GC1860

High accuracy, Fast response, High bandwidth
Current Sensor IC

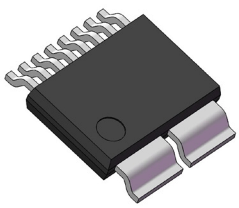
FEATURES

- High Accuracy, Large Current
  - 0~100A Current sensor
  - Low primary conductor resistance: 0.27mΩ
  - Typical V_{OE} temperature drift: ±2mV
  - Typical sensitivity temperature drift: ±0.2%
  - Typical linearity error: ±0.05%
- High Bandwidth, Fast Response
  - Typical bandwidth: 250kHz
  - Typical response time: 1.2µs
- High Anti-interference, High Isolation
  - Differential Hall effectively resists external magnetic field interference
  - Isolated voltage: 5000Vrms
  - Compatible with 3.3V/5V power supply
  - Ratiometric/fixed output

DESCRIPTION

GC1860 series is an open loop hall current sensor that sets high accuracy, high bandwith, fast response, high linearity, low temperature drift and other advantages.GC1860 provides 0~100A current measurement range. GC1860 provides a new solution in high performance current sensor area, besides, differential hall sets can immune stray field.

PACKAGE



SOIC-10

TYPICAL APPLICATIONS

- White Goods
- Variable-frequency Drive
- Power Supply
- Motor Control

TYPICAL APPLICATION CIRCUIT

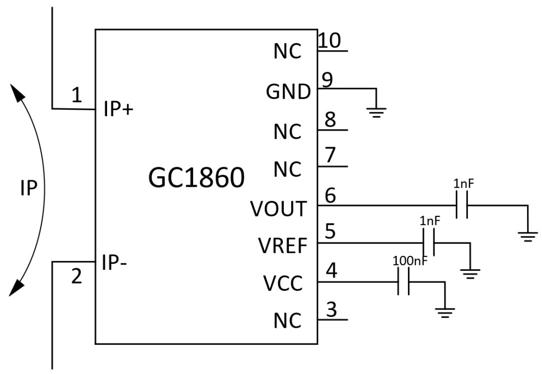


Figure 1. Typical Application Circuit Diagram Of Type B

THERMAL CURVE

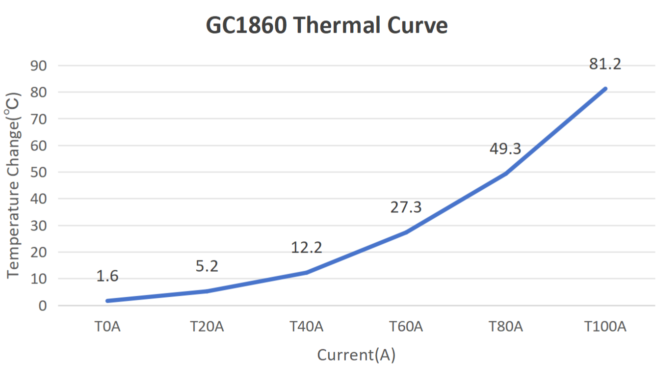


Figure 2. Thermal Curve
(Thermal Curve was measured by Matrixsens using MSEVB0011GC1860REVA2 EVM in Zhangjiagang application laboratory at room temperature and no wind.)

SELECTION GUIDE

Part Number	Output Mode	I_{PR}(A)	Sensitivity(mV/A)		MSL Rating	Operating Temperature	Packing
			V_{CC}=3.3V(*=3.3)	V_{CC}=5V(*=5)			
GC1860D*-AR050FB-T	Fixed Output Mode	±50	26.4	40	3	-40°C to 125°C	Tape and reel, 1000 pieces per reel
GC1860D*-AR080FB-T		±80	16.5	25			
GC1860D*-AR100FB-T		±100	13.2	20			
GC1860D*-AR050RB-T	Ratiometric Output Mode	±50	26.4	40			
GC1860D*-AR080RB-T		±80	16.5	25			
GC1860D*-AR100RB-T		±100	13.2	20			

Note: Continuous testing at 25°C supports 100A, if the test range increases or the ambient temperature rises, please refer to the derating curve in application manuals to take heat dissipation measures. 50A and above have unidirectional output mode, new range will be added without notice.

PART NUMBER SPECIFICATION

GC1860D 5 - A R 20 R B - T

Whether it contains lead
- T：Lead-free process

Output polarity
- B：Bipolar
- U：Unipolar

Output mode
- F：Fixed
- R：Ratiometric

Current sensing range

Packing requirement
- U：Tube(only small samples are available)
- R：Tape and reel

Pin sequence
- A：7-legVCC，6-legVOUT，5-legVREF，3and10-legGND
- B：4-legVCC，6-legVOUT，5-legVREF，9-legGND

Supply voltage
- 3：3.3V
- 5：5V

Product model

CONTENTS

1. ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	Unit	Min.	Typ.	Max.
Supply Voltage	V_{CC}	V	-0.3	/	6.5
Maximun Output Current	I_{OUTmax}	mA	-45	/	45
Maximun Output Voltage	V_{OUTmax}	V	0.1	/	V_{CC}-0.1
Storage temperature	T_S	℃	-55	/	150
Operating Ambient Temperature	T_A	℃	-40	/	125
Maximum Junction Temperature	T_{Jmax}	℃	/	/	165

Note: Operation outside the absolute maximum ratings may cause permanent device damage. Absolute maximum ratings do not imply functional operation of the device at these or any other conditions beyond those listed under recommended operating conditions. If used outside the recommended operating conditions but within the absolute maximum ratings, the device may not be fully functional, and this may affect device reliability, functionality, performance, and shorten the device lifetime.

2. ESD RATINGS

Characteristic	Symbol	Unit	Notes	Value
Human Body Model	V_{HBM}	kV	ESD between any two pins	TBD
Charged Device Model	V_{CDM}	kV		TBD

3. ISOLATION CHARACTERISTICS

Characteristic	Symbol	Unit	Notes	Value
Dielectric Surge Voltage	V_{SURGE}	V	Test method refers to IEC 61000-4-5, 1.2/50μs waveform.	TBD
Dielectric Strength Test Voltage	V_{ISO}	V_{RMS}	60s, 50Hz isolation withstand voltage parameters, according to UL62368-1, test 6kV/1s before delivery to verify the insulation performance, and verify the partial discharge is less than 5pc.	5000
Working Voltage for Basic Isolation	V_{WVBI}	V_{PK} or V_{CC}	Maximum approved working voltage for basic (single) isolation according to UL 60950-1 .	TBD
		V_{RMS}		TBD
Creepage	D_{CR}	mm	Shortest terminal-to-terminal distance across the package surface.	8.2
Comparative Tracking Index	CTI	V	Material Group II	400~599

4. PINOUT DIAGRAM & FUNCTIONAL BLOCK DIAGRAM

Type A:

Number	Name	Description
1	IP+	Current flows into the chip, positive direction
2	IP-	Current flows out of the chip, negative direction
3,10	GND	Device ground terminal pin
5	VREF	Zero current reference voltage pin
6	VOUT	Analog output signal pin
7	VCC	Device power supply terminal pin
4,8,9	NC	No connect

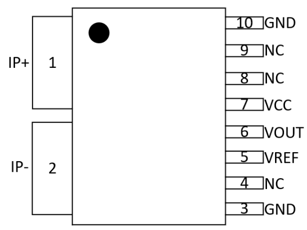


Figure 3. Type A Pinout Diagram

Type B:

Number	Name	Description
1	IP+	Current flows into the chip, positive direction
2	IP-	Current flows out of the chip, negative direction
9	GND	Device ground terminal pin
5	VREF	Zero current reference voltage pin
6	VOUT	Analog output signal pin
4	VCC	Device power supply terminal pin
3,7,8	NC	No connect

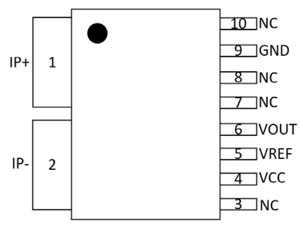


Figure 4. Type B Pinout Diagram

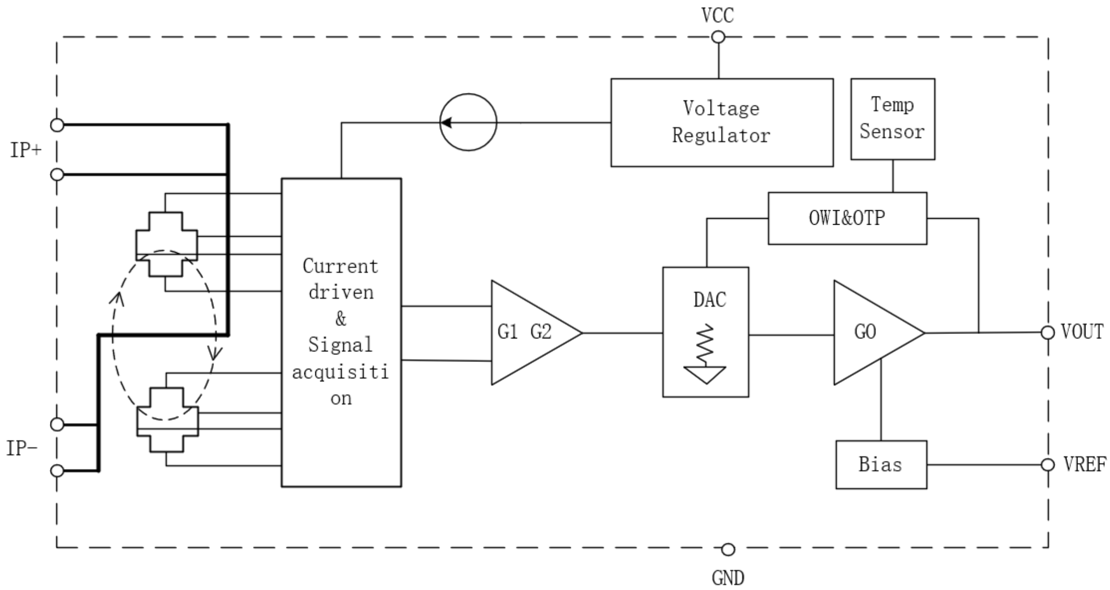


Figure 5. Functional Block Diagram

5. ELECTRICAL CHARACTERISTICS

T_A=25°C, V_{CC}=5V/3.3V, C_{REF}=1nF, C_L=1nF, C_{VCC}=100nF(Unless otherwise noted)

Characteristic	Symbol	Unit	Test Conditions	Min.	Typ.	Max.
Supply Voltage	V_{CC}	V	*=3	3	3.3	3.6
			*=5	4.5	5	5.5
Supply Current[Note1]	I_{CC}	mA	no-load, V_{CC}=3.3V	/	7.5	10
			no-load, V_{CC}=5V	/	10	15
Primary Conductor Resistance[Note1]	R_P	mΩ	/	/	0.27	/
Power-On Time[Note2]	T_{PO}	ms	Chip power-on(V_{CC}>3.0V), V_{OUT} and V_{REF} stable time	/	1	/
Output Capacitive Load[Note2]	C_L	nF	/	/	/	10
Output Resistive Load[Note2]	R_L	kΩ	/	4.7	/	/
Reference Resistive Load[Note2]	R_{LREF}	kΩ	/	10	/	/
Output Voltage Range[Note2]	V_S	V	R_L=10kΩ to V_{CC} or V_{GND}	0.1	/	V_{CC}-0.1
Common Mode Field Rejection Ratio[Note2]	*CMFR*	dB	/	/	40	/
Rise Time	T_r	µs	100A range, small signal measurement	/	1.0	/
Response Time	$T_{RESPONSE}$	µs	100A range, small signal measurement	/	1.2	/
Internal Bandwidth	B_W	kHz	100A range, small signal measurement	/	250	/
Output Noise	V_N	mVrms	100A range, small signal measurement	/	4	/
Nonlinearity[Note1]	E_{LIN}	%	/	/	±0.05	±0.2
Reference Voltage[Note1]	V_{REF}	V	Fixed output, Bipolar, V_{CC}=5V	2.49	2.5	2.51
			Fixed output, Bipolar, V_{CC}=3.3V	1.64	1.65	1.66
			Fixed output, Unipolar, V_{CC}=5V	0.49	0.5	0.51
			Ratiometric output, Bipolar	/	V_{CC}×0.5	/
Ratiometric Output Sensitivity Error[Note1]	S_{ERR}	%	V_{CC}=3.15~3.45V or V_{CC}=4.75~5.25V	/	0.6	/
Sensitivity Temperature Drift[Note1]	dS_{ERR}	%	I_P=I_{PRmax}, T_A=-40°C ~ 125°C	-1	±0.2	1
Offset Temperature Drift[Note1]	$V_{IOUT(Q)TC}$	mV	I_P=0A, T_A=-40°C ~ 125°C	-5	±2	5

Note1: These parameters are obtained from laboratory testing with 3σ data.
Note2: These parameters are guaranted by design.

GC1860D*-AU50FB-T/RB-T DEVICE PERFORMANCE CHARACTERISTICS

T_A=25℃, V_{CC}=5V/3.3V, C_{REF}=1nF, C_L=1nF, C_{VCC}=100nF(Unless otherwise noted)

Characteristic	Symbol	Unit	Test Conditions	Min.	Typ.[Note1]	Max.
NOMINAL PERFORMANCE						
Current Sensing Range	I_{PR}	A	/	-50	/	50
Sensitivity(*=3)	*Sens*	mV/A	$I_{PRmin} < I_{PR} < I_{PRmax}$	/	26.4	/
Sensitivity(*=5)	*Sens*	mV/A	$I_{PRmin} < I_{PR} < I_{PRmax}$	/	40	/
Zero Current Output Voltage	$V_{IOUT(Q)}$	V	Bipolar, I_{PR}=0A, V_{CC}=3.3V, Fixed output	1.64	1.65	1.66
			Bipolar, I_{PR}=0A, V_{CC}=5V, Fixed output	2.49	2.5	2.51
			Bipolar, I_{PR}=0A, Ratiometric output	/	V_{CC}*0.5	/
ACCURACY PERFORMANCE						
Total Output Error	E_{TOT}	%	I_P=I_{PRmax}, T_A=-40℃ ~ 125℃	-1.5	±0.5	1.5
TOTAL OUTPUT ERROR COMPONENTS: $E_{TOT} = (V_{IOUT}-V_{IOUT\ Ideal})/(Sens_{Ideal}\times I_P)\times 100\%$, $E_{TOT}= ((V_{IOUT\ Meas}-V_{REF\ Meas})-(V_{IOUT\ Ideal}-V_{REF\ Ideal}))/(Sens_{Ideal}\times I_P)\times 100\%$						
Sensitivity Error	E_{SENS}	%	I_P=I_{PRmax}, T_A=25℃ ~ 125℃	-1.1	±0.3	1.1
			I_P=I_{PRmax}, T_A=-40℃ ~ 25℃	-0.8	±0.3	0.8
Offset Error[Note2]	V_{OE}	mV	I_P=0A, T_A=25℃ ~ 125℃	-10	±2	10
			I_P=0A, T_A=25℃	-5	±2	5
			I_P=0 A, T_A=-40℃ ~ 125℃	-10	±2	10
LIFETIME DRIFT CHARACTERISTICS						
Sensitivity Error Lifetime Drift	E_{SENS_drift}	%	After reliability test, T_A=25℃	/	TBD	/
Total Output Error Lifetime Drift	E_{TOT_drift}	%	After reliability test, T_A=25℃	/	TBD	/

Note1: These parameters are obtained from laboratory testing with 3σ data.
Note2: Offset error refers to ratiometric output mode of unipolar output or fixed output mode of differential output.

GC1860D*-AU80FB-T/RB-T DEVICE PERFORMANCE CHARACTERISTICS

T_A=25°C, V_{CC}=5V/3.3V, C_{REF}=1nF, C_L=1nF, C_{VCC}=100nF(Unless otherwise noted)

Characteristic	Symbol	Unit	Test Conditions	Min.	Typ.[Note1]	Max.
NOMINAL PERFORMANCE						
Current Sensing Range	I_{PR}	A	/	-80	/	80
Sensitivity(*=3)	*Sens*	mV/A	$I_{PRmin} < I_{PR} < I_{PRmax}$	/	16.5	/
Sensitivity(*=5)	*Sens*	mV/A	$I_{PRmin} < I_{PR} < I_{PRmax}$	/	25	/
Zero Current Output Voltage	$V_{IOUT(Q)}$	V	Bipolar, I_{PR}=0A, V_{CC}=3.3V, Fixed output	1.64	1.65	1.66
			Bipolar, I_{PR}=0A, V_{CC}=5V, Fixed output	2.49	2.5	2.51
			Bipolar, I_{PR}=0A, Ratiometric output	/	V_{CC}*0.5	/
ACCURACY PERFORMANCE						
Total Output Error	E_{TOT}	%	I_P=I_{PRmax}, T_A=-40°C ~ 125°C	-1.5	±0.5	1.5
TOTAL OUTPUT ERROR COMPONENTS: $E_{TOT} = (V_{IOUT}-V_{IOUT\,Ideal})/(Sens_{Ideal} \times I_P) \times 100\%$, $E_{TOT} = ((V_{IOUT\,Meas}-V_{REF\,Meas})-(V_{IOUT\,Ideal}-V_{REF\,Ideal}))/(Sens_{Ideal} \times I_P) \times 100\%$						
Sensitivity Error	E_{SENS}	%	I_P=I_{PRmax}, T_A=25°C ~ 125°C	-1.1	±0.3	1.1
			I_P=I_{PRmax}, T_A=-40°C ~ 25°C	-0.8	±0.3	0.8
Offset Error[Note2]	V_{OE}	mV	I_P=0A, T_A=25°C ~ 125°C	-10	±2	10
			I_P=0A, T_A=25°C	-5	±2	5
			I_P=0 A, T_A=-40°C ~ 125°C	-10	±2	10
LIFETIME DRIFT CHARACTERISTICS						
Sensitivity Error Lifetime Drift	E_{SENS_drift}	%	After reliability test, T_A=25°C	/	TBD	/
Total Output Error Lifetime Drift	E_{TOT_drift}	%	After reliability test, T_A=25°C	/	TBD	/

Note1: These parameters are obtained from laboratory testing with 3σ data.
Note2: Offset error refers to ratiometric output mode of unipolar output or fixed output mode of differential output.

GC1860D*-AU100FB-T/RB-T DEVICE PERFORMANCE CHARACTERISTICS

T_A=25°C, V_{CC}=5V/3.3V, C_{REF}=1nF, C_L=1nF, C_{VCC}=100nF(Unless otherwise noted)

Characteristic	Symbol	Unit	Test Conditions	Min.	Typ.[Note1]	Max.
NOMINAL PERFORMANCE						
Current Sensing Range	I_{PR}	A	/	-100	/	100
Sensitivity(*=3)	*Sens*	mV/A	$I_{PRmin} < I_{PR} < I_{PRmax}$	/	13.2	/
Sensitivity(*=5)	*Sens*	mV/A	$I_{PRmin} < I_{PR} < I_{PRmax}$	/	20	/
Zero Current Output Voltage	$V_{IOUT(Q)}$	V	Bipolar, I_{PR}=0A, V_{CC}=3.3V, Fixed output	1.64	1.65	1.66
			Bipolar, I_{PR}=0A, V_{CC}=5V, Fixed output	2.49	2.5	2.51
			Bipolar, I_{PR}=0A, Ratiometric output	/	V_{CC}*0.5	/
ACCURACY PERFORMANCE						
Total Output Error	E_{TOT}	%	I_P=I_{PRmax}, T_A=-40°C ~ 125°C	-1.6	±0.6	1.6
TOTAL OUTPUT ERROR COMPONENTS: $E_{TOT} = (V_{IOUT}-V_{IOUT\ Ideal})/(Sens_{Ideal} \times I_P) \times 100\%$, $E_{TOT} = ((V_{IOUT\ Meas}-V_{REF\ Meas})-(V_{IOUT\ Ideal}-V_{REF\ Ideal}))/(Sens_{Ideal} \times I_P) \times 100\%$						
Sensitivity Error	E_{SENS}	%	I_P=I_{PRmax}, T_A=25°C ~ 125°C	-1.2	±0.3	1.2
			I_P=I_{PRmax}, T_A=-40°C ~ 25°C	-0.8	±0.3	0.8
Offset Error[Note2]	V_{OE}	mV	I_P=0A, T_A=25°C ~ 125°C	-8	±2	8
			I_P=0A, T_A=25°C	-5	±2	5
			I_P=0 A, T_A=-40°C ~ 125°C	-8	±2	8
LIFETIME DRIFT CHARACTERISTICS						
Sensitivity Error Lifetime Drift	E_{SENS_drift}	%	After reliability test, T_A=25°C	/	TBD	/
Total Output Error Lifetime Drift	E_{TOT_drift}	%	After reliability test, T_A=25°C	/	TBD	/

Note1: The parameters are obtained from laboratory testing with 3σ data.
Note2: Offset error refers to ratiometric output mode of unipolar output or fixed output mode of differential output.

6. PARAMETERS DESCRIPTION

6.1 Sensitivity *Sens*

The change in sensor IC output in response to a 1A change through the primary conductor. The sensitivity is the product of the magnetic circuit sensitivity (G/A) (1G = 0.1 mT) and the linear IC amplifier gain (mV/G). The linear IC amplifier gain is programmed at the factory to optimize the sensitivity (mV/A) for the full-scale current of the device.

6.2 Sensitivity error E_{SENS}

Sensitivity error E_{SENS} refers to the percentage deviation between the actual measured sensitivity and the ideal sensitivity.

For example, when V_{CC} = 5V,

$$E_{SENS}=(Sens_{Meas(5V)}-Sens_{Ideal(5V)})/Sens_{Ideal(5V)}\times 100\%$$

6.3 The sensitivity temperature drift of dS_{ERR}

Over the entire operating temperature range is defined as:

$$dS_{ERR}=(Sens_{(TA)}-Sens_{(25°C)})/Sens_{(25°C)}\times 100\%$$

6.4 Saturation output voltage $V_{OUT\text{-}SAT(H/L)}$

$V_{OUT\text{-}SAT(H)}$ is the maximum output of the chip under the positive current.

$V_{OUT\text{-}SAT(L)}$ is the maximum output of the chip under negative current.

6.5 Zero current output voltage $V_{IOUT(Q)}$

I_p=0, Output voltage of the sensor $V_{IOUT(Q)}$.

For bipolar device, the output voltage $V_{IOUT(Q)}=V_{CC}\times 0.5$,

For unipolar device, the output voltage $V_{IOUT(Q)}=V_{CC}\times 0.1$.

Variation in $V_{IOUT(Q)}$ can be attributed to the resolution of the linear IC quiescent voltage trim and thermal drift.

6.6 Offset voltage V_{OE}

Used to measure the influence of external non-magnetic factors. Under zero-current conditions, in ratiometric output mode, it is the difference between the actual output voltage and the theoretical output voltage. In fixed output mode, it is the difference between the actual output voltage and the actual V_{REF} voltage.

6.7 Offset temperature drift $V_{IOUT(Q)TC}$

Due to internal circuit tolerance and heat dissipation, static output voltage due to internal circuit tolerance and heat dissipation $V_{OUT(Q)}$ differential static output voltage V_{OE}. May shift with operating temperature $V_{OUT(Q)TC}$.

Defined in ratiometric output mode:

$$V_{IOUT(Q)TC}=V_{OUT(Q)(TA)}-V_{OUT(25°C)}$$

Defined in fixed output mode:

$$V_{IOUT(Q)TC}=(V_{OUT(Q)(TA)}-V_{REF(TA)})-(V_{OUT(Q)(25°C)}-V_{REF(25°C)})$$

6.8 Noise V_N

Noise is the macroscopic sum of thermal noise and shot noise inside the current sensor.

Dividing the noise (mV) by the sensitivity (mV/A) gives the smallest current that the device can resolve.

6.9 Symmetry E_{SYM}

Definition: The relationship between the actual output voltage $V_{IOUT(Q)}$ and the forward half-range $V_{IOUT\text{-}POSHALF}$ and reverse half-range $V_{IOUT\text{-}NEGHALF}$ outputs.

The formula is defined as follows:

$$E_{SYM}=(1-(V_{IOUT\text{-}POSHALF}-V_{IOUT(Q)})/(V_{IOUT(Q)}-V_{IOUT\text{-}NEGHALF}))\times 100\%$$

6.10 Nonlinearity E_{LIN}

The design output of the device varies linearly with the measured current.

Ideally, under the same supply voltage and ambient temperature conditions, the output sensitivity of the device is the same for two different current sizes I1(half scale current) and I2(full scale current). In practical application, there is a difference in sensitivity for the measurement of two different current sizes I1 and I2, and nonlinear sensitivity error E_{LIN} describes the difference digitally.

In the chip, positive current nonlinearity E_{LINPOS} and negative current nonlinearity E_{LINNEG} are defined as follows:

I_{POSx}, I_{NEGx} are positive current and negative current

$I_{POS2}=2\times I_{POS1}$

$I_{NEG2}=2\times I_{NEG1}$

$Sens_{Ix}=(V_{IOUT(Ix)}-V_{IOUT(Q)})/Ix$

$E_{LINPOS}=(1-(Sens_{IPOS2}/Sens_{IPOS1}))\times 100\%$

$E_{LINNEG}=(1-(Sens_{INEG2}/Sens_{INEG1}))\times 100\%$

6. PARAMETER DESCRIPTION (CONTINUED)

6.11 Proportional output sensitivity error S_{ERR}

The proportional output sensitivity error S_{ERR} is defined based on the supply voltage Vcc:

$$S_{ERR}=(1-(Sens_{Vcc}/Sens_{5V})/(Vcc/5V))\times 100\%$$

$$S_{ERR}=(1-(Sens_{Vcc}/Sens_{3.3V})/(Vcc/3.3V))\times 100\%$$

Proportional output error of static voltage V_{0zero}

Error between the ratio of V_{out1} and V_{out0} value at V_{CC}=5V and the theoretical ratio when Vcc varies from 4.5V to 5.5V, or at V_{CC}=3.3V and the theoretical ratio when V_{CC} varies from 3.0V to 3.6V.

$$V_{0zero}=(1-(Vout1/Vout0)/(V_{CC}/5V))\times 100\%$$

$$V_{0zero}=(1-(Vout1/Vout0)/(V_{CC}/3.3V))\times 100\%$$

6.12 Total output error E_{TOT}

The difference between the current measurement from the sensor IC and the actual current (I_P), relative to the actual current. This is equivalent to the difference between the ideal output voltage and the actual output voltage,divided by the ideal sensitivity, relative to the current flowing through the primary conduction path:

$$E_{TOT}=(V_{IOUT}-V_{IOUTIdeal})/(Sens_{Ideal}\times I_P)\times 100\%$$

Defined in fixed output mode:

$$E_{TOT}=((V_{IOUT\ Meas}-V_{REF\ Meas})-(V_{IOUT\ Ideal}-V_{REF\ Ideal}))/(Sens_{Ideal}\times I_P)\times 100\%$$

Where: Total output error E_{TOT} contains all error sources and is a function of I_P.

$$V_{IOUTIdeal}=V_{IOUT(Q)}+(Sens_{Ideal}\times I_P)$$

At relatively large current, E_{TOT} is mainly sensitivity error, while at relatively small current, E_{TOT} is mainly zero current sensitivity error voltage V_{OE}. As I_P approaches zero, E_{TOT} approaches infinity due to the bias voltage.

6.13 Dynamic response characteristic

6.13.1 Power-on time T_{PO}

When the supply is ramped to its operating voltage, the device requires a finite amount of time to power its internal components before responding to an input magnetic field. Power-On Time (T_{PO}) is defined as the time interval between the power supply has reached its minimum specified operating voltage (V_{UVLOD}) and the sensor output has settled within ±10% of its steady-state value under an applied magnetic field.

6.13.2 Rise time T_r

The time interval between the sensor output voltage reaches 10% of its full-scale value and it reaches 90% of its full-scale value.

6.13.3 Propagation delay T_{PROP}

The time interval between the sensed primary current reaches 20% of its final value and the sensor output voltage reaches 20% of its full-scale value.

6.13.4 Response Time $T_{RESPONSE}$

The time interval between the sensed primary current reaches 90% of its final value and the sensor output voltage reaches 90% of its full-scale value.

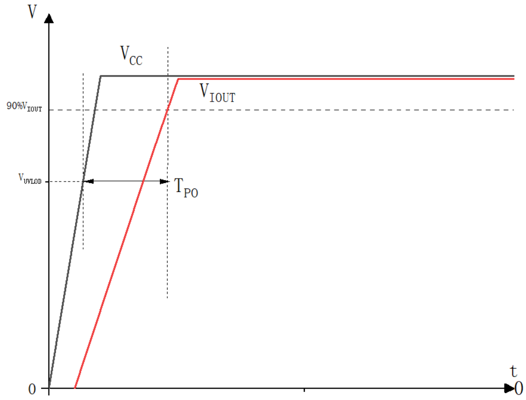


Figure 6. Power-On Time T_{PO}

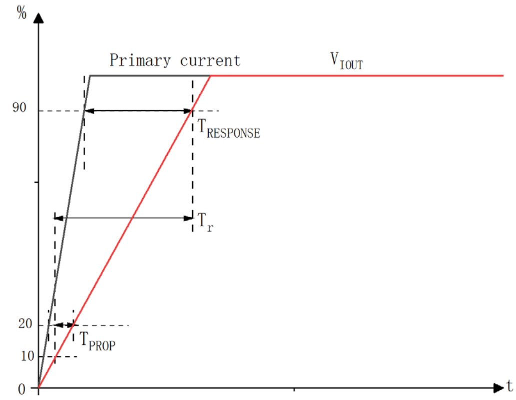


Figure 7. Dynamic Response Time Parameters

7. THERMAL EVALUATION

The product will naturally heat up during use, and the thermal curve performance of this device was measured in a windless environment at 25±3°C in Zhangjiagang Application Laboratory using a MSEVB0011GC1860REVA2 EVM.

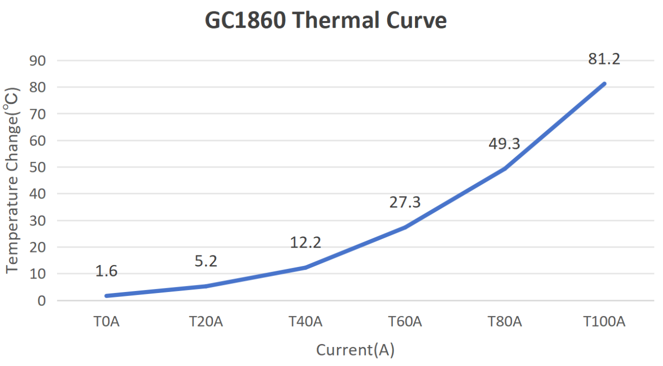


Figure 8. Thermal curve

8. LAYOUT GUIDELINES

Test the information of the Demo board
The IP heat dissipation copper thickness of the demo board is 4oz,the heat dissipation area is 2×725 (mm^2),the test wiring uses Kelvin sense to avoid the voltage drop caused by GND impedance, and capacitors should as close as possible to the chip pins.C_L=1nF, C_{REF}=1nF, C_{VCC}=100nF

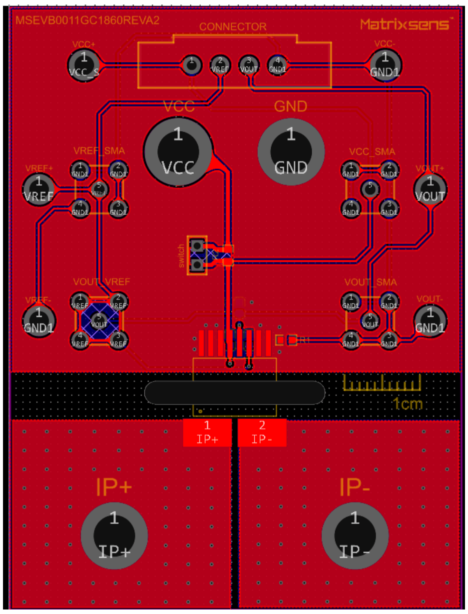


Figure 9. The front of the Demo board

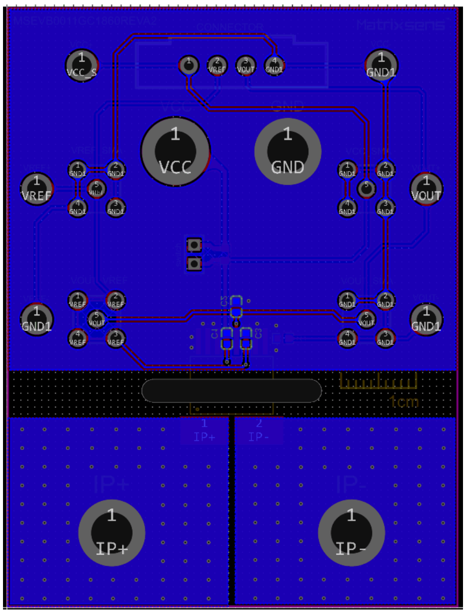
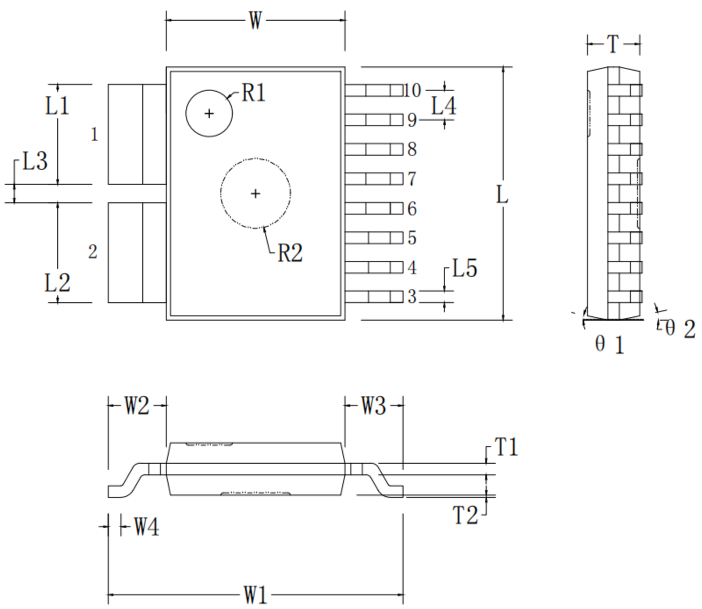


Figure 10. The back of the Demo board

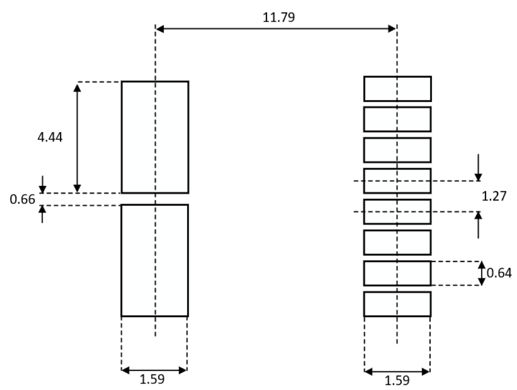
9. PACKAGE OUTLINE



NUM	SIZE (mm)			NOTE
	MIN	NOM	MAX	
*W	7.50	7.70	7.90	
*W1	12.50	12.70	12.90	
*W2/W3	2.50	2.60	2.70	
W4	0.40	/	/	
*T	2.15	2.25	2.35	
T1	0.45	0.50	0.55	
T2	0.00	0.10	0.20	
*L	10.70	10.90	11.10	
L1/L2	4.20	4.30	4.40	
L3	0.70	0.80	0.90	
*L4	1.17	1.27	1.37	
*L5	0.45	0.50	0.55	
R1	0.90	1.00	1.10	
R2	1.40	1.50	1.60	
θ1/θ2	9°	12°	15°	

Figure 11. SOIC-10 Package

Example Board Layout:



General linear tolerance: ±0.2mm

Unit:mm

Figure 12. Recommend pad size

10. TAPE AND REEL & STORAGE INFORMATION

10.1 Tape and reel

1000 pieces per reel

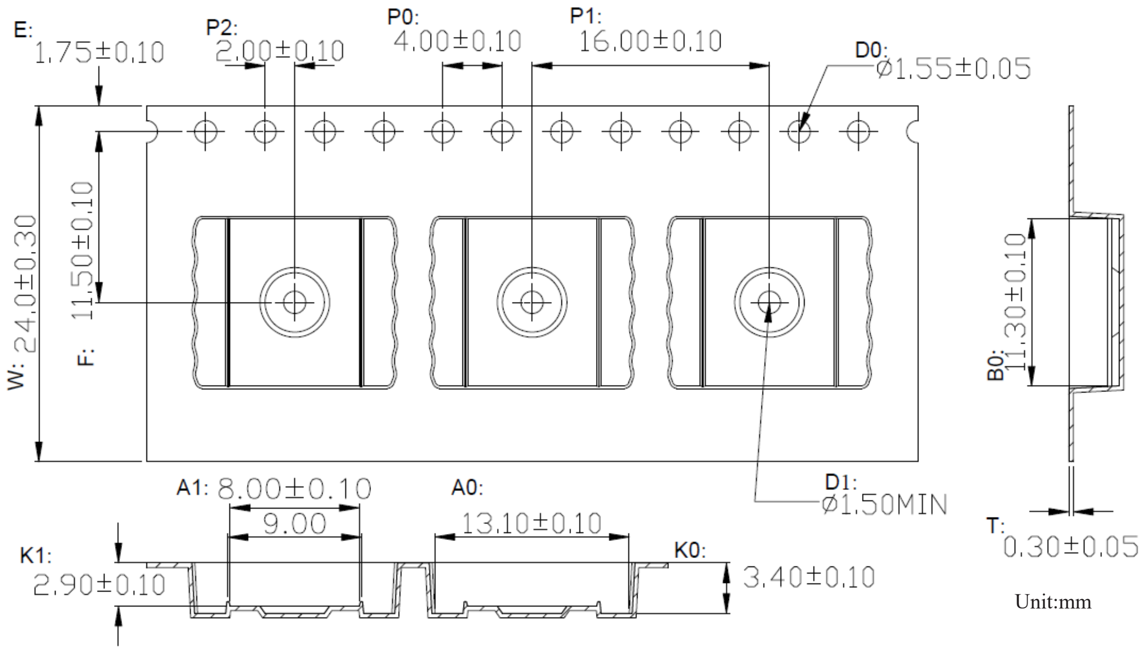


Figure 13. Tape rules

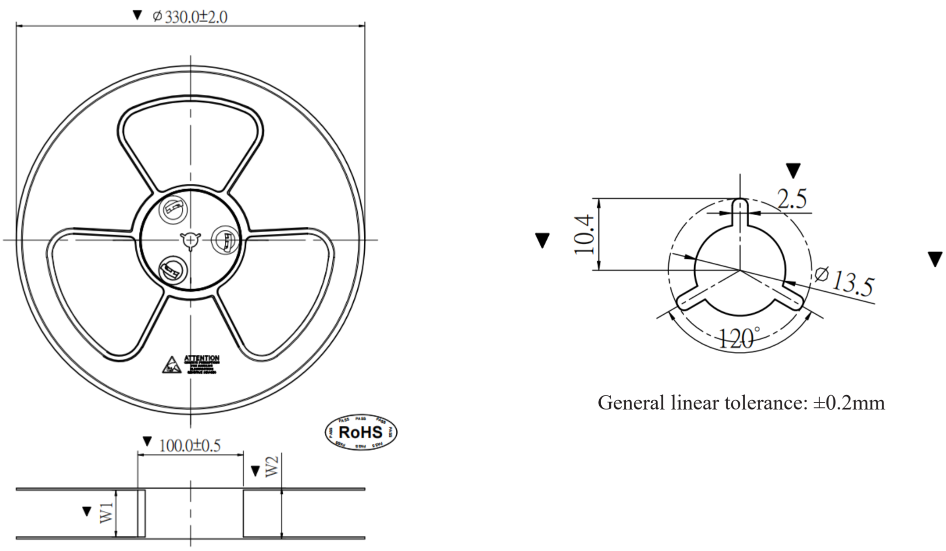


Figure 14. Blue print

10.2 Storage method

10.2.1 The product should be stored at MSL3 standard.

11. SAFETY WARNING

The environmental requirements of this product are as follows:

11.1 ESD control should be done when touching the product.

11.2 The use of this product shall comply with the relevant provisions of local laws and regulations.

12.REVISION HISTORY

Number	Description	Date
V1.0	Chinese version first release(pre-datasheet)	2024-06
V1.0	English version first release(pre-datasheet)	2024-06