Panasonic

Specifications for

No.	Model Number	Product Name
1	CCAH32ST24	GPS Antenna

Approved by	
Company Name	
Contact person	
Date	/ /

Panasonic Corporation	Approved by	Osamu Watanabe
	Checked by	Ryo Taniguchi
Issued on : / /	Designed by	A. Ohya

Revision History

No.	DATE	Change Description	APPROVAL	CHECKED	DESIGN
	Dec. / 11 / 2017	First issue			

Contents

1. Description:

   This specification defines the requirements for a family of active GPS antennas, typically consisting of five major sub-assemblies.

   They are :

   (1) Passive Dielectric Patch Antenna Element

   (2) Active Low Noise Amplifier / Filter - PWB assembly

   (3) Top radome of cone shaped plastic and bottom radome of aluminum casting assembly

   (4) N-type connector assembly

   (5) Mounting base

   Intend to be used mainly in Timing / Industrial applications.

   (except for use at sea, on the coast)

2. Appearance:

   Antenna Unit (with radome, and connector - refer to an attached drawing)

Dimension	Dia.90 x 98.4 mm Height (without connector)
Weight	200 +/- 20 g (Antenna)
	230 +/- 20 g (Mounting base)

3. Operating Condition:

Temperature	-40 to +85 deg. C
Humidity	Less than 95 %RH (non-condensing)

4. Storage Condition:

Temperature	-45 to +90 deg. C
Humidity	Less than 95 %RH (non-condensing)

5. Output Terminal:

Connector	N-type connector (Jack)

6. Electrical Specifications :

*All value are defined at 25 +/- 15 deg. C, 65 +/- 20 %RH unless otherwise noted.

*Antenna characteristics are measured in an anechoic chamber.

6-1) Antenna Overall Characteristic

Polarization	Right hand circular polarization	
Band Width	1575.42 +/- 1.023 MHz	
Power Supply	3.5 - 6.0 V DC	
Current	20 mA (Typical)	27 mA (Maximum)
Total Gain	33 dB (Typical)	
	25 dB (Minimum) at elevation angle 90 deg.	
Output VSWR	1.5 (Typical)	2.5 (Maximum)
Output Impedance	50 ohm	
Lightning Protection	80 V (Typical) for IEC1000-4-5 standard	

6-2) GPS Passive Antenna (reference)

Gain	3.0 dBi (Minimum) at elevation angle 90 deg.	
	-10 dBi (Minimum) at elevation angle 0 deg.	
Axial Ratio	3.0 dB (Typical)	

6-3) Filter/LNA (reference)

3dB band width	1575.42 +/- 1.032 MHz	
Variation	1.0 dB (Maximum) measured at L1 band	
Gain	28 dB (Typical)	
Attenuation	60 dB (Minimum) at 1575.4 MHz +/- 50 MHz	
1dB Compression Point (at 1509 MHz)	+10 dBm (Typical)	+0 dBm (Minimum)
Noise Figure	2.5 dB (Typical)	3.2 dB (Maximum)

7. Electrical Specification After Environmental Test

Measured at 25 +/- 15 deg. C, 65 +/- 20 %RH, 5 V DC

DC Current	20 mA (Typical)	27 mA (Maximum)
Total Gain	33 dB (Typical)	
	25 dB (Minimum) at elevation angle 90 deg.	
Output VSWR	1.5 (Typical)	2.5 (Maximum)
Appearance	No visible deformations and cracks.	

*Refer attached environmental test method.

8. Indication

The following is specified in the products.
(see appearance drawing for more information)

8-1) Antenna Body

Stick a label on the bottom surface of a radome.
The following is specified in the label;
① Part number
② Serial No

8-2) Packing Material

Stick a label on the surface of a carton box .
The following is specified in the label;
① Product name, Part number
② Quantity (Unit)

9. Package

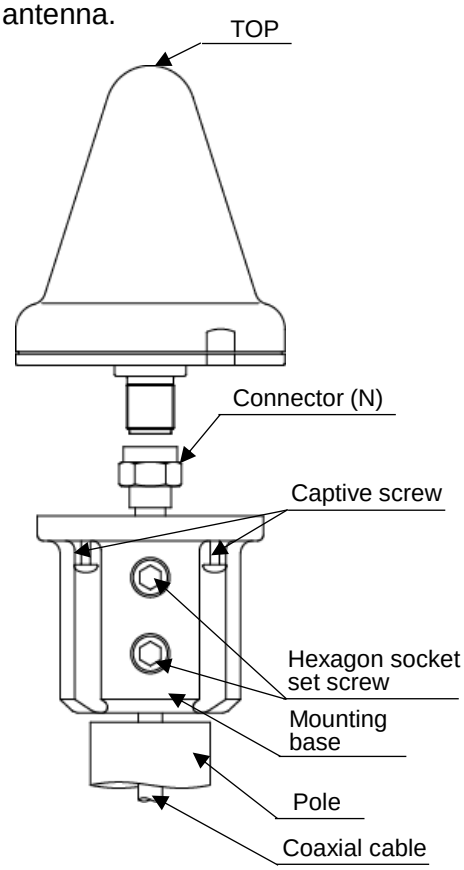
See packing specification drawing for more information.

10. Outgoing Inspection

Visual inspection and performance (Total gain, Output VSWR and Consumption current) inspection are made in accordance with the Panasonic Product Inspection.

11. Installation Precautions
- Connect a coaxial cable which is passed through a installation pole and a mounting bracket to a connector of GPS antenna.
- Install a mounting bracket to a bottom case of GPS antenna with screws for fixing to a main body.
- Fix a mounting bracket completely to an installation pole with fixing screws.

Note:
- Securely connect the connector so that water does not penetrate in from the connector part.
  - Recommended fastening torque for N connector : 0.9 Nm +/- 25 %
- To prevent loosening of connector threads, fasten with self-fusing tape or another such fastening agent.
- Recommended fastening torque for Captive screw : 0.75 Nm +/- 20 %
- Recommended width of installation pole : φ41～43 mm
- Recommended fastening torque for Hexagon socket set screw : 6.3 Nm +/- 20 %
  *if and only if installed to those polls specified below.
  - External diameter : φ41～43 mm
  - Material : Stainless steel (thickness about 2 mm)
- Follow the precautions below when installing the GPS antenna.
  - At a location where the sky overhead is free from obstructions, install so that the top side of the GPS antenna faces the sky.
  - Please install after checking that there are no transmitters or other such devices with a frequency near that of the GPS LI band (1575.45 MHz +/- 100 MHz) in the vicinity.
- When installing the GPS antenna in an environment where lighting surge can be applied to the product, countermeasures must be taken by the customer to avoid damages and malfunctions.



12. Others
- Any question arising out of this specification shall be settled upon consultation between both parties.
- Made in Japan

Table 1.0

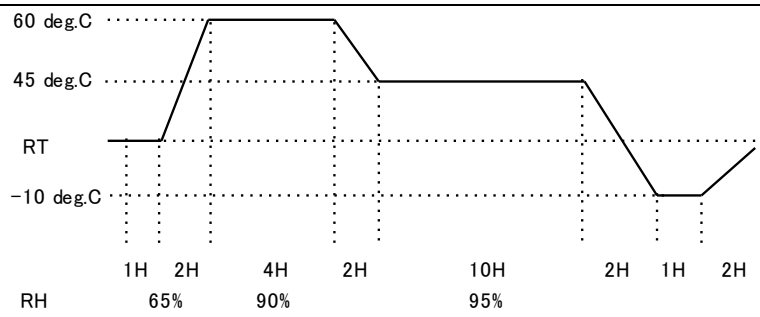
Test Items	Test Condition	Evaluation Item
High Temperature Test	The specimens are subject to 85 deg. C for 90 minutes.	Standard Item According to Note 2
Low Temperature Test	The specimens are subject to -40 deg. C for 90 minutes.	Standard Item According to Note 2
Heat Cycle Test	Cycle Test : -40 deg.C 2 hours ⇄ (2Hours) ⇄ 85 deg. C 2 hours 30 Cycle s then stored at standard evaluation condition for more than 2 hours.	Standard Item According to Note 2
Heat / Humidity Cycle Test	 5 Cycles , then stored at standard evaluation condition for 60 +/− 10 min.	Standard Item According to Note 2
Thermal Shock Test	Cycle Test : -45 deg. C 2 hours ⇄ (5 min.) ⇄ 90 deg. C 2 hours 30 Cycles, then stored at standard evaluation condition for more than 2 hours.	Standard Item According to Note 2
Connector Mating Test	Mating connectors 250 times, then stored at standard test evaluation for more than 30 minutes.	Standard Item According to Note 2
Moisture Resistance Test	The specimens are subject to 60 deg. C, 90 %RH for 96 hours, then store at standard evaluation condition for more than 2 hours.	Standard Item According to Note 2
Water Resistance Test	Based on IEC standard (IPX6/IPX7)	To confirm water immersion
Dust Resistance Test	Based on IEC standard (IP6X)	To confirm dust immersion
Heat/Vibration Cycle Test	Vibration : 33 to 50 Hz 15 min. sweep, 1G, for 4 hours Heat Cycle : -40 deg. C 25min. ⇄ (5min.) ⇄ 85 deg. C 25 min. 4 cycles, then store at standard evaluation condition for more than 2 hours.	Standard Item According to Note 2
High Temperature Storage Test	The specimens are subject to 90 deg. C for 96 hours, then stored at standard evaluation condition for more than 2 hours.	Standard Item According to Note 2
Low Temperature Storage Test	The specimens are subject to -45 deg. C for 72 hours, then stored at Standard evaluation condition for more than 2 hours.	Standard Item According to Note 2

Table 1.0 (continued)

Test Items	Test Condition	Evaluation Item
Weather Resistance Test	The specimens are subject to below condition in a sunshine weather meter, then stored at standard evaluation condition for more than 2 hours. Temperature of black panel : 63 deg. C +/- 3 deg. C rain : 12 minutes / 60 minutes Nozzle : 1mm of diameter Water pressure at the nozzle : 0.8 to 1.3 Kg / sq. cm Light radiation time : 1200 hours	Standard Item According to Note 2
Salt atmosphere Test	Spray 5 +/- 1 % NaCl solvent (35 deg. C +/- 2 deg. C) to the specimens for 16 hours then stop spraying 8 hours. 20 Cycles of above test.	Standard Item According to Note 2
High Temperature Test (Operating)	The specimens are subject to 6.6 V DC at 85 deg. C for 120 hours, then store at standard evaluation condition for more then 2 hours.	Standard Item According to Note 2
Low Temperature Test (Operating)	The specimens are subject to 3.15 V DC at -40deg. C for 72 hours, then store at standard evaluation condition for more then 2 hours.	Standard Item According to Note 2
Long Time Operating Test	The specimens are subject to 5 V DC for more than 1,000 hours, then store at standard evaluation condition.	Standard Item According to Note 2
Static Electricity Resistance Test	Adding +/- 10 KV to every touchable place at 10 times, then store at standard evaluation condition.	Standard Item According to Note 2
Package drop Test	Packaged specimens are dropped on a cement floor from 1 m height in each direction along 6 surface, 3 mutually perpendicular and one corner.	Standard Item According to Note 2

Note 1: Standard evaluation condition
Temperature : 25 deg. C +/- 15 deg. C
Humidity : 65 +/- 20%RH
Power Supply : 5 V DC

Note 2: Evaluation Items
Appearance, Total gain, Electric current, Output VSWR

Appearance : No visible deformations and cracks.

Disclaimer

Our company will bear no responsibility for the following under any circumstances.

1. Losses or damages caused by installation or use at variance with the content of these specifications
2. Damages or losses caused by falling or tipping over due to reasons other than defects or problems with the product itself (including problems with installation)
3. Inconvenience, losses or damages caused by the inability to receive GPS signals due to any reason or cause, including malfunction or problems with the product itself

Safety precautions

1. Rely on a specialist for installation.
   Installation requires skill and experience.
   Always rely on an installation specialist.
2. Do not disassemble or modify the product.
   Doing so may cause malfunction.
3. Inspect periodically.
   If fittings or screws become rusted, mounting parts may deteriorate, resulting in accidents such as falling.
4. Mount screws and connectors with the specified torque.
   Failure to do this may result in accidents such as falling.
5. Work at high locations should be done by a qualified technician. Installation requires skill and experience.
   Always rely on an installation specialist.
6. Never use screws other than those included or specified.
   Using non-specified screws may cause accidents such as falling.
7. Take measures to prevent falling when carrying out installation or removal work. Also check before work that there are no people in the surrounding area.
   Failure to heed this precaution may result in injury due to falling.
8. Do not install in regions susceptible to major salt damage, or at locations where corrosive gas is emitted.
   This will cause deterioration of mounting parts, and may result in accidents such as falling.
9. Inspect after a typhoon or earthquake.
   Fitting breakage or screw loosening due to shaking may result in accidents such as falling.
10. If the antenna will not be used, do not leave it in place. Always remove it.
11. Do not insert a screw etc into the drainage hole (8 holes).
    It may cause a failure and/or water immersion.
12. Do not hold the GPS antenna by using drainage hole (8 holes).
    It may cause a trouble such as dropping etc.

Quality Assurance Period

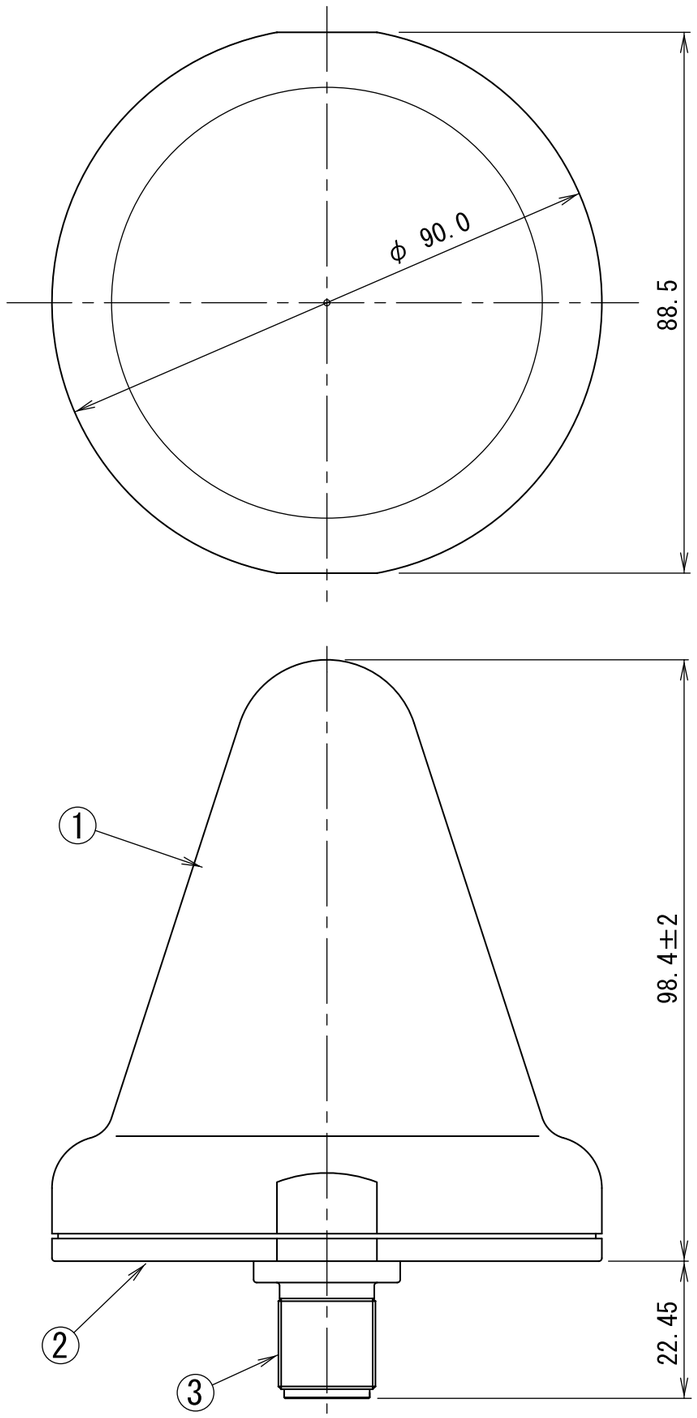
The quality assurance period of GPS Products(GPS antennas) is thirteen months from the date of shipment from Panasonic Corporation.

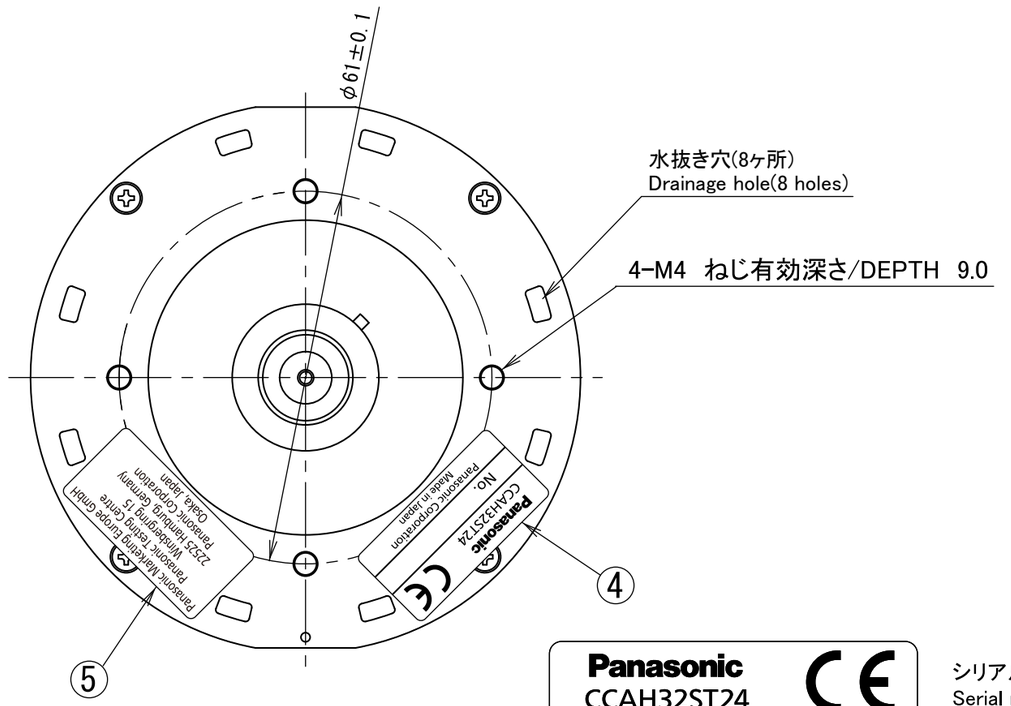
Scope of Assurance

1. If any latent defect is found in the GPS Products during the above assurance period and if any damage is incurred (when the GPS Product develops trouble by reasons on the part of Panasonic), such defective part of the GPS Product will be repaired or replaced.
2. If said defective GPS Product is already delivered to a third party by You, You shall conduct such repair or replacement. Panasonic shall deliver to you free of charge such repair or replacement parts required at that time.
3. If any claim is raised against Panasonic by You for the defective GPS Products, the remedy for such claim shall be solely limited to either replacing such defective GPS Products or refunding their purchase price as selected by Panasonic.

Panasonic shall not be liable to any payment for the loss in excess of the purchase price of the GPS Products. Furthermore, Panasonic shall not be liable any loss of usage, time, business or benefit or for any collateral or consequential damages arising out of the use or non-use of the GPS Products.

4. Panasonic shall not be liable for any damages arising from any defect in the GPS Products found after the assurance period.
5. Panasonic shall not be liable for any responsibility set forth above even during the assurance period if any of the following is applicable in relation to the GPS Products :
   a) Damages arising from the specifications, standards, installation method, etc., specified by You.
   b) Damages arising after delivery due to alteration in construction, performance, specifications, etc.
   c) Damages arising from natural characteristics of the materials used such as natural wear, rust, transformation, discoloration, etc., or from changes occurring from the lapse of time.
   d) Phenomena or damages arising from such phenomena which were not preventable by the technique that was put into practice at the time the individual contract for the GPS Products was executed.
   e) Damages or accidents that occurred were not promptly reported to Panasonic (within 30 days).
   f) Damages due to abuse or misuse by persons other than Panasonic employees.
   g) Damages arising from acts of God such as earthquake, fire, flood, etc.,or from force majeure.
   h) Damages due to improper use not in line with the GPS Product specifications, acceptance specifications, instruction manuals, catalogs, etc.
   i) Damages due to use, storage, transit, etc., not in accordance with the environmental conditions (temperature, humidity, atmospheric pressure, hydraulic pressure, etc.) that were normally expected at the time of development, manufacture and sale.
   j) Damages that could have been prevented if a machine of You or of a third party into which the GPS Products are incorporated for use is equipped with functions or structures generally required as necessary in the industry.
   k) Damages arising only when used under a particular combination of products as designed by You or a third party and not by Panasonic.
   l) Damages due to inappropriate storage.
   m) Damages arising from other reasons which Panasonic is not responsible.





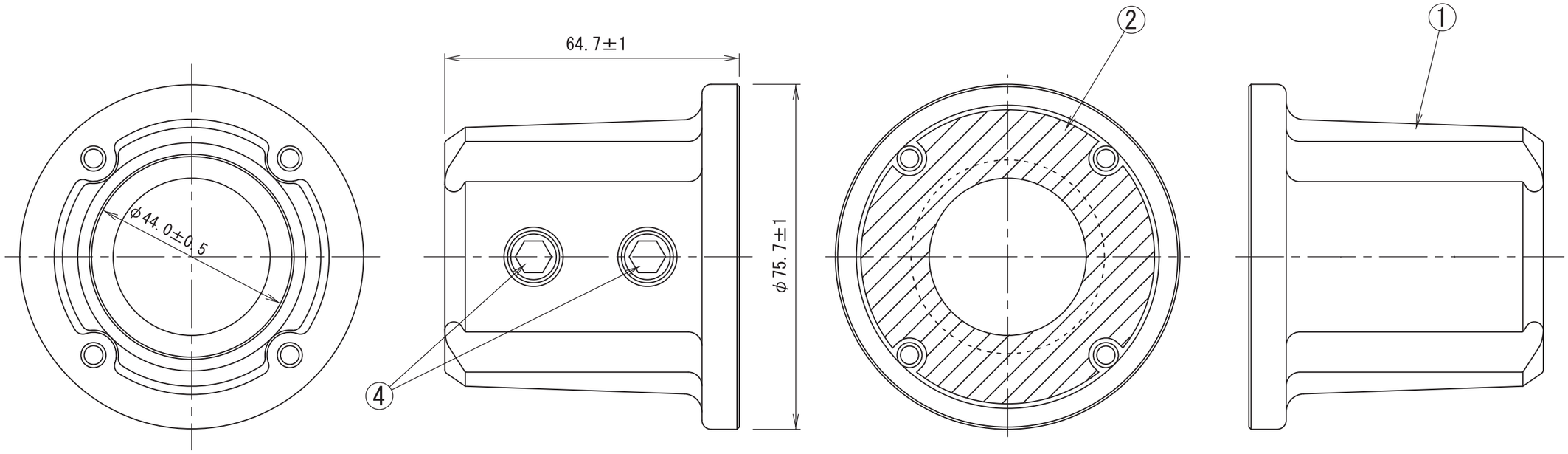
④ 定格銘板/Label(A) Scale(2:1)

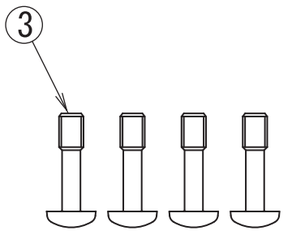
No.	名称/Item	材質/Material	処理/Finish	備考/Note
5	連絡先表示ラベル Label(C)	ポリエステル Polyester	ラミネート Laminate	ラベル:白 文字:黒 Lable:White Characters:Black
4	定格銘板 Label(A)	ポリエステル Polyester	ラミネート Laminate	ラベル:白 文字:黒 Lable:White Characters:Black
3	コネクタ Connector	シェル/Shell:C3604BD コンタクト/Contact:C5210R	シェル/Shell:MBNi コンタクト/Contact:MBAg	N型 N type
2	下ケース Housing	アルミダイカスト die-cast Alminum	塗装 Painting	塗装色:白 Color:White
1	レドーム Radome	ポリカーボネート PC	———	成形色:白 Color:White

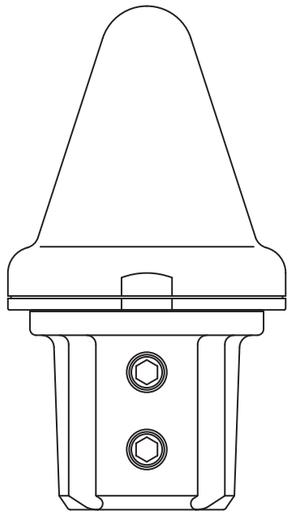
作成日/Date	仕様書番号/Specification number	品名/Product name	公差/Tolerance	尺度/Scale
Jun. 26, 2017	CCAH32ST24	GPS Antenna	±1.0	1:1 (Free)

承認/Approval	確認/Check	作成/Design	図番/Drawing number
O.Watanabe	R.Taniguchi	A.Oya	(1/2) CCAH32ST24-ea01

Unit:mm







REFERENCE DRAWING(S=1:2)

設置ポール推奨太さ：φ41～43mm
Recommended width of installation pole : φ41～43mm

No.	名称/Item	材質/Material	処理/Finish	備考/Note
4	取付固定用ねじ Hexagon socket set screw	SUS	ラスパート Ruspert	色彩：シルバー color：silver　M8×L8
3	本体固定用ねじ Captive screw	SUS	ラスパート Ruspert	色彩：シルバー color：silver　M4×L16
2	ゴムシート Rubber gasket	EPDM	―――	両面テープ付き with Double-coated adhesive tape
1	取付金具 Mounting base	アルミダイカスト die-cast Alminum	塗装 Painting	塗装色：白 Color：White

作成日/Date	仕様書番号/Specification number	品名/Product name	公差/Tolerance	尺度/Scale
Jun. 26, 2017	CCAH32ST24	取付金具 Mounting base	±1.0	1：1 (Free)

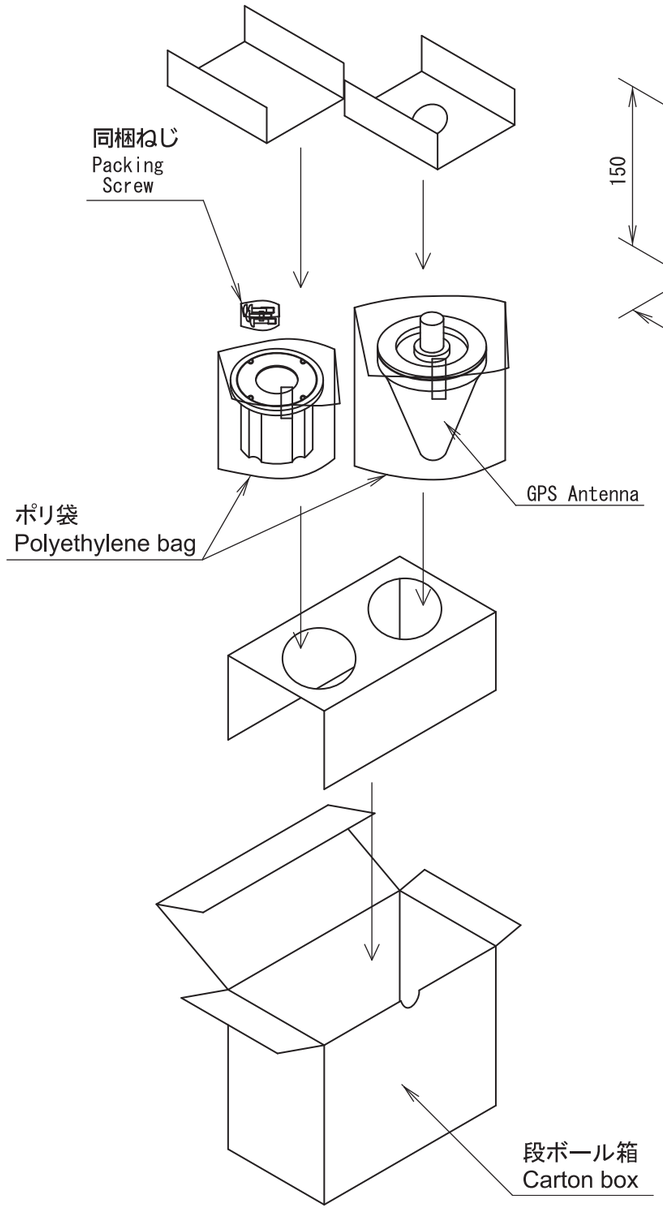
承認/Approval	確認/Check	作成/Design	図番/Drawing number
O.Watanabe	R.Taniguchi	A.Oya	(2/2) CCAH32ST24-ea01

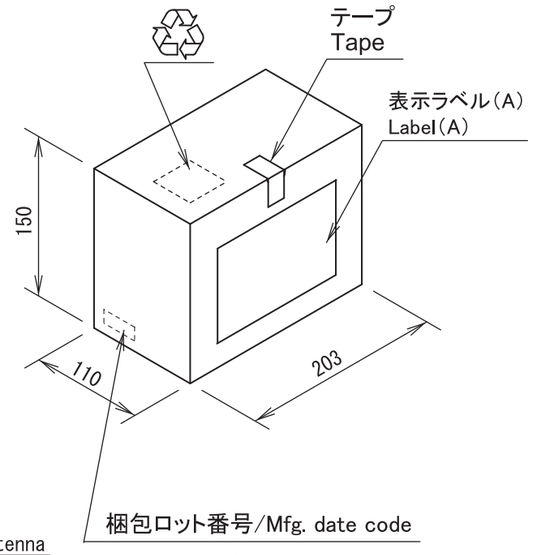
Unit:mm

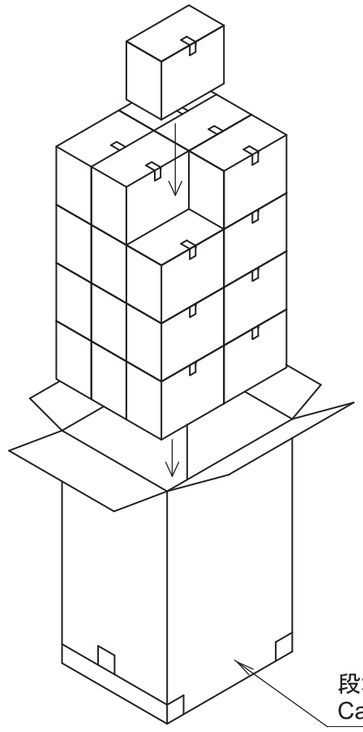
(JIS A-3)

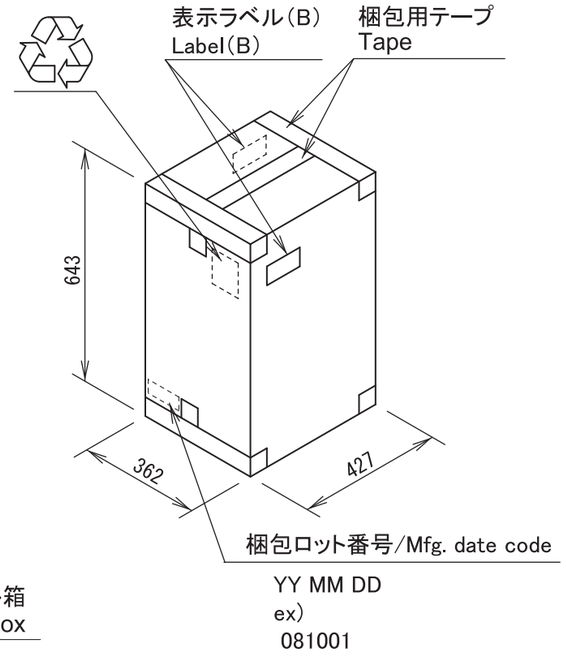
Panasonic Corporation

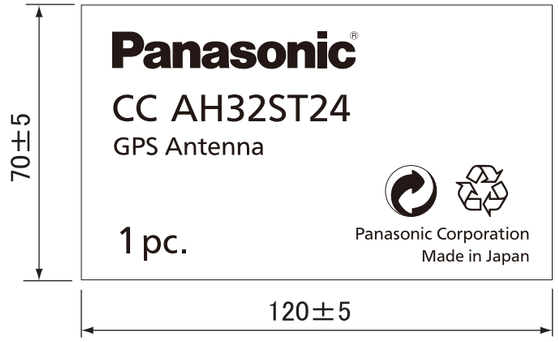
(120101)



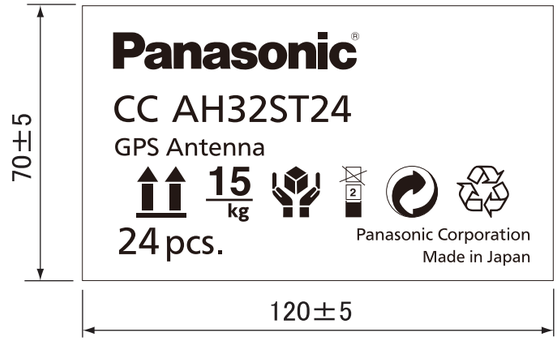








表示ラベル(A)/Label(A) Sample



表示ラベル(B)/Label(B) Sample

最大入り数:24台
Max Quantity:24pcs.

Unit:mm

作成日/Date	仕様書番号/Specification number	品名/Product name	公差/Tolerance	尺度/Scale
Jun. 26, 2017	CCAH32ST24	GPS Antenna	±20	Free

承認/Approval	確認/Check	作成/Design	図番/Drawing number
O.Watanabe	R.Taniguchi	A.Oya	CCAH32ST24-ep01

(JIS A-3)

Panasonic Corporation

(120101)