GW4230

Solar PV Systems Maximum Power Point Tracking (MPPT)

Description

The GW4230 is a single-chip Maximum Power Point Tracking (MPPT) SoC designed for solar PV systems. Optimized for applications utilizing solar photovoltaic (PV) cells, the GW4230 achieves up to 99.9% MPPT efficiency (input efficiency without loss) and 99.3% conversion efficiency (output efficiency with loss) through a custom MPPT algorithm. It can also be configured for customer-specific tasks.

Features

- Maximum power point tracking (MPPT) features
  - Input/output voltage: 0 ~ 25V
  - Input current 0 ~ 10A
  - Maximum 99% accuracy of current/voltage sensing
  - Maximum MPPT efficiency (Input efficiency without loss): 99.9%
  - Maximum Conversion efficiency (Output efficiency with loss): 99.3%
- Serial I/F: UART Rx/Tx, I2C SCL/SDA and additional debugger I/F with DSCL/DSDA
- State-of-the-art PWM technology with 10bit accuracy in direct PWM mode and maximum 20bit effective accuracy with sigma-delta PWM mode
- Hardware reset, power-on reset (POR), and brown out detection (BOD)
- Integrated temperature sensor
- Solar DSP
  - Flexible accelerator for multiplication and deep addition and power calculation
  - Programmable IIR type low pass filters for ADC samples
  - 16bit output resolutions
- Highly accurate 12bit ADC
- PWM-controlled gate driver with charge pump: Driving external N-channel FET with VGS = 10V, 11V up to 3 high-side FETs and 2 low-side FETs
- Input/output voltage sensing: 0 ~ 25V@250W
- Output current sensing: 0 ~ 20A@250W
- Two 12-bit DACs and comparators: Tracking input voltage envelope for switching to non-MPPT operation mode
- Internal DC-DC down converter regulating 11V~25V to 11V
- 8051 compatible MCU
  - 16Kbyte flash memory for code with 512byte trimming data area
  - 2Kbyte SRAM for data

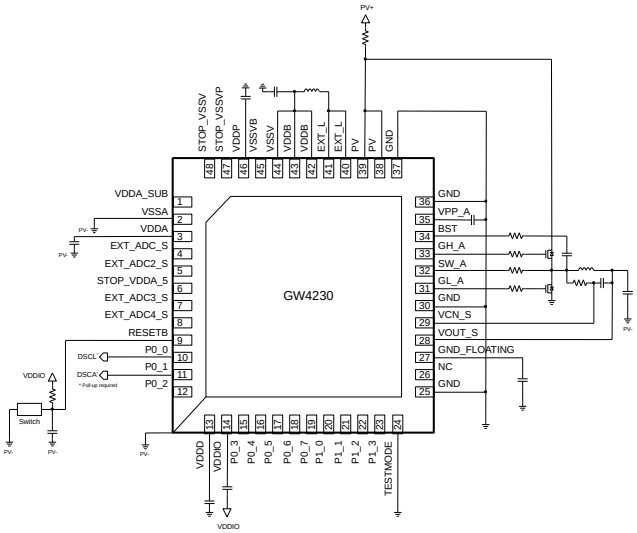
Physical Characteristics

- Operating voltages
  - External supply voltage, PV+: 0V to 25V
  - I/O voltage: 5V
  - Analog core voltage: 5.0V
  - Digital core voltage: 1.5V
- Operating temperature: -40°C to 85°C
- Available in 6x6 0.4mm pitch 48-QFN package

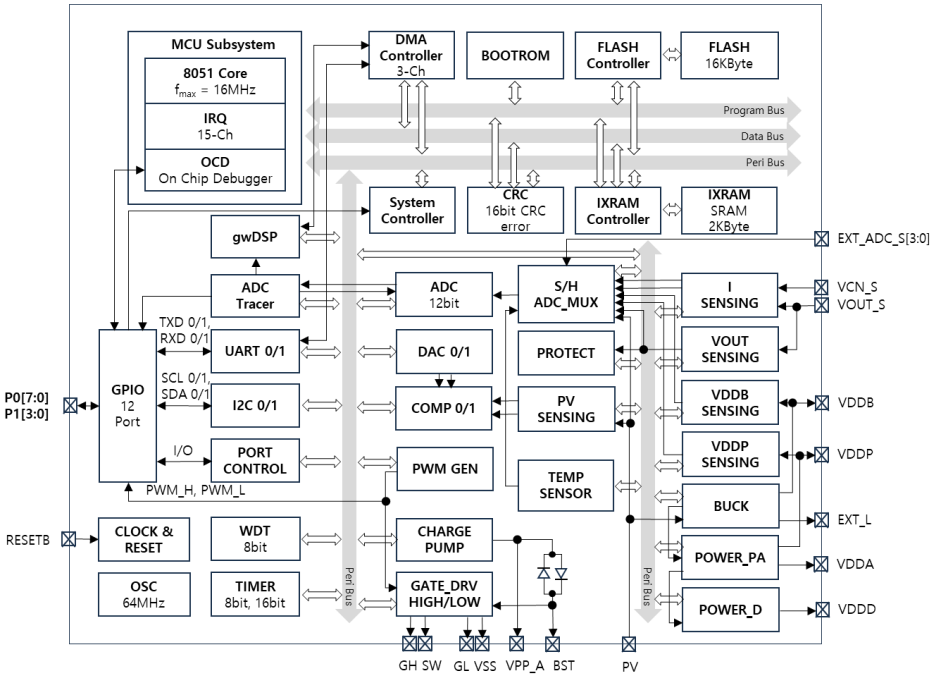
Typical Applications

- MPPT solution for solar PV system
- Energy harvesting
- Any DC sources with MPPT behavior
- USB battery charger

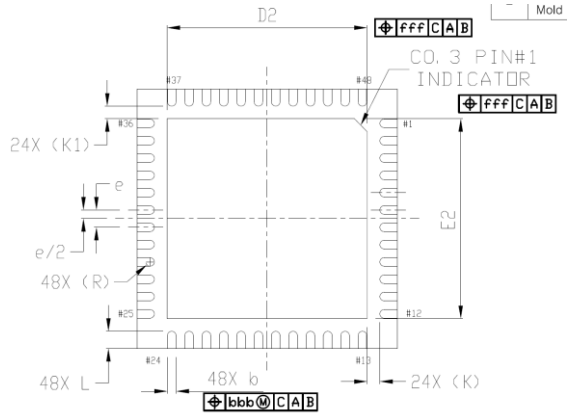
Basic Application Diagram



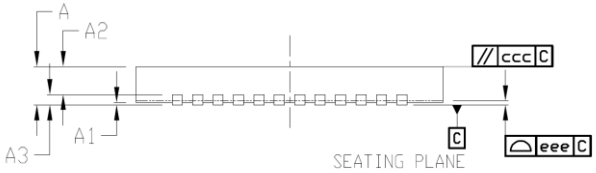
Block Diagram



Package Information



		SYMBOL	MIN	NOM	MAX
TOTAL THICKNESS		A	0.70	0.75	0.80
STAND OFF		A1	0	0.02	0.05
MOLD THICKNESS		A2	---	0.55	---
L/F THICKNESS		A3		0.203 REF	
LEAD WIDTH		b	0.15	0.20	0.25
BODY SIZE	X	D	5.90	6.00	6.10
	Y	E	5.90	6.00	6.10
LEAD PITCH		e		0.40 BSC	
EXPOSED PAD SIZE	X	D2	4.52	4.62	4.72
	Y	E2	4.52	4.62	4.72
LEAD LENGTH		L	0.35	0.40	0.45
LEAD TIP TO EXPOSED PAD EDGE		K		0.29 REF	
		K1		0.29 REF	
LEAD TIP ROUND SIZE		R	b MIN/2	---	---
PACKAGE EDGE TOLERANCE		aaa		0.10	
MOLD FLATNESS		ccc		0.10	
COPLANARITY		eee		0.08	
LEAD OFFSET		bbb		0.07	
EXPOSED PAD OFFSET		fff		0.10	



Ordering Information

Device name	Package	Remark
GW4230INJVT	6.0mmx6.0mm, 0.4 mm pitch	QFN48, Industrial

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Corporate Headquarters

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

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