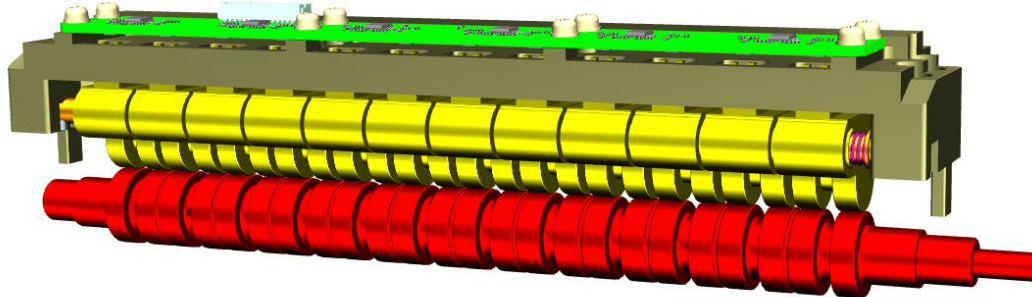


LDJ-CM-T12-DS



FEATURES

1. Hard Cr coating on the surface of the shaft
2. Thickness Resolution down to 0.005 mm
3. SPI Interface; Digital Serial Output

DESCRIPTION

LDJ-CM-T12-DS is a high-resolution thickness detection module, which is usually being used to detect the thickness of bank notes and the tape on the bank notes. The principle is to detect the movement of permanent magnets caused by bank note's passing through. TMR-based magnetic sensor enables the high accuracy and high signal-to-noise ratio.

ELECTRICAL SPECIFICATIONS (TA = 25°C)

Parameter	Symbol	Testing Condition	Value			Unit
			Min.	Typ.	Max.	
Supply Voltage	Vcc		4.5	5	5.5	V
Internal Supply Voltage	VFS	Vcc = 5V	3.2	3.3	3.4	V
Supply Current	Ic			50		mA
Detection Range of thickness	T		5		400	um
Offset Voltage	Vref	VFS = 3.3 V = 4096 LSB		2048		LSB
Output Voltage for 0.1 mm	Vo	Thickness = 0.1mm VFS = 3.3 V = 4096 LSB		255		LSB
Noise (Quiescent)	Vnoise	VFS = 3.3 V = 4096 LSB		12.5		LSB
Resolution	R	VFS = 3.3 V = 4096 LSB	5			LSB
Temp. Coefficient of Gain	TCG	-10°C ~ 65°C		1500		ppm/K
Channels				12		Channel
Total Detection Width				180		mm
Air Gap (Channel to Channel)				1.7		mm

ABSOLUTE PARAMETERS

Parameter	Symbol	Min.	Typ.	Max.	Unit
Working Temperature	T _A	-10		65	
Storage Temperature	T _S	-40		85	

PIN DESCRIPTION

Connector type: BM15B-GHS-TBT

PIN1	V _{dd}	DC supply voltage, 4.6V ~ 5.5V
PIN2	V _{dd}	DC supply voltage, 4.6V ~ 5.5V
PIN3	GND	Ground
PIN4	SPI_CLK	SPI Digital clock input. The range of frequencies for this input is 1 MHz to 20 MHz. This clock directly controls the conversion and readout processes.
PIN5	GND	Ground
PIN6	SPI_DATA	Data Out. Logic output. The conversion result is provided on this output as a serial data stream. The bits are clocked out on the falling edge of the SPI_CLK input. The data stream from the sensor consists of four leading zeros followed by the 12 bits of conversion data; this is provided MSB first.
PIN7	GND	Ground
PIN8	SPI_CS	Chip select. A conversion process begins on the falling edge of CS.
PIN9	GND	Ground
PIN10	CHANEL_CS0	Channel Chose _Signal 0
PIN11	CHANEL_CS1	Channel Chose _Signal 1
PIN12	CHANEL_CS2	Channel Chose _Signal 2
PIN13	CHANEL_CS3	Channel Chose _Signal 3
PIN14	CHANEL_CS4	Channel Chose _Signal 4
PIN15	CHANEL_CS5	Channel Chose _Signal 5

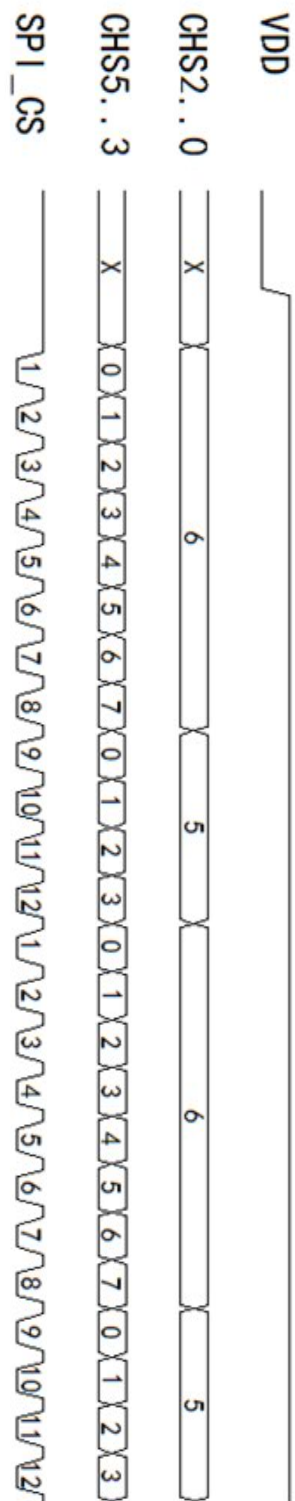
TIMING SPECIFICATIONS

Symbol	Parameter	Min.	Typ.	Max.	Unit
f _{SCLK}	ADC serial clock frequency	0.01		20	MHz
f _{S10}	18 Channels sampling frequency		20		kHz
t _{CL}	SCLK low pulse width	0.4/f _{SCLK}			nS
t _{CH}	SCLK high pulse width	0.4/f _{SCLK}			nS
t _{CHSSU}	VDD to CHS 1-3 setup time	100			nS
t _{NONE}	Channel selection none	20		800	nS
t _{CESU}	Channel selection to CENB setup time	800			nS
t _{CHS}	Channel selection	800			nS

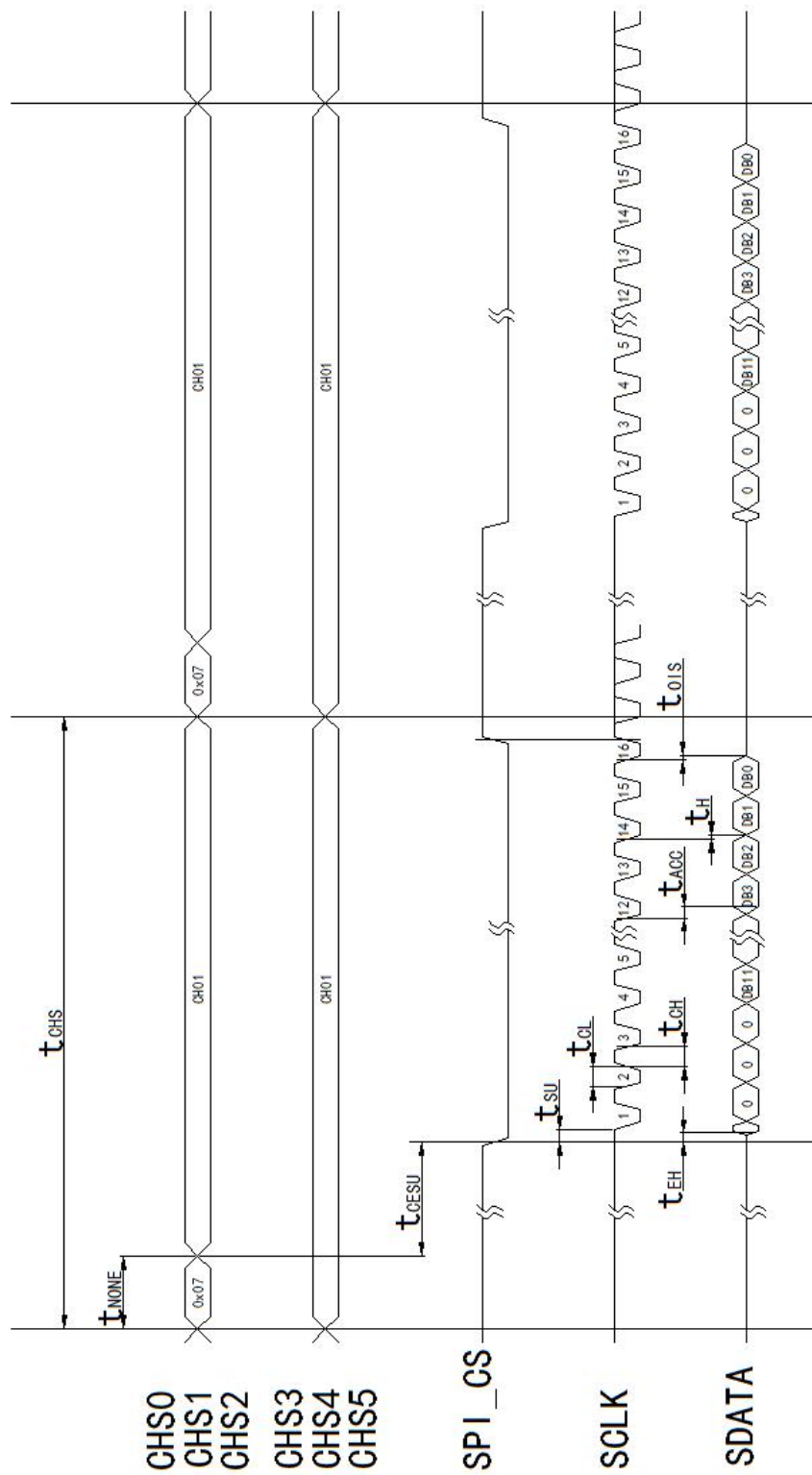
CHANNEL CHOSE SPECIFICATIONS

Channel	CHANEL_C S2	CHANEL_C S1	CHANEL_C S0	CHANEL_C S5	CHANEL_C S4	CHANEL_C S3
CH01	H	H	L	L	L	L
CH02	H	H	L	L	L	H
CH03	H	H	L	L	H	L
CH04	H	H	L	L	H	H
CH05	H	H	L	H	L	L
CH06	H	H	L	H	L	H
CH07	H	H	L	H	H	L
CH08	H	H	L	H	H	H
CH09	H	L	H	L	L	L
CH10	H	L	H	L	L	H
CH11	H	L	H	L	H	L
CH12	H	L	H	L	H	H

TIMING DIAGRAM (CHANNEL CHOSE)

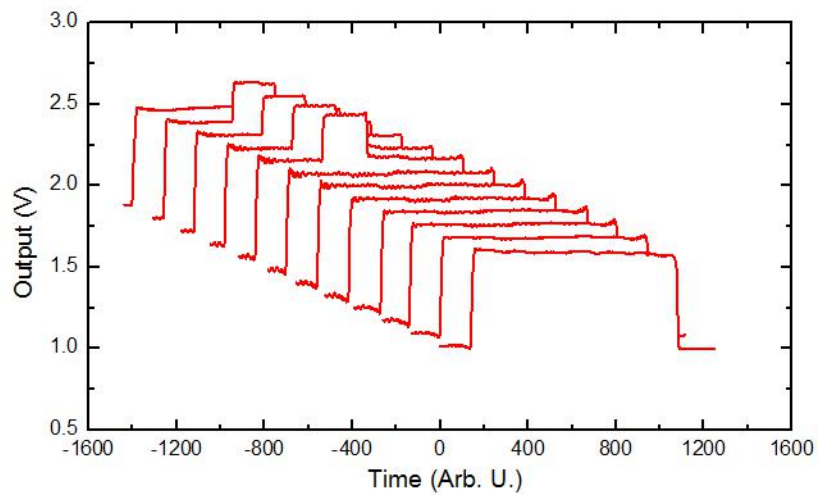


TIMING DIAGRAM (ADC SAMPLING)



Timing Diagram (ADC)

TYPICAL GRAPH



Test Graph of 0.04 mm Adhesive tape on a bank note.

DIMENSIONS

Unit: mm

