Dual Track F/2F Decoder

General Description

The PN2200 is designed for magnetic strip card reader system. The F/2F read/decoder IC will recover clock and data signals from an F/2F data stream generated from a magnetic head. PN2200 will function for data rates from 200 to 15,000 bits per second. Acquisition and tracking of the data within this range is automatically.

PN2200 is consisted by two major blocks at each channel:

Analog block-

This block amplifies and filters the signal read from the magnetic reader head, rejects common mode noise and detects signal peaks. It also includes protection circuit to protect the component. And latches onto the data rate and performs the recovery of individual bits from the F/2F data stream.

Digital block-

The enable and disable counters provide initialization for the recovery block. These counters initialize both bit recovery and the signal conditioning and detection block.

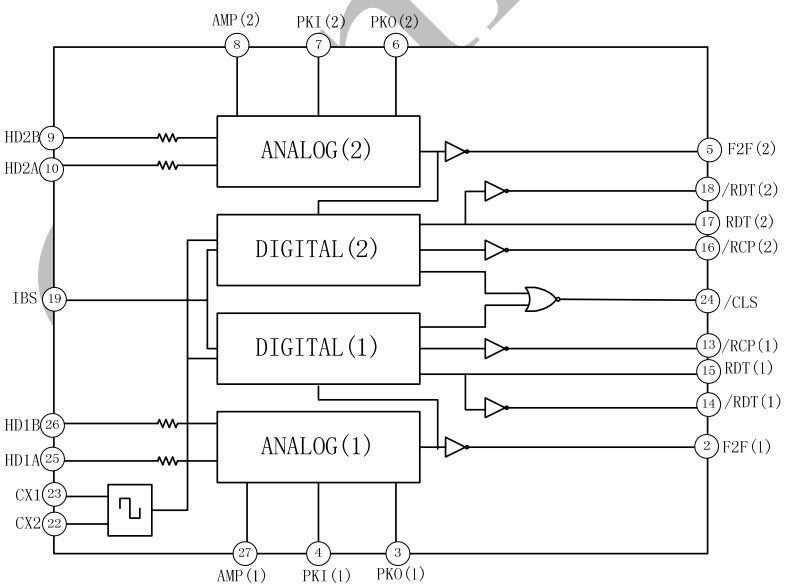
Features

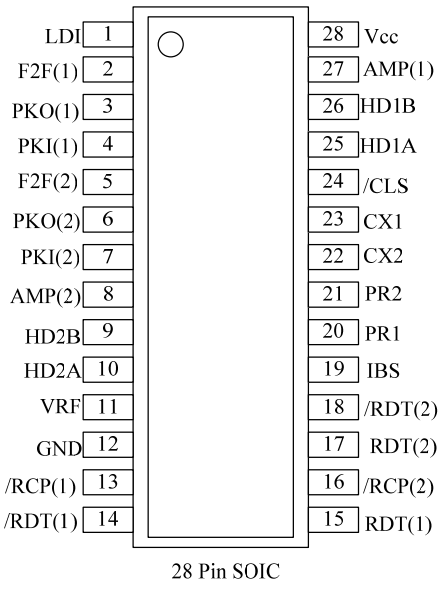
- Dual track F/2F decoder
- Lower Power requirement: DC 5V
- 200-15,000 F/2F bits per second
- Acce200-15,000 F/2F bits per second pts amplitude from 10% of ISO reference to 200% excess of ISO reference voltage
- CMOS process

Applications

- magnetic strip card reader system

Function Block and PIN Description





28 Pin SOIC

Pin Definitions

Table 1. Pin Definitions

Pin Number	Pin Name	Pin Function Description
1	LDI	Read control
2,5	F2F(1/2)	F2F output
3,6	PKO(1/2)	Peak detector output
4,7	PKI(1/2)	Peak detector input
27,8	AMP(1/2)	Amplifier output
25,26,10,9	HD(1A/B,2A/B)	Amplifier input
11	VRF	Reference voltage output
12	GND	Ground
13,16	/RCP(1/2)	Read clock output
14,15,17,18	/RDT(1/2)、RDT(1/2)	Read data output
19	IBS	Ignore bit select
23	CX1	Capacitance for oscillation
22	CX2	Capacitance for oscillation
24	/CLS	Card loading signal output
28	Vcc	Power supply

Guaranteed operating ranges

(T_J=25°C, V_{CC} = 5 V, VoH= 2.4 V , VoL= 0.4 V)

Table 2. Recommended Operating Condition

Symbol	Parameter	Min.	Typ	Max.	Unit
Vcc	Supply Voltage	4.75	5	5.25	V
IoH	Output Current-High	—	—	-7	mA
IoL	Output Current-Low	—	—	6	mA

Electrical Characteristics

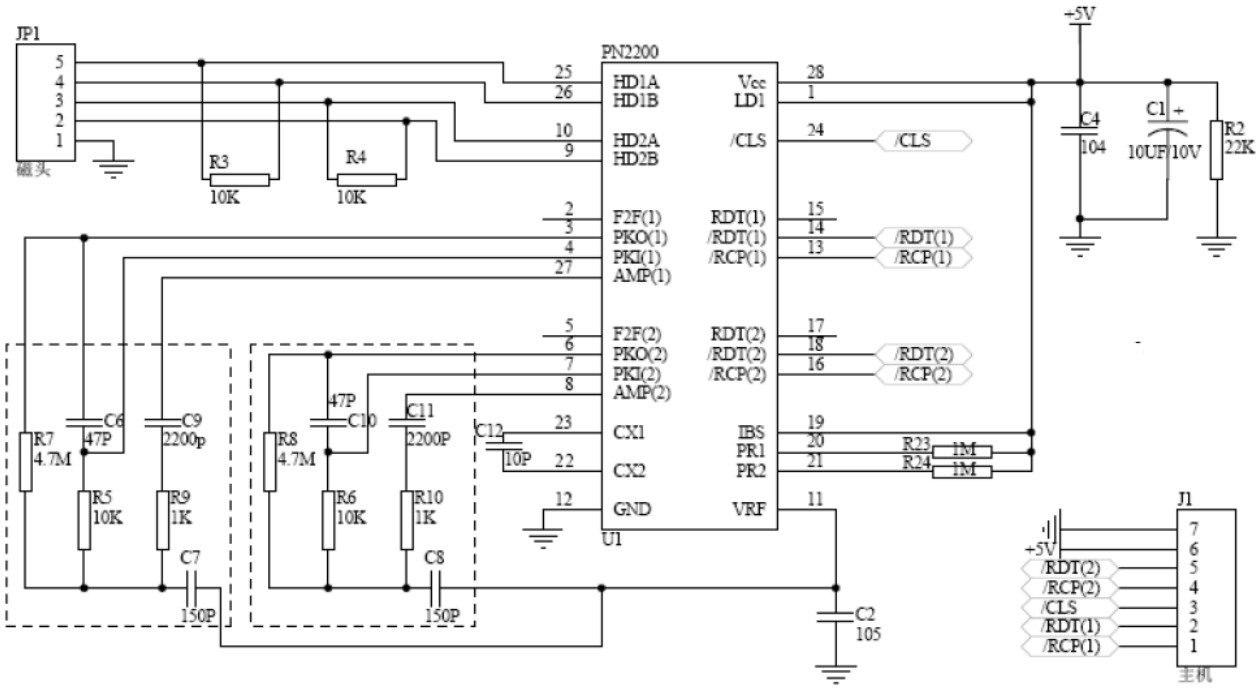
Table 3. Electrial Characteristics

Symbol	Parameter		Test Condition	Min.	Typ.	Max.	Unit
V_{REF}	Reference voltage	VRF(A/B)	V_{IN}=0mVp-p	1.63	—	1.70	V
I_{CCW}	Standby circuit current	Vcc	V_{IN}=0mVp-p	—	2.5	—	mA
I_{CCR}	Operating circuit current	Vcc	V_{IN}=50mVp-p,F_{IN}=8.2KHz,Sine wave, C_{OSC}=33pF	1.8	—	3.5	mA
GV_1	Voltage gain 1 of OP amp	AMP(1/2)	V_{IN}=50mVp-p,F_{IN}=1KHz, Sine wave	—	16	—	V/V
GV_2	Voltage gain 2 of OP amp	AMP(1/2)	V_{IN}=50mVp-p,F_{IN}=15KHz, Sine wave	—	16	—	V/V
R_{IN}	Input resistance of amp	AMP(1/2)	V_{IN}=50mVp-p,F_{IN}=1KHz, Sine wave	—	30	—	KΩ

V_{OPP}	Maximum output voltage of amp	AMP(1/2)	F_{IN}=1KHz,Sine wave	2.88	—	3.44	V
V_{TH+1}	Positive threshold voltage	PKI(1/2)~ F2F(1/2)	V_{RF}=1.7V	0.36	—	0.45	V
V_{TH-1}	Negative threshold voltage	PKI(1/2)~ F2F(1/2)	V_{RF}=1.7V	-0.54	—	-0.42	V
V_{OL2}	"L" Output voltage of F2F	F2F(1/2)	V_{PKI}=0V,I_{F2F}=0.5mA	—	0.05	—	V
V_{OH2}	"H" Output voltage of F2F	F2F(1/2)	V_{PKI}=5V,I_{F2F}=-0.5mA	3.02	—	3.05	V

Application Example

Vcc=DC 5V, tolerance ±5%

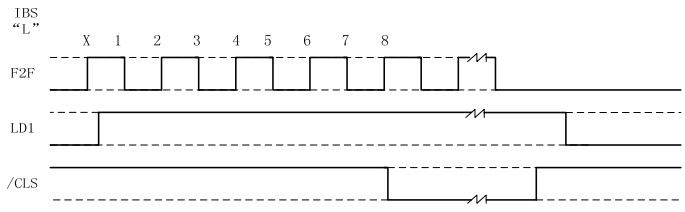
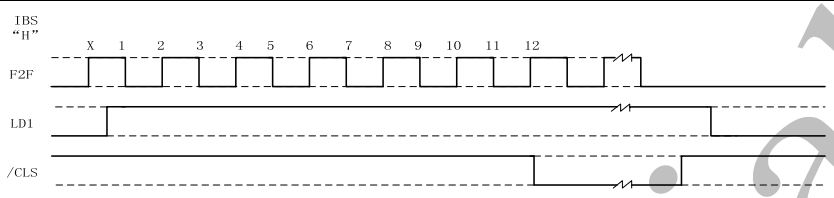


Note:

1. R2 should use 10K~100K value to increase the circuit reliability.

Functional Description

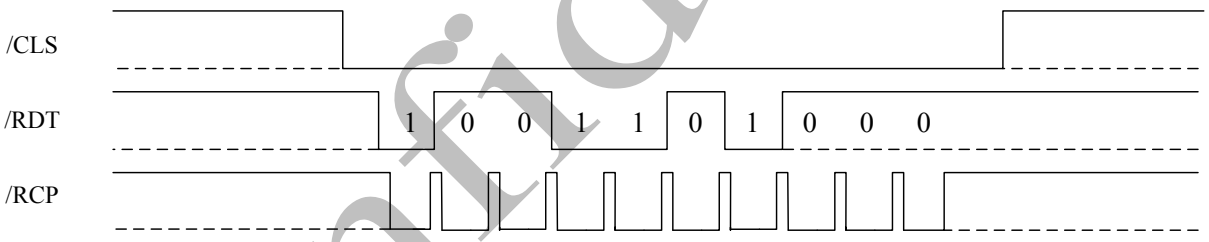
1. IBS Functions

IBS	Ignore bits	Waveform
L	8	
H	12	

Description

- L of LDI input resets internal digital circuit.
- LDI input may be always "H" so that the circuit is operating normally.
- CLS output goes "L" after counting the flux changes FC(F/2F status change) of the number of ignore bits, and goes back "H" when bit internal counter is in full count state.

2. Output Function



Package Dimensions（SOIC-28）

Table 4. SOIC-28 mechanical data

Size / symbol	Min(mm)	Max(mm)	Size / symbol	Min(mm)	Max(mm)
A	2.350	2.650	E	7.400	7.700
A1	0.100	0.300	E1	10.210	10.610
A2	2.290	2.500	e	1.270（BSC）	
b	0.330	0.510	L	0.400	1.270
c	0.204	0.330	θ	8°TYP	
D	17.700	18.100			

Package dimensions