CSFR-A-NP SERIES CURRENT TRANSDUCER

CSFR-A-NP

IAF
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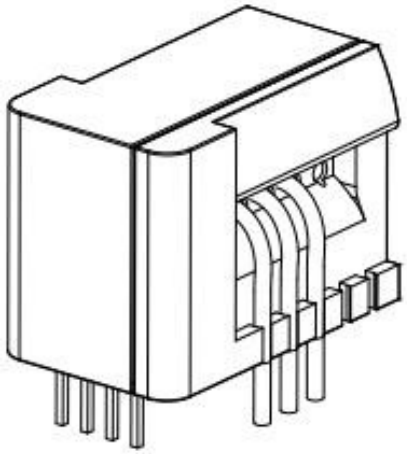
CSFR-A-NP Series Current Transducer

Description

For DC, AC and pules current measurement, the primary and secondary side of the transducer are insulated.

Characteristics

- Closed-loop fluxgate
- Primary and secondary side are insulated
- Low power consumption
- Wide range
- No insertion loss
- Plastic case material recognized according to UL 94-V0



Applications

- AC motor and servo motor drives
- Uniterruptible Power Supplies (UPS)
- Static converters for DC motor drives
- Switched Mode Power Supplies (SMPS)
- Solar inverters

Model Number and Parameter

Product Model		
Model No.	**Rated Input Current I_{PN} (A)**	**Measuring Range I_{PM} (A)**
CAFR-6A-NP	6	±20
CAFR-15A-NP	15	±51
CAFR-25A-NP	25	±85
CAFR-50A-NP	50	±150

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CAFR-6A-NP Parameter

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal RMS current	I_{PN}	A	-6	-	6	
Primary currnet, measuring range	I_{PM}	A	-20	-	20	
Supply voltage	V_C	V	4.75	5.0	5.25	
Output voltage	V_{OUT}	V	$V_{OUT}=(V_C/5)$ x $(2.5+G_{th}$ x $I_P)$			@ V_C=5V
Reference output voltage	V_{REF}	V	2.495	2.5	2.505	@V_C=5V and I_P=0A
Output voltage at zero	V_{OUT}			V_{REF}		@V_C=5V and I_P=0A
Theoretical gain	G_{th}	mV/A	-	104.2	-	
Current consumption	I_C	mA	15	-	19	@ I_P=I_{PN}
Load resistance	R_L	kΩ	10	-	unlimited	@V_{OUT} to GND
Load capacitance	C_L	nF	-	-	0.1	
Power filter capacitance	C_f	μF	-	-	0.1	
Performance data						
Gian error	ε_G	%	-0.8	-	0.8	@T_A=25@V_C=5V
Temperature drift of gian error	T_{CG}	PPM/K	-	-	±40	@T_A -40℃~85℃
Zero error	V_{OE}	mV	-5.3	-	5.3	@V_C=5V and I_P=0A V_{OUT}-V_{REF}
Temperature drift of zero error	T_{CVOE}	PPM/K	-	±6	±14	@TA -40℃~85℃
Magnetic offset voltage	V_{OM}	mV	-10.42	-	10.42	@T_A=25@V_C=5V 10*I_{PN}
Non-linearity error	ε_L	% of I_{PN}	-0.1	-	0.1	Zero not included V_{OE}
Response time	t	μs	-	-	0.3	@ di/dt =18A/μs
Frequency bandwidth (-1dB)	BW	kHz	200	-	-	
Franquency bandwidth (-3dB)	BW	kHz	300	-	-	
Phase shift	$\Delta\varnothing$	degree	-	-	-	
Output noise	$V_{no(p-p)}$	mV	-	-	-	
Ambient operation temperature	T_A	℃	-40....+85			
Ambient storage temperature	T_S	℃	-55....+105			
Mass	m	g	9			

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CAFR-15A-NP Parameter

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal RMS current	I_{PN}	A	-15	-	15	
Primary currnet, measuring range	I_{PM}	A	-51	-	51	
Supply voltage	V_C	V	4.75	5.0	5.25	
Output voltage	V_{OUT}	V	$V_{OUT}=(V_C/5)$ x $(2.5+G_{th}$ x $I_P)$			@ V_C=5V
Reference output voltage	V_{REF}	V	2.495	2.5	2.505	@V_C=5V and I_P=0A
Output voltage at zero	V_{OUT}			V_{REF}		
Theoretical gain	G_{th}	mV/A	-	41.67	-	
Current consumption	I_C	mA	15	-	24	@ $I_P=I_{PN}$
Load resistance	R_L	kΩ	10	-	unlimited	@V_{OUT} to GND
Load capacitance	C_L	nF	-	-	0.1	
Power filter capacitance	C_F	μF	-	-	0.1	
Performance data						
Gian error	ε_G	%	-0.8	-	0.8	@T_A=25@V_C=5V
Temperature drift of gian error	T_{CG}	PPM/K	-	-	±40	@T_A -40℃~85℃
Zero error	V_{OE}	mV	-2.21	-	2.21	@V_C=5V and I_P=0A V_{OUT}-V_{REF}
Temperature drift of zero error	T_{COE}	PPM/K	-	±2.3	±6	@TA -40℃~85℃
Magnetic offset voltage	V_{OM}	mV	-4.167	-	4.167	@T_A=25@V_C=5V 10*I_{PN}
Non-linearity error	ε_L	% of I_{PN}	-0.1	-	0.1	Zero not included V_{OE}
Response time	tr	μs	-	-	0.3	@ di/dt =44A/μs
Frequency bandwidth (-1dB)	BW	kHz	200	-	-	
Frequency bandwidth (-3dB)	BW	kHz	300	-	-	
Phase shift	$\Delta\varnothing$	degree	-	-	-	
Output noise	$V_{no(p-p)}$	mV	-	-	-	
Ambient operation temperature	T_A	℃	-40....+85			
Ambient storage temperature	T_S	℃	-55....+105			
Mass	m	g	9			

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CAFR-25A-NP Parameter

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal RMS current	I_{PN}	A	-25	-	25	
Primary currnet, measuring range	I_{PM}	A	-85	-	85	
Supply voltage	V_C	V	4.75	5.0	5.25	
Output voltage	V_{OUT}	V	$V_{OUT}=(V_C/5)$ x $(2.5+G_{th}$ x $I_P)$			@ V_C=5V
Reference output voltage	V_{REF}	V	2.495	2.5	2.505	@V_C=5V and I_P=0A
Output voltage at zero	V_{OUT}			V_{REF}		
Theoretical gain	G_{th}	mV/A	-	25	-	
Current consumption	I_C	mA	15	-	39	@ I_P=I_{PN}
Load resistance	R_L	kΩ	10	-	unlimited	@V_{OUT} to GND
Load capacitance	C_L	nF	-	-	0.1	
Power filter capacitance	C_F	μF	-	-	0.1	
Performance data						
Gian error	ε_G	%	-0.8	-	0.8	@T_A=25@V_C=5V
Temperature drift of gian error	T_{CG}	PPM/K	-	-	±40	@T_A -40℃~85℃
Zero error	V_{OE}	mV	-1.35	-	1.35	@V_C=5V and I_P=0A V_{OUT}-V_{REF}
Temperature drift of zero error	T_{CVOE}	PPM/K	-	±1.4	±4	@TA -40℃~85℃
Magnetic offset voltage	V_{OM}	mV	-2.5	-	2.5	@T_A=25@V_C=5V 10*I_{PN}
Non-linearity error	ε_L	% of I_{PN}	-0.1	-	0.1	Zero not included V_{OE}
Response time	t	μs	-	-	0.3	@ di/dt =68A/μs
Frequency bandwidth (-1dB)	BW	kHz	200	-	-	
Frequency bandwidth (-3dB)	BW	kHz	300	-	-	
Phase shift	$\Delta\varnothing$	degree	-	-	-	
Output noise	$V_{no(p-p)}$	mV	-	-	-	
Ambient operation temperature	T_A	℃	-40....+85			
Ambient storage temperature	T_S	℃	-55....+105			
Mass	m	g	9			

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CAFR-50A-NP Parameter

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal RMS current	I_{PN}	A	-50	-	50	
Primary currnet, measuring range	I_{PM}	A	-150	-	150	
Supply voltage	V_C	V	4.75	5.0	5.25	
Output voltage	V_{OUT}	V	$V_{OUT}=(V_C/5)$ x $(2.5+G_{th}$ x $I_P)$			@ V_C=5V
Reference output voltage	V_{REF}	V	2.495	2.5	2.505	@V_C=5V and I_P=0A
Output voltage at zero	V_{OUT}			V_{REF}		
Theoretical gain	G_{th}	mV/A	-	12.5	-	
Current consumption	I_C	mA	15	-	65	@ $I_P=I_{PN}$
Load resistance	R_L	kΩ	10	-	unlimited	@V_{OUT} to GND
Load capacitance	C_L	nF	-	-	0.1	
Power filter capacitance	C_F	μF	-	-	0.1	
Performance data						
Gian error	ε_G	%	-0.8	-	0.8	@T_A=25@V_C=5V
Temperature drift of gian error	T_{CG}	PPM/K	-	-	±40	@T_A -40℃~85℃
Zero error	V_{OE}	mV	-0.725	-	0.725	@V_C=5V and I_P=0A V_{OUT}-V_{REF}
Temperature drift of zero error	T_{CVOE}	PPM/K	-	±0.7	±3	@TA -40℃~85℃
Magnetic offset voltage	V_{OM}	mV	-1.25	-	1.25	@T_A=25@V_C=5V 10*I_{PN}
Non-linearity error	ε_L	% of I_{PN}	-0.1	-	0.1	Zero not included V_{OE}
Response time	t	μs	-	-	0.3	@ di/dt =100A/μs
Frequency bandwidth (-1dB)	BW	kHz	200	-	-	
Frequency bandwidth (-3dB)	BW	kHz	300	-	-	
Phase shift	$\Delta\varnothing$	degree	-	-	-	
Output noise	$V_{no(p-p)}$	mV	-	-	-	
Ambient operation temperature	T_A	℃	-40....+85			
Ambient storage temperature	T_S	℃	-55....+105			
Mass	m	g	9			

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Attention:

（1） The output voltage Uout, offset voltage U_{QOV}, sensitive Gth are fully proportional to the power supply Vc.

（2） The frequency of the current to be measured should be limited within the frequency bandwidth of the transducer, otherwise it will cause overheating of the magnetic core and cihp;

（3） Wrong wiring may damage the transducer.

Insulation Characteristic

Parameter	Symbol	Unit	Value	Comment
RMS voltage for AC insulation test @ 50Hz,1min	U_D	KV	4.1	
Impuse withstand voltage 1.2/50uS	U_W	KV	7.5	
Case material	-	-	UL94-V0	PPO
Comparative tracking index	CTI	V	600	
Creepage distance(pri. - sec.)	d_{CP}	mm	7.5	
Clearance distance (pri. - sec.)	d_{CI}	mm	7.5	

Absolute Maximum Ratings

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

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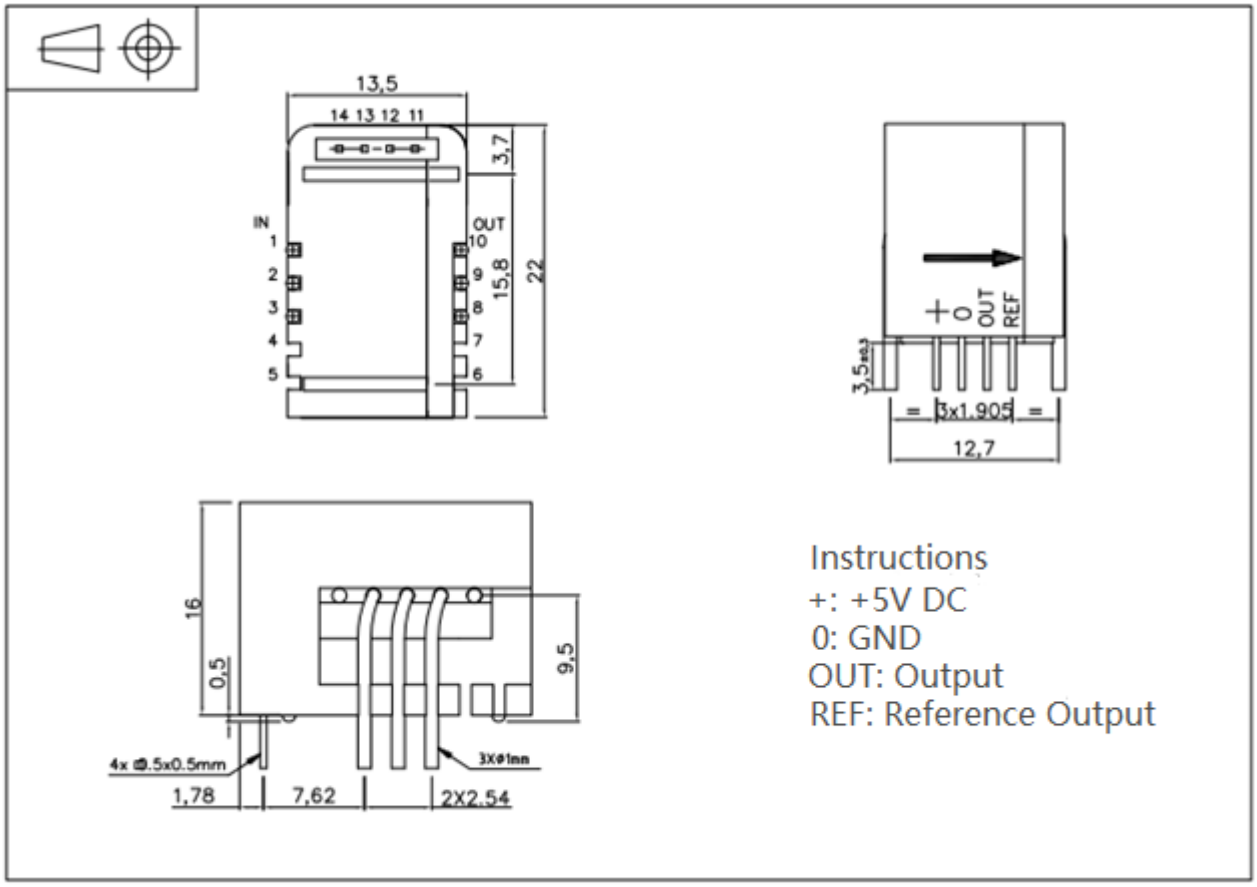
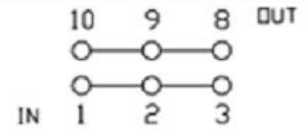
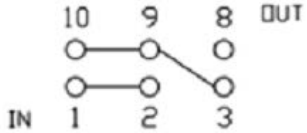
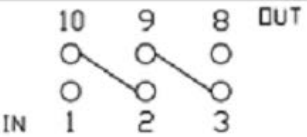
Dimension



Connection mode of primary busbar

Primary Turns	Primary Nominal Current	Connetion Type
1	±6/±15/±25/±50	
2	±3/±7.5/±12/±25	
3	±2/±5/±8/±17	

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Cautions

- The use of transducer must comply with standard IEC61010-1. Transducers must be installed in electronic or electrical equipment that meets application standards and safety requirements in accrodance with the usage instructions
- Watch out the risk of electrical shock!
- Some parts of the transducer may be exposed to dangerous voltages (e.g. primary busbar, power supply) while it is working. Neglecting these factors will result in damage and serious danger. The transducers are built-in equipment, its conductive part must be inaccessible after installation. If necessary, a protective housing or addtional shield could be added. Main supply must be able to be disconnected.

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