

GW4235

Low Power Energy Harvest with MPPT

Description

GW4235 is a microlight collection management charging chip that integrates power management, charge/discharge management, and energy storage device management. The GW4235 can achieve cold start with energy input as low as 400mV and 15 μ W of power, and after startup, it can obtain DC power from light conversion devices such as solar panels, charge energy storage devices such as rechargeable batteries or supercapacitors, and provide stable operating voltage for different loads through two LDO regulators.

Features

- Ultra-low power start-up: cold start can be realized under 400mV input voltage and 15 μ W input power.
- Boost regulator: MPPT can be configured through pins, which can be configured as 70%, 75%, 85% or 90%; the MPPT open circuit voltage is detected every 5 seconds; the input voltage range is 150mV to 5V after startup.
- Low-voltage LDO output: support a maximum load current of 20mA; output voltage 1.2V/1.8V optional; switch control through pins.
- High-voltage LDO output supports a maximum load current of 80mA; the output voltage is optional/adjustable from 1.8V to 4.2V; it can be controlled by pins.
- Battery management: configure overcharge and over discharge protection parameters for rechargeable batteries or supercapacitors; prompt when the battery is exhausted; prompt when LDO is available.
- Battery switching: When the energy storage battery is exhausted, it will automatically switch to the primary battery; when the energy storage battery recovers, it will automatically switch to the energy storage battery.

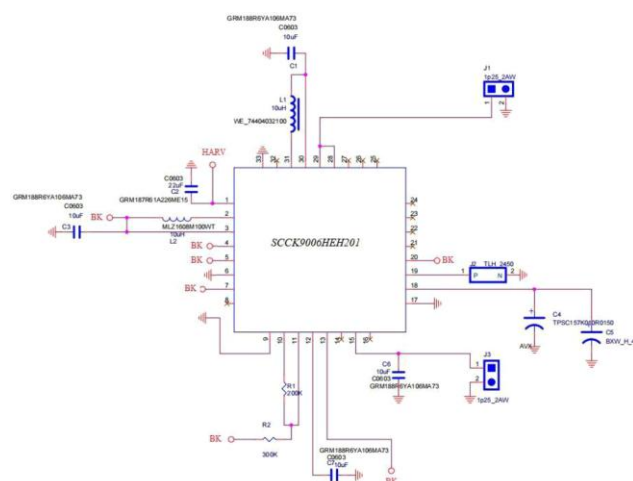
Physical Characteristics

- Operating voltages
 - Input voltage:
 - Cold start: 0.4V to 5V
 - After cold start: 0.15V to 5V
 - Output voltage:
 - Boost converter: 2.2V to 4.5V
 - Buck converter: 2V to 2.5V
 - Energy storage device voltage:
 - Rechargeable Batt.: 2.2V to 4.5V
 - Capacitance: 0V to 4.5V
- Operating junction temp.: -40°C to 125°C

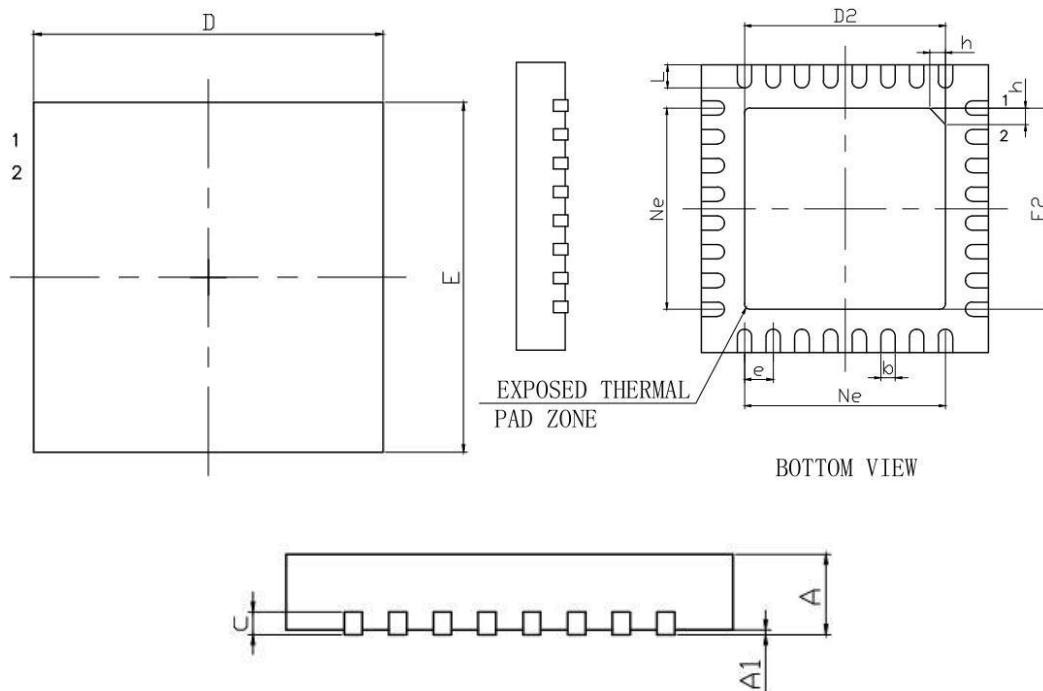
Typical Applications

- Industrial Monitoring
- Home Automation
- Electronic Health Monitoring
- Industrial Internet of Things
- Wireless Sensor Nodes

Basic Application Diagram



Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0	0.02	0.05
b	0.18	0.25	0.30
c	0.18	0.20	0.25
D	4.90	5.00	5.10
D2	3.40	3.50	3.60
e	0.50BSC		
Ne	3.50BSC		
E	4.90	5.00	5.10
E2	3.40	3.50	3.60
L	0.35	0.40	0.45
h	0.30	0.35	0.40

Ordering Information

Device name	Package	Remark
GW4235IRTVT	5.0mmx5.0mm, 0.5mm pitch	QFN32, Tray
GW4235IRTVR	5.0mmx5.0mm, 0.5mm pitch	QFN32, Tape & Reel

Notice

1. The descriptions of circuits, software, and other related information in this document are solely meant to demonstrate how semiconductor products operate and provide examples of their applications. You hold complete responsibility for incorporating or using the circuits, software, and information in designing your own product or system.
2. Gwanak Analog takes no responsibility for any losses or damages suffered by you or third parties resulting from the utilization of these circuits, software, or information.
3. Gwanak Analog explicitly disclaims any responsibility or liability for infringement or any other claims related to patents, copyrights, or other intellectual property rights of third parties, resulting from the use of Gwanak Analog products or technical information described in this document. This includes, but is not limited to, product data, drawings, charts, programs, algorithms, and application examples.
4. This document does not grant any form of license, whether explicit, implicit, or otherwise, under any patents, copyrights, or other intellectual property rights owned by Gwanak Analog or any other party.
5. It is your responsibility to identify and obtain any necessary licenses from third parties for the legal import, export, manufacturing, sales, use, distribution, or any other actions involving products that incorporate Gwanak Analog products, if such licenses are required.
6. You are prohibited from making any changes, modifications, copies, or reverse engineering of Gwanak Analog products, whether partially or entirely. Gwanak Analog takes no responsibility for any losses or damages suffered by you or third parties resulting from such actions of alteration, modification, copying, or reverse engineering.
7. No semiconductor product can guarantee absolute security. Despite any security measures or features incorporated into Gwanak Analog hardware or software products, Gwanak Analog holds no liability for any vulnerabilities or security breaches, including unauthorized access or usage of Gwanak Analog products or systems utilizing them. Gwanak Analog does not provide assurance or guarantee that Gwanak Analog products or systems created with them will be immune to issues like corruption, attacks, viruses, interference, hacking, data loss or theft, or other security intrusions. Gwanak Analog disclaims all responsibility and liability associated with vulnerability issues. Additionally, to the extent permitted by applicable law, Gwanak Analog disclaims all warranties, whether expressed or implied, regarding this document and any related software or hardware, including but not limited to warranties of merchantability or fitness for a particular purpose.
8. While Gwanak Analog strives to enhance the quality and reliability of its products, semiconductor products possess inherent characteristics, such as a certain failure rate and potential malfunctions under specific usage conditions. Unless explicitly specified as high-reliability products or intended for harsh environments in Gwanak Analog data sheets or other official documents, Gwanak Analog products do not incorporate radiation-resistant design. It is your responsibility to implement safety precautions to mitigate the risk of bodily harm, injuries, damage, or public hazards resulting from failures or malfunctions of Gwanak Analog products. These safety measures may include hardware and software safety design, such as redundancy, fire control, malfunction prevention, appropriate measures to address aging degradation, or other suitable actions. Since evaluating microcomputer software independently is challenging and impractical, you are accountable for assessing the safety of the final products or systems manufactured by you.
9. For specific information regarding environmental concerns related to Gwanak Analog products, kindly get in touch with a Gwanak Analog sales office. It is your responsibility to conduct a thorough investigation and ensure compliance with relevant laws and regulations pertaining to the usage or inclusion of controlled substances, including but not limited to the EU RoHS Directive. Gwanak Analog takes no responsibility for any damages or losses incurred due to your failure to comply with applicable laws and regulations.
10. Gwanak Analog products and technologies must not be utilized or included in any products or systems that are prohibited by domestic or foreign laws or regulations. You are required to adhere to export control laws and regulations imposed by governments of countries that assert jurisdiction over the parties involved or the transactions taking place.
11. The buyer, distributor, or any party involved in the distribution, sale, or transfer of Gwanak Analog products to a third party is responsible for informing the third party in advance about the contents and conditions specified in this document.
12. The content of this document cannot be reproduced, copied, or duplicated, either fully or partially, without obtaining prior written consent from Gwanak Analog.
13. If you have any inquiries about the information provided in this document or Gwanak Analog products, please reach out to a Gwanak Analog sales office for assistance.

Corporate Headquarters

Gwanak Analog Co., Ltd.,
5F, Seoul National University Research Park,
1 Gwanak-ro, Gwanak-gu, Seoul, 08826, Korea

Contact Information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit:
www.gwanakanalog.com

Trademarks

Gwanak Analog and Gwanak Analog logo are trademarks of Gwanak Analog Company. All trademarks and registered trademarks are the property of their respective owners.