CUSTOMER : Standard

DATE : 2023. 05. 18

PRODUCT SPECIFICATION

Model	Customer P/N	Description
REBE-TZ15L **REBE-TZ21L** **REBE-TZ29L** **REBE-TZ37L** **REBE-TZ42L** **REBE-TZ75L**	-	3 Color graphic Button LED IEEE802.15.4

RoHS
Compliant

APPROVAL	REMARK	APPENDIX

DESIGNED	CHECKED	APPROVED
2022.05.23	2022.05.23	2022.05.23
K.S.AN	J.B.KIM	I.U.KIM

ΛTEC IoT
에이텍아이오티

Revision History

Revision	Date	Contents of Revision Change	Remark
1.0	'23.04.01	First release	
1.1	'23.04.21	Add Certification	K.S. AN
1.2	'23.05.18	H/W Block Diagram modified	K.S. AN

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1. Application

This Specification is Applied to ATEC IoT Wireless Electronic Shelf Label. (ATEC IoT ESL Tag)
ATEC IoT ESL Tag is used by retailers for displaying product pricing or information 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 or information display to be automatically updated whenever a product price or information 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 8.

3.2. Characteristic

Electrical Characteristics should meet the contents of clause 7.

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4. Overall Service Scenario

POS **Server** **ESL EMS[1]**

Wired

- WiFi / Ethernet
- IEEE802.15.4
- 2,000 Tags per GW

- One Platform & Integrated Gateway

GATEWAY

Wireless & Bi-Directional

$550

$550

2.4GHz Wireless Tags

(Battery / Power Line)
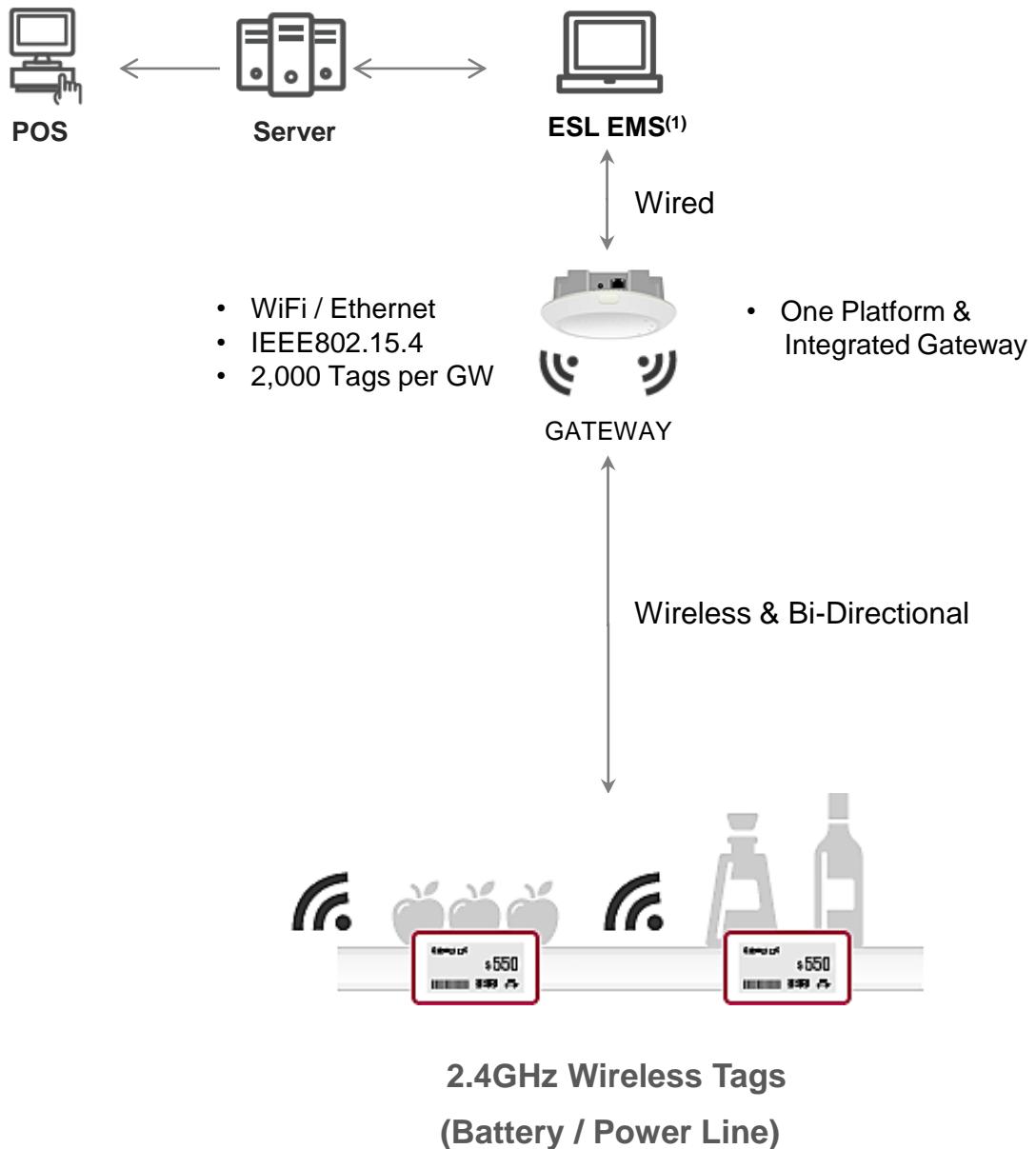
(1) EMS : ESL Management Software

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5. General Features

5.1. Description

Item		Description
Size		REBE-TZ15L (1.5") : 46.8 x 36.5 x 13.0 mm REBE-TZ21L (2.1") : 68.0 x 36.5 x 13.0 mm REBE-TZ29L (2.9") : 87.8 x 44.0 x 13.0 mm REBE-TZ37L (3.7") : 101.8 x 59.5 x 13 .0 mm REBE-TZ42L (4.2") : 103.0 x 96.0 x 12 .0 mm REBE-TZ75L (7.5") : 127.0 x 179.8 x 14.6 mm

Digital Display		Type : Electrophoretic Display
		Size / DPI
		  - REBE-TZ15L : 27.5(H) x 27.5(V) (mm) / 140
		  - REBE-TZ21L : 48.8(H) x 23.9(V) (mm) / 130
		  - REBE-TZ29L : 67.1(H) x 29.2V) (mm) / 112
		  - REBE-TZ37L : 82.0(H) x 47.3(V) (mm) / 130
		  - REBE-TZ42L : 63.9(H) x 85.1(V) (mm) / 120
		  - REBE-TZ75L : 98.7(H) x 164 V) (mm) / 124

Display Color		3-Color (Red/Black/White) [1]
Indicator Color		3-Color (Red/Green/Blue) [2]

Power [3]		Rate : 3.0 V / 100 mA
		 - REBE-TZ15L
		   : CR2450 Coin Battery 1in1 PKG* 1 set (Removable)
		 - REBE-TZ21L, REBE-TZ29L
		   : CR2450 Coin Battery 2in1 PKG* 1 set (Removable)
		 - REBE-TZ37L, REBE-TZ42L, REBE-TZ75L
		   : CR2450 Coin Battery 3in1 PKG* 1 set (Removable)

NFC [4]		Operating frequency of 13.56 MHz (Receiving Only)
Network	802.15.4	2.4GHz IEEE802.15.4 compliant RF Transceiver
	Security	Robust wireless network (ATEC IOT own protocol)
	Protocol	Compatible with ATEC IOT protocol communication devices
	Comm. Range	Max. 30m (Under LoS) [5][6]

[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 LED luminous intensity depends on operating voltage.
(3) It can be used by connecting an external power source that meets power specification instead of the battery provided (Refer to clause 6.2. about Power specifications)
(4) Refer to clause 9.2.1 about NFC Function
(5) LoS (Line of Sight) : Without any sort of an obstacle between a gateway and end devices.
(6) Communication Range depends on surrounding environment.

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5.2. Battery Life Time

Model	Life Time (1)
REBE-TZ15L	3years
REBE-TZ21L REBE-TZ29L REBE-TZ37L REBE-TZ42L REBE-TZ75L	5years

(at 23℃ and 55% RH , Image update 2 times per day)

[Notice] (1) The battery life time depends on operating conditions
(Temperature, humidity, wireless environment, image update count, Indicator…etc)

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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	Temperature	10	23	30	℃
	Humidity	45	55	65	%RH
Storage Environment	Temperature	0	23	40	℃
	Humidity	45	55	65	%RH

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

(2) Depending on the characteristic of the EPD, it may become reddish by passing time.

(3) Moisture, liquid and direct sunlight can damage the tag and reduce its life time.

(4) Getting a magnetic close to the tag can be degraded the performance.

(wireless communication, remote controller, etc)

(5) When storing the tag, change it to a white screen, and maintain the proper temperature and humidity.

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

(7) The display glass may break when it is dropped or bumped on a hard surface. (fragile by external impact)

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	2.3	3.0	3.3	V
Power Consumption	@ 3.0~3.3V	-	-	100	mA
ESD Protection	Air Condition @Soft Fail	-8	-	+8	kV

[Notice]   It can be used by connecting an external power source instead of the battery provided
But it must meet the power specifications shown above. (Adapter, SMPS, etc.)

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7. Electrical Specification

7.1. IEEE802.15.4

The REBE-TZ15L 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	kHz
Error Vector Magnitude	Required Max. 35%	-	-	35	%

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8. Mechanical Information

8.1. Mechanical Dimension

8.1.1 REBE-TZ15L

8.1.2 REBE-TZ21L

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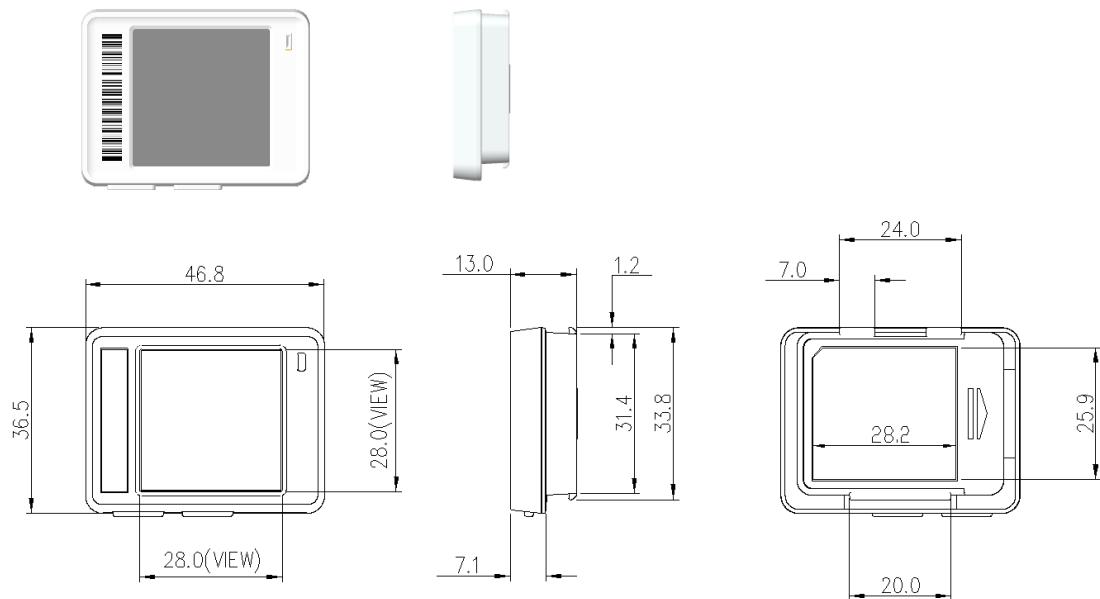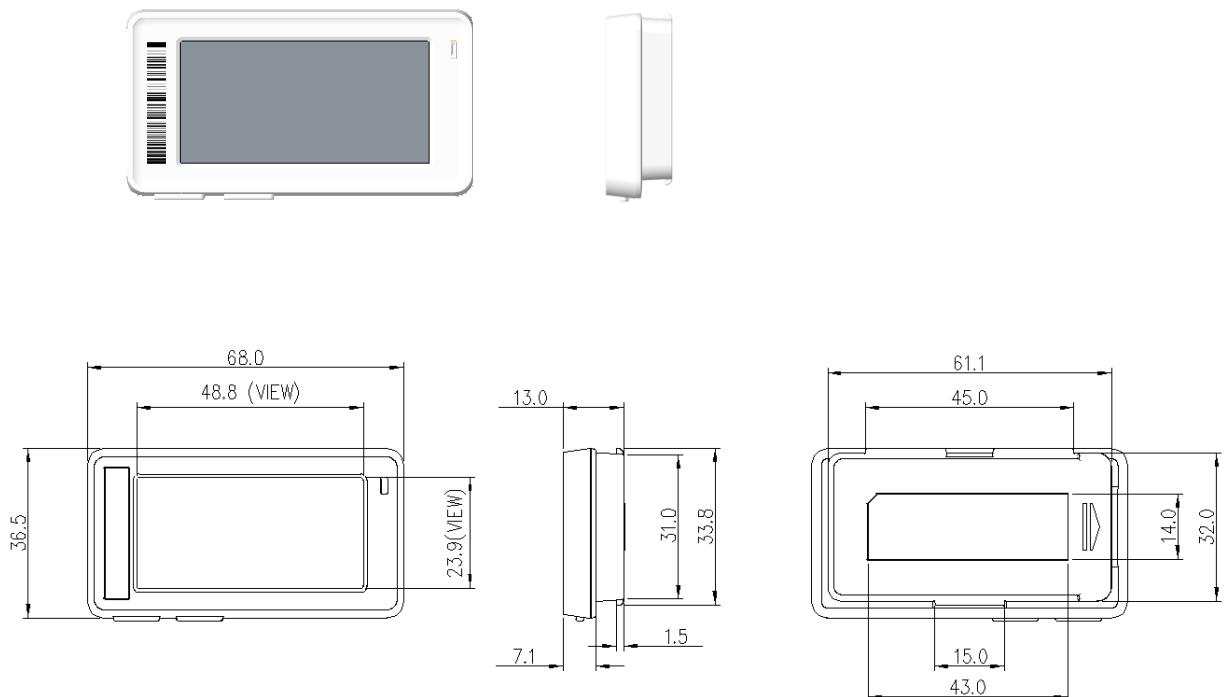
8.1.3 REBE-TZ29L

8.1.4 REBE-TZ37L

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8.1.5 REBE-TZ42L

103.0

12.0

96.0

103.0

12.0

1.2

31.4

33.8

63.9(VIEW)

96.0

85.1(VIEW)

6.7

2.4

96.0

79.8

35.0

29.8

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8.1.6 REBE-TZ75L

127.0

14.6

179.8

127.0

14.6

1.2

31.3

33.7

179.8

164.0 (VIEW)

98.7 (VIEW)

9.6

2.6

96.0

80.1

34.9

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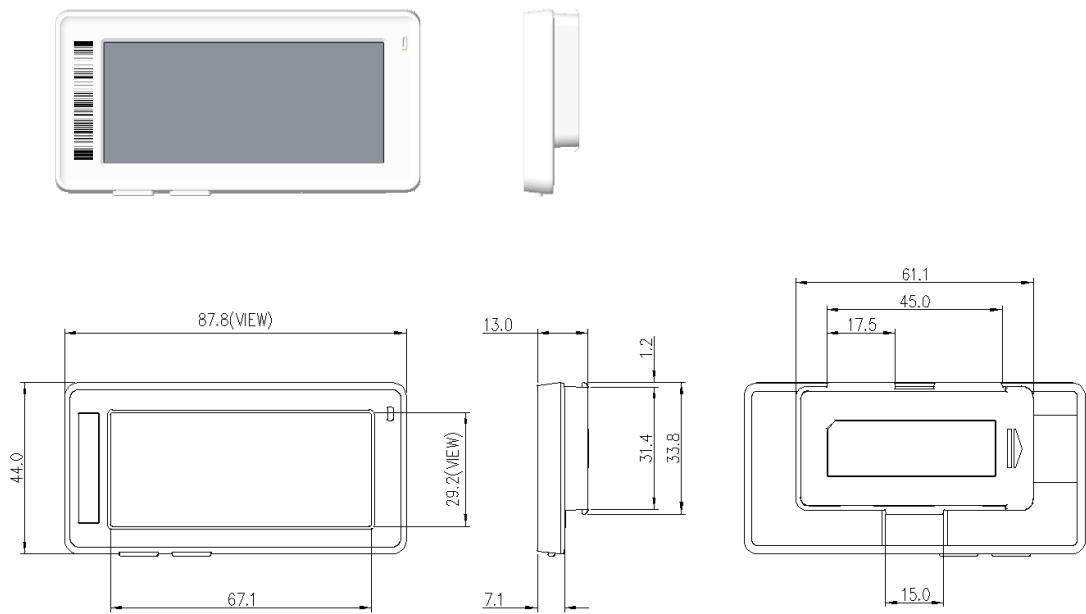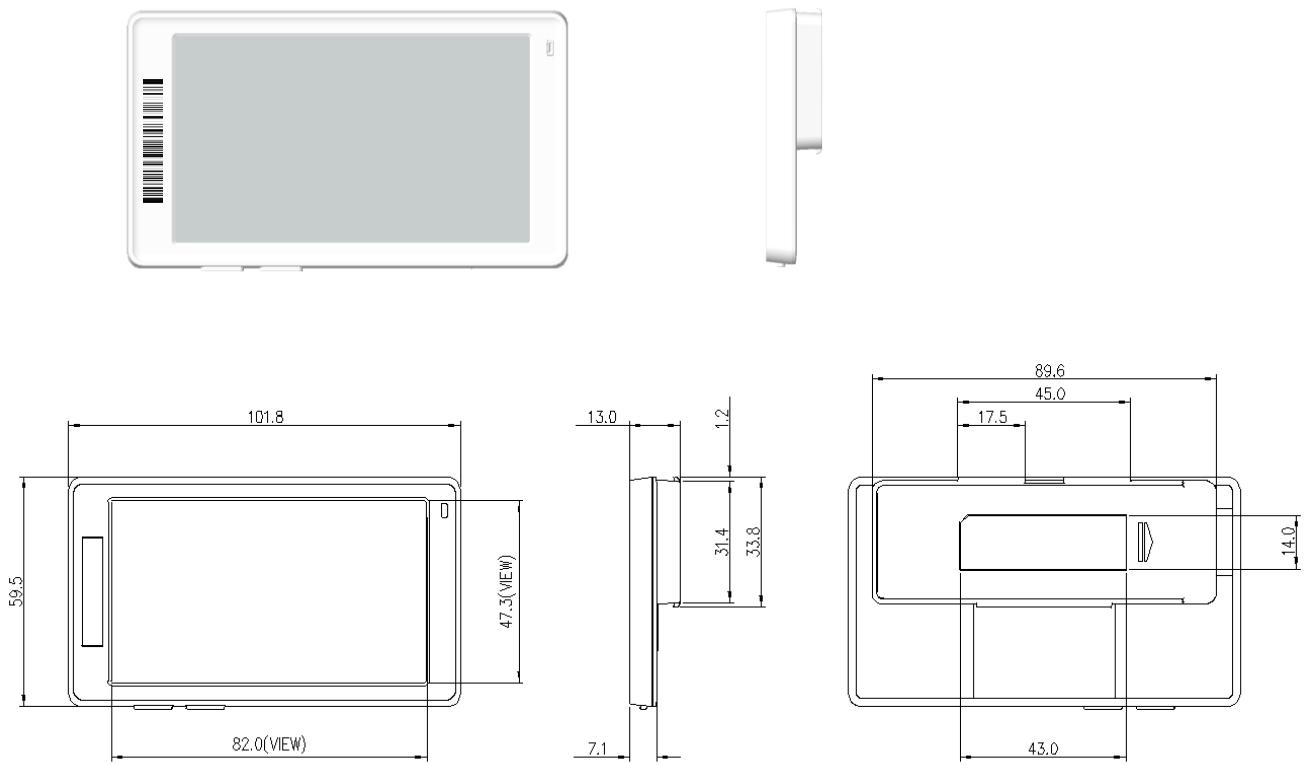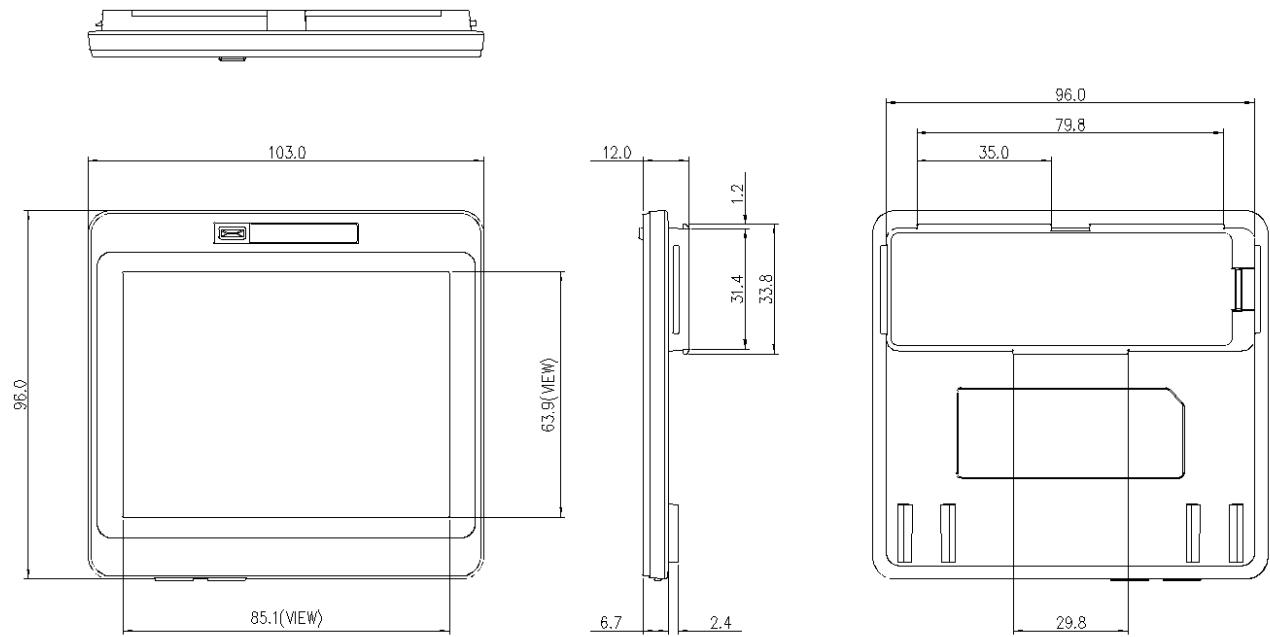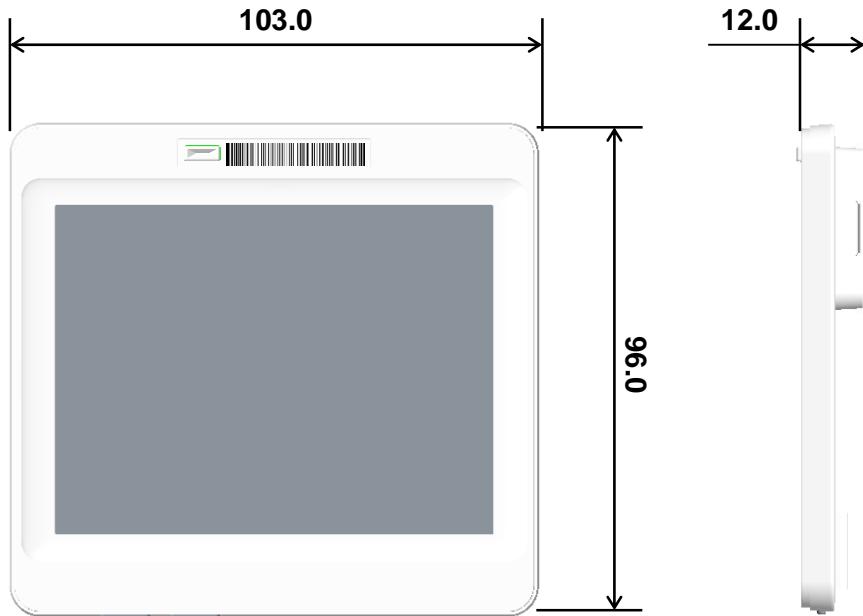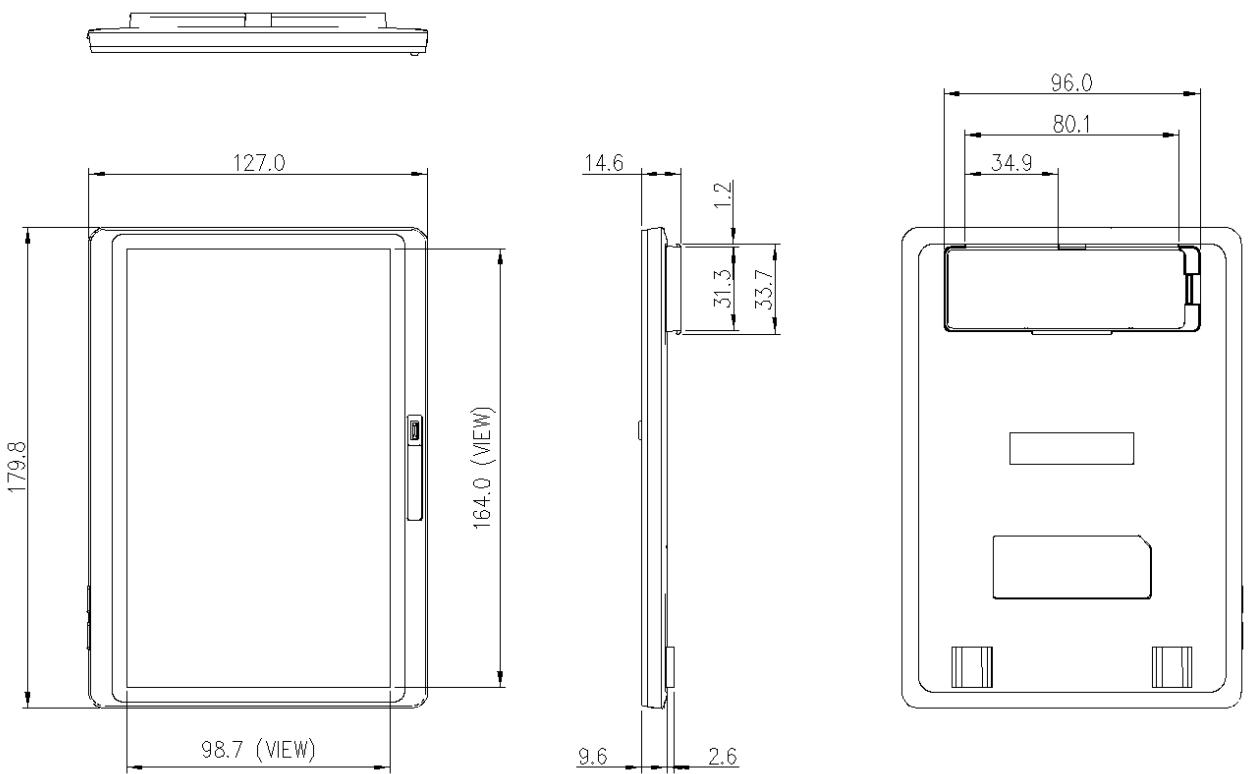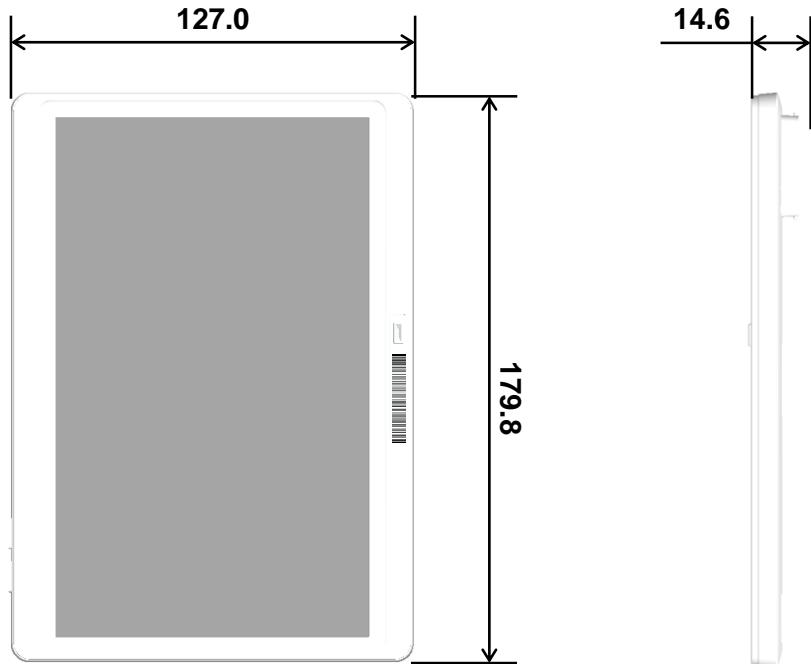
8.2. Battery Dimension

8.2.1 CR2450 Coin Battery 1in1 PKG* 1 set

Unit : mm
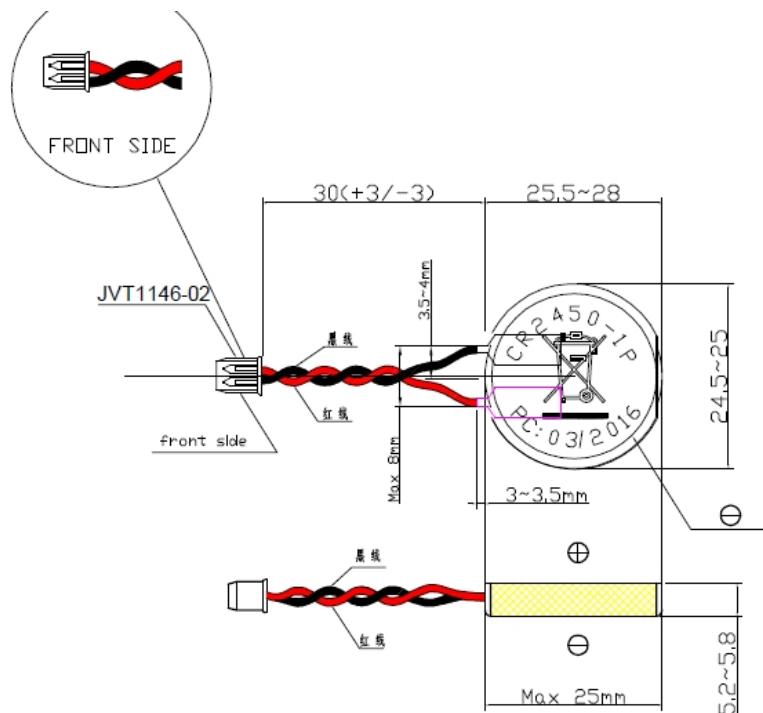
8.2.2 CR2450 Coin Battery 2in1 PKG* 1 set

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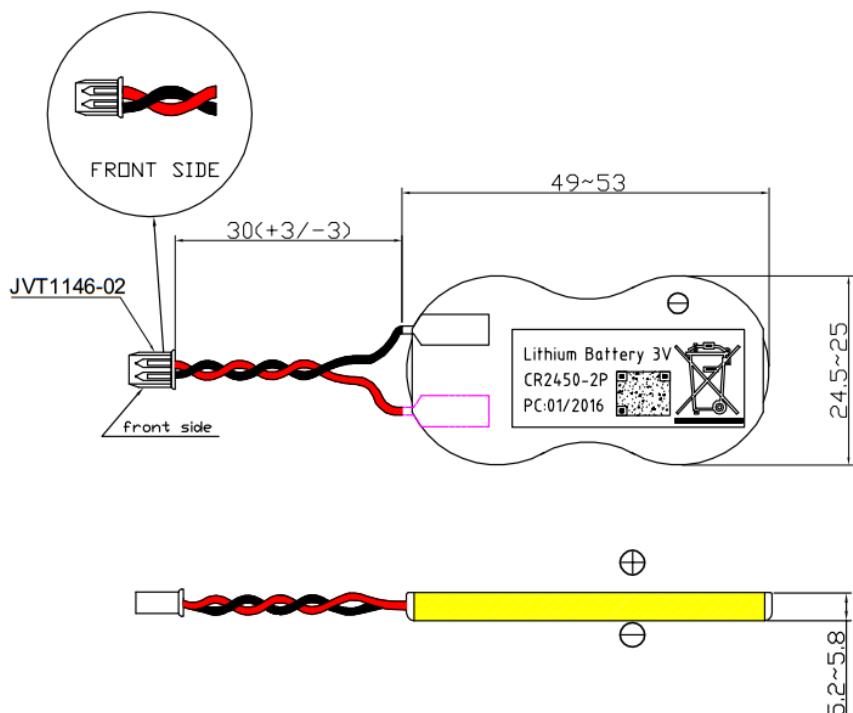
8.2.3 CR2450 Coin Battery 3in1 PKG* 1 set

Unit : mm
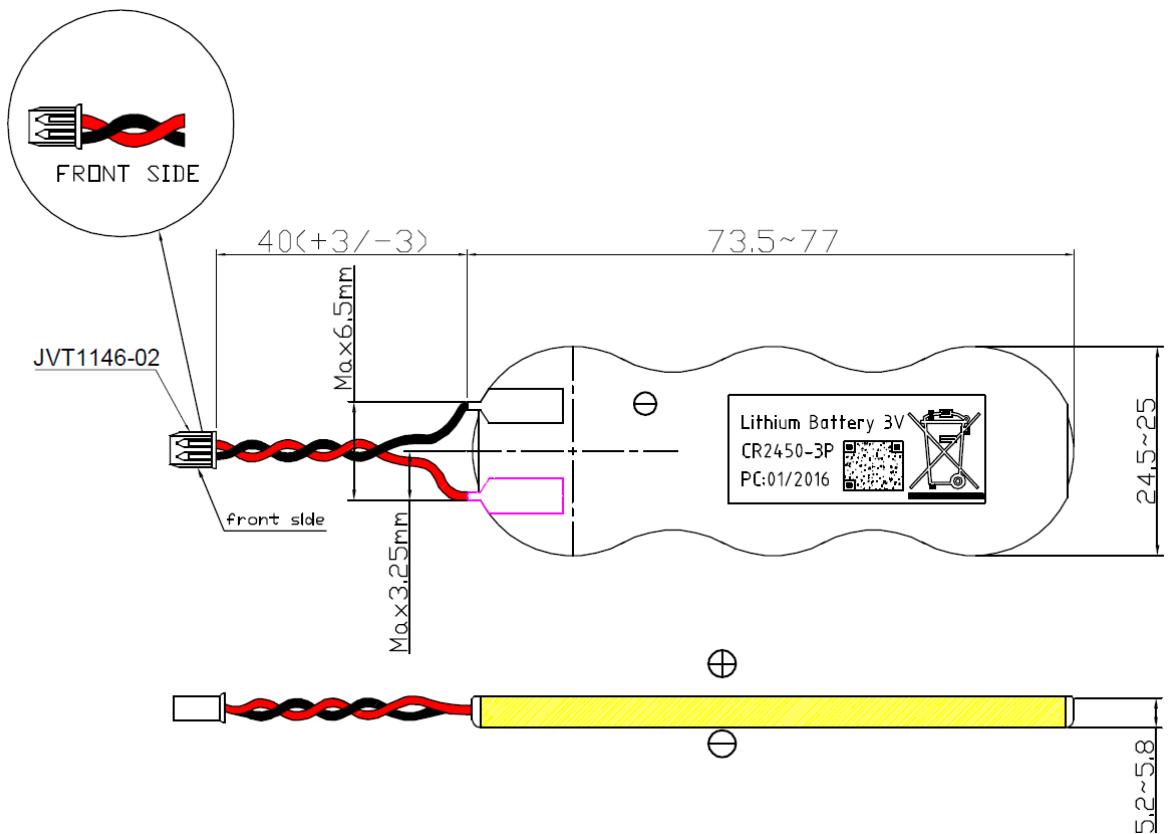
8.3. Label Specification

8.3.1. Product Labeling Specification

unit : mm
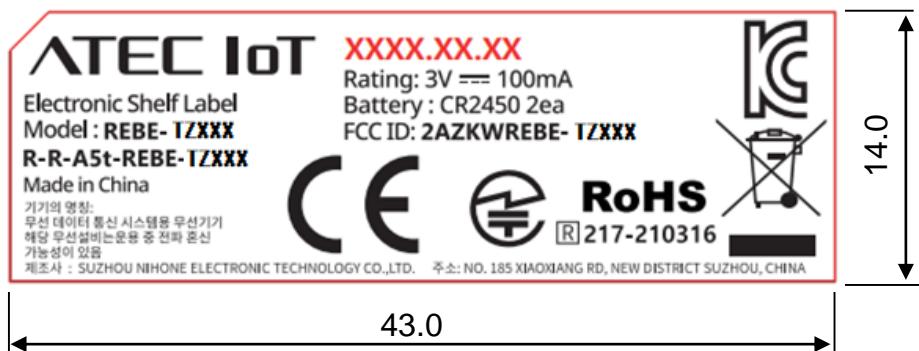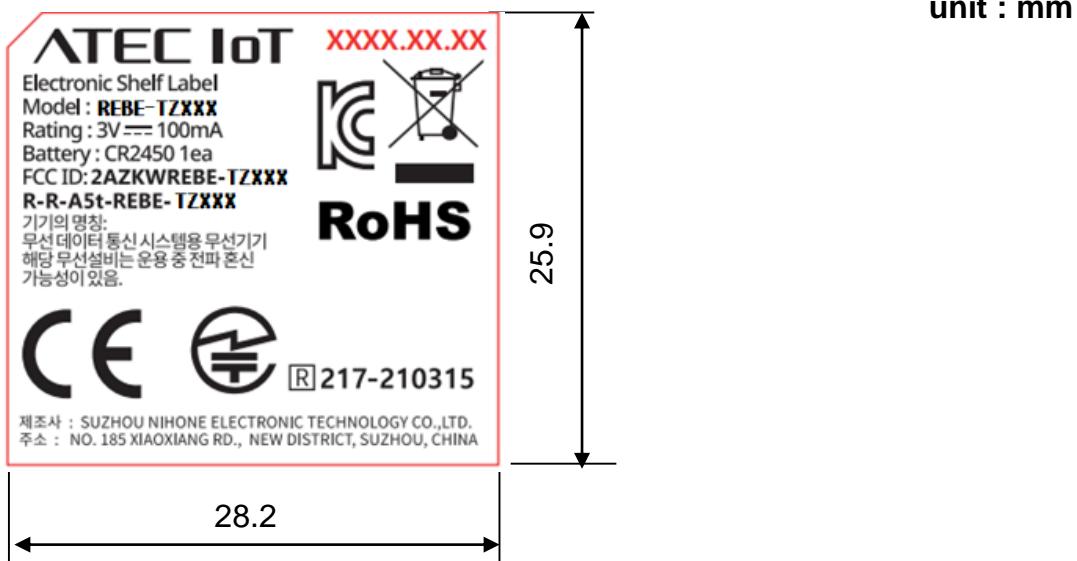
[Notice]
- Model Name : REBE-TZ①②③ (i.e REBE-TZ15L)
- FCC ID : 2AZKWREBE-TZ ①②③ (i.e REBE-TZ15L)
- KC : R-R-A5t-REBE-TZ ①②③ (i.e REBE-TZ15L)
  - REBE-TZ : ESL System, SET Battery Type, Electrophoretic Display, 3 Color
  - ①② : Display size
    - 15 →1.5" , 21 → 2.1" ……… C5 → 12.5 "
  - ③ : Tag Type (LED, BUTTON, etc)

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9. User Quick Manual

9.1. Tag Information

| Symbol	Mode	Function	Image
⊂⏻⊃	Deep Sleep	Initial Mode	
▽	Connected	Connected to Gateway	
▽	Disconnected	Disconnected to Gateway	
🔋	Low Battery	Battery change Recommended	
🔋	Empty 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

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9.2. Description & Function

9.2.1. Remote Control 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

Registration
Delete
Next
Keep Alive
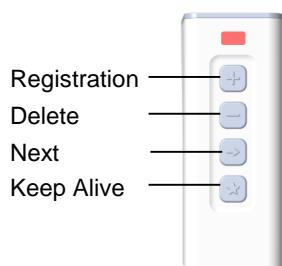
(a) function
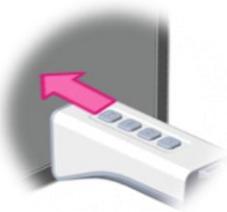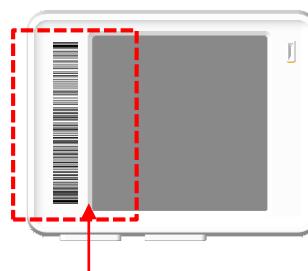
(b) Contact Point

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

< Remote control device>

※ A remote controller or a NFC Device contact point

1.5"

2.1"

2.9"

3.7"

4.2"

7.5"
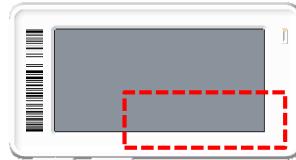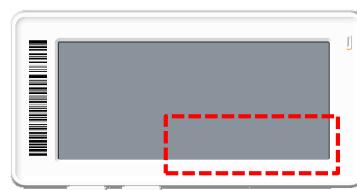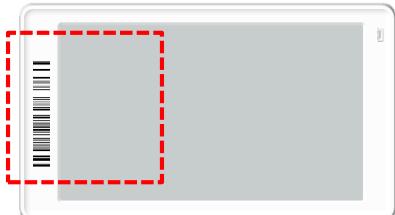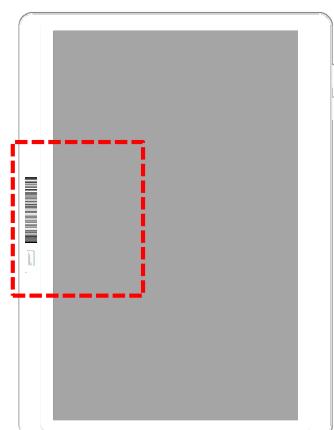
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9.2.2. Button Function

Two buttons provide customer with several functions as below
 - Waking Tag up from sleep mode
 - Updating new purchase image on Tag
 - Changing purchase image on Tag

Registration
Keep Alive

Next Image
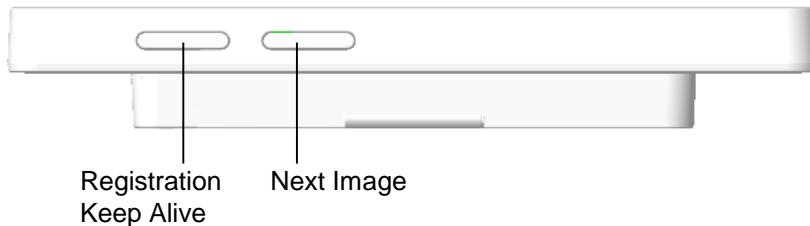
10. Disclaimers

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

-. Consultation with *ATEC IoT* 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 IoT*, disassembly is prohibited if
purposed for reverse-engineering. All defected devices must be reported to *ATEC IoT*
and not to be disassembled or analyzed.

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

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11. Certification

a. Rule Part 15.19(a)(3): 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.

b. Rule Part 15.21: The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that 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 B digital

NOTE: 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

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