

HS-2210M-02-0300



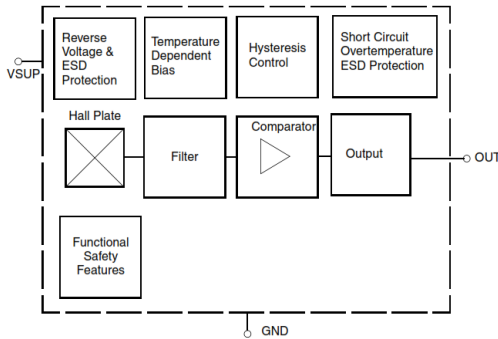
Product image serves as example only.

HS-2210M-02-0300

Latching 3 - Wire

Hall Effect Sensor M10 thread

Block Diagram



Features

- Customized types available
- Operates with magnetic fields up to 12 kHz
- Open drain output
- Threaded housing

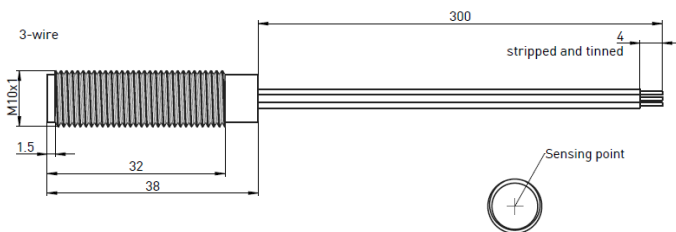
Approvals



Recommended Operating Conditions

Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
V _{SUP}	Supply voltage	2,7	–	24	V	
V _{OUT}	Output voltage	–	–	24	V	
I _{OUT}	Output current	–	–	25	mA	

Dimensions



Wire Assignment

Name	Function	Cable colour
V _{SUP}	Supply Voltage	red
OUT	Output	white
GND	Ground	black

HS-2210M-02-0300

→ wire length (mm)

Environmental Characteristics

Operating temperature	°C	- 20 to + 85
-----------------------	----	--------------

Material Information

	Material	Colour
Housing	Nickel plated brass	nickel
Cable	UL 1007 AWG 24	red, white, black
Potting	Epoxy	black

HS-2210M-02-0300



HS-2210M-02-0300

Latching 3 - Wire

Hall Effect Sensor M10 thread

Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
Supply						
V_{UV}	Undervoltage threshold	2	–	2,7	V	
I_{SUP}	Supply current	1,1	1,6	2,4	mA	
I_{SUPR}	Reverse current	–1	–	–	mA	for $V_{SUP} = -18$ V
Port Output						
V_{ol}	Port low output voltage	–	0,13	0,4	V	$I_o = 20$ mA
		–	–	0,5	V	$I_o = 25$ mA
I_{oleak}	Output leakage current	–	0,1	10	μ A	
t_f	Output fall time ¹⁾	–	–	1	μ s	$V_{SUP} = 12$ V; $R_L = 820 \Omega$; $C_L = 20$ pF
t_r	¹⁾	–	–	1	μ s	
B_{noise}	Effective noise of magnetic switching points (RMS) ²⁾	–	72	–	μ T	For square wave signal with 12 kHz
t_j	Output jitter (RMS) ¹⁾	–	± 0.58	± 0.72	μ s	For square wave signal with 1 kHz. Jitter is evenly distributed between -1μ s and $+1 \mu$ s
t_d	Delay time ^{2),3)}	–	16	21	μ s	
t_{samp}	Output refresh period ²⁾	1,6	2,2	3	μ s	
t_{en}	Enable time of output after exceeding of V_{UV} ⁴⁾	20	50	60	μ s	$V_{SUP} = 12$ V $B > B_{on} + 2$ mT or $B < B_{off} - 2$ mT

- 1) Characterized on small sample size, not tested
- 2) Guaranteed by design
- 3) Systematic delay between magnetic threshold reached and output switching
- 4) If power-on self-test is executed, t_{en} will be extended by power-on self-test period

Absolute Maximum Ratings

Stresses beyond those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device
Functional operation of the device at these conditions is not implied. Exposure to the absolute rating conditions for extended periods will affect device reliability

Symbol	Parameter	Min.	Max.	Unit	Conditions
V_{SUP}	Supply voltage	–18	28	V	$t < 96$ h ¹⁾
		–	32	V	$t < 5$ min ¹⁾
		–	40	V	$t < 10 \times 400$ ms "Load-Dump" ¹⁾ with series resistor $R_V > 100 \Omega$.
V_{OUT}	Output voltage	–0.5	28	V	$t < 96$ h ¹⁾
I_o	Output current	–	65	mA	
I_{OR}	Reverse output current	–50	–	mA	

- 1) No cumulative stress

HS-2210M-02-0300



HS-2210M-02-0300

Latching 3 - Wire

Hall Effect Sensor M10 thread

Magnetic Characteristics

Parameter	On point B_{ON}			Off point B_{OFF}			Hysteresis B_{HYS}			Unit
	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
T_J										
-40 °C	1,3	2,8	4,3	-4.3	-2.8	-1.3	-	5,6	-	mT
25 °C	1	2,5	4	-4.0	-2.5	-1.0	-	5	-	mT
170 °C	0,8	2,3	3,8	-3.8	-2.3	-0.8	-	4,6	-	mT

¹⁾ The hysteresis is the difference between the switching points $B_{HYS} = B_{ON} - B_{OFF}$

Note: The output turns to Low-Z with the magnetic south pole on the top side of the package and turns into High-Z with the magnetic north pole on the top side. The output state does not change if the magnetic field is removed again. For changing the output state, the opposite magnetic field polarity must be applied. For correct function in the application, the sensor requires both magnetic polarities (north and south) on the top side of the package.

Magnetic Approach (for example)

