

User Manual:ST-GM16XX2

Product Name	ESL Graphic TAG
Model Name	ST-GM16XX2
Customer	World wide



1. General Outline

1.1 Overview

S-Label EPD-TAG is the product for RF transmission solution ideal for ZigBee and other low cost, low power IEEE 802.15.4 RF transmission applications. S-Label EPD-TAG consists of RF Transceiver, RF circuitry and 8051-compatible MCU offering ZigBee network protocol and 802.15.4 MAC protocol and other peripheral devices.

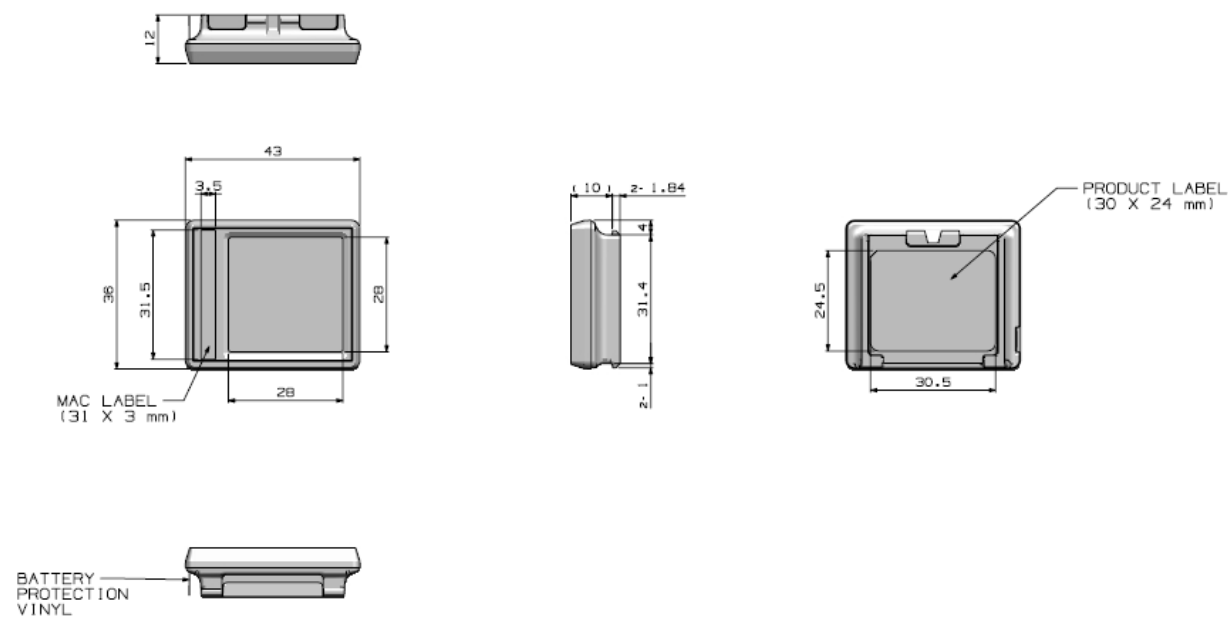
1.2 Features

- Display : EPD PANEL (Graphic type)
- Communication : Wireless communication based on IEEE 802.15.4
- Operating on 2.4GHz Unlicensed ISM band for ZigBee (Range “2405~2480MHz”)
- Low Power Consumption
- External Wakeup : RF Wakeup(using ISM Band(2.4GHz))
- Outline Dimension : 43 mm x 36 mm x 12 mm
- Active Area : 28 x 28 mm
- No additional anti-theft locking structure : Rail Mounted only
- RoHS compliant

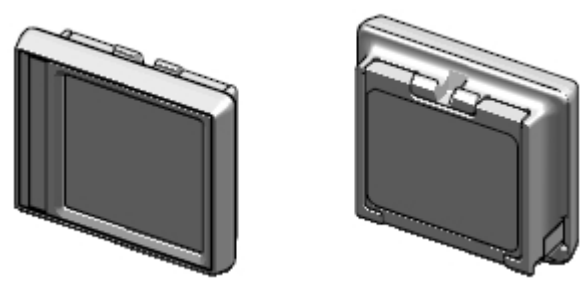
1.3 Application

- Retail industry with the electronic display and platform, solutions, and services
- Intelligently communicating, managing, and optimizing price and product informations.

1.4 Physical Dimension (mm)



1.5 Appearance



2. Specifications

2.1 Product

Item	Description
Size	43 x 36 x 12 mm
Battery	CR2450 Lithium Battery (3V, 1ea) 2.4 ~ 3.3Vdc(condition : In active status)
Display	EPD PANEL display (Graphic type)
Information display	Price, Unit, Discount, etc.
Communication	IEEE802.15.4 2.4GHz ISM Band (Range "2405~2480MHz")
Distance	Radius 20m (Indoor, Line of Sight)
Operation Temp.	-25 ~ 40 °C
Etc.	No additional anti-theft locking structure : Rail Mounted only

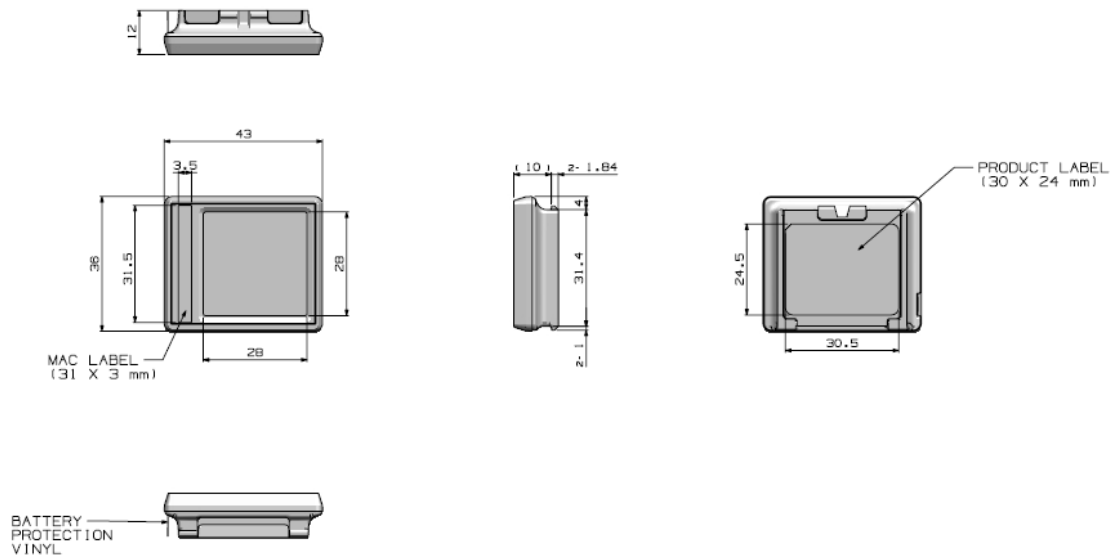
2.2 Radio (RF)

2.2.1 Production Characteristic

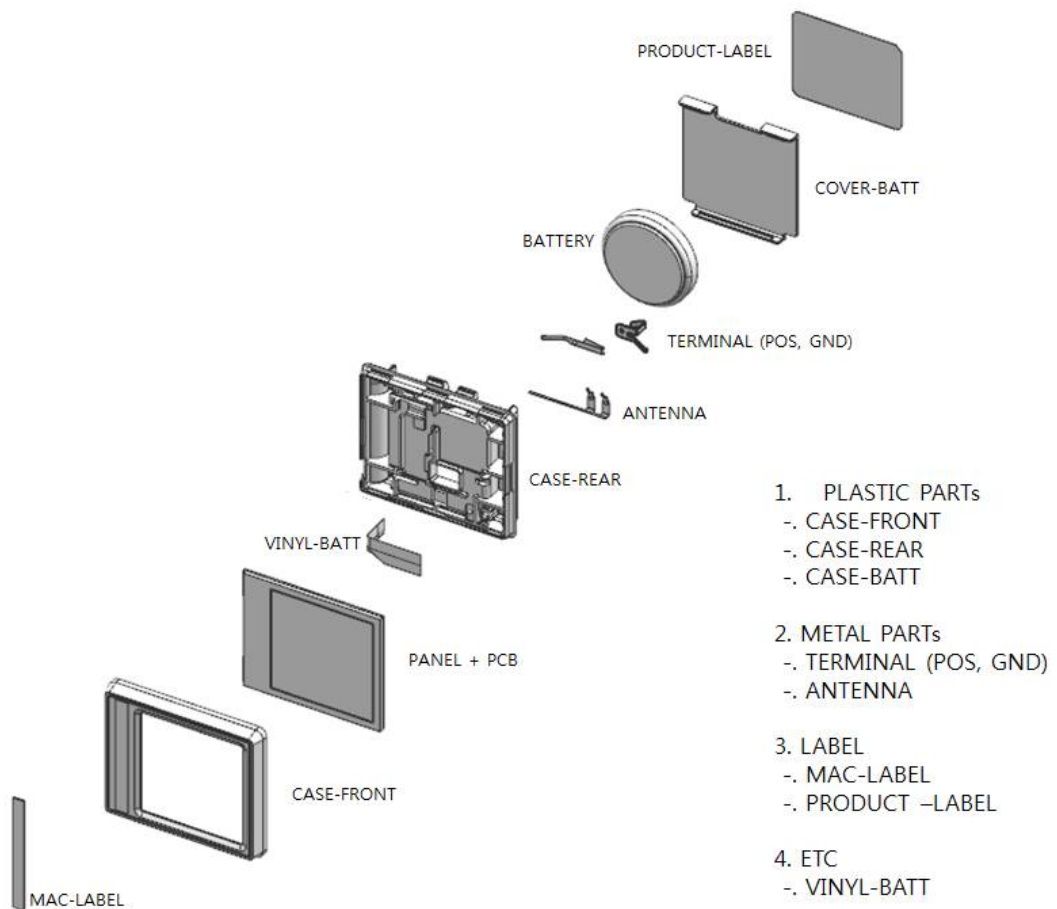
Items	Parameter	spec.			Units	Condition
		Min	Typ	Max		
TX	Transmit Power	-3	0	8	dBm	
	Error Vector Magnitude		10	28	%	When measured for 100 chips
	Tx Current		-	37	mA	Total current at max Tx Power
RX	Receiver Sensitivity	-90	-	-	dBm	PER < 1%

3. Assembly Specifications

3.1 Outline Drawing of EPD TAG



3.2 Exploded view of EPD TAG



3.2 Sticker Label Specification

3.2.1 Serial Number information

* Serial 1, 2 Code Value

13 3 G S A A 033

① ② ③ ④ ⑤ ⑥ ⑦

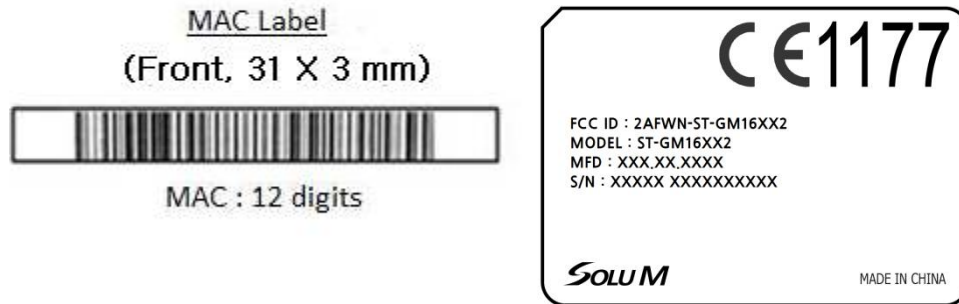
- ① Year : Last two digits of manufacturing year.
(00 ~ 99, example : 2013 is '13')
- ② Month : Manufacturing month
(1 ~ 9, X(10), Y(11), Z(12))
- ③ Date : Manufacturing date
(1 ~ 9, A(10) ~ V(31))
- ④ Vendor : One character of manufacturing vendor
(S : SEMTHAI, T : TSEM, etc)
- ⑤ Line number : One character of Manufacturing Line number
(A, B, C, etc)
- ⑥ Revision : Product revision number
(A : First, B : Second, C : Third, etc)
- ⑦ ZigBee IC Lot Number
(032 : ZBS242QR1032, 033 : ZBS243QR1033)

①	
년	CODE
2009	09
2010	10
2011	11
2012	12
2013	13
2014	14
2015	15
2016	16
2017	17
2018	18
2019	19
2020	20
2021	21
2022	22

②	
월	CODE
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	X
11	Y
12	Z

③	
일	CODE
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	A
11	B
12	C
13	D
14	E
15	F
16	G
17	H
18	I
19	J
20	K
21	L
22	M
23	N
24	O
25	P
26	Q
27	R
28	S
29	T
30	U
31	V

3.2.2 MAC Label drawing & example (Front, Back)



- Product information is indicated in a printed sticker label. The information consists of MODEL(model name), MFD(manufacturing date), S/N(serial number), MAC(MAC address), CE & KC certification mark, FCC ID and Manufacturer(SEMCO).

- 1) Model Name : ST-GM16XX2
- 2) MFD : (month).(date).(year) ex) SEP.25.2013
- 3) S/N : Daily Production Quantity (5 digits) & Serial Number Information
(hexadecimal 10 digits)
- 4) MAC : barcode & barcode number(hexadecimal 12 digit)
ex) XXXXXXXX101X
 - 8 digits(1st ~ 8th) : xxxxxxxx (Increasing number:00000000 ~ FFFFFFFF)
 - 2 digits(9th ~ 10th) : 10 (TAG type, 10 : 1.6inch mono TAG)
 - 1 digits(11th) : 1 (Attribute, 1 : Ultra IC)
 - 1 digits(12th) : x (Checksum : XOR Calculation Value 1 ~ 11 digit)

Cautions for Treatment

Provisions should be made to protect against any damage to the product caused by improper handling.

It is highly recommended that the product should be installed within 3 months from the date of arrival in the logistics hub. Recommended storage condition is in 0-40 Celsius degree, 20-60% RH environment.

This RF device operates on the 2.4GHz frequency band and can produce radio interference. The device, therefore, may not be used for applications where safety of human lives is concerned.

Usage Environment

Take extra cautions when using this RF device in the vicinity of other electronic devices and appliances. Most electronic devices and appliances use electromagnetic waves. Electromagnetic waves emitted by this RF device can affect other electronic devices and appliances.

If using the device in an explosion hazard area, follow all safety regulations, instructions, and signals.

Storage and Use

- Moisture and liquids can damage internal parts and circuit boards if allowed to enter into the device itself.
- Do not place or store the product on a sloped surface. The product may slide and fall off the surface and damaged.
- Use the product in temperatures ranging from 0℃ to +40℃. Parts and circuits may be damaged if used or stored under temperature extremes.
- The display panel needs extra care when handling.
 - Do not apply any impacts on outside since e-Paper display is fragile.
 - Continuous exposure to excessive moisture (over 60% RH) or UV makes display lifetime shortened.
 - Ghosting image may be appeared in temperature conditions of less than 5 Celsius degree.
- Avoid areas with strong magnetism or subject to magnetism.

Contact between the device and a magnetic object can lead to malfunctions.
- Do not place the product near heat-producing kitchen appliances like a stove or a microwave or in the vicinity of highly pressurized containers.
- External impact to the product, such as from being dropped, can damage the product.
- If you are using in chilled section may reduce the battery life time
- Twisting and bending the product can damage the exterior casing and the internal components.

- This product uses 2.4GHz frequency band for wireless communication network. Radio communications can be limited or affected by other applications which share same frequency band, such as WiFi, Bluetooth, Zigbee, etc.

Battery Replacement

■ Audience

Authorized persons with the following knowledge are allowed to replace the battery.

- . Battery / - . Electronic assemblies like circuit board/ - . Compliance of the instruction

* Note : If not authorized person, it will not give any warranty

(When need to replace the battery. Please contact authorized person and get instructions)

■ Instructions

- Risk of short circuit if battery is incorrectly installed / stored.
- Keep attention that your hands are dry before you start with replacement
- Keep away batteries from children and infants.
- Don't heat, change, bend, drop, short-circuit and disassemble battery.
- Don't mix the used battery together with the new battery or different type of batteries.

*Note : Battery rarely has a little stain or leak.

■ Steps

- ① Open the battery cover
- ② Take out the battery
- ③ Put in the new battery
- ④ Check the battery direction
- ⑤ Put the battery cover

WARNING : This equipment may generate or use radio frequency energy. Changes or modifications to this equipment may cause harmful interference unless the modifications are expressly approved in the instruction manual. The user could lose the authority to operate this equipment if an unauthorized change or modification is made.

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.

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.

Caution

This device complies with FCC radiation exposure limits for an uncontrolled environment. Avoid operating this device at a distance less than 20cm from the user