

CS04R-A-NP SERIES CURRENT SENSOR/TRANSDUCER

DESCRIPTION:

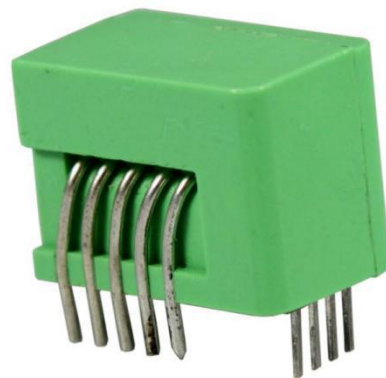
For the electronic measurement of current:DC, AC, pulsed ..., with galvanic separation between the primary and the secondary circuit.

FAEAUTRES:

- ◆ Closed loop current sensor using the Fluxgate technology
- ◆ Galvanic separation between the primary and the secondary circuit
- ◆ Low power consumption
- ◆ Wide range
- ◆ No insertion loss
- ◆ Raw materials recognized according to UL 94-V0

APPLICATIONS:

- ◆ AC variable speed and servo motor drives
- ◆ Uninterruptible Power supplies (UPS)
- ◆ Static converters for DC motor drives
- ◆ Switched Mode Power Supplies (SMPS)
- ◆ Solar Inverter Power Supplies



MODEL LIST:

PRODUCT MODEL		
Model	Rated input current I_{PN} (A)	Measuring range I_{PM} (A)
CS04- 6A-NP	6	± 20
CS04-15A-NP	15	± 51
CS04-25A-NP	25	± 85
CS04-50A-NP	50	± 150

CS04R-6A-NP SPECIFICATION

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical Data						
Primary side rated current	I_{PN}	A	-6	-	6	
Primary current measurement	I_{PM}	A	-20	-	20	
Supply voltage	V_C	V	4.75	5.0	5.25	
Output voltage	V_{OUT}	V	$V_{OUT}=(V_C/5) \times (2.5+G_{th} \times I_P)$ @ $V_C=5V$			
Reference output voltage	V_{OUT}	V	2.495	2.5	2.505	@ $V_C=5V$ & $I_P=0A$
Zero output voltage	G_{th}	mV/A	-	104.2	-	
Theoretical gain	I_C	mA	15	-	19	@ $I_P=I_{PN}$
Current consumption	R_L	k Ω	10	-	unlimited	@ V_{OUT} to GND
Load resistance	C_2	nF	-	-	0.1	
Load capacitance	C_1	μ F	-	-	0.1	
Power filter capacitor	I_{PN}	A	-6	-	6	
Performance Data						
Gain error	$\mathcal{E}_G$	%	-0.8	-	0.8	@ $T_A=25@V_C=5V$
Temperature drift of gain error	T_{CG}	PPM/K	-	-	± 40	@ T_A -40°C~105°C
Zero point error	V_{OE}	mV	-5.3	-	5.3	@ $V_C=5V$ & $I_P=0A$ $V_{OUT}-V_{REF}$
Temperature drift of zero error	$TC_{V_{OE}}$	PPM/K	-	± 6	± 14	@ T_A -40°C~105°C
Magnetic offset voltage	V_{OM}	mV	-10.42	-	10.42	@ $T_A=25@V_C=5V$ $10 \times I_{PN}$
Nonlinear error	$\mathcal{E}_L$	% of I_{PN}	-0.1	-	0.1	exclude zero V_{OE}
Response time	t_r	μ s	-	-	0.3	@ $di/dt=18A/\mu$ s
Bandwidth (-1 dB)	BW	kHz	200	-	-	
Bandwidth (-3dB)	BW	kHz	300	-	-	
Phase shift	$\Delta\varnothing$	degree	-	-	-	
Output noise	$V_{no\ pp}$	mV	-	-	-	
General Data						
Ambient operating temperature	T_A	°C	-40....+105			
Ambient storage temperature	T_S	°C	-55....+105			
Mass	m	g	9			

CS04R -15A-NP SPECIFICATION

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical Data						
Primary side rated current	I_{PN}	A	-15	-	15	
Primary current measurement range	I_{PM}	A	-51	-	51	
Supply voltage	V_C	V	4.75	5.0	5.25	
Output voltage	V_{OUT}	V	$V_{OUT}=(V_C/5) \times (2.5+G_{th} \times I_P)$			@ $V_C=5V$
Reference output voltage	V_{OUT}	V	2.495	2.5	2.505	@ $V_C=5V$ & $I_P=0A$
Zero output voltage	G_{th}	mV/A	-	41.67	-	
Theoretical gain	I_C	mA	15	-	24	@ $I_P=I_{PN}$
Current consumption	R_L	kΩ	10	-	unlimited	@ V_{OUT} to GND
Load Resistance	C_2	nF	-	-	0.1	
Load capacitance	C_1	μF	-	-	0.1	
Power filter capacitor	I_{PN}	A	-15	-	15	
Performance Data						
Gain error	$\mathcal{E}_G$	%	-0.8	-	0.8	@ $T_A=25@V_C=5V$
Temperature Drift of Gain error	T_{CG}	PPM/K	-	-	±40	@ T_A -40°C~105°C
Zero point error	V_{OE}	mV	-2.21	-	2.21	@ $V_C=5V$ & $I_P=0A$ $V_{OUT}-V_{REF}$
Temperature Drift of Zero Error	$TC_{V_{OE}}$	PPM/K	-	±2.3	±6	@ T_A -40°C~105°C
Magnetic Offset Voltage	V_{OM}	mV	-4.167	-	4.167	@ $T_A=25@V_C=5V$ $10*I_{PN}$
Nonlinear error	$\mathcal{E}_L$	% of I_{PN}	-0.1	-	0.1	exclude zero V_{OE}
Response time	t_r	μs	-	-	0.3	@ $di/dt =44A/\mu s$
Bandwidth (-1 dB)	BW	kHz	200	-	-	
Bandwidth (-3dB)	BW	kHz	300	-	-	
Phase shift	$\Delta\varnothing$	degree	-	-	-	
Output noise	$V_{no\ pp}$	mV	-	-	-	
General Data						
Ambient operating temperature	T_A	°C	-40....+105			
Ambient storage temperature	T_S	°C	-55....+105			
Mass	m	g	9			

CS04R-25A-NP SPECIFICATION

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical Data						
Primary side rated current	I_{PN}	A	-25	-	25	
Primary current measurement range	I_{PM}	A	-85	-	85	
Supply voltage	V_C	V	4.75	5.0	5.25	
Output voltage	V_{OUT}	V	$V_{OUT}=(V_C/5) \times (2.5+G_{th} \times I_P)$			@ $V_C=5V$
Reference output voltage	V_{OUT}	V	2.495	2.5	2.505	@ $V_C=5V$ & $I_P=0A$
Zero output voltage	G_{th}	mV/A	-	25	-	
Theoretical gain	I_C	mA	15	-	39	@ $I_P=I_{PN}$
Current consumption	R_L	k Ω	10	-	unlimited	@ V_{OUT} to GND
Load Resistance	C_2	nF	-	-	0.1	
Load capacitance	C_1	μ F	-	-	0.1	
Power filter capacitor	I_{PN}	A	-25	-	25	
Performance Data						
Gain error	$\mathcal{E}_G$	%	-0.8	-	0.8	@ $T_A=25@V_C=5V$
Temperature Drift of Gain error	T_{CG}	PPM/K	-	-	± 40	@ T_A -40°C~105°C
Zero point error	V_{OE}	mV	-1.35	-	1.35	@ $V_C=5V$ & $I_P=0A$ $V_{OUT}.V_{REF}$
Temperature Drift of Zero Error	TC_{VOE}	PPM/K	-	± 1.4	± 4	@ T_A -40°C~105°C
Magnetic Offset Voltage	V_{OM}	mV	-2.5	-	2.5	@ $T_A=25@V_C=5V$ $10*I_{PN}$
Nonlinear error	$\mathcal{E}_L$	% of I_{PN}	-0.1	-	0.1	exclude zero V_{OE}
Response time	t_r	μ s	-	-	0.3	@ $di/dt =68A/\mu$ s
Bandwidth (-1 dB)	BW	kHz	200	-	-	
Bandwidth (-3dB)	BW	kHz	300	-	-	
Phase shift	$\Delta\emptyset$	degree	-	-	-	
Output noise	$V_{no\ pp}$	mV	-	-	-	
General Data						
Ambient operating temperature	T_A	°C	-40....+105			
Ambient storage temperature	T_S	°C	-55....+105			
Mass	m	g	9			

CS04R - 50A-NP SPECIFICATION

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical Data						
Primary side rated current	I_{PN}	A	-50	-	50	
Primary current measurement range	I_{PM}	A	-150	-	150	
Supply voltage	V_C	V	4.75	5.0	5.25	
Output voltage	V_{OUT}	V	$V_{OUT}=(V_C/5) \times (2.5+G_{th} \times I_P)$			@ $V_C=5V$
Reference output voltage	V_{OUT}	V	2.495	2.5	2.505	@ $V_C=5V$ & $I_P=0A$
Zero output voltage	G_{th}	mV/A	-	12.5	-	
Theoretical gain	I_C	mA	15	-	65	@ $I_P=I_{PN}$
Current consumption	R_L	k Ω	10	-	unlimited	@ V_{OUT} to GND
Load Resistance	C_2	nF	-	-	0.1	
Load capacitance	C_1	μF	-	-	0.1	
Power filter capacitor	I_{PN}	A	-50	-	50	
Performance Data						
Gain error	$\mathcal{E}_G$	%	-0.8	-	0.8	@ $T_A=25@V_C=5V$
Temperature Drift of Gain error	T_{CG}	PPM/K	-	-	± 40	@ T_A -40°C~105°C
Zero point error	V_{OE}	mV	-0.725	-	0.725	@ $V_C=5V$ & $I_P=0A$ $V_{OUT}-V_{REF}$
Temperature Drift of Zero Error	TC_{VOE}	PPM/K	-	± 0.7	± 3	@ T_A -40°C~105°C
Magnetic Offset Voltage	V_{OM}	mV	-1.25	-	1.25	@ $T_A=25@V_C=5V$ $10*I_{PN}$
Nonlinear error	$\mathcal{E}_L$	% of I_{PN}	-0.1	-	0.1	exclude zero V_{OE}
Response time	t_r	μs	-	-	0.3	@ di/dt =100A/ μs
Bandwidth (-1 dB)	BW	kHz	200	-	-	
Bandwidth (-3dB)	BW	kHz	300	-	-	
Phase shift	$\Delta \varnothing$	degree	-	-	-	
Output noise	$V_{no\ pp}$	mV	-	-	-	
General Data						
Ambient operating temperature	T_A	°C	-40....+105			
Ambient storage temperature	T_S	°C	-55....+105			
Mass	m	g	9			

Note :

- (1) output voltage U_{out} , Offset voltage U_{QOV} , and the sensitivity G_{th} are completely proportional to the power supply V_c ;
- (2) The frequency of the current to be measured needs to be limited within the frequency band of the current sensor, otherwise the core and chip will be overheated;
- (3) Wrong wiring may damage the current sensor ;

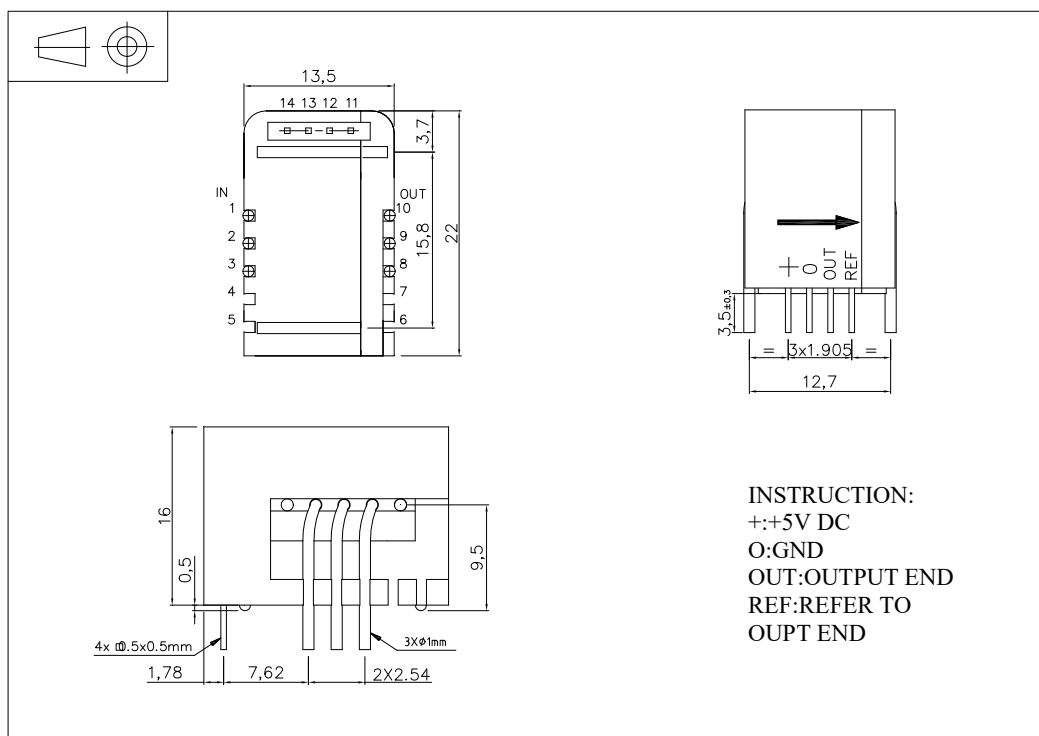
Insulation data:

Parameter	Symbol	Unit	Value	Remark
AC isolation withstand voltage test RMS @ 50Hz, 1min	U_D	KV	4.1	
Impulse withstand voltage 1.2/50uS	U_W	KV	7.5	
Shell material	-	-	UL94-V0	PPO
Relative tracking index	CTI	V	600	
Creepage distance	d_{CP}	mm	7.5	
Electrical clearance	d_{CI}	mm	7.5	

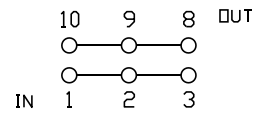
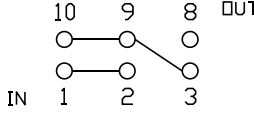
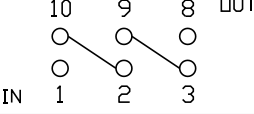
Maximum limit:

Parameter	Symbol	Unit	Value
Supply voltage	V_C	V	7
Continuous output current	I_{out}	mA	-
Electrostatic discharge - contact discharge	V_{ESD}	KV	4

Mechanical Dimensions (in mm) :



Reference for primary side busbar wiring method:

Primary turns	Primary side rated current	Connection method
1	$\pm 6/\pm 15/\pm 25/\pm 50$	
2	$\pm 3/\pm 7.5/\pm 12/\pm 25$	
3	$\pm 2/\pm 5/\pm 8/\pm 17$	

Safety

This device must be used according to IEC610101.

This device must be used in electric/electronic equipment with applicable standards and safety requirements in accordance with the operating instructions.

Caution, risk of electrical shock.

When operating the device, certain parts can carry hazardous voltage (eg. primary busbar, power supply). Ignoring this warning can lead to injury and/or cause serious damage.

This is a builtin device, whose conducting parts must be inaccessible after installation.

A protective housing or additional shield can be used.

Main supply must be able to be disconnected.

