Integrated Current Sensor GXS Series (Version A) Industrial Only

I_{PM} **From 5 to 60 A**

Version A – Industrial Grade Only Description

The GXS Series is a LEM integrated current transducer solution designed to measure AC and DC current in industrial applications. The sensor can reject an external field coming from a noisy environment.Innovative isolation technology and signal conditioning design can meet high isolation levels while sensing the current flowing through the primary conductor. The primary conductor (pins 1 and 4) has a very low electrical resistance of 1.2 mΩ(typical), which enables excellent performance at low power losses. The GXS is capable of measuring currents from 5 to 60A over a wide temperature range. The galvanic isolation between the primary and secondary eliminates the need for any additional insulation, reducing the total footprint and the cost of the system.

Note on Version Q – Automotive Grade

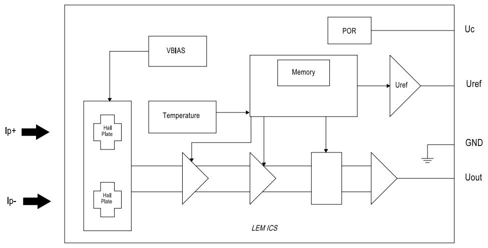
The Version Q of the GXS Series will be dedicated to automotive applications, with AEC-Q100 qualification and specifications tailored to meet automotive sector requirements.

Features & Advantages

- Open loop multi-range current sensor: 5~60 A
- Low electrical resistance 1.2 mΩ
- Supply voltage :5 V or 3.3 V
- Ratiometric output & Fixed output
- High bandwidth: 400 kHz
- 1.5us response time
- Galvanic separation between primary and secondary with 4mm of dCI of and 4mm of dCp .
- Withstand isolation voltage (VISO): 3000Vrms
- Working Voltage for Basic Isolation: 600Vdc/424Vrms
- CMTI > 100V/ns
- CTI(I)
- Working Temperature: -40°C ... 125°C
- UL62368/EN62368 safety certification
- SOIC8 Package
- ROHS
- Maximum surge isolation withstands voltage (VIOSM): 6 kV.

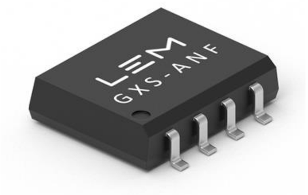
Typical Applications

- Photovoltaic System
- Servo and Drive
- Automation
- Industrial power supply
- Motor control
- DCDC
- OBC/DC-DC/PTC Heater
- Charging pile
- Power distribution.



Product MOQ

GXS-XXX: 2500pcs/Reel.



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Main Order Information (Recommended the following device)

Part number	Full Scale Primary Current(A)	Nominal current(A)	Power Supply(V)	Sensitivity (mV/A)	Package
GXS ANF 5-2 30001A	5	2	3.3	264	SOIC 8L
GXS ANF 5-2 50101A	5	2	5	400	
GXS ANF 10-4 51101A	10	4	5	400	
GXS ANF 10-4 50101A	10	4	5	200	
GXS ANF 10-4 30101A	10	4	3.3	132	
GXS ANF 10-4 30001A	10	4	3.3	132	
GXS ANF 10-4 31101A	10	4	3.3	264	
GXS ANF 10-4 50001A	10	4	5	200	
GXS ANF 20-8 50101A	20	8	5	100	
GXS ANF 20-8 51101A	20	8	5	200	
GXS ANF 20-8 50001A	20	8	5	100	
GXS ANF 20-8 30101A	20	8	3.3	66	
GXS ANF 20-8 30001A	20	8	3.3	66	
GXS ANF 25-10 50001A	25	10	5	80	
GXS ANF 25-10 50101A	25	10	5	80	
GXS ANF 30-12 30101A	30	12	3.3	44	
GXS ANF 30-12 50101A	30	12	5	66.67	
GXS ANF 30-12 50001A	30	12	5	66.67	
GXS ANF 30-12 51101A	30	12	5	133.3	
GXS ANF 30-12 30001A	30	12	3.3	44	
GXS ANF 40-16 30101A	40	16	3.3	33	
GXS ANF 40-16 50101A	40	16	5	50	
GXS ANF 50-20 50001A	50	20	5	40	
GXS ANF 50-20 50101A	50	20	5	40	
GXS ANF 50-20 51001A	50	20	5	80	
GXS ANF 50-20 30101A	50	20	3.3	26.4	

For more information about LEM stock and lead time please contact us.

https://www.lem.com/en/form/contact-us?utm_source=lem&utm_medium=datasheet&utm_campaign=ds_...

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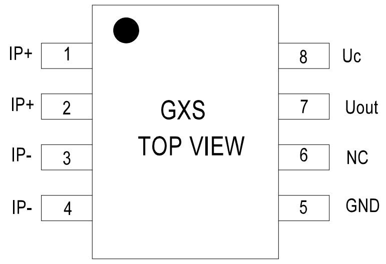
Released product name#	Current measurement range （A max）	Nominal current （A RMS） [1]	Supply voltage U_C	Ratiometricity	Temperature range
GXS ANF 50-20 50001A	50	20	5	N	−40 °C ... 125 °C
GXS ANF 25-10 50001A	25	10	5	N	
GXS ANF 20-8 51101A	20	8	5	Y	
GXS ANF 20-8 50101A	20	8	5	Y	
GXS ANF 10-4 50101A	10	4	5	Y	

Product Naming Rules:

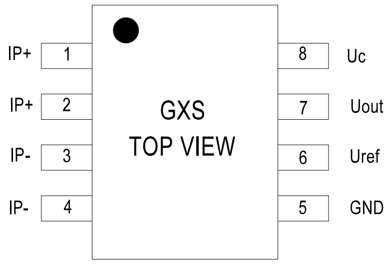
GXS (0) ANF (1) 20 (2) – 8 (3) 5 (4) 0 (5) 1 (6) 0 (7) 1 (8) A (9)

- (0) Integrated Current Sensor
- (1) ASIC Version
- (2) Full Scale Current (A)
- (3) Nominal Current (A)
- (4) Supply Voltage: 5 – VCC = 5 V; 3 – VCC = 3.3 V
- (5) Output Directionality: 0 – Bipolar output ; 1 – Unipolar output
- (6) Output mode: 0 – Fixed mode output; 1 – Ratiometric mode output
- (7) Trimming code
- (8) Operating Temperature Range: 0:-40~150 ℃； 1:-40~125 ℃
- (9) Product Grade： A for Industrial， Q for Automotive

Pin Configuration and Functions



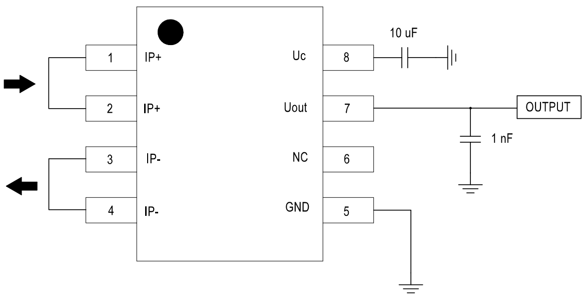
Ratiometric mode



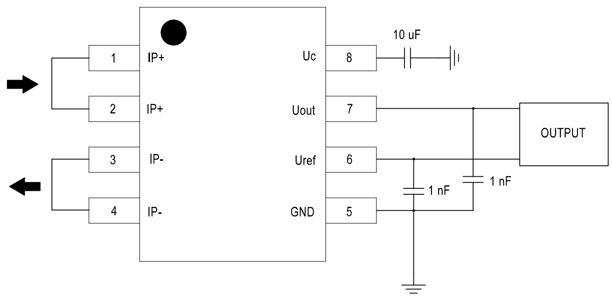
Fixed mode

Pin #	Name	Function
1-2	I_P+	Input of the primary current
3-4	I_P−	Output of the primary current
5	GND	Ground
6	U_{ref} / NC	R version: Not connected (this Pin can also connect to GND) F version: Reference Voltage
7	U_{out}	Output voltage
8	U_C	Supply voltage

Application circuit



Ratiometric mode application circuit



Fixed mode application circuit

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Absolute maximum ratings

Parameter	Symbol	Unit	Value
Maximum supply voltage @ 5 V, 25 °C	$U_{C\ max}$	V	6.5
Maximum junction temperature [1)]	$T_{J\ max}$	°C	150
Electrostatic discharge voltage (HBM - Human Body Model)	$U_{ESD\ HBM}$	kV	8
Electrostatic discharge voltage (CDM - Charged Device Model)	$U_{ESD\ CDM}$	kV	2
Maximum source / sink current		mA	±25

Note: Absolute maximum ratings apply at 25 °C unless otherwise noted.

Stresses above these ratings may cause permanent damage.

Exposure to absolute maximum ratings for extended periods may degrade reliability.

Environmental and mechanical characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Ambient operating temperature	T_A	°C	−40		125	
Ambient storage temperature	$T_{A\ st}$	°C	−40		150	
Resistance of the primary @ T_A = 25 °C	R_P	mΩ		1.2		

Insulation coordination

Parameter	Symbol	Unit	Value	Comment
RMS voltage for AC insulation test, 50 Hz, 1 min	U_{ISO}	V_{rms}	3000	According to IEC 62368-1 OSAT tested at 3.6kV for 1 second
Impulse withstand voltage 1.2/50 µs	U_{Surge}	kV	6	According to IEC 61000-4-5
Surge current	I_{Surge}	kA	4	According to IEC 61000-4-5
Clearance	d_{CI}	mm	4	Shortest distance through air
Creepage	d_{CP}	mm	4	Shortest path along device body
Comparative tracking index	CTI	V/ns	>=600	CTI I
Common-mode transient immunity	$CMTI$	V/ns	>100	The criterion for judging the failure is that the output peak is greater than 100mV and the duration is longer than 1us
Working voltage for basic isolation	V_{WVBI}	V_{rms}	424	Basic insulation according to IEC 62368-1
		V_{dc}	600	Basic insulation according to IEC 62368-1

Note: [1)] Done on LEM evaluation board PCB.

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GXS Common Characteries (T_A = −40 °C ... 125 °C, U_C = 5 V or 3.3 V, unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
DC supply voltage	U_C	V	3	3.3	3.6	U_C = 3.3 V
			4.5	5	5.5	U_C = 5 V
DC current consumption	I_C	mA	/	12	15	No load, U_C = 5 V, 'R' version
			/	7.5	8	No load, U_C = 3.3 V, 'R' version
Internal reference voltage @ I_P = 0 A	U_{ref}	V	2.49	2.5	2.51	U_C = 5 V, Bipolar&Fixed version, T_A = 25 °C
			1.64	1.65	1.66	U_C = 3.3 V, Bipolar&Fixed version, T_A = 25 °C
			0.49	0.5	0.51	U_C = 5 V, Unipolar&Fixed version, T_A = 25 °C
			0.32	0.33	0.34	U_C = 3.3 V, Unipolar&Fixed version, T_A = 25 °C
Ratiometric output zero current output voltage)	U_{OQ}	V	/	U_C / 2	/	Bipolar Ratiometric Version
			/	0.1 * U_C	/	Unipolar Ratiometric Version
Internal filter resistance [1]	R_{filter}	kΩ	/	4.7	/	
Power on time	T_{PO}	ms		1	/	Recommend customer to read output after 1ms power-on time, before 1ms internal OTP is loading, T_A = 25 °C
Output current		mA		1		
Output capacitance load output [1]	C_L	nF			10	
Output resistance load [1]	R_L	kΩ	10			
Internal output series resistance		Ω		5		
Output short current	I_{short}	mA		25		Short to U_C and short to GND, T_A = 25 °C
Output voltage range @ I_{PM}	U_S	V	0.1		U_C − 0.1	T_A = 25 °C, C_L = 1 nF, R_L = 10 kΩ, to U_C or GND
Common mode field rejection [1]	$CMFR$	dB		>40		
Power supply rejection ratio	$PSRR$	dB		−50		Only for F version, DC to 1 kHz, 100 mV pk-pk ripple around U_C = 5 V, I_P = 0 A
Rise time [1]	T_r	us		0.9		T_A = 25 °C, C_L = 1 nF, U_C = 3.3 V
Propagation delay [1]	T_P	us		0.9		T_A = 25 °C, C_L = 1 nF, U_C = 3.3 V
Response time [1]	T_{res}	us		1.5		T_A = 25 °C, C_L = 1 nF, U_C = 3.3 V
Frequency bandwidth (−3 dB)	BW	kHz		400		T_A = 25 °C, −3 dB bandwidth, C_L = 1 nF, U_C = 5 V, 30 A, R version
Non-linearity error 0 ... ± I_{PM}	E_{INL}	%	/	±0.2	/	Linearity error 0 ... ± I_{PM}
Noise density	N_d	uArms/√Hz		120		T_A = 25 °C, U_C = 5 V, C_L = 1 nF
				140		T_A = 25 °C, U_C = 3.3 V, C_L = 1 nF
Ratiometric output sensitivity error	S_{ERR}	%		0.75		
Ratiometric output offset error	U_{outOR}	%		0.1		'R' version, U_C = 4.85 V~ 5.15 V, T_A = 25 °C

Note: [1] Guaranteed by design.

Electrical data GXS ANF 10-4 51101A, (At T_A = −40 °C ... 125 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		4		
Primary current, measuring range	I_{PM}	A	−10		10	
Internal reference voltage @ IP = 0 A	$U_{I\,ref}$	V		$0.1{*}U_C$		I_{PR} = 0 A
Nominal sensitivity	S_N	mV/A		400		
Sensitivity error [1]	ε_S	%	−2		2	T_A = 25 °C ... 125 °C
				±2.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−15		15	T_A = 25 °C ... 125 °C
				±15		T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA	−37.5		37.5	
Total output error	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 125 °C
				±2.5		T_A = −40 °C ... 25 °C
Offset lifetime drift	U_{OE_drif}	mV	−12		12	After reliability test, T_A = 25 °C
Sensitivity error lifetime drift	E_{S_drift}	%	−2.3		2.3	After reliability test, T_A = 25 °C
Total output error over lifetime drift	E_{total_drift}	%	−2.8		2.8	After reliability test, T_A = 25 °C

Electrical data GXS ANF 10-4 50101A, (At T_A = −40 °C ... 125 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		4		
Primary current, measuring range	I_{PM}	A	−10		10	
Internal reference voltage @ IP = 0 A	$U_{I\,ref}$	V		$U_C / 2$		I_{PR} = 0 A
Nominal sensitivity	S_N	mV/A		200		
Sensitivity error [1]	ε_S	%	−2		2	T_A = 25 °C ... 125 °C
				±2.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−15		15	T_A = 25 °C ... 125 °C
				±15		T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA	−75		75	
Total output error	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 125 °C
				±2.5		T_A = −40 °C ... 25 °C
Offset lifetime drift	U_{OE_drif}	mV	−12		12	After reliability test, T_A = 25 °C
Sensitivity error lifetime drift	E_{S_drift}	%	−2.3		2.3	After reliability test, T_A = 25 °C
Total output error over lifetime drift	E_{total_drift}	%	−2.8		2.8	After reliability test, T_A = 25 °C

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Electrical data GXS ANF 10-4 50001A, (At T_A = −40 °C ... 125 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		4		
Primary current, measuring range	I_{PM}	A	−10		10	
Internal reference voltage @ IP = 0 A	$U_{I\,ref}$	V		2.5		I_{PR} = 0 A
Nominal sensitivity	S_N	mV/A		200		
Sensitivity error [1]	ε_S	%	−2		2	T_A = 25 °C ... 125 °C
				±2.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−15		15	T_A = 25 °C ... 125 °C
				±15		T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA	/		/	
Total output error	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 125 °C
				±2.5		T_A = −40 °C ... 25 °C
Offset lifetime drift	U_{OE_drif}	mV	−12		12	After reliability test, T_A = 25 °C
Sensitivity error lifetime drift	E_{S_drift}	%	−2.3		2.3	After reliability test, T_A = 25 °C
Total output error over lifetime drift	E_{total_drift}	%	−2.8		2.8	After reliability test, T_A = 25 °C

Electrical data GXS ANF 10-4 30001A, (At T_A = −40 °C ... 125 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		4		
Primary current, measuring range	I_{PM}	A	−10		10	
Internal reference voltage @ IP = 0 A	$U_{I\,ref}$	V		1.65		I_{PR} = 0 A
Nominal sensitivity	S_N	mV/A		132		
Sensitivity error [1]	ε_S	%	−2		2	T_A = 25 °C ... 125 °C
				±2.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−15		15	T_A = 25 °C ... 125 °C
				±15		T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA	−113.64		113.64	
Total output error	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 125 °C
				±2.5		T_A = −40 °C ... 25 °C
Offset lifetime drift	U_{OE_drif}	mV	−12		12	After reliability test, T_A = 25 °C
Sensitivity error lifetime drift	E_{S_drift}	%	−2.3		2.3	After reliability test, T_A = 25 °C
Total output error over lifetime drift	E_{total_drift}	%	−2.8		2.8	After reliability test, T_A = 25 °C

Electrical data GXS ANF 20-8 50101A, (At T_A = −40 °C ... 125 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	$I_{P N}$	A		8		
Primary current, measuring range	$I_{P M}$	A	−20		20	
Internal reference voltage @ IP = 0 A	$U_{I ref}$	V		U_C / 2		$I_{P R}$ = 0 A
Nominal sensitivity	S_N	mV/A		100		
Sensitivity error [1]	ε_S	%	−1.5		1.5	T_A = 25 °C ... 125 °C
				±1.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S L 25}$	% of $I_{P N}$	/	2	/	
Electrical offset voltage referred to primary	$U_{O E}$	mV	−10		10	T_A = 25 °C ... 125 °C
				±10		T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	$I_{O E}$	mA	−100		100	
Total output error	E_{total}	% of $I_{P N}$	−1.5		1.5	T_A = 25 °C ... 125 °C
				±1.5		T_A = −40 °C ... 25 °C
Offset lifetime drift	$U_{O E\_drif}$	mV	−12		12	After reliability test, T_A = 25 °C
Sensitivity error lifetime drift	E_{S_drift}	%	−2.3		2.3	After reliability test, T_A = 25 °C
Total output error over lifetime drift	E_{total_drift}	%	−2.8		2.8	After reliability test, T_A = 25 °C

Electrical data GXS ANF 20-8 51101A, (At T_A = −40 °C ... 125 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	$I_{P N}$	A		8		
Primary current, measuring range	$I_{P M}$	A	−20		20	
Internal reference voltage @ IP = 0 A	$U_{I ref}$	V		0.1 * U_C		$I_{P R}$ = 0 A
Nominal sensitivity	S_N	mV/A		200		
Sensitivity error [1]	ε_S	%	−1.5		1.5	T_A = 25 °C ... 125 °C
				±1.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S L 25}$	% of $I_{P N}$	/	2	/	
Electrical offset voltage referred to primary	$U_{O E}$	mV	−10		10	T_A = 25 °C ... 125 °C
				±10		T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	$I_{O E}$	mA	−50		50	
Total output error	E_{total}	% of $I_{P N}$	−1.5		1.5	T_A = 25 °C ... 125 °C
				±1.5		T_A = −40 °C ... 25 °C
Offset lifetime drift	$U_{O E\_drif}$	mV	−12		12	After reliability test, T_A = 25 °C
Sensitivity error lifetime drift	E_{S_drift}	%	−2.3		2.3	After reliability test, T_A = 25 °C
Total output error over lifetime drift	E_{total_drift}	%	−2.8		2.8	After reliability test, T_A = 25 °C

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Electrical data GXS ANF 20-8 30001A, (At T_A = −40 °C ... 125 °C, U_C = 3.3 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		8		
Primary current, measuring range	I_{PM}	A	−20		20	
Internal reference voltage @ IP = 0 A	$U_{I\,ref}$	V		1.65		I_{PR} = 0 A
Nominal sensitivity	S_N	mV/A		66		
Sensitivity error [1]	ε_S	%	−2		2	T_A = 25 °C ... 125 °C
				±2.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	T_A = 25 °C ... 125 °C
				±10		T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA	−151.52		151.52	
Total output error	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 125 °C
				±2.5		T_A = −40 °C ... 25 °C
Offset lifetime drift	U_{OE_drif}	mV	−12		12	After reliability test, T_A = 25 °C
Sensitivity error lifetime drift	E_{S_drift}	%	−2.3		2.3	After reliability test, T_A = 25 °C
Total output error over lifetime drift	E_{total_drift}	%	−2.8		2.8	After reliability test, T_A = 25 °C

Electrical data GXS ANF 25-10 50001A, (At T_A = −40 °C ... 125 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		10		
Primary current, measuring range	I_{PM}	A	−25		25	
Internal reference voltage @ IP = 0 A	$U_{I\,ref}$	V		2.5		I_{PR} = 0 A
Nominal sensitivity	S_N	mV/A		80		
Sensitivity error [1]	ε_S	%	−2		2	T_A = 25 °C ... 125 °C
				±2.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	T_A = 25 °C ... 125 °C
				±10		T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA	−125		125	
Total output error	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 125 °C
				±2.5		T_A = −40 °C ... 25 °C
Offset lifetime drift	U_{OE_drif}	mV	−12		12	After reliability test, T_A = 25 °C
Sensitivity error lifetime drift	E_{S_drift}	%	−2.3		2.3	After reliability test, T_A = 25 °C
Total output error over lifetime drift	E_{total_drift}	%	−2.8		2.8	After reliability test, T_A = 25 °C

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Electrical data GXS ANF 30-12 30101A, (At T_A = −40 °C ... 125 °C, U_C = 3.3 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		12		
Primary current, measuring range	I_{PM}	A	−30		30	
Internal reference voltage @ IP = 0 A	$U_{I\ ref}$	V		U_C / 2		I_{PR} = 0 A
Nominal sensitivity	S_N	mV/A		44		
Sensitivity error [1]	ε_S	%	−2.2		2.2	T_A = 25 °C ... 125 °C
				±3.2		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\ L\ 25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	T_A = 25 °C ... 125 °C
				±10		T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA	−227.27		227.27	
Total output error	E_{total}	% of I_{PN}	−2.5		2.5	T_A = 25 °C ... 125 °C
				±3.2		T_A = −40 °C ... 25 °C
Offset lifetime drift	U_{OE_drif}	mV	−12		12	After reliability test, T_A = 25 °C
Sensitivity error lifetime drift	$E_{S\ \_drift}$	%	−2.3		2.3	After reliability test, T_A = 25 °C
Total output error over lifetime drift	E_{total_drift}	%	−2.8		2.8	After reliability test, T_A = 25 °C

Electrical data GXS ANF 30-12 50101A, (At T_A = −40 °C ... 125 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		12		
Primary current, measuring range	I_{PM}	A	−30		30	
Internal reference voltage @ IP = 0 A	$U_{I\ ref}$	V		U_C / 2		I_{PR} = 0 A
Nominal sensitivity	S_N	mV/A		66.67		
Sensitivity error [1]	ε_S	%	−1.5		1.5	T_A = 25 °C ... 125 °C
				±1.8		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\ L\ 25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	T_A = 25 °C ... 125 °C
				±10		T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA	−150		150	
Total output error	E_{total}	% of I_{PN}	−1.5		1.5	T_A = 25 °C ... 125 °C
				±1.8		T_A = −40 °C ... 25 °C
Offset lifetime drift	U_{OE_drif}	mV	−12		12	After reliability test, T_A = 25 °C
Sensitivity error lifetime drift	$E_{S\ \_drift}$	%	−2.3		2.3	After reliability test, T_A = 25 °C
Total output error over lifetime drift	E_{total_drift}	%	−2.8		2.8	After reliability test, T_A = 25 °C

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Electrical data GXS ANF 40-16 50101A, (At T_A = −40 °C ... 125 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	$I_{P N}$	A		16		
Primary current, measuring range	$I_{P M}$	A	−40		40	
Internal reference voltage @ IP = 0 A	$U_{I ref}$	V		U_C / 2		$I_{P R}$ = 0 A
Nominal sensitivity	S_N	mV/A		50		
Sensitivity error [1]	ε_S	%	−2.2		2.2	T_A = 25 °C ... 125 °C
				±3.2		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S L 25}$	% of $I_{P N}$	/	2	/	
Electrical offset voltage referred to primary	$U_{O E}$	mV	−10		10	T_A = 25 °C ... 125 °C
				±10		T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	$I_{O E}$	mA	−200		200	
Total output error	E_{total}	% of $I_{P N}$	−2.5		2.5	T_A = 25 °C ... 125 °C
				±3.2		T_A = −40 °C ... 25 °C
Offset lifetime drift	$U_{O E\_drif}$	mV	−12		12	After reliability test, T_A = 25 °C
Sensitivity error lifetime drift	E_{S_drift}	%	−2.3		2.3	After reliability test, T_A = 25 °C
Total output error over lifetime drift	E_{total_drift}	%	−2.8		2.8	After reliability test, T_A = 25 °C

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Electrical data GXS ANF 50-20 50001A, (At T_A = −40 °C ... 125 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		20		
Primary current, measuring range	I_{PM}	A	−50		50	
Internal reference voltage @ IP = 0 A	$U_{I\,ref}$	V		2.5		I_{PR} = 0 A
Nominal sensitivity	S_N	mV/A		40		
Sensitivity error [1]	ε_S	%	−2.2		2.2	T_A = 25 °C ... 125 °C
				±3.2		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	T_A = 25 °C ... 125 °C
				±10		T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA	−250		250	
Total output error	E_{total}	% of I_{PN}	−2.5		2.5	T_A = 25 °C ... 125 °C
				±3.2		T_A = −40 °C ... 25 °C
Offset lifetime drift	U_{OE_drif}	mV	−12		12	After reliability test, T_A = 25 °C
Sensitivity error lifetime drift	E_{S_drift}	%	−2.3		2.3	After reliability test, T_A = 25 °C
Total output error over lifetime drift	E_{total_drift}	%	−2.8		2.8	After reliability test, T_A = 25 °C

Electrical data GXS ANF 50-20 50101A, (At T_A = −40 °C ... 125 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		20		
Primary current, measuring range	I_{PM}	A	−50		50	
Internal reference voltage @ IP = 0 A	$U_{I\,ref}$	V		U_C / 2		I_{PR} = 0 A
Nominal sensitivity	S_N	mV/A		40		
Sensitivity error [1]	ε_S	%	−2.2		2.2	T_A = 25 °C ... 125 °C
				±3.2		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	T_A = 25 °C ... 125 °C
				±10		T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA	−250		250	
Total output error	E_{total}	% of I_{PN}	−2.5		2.5	T_A = 25 °C ... 125 °C
				±3.2		T_A = −40 °C ... 25 °C
Offset lifetime drift	U_{OE_drif}	mV	−12		12	After reliability test, T_A = 25 °C
Sensitivity error lifetime drift	E_{S_drift}	%	−2.3		2.3	After reliability test, T_A = 25 °C
Total output error over lifetime drift	E_{total_drift}	%	−2.8		2.8	After reliability test, T_A = 25 °C

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.

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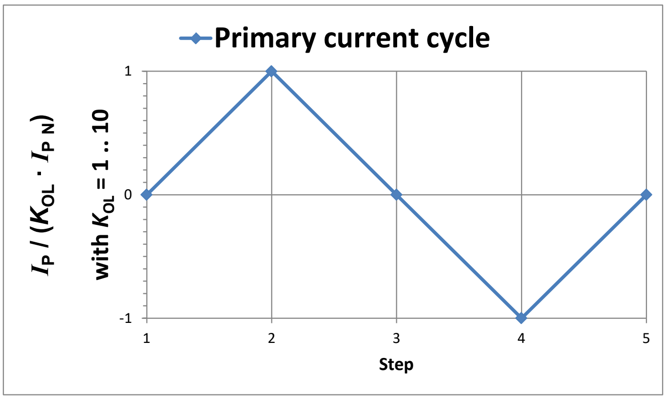
Performance parameters definition



K_{OL}: Overload factor

Figure 1: Current cycle used to measure electrical offset (transducer supplied)

Electrical offset referred to primary

Using the current cycle shown in figure 1, the electrical offset voltage U_{OE} is the residual output referred to primary when the input current is zero.

$$U_{OE} = \frac{U_{P(3)} + U_{P(5)}}{2}$$

The temperature variation U_{OT} of the electrical offset voltage U_{OE} is the variation of the electrical offset from 25 °C to the considered temperature.

$$U_{OT}(T) = U_{OE}(T) - U_{OE}(25\ °C)$$

Delay times

The delay time $t_{D\,10}$ @ 10 % and the delay time $t_{D\,90}$ @ 90 % with respect to the primary are shown in the next figure.
Both slightly depend on the primary current di/dt.
They are measured at nominal current.

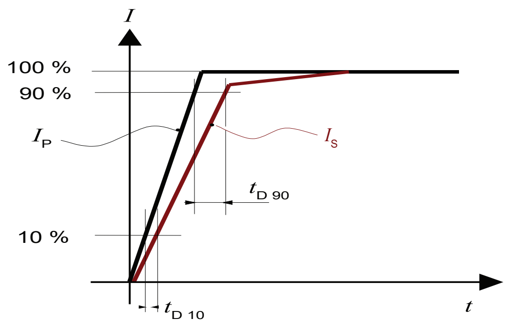


Figure 2: $t_{D\,10}$ (delay time @ 10 %) and $t_{D\,90}$ (delay time @ 90 %)

Total error referred to primary

The total error ε_{tot} is the error at $\pm I_{PN}$, relative to the rated value I_{PN}.
It includes all errors mentioned above

- the electrical offset I_{OE}
- the magnetic offset I_{OM}
- the sensitivity error ε_S
- the linearity error ε_L (to I_{PN}).

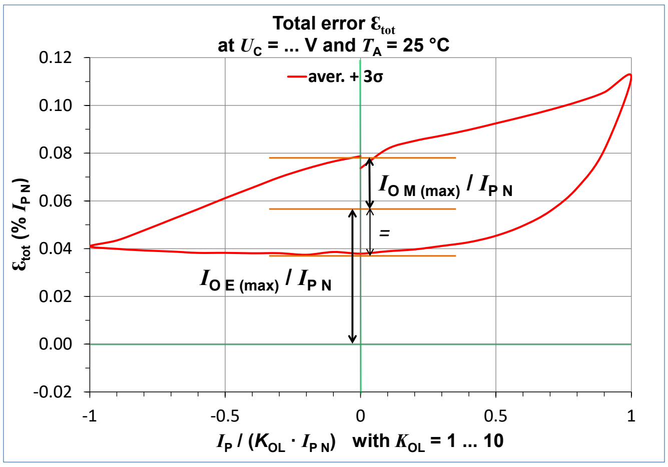
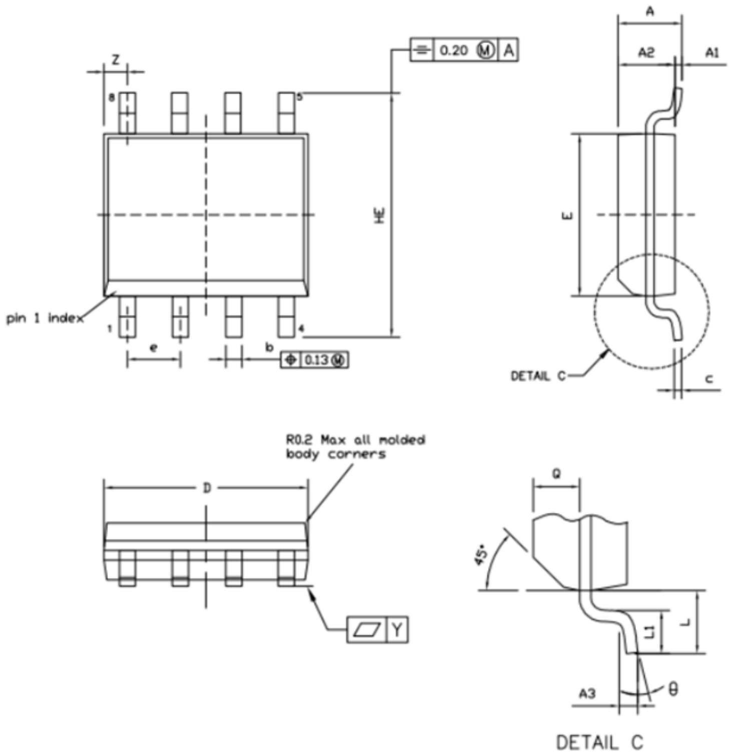


Figure 3: Total error ε_{tot}

Dimensions (in mm)



※ CONTROLLING DIMENSION : MM

SYMBOL	MILLIMETER		
	MIN.	NOM.	MAX.
A	---	---	1.75
A1	0.10	---	0.25
A2	1.25	1.35	1.45
b	0.33	0.38	0.49
c	0.19	0.20	0.25
D	4.80	4.90	5.00
E	3.80	3.90	4.00
Q	0.60	0.65	0.70
HE	5.80	6.00	6.20
e	1.27 BSC		
L	1.05 BSC		
L1	0.40	0.64	1.00
Y	---	0.10	---
Z	0.3	0.5	0.7
A3	0.25 BSC		
θ	0°	5°	8°

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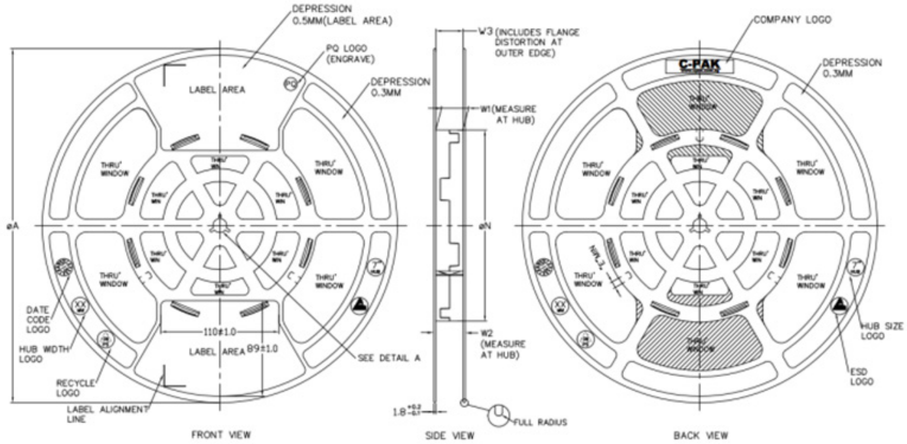
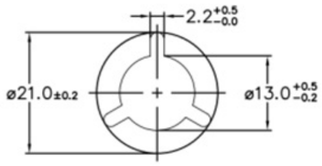
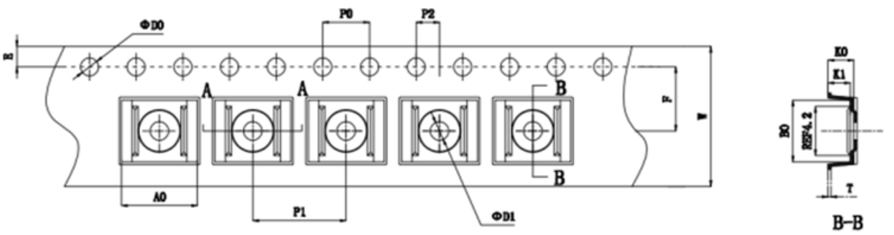
Tape and Reel (in mm)

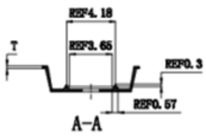




PRODUCT SPECIFICATION						
TAPE WIDTH	øA ±2.0	øN ±2.0	W1	W2 (MAX)	W3	E (MIN)
08MM	330	178	$8.4^{+1.5}_{-0.0}$	14.4	SHALL ACCOMMODATE TAPE WIDTH WITHOUT INTERFERENCE	5.5
12MM	330	178	$12.4^{+2.0}_{-0.0}$	18.4		5.5
16MM	330	178	$16.4^{+2.0}_{-0.0}$	22.4		5.5
24MM	330	178	$24.4^{+2.0}_{-0.0}$	30.4		5.5
32MM	330	178	$32.4^{+2.0}_{-0.0}$	38.4		5.5

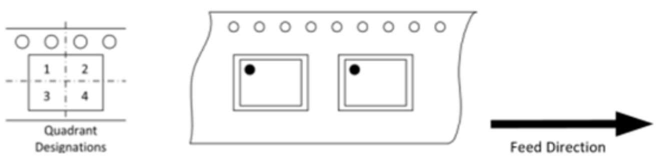
SURFACE RESISTIVITY			
LEGEND	SR RANGE	TYPE	COLOUR
A	BELOW 10^{12}	ANTISTATIC	ALL TYPES
B	10^{6} TO 10^{11}	STATIC DISSIPATIVE	BLACK ONLY
C	10^{5} & BELOW 10^{5}	CONDUCTIVE (GENERIC)	BLACK ONLY
E	10^{9} TO 10^{11}	ANTISTATIC (COATED)	ALL TYPES





Symbol	Spec (mm)
E	1.75±0.10
F	5.5±0.10
P2	2.00±0.10
D0	1.55±0.05
D1	1.6±0.10
P0	4.00±0.10
10P0	40.00±0.20

Symbol	Spec (mm)
W	12.00±0.30
P1	8.00±0.10
A0	6.50±0.10
B0	5.30±0.10
K0	2.20±0.10
K1	1.90±0.10
T	0.30±0.05



Safety

Caution

If the device is used in a way that is not specified by the manufacturer, the protection provided by the device may be compromised.
Always inspect the electronics unit and connecting cable before using this product and do not use it if damaged.
Mounting assembly shall guarantee the maximum primary conductor temperature, fulfill clearance and creepage distance, minimize electric and magnetic coupling, and unless otherwise specified can be mounted in any orientation.

Caution, risk of electrical shock

This transducer must be used in limited-energy secondary circuits SELV according to IEC 61010-1, in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the manufacturer's operating specifications.

Use caution during installation and use of this product; certain parts of the module can carry hazardous voltages and high currents (e.g. power supply, primary conductor).
Ignoring this warning can lead to injury and or/or cause serious damage.

This transducer is a build-in device, whose hazardous live parts must be inaccessible after installation.
This transducer must be mounted in a suitable end-enclosure.
Besides make sure to have a distance of minimum 30 mm between the primary terminals of the transducer and other neighboring components.

This transducer is a built-in device, not intended to be cleaned with any product. Nevertheless if the user must implement cleaning or washing process, validation of the cleaning program has to be done by himself.

ESD susceptibility
The product is susceptible to be damaged from an ESD event and the personnel should be grounded when handling it.

Do not dispose of this product as unsorted municipal waste. Contact a qualified recycler for disposal.
Although LEM applies utmost care to facilitate compliance of end products with applicable regulations during LEM product design, use of this part may need additional measures on the application side for compliance with regulations regarding EMC and protection against electric shock. Therefore LEM cannot be held liable for any potential hazards, damages, injuries or loss of life resulting from the use of this product.

Underwriters Laboratory Inc. recognized component

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