iW2202

Digital Single-Stage PFC Controller

1.0 Features

- Active, single-stage PFC controller provides unity power-factor & low THD (< 5%)
- Low parts count for low system cost and small size
- Over 90% efficiency possible
- Primary-side control eliminates opto-coupler and secondary-side reference
- No external loop compensation required
- Active voltage positioning compensates cable IR drop
- Primary-side power for constant current operation
- Fast transient response
- Digital control enables simple design
- Critical DCM operation (valley-mode switching) minimizes EMI and improves system efficiency
- Blue Angel™ and Energy Star® compliant
- Built-in start-up signal to drive active start-up circuit
- 20µA typical start-up current
- Built-in gate drive with ±1A peak output current
- Built-in soft-start
- Built-in cycle-by-cycle short-circuit protection

2.0 Description

The iW2202 is a single stage switch-mode power supply controller IC that employs digital processing for optimized Power Factor Correction (PFC), green-mode efficiency and the lowest component count solution for AC/DC off-line conversion. The iW2202 employs a new digital control technology that enables accurate control of the power supply from the primary side. The part is ideal for driving a single-stage PFC flyback converters with minimal external components. The iW2202 eliminates the need for compensation components, including secondary feedback circuitry. iWatt's proprietary control scheme achieves excellent regulation over the full range of line and load. The predictive digital control technique provides robust loop compensation with no external components required. Primary-side control for secondary constant current mode operation is provided without the need for additional secondary sensing or control circuits, such as a control reference and opto-coupler.

The iW2202 is ideal for adapters used in battery charging applications. The part can control a constant current or constant voltage output without secondary side sensing or feedback.

3.0 Applications

- Notebook adapter
- LCD TV
- AC / DC adapter
- Battery charger
- Power tool charger
- Electronic ballast
- Best for 50W - 200W

GREEN

Excellent light load efficiency
Eliminates power line noise
Lead-free package

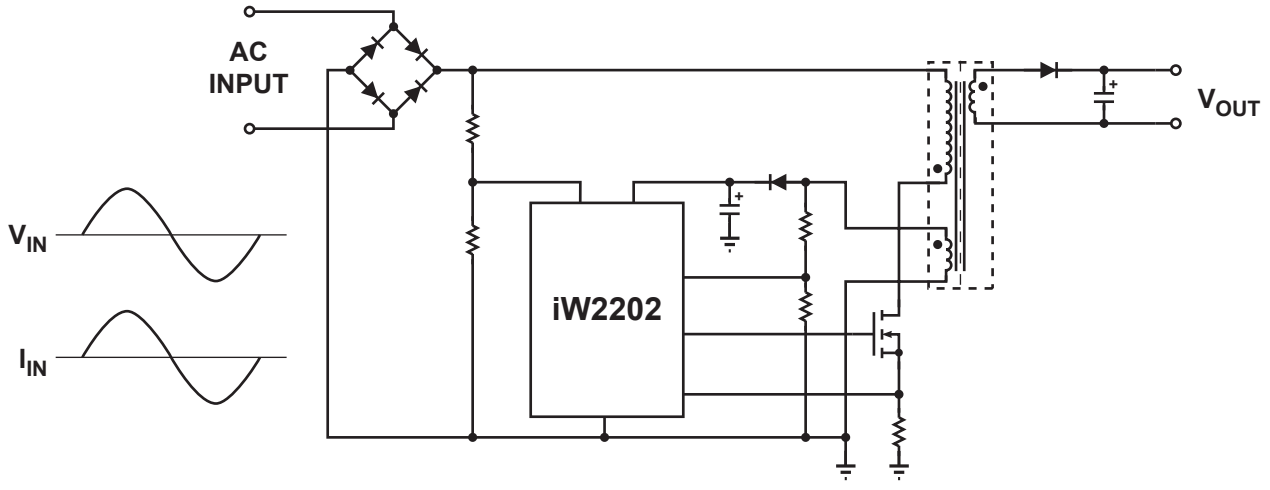
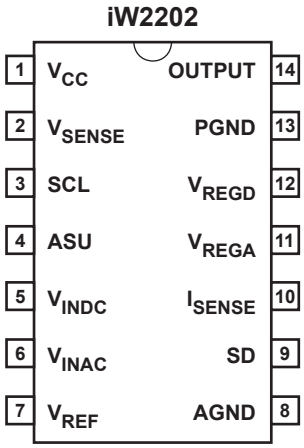


Figure 2.0.1 iW2202 Simplified Application Circuit

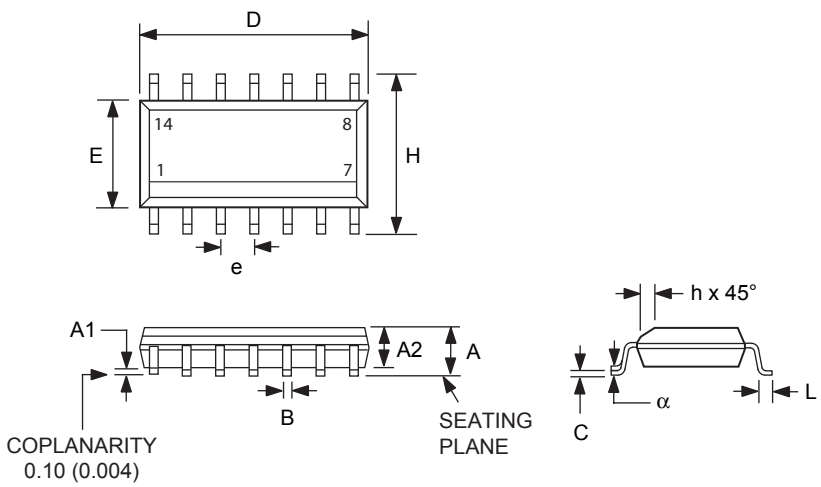
4.0 Pinout Description



Pin #	Name	Type	Pin Description
1	V_{CC}	Input	iW2202 supply voltage.
2	V_{SENSE}	Input	Voltage sense input from the auxiliary winding.
3	SCL	Input	Secondary current limit.
4	ASU	Output	Active start-up MOSFET control.
5	V_{INDC}	Input	Average AC line voltage sense, attenuated and rectified.
6	V_{INAC}	Input	AC line input voltage sense, attenuated and rectified.
7	V_{REF}	Output	Internal reference decoupling pin. This pin must be bypassed with a capacitor and a parallel resistor to AGND. No other external load is allowed on this pin.
8	AGND	Ground	Analog signal ground connection.
9	SD	Input	Shutdown pin used for primary-side OVP and/or external thermal shutdown. This pin can also be used to activate the built-in debug function.
10	I_{SENSE}	Input	Primary current sense input for cycle-by-cycle peak current control.
11	V_{REGA}	Output	Internal regulator decoupling pin. Must be decoupled with a bypass capacitor to AGND.
12	V_{REGD}	Output	Internal regulator decoupling pin. This pin must be decoupled with a bypass capacitor to PGND. No other external load is allowed on this pin.
13	PGND	Ground	Power ground connection.
14	OUTPUT	Output	Gate drive output for the external power MOSFET switch.

13.0 Physical Dimensions

14-Lead Small Outline (SOIC) Package



Symbol	Inches		Millimeters	
	MIN	MAX	MIN	MAX
A	0.061	0.068	1.55	1.73
A1	0.0040	0.0098	0.127	0.250
A2	0.055	0.061	1.40	1.55
B	0.0138	0.0192	0.35	0.49
C	0.0075	0.0098	0.19	0.25
D	0.337	0.344	8.58	8.74
E	0.150	0.157	3.81	3.99
e	0.050 BSC		1.27 BSC	
H	0.230	0.244	5.84	6.20
h	0.010	0.016	0.25	0.41
L	0.41	0.89	0.41	0.89
α	0°	8°		

Compliant to JEDEC Standard MS-012AB
Controlling dimensions are in inches; millimeter dimensions are for reference only

Figure 13.0.1. Physical dimensions, SO-14 package

14.0 Ordering Information

Part Number	Package	Operating Temp. Range	Description
iW2202-14SO-OO	SOIC-14	0°C - 85°C	iW2202 PFC Controller -Tube[1]
iW2202-14SO-TR	SOIC-14	0°C - 85°C	iW2202 PFC Controller -Tape & Reel[2]

Note 1: Tube packing quantity is 54 units.

Note 2: Tape & Reel packing quantity is 2,500 units.

About iWatt

iWatt Inc. is a fabless semiconductor company that develops intelligent power management ICs for computer, communication, and consumer markets. The company's patented *pulseTrain*™ technology, the industry's first truly digital approach to power system regulation, is revolutionizing power supply design.

Trademark Information

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