SPECIFICATIONS FOR APPROVAL

REBE-TZ15K

Model	Model Name	Customer P/N1
1.54” 3-Color Graphic	REBE-TZ15K	-

RoHS
Compliant

APPROVAL	REMARK	APPENDIX

DESIGNED	CHECKED	APPROVED
2020.06.19	2020.06.19	2020.06.22
K.S.AN	H.H.HAN	I.U.KIM

ATEC AP

Revision History

Revision	Date	Contents of Revision Change	Remark
1.0	’20.06.22	First release	-

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1. Application

This Specification is applied to ATEC AP Wireless Electronic Shelf Label. (REBE-TZ15K)
REBE-TZ15K is used by retailers for displaying product pricing on shelves. Typically, electronic display modules are attached to the front edge of retail shelving. These modules use Electrophoretic Display (EPD) or similar screen technologies to show the current product price to the customer.

A communication network allows the price display to be automatically updated whenever a product price is changed.

2. Quality

Quality should meet each condition which mentioned on this specification. However, the items which are not mentioned on this specification follow the inspection agreements and standards which are agree with both companies.

3. Appearance and Characteristics

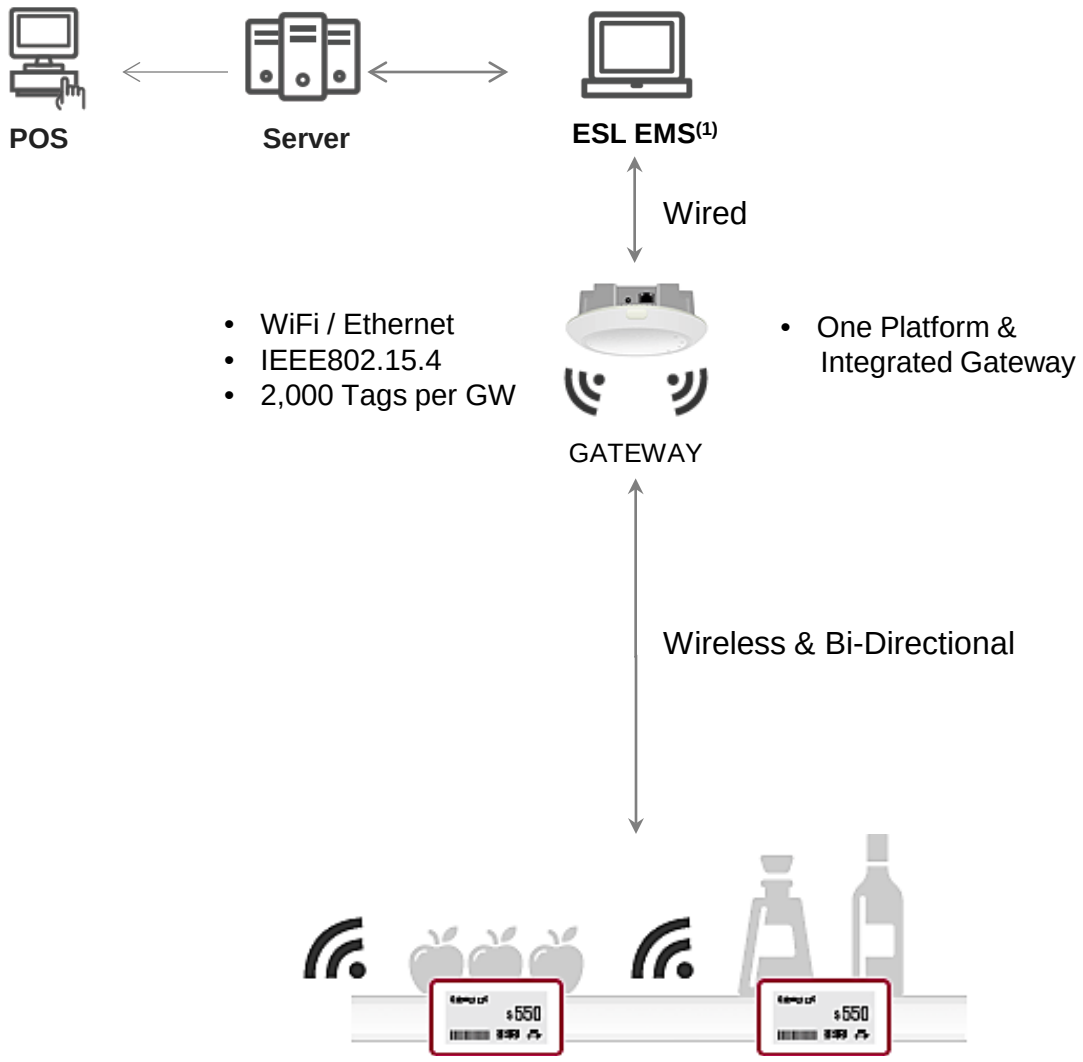
3.1. Appearance

Appearance should not be contaminated by harmful materials and should not have cracks, etc. Mechanical dimensions should meet the contents of clause 9.

3.2. Characteristic

Electrical Characteristics should meet the contents of clause 7.

4. Overall Service Scenario



2.4GHz Wireless Tags

(Battery / Power Line)

(1) EMS : ESL Management Software

5. General Features

5.1. Description

Item		Description
Size		42.5 x 36.5 x 12.0 (mm)
Weight		Typ. 18.5g (Include Battery-Battery 6.5g)
Digital Display		Type : Electrophoretic Display Size / DPI : 27.51(H) x 27.51(V) (mm) / 140
Display Color		3-Color (Red/Black/White) (1)
Power		Rate : 3.0 V / 100 mA CR2450 Coin Battery 1 PKG (Removable) Battery Capacity : Max. 550 mAh Battery life time: 3 year at 23℃ and 50% RH (2) (Image update 2 times per day)
NFC		Operating frequency of 13.56 MHz
Network	802.15.4	2.4GHz IEEE802.15.4 compliant RF Transceiver
	Security	Robust wireless network (ATEC AP own protocol)
	Protocol	Compatible with ATEC AP protocol communication devices
	Comm. Range	Max. 30m (Under LoS) (3)(4)

[Notice] (1) If the background of display is red, display quality can be decreased.
Generally, we recommend that the portion of red color has less than 50%.
(2) The battery life time depends on operating conditions
(Temperature, humidity, wireless environment, image update count…etc)
(3) LoS (Line of Sight) : Without any sort of an obstacle between a gateway and end devices.
(4) Communication Range depends on surrounding environment.

6. Absolute Maximum Rating

6.1. Environmental Conditions

The normal operating environmental conditions are those as below. In such conditions, ESL must be in conformity with the present specification. The conformity to such requirement must be certified by the manufacturer.

Parameter	Condition	Min.	Typ.	Max.	Unit
Operating Environment (1)	Temperature	10	23	30	℃
	Humidity	35	50	65	%RH
Storage Environment (2)	Temperature	10	23	30	℃
	Humidity	-	-	55	%RH

[Notice] (1) Tag can operate at 0~40℃. But only assure the image quality of EPD at 10~30℃.

(2) After receiving the product, it should be installed within 3 months

6.2. Electrical Conditions

The operating electrical conditions are those as below. In such conditions the ESL must be in conformity with the present specification. All devices can be damaged or non-operated over the specification as below. The conformity to such requirement must be certified by the manufacturer.

Parameter	Condition	Min	Typ.	Max	Unit
Supply Voltage	DC Power Supply	2.2	3.0	3.3	V
Power Consumption		-	-	100	mA
ESD Protection	Air Condition @Soft Fail	-8	-	+8	kV

7. Electrical Specification

7.1. IEEE802.15.4

The REBE-TZ15K supports IEEE802.15.4.

7.2. General Specification

- Standard : Only IEEE802.15.4 PHY
- Frequency : 2405 ~ 2480MHz
- Channel : 16CH. (5MHz Spacing)
- Modulation : DSSS/O-QPSK
- Max. Data Rate : 250Kbps

7.3. Electrical Specification

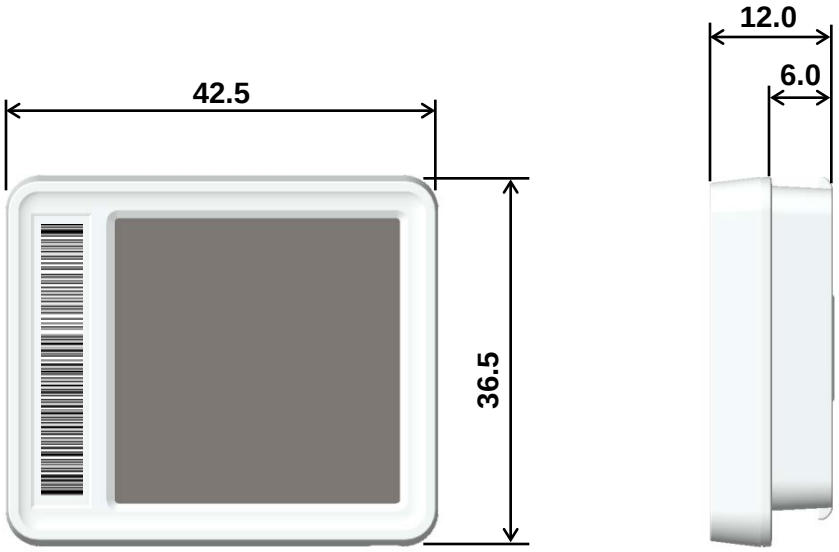
- Channel power depend on each country regulations (EX. KC, etc)
- The electrical specification which is shown below is ATEC AP internal specification.
- All values depend on surrounding environment and current statement of access point

RF Performance					
Parameter	Condition	Min	Typ	Max	Unit
Output Power	-	0	-	-	dBm
Receiver Sensitivity	PER=1% (Required -85dBm)	-85	-	-	dBm
Maximum Input Level	PER=1% (Required -20dBm)	-	-	-20	dBm
Frequency Tolerance	Required Max. ±75kHz	-75	-	75	ppm
Error Vector Magnitude	Required Max. 35%	-	-	35	%

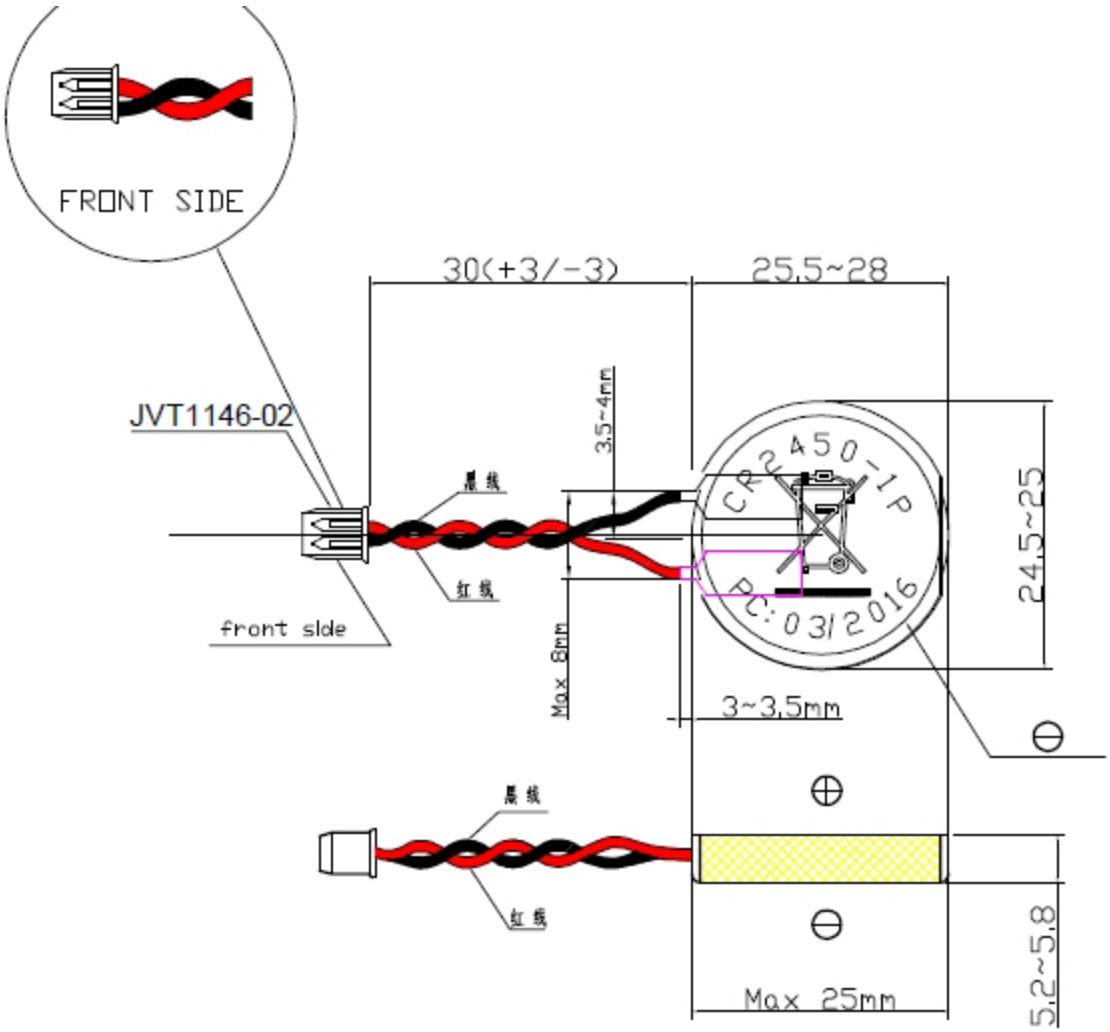
8. Mechanical Information

8.1. Mechanical Dimension

Size	42.5 x 36.5 x 12.0 (mm)
Weight	Typ. 18.5g (Include Battery-Battery 6.5g)



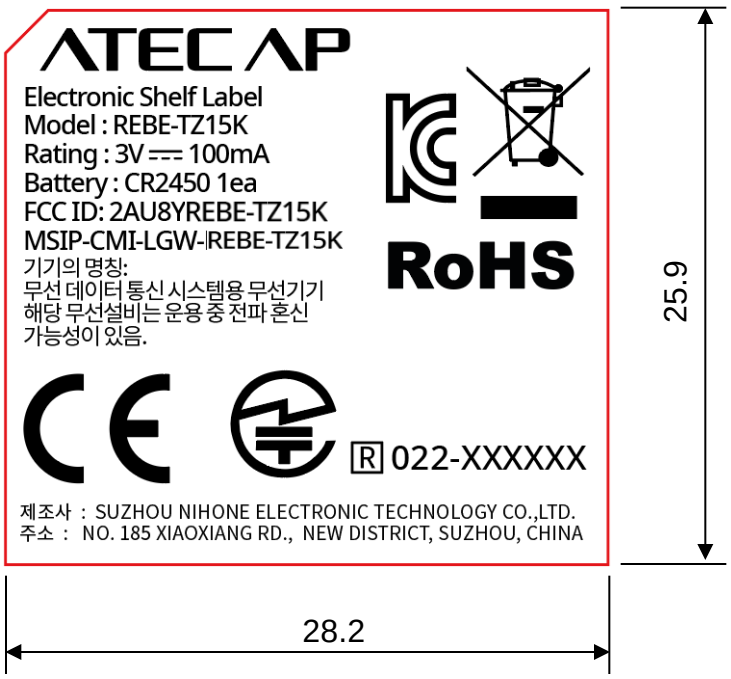
8.2. Battery Dimension



8.3. Label Specification

8.3.1. Product Label Specification

unit : mm



8.3.2. MAC Barcode Labeling Specification

Unit : mm

Label Size : 28 x 5mm
Barcode Size : 23 x 3mm

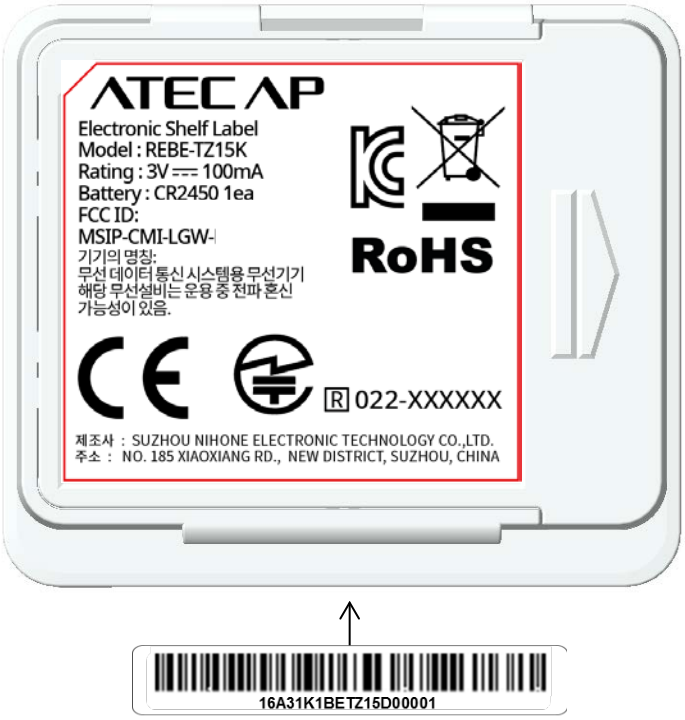
8.3.3. Serial Barcode Labeling Specification

Label Size : 28 x 5mm
Barcode Size : 26 x 3mm

Serial Barcode Information (19-codes)

YY	M	DD	F	L	XXXXXXX	12345
Year 2016 : 16	**Month** 1 : 1 2 : 2 3 : 3 4 : 4 5 : 5 6 : 6 7 : 7 8 : 8 9 : 9 10 : A 11 : B 12 : C	**Date** 01 . . . 31	**Factory** LGIT Kwangju : A LGIT Osan : B LGIT Indonesia : C LGIT China : D ShineFul : K DainTech : L	**SMT Line** Line 1 : 1 Line 2 : 2 Line 3 : 3 Line 4 : 4 Line 5 : 5 Line 6 : 6	**Model No.**	**Production Sequence 5-digit Serial No**

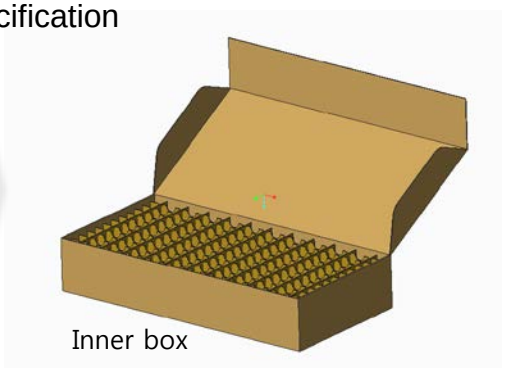
8.3.4. Labeling Specification

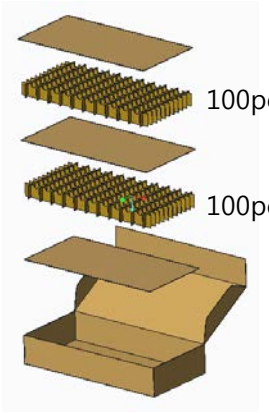


8.4. Rendering

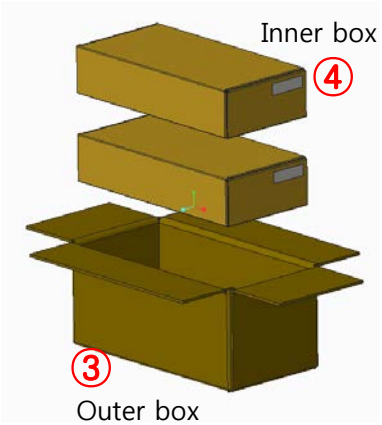
9. Packaging

9.1. Packaging Specification

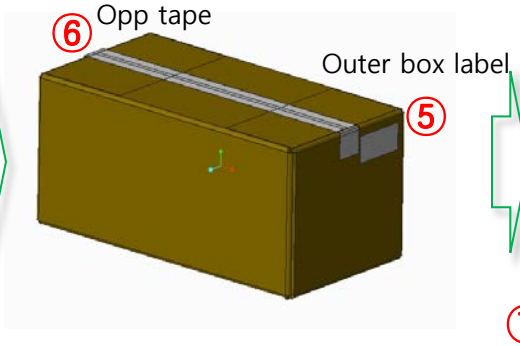


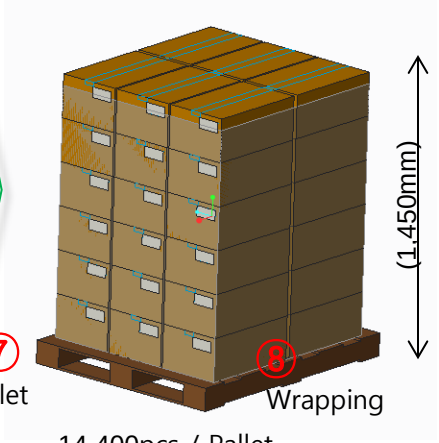


Inner box ASS'Y
200pcs / inner box



400pcs / Outer box





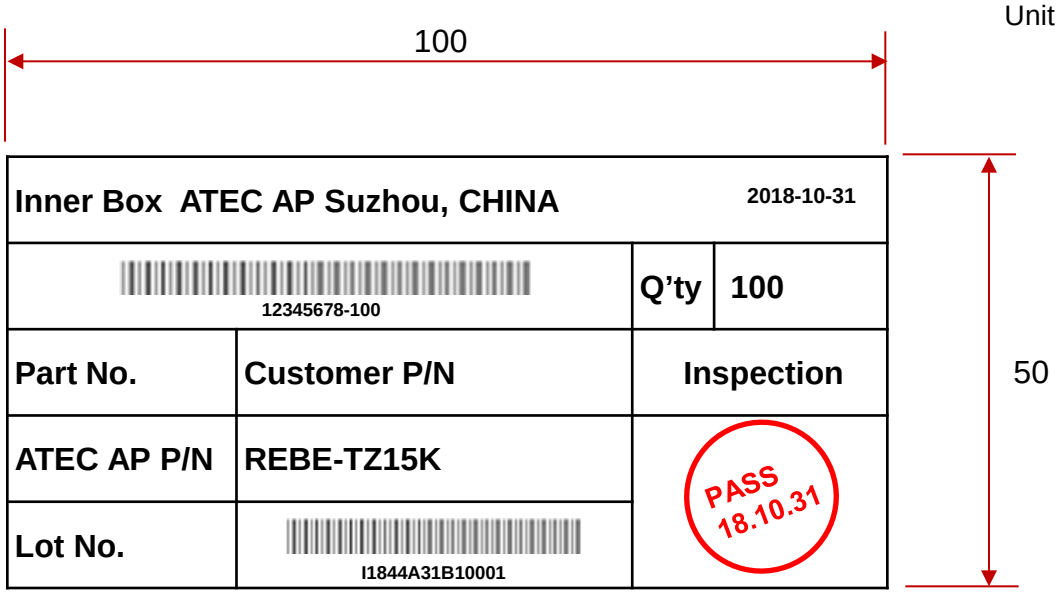
14,400pcs / Pallet
(400*6*6)

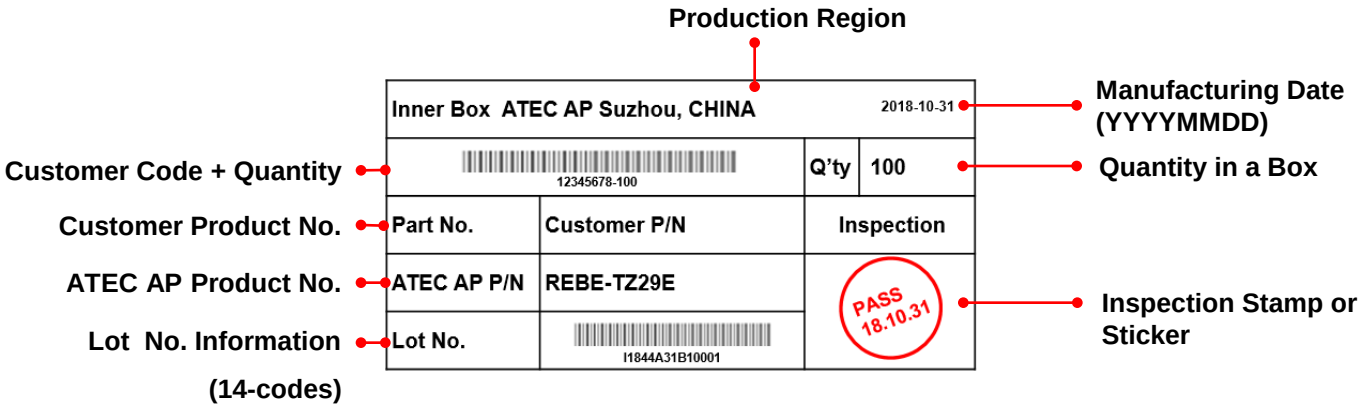
No.	Item	Q'ty	Spec.
①	PE_BAG	1	1. Material : LDPE 2. Size : 110*65mm
②	Inner box Ass'y	0.005	1. Material : Corrugated paper 2. Size : 535*265*100mm
③	Outer box	0.0025	1. Material : Corrugated paper 2. Size : 555*270*215mm
④	Inner box Label	0.005	1. Material : Art paper 2. Size : 100*30mm
⑤	Outer box Label	0.0025	1. Material : Art paper 2. Size : 100*50mm
⑥	OPP Tape	-	1. Material : PE 2. Size : Width 50mm
⑦	Pallet	0.00006945	1. Material : Wood 2. Size : 1100*920*100
⑧	Wrapping	-	1. Material : PE

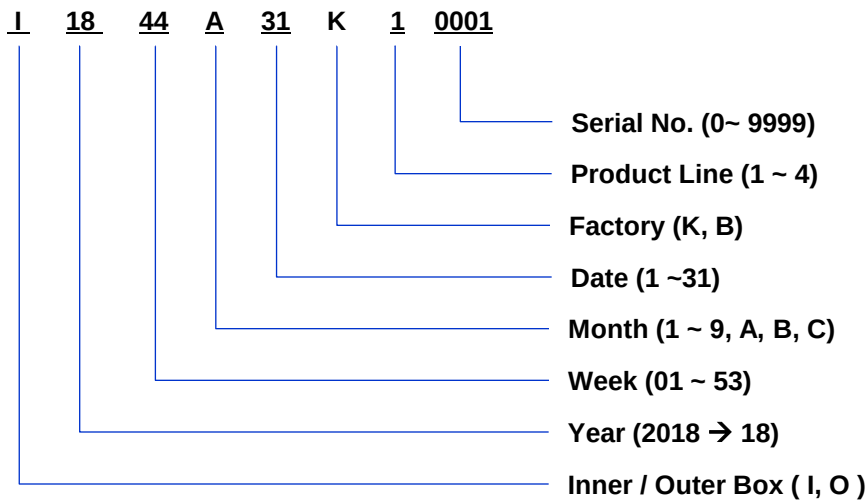
9.2. Packaging Label Specification

9.2.1. Inner Box Label Specification

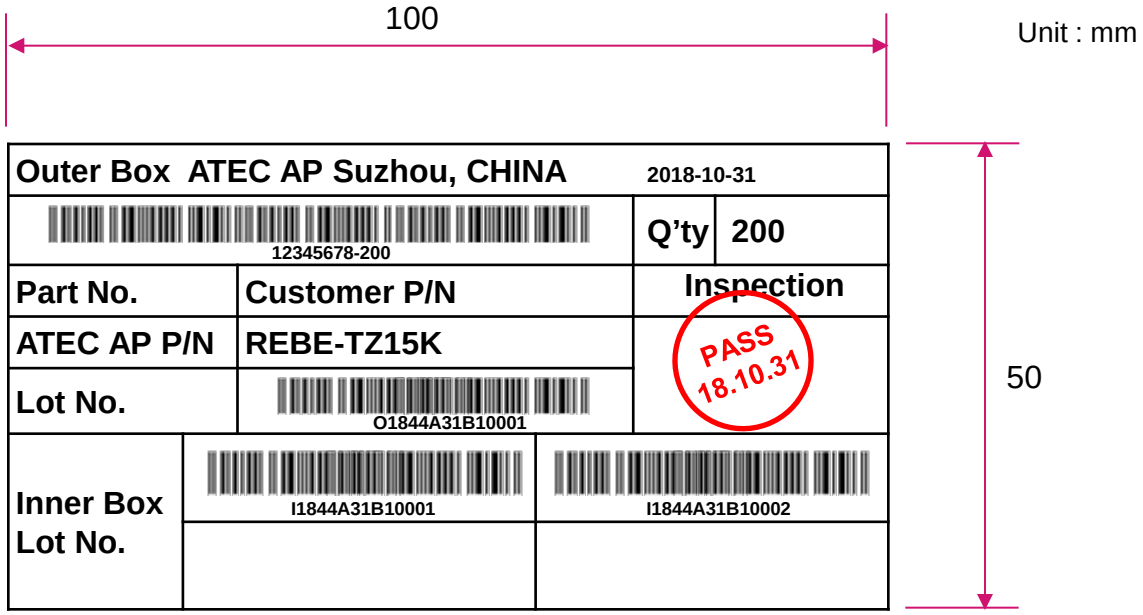
Unit : mm

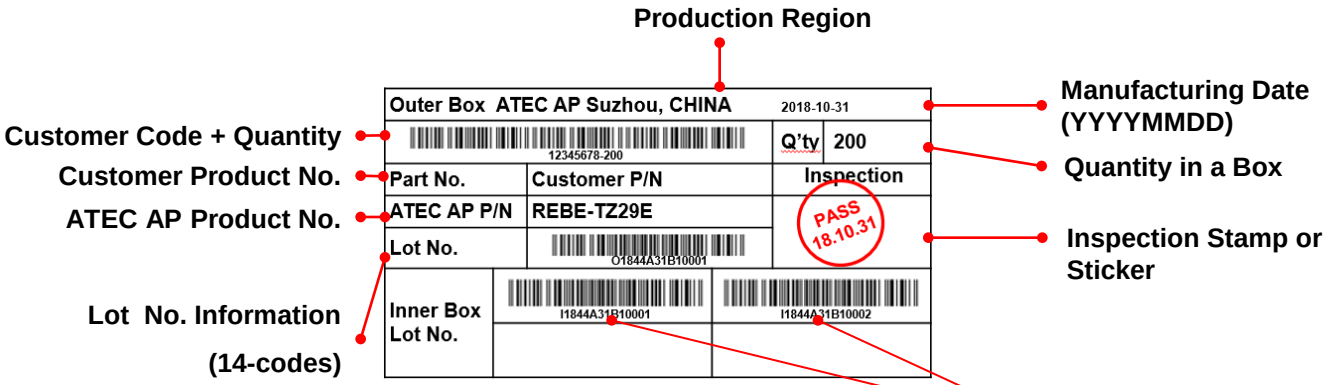






9.2.2. Outer Box Label Specification





O 18 44 A 31 K 1 0001

- **0001** — Serial No. (0~ 9999)
- **1** — Product Line (1 ~ 4)
- **K** — Factory (K, B)
- **31** — Date (1 ~31)
- **A** — Month (1 ~ 9, A, B, C)
- **44** — Week (01 ~ 53)
- **18** — Year (2018 → 18)
- **O** — Inner / Outer Box (I, O)

10. User Quick Manual

10.1. Tag Information

Symbol	Mode	Function	Image
	Deep Sleep	Initial Mode	
	Connected	Connected to Gateway	
	Disconnected	Disconnected to Gateway	
	Low Battery	Battery Discharged	
	Busy	Ready to image download	

[Notice]

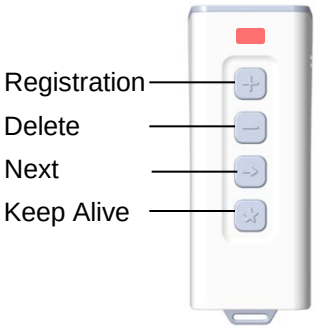
*** In this status of low battery, we can not ensure any normal operations.**

*** After change battery, the tag's display will be changed to normal status within next keep alive interval**

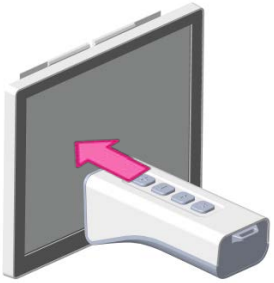
10.2. Description & Key Function

Remote control device provides customer with several functions as below

- Waking Tag up from sleep mode
- Updating new purchase image on Tag
- Deleting purchase image on Tag
- Returning a Tag to be factory settings



(a) function



(b) Contact direction

< Remote control device>

A remote controller or a NFC Device contact point for communication.

11. RoHS Compliance

REBE-TZ15K devices meet the requirements of Directive 2002/95/EC of the European Parliament and of the Council on the Restriction of Hazardous Substance (RoHS)

12. Related Certification

- KC, FCC, CE, TELEC

12.1 KC (Korean Certification)

LG Innotek

* 제품 사양

- 무선 사양 : IEEE 802.15.4(Zigbee)
- 사용주파수 : 2 402 MHz ~ 2 480 MHz (Zigbee), 13.56 MHz (NFC 수신)
- 채널수 : 16 개 - 출력 : 10 mW/MHz 이하

* 인증표시사항

- 기기 명칭 : 특정소출력 무선기기(무선데이터통신시스템용 무선기기)
  + RFID/USN용 무선기기(13.56 MHz 대역 사용기기)
- 인증자 상호 : 엘지이노텍(주)
- 모델명 : REBE-TZ15D
- 제조사 / 제조국가 : SUZHOU NIHONE Electronics Technology Co., LTD / 중국
- 제조년월 : 제품 별도 표기
- 인증번호 : MSIP-CMI-LGW-REBETZ15D

본 기자재는 통상이용상태에서 인체로부터 20 ㎝ 이내 사용하지 않는 기자재이므로 SAR 비 대상기자재로 간주하여 SAR 시험하지 않음

해당 무선설비는 전파혼신가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없음

12.2 FCC (Federal Communications Commission)

LG Innotek

Regulation Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC 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 received, including interference that may cause undesired operation.

Caution:

Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void user's authority to operate the equipment. This appliance and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter.

A minimum separation distance of 20 cm must be maintained between the antenna and the person for this appliance to satisfy the RF exposure requirement.

12.3 CE (Conformity European)

EU DECLARATION OF CONFORMITY [1]

LG Innotek

Number [2]

DoC_LGIT_REBE-TZ15D_171208

Name and address of the Manufacturer [3]

LG Innotek Co., Ltd.
26, Hanasandan Sbeon-ro, Gwangsan-gu, Gwangju, 62229, Korea

This declaration of conformity is issued under the sole responsibility of the manufacturer. [4]

Object of the declaration [5]
Product information [6]

Product name: Electronic Shelf Label, Model name: REBE-TZ15D

Additional information [7]

SW version: 1.x (x can be 1 digit or 2 digit number)

The object of the declaration described above is in conformity with the relevant Union harmonization legislation: [8]

- References to the relevant harmonized standards used or references to the technical specifications in relation to which conformity is declared [9]

Radio Equipment Directive 2014/53/EU	RoHS Directive 2011/65/EU
EN 300 328 V2.1.1, EN 300 330 V2.1.1 EN 62311:2008 EN 301 489-1 V2.1.1, EN 301 489-3 V2.1.1, EN 301 489-17 V3.1.1 EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013	EN 50581:2012

The notified body [10] *MiCOM Labs, Inc.* performed *a conformity assessment of the technical construction files*

and issued the certificate

Additional information [7]

Signed for and on behalf of: [11] *LG Innotek Co., Ltd.*

Senior Research Engineer/ Inchang Jeong

Signature of Authorized person

Date of issue: *Dec. 8. 2017*

EU Representative: LG Innotek Co., Ltd. Am Limespark 2 (Innovapark) 65843 Sulzbach am Taunus, Germany
http://www.lginnotek.com/esl/index.jsp

1/2

ATEC AP

12.4 TELEC (Technical Regulations Conformity Certification)

BUREAU VERITAS

工事設計認証書

認証を受けた者	LG Innotek Co., Ltd.
特定無線設備の種別	第2条第1項第19号に掲げる無線設備
電波の型式、周波数及び空中線電力	G1D 2405～2480MHz(5MHz間隔16波) 0.001W/MHz
特定無線設備の型式又は名称	REBE-TZ15D
特定無線設備の製造者名	Suzhou Nihone Electronic Technology Co., Ltd.
工事設計認証番号	022-100054
認証をした年月日	平成29年11月9日
備考	

上記のとおり、電波法第38条の24第1項の規定に基づく工事設計認証を行ったものであることを証する。

平成29年11月9日

ビューローベリタスジャパン株式会社

BUREAU VERITAS JAPAN CO., LTD. CPS Division

Bureau Veritas Japan Co., Ltd.
Yamashitacho SSK Building 5F,
22 Yamashita-cho, Naka-ku, Yokohama,
231-0023 Japan
Tel:+81(0)45-641-4217 Fax:+81(0)45-641-8493
www.bureauveritas.jp

ATEC AP

13. Disclaimers

-. *ATEC AP* is not responsible for any damages caused by any accidents or operational environments exceeding the absolute maximum ratings.

-. Consultation with *ATEC AP* is recommended for unassured environments or operations to avoid any possible malfunctions or damages of the products or risk of life or health.

-. Any unauthorized, without prior written consents, from *ATEC AP* disassembly is prohibited if purposed for reverse-engineering. All defected devices must be reported to *ATEC AP* and not to be disassembled or analyzed.

-. The product information can be modified and upgraded without prior notice.

14. Ordering Information

1	2	3	4	—	6	7	8	9	10

[Big Class] Big Class

RE	ESL System

[Product Type]
Middle Class

G	Gateway
D	Set-Adapter Type
B	Set-Battery Type
P	PCB Type
A	Accessory

[LCD] Small Class (LCD type)

X	Not Used		
E	Bistable	Graphic	Electrophoretic Display

[Color] Color [Color]

X	Not Used
M	Mono
T	3-Color
F	4-Color
I	5-Color 이상
A	Full Color

[Version](**A~Z**)

[Inch] LCD Size

	Display Size
XX	Not Used
01~09	0.1” ~ 1.0”
10~19	1.0” ~ 2.0”
20~29	2.0” ~ 3.0”
30~39	3.0” ~ 4.0”
40~49	4.0” ~ 5.0”
50~59	5.0” ~ 6.0”
60~69	6.0” ~ 7.0”
70~79	7.0” ~ 8.0”
80~89	8.0” ~ 9.0”
90~99	9.0” ~ 10.0”
A0~A9	10.0” ~ 11.0”
B0~B9	11.0” ~ 12.0”
C0~C9	12.0” ~ 13.0”
D0~D9	13.0” ~ 14.0”
↓	↓
Z0~Z9	35.0” ~

[Chip] Main Chip [RF]

X	Not Used
Z	802.15.4

※ Example
REBE–TZ15K
: 1.54 Inch 3-color ESL
Revision D