

# Hall Effect Current Sensors L32P\*\*\*S05BFS Series



### Features:

- Open Loop type
- Printed circuit board mounting
- Unipolar power supply
- Industrial temperature range
- Sulfur-proof as standard
- Bus bar version available for 50A & 100A models
- Insulated plastic case according to UL94V0

### Advantage:

- Excellent accuracy and linearity
- Wide nominal current range
- Low temperature drift
- Wide frequency bandwidth
- No insertion loss
- High Immunity To External Interference
- Optimised response time
- Current overload capability

## Specifications

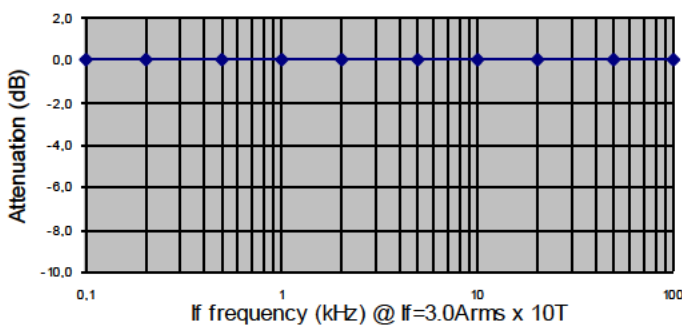
$T_A=25^{\circ}\text{C}$ ,  $V_{CC}=+5\text{V}$ ,  $R_L=10\text{k}\Omega$

Parameters	Symbol	L32P050S05BFS	L32P100S05BFS	L32P150S05BFS	L32P200S05BFS	L32P300S05BFS	L32P400S05BFS
Rated current	$I_f$	50A	100A	150A	200A	300A	400A
Maximum Current	$I_{fmax}$	$\pm 150\text{A}$	$\pm 300\text{A}$	$\pm 450\text{A}$	$\pm 600\text{A}$	$\geq \pm 600\text{AT}$	$\geq \pm 600\text{AT}$
Primary conductor		Aperture or Bus Bar		Aperture			
Output Voltage	$V_{OUT}$	$V_{REF} + 0.625\text{V} \pm 0.015\text{V} @ \pm I_f$					
Offset Voltage	$V_{OE}$	$V_{REF} \pm 0.025\text{V} @ I_f = 0\text{A}$					
Reference voltage	$V_{REF}$	$+2.5\text{V} \pm 0.020\text{V}$					
Output Linearity <sup>1</sup>	$\epsilon_L$	$\leq \pm 0.5\% @ 0\text{A}, 0.5 I_f, I_f$					
Power Supply	$V_{CC}$	$+ 5\text{V} \pm 5\%$					
Current Consumption	$I_C$	$\leq 15\text{mA}$					
Response Time <sup>2</sup>	$t_r$	$\leq 5\mu\text{s} (@ di/dt = \text{F.S.} / \mu\text{s})$					
Output Temperature Characteristic <sup>1</sup>	$\text{TCV}_{OUT}$	$\leq \pm 1.5\text{mV}/^{\circ}\text{C}$					
Offset Temperature Characteristic	$\text{TCV}_{OE}$	$\leq \pm 1.0\text{mV}/^{\circ}\text{C} @ I_f = 0\text{A}$	$\leq \pm 0.5\text{mV}/^{\circ}\text{C} @ I_f = 0\text{A}$	$\leq \pm 0.3\text{mV}/^{\circ}\text{C} @ I_f = 0\text{A}$			
Reference Temperature Characteristic	$\text{TCV}_{REF}$	$\leq \pm 0.012\% / ^{\circ}\text{C}$					
Hysteresis error	$V_{OH}$	$\leq 7.5\text{mV} (0\text{A} \leftrightarrow I_f)$	$\leq 5.0\text{mV} (0\text{A} \leftrightarrow I_f)$	$\leq 2.5\text{mV} (0\text{A} \leftrightarrow I_f)$			
Withstand Voltage	$V_d$	AC2500V for 1minute (sensing current 0.5mA), inside of aperture $\leftrightarrow$ terminal					
Insulation Resistance	$R_{IS}$	$> 500\text{M}\Omega (500\text{V DC})$ , inside of aperture $\leftrightarrow$ terminal					
Frequency Bandwidth <sup>3</sup>	$f$	DC .. 50kHz					
Operating Temperature	$T_A$	$-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$					
Storage Temperature	$T_S$	$-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$					

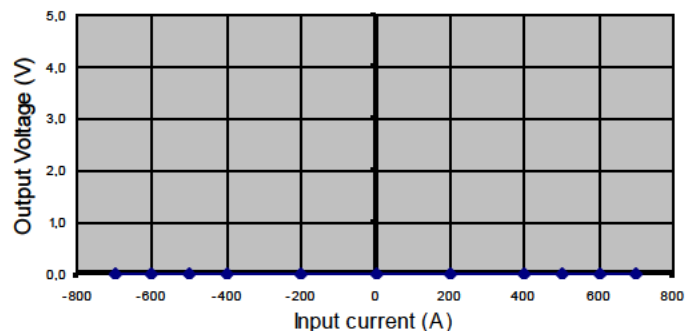
<sup>1</sup> Without offset — <sup>2</sup> Time between 10% input current full scale and 90% of sensor output full scale — <sup>3</sup> Small signal only to avoid excessive heating of magnetic core

## Electrical Performances

Frequency Characteristic data not yet available



Saturation Characteristic data not yet available





## Saturation Characteristics

L32P050S05(B)FS

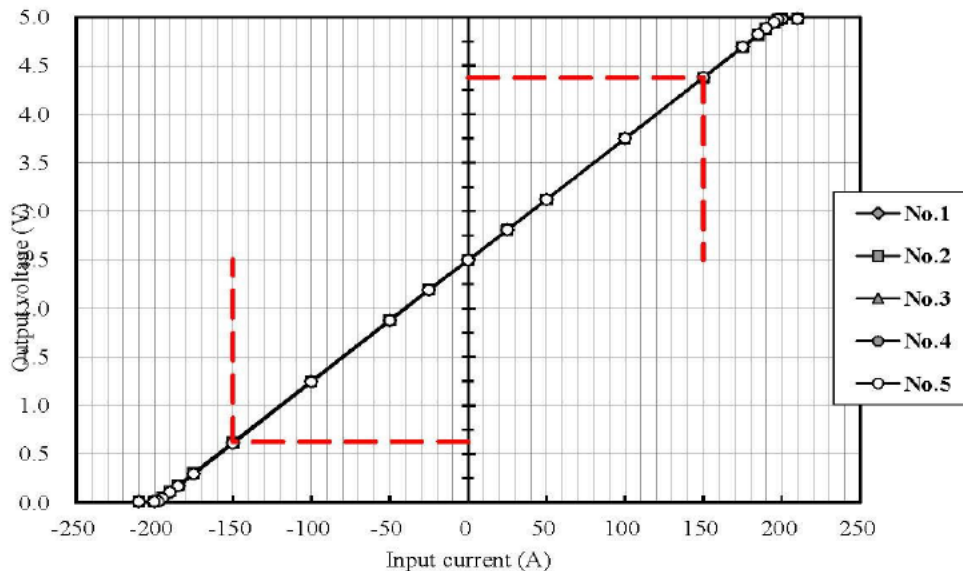
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### Saturation characteristic

at  $V_{cc}=+5V$ ,  $R_L=10k\Omega$ ,  $T_a=+25^\circ C$

Input current (A)	Output voltage (V)					Theoretical value (V)
	No.1	No.2	No.3	No.4	No.5	
210.0	4.981	4.981	4.981	4.981	4.981	5.000
200.0	4.980	4.981	4.980	4.980	4.980	4.995
197.5	4.975	4.975	4.971	4.978	4.976	4.964
195.0	4.945	4.945	4.940	4.947	4.945	4.933
190.0	4.882	4.882	4.877	4.884	4.882	4.870
185.0	4.819	4.819	4.814	4.821	4.819	4.808
175.0	4.693	4.693	4.689	4.695	4.693	4.683
150.0	4.378	4.378	4.374	4.380	4.378	4.370
100.0	3.749	3.750	3.746	3.749	3.748	3.745
50.0	3.120	3.122	3.120	3.119	3.120	3.120
25.0	2.807	2.809	2.807	2.805	2.807	2.808
0.0	2.495	2.499	2.498	2.494	2.495	2.495
-25.0	2.190	2.194	2.195	2.188	2.189	2.183
-50.0	1.874	1.878	1.880	1.871	1.873	1.870
-100.0	1.243	1.248	1.251	1.239	1.242	1.245
-150.0	0.612	0.617	0.621	0.606	0.610	0.620
-175.0	0.296	0.301	0.306	0.290	0.295	0.308
-185.0	0.169	0.175	0.180	0.163	0.168	0.183
-190.0	0.106	0.112	0.117	0.100	0.105	0.120
-195.0	0.043	0.049	0.054	0.037	0.042	0.058
-197.5	0.013	0.018	0.022	0.008	0.011	0.026
-200.0	0.008	0.008	0.008	0.008	0.008	0.000
-210.0	0.008	0.008	0.008	0.008	0.008	0.000

Saturation characteristic (Internal Reference)



## Frequency Characteristics

L32P150S05FS

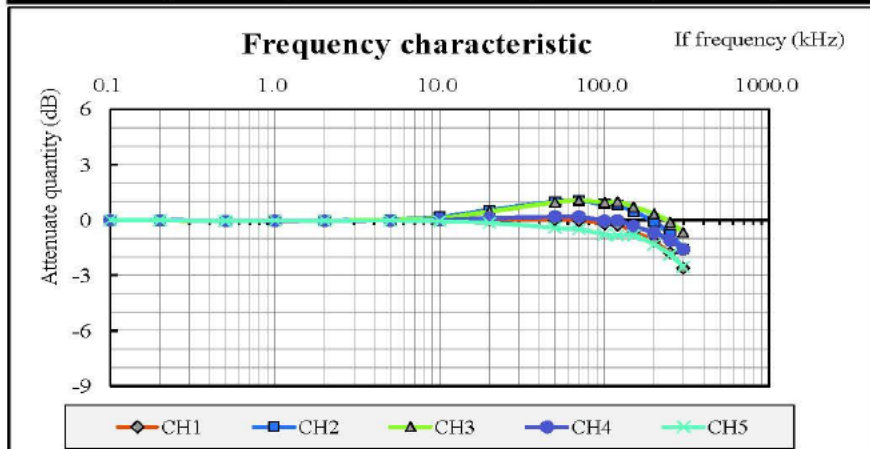
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### Frequency characteristic (Reference)

at Detected current  $I_f = 3.2 \times 12 \text{ A}$ ,  $V_{cc} = +5 \text{ V}$ ,  $R_L = 10 \text{ k}\Omega$ ,  $T_a = +25^\circ \text{C}$

If frequency (kHz)	Output voltage - Offset voltage (mVrms)					Remarks
	CH1	CH2	CH3	CH4	CH5	
0.1	165	165	168	166	166	
0.2	165	165	168	166	166	
0.5	164	164	167	165	165	
1.0	165	164	168	166	166	
2.0	165	164	168	166	165	
5.0	165	166	169	166	166	
10.0	165	168	171	166	165	
20.0	166	176	178	168	163	
50.0	165	185	188	170	158	
70.0	165	186	191	170	157	
100.0	161	182	188	166	152	
120.0	160	181	189	166	151	
150.0	154	174	183	160	151	
200.0	145	163	175	154	143	
250.0	134	151	166	147	134	
300.0	122	137	156	139	124	

If frequency (kHz)	Output voltage attenuate quantity (dB)					Remarks
	CH1	CH2	CH3	CH4	CH5	
0.1	0.000	0.000	0.000	0.000	0.000	
0.2	-0.011	-0.003	-0.022	-0.011	-0.016	
0.5	-0.054	-0.054	-0.054	-0.058	-0.052	
1.0	-0.029	-0.029	-0.028	-0.038	-0.029	
2.0	-0.034	-0.033	-0.031	-0.044	-0.039	
5.0	-0.005	0.031	0.009	-0.026	-0.029	
10.0	0.003	0.170	0.111	-0.008	-0.071	
20.0	0.030	0.541	0.457	0.107	-0.153	
50.0	0.002	0.995	0.960	0.189	-0.422	
70.0	-0.026	1.040	1.067	0.180	-0.505	
100.0	-0.229	0.853	0.954	-0.037	-0.793	
120.0	-0.287	0.822	0.986	-0.021	-0.838	
150.0	-0.621	0.456	0.702	-0.340	-0.833	
200.0	-1.155	-0.090	0.327	-0.693	-1.333	
250.0	-1.805	-0.768	-0.111	-1.106	-1.876	
300.0	-2.623	-1.593	-0.667	-1.594	-2.548	



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