



C11204-01

Bias power supply with built-in high precision temperature compensation for MPPCs

The C11204-01 is a high voltage power supply that is optimized for MPPCs (multi-pixel photon counters). It can output up to 90 V. It contains a temperature compensation function that constantly optimizes the MPPC operation even in environments with varying temperatures. It also has built-in output voltage monitor and output current monitor. All functions can be controlled from a PC via its serial interface (UART).

Features

- **Wide output voltage range: 50 V to 90 V**
- **Low ripple noise*1: 0.1 mVp-p typ.**
- **Superb temperature stability: ±10 ppm/°C typ.**
- **Finely adjustable resolution (in 1.8 mV steps)**
- **Serial interface**

*1: No load, using the recommended circuit

Applications

- **Power supply for MPPCs**

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Supply voltage	Vs		6	V
Operating temperature	Topr	No condensation	0 to +50	°C
Storage temperature	Tstg	No condensation	-20 to +70	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage	Vs		4.75	5	5.25	V
High level input voltage (RXD)	V _{IH}	4.75 ≤ Vs ≤ 5.25	0.65V _{cc}	-	V _{cc}	V
Low level input voltage (RXD)	V _{IL}	4.75 ≤ Vs ≤ 5.25	0	-	0.4V _{cc}	V
High level input voltage (TXD)	V _{OH}	Vs = 5 V	V _{cc} - 2.0	-	V _{cc}	V
Low level input voltage (TXD)	V _{OL}	Vs = 5 V	-	-	2.0	V

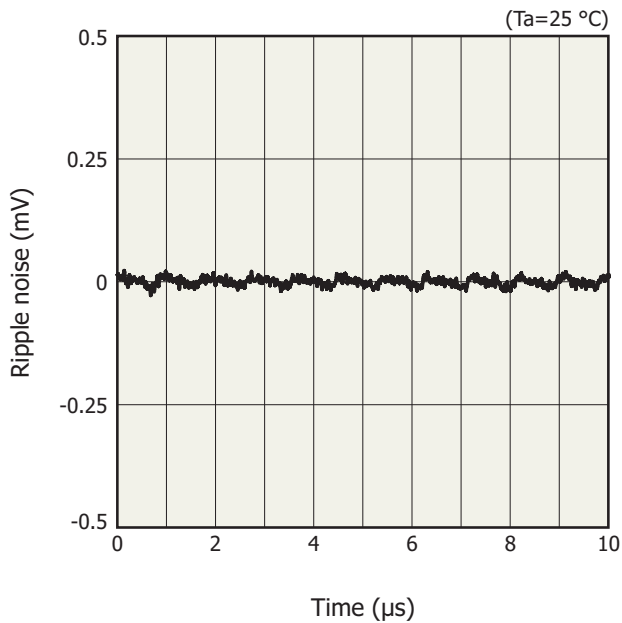
Electrical characteristics (Typ. Ta=25 °C, Vs=+5 V, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	Vs		4.75	5	5.25	V
Current consumption	Icc	Vo=72 V, no load	-	20	-	mA
Output voltage	Vo	No load	-	50 to 90	-	V
Output current	Io		0	-	2	mA
Ripple noise*2	Vn	Vo=72 V, no load	-	0.1	0.2	mVp-p
Setting precision	-	Vo=72 V, no load	-	±10	-	mV
Setting resolution	-		-	1.8	-	mV
Temperature stability	-	25 ± 10 °C Vo=72 V, no load	-	±10	-	ppm/°C
Interface*3	-		Serial communication			-

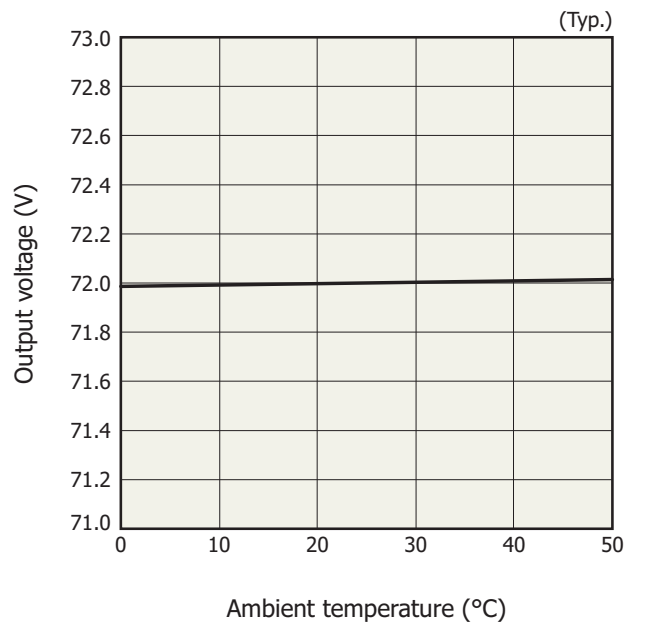
*2: Using the recommended circuit

*3: To control the C11204-01 from a PC, we recommend that you use the C12332 driver circuit (starter kit) for MPPC (sold separately, C11204-01 built in).

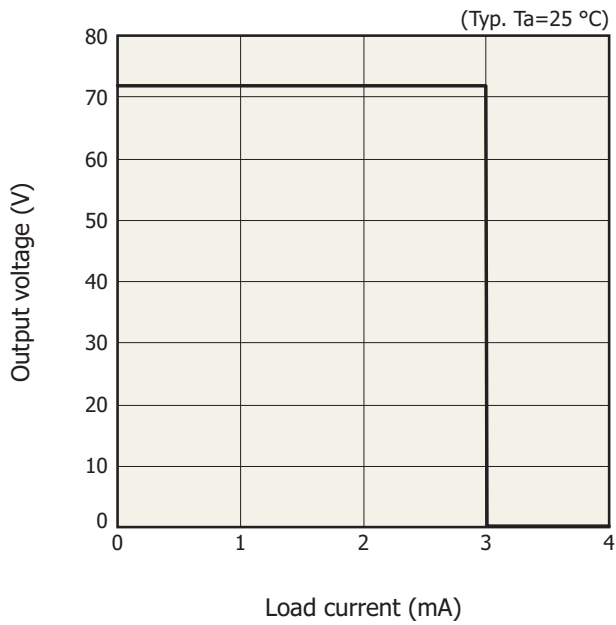
Ripple noise vs. time (typical example)



Output voltage vs. ambient temperature

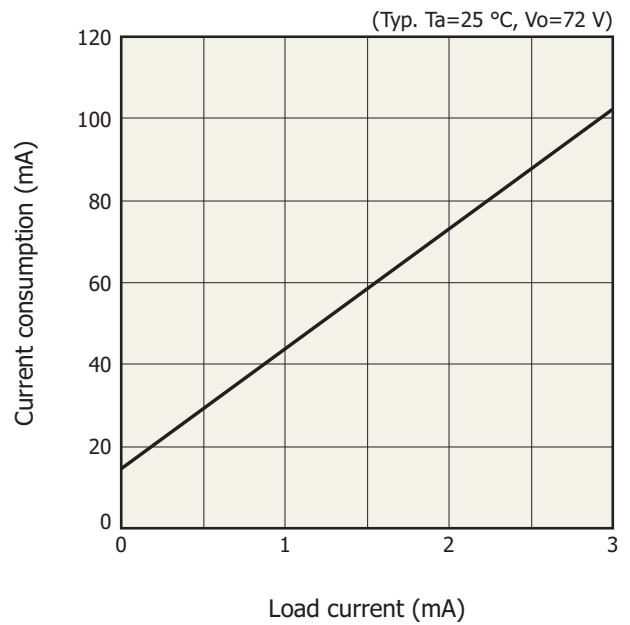


Output voltage vs. load current



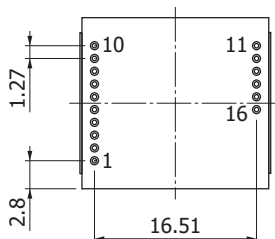
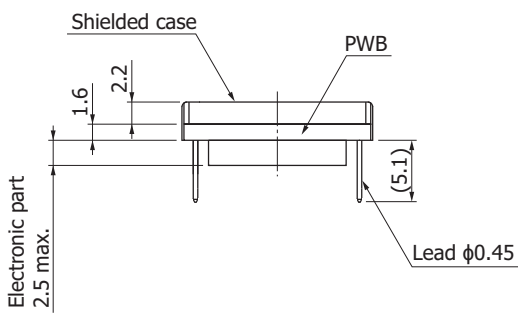
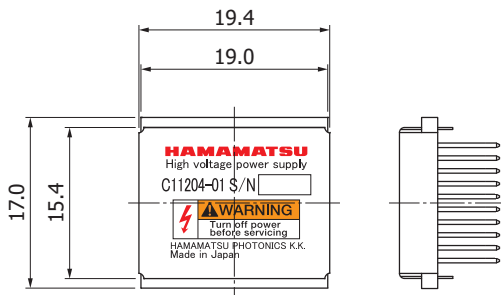
KACCB0289EA

Current consumption vs. load current



KACCB0290EA

Dimensional outline (unit: mm)



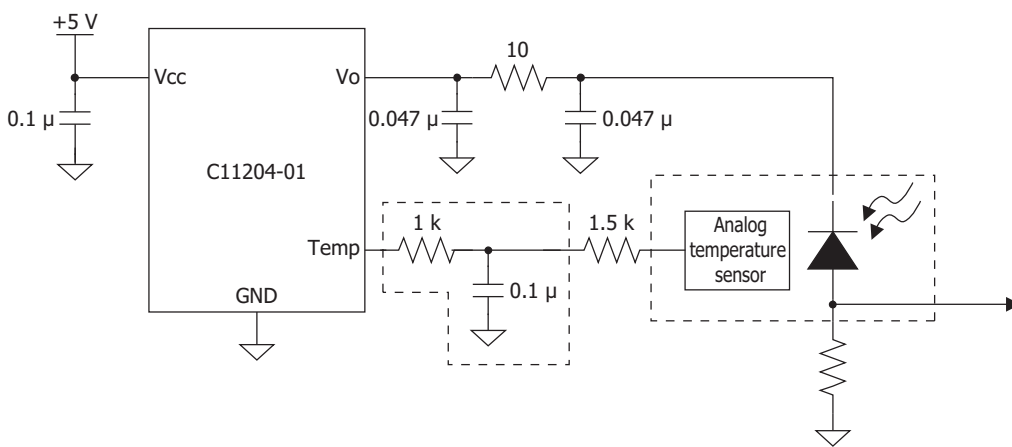
Tolerance unless otherwise noted: ± 0.2

KACCA0308EB

Pin connections

Pin no.	Symbol	Function
1	Vcc	Positive supply voltage Furnish a bypass capacitor to ground as close to this pin as possible.
2, 5, 8, 15	GND	Ground Connect directly to the ground plane using the shortest wire possible.
3	RXD	Serial data input
4	TXD	Serial data output
6, 7, 9, 11 to 14	NC	NC
10	Vo	High voltage output
16	Temp	Connect to an analog temperature sensor

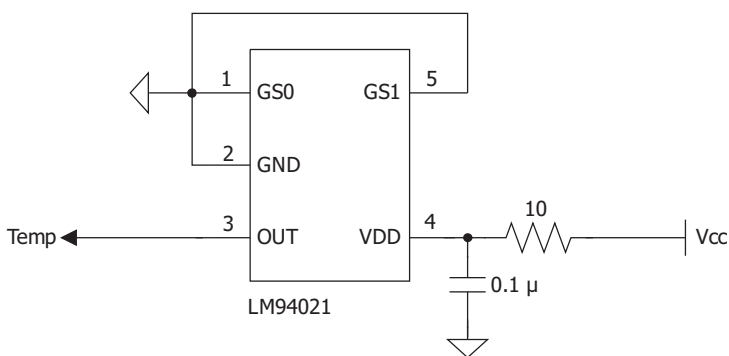
Recommended circuit



KACCC0661EA

Note: For the bypass capacitor to connect to Vo, use a high-withstand-voltage, low-ESR capacitor. Provide a noise filter near the Temp pin.

Analog temperature sensor block



KACCC0660EA

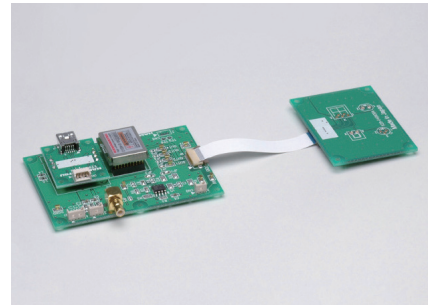
Note: For the analog temperature sensor, use the LM94021 by Texas Instruments. Connect pins 1 and 5 of the analog temperature sensor to ground.

UART Communication specifications

Parameter	Specifications
Baud rate	38400 bps
Data bits	8
Parity bits	Even
Stop bit	1
Flow control	None

Related product: C12332 Driver circuit (starter kit) for MPPC

The C12332 is a starter kit designed for simple non-cooled MPPC evaluations. It consists of a sensor board and a power supply board. The sensor board includes an MPPC socket and a temperature sensor. The power supply board includes a C11204-01 power supply module for MPPC, an amplifier, and a USB interface board. The USB interface allows you to change the bias voltage and set the temperature compensation coefficient from a PC. The C12332 operates just by connecting it to an external power supply (± 5 V).



Related information

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

- Precautions
- Disclaimer

Information described in this material is current as of March, 2015.

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.

Type numbers of products listed in the delivery specification sheets or supplied as samples may have a suffix "(X)" which means preliminary specifications or a suffix "(Z)" which means developmental specifications.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use.

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