

Document No: TNS21252

# PRODUCT & DELIVERY HARDWARE SPECIFICATION

MODEL NAME                    : YG-1540001  
                                      : YG-1540002

Hitachi High-Tech Nexus Corporation  
Tokyo Communication Equipment Manufacturing Co., Ltd.

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## 1. Scope

This product is the 13.56MHz RFID R/W module. It supports the ISO/IEC15693.

■ Product name : :YG-1540001, YG-1540002

### ■ Main specification

Item	Function	
RFID Tag	ISO15693(Tag-it HF-I Plus/Pro、I·CODE SLI)	
Communication Frequency	13.56MHz ± 7kHz	
I/F	38400bps (+0.32%) Data Length 8bit、StopBit:1bit、Parity: NONE error correction :BCC RS422/485	
Communication Range ※1	・YG-1540001 Approximately 5mm~65mm ・YG-1540002 Approximately 5mm~45mm	
Operation temperature	0~+50°C	
Operation humidity	20~85%RH(no condensation)	
Dimension	YG-1540001	52.5mm × 20mm
	YG-1540002	φ 40.5mm
Legal regulation compliance	Inductive read write communication equipment YG-1540001 :No. AC-21063 YG-1540002 :No. AC-21064	
RoHS	RoHS2 Compatible	
RF OUTPUT POWER	MAX 500mW	

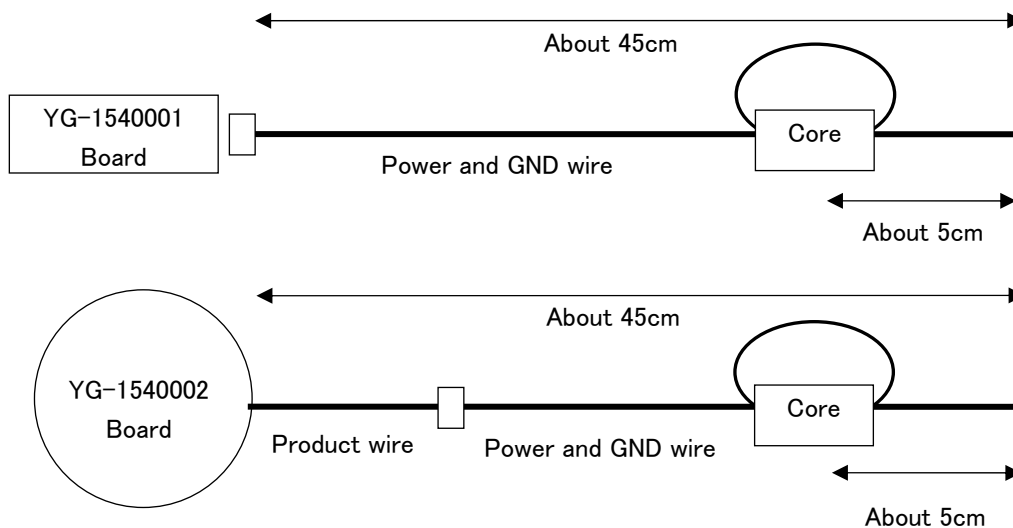
\* The software specification refers to [command specification of YG-1540001/2]

※1 Using RI-I03-112A-03(38 x 22.5mm). It depends on the surround environment.

**CAUTION : When using this device in the final products outside Japan, use a power supply wire harness with a ferrite core and a total length of 45cm.**

※ The ferrite core should be equivalent with E04SR150718/Seiwa Electronics.

※ The above ferrite core should use with two turn(one loop).



## ■ Supports Legal Regulation

This product complies with the regulations of the Radio Law of the United States and Canada (FCC, IC) and is certified.

**Model Name : YG-1540001**

FCC ID: WSLYG1540001

IC : 8213A-YG1540001

**Model Name : YG-1540002**

FCC ID: WSLYG1540002

IC : 8213A-YG1540002

- This device complies with **Part 15 of the FCC Rules** and **RSS-Gen of IC Rules**.

Operation is subject to the following two conditions :

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference, including interference that may cause undesired operation.

L'exploitation est soumise aux deux conditions suivantes :

- (1) Cet appareil ne doit pas causer d'interférences nuisibles, et
- (2) Cet appareil doit accepter toute interférence, y compris les interférences pouvant provoquer un fonctionnement indésirable.

- CAN ICES-3 (A)/NMB-3(A)

### FCC CAUTION :

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### NOTE :

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

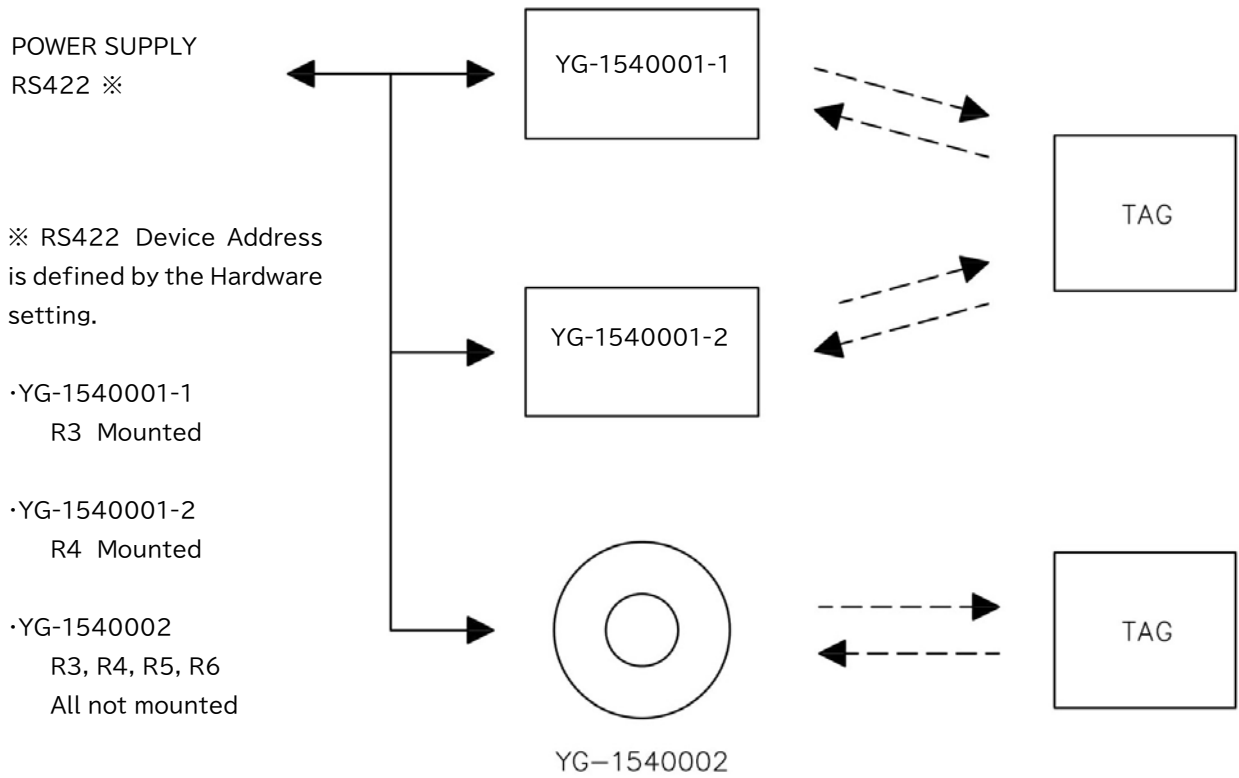
### RF exposure compliance

- 1) To comply with FCC/IC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.
- 2) This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

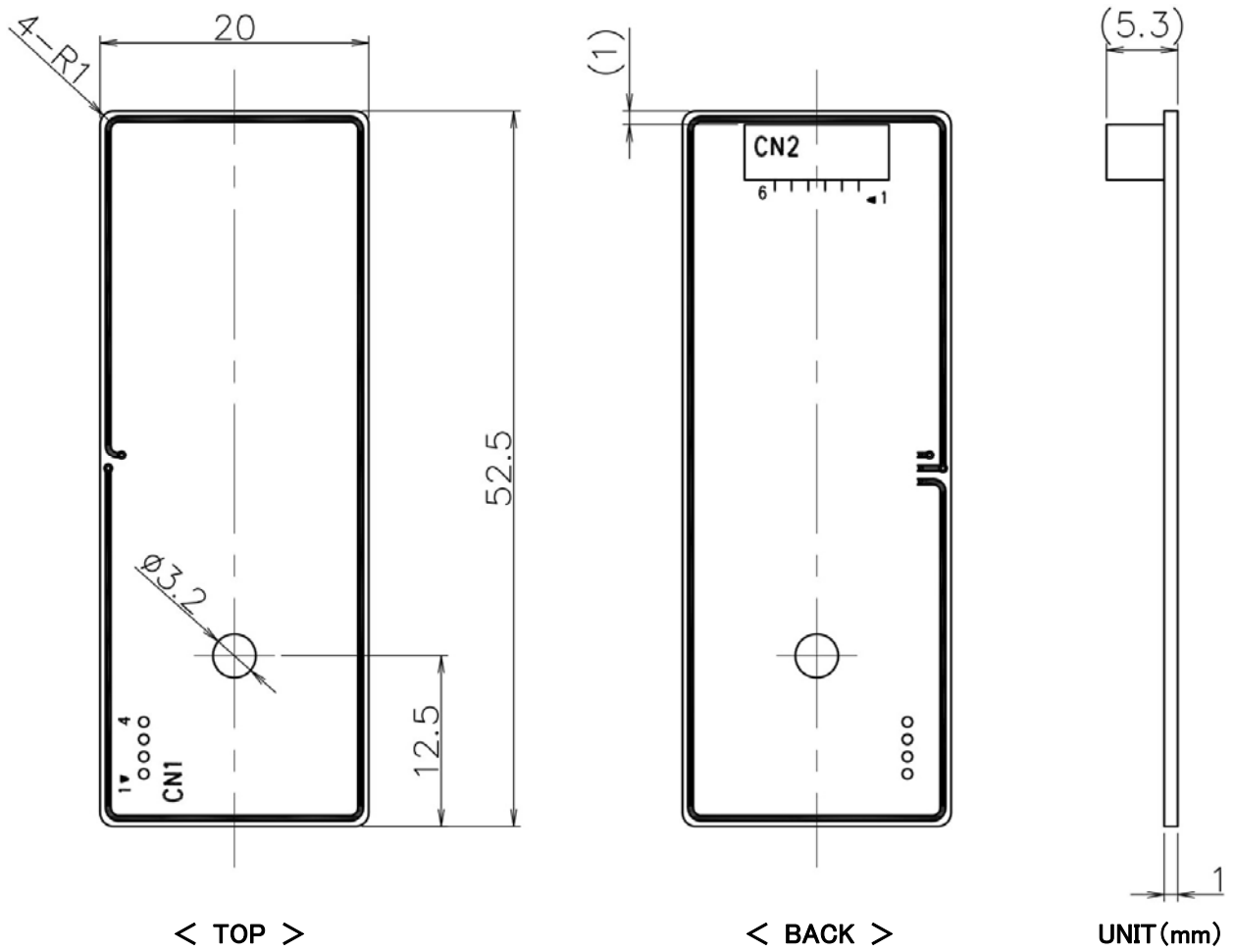
### Conformité à l'exposition aux RF

- 1) Pour se conformer aux exigences de conformité d'exposition RF FCC/IC, une distance de séparation d'au moins 20 cm doit être maintenue entre l'antenne de cet appareil et toutes les personnes.
- 2) Cet émetteur ne doit pas être co-localisé ou fonctionner en conjonction avec une autre antenne ou émetteur.

**2. System Configuration**



3. Aspect  
3.1 YG-1540001



Material :FR-4 Layer4  
 Thick :1.0mm  
 Think of Copper :18  $\mu$  m  
 Margin :0.1mm

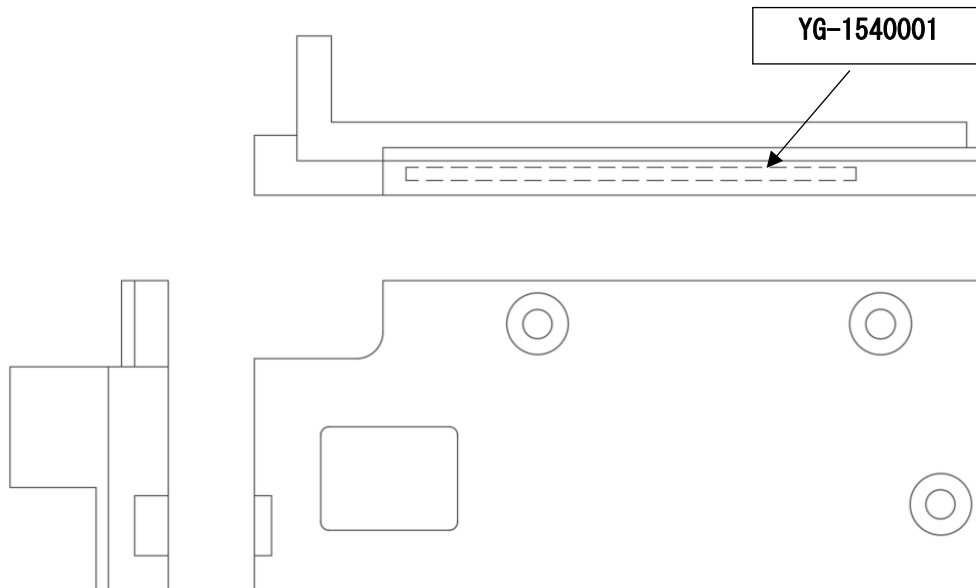
●CN1

No	Name	Function
1	VCC3V	For Programming
2	TOOL0	"
3	RST	"
4	GND	"

●CN2 SM06B-GHS-TB(JST)

No	Name	Function
1	VIN	POWER
2	GND	GND
3	A	422I/F A
4	B	422I/F B
5	Z	422I/F Z
6	Y	422I/F Y

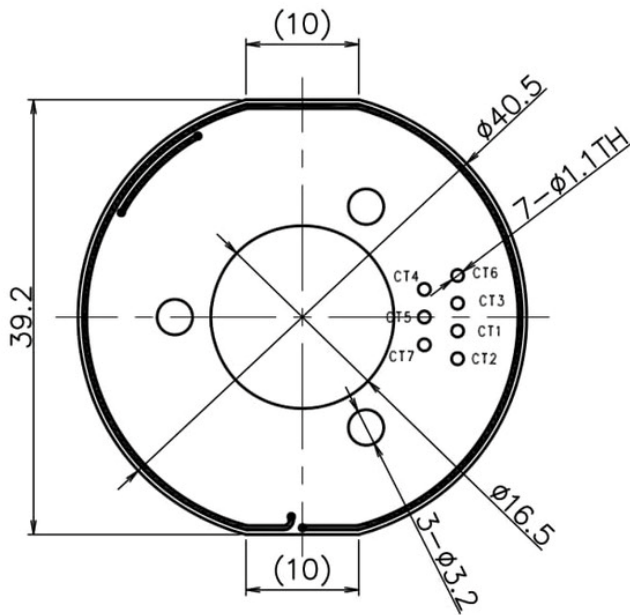
YG-1540001 is used with Moleded plastic case. (Specifications of plastic case may change)



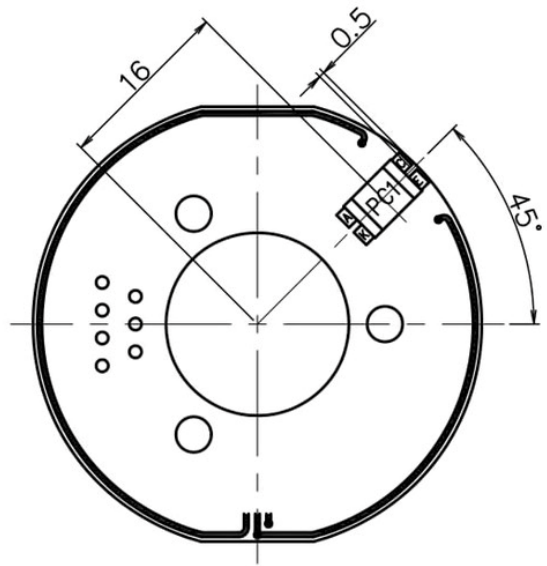
< Plastic Case (example) >

※ When using this device for the final products outside Japan, indicate the FCC ID and IC lighting number on the surface of the plastic case with a label or the like. If you cannot attach a label, etc., refer to the FCC ID and IC lighting number described in this manual instead of indicated them(P4).

3.2 YG-1540002

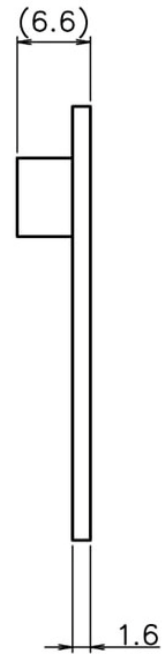
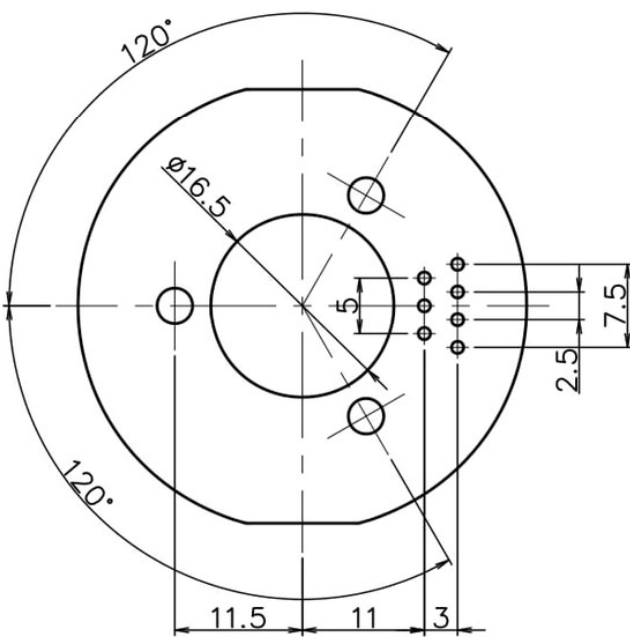


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UNIT (mm)



Material : FR-4 Layer4  
 Thick : 1.0mm  
 Think of Copper : 18 μm  
 Margin : 0.1mm

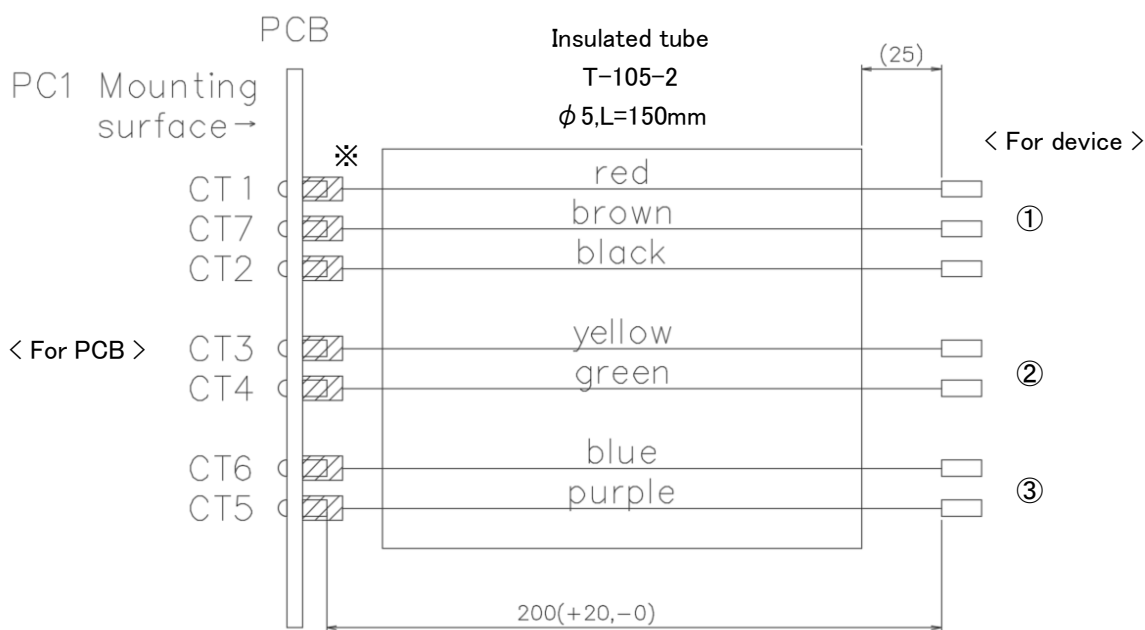


●PIN ARRAYS

TH	SIGNAL	Function
CT1	VIN	POWER
CT2	GND	GND
CT3	A	422I/F A
CT4	B	422I/F B
CT5	Z	422I/F Z
CT6	Y	422I/F Y
CT7	FS1	Photo Interrupter

●Wire

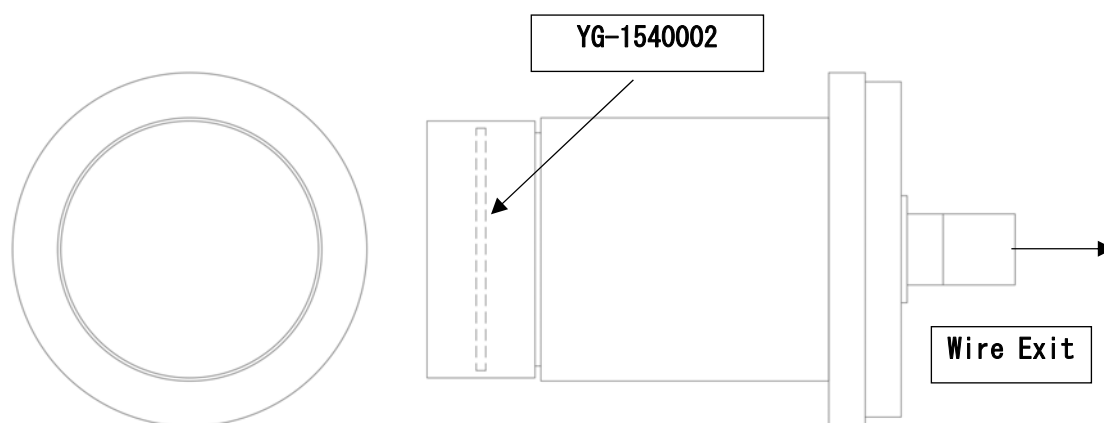
Item	Description	Contents
Wire	UL1061 AWG28	“Line color” is described in the figure below
Length	200mm(+20mm,-0mm)	Not including terminals
Terminate	For PCB	SIN-002T-1.0(JST) Solder
	For device ① ②	SPND-002T-C0.5(JST)
	For device ③	SXA-001T-P0.6(JST)
Attach	housing	PNIRP-03V-S(For①), PNIRP-02V-S(For②), XMP-02V(For③)
	retainer	PNIS-03V(For①), PNIS-02V(For②), XMS-02V(For③)



UNIT (mm)

- 1: UL1061 AMG28 use
- 2: All materials are UL Certified
- 3: Each terminal should be crimped with a special crimping tool
- 4: Use contacts that match the connector and wire diameter

YG-1540002 is used with Moleded plastic case. (Specifications of plastic case may change)



< Plastic Case (Cylindrical Type) >

※ When using this device for the final products outside Japan, indicate the FCC ID and IC lighting number on the surface of the plastic case with a label or the like. If you cannot attach a label, etc., refer to the FCC ID and IC lighting number described in this manual instead of indicated them(P4).

#### 4. Absolute Maximum Rating

Item	Symbol	Rating	Unit	Memo
Input Power	$V_{IN}$	5.5	V	
RS422 Input	$V_A, V_B, V_Y, V_Z$	-9 to 14	V	IC:SN65HVD3080E/TI Vdd=5V
Operation Temperature	$T_{opt}$	0~+50	°C	
Operation Humidity	$H_{opt}$	20~85	%RH	No condensation

#### 5. Electrical Characteristics

Item	Symbol	Condition	Rate			Unit
			Min.	Typ.	Max.	
Power	$V_{IN}$		4.8	5.0	5.2	V
Logic Power	$V_{DD}$		-	3.3	-	V
GND	GND		-	0	-	V
Consumption Current	$I_{DD}$	$V_{IN} = 5V$ $V_{DD} = 3.3V$	-	-	160	mA

#### 6. AC(Reference Data -No warranty)

Item	Symbol	Condition	Rate			Unit
			Min.	Typ.	Max.	
Inventory	$T_u$	Without RS422		18		msec
Single Block Read	$T_{mr}$	Without RS422		18		msec
Single Block Write	$T_{wr}$	Without RS422		39		msec

Just RFID Communication Time

## 7. RFID Tag Command List

No	Command Name	Function Code	Tag-it HF-I Pro	Tag-it HF-I Plus	I-CODE SLI	Memo
1	Inventory	H'01	○	○	○	
2	StayQuiet	H'02	○	○	○	
3	ReadSingleBlock	H'20	○	○	○	
4	WriteSingleBlock	H'21	○	○	○	
5	LockBlock	H'22	○	○	○	
6	ReadMultipleBlocks	H'23	× 1	○	○	
7	WriteAFI	H'27	× 1	○	○	
8	LockAFI	H'28	× 1	○	○	
9	WriteDSFID	H'29	× 1	○	○	
10	LockDSFID	H'2A	× 1	○	○	
11	GetSystemInformation	H'2B	× 1	○	○	
12	WriteSingleBlock × BlockLength	H'90	○	○	○	YG-1540001 YG-1540002 Original
13	Kill	H'A4	○	× 2	× 2	TI Original
14	WriteSingleBlockPwd	H'A5	○	× 2	× 2	TI Original

• × 1 : 「ResultCode = NG\_READER\_RESPONSE\_RECV」

• × 2 : 「ResultCode = NG\_15693\_FAILURE」

※ For details refer to 「JIS X 6323-3」

※ FunctionCodes are described [command specification of PC-1540001/2]

※ Kill andWriteSingleBlockPwd refer to

Tag-it™ HF-I Pro Transponder Chip/Inlays. Commands and Options. Reference Guide.

Literature Number: SCBU008. November 2005

8. Production Flow

Solder Print	Mounting of electronic components
Components Mount	
Re-Flow	
Aspect Inspection	Inspect about the condition of the PCB
Splitting PCB	Split the sheet of the PCB
Wire Assemble※	Wire Assemble
Wire Aspect Inspect※	Inspect about the condition of the Wires.
Test	Function Test
Final Aspect inspect	Inspect about the final production.
Packing	Packing

※YG-1540002 Only

9. Function Test

YG-1540001

Test Item	Content
Insulation Resistance	Over 10k Ω
Voltage	3.3V±5%
Writing Firmware	Success or Frailer
RFID Communication Test	5~65mm No Re-try

YG-1540002

Test Item	Content
Insulation Resistance	Over 10k Ω
Voltage	3.3V±5%
Writing Firmware	Success or Frailer
RFID Communication Test	5~45mm No Re-try
Photo Sensor	Success or Frailer

**10. Shipping**

We pack it so that quality isn't damaged during transportation.

**11. Warranty**

If any defect arises in the product mentioned in this document within six month after delivery, and Supplier is Assumed to be responsible for it, and such the product is undoubtedly out of specification, the product shall be returned and replaced with a new product or a re-tested product by Supplier at Supplier's cost.

We do not assume any responsibility for the expenses of resulting damages caused from the under-mentioned cases even under warranty.

- Any defect and/or abrasion caused by force majeure such as natural hazard and abnormal voltage drop.
- Any defect and/or abrasion caused from displacement, drop, removal and/or transportation.
- Any modification or a party designated by Supplier.
- Improper handling, regardless intention or fault.
- Responsibility for over and short of final specification approved by customer.
- Any defect caused from aging such as degradation of painted surface and plated surface.

**12. Miscellaneous**

- If you have any questions, it shall be settled after discussion.
- All right reserved, do not reprint this work without permission.

**13. Revision History**

Date	Revision	content
2021/11/15	1.0	First revision