

## 11. Reliability Condition

### 11.1 Environment Test

| ITEM                        | TEST CONDITION           | LIMIT                                                      |
|-----------------------------|--------------------------|------------------------------------------------------------|
| High Temperature Action     | 85℃±3℃, 1hr              | After test, Must meet the characteristics spec of 4.4 list |
| High Temperature Resistance | +85℃±3℃, 120hr±2hr       |                                                            |
| Low Temperature Action      | -40℃±3℃, 1hr             |                                                            |
| Low Temperature Resistance  | -40℃±3℃, 120hr±2hr       |                                                            |
| Humidity Action             | +85±3℃, RH85%            |                                                            |
| Humidity Resistance         | +85±3℃, RH85%, 120hr±2hr |                                                            |

### 11.2 Thermal shock test , Reflow test

| ITEM          | TEST CONDITION                                                                                             | LIMIT                                                      |
|---------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| Thermal shock | condition : -40℃±3℃/1min ↔ +85℃±3℃/1min<br>Test Cycle : 32 cycle<br>Temperature change time : within 5 min | After test, Must meet the characteristics spec of 4.4 list |
| Reflow        | Pre Heating : 200±5℃, 30~60 sec<br>Peak Heating : 260℃±5℃, 30sec Max                                       |                                                            |

### 11.3 Mechanical Test

| ITEM      | TEST CONDITION                                                                                              | LIMIT                                                      |
|-----------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| Vibration | Freq : 10~500Hz , Acceleration : 10 ×9.8m/s <sup>2</sup> (G)<br>Sweep time : 15 min , X.Y.Z each 5 times    | After test, Must meet the characteristics spec of 4.4 list |
| Drop      | 18 times free fall Using the drop jig 152cm high<br>Jig : 120g±20g Plastic Jig<br>Bottom : Concrete or Iron |                                                            |

### 11.4 MSL LEVEL Test

#### 1) JEDEC J-STD-020C Test

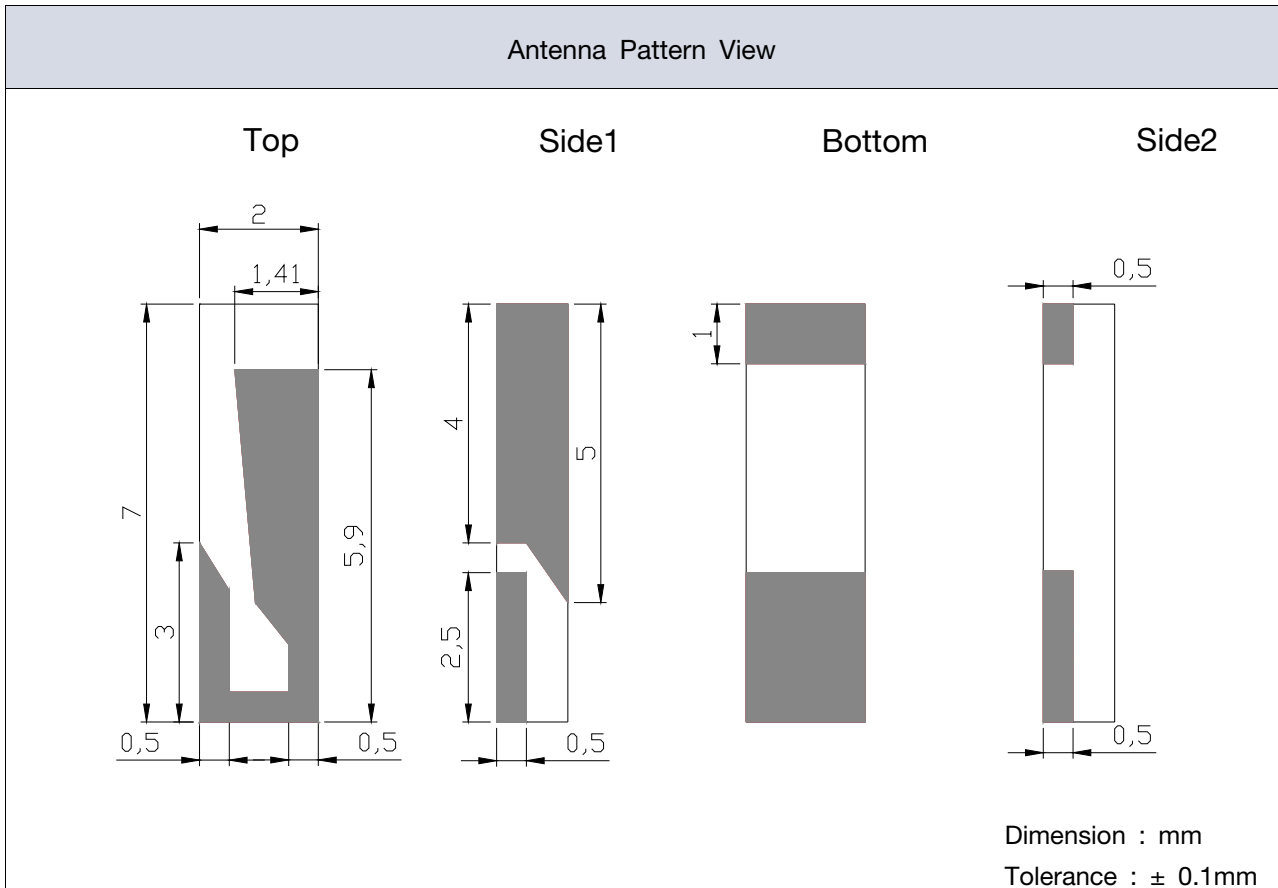
|   | Floor Life |               | Soak Requirements |               |
|---|------------|---------------|-------------------|---------------|
|   | Time       | Conditions    | Time              | Conditions    |
| 1 | Unlimited  | = < 30℃/85%RH | 168+5/-0          | = < 85℃/85%RH |

#### 2) Test Condition

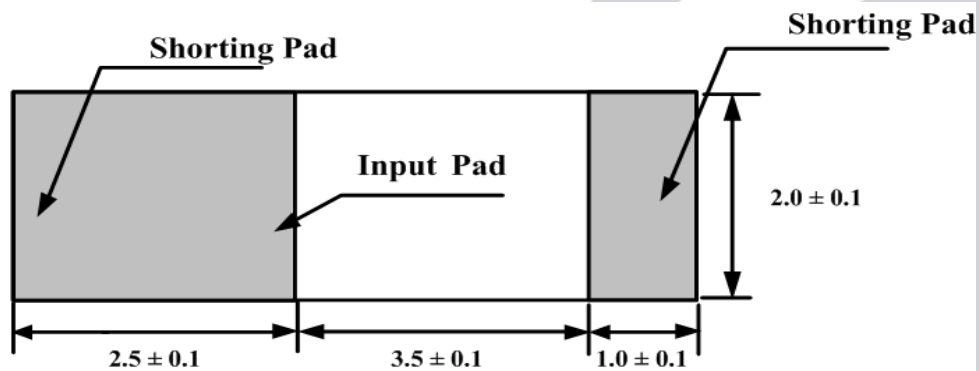
| ITEM              | Conditon                                                              | LIMIT                                                      |
|-------------------|-----------------------------------------------------------------------|------------------------------------------------------------|
| Soak Requirements | After leaving +85±3℃, RH85% 168hr±2hr<br>2 times Reflow without aging | After test, Must meet the characteristics spec of 4.4 list |

## 12. Mechanical Characteristics

### 12.1 Antenna Pattern Dimension



### 12.2 Pin name

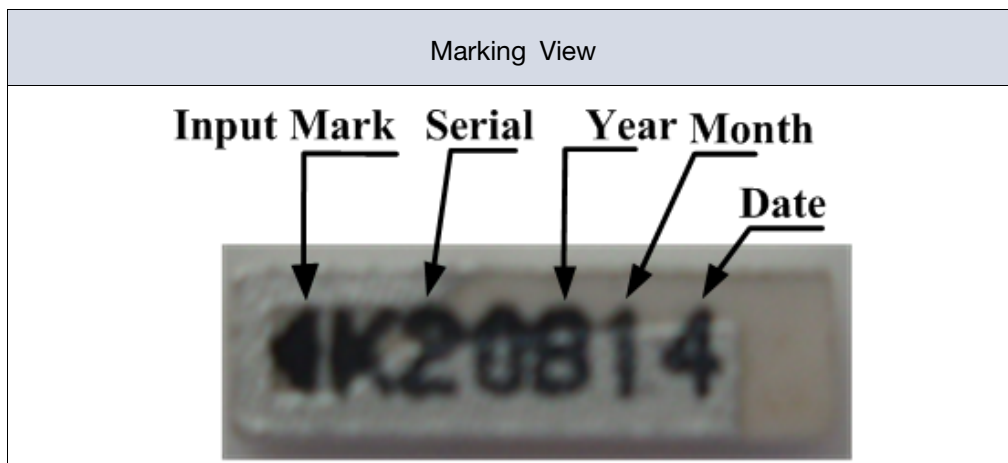


### 12.3 Lot number notation

|          |          |          |
|----------|----------|----------|
| <b>8</b> | <b>1</b> | <b>4</b> |
| ①        | ②        | ③        |

- ① Year : 7 - 2007 ····  
 ② Month : 1 - January, 2 - February ··· 9 - September, A - October, B - November ···  
 ③ Date : 1 - 1st , 2 - 2nd ···· A - 10th, B - 11th ····

### 12.4 Marking



|   |             |          |          |          |
|---|-------------|----------|----------|----------|
| ◀ | <u>K 20</u> | <u>8</u> | <u>1</u> | <u>4</u> |
| ① | ②           | ③        | ④        | ⑤        |

- ① Input Signal  
 ② Serial  
 ③ Year : 1 - 2001, 2 - 2002, ···· 7 - 2007 ····  
 ④ Month : 1 - January, 2 - February ··· 9 - September, A - October, B - November ···  
 ⑤ Date : 1 - 1st , 2 - 2nd ···· A - 10th, B - 11th ····

### 12.5 Marking type

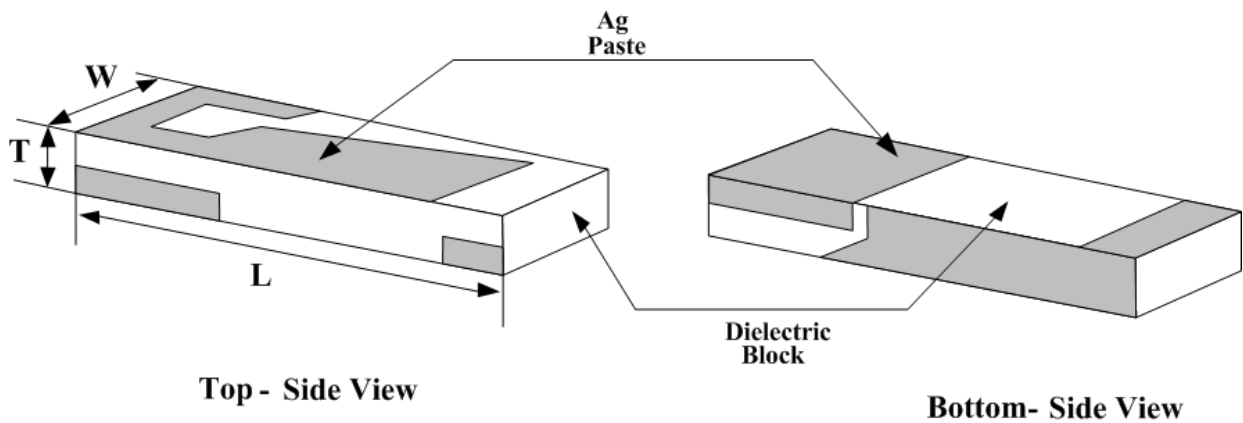
Ink marking - Using Black Ink

### 13. Structure and Material

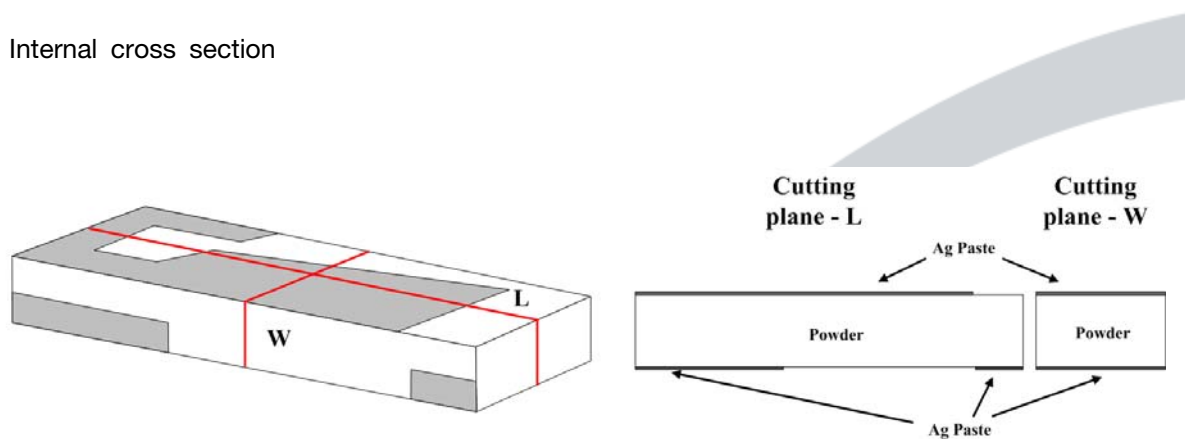
#### 13.1 materialization method

Chip antenna forms the pattern with Ag paste on the brick of dielectric block and materializes the characteristics

#### 13.2 Struture



#### 13.3 Internal cross section



#### 13.4 Material

| ITEM             | Material | Maker  | Printing pattern SPEC                          |
|------------------|----------|--------|------------------------------------------------|
| Dielectric Block | Powder   | Fuji   |                                                |
| PATTERN          | Ag Paste | METECH | Thickness : TYP 10 $\mu$ m                     |
| PAD              | Ag paste | METECH | Thickness : Min 10 $\mu$ m (TYP 16~20 $\mu$ m) |

## 14. Attention

### 14.1 Temperature Condition

|                         | Range of Temperature | Unit |
|-------------------------|----------------------|------|
| Application temperature | -40 ~ +85            | ℃    |
| Keeping temperature     | -40 ~ +85            | ℃    |

### 14.2 Temperature Test Condition

|                         | Condition | Range of Temperature                       |
|-------------------------|-----------|--------------------------------------------|
| Application temperature | Low       | 24hr normal action at -75℃                 |
|                         | High      | 24hr normal action at +150℃                |
| Keeping temperature     | Low       | normal action when left for 1000hr at -75℃ |
|                         | High      | normal action when left for 1000hr at +85℃ |

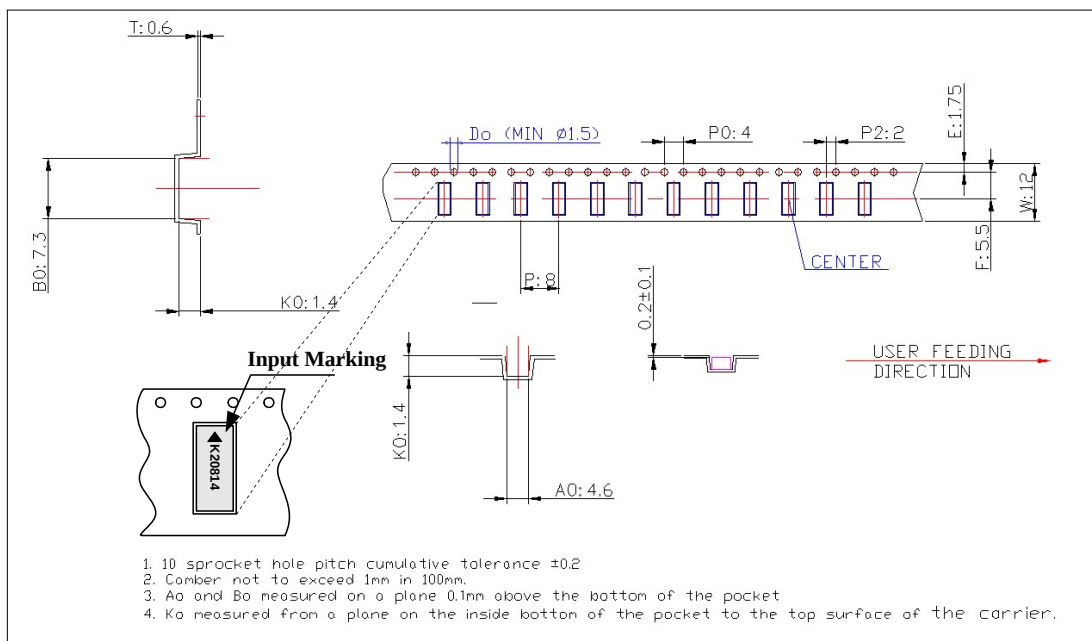
\* Because of the keeping temperature problem, no admission when left over +85℃



## 15. Packing

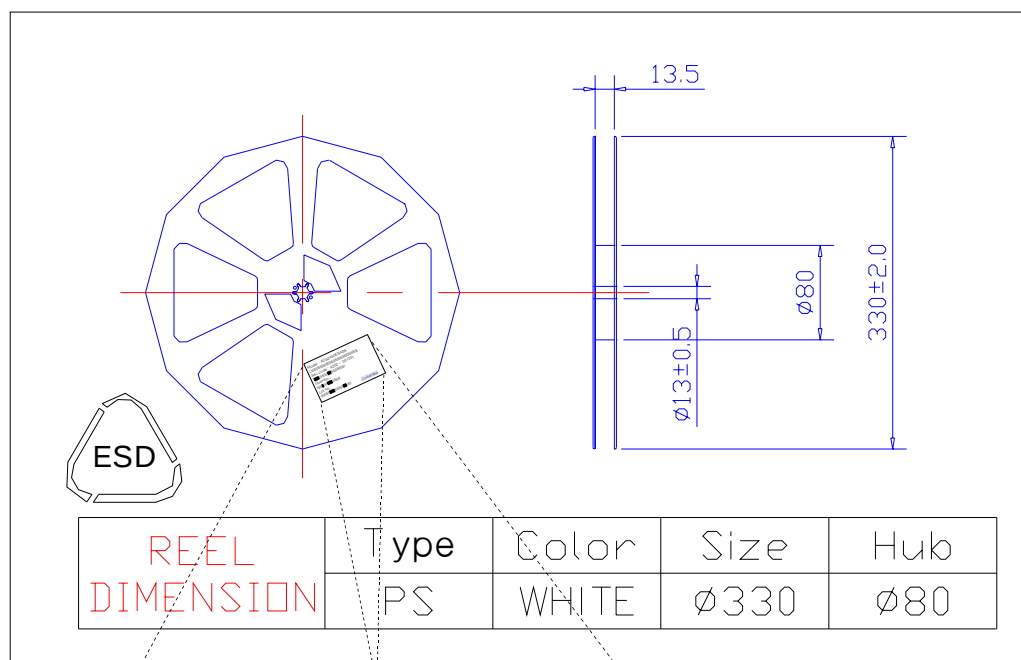
### 15.1 Carrier/Reel

| ITEM         | Material | Surface Resistance   | electrostatic emission | Packing method |
|--------------|----------|----------------------|------------------------|----------------|
| Carrier tape | A-PET    | Typical $10^8\Omega$ | 10V MAX                | Heat press     |
| Cover tape   | PET      | Typical $10^8\Omega$ | 30V MAX                |                |
| Reel         | PS       | Typical $10^8\Omega$ | 30V MAX                | -              |



|                        |                          |
|------------------------|--------------------------|
| DKC DWG. No.           | D-1208-048               |
| DIMENSIONAL UNIT       | MM                       |
| UNTOLERANCED DIMENSION | $\pm 0.1$                |
| CAD FILE NAME          | 050504                   |
| DESIGNED BY            | K. M. J                  |
| SCALE                  | 1/1                      |
| TITLE                  | CARRIER TAPE<br>2*7*1.2p |
| PART.                  | CARRIER TAPE             |
| MATERIAL               | C-PET                    |
| LENGTH                 | 48.4M                    |
| COUNT                  | 6050P                    |

| NAME | SPEC.          |
|------|----------------|
| W    | 12.0 $\pm 0.2$ |
| E    | 1.75 $\pm 0.1$ |
| F    | 5.5 $\pm 0.1$  |
| Do   | 1.5 $\pm 0.1$  |
| P    | 8.0 $\pm 0.1$  |
| P0   | 4.0 $\pm 0.1$  |
| P2   | 2.0 $\pm 0.1$  |
| A0   | 2.3 $\pm 0.1$  |
| B0   | 7.3 $\pm 0.1$  |
| K0   | 1.4 $\pm 0.1$  |
| T    | 0.3 $\pm 0.05$ |



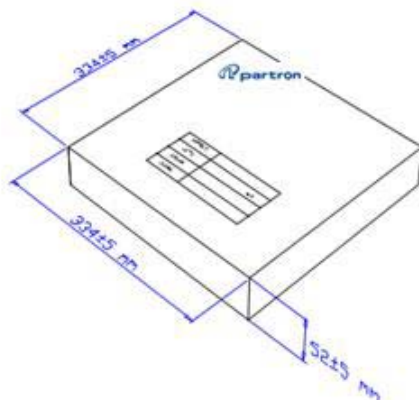
Model : ACS2450GBAK20  
 Quantity : 5000  
 Lot No : 814



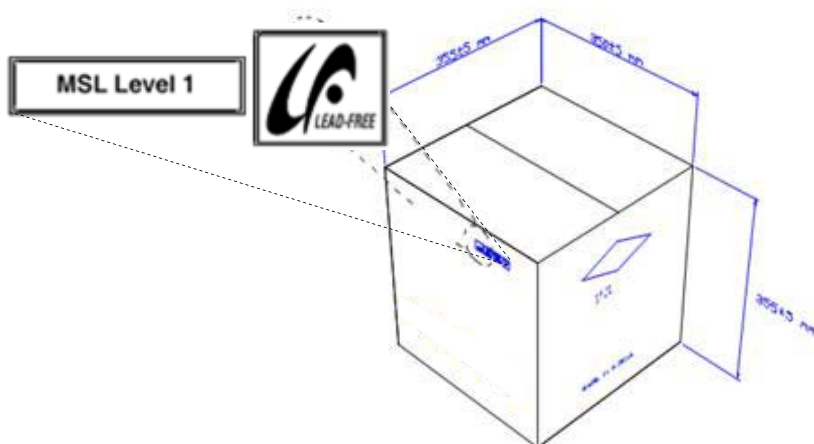
MSL Level 1



## 15.2 BOX



Material : SK/S/K-B  
Corrugated cardboard



## 15.3 Actual packing Picture



Reel



Internal Box



External Box



Reel / Internal Box label



External Box label

## 16. Process Control

| Product          |             | Issued/Revision |                    | Process Control       |                                    |                      |                     |                   | Record                                   | By designed          | By checked                            | By approved           |          |         |
|------------------|-------------|-----------------|--------------------|-----------------------|------------------------------------|----------------------|---------------------|-------------------|------------------------------------------|----------------------|---------------------------------------|-----------------------|----------|---------|
| CHIP ANTENNA     |             | Issued          | 04.04.06           |                       |                                    |                      |                     |                   | Revised                                  | 05.04.03             | PRCP-C001                             |                       |          |         |
| Input Materials  | FLOW CHART  |                 | Process name       | Management of Factors |                                    |                      |                     |                   | Management of quality                    |                      |                                       |                       |          |         |
|                  | preparation | Main Process    |                    | Equipment Name        | Checked                            | Condition            | Cycle of management | Record            | Checked Item                             | Margin               | Method of Inspection                  | Cycle of management   | Record   | Action  |
| Ceramic POWDER   |             | ◇               | Import Inspection  |                       |                                    |                      |                     |                   | shrinking rate permittivity              | refer to Guide Sheet | Micrometer Network                    | 10ea/LOT              | C/sheet  | Return  |
| POWDER lubricant | ○           |                 | powder             | Mixer                 |                                    |                      |                     |                   | mixing                                   | POWDER lubricant     | Scale                                 | PER MIXING            | -        | Exhaust |
|                  |             | ○               | Shaping            | Press                 | pressure Mold Condition            | refer to Guide Sheet | Per LOT 1/day       | parameter C/SHEET | dimension weight density aspect          | refer to Guide Sheet | Micrometer scale Calculated Visual    | 5/100EA 10ea/lot      | LOT CARD | Exhaust |
|                  |             | ○               | Plasticity         | Plasticity Hole       | SETTER Outside Temperature PROFILE | refer to Guide Sheet | all 2/day 1/month   | C/sheet           |                                          |                      |                                       |                       |          |         |
|                  |             | ◇               | Block              |                       |                                    |                      |                     |                   | wide length shape                        | refer to Guide Sheet | Micrometer Calipers Visual Inspection | 20ea/LOT 20ea/LOT all | C/sheet  | Exhaust |
| AG PASTE         |             | ○               | SIDE1 PAD Printing | Printer screen        | Squeeze velocity/presure SNAP      | refer to Guide Sheet | 1/day               | -                 | PATTERN Dimension aspect                 | refer to Guide Sheet | Microscope                            | 10ea/3Jig             | c/sheet  | Rework  |
|                  |             | ○               | Dry                | Dryer Dry Jig         | Temperature Belt speed             | refer to Guide Sheet | 1/week              | Parameter         | Dry Condition Printed condition breakage | refer to Guide Sheet | Visual Inspection                     | all                   | Lot card | Rework  |

| Product         |             |                                                                                     | Issued/Revision            |                       | Process Control               |                      |                     |                   |                                          | Record               | By designed           | By checked          | By approved |                |
|-----------------|-------------|-------------------------------------------------------------------------------------|----------------------------|-----------------------|-------------------------------|----------------------|---------------------|-------------------|------------------------------------------|----------------------|-----------------------|---------------------|-------------|----------------|
| CHIP ANTENNA    |             |                                                                                     | Issued                     | 04.04.06              |                               |                      |                     |                   |                                          | PRCP-C001            |                       |                     |             |                |
| Input Materials | FLOW CHART  |                                                                                     | Process name               | Management of Factors |                               |                      |                     |                   | Management of quality                    |                      |                       |                     |             |                |
|                 | preparation | Main Process                                                                        |                            | Equipment Name        | Checked                       | Condition            | Cycle of management | Record            | Checked Item                             | Margin               | Method of Inspection  | Cycle of management | Record      | Action         |
| AG PASTE        |             |    | SIDE 2 PAD Printing        | Printer screen        | Squeeze velocity/presure SNAP | refer to Guide Sheet | 1/day               | -                 | PATTERN Dimension aspect                 | refer to Guide Sheet | Microscope            | 10ea/3Jig           | c/sheet     | Rework         |
|                 |             |    | Dry                        | Dryer Dry Jig         | Temperature Belt speed        | refer to Guide Sheet | 1/week              | Parameter         | Dry Condition Printed condition breakage | refer to Guide Sheet | Visual Inspection     | all                 | Lot card    | Rework         |
|                 |             |    | Baking                     | Baking Hole mesh net  | Temperature Belt speed        | refer to Guide Sheet | 1/week              | Parameter C/Sheet | Breakage Pollution                       | refer to Guide Sheet | Visual Inspection     | all                 | Lot card    | Exhaust Rework |
| AG PASTE        |             |   | TOP printing               | Printer screen        | Squeeze velocity/presure SNAP | refer to Guide Sheet | 1/day               | -                 | PATTERN dimension                        | refer to Guide Sheet | measure               | 10ea/3Jig           | c/sheet     | Rework         |
|                 |             |  | Dry                        | Dryer Dry Jig         | Temperature Belt speed        | refer to Guide Sheet | 1/week              | Parameter         | Dry Condition Printed condition breakage | refer to Guide Sheet | Visual Inspection     | all                 | Lot card    | Rework         |
| AG PASTE        |             |  | BOTTOM PAD Printing<br>CTQ | printer screen        | Squeeze velocity/presure SNAP | refer to Guide Sheet | 1/day               | -                 | PATTERN dimension aspect                 | refer to Guide Sheet | measure<br>Microscope | 10ea/3Jig           | c/sheet     | Rework         |

| Product                  |             |              | Issued/Revision              |                           | Process Control           |                         |                     |                      | Record                                            | By designed                              | By checked                                 | By approved                |                                 |                   |
|--------------------------|-------------|--------------|------------------------------|---------------------------|---------------------------|-------------------------|---------------------|----------------------|---------------------------------------------------|------------------------------------------|--------------------------------------------|----------------------------|---------------------------------|-------------------|
| CHIP ANTENNA             |             |              | Issued                       | 04.04.06                  |                           |                         |                     |                      | PRCP-C001                                         |                                          |                                            |                            |                                 |                   |
| Input Materials          | FLOW CHART  |              | Process name                 | Management of Factors     |                           |                         |                     |                      | Management of quality                             |                                          |                                            |                            |                                 |                   |
|                          | preparation | Main Process |                              | Equipment Name            | Checked                   | Condition               | Cycle of management | Record               | Checked Item                                      | Margin                                   | Method of Inspection                       | Cycle of management        | Record                          | Action            |
|                          | ○           |              | Dry                          | Dryer<br>Dry Jig          | Temperature<br>Belt speed | refer to<br>Guide Sheet | 1/week              | Parameter            | Dry Condition<br>Printed condition<br>breakage    | refer to<br>Guide Sheet                  | Visual Inspection                          | all                        | Lot card                        | Rework            |
|                          |             | ○            | Baking                       | Baking Hole<br>mesh net   | Temperature<br>Belt speed | refer to<br>Guide Sheet | 1/week              | Parameter<br>C/Sheet | Breakage<br>Pollution                             | refer to<br>Guide Sheet                  | Visual Inspection                          | all                        | Lot card                        | Exhaust<br>Rework |
|                          |             | ◇            | aspect<br>inspection         |                           |                           |                         |                     |                      | aspect                                            | Reference SPL<br>refer to<br>Guide Sheet | Visual Inspection<br>microscope            | all                        | Lot card<br>production<br>diary | Exhaust<br>repair |
|                          |             | ○            | MARKING                      | Marking<br>Machine        |                           |                         |                     |                      | marking                                           | Reference SPL                            | Visual Inspection                          | all                        | Lot card<br>production<br>diary | Rework<br>Exhaust |
|                          |             | ◇            | Electrical<br>Characteristic | NETWORK<br>Inspection Jig | proofreading<br>Condition | refer to<br>Guide Sheet | 1/2hour             | C/sheet              | Electrical<br>Characteristic                      | refer to<br>Guide Sheet                  | Network                                    | all                        | Lot card<br>production<br>diary | Exhaust<br>repair |
|                          |             | ◇            | aspect<br>inspection         |                           |                           |                         |                     |                      | aspect<br>dimension                               | Reference SPL<br>refer to<br>Guide Sheet | Visual Inspection<br>microscope            | all                        | Lot card<br>production<br>diary | Exhaust<br>repair |
| Carrier<br>cover<br>reel |             | ○            | Taping                       |                           |                           |                         |                     |                      | Quantity<br>Direction<br>aspect                   | refer to<br>Guide Sheet                  | Manual                                     | all                        | Lot card<br>production<br>diary | Rework            |
|                          |             | ◇            | shipper<br>inspection        | NETWORK<br>Inspection Jig | proofreading<br>Condition | refer to<br>Guide Sheet | 1/person            | C/sheet              | Electrical<br>Characteristic<br>aspect<br>packing | refer to<br>Guide Sheet                  | Network<br>microscope<br>Visual Inspection | refer<br>to Guide<br>Sheet | Result<br>Paper                 | return<br>Exhaust |
| packing<br>box<br>label  |             | ○            | packing                      | bar code<br>printer       |                           |                         |                     |                      | packing<br>P/N<br>Quantity                        | refer to<br>Guide Sheet                  | Visual Inspection                          | all                        | -                               | Rework            |
|                          |             | ◇            | packing<br>inspection        |                           |                           |                         |                     |                      | packing<br>P/N<br>Quantity                        | refer to<br>Guide Sheet                  | Visual Inspection                          | all                        | -                               | return            |

## 17. RoHS Data

### 1) Ceramic Powder

**SGS**

**Test Report** No.: CE/2007/76776 Date: 2007/08/03 Page: 1 of 3

FUJII TITANIUM IND. CO., LTD.  
12-8, SENGUN-CHO, HIRATSUKA-CITY, KANAKAWA-PREF. JAPAN.

The following sample(s) was/were submitted and identified by/on behalf of the client as:

Sample Description : MIXTURE OF MAGNESIUM SILICATE, STRONTIUM  
Style/Item No. : MMS-08 (S)  
Sample Receiving Date : 2007/07/27  
Testing Period : 2007/07/27 TO 2007/08/03

Test Requested : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.  
Test Method : With reference to IEC 62321, Ed.1 111/54/CDV Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products.  
(1) Determination of Cadmium by ICP-AES.  
(2) Determination of Lead by ICP-AES.  
(3) Determination of Mercury by ICP-AES.  
(4) Determination of Hexavalent Chromium for non-metallic samples by UV/Vis Spectrometry.  
(5) Determination of PBB and PBDE by GC/MS.

Test Result(s) : Please refer to next page(s).

*[Signature]*  
Dennis Yen, M.P., Operation Manager  
Signed for and on behalf of  
SGS TAIWAN LTD.  
Chemical Laboratory - Taipei

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FUJII TITANIUM IND. CO., LTD.  
12-8, SENGUN-CHO, HIRATSUKA-CITY, KANAKAWA-PREF. JAPAN.

Test results by chemical method (Unit: mg/kg)

| Test Item (s):                                    | Method (Refer to) | Result No. 1 | MDL |
|---------------------------------------------------|-------------------|--------------|-----|
| Cadmium (Cd)                                      | (1)               | n.d.         | 2   |
| Lead (Pb)                                         | (2)               | n.d.         | 2   |
| Mercury (Hg)                                      | (3)               | n.d.         | 2   |
| Hexavalent Chromium Cr(VI) by alkaline extraction | (4)               | n.d.         | 2   |
| Sum of PBBs                                       |                   | n.d.         | -   |
| Mono-bromobiphenyl                                |                   | n.d.         | 5   |
| Di-bromobiphenyl                                  |                   | n.d.         | 5   |
| Tri-bromobiphenyl                                 |                   | n.d.         | 5   |
| Tetra-bromobiphenyl                               |                   | n.d.         | 5   |
| Penta-bromobiphenyl                               |                   | n.d.         | 5   |
| Hexa-bromobiphenyl                                |                   | n.d.         | 5   |
| Hepta-bromobiphenyl                               |                   | n.d.         | 5   |
| Octa-bromobiphenyl                                |                   | n.d.         | 5   |
| Nona-bromobiphenyl                                |                   | n.d.         | 5   |
| Deca-bromobiphenyl                                |                   | n.d.         | 5   |
| Sum of PBDEs (Mono to Nona) (Note 4)              | (5)               | n.d.         | -   |
| Mono-bromobiphenyl ether                          |                   | n.d.         | 5   |
| Di-bromobiphenyl ether                            |                   | n.d.         | 5   |
| Tri-bromobiphenyl ether                           |                   | n.d.         | 5   |
| Tetra-bromobiphenyl ether                         |                   | n.d.         | 5   |
| Penta-bromobiphenyl ether                         |                   | n.d.         | 5   |
| Hexa-bromobiphenyl ether                          |                   | n.d.         | 5   |
| Hepta-bromobiphenyl ether                         |                   | n.d.         | 5   |
| Octa-bromobiphenyl ether                          |                   | n.d.         | 5   |
| Nona-bromobiphenyl ether                          |                   | n.d.         | 5   |
| Deca-bromobiphenyl ether                          |                   | n.d.         | 5   |
| Sum of PBDEs (Mono to Deca)                       |                   | n.d.         | -   |

**TEST PART DESCRIPTION:**  
NO.1 : OFF-WHITE POWDER

Note : 1. mg/kg = ppm  
2. n.d. = Not Detected  
3. MDL = Method Detection Limit  
4. According to 2005/717/EC DecaBDE is exempt.  
5. "-" = Not Regulated

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**Test Report** No.: CE/2007/76776 Date: 2007/08/03 Page: 3 of 3

FUJII TITANIUM IND. CO., LTD.  
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\*\*\* End of Report \*\*\*

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## 2) Ag Paste

**SGS**

**Test Report No. F690561LF-CTSAAY67-22595** Issued Date: October 18, 2007 Page 1 of 2

To: **METECH KOREA CO., LTD.**  
B-501 Dongyang Paragon office1 17-2 Jeongja-dong  
Bundang-gu  
Sungnam-city  
Gyeonggi-do  
Korea

The following merchandise was submitted and identified by the client as :

**Product Name** : Silver Paste

**SGS File No.** : AYA07-22595

**Received Date** : October 12, 2007

**Test Performing Date** : October 15, 2007

**Test Performed** : SGS Testing Korea tested the sample(s) selected by applicant with following results

**Test Results** : For further details, please refer to following page(s)

SGS Testing Korea Co. Ltd.

Pluto Kim  
Monet Jeong  
Billy Oh / Testing Person

Jeff Jang  
Jeff Jang / Chemical Lab Mgr

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F052 Version2

**SGS**

**Test Report No. F690561LF-CTSAAY67-22595** Issued Date: October 18, 2007 Page 2 of 2

**Sample No.** : AYA07-22595.001

**Sample Description** : Silver Paste

**Item No./Part No.** : PCC11537HV

**Heavy Metals**

| Test Item                   | Unit  | Test Method                                | MDL | Results |
|-----------------------------|-------|--------------------------------------------|-----|---------|
| Cadmium (Cd)                | mg/kg | US EPA 3052(1995), US EPA 6010B(1995), ICP | 0.5 | N.D.    |
| Lead (Pb)                   | mg/kg | US EPA 3052(1995), US EPA 6010B(1995), ICP | 5   | N.D.    |
| Mercury (Hg)                | mg/kg | US EPA 3052(1995), US EPA 6010B(1995), ICP | 2   | N.D.    |
| Hexavalent Chromium (Cr VI) | mg/kg | US EPA 3060A(1996), US EPA 7198A(1992), UV | 1   | N.D.    |

Picture of Sample as Received:

Sample Color : Gray



\*\*\* End \*\*\*

**NOTE:** (1) N.D. = Not detected. (=MDL)  
(2) mg/kg = ppm  
(3) MDL = Method Detection Limit  
(4) - = No regulation  
(5) \* = Qualitative analysis (No Unit)  
(6) Negative = Undetectable / Positive = Detectable

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### 3) Marking Ink

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To: **IMAJE KOREA CO., LTD**  
 #1302 7th Daerang Techno Town 459-11  
 Gaseon-dong  
 Geumcheon-gu  
 SEOUL  
 Korea

The following merchandise was submitted and identified by the client as :

**Product Name** : S135E Black Ink  
**SGS File No.** : AYA07-24109R1  
**Received Date** : October 31, 2007  
**Test Performing Date** : November 01, 2007  
**Test Performed** : SGS Testing Korea tested the sample(s) selected by applicant with following results  
**Test Results** : For further details, please refer to following page(s)  
**Buyer(s)** : LG ELECTRONICS  
**Comments** : This Report cancels and supercedes the Report No.F690501LF-CTSA7-24109 dated November 05, 2007 issued by SGS Testing Korea Co., Ltd. The Item No/part No. had changed from Gamet to S135E by customer's request.

SGS Testing Korea Co. Ltd.  
*Jeff Jang*  
 Jeff Jang / Chemical Lab Mgr

Pluto Kim  
 Monal Jeong  
 Billy Oh / Testing Person

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**Sample No.** : AYA07-24109R1.001  
**Sample Description** : S135E Black Ink  
**Item No./Part No.** : S135E  
**Comments** : Material is butanone.

**Heavy Metals**

| Test Items                  | Unit  | Test Method                                | MDL | Results |
|-----------------------------|-------|--------------------------------------------|-----|---------|
| Cadmium (Cd)                | mg/kg | US EPA 3052(1996), US EPA 8210B(1996), ICP | 0.5 | N.D.    |
| Lead (Pb)                   | mg/kg | US EPA 3052(1996), US EPA 8210B(1996), ICP | 5   | N.D.    |
| Mercury (Hg)                | mg/kg | US EPA 3052(1996), US EPA 8210B(1996), ICP | 2   | N.D.    |
| Hexavalent Chromium (Cr VI) | mg/kg | US EPA 3060A(1996), US EPA 7196A(1992), UV | 1   | N.D.    |

**Phthalates and related compounds**

| Test Items               | Unit  | Test Method         | MDL | Results |
|--------------------------|-------|---------------------|-----|---------|
| Mandelonitrophenyl       | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Dibromodiphenyl          | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Tribromodiphenyl         | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Tetrabromodiphenyl       | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Pentabromodiphenyl       | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Hexabromodiphenyl        | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Heptabromodiphenyl       | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Octabromodiphenyl        | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Nonabromodiphenyl        | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Decabromodiphenyl        | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Monobromodiphenyl ether  | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Dibromodiphenyl ether    | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Tribromodiphenyl ether   | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Tetrabromodiphenyl ether | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Pentabromodiphenyl ether | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Hexabromodiphenyl ether  | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Heptabromodiphenyl ether | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Octabromodiphenyl ether  | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Nonabromodiphenyl ether  | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Decabromodiphenyl ether  | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |

**NOTE:** (1) N.D. = Not detected (<MDL)  
 (2) mg/kg = ppm  
 (3) MDL = Method Detection Limit  
 (4) - = No regulation  
 (5) - = Qualitative analysis (No Unit)  
 (6) Negative = Undetectable / Positive = Detectable

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**Picture of Sample as Received:**  
**Sample Color** : Black



--- End ---

**NOTE:** (1) N.D. = Not detected (<MDL)  
 (2) mg/kg = ppm  
 (3) MDL = Method Detection Limit  
 (4) - = No regulation  
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