Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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Current transducer GHS-SME series I_{PN} = 10 … 20 A

GHS 10-SME, GHS 12-SME, GHS 16-SME, GHS 20-SME

For the electronic measurement of current: DC, AC, pulsed..., with galvanic separation between the primary and the secondary circuit.

RoHS

Features

- Hall effect measuring principle
- Multirange current transducer through PCB pattern lay-out
- Galvanic separation between primary and secondary circuit
- Insulated test voltage 2100 V rms
- Low power consumption
- Extremely low profile
- Single power supply +5 V
- Fixed offset & sensitivity.

Advantages

- Small size and space saving
- High immunity to external interference
- High insulation capability
- Low electrical resistance (0.8 mΩ)
- No magnetic hysteresis
- Robust against external fields and cross-talk.

Applications

- Motors control
- Over current detection
- The solar inverter on DC side of the inverter (MPTT)
- Combiner box
- Smart metering.

Standards

- IEC 60950-1: 2005
- EN 60749-15: 2010
- EN 60749-20: 2008
- EN 60749-21: 2011
- IPC/JEDEC J-STD020: 2014
- EIA/JEDEC J-STD022-B102: 2004
- EIA/JEDEC J-STD022-B106: 2008
- EIA/JEDEC J-STD022-A113: 2015.

Application Domains

- Industrial.

Absolute ratings (not operating)

Parameter	Symbol	Unit	Min	Typ	Max	Conditions
Maximum supply voltage	U_C	V			10	
Overload capability	$\hat{I}_P$	A			±200	T_A = 25 °C, 1 ms pulse
Electrostatic discharge voltage (HMB-Human Body Model)	$U_{ESD\ HBM}$	V			2000	AEC-Q100-002 REV D
Electrostatic discharge voltage (CDM-Charged Device Model)	$U_{ESD\ CDM}$	V			500	AEC-Q100-0011 REV B
Maximum output current	I_{out}	mA			70	
Maximum output voltage	V_{out}	V			10	
Secondary Reverse voltage	U_{SR}	V	−0.3			
Maximum junction temperature	T_J	°C			165	

Insulation coordination

Parameter	Symbol	Unit	Min	Typ	Max	Conditions
Example application	U_d	V			300	CAT II PD2 according to IEC 60664-1
Rms voltage for AC insulation test, 50/60 Hz, 1 min)	U_d	V			2100	according to IEC 60664-1
Impulse withstand voltage 1.2/50 µs	$\hat{U}_W$	V			3600	according to IEC 60664-1
Clearance (pri. - sec.)	d_{Cl}	mm		4		
Creepage distance (pri. - sec.)	d_{Cp}	mm		4		

Environmental and mechanical characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Conditions
Ambient operating temperature	T_A	°C	-40		125	
Ambient storage temperature	T_S	°C	-55		165	
Resistance of the primary @T_A = 25 °C	R_P	mΩ		0.8		

Self diagnostic

Parameter	Symbol	Unit	Min	Typ	Max	Action	Output	Conditions
Start-up time	t_{start}	ms			1			V_{out} = 100 % of FS Pull-down resistor ≤ 100 kΩ. During the power-on delay the output will remain at 10 % fault band all the time
Undervoltage lockout	U_{UVLO}	V	3.15	3.3	3.45	IC reset	max 5 % U_C, Pull-down mode min 95 % U_C, Pull-up mode	$R_L \le$ 25 kΩ, $T \le$ 125 °C
Undervoltage lockout hysteresis	$U_{UVLO\ HYST}$	V	0.25	0.3	0.4			
Overvoltage lockout	U_{OVLO}	V	6.7		7.6	IC reset	max 5 % U_C, Pull-down mode min 95 % U_C, Pull-up mode	$R_L \le$ 25 kΩ, $T \le$ 125 °C
Overvoltage lockout hysteresis	$U_{OVLO\ HYST}$	V	0.05	0.1	0.7			

Electrical data GHS 10-SME

At T_A = −40 °C … 125 °C, U_C = +5 V, R_L = 6 kΩ.

Parameter	Symbol	Unit	Min	Typ	Max	Conditions
Primary nominal rms current	I_{PN}	A		10		
Primary current, measuring range	I_{PM}	A	−25		25	
Supply voltage [1)]	U_C	V	4.5	5	5.5	
Current consumption	I_C	mA	7	12	14	
Output voltage range	V_{out}	% U_C	10		90	Pull down ≥ 10 kΩ, pull up ≥ 10 kΩ
Maximum output current (driving capability)	I_{out}	mA	−2		2	V_{out} in range (3 % U_C, 97 % U_C), R_L in range (6 kΩ, 10 kΩ)
Output current limitation	I_{SL}	mA	35		180	Output shorted to ±U_C permanent
Output internal resistance	R_{out}	Ω		1	5	V_{out} = 50 % U_C, R_L = 10 kΩ
Step response time to 90 % of I_{PN}	t_r	µs		5	6	
Frequency bandwidth (−3 dB), T_A = 25 °C	BW	kHz		100		
Output voltage noise (spectral density) rms	e_{no}	µV/√Hz		25		
Capacity loading	C_L	nF		10		Stability of the output
Load resistance	R_L	kΩ	6		100	
Sensitivity	G	mV/A		80		
Offset voltage	V_O	V		2.5		T_A = 25 °C
Electrical offset voltage	V_{OE}	V	−0.005		0.005	T_A = 25 °C
Temperature coefficient of V_{OE}	TCV_{OE}	mV/K	−0.1		0.1	
Temperature coefficient of G	TCG	ppm/K	−150		150	
Linearity error	ε_L	%	−0.25		0.25	@ I_{PN}
Sensitivity error	ε_G	%	−1		1	Factory adjustment
Accuracy @ I_{PN} [2)]	X	%	−1.25		1.25	T_A = 25 °C
Accuracy @ I_{PN} @ T_A = 105 °C	X	%	−3.5		3.5	
Accuracy @ I_{PN} @ T_A = 125 °C	X	%	−4		4	

Electrical data GHS 12-SME

At T_A = −40 °C … 125 °C, U_C = +5 V, R_L = 6 kΩ.

Parameter	Symbol	Unit	Min	Typ	Max	Conditions
Primary nominal rms current	I_{PN}	A		12		
Primary current, measuring range	I_{PM}	A	−30		30	
Supply voltage [1)]	U_C	V	4.5	5	5.5	
Current consumption	I_C	mA	7	12	14	
Output voltage range	V_{out}	% U_C	10		90	Pull down ≥ 10 kΩ, pull up ≥ 10 kΩ
Maximum output current (driving capability)	I_{out}	mA	−2		2	V_{out} in range (3 % U_C, 97 % U_C), R_L in range (6 kΩ, 10 kΩ)
Output current limitation	I_{SL}	mA	35		180	Output shorted to ±U_C permanent
Output internal resistance	R_{out}	Ω		1	5	V_{out} = 50 % U_C, R_L = 10 kΩ
Step response time to 90 % of I_{PN}	t_r	µs		5	6	
Frequency bandwidth (−3 dB), T_A = 25 °C	BW	kHz		100		
Output voltage noise (spectral density) rms	e_{no}	µV/√Hz		20		
Capacity loading	C_L	nF		10		Stability of the output
Load resistance	R_L	kΩ	6		100	
Sensitivity	G	mV/A		66.7		
Offset voltage	V_O	V		2.5		T_A = 25 °C
Electrical offset voltage	V_{OE}	V	−0.005		0.005	T_A = 25 °C
Temperature coefficient of V_{OE}	TCV_{OE}	mV/K	−0.1		0.1	
Temperature coefficient of G	TCG	ppm/K	−150		150	
Linearity error	ε_L	%	−0.25		0.25	@ I_{PN}
Sensitivity error	ε_G	%	−1		1	Factory adjustment
Accuracy @ I_{PN} [2)]	X	%	−1.25		1.25	T_A = 25 °C
Accuracy @ I_{PN} @ T_A = 105 °C	X	%	−3.5		3.5	
Accuracy @ I_{PN} @ T_A = 125 °C	X	%	−4		4	

Electrical data GHS 16-SME

At T_A = −40 °C … 125 °C, U_C = +5 V, R_L = 6 kΩ.

Parameter	Symbol	Unit	Min	Typ	Max	Conditions
Primary nominal rms current	I_{PN}	A		16		
Primary current, measuring range	I_{PM}	A	−40		40	
Supply voltage [1)]	U_C	V	4.5	5	5.5	
Current consumption	I_C	mA	7	12	14	
Output voltage range	V_{out}	% U_C	10		90	Pull down ≥ 10 kΩ, pull up ≥ 10 kΩ
Maximum output current (driving capability)	I_{out}	mA	−2		2	V_{out} in range (3 % U_C, 97 % U_C), R_L in range (6 kΩ, 10 kΩ)
Output current limitation	I_{SL}	mA	35		180	Output shorted to ±U_C permanent
Output internal resistance	R_{out}	Ω		1	5	V_{out} = 50 % U_C, R_L = 10 kΩ
Step response time to 90 % of I_{PN}	t_r	µs		5	6	
Frequency bandwidth (−3 dB), T_A = 25 °C	BW	kHz		100		
Output voltage noise (spectral density) rms	e_{no}	µV/√Hz		16		
Capacity loading	C_L	nF		10		Stability of the output
Load resistance	R_L	kΩ	6		100	
Sensitivity	G	mV/A		50		
Offset voltage	V_O	V		2.5		T_A = 25 °C
Electrical offset voltage	V_{OE}	V	−0.005		0.005	T_A = 25 °C
Temperature coefficient of V_{OE}	TCV_{OE}	mV/K	−0.1		0.1	
Temperature coefficient of G	TCG	ppm/K	−150		150	
Linearity error	ε_L	%	−0.25		0.25	@ I_{PN}
Sensitivity error	ε_G	%	−1		1	Factory adjustment
Accuracy @ I_{PN} [2)]	X	%	−1.25		1.25	T_A = 25 °C
Accuracy @ I_{PN} @ T_A = 105 °C	X	%	−3.5		3.5	
Accuracy @ I_{PN} @ T_A = 125 °C	X	%	−4		4	

Electrical data GHS 20-SME

At T_A = −40 °C … 125 °C, U_C = +5 V, R_L = 6 kΩ.

Parameter	Symbol	Unit	Min	Typ	Max	Conditions
Primary nominal rms current	I_{PN}	A		20		
Primary current, measuring range	I_{PM}	A	−50		50	
Supply voltage [1)]	U_C	V	4.5	5	5.5	
Current consumption	I_C	mA	7	12	14	
Output voltage range	V_{out}	% U_C	10		90	Pull down ≥ 10 kΩ, pull up ≥ 10 kΩ
Maximum output current (driving capability)	I_{out}	mA	−2		2	V_{out} in range (3 % U_C, 97 % U_C), R_L in range (6 kΩ, 10 kΩ)
Output current limitation	I_{SL}	mA	35		180	Output shorted to ±U_C permanent
Output internal resistance	R_{out}	Ω		1	5	V_{out} = 50 % U_C, R_L = 10 kΩ
Step response time to 90 % of I_{PN}	t_r	µs		5	6	
Frequency bandwidth (−3 dB), T_A = 25 °C	BW	kHz		100		
Output voltage noise (spectral density) rms	e_{no}	µV/√Hz		12		
Capacity loading	C_L	nF		10		Stability of the output
Load resistance	R_L	kΩ	6		100	
Sensitivity	G	mV/A		40		
Offset voltage	V_O	V		2.5		T_A = 25 °C
Electrical offset voltage	V_{OE}	V	−0.005		0.005	T_A = 25 °C
Temperature coefficient of V_{OE}	TCV_{OE}	mV/K	−0.1		0.1	
Temperature coefficient of G	TCG	ppm/K	−150		150	
Linearity error	ε_L	%	−0.25		0.25	@ I_{PN}
Sensitivity error	ε_G	%	−1		1	Factory adjustment
Accuracy @ I_{PN} [2)]	X	%	−1.25		1.25	T_A = 25 °C
Accuracy @ I_{PN} @ T_A = 105 °C	X	%	−3.5		3.5	
Accuracy @ I_{PN} @ T_A = 125 °C	X	%	−4		4	

Ratiometric mode

At U_C ±10 %

Parameter	Symbol	Unit	Specification			Conditions
			Min	Typical	Max	
Ratiometry error Offset	$\varepsilon_r\ V_o$	%	−0.4		0.4	V_o = 50 % U_C
Ratiometry error Sensitivity	$\varepsilon_r\ G$	%	−0.4		0.4	

Notes: [1] The output voltage V_{OUT} is fully ratiometric. The offset and sensitivity are dependent on the supply voltage U_C relative to the following formula:

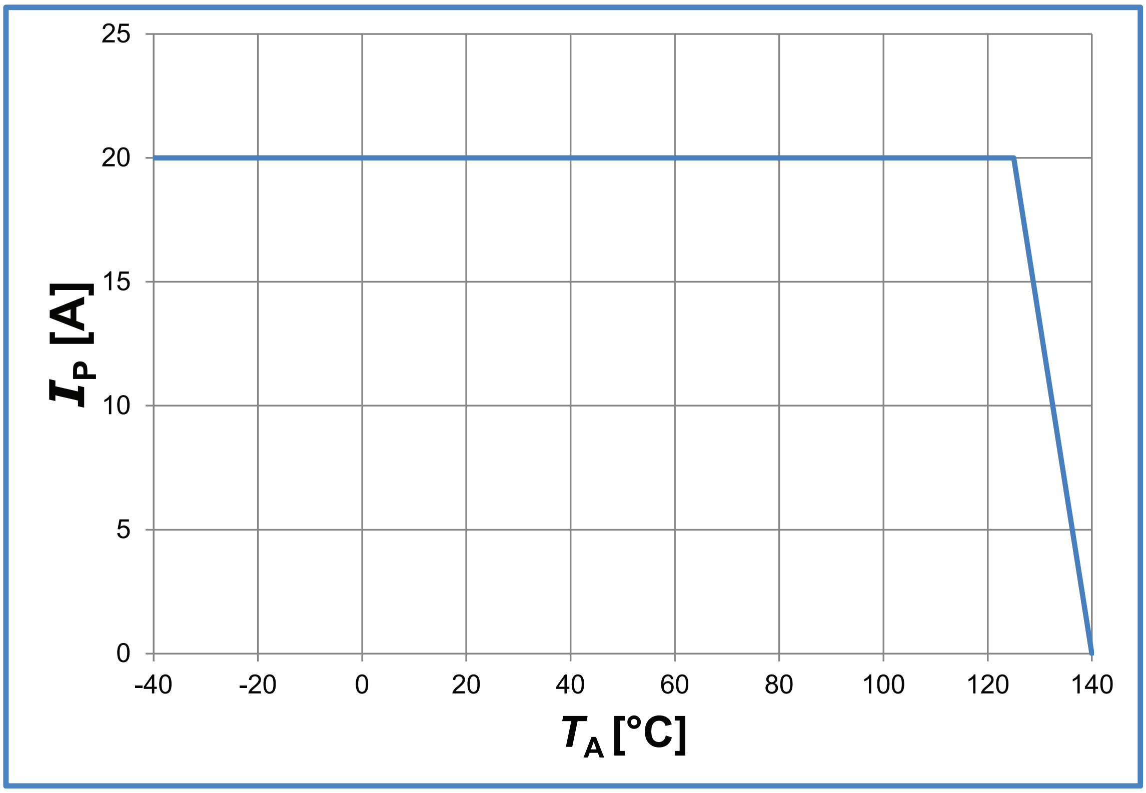
$$I_P = \left(\frac{5}{U_C} \times V_{out} - V_o\right) \times \frac{1}{G} \text{ with } G \text{ in (V/A)}$$

[2] Accuracy X at a given temperature (T_A > 25 °C) :

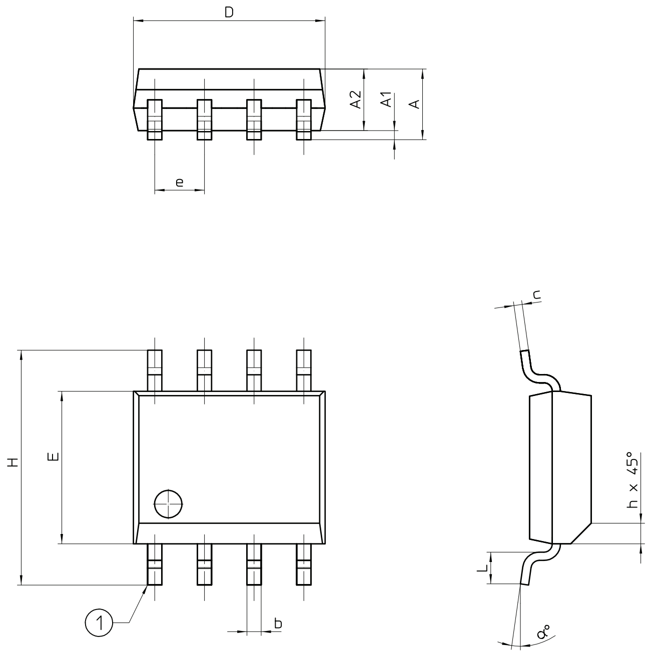
$$X_{TA} = (\varepsilon_L + \varepsilon_G) + \frac{TCV_{OE}}{I_{PN} \times G} + TCG \times 10^6) \times (T_A - 25) \times 100$$

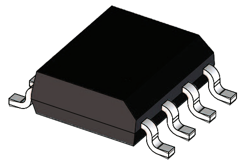
GHS-SMS series, maximum continuous DC current

For all ranges



Dimensions GHS-SME series (in mm)





SOIC 8 Dimensions in mm

	min	nom	max
A	1.55	1.63	1.73
A1	0.1	0.15	0.25
A2	1.45	1.48	1.48
D	4.8	4.9	4.98
E	3.81	3.94	3.99
H	5.84	5.99	6.19
L	0.41	0.64	0.89
b	0.36	0.41	0.46
c	0.19	0.2	0.25
e	TYP 1.27		
h	TYP 0.33		
α	0°		8°

Connection