

## ● Introduction

125KHz RFID reading module series are compact size and helps to shorten and simplify RFID products development schedule. Supports DC input range between 3.7~5.4V (or customized for 12V). Low power consumption and epoxy potted design suitable for integration with either portable or stationary product. The OEM/ODM is welcomed.



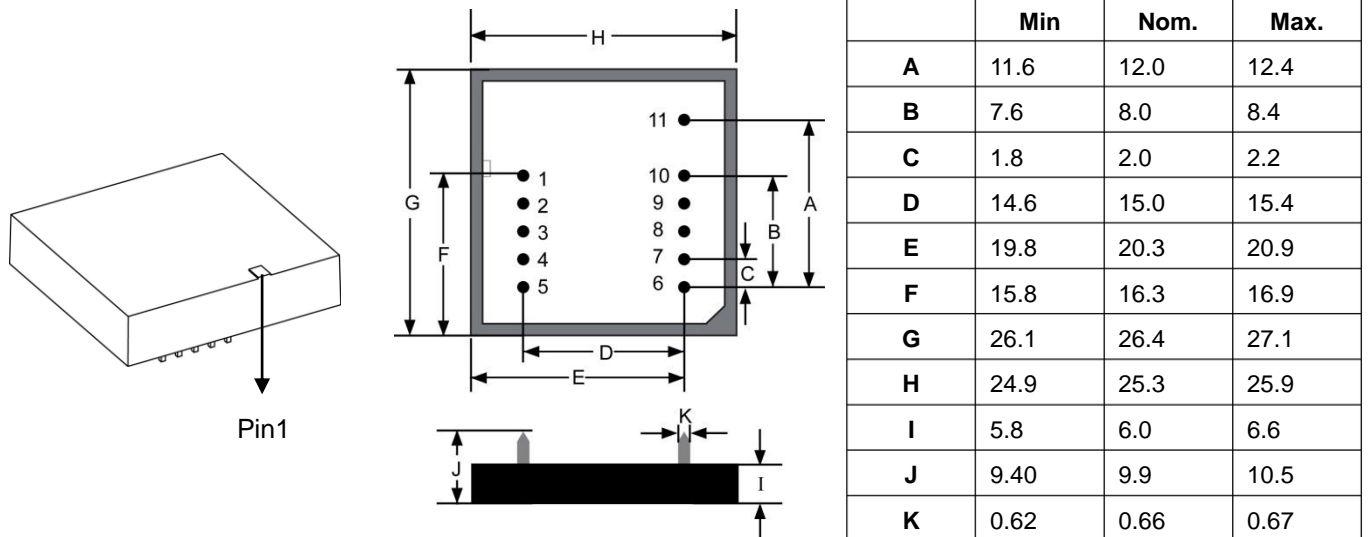
## ● Features

1. AM 125KHz contactless proximity reading module specially for EM cards.
2. Either Wiegand 26, ABA or ASCII format output selected by pin connection.
3. Read only for EM cards, and the data are sent by Data 0 and Data 1.
4. Lower cost with effective performance.
5. Compact size.

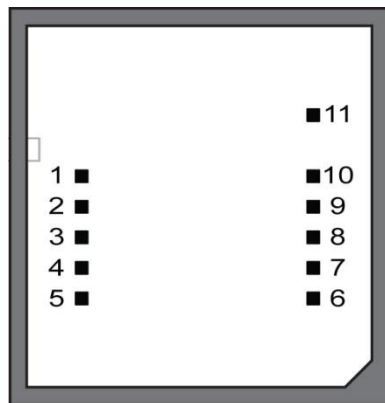
## ● Specification

RFID frequency	125KHz ASK
Applicable cards	EM4001, EM4100, EM 4102, TEMIC 5557(ISO1785) or compatible
Reading range	Depending on tag size, tag type and antenna size
Output format	Wiegand 26 bits, ABA, ASCII
Power input	+3.7V through +5.4V
Power Consumption	5V DC @ 30mA nominal / 3.7V DC @ 14mA nominal
Encoding	Manchester 64-bit, modulus 64
Transmission spec.	9,600 bps N, 8, 1
Standby / Working current	40mA±10% @5V DC / 45mA±10% @ 5V DC 14.4mA±10% @3.7V DC / 14mA±10% @ 3.7V DC
Material	ABS
Dimensions(L) x(W) x(H) mm/inch	26 x 25 x 7 / 1 x 1 x 0.3
Operating temperature	-10℃~75℃
Storage temperature	-20℃~85℃

● **Dimension: Unit: mm[inch]**



● **Bottom view**

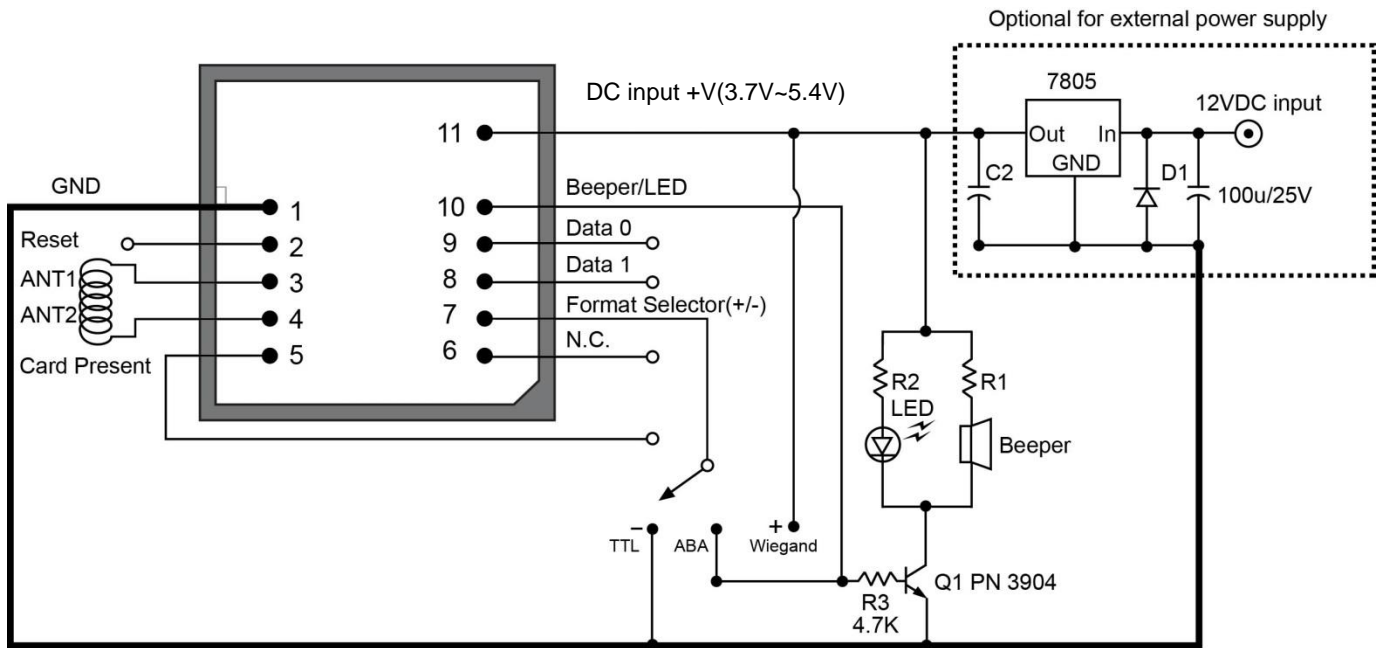


1. **Ground**
2. **Reset**
3. **Antenna**
4. **Antenna**
5. **Card Present Output**
6. **N.C.**
7. **Format Selector(+/-)**
8. **Data 1**
9. **Data 0**
10. **Beeper/LED**
11. **+3.7V ~ +5.4V**

● **Pin assignments**

Pin No.	Description	Wiegand26	ABA	ASCII
Pin 1	Ground	GND 0V	GND 0V	GND 0V
Pin 2	Reset	N.C.	N.C.	N.C.
Pin 3	To External Antenna and Tuning Capacitor	Antenna	Antenna	Antenna
Pin 4	To External Antenna	Antenna	Antenna	Antenna
Pin 5	Card Present Output	No function	Card Present output	No function
Pin 6	Future	N.C.	N.C.	N.C.
Pin 7	Format Selector(+/-)	Connect to +5V	Connect to Pin 10	Connect to GND
Pin 8	Data 1	D1	Magstripe clock	CMOS
Pin 9	Data 0	D0	Data*	TTL(to IC UART)
Pin 10	3.1 kHz Logic	Beeper/LED	Beeper/LED	Beeper/LED
Pin 11	DC Voltage Supply	+3.7V ~ +5.4V	+3.7V ~ +5.4V	+3.7V ~ +5.4V

## ● Wiring example



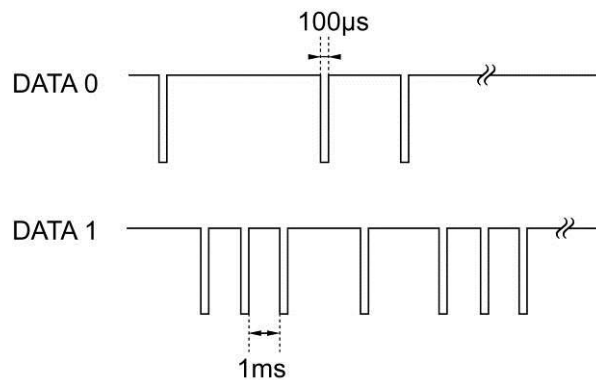
## ● Data formats

### Wiegand 26 bits output format

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
P	E	E	E	E	E	E	E	E	E	E	E	E	O	O	O	O	O	O	O	O	O	O	O	O	P
Summed for even parity(E)													Summed for Odd parity(O)												

P=Starts Even parity bit and stop Odd parity bit.

Even parity “E” is generated by summing from bit2 to bit13; Odd parity “O” is generated by summing from bit14 to bit25.



### UART output format

STX(02Hex)	CARD ID(10 ASCII)	CHECK SUM(2 ASCII)	CR	LF	ETX(03Hex)
------------	-------------------	--------------------	----	----	------------

The 1 byte (2 ASCII characters) Check sum is the “Exclusive OR” of the 5 hex bytes(10 ASCII)Data characters.

If the card no. is 0000318F59, you will get the following ASCII with check sum.

STX  
Hex with check sum : 02H, 30H, 30H, 30H, 30H, 33H, 31H, 38H, 46H, 35H, 39H, 45H, 37H, 03H  
Check sum algorism : 00H ⊕ 00H ⊕ 31H ⊕ 8FH ⊕ 59H = E7  
(check sum) (check sum) ETX

**XOR=Exclusive OR**

### Transmission Spec.

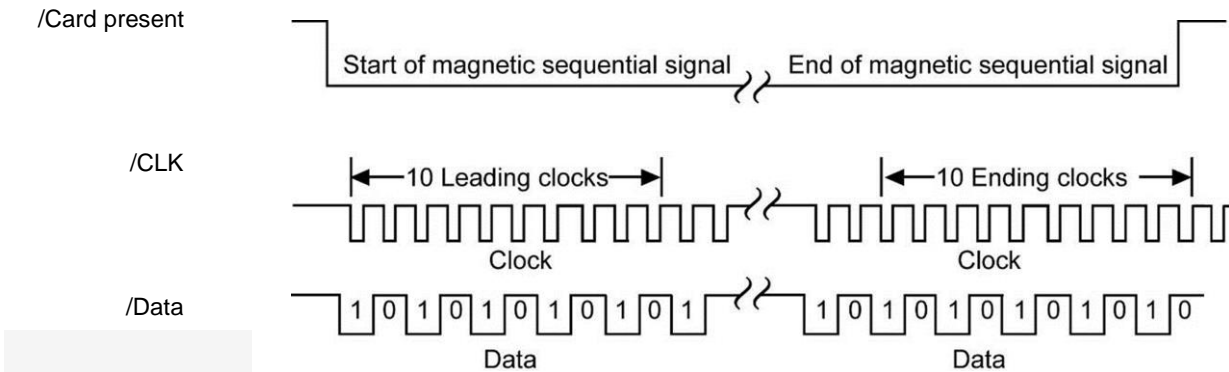
Baud rate : 9,600 bps  
Parity bit : none  
Data bit : 8  
Stop bit : 1

## Magnetic stripe ABA Track2 output format

10 Leading Zeros	SS	CARD ID	ES	LRC	10 Ending Zeros
------------------	----	---------	----	-----	-----------------

SS is the start sentinel character of 11010, ES is the end character of 11111, LRC is the longitudinal redundancy check.

## ABA Track2 timing graph:



## ● Application



## ● Ordering information

<b>PIEM-FW</b>	: RFID 125KHz EM read module, Wiegand 26 bits, With antenna.
<b>PIEM-FWS</b>	: RFID 125KHz EM read module, Wiegand 26 bits, ASCII, With antenna.
<b>PXEM-FWAS</b>	: RFID 125KHz EM read module, Wiegand 26 bits, ABA, ASCII, Without antenna.
<b>PIEM-FWAS</b>	: RFID 125KHz EM read module, Wiegand 26 bits, ABA, ASCII, With antenna.
<b>PIEM-FWAS-H</b>	: RFID 125KHz EM read module, Wiegand 26 bits, ABA, ASCII, High Reset, With antenna.
<b>PIEM-FWAS-LB</b>	: RFID 125KHz EM read module, Wiegand 26 bits, ABA, ASCII, Low Reset, With antenna. <b>(ID-12 compatible)</b>
<b>PIEM-FS-840</b>	: RFID 125KHz EM read module, ASCII, read Manchester 64 and 128 bits, With antenna.
<b>PIEM-FW34AS</b>	: RFID 125KHz EM read module, Wiegand 34 bits, ABA, ASCII, With antenna.
<b>PIEM-FWAS-12V</b>	: RFID 125KHz EM read module, Wiegand 26 bits, ABA, ASCII, DC 12V, With antenna.
<b>PXEM-FSCS-3.3V</b>	: RFID 125KHz EM read module, ASCII, Checksum, DC 3.3V, Without antenna.

Specifications subject to change without notice for further modification.

W-04-PXEM-FWAS/E