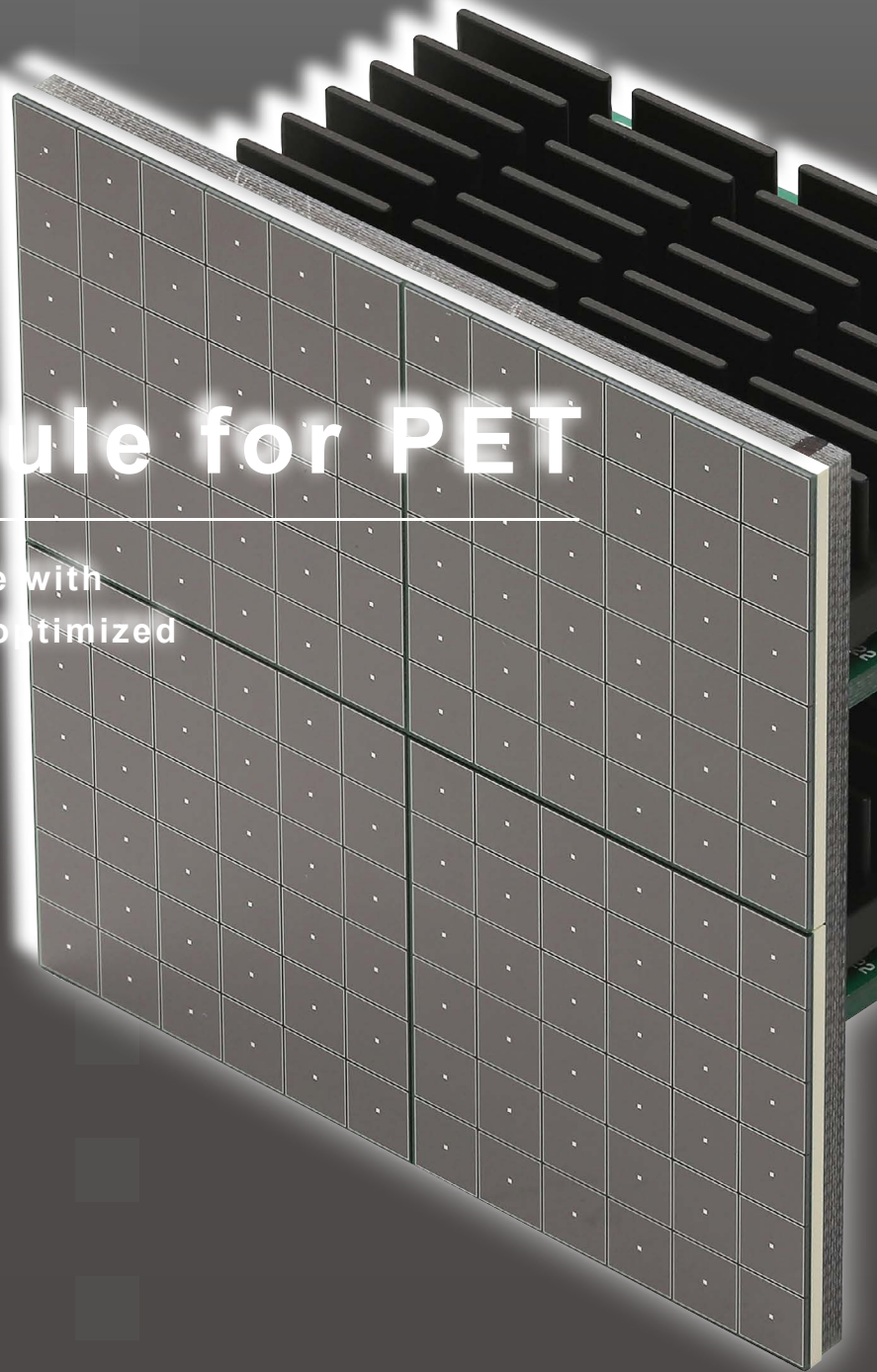
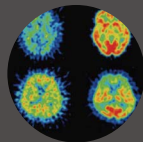
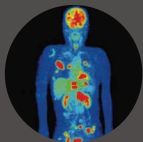


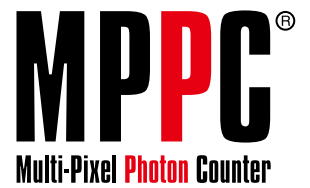
MPPC[®] module for PET

By combining our MPPC device with circuit technologies, we offer optimized modules and circuits for PET.



HAMAMATSU
PHOTON IS OUR BUSINESS

DETECTOR

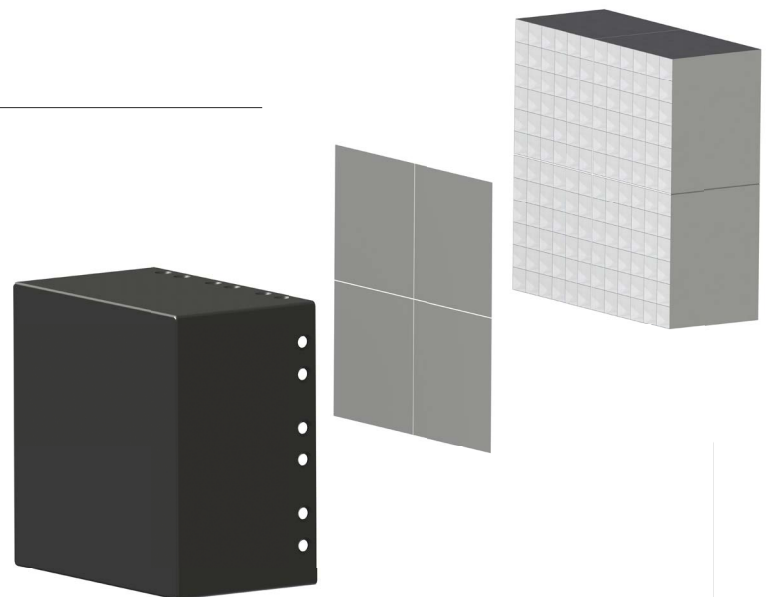
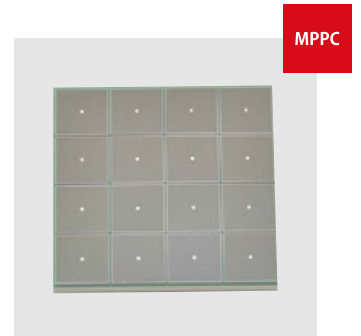


MPPC array

The MPPC is one of the devices called silicon photomultipliers (SiPM). [The S14161 series](#) is an MPPC (SiPM) array for precision measurement. It inherits the superb low afterpulse characteristics of its predecessor and further provides lower crosstalk and lower dark count.

Features

- Reduced crosstalk and dark count (compared to previous products)
- Low afterpulses
- Outstanding photon counting capability (outstanding photon detection efficiency against incident photons)
- Excellent uniformity
- Low voltage operation



SCINTILLATOR

The lutetium scintillator features high light emission yields and fast decay time. Combining this scintillator with the MPPC enables the construction of excellent PET imaging systems, such as TOF-PET.

Features

- High light output
- Superior time resolution
- No deliquescence unlike CsI

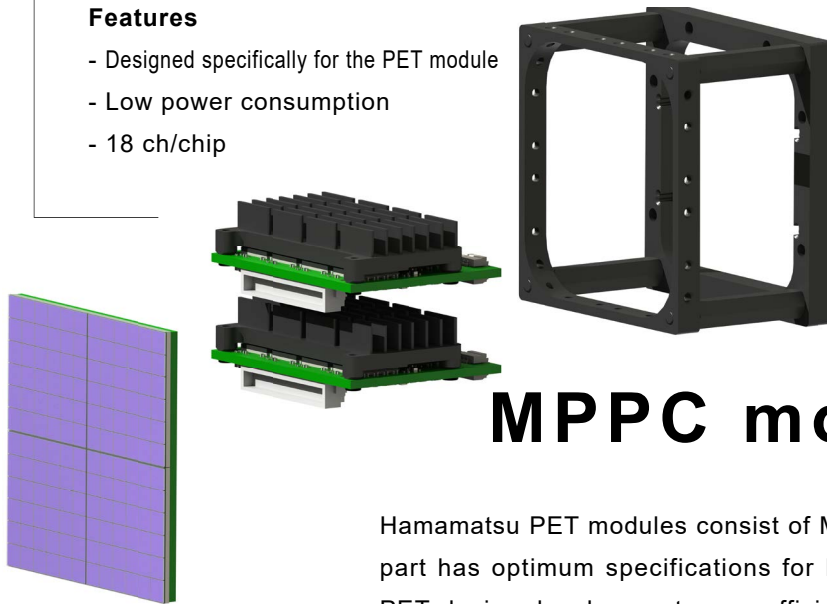
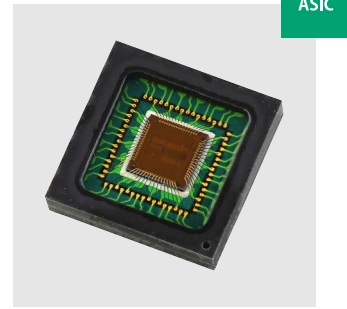


ASIC

An ASIC optimized for the MPPC and lutetium scintillator in the MPPC module was specifically designed. This ASIC along with TDC, FPGA, and other signal processing circuits necessary for TOF-PET is mounted on a compact circuit board. This is incorporated in the PET module.

Features

- Designed specifically for the PET module
- Low power consumption
- 18 ch/chip



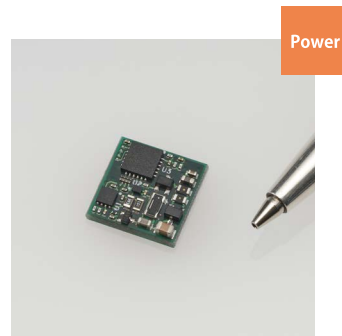
MPPC module for PET

Hamamatsu PET modules consist of MPPC arrays, scintillators, and ASICs. Each part has optimum specifications for PET. Using these modules can make your PET device development more efficient. Further, Hamamatsu provides not only the light detection section but also latter-stage circuits and interface boards.

POWER SUPPLY

The power supply is for driving the MPPC. It contains a temperature compensation function to keep the MPPC operation stable.

A single power supply can run multiple MPPC arrays.



PERIPHERAL CIRCUIT


The power supply unit and peripheral circuits (sold separately) are for running the PET module properly.



MPPC module for PET



The module is installed in a PET device. It integrates an MPPC, a scintillator, and an ASIC board.

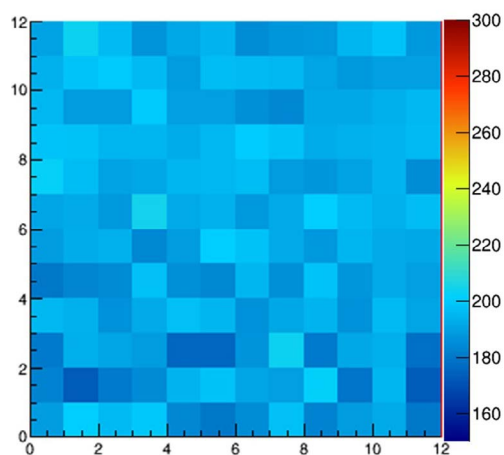
Type no.	C13500-4075YC-12
Photo	
Scintillator size/ch	4 × 4 mm (12 × 12 ch)
MPPC size/ch	4 × 4 mm, 75 μm pitch (12 × 12 ch)
Count rate	< 500 kcps
CTR (FWHM)	< 210 ps
Power consumption	2.6 W

Features 1

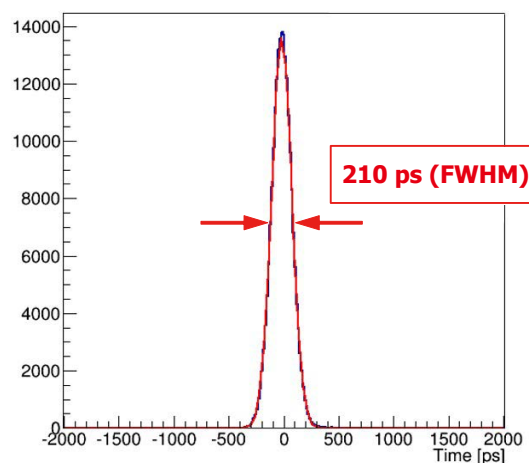
Excellent time resolution: 210 ps

- CTR (FWHM): 210 ps
- CTR variation (12 × 12 ch): ±15 ps max.

■ 2D map of CTR



■ Histogram of CTR

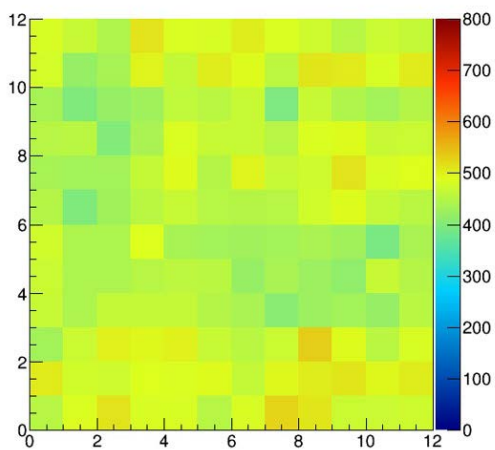


Features 2

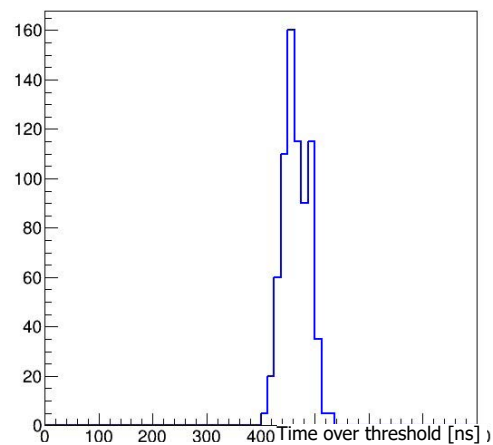
Outputs energy information of all channels

As the energy information of the PET module is processed using time over threshold, it is output as time information.

■ 2D map of energy peak (511 keV)



■ Histogram of energy peak (511 keV)



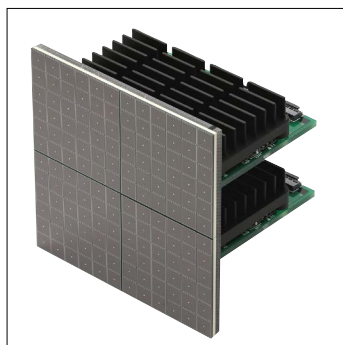
Features 3

Customizable for OEM

Customization is possible according to your needs.
Consult with your nearest Hamamatsu sales office.

Examples:

- MPPC
- Scintillator size
- Structure

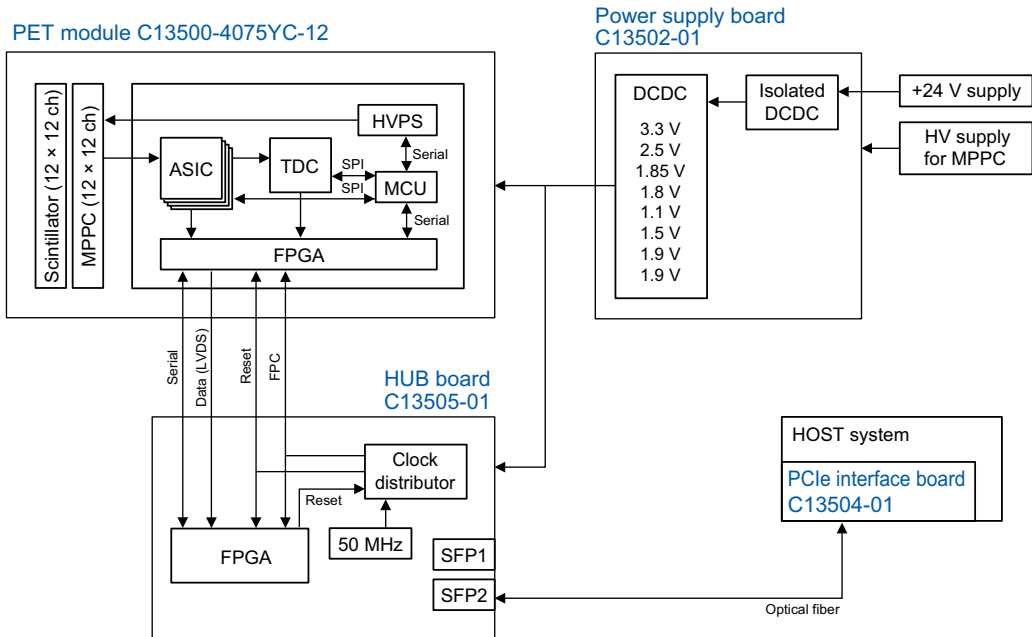


Peripheral circuits and power supply

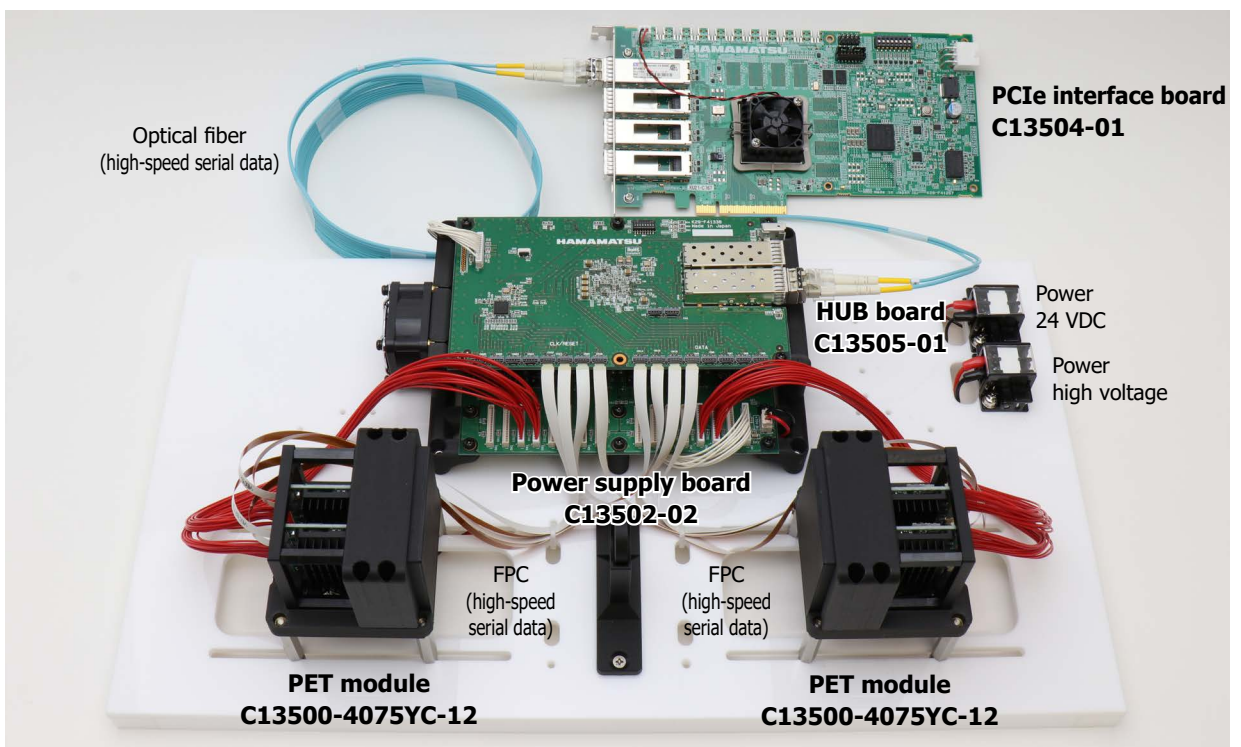
PERIPHERAL CIRCUIT

These are peripheral devices for running the PET modules and peripheral circuits for generating output.

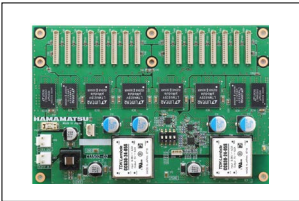
■ Block diagram



■ Connection example



Power supply board C13502-02

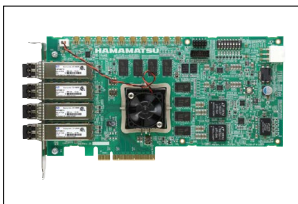


This unit is able to provide a power supply that is required for the PET modules. The C13502-02 can distribute power to 8 PET modules. This unit is the ideal power source to operate the PET modules C13500 series.

Features

- The power supply is delivered to the PET modules.
- Distributes to 16 signal processing units

PCIe interface board C13504-01

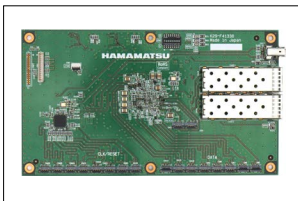


The C13504 series attach to the PCIe connector on a PC and easily collect measurement data in a PC with high-speed data transfer by connecting C13505-01.

Features

- High-speed optical interface
 - 10 Gbps (SFP) cage × 2
- Windows 10 (64-bit), CentOS 6.7 (64-bit)

HUB board C13505-01



The C13505-01 provides sync signals that the PET modules require. It can distribute to PET modules. The C13505-01 also gathers measurement data from the PET modules C13500 series and outputs data to PC via an optical fiber with high-speed data transfer.

Features

- Output signal: LVDS
- Distribute to 4 modules (C13500-4075YC-12)
- High-speed interface: 10 Gbps (SFP), 3 Gbps (Metal)

Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

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