

# CURRENT SENSOR

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PRODUCT SERIES: STB-CABxxxN-xxF

PRODUCT PART NUMBER: STB-CAB700N-xxFx  
STB-CAB500N-xxFx

VERSION: Ver 2.0



Sinomags Technology Co., Ltd.

Web site: [www.sinomags.com](http://www.sinomags.com)

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## 1. Characteristic

CABxxxN-xxF Series current sensor is based on Sinomags Open loop fluxgate technology, with CANBUS digital output. It can be used to measure 700A rated current. Using a proprietary Digital Compensation technology. This product brings the best combination of performance and reliability.

- Error  $\pm 30\text{mA}$  @  $<\pm 10\text{A}$ , Accuracy  $\pm 0.3\%$  @  $<\pm 30\text{A}$ ; Accuracy  $\pm 0.5\%$  @  $<\pm I_{PN}$
- High electromagnetic compatibility against complex electromagnetic interference environment.
- Excellent anti magnetic interference.
- CANBUS output, convenient for system integration.
- Ultra-high over current capability

## 2. General parameters

Working temperature:	-40°C~+85°C;
Storage temperature:	-40°C~+85°C
Insulation resistance:	$\geq 500\text{ M}\Omega$ ;
Rms voltage for AC insulation test	50Hz 1min 2.5KV
Over-voltage(12V)	24V/1 minute
Over-voltage(24V)	36V/1 minute
Electrostatic discharge voltage	4KV

### 3. Electrical parameters

#### 3.1. STB-CAB700N-xxF Supply Voltage $U_C = 12V$

Parameter	Symbol	Unit	Specification			Conditions
			Min	Type	Max	
Nominal Measuring Range	$I_{PN}$	A	-700		700	
Supply Voltage	$U_C$	V	7.2	12	18	Full accuracy
Current Consumption @ $I_P=0A$	$I_C$	mA		33		$U_C=12V, T=25^\circ C$
Current Consumption @ $I_P=700A$	$I_C$	mA		200		$U_C=12V, T=25^\circ C$
All Temperature Sensitivity error Accuracy @ $I_P \leq 10A$	$X_G$	A	-0.03		0.03	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
All Temperature Sensitivity error Accuracy @ $10A < I_P \leq 30A$	$X_G$	%	-0.3		0.3	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
All Temperature Sensitivity error Accuracy @ $30A < I_P \leq 700A$	$X_G$	%	-0.5		0.5	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
Offset=0A	$I_{OS}$	mA	-30		30	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
Linearity error with $I_{PN}$	$\epsilon_L$	%		0.2		@room temperature
Temperature coefficient of G	TCG	ppm/ $^\circ C$		20		

### 3.2. STB-CAB500N-xxF Supply Voltage $U_C = 12V$

Parameter	Symbol	Unit	Specification			Conditions
			Min	Type	Max	
Nominal Measuring Range	$I_{PN}$	A	-500		500	
Supply Voltage	$U_C$	V	7.2	12	18	Full accuracy
Current Consumption @ $I_P=0A$	$I_C$	mA		33		$U_C=12V, T=25^\circ C$
Current Consumption @ $I_P=500A$	$I_C$	mA		150		$U_C=12V, T=25^\circ C$
All Temperature Sensitivity error Accuracy @ $I_P \leq 10A$	$X_G$	A	-0.03		0.03	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
All Temperature Sensitivity error Accuracy @ $10A < I_P \leq 30A$	$X_G$	%	-0.3		0.3	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
All Temperature Sensitivity error Accuracy @ $30A < I_P \leq 500A$	$X_G$	%	-0.5		0.5	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
Offset=0A	$I_{OS}$	mA	-30		30	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
Linearity error with $I_{PN}$	$\epsilon_L$	%		0.2		@room temperature
Temperature coefficient of G	TCG	ppm/ $^\circ C$		20		

### 3.3. STB-CAB700N-xxFH Supply Voltage $U_C = 24V$

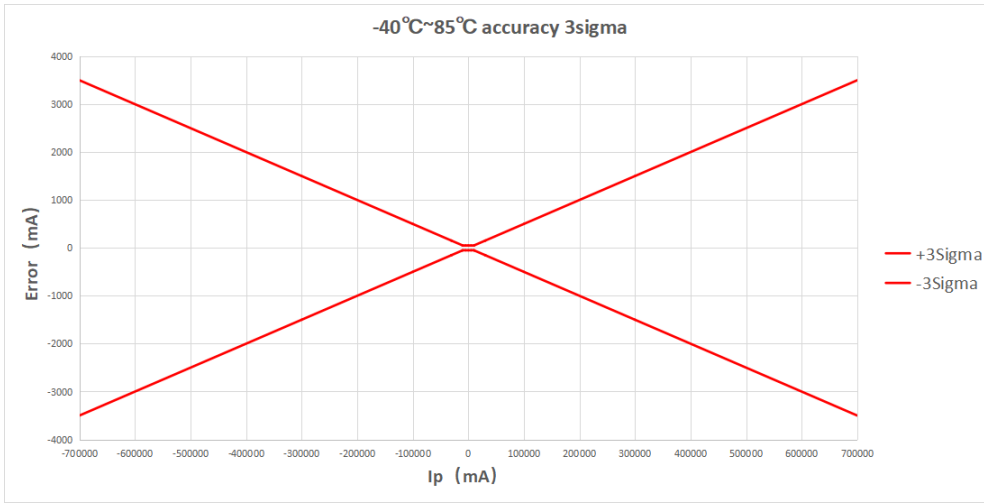
Parameter	Symbol	Unit	Specification			Conditions
			Min	Type	Max	
Nominal Measuring Range	$I_{PN}$	A	-700		700	
Supply Voltage	$U_C$	V	8	24	32	Full accuracy
Current Consumption @ $I_P=0A$	$I_C$	mA		33		$U_C=24V, T=25^\circ C$
Current Consumption @ $I_P=700A$	$I_C$	mA		130		$U_C=24V, T=25^\circ C$
All Temperature Sensitivity error Accuracy @ $I_P \leq 10A$	$X_G$	A	-0.03		0.03	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
All Temperature Sensitivity error Accuracy @ $10A < I_P \leq 30A$	$X_G$	%	-0.3		0.3	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
All Temperature Sensitivity error Accuracy @ $30A < I_P \leq 700A$	$X_G$	%	-0.5		0.5	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
Offset=0A	$I_{OS}$	mA	-30		30	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
Linearity error with $I_{PN}$	$\epsilon_L$	%		0.2		@room temperature
Temperature coefficient of G	TCG	ppm/ $^\circ C$		20		

### 3.4. STB-CAB500N-xxFH Supply Voltage $U_C = 24V$

Parameter	Symbol	Unit	Specification			Conditions
			Min	Type	Max	
Nominal Measuring Range	$I_{PN}$	A	-500		500	
Supply Voltage	$U_C$	V	8	24	32	Full accuracy
Current Consumption @ $I_P=0A$	$I_C$	mA		33		$U_C=24V, T=25^\circ C$
Current Consumption @ $I_P=500A$	$I_C$	mA		100		$U_C=24V, T=25^\circ C$
All Temperature Sensitivity error Accuracy @ $I_P \leq 10A$	$X_G$	A	-0.03		0.03	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
All Temperature Sensitivity error Accuracy @ $10A < I_P \leq 30A$	$X_G$	%	-0.3		0.3	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
All Temperature Sensitivity error Accuracy @ $30A < I_P \leq 500A$	$X_G$	%	-0.5		0.5	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
Offset=0A	$I_{OS}$	mA	-30		30	$=-40$ to $85^\circ C$ ; $\pm 3$ sigma
Linearity error with $I_{PN}$	$\epsilon_L$	%		0.2		@room temperature
Temperature coefficient of G	TCG	ppm/ $^\circ C$		20		

## 4. Total Error Graph for CAB-700 Series

Performances are considered with average value over 20 CAN frames(200ms)



## 5. CAB-700 CAN Output specification

CANBUS speed refer to product version table,

CANBUS protocol: version 2.0A/B

CAN oscillator tolerance: 0.3125%

Byte order: big endian (Motorola)

120 ohm termination resistor to be added externally, internal CAN no impedance

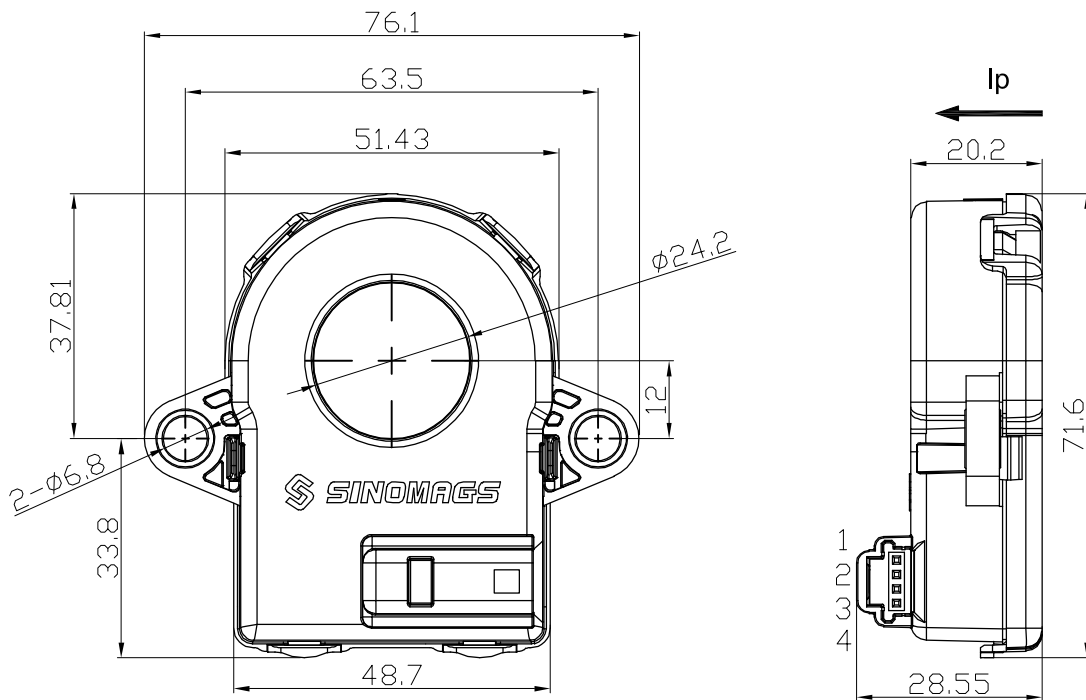
Message Description	CAN ID	name	Data Length (bytes)	Type of frame	Message launch type	Signal description	Signal Name	Start bit	Len-gth
Current Ip (mA)	0x3C2	CAB700	8	stand ard	Cyclic message every 10ms	Ip Value: 80000000H= 0mA, 7FFFFFFFH= - 1mA, 80000001H= 1mA	IP_VALUE	24	32
						b0:Error indication (0=Normal ,1=failure)	ERROR_INDICATION	32	1
						b7-b1:Error information	ERROR_INFORMATION	33	7
						Vacant bits (fix to 0)	UNDEFINE	40	8
							PCBA Ver	48	8
							FIRMWARE Ver	56	8

## 6. Diagnostic Trouble Code (DTC)

FAILLURE MODE	Ip VALUE	ERROR INDICATION	ERROR INFORMATION
Overcurrent Detection Ip> Approximate 710A/520A	FFFFFFFF	1	0x41
Fluxgate under frequency	FFFFFFFF	1	0x42
Signal not available for more than 100ms	FFFFFFFF	1	0x44
Supply voltage out of range	FFFFFFFF	1	0x46
Flash CRC error	FFFFFFFF	1	0x48

## 7. Dimensions: (in mm)

Connector type: TYCO 1473672-1



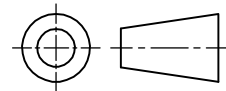
### Terminals

1	CAN-L
2	CAN-H
3	GND
4	Uc

Material : Fit UL94V-0 & RoHS requirements ;

General tolerance :  $\pm 0.5$

Unit : mm



### Mechanical characteristics

1. Unspecified tolerance:  $\pm 0.5$ mm
2. Plastic housing material: PA66+ GF30%
3. Mounting screw M6, torque recommendation 3 Nm
4. Mass:  $58g \pm 5g$

## 8. Application

- Hybrid and electric vehicle battery pack
- Accurate current measurement for battery management applications

## 9. Product definition statement

	STB	-	CAB	700	N	-	5	2	F	1
Current sensor										
Product information										
Rated current										
Installing form										
	N:		Perforation $\varnothing$ 24.2mm, mounting hole $\varnothing$ 6.8mm							
Baud rate										
	1:		125k							
	2:		250k							
	5:		500k							
CAN ID										
	1:		3C1							
	2:		3C2							
	3:		3C3							
	4:		3C4							
	5:		3C5							
	9:		3C0							
Edition										
	F:		Fluxgate 12V power supply							
	FH:		Fluxgate 24V power supply							
Resistance of matching										
	Blank:		None							
	1:		120 $\Omega$							