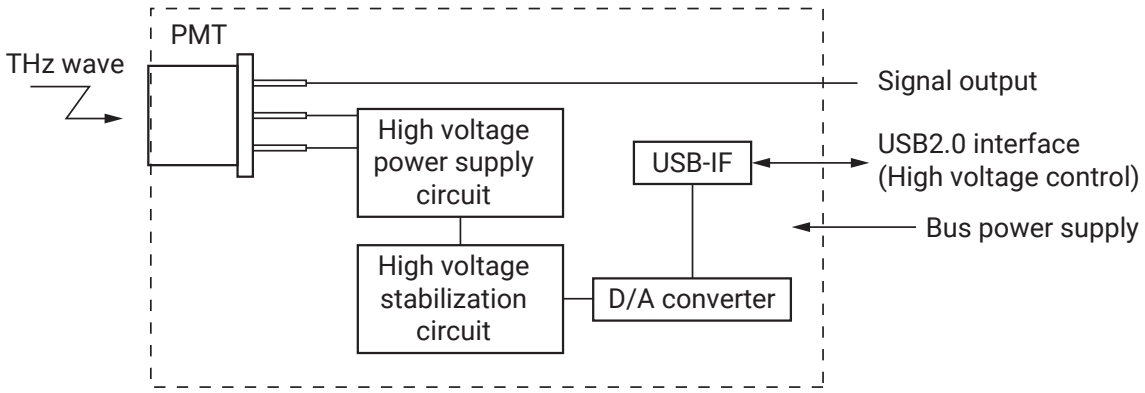
H17362

Parameter	Description/Value	Unit
Contents	Main unit, C mount adapter and rod mounting plate	-
Input voltage	USB bus power (+4.75 to +5.25)	V dc
Current consumption	0.1	A
Effective area	6 x 6	mm
Threshold E-field (typ.) *1	5	kV/cm
Recommended spectral response	0.5 to 2.0	THz
Rise time *1	1.6	ns
Operating ambient temperature *2	+5 to +50	°C
Storage temperature *2	-20 to +50	°C
Operating ambient/storage humidity *2	Below 85	%
Compatible OS	Windows 10/11	-

*1: Supply voltage to PMT -1500 V, THz frequency 1.05 THz

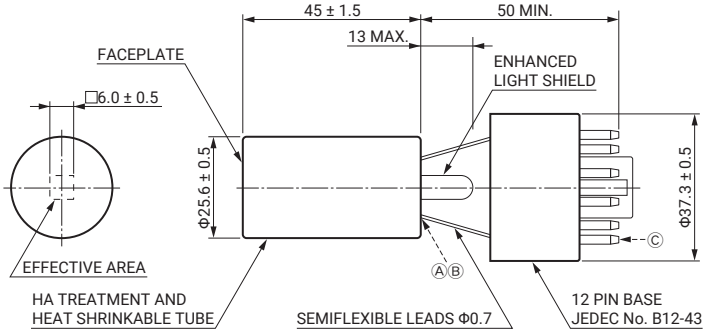
*2: No condensation

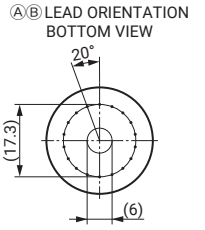
Block diagram of H17362

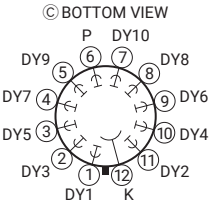


Dimensional outlines (Unit: mm)

R17201-01





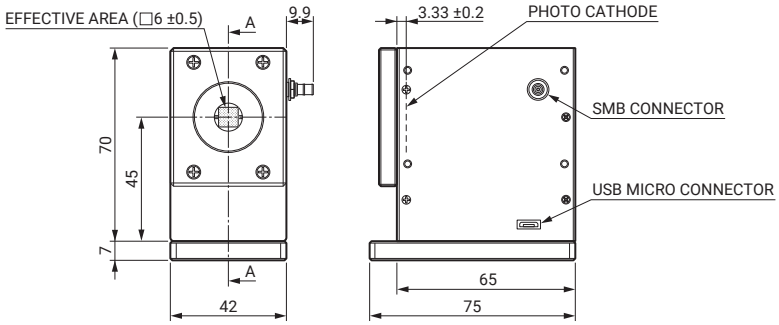


Electrodes	K	Dy1	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7	Dy8	Dy9	Dy10	P
Ratio	1	1	1	1	1	1	1	1	1	1	2	1

Supply voltage: 1500 V, K: Cathode, Dy: Dynode, P: Anode

Weight: 42 g

H17362



Weight: 266 g

* Mounting hole for optical rod

How to set up H17362

The H17362 is a THz PMT module with a built-in USB interface. It is connected to the USB port of your personal computer and controlled by software

Please download the device driver and sample software from the following page.

https://www.hamamatsu.com/sp/etd/software_etd/download/thz-pmt_module/h17362_en.html

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