



C14156

Bias power supply with built-in temperature compensation function for MPPC

The C14156 is a high voltage power supply that is optimized for driving MPPCs (multi-pixel photon counters). Up to 80 V can be output by applying a control voltage and supply voltage. It contains a temperature compensation function that constantly optimizes the MPPC operation even in environments with varying temperatures.

Features

- Wide output voltage range: 0 V to 80 V
- With a temperature compensation function
- With an ON/OFF control function
- Output voltage adjustment using a control voltage
- Compact, surface mount type

Applications

- Driving MPPCs

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Supply voltage	Vs		6	V
Control voltage	Vcont		0 to Vs	V
Setting voltage of the output voltage temperature coefficient	Vtcr		0 to Vs	V
ON/OFF control voltage	SHDN		0 to Vs	V
Operating temperature	Topr	No dew condensation*1	-20 to +60	°C
Storage temperature	Tstg	No dew condensation*1	-30 to +85	°C
Reflow soldering conditions*2	Tsol		Peak temperature: 240 °C, 3 times (see P.5)	-

*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.

*2: JEDEC level4

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

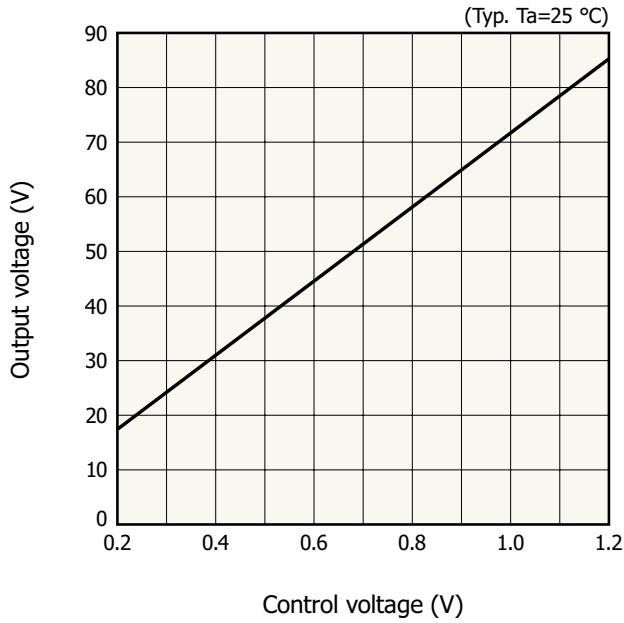
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	Vs		4.75	5	5.25	V
Control voltage	Vcont		0	-	1.2	V

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

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Current consumption	Icc	Vo=56 V, no load	-	25	-	mA
Output voltage	Vo	No load	-	0 to 80	-	V
Output current	Io		0	-	2	mA
Ripple noise*3	Vn	Vo=56 V, no load	-	1	-	mVp-p
Temperature stability	-	25 ± 10 °C Vo=56 V, no load	-	±200	-	ppm/°C

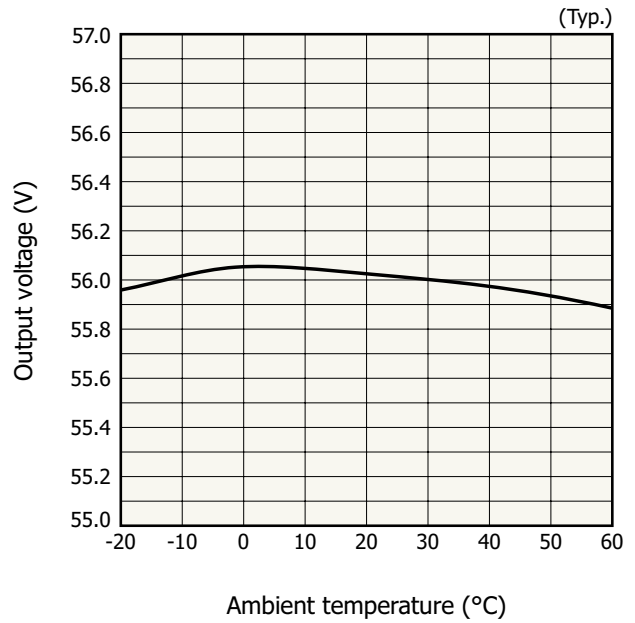
*3: Using recommended circuit

Output voltage vs. control voltage



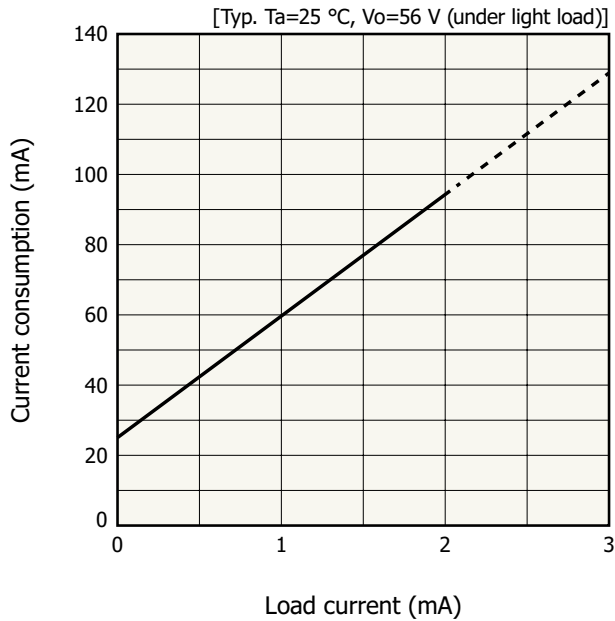
KACCB0515EA

Output voltage vs. ambient temperature



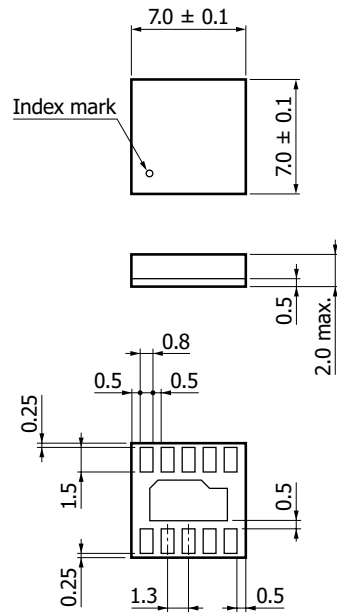
KACCB0516EA

Current consumption vs. load current



KACCB0517EA

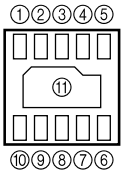
Dimensional outline (unit: mm)



Tolerance unless otherwise noted: ±0.2

KACCA0417EA

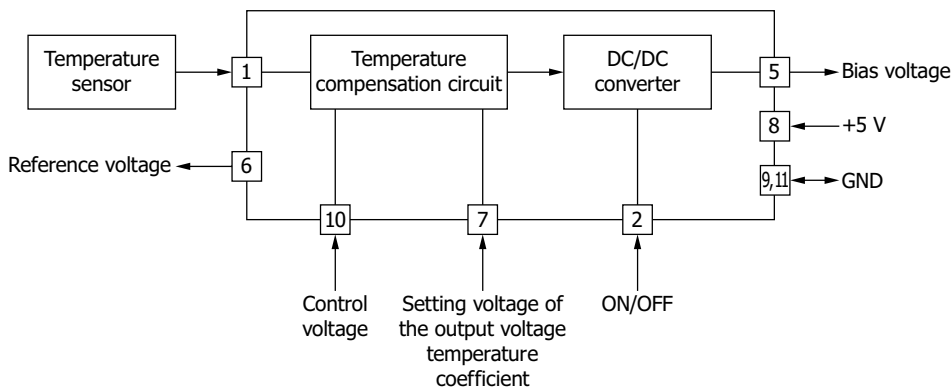
Pin connections



KACCC0910EA

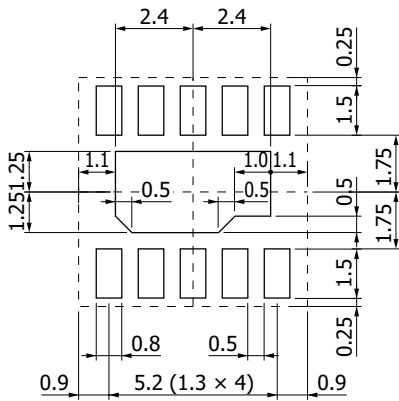
Pin no.	Symbol	Function
1	Temp	Connect to an analog temperature sensor. If you do not use the temperature compensation function (not connecting a temperature sensor), insert a 1 kΩ resistor between pin no.1 and GND.
2	SHDN	Output voltage ON/OFF control
3, 4	NC	No connection These pins should not be connected to any terminals.
5	Vo	High voltage output
6	Vref	Reference voltage output
7	Vtcr	Output voltage temperature coefficient control
8	Vs	Positive supply voltage Connect a bypass capacitor between this pin and ground. Connect the capacitor as close to this pin as possible.
9, 11	GND	Ground Connect directly to the ground plane using the shortest wire possible.
10	Vcont	Control voltage

Block diagram



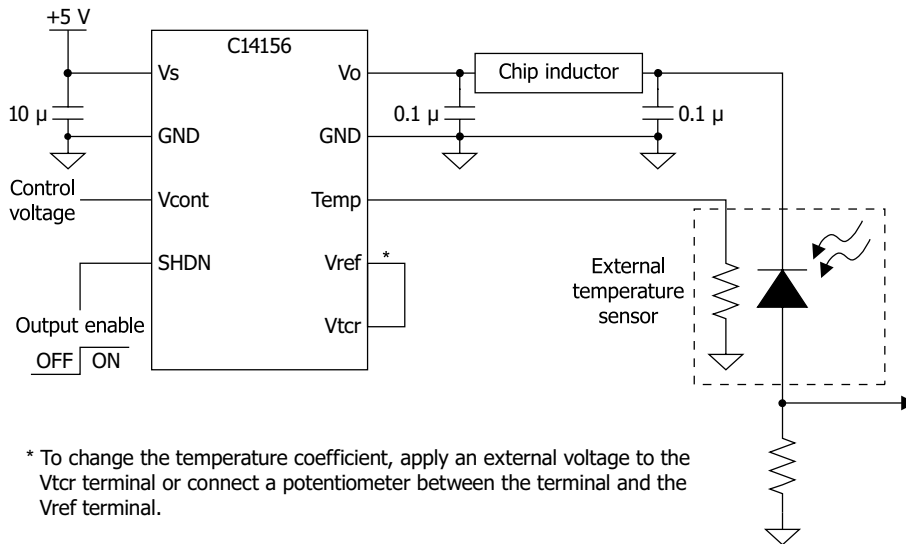
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Recommended land pattern (unit: mm)



KACCC0911EA

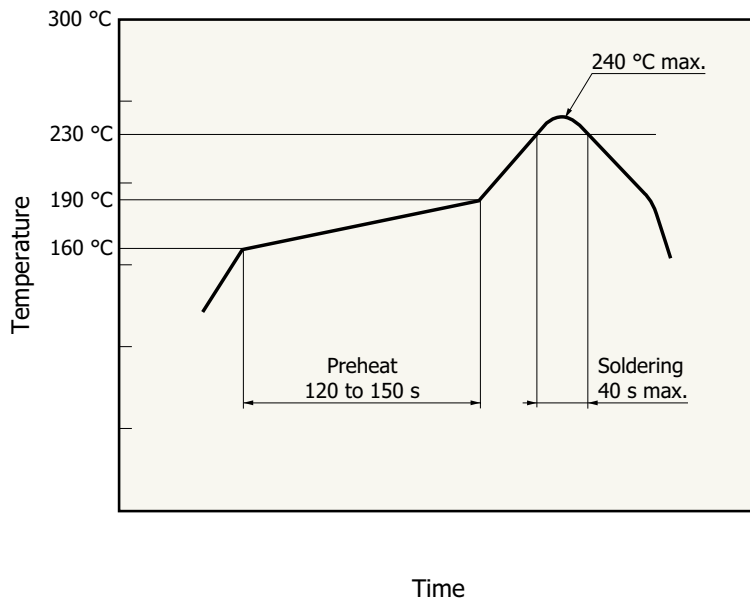
Recommended circuit



KACCC0912EA

Note: For the analog temperature sensor, use an LP731JTTE102F3600 by KOA.
 If you do not use the temperature compensation function (not connecting a temperature sensor), insert a 1 kΩ resistor between pin no.1 and GND.

Recommended reflow soldering conditions



KPICB0172EA

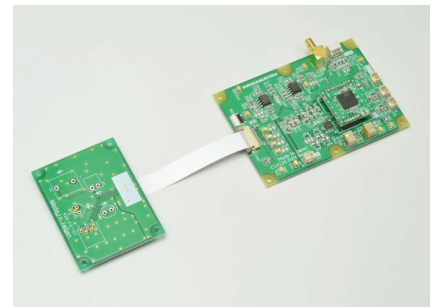
- This product supports lead-free soldering. After unpacking, store it in an environment at a temperature of 30 °C or less and a humidity of 60% or less, and perform soldering within 72 hours.
- The effect that the product receives during reflow soldering varies depending on the circuit board and reflow oven that are used. When you set reflow soldering conditions, check that problems do not occur in the product by testing out the conditions in advance.
- When three or more months have passed or if the packing bag has not been stored in an environment described above, perform baking at 125 ± 5 °C for 24 +0/-1 hours. For precautions on the baking method, see "Surface mount type products/Precautions."

Accessories




- Instruction manual

Related product: "Driver circuit for MPPC" C14488

The C14488 is a simple evaluation starter kit for non-cooled MPPC. 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 C14156 power supply module for MPPC and an amplifier. You can simply operate this module by supplying an external power supply (± 5 V) and control voltage. The output voltage can be varied according to the external control voltage.



Power supply lineup for MPPCs

Photo	Type no.	Package type	Temperature stability (ppm/°C)	Features
	C11204-01	With leads	±10	High precision Low ripple noise
	C11204-02	Surface mount type	±10	High precision Low ripple noise Compact: 11.5 × 11.5 mm
	C14156	Surface mount type	±200	Low cost Compact: 7 × 7 mm

Related information

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

Precautions

- Disclaimer
- Surface mount type products

Information described in this material is current as of May 2022.

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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