

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

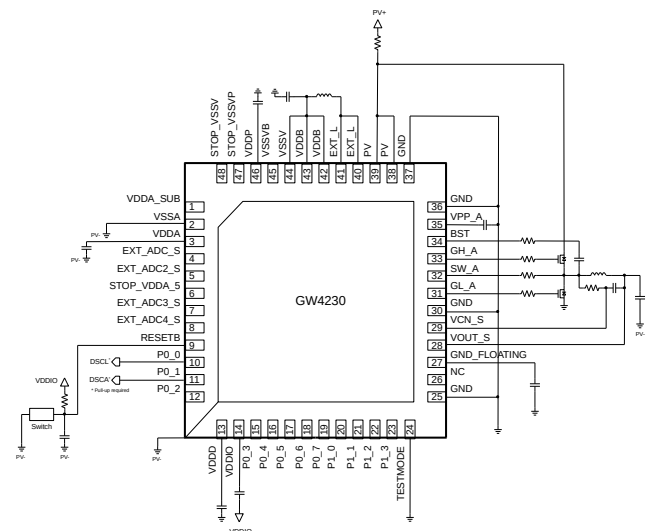
Physical Characteristics

- 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

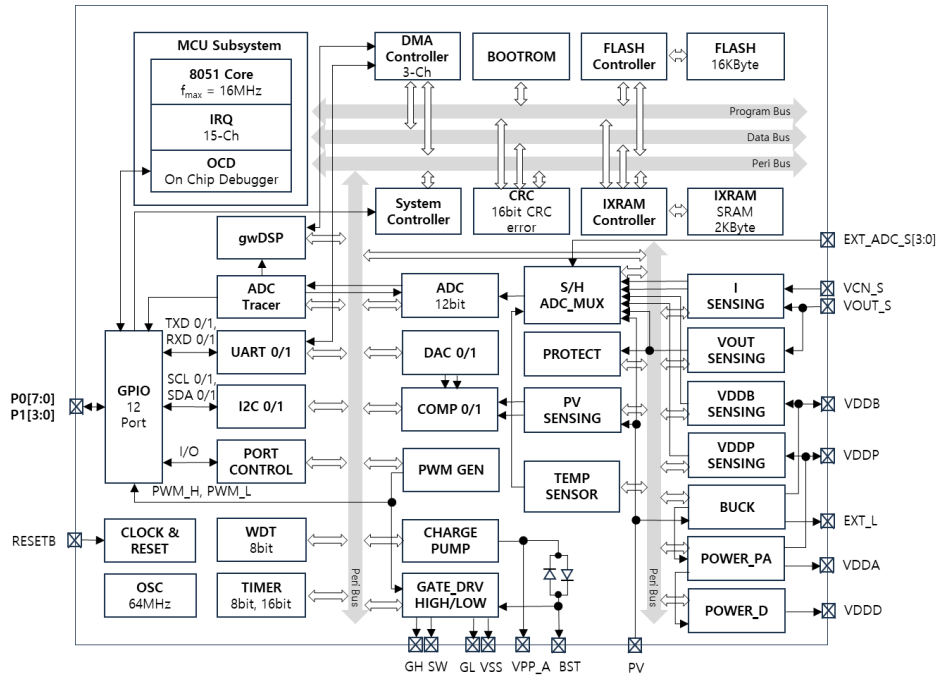
Typical Applications

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

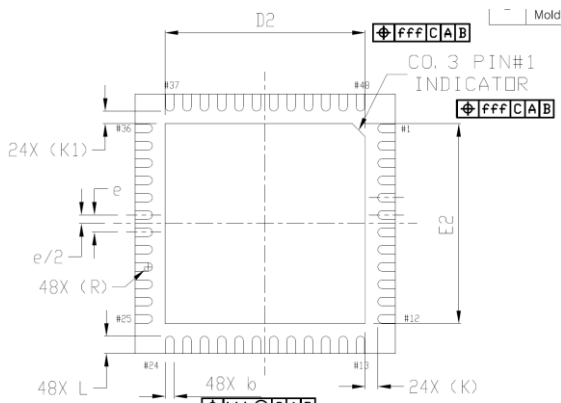
Basic Application Diagram



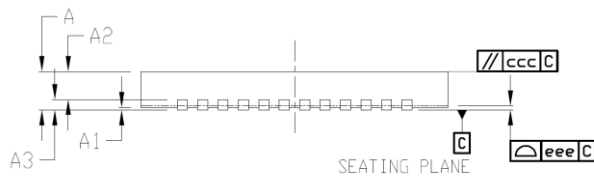
Block Diagram



Package Information



	SYMBOL	MIN	NDM	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
GW4230_Q48C	48QFN, 6x6, 0.4 mm pitch	QFN48, Commercial
GW4230_Q48I	48QFN, 6x6, 0.4 mm pitch	QFN48, Industrial

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