



FI-C307V-TW
UHF RFID Reader Module
Data Sheet



DOCUMENT INFORMATION

TITLE	UHF RFID Reader Module
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DOCUMENT STATUS EXPLANATION

OBJECTIVE SPECIFICATION	Documents contains target values. Revised and supplementary data will be published later.
ADVANCE INFORMATION	Documents contains target values. Revised and supplementary data will be published later.
EARLY PRODUCTION INFORMATION	Documents contains target values. Revised and supplementary data will be published later.
PRODYCTION INFORMATION	Documents contains the final product specification

THIS PRODUCT APPLIES TO THE FOLLOWING PRODUCTS

PRODUCT NAME	Order Number	ROM / Flash Version	PCN reference
UHF RFID READER MODULE	FI-C307V-TW		N/A

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1. Overview

FI-C307-TW is designed as UHF RFID reader board with Antenna for a combination module controller, applied to Smart phone(OTG), Tablet PC(OTG) and other application as well . FI-C307-TW delivers small, reliable, easy to design and cost-effective EPC G2 UHF reader solution. FI-C307-TW is not only support RFID supply chain system but also support RFID life system, especially Anti-counterfeiting and Home automation system.

2. Specification of RFID

2.1 Recommend operating conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply voltage	VIN	5	5.3	5.5	V
Voltage ripple and noise	Vnoise	-	-	80	mVp-p
Operating Temperature	Ta	-20	-	+70	°C
Storage Temperature	Ts	-40	-	+85	°C
Enable pin high (enabled)	VEN(HI)	0.9	-	VIN	V
Enable pin low (disabled)	VEN(LO)	0	-	0.4	V
UART_RX Input Low Voltage	VIL	-0.5	-	0.66	V
UART_RX Input High Voltage	VIH	1.98	-	3.8	V
UART_TX Output Low Voltage	VOL	-	-	0.5	V
UART_TX Output High Voltage	VOH	2.2	-	-	V
Operation range	Around 4 meter depend on Alien 9640 TAG				

2.2 Electrical characteristics

2.2.1 DC characteristics (VIN =3.6V to 5V, VSS= 0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Average operating current	I _{oc}	-	315	-	mA
Standby current	I _{SB}	-	-	10	mA
Peak current	I _{peak}	-	350	-	mA

2.2.2 AC characteristics (Ta =25°C, VIN =5V, VSS = 0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit
RF Output Frequency	F _c	922	-	928	Mhz
RF Output Power	P _{out}	-	29	-	dbm
RF Transmission setup time	TRF_OUT	-	-	0.5	ms
RF Frequency error	Error	-	-	1000	ppm
Interrogator Transmit Spurious Emissions, In-Band	In accordance with local regulations				-
Interrogator Transmit Spurious Emissions, Out of-Band	In accordance with local regulations				-
RF Bandwidth	In accordance with local regulations				-
Transmit data rate	DRate	-	26K	-	bps
Modulation	ASK				
Modulation Type	90% normally				
Data Coding	PIE				
Demodulation	ASK				
Download data rate	DRate	-	40K	-	bps
Data encoding	FM0				

2.3 Production assembly specification

2.3.1 All parts of product is listed by element list.

2.3.2 Dimension: 70mm*70mm*(max) 11mm

3. EMI/EMC/Environmental regulations

TBD

4. Pin Description

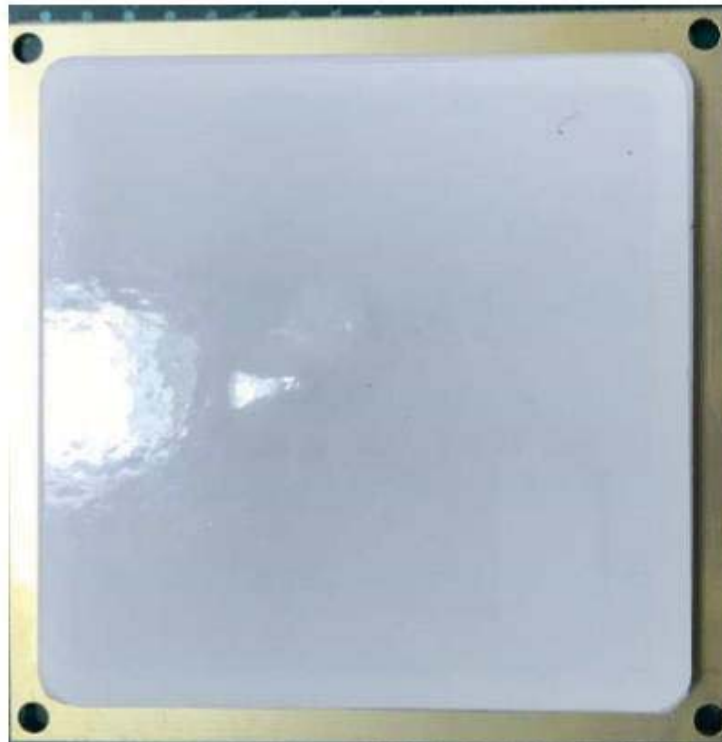
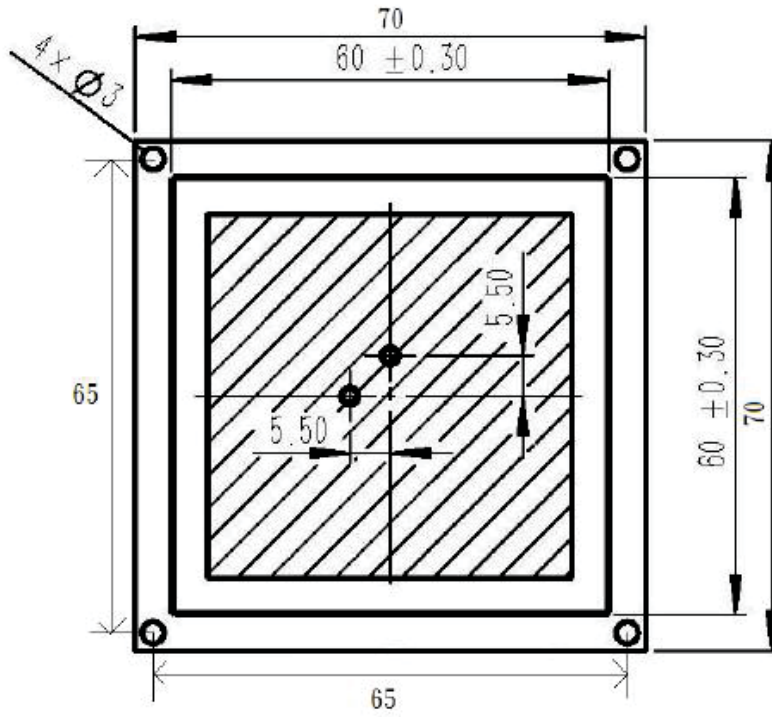


CN1 PIN DESCRIPTION

PIN no	Pin name	Direction	Description
G	GND	P	Ground
V	VIN	P	Power input
T	HCI_TXD	O	UART TX PIN
R	HCI_RXD	I	UART RX PIN
C	Enable	I	Module enable; H enable (default H)



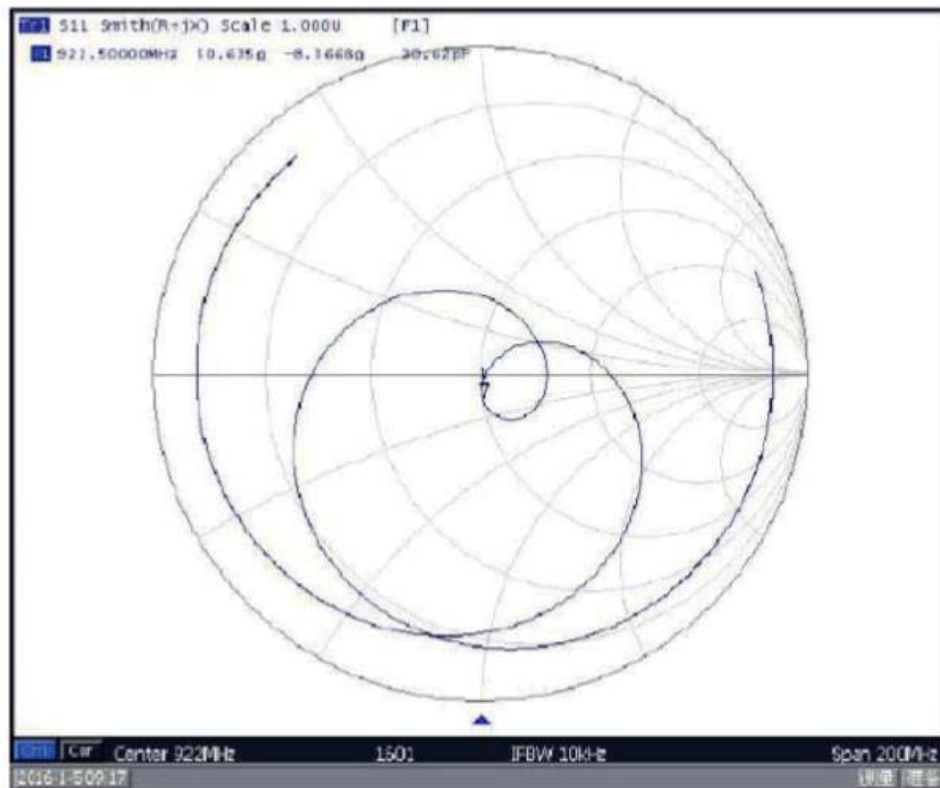
5. Mechanical Characteristics



6. Antenna Specification

Antenna		
1	Antenna model(天線規格)	6065D(60mm*60mm*5mm)
2	Frequency Range(頻率範圍)	925MHz+/-2MHz
3	V.S.W.R(駐波比)	1.5 MAX
4	Band With@10dB(10dB 帶寬)	8MHz MIN
5	Gain(增益)	3.2 dB typ @70mm*70mm groundplane
6	Impedence(阻抗)	50Ω
7	Polarization(極化方式)	RHCP

Patch Smith



7. ASCII Protocol Commands

Command and return message is transmitted as ASCII format. All command is start with a command character and arguments (if any, in hexadecimal units) and stop with a <CR>(0x0D hex), and return message is start with a <LF>(0x0A hex) , command first character and stop with a <CR><LF>. If command is none match, return message will be <LF>X<CR><LF>.

Ex.

PC or Host: <LF>S<CR>

Reader return message: <LF>S01234567<CR><LF>

RFID Command Overview :

Command*	Return Message**	Description
V	Vxxyy,<message> xx: major version number yy: minor version number <message>: other info.	display reader firmware version
S	S01234567 01234567 is reader ID	display reader ID
Q	Q<none or EPC> <none or EPC> none: no tag in RF field EPC: PC+EPC+CRC16	display tag EPC ID
R<bank>,<address>,<length> <bank> memory bank 0: reserved 1: EPC 2: TID 3: USER <address> start address 0 ~ 3FFF <length> read word length 1 ~ 20	R<none or read data> or <error code> <none or read data> none: no tag in RF field <Error code> 0: other error 3: memory overrun 4: memory locked B: Insufficient power F: Non-specific error	read tag memory data
W<bank>,<address>,<length>,<data> <bank> memory bank 0: reserved 1: EPC	W<none or <OK>> or <error code> <none or <OK>> none: no tag in RF field <OK>: written ok <error code>	write data to tag memory



<p>2: TID 3: USER <address> start address 0 ~ 3FFF <length> write words length 1 ~ 20</p>	<p>0: other error 3: memory overrun 4: memory locked B: Insufficient power F: Non-specific error Z00~Z1F: words write 3Z00~3Z1F: error code and words write</p>	
<p>K<password>,<recom> <password> kill password 00000000~FFFFFFFF <recom> recommissioning 0~7</p>	<p>K<none or <OK>> or <error code> <none or <OK>> none: no tag in RF field <OK>: kill ok <error code> 0: other error 3: memory overrun 4: memory locked B: Insufficient power F: Non-specific error</p>	<p>kill tag</p>
<p>L<mask>,<action> <mask> lock mask 000~3FF <action> lock action 000~3FF</p>	<p>L<none or <OK>> or <error code> <none or <OK>> none: no tag in RF field <OK>: lock ok <error code> 0: other error 3: memory overrun 4: memory locked B: Insufficient power F: Non-specific error</p>	<p>lock memory</p>
<p>P<password> <password> access password 00000000~FFFFFFFF</p>	<p>P</p>	<p>set access password for R W L command, one time use</p>
<p>U</p>	<p>U<none or EPC> <none or EPC> none: no tag in RF field EPC: PC+EPC+CRC16</p>	<p>Multi-TAG read EPC</p>
<p>G1 G0</p>	<p>G1 G0</p>	<p>Start command logging End command logging</p>



G2	G2	Run logging commands For external TACT switch function
T<bank>,<bit address>,<bit length >,<bit data > <bank> memory bank 0: reserved 1: EPC 2: TID 3: USER <bit address> start bit address 0~3FFF <bit length > select bit length 1~60 <bit data > select bit mask data	T	Select matching tag
N0,00 read RFID Reader power N1, <value> set RFID Reader power (0~27dBm) <value> 00~1B	N<value> <NULL>	Read/Set RFID Reader power level
N4,00 read Regulation N5, <value> set Regulation <value> 01~08 01: US 902~928 02: TW 922~928 03: CN 920~925 04: CN2 840~845 05: EU 865~868 06: JP 916~921 07: KR 917~921 08: VN 918~923	N<value> <value> 01: US 902~928 02: TW 922~928 03: CN 920~925 04: CN2 840~845 05: EU 865~868 06: JP 916~921 07: KR 917~921 08: VN 918~923	Read/Set Frequency Range
N6,00 get GPIO configuration N7,<value> set GPIO configuration <value>mask and setting	N<value> <value> 4+2+1 4: pin10 out 2: pin11 out	get/set GPIO input/output configuration



<p>mask: first digi 4+2+1 4: pin10 2: pin11 1: pin14 setting: second digi 4+2+1 4: pin10 out 2: pin11 out 1: pin14 out</p>	<p>1: pin14 out</p>	
<p>N8,00 read GPIO pins N9,<value> write GPIO pins <value>mask and setting mask: first digi 4+2+1 4: pin10 2: pin11 1: pin14 setting: second digi 4+2+1 4: pin10 high 2: pin11 high 1: pin14 high</p>	<p>N<value> <value> 4+2+1 4: pin10 high level 2: pin11 high level 1: pin14 high level</p>	<p>read/write GPIO pins</p>
<p>UR: U<slot Q>, R<band>,<address>,<length> Slot Q: 0~10 <bank> memory bank 0: reserved 1: EPC 2: TID 3: USER <address> start word address 0 ~ 3FFF <length> read word length 1 ~ 20</p>	<p>U<EPC>,<R<DATA> or <error code> EPC= PC+EPC+CRC16 DATA= read data Error code: 0: other error 3: memory overrun 4: memory locked B: Insufficient power F: Non-specific error</p>	<p>Multi-Band data read with EPC for multi-Tag read</p>
<p>QR: Q , R<band>,<address>,<length> <bank> memory bank 0: reserved</p>	<p>Q<EPC>,<R<DATA> or <error code> EPC= PC+EPC+CRC16 DATA= read data Error code:</p>	<p>Multi-Band data read with EPC for single-Tag read</p>

1: EPC 2: TID 3: USER <address> start word address 0 ~ 3FFF <length> read word length 1 ~ 20	0: other error 3: memory overrun 4: memory locked B: Insufficient power F: Non-specific error	
NB,<value> set UART Baud Rate <value> 00: 4800 01: 9600 02: 14.4k 03: 19.2k 04: 38.4k (default) 05: 57.6k 06: 115.2k 07: 230.4k	N<value> <value> 00: 4800 01: 9600 02: 14.4k 03: 19.2k 04: 38.4k (default) 05: 57.6k 06: 115.2k 07: 230.4k	Setting Baud Rate. After return message, Baud Rate will change.

*command is start with <LF> stop with <CR>

*Return Message is start with <LF> stop with <CR><LF>

Example:

1. Read TID memory bank, start address at 0, read 4 words length, TID data is 0x1234567890

Host send: <LF>R2,0,4<CR>

Hex format: 0A 52 32 2C 30 2C 34 0D

Reader message: <LF>R123456789ABCDEF0<CR><LF>

Hex format: 0A 52 31 32 33 34 35 36 37 38 39 41 42 43 44 45 46 30 0D 0A

2. Write USER memory bank, start address at 12, write 2 word length, write data is 0xAAAABBBB

Host send: <LF>W3,C,2,AAAABBBB<CR>

Hex format: 0A 57 33 2C 43 2C 32 2C 41 41 41 41 42 42 42 42 0D

Reader message: <LF>W<OK><CR><LF>

Hex format: 0A 57 3C 4F 4B 3E 0D 0A

8. Ordering information

Ordering No.	Product
FI-C307V-TW	UHF RFID Reader Board with antenna / For ISO-18000-6C Protocol



Revision History

Revision	Date	Description / Change
R00	8-Apr-2016	Production release

Product Contact Information

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