

GZC6800A

Current Sensor

Analog Output

Datasheet

Version: V1.0

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Document Revision History

Revision	Description	Date
V1.0	Initial version	2025.8.28

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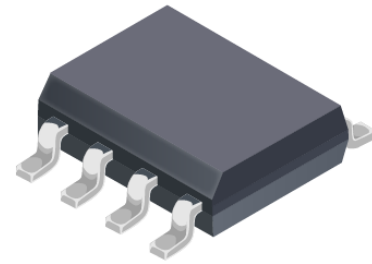
1. Product Description

GZC6 800A product series from Sencoch is a high-precision linear Hall current sensor chip based on the Hall effect principle.

This product is widely used for AC or DC current detection in industrial, commercial, and communication systems. Each GZC6 800A consists of a high-precision, low-temperature-drift linear Hall

element and a built-in low-resistance current conductor path. An

applied current flowing through this low-resistance current conductor path generates a magnetic field, which the Hall element converts into a voltage signal output proportional to the input current. Due to the use of differential current sensing technology in the product design, interference from external common-mode magnetic fields can be effectively suppressed, improving accuracy in magnetically noisy environments.



The GZC6 800A's output voltage is precisely calibrated in-house to meet different current range requirements. The output exhibits a positive slope ($>VOQ$) when applied current flows through the internal current conduction path (from pins 1 and 2 to pins 3 and 4). The internal resistance of this conduction path is typically $1.0\text{ m}\Omega$, resulting in low heat generation and low power consumption. The terminals of the conduction path (pins 1 to 4) are electrically isolated from the signal lines (pins 5 to 8). This allows the GZC6 800A current sensor to be used in high-end current sensing applications without the need for additional, expensive isolation technologies.

The products are designed and tested based on industry standards such as IEC61010 and IEC61326, and comply with a standard of CE and RoHS .

- IEC61010-1 : 2 010
- IEC61 326-1 :2 012
- CE certification
- RoHS Certification

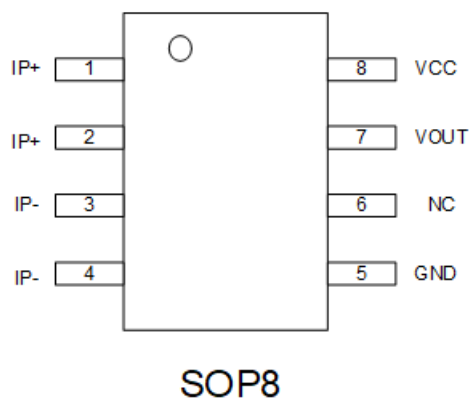
2. Product Features

- $\pm 0.5\%$ nonlinear error over the entire temperature range
- Fast output step response time: $1.2\ \mu\text{s}$
- 300kHz signal bandwidth
- Powered by 5.0V DC power supply
- Working Temperature -40°C to 125°C
- Rated current detection range: (bidirectional) $---\pm 5\text{ A}\sim\pm 50\text{ A}$
- Detecting AC and DC current signals
- Current proportional voltage output mode
- Extremely stable zero-current output voltage

3. Application Areas

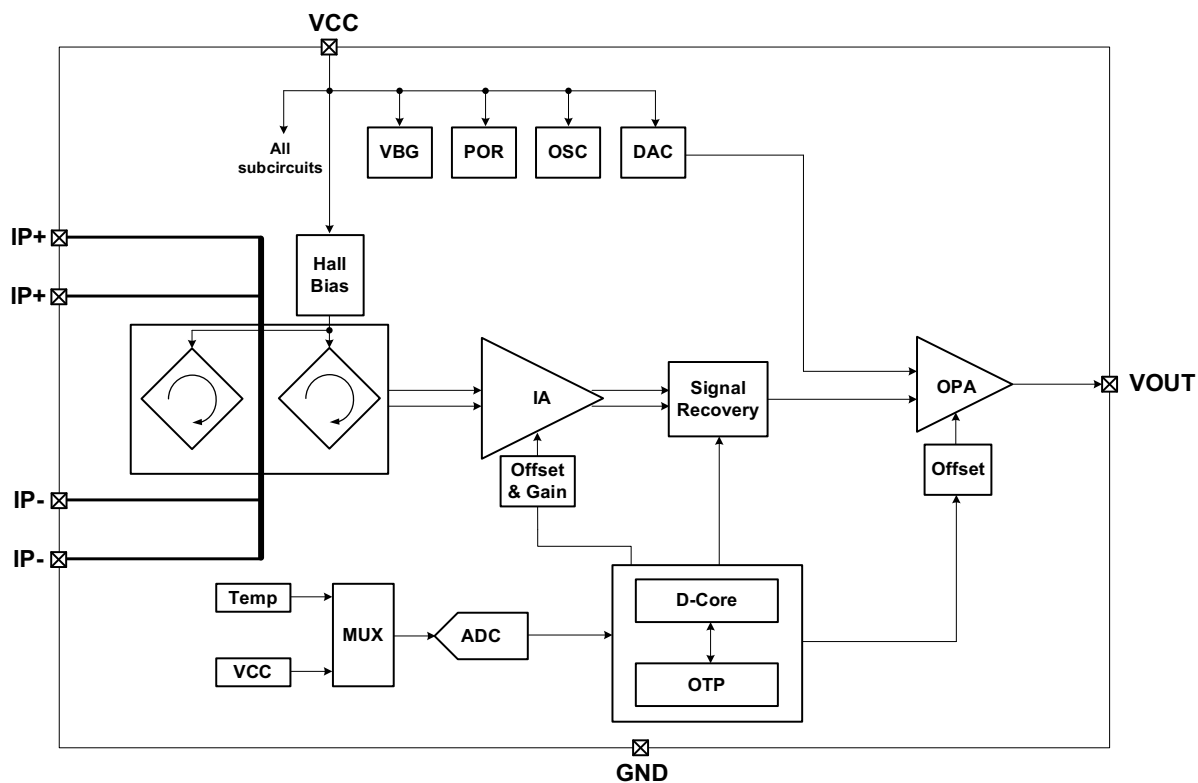
- Medium&low power frequency converters
- Motor phase and rail
- String photovoltaic inverter
- Chargers and converters
- MPPT Current Detection
- DC power supply
- Overcurrent protection
- Uninterruptible Power Supply (UPS)

4. Pin Configuration and Functions

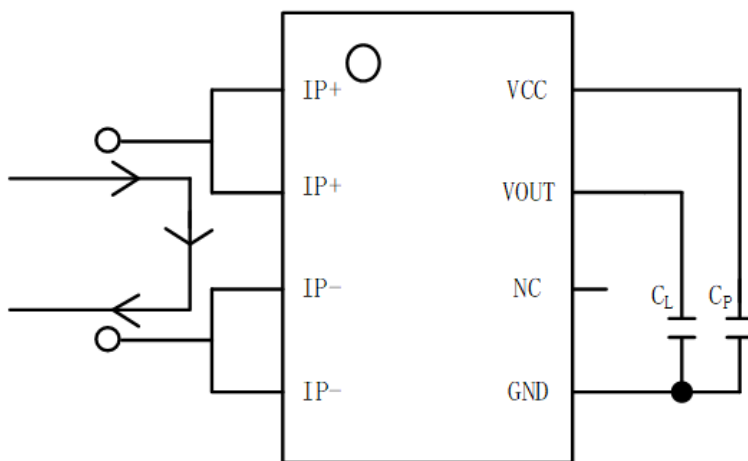


No.	Symbol	Description
1,2	IP+	Input current positive terminal
3, 4	IP-	Input current negative terminal
5	GND	signal ground
6	N C	Floating/Grounded
7	V OUT	Output signal voltage
8	VCC	Input power supply voltage

5. Functional block diagram and application circuit



GZC6800A Functional Block Diagram



For applications with power supply interference, it is recommended to place the capacitors close to the product . Recommended bypass capacitor from power supply to ground: $C_P = 100\text{nF}$; output filter capacitor: $C_L = 1\text{nF}$.

6. Electrical and magnetic properties

6.1 Absolute Maximum Rating

The absolute maximum rating is a limit for a single application; exceeding this value may damage the product.

Parameter	Description	Minimum value	Maximum value	Unit
VCC	power supply voltage	-	12	V
VRCC	Power supply reverse voltage	- 0.5	-	V
VOU	Output voltage	-	12	V
VRU	Output reverse voltage	-0.5	-	V
IOU	Continuous output current	-	20	mA
T O	Operating ambient temperature	-40	1 25	°C
TS	Storage temperature	- 5 0	150	°C
TA	Junction temperature	-	175	°C
V HBM	Antistatic (HBM)	- 8	8	kV
V CDM	Antistatic (CDM)	-2	2	kV

6.2 Isolation and Packaging Characteristics

Parameter	Description	Test conditions	Value	Unit
VISO	Insulation strength voltage	t = 60s 50/60Hz Compliant with IEC 62368-1 standard	3000	Vrms
V SUG	Lightning surge voltage	Pulse width 1.2/50μs conforms to IEC 61000-4-5 standard .	6000	V dc
V IOWM	Maximum operating isolation voltage	Compliant with IEC 62368-1 standard	594 420	Vpk Vrms
DC I	electrical clearance	Measure the shortest air distance from the input terminal to the output terminal.	4.2	mm
DC P	creepage distance	Measure the shortest distance from the input terminal along the molding compound to the output terminal.	4.2	mm
CTI	Relative tracking index	Compliant with IEC60112 standard	550	V

6.3 Electrical Specifications

TA = 25 °C, VCC = 5V (excluding other specified conditions)

Parameter	Description	Test conditions	Min. value	Typ. value	Max. value	Unit
NP	Number of turns of the primary side		-	1	-	
RIP	conductor resistance	TA=25°C	-	1.0	-	mΩ
VCC	power supply voltage		4.5	5	5.5	V
ICC	Consume current		-	14	19	mA
VOL	Analog output low level	RL ≥ 10 KΩ	-	-	0.3	V
VOH	Analog output high level	RL ≥ 10 KΩ	VCC-0.3	-	-	V
V PORL	Power-on reset low level	VCC decreases	-	3.2	-	V
V PORH	Power-on reset high level	When VCC rises	-	3.6	-	V
CL	Output load capacitor	V OUT–GND	-	1	10	nF
RL	Output load resistor	Scroll down to GND	10	-	-	KΩ
		Pull up to VCC	10	-	-	KΩ
BW	bandwidth	-3dB, CL=1nF	-	300	-	kHz
T PO	Power-on time	CL=1nF	-	200	-	us
TR	Ascent Time	CL = 1 nF	-	1.2	-	us
TRES	Output response time	CL = 1 nF	-	1.2	-	us
T DEL	Propagation delay time	CL = 1 nF	-	0.5	-	us
V NOI	Output noise	TA=25°C , 50A		2.5		m Vpp
				5		m Vrms
ELIN	Nonlinear error	IP=IPM	- 1.0	0.5	1.0	%
E RAT-SNST	Sensitivity proportional error	VCC=4.5-5.5V	-	± 1.0	-	%
E RAT-VOQ	Zero current output voltage ratio error	VCC=4.5-5.5V	-	± 0.5	-	%

6.4 Accuracy Specifications

GZC6 800A-5P0BRK001B01 TA = 25 °C, VCC = 5V (excluding other specified conditions)

Para.	Description	Test conditions	Min. value	Typ. value	Max. value	Unit
IPN	Rated input current	effective value	- 5.0	-	5.0	A
SNST	Sensitivity	$-5A \leq IP \leq 5A$	-	400	-	mV/A
VOQ	Zero current output voltage	IP=0A	-	VCC/2	-	V
VOE	Zero current output error	IP=0A, TA=25 °C	- 8	-	8	m V
		IP = IPN , TA = -40 °C to 25 °C	-20	-	20	m V
		IP = IPN , TA = 25 °C to 125 °C	-20	-	20	mV
ESNST	Sensitivity error	IP = IPN , TA = 25 °C	-	± 0.8	-	%
		IP = IPN , TA = -40 °C to 25 °C	-	±1.5	-	%
		IP = IPN , TA = 25 °C to 125 °C	-	± 2.0	-	%
ETOT	Total output error	IP = IPN , TA = 25 °C	-1.2	-	1.2	%
		IP = IPN , TA = -40 °C to 25 °C	-2.0	-	2.0	%
		IP = IPN , TA = 25 °C to 125 °C	- 2.5	-	2.5	%

GZC6 800A-10PBRK001B01 TA = 25 °C, VCC = 5V (excluding other specified conditions)

Para.	Description	Test conditions	Min. value	Typ. value	Max. value	Unit
IPN	Rated input current	effective value	- 10	-	10	A
SNST	Sensitivity	$-10A \leq IP \leq 10A$	-	200	-	mV/A
VOQ	Zero current output voltage	IP=0A	-	VCC/2	-	V
VOE	Zero current output error	IP=0A, TA=25 °C	- 5	-	5	m V
		IP = IPN , TA = -40 °C to 25 °C	-15	-	15	m V
		IP = IPN , TA = 25 °C to 125 °C	-15	-	15	mV
ESNST	Sensitivity error	IP= IPN ,TA=25 °C	-	± 0.8	-	%
		IP= IPN , TA=-40 °C to 25 °C	-	±1.5	-	%
		IP= IPN , TA=25 °C to 125 °C	-	± 2.0	-	%
THIS	total output error	IP= IPN ,TA=25 °C	-1.2	-	1.2	%
		IP = IPN , TA = -40 °C to 25 °C	-2.0	-	2.0	%
		IP = IPN , TA = 25 °C to 125 °C	- 2.5	-	2.5	%

GZC6 800A-20PBRK001B01 TA = 25 °C, VCC = 5V (excluding other specified conditions)

Para.	Description	Test conditions	Min. value	Typ. value	Max. value	Unit
IP N	Rated input current	effective value	- 20	-	20	A
SNST	Sensitivity	$-20A \leq IP \leq 20A$	-	100	-	mV/A
V OQ	Zero current output voltage	IP=0A	-	VCC/2	-	V
VOE	Zero current output error	IP=0A, TA=25 °C	- 5	-	5	mV
		IP=0A, TA=25 °C to 125 °C	-15	-	15	mV
		IP=0A, TA=-40 °C to 25 °C	-15	-	15	mV
ESNST	Sensitivity error	IP = IPN , TA = 25 °C	-	± 0.8	-	%
		IP= IPN , TA=25 °C to 125 °C	-	±1.5	-	%
		IP= IPN , TA=-40 °C to 25 °C	-	± 2.0	-	%
THIS	total output error	IP= IPN ,TA=25 °C	-1.2	-	1.2	%
		IP= IPN , TA=-40 °C to 25 °C	-2.0	-	2.0	%
		IP = IPN , TA = 25 °C to 125 °C	- 2.5	-	2.5	%

GZC6 800A-25PBRK001B01 TA = 25 °C, VCC = 5V (excluding other specified conditions)

Para.	Description	Test conditions	Min. value	Typ. value	Max. value	Unit
IP N	Rated input current	effective value	- 25	-	25	A
SNST	Sensitivity	$-25A \leq IP \leq 25A$	-	80	-	mV/A
V OQ	Zero current output voltage	IP=0A	-	VCC/2	-	V
VOE	Zero current output error	IP=0A, TA=25 °C	- 5	-	5	mV
		IP= IPN , TA=-40 °C to 25 °C	-15	-	15	mV
		IP= IPN , TA=25 °C to 125 °C	-15	-	15	mV
ESNST	sensitivity error	IP= IPN ,TA=25 °C	-	± 0.8	-	%
		IP= IPN , TA=-40 °C to 25 °C	-	±1.5	-	%
		IP= IPN ,TA=25 °C to 125 °C	-	± 2.0	-	%
ETOT	Difference between export and output	IP= IPN ,TA=25 °C	-1.2	-	1.2	%
		IP= IPN ,TA=-40 °C to 25 °C	-2.0	-	2.0	%
		IP = IPN , TA = 25 °C to 125 °C	- 2.5	-	2.5	%

GZC6 800A-30PBRK001B01 TA = 25 °C, VCC = 5V (excluding other specified conditions)

Para.	Description	Test conditions	Min. value	Typ. value	Max. value	Unit
IP N	Rated input current	effective value	- 30	-	30	A
SNST	Sensitivity	$-30A \leq IP \leq 30A$	-	66.7	-	mV/A
V OQ	Zero current output voltage	IP=0A	-	VCC/2	-	V
VOE	Zero current output error	IP=0A, TA=25 °C	- 5	-	5	m V
		IP = IPN , TA = -40 °C to 25 °C	-15	-	15	m V
		IP = IPN , TA = 25 °C to 125 °C	-15	-	15	mV
ESNST	Sensitivity error	IP = IPN , TA = 25 °C	-	± 0.8	-	%
		IP = IPN , TA = -40 °C to 25 °C	-	±1.5	-	%
		IP= IPN , TA=25 °C to 125 °C	-	± 2.0	-	%
THIS	total output error	IP= IPN ,TA=25 °C	-1.2	-	1.2	%
		IP= IPN , TA=-40 °C to 25 °C	-2.0	-	2.0	%
		IP= IPN , TA=25 °C to 125 °C	- 2.5	-	2.5	%

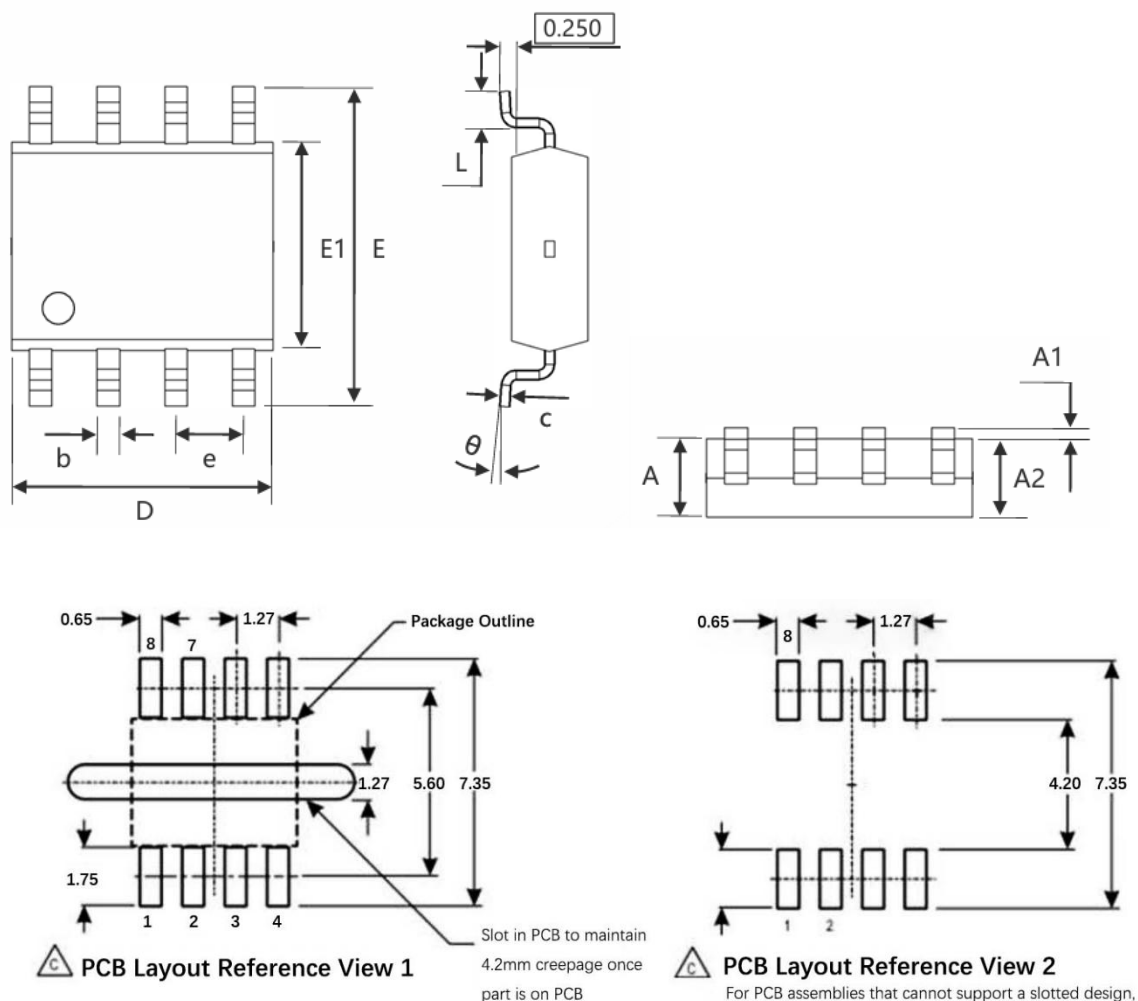
GZC6 800A-40PBRK001B01 TA = 25 °C, VCC = 5V (excluding other specified conditions)

Para.	Description	Test conditions	Min. value	Typ. value	Max. value	Unit
IP N	Rated input current	effective value	- 40	-	40	A
SNST	Sensitivity	$-40A \leq IP \leq 40A$	-	50	-	mV/A
V OQ	Zero current output voltage	IP=0A	-	VCC/2	-	V
VOE	Zero current output error	IP=0A, TA=25 °C	- 5	-	5	m V
		IP = IPN , TA = -40 °C to 25 °C	-15	-	15	m V
		IP = IPN , TA = 25 °C to 125 °C	-15	-	15	mV
ESNST	Sensitivity error	IP = IPN , TA = 25 °C	-	± 1.2	-	%
		IP = IPN , TA = -40 °C to 25 °C	-	±1.8	-	%
		IP= IPN , TA=25 °C to 125 °C	-	± 2.3	-	%
THIS	total output error	IP= IPN ,TA=25 °C	-1.7	-	1.7	%
		IP= IPN , TA=-40 °C to 25 °C	-2.3	-	2.3	%
		IP= IPN , TA=25 °C to 125 °C	- 2.8	-	2.8	%

GZC6 800A-50PBRK001B01 TA = 25 °C, VCC = 5V (excluding other specified conditions)

Para.	Description	Test conditions	Min. value	Typ. value	Max. value	Unit
IP N	Rated input current	effective value	- 50	-	50	A
SNST	Sensitivity	$-50A \leq IP \leq 50A$	-	40	-	mV/A
V OQ	Zero current output voltage	IP=0A	-	VCC/2	-	V
VOE	Zero current output error	IP=0A, TA=25 °C	- 5	-	5	m V
		IP = IPN , TA = -40 °C to 25 °C	-15	-	15	m V
		IP = IPN , TA = 25 °C to 125 °C	-15	-	15	mV
ESNST	Sensitivity error	IP = IPN , TA = 25 °C	-	± 1.2	-	%
		IP = IPN , TA = -40 °C to 25 °C	-	±2.0	-	%
		IP= IPN , TA=25 °C to 125 °C	-	± 2.5	-	%
THIS	total output error	IP= IPN ,TA=25 °C	-1.7	-	1.7	%
		IP= IPN , TA=-40 °C to 25 °C	-2.5	-	2.5	%
		IP= IPN , TA=25 °C to 125 °C	- 3.0	-	3.0	%

7. Packaging Information (Unit: mm)



	Min.Value (mm)	Max.Value(mm)	Min.Value (IN)	Max.Value(IN)
A	1.450	1.750	0.057	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
C	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°