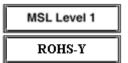
: GETEC-C1-09-037 Test Report Number : GETEC-E3-09-020

APPENDIX J : ANTENNA SPECIFICATION

EUT Type: Phone Adapter FCC ID.: UXZBSH100







Approval Sheet

Products	Dielectric Chip Antenna		
Customer	CLIPCOM		
Model		BS-H100	
Customer CODE			
Supplier		PARTRON	
Supplier CODE		ACS2450KCAH10	
	By designed	By checked	By approved
CLIPCOM			
	By designed	By checked	By approved
PARTRON	with	*	多人
	Research 5 Team	Quality Assurance	Laboratory
	Chanik.Jeon	Kwang-Gyu.Lee	Byoung-Jun.Yim
	07/31	07/31	07/31

2008. 07. 31



22-6 Seokwoo-dong, Hwaseong-si, Gyeonggi-do, Korea 455-300

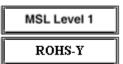
Te I: 82-31-201-7870~6 Fax: 82-31-201-7800 www.partron.co.kr

Ver 1.0 (2008.07.31)

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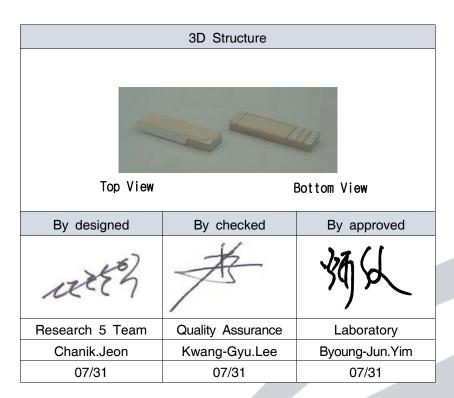






SPECIFICATION

MODEL: ACS2450KCAH10



2008. 07. 31



22-6 Seokwoo-dong, Hwaseong-si, Gyeonggi-do, Korea 455-300

Tel: 82-31-201-7870~6 Fax: 82-31-201-7800 www.partron.co.kr



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2.	Summary of Parts	2	р
3.	Critical to Quality	2	р
4.	Electrical Characteristics	3	р
5.	Measurement Process	8	р
6.	Internal Block Diagram	10	р
7.	Basis Action / Application Note	10	р
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1. Revision

Revision No	Originator	Description of changes	Date of changes
Ver 1.0	Chanik.Jeon	Issued	2008.07.31



2. Summary of Parts

- This product is the internal dielectric chip antenna of radio communication, forms the pattern with Ag paste on the brick of dielectric block and materializes the characteristics

Туре	Only Bulk Ceramic			
Material	Dielectric Block	Mg₂SiO₄(Magnesium Silicate)		
iviateriai	Electrode Paste	Ag		
	$W = 3.0\pm0.1$			
Size[mm]	$L = 11.0\pm0.1$	13 Pag and I wanted		
	$T = 1.2 \pm 0.1$	W Ag Paste		
Flatness Level	0.04	T		
MSL Level	MSL Level 1			
ESD Level	More than 15 KV (HBM CLASS 3B)	Top- Side View Dielectric Block Bottom- Side View		
Version	Revision 1.0			

3. Critical to Quality (

- The following list is specified as the emphasis management list and managed.

CTQ ITEM	Specification Reason
Shape weight, size	Shape weight and size determines the electric block size after plastic and the dielectric block size effects the level of detail for the printing.
Plastic Size	The size after plastic effects the level of detail for the printing.
Printing Size	The level of detail for printing size is an essential list of the BT antenna.

CTF ITEM	Specification Reason
Single Element measurement SWR	An important Parameter classifying the electrical characteristics.

- require attention for the following list.

ITEM	Content
Keeping	Sealing tightly when keeping for a long time.
Action	Maybe characteristics changes when changing any design.

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4. Electrical Characteristics

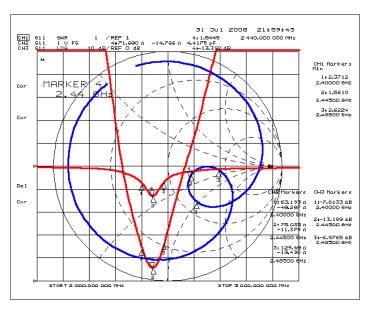
4.1 Set Condition

ITEM		SPEC		
Frequency Range [MHz]		2400 ~ 2485		
	SWR	[Max]		3.0 : 1 [Typ 2.5:1]
	Input Impe	dance $[\Omega]$		50 Ohm
	Polariz	zation		Linear
	Total Gair	n (Peak / /	Avg) [dBi]	0.1 / -4.9
		Thata	Peak	0.18
	Azimuth	Theta	Average	-4.86
		Phi	Peak	3.32
			Average	-3.17
	Elevation 1	Theta	Peak	-0.92
Gain[dBi]			Average	-3.50
		Phi	Peak	-5.13
			Average	-12.54
	Elevation 2	Theta	Peak	-9.22
			Average	-14.29
		Phi	Peak	2.47
			Average	-2.43

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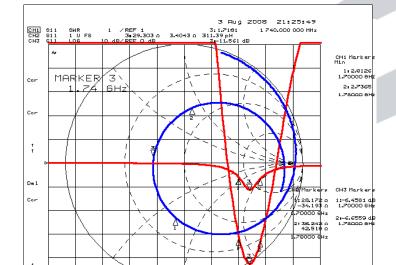
4.2 S11 Graph of Set Condition



4.3 Test Fixture Condition

ITEM	SPEC
Frequency Range [MHz]	1700 ~ 1780
Lower frequency(1700MHz) SWR [Min~Max]	1~4.0 : 1[typ3.2 : 1]
Upper frequency(1780MHz) SWR [Min~Max]	1~4.0 : 1[typ3.2 : 1]

4.4 S11 Graph of Test Fixture Condition CTD

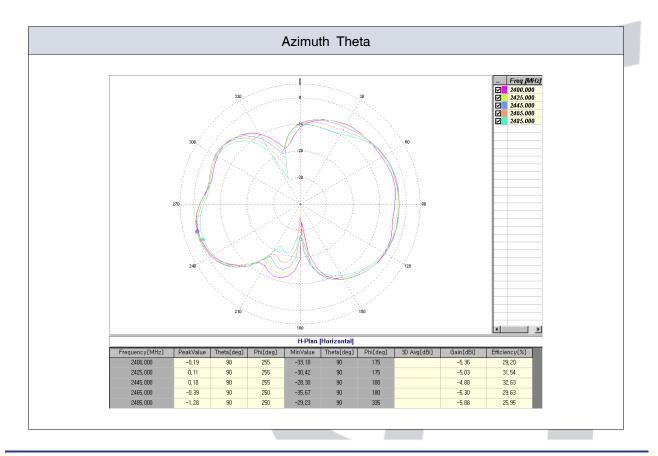


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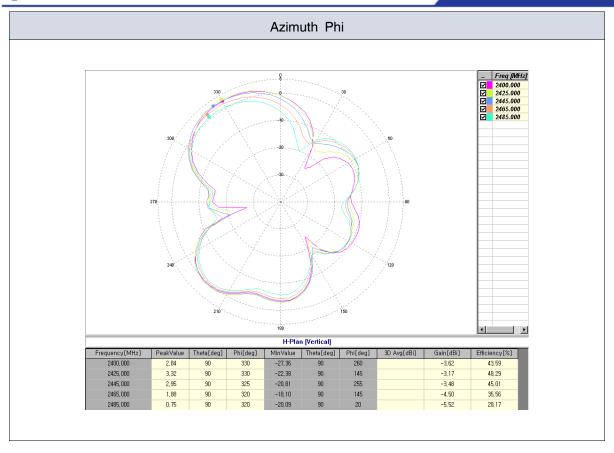
4.5 Radiation Pattern

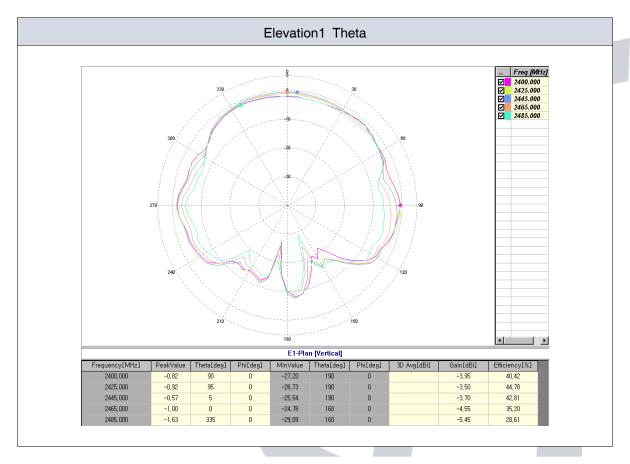
Azimuth Plane	Elevation1 Plane	Elevation2 Plane
270° 90°	90° 180°	270° — 90° — 180°
Theta	Vertical field of measured plane	
Phi	Horizontal field of measured plane	



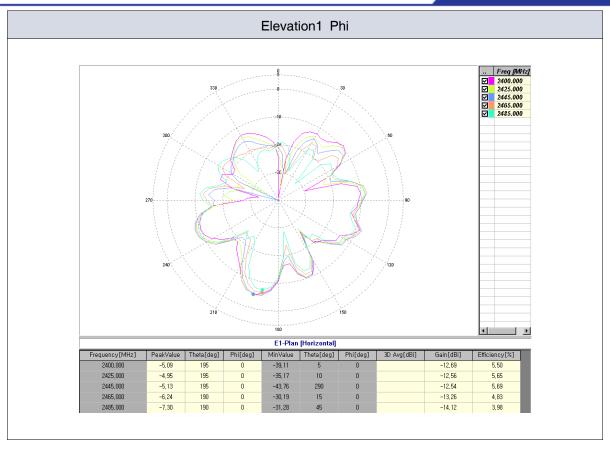
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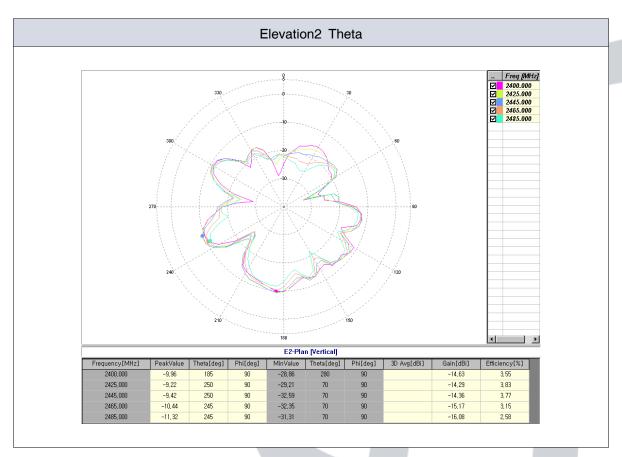




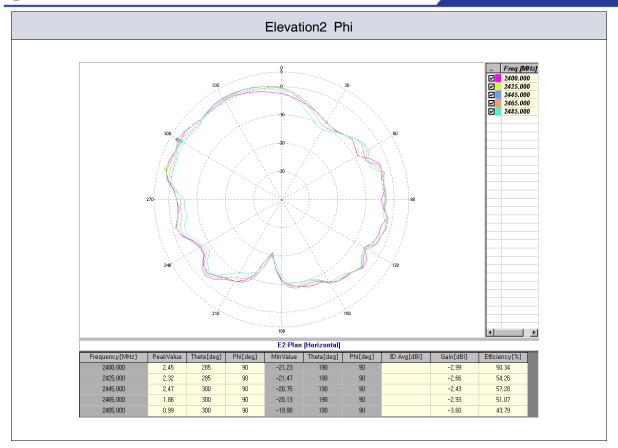












5. Measurement Process

5.1 SWR/Return loss

Use Network Analyzer when measuring SWR/Return loss and selecting standard SPL, Use automatic inspection equipment when selecting superior and inferior goods.

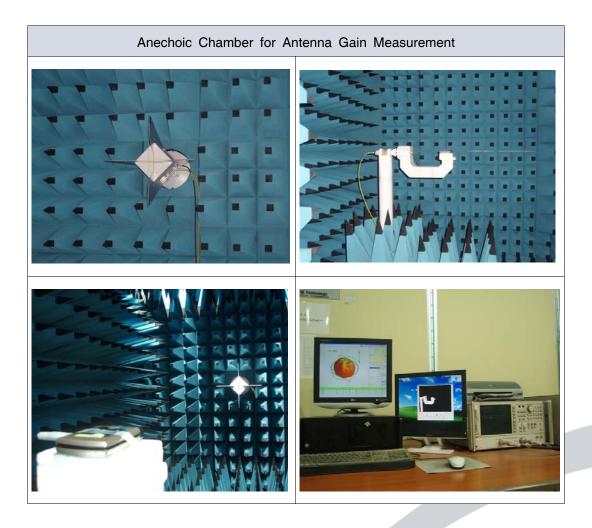
	Set Condition	Test Fixture Condition
Network Analyzer	Agilent HP8753D	Agilent HP8753D or Advantest R3765CH
Cable	RF cable(300mm)	RF cable(300mm)
Test condition		

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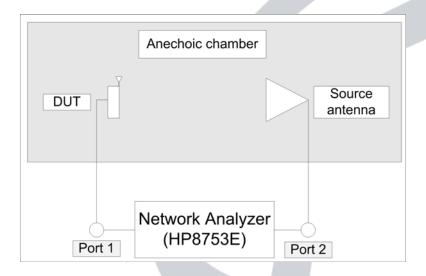


5.2 Gain

Antenna gain is measured in the Anechoic Chamber of this company, using set above of 4.1 list.



5.3 Gain test block diagram

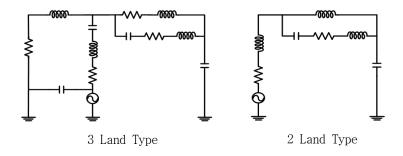


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6. Internal Block Diagram

This product is made of the dielectric block and RF part materialized the characteristics by structural change of Ag pattern on the brick of dielectric block and conditioning value of the structural equivalent circuit.



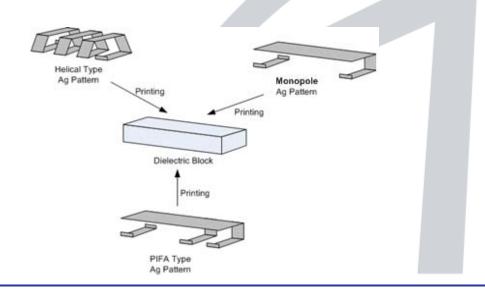
7. Basis Action / Application Note

This product is the internal dielectric chip antenna of radio communication, coverts the electric signal advanced along by transmission line into free space wave.

This product will be mounted wherever you want and the design is revised by mount condition. But require attention to select the mount position, because this product is the radiation part and changed characteristics by boundary condition,



As the following, this product is easy to revise the various types for the boundary condition.



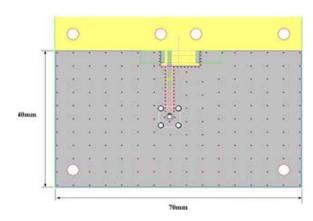
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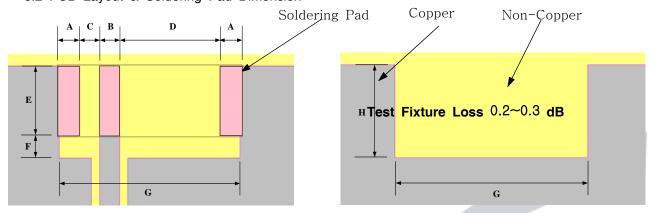
8. Measurement Jig SPEC

8.1 Test Fixture And GROUND Condit





*EvB'd and Test Fixture Jig is the same(Contact way of Ev B'd is soldering, Test Fixture is copper contact way) 8.2 PCB Layout & Soldering Pad Dimension



Top Layout

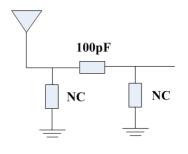
Bottom Pa	attern
-----------	--------

Parameter	Α	В	С	D	Е	F	G	Parameter
Value[mm]	1.1	1.0	7.0	3.2	1.0	11.2	4.2	Value[mm]

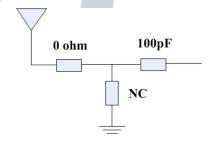
Unit; mm

Unless specified tolerances are ±0.1

8.3 Matching Circuit And Reference Value







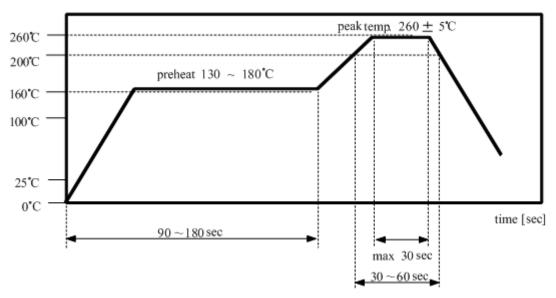
T Matching

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9. REFLOW PROFILE

9.1 Reflow Soldering

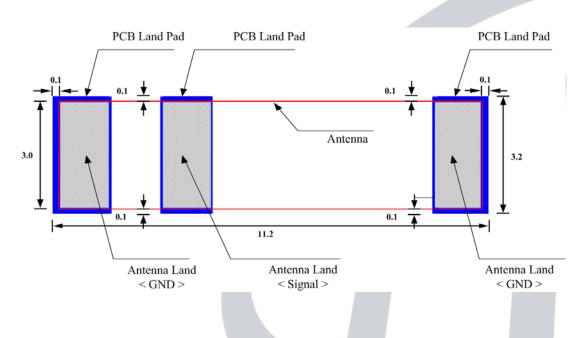


9.2 Manual Soldering

Soldering Temperature : $340\,^{\circ}\text{C}\,\pm5\,^{\circ}\text{C}$, 5sec max per each terminal

9.3 PCB Pattern Design

As the following, the PCB land pattern lays out 0.1mm outside land pattern of antenna more than indicated antenna land dimension



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10. Primary Inspection List

Item	Electrical Characteristic[MHz]			Size [mm]		
	VSWR	3.5 Max	W 0 0 0 1 1 11 0 0 1 T			
Standard	1700	1780	W=3.0±0.1	L=11.0±0.1	T=1.2±0.1	
1	2.57	2.93	3.03	11.02	1.21	
2	2.58	2.64	3.02	11.01	1.22	
3	2.64	2.71	3.02	11.02	1.22	
4	2.60	2.91	3.01	11.01	1.21	
5	3.02	2.58	3.02	11.01	1.24	
6	2.63	2.71	3.04	11.00	1.23	
7	2.67	2.39	3.01	11.03	1.22	
8	2.83	2.65	3.01	11.00	1.23	
9	2.49	2.95	3.04	11.02	1.23	
10	2.44	3.02	3.03	11.02	1.24	
11	2.48	3.03	3.02	11.01	1.21	
12	3.00	2.65	3.02	11.00	1.22	
13	3.22	2.48	3.04	11.01	1.21	
14	2.86	2.73	3.01	11.01	1.23	
15	2.63	2.86	3.01	11.01	1.24	
16	3.01	2.56	3.02	11.00	1.23	
17	2.69	2.77	3.01	11.01	1.22	
18	2.69	2.75	3.04	11.00	1.22	
19	2.45	2.96	3.03	11.02	1.21	
20	2.55	2.92	3.02	11.01	1.21	
Min	2.44	2.39	3.01	11.00	1.21	
Max	3.22	3.03	3.04	11.03	1.24	
Х	2.70	2.76	3.02	11.01	1.22	
σ	0.21	0.18	0.01	0.01	0.01	
Cpk	1.96	2.23	2.28	3.44	2.38	
Decision	ОК	OK	ОК	ОК	ОК	

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11. Reliability Condition

11.1 Environment Test

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

11.2 Thermal shock test, Reflow test

ITEM	TEST CONDITION	LIMIT
	condition : $-40^{\circ}\pm3^{\circ}$ /1min $\leftrightarrow +85^{\circ}\pm3^{\circ}$ /1min	
Thermal shock	Test Cycle: 32 cycle	After test, Must meet the
	Temperature change time: within 5 min	characteristics spec of
Deflow	Pre Heating: 200±5℃, 30~60 sec	4.4 list
Reflow	Peak Heating: 260°C±5°C, 30sec Max	

11.3 Mechanical Test

ITEM	TEST CONDITION	LIMIT
Vibration	Freq: 10~500Hz, Acceleration: 10 ×9.8 ^{m/s²} (G)	
Vibration	Sweep time: 15 min, X.Y.Z each 5 times	After test, Must meet the
	18 times free fall Using the drop jig 152cm high	characteristics spec of
Drop	Jig : 120g±20g Plastic Jig	4.4 list
	Bottom : Concrete or Iron	

11.4 MSL LEVEL Test

1) JEDEC J-STD-020C Test

	ı	Floor Life	Soak F	Requirements
	Time Conditions		Time	Conditions
1	Unlimited	= < 30°C/85%RH	168+5/-0	= < 85°C/85%RH

2) Test Condition

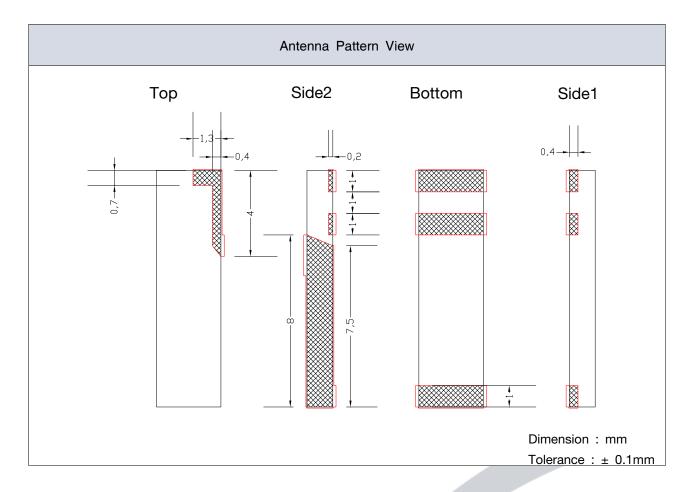
ITEM	Conditon		LIMIT
Soak Requirements	After leaving +85±3℃, RH85% 2 times Reflow without aging	168hr±2hr	After test, Must meet the characteristics spec of 4.4 list

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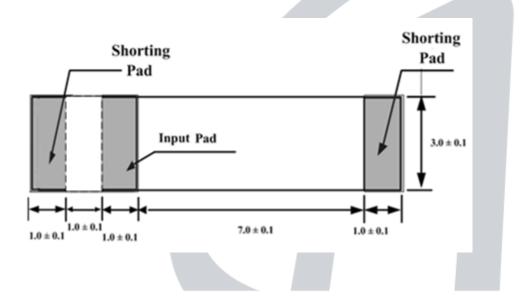


12. Mechanical Characteristics

12.1 Antenna Pattern Dimension



12.2 Pin name



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12.3 Lot number notation

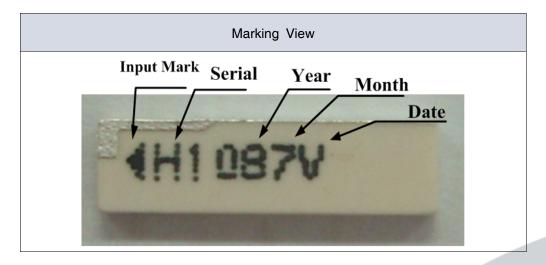
8 7 V ① ② ③

① Year : 7 - 2007 ····

2 Month: 1 - January, 2 - February · · · · 9 - September, A - October, B - November · ·

③ Date : 1 - 1st , 2 - 2nd ···· A - 10th, v - 31th ····

12.4 Marking



 ◀
 H 1 0
 8
 7
 ⊻

 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

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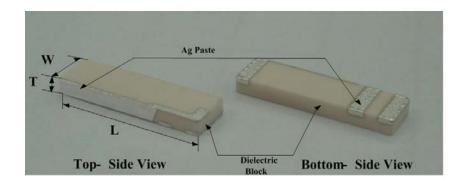


13. Structure and Material

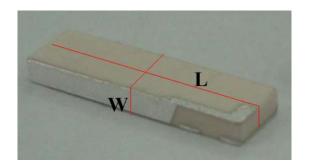
13.1 materialization method

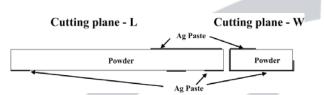
Chip antenna forms the pattern with Ag paste on the brick of dielectric block and materializes the characteristics

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 ^{μm}
PAD	Ag paste	METECH	Thickness: Min 10 ^{µm} (TYP 16~20 ^{µm})

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14. Attention

14.1 Temperature Condition

	Range of Temperature	Unit
Application temperature	-40 ~ +85	°C
Keeping temperature	-40 ~ +85	°C

14.2 Temperature Test Condition

	Condition	Range of Temperature	
Amaliantian tanananatuus	Low	24hr normal action at -75℃	
Application temperature	High	24hr normal action at +150°C	
Vanish tamananah wa	Low	normal action when left for 1000hr at -75°C	
Keeping temperature	High	normal action when left for 1000hr at +85℃	

 $^{^{\}star}$ Because of the keeping temperature problem, no admission when left over +85 $^{\circ}\mathrm{C}$



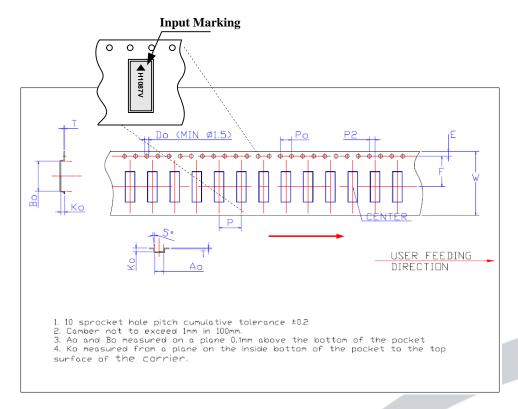
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15. Packing

15.1 Carrier/Reel

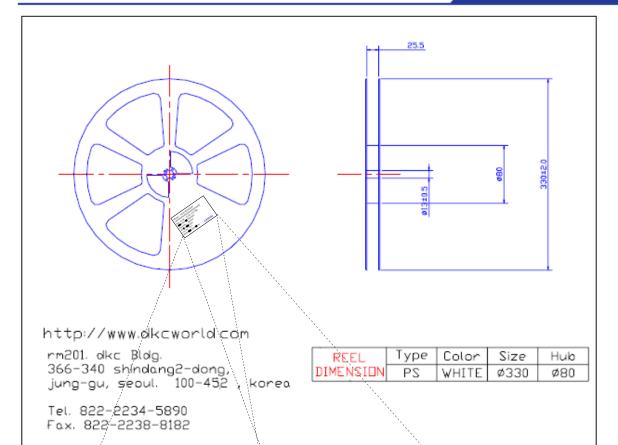
ITEM	Material	Surface Resistance	electrostatic emission	Packing method
Carrier tape	A-PET	Typical 10 ⁸ Ω	10V MAX	Heat muses
Cover tape	PET	Typical 10 ⁸ Ω	30V MAX	Heat press
Reel	PS	Typical 10 ⁸ Ω	30V MAX	-



DKC DWG. No.	D-2408-006	TITLE		NAME	SPEC.
DIMENSIONAL		7	ARRIER TAPE 3*11*1.2P	W	24±0.2
UNIT	ММ		J# 1 .ZF	E	1.75±0.1
UNTOLERANCED DIMENSION	±0.1	PART.	PART. CARRIER TAPE		11.5±0.1
DIMEN2101A				Do	1.5+0.1
CAD FILE NAME	041222	MATERIAL	C-PET	Р	8.0±0.1
DESIGNED BY	K. M. J	LENGTH	49.6M	Po	4.0±0.1
				P2	2.0±0.1
SCALE	1/1	COUNT	6200P	Ao	3.3±0.1
				Во	11.3±0.1
				Ко	1.4±0.1
				Т	0.3±0.05

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Model: ACS2450KCAH10

(I) PARTRON

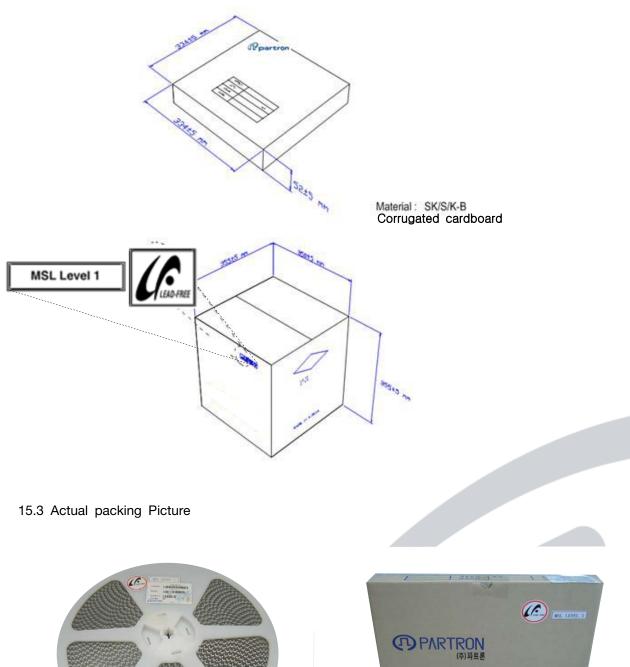
MSL Level 1



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15.2 BOX



Ree1



Internal Box

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MODEL : AC\$2450KCAH10

WANTITY : 5000

LOT NO : 87V

PARTRON

MSL LEVEL 1

Reel / Internal Box label



External Box label



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16. Process Control

	Produc	t	Issu	ued/Revision	1	_				Record	By designed	By chec	ked a	By pproved
CHIF	P ANTE	ENNA	Issued Revised	04.04.0 05.04.0		Pro	cess (Control		PRCP-C0	01			
Input	FLOW	CHART	Process		Manage	ement of Facto	ors			M	anagement of qua	lity		
Materials	prepar ation	Main Process	name	Equipment Name	Checked	Condition	Cycle of management	Record	Checked Item	Margin	Method of Inspection	Cycle of management	Record	Action
Ceramic POWDER		\Diamond	Import Inspection						shrinking rate permittivity	refer to Guide Sheet	Micrometer Network	10ea/L0T	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						
		\Diamond	Block						wide length shape	refer to Guide Sheet	Micrometer Calipers Visual Inspection	20ea/L0T 20ea/L0T 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

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	Produc	t	Į:	ssued/Revisior	า						Record	By designed	By chec	ked By	approved
СНІ	P ANTE	ENNA	Issue Revis				Pro	cess	Control		PRCP-C0	01			
Input	FLOW	CHART	Process		М	anagem	ent of Factor	S			N	lanagement of qual	ity		
Materials	prepar ation	Main Process	name	Equipment Name	Chec	ked	Condition	Cycle of management	Record	Checked Item	Margin	Method of Inspection	Cycle of management	Record	Action
AG PASTE			SIDE 2 PAD Printing	Printer screen	Sque velocity/ SNA	presure	refer to Guide Sheet	1/day	_	PATTERN Dimension aspect	refer to Guide Sheet	Microscope	10ea/3Jig	c/sheet	Rework
			Dry	Dryer Dry Jig	Temper Belt s		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	Temper Belt s		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	Sque velocity/ SNA	presure	refer to Guide Sheet	1/day	_	PATTERN dimension	refer to Guide Sheet	measure	10ea/3Jig	c/sheet	Rework
			Dry	Dryer Dry Jig	Temper Belt s		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 CTQ	printer screen	Sque velocity/ SNA	presure	refer to Guide Sheet	1/day	-	PATTERN dimension	refer to Guide Sheet	measure Microscope	10ea/3Jig	c/sheet	Rework

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	Produc	et		sued/Revision			Dro	2000	Control		Record	Ву	/ designed	By chec	ked By	approved
СН	IP ANTE	ENNA	Issued Revise				PIC	ocess (Control		PRCP-C0	01				
Input	FLOW	CHART	Process		M	anagen	ment of Facto	rs			1	Manageme	ent of qua	lity		
Materials	prepar ation	Main Process	name	Equipment Name	Chec	ked	Condition	Cycle of management	Record	Checked Item	Margin		hod of pection	Cycle of management	Record	Action
			Dry	Dryer Dry Jig	Tempera		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	Temper Belt s		refer to Guide Sheet	1/week	Parameter C/Sheet	Breakage Pollution	refer to Guide Sheet	Visual	Inspection	all	Lot card	Exhaust Rework
		\Diamond	aspect inspection							aspect	Reference SPL refer to Guide Sheet		Inspection OSCOPE	all	Lot card	Exhaust repair
			MARKING	Marking Machine						marking	Reference SPL	Visual	Inspection	all	Lot card production diary	Rework Exhaust
		\Diamond	Electrical Characteristic	NETWORK Inspection Jig	proofre Condi		refer to Guide Sheet	1/2hour	C/sheet	Electrical Characteristic	refer to Guide Sheet	Ne	twork	all	Lot card production diary	Exhaust repair
		\Diamond	aspect inspection							aspect dimension	Reference SPL refer to Guide Sheet		Inspection oscope	all	Lot card production diary	Exhaust repair
Carrier cover reel			Taping							Quantity Direction aspect	refer to Guide Sheet	Ма	ınual	all	Lot card production diary	Rework
		\Diamond	shipper inspection	NETWORK Inspection Jig	proofre Condi		refer to Guide Sheet	1/person	C/sheet	Electrical Characteristic aspect packing	refer to Guide Sheet	micr	twork oscope Inspection	refer to Guide Sheet	Result Paper	return Exhaust
packing box label			packing	bar code printer						packing P/N Quantity	refer to Guide Sheet	Visual	Inspection	all	-	Rework
		\bigcirc	packing inspection							packing P/N Quantity	refer to Guide Sheet	Visual	Inspection	all	_	return

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17. RoHS Data

1) Ceramic Powder



Pluto Kim Monet Jeong Billy Oh / Testing Person

SGS

Test Report No. F690501/LF-CTSAYL07-24813 Issued Date: November 13, 2007 Page 2 of 3

Sample No. : AYL07-24813.001
Sample Description : MMS-08(B)
Item No/Part No. : N/A
Heavy Metals

NOTE: (1) N.D. = Not detected (~MOL);
(2) ImpRig = ppm
(3) M.D. = Method Detection Limit
(4) = No regulation
(4) = No regulation
(6) (No regulation
(7) SUD33 : calculation from 50 by the equation = (121.760 X 2 + 15.9994 X 3) X Sb = 1.197 X Sb
(7) SND33 : calculation from 50 by the equation = (121.760 X 2 + 15.9994 X 3) X Sb = 1.197 X Sb

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NOTE: (1) N.D. = Not detected (<NDL).
(2) Implieg = ppm
(3) M.D. = Method Detection Limit
(4) = No regulation
(5) "* Quantitive analysis (No Unit)
(6) Negotive ** Unosecutable Fourier ** Detectable
(7) SeaCo: Calculative fam. B by the equation = (121.760 x 2 + 15.9994 x 5) X Se = 1.977 X Se
(7) SeaCo: Calculative fam. B by the equation = (121.760 x 2 + 15.9994 x 5) X Se = 1.977 X Se

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2) Ag Paste

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Issued Date: November 14, 2007 Page 1 of 4

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SGS File No. : AYL07-24812 ; November 07, 2007 Received Date Test Performing Date : November 08, 2007

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

; For further details, please refer to following page(s)

Jeff Jay

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Test Report No. F690501/LF-CTSAYL07-24812

Issued Date: November 14, 2007 Page 2 of 4

: AYL07-24812.001 : Silver paste (PCC11837HV) : N/A

Test items	Unit	Test Method	MDL	Results
Sb (Sb2O3)	mg/kg	US EPA 30508(1996), US EPA 60108(1996), ICP	10	N.D.
Arsenic (As)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	10	N.D.

Test Items	Unit	Test Method	MDL	Regults
Di(etnylhexyl) Phthalate (DEHP)	mg/kg	US EPA 8061A, GC/MS	50	3760
DI-Iso-decyl Phthalate (DIDP)	mg/kg	US EPA 8061A , GC/MS	50	N.D.
Di-methyl Phthalate (DMP)	mg/kg	US EPA 8061A , GC/MS	50	N.D.
Di-n-octyl Phthalate (DNOP)	mg/kg	US EPA 8061A , GC/MS	50	N.D.
Dibulyi Phthalate (DBP)	mg/kg	US EPA 8061A , GC/MS	50	N.D.
Butyl Benzyl Phthalate (BBP)	mg/kg	US EPA 8061A , GC/MS	50	N.D.
Di-ethyl Phthalate(DEP)	mg/kg	US EPA 8061A , GC/MS	50	N.D.
Di-Isononyi Phthalate (DINP)	mg/kg	US EPA 8061A . GC/MS	50	N.D.

Halogen Contents				
Test items	Unit	Test Method	MDL	Regults
Bromine(Br)	mg/kg	EN 14582:2007 . IC	30	N.D.
Chlorine(CI)	mg/kg	EN 14582:2007 , IC	30	N.D.
Eluction(E)	mo/so	EN 14552-2007, IC	30	ALD.

Fluorine(F)	mg/kg	EN 14582:2007 , IC	30	N.D.
Organotin Compounds				
Test Items	Unit	Test Method	MDL	
				Results

Azo Dyes	70 70			
Triphenyitin (TPhT)	mg/kg	DIN 38407-13 , GC/MS	0.1	N.D.
Tributylitn (TBT)	mg/kg	DIN 38407-13 , GC/MS	0.03	N.D.

(1) N.D. - Net detected, CADUL;
(2) mg/kg = gm.
(3) MCL, - Method Detection Limit
(3) MCL, - Method Detection Limit
(6) "* - Couldains analysis (No Lim)
(6) "* - Couldains analysis (No Lim)
(6) "* - Couldains analysis (No Lim)
(6) Negative * Limitectable (Passive * Detectable
(7) SSDO) : collabolistic form 3b by the equation of (121.760 X 2 + 15.9904 X 3) X 5b = 1,197 X 5b
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Test Report No. F690501/LF-CT\$AYL07-24812 Issued Date: November 14, 2007 Page 3 of 4

 Sample No.
 ; AYL07-24812.001

 Sample Description
 ; Silver paste (PCC11837HV)

 Item No./Part No.
 ; N/A

Azo Dves				
Test Items	Unit	Test Method	MDL	Results
4-Chloro-o-Toluidine	mg/kg	EN14362-1, GC/MS	5	N.D.
2-Naphlylamine	mg/kg	EN14362-1 , GC/MS	5	N.D.
o-Aminoazotoluene	mg/kg	EN14362-1, GC/MS	5	N.D.
2-Amino-4-Nitrotoluene	mg/kg	EN14362-1, GC/MS	5	N.D.
p-Chioroaniline	mg/kg	EN14362-1 , GC/MS	5	N.D.
2.4-Diaminoanisole	mg/kg	EN14362-1 , GC/MS	5	N.D.
4,4'-diaminodiphenyimethane	mg/kg	EN14362-1 , GC/MS	5	N.D.
3,3'-Dichlorobenzidine	mg/kg	EN14362-1, GC/MS	5	N.D.
3,3-Dimethoxybenzidine	mg/kg	EN14362-1 , GC/MS	5	N.D.
3,3-Dimethylbenzidine	mg/kg	EN14362-1, GC/MS	5	N.D.
3,3-Dimethyl-4.4'-diaminodiphenyl methane	mg/kg	EN14362-1 , GC/MS	5	N.D.
p-Cresidine	mg/kg	EN14362-1, GC/MS	5	N.D.
4.4'-Methylen-bis-(2-chloroaniline)	mg/kg	EN14362-1 , GC/MS	5	N.D.
4,4'-Oxydianiline	mg/kg	EN14362-1, GC/MS	5	N.D.
4.4'-Thioaniline	mg/kg	EN14362-1 , GC/MS	5	N.D.
o-Toluldine	mg/kg	EN14362-1, GC/MS	5	N.D.
2,4-Toluenedlamine	mg/kg	EN14362-1, GC/MS	5	N.D.
2,4,5-Trimethylaniline	mg/kg	EN14362-1, GC/MS	5	N.D.
p-Phenylazoaniline	mg/kg	EN14362-1, GC/MS	5	N.D.
o-Anisidine	mg/kg	EN14362-1 , GC/MS	5	N.D.
2,4-Xylidine	mg/kg	EN14362-1, GC/MS	5	N.D.
2,6-Xylidine	mg/kg	EN14362-1 , GC/MS	5	N.D.

NOTE: (1) N.D. = Nor detected (<NDL)
(2) mplks = prim
(3) MIC. = Method Detection Limit
(4) = No negulation
(5) = 10 cultinative enablysis (No Unit)
(8) (Regulative = Lunderschafe) Postine = Detectable
(7) 00003 - cultinative Tom Sey The equation = (121.760 X 2 + 15.9904 X 3) X Sb = 1.197 X Sb

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 Unit
 Test Method
 MDL
 Results

 mg/kg
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 10
 N.D.

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Test Report No. F690501/LF-CTSAYL07-24812



(1) N.D. = Not detected (=MDL).
(2) mg/leg = sport
(3) MoL. Membra Gleection Limit
(3) MoL. Membra Gleection Limit
(5) "* Qualitative analysis (No Limit
(5) "* Qualitative analysis (No Limit
(7) "* Negative = Limitediscretable /* Posterior = Detectable
(7) Sel203 : sacculated from 58 by the equation * (121.760 X 2 + 15.9994 X 3) X 5b = 1.197 X 5b
(7) Sel203 : sacculated from 58 by the equation * (121.760 X 2 + 15.9994 X 3) X 5b = 1.197 X 5b

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3) Marking Ink

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Test Report No. F690501/LF-CT\$AYL07-24811

Issued Date: November 13, 2007 Page 1 of 4

IMALE KOREA CO, LTD #1302 7th Daerung Techno Town 489-11 Gasan-dong Geumcheen-gu SEOUL Korea

The following merchandise was submitted and identified by the client as

SGS File No. : AYL07-24811 Received Date : November 06, 2007 Test Performing Date : November 07, 2007

Test Performing use

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

Test Results

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

Pluto Kim Monet Jeong Billy Oh / Testing Person

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Test Report No. F690501/LF-CTSAYL07-24811

Issued Date: November 13, 2007 Page 2 of 4

Sample Description : 5135E Black Ink Item No./Part No. : 5135E

10						
	Test Items	Unit	Test Method	MDL	Results	
I	Sb (Sb2O3)	mg/kg	US EPA 3050B(1996), US EPA 6010B(1996), ICP	10	N.D.	
1	Arsenic (As)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	10	N.D.	ĺ

Test Items	Unit	Test Method	MDL	Results
Di(ethylnexyl) Phthalate (DEHP)	mg/kg	US EPA 8061A, GC/MS	50	N.D.
DI-Iso-decyl Phthalate (DIDP)	mg/kg	US EPA 8061A, GC/MS	50	N.D.
Di-methyl Phthalate (DMP)	mg/kg	US EPA 8061A , GC/MS	50	N.D.
Di-n-octyl Phthalate (DNOP)	mg/kg	US EPA 8061A, GC/MS	50	N.D.
Dibutyl Phthalate (DBP)	mg/kg	US EPA 8061A , GC/MS	50	N.D.
Butyl Benzyl Phthalate (BBP)	mg/kg	US EPA 8061A , GC/MS	50	N.D.
DI-ethyl Phthalate(DEP)	rng/kg	US EPA 8061A , GC/MS	50	N.D.
Di-Isononyi Phthalate (DINP)	mg/kg	US EPA 8061A , GC/MS	50	N.D.

Test Items	Unit	Test Method	MDL	Regults
Bromine(Br)	mg/kg	EN 14582:2007 , IC	30	N.D.
Chiorine(CI)	mg/kg	EN 14582:2007, IC	30	73
Fluorine(F)	mg/kg	EN 14582:2007 . IC	30	N.D.

Test items	Unit	Test Method	MDL	Results
Tributyitin (TBT)	mg/kg	DIN 38487-13 , GC/MS	0.03	N.D.
Triphenyitin (TPhT)	mg/kg	DIN 38407-13 , GC/MS	0.1	N.D.

Test Items	Unit	Test Method	MDL	Results
4-Aminodiphenyl	mg/kg	EN14362-1, GC/MS	5	N.D.
Benzidine	mg/kg	EN14362-1 , GC/MS	5	N.D.

(1) N.D. - Not detected (+00L).
(2) mg/la = pin (-1) - Not detected (+00L).
(3) MOL. - Method Detection Limit (-1) - Not pin (

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Issued Date: November 13, 2007 Page 3 of 4

 Sample No.
 ; AYL07-24811.001

 Sample Description
 : 5135E Black link

 Item No./Part No.
 : 5138E

Test items	Unit	Test Method	MDL	Results
4-Chioro-o-Toluidine	mg/kg	EN14362-1, GC/MS	5	N.D.
2-Naphtylamine	mg/kg	EN14362-1, GC/MS	5	N.D.
o-Aminoazotoluene	mg/kg	EN14362-1, GC/MS	5	N.D.
2-Amino-4-Nitrotoluene	mg/kg	EN14362-1, GC/MS	5	N.D.
p-Chioroaniline	mg/kg	EN14362-1, GC/MS	5	N.D.
2,4-Diaminoaniscle	mg/kg	EN14362-1 , GC/MS	5	N.D.
4,4'-diaminodiphenylmethane	mg/kg	EN14362-1 , GC/MS	5	N.D.
3,3'-Dichlorobenzidine	mg/kg	EN14362-1, GC/MS	5	N.D.
3,3-Dimethoxybenzidine	mg/kg	EN14362-1, GC/MS	5	N.D.
3,3-Dimethylbenzidine	mg/kg	EN14362-1, GC/MS	5	N.D.
3,3-Dimethyl-4.4-diaminodiphenyl methane	mg/kg	EN14362-1 , GC/MS	5	N.D.
p-Cresidine	mg/kg	EN14362-1, GCMS	5	N.D.
4,4'-Methylen-bis-(2-chiproanline)	mgrkg	EN14362-1, GC/MS	5	N.D.
4,4'-Oxydianiline	mg/kg	EN14362-1, GC/MS	5	N.D.
4,4'-Thioaniline	mg/kg	EN14362-1, GC/MS	5	N.D.
o-Toluldine	mg/kg	EN14362-1, GC/MS	5	N.D.
2,4-Toluenediamine	mg/kg	EN14362-1, GC/MS	5	N.D.
2,4,5-Trimethylaniline	mg/kg	EN14362-1, GCMS	5	N.D.
p-Phenylazoaniline	mg/kg	EN14362-1, GC/MS	5	N.D.
o-Anisidine	mg/kg	EN14362-1 , GC/MS	5	N.D.
2,4-Xylidine	mg/kg	EN14362-1 , GC/MS	5	N.D.
2.6-Xvlidine	mg/kg	EN14362-1 . GC/MS	5	N.D.

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Test Report No. F690501/LF-CTSAYL07-24811

Issued Date: November 13, 2007 Page 4 of 4

NOTE: (1) N.D. = Not detected (~MDL) 2 mg/kg = ppm
(3) M.D. + Method Detection Limit
(4) = No regulation manysis (No Limit)
(5) ** O Coultable entangles (No Limit)
(6) ** O Coultable entangles (No Limit)
(7) Sb203 : calculated from Sb by the equation = (121.760 X 2 + 15.6004 X 3) X Sb = 1.197 X Sb

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NOTE: (1) N.D. = Not detected (-4/0CL)
(2) mylig = prom
(3) M/C_ = Method Detection Limit
(4) = = No regulation
(5) = C_ authorize enables (No Unit)
(6) Regulative = Lindercable / Positive = Detectable
(7) 000023 - colonizer from 50 price equation = (121.760 X.2 + 15.9994 X.3) X.Sb = 1.197 X.Sb
(7) 000023 - colonizer from 50 price equation = (121.760 X.2 + 15.9994 X.3) X.Sb = 1.197 X.Sb

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