HC701W

AEC-Q100 Qualified
4800V_{RMS} Isolation
Hall Current Sensor IC in SO16 Package

Features

- Reinforced isolation: **4800V_{RMS}**
- AEC-Q100 qualified
- Primary conductor resistance: **0.8 mΩ**
- Single supply: **3.3V or 5V**
- Output voltage proportional to AC or DC current: **±20A, ±30A, ±40A, ±50A, ±60A, ±70A**
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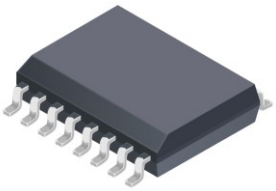
- Ratio-metric output from supply voltage
- Adjustable bandwidth and resolution with a filter pin
- Small-footprint SOIC-16 package suitable for replacing bulky transformers or shunt current sensing solutions
- Integrated shield virtually eliminates capacitive coupling from current conductor to die, greatly suppressing output noise due to high dv/dt transients
- Factory-trimmed sensitivity and quiescent output voltage for improved accuracy
- Chopper stabilization results in extremely stable quiescent output voltage

- Bandwidth: **120 kHz**
  Response time: **4 us**

Package

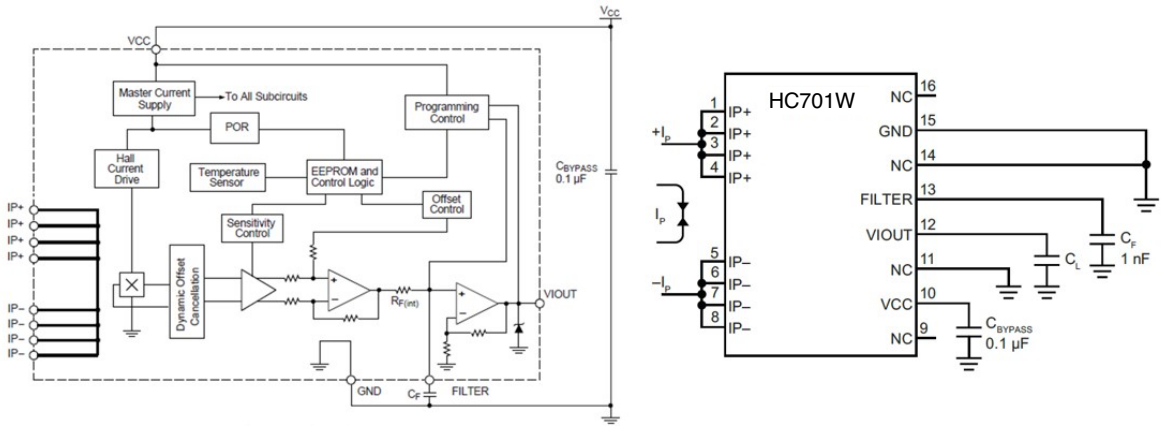


SOIC-16

Application

- Solar MPPT
- Telecom power
- Over-current fault protection
- Charging piles
- Load detection and management

Functional Block Diagram



Description

The HC701W current sensor IC is an economical and precise solution for AC or DC current sensing in industrial, automotive, commercial, and communications systems. The small package is ideal for space-constrained applications while also saving costs due to reduced board area.

The device consists of a precise, low-offset, linear Hall sensor circuit with a copper conduction path located near the surface of the die. Applied current flowing through this copper conduction path generates a magnetic field which is sensed by the integrated Hall IC and converted into a proportional voltage. A precise, proportional voltage is provided by the low-offset, chopper-stabilized BCD Hall IC, which is programmed for accuracy after packaging. The output of the device has a positive slope when an increasing current flows through the primary copper conduction path (from pins 1 ,2, 3, and 4,

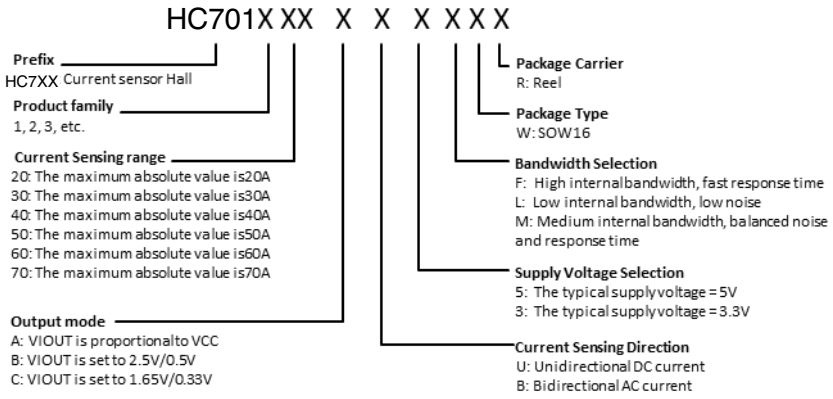
 to pins 5, 6, 7 and 8), which is the path used for current sensing. The internal resistance of this conductive path is 0.8 mΩ typical, providing low power loss.

The terminals of the conductive path are electrically isolated from the sensor leads (pins 9 through 16). This allows the HC701 current sensor IC to be used in high-side current sense applications without the use of high-side differential amplifiers or other costly isolation techniques.
The HC701 is provided in a small, low-profile surface-mount SOW16 package. The leadframe is plated with 100% matte tin, which is compatible with standard lead (Pb) free printed circuit board assembly processes. Internally, the device is Pb-free, except for flip-chip high-temperature Pb-based solder balls, currently exempt from RoHS. The device is fully calibrated prior to shipment from the factory.

Table of Contents

1 Product Family Members

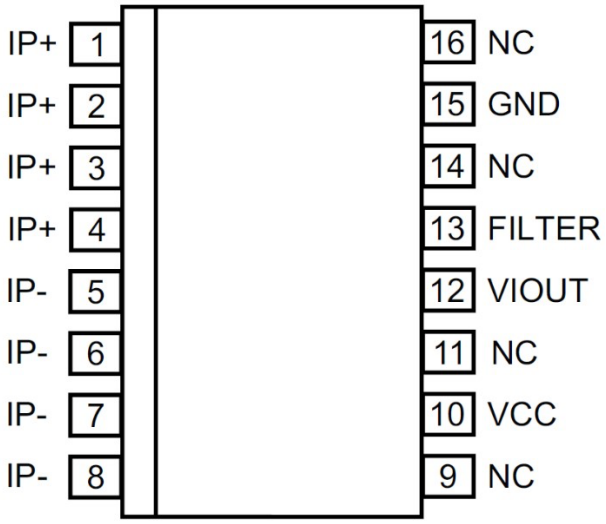
HC701Wx is available in many delivery forms, which are distinguished by a specific nomenclature code.



Part Number	VCC (V)	I_{PR} (A)	Sens (mV/A)	T_j (°C)	Packing
HC701W20AU5*	5±0.5	20	200	-40 to 150	Tape and Reel, 3000 pieces per reel
HC701W20AU3*	3.3±0.3	20	132		
HC701W20AB5*	5±0.5	±20	100		
HC701W20AB3*	3.3±0.3	±20	66		
HC701W20BU5*	5±0.5	20	200		
HC701W20BB5*	5±0.5	±20	100		
HC701W20CU3*	3.3±0.3	20	132		
HC701W20CB3*	3.3±0.3	±20	66		
HC701W30AU5*	5±0.5	30	133		
HC701W30AU3*	3.3±0.3	30	88		
HC701W30AB5*	5±0.5	±30	66		
HC701W30AB3*	3.3±0.3	±30	44		
HC701W30BU5*	5±0.5	30	133		
HC701W30BB5*	5±0.5	±30	66		
HC701W30CU3*	3.3±0.3	30	88		
HC701W30CB3*	3.3±0.3	±30	44		
HC701W40AU5*	5±0.5	40	100		
HC701W40AU3*	3.3±0.3	40	66		
HC701W40AB5*	5±0.5	±40	50		
HC701W40AB3*	3.3±0.3	±40	33		
HC701W40BU5*	5±0.5	40	100		
HC701W40BB5*	5±0.5	±40	50		
HC701W40CU3*	3.3±0.3	40	66		
HC701W40CB3*	3.3±0.3	±40	33		
HC701W50AU5*	5±0.5	50	80		
HC701W50AU3*	3.3±0.3	50	52		
HC701W50AB5*	5±0.5	±50	40		
HC701W50AB3*	3.3±0.3	±50	26		
HC701W50BU5*	5±0.5	50	80		
HC701W50BB5*	5±0.5	±50	40		
HC701W50CU3*	3.3±0.3	50	52		
HC701W50CB3*	3.3±0.3	±50	26		
HC701W60AU5*	5±0.5	60	66		
HC701W60AU3*	3.3±0.3	60	44		
HC701W60AB5*	5±0.5	±60	33		
HC701W60AB3*	3.3±0.3	±60	22		
HC701W60BU5*	5±0.5	60	66		
HC701W60BB5*	5±0.5	±60	33		
HC701W60CU3*	3.3±0.3	60	44		
HC701W60CB3*	3.3±0.3	±60	22		
HC701W70AU5*	5±0.5	70	57.1		
HC701W70AU3*	3.3±0.3	70	37.1		

HC701W70AB5*	5±0.5	±70	28.6
HC701W70AB3*	3.3±0.3	±70	18.6
HC701W70BU5*	5±0.5	70	57.1
HC701W70BB5*	5±0.5	±70	28.6
HC701W70CU3*	3.3±0.3	70	37.1
HC701W70CB3*	3.3±0.3	±70	18.6

2 Pin Definitions and Descriptions



Pinout Diagram

Number	Name	Function
1,2,3,4	IP+	Terminals for current being sensed, fused internally
5,6,7,8	IP–	Terminals for current being sensed, fused internally
9	NC	No internal connection; recommened to connect to GND for the best ESD performance
10	VCC	Device power supply terminal
11	NC	No internal connection; recommened to connect to GND for the best ESD performance
12	VIOUT	Analog output signal
13	FILTER	Terminal for external capacitor that sets bandwidth
14	NC	No internal connection; recommened to connect to GND for the best ESD performance
15	GND	Signal ground terminal
16	NC	No internal connection; recommened to connect to GND for the best ESD performance

3 Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units
Supply Voltage	V_{CC}	-	6	V
Reverse Supply Voltage	V_{RCC}	-0.1	-	V
Output Voltage	V_{IOUT}	-	V_{CC} +0.5	V
Reverse Output Voltage	V_{RIOUT}	-0.1	-	V
Operating Ambient Temperature	T_A	-40	150	°C
Storage Temperature	T_S	-65	165	°C
Junction temperature	$T_{J(max)}$		165	°C

Note 1: Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute-maximum- rated conditions for extended periods may affect device reliability.

Isolation Characteristics

Characteristic	Symbol	Notes	Rating	Unit
Dielectric Surge Strength Test Voltage	VSURGE	Tested ±5 pulses at 2/minute in compliance to IEC 61000-4-5 1.2 µs (rise) / 50 µs (width).	8000	V
Dielectric Strength Test Voltage	VISO	Agency type-tested for 60 seconds per UL 60950-1 (edition 2). Production tested at 3000 V_{RMS} for 1 second, in accordance with UL 60950-1 (edition 2).	4800	VRMS
Working Voltage for Basic Isolation	VWVBI	Maximum approved working voltage for basic (single) isolation according to UL 60950-1 (edition 2).	1550	VPK
			1097	V_{RMS} or VDC
Working Voltage for Reinforced Isolation	VWVRI	Maximum approved working voltage for reinforced isolation according to UL 60950-1 (edition 2).	800	VPK
			565	V_{RMS} or VDC
Clearance	D_{cl}	Minimum distance through air from IP leads to signal leads.	7.5	mm
Creepage	D_{cr}	Minimum distance along package body from IP leads to signal leads	8.2	mm

Thermal Characteristics

Characteristic	Symbol	Test Conditions*	Value	Units
Package Thermal Resistance (Junction to Ambient)	RθJA		23	ºC/W
Package Thermal Resistance (Junction to Lead)	RθJL		5	ºC/W

4 ESD Protections

Parameter	Value	Unit
All pins 1)	±8000	V
All pins 2)	±400	V
All pins 3)	±1500	V

1) HBM (Human Body Mode) according to AEC-Q100-002
2) MM (Machine Mode) according to AEC-Q100-003
3) CDM (charged device mode) according to AEC-Q100-011

5 Electrical Characteristics:

Valid through the full range of T_A , V_{CC} = 5 V, C_F = 0, unless otherwise specified

Characteristic[1]	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Supply Current	I_{CC}	V_{CC} = 5 V, output open	–	10	14	mA
Output Capacitance Load	C_L	VIOUT to GND	–	–	10	nF
Output Resistive Load	R_L	VIOUT to GND	4.7	–	–	kΩ

[1] Device may be operated at higher primary current levels, I_P, ambient temperatures, T_A, and internal leadframe temperatures, provided the Maximum Junction Temperature, T_J(max), is not exceeded.

Primary Conductor Resistance	R_{IP}	T_A = 25°C	–	0.8	–	mΩ
Internal Filter Resistance[1]	$R_{F(int)}$		–	1.7	–	kΩ
Rise Time	t_r	I_P = I_P(max), T_A = 25°C, C_L = 1 nF	–	3	–	µs
Propagation Delay	t_{pd}	I_P = I_P(max), T_A = 25°C, C_L = 1 nF	–	2	–	µs
Response Time	$t_{RESPONSE}$	I_P = I_P(max), T_A = 25°C, C_L = 1 nF	–	4	–	µs
Bandwidth	BW	Small signal –3 dB; C_L = 1 nF	–	120	–	kHz
Noise Density	I_{ND}	Input-referenced noise density; T_A = 25°C, C_L = 1 nF	–	150	–	$\mu A_{(rms)}/\sqrt{Hz}$
Noise	I_N	Input-referenced noise: C_F = 4.7 nF, C_L = 1 nF, BW = 18 kHz, T_A = 25°C	–	25	–	$mA_{(rms)}$
Nonlinearity	E_{LIN}	Through full range of I_P		±1		%
Sensitivity Ratiometry Coefficient	SENS_RAT_COEF	V_{CC} = 4.5 to 5.5 V, T_A = 25ºC	–	1.3	–	–
Zero-Current Output Ratiometry Coefficient	QVO_RAT_COEF	V_{CC} = 4.5 to 5.5 V, T_A = 25ºC	–	1	–	–
Saturation Voltage[2]	V_{OH}	R_L = 4.7 kΩ, TA = 25°C	VCC – 0.2		–	V
	V_{OL}	R_L = 4.7 kΩ, TA = 25°C	–		0.2	V
Power-On Time	t_{PO}	Output reaches 90% of steadystate level, T_A = 25°C, I_P = I_{PR}(max) applied	–	62	–	µs
Shorted Output-to-Ground Current	$I_{SC(GND)}$	T_A = 25ºC	–	3.3	–	mA
Shorted Output-to-V_{CC} Current	$I_{SC(VCC)}$	T_A = 25ºC	–	45	–	mA

[1] $R_{F(int)}$ forms an RC circuit via the FILTER pin.
[2] The sensor IC will continue to respond to current beyond the range of I_P until the high or low saturation voltage; however, the nonlinearity in this region will be worse than through the rest of the measurement range.

HC701W20AU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	20	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 5V	–	200	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A, VCC = 5V	–	V_{CC} × 0.1	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W20AU3 Range L, valid at T_j unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		0	–	20	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 3.3V	–	132	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A, VCC = 3.3V	–	V_{CC} × 0.1	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%

Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W20AB5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-20	–	20	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 5V	–	100	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A, VCC = 5V	–	V_{CC} × 0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W20AB3 Range L, valid at T_j unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		-20	–	20	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 3.3V	–	66	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A, VCC = 3.3V	–	V_{CC} × 0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W20BU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	20	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	200	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV

Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W20BB5 Range L, valid at T_j unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-20	–	20	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	100	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	2.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W20CU3 Range L, valid at T_j unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		0	–	20	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	132	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.33	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W20CB3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		-20	–	20	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	66	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	1.65	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W30AU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	30	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 5V	–	133	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A, VCC = 5V	–	V_{CC} × 0.1	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W30AU3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		0	–	30	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 3.3V	–	88	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A, VCC = 3.3V	–	V_{CC} × 0.1	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W30AB5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-30	–	30	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 5V	–	66	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A, VCC = 5V	–	V_{CC} × 0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.8	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W30AB3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		-30	–	30	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 3.3V	–	44	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A, VCC = 3.3V	–	V_{CC} × 0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.8	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W30BU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	30	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	133	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W30BB5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-30	–	30	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	66	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	2.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W30CU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	30	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	88	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.33	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W30CU3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		0	–	30	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	88	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.33	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W30CB5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-30	–	30	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	44	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	1.65	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W30CB3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		-30	–	30	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	44	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	1.65	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W40AU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	40	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 5V	–	100	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A, VCC = 5V	–	V_{CC} × 0.1	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W40AU3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		0	–	40	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 3.3V	–	66	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A, VCC = 3.3V	–	V_{CC} × 0.1	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W40AB5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-40	–	40	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 5V	–	50	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A, VCC = 5V	–	V_{CC} × 0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W40AB3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		-40	–	40	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 3.3V	–	33	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A, VCC = 3.3V	–	V_{CC} × 0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W40BU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	40	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	100	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W40BB5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-40	–	40	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	50	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	2.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j =-40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W40CU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	40	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	66	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.33	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W40CU3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		0	–	40	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	66	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.33	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W40CB5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-40	–	40	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	33	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	1.65	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W40CB3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		-40	–	40	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	33	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	1.65	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W50AU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	50	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 5V	–	80	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A, VCC = 5V	–	V_{CC} × 0.1	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W50AU3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		0	–	50	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 3.3V	–	52	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A, VCC = 3.3V	–	V_{CC} × 0.1	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W50AB5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-50	–	50	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 5V	–	40	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A, VCC = 5V	–	V_{CC} × 0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W50AB3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		-50	–	50	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 3.3V	–	26	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A, VCC = 3.3V	–	V_{CC} × 0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W50BU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	50	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	80	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W50BB5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-50	–	50	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	40	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	2.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W50CU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	50	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	52	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.33	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W50CU3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		0	–	50	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	52	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.33	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W50CB5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-50	–	50	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	26	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	1.65	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W50CB3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		-50	–	50	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	26	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	1.65	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

CH70360AU3* Performance Characteristics:

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		0	–	60	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 3.3V	–	44	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A, VCC = 3.3V	–	V_{CC} × 0.1	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_A = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_A = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_A = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}		–3	±1	3	%
Total Output Error Lifetime Drift	E_{tot_drift}		–3	±1	3	%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

CH70360AB5* Performance Characteristics:

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-60	–	60	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 5V	–	33	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A, VCC = 5V	–	V_{CC} × 0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_A = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_A = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_A = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}		–3	±1	3	%
Total Output Error Lifetime Drift	E_{tot_drift}		–3	±1	3	%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

CH70360AB3* Performance Characteristics:

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		-60	–	60	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 3.3V	–	22	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A, VCC = 3.3V	–	V_{CC} × 0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_A = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_A = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_A = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}		–3	±1	3	%
Total Output Error Lifetime Drift	E_{tot_drift}		–3	±1	3	%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

CH70360BU5* Performance Characteristics:

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	60	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	66	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_A = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_A = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_A = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}		–3	±1	3	%
Total Output Error Lifetime Drift	E_{tot_drift}		–3	±1	3	%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

CH70360BB5* Performance Characteristics:

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-60	–	60	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	33	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	2.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_A = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_A = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_A = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}		–3	±1	3	%
Total Output Error Lifetime Drift	E_{tot_drift}		–3	±1	3	%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

CH70360CU5* Performance Characteristics: Range L, valid at T unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	60	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	44	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.33	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_A = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_A = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_A = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}		–3	±1	3	%
Total Output Error Lifetime Drift	E_{tot_drift}		–3	±1	3	%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.

3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

CH70360CU3* Performance Characteristics:

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		0	–	60	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	44	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.33	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_A = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_A = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_A = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}		–3	±1	3	%
Total Output Error Lifetime Drift	E_{tot_drift}		–3	±1	3	%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

CH70360CB5* Performance Characteristics:

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-60	–	60	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	22	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	1.65	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_A = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_A = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_A = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}		–3	±1	3	%
Total Output Error Lifetime Drift	E_{tot_drift}		–3	±1	3	%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

CH70360CB3* Performance Characteristics:

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		-60	–	60	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	22	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	1.65	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_A = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_A = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_A = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}		–3	±1	3	%
Total Output Error Lifetime Drift	E_{tot_drift}		–3	±1	3	%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares.

See Application Information section.

HC701W70AU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	70	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 5V	–	57.1	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A, VCC = 5V	–	V_{CC} × 0.1	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W70AU3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		0	–	70	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 3.3V	–	37.1	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A, VCC = 3.3V	–	V_{CC} × 0.1	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W70AB5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-70	–	70	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 5V	–	28.6	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A, VCC = 5V	–	V_{CC} × 0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W70AB3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		-70	–	70	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$, VCC = 3.3V	–	18.6	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A, VCC = 3.3V	–	V_{CC} × 0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W70BU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	70	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	57.1	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W70BB5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-70	–	70	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	28.6	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	2.5	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W70CU5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		0	–	70	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	37.1	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.33	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W70CU3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		0	–	70	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	37.1	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional, I_P = 0 A	–	0.33	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.7	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.7	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±6	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W70CB5

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		4.5	–	5.5	V
Current-Sensing Range	I_{PR}		-70	–	70	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	18.6	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	1.65	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

HC701W70CB3

unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.[1]	Max.	Unit
Nominal Performance						
Supply Voltage	V_{CC}		3	–	3.6	V
Current-Sensing Range	I_{PR}		-70	–	70	A
Sensitivity	Sens	$I_{PR(min)} < I_P < I_{PR(max)}$	–	18.6	–	mV/A
Zero-Current Output Voltage	$V_{IOUT(Q)}$	Bidirectional, I_P = 0 A	–	1.65	–	V
Accuracy Performance						
Total Output Error[2]	E_{TOT}	$I_P = I_{PR(max)}$, T_j = -40°C to 150ºC	–2	±0.8	2	%
Total Output Error Components[3] $E_{TOT} = E_{SENS} + 100 \times V_{OE}/(Sens \times I_P)$						
Sensitivity Error	E_{sens}	$I_P = I_{PR(max)}$, T_j = -40°C to 150°C	–1.5	±0.6	1.5	%
Offset Voltage	V_{OE}	I_P = 0 A, T_j = -40°C to 150ºC	–10	±5	10	mV
Lifetime Drift Characteristics						
Sensitivity Error Lifetime Drift	E_{sens_drift}			±1		%
Total Output Error Lifetime Drift	E_{tot_drift}			±1		%

1 Typical values with +/- are 3 sigma values
2 Percentage of I_P, with $I_P = I_{PR(max)}$.
3 A single part will not have both the maximum/minimum sensitivity error and maximum/minimum offset voltage, as that would violate the maximum/minimum total output error specification. Also, 3 sigma distribution values are combined by taking the square root of the sum of the squares. See Application Information section.

6 Application Information

6.1 Estimating Total Error vs. Sensed Current

The Performance Characteristics tables give distribution (±3sigma) values for Total Error at $I_{PR(max)}$; however, one often wants to know what error to expect at a particular current. This can be estimated by using the distribution data for the components of Total Error, Sensitivity Error, and Offset Voltage. The ±3 sigma value for Total Error (E_{TOT}) as a function of the sensed current (I_P) is estimated as:

$$E_{TOT}(I_P) = \sqrt{E_{SENS}^{\ 2} + \left(\frac{100 \times V_{OE}}{Sens \times I_P}\right)^2}$$

Here, E_{SENS} and V_{OE} are the ±3 sigma values for those error terms. If there is an average sensitivity error or average offset voltage, then the average Total Error is estimated as:

$$E_{TOTAVG}(I_P) = E_{SENSAVG} + \frac{100 \times V_{OE} I_{AVGP}}{Sens \times V}$$

The resulting total error will be a sum of E_{TOT} and E_{TOT_AVG}. Using these equations and the 3 sigma distributions for Sensitivity Error and Offset Voltage, the Total Error versus sensed current (I_P) is below for the HC701W20AB. As expected, as one goes towards zero current, the error in percent goes towards infinity due to division by zero.

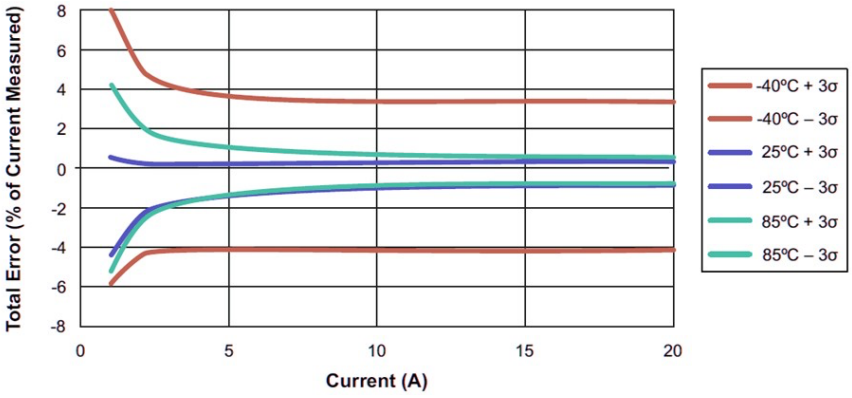


Figure 1: Predicted Total Error as a Function of the Sensed Current for the HC701W20AB

6.2 Definitions of accuracy characteristics

Sensitivity (Sens). The change in sensor IC output in response to a 1 A change through the primary conductor. The sensitivity is the product of the magnetic circuit sensitivity (G/A) (1 G = 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.

Nonlinearity (E_{LIN}). The nonlinearity is a measure of how linear the output of the sensor IC is over the full current measurement range. The nonlinearity is calculated as:

$$E_{LIN} = \{1 - [\frac{V_{IOUT}(I_{PR(max)}) - V_{IOUT(Q)}}{2 \times V_{IOUT}(I_{PR(max)}/2) - V_{IOUT(Q)}}]\} \times 100(\%)$$

where $V_{IOUT}(I_{PR(max)})$ is the output of the sensor IC with the maximum measurement current flowing through it and $V_{IOUT}(I_{PR(max)}/2)$ is the output of the sensor IC with half of the maximum measurement current flowing through it.

Zero-Current Output Voltage ($V_{IOUT(Q)}$). The output of the sensor when the primary current is zero. For a unipolar supply voltage, it nominally remains at 0.5 × V_{CC} for a bidirectional device and 0.1 × V_{CC} for a unidirectional device. For example, in the case of a bidirectional output device, V_{CC} = 5 V translates into $V_{IOUT(Q)}$ = 2.5 V. Variation in $V_{IOUT(Q)}$ can be attributed to the resolution of the linear IC quiescent voltage trim and thermal drift.

Offset Voltage (V_{OE}). The deviation of the device output from its ideal quiescent value of 0.5 × V_{CC} (bidirectional) or 0.1 × V_{CC} (unidirectional) due to nonmagnetic causes. To convert this voltage to amperes, divide by the device sensitivity, Sens.

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:

$$E_{TOT}(I_P) = \frac{V_{IOUT\_ideal}(I_P) - V_{IOUT}(I_P)}{Sens_{ideal}(I_P) \times I_P} \times 100(\%)$$

The Total Output Error incorporates all sources of error and is a function of I_P . At relatively high currents, E_{TOT} will be mostly due to sensitivity error, and at relatively low currents, E_{TOT} will be mostly due to Offset Voltage (V_{OE}). In fact, at I_P = 0, E_{TOT} approaches infinity due to the offset. This is illustrated in Figures 2 and 3. Figure 2 shows a distribution of output voltages versus I_P at 25°C and across temperature. Figure 3 shows the corresponding E_{TOT} versus I_P .

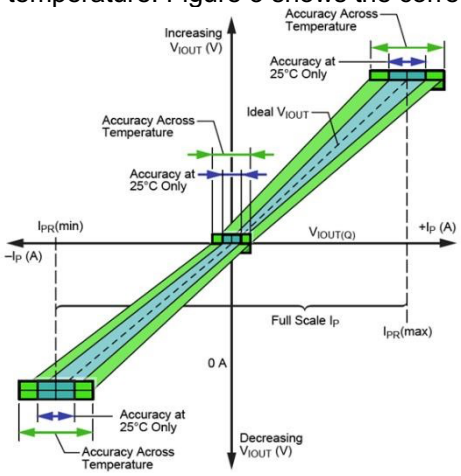


Figure 2: Output Voltage versus Sensed Current

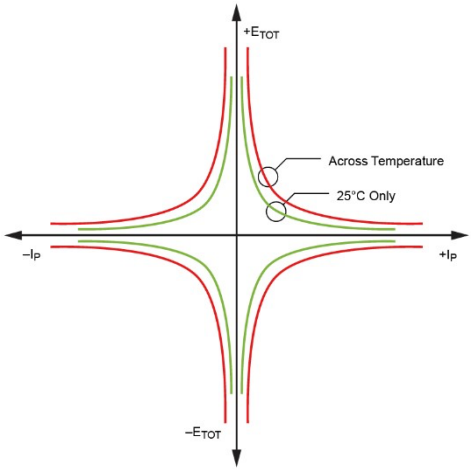


Figure3: Total Output Error versus Sensed Current

Sensitivity Ratiometry Coefficient (SENS_RAT_COEF). The coefficient defines how the sensitivity scales with V_{CC}. The ideal coefficient is 1, meaning the sensitivity scales proportionally with V_{CC}. A 10% increase in V_{CC} results in a 10% increase in sensitivity. A coefficient of 1.1 means that the sensitivity increases by 10% more than the ideal proportionality case. This means that a 10% increase in V_{CC} results in an 11% increase in sensitivity. This relationship is described by the following equation:

$$\mathrm{Sens}(V_{CC}) = Sens(5V)\left[1 + \frac{(V_{CC} - 5V) \times SENS\_RAT\_COEF}{5V}\right]$$

This can be rearranged to define the sensitivity ratiometry coefficient as:

$$SENS_{RATCOEF} = \left[\frac{\mathrm{Sens}(V_{CC})}{Sens(5V)} - 1\right] \times \frac{5V}{V_{CC} - 5V}$$

Zero-Current Output Ratiometry Coefficient (QVO_RAT_ COEF). The coefficient defines how the zero-current output voltage scales with V_{CC}. The ideal coefficient is 1, meaning the output voltage scales proportionally with V_{CC}, always being equal to V_{CC}/2. A coefficient of 1.1 means that the zerocurrent output voltage increases by 10% more than the ideal proportionality case. This means

that a 10% increase in V_{CC} results in an 11% increase in the zero-current output voltage. This relationship is described by the following equation:

$$\mathrm{VIOUTQ}(V_{CC}) = \mathrm{VIOUTQ}(5V)[1 + \frac{(V_{CC} - 5V) \times QVO\_RAT\_COEF}{5V}]$$

This can be rearranged to define the zero-current output ratiometry coefficient as:

$$QVO\_RAT\_COEF = [\frac{\mathrm{VIOUTQ}(V_{CC})}{V_{CC} - 5V} - 1] \times \frac{5V}{\mathrm{VIOUTQ}(5V)}$$

6.3 Definitions of dynamic response characteristics

Power-On Time (t_{PO}). When the supply is ramped to its operating voltage, the device requires a finite time to power its internal components before responding to an input magnetic field. Power-On Time, t_{PO} , is defined as the time it takes for the output voltage to settle within ±10% of its steady-state value under an applied magnetic field, after the power supply has reached its minimum specified operating voltage, $V_{CC(min)}$, as shown in the chart at right.

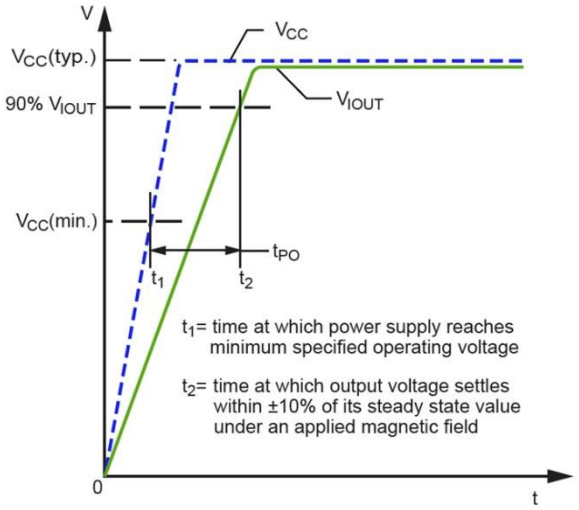


Figure 4: Power-On Time

Rise Time (t_r). The time interval between a) when the sensor IC reaches 10% of its full-scale value, and b) when it reaches 90% of its full-scale value. The rise time to a step response is used to derive the bandwidth of the current sensor IC, in which f(–3 dB) = 0.35 / t_r. Both t_r and $t_{RESPONSE}$ are detrimentally affected by eddy-current losses observed in the conductive IC ground plane.

Propagation Delay (t_{pd}). The propagation delay is measured as the time interval a) when the primary current signal reaches 20% of its final value, and b) when the device reaches 20% of its output corresponding to the applied current.

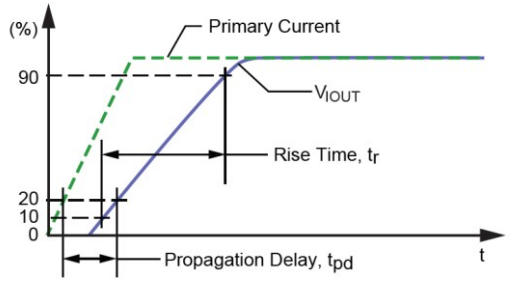


Figure 5: Rise Time and Propagation Delay

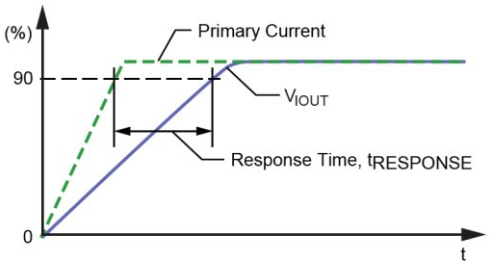


Figure 6: Response Time

Response Time ($t_{RESPONSE}$). The time interval between a) when the primary current signal reaches 90% of its final value, and b) when the device reaches 90% of its output corresponding to the applied current.

7 Package Information:

For Reference Only – Not for Tooling Use
Dimensions in millimeters – NOT TO SCALE
Dimensions exclusive of mold flash, gate burrs, and dambar protrusions

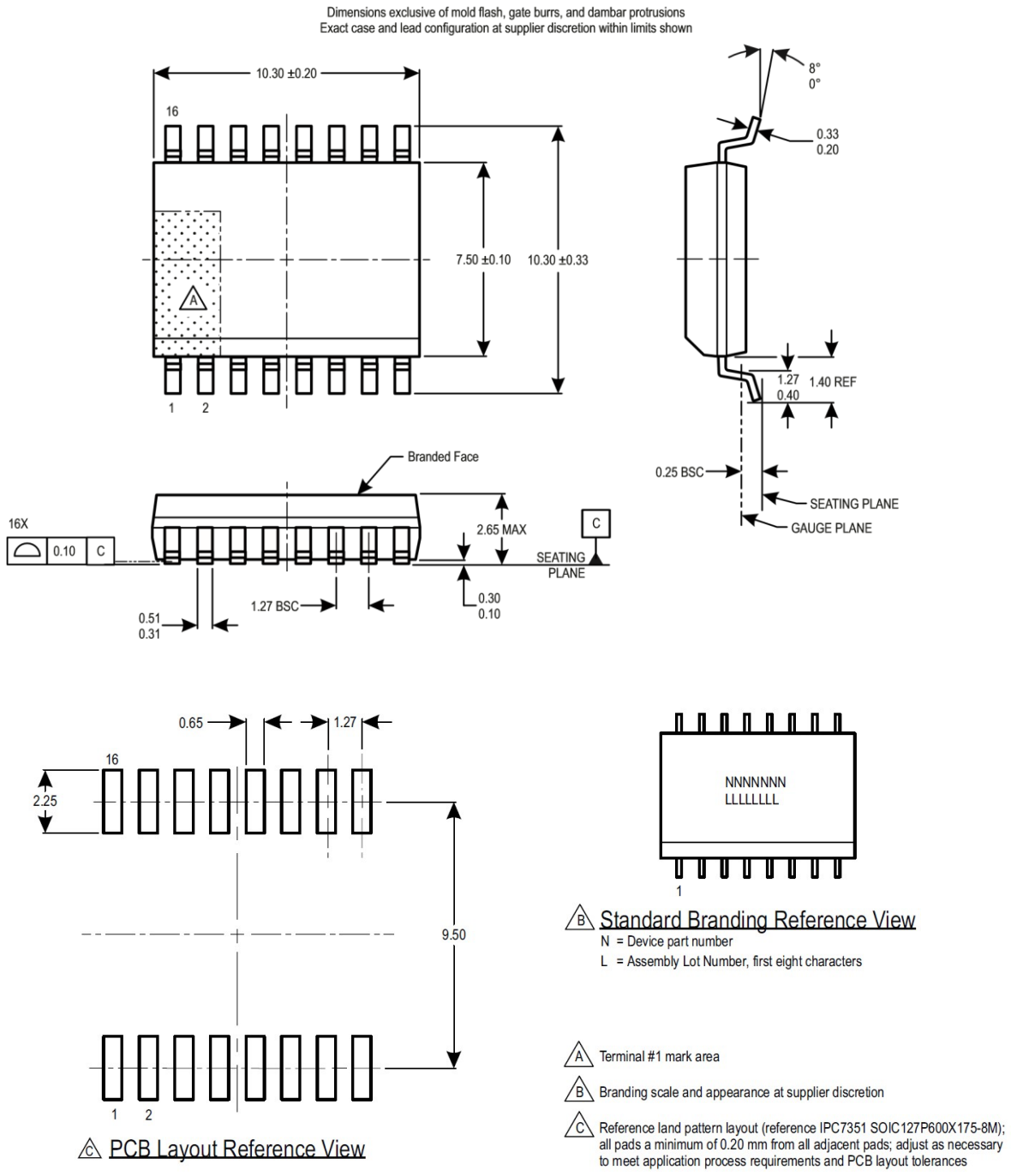


Figure 7: Package SOW16