CSHV SERIES

005999
Issue 1

Open Loop Current Sensors

DESCRIPTION

The CSHV Series are open loop current sensors that use Hall-effect sensing and patented Honeywell technology to bring the best combination of performance and reliability for current sensing applications.

These products are non-intrusive and electrically isolated from the monitored circuit. This ensures a simple and reliable structure without loss of power to the monitored circuit. They are rated for a primary current measurement range of ±100 A to ±1200 A DC.

CUSTOMIZATION

The CSHV Series may be customized to best meet specific application needs. Solutions may be tailored to exact specifications for improved time to market, lower total system costs, and enhanced reliability.

Honeywell provides global technical assistance and engineering/service support.

DIFFERENTIATION

- **Accuracy:** Hall-effect sensing and stable amplification circuitry for improved accuracy over the full operating temperature range.
- **Magnetic immunity:** Optimized magnetic circuit allows for excellent performance in diverse magnetic environments.
- **Flexible:** Customizable to meet specific application requirements.

VALUE TO CUSTOMERS

- **Accurate:** Designed to enable precise battery state measurement for improved user experience.
- **Ease of use:** Magnetic immunity allows for easy integration into different magnetic environments.
- **Easy system integration:** Analog voltage output may be used by battery management system.

POTENTIAL APPLICATIONS

- Current measurement for battery management systems in electrified vehicles (EV, HEV, PHEV, BEV)
- Current leakage detection and fault isolation in battery charging systems
- Current measurement in energy storage systems
- Fault detection in heavy industrial equipment

RoHS COMPLIANT

FEATURES

- Active open loop current sensing using Hall-effect technology
- High accuracy and low temperature drift
- Operating temperature of -40°C to 125°C [-40°F to 257°F]
- Analog voltage output
- CE certification; REACH and RoHS compliant

PORTFOLIO

Honeywell offers a variety of current sensors for potential use in many applications. To view the entire product portfolio, click here.

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TABLE 1. ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	UNIT	PARAMETER			CONDITION
			MIN.	TYP.	MAX.	
Supply voltage max.	$V_{S\ max.}$	V	—	—	10	—
Reverse supply voltage max.	$V_{R\ max.}$	V	-0.3	—	—	—
Output voltage max.	$V_{OUT\ max.}$	V	-0.3	—	10	V_{OUT} reverse/forward voltage
Output current max.	$I_{OUT\ max.}$	mA	-10	—	10	—
Ambient storage temperature	—	°C	-40	—	125	—
Electrostatic discharge voltage	V_{ESD}	kV	—	—	8	—
RMS voltage for AC isolation test	V_{DWV}	kV	—	—	2.5	50 Hz, 1 min
Creepage distance	d_{Cp}	mm	4.9	—	—	—
Clearance	d_{Cl}	mm	4.9	—	—	—
Comparative tracking index	CTI	—	PLC3	—	—	—

TABLE 2. OPERATING CHARACTERISTICS IN NOMINAL RANGE (I_{PN})

CHARACTERISTIC	SYMBOL	UNIT	PARAMETER			CONDITION
			MIN.	TYP.	MAX.	
Primary current, nominal DC	I_{PN}	A	$-I_{PN}$	—	I_{PN}	±100 A to ±1200 A
Supply voltage	V_S	V	4.5	5	5.5	—
Ambient operating temperature	—	°C	-40	—	125	—
Output voltage	V_{OUT}	V	$V_{OUT} = \frac{V_S}{5}(G * I_P + V_{OS})$			$I_P = (V_{OUT} * \frac{5}{V_S} - V_{OS}) / G$
Sensitivity	G	mV/A	—	$2000/I_{PN}$	—	T_A = 25°C
Output voltage (at I_P = 0)	V_{OS}	V	—	2.5	—	—
Current consumption	I_{SUPPLY}	mA	— —	13 —	— 16	T_A = 25°C, V_S = 5 V
Load resistance	R_L	Ohm	10k	—	—	—
Output impedance	R_{out}	Ohm	—	1	10	T_A = 25°C
Ratiometric error	ε_r	%	—	±0.5	—	—
Sensitivity error	ε_g	%	—	±0.6	—	T_A = 25°C, V_S = 5 V
Electrical offset voltage	$V_{OS,\ ELECT}$	mV	—	±3	—	T_A = 25°C, V_S = 5 V
Magnetic offset voltage	$V_{OS,\ MAG}$	mV	—	±2	—	T_A = 25°C, V_S = 5 V
Linearity error (% of full scale output)	ε_L	%	-1	—	1	—
Average temperature coeff of $V_{OS,\ ELECT}$	—	mV/°C	—	±0.04	—	—
Average temperature coeff of G	—	%/°C	—	±0.02	—	—
Step response time (10% to 90%)	t_r	µs	—	2	6	—
Frequency bandwidth (-3 dB)	BW	kHz	45	—	—	—
Output RMS noise (RMS)	—	mV	—	—	2	—

[1] See Table 5 for catalog listing specifics.

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TABLE 3. OVERALL ACCURACY

I_P (A)	T_A = 25°C, V_S = 5 V			-40°C < T_A < 125°C, V_S = 5 V		
$-I_{PN}$	±20 mV	±1%*I_{PN}	±1.00%	±40 mV	±2%*I_{PN}	±2.00%
0	±7 mV	±0.35%*I_{PN}	±0.35%	±10 mV	±0.5%*I_{PN}	±0.5%
I_{PN}	±20 mV	±1%*I_{PN}	±1.00%	±40 mV	±2%*I_{PN}	±2.00%

TABLE 4. MECHANICAL CHARACTERISTICS

CHARACTERISTIC	DESCRIPTION
Housing material	PBT + GF30%
Mounting screw	M4, 2,5 N torque max.
Mating electrical connector	TE MPN 1473672-1
Weight	58 g

TABLE 5. ORDER GUIDE

CATALOG LISTING	MEASURE RANGE (A)	SENSITIVITY (mV/A at V_S = 5 V)	OFFSET (mV at V_S = 5 V)		ACCURACY (% at V_S = 5 V)	
			25°C	-40°C to 85°C	25°C	-40°C to 85°C
CSHV100A-001	±100	20	±7 mV	±25 mV	±1%	±2%
CSHV200A-001	±200	10		±15 mV		
			25°C	-40°C to 125°C	25°C	-40°C to 125°C
CSHV300A-001	±300	6.667	±7 mV	±18 mV	±1%	±2%
CSHV400A-001	±400	5		±10 mV		
CSHV500A-001	±500	4				
CSHV600A-001	±600	3.333				
CSHV700A-001	±700	2.857				
CSHV800A-001	±800	2.5				
CSHV900A-001	±900	2.222				
CSHV1000A-001	±1000	2				
CSHV1100A-001	±1100	1.818				
CSHV1200A-001	±1200	1.667				

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FIGURE 1. NOMENCLATURE

CS	H	V	1200	A	001
Type	Principle	Use	Rated Current	Output Configuration	Version

Type	Principle	Use
Current Sensor	H Hall-effect open loop	V Vehicle applications

Rated Current	
100	100 A
200	200 A
300	300 A
400	400 A
500	500 A
600	600 A
700	700 A
800	800 A
900	900 A
1000	1000 A
1100	1100 A
1200	1200 A

Output Configuration	
A	One channel

Version	
001	ASIC 1

FIGURE 2. DIMENSIONAL DRAWINGS (FOR REFERENCE ONLY: MM/IN)

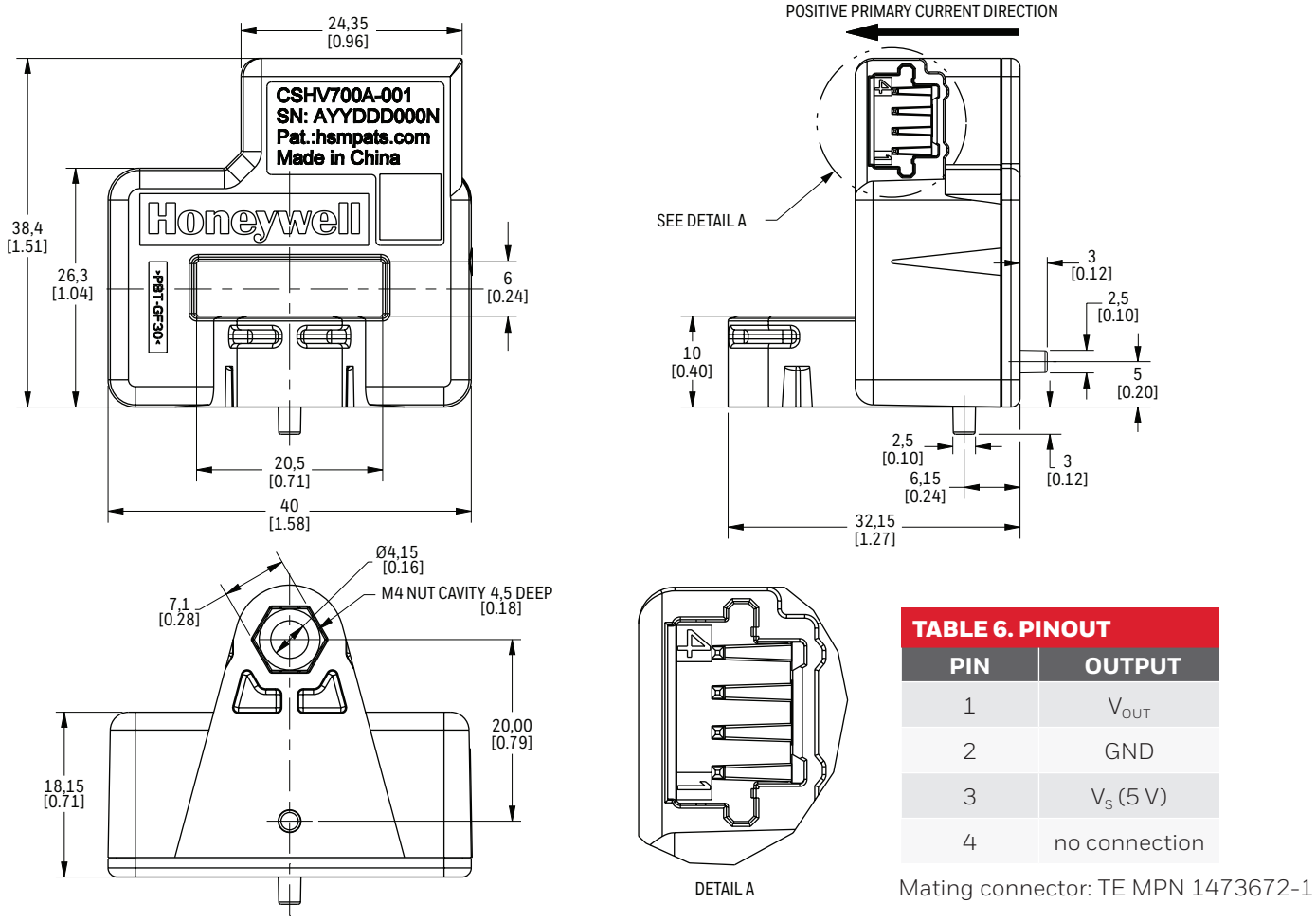


TABLE 6. PINOUT

PIN	OUTPUT
1	V_{OUT}
2	GND
3	V_S (5 V)
4	no connection

Mating connector: TE MPN 1473672-1

FIGURE 3. PART MARKING DETAILS

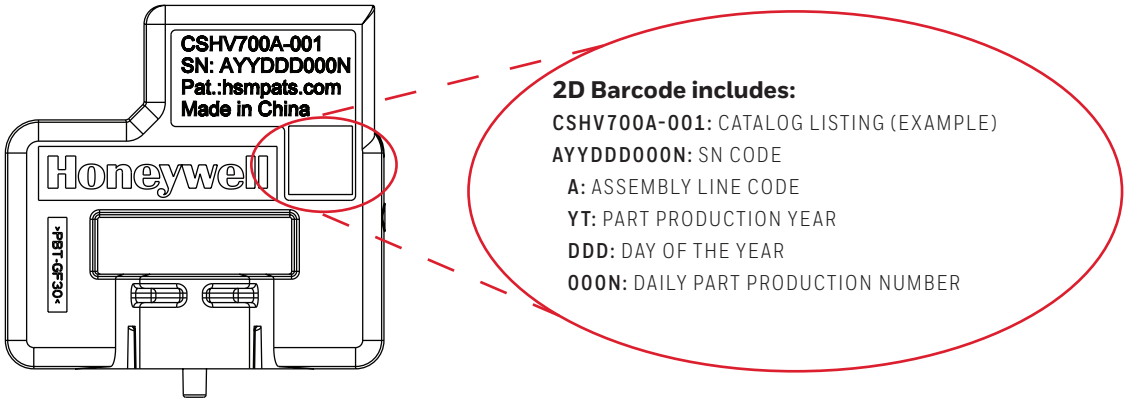
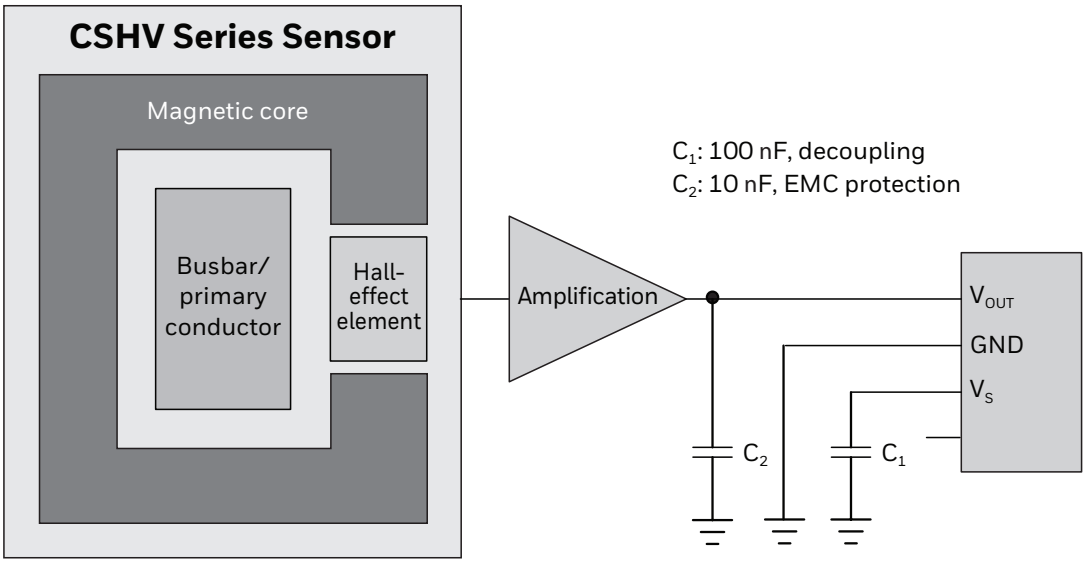


FIGURE 4. ELECTRICAL DIAGRAM



NOTICE

SENSOR ACCESSIBILITY

- Ensure that the current sensor is installed in a suitable electrical enclosure that is only accessible with the use of special tools.

ADDITIONAL MATERIALS

The following associated literature is available at sps.honeywell.com/ast:

- Product range guide
- Installation drawings

FOR MORE INFORMATION

Honeywell services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing or the nearest Authorized Distributor, visit our website or call:

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WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, Honeywell assumes no responsibility for its use.

⚠ WARNING
PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

⚠ WARNING
MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

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