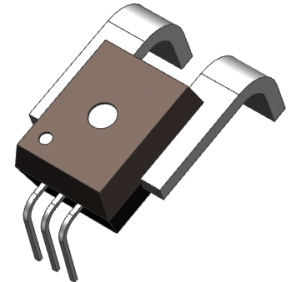


Sentronic MCT series current sensors provide a smaller, cost-effective solution for AC, DC current measurement in industrial and automotive applications. MCT provide abundant variants of output modes.

Features and Benefits:

- Open-loop current sensor using Hall effect IC
- Single 5V supply
- Response time ~3us, bandwidth 170Khz
- Options for uni-direction DC or bi-direction AC
- Analog output proportional to AC or DC currents
- Current detection range: $\pm 50A$ - $\pm 200A$
- Operating temperature range: $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ (150A: $-40\text{ }^{\circ}\text{C}$ to $+105\text{ }^{\circ}\text{C}$; 200A: $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$)
- QVO (Zero current output):
 - xR: QVO ratiometric to supply voltage V_{CC} , Fixed Gain $V_{QVO} = V_{CC}/2$ or $V_{CC}/10$
 - xF: Fixed QVO and Gain $V_{QVO} = 2.5$ or 0.50 Volts
- Good linearity, accuracy and temperature drift
- Supper low power loss: $100\text{ }\mu\Omega$ internal conductor resistance

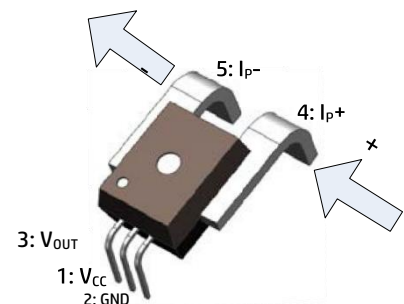


Applications:

- Inverters and UPS
- Switching Power Supply
- Motor Controller

Pinout Table:

Number	Name	Description
1	VCC	Device power supply
2	GND	Signal ground
3	VOUT	Analog output signal
4	I _{P+}	Terminal+ for current being measured
5	I _{P-}	Terminal- for current being measured



Principle of Open-loop current sensor:

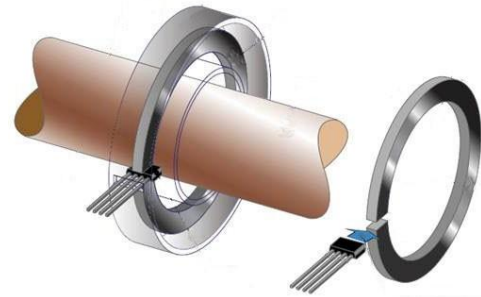
The open-loop current sensor use Ampere’s law which means the magnetic field in space around an electric current is proportional to the electric current which serves as its source.

The magnetic flux density B is generated by the primary current IP, hall element output voltage will change with the magnetic field. In the linear region of the hysteresis curve, B is proportional to:

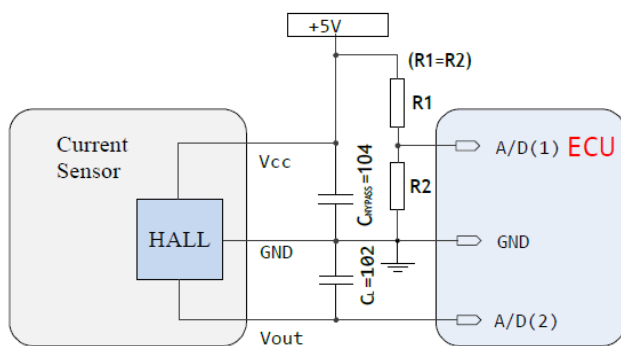
$B (IP) = K * IP$ (constant k) Hall output voltage is express as:

$$V_H = (R_H/d) * I * K * IP \text{ (constant k, } R_H, d, I) \quad V_H = K_1 * IP \text{ (constant } k_1)$$

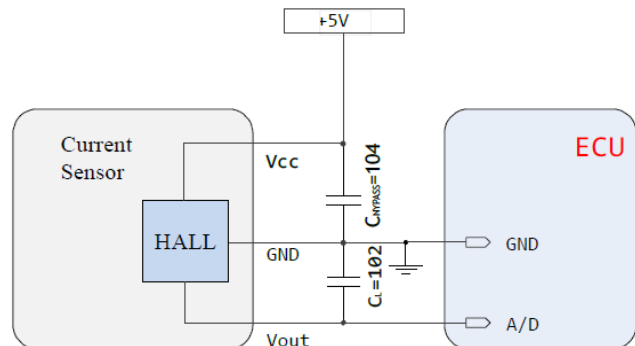
Hall IC calculates the primary current by amplifying VH to obtain a voltage.



Application Circuit:



-xR : $V_{QVO} = V_{CC}/2$, Fixed Gain

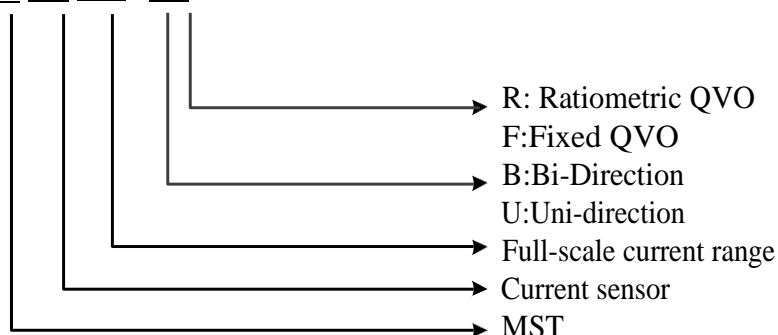


-xF : $V_{QVO} = 2.5V$, Fixed Gain

*VCC BYPASS capacitor must be close to Device power supply pin

Part Number Format

M CT xxx x x

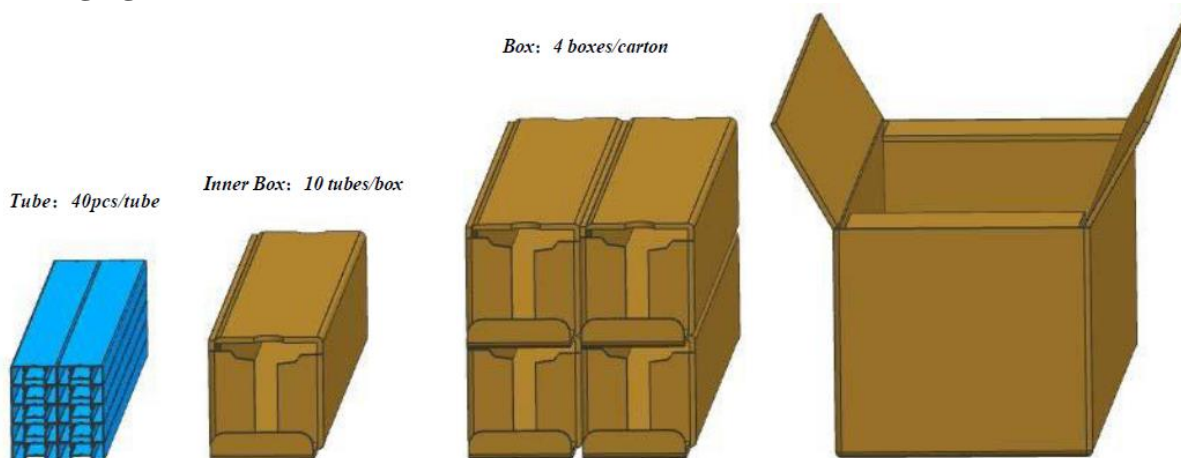


Ordering Information:

Part number	QVO V _{OUT(Q)} (V)	Primary Current I _P (A)	Sensitivity Sens _(Typ.) (mV/A)	MPQ(PCS)	MOQ(PCS)
MCT050BR	V _{CC} /2	±50	40	40	400
MCT050BF	2.50				
MCT050UR	V _{CC} /10	50	80	40	400
MCT050UF	0.50				
MCT100BR	V _{CC} /2	±100	20	40	400
MCT100BF	2.50				
MCT100UR	V _{CC} /10	100	40	40	400
MCT100UF	0.50				
MCT150BR	V _{CC} /2	±150	13.33	40	400
MCT150BF	2.50				
MCT150UR	V _{CC} /10	150	26.67	40	400
MCT150UF	0.50				
MCT200BR	V _{CC} /2	±200	10	40	400
MCT200BF	2.50				
MCT200UR	V _{CC} /10	200	20	40	400
MCT200UF	0.50				
MCT250BR	V _{CC} /2	±250	8	40	400
MCT250BF	2.50				
MCT250UR	V _{CC} /10	250	16	40	400
MCT250UF	0.50				

**Touch Sentronic plant for specific output variants*

Packaging information:



Absolute Maximum Ratings

Characteristic	Symbol	Rating	Unit
Supply Voltage	V_{CC}	-0.3 to 6.5	V
Supply Current	I_{CC}	18	mA
Output Voltage	V_{OUT}	0.15 to $V_{CC}-0.15$	V
Output Current	I_{OUT}	± 40	mA
Operating Temperature	T_A	-40 to 150	$^{\circ}C$
Max Junction Temperature	T_J	165	$^{\circ}C$
Storage Temperature	T_S	-55 to 165	$^{\circ}C$

Common Operating Characteristics

Valid at $T_A = -40^{\circ}C$ to $125^{\circ}C$, and $V_{CC}=5V$, 0.1uF bypass capacitor unless otherwise specified

Parameter	Symbol	Condition	Min	Typ	Max	Unit	
Supply Voltage	V_{CC}		4.5	5	5.5	V	
Supply Current	I_{CC}	$R_L \geq 10K\Omega$		13	18	mA	
Power on Delay	T_{PO}	$T_A=25^{\circ}C$		80		μs	
QVO Ratiometric Error (-R)	E_r		-0.3		0.3	%	
Zero Current Output Voltage	V_{QVO}	SCTxxxBR	$T_A = 25^{\circ}C$		$V_{CC}/2$		V
		SCTxxxBF			2.50		
		SCTxxxUR			$V_{CC}/10$		
		SCTxxxUF			0.50		
Output voltage Range @ I_P	$V_{OUT}-V_{QVO}$	SCTxxxBR			± 2		V
		SCTxxxBF			4		
		SCTxxxUR					
		SCTxxxUF					
Output Load Resistance	R_L	V_{OUT} to V_{CC} or GND	2			$K\Omega$	
Output Load Capacitance	C_L	V_{OUT} TO GND	6		100	nF	
Response Time	$t_{RESPONSE}$	$T_A=25^{\circ}C$, $C_L=1nF$, I_P step=50% of I_{P+} , 90% input to 90% output		3		μs	
Internal Bandwidth	BW	Small signal -3dB, $C_L=1nF$, $T_A=25^{\circ}C$	120	170		KHz	
DC Output Impedance	R_{OUT}	$T_A = 25^{\circ}C$	-	3	-	Ω	

ISOLATION CHARACTERISTICS

Characteristic	Symbol	Notes	Rating	Unit
Dielectric Strength Test Voltage	V_{ISO}	Agency type-tested for 60 seconds per UL standard 60950-1, 2nd Edition	4800	VAC
Working Voltage for Basic Isolation	V_{WFSI}	For basic (single) isolation per UL standard 60950-1, 2nd Edition	990	VDC or V_{pk}
			700	V_{rms}
Working Voltage for Reinforced Isolation	V_{WFRI}	For reinforced (double) isolation per UL standard 60950-1, 2nd Edition	636	VDC or V_{pk}
			450	V_{rms}

B050 Performance Characteristics

Valid at $T_A = -40^{\circ}\text{C}$ to 125°C , and $V_{CC} = 5\text{V}$, unless otherwise specified

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Nominal Performance						
Current Sensing Range	I_P		-50		50	A
Sensitivity	Sen_{STA}	@ $V_{CC}=5\text{V}$		40		mV/A
Accuracy Performance						
Sensitivity Error	E_{Sens}	@ $T_A=25^{\circ}\text{C}; V_{CC}=5\text{V}$	-1		1	%
Electrical Offset Error	V_{OE}	$I_P=0\text{A}, T_A=25^{\circ}\text{C}$	-4	± 3	4	mV
		$I_P=0\text{A}, T_A=-40^{\circ}\text{C} \sim 125^{\circ}\text{C}$	-20	± 8	20	mV
Magnetic Offset Error	I_{OM}	$I_P=0\text{A}, T_A=25^{\circ}\text{C}$, after excursion of 50A		125	250	mA
Offset Current	I_{OFFSET}	$T_A=25^{\circ}\text{C}$			0.3	A
Linearity Error	Lin_{ERR}	Of full rang	-1	0.5	1	%
Total Output Error	$E_{\text{TOT(HT)}}$	Full scale of $I_P, T_A=25^{\circ}\text{C} \sim 125^{\circ}\text{C}$	-2		2	%
	$E_{\text{TOT(LT)}}$	Full scale of $I_P, T_A=-40^{\circ}\text{C} \sim 25^{\circ}\text{C}$	-2		2	%

U050 Performance Characteristics

Valid at $T_A = -40^{\circ}\text{C}$ to 125°C , and $V_{CC} = 5\text{V}$, unless otherwise specified

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Nominal Performance						
Current Sensing Range	I_P		0		50	A
Sensitivity	Sen_{STA}	@ $V_{CC}=5\text{V}$		80		mV/A
Accuracy Performance						
Sensitivity Error	E_{Sens}	@ $T_A=25^{\circ}\text{C}; V_{CC}=5\text{V}$	-1		1	%
Electrical Offset Error	V_{OE}	$I_P=0\text{A}, T_A=25^{\circ}\text{C}$	-4	± 3	4	mV
		$I_P=0\text{A}, T_A=-40^{\circ}\text{C} \sim 125^{\circ}\text{C}$	-20	± 8	20	mV
Magnetic Offset Error	I_{OM}	$I_P=0\text{A}, T_A=25^{\circ}\text{C}$, after excursion of 50A		80	150	mA
Offset Current	I_{OFFSET}	$T_A=25^{\circ}\text{C}$			0.15	A
Linearity Error	Lin_{ERR}	Of full rang	-1	0.5	1	%
Total Output Error	$E_{\text{TOT(HT)}}$	Full scale of $I_P, T_A=25^{\circ}\text{C} \sim 125^{\circ}\text{C}$	-2		2	%
	$E_{\text{TOT(LT)}}$	Full scale of $I_P, T_A=-40^{\circ}\text{C} \sim 25^{\circ}\text{C}$	-2		2	%

B100 Performance Characteristics

Valid at $T_A = -40^{\circ}\text{C}$ to 125°C , and $V_{CC} = 5\text{V}$, unless otherwise specified

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Nominal Performance						
Current Sensing Range	I_P		-100		100	A
Sensitivity	Sen_{STA}	@ $V_{CC}=5\text{V}$		20		mV/A
Accuracy Performance						
Sensitivity Error	E_{Sens}	@ $T_A=25^{\circ}\text{C}; V_{CC}=5\text{V}$	-1		1	%

Electrical Offset Error	V_{OE}	$I_P=0A, T_A=25^{\circ}C$	-4	± 3	4	mV
		$I_P=0A, T_A=-40^{\circ}C \sim 125^{\circ}C$	-20	± 8	20	mV
Magnetic Offset Error	I_{OM}	$I_P=0A, T_A=25^{\circ}C$, after excursion of 100A		200	300	mA
Offset Current	I_{OFFSET}	$T_A=25^{\circ}C$			0.5	A
Linearity Error	Lin_{ERR}	Of full rang	-1	0.5	1	%
Total Output Error	$E_{TOT(HT)}$	Full scale of $I_P, T_A=25^{\circ}C \sim 125^{\circ}C$	-2		2	%
	$E_{TOT(LT)}$	Full scale of $I_P, T_A=-40^{\circ}C \sim 25^{\circ}C$	-2		2	%

U100 Performance Characteristics

Valid at $T_A = -40^{\circ}C$ to $125^{\circ}C$, and $V_{CC} = 5V$, unless otherwise specified

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Nominal Performance						
Current Sensing Range	I_P		-100		100	A
Sensitivity	$Sens_{TA}$	@ $V_{CC}=5V$		40		mV/A
Accuracy Performance						
Sensitivity Error	E_{Sens}	@ $T_A=25^{\circ}C; V_{CC}=5V$	-1		1	%
Electrical Offset Error	V_{OE}	$I_P=0A, T_A=25^{\circ}C$	-4	± 3	4	mV
		$I_P=0A, T_A=-40^{\circ}C \sim 125^{\circ}C$	-20	± 8	20	mV
Magnetic Offset Error	I_{OM}	$I_P=0A, T_A=25^{\circ}C$, after excursion of 100A		100	150	mA
Offset Current	I_{OFFSET}	$T_A=25^{\circ}C$			0.25	A
Linearity Error	Lin_{ERR}	Of full rang	-1	0.5	1	%
Total Output Error	$E_{TOT(HT)}$	Full scale of $I_P, T_A=25^{\circ}C \sim 125^{\circ}C$	-2		2	%
	$E_{TOT(LT)}$	Full scale of $I_P, T_A=-40^{\circ}C \sim 25^{\circ}C$	-2		2	%

B150 Performance Characteristics

Valid at $T_A = -40^{\circ}C$ to $105^{\circ}C$, and $V_{CC} = 5V$, unless otherwise specified

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Nominal Performance						
Current Sensing Range	I_P		-150		150	A
Sensitivity	$Sens_{TA}$	@ $V_{CC}=5V$		13.33		mV/A
Accuracy Performance						
Sensitivity Error	E_{Sens}	@ $T_A=25^{\circ}C; V_{CC}=5V$	-1		1	%
Electrical Offset Error	V_{OE}	$I_P=0A, T_A=25^{\circ}C$	-4	± 3	4	mV
		$I_P=0A, T_A=-40^{\circ}C \sim 105^{\circ}C$	-20	± 8	20	mV
Magnetic Offset Error	I_{OM}	$I_P=0A, T_A=25^{\circ}C$, after excursion of 150A		300	400	mA
Offset Current	I_{OFFSET}	$T_A=25^{\circ}C$			0.75	A
Linearity Error	Lin_{ERR}	Of full rang	-1	0.5	1	%
Total Output Error	$E_{TOT(HT)}$	Full scale of $I_P, T_A=25^{\circ}C \sim 105^{\circ}C$	-2		2	%
	$E_{TOT(LT)}$	Full scale of $I_P, T_A=-40^{\circ}C \sim 25^{\circ}C$	-2		2	%

U150 Performance Characteristics

Valid at $T_A = -40^{\circ}\text{C}$ to 105°C , and $V_{CC} = 5\text{V}$, unless otherwise specified

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Nominal Performance						
Current Sensing Range	I_P		-150		150	A
Sensitivity	Sen_{STA}	@ $V_{CC}=5\text{V}$		26.67		mV/A
Accuracy Performance						
Sensitivity Error	E_{Sens}	@ $T_A=25^{\circ}\text{C}; V_{CC}=5\text{V}$	-1		1	%
Electrical Offset Error	V_{OE}	$I_P=0\text{A}, T_A=25^{\circ}\text{C}$	-4	± 3	4	mV
		$I_P=0\text{A}, T_A=-40^{\circ}\text{C} \sim 105^{\circ}\text{C}$	-20	± 8	20	mV
Magnetic Offset Error	I_{OM}	$I_P=0\text{A}, T_A=25^{\circ}\text{C}$, after excursion of 150A		180	320	mA
Offset Current	I_{OFFSET}	$T_A=25^{\circ}\text{C}$			0.45	A
Linearity Error	Lin_{ERR}	Of full rang	-1	0.5	1	%
Total Output Error	$E_{\text{TOT(HT)}}$	Full scale of $I_P, T_A=25^{\circ}\text{C} \sim 105^{\circ}\text{C}$	-2		2	%
	$E_{\text{TOT(LT)}}$	Full scale of $I_P, T_A=-40^{\circ}\text{C} \sim 25^{\circ}\text{C}$	-2		2	%

B200 Performance Characteristics

Valid at $T_A = -40^{\circ}\text{C}$ to 85°C , and $V_{CC} = 5\text{V}$, unless otherwise specified

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Nominal Performance						
Current Sensing Range	I_P		-200		200	A
Sensitivity	Sen_{STA}	@ $V_{CC}=5\text{V}$		10		mV/A
Accuracy Performance						
Sensitivity Error	E_{Sens}	@ $T_A=25^{\circ}\text{C}; V_{CC}=5\text{V}$	-1		1	%
Electrical Offset Error	V_{OE}	$I_P=0\text{A}, T_A=25^{\circ}\text{C}$	-4	± 3	4	mV
		$I_P=0\text{A}, T_A=-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$	-20	± 6	20	mV
Magnetic Offset Error	I_{OM}	$I_P=0\text{A}, T_A=25^{\circ}\text{C}$, after excursion of 200A		400	500	mA
Offset Current	I_{OFFSET}	$T_A=25^{\circ}\text{C}$			1.0	A
Linearity Error	Lin_{ERR}	Of full rang	-1	0.5	1	%
Total Output Error	$E_{\text{TOT(HT)}}$	Full scale of $I_P, T_A=25^{\circ}\text{C} \sim 85^{\circ}\text{C}$	-2		2	%
	$E_{\text{TOT(LT)}}$	Full scale of $I_P, T_A=-40^{\circ}\text{C} \sim 25^{\circ}\text{C}$	-2		2	%

U200 Performance Characteristics

Valid at $T_A = -40^{\circ}\text{C}$ to 85°C , and $V_{CC} = 5\text{V}$, unless otherwise specified

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Nominal Performance						
Current Sensing Range	I_P		-200		200	A
Sensitivity	Sen_{STA}	@ $V_{CC}=5\text{V}$		20		mV/A
Accuracy Performance						
Sensitivity Error	E_{Sens}	@ $T_A=25^{\circ}\text{C}; V_{CC}=5\text{V}$	-1		1	%
Electrical Offset Error	V_{OE}	$I_P=0\text{A}, T_A=25^{\circ}\text{C}$	-4	± 3	4	mV

		$I_P=0A, T_A=-40^{\circ}C \sim 85^{\circ}C$	-20	± 6	20	mV
Magnetic Offset Error	I_{OM}	$I_P=0A, T_A=25^{\circ}C$, after excursion of 200A		200	250	mA
Offset Current	I_{OFFSET}	$T_A=25^{\circ}C$			0.5	A
Linearity Error	Lin_{ERR}	Of full rang	-1	0.5	1	%
Total Output Error	$E_{TOT(HT)}$	Full scale of $I_P, T_A=25^{\circ}C \sim 85^{\circ}C$	-2		2	%
	$E_{TOT(LT)}$	Full scale of $I_P, T_A=-40^{\circ}C \sim 25^{\circ}C$	-2		2	%

B250 Performance Characteristics

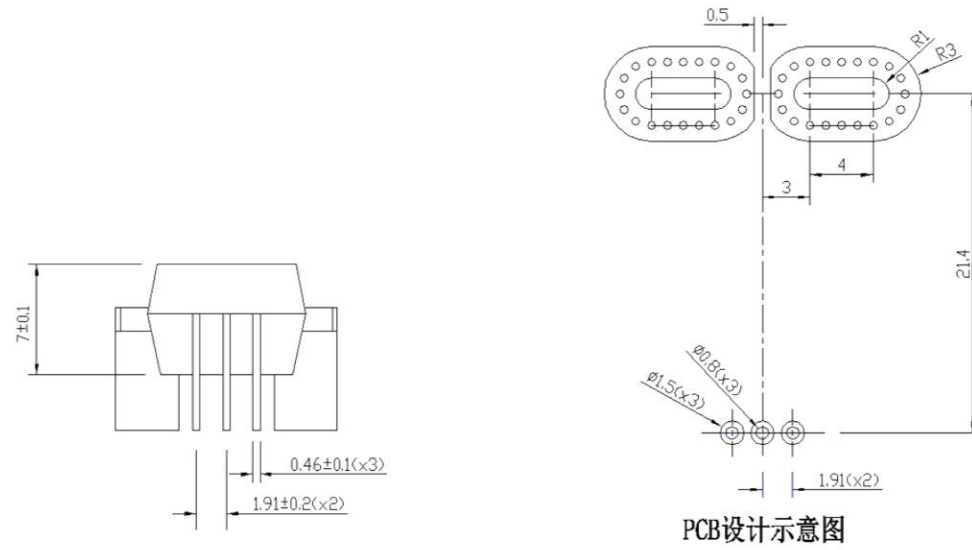
Valid at $T_A = -40^{\circ}C$ to $85^{\circ}C$, and $V_{CC} = 5V$, unless otherwise specified

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Nominal Performance						
Current Sensing Range	I_P		-250		250	A
Sensitivity	Sen_{STA}	@ $V_{CC}=5V$		8		mV/A
Accuracy Performance						
Sensitivity Error	$ESens$	@ $T_A=25^{\circ}C; V_{CC}=5V$	-1		1	%
Electrical Offset Error	V_{OE}	$I_P=0A, T_A=25^{\circ}C$	-4	± 3	4	mV
		$I_P=0A, T_A=-40^{\circ}C \sim 85^{\circ}C$	-20	± 6	20	mV
Magnetic Offset Error	I_{OM}	$I_P=0A, T_A=25^{\circ}C$, after excursion of 250A		500	640	mA
Offset Current	I_{OFFSET}	$T_A=25^{\circ}C$			1.25	A
Linearity Error	Lin_{ERR}	Of full rang	-1	0.5	1	%
Total Output Error	$E_{TOT(HT)}$	Full scale of $I_P, T_A=25^{\circ}C \sim 85^{\circ}C$	-2		2	%
	$E_{TOT(LT)}$	Full scale of $I_P, T_A=-40^{\circ}C \sim 25^{\circ}C$	-2		2	%

U250 Performance Characteristics

Valid at $T_A = -40^{\circ}C$ to $85^{\circ}C$, and $V_{CC} = 5V$, unless otherwise specified

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Nominal Performance						
Current Sensing Range	I_P		0		250	A
Sensitivity	Sen_{STA}	@ $V_{CC}=5V$		16		mV/A
Accuracy Performance						
Sensitivity Error	$ESens$	@ $T_A=25^{\circ}C; V_{CC}=5V$	-1		1	%
Electrical Offset Error	V_{OE}	$I_P=0A, T_A=25^{\circ}C$	-4	± 3	4	mV
		$I_P=0A, T_A=-40^{\circ}C \sim 85^{\circ}C$	-20	± 6	20	mV
Magnetic Offset Error	I_{OM}	$I_P=0A, T_A=25^{\circ}C$, after excursion of 200A		250	320	mA
Offset Current	I_{OFFSET}	$T_A=25^{\circ}C$			0.65	A
Linearity Error	Lin_{ERR}	Of full rang	-1	0.5	1	%
Total Output Error	$E_{TOT(HT)}$	Full scale of $I_P, T_A=25^{\circ}C \sim 85^{\circ}C$	-2		2	%
	$E_{TOT(LT)}$	Full scale of $I_P, T_A=-40^{\circ}C \sim 25^{\circ}C$	-2		2	%



Terminals	Definitions
1	Vcc
2	GND
3	Vout
4	IP+
5	IP-

Performances Parameters Definitions:

● **Quiescent Voltage Output (QVO):**

In the quiescent state (no significant magnetic field, $B=0G$), Current Sensor Output Voltage V_{QVO}

-xR: V_{QVO} has a constant ratio to the supply voltage;

$$V_{QVO} = V_{CC}/2 \text{ or } V_{QVO} = V_{CC}/10$$

-xF: V_{QVO} and Gain is fixed and doesn't change with supply voltage;

$$V_{QVO} = 2.5V \text{ or } V_{QVO} = 0.5V$$

- **Sensitivity(Sens):** Sens is the slope of the straight line ; $V_{OUT} = V_{QVO} + 2 \times I_P/I_{P_MAX}$
Sens is programmed to: **Sens** = $2/I_{P_MAX}$

● **Offset with Temperature:**

Due to internal component tolerances and thermal considerations, the Quiescent Voltage Output (QVO) may drift from its nominal value through the operating ambient temperature (TA).

Sensitivity with temperature:

Due to the influence of internal temperature compensation coefficient, the sensitivity will change through the whole working temperature, and be different from the expected value at room temperature.

● **Error - Electrical Offset Voltage:**

The noise of HALL element and internal operational amplifier cause the error.

● **Error - Magnetic Offset:**

The magnetic offset is the consequence of any current on the primary side.

It's defined after a stated excursion of primary current.

● **Error – Total offset voltage:**

The zero offset voltage is the output voltage when the primary current is zero, with ideal value: $V_{QVO} = V_{CC}/2$ (or fixed 2.5V). The difference between V_{QVO} and ideal value is named Total offset voltage error. This offset error can be attributed to the zero-point offset voltage (due to the ASIC internal QVO adjusted resolution), magnetic offset, temperature drift, and hysteresis

● **Response Time:**

The time between the primary current signals (IPN) reaches 90% of its final value and when the sensor output signal reaches 90%. See figure1.

● **Rise Time**

The time between when the sensor output reaches 10% of its final value, and when it reaches 90% of its final value

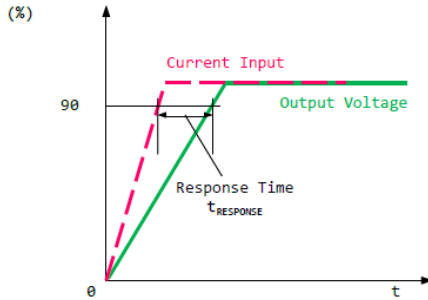


Figure1

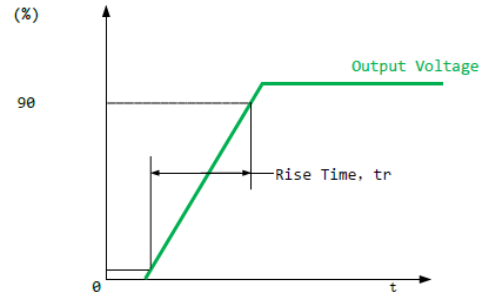


Figure2

● **QVO Ratiometricity error:**

When the supply voltage VCC changes from 5.0V to $4.75 < V_{CC1} < 5.25V$, the deviation between the sensor zero output and the theoretical value, the formula is defined as follows:

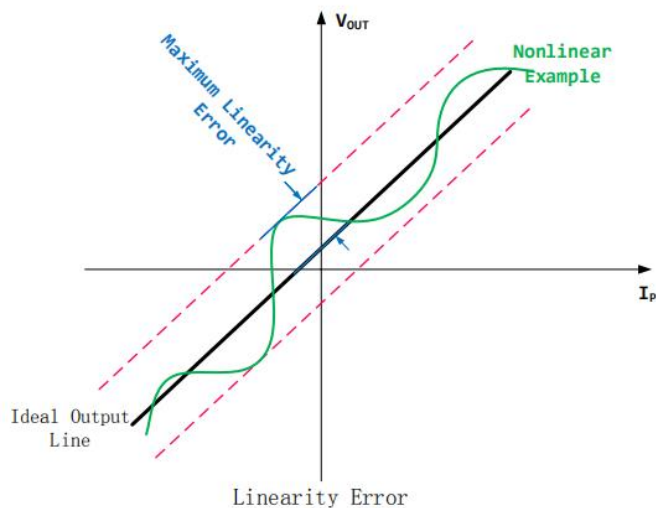
$$E_r = \frac{(V_{QVO}(V_{CC1}))}{V_{QVO}(5.0V) - V_{CC1}/5.0} \times 100\%$$

● **Linearity Error:**

The maximum Positive and Negative error comparing with ideal output line.

$$(-BR \text{ mode: } V_{out} = V_{CC}/2 + 2 \times \frac{I_P}{P(MAX)} \quad)$$

$$(-BF \text{ mode: } V_{out} = 2.5 + 2 \times \frac{I_P}{P(MAX)} \quad)$$



● **Total Output Error E_{TOT}:**

Error between the device measurement current and Applied current (I_P), which is defined as the difference between the ideal output voltage and the actual output voltage divided by the ideal sensitivity:

$$E_{TOT(I_P)} = \frac{V_{I_{OUT}(I_P)} - V_{I_{OUT}(ideal)(I_P)}}{Sens_{(ideal)} \times I_P}$$

$$V_{I_{OUT}(ideal)(I_P)} = V_{I_{OUT}(Q)} + (Sens_{(ideal)} \times I_P)$$

At relatively high currents, E_{TOT} is mainly due to sensitivity errors; while at relatively low currents, E_{TOT} is mainly due to offset voltage errors (V_{OE}). Actually, when the I_P approaches zero, the E_{TOT} approaches infinity due to offset voltage error.

● **Important notes**

1. Wrong wiring may cause sensor damage. After the sensor is connected to the 5V power supply, the measured current passes through the direction of the sensor current terminal, and the corresponding voltage value can be measured at the output end.

2.-**BR mode:** V_{OUT} is proportional to V_{CC},

$$V_{OUT} = \frac{V_{CC}}{2} + 2 \times \frac{I_P}{I_{P(MAX)}}$$

Supply voltage change will cause V_{OUT} change by ratio.

For example: V_{CC} range:4.75V~5.25V;

V_{QVO} output range at 0A: 2.375V~2.625V。

V_{OUT(IPMAX)} output range at I_{pmax}: 4.275V~4.725V。

-**BF mode:** V_{QVO}=2.5V, V_{OUT} sensitivity is fixed:

$$V_{OUT} = 2.5 + 2 \times \frac{I_P}{I_{P(MAX)}}$$

For example: V_{CC} range: 4.75V~5.25V; V_{QVO} output range at 0A:2.5V; V_{OUT(IPMAX)} output range at I_{pmax}:4.5V。 V_{QVO} and V_{OUT(IPMAX)} don't change with V_{CC}fluctuating.