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Driver circuit for MPPC®

C12332-01

Simple evaluation starter kit for non-cooled MPPC

The C12332-01 is a simple evaluation starter kit for non-cooled MPPC. MPPC evaluation is possible by mounting an MPPC in the socket of the sensor circuit board. Various types of MPPCs can be evaluated. MPPC with flexible cable (for evaluating surface mount type MPPC) can also be connected by using the FFC connector of the power supply circuit board.
The power supply circuit board is equipped with the C11204-01, a high-accuracy, high-voltage power supply that provides the operating voltage for MPPC. It operates just by connecting to an external power supply (±5 V). It is also equipped with a USB interface that can be used to set the operating voltage and temperature compensation coefficient from a PC running the supplied sample software.

Features

- **Enables the evaluation of non-cooled MPPC**
- **Sensor circuit board with a socket for mounting an MPPC with leads**
- **Connection possible to MPPC with flexible cable**
- **Equipped with a high-accuracy, high-voltage C11204-01 power supply**
- **Adjustable operating voltage and temperature compensation coefficient**
- **Selectable amplifier usage (the default condition is use)**
- **Selectable load resistance 50 Ω or 1 kΩ**
- **Analog output**

Applications

- **Simple initial evaluation of MPPCs**

Note: MPPC is sold separately.

Compatible MPPCs

Type no.	Number of channels (ch)	Effective photosensitive area (mm)	Pixel pitch (μm)	Number of pixels
S12571-010C	1	1 × 1	10	10000
S12571-015C			15	4489
S12572-010C		3 × 3	10	90000
S12572-015C			15	40000
S13360-1325CS		1.3 × 1.3	25	2668
S13360-1350CS			50	667
S13360-1375CS			75	285
S13360-3025CS		3 × 3	25	14400
S13360-3050CS			50	3600
S13360-3075CS			75	1600
S13360-6025CS		6 × 6	25	57600
S13360-6050CS			50	14400
S13360-6075CS			75	6400

Absolute maximum ratings

Parameter	Symbol	Condition	Specification	Unit
Supply voltage	Vs		±5.8	V
Operating temperature	Topr	No dew condensation*1	-20 to +60	°C
Storage temperature	Tstg	No dew condensation*1	-20 to +80	°C

*1: When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

Recommended operating conditions (Ta=25 °C, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage*2	Vs		±4.75	±5	±5.25	V
Load resistance*3	RL	When amplifier is not used	-	50 or 1 k	-	Ω

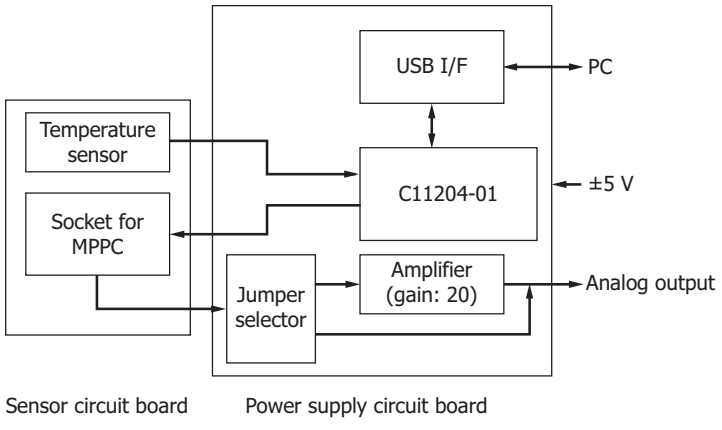
*2: Use a power supply with 300 mA or higher output.
*3: The initial condition is 50 Ω. When using an amplifier, set the load resistance to 50 Ω.

Electrical characteristics (Ta=25 °C, Vs=±5 V, unless otherwise noted)

Parameter		Symbol	Condition		Min.	Typ.	Max.	Unit
Current consumption		Is	Vo=72 V, no load, when communication with a PC	+5 V	+36	+48	+60	mA
				-5 V	-10	-15	-20	
MPPC supply voltage range*4		Vo	No load		-	40 to 80	-	V
Setting voltage resolution*5		-			-	10	-	mV
Setting voltage error		-	Vo=72 V, no load		-	±10	±40	mV
Voltage monitor error		-	Vo=72 V, no load		-	±10	-	mV
Current monitor error		-	Vo=72 V, Io=1.0 mA		-	±0.05	-	mA
Cutoff frequency	High	fc	When amplifier (gain: 20) is used (RL=50 Ω), -3 dB		-	40	-	MHz
	Low				-	DC	-	
Mounted temperature sensor		-			LM94021BIMG (by Texas Instruments)			-
Interface*6		-			USB 2.0 (Full Speed)			-

*4: The MPPC operating voltage varies depending on the product. Refer to the value provided with the product.
*5: When the sample software is used
*6: After you set the operating voltage, remove the USB cable from the driver circuit for MPPC to eliminate any noise effects from the PC.

Block diagram



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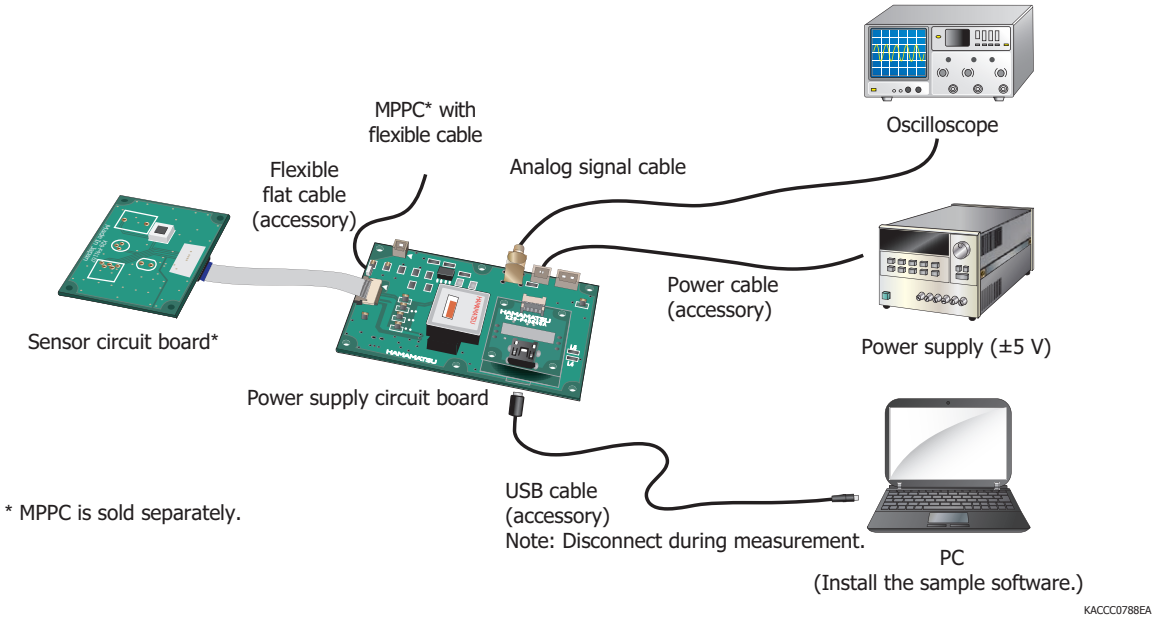
Connection example



* MPPC is sold separately.

Procedure

Connect

Connect the following cables to the circuit board connectors.
- Power cable
- USB cable
- Signal cable
- Flexible flat cable

Supply power

Supply power from an external source.

Install the driver software and sample software

Install the driver software on the supplied CD-ROM into your PC. Then install (copy) the sample software.

Set parameters

Start the sample software, and set the operating voltage and other MPPC parameters.

Apply operating voltage

From the sample software, apply the MPPC operating voltage.

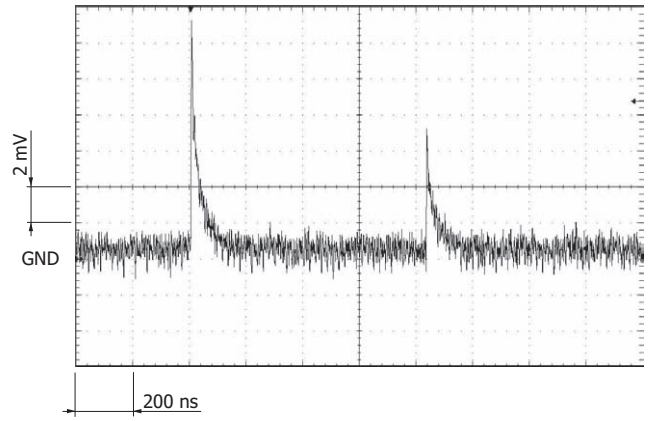
Measure

From the sample software, disconnect the communication with the PC, remove the USB cable, and make measurements using an oscilloscope or other device.

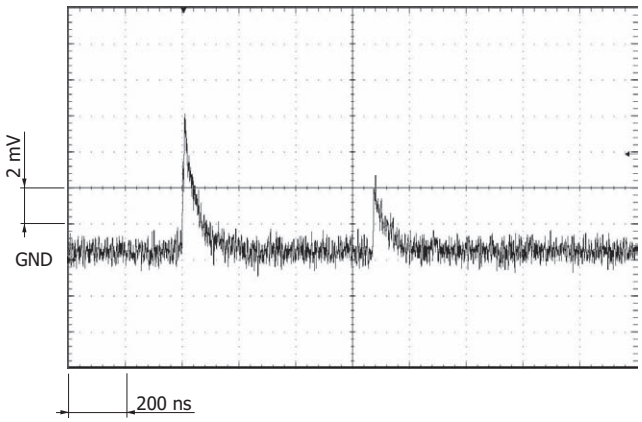
Measurement examples [using amplifier, gain: approx. 20x (default), R_L=50 Ω]

Dark state

S13360-1350CS

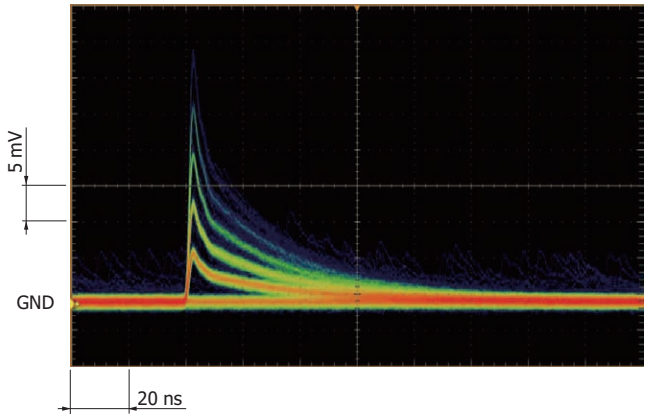


S13360-3050CS

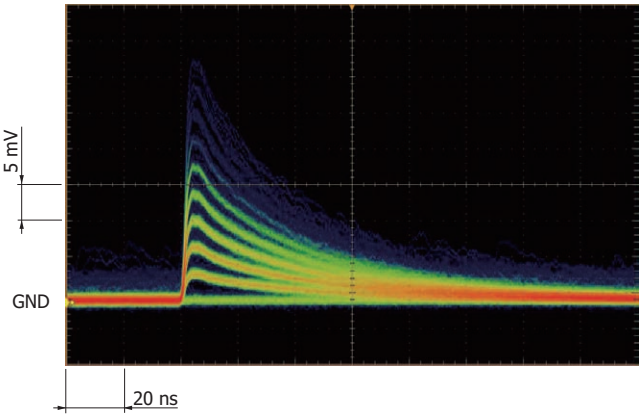


Impulse light (wavelength: 466 nm)

S13360-1350CS

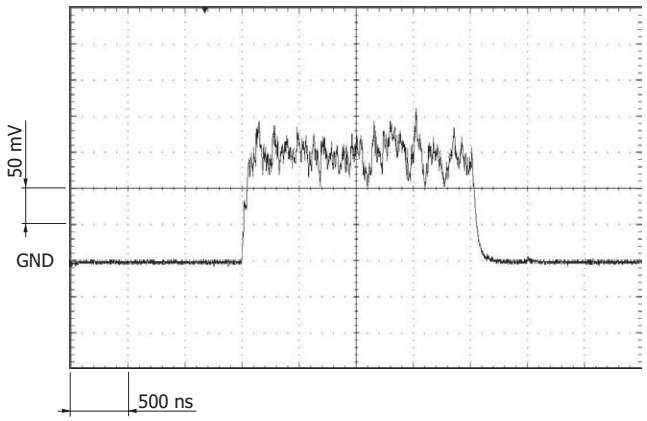


S13360-3050CS

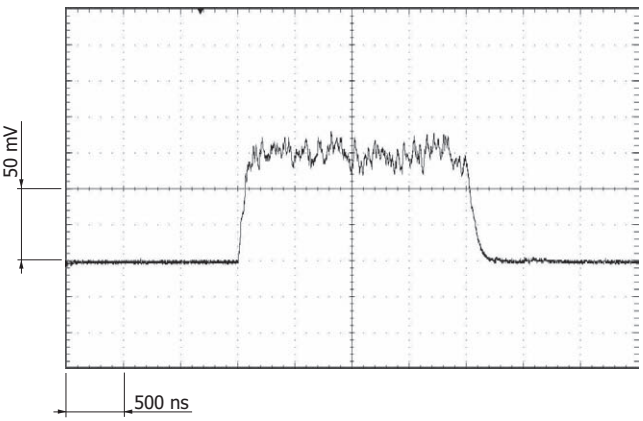


Pulse light (wavelength: 470 nm, pulse width: 2 μs)

S13360-1350CS

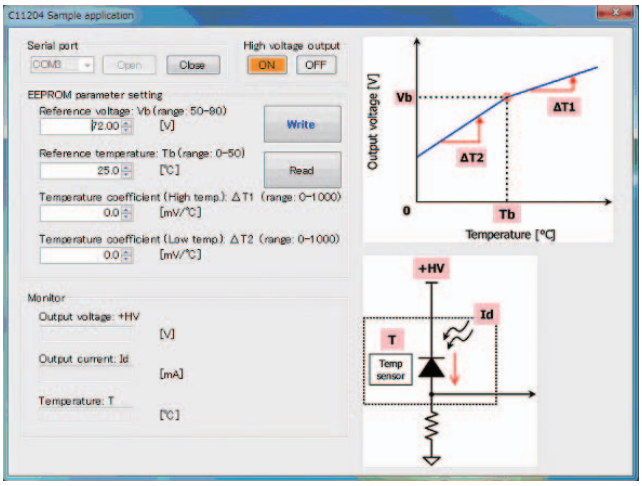


S13360-3050CS



Sample software (included)

The sample software*7 is designed to simplify the MPPC evaluation. You can use the sample software to set the operating voltage and temperature compensation coefficient. The sample software has been confirmed to work with Microsoft .NET Framework 2.0 and later. The sample software was created on Microsoft® Visual Basic® 2008 Express Edition SP1.

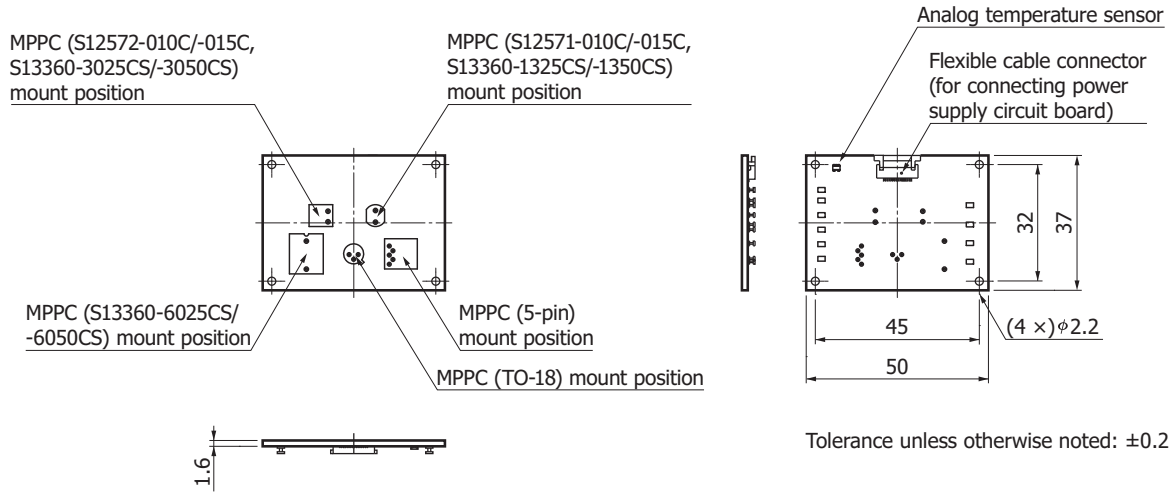


*7: Compatible OS
Microsoft® Windows® 7 Professional SP1 (32-bit, 64-bit)

Note: Microsoft, Windows, Visual Studio, and Visual Basic are registered trademarks of Microsoft Corporation in the United States and/or other countries.

Dimensional outlines (unit: mm)

Sensor circuit board



Tolerance unless otherwise noted: ±0.2

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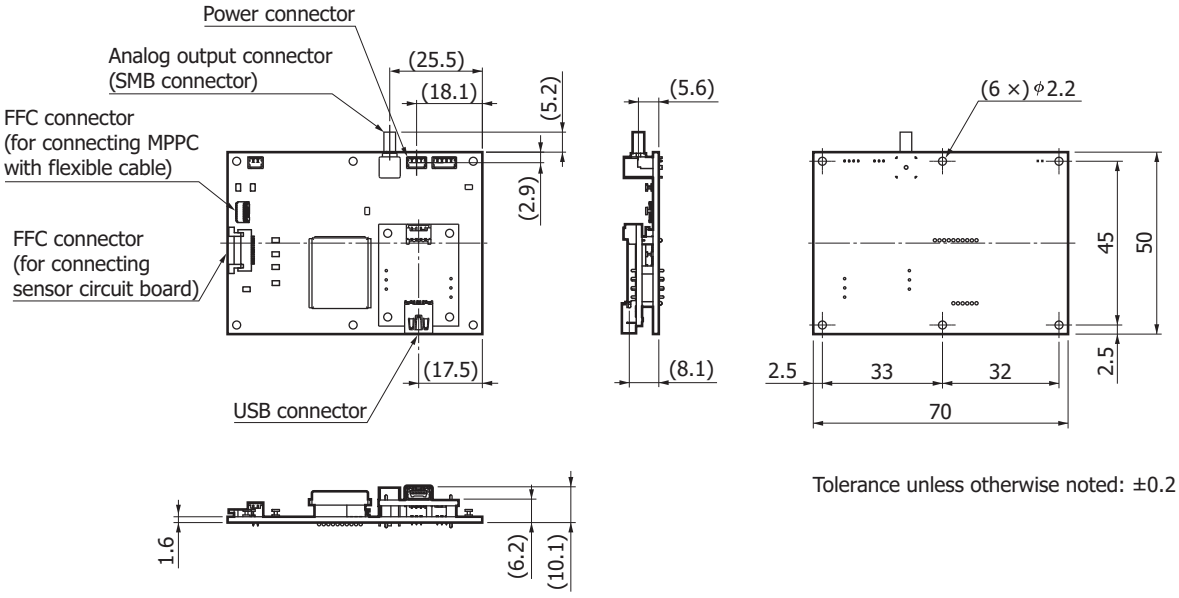
Power supply circuit board



Tolerance unless otherwise noted: ±0.2

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Accessories

· Power cable
· Operating voltage check cable
· USB cable
· Flexible flat cable (50 mm)
· CD-ROM (instruction manual, driver software, sample software, etc.)
· Quick start guide

Precautions

· For cleaning the product, wipe using a clean, soft, dry cloth. Do not use organic solvents such as thinner and acetone.
· If the product and the PC are connected with a USB cable, do not remove the USB cable while the sample software is communicating.
· This product is a simple MPPC evaluation circuit. Do not integrate this product in your device.

Options (sold separately)

Coaxial conversion adapter A10613 series

Coaxial conversion adapters for converting the SMB coaxial connector for extracting MPPC module signals into a BNC coaxial connector or an SMA coaxial connector. These adapters make connection to a BNC cable or SMA cable possible.

A10613-01 (SMB-BNC)

A10613-02 (SMB-SMA)

Related information

http://www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions
· Disclaimer

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