APPROVAL SHEET

Dielectric Chip Antenna

Part No : AMAN802012PT07

Modle : PC-8200N

2006. 3. 17

AMOTECH Co., Ltd
5B-1L, 617, Namchon-Dong, Namdong-Gu,
Incheon, KOREA.

TEL : 82-32-821-0363 FAX : 82-32-811-0283

Written	Checked		Approved

Content

1. Revision Record

Date	Content	Page
2006. 3. 17	NEW	

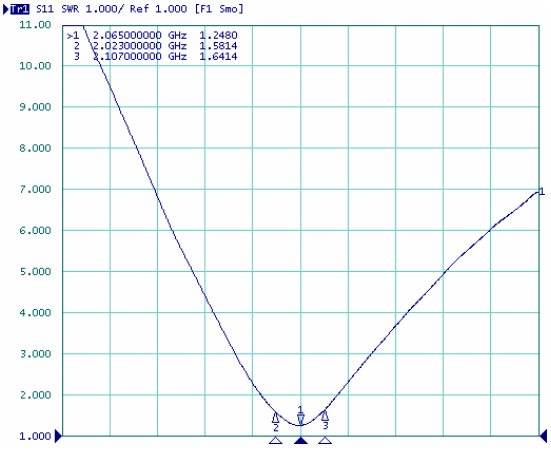
2. SPECIFICATIONS

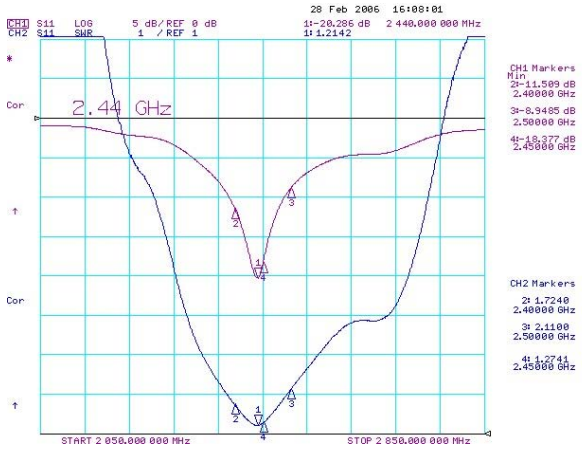
2.1 Electrical Specification

No	ITEM	Spec			Remark
1	VSWR	Max 5.0 : 1 @ 2065±42MHz			
2	Radiation Gain	Avg.	H	Min -5.0	dBi
			E1	Min -3.5	
			E2	Min -3.5	
		Peak	H	Min -3.0	
			E1	Min -1.0	
			E2	Min -1.0	
3	Radiation Pattern	Omni-directional			
4	Impedence	nominal 50			Ω

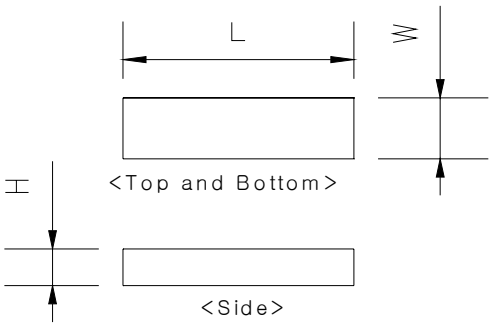
※ Radiation Pattern : measured data after matching on Bluetooth range

※ VSWR : measured data on manual jig





2.2 Mechanical Specification



L (Length)	8.0
W (Width)	2.0
H (Height)	1.2

- unit : mm
- Tolerance : ± 0.15

2.3 Model & Lot notation

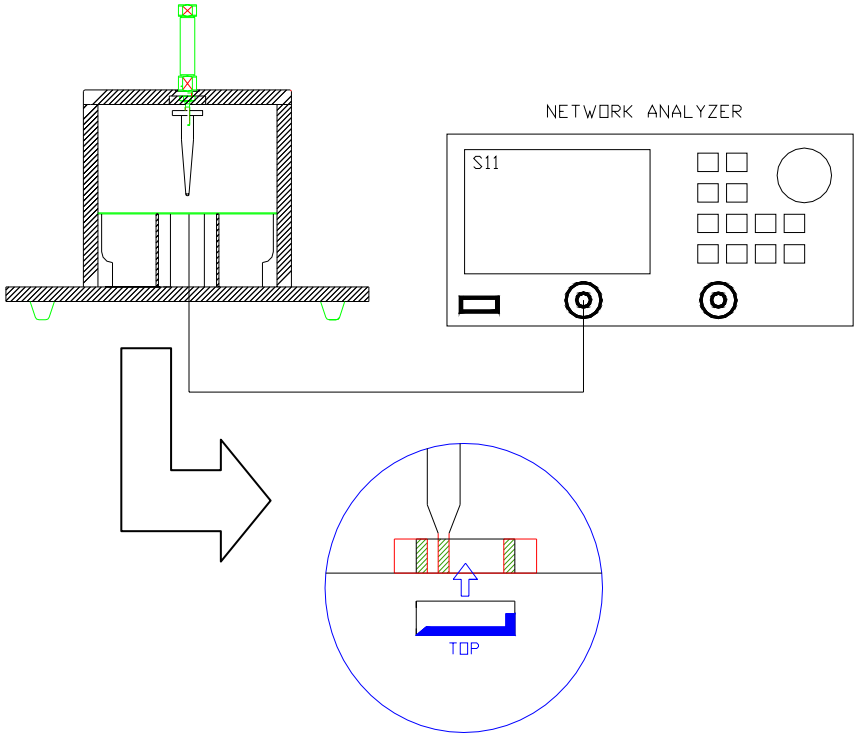
Model : **AMAN** (1) **802012** (2) **PT** (3) **07** (4)

(1) : **AM**OTECH **AN**TENNA
(2) : Chip Size (Length X Width X Height)
(3) : Enterprise, Ex) PANTECH – PT
(4) : Model Num. (Ex : 07-PN820)

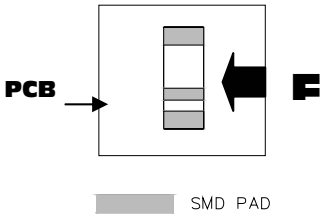
Lot : **XX** (1) **XX** (2) **X** (3) **X** (4) **XX** (5)

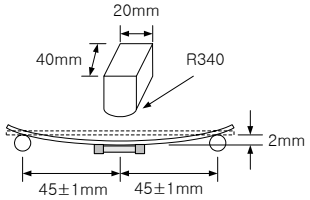
3. MEASUREMENT

3.1 VSWR's Measurement



4. RELIABILITY TEST

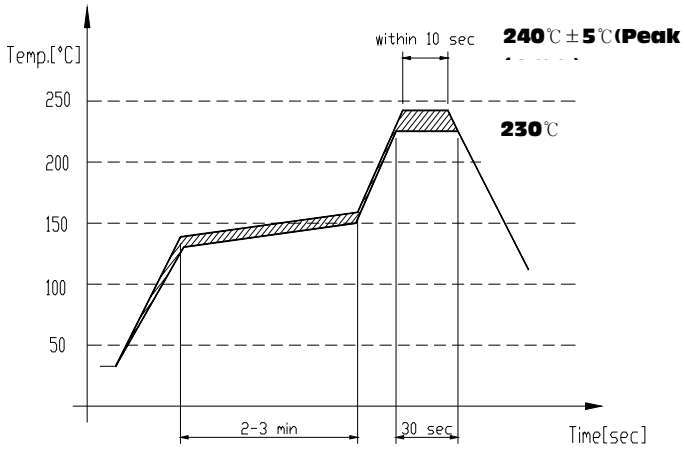
No	ITEM	TEST CONDITION	TEST REQUIREMENTS
1	Adhesion strength	1. Applied force on SMD chip till detached point from PCB.  	1. No mechanical damage by forces applied on the right. 2. Strength (F) > kgf

2	bending strength	1. Flexural state: 2 mm 2. Speed: 0.5 mm/sec 3. lasting time: 5 sec 	1. No mechanical damage by forces applied on the right.
3	Thermal shock	1. 1 cycle / 1 step : -40 ± 3℃, 30 min 2 step : +125 ± 3℃, 30 min 2. Number of cycle : 30 3. Measure f_C after left for 48 hrs min. at room temperature	1. No visual damage 2. Within electric spec (VSWR)
4	High temp. resistance	1. Temperature : +125 ± 5℃ 2. Time : 1000 ± 24 hrs 3. Measure f_C after left for 48 hrs min. at room temperature	1. No visual damage 2. Within electric spec (VSWR)
5	Low temp. resistance	1. Temperature : -40 ± 5℃ 2. Time : 1000 ± 24 hrs 3. Measure f_C after left for 48 hrs min. at room temperature	1. No visual damage 2. Within electric spec (VSWR)
6	High temp. & humidity :Steady Condition	1. Humidity : 85 % RH 1. Temperature : +85 ± 3℃ 2. Time : 1000 ± 24 hrs 3. Measure f_C after left for 48 hrs min. at room temperature	1. No visual damage 2. Within electric spec (VSWR)
7	ESD	1. ESD Level : 8KV 2. Mode : Contact discharge 3. Number of Test: 100	1. No visual damage 2. Within electric spec (VSWR)

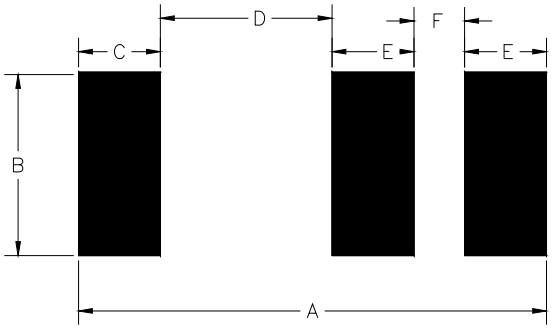
5. Soldering Recommendation

5.1 Soldering Profile

Solder paste : Ag/Sn/Cu:96.5/3.0/0.5



5.2 Soldering Land Pattern

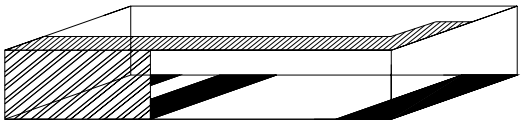


UNIT : mm

A	8.0
B	2.0
C	1.0
D	4.2
E	1.0
F	0.8

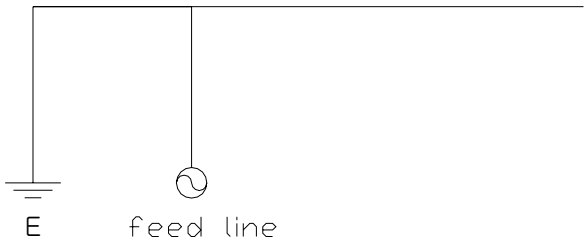
6. Structure & Material

6.1 Material



1	(Bulk)		Material
2	Pattern	TOP	Ag
		BOTTOM	
		SIDE	

6.2 Equivalent circuit



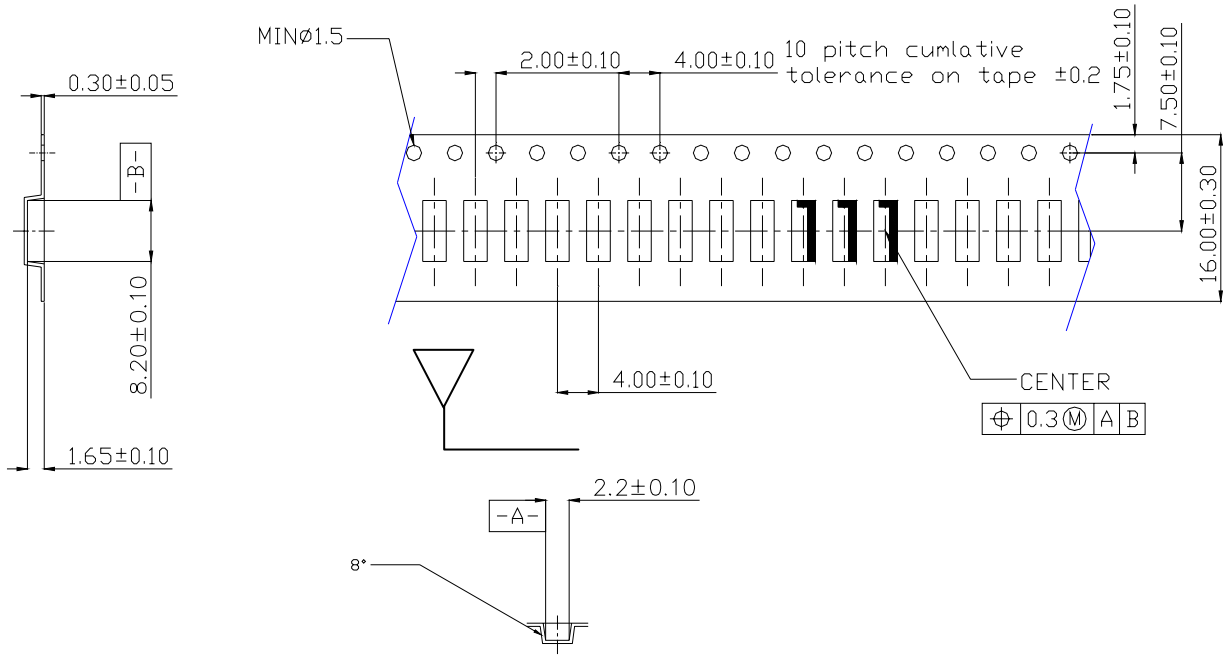
7. Caution and Warranty

1. Ceramic Patch Antennas can be degraded when used at high temperature and humidity.
2. Electrode metallization made from silver is unprotected and will tarnish during storage in normal atmospheres affected by sulphuric compounds but has no effect whatsoever on the electrical performance or the processability of the patches. Because of this normal and to be expected process, AMOTECH accepts no warranty claims for tarnished products.
3. Ceramic Patch Antennas must avoid shock and drop, to prevent crack of antenna due to weight of itself.
4. Ceramic Patch Antennas must be used within 6 months, the antenna produced before 6 months should be checked for soldering feature before using

8. Packing

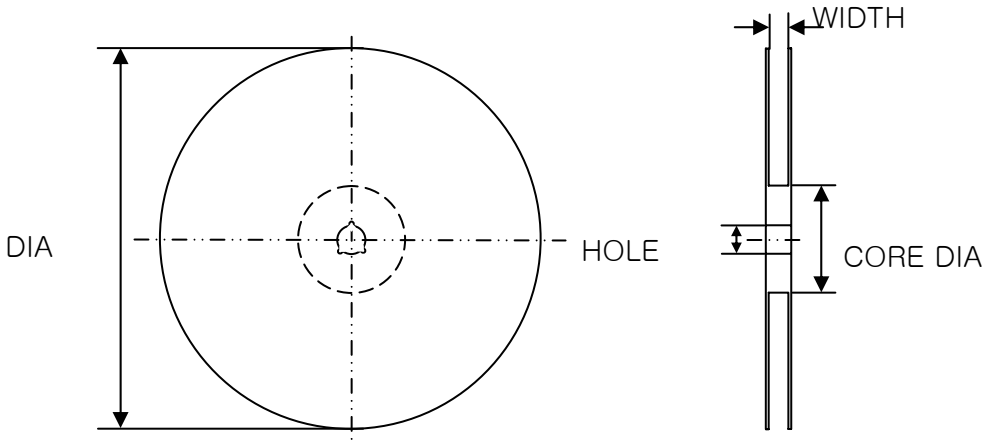
8.1 Tape Dimension (unit : mm)

8.1.1 Size



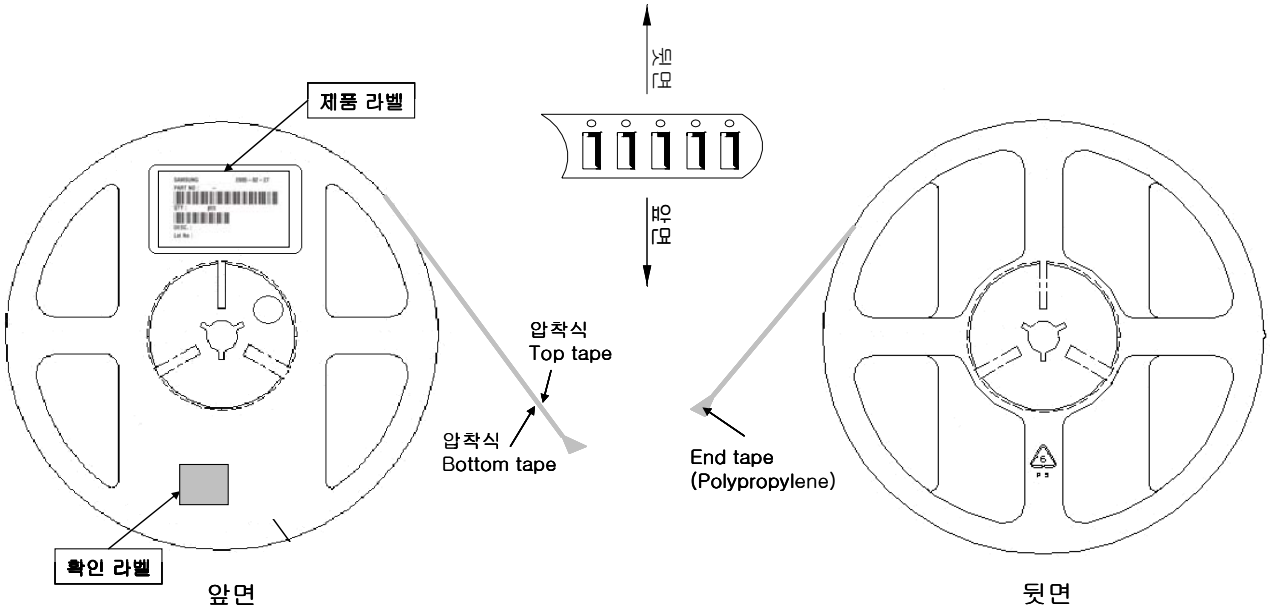
8.2 Description of Reel

8.2.1 Size



ITEM	DIA	WIDTH	CORE DIA	HOLE
Size(mm)	180.0 +0,-3	17.0 ± 0.3	60.0 ± 1	13.0 ± 0.5

8.2.2 Attaching Lavel & Winding Method



8.2.3 Material

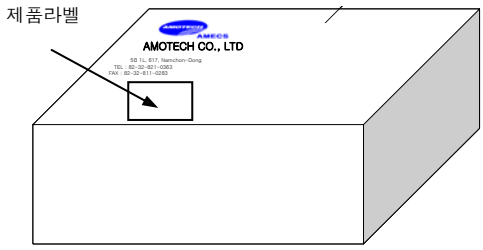
1) Plastic reel : GPPS (General Purpose Poly Styrene) resin

8.3 Description of Packing Box

8.3.1 Small Box

Size : 185 (W) x 185 (D) x 68 (T) (mm)

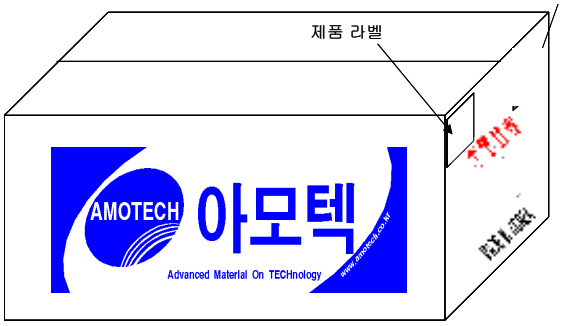
quantity : 3 reel (2,000 ea/reel × 3 reel = 6,000 ea)



8.3.2 Medium Box

Size : 365 (W) x 200 (D) x 200 (T) (mm)

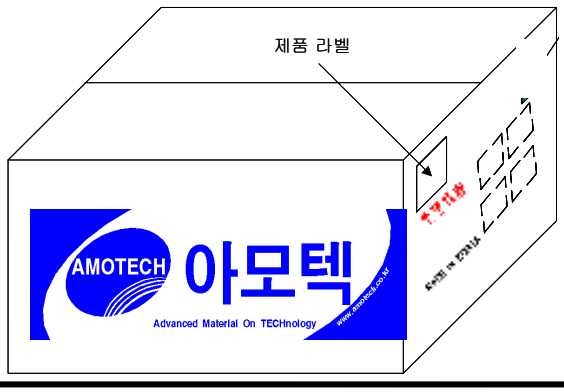
quantity : 5 Small Box (6,000 ea/ Small Box × 5 Small Box = 30,000 ea)



8.3.3 Large Box

Size : 390 (W) x 390 (D) x 280 (T) (mm)

quantity : 14 Small Box (6,000 ea/ Small Box ×14 Small Box = 84,000 ea)



8.4 Description of Packing Label

AMOTECH CO.,LTD.

617 5B-1L, Namchon-Dong, Namdong-Gu, Incheon-City, Korea

Dielectric Chip Antenna

Type : AMAN802012PT07

Lot No :

Quantity : 2,000 pcs Date :

9. Harmfulness material's Test Report

9.1 Materal ngredient Analysis

SGS Testing Korea Co., Ltd.
#18-34, Sanbon-dong, Gunpo-city, Kyunggi-do, Korea 435-040
Tel : 031) 428-5765~6, Fax: 031) 427-2374, InterNet>http://www.sgslab.co.kr

Test Report No. F690501/LF-CTS050284 Date : May 12, 2005 Page 1 of 2

AMOTECH
617, Namchon-dong, Namdong-gu,
Incheon, Korea

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

Type of Product	:	Ceramic PIFA Antenna
SGS File No.	:	G-49/2005-2072/9
Buyer	:	SAMSUNG
Style / Item No.	:	Ceramic PIFA Antenna
Sample Receiving Date	:	May. 04, 2005
Test Performing Date	:	May. 06, 2005
Test Performed	:	SGS Testing Korea tested the sample which was selected by applicant with following result.
Test Results	:	For further details, please refer to following page.

SGS Testing Korea Co., Ltd.

Jae S. Han

KHJ/hjp

Jason Han / Director

SGS Testing Korea Co., Ltd.
#18-34, Sanbon-dong, Gunpo-city, Kyunggi-do, Korea 435-040
Tel : 031) 428-5765~6, Fax: 031) 427-2374, InterNet>http://www.sgslab.co.kr

Test Report No. F690501/LF-CTS050284 Date : May 12, 2005 Page 2 of 2

Heavy Metal

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	USEPA 3050B, ICP-AES	0.5	n. d.
Lead (Pb)	mg/kg	USEPA 3050B, ICP-AES	5	n. d.
Mercury (Hg)	mg/kg	USEPA 3052, ICP-AES	2	n. d.
Hexavalent Chromium (Cr VI)	mg/kg	USEPA 3060A, UV-vis	1	n. d.

Flame Retardants

Test Items	Unit	Test Method	MDL	Results
Polybrominated Biphenyls (PBBs)	-	-	-	-
Bromobiphenyl	mg/kg	With reference to USEPA 3540C. Analysis was performed by GC/MS..	5	n. d.
Dibromobiphenyl	mg/kg		5	n. d.
Tribromobiphenyl	mg/kg		5	n. d.
Tetrabromobiphenyl	mg/kg		5	n. d.
Pentabromobiphenyl	mg/kg		5	n. d.
Hexabromobiphenyl	mg/kg		5	n. d.
Heptabromobiphenyl	mg/kg		5	n. d.
Octabromobiphenyl	mg/kg		5	n. d.
Nonabromobiphenyl	mg/kg		5	n. d.
Decabromobiphenyl	mg/kg		5	n. d.
Polybrominated Diphenyl Ethers (PBDEs)	-	-	-	-
Bromodiphenyl ether	mg/kg	With reference to USEPA 3540C. Analysis was performed by GC/MS.	5	n. d.
Dibromodiphenyl ether	mg/kg		5	n. d.
Tribromodiphenyl ether	mg/kg		5	n. d.
Tetrabromodiphenyl ether	mg/kg		5	n. d.
Pentabromodiphenyl ether	mg/kg		5	n. d.
Hexabromodiphenyl ether	mg/kg		5	n. d.
Heptabromodiphenyl ether	mg/kg		5	n. d.
Octabromodiphenyl ether	mg/kg		5	n. d.
Nonabromodiphenyl ether	mg/kg		5	n. d.
Decabromodiphenyl ether	mg/kg		5	n. d.

Note : n. d. = Not detected
MDL = Method Detection Limit

********** End **********

9.2 Powder

SGS

Test Report

FU.I TITANIUM IND. CO., LTD.
12-8, SENGEN-CHO, HIRATSUKA-CITY,
KANAKAWA-PREF, JAPAN

Report No. : CE/2004/61738
Date : 2004/06/21
Page : 1 of 1

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

Type of Product : BARIUM TITANTE POWDER
Style/Item No : MMT-20M(B)
Sample Received : 2004/06/15
Testing Date : 2004/06/15 TO 2004/06/21

Test Result

PART NAME NO.1 : GRAY POWDER

Test Item (s)	Unit	Method	MDL	Result No.1				
Cadmium (Cd)	ppm	ICP-AES after as per EN 1122, method B:2001 or other acid digestion.	2	N.D.				
Chromium (Cr)	ppm	ICP-AES after as per US EPA 3050B or other acid digestion.	2	N.D.				
Mercury (Hg)	ppm	ICP-AES after as per US EPA 3052 or other acid digestion.	2	N.D.				
Lead (Pb)	ppm	ICP-AES after as per US EPA 3050B or other acid digestion.	2	N.D.				

NOTE: (1) N.D. = Not detected.(<MDL)
(2) ppm = mg/kg
(3) MDL = Method Detection Limit

Dennis Yeh, M.S. / Operation Manager
"Signed for and on behalf of
SGS TAIWAN LTD.

TW0883088

9.3 Ag paste

SGS

Test Report No. F690501/LF-CTSGP06-0257 Date: January 11, 2006 Page 1 of 2

To: MICRO M CO., LTD.
Rm#503, B-dong, Bundangtechnopark
Yatap-dong
Bundang-gu
KYUNGKI-DO
Korea

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

Commodity	: PCC11837
SGS File No.	: GP06-0257
Received Date	: January 04, 2006
Test Performing Date	: January 05, 2006
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)	: SAMSUNG

SGS Testing Korea Co. Ltd.

Brendan Lee
Patrick An
Monet Jeong
Jinee Song
/Testing Person

Jeff Jang / Technical Mgr

Jason Han / Lab Director

The above certificate is the accredited test items by Korea Laboratory Accreditation Schmee (KOLAS), which signed the ILAC-MRA.

SGS

Test Report No. F690501/LF-CTSGP06-0257 Date: January 11, 2006 Page 2 of 2

Sample No. : GP06-0257.001
Sample Description : PCC11837
Style/Item No. : N/A
Comments : Material is silver paste.

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium(Cd)	mg/kg	US EPA 3050B(1996), US EPA 6010B(1996)	0.5	N.D.
Lead (Pb)	mg/kg	US EPA 3050B(1996), US EPA 6010B(1996)	5	12.0
Mercury (Hg)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996)	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	US EPA 3060A(1996), US EPA 7196A(1992)	1	N.D.

Picture of Sample as Received:

*** End ***

NOTE: (1) N.D. = Not detected (<MDL)
(2) ppm = mg/kg
(3) MDL = Method Detection Limit
(4) Estimated expanded uncertainty U with a coverage factor =2, k corresponding to a level of confidence of about 95%

The above certificate is the accredited test items by Korea Laboratory Accreditation Scheme (KOLAS), which signed the ILAC-MRA.

9.4 Carrier Tape

SGS

SGS Korea Co., Ltd.

#1002-2, Hwasan-ri, Onsan-ub, Ulju-gun, Ulsan, Korea 689-890
Tel : 052)239-6908~10, Fax: 052)239-6913, InterNet>http://www.sgsgroup.co.kr

Test Report No. F690101/LF-CTS008578 Date : December 19, 2003 Page 1 of 2

CHEM TECH SOLUTION CO., LTD
#402 Najin Bldg., 408, Sang-dong, Wonmi-gu, Bucheon-si,
Gyeonggi-do, Korea

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

Type of Product	:	PS Clear Sheet
SGS File No.	:	S-49/2003-4761
Country of Origin	:	Korea
Sample Receiving Date	:	Dec. 11, 2003
Test Performing Date	:	Dec. 12, 2003
Test Performed	:	SGS Korea tested the sample which was selected by applicant with following result.
Test Results	:	For further details, please refer to following page.

SGS Korea Co., Ltd.

T.J.Hwang

SBP/mss

T.J.Hwang / Lab. Manager

SGS

SGS Korea Co., Ltd.

#1002-2, Hwasan-ri, Onsan-ub, Ulju-gun, Ulsan, Korea 689-890
Tel : 052)239-6908~10, Fax: 052)239-6913, InterNet>http://www.sgsgroup.co.kr

Test Report No. F690101/LF-CTS008578 Date : December 19, 2003 Page 2 of 2

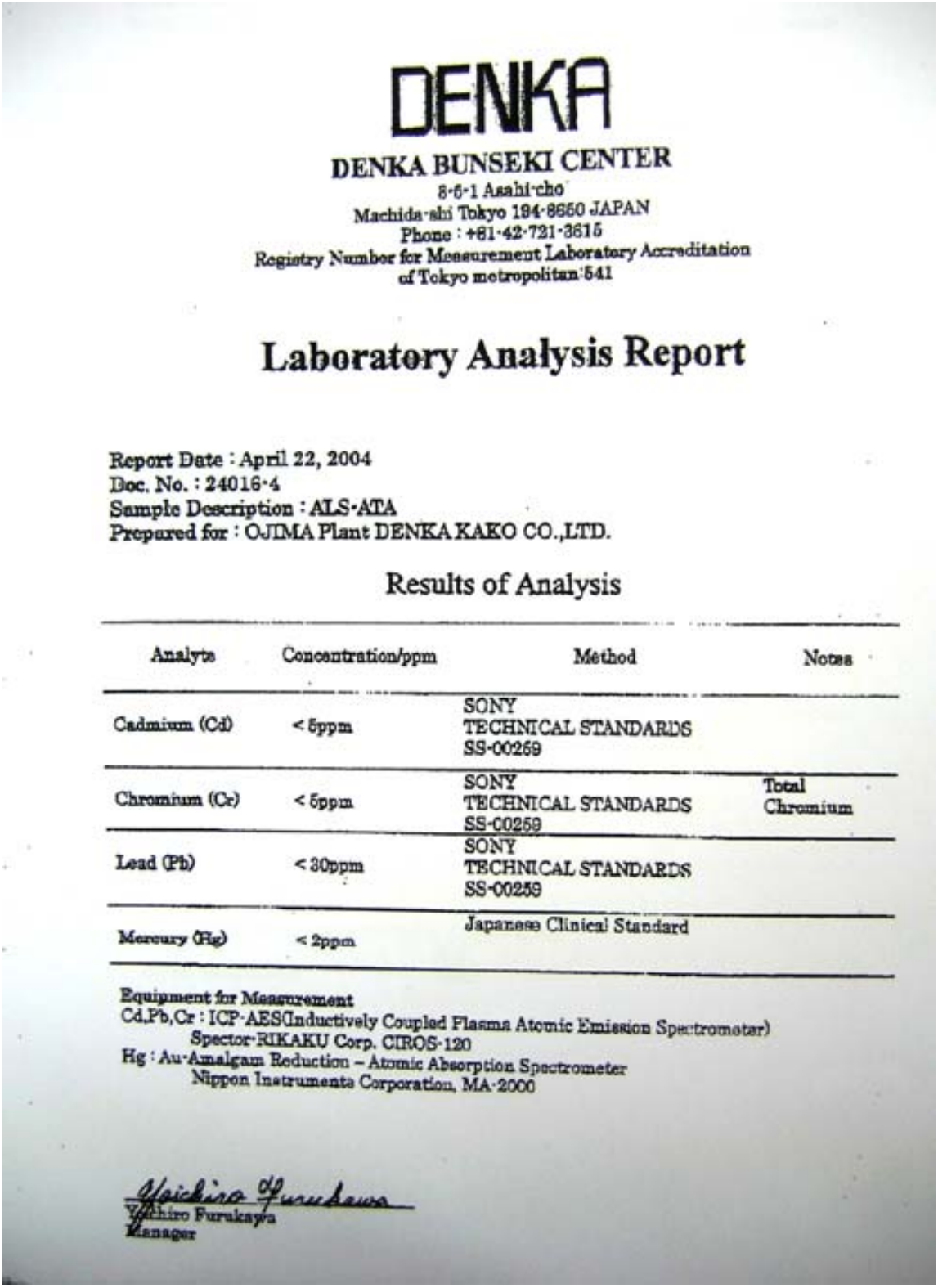
Heavy Metal

Test Item	Unit	Test Method	Detection Limit	Result
Cadmium (Cd)	mg/kg	EN 1122, ICP-AES	0.5	n. d.
Lead (Pb)	mg/kg	USEPA 3050B, ICP-AES	5	n. d.
Mercury (Hg)	mg/kg	USEPA 3052, ICP-AES	0.5	n. d.
Hexavalent Chromium (Cr VI)	mg/kg	USEPA 3060A	0.16	n. d.

ote : n. d. = Not detected

********** End **********

9.5 Carrier Cover



DENKA

DENKA BUNSEKI CENTER
8-6-1 Asahi-cho
Machida-shi Tokyo 194-8650 JAPAN
Phone : +81-42-721-3615
Registry Number for Measurement Laboratory Accreditation
of Tokyo metropolitan 541

Laboratory Analysis Report

Report Date : April 22, 2004
Doc. No. : 24016-4
Sample Description : ALS-ATA
Prepared for : OJIMA Plant DENKA KAKO CO.,LTD.

Results of Analysis

Analyte	Concentration/ppm	Method	Notes
Cadmium (Cd)	< 5ppm	SONY TECHNICAL STANDARDS SS-00259	
Chromium (Cr)	< 5ppm	SONY TECHNICAL STANDARDS SS-00259	Total Chromium
Lead (Pb)	< 30ppm	SONY TECHNICAL STANDARDS SS-00259	
Mercury (Hg)	< 2ppm	Japanese Clinical Standard	

Equipment for Measurement
Cd,Pb,Cr : ICP-AES(Inductively Coupled Plasma Atomic Emission Spectrometer)
Spector-RIKAKU Corp. CIROS-120
Hg : Au-Amalgam Reduction – Atomic Absorption Spectrometer
Nippon Instruments Corporation, MA-2000

Yoichiro Furukawa
Manager