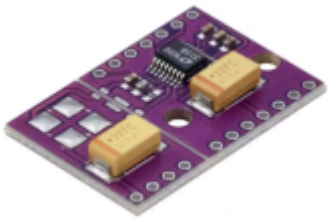
LamaPLC: LTC3108-1 Ultra Low Voltage Boost Converter Power Manager Breakout Development Board

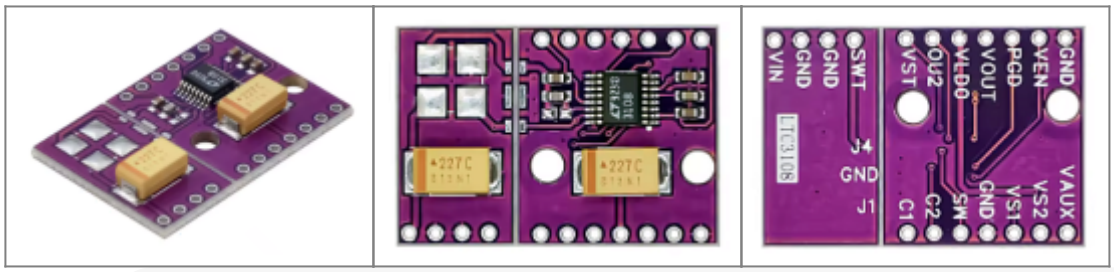
The LTC3108-1 is a compact, ultralow-voltage step-up DC/DC converter and power manager from Analog Devices, engineered to harvest energy from sources as low as 20 mV, including **thermoelectric generator**s (TEGs) and small **solar cell**s.



Key Features and Specifications

- **Ultralow Start-Up Voltage:** Operates from input voltages as low as 20mV (with a 1:100 transformer ratio), making it suitable for very low-power sources.
- **Power Management:** Provides a complete solution for wireless sensing and data acquisition, including surplus energy management to a storage capacitor or rechargeable battery.
- **Selectable Main Output (VOUT):** The main output is programmable to one of four fixed voltages using external pins (VS1 and VS2): 2.5V, 3V, 3.7V, or 4.5V. This differs from the standard LTC3108, which offers 2.35V, 3.3V, 4.1V, or 5V options.
- **Integrated LDO:** Includes a 2.2V LDO (low dropout regulator) capable of supplying up to 3mA to power an external microprocessor.
- **Additional Outputs:** Features a second logic-controlled output (VOUT2) and a reserve energy output (VSTORE) for backup power.
- **Power Good Indicator:** A PGOOD indicator pin signals when the main output voltage is within regulation.
- **Extremely Low Quiescent Current:** Ensures fast charging of the output reservoir capacitor.

More information: https://www.digikey.tw/htmldatasheets/production/1595402/0/0/1/ltc3108-1.html



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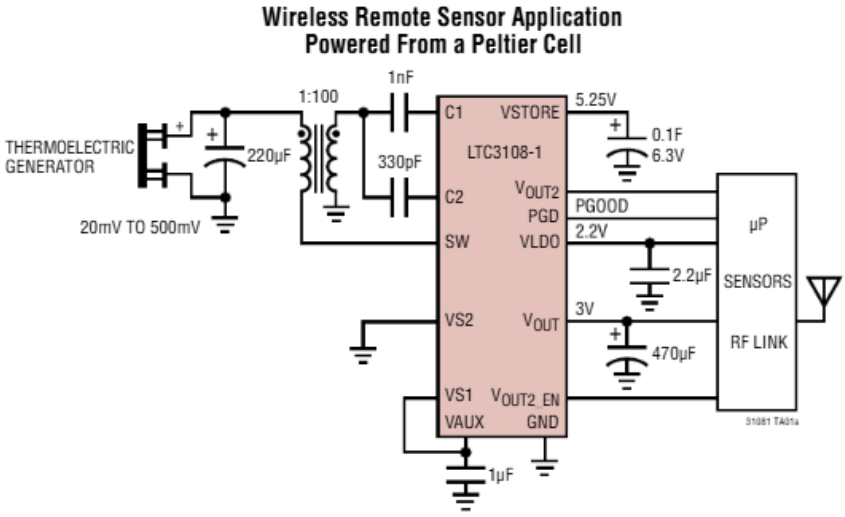
Pinout

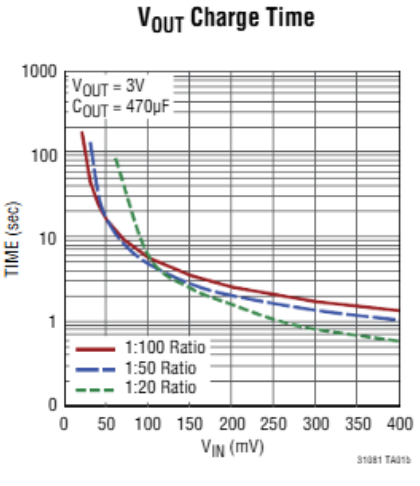
Pin	Name	Function Description
SW	Drain connection for the internal N-channel MOSFET switch. Connects to the primary of the step-up transformer.	
C1, C2	Connections for the external charge pump capacitors used to boost the voltage.	
VAUX	Output of the internal rectifier. A bypass capacitor (typically 1 µF) is required for the chip to function.	
VSTORE	Output for a large storage capacitor or battery to hold excess harvested energy for use when the input source is unavailable.	
VOUT	Main regulated output. Voltage is selectable (2.5V, 3V, 3.7V, or 4.5V) via VS1 and VS2 pins.	
VOUT2	A second switched output controlled by the VOUT2_EN pin. Useful for powering sensors only when needed.	
VLDO	2.2V low dropout (LDO) regulator output, providing up to 3mA for a microprocessor.	
PGD	Power Good Indicator. Logic is high when VOUT is in regulation.	
VS1, VS2	Output voltage select pins. These determine the regulation level for the main VOUT.	
GND	Signal and power ground. For the DFN package, the exposed pad must also be soldered to ground.	

Package Pin Mapping

- 12-Lead DFN: SW (1), VAUX (2), VSTORE (3), VOUT (4), VOUT2 (5), VOUT2_EN (6), PGD (7), VS1 (8), VS2 (9), C2 (10), C1 (11), GND (12).
- 16-Lead SSOP: Pins follow a similar sequence but include additional GND pins (1, 8, 9, 16).

Typical application





Peltier-Powered Energy Harvester for Remote Sensor Applications

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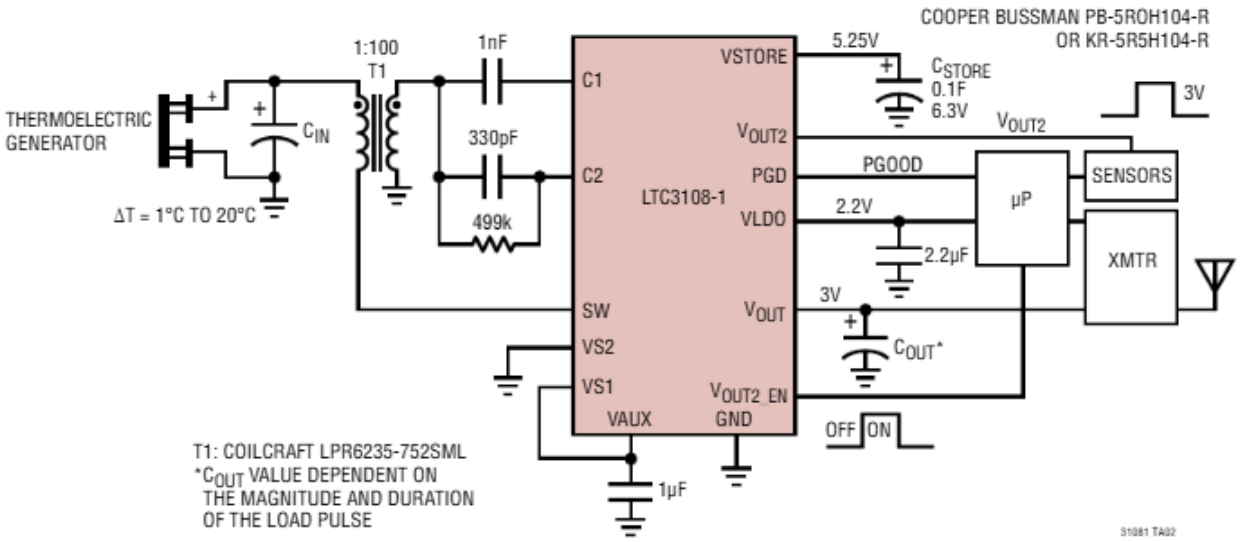

LTC3108-1, Voltage, Boost, Converter, power manager, step-up, DC/DC converter, thermoelectric generator, solar cell