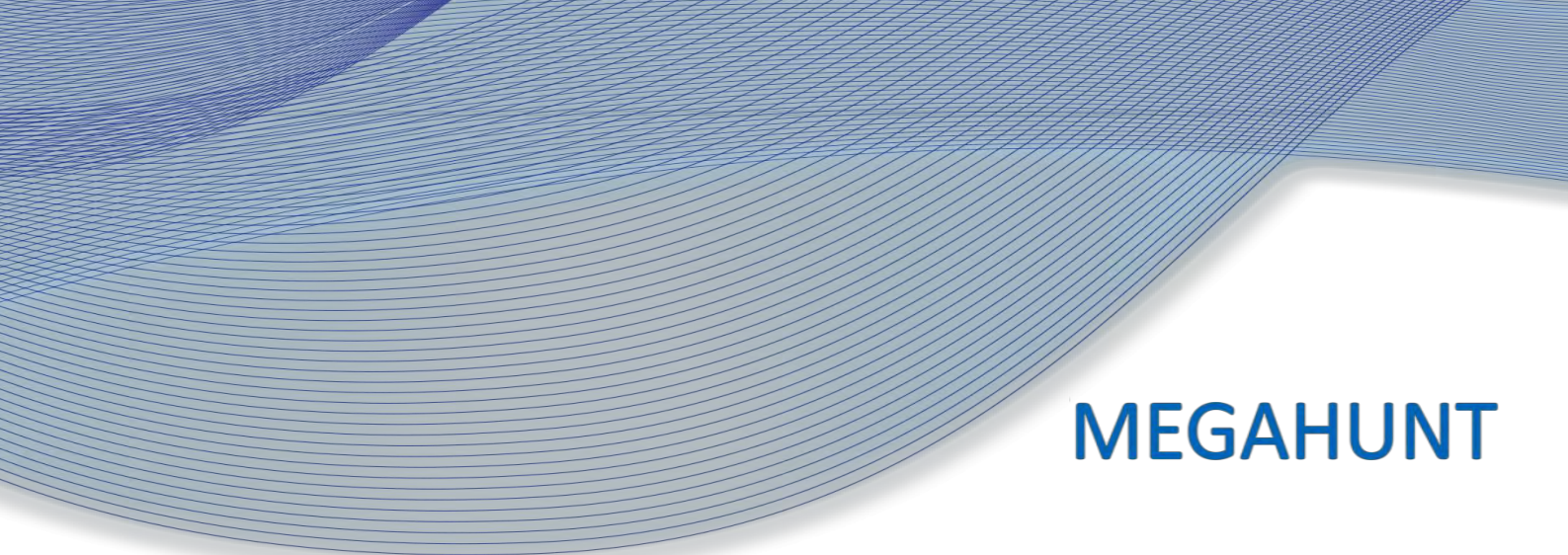




MEGAHUNT

MH1641D

Datasheet

Magnetic Swipe Card Decoding IC

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Megahunt Tehnologies Inc.

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1 Summary

1.1 Description

MH1641D, with the full function of the magnetic swipe card decoding, communicating with the host MCU through the DATA and STROBE pin, packaged in a tiny 14 pin DFN , this ASIC provides backwards compatibility while adding an easier reset function, a larger data buffer, lower power, and indefinite memory retention.

1.2 Main features of MH1641D

- Single , dual, and triple track magnetic stripe decoding, one triple-track decoder ASIC works for all
- Bi-directional decoding
- Swipe speed: 5cm/s–200cm/s
- High-noise immunity with high performance: Supports low-amplitude, high jitter and other badly damaged cards decoding
- Automatic gain adjustment: Support signal amplitude 3mV-1V
- Supply Voltage: 1.8V-3.6V
- Dynamic Current: 3mA

1.3 Pin Description

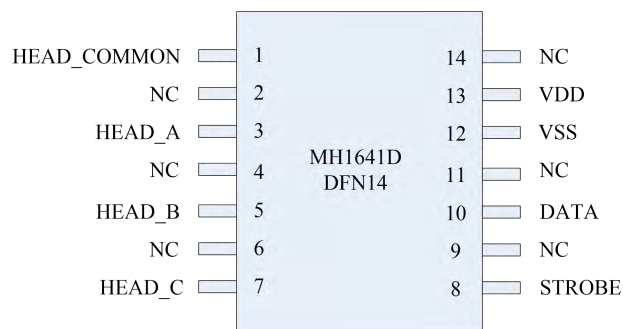


Figure 1 MH1641D Pin Diagram

Table 1 MH1641D Pin Definition

Pin	Pin-Name	Type	Description
1	HEAD_COMMON	analog	Decoding Circuit Reference Voltage Pin
2	NC		
3	HEAD_A	analog	Track1 Input Pin
4	NC		
5	HEAD_B	analog	Track2 Input Pin

Pin	Pin-Name	Type	Description
6	NC		
7	HEAD_C	analog	Track3 Input Pin
8	STROBE	Input	Clock Pin
9	NC		
10	DATA	Inout	Data Pin
11	NC		
12	VSS	Ground	Ground
13	VDD	Power	Power
14	NC		

2 Communication Interface

2.1 Signal Description

2.1.1 DATA

DATA pin is the input/output interface, the default value is high. Within 100 ms after MH1641D power supply, DATA pin will be in a state of uncertainty so the host can't operate the signal.

2.1.2 STROBE

STROBE pin is the input interface, The host reset MH1641D and read the decoding data by operating the STROBE and DATA signal. Within 100 ms after MH1641D power supply, STROBE pin will be in a state of uncertainty so the host can't operate the signal.

2.2 Signal Timing

2.2.1 Reset Timing

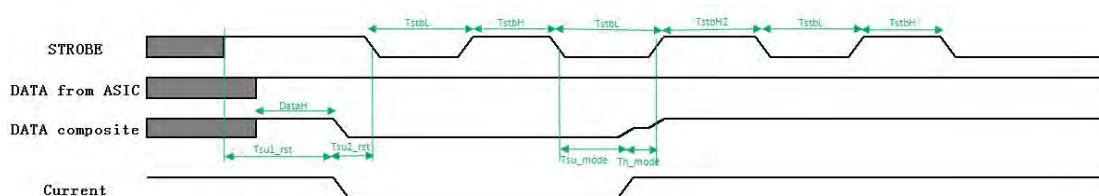


Figure 2 MH1641D Reset Sequence

After MH1641D is powered on, the reset operation is initiated by the host:

1. The host take the STROBE signal high and then take the Data signal high;
2. The host take the Data signal low and then take the STROBE signal low;
3. The host take the STROBE signal high and then low during the DATA signal is low;
4. The host twice take the STROBE signal high and then low to complete the reset

sequence. And MH1641D will enter the Waiting-Read state.

Table 2 MH1641D Reset Time

Param	Description	T-Min	T-Max	Unit
TstbL	STROBE low	250		ns
TstbH	STROBE high	250		ns
TstbH2	STROBE high, special case	20		us
Tsu1_rst	From the rising edge of STROBE to th falling edge of DATA	170		ns
Tsu2_rst	From the falling edge of DATA to the falling edge of STROBE,used to initiate a reset.	5		us
Th_mode	From the realease of DATA until STROBE is taken high	20		ns
Tsu_mode	From the falling edge of STROBE to the release of DATA	20		ns
DataH	Data high	5		ns

2.2.2 Waiting-Read Timing

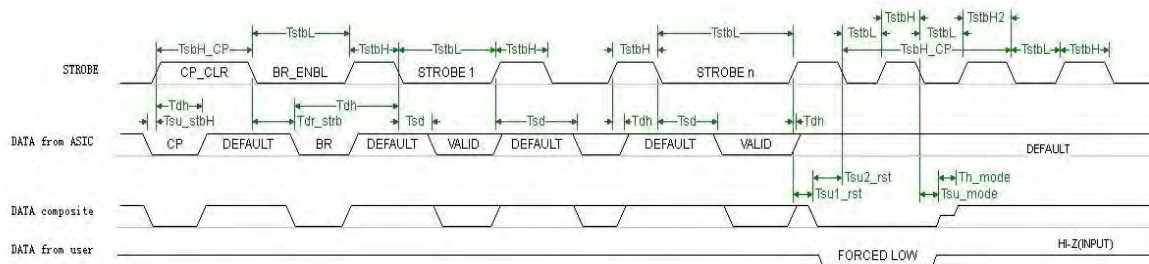


Figure 3 MH1641 Waiting-Read Timing

From the Waiting-Read state, once three flux transitions have been detected, MH1641D signals “Card-Present” by pulling DATA low. It then begins to store data from the card into its buffer. The controller should respond to the Card-Present indication by taking STROBE high. MH1641D will respond to this rising edge of STROBE by taking DATA high, clearing the Card-Present indication. The controller should then take STROBE low and wait for DATA to fall, indicating the Buffer-Ready state. This falling edge of DATA is the signal to a micro-controller that the card swipe has ended, and the on-chip memory of MH1641D contains data to be read. The data is extracted or read from the buffer memory by pulsing the STROBE input high and then low to advance the data pointer that steers the data to the DATA pin. During data extraction and when the STROBE input is low, a low on DATA represents a “one” bit and a high represents a “zero” bit. DATA returns to its default high

state after each rising edge of the controller-issued STROBE. Note that after DATA initially falls to its Buffer-Ready state, MH1641D will ignore further card signals until reset.

Table 3 Waiting-Read Time

Param	Description	T-Min	T-Max	Unit
TstbH_CP	STROBE high,clear buffer	2		us
TstbL	STROBE low	250		ns
TstbH	STROBE high	250		ns
TstbH2	STROBE high, special case	20		us
Tsu_stbH	From the falling edge of DATA to the rising edge of STROBE	20		ns
Tdh	From the rising edge of STROBE to the rising edge of DATA	5		ns
Tdr_strb	From the falling edge of STROBE to the falling edge of DATA		10	us
Tsd	From falling edge of STROBE until DATA is valid		200	ns
Tsu1_rst	From the rising edge of STROBE to the falling edge of DATA	170		ns
Tsu2_rst	From the falling edge of DATA to the falling edge of STROBE,used to initiate a reset.	5		us
Th_mode	From the realease of DATA until STROBE is taken high	20		ns
Tsu_mode	From the falling edge of STROBE to the release of DATA	20		ns

2.3 Decode Data Output Format

The data output method of MH1641D is serial output, the data format is as follows:

16bits Preamble + Track1 Data + Track2 Data + Track3 Data + Track3 Reverse data
+ Track2 Reverse data + Track1 Reverse data

Until Reset, MH1641D will be unlimited cycle output data according to the above format.

16bits Preamble ==> **1100 0000 0000 0000**, preamble means the starting identifies.

The Preamble is shown from right to left in the order it is transmitted.The first bit transmitted is the right-most bit shown.

Three tracks of data length are 704bits, and track data may less than 704bits so the empty data bit to fill zeros.

3 Package Information

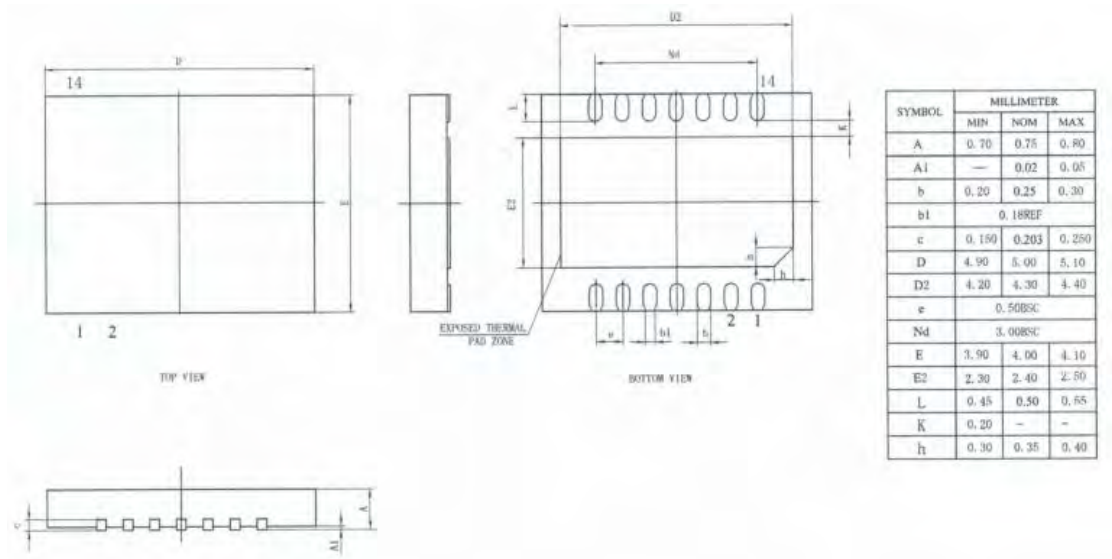


Figure 4 MH1641D Package size chart_DFN14

4 Reference Design

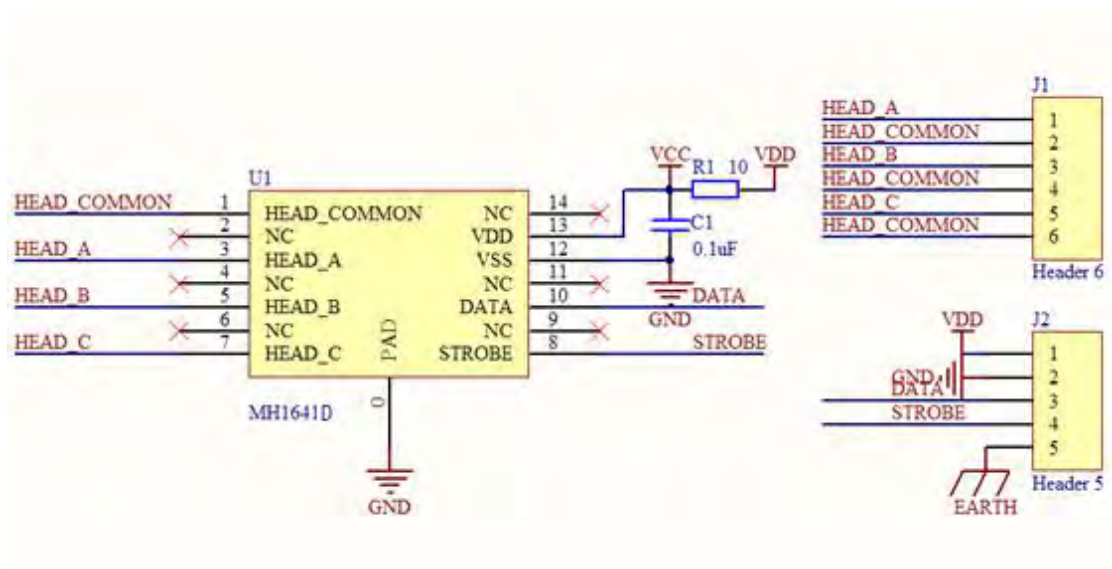


Figure 5 Reference design schematics