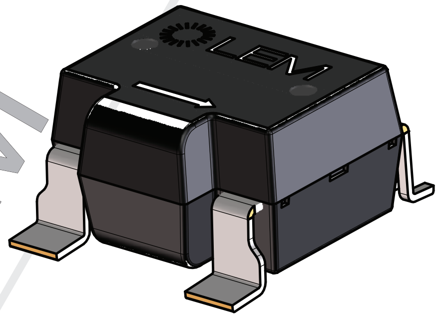
Current Transducer HMSR-SMS series

I_{PN} = 6 ... 30 A

Ref: HMSR 6-SMS, HMSR 8-SMS, HMSR 10-SMS, HMSR 20-SMS, HMSR 30-SMS

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



Features

- Open loop multi-range current transducer
- Voltage output
- Double overcurrent detection
- Single power supply +5 V
- 3.3 V SP version available
- Galvanic separation between primary and secondary
- Low power consumption
- Compact design for surface mount PCB mounting
- Factory calibrated
- High bandwidth, very low loss magnetic core.

Advantages

- Low profile: h = 6 mm
- Low foot-print
- Low electrical resistance 0.76 mΩ
- Reinforced insulation capability.
- High resolution
- High immunity to external interference.

Applications

- Small drives
- HVAC
- Appliances
- Solar.

Standards

- IEC 61800-5-1: 2007
- IEC 62109-1: 2010
- IEC 60950-1: 2005.

Application Domain

- Industrial.

Insulation coordination

Parameter	Symbol	Unit	Value	Comment
RMS voltage for AC insulation test, 50/60 Hz, 1 min	U_d	kV	4.95	According to IEC 60950-1
Impulse withstand voltage 1.2/50 µs	$\hat{U}_W$	kV	8	
Partial discharge RMS test voltage (q_m < 5 pC)	U_t	V	990	Primary/secondary According to IEC 60950-1
Creepage distance (pri. - sec.)	d_{Cp}	mm	8	Shortest path along device body
Clearance (pri. - sec.)	d_{Cl}	mm	8	Shortest mounted on PCB with recommended layout
Case material	-	-	V0	According to UL 94
Comparative tracking index	CTI	-	600	
Application example	-	V	600	Reinforced insulation, CAT III, PD 2, according to IEC 62109-1 Altitude ≤ 3000 m

Environmental and mechanical characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Comment
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		0.76		
Thermal resistance junction to board	$R_{th\ JB}$	°K/W		TBD		
Mass	m	g			1	TBD

Absolute maximum ratings

Parameter	Symbol	Unit	Value
Supply voltage (not destructive)	U_C	V	8
Supply voltage (not entering non standard modes)	U_C	V	6.5
Electrostatic discharge voltage (HBM - Human Body Model)	$U_{ESD\ HBM}$	kV	2
Maximum output current source	$I_{out\ max}$	mA	25
Maximum input current sink	$I_{in\ max}$	mA	50
Maximum junction temperature	$T_{J\ max}$	°C	150

Stresses above these ratings may cause permanent damage. Exposure to absolute maximum ratings for extended periods may degrade reliability.

Electrical data HMSR 6-SMS

At T_A = 25 °C, U_C = +5, R_L = 10 kΩ unless otherwise noted (see Min, Max, typ. definition paragraph in page 10).

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal RMS current	I_{PN}	A		6		
Primary current, measuring range	I_{PM}	A	−15		15	
Supply voltage [1]	U_C	V	4.5	5	5.5	
Current consumption	I_C	mA		20	26	
Reference voltage (output)	V_{ref}	V	2.48	2.5	2.52	Internal reference
Reference voltage (input)	V_{ref}	V	0.5		2.6	External reference
Output voltage range @ I_{PM}	$V_{out} - V_{ref}$	V	−2		2	
V_{ref} output resistance	R_{ref}	Ω	120	200	333	
V_{out} output resistance	R_{out}	Ω		2	5	
Capacity loading	C_L	nF	0		6	
Electrical offset voltage @ I_P = 0	V_{OE}	mV	−5		5	$V_{out} - V_{ref}$ @ V_{ref} = 2.5 V
Electrical offset current, referred to primary	I_{OE}	mA	−37.5		37.5	
Temperature coefficient of V_{ref}	TCV_{ref}	ppm/K	−150		150	−40 °C … 105 °C
Temperature coefficient of V_{OE}	TCV_{OE}	mV/K	−0.075		0.075	−40 °C … 105 °C
Temperature coefficient of I_{OE}	TCI_{OE}	mA/K	−0.6		0.6	−40 °C … 105 °C
Theoretical sensitivity	G_{th}	mV/A		133.33		800 mV @ I_{PN}
Sensitivity error	ε_G	%	−0.75		0.75	Factory adjustment
Temperature coefficient of G	TCG	ppm/K	−200		200	−40 °C … 105 °C
Linearity error 0 ... I_{PN}	ε_L	% of I_{PN}	−0.75		0.75	
Linearity error 0 ... I_{PM}	ε_L	% of I_{PM}	−0.5		0.5	
Magnetic offset current (@ 10 × I_{PN}) referred to primary	I_{OM}	A	TBD		TBD	
Output RMS noise voltage spectral density 100 Hz… 100 kHz	e_{no}	µV/√Hz			TBD	NBW = 1 kHz ... 100 kHz
Output RMS noise voltage DC … 10 kHz DC … 100 kHz DC … 10 MHz	V_{no}	mVpp		 TBD TBD TBD		
Reaction time @ 10 % of I_{PN}	t_{ra}	µs			2	TBD
Step response time to 90 % of I_{PN}	t_r	µs			2.1	TBD
Frequency bandwidth (−3 dB)	BW	kHz		300		TBD
Internal overcurrent detection (OCD) threshold	I_{IOCD}	A		2.93 × I_{PN}		Factory setting EEPROM
Internal OCD threshold accuracy	X_{IOCD}	%	−10		10	
Internal OCD output on resistance	$R_{on\,IOCD}$	Ω	70	95	100	open drain output, active low
Internal OCD output hold time	$t_{hold\,IOCD}$	µs	7	10	14	
Internal OCD response time	$t_{r\,IOCD}$	µs	1.4		2.1	2 signal peaks detected
Accuracy @ I_{PN}	X	% of I_{PN}	−1.5		1.5	
Accuracy @ I_{PN} @ T_A = +85 °C	X	% of I_{PN}	−3.26		3.26	See formula note [2]
Accuracy @ I_{PN} @ T_A = +105 °C	X	% of I_{PN}	−3.85		3.85	See formula note [2]
Accuracy @ I_{PN} @ T_A = +125 °C	X	% of I_{PN}	−4.44		4.44	See formula note [2]

Notes: [1] 3.3 V SP version available

[2] Accuracy @ T_A (% of I_{PN}) = $X + \left(\frac{TCG}{10000} \times (T_A - 25) + \frac{TCI_{OE}}{1000 \times I_{PN}} \times 100 \times (T_A - 25)\right)$.

Electrical data HMSR 8-SMS

At T_A = 25 °C, U_C = +5, R_L = 10 kΩ unless otherwise noted (see Min, Max, typ. definition paragraph in page 10).

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal RMS current	I_{PN}	A		8		
Primary current, measuring range	I_{PM}	A	−20		20	
Supply voltage [1]	U_C	V	4.5	5	5.5	
Current consumption	I_C	mA		20	26	
Reference voltage (output)	V_{ref}	V	2.48	2.5	2.52	Internal reference
Reference voltage (input)	V_{ref}	V	0.5		2.6	External reference
Output voltage range @ I_{PM}	$V_{out} - V_{ref}$	V	−2		2	
V_{ref} output resistance	R_{ref}	Ω	120	200	333	
V_{out} output resistance	R_{out}	Ω		2	5	
Capacity loading	C_L	nF	0		6	
Electrical offset voltage @ I_P = 0	V_{OE}	mV	−5		5	$V_{out} - V_{ref}$ @ V_{ref} = 2.5 V
Electrical offset current, referred to primary	I_{OE}	mA	−50		50	
Temperature coefficient of V_{ref}	TCV_{ref}	ppm/K	−150		150	−40 °C … 105 °C
Temperature coefficient of V_{OE}	TCV_{OE}	mV/K	−0.075		0.075	−40 °C … 105 °C
Temperature coefficient of I_{OE}	TCI_{OE}	mA/K	−0.8		0.8	−40 °C … 105 °C
Theoretical sensitivity	G_{th}	mV/A		100		800 mV @ I_{PN}
Sensitivity error	ε_G	%	−0.75		0.75	Factory adjustment
Temperature coefficient of G	TCG	ppm/K	−200		200	−40 °C … 105 °C
Linearity error 0 ... I_{PN}	ε_L	% of I_{PN}	−0.75		0.75	
Linearity error 0 ... I_{PM}	ε_L	% of I_{PM}	−0.5		0.5	
Magnetic offset current (@ 10 × I_{PN}) referred to primary	I_{OM}	A	TBD		TBD	
Output RMS noise voltage spectral density 100 Hz… 100 kHz	e_{no}	µV/√Hz			TBD	NBW = 1 kHz ... 100 kHz
Output RMS noise voltage DC … 10 kHz DC … 100 kHz DC … 10 MHz	V_{no}	mVpp		TBD TBD TBD		
Reaction time @ 10 % of I_{PN}	t_{ra}	µs			2	TBD
Step response time to 90 % of I_{PN}	t_r	µs			2.1	TBD
Frequency bandwidth (−3 dB)	BW	kHz		300		TBD
Internal overcurrent detection (OCD) threshold	$I_{I\,OCD}$	A		2.93 × I_{PN}		Factory setting EEPROM
Internal OCD threshold accuracy	$X_{I\,OCD}$	%	−10		10	
Internal OCD output on resistance	$R_{on\,I\,OCD}$	Ω	70	95	100	open drain output, active low
Internal OCD output hold time	$t_{hold\,I\,OCD}$	µs	7	10	14	
Internal OCD response time	$t_{r\,I\,OCD}$	µs	1.4		2.1	2 signal peaks detected
Accuracy @ I_{PN}	X	% of I_{PN}	−1.5		1.5	
Accuracy @ I_{PN} @ T_A = +85 °C	X	% of I_{PN}	−3.26		3.26	See formula note [2]
Accuracy @ I_{PN} @ T_A = +105 °C	X	% of I_{PN}	−3.85		3.85	See formula note [2]
Accuracy @ I_{PN} @ T_A = +125 °C	X	% of I_{PN}	−4.44		4.44	See formula note [2]

Notes: [1] 3.3 V SP version available

[2] Accuracy @ T_A (% of I_{PN}) = $X + \left(\frac{TCG}{10000} \times (T_A - 25) + \frac{TCI_{OE}}{1000 \times I_{PN}} \times 100 \times (T_A - 25)\right)$.

Electrical data HMSR 10-SMS

At T_A = 25 °C, U_C = +5, R_L = 10 kΩ unless otherwise noted (see Min, Max, typ. definition paragraph in page 10).

Parameter	Symbol	Unit	Min	Typ	Max	Comment
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		20	26	
Reference voltage (output)	V_{ref}	V	2.48	2.5	2.52	Internal reference
Reference voltage (input)	V_{ref}	V	0.5		2.6	External reference
Output voltage range @ I_{PM}	$V_{out} - V_{ref}$	V	−2		2	
V_{ref} output resistance	R_{ref}	Ω	120	200	333	
V_{out} output resistance	R_{out}	Ω		2	5	
Capacity loading	C_L	nF	0		6	
Electrical offset voltage @ I_P = 0	V_{OE}	mV	−5		5	$V_{out} - V_{ref}$ @ V_{ref} = 2.5 V
Electrical offset current, referred to primary	I_{OE}	mA	−62.5		62.5	
Temperature coefficient of V_{ref}	TCV_{ref}	ppm/K	−180		180	−40 °C … 105 °C
Temperature coefficient of V_{OE}	TCV_{OE}	mV/K	−0.075		0.075	−40 °C … 105 °C
Temperature coefficient of I_{OE}	TCI_{OE}	mA/K	−0.9		0.9	−40 °C … 105 °C
Theoretical sensitivity	G_{th}	mV/A		80		800 mV @ I_{PN}
Sensitivity error	ε_G	%	−0.75		0.75	Factory adjustment
Temperature coefficient of G	TCG	ppm/K	−200		200	−40 °C … 105 °C
Linearity error 0 ... I_{PN}	ε_L	% of I_{PN}	−0.5		0.5	
Linearity error 0 ... I_{PM}	ε_L	% of I_{PM}	−0.5		0.5	
Magnetic offset current (@ 10 × I_{PN}) referred to primary	I_{OM}	A	TBD		TBD	
Output RMS noise voltage spectral density 100 Hz… 100 kHz	e_{no}	µV/√Hz			TBD	NBW = 1 kHz ... 100 kHz
Output RMS noise voltage DC … 10 kHz DC … 100 kHz DC … 10 MHz	V_{no}	mVpp		 TBD TBD TBD		
Reaction time @ 10 % of I_{PN}	t_{ra}	µs			2	TBD
Step response time to 90 % of I_{PN}	t_r	µs			2.1	TBD
Frequency bandwidth (−3 dB)	BW	kHz		300		TBD
Internal overcurrent detection (OCD) threshold	$I_{I\,OCD}$	A		2.93 × I_{PN}		Factory setting EEPROM
Internal OCD threshold accuracy	$X_{I\,OCD}$	%	−10		10	
Internal OCD output on resistance	$R_{on\,I\,OCD}$	Ω	70	95	100	open drain output, active low
Internal OCD output hold time	$t_{hold\,I\,OCD}$	µs	7	10	14	
Internal OCD response time	$t_{r\,I\,OCD}$	µs	1.4		2.1	2 signal peaks detected
Accuracy @ I_{PN}	X	% of I_{PN}	−1.25		1.25	
Accuracy @ I_{PN} @ T_A = +85 °C	X	% of I_{PN}	−3.01		3.01	See formula note [2]
Accuracy @ I_{PN} @ T_A = +105 °C	X	% of I_{PN}	−3.60.		3.60	See formula note [2]
Accuracy @ I_{PN} @ T_A = +125 °C	X	% of I_{PN}	−4.19		4.19	See formula note [2]

Notes: [1] 3.3 V SP version available

[2] Accuracy @ T_A (% of I_{PN}) = $X + \left(\frac{TCG}{10000} \times (T_A - 25) + \frac{TCI_{OE}}{1000 \times I_{PN}} \times 100 \times (T_A - 25)\right)$.

Electrical data HMSR 20-SMS

At T_A = 25 °C, U_C = +5, R_L = 10 kΩ unless otherwise noted (see Min, Max, typ. definition paragraph in page 10).

Parameter	Symbol	Unit	Min	Typ	Max	Comment
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		20	26	
Reference voltage (output)	V_{ref}	V	2.48	2.5	2.52	Internal reference
Reference voltage (input)	V_{ref}	V	0.5		2.6	External reference
Output voltage range @ I_{PM}	$V_{out} - V_{ref}$	V	−2		2	
V_{ref} output resistance	R_{ref}	Ω	120	200	333	
V_{out} output resistance	R_{out}	Ω		2	5	
Capacity loading	C_L	nF	0		6	
Electrical offset voltage @ $I_P = 0$	V_{OE}	mV	−5		5	$V_{out} - V_{ref}$ @ V_{ref} = 2.5 V
Electrical offset current, referred to primary	I_{OE}	mA	−125		125	
Temperature coefficient of V_{ref}	TCV_{ref}	ppm/K	−180		180	−40 °C … 105 °C
Temperature coefficient of V_{OE}	TCV_{OE}	mV/K	−0.075		0.075	−40 °C … 105 °C
Temperature coefficient of I_{OE}	TCI_{OE}	mA/K	−1.9		1.9	−40 °C … 105 °C
Theoretical sensitivity	G_{th}	mV/A		40		800 mV @ I_{PN}
Sensitivity error	ε_G	%	−0.75		0.75	Factory adjustment
Temperature coefficient of G	TCG	ppm/K	−200		200	−40 °C … 105 °C
Linearity error 0 ... I_{PN}	ε_L	% of I_{PN}	−0.5		0.5	
Linearity error 0 ... I_{PM}	ε_L	% of I_{PM}	−0.5		0.5	
Magnetic offset current (@ 10 × I_{PN}) referred to primary	I_{OM}	A	TBD		TBD	
Output RMS noise voltage spectral density 100 Hz… 100 kHz	e_{no}	µV/√Hz			TBD	NBW = 1 kHz ... 100 kHz
Output RMS noise voltage DC … 10 kHz DC … 100 kHz DC … 10 MHz	V_{no}	mVpp		TBD TBD TBD		
Reaction time @ 10 % of I_{PN}	t_{ra}	µs			2	TBD
Step response time to 90 % of I_{PN}	t_r	µs			2.1	TBD
Frequency bandwidth (−3 dB)	BW	kHz		300		TBD
Internal overcurrent detection (OCD) threshold	$I_{I\,OCD}$	A		2.93 × I_{PN}		Factory setting EEPROM
Internal OCD threshold accuracy	$X_{I\,OCD}$	%	−10		10	
Internal OCD output on resistance	$R_{on\,I\,OCD}$	Ω	70	95	100	open drain output, active low
Internal OCD output hold time	$t_{hold\,I\,OCD}$	µs	7	10	14	
Internal OCD response time	$t_{r\,I\,OCD}$	µs	1.4		2.1	2 signal peaks detected
Accuracy @ I_{PN}	X	% of I_{PN}	−1.25		1.25	
Accuracy @ I_{PN} @ T_A = +85 °C	X	% of I_{PN}	−3.01		3.01	See formula note [2]
Accuracy @ I_{PN} @ T_A = +105 °C	X	% of I_{PN}	−3.60.		3.60	See formula note [2]
Accuracy @ I_{PN} @ T_A = +125 °C	X	% of I_{PN}	−4.19		4.19	See formula note [2]

Notes: [1] 3.3 V SP version available

[2] Accuracy @ T_A (% of I_{PN}) = $X + \left(\frac{TCG}{10000} \times (T_A - 25) + \frac{TCI_{OE}}{1000 \times I_{PN}} \times 100 \times (T_A - 25)\right)$.

Electrical data HMSR 30-SMS

At T_A = 25 °C, U_C = +5, R_L = 10 kΩ unless otherwise noted (see Min, Max, typ. definition paragraph in page 10).

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal RMS current	I_{PN}	A		30		
Primary current, measuring range	I_{PM}	A	−75		75	
Supply voltage [1]	U_C	V	4.5	5	5.5	
Current consumption	I_C	mA		20	26	
Reference voltage (output)	V_{ref}	V	2.48	2.5	2.52	Internal reference
Reference voltage (input)	V_{ref}	V	0.5		2.6	External reference
Output voltage range @ I_{PM}	$V_{out} - V_{ref}$	V	−2		2	
V_{ref} output resistance	R_{ref}	Ω	120	200	333	
V_{out} output resistance	R_{out}	Ω		2	5	
Capacity loading	C_L	nF	0		6	
Electrical offset voltage @ $I_P = 0$	V_{OE}	mV	−5		5	$V_{out} - V_{ref}$ @ V_{ref} = 2.5 V
Electrical offset current, referred to primary	I_{OE}	mA	−187.5		187.5	
Temperature coefficient of V_{ref}	TCV_{ref}	ppm/K	−180		180	−40 °C … 105 °C
Temperature coefficient of V_{OE}	TCV_{OE}	mV/K	−0.075		0.075	−40 °C … 105 °C
Temperature coefficient of I_{OE}	TCI_{OE}	mA/K	−2.8		2.8	−40 °C … 105 °C
Theoretical sensitivity	G_{th}	mV/A		26.67		800 mV @ I_{PN}
Sensitivity error	ε_G	%	−0.75		0.75	Factory adjustment
Temperature coefficient of G	TCG	ppm/K	−200		200	−40 °C … 105 °C
Linearity error 0 ... I_{PN}	ε_L	% of I_{PN}	−0.5		0.5	
Linearity error 0 ... I_{PM}	ε_L	% of I_{PM}	−0.5		0.5	
Magnetic offset current (@ 10 × I_{PN}) referred to primary	I_{OM}	A	TBD		TBD	
Output RMS noise voltage spectral density 100 Hz… 100 kHz	e_{no}	µV/√Hz			TBD	NBW = 1 kHz ... 100 kHz
Output RMS noise voltage DC … 10 kHz DC … 100 kHz DC … 10 MHz	V_{no}	mVpp		TBD TBD TBD		
Reaction time @ 10 % of I_{PN}	t_{ra}	µs			2	TBD
Step response time to 90 % of I_{PN}	t_r	µs			2.1	TBD
Frequency bandwidth (−3 dB)	BW	kHz		300		TBD
Internal overcurrent detection (OCD) threshold	$I_{I\,OCD}$	A		2.93 × I_{PN}		Factory setting EEPROM
Internal OCD threshold accuracy	$X_{I\,OCD}$	%	−10		10	
Internal OCD output on resistance	$R_{on\,I\,OCD}$	Ω	70	95	100	open drain output, active low
Internal OCD output hold time	$t_{hold\,I\,OCD}$	µs	7	10	14	
Internal OCD response time	$t_{r\,I\,OCD}$	µs	1.4		2.1	2 signal peaks detected
Accuracy @ I_{PN}	X	% of I_{PN}	−1.25		1.25	
Accuracy @ I_{PN} @ T_A = +85 °C	X	% of I_{PN}	−3.01		3.01	See formula note [2]
Accuracy @ I_{PN} @ T_A = +105 °C	X	% of I_{PN}	−3.60.		3.60	See formula note [2]
Accuracy @ I_{PN} @ T_A = +125 °C	X	% of I_{PN}	−4.19		4.19	See formula note [2]

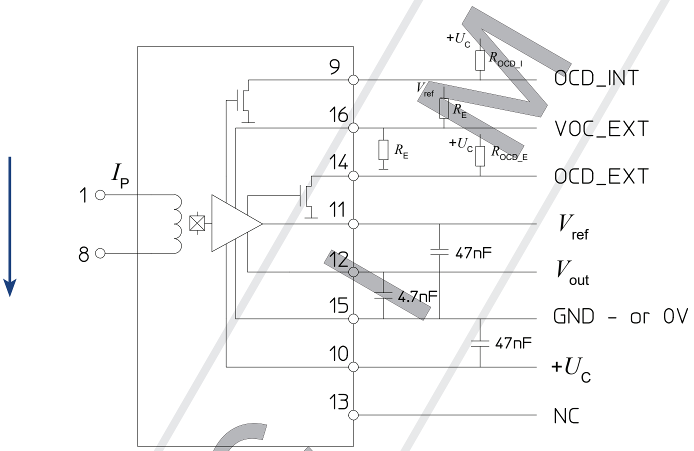
<u>Notes</u>: [1] 3.3 V SP version available

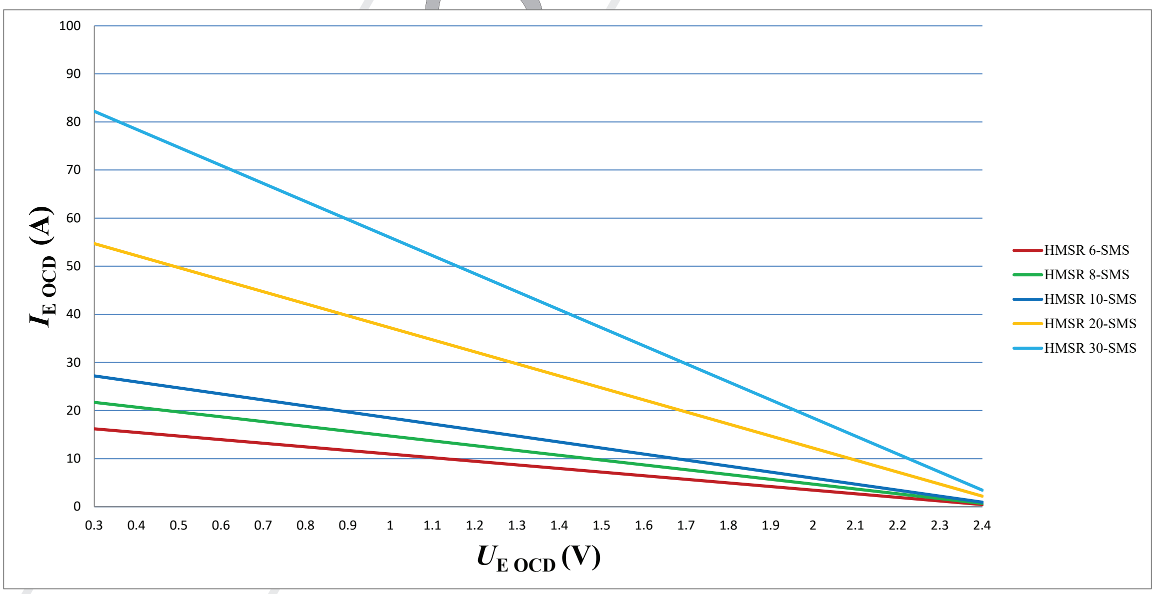
[2] Accuracy @ T_A (% of I_{PN}) = $X + \left(\frac{TCG}{10000} \times (T_A - 25) + \frac{TCI_{OE}}{1000 \times I_{PN}} \times 100 \times (T_A - 25)\right)$.

External overcurrent detection

<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Symbol</th><th rowspan="2">Unit</th><th colspan="3">Specification</th><th rowspan="2">Conditions</th></tr>
<tr><th>Min</th><th>Typical</th><th>Max</th></tr>
<tr><td>External OCD voltage</td><td>$U_{\text{E OCD}}$</td><td>V</td><td>0.3</td><td></td><td>2</td><td></td></tr>
<tr><td>External OCD output on resistance to ground</td><td>$R_{\text{on E OCD}}$</td><td>Ω</td><td>35</td><td>200</td><td>300</td><td></td></tr>
<tr><td>External OCD response time</td><td>$t_{\text{r E OCD}}$</td><td>µs</td><td></td><td>10</td><td></td><td>To be added to the sensor response time</td></tr>
<tr><td>External OCD output hold time</td><td>$t_{\text{hold E OCD}}$</td><td>µs</td><td></td><td>10</td><td></td><td></td></tr>
<tr><td>External OCD threshold error</td><td>$\varepsilon_{\text{E OCD}}$</td><td>% of $I_{\text{P N}}$</td><td></td><td>±5</td><td></td><td>Switch point error between V_{out} and $U_{\text{E OCD}}$</td></tr>
</table>

$I_{\text{E OCD}}$: External overcurrent detection (OCD threshold)





$$I_{\text{E OCD}} = \frac{(V_{\text{ref}} - U_{\text{E OCD}})}{G_{\text{Th}}} \times 1000 \quad U_{\text{E OCD}} = \frac{R_{\text{E}}}{R_{\text{E}} + R_{\text{ref}}} \times V_{\text{ref}}$$

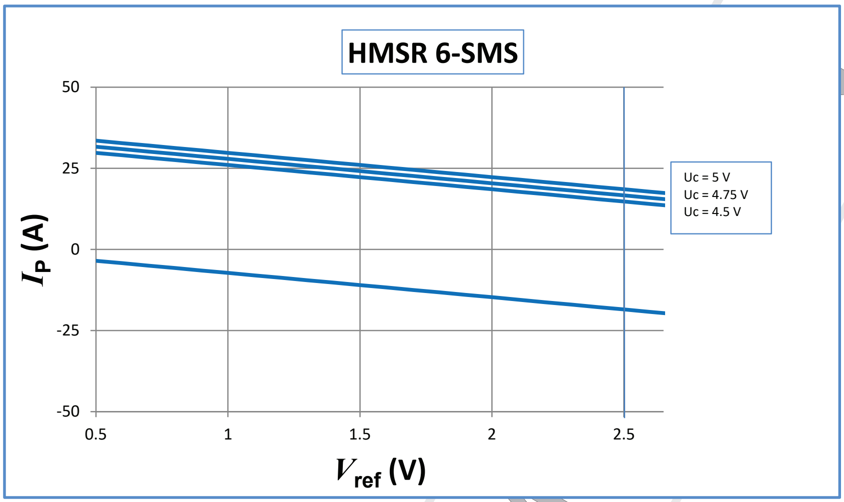
Packaging

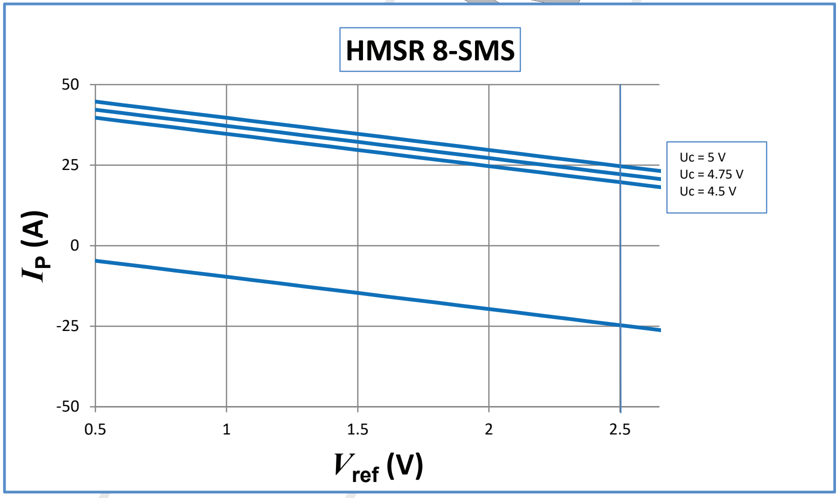
To be defined.

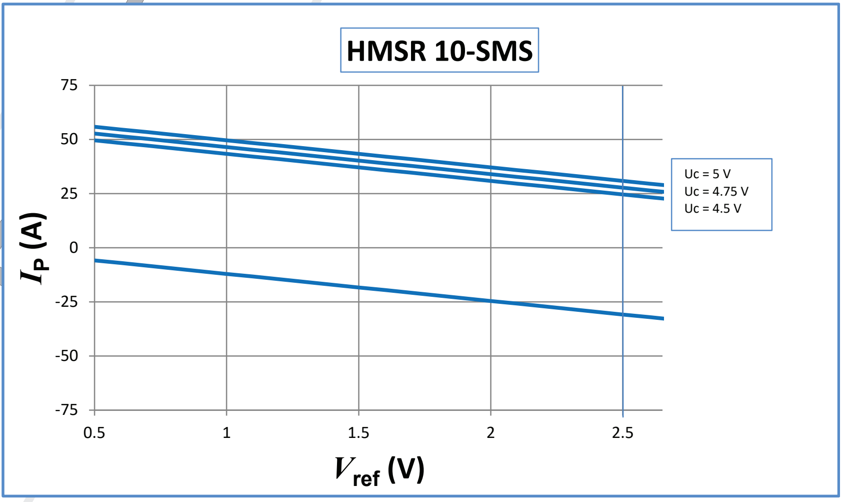
Definition of typical, minimum and maximum values

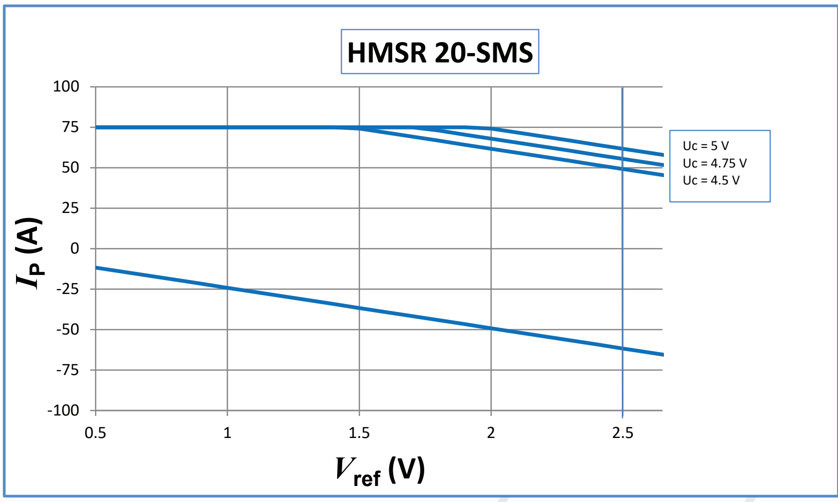
Minimum and maximum values for specified limiting and safety conditions have to be understood as such as well as values shown in “typical” graphs.
On the other hand, measured values are part of a statistical distribution that can be specified by an interval with upper and lower limits and a probability for measured values to lie within this interval.
Unless otherwise stated (e.g. “100 % tested”), the LEM definition for such intervals designated with “min” and “max” is that the probability for values of samples to lie in this interval is 99.73 %.
For a normal (Gaussian) distribution, this corresponds to an interval between −3 sigma and +3 sigma. If “typical” values are not obviously mean or average values, those values are defined to delimit intervals with a probability of 68.27 %, corresponding to an interval between −sigma and +sigma for a normal distribution.
Typical, maximal and minimal values are determined during the initial characterization of the product.

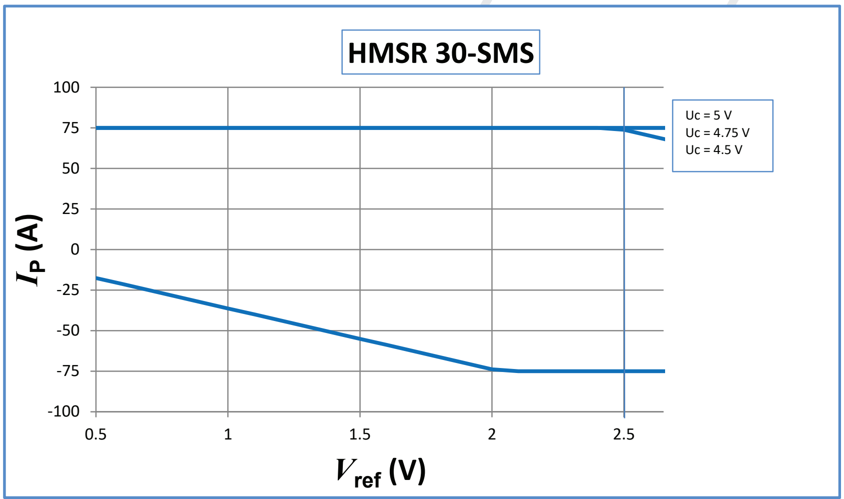
HMSR-SMS series, measuring range versus external reference voltage



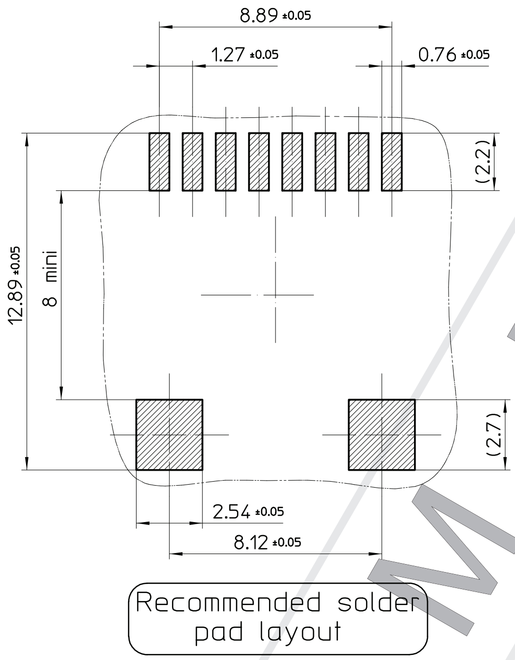





HMSR 20-SMS
100
75
50
25
0
-25
-50
-75
-100
0.5
1
1.5
2
2.5
I_P (A)
V_{ref} (V)
Uc = 5 V
Uc = 4.75 V
Uc = 4.5 V


HMSR 30-SMS
100
75
50
25
0
-25
-50
-75
-100
0.5
1
1.5
2
2.5
I_P (A)
V_{ref} (V)
Uc = 5 V
Uc = 4.75 V
Uc = 4.5 V

HMSR-SMS series, PCB footprint (in mm)



	d_{Cl} (mm)	d_{Cp} (mm)
A-B	8	8

Assembly on PCB

- Wave soldering profile — maximum 260 °C for 10 s
  No clean process only.

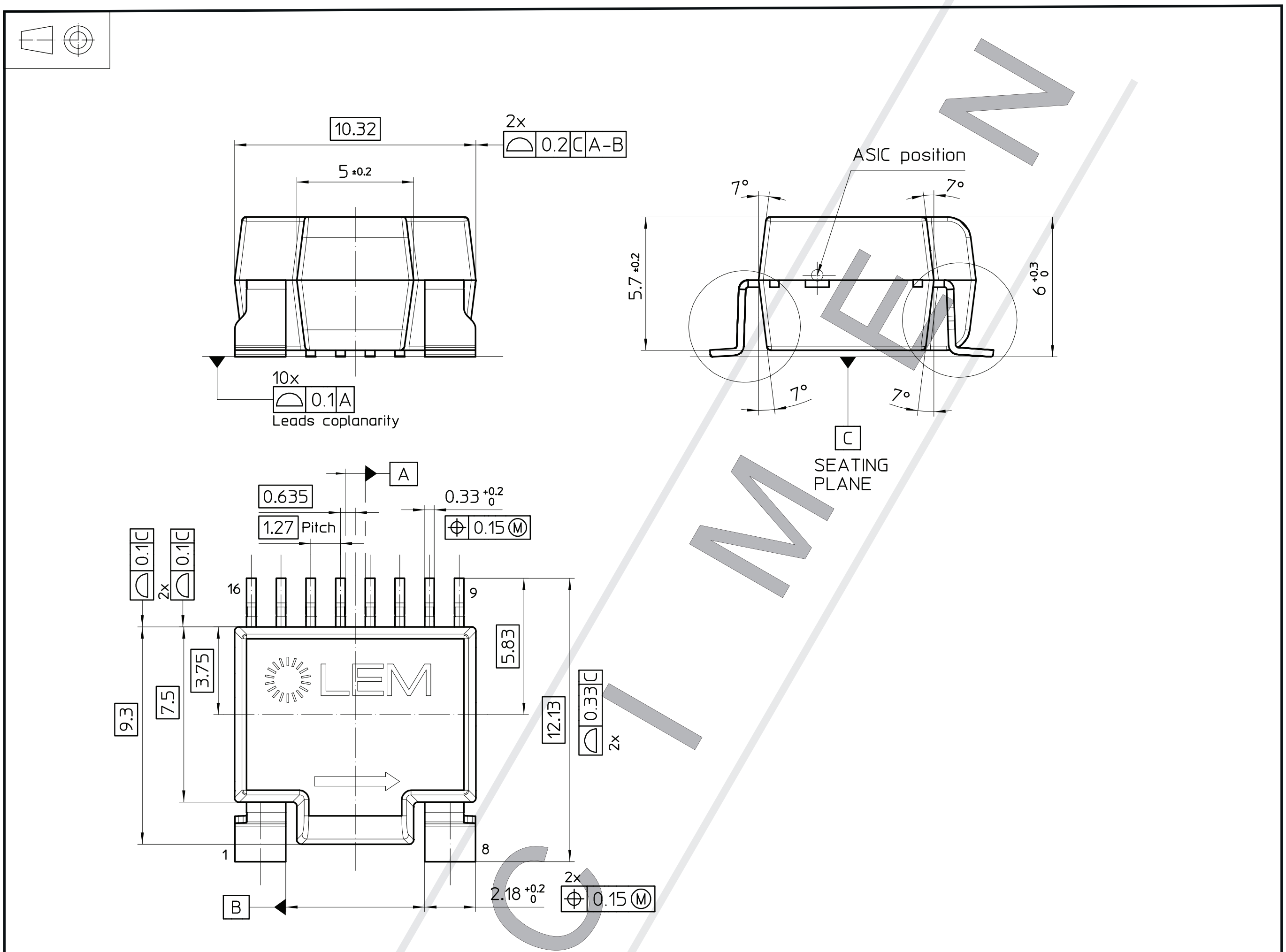
Safety

This transducer must be used in limited-energy secondary circuits according to IEC 61010-1.

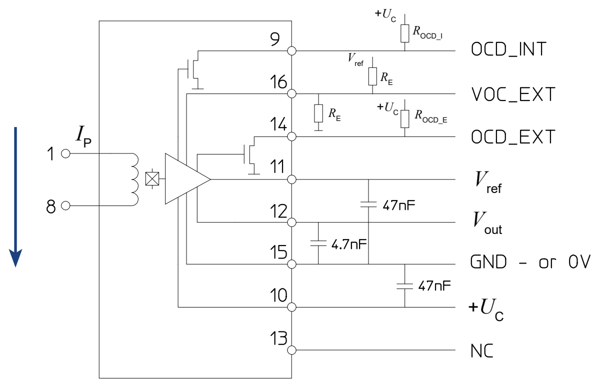
This transducer must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the manufacturer's operating instructions.

Caution, risk of electrical shock
When operating the transducer, certain parts of the module can carry hazardous voltage (e.g. primary busbar, power supply). Ignoring this warning can lead to injury and/or cause serious damage.
This transducer is a build-in device, whose conducting parts must be inaccessible after installation.
A protective housing or additional shield could be used. Main supply must be able to be disconnected.

Dimensions (in mm. General linear tolerance ±0.15 mm)



Connection



Remarks

- V_{out} is positive with respect to V_{ref} when positive I_P flows in direction of the arrow shown on the drawing above
- Installation of the transducer must be done unless otherwise specified on the datasheet, according to LEM Transducer Generic Mounting Rules. Please refer to LEM document N°ANE120504 available on our Web site: **Products/Product Documentation.**