

Lct

SPECIFICATION FOR APPROVAL

承認書

客 戶 承 認 印 章	龍呈國際科技有限公司		
	業 務	工 程	品 管

客 戶 智邦科技股份有限公司

CUSTOMER _____

品 名 2.4G 2Dbi WI-FI Emb. Ant 137B IpeX L160mm

SPECIES _____

料 號 FWP_16937B-I32

PART NO. _____

客 戶 料 號 120300014400E

CUSTOMER PART NO. _____

龍呈國際科技有限公司

Long Cheng Tech. Int'l Co., Ltd.

新竹縣竹北市中和街 62 巷 15 弄 3 號 3 樓

3Floor, No.3, Alley 15, Lane 62, Chung Ho St.,

Chu-Pei City, Hsin Chu, Taiwan, R.O.C

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Lct**龍呈國際科技有限公司****Long Cheng Tech. Int'l Co., Ltd.**

新竹縣竹北市中和街 62 巷 15 弄 3 號 3 樓

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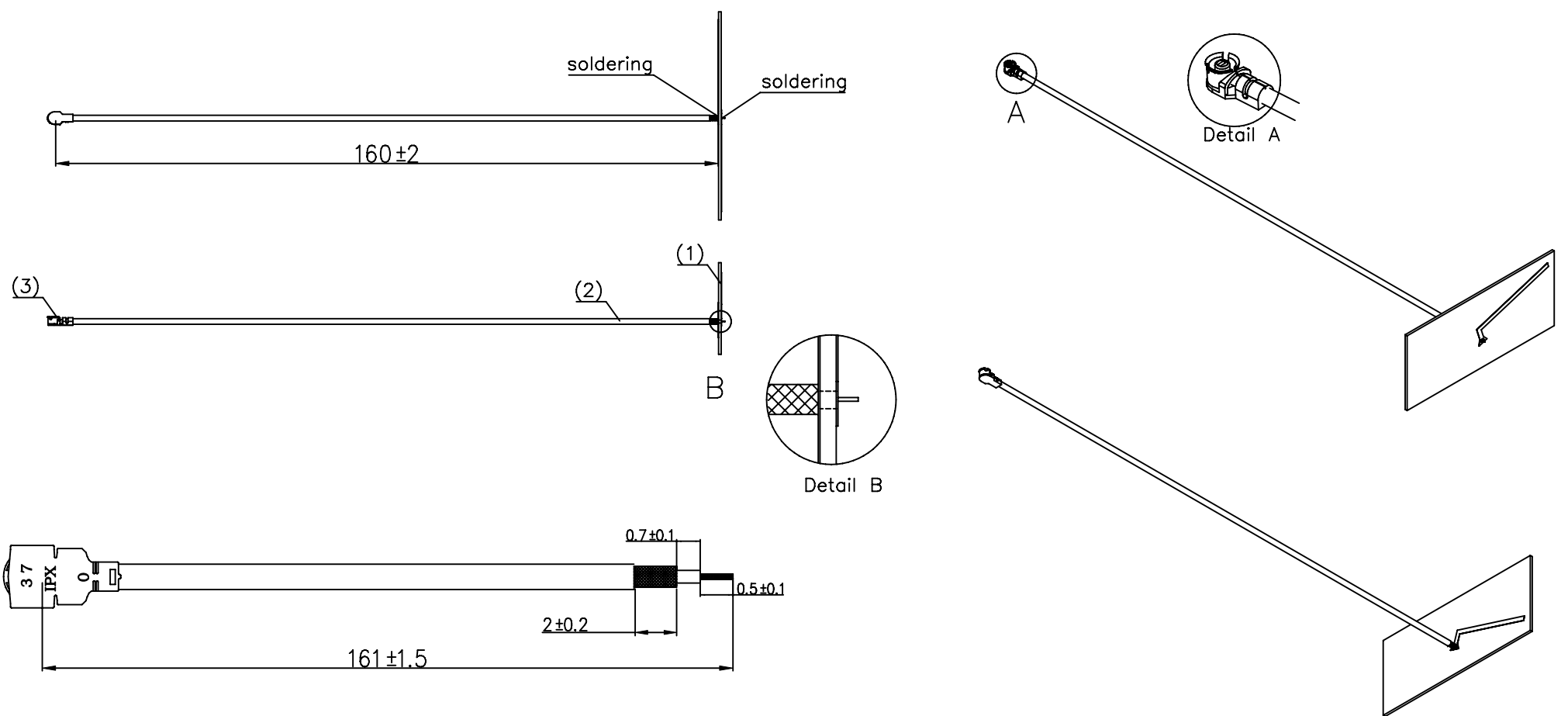
TEL:+886-3-5541117 FAX:+886-3-5541065

Chu-Pei City, Hsin Chu, Taiwan, R.O.C

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6		5		4		3		2		1					
LTR	Zone	REVISION RECORD / Description		DWN	CHK	DATE	LTR	Zone	REVISION RECORD / Description		DWN	CHK	DATE	DRAWING NUMBER	
1		New Release				Apr/13/06"								FWP_16937B-132	
2															



9				
8				
7				
6				
5				
4				
3	COAXIAL CABLE ϕ 1.37 Black	1		M02-137GBR-BL
2	I-PEX PLUG (20351-111R-37)	1	Brass Gold plated	M01-MHF137-00
1	PCB FR4 50x22 T=0.65mm for WI-PI PHONE	1		M03-WIFIPH-00
NO	DESCRIPTION	Q'ty	MATERIAL	Part Number

Lc **LONG CHENG ELECTRONICS CO. LTD**
 龍呈國際科技有限公司

DESCRIPTION:
 2.4G 2DBI WI-FI PHONE PCB Ant. 137(B)IPEX L160mm (120300014400E)

DIMENSION:		PART NUMBER		REV
1 PLC	± 0.5	FWP_16937B-132		1
2 PLC	± 0.3	SIZE	SCALE	SHEET
3 PLC	± 0.2	A4	1/1	1 OF 1
ANGLES	$\pm 5^\circ$			

UNIT	APVD
mm	
MATERIAL	CHK
SEE NOTE	
FINISH	DWN
SEE NOTE	MIAO

電氣特性規格

Electrical Specifications

頻率範圍 (Frequency Range)	2400MHZ - 2500MHZ
增益 (Gain)	2Dbi(typical)
電壓駐波比 (VSWR) Return Loss Isolation Test	Return Loss \leq -10 VSWR \leq 2
極化 (Polarzation)	Linear
半功率水平波束寬 (HPBW/Horizontal)	120°
半功率垂直波束寬 (HPBW/Vertical)	60°(typical)
最大功率 (Max. Power Rating)	2 W (CW)
阻抗匹配 (Impedance)	50 Ohms (typical)

機械特性規格

Mechanical Specifications

接頭種類 (Connector Type)	M.H.F(20351-111R-37)
塑膠顏色 (Plastic Color)	N/A
同軸線材 (Coaxial Cable Type)	1.37
同軸線材規格 (Coaxial Cable Spec.)	See attached file
天線罩材質 (Radom Material)	N/A
同軸線材顏色 (Coaxial Cable Color)	Black
輻射材料 (Radiator Material)	PCB
工作溫度與溼度 (Working Temperature & Humidity)	-40°C - +80°C 90% @ 25°C
儲存溫度與溼度 (Storage Temperature & Humidity)	-40°C - +85°C 95% @ 25°C
重量 (Weight)	2.5g (Max.)

電氣特性測試

Electrical Specifications Test

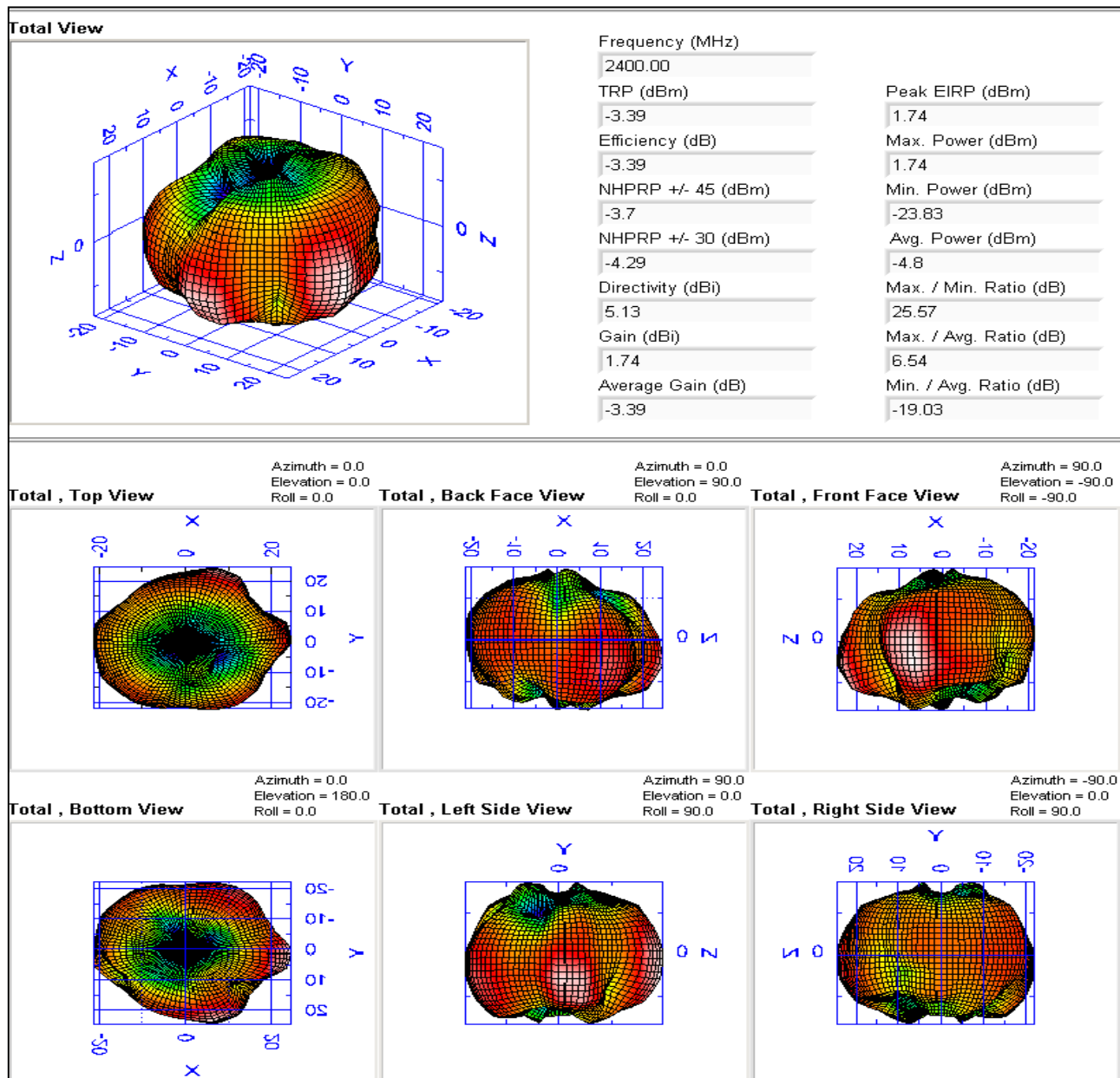
電壓駐波比測試
(VSWR Test)

測試使用儀器
(Test Instrument)

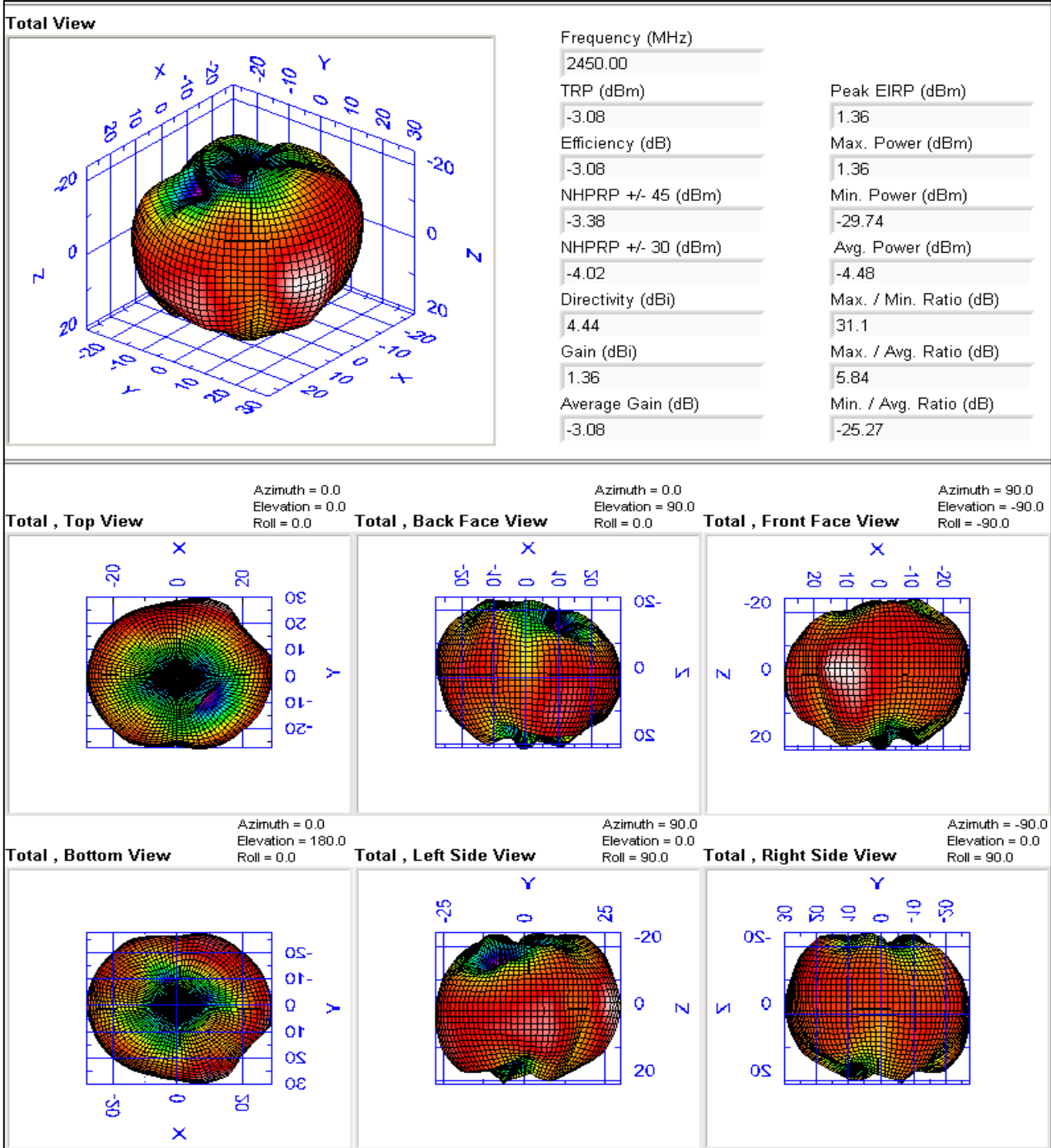
Advantest R3767CG Vector Network Measurement

測試資料
(Test Result)

2.4 GHz 3D-radiation pattern

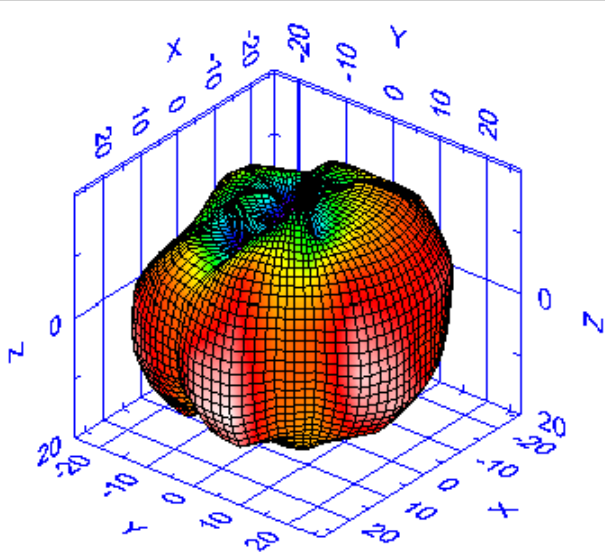


2.45 GHz 3D-radiation pattern



2.5 GHz 3D-radiation pattern

Total View



Frequency (MHz)

2500.00

TRP (dBm)

-2.92

Efficiency (dB)

-2.92

NHPRP +/- 45 (dBm)

-3.17

NHPRP +/- 30 (dBm)

-3.76

Directivity (dBi)

4.57

Gain (dBi)

1.65

Average Gain (dB)

-2.92

Peak EIRP (dBm)

1.65

Max. Power (dBm)

1.65

Min. Power (dBm)

-27.2

Avg. Power (dBm)

-4.38

Max. / Min. Ratio (dB)

28.85

Max. / Avg. Ratio (dB)

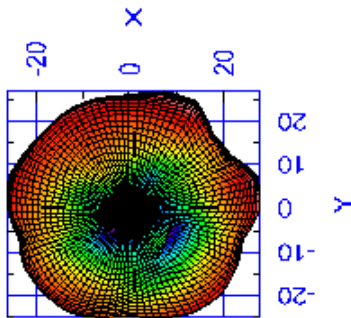
6.03

Min. / Avg. Ratio (dB)

-22.82

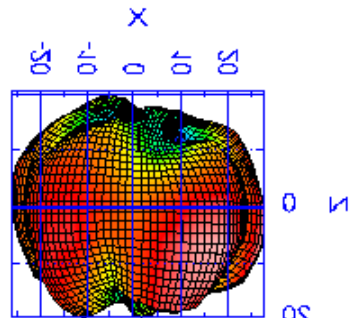
Total , Top View

Azimuth = 0.0
Elevation = 0.0
Roll = 0.0



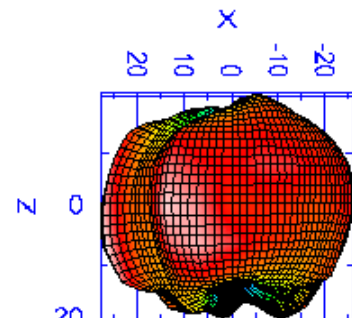
Total , Back Face View

Azimuth = 0.0
Elevation = 90.0
Roll = 0.0



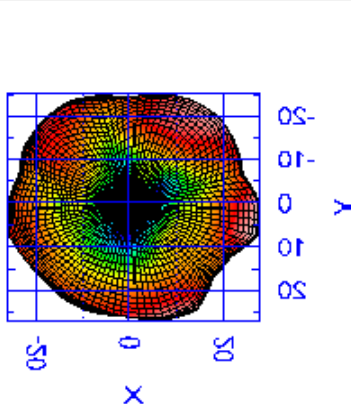
Total , Front Face View

Azimuth = 90.0
Elevation = -90.0
Roll = -90.0



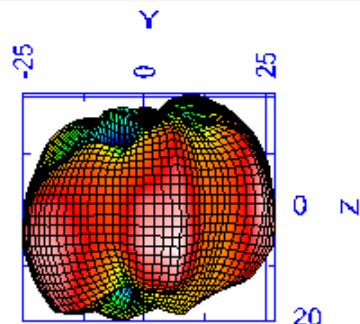
Total , Bottom View

Azimuth = 0.0
Elevation = 180.0
Roll = 0.0



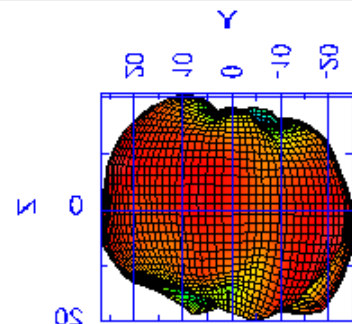
Total , Left Side View

Azimuth = 90.0
Elevation = 0.0
Roll = 90.0



Total , Right Side View

Azimuth = -90.0
Elevation = 0.0
Roll = 90.0

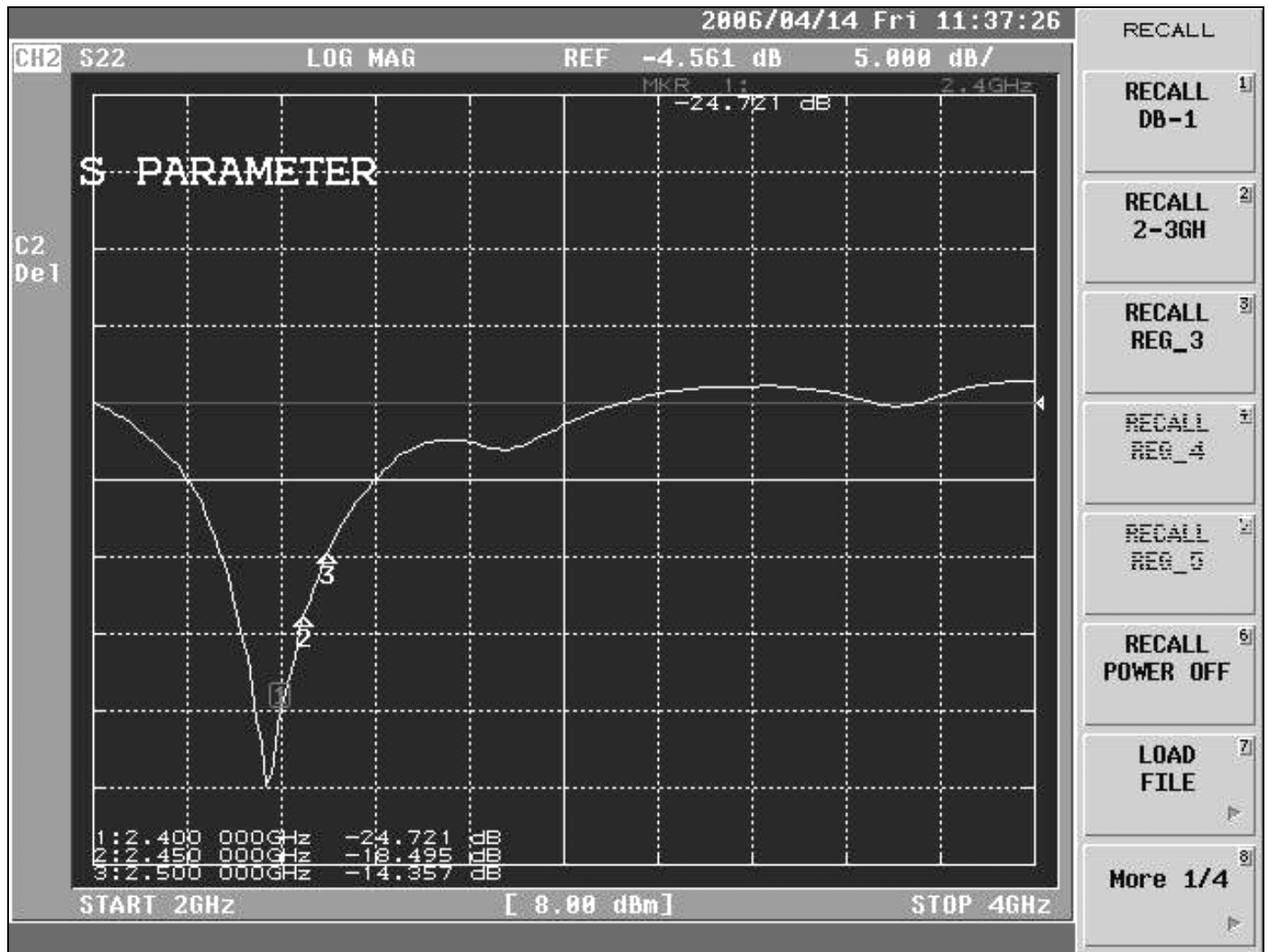


Test Report

Date :	2006/4/14	Tester:	Miao
Model / P/N :	FWP_16937B-I32	Description	2.4G 2Dbi WI-FI Emb. Ant 137B Ipex L160mm

Return Loss / Smith chart Test

Without Antenna (Plastics) cover (Freq. range: 2.4GHz~2.5GHz)



BILL OF MATERIAL

LEVEL	ITEM	GB P/N	SPECIFICATION	VENDER	QT'Y	MEMO
1	10	CW30039G054G	UUL 1354 80 30V COAXIAL CABLE 1.CONDUCTOR:30AWGx1C,SILVER PLATED COPPER WIRE. 2.INSULATION:FEP, OD=0.92±0.02mm, SELF-COLOR. 3.SHIELD:BRAID (16/5/0.05)TINNED PLATED COPPER WIRE,COVERAGE 90% MIN. 4.JACKET:FEP,OD=1.37±0.05mm,COLOR:BLACK GB COLOR:000 NO MARKING.	V-CN080	1mm	
1	20	W095095000AP	CARDBOARD.	V-CN080	0.000006pce	
1	30	Z100100100C00P	CARTON.	V-CN080	0.000001pce	

ELECTRICAL CHARACTERISTICS

ITEM	SPECIFICATION	MEMO																										
1	OPERATION TEMPERATURE:80																											
2	ELECTRICAL PROPERTIES: 2-1.INSULATION RESISTANCE:DC/250V 1000Mohm.m MIN.. 2-2.VOLTAGE RATING:30V. 2-3.WITHSTAND VOLTAGE:AC/500V RMS FOR ONE MINUTE. 2-4.CONDUCTOR RESISTANCE:LESS THAN 520ohm/KM(at 20) 2-5.CAPACITANCE:97pF/M(NOMINAL) 2-6.IMPEDANCE:50 ohm NOM @ TDR. 2-7: <table border="1" style="margin-left: 40px;"> <thead> <tr> <th colspan="2">NOM. ATTENUATION(dB/M)</th> </tr> </thead> <tbody> <tr><td>0.1GHz</td><td>0.5</td></tr> <tr><td>0.4GHz</td><td>1.0</td></tr> <tr><td>0.8GHz</td><td>1.5</td></tr> <tr><td>1.0GHz</td><td>1.6</td></tr> <tr><td>1.5GHz</td><td>2.0</td></tr> <tr><td>1.9GHz</td><td>2.3</td></tr> <tr><td>2.4GHz</td><td>2.6</td></tr> <tr><td>2.45GHz</td><td>2.7</td></tr> <tr><td>3.0GHz</td><td>2.9</td></tr> <tr><td>5.2GHz</td><td>4.0</td></tr> <tr><td>5.8GHz</td><td>4.3</td></tr> <tr><td>6.0GHz</td><td>4.3</td></tr> </tbody> </table>	NOM. ATTENUATION(dB/M)		0.1GHz	0.5	0.4GHz	1.0	0.8GHz	1.5	1.0GHz	1.6	1.5GHz	2.0	1.9GHz	2.3	2.4GHz	2.6	2.45GHz	2.7	3.0GHz	2.9	5.2GHz	4.0	5.8GHz	4.3	6.0GHz	4.3	
NOM. ATTENUATION(dB/M)																												
0.1GHz	0.5																											
0.4GHz	1.0																											
0.8GHz	1.5																											
1.0GHz	1.6																											
1.5GHz	2.0																											
1.9GHz	2.3																											
2.4GHz	2.6																											
2.45GHz	2.7																											
3.0GHz	2.9																											
5.2GHz	4.0																											
5.8GHz	4.3																											
6.0GHz	4.3																											

MECHANICAL CHARACTERISTICS

ITEM	SPECIFICATION	MEMO

NOTE

ITEM	SPECIFICATION	MEMO

DRAWN	DRAGON	GOLDEN BRIDGE ELECTECH INC.	DRAWING NO.	AS53-04080005-6	
ENGINEER	DUNNE		REVISION		
CHECKED	WINCO		UNIT	NONE	
APPROVED	JEFF		SCALE	NONE	
SAMPLE NO.	AS53-04080005-6	ORG:	UTE	PAGE NO.	2 OF 2
CUSTOMER:	啟碁科技	SPEC:	ROUND CABLE	DATE	2004.08.16
P/N:				FILE:	R:\SP\SP04\AS53-04080005-6A.DOC



.Test Equipments

ID	Product Number	Description
1	Tek 80E04	TDR Module
2	Tek TDS8000B	TDR Mainframe
3	8753D	Network Analyzer

.Device Under Test(DUT) Information

Report Title:	11977
DUT Length:	1 Meters
Engineer:	Illumine
QTY:	6 PCS
Tested Pairs:	1 Pair
Humidity:	65%
Bundle Number:	
Temperature:	22

.Specification

Impedance: 50 ohm NOM

Attenuation:	0.1GHz	0.5dB
	0.4GHz	1dB
	0.8GHz	1.5dB
	1GHz	1.6dB
	1.5GHz	2dB
	1.9GHz	2.3dB
	2.4GHz	2.6dB
	2.45GHz	2.7dB
	3GHz	2.9dB
	5.2GHz	4.0dB
	5.8GHz	4.3dB
	6GHz	4.3dB



Test Report

LONG CHENG TECH. INTL. CO., LTD.
3F, NO. 3, ALLEY 15, LANE 62, CHUNG HO ST.,
JUBEI CITY, HSINCHU HSIEN, TAIWAN, R.O.C.

Report No : CE/2004/51314
Date : 2004/05/21
Page : 1 of 6

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

Type of Product : COAXIAL CABLE
Style/Item No : COAXIAL CABLE
Sample Received : 2004/05/13.
Testing Date : 2004/05/13 TO 2004/05/21

Test Result : - Please see the next page -


Daniel Yen, M.R. / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.

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TW 0761646

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f (886-2) 2299-3237

Member of SGS Group(Société Générale de Surveillance)



Test Report

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Test Result

PART NAME NO.1 : GRAY PLASTIC (JACKET)

Test Item(s):	Unit	Method	MDL	Result				
				NO.1				
Asbestos		With reference to Health Canada, Proudct safety Bureau Reference-Manual method.						
Anthrophyllite	**	As per NIOSH 9000 method. Analysis was performed by XRD.	-	Negative				
Crocodolite	**	As per NIOSH 9000 method. Analysis was performed by XRD.	-	Negative				
Amosite	**	As per NIOSH 9000 method. Analysis was performed by XRD.	-	Negative				
Tremolite	**	As per NIOSH 9000 method. Analysis was performed by XRD.	-	Negative				
Chrysotile	**	As per NIOSH 9000 method. Analysis was performed by XRD.	-	Negative				
Actinolite	**	As per NIOSH 9000 method. Analysis was performed by XRD.	-	Negative				

Test Item(s):	Unit	Method	MDL	Result				
				NO.1				
AZO		As per LMBG 8202-2						
4-AMINODIPHENYL (CAS NO.92-67-1)	ppm	Analysis was performed by GC/MS.	3	N.D.				
BENZIDINE (CAS NO.92-87-5)	ppm	Analysis was performed by GC/MS.	3	N.D.				

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Test Report

LONG CHENG TECH. INTL. CO., LTD.
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 JUBEI CITY, HSINCHU HSIEN, TAIWAN, R.O.C.

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Test Item(s):	Unit	Method	MDL	Result			
				NO.1			
4-CHLORO-O-TOLUIDINE (CAS NO.95-69-2)	ppm	Analysis was performed by GC/MS.	3	N.D.			
2-NAPHTHYLAMINE (CAS NO.91-59-8)	ppm	Analysis was performed by GC/MS.	3	N.D.			
O-AMINOAZOTOLUENE (CAS NO.97-56-3)	ppm	Analysis was performed by GC/MS.	3	N.D.			
2-AMINO-4-NITROTOLUENE (CAS NO.99-55-8)	ppm	Analysis was performed by GC/MS.	3	N.D.			
P-CHLOROANILINE (CAS NO.106-47-8)	ppm	Analysis was performed by GC/MS.	3	N.D.			
2,4-DIAMINOANISOLE (CAS NO.615-05-4)	ppm	Analysis was performed by GC/MS.	3	N.D.			
4,4-DIAMINODIPHENYLMETHANE (CAS NO.101-77-9)	ppm	Analysis was performed by GC/MS.	3	N.D.			
3,3-DICHLOROBENZIDINE (CAS NO.91-94-1)	ppm	Analysis was performed by GC/MS.	3	N.D.			
3,3-DIMETHOXYBENZIDINE (CAS NO.119-90-4)	ppm	Analysis was performed by GC/MS.	3	N.D.			
3,3-DIMETHYLBENZIDINE (CAS NO.119-93-7)	ppm	Analysis was performed by GC/MS.	3	N.D.			
3,3-DIMETHYL-4,4-DIAMINODIPHENYLMETHANE (CAS NO.838-88-0)	ppm	Analysis was performed by GC/MS.	3	N.D.			
P-CRESIDINE(2-METHOXY-5-METHYLANILINE) (CAS NO.120-71-8)	ppm	Analysis was performed by GC/MS.	3	N.D.			
4,4-METHYLENE-BIS-(2-CHLORANILINE) (CAS NO.101-14-4)	ppm	Analysis was performed by GC/MS.	3	N.D.			
4,4-OXYDIANILINE (CAS NO.101-80-4)	ppm	Analysis was performed by GC/MS.	3	N.D.			
4,4-THIODIANILINE (CAS NO.139-65-1)	ppm	Analysis was performed by GC/MS.	3	N.D.			
O-TOLUIDINE (CAS NO.95-53-4)	ppm	Analysis was performed by GC/MS.	3	N.D.			

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Test Report

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 JUBEI CITY, HSINCHU HSIEN, TAIWAN, R.O.C.

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Test Item(s):	Unit	Method	MDL	Result				
				NO.1				
2,4-TOLUYLENDIAMINE (CAS NO.95-80-7)	ppm	Analysis was performed by GC/MS.	3	N.D.				
2,4,5-TRIMETHYLANILINE (CAS NO.137-17-7)	ppm	Analysis was performed by GC/MS.	3	N.D.				
O-ANISIDINE (CAS NO.90- 04-0)	ppm	Analysis was performed by GC/MS.	3	N.D.				
P-AMINOAZOBENZENE (CAS NO.60-09-3)	ppm	Analysis was performed by GC/MS.	3	N.D.				

Test Item(s):	Unit	Method	MDL	Result				
				NO.1				
Chlorinated Paraffin (C10~C13) (CAS NO:010871- 26-2)	%	Analysis was performed by GC/MS.	0.01	N.D.				

Test Item(s):	Unit	Method	MDL	Result				
				NO.1				
Mirex(CAS NO:002385-85-5)	ppm	Analysis was performed by GC/MS.	4	N.D.				

Test Item(s):	Unit	Method	MDL	Result				
				NO.1				
Organic-tin compounds								
Triphenyl Tin(TPT)(CAS NO:000668-34-8)	ppm	With reference to 83/677/EEC & DIN 38407. Analysis was performed by GC/FPD.	0.001	N.D.				
Tributyl Tin(TBT)	ppm	With reference to 83/677/EEC & DIN 38407. Analysis was performed by GC/FPD.	0.001	N.D.				

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Test Item(s):	Unit	Method	MDL	Result				
				NO.1				
PCBs(Polychlorinated Biphenyls)(CAS NO:001336-36-3)	ppm	With reference to US EPA 8082,89/677/EEC. Analysis was performed by GC/ECD/MS.	0.5	N.D.				

Test Item(s):	Unit	Method	MDL	Result				
				NO.1				
PBBs(Polybrominated biphenyls)(CAS NO:67774-32-7)	%	With reference to 83/264/EEC. Analysis was performed by GC/MS/ECD or HPLC/DAD/MS.	0.0005	N.D.				
PBBEs(PBDEs)(Polybrominated biphenyl ethers)	%	With reference to 83/264/EEC. Analysis was performed by GC/MS/ECD or HPLC/DAD/MS.	0.0005	N.D.				

Test Item(s):	Unit	Method	MDL	Result				
				NO.1				
Polychlorinated Naphthalene	ppm	Analysis was performed by GC/MS.	5	N.D.				

Test Item(s):	Unit	Method	MDL	Result				
				NO.1				
PVC free(CAS No:9002-86-2)	**	Analysis was performed by FTIR/ATR AND Pyro-GC/MS.	-	Negative				

Test Item(s):	Unit	Method	MDL	Result				
				NO.1				
Chromium VI (Cr+6)	ppm	As per US EPA 7196A and US EPA 3060A.	2	N.D.				

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TW 0761650



Test Report

LONG CHENG TECH. INTL. CO., LTD.
 3F, NO. 3, ALLEY 15, LANE 62, CHUNG HO ST.,
 JUBEI CITY, HSINCHU HSIEN, TAIWAN, R.O.C.

Report No : CE/2004/51314
 Date : 2004/05/21
 Page : 6 of 6

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.				
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
 (4) " ---" = Not Applicable
 (5) " -" = Not Regulation
 (6) * = Results shown are of the adjusted analytical results.
 (7) **= Qualitative analysis(No Unit)
 (8) Negative = Undetectable / Positive = Detectable.

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TW 0761651

Web Hong Shegn 0769-5531811

SGS

Test Report

No.: GZSCR040307950/LP

Date: MAR 15, 2004

Page 1 of 1

DONGGUAN DACHEN ELECTRICAL PRODUCTS LTD
HSIN FENG LU DON, HSIN CHENG DISTRICT,
SHEK KIT TOWN, DONGGUAN CITY,
GUANGDONG, PEOPLE REPUBLIC OF CHINA

Report on the submitted sample said to be RF1.37 CONDUCTOR (镀银铜丝)

SGS Ref No. : SZ040302401EC-5.3
Manufacture / Supplier : GBE
Country of Destination : CHINA
Sample Receiving Date : MAR 14, 2004
Testing Period : MAR 15, 2004 TO MAR 15, 2004

Test Requested : As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample.

Test Method : Lead content - In-house method .
Cadmium content - In-house method ..
Mercury content - In-house method .
Hexavalent Chromium content - with reference to EPA 3060A & EPA 7196A .
Analysis was performed by Inductively Coupled Plasma Atomic Emission Spectrometer (ICP-AES) / UV-VIS Spectrophotometer.

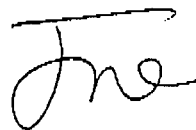
RESULTS

	Silvery metal wire
Lead content (Pb)	N.D.
Cadmium Content (Cd)	N.D.
Mercury Content (Hg)	N.D.
Hexavalent Chromium Content [Cr(VI)]	N.D.

Note : - N.D. = Not Detected (< 2 ppm)
- ppm = mg/kg

*** End of Report ***

Signed for and on behalf of
SGS-CSTC Ltd.



He Xiaoyan, Jane
Tech. Manager

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GZCM 121237

SGS

Test Report

No.: GZSCR040307949/LP

Date: MAR 15, 2004

Page 1 of 1

DONGGUAN DACHEN ELECTRICAL PRODUCTS LTD
HSIN FENG LU DON, HSIN CHENG DISTRICT,
SHEK KIT TOWN, DONGGUAN CITY,
GUANGDONG, PEOPLE REPUBLIC OF CHINA

Report on the submitted sample said to be RF1.13 CONDUCTOR (镀银铜丝)

SGS Ref No. : SZ040302401EC-5.2
Manufacture / Supplier : GBE
Country of Destination : CHINA
Sample Receiving Date : MAR 14, 2004
Testing Period : MAR 15, 2004 TO MAR 15, 2004

Test Requested : As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample.

Test Method : Lead content - In-house method .
Cadmium content - In-house method ..
Mercury content - In-house method .
Hexavalent Chromium content - with reference to EPA 3060A & EPA 7196A .
Analysis was performed by Inductively Coupled Plasma Atomic Emission Spectrometer (ICP-AES) / UV-VIS Spectrophotometer.

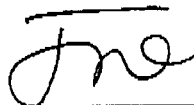
RESULTS

	Silvery metal wire
Lead content (Pb)	N.D.
Cadmium Content (Cd)	N.D.
Mercury Content (Hg)	N.D.
Hexavalent Chromium Content [Cr(VI)]	N.D.

Note : - N.D. = Not Detected (< 2 ppm)
- ppm = mg/kg

*** End of Report ***

Signed for and on behalf of
SGS-CSTC Ltd.



He Xiaoyan, Jane
Tech. Manager

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GZCM 121236

SGS**Test Report**

No.: GZSCR040307948/LP

Date: MAR 15, 2004

Page 1 of 1

DONGGUAN DACHEN ELECTRICAL PRODUCTS LTD
 HSIN FENG LU DON, HSIN CHENG DISTRICT,
 SHEK KIT TOWN, DONGGUAN CITY,
 GUANGDONG, PEOPLE REPUBLIC OF CHINA

Report on the submitted sample said to be RF1.13 & 1.37 BRAID (镀银铜丝)

SGS Ref No. : SZ040302401EC-5.1
 Manufacture / Supplier : GBE
 Country of Destination : CHINA
 Sample Receiving Date : MAR 14, 2004
 Testing Period : MAR 15, 2004 TO MAR 15, 2004

Test Requested : As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample.

Test Method : Lead content - In-house method .
 Cadmium content - In-house method ..
 Mercury content - In-house method .
 Hexavalent Chromium content - with reference to EPA 3060A & EPA 7196A .
 Analysis was performed by inductively Coupled Plasma Atomic Emission Spectrometer (ICP-AES) / UV-VIS Spectrophotometer.

RESULTS

	Silvery metal wire
Lead content (Pb)	N.D.
Cadmium Content (Cd)	N.D.
Mercury Content (Hg)	N.D.
Hexavalent Chromium Content [Cr(VI)]	N.D.

Note : - N.D. = Not Detected (< 2 ppm)
 - ppm = mg/kg

*** End of Report ***

Signed for and on behalf of
 SGS-CSTC Ltd.



He Xiaoyan, Jane
 Tech. Manager

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GZCM 121235



Test Report

GOLDEN BRIDGE ELECTECH INC.
3F., NO.6, LANE 270, SEC.3, PEI SHEN RD., SHEN
KENG, TAIPEI, TAIWAN, R.O.C.

Report No : CE/2004/31925
Date : 2004/03/24
Page : 1 of 1

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

Type of Product : MINI RF CABLE
Style/Item No : COAXIAL CABLE
Sample Received : 2004/03/17.
Testing Date : 2004/03/17 TO 2004/03/24

Test Result

PART NAME NO.1 : BLACK PLASTIC JACKET
PART NAME NO.2 : GRAY PLASTIC JACKET
PART NAME NO.3 : WHITE PLASTIC JACKET
PART NAME NO.4 : TRANSPARENT PLASTIC INSULATION

Test Item(s):	Unit	Method	MDL	Result			
				NO.1	NO.2	NO.3	NO.4
PBBs(Polybrominated biphenyls)(CAS NO:67774-32-7)	%	With reference to 83/264/EEC. Analysis was performed by GC/MS.	0.0005	N.D.	N.D.	N.D.	N.D.
PBDEs(PBDEs)(Polybrominated biphenyl ethers)	%	With reference to 83/264/EEC. Analysis was performed by GC/MS.	0.0005	N.D.	N.D.	N.D.	N.D.

- NOTE: (1) N.D. = Not detected.(<MDL)
(2) ppm = mg/kg
(3) MDL= Method Detection Limit
(4) " ---" = Not Applicable
(5) " -" = Not Regulation
(6) * = Results shown are of the adjusted analytical results.
(7) **= Qualitative analysis(No Unit)
(8) Negative = Undetectable / Positive = Detectable.


Daniel Yen, M.P. / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.

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TW 0680577

SGS Taiwan Ltd.
台灣檢驗科技股份有限公司

No. 138-1 Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan. / 台北縣五股工業區五工路138-1號
t (886-2) 2299-3939 f (886-2) 2299-3237 www.sgs.com.tw

Member of SGS Group(Société Générale de Surveillance)

TOTAL P.01



Test Report

No.: GZSCR040931790/LP

Date: SEP 09, 2004

Page 1 of 1

DONGGUAN DACHEN ELECTRICAL PRODUCTS LTD.
HSIN FENG LU DON, HSIN CHENG DISTRICT,
SHEK KIT TOWN, DONG GUAN CITY, GUANG DONG

Report on the submitted sample said to be RF CABLE 镀锡编织铜丝 (镀锡铜)

SGS Ref No. : SZ040910232EC
Country of Origin : CHINA
Sample Receiving Date : SEP 03, 2004
Testing Period : SEP 03, 2004 TO SEP 08, 2004

Test Requested : As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample.

Test Method : Lead content – In-house method, with reference to EPA method 3050B: 1996 .
Cadmium content – In-house method, with reference to BS EN1122: 2001 method B .
Mercury content – In-house method, with reference to EPA 3052: 1996.
Hexavalent Chromium content – with reference to EPA 3060A: 1996 & EPA 7196A: 1992 .
Analysis was performed by Inductively Coupled Plasma Atomic Emission Spectrometer (ICP-AES) / UV-VIS Spectrophotometer.

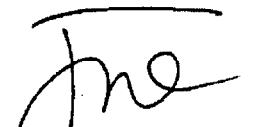
RESULTS

Lead Content (Pb)(ppm)	7
Cadmium Content (Cd)	N.D.
Mercury Content (Hg)	N.D.
Hexavalent Chromium Content [Cr(VI)]	N.D.

Note : - N.D. = Not Detected (< 2 ppm)
- ppm = mg/kg

*** End of Report ***

Signed for and on behalf of
SGS-CSTC Ltd.

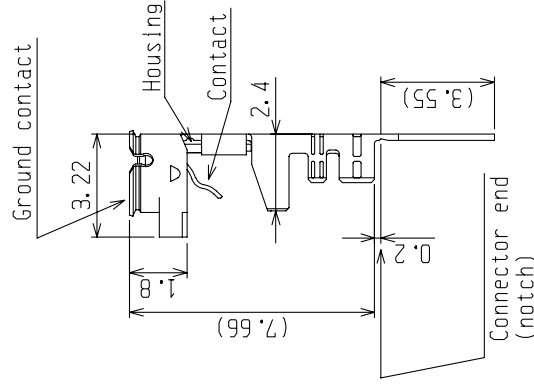
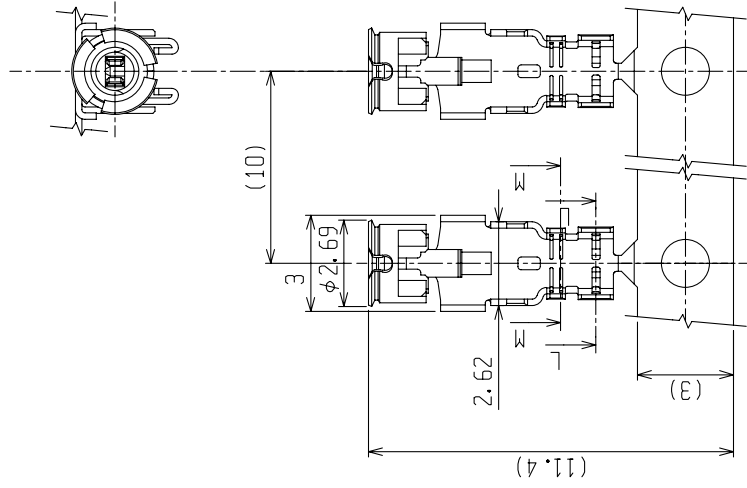


He Xiaoyan, Jane
Tech Manager

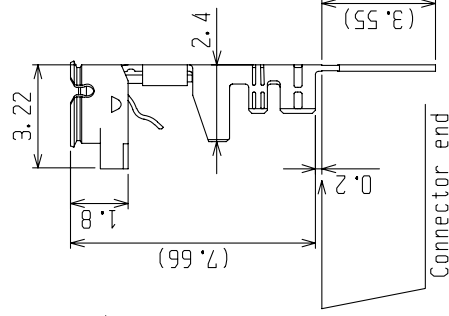
This Test Report is issued by the Company subject to its General Conditions of Service printed overleaf or attached. Said Conditions are also available upon request or are accessible at www.sgs.com. Attention is drawn to the limitations of liability, indemnification and jurisdictional policies defined therein. The results shown in this Test Report refer only to the sample(s) tested unless otherwise stated and such sample(s) are retained for 30 days only. This Test Report shall not be reproduced except in full, without written approval of the Company.

GZCM 150809

PART NO.
20351-1R-37



Part No. 20351-101R-37
For hand tool
(with notch)



Part No. 20351-111R-37
For semi auto
termination machine
(without notch)

GENERAL TOLERANCE	
6 MAX.	±0.2
6 OVER MAX. 30	±0.3
30 OVER MAX. 120	±0.5
ANGLE	±2°

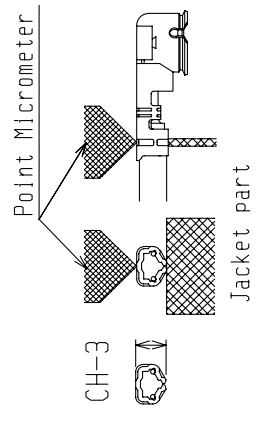
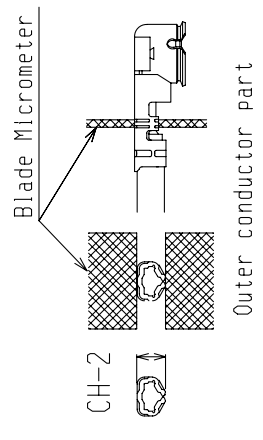
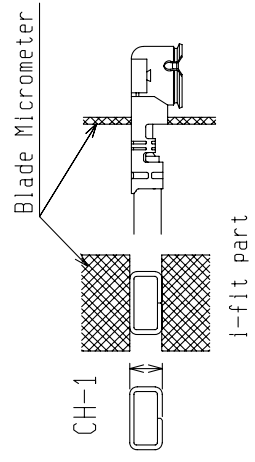
DESIGN D BY		DATE	
3	ZD4D46	K.O	Feb/12/04
2	Z3156	A.H	OCT/28/03
1	Z3124	K.O	SEP/16/03
0	Z3122	T.H	SEP/11/03
REV	ECN	BY	DATE
		APP	SEP/11/03
REV. RECORD		BY	DATE
		APP	SEP/11/03
SERIES No.		2814	
CUSTOMER COPY		K. Katabuchi	
PROJECTION		1st angle	
SCALE		6/1	
UNIT		mm	
DWG. No.		20351	
SHEET		1/3	
REV.		3	

I-PEX

Interconnect
and Packaging Electronics
TOKYO, JAPAN

TITLE
MHF series micro coaxial connector plug
vertical (ground contact : gold plating)

Part No.	20351-101R-37 ----- 20351-111R-37	
Applicable cable nominal dimension		
Jacket	Outer conductor silver or tin Dielectric core Inner conductor silver conductor silver plating	
Braided shield of Outer conductor 外部導体の編組	Single / 1重編組	
P/N of hand Tool	90233-037	
P/N of semi auto termination machine	90232-037	
Sect. M-M	2.65	
Sect. L-L	2.65	
Crimp Height	CH-1	1.34~1.40
	CH-2	1.33~1.38
	CH-3	1.31~1.36



Crimp Height

DESIGN D BY	DATE		Interconnect and Packaging Electronics TOKYO, JAPAN		
CHK'D BY	DATE				
APP'D BY	DATE				
REV ECN	BY	DATE	APP	TITLE	MHF series micro coaxial connector plug vertical (ground contact : gold plating)
REV. RECORD	PROJECTION		SCALE	UNIT	DWG. No.
SERIES No.	2814	—/—	mm	20351	SHEET REV.
CUSTOMER COPY					2/3

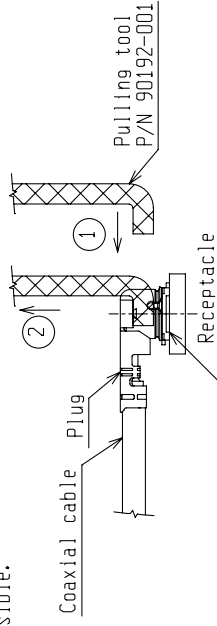
GENERAL TOLERANCE	±0.2
6 OVER MAX.	±0.3
30 OVER MAX.	±0.5
ANGLE	±2°

5-2 コネクタ除去時

5-2 Unmating.

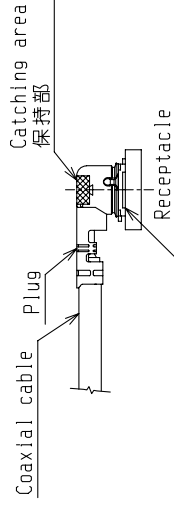
(1) 抜きジグを用いる場合
下図のようにできるだけ
垂直に引き抜いて下さい。

(1) In case of unmating by
pulling tool.
Please use the pulling
tool as the following drawing,
and please pull plug to
vertical direction as directly
as possible.



(2) 手で直接引き抜く場合
下図の保持部をつかみ、できる
だけ垂直に引き抜いて下さい。

(2) In case of unmating directly
by hand
Please catch the catching area
of Plug, and please pull plug
to vertical direction as directly
as possible.



5-3 Crimp over standards of outer conductor 5-3 外部導体はみ出し量

Standards: Less than 10% from
total numbers of outer
conductor
(Numbers of outer conductor's
crimp over from outer
conductor's barrel)

外部導体はみ出し量規定
: 外部導体トータル本数
の10%以下
(外部導体バレルの外に
はみ出し量)

5-4 熱収縮チューブについて
の注意

5-4 Caution about Heat shrinkage tubes
Please be careful not to melt
housing when using heat
shrinkage tubes.
It will become cause of open
circuit.

5-4 熱収縮チューブについて
の注意
熱収縮チューブで外部導体
を覆う場合は、過熱不良の
原因になりますので、熱に
よりハウジングを溶融させな
いよう注意してください。

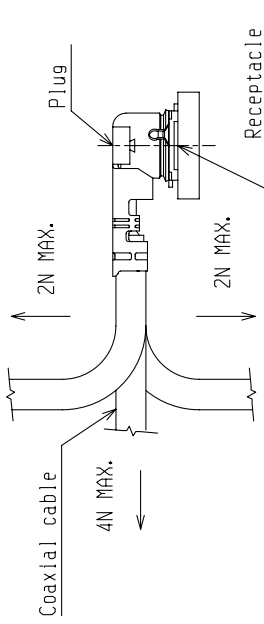
6. Tip of contact should be
recessed of housing after
crimped about mating area.

6. 圧着後、コネクタかみ合部に
おいて、コネクタ先端が
ハウジングより飛び出さない事。

DESIGN D BY		DATE	I-PEX Interconnect and Packaging Electronics TOKYO, JAPAN	
CHK'D BY	DATE	DATE	TITLE MHF series micro coaxial connector plug vertical (ground contact : gold plating)	
APP'D BY	DATE	DATE	UNIT	SHEET
CUSTOMER	PROJECTION	SCALE	UNIT	REV.
COPY	2814	—/—	mm	3/3
SERIES No.	20351	DWG. No.		

Notes

- Material
(1) Housing : PBT, UL94V-0, black
(2) Contact
phosphor bronze
gold plating 0.1 μ m MIN.
over nickel 1.27 μ m MIN.
(3) Ground contact
phosphor bronze
gold plating 0.05 μ m MIN.
over nickel 1.27 μ m MIN.
- Packing : reel
- Mating partner part No.
: 20279-001E-01
- Permissible load of cable at mating

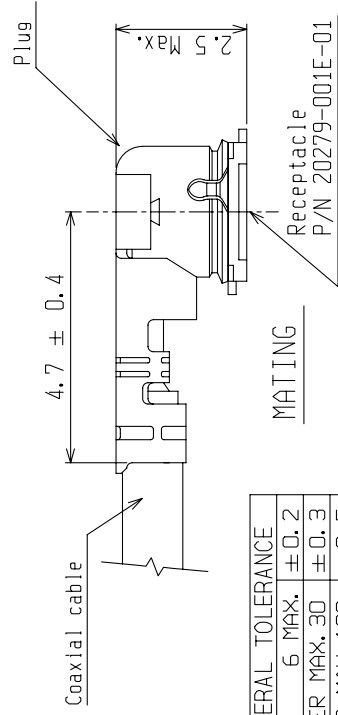


5. Suggestions for mating & unmating operation.

5. コネクタかみ合時および抜き時の注意

5-1 Mating.
Please mate the connector straightly
to vertical direction as much as
possible, adjusting the mating axis
of plug and receptacle.
As excessive slant angle mating may
break the connector, please don't
do it.

5-1 コネクタ挿入時
PlugとReceptacleのかみ合軸を合わせ、
できるだけ垂直に挿入して下さい。
極端な斜め挿入は行わないで下さい。
コネクタ破損の原因となりますので、過度なこじり
挿入は行わないで下さい。



GENERAL TOLERANCE	±0.2
6 OVER MAX.	±0.3
30 OVER MAX.	±0.5
ANGLE	±2°

No.2006-3
Feb/13 /04

材料証明書
MATERIAL CERTIFICATE

当社製品には下記の材料が使われている事を証明致します。
WE HEREBY CERTIFY THAT THE FOLLOWING MATERIALS ARE USED IN OUR PRODUCT.

PRODUCT NAME : MHF series micro coaxial connector PLUG
P/N 20278-**1R-**, 20308-**1R-**, P/N 20351-**1R-37

	部品 COMPONENT	材料/MATERIAL			UL94難燃性 UL94 FLAME CLASS	ULファイルNo. UL FILE No.
		材質名 MATERIAL	型名 CAT No.	材料メーカ MANUFACTURER		
1	HOUSING	PBT	3116	WINTECH POLYMER LTD.	V-0	E 213445

PRODUCT NAME : MHF series micro coaxial connector RECEP.
P/N 20279-001E-01, P/N20314-001E-01

	部品 COMPONENT	材料/MATERIAL			UL94難燃性 UL94 FLAME CLASS	ULファイルNo. UL FILE No.
		材質名 MATERIAL	型名 CAT No.	材料メーカ MANUFACTURER		
1	HOUSING	LCP	E130i	POLYPLASTICS CO.,LTD.	V-0	E 106764

PRODUCT NAME : MHF II connector P/N 20311-**1R-**, P/N 20312-**1R-**

	部品 COMPONENT	材料/MATERIAL			UL94難燃性 UL94 FLAME CLASS	ULファイルNo. UL FILE No.
		材質名 MATERIAL	型名 CAT No.	材料メーカ MANUFACTURER		
1	HOUSING	LCP	A430	POLYPLASTICS CO.,LTD.	V-0	E 106764

株式会社アイペックス
I-PEX Co.,Ltd.

APPROVAL	CHECK	ORIGINATOR
T.Harada Feb/13/'04		K.Ohbayashi Feb/13/'04

FORM REV.0



Test Report

I-PEX JP CO., LTD. TAIWAN BRANCH (JAPAN)
4F-4, NO.2, JIAN BA ROAD, CHUNG HO CITY,
TAIPEI 235, TAIWAN, R.O.C.

Report No : CE/2004/42496
Date : 2004/04/27
Page : 1 of 1

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

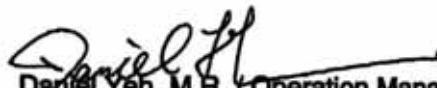
Type of Product : MHF CONNECTOR
Style/Item No : 20278-111R-XX
Sample Received : 2004/04/22.
Testing Date : 2004/04/22 TO 2004/04/27

Test Result

PART NAME NO.1 : MIX GOLDEN COLORED METAL & BLACK PLASTIC

Test Item(s):	Unit	Method	MDL	Result				
				NO.1				
Chromium VI (Cr+6)	ppm	As per US EPA 7196A and US EPA 3060A.	2	N.D.				
Cadmium (Cd)	ppm	ICP-AES After As per EN 1122, Method B:2001 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
(4) " ---" = Not Applicable


Daniel Yeh, M.R. / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.

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Test Report No. JP/2004/120691 Date: January 25, 2005 Page 1 of 2

NIHON SUPERIOR, LTD.
NS BLDG 1-16-15, ESAKA-CHO, SUITA-CITY,
OSAKA 564-0063 JAPAN

Report on the submitted samples said to be "SN100CL".

Client Ref. No. :
Sample Receiving Date : 2004/12/17
Testing Period : 2004/12/22 TO 2005/1/24
Color, Appearance etc. of the sample : Solder Bar

Test Result

Test Item	Unit	Result	Method	Instrument	Detection Limit
Cd	ppm	N.D.	EN 1122B	ICP-AES	2
Hg	ppm	N.D.	EPA 3052	ICP-AES	2
Cr(VI)	ppm	N.D.	EPA 3060A	UV-VIS	2
Pb	ppm	286	EPA 3050B	ICP-AES	2
PBBs					
Bromobiphenyl	ppm	N.D.	—	GC/MS	5
Dibromobiphenyl	ppm	N.D.	—	GC/MS	5
Tribromobiphenyl	ppm	N.D.	—	GC/MS	5
Tetrabromobiphenyl	ppm	N.D.	—	GC/MS	5
Pentabromobiphenyl	ppm	N.D.	—	GC/MS	5
Hexabromobiphenyl	ppm	N.D.	—	GC/MS	5
Heptabromobiphenyl	ppm	N.D.	—	GC/MS	5
Octabromobiphenyl	ppm	N.D.	—	GC/MS	5
Nonabromobiphenyl	ppm	N.D.	—	GC/MS	5
Decabromobiphenyl	ppm	N.D.	—	GC/MS	5

JP 507429

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SGS Hor E&A Ltd. Japan Branch (Incorporated in Switzerland)



Test Report No. JP/2004/120692 Date: January 25, 2005 Page 1 of 2

NIHON SUPERIOR, LTD.
NS BLDG 1-16-15, ESAKA CHO, SUITA-CITY,
OSAKA 564-0063 JAPAN

Report on the submitted samples said to be "SN100CLe".

Client Ref. No. :
Sample Receiving Date : 2004/12/17
Testing Period : 2004/12/22 TO 2005/1/24
Color, Appearance etc. of the sample : Solder Bar

Test Result

Test Item	Unit	Result	Method	Instrument	Detection Limit
Cd	ppm	N.D.	EN 1122B	ICP-AES	2
Hg	ppm	N.D.	EPA 3052	ICP-AES	2
Cr(VI)	ppm	N.D.	EPA 3060A	UV-VIS	2
Pb	ppm	340	EPA 3050B	ICP-AES	2
PBBs					
Bromobiphenyl	ppm	N.D.	—	GC/MS	5
Dibromobiphenyl	ppm	N.D.	—	GC/MS	5
Tribromobiphenyl	ppm	N.D.	—	GC/MS	5
Tetrabromobiphenyl	ppm	N.D.	—	GC/MS	5
Pentabromobiphenyl	ppm	N.D.	—	GC/MS	5
Hexabromobiphenyl	ppm	N.D.	—	GC/MS	5
Heptabromobiphenyl	ppm	N.D.	—	GC/MS	5
Octabromobiphenyl	ppm	N.D.	—	GC/MS	5
Monobromobiphenyl	ppm	N.D.	—	GC/MS	5
Decabromobiphenyl	ppm	N.D.	—	GC/MS	5

JP 501431

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Green Testing Center | t +81(0)45 330 1100 f +81(0)45 330 1105 | www.sgsgroup.co.jp / www.sgs.com

Member of the SGS Group (Entité membre de Swisscom)

Test Item	Unit	Result	Method	Instrument	Detection Limit
PBDEs					
Mono-bromobiphenyl ether	ppm	N.D.	—	GC/MS	5
Di-bromobiphenyl ether	ppm	N.D.	—	GC/MS	5
Tri-bromobiphenyl ether	ppm	N.D.	—	GC/MS	5
Tetra-bromobiphenyl ether	ppm	N.D.	—	GC/MS	5
Penta-bromobiphenyl ether	ppm	N.D.	—	GC/MS	5
Hexa-bromobiphenyl ether	ppm	N.D.	—	GC/MS	5
Hepta-bromobiphenyl ether	ppm	N.D.	—	GC/MS	5
Octa-bromobiphenyl ether	ppm	N.D.	—	GC/MS	5
Nona-bromobiphenyl ether	ppm	N.D.	—	GC/MS	5
Deca-bromobiphenyl ether	ppm	N.D.	—	GC/MS	5

Note: N.D. = not detected

Remark: ICP - Perkin Elmer

*** End of Report ***

Signed for and on behalf of
 SGS Far East Ltd.
 Green Testing Center

後藤 邦之

Kuniyuki Goto
 Laboratory Manager

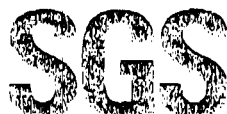
501432

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Member of the SGS Group (Publicly Listed Company)



Test Report


SOLNET METAL INDUSTRY CO., LTD.
9, LANE 83, HWA CHENG RD., HSIN CHUANG, TAIPEI
HSIEN, TAIWAN.

Report No. : CE/2005/53041
Date : 2005/05/24
Page : 1 of 4

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

Type of Product : LEAD-FREE SOLDER
Style/Item No : M705 (Sn 96.5-3Ag-0.5Cu)
Sample Received : 2005/05/17
Testing Date : 2005/05/17 TO 2005/05/24

Test Result : - Please see the next page -


Daniel Yen, M.R. / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.

★ Sample to be returned as requested★

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1907704



Test Report

SOLNET METAL INDUSTRY CO., LTD.
9, LANE 83, HWA CHENG RD., HSIN CHUANG, TAIPEI
HSIEN, TAIWAN.

Report No. : CE/2005/53041
Date : 2005/05/24
Page : 2 of 4

Test Result

PART NAME NO.1 : SILVER COLORED METAL WIRE (PLEASE REFER TO THE PHOTO ATTACHED)

Test Item (s):	Unit	Method	MDL	Result
				No.1
Monobromobiphenyl	%	With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC)	0.0005	N.D.
Dibromobiphenyl	%		0.0005	N.D.
Tribromobiphenyl	%		0.0005	N.D.
Tetrabromobiphenyl	%		0.0005	N.D.
Pentabromobiphenyl	%		0.0005	N.D.
Hexabromobiphenyl	%		0.0005	N.D.
Heptabromobiphenyl	%		0.0005	N.D.
Octabromobiphenyl	%		0.0005	N.D.
Nonabromobiphenyl	%		0.0005	N.D.
Decabromobiphenyl	%		0.0005	N.D.
Total PBBs(Polybrominated biphenyls)/Sum of above	%	-	N.D.	
Monobromobiphenyl ether	%	With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC)	0.0005	N.D.
Dibromobiphenyl ether	%		0.0005	N.D.
Tribromobiphenyl ether	%		0.0005	N.D.
Tetrabromobiphenyl ether	%		0.0005	N.D.
Pentabromobiphenyl ether	%		0.0005	N.D.
Hexabromobiphenyl ether	%		0.0005	N.D.
Heptabromobiphenyl ether	%		0.0005	N.D.
Octabromobiphenyl ether	%		0.0005	N.D.
Nonabromobiphenyl ether	%		0.0005	N.D.
Decabromobiphenyl ether	%		0.0005	N.D.
Total PBBEs(PBDEs)(Polybrominated biphenyl ethers)/Sum of above	%	-	N.D.	

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1908197



Test Report

SOLNET METAL INDUSTRY CO., LTD.
9, LANE 83, HWA CHENG RD., HSIN CHUANG, TAIPEI
HSIEN, TAIWAN.

Report No. : CE/2005/53041
Date : 2005/05/24
Page : 3 of 4

Test Item (s):	Unit	Method	MDL	Result
				No.1
Chromium VI (Cr+6)	ppm	UV-VIS after reference to US EPA 3060A.	2	N.D.
Cadmium (Cd)	ppm	ICP-AES after reference to EN 1122, method B:2001 or other acid digestion.	2	N.D.
Mercury (Hg)	ppm	ICP-AES after reference to US EPA 3052 or other acid digestion.	2	N.D.
Lead (Pb)	ppm	ICP-AES after reference to US EPA 3050B or other acid digestion.	2	299.5

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

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