WCS3740

Hall Effect Base Linear Current Sensor

Features:

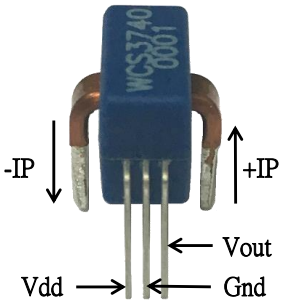
- Low noise analog signal path
- 125 μΩ internal conductor resistance
- Output voltage proportional to AC and DC current
- Min. sensing current 0~40A at 5V voltage supply
- High sensitivity 32mV/A
- Wide operating voltage range 3.0~12V
- Low operating current 3mA
- Nearly zero magnetic hysteresis
- Ratiometric output from supply voltage
- 23K Hz Bandwidth

Functional Description :

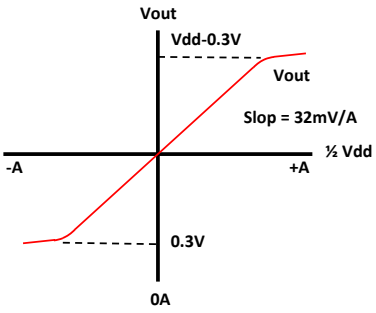
The Winson WCS3740 current sensor provides economical and precise solution for both DC and AC current sensing in industrial, commercial and communications systems. The unique package allows for easy implementation by the customer. Typical applications include motor control, load detection and management, over-current fault detection and any intelligent power management system etc…

The WCS3740 consists of a precise, low-temperature drift linear hall sensor IC with temperature compensation circuit and a current path with 125 μΩ typical internal conductor resistance. This extremely low resistance can effectively reduce power loss, operating temperature and increase the reliability greatly. Applied current flowing through this conduction path generates a magnetic field which is sensed by the integrated Hall IC and converted into a proportional voltage.

The terminals of the conductive path are electrically isolated from the sensor leads. This allow the WCS3740 current sensor to be used in applications requiring electrical isolation without the use of opto-isolators or other costly isolation techniques and make system more competitive in cost.



Vout vs. Primary Current



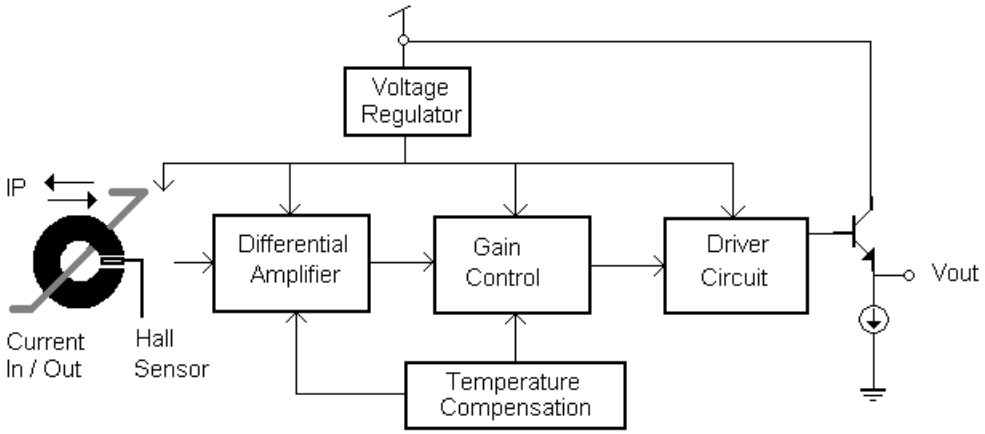
Absolute Maximum Range

Supply Voltage, Vdd ---------- **14V**
Pass Current, IP ----------**40A**
Pass Current(10ms pulse), Ipulse ----------**80A**
Output Current Sink---------- **0.4mA**
Output Current Source---------- **2mA**
Basic Isolation Voltage ---------- **1000V**
Operating Temperature Range, Ta ----------
---------- **-20ºC to +125ºC**
Storage Temperature Range, Ts ----------
---------- **-65ºC to +150ºC**
Power Dissipation, Pd ----------**1W**

Order Information **(Vdd = 5V)**

Part No.	Sensitivity	Current range
WCS3740	32 mV/A	DC: ±0 ~ 40A
		AC: rms 30A

Function Block:



Winson reserves the right to make changes to improve reliability or manufacturability.

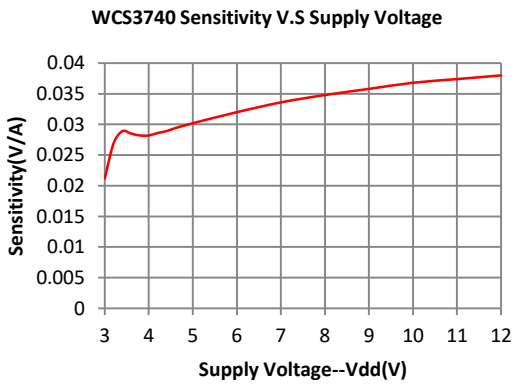
Electrical Characteristics: (T=+25˚C, Vdd=5.0V)

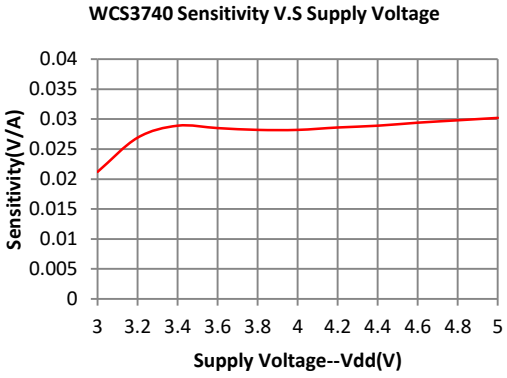
Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Supply Voltage	Vdd	—	3.0	—	12	V
Supply Current	Isupply	IP =0 A	—	3.5	6.0	mA
Zero Current Vout	V0G	IP =0 A(DC Mode)	2.4	2.5	2.6	V
Primary Conductor Resistance	Rprimary	IP =10 A	—	125	—	μΩ
Sensitivity	Sens	IP =+-10 A	27	32	37	mV/A
Bandwidth	BW	—	—	23	—	kHz
Measurable Current Range	MR	Vdd=5V (DC Mode)	—	±40	—	A
		Vdd=5V (AC RMS)	—	30	—	
Temperature Drift	△Vout	Ip =0 A	—	±0.5	—	mV/℃
Output Noise	V_{Np-p}	Ip =0 A	—	7.5	—	mV
	$V_{Np-p(0.01uF)}$	Ip =0 A, C = 0.01uF	—	1	—	

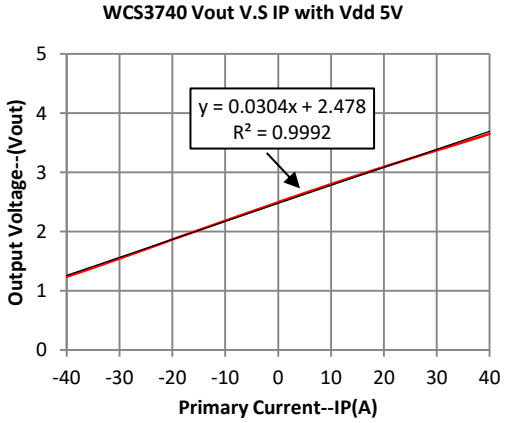
1. All output-voltage measurements are made with a voltmeter having an input impedance of at least 100kΩ

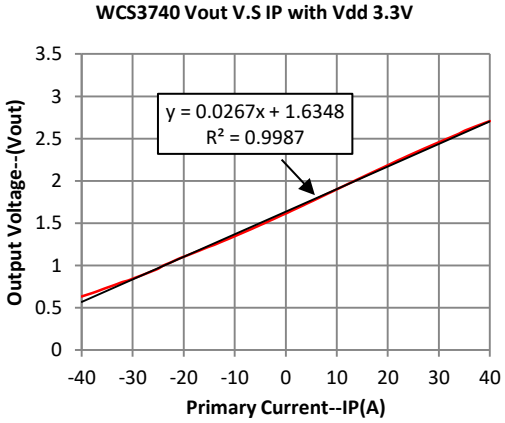
2. Do not apply any 'resistor load' on output pin, it will degrade IC's performance

Characteristic Diagrams:









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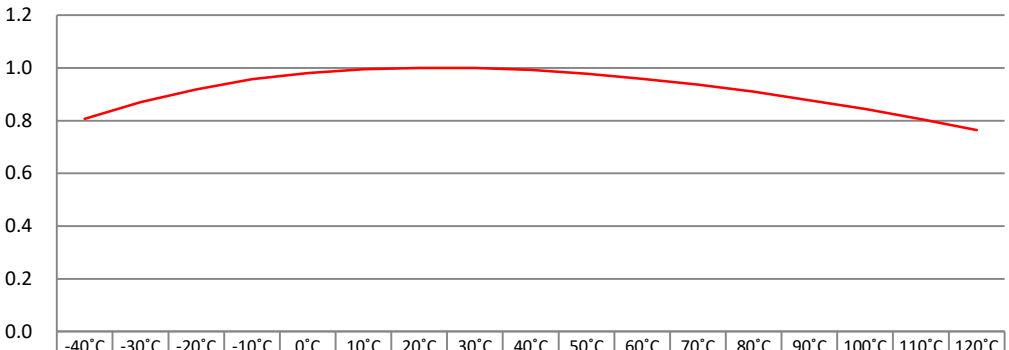
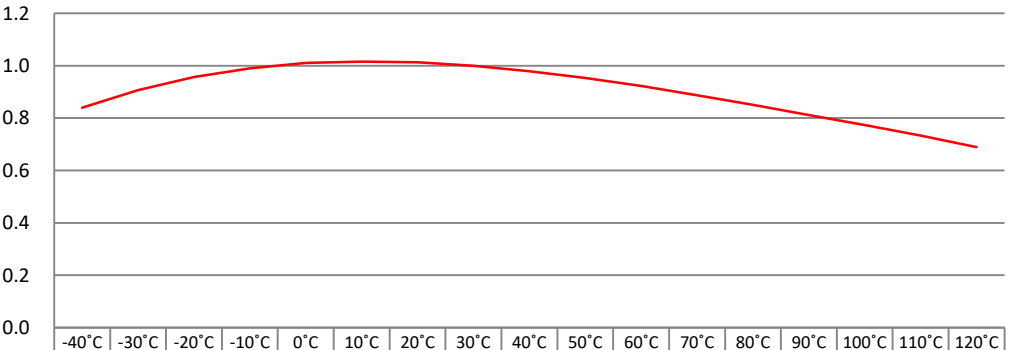
WCS3740 Sensitivity standardization of 30˚C (5V) V.S Temperature



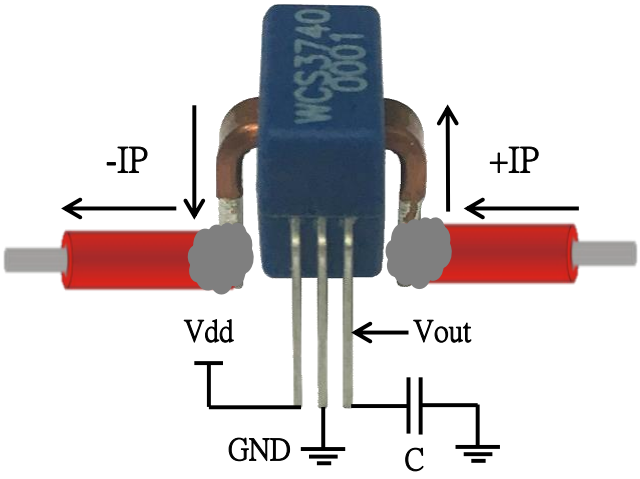
	-40˚C	-30˚C	-20˚C	-10˚C	0˚C	10˚C	20˚C	30˚C	40˚C	50˚C	60˚C	70˚C	80˚C	90˚C	100˚C	110˚C	120˚C
Ratio	0.807	0.870	0.918	0.957	0.980	0.995	1	1	0.992	0.978	0.959	0.936	0.909	0.877	0.844	0.806	0.764

WCS3740 Sensitivity standardization of 30˚C (3.3V) V.S Temperature



	-40˚C	-30˚C	-20˚C	-10˚C	0˚C	10˚C	20˚C	30˚C	40˚C	50˚C	60˚C	70˚C	80˚C	90˚C	100˚C	110˚C	120˚C
Ratio	0.839	0.907	0.956	0.990	1.011	1.016	1.014	1	0.979	0.953	0.922	0.888	0.851	0.811	0.774	0.733	0.690

Application Circuit:



Capacitor C(0.01uF~0.1uF) is recommend to be connected between Vout and GND to reduce output noise.

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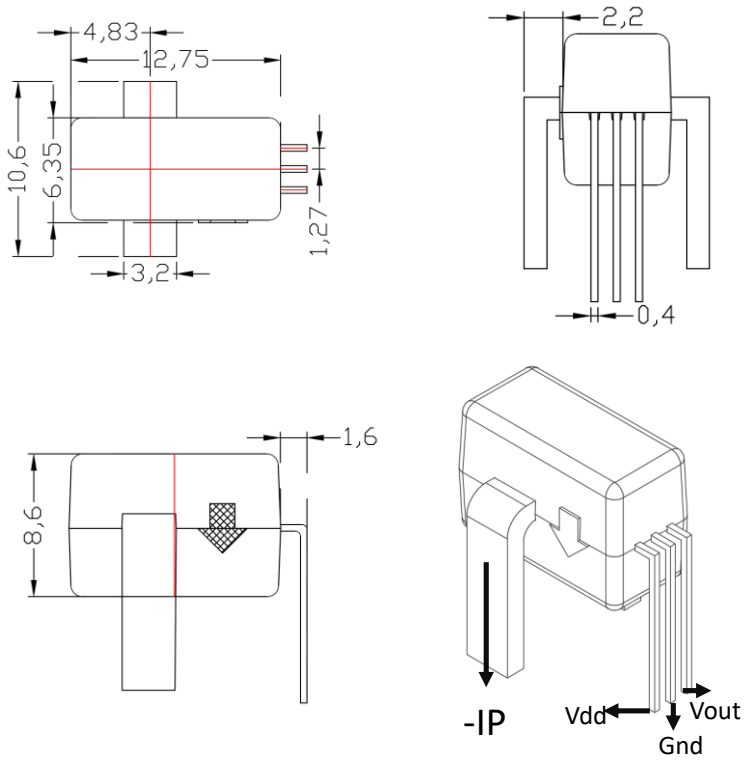
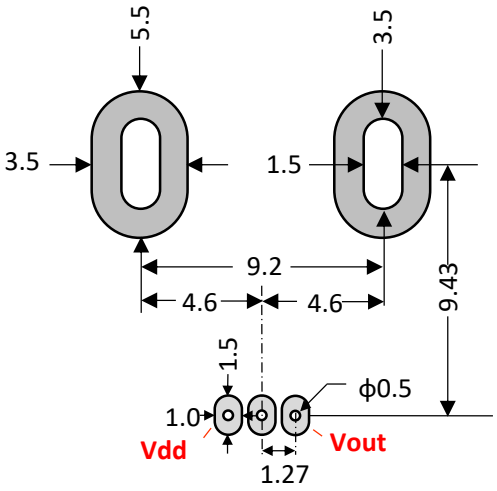
Package Information:

(Unit: mm)



PCB Layout Reference View



WCS Application Note : please refer to Winson Website -> Products-> Application Note -> WCS Application Note : http://www.winson.com.tw/Product/83

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