
AC / DC Sensing Current Sensor with Digital Data output**Feature:**

- Small package with digital current output
- Operating voltage DC5.0V
- Temperature compensation
- Diameter 9.0mm conductor through hole
- Sensing current range:
AC: 0~15A (50Hz, 60Hz)
DC: 0~±22A
- High accuracy:
AC: (0~8A) ± 0.08A
(8~15A) ± 1%
- DC: ±(0~8A) ± 0.08A
±(8~22A) ± 1%
- Resolution: 34mA
- UART digital data output · Baud Rate : 9600 bps
- Isolation voltage 4KV
- Application Note: <http://www.winson.com.tw/Product/83>

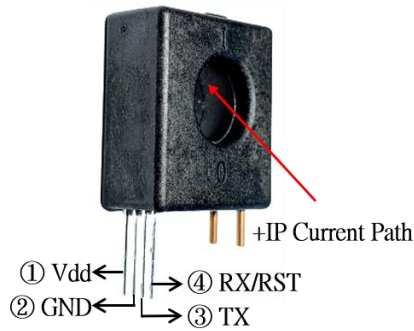
**General Description:**

DWCS2200 is a AC/DC current sensor with calibrated digital signal output. It applies exclusive digital signal collecting technique and allows for easy implementation without breaking original system. Typical applications include load detection and management, over-current fault detection and any intelligent power management system etc...

DWCS2200 is composed of a precise, low-temperature drift, differential output linear hall sensor IC with temperature compensation circuit, temperature sensor, digital signal processor and through-hole mechanism with a diameter of 9.0mm etc. through differential output, DWCS2200 improves its sensitivity twice as much as the original.

All the sensors on DWCS2200 are temperature compensated and calibrated with accurate calibration instrument. The UART interface directly transmits digital current signals, making system integration simple and fast. Small size, low consumption and the terminals of the conductive path are electrically isolated from the sensor leads enable DWCS2200 to be suited in all kinds of harsh application occasions.

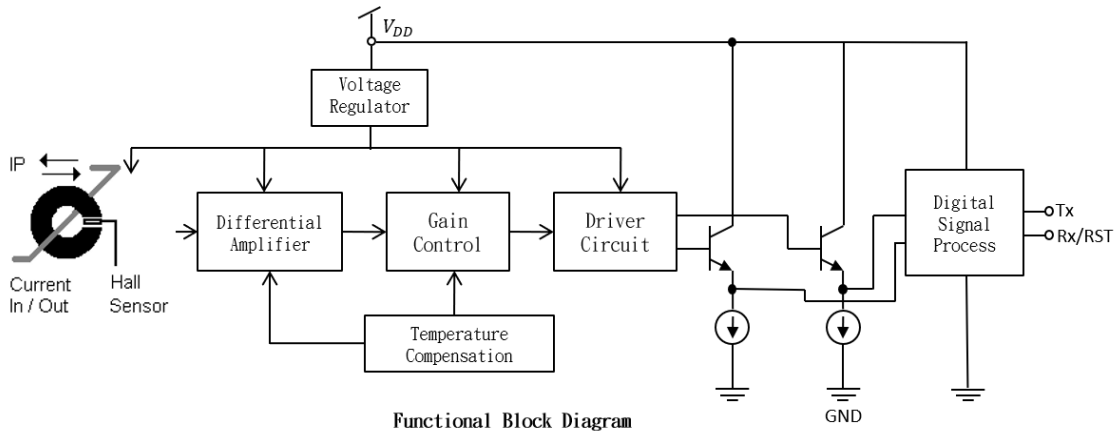
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Absolute Maximum Range

Supply Voltage, Vdd -----	6V
Pass Through Wire Diameter -----	9.0mm
Basic Isolation Voltage -----	4000V
Operating Temperature Range, Ta -----	-20°C to +70°C
Storage Temperature Range, Ts -----	-60°C to +125°C

Note: Stresses above those listed may cause permanent damage to the devices



Selection Guide:

Model	Maximum Current		Operating Voltage	Frequency	Mode
	AC	DC			
DWCS2200-AC50C	15A	-	5.0V	50Hz/60Hz	Continuous
DWCS2200-DC50C	-	22A	5.0V	DC	Continuous
DWCS2200-50C	15A	22A	5.0V	50Hz/60Hz, DC	Professional (AT+Command)

Note:

Continuous Mode: UART Interface, continuous transmission, external reset method (RST pull low to GND).

Professional Mode: UART interface, command transmission, internal reset method (RX received command).

Pad Description:

Pad No	Pad Name	I/O	Description
1	VDD	-	The positive power input pin
2	GND	-	The system ground

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3	TX	O	The current data output, UART interface, baud rate 9600 bits/sec
4	RX/RST	I	RST(Continuous): External Reset, RX(Professional): Internal UART Reset

Electrical Characteristics: Common Operating Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
VDD	Operation Voltage	-	4.9	5	5.1	V
IDD	Operation Current	VDD = 5.000V	-	6.5	12	mA
-	Conductor Through Hole	-	-	9	-	mm
TOP	Operating Temperature	-	-20	-	70	°C
Acc	Internal Temperature Accuracy	VDD = 5.000V	-	-	5	°C

-AC50C

VDD = 5.000V

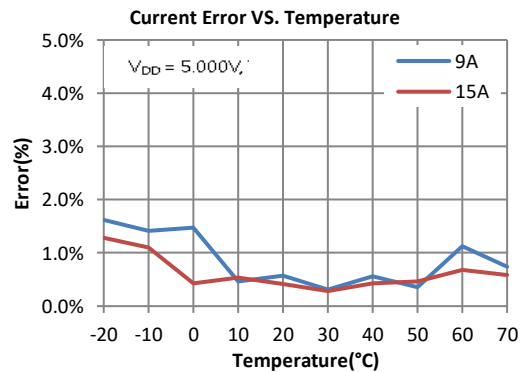
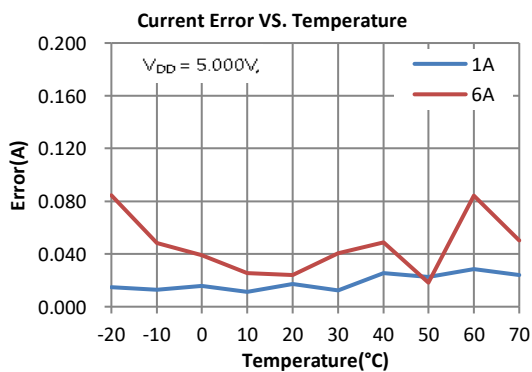
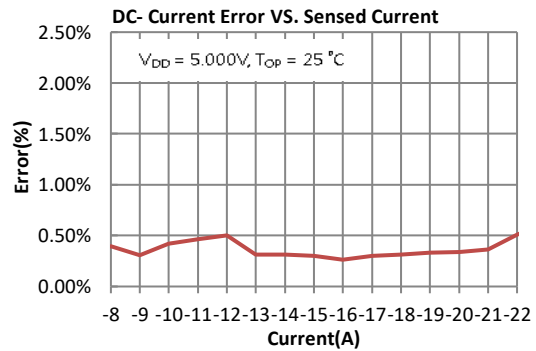
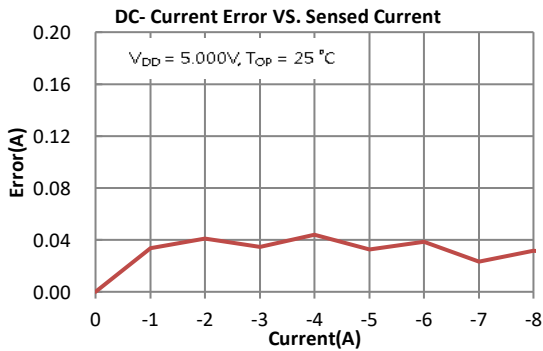
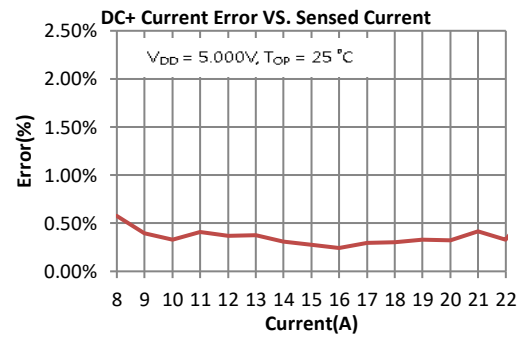
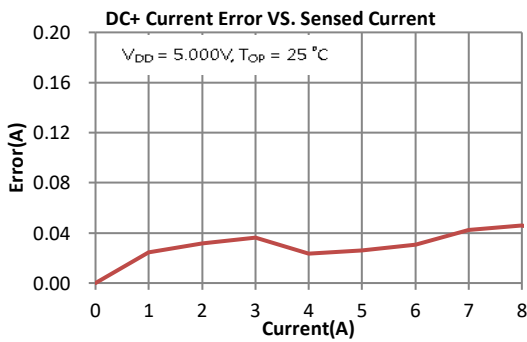
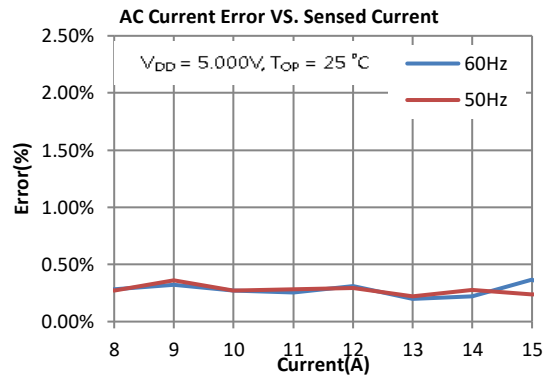
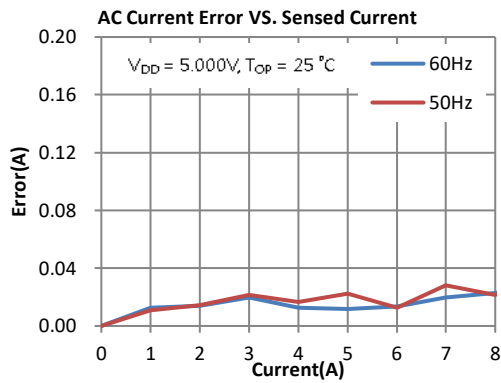
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
IOP	Current Range	-	0	-	15	A
ETOT	Current Output Error	IOP= 0~8A, T _{op} = 25 °C	-	±0.08	-	A
		IOP= 8~15A, T _{op} = 25 °C	-	±1	-	%
		IOP= 0~15A, -20 °C < T _{op} < 70 °C	-	±4	-	%

-DC50C

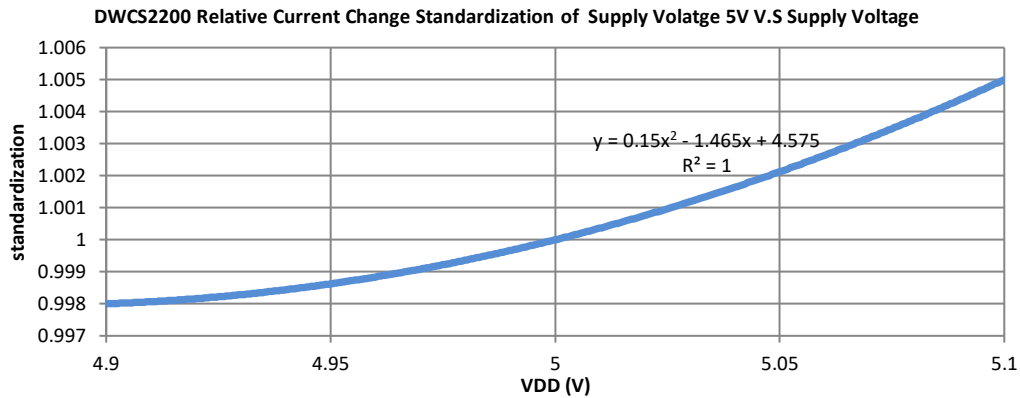
VDD = 5.000V

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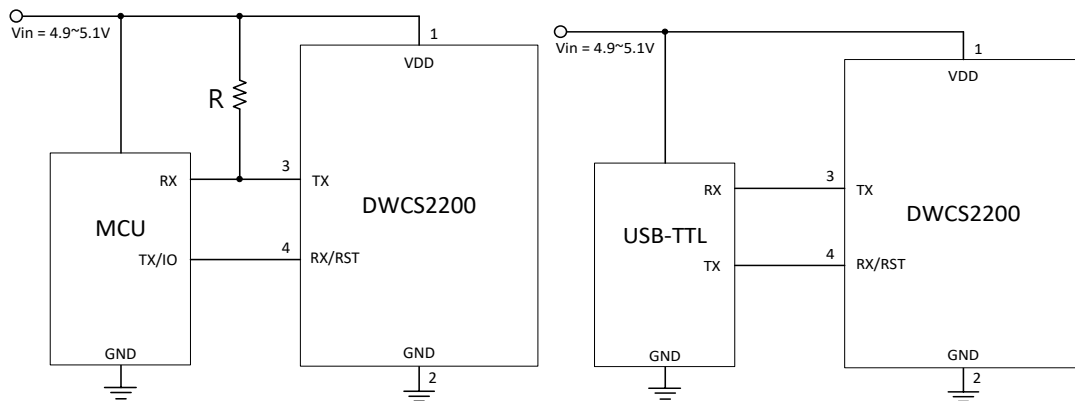


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Application Notes:

(1) Application Diagram:



App. 1 Connect to MCU

App. 2. Connect to USB-TTL

(DWCS2200 TX needs open drain with external pull-up resistors)

(2) Measured Current Data Output:

The measured current can be transmitted by UART format.

(3.1) If the measured data is AC “1.23”A, then the output data is ‘~’, ‘1’, ‘.’, ‘2’, ‘3’, ‘0’, ‘r’, ‘\n’, total of 8 bytes; the output data is ASCII code. If the measured data is “10.45” A, then the output data is ‘~’, ‘1’, ‘0’, ‘.’, ‘4’, ‘5’, ‘r’, ‘\n’, total of 8 bytes.

(3.2) If the measured data is +DC “1.23”A, then the output data is ‘+’, ‘1’, ‘.’, ‘2’, ‘3’, ‘0’, ‘r’, ‘\n’, total of 8 bytes; the output data is ASCII code.

(3.3) If the measured data is -DC “1.23”A, then the output data is ‘-’, ‘1’, ‘.’, ‘2’, ‘3’, ‘0’, ‘r’, ‘\n’, total of 8 bytes; the output data is ASCII code.

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(3) Measured Current Data Output:

In order to calculate true RMS of AC current, you need to know “zero” value of AC current first. The “zero” value of symmetric AC current is the average value $V_o(dc)$ of the current shown in Figure 1.

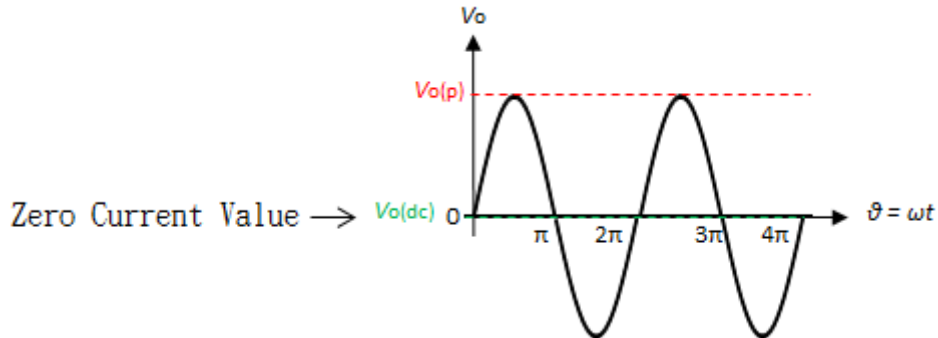


Figure 1 The zero current value of sine waveform

But in asymmetrical AC current, the “zero” value is not the average value $V_o(dc)$ of the current. Based on this “zero” value and do RMS calculation. You will get wrong answer.

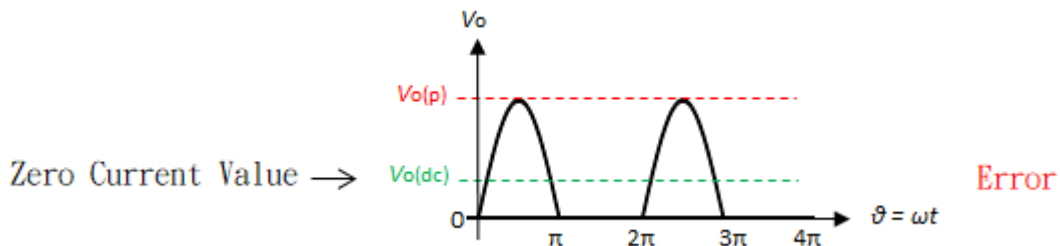


Figure 2 The zero current value of the asymmetric waveform (Error)

The DWCS2200 offers a true RMS solution for both symmetric and asymmetric AC current. It can correctly detect “zero” current value, shown in Figure 3. and do perfect RMS calculation.

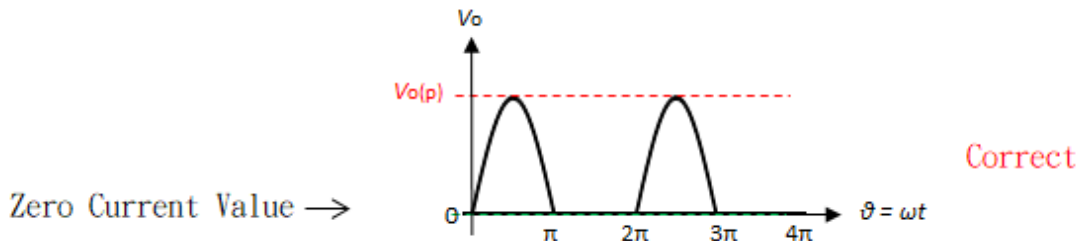
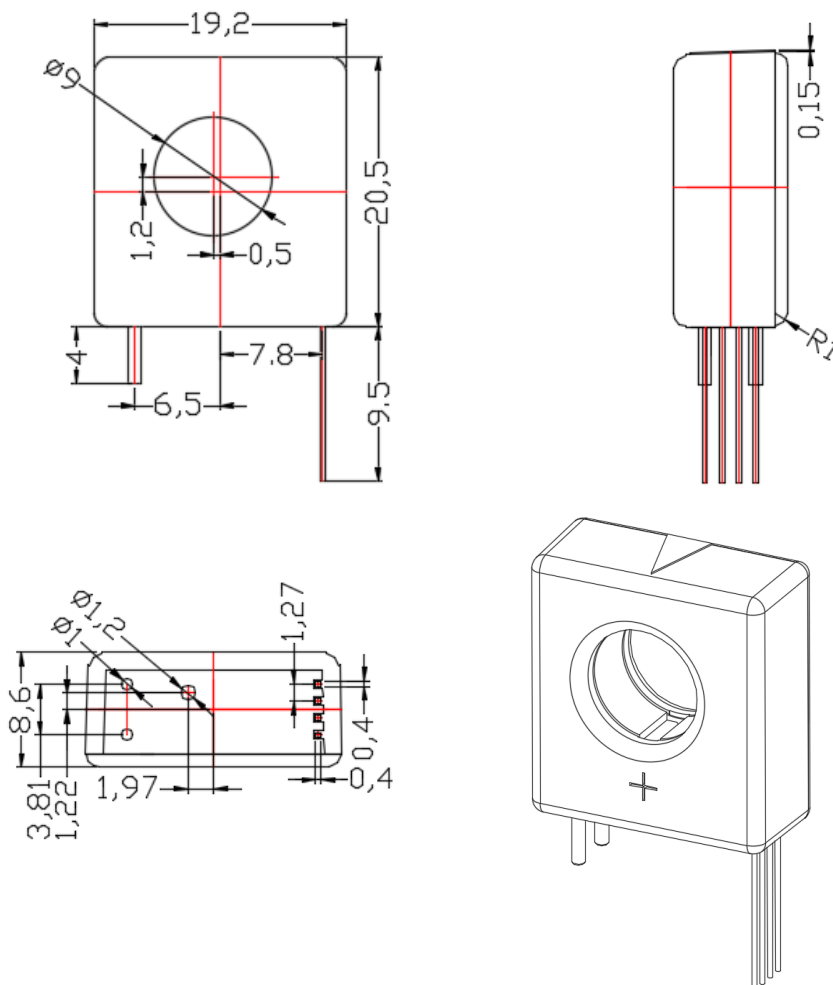


Figure 3 The zero current value of the asymmetric waveform (Correct)

(4) UART Commands:

Setting Command	Command	Example	Return Parameter
Reset Current	AT+RST\r\n	"AT+RST\r\n"	"OK\r\n" ⁽²⁾
0: DC 1: AC ⁽²⁾	AT+CURRE\r\n	"AT+CURRE,0\r\n" "AT+CURRE,1\r\n"	"OK\r\n" ⁽²⁾
Measure Current ⁽²⁾	AT+MEAS\r\n	"AT+MEAS\r\n"	<Current>
Measure Temperature ⁽²⁾	AT+TEMP\r\n	"AT+TEMP\r\n"	<Temperature>

1. Command is error: return "Err\r\n" °.
2. It is only applicable to the professional version, and it is prohibited to use it in continuous mode.

Package: (Units: mm)


3.

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