

TO: 天津台達有限公司

## SPECIFICATION FOR APPROVAL

DESCRIPTION : 2.4Ghz Swivel Antenna

CUSTOMER DWG. NO. /PART NO : \_\_\_\_\_

KINSUN PROD. NO : 6602803081-000

DATE : 2007/6/28

PLEASE RETURN TO US ONE COPY OF “ SPECIFICATION FOR APPROVAL ” WITH YOUR APPROVED SIGNATURES

### APPROVED SIGNATURES

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**慶陞工業股份有限公司**  
**KINSUN INDUSTRIES INC.**

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**MECHANICAL**

Antenna Cover : PU

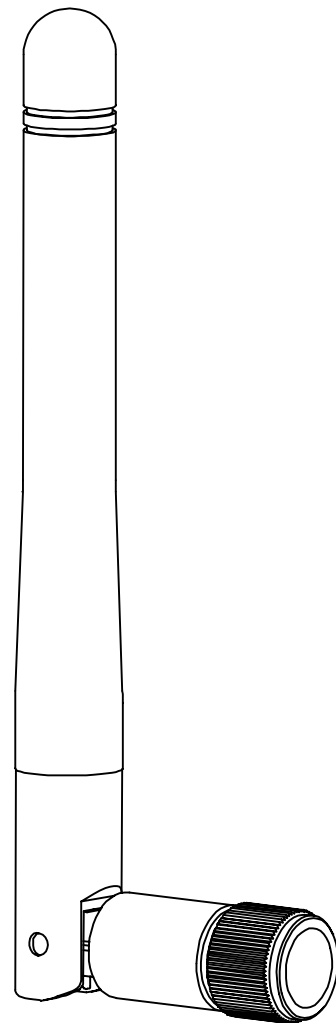
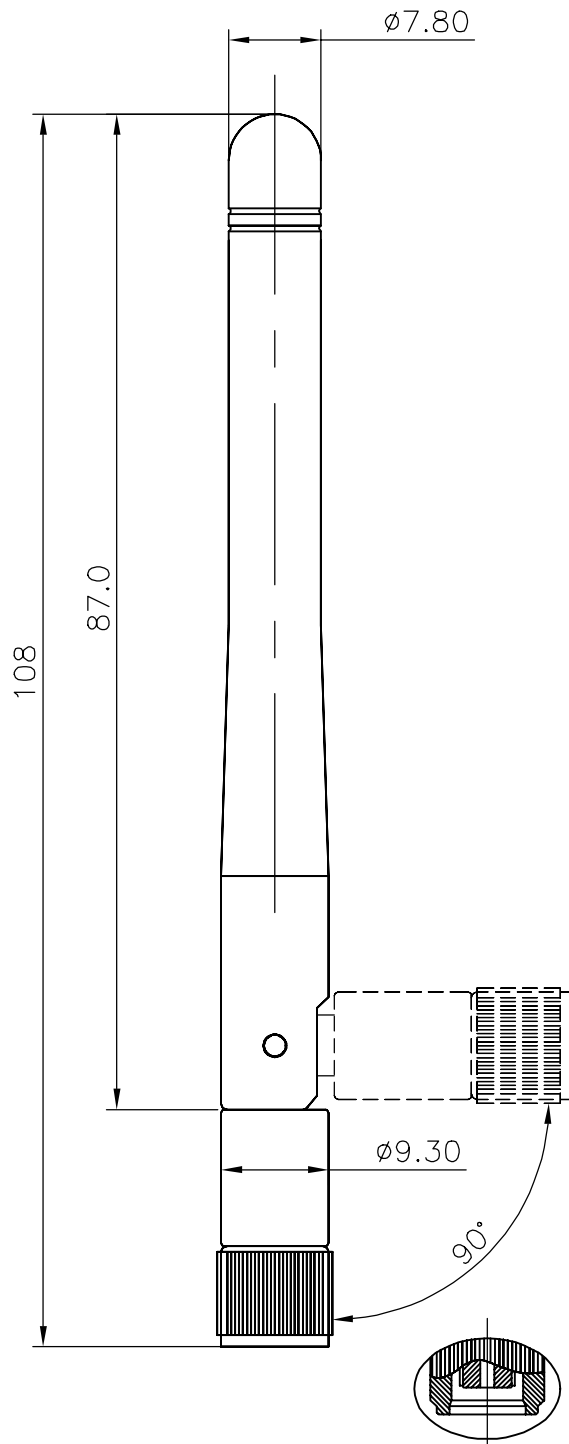
Antenna Base : PC UL 94V-0

Color : Black

**ELECTRICAL**

Frequency : 2.4GHz

Connector : SMA-Male-RP



設計DR.  
Marco  
94/01/03

核准APPD.

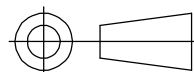
容許公差	TOLERANCE
.XXX	±0.10
.XX	±0.25
.X	±0.38
X	±0.50
ANG	±3°

品名  
ARTICLE 6602-2.4G-SMA

版本說明 REVISION NOTE

圖號  
DWG NO. 6602803081

**KINSUN** 慶陞



單位 UNIT	比例 SCALE	張數 SHEET	版本 REV.
mm	1.5/1	1/1	A

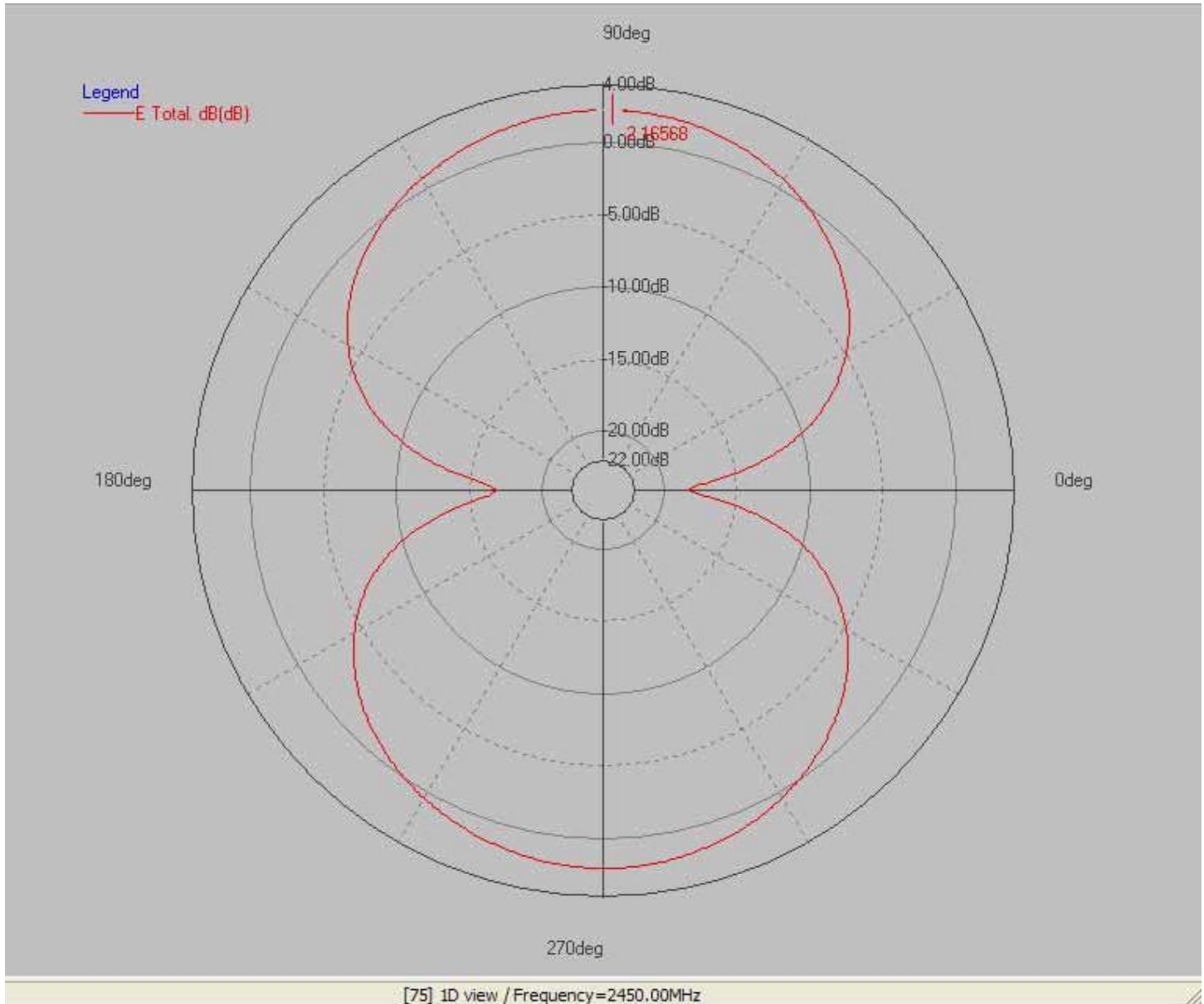
Brand / Model : 6602803081-000

Remark : 2450MHz

Tested by : Nick Dai

Date : 2005/04/29

Time : 下午 02 : 30



-- : Max. deg

\*Unit : dBi

Frequency(MHz) : **2450.00**

Pattern Field : **E plane**

Average Gain(dB) : **-2.06dB**

Maximum Gain(dB) : **2.17dB**

Maximum Gain(degree) : **88.57**

Minimum Gain(dB) : **-18.37dB**

Minimum Gain(degree) : **0.00**

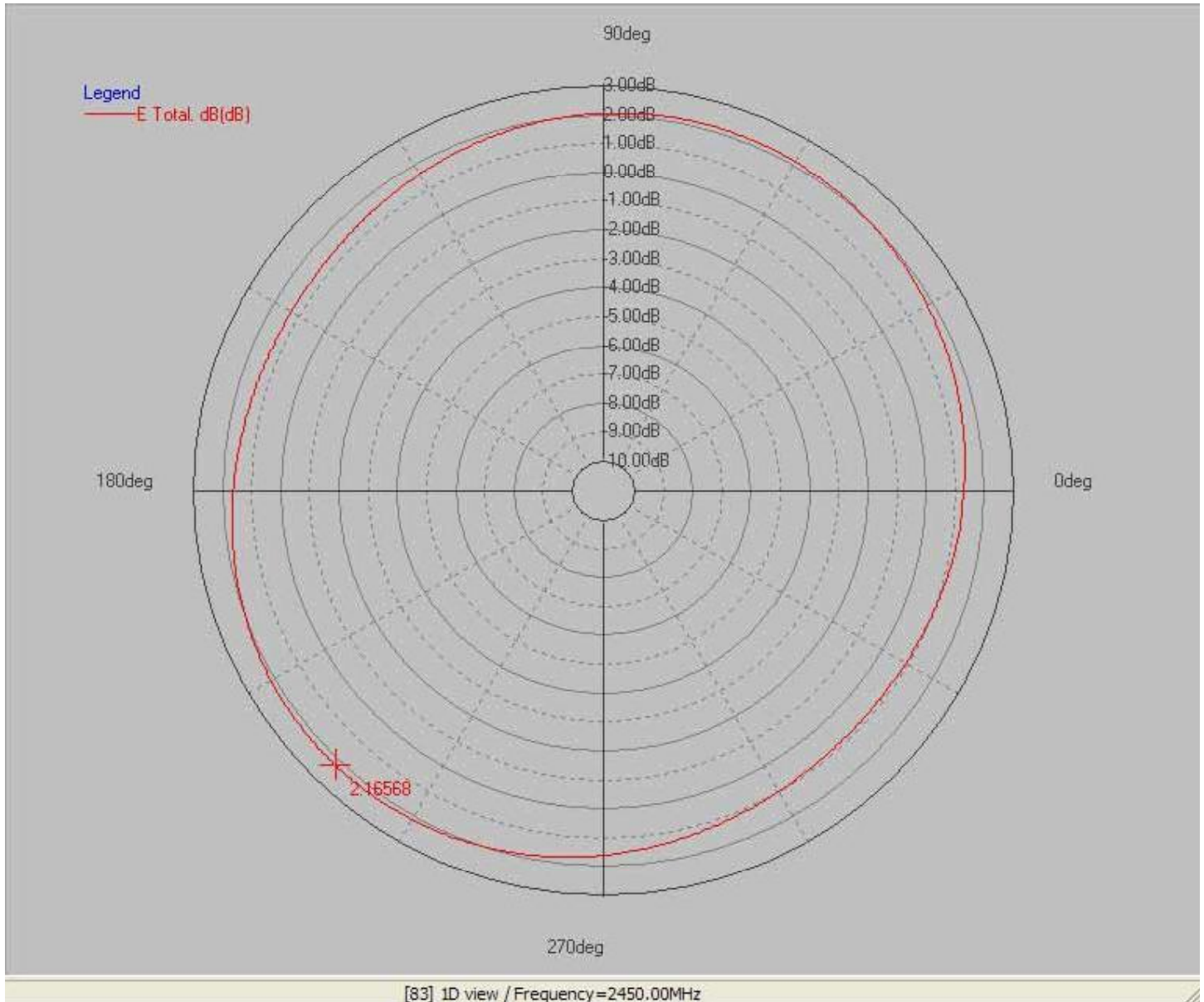
Brand / Model : 6602803081-000

Remark : 2450MHz

Tested by : Nick Dai

Date : 2005/04/29

Time : 下午 02 : 30



-- : Max. deg

\*Unit : dBi

Frequency(MHz) : 2450.00

Pattern Field : H plane

Average Gain(dB) : 1.62dB

Maximum Gain(dB) : 2.17dB

Maximum Gain(degree) : 226.02

Minimum Gain(dB) : 0.85dB

Minimum Gain(degree) : 318.10

6602803081-000

### S11



### VSWR



# TECHNICAL DATA

## Electrical Properties

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**Frequency Range: 2.4~2.5GHz**

**Impedance: 50 Ohm nominal**

**V.S.W.R :  $\leq 2.0$**

**Gain: 3dBi**

**Radiation: Omni**

**Polarization: Vertical**

**Electrical Wave:  $\lambda / 4$  Dipole**

**Connector: SMA MALE REVERSE**

## Mechanical Properties

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**Antenna Cover: PU**

**Color : BLACK**

**Operation Temperature:-20°C ~+60°C**

**Storage Temperature:-30°C ~+75°C**



# SMA Specifications

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## 1. Description:

The Connector is Reverse SMA joint on the Antenna

## 2. Electrical Properties

2-1 Impedance.....	50 Ohms
2-2 Frequency Range.....	0-8 Ghz
2-3 SWR.....	1.1 (Max.)
2-4 Working Voltage.....	≤ 250 Vrms
2-5 Dielectric Withstanding Voltage.....	≤ 750 Vrms
2-6 Insulation Resistance.....	≥ 2000 Megohms
2-7 Contact Resistance.....	Center contact: 3.0 Milliohms (Max.) Outer contact: 2.5 Milliohms (Max.)
2-8 Insertion Loss.....	0.2 dB

## 3. Mechanical Properties :

3-1 Recommended coupling nut torque.....	4.0 in. lbs. ~ 8.8 in. lbs.
3-2 Coupling nut retention force.....	≥ 50 lbs.
3-3 Contact captivation axial.....	≥ 5 lbs.

## 4. Environmental Ratings

4-1 Operating Temperature.....	-65°C ~ +165°C
4-2 Thermal Shock.....	MIL-STD-202, Method 107, Condition B
4-3 Corrosion.....	MIL-STD-202, Method 101, Condition B
4-4 Shock.....	MIL-STD-202, Method 213, Condition I
4-5 Vibration.....	MIL-STD-202, Method 204, Condition D
4-6 Moisture Resistance.....	MIL-STD-202, Method 106

## 5. Material Specifications

5-1 Body.....	Brass Per JIS H3250 C3604 BD, Gold Plated Per MIL-G-45204
5-2 Contact.....	Beryllium Copper Per QQ-C-530, Gold Plated Per MIL-G-45204
5-3 Insulator.....	PTFE Fluorocarbon Per ASTM D 1710



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# SMA Test Report

Name: Ping

Date: 2004/5/3

N- 1	Au- 7.09 $\mu$ "	Ni- 186.2 $\mu$ "
N- 2	Au- 6.95 $\mu$ "	Ni- 131.5 $\mu$ "
N- 3	Au- 7.01 $\mu$ "	Ni- 117.6 $\mu$ "
N- 4	Au- 6.92 $\mu$ "	Ni- 177.8 $\mu$ "
N- 5	Au- 7.50 $\mu$ "	Ni- 209.6 $\mu$ "

## BLOCK RESULT

Product : Au/Ni/Cd

	<u>Au</u>	<u>Ni</u>
Mean Value.....X :	7.10 $\mu$ "	164.4 $\mu$ "
Meas. Time..... :	10 s	
Standard Dev .....S :	0.241 $\mu$ "	38.7 $\mu$ "
C. O. V. [G].....V :	3.39 %	23.51 %
No of Readings..... :	5	5
Range.....R :	0.60 $\mu$ "	92.1 $\mu$ "
Min. Readings..... :	6.90 $\mu$ "	117.4 $\mu$ "
Max. Readings..... :	7.50 $\mu$ "	209.6 $\mu$ "

Check : BEN Test: jaff



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Name : Body

Date : 2001/12/13

N- 1	Au- 7.03 $\mu$ "	Ni- 164.5 $\mu$ "
N- 2	Au- 7.70 $\mu$ "	Ni- 208.8 $\mu$ "
N- 3	Au- 8.04 $\mu$ "	Ni- 210.8 $\mu$ "
N- 4	Au- 7.75 $\mu$ "	Ni- 204.6 $\mu$ "
N- 5	Au- 7.36 $\mu$ "	Ni- 210.4 $\mu$ "

**BLOCK RESULT**

Product : Au/Ni/Cd

	<u>Au</u>	<u>Ni</u>
Mean Value.....X :	7.61 $\mu$ "	199.7 $\mu$ "
Meas. Time..... :	10 s	
Standard Dev.....S :	0.332 $\mu$ "	19.9 $\mu$ "
C. O. V. [G].....V :	4.36 %	9.96 %
No of Readings..... :	5	5
Range.....R :	0.87 $\mu$ "	46.4 $\mu$ "
Min. Readings..... :	7.20 $\mu$ "	164.5 $\mu$ "
Max. Readings..... :	8.02 $\mu$ "	210.9 $\mu$ "

Check :

Test :



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# SMA Test Report

## 鹽水噴霧試驗記錄表

試驗日期：  
試驗號碼：  
試驗時間：08:00 ~ 18:00 共計10小時

### 試驗項目及內容

1 氯化鈉品質.....	工業用一般月鹽
2 蒸餾水品質.....	純水
3 外觀要求程度.....	10 (小時)
4 噴霧採取器：	
4.1 噴霧量.....	15.6 (ml/80cm/h)
4.2 收集溶液在室的比重或濃度.....	1.0321
4.3 酸鹼濃度.....	6.7
5 試樣：	
5.1 種類.....	銅材
5.2 形狀.....	N/A
5.3 尺度.....	N/A
5.4 數目.....	5 pcs
6 壓縮空氣壓力.....	1.00 kg f/cm
7 試驗室相對濕度.....	90 %
8 試驗室溫度.....	35±1 °C
9 壓力桶溫度.....	47±1 °C
10 鹽水桶溫度.....	35±1 °C
11 其它.....	2~3 μ (Ni) ; 1.2 μ (Au)

### 判定

1. 依據標準判定.....符合 RN 8 級↑
2. 依其它方法判定..... N/A



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# SMA Brass

## 檢驗報告表

編號:

客 戶	工業股份有限公司		
品 名	FREE CUTTING BRASS ROD	九 5.0 mm	
規 格	JIS H3250 C3604 BD		
數 據 項 目	標 準 值	實 測 值	備 註
化 學 成 份 %	Cu	57.0 - 61.0	
	Pb	1.8 - 3.7	
	Fe	< 0.5	
	Sn+Fe	< 1.2	
	Zn	REMAINDER	
其 它			



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# SMA Beryllium Copper

## 线

线是种类最多的铜合金产品，没有任何产品在应用上有这么广泛。

圆线之使用包括：

- 长行程螺线弹簧
- 小型机电拍座
- 冷锻钉头紧固件
- 弹簧负载测试探针
- 轻量疲劳测试线
- BANDOLIERS 连接器触点
- 编织屏蔽布
- 密度及防止生物恶臭上线及筛网结构
- 眼镜框

线可直接切成一定长度称为杆 (ROD)。

线之断面也可以不是圆形。“异形”线在特殊的应用中担任了重要的角色。如扁线用于可收缩天线及高压电缆。扁线也可用于代替琴带。虽然有宽度对厚度之比，如果超过此比例不可行，但在许多情形下可达到节约。扁线可减少剪裁毛边。

方线用于电子触点。特别是线的包封需要尖锐的角时，可以达到可举的接触。偶尔，方形及长方形的线，需要斜角以定向。这些需求及其他较不普遍的形状的铜线均可以达到。

本公司所供应之线直径自12.7mm至1.3mm，其公差如表所示。较细的线可向本公司定单或从本公司之许多再拉制商获得。

线可以退火态 (A) 或四分之一硬 (1/4H)、二硬 (1/2H) 或全硬 (E) 供应，但在特殊情况下也供应预硬化 (亦称“预处理”) 线。本产品适用于各种强度与耐久性的产品。可达到柔软而严格的成型要求。

技术规格		
BRUSH 合金	UNS 牌号	线材
25	C17200	ASTM B 197 QQ-C-530 AMS 4725 SAE J 48*, SAE J 483 JIS H3870
M25	C17300	ASTM B 197 QQ-C-590
3	C17510	*
10	C17500	*

ASTM 美国材料试验学会  
 QQ 线材规格  
 SAE 美国汽车工程师学会  
 AMS 美国军用规格 (SAE 规格)  
 JIS 日本工业标准  
 DIN 德国工业规格

注：除表中列示外，下列亦属 ASTM 标准线材。  
 \* 可供应产品，但未列在规格表中

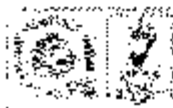
公差 (毫米)			
线直径		BRUSH WELLMAN 标准公差 (+或-)	
以上	以下	冷拉	退火
1.27	— 2	0.008	0.025
2	— 3	0.01	0.05
3	— 6	0.015	0.05
6	— 8	0.02	0.05
8	— 10	0.025	0.05
10	— 12	0.025	0.05

注：非圆线之公差为直径公差之十倍。



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# SMA Beryllium Copper

鍍銅線之機械及電學性質							
合金 Alloy	狀態 (*)	熱處理	線直徑 mm	抗拉強度 kg/mm <sup>2</sup>	屈服強度 kg/mm <sup>2</sup>	伸長百分比	導電百分比 IACS
25 C17200 和 M25 C17300	A (TB00)		1.3-12.7	42-55	11-22	30-60	15-19
	1/4H (TD01)	-	1.3-12.7	63-81	52-74	3-25	15-19
	1/2H (TD02)	-	1.3-12.7	77-95	63-88	2-15	15-19
	3/4H (TD03)	-	1.3-2.0	91-109	80-106	2-8	15-19
	H (TD04)		1.3-2.0	98-117	91-113	1-6	15-19
	AT (TF00)	5hr 315-330°C	1.3-12.7	112-141	101-127	3 以上	22-28
	1/4HT (TH01)	2hr 315-330°C	1.3-12.7	123-146	116-141	2 以上	22-28
	1/2HT (TH02)	1.5hr 315-330°C	1.3-12.7	130-152	119-148	2 以上	22-28
	3/4HT (TH03)	1hr 315-330°C	1.3-2.0	139-162	123-155	2 以上	22-28
	HT (TH04)	1hr 315-330°C	1.3-2.0	137-162	126-155	1 以上	22-28
3 C17510 和 10 C17500	A (TB00)		1.3-12.7	24-59	7-22	20-60	20-30
	H (TD04)		1.3-12.7	45-57	38-53	2-20	20-30
	AT (TF00)	3hr 480-495°C	1.3-12.7	73-92	56-78	10 以上	45-60
	HT (TH04)	3hr 480-495°C	1.3-12.7	77-99	66-88	10 以上	48-60

\*ASTM之號碼及尺寸表示於產品上



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# SMA PTFE

## APPENDIX

LEO ME PTFE rod is manufactured with virgin PTFE powder by ram extrusion or compression molding and is conformed to meet the requirement of ASTM 1710 (Standard Specification for TFE FLUOROCARBON ROD) described in following table and JIS K 6889 ( JAPANESE INDUSTRIAL STANDARD POLYTETRAFLUOROETHYLENE RODS) .

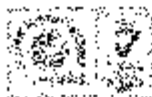
TABLE 1 Detail Specification for PTFE Rod

ITEM	PROPERTY	ASTM TEST METHOD	VALUE
1	Specific gravity	D792	2.15-2.2
2	Tensile strength	D638	280-350 kg/cm <sup>2</sup>
3	Elongation	D638	200-400%
4	Dielectric strength	D149	30kV/mm
5	Deformation under load. 6.9Mpa, 50C, %	D621	3.5 - 6
6	Dissipation factor 1 KHz	D150	Less than 0.0005
7	Dielectric constant 1 KHz	D150	2.0 - 2.1
8	Volume resistivity	D257	> 10 <sup>16</sup>
9	Surface resistivity	D257	10 <sup>17</sup>
10	Flexural modulus	D790	430-500Mpa
11	Compressibility	D1147	16-20%
12	Hardness, durometer	D2240	D53 - D60
13	Impact strength	D256	16kg-cm/cm
14	Coefficient of linear thermal expansion, per C. 30C to 80C, 10 <sup>-5</sup> C	D696	12.3 to 11.6



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# SMA PTFE

## PROPERTY

Item	UNIT	TEST METHOD (ASTM)	PTFE (NATURE)
Apparent density	w/g g/li.	D-1457	260
Specific Gravity	g/cm <sup>3</sup>	D-792	2.18
Tensile Strength	kg/cm <sup>2</sup>	D-638	315
Elongation	%	D-638	400
Deformation (Total) MD		D-621	—
60min. CD	%	(23°C 140 kg/m <sup>2</sup> )	—
24Hrs. CD			14.3
			16.7
Permanent Deformation MD			7.9
CD			8.4
Deformation MD		150°C	51.8
60min. CD		200 kg/cm <sup>2</sup>	
Flexural Strength (0.2% offset) CD	kg/cm <sup>2</sup>	D-790	57
Flexural Modulus CD			3,500 - 6,300
Compressive Strength (0.2% offset) MD	kg/cm <sup>2</sup>	D-695	77
CD			—
Compressive Modulus MD			4,200
CD			—
Hardness	Durometer "D"	D-2240	55
Impact Strength	kg-cm/cm	D-256	15.8
Coefficient of Thermal Conductivity	K-cm/hr.°C	Cenco Fitch	0.21
Coefficient of Linear Thermal Expansio			
25-90°C MD	0.01mv/°C	D-696	—
CD			12.2
25-150°C MD			—
CD			12.6
25-200°C MD			13.7
CD			—
25-260°C MD	16.4		
CD			
Water Adsorption	%	D-570	0
Coefficient of Friction(Dynamic)		P=7 kg/cm <sup>2</sup> V=0.5 m/sec	—
Coefficient of Friction(Static)		P=35 kg/cm <sup>2</sup>	0.05-0.08



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# SMA PTFE

## QUALITY CONTROL REPORT

We hereby state that the following material is in accordance with our specifications.

Date : November 6, 2001  
Product : ICI PTFE G201  
Lot No : FPHRI 9001  
Contents : 25kg \* 35  
Ref No : HQKE -01 - 1554

Inspection Item	Unit	Data	Test Method
Bulk density	g/L	465	ASTM D 4895
Standard specific gravity		2.174	ASTM D 4895
Particle size(Avg.)	µm	500	ASTM D 4895
Melting point	°C	325	ASTM D 4895
Extrusion pressure	MPa	69.7	Asahi method
Water content	mas %	0.001	ASTM D 4895

ASAHI GLASS FLUOROPOLYMERS CO., LTD.

*Tatsuya Higuchi*

Production Engineering Group  
Polymer Production Department  
Chemical Division



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# Antenna Cover Polyurethane

Elastogran GmbH  
Geschäftsbereich TPU-Elastomere

Elastogran



Elastogran GmbH · Postfach 1140 · 48440 Lemförde · Germany  
WGF COMPANY LTD.

P.O. BOX 36 - 431  
RC TAOYUAN HSIEN

BASF Gruppe

Date 18.07.2001  
No. 52046

## Inspection Certificate EN 10 204-3.1 B (DIN 50049)

Product : ES 95 A 50 000 B No. : 15002939  
Batch : 207672  
Basic-Batch 207673

Property	Test method	Unit	Value
Dichte	DIN 53479	g/cm <sup>3</sup>	1,24
Shore-Haerte D	DIN 53505	-	50
Zugfestigkeit	DIN 53504	MPa	53
Reissdehnung	DIN 53504	%	550
Abrieb	DIN 53516	mm <sup>3</sup>	22

Dichte = Density/Densité, Shore Härte = Shore hardness/Shore Dureté, Zugfestigkeit = Tensile strength/Résistance traction,  
Reissdehnung = Elongation at break/Allongement rupture, Walterelösdurstand = Tear strength, Abrieb = Abrasion loss/Abrasion

The stated values are measured from a representative batch (basic-batch) of every product campaign.

Test platens are injection moulded from dry granulate with less than 0,05% water content. Test platens tempered 50 hrs. at 100 °C,  
then cooled to 23 °C / 50 % RH before testing. Test specimen cut from test platens.

We hereby certify that the material described above complies with the terms of the order contract.

Hersteller Schoote

Works inspector

The above information is derived from our quality checks. It does not relieve the purchaser from examining the product upon delivery  
and gives no assurance of suitability of the product for any particular purpose.



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# Antenna Cover Polyurethane

## Elastollan S規格系列

聚酯類Polyester，有良好機械特性，优异的耐壓性，高彈性，抗拉及撕裂強度用於運動鞋底、溜冰鞋及機械零件等，射出及押出成形

物 性	單位	DIN	S80A	S85A	S88A	S90A	S95A	S98A	S99D	Se4C	S74D
用於射出 ▲ 押出 ■ 吹出 ●			▲■	▲■	▲	▲■	▲	▲	▲	▲	▲
硬度 蕭氏A Hardness	Shore A	53508	81	85	88	93	96				
硬度 蕭氏D Hardness	Shore D	53505			36	41	48	55	60	64	75
密度Density	g/cm <sup>3</sup>	53479	1.22	1.23	1.23	1.24	1.24	1.25	1.25	1.26	1.26
抗拉強度Tensile strength *	N/mm <sup>2</sup>	535482	50	55	55	55	50	45	45	45	40
斷裂延伸率Elongation at break *	%	535432	750	650	650	600	550	500	500	450	300
20% 抗拉模數 Tensile modulus *	N/mm <sup>2</sup>	535452	2	2	3	6	8	13	15	22	25
100% 抗拉模數Tensile modulus *	N/mm <sup>2</sup>	535452	4	5	6	9	11	16	18	23	30
300% 抗拉模數 Tensile modulus *	N/mm <sup>2</sup>	535452	8	8	9	13	20	23	34	38	40
彈性模數 - 張力測試 (測試樣品3mm) Modulus of elasticity	N/mm <sup>2</sup>	53571						200	250	410	800
撕裂強度 Tear strength	N/mm	53515	60	70	75	95	120	150	170	200	240
摩擦損耗 Abrasion loss	mm <sup>3</sup>	53516	40	35	30	30	30	25	25	25	25
室溫壓縮變形率 Compression set	%	53517	25	25	25	25	25	30	40	45	55
70℃壓縮變形率 Compression set	%	53517	35	35	35	45	45	45	50	55	60
凹口衝擊強度 +23℃	kJ/m <sup>2</sup>	5345	不破裂	不破裂	不破裂	不破裂	不破裂	不破裂	不破裂	不破裂	不破裂
Notched impact strength (Charpy) -30℃			不破裂	不破裂	不破裂	不破裂	5	6	6	4	3

- \*S2試片在100mm/min的應變速度下測量
- \*厚度2或6mm射出試片，在100℃回火20小時後測試
- \*上列測試值僅供參考，若因客戶製品設計而變
- \*換算單位：1MPa=10.2kg/cm<sup>2</sup>=146PSI=1N/mm<sup>2</sup>  
1kJ/m<sup>2</sup>=1.02kg·cm/cm<sup>2</sup>

- 加工條件
- 射出成形溫度175~240℃
  - 模溫20~70℃
  - 押出成形溫度175~230℃



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# Antenna Base Polycarbonate

TEIJIN CHEMICALS LTD.

TEIJIN CHEMICALS LTD.  
2-2, UCHISAIWAJCHO 1-CHOME,  
CHIYODA-KU, TOKYO, JAPAN

TELEPHONE: TOKYO (3506) 4780  
FACSIMILE: TOKYO (3506) 4780

TO WHOM IT MAY CONCERN

## CERTIFICATE OF QUALITY

COMMODITY : TEIJIN BAKLITE (Polycarbonate Resin)

GRADE NO. : L-1250E100  
COL. NO. : NATURAL

ITEM	UNIT	TEST METHOD	TEIJIN CHEMICALS QUALITY STANDARD	TEST RESULT
IMPACT STRENGTH (100D NOTCHED 3.2mm thick)	kgfcm/cm	ASTM D256	≥ 30	PASS
FLEXURAL MODULUS	kgf/cm <sup>2</sup>	ASTM D790	28 500 ± 1 500	PASS
TENSILE STRENGTH (AT BREAK)	kgf/cm <sup>2</sup>	ASTM D638	320 ± 140	PASS

NOTE : ALL FIGURES ENTERED IN THIS TABLE ARE FOR THIS SPECIFIC LOT AND, THEREFORE,  
NO GUARANTEE.

TEIJIN CHEMICALS LTD.

*M. Nishikawa*  
for Y. EIKUCHI  
MANAGER  
SALES ADMINISTRATION DEPT.



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# Antenna Base Polycarbonate

QMFZ2

Component - Plastics

TEIJIN CHEMICALS LTD

E50075 (M)

							(C - cont. from 6030 card)				
L-1225JM(d), L-1225ZL(d)	All	0.40	94V-2	80	80	80	4	3	2	—	—
		0.75	94V-2	80	80	80	3	1	2	—	—
		1.5	94V-2	125	115	125	3	1	3	—	—
		2.1	94HB	125	115	125	3	1	3	—	—
		3.0	94HB	125	115	125	2	1	3	5	2
L-1225LL(d)	All	6.0	94HB	125	115	125	1	1	4	—	—
		0.4	94V-2	80	80	80	4	3	2	—	—
		0.75	94V-2	80	80	80	5	1	2	—	—
		1.5	94V-2	125	115	125	3	1	3	—	—
		3.0	94V-2	125	115	125	3	1	3	5	2
L-1250Y(fz)(d), L-1250U#(d), L-1250V#(d), L-1250W(d)	All	6.0	94HB	125	115	125	2	1	3	—	—
		0.40	94V-2	80	80	80	4	3	2	—	—
		0.84	94V-2	80	80	80	4	—	4	—	—
		1.5	94HB	125	115	125	4	0	3	—	—
		3.0	94HB	125	115	125	2	0	3	5	2
6.0	94HB	125	115	125	1	0	4	—	—		

Reports: February 10, 1989; February 10, 1989; September 24, 1990.

Replaces E50075C dated November 1, 1994.

699748006

#7047

Underwriters Laboratories Inc.®

(Cont. on 0005 card)

011/0032918

QMFZ8

July 28, 1997

Component - Plastics Certified For Canada

TEIJIN CHEMICALS LTD

E50075 (M)

(C - cont. from B card)

(cc) 10 thru 30 incl.

(i) A two digit number (10-15) denoting carbon filler content.

(j) A two digit number (10-40) denoting the total content of carbon fiber and glass fiber.

ww = A two digit number 10 thru 20 denoting content of carbon filler.

# Any one or two letters may be suffixed to the grade.

Marking: Company name and material designation, generic polymer identification, color number where appropriate, and batch or lot number or date of manufacture on container, wrapper or molded on finished part.

See General Information Preceding These Recognitions.

Small-scale test data does not pertain to building materials, furnishings and related contents. Small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

699748006

Underwriters Laboratories Inc.®

011/0251659



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# Antenna Base Polycarbonate

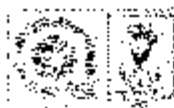
## Properties of Panlite

Items	Unit	Test Method	Condition	Weather Resistant Grade (SAE approved)		
				L-1225ZL	L-1225Z	L-1250Z
Specific gravity	—	ASTM D792	—	1.21	1.20	~ 1.20
Water absorption	%	ASTM D670	24 hr in 23°C water	0.20	0.20	0.20
Light transmission	%	ASTM D1003	3mm thick	88	89	88
Refractive index	—	ASTM D442	—	1.585	1.585	1.585
Tensile strength	Yield	MPa (kgf/cm <sup>2</sup> )	ASTM D638	65 (650)	63 (640)	62 (630)
	Break	MPa (kgf/cm <sup>2</sup> )	ASTM D638	64 (655)	77 (790)	80 (820)
Tensile modulus	MPa (kgf/cm <sup>2</sup> )	ASTM D638	—	2,100 (22,300)	2,130 (21,700)	2,120 (21,800)
Tensile elongation	Yield	%	ASTM D638	6	6	6
	Break	%	ASTM D638	130	140	140
Flexural strength	MPa (kgf/cm <sup>2</sup> )	ASTM D790	—	96 (980)	93 (950)	92 (940)
Flexural modulus	MPa (kgf/cm <sup>2</sup> )	ASTM D790	—	2,330 (23,800)	2,260 (23,000)	2,230 (22,700)
Compressive strength	MPa (kgf/cm <sup>2</sup> )	ASTM D695	—	77 (790)	76 (790)	76 (770)
Impact strength	J/m (kgf-cm/cm)	ASTM D256	200° notched 3.2mm thick	100 (10)	830 (85)	880 (90)
	J/m (kgf-cm/cm)	ASTM D256	120° notched 6.4mm thick	50 (5)	130 (13)	140 (14)
Rockwell hardness	—	ASTM D785	M scale	77	77	77
Mold shrinkage	%	ASTM D955	Flow direction	0.5~0.7	0.5~0.7	0.5~0.7
			Transverse direction	0.5~0.7	0.5~0.7	0.5~0.7
Heat distortion temperature	°C	ASTM D648	Load 0.451 MPa (4.6 kgf/cm <sup>2</sup> )	138	141	142
			Load 1.813 MPa (18.6 kgf/cm <sup>2</sup> )	126	131	132
Coefficient of linear expansion	× 10 <sup>-5</sup> cm/cm/°C	ASTM D698	Flow direction	7	7	7
			Transverse direction	7	7	7
Dielectric breakdown strength	kV/mm	ASTM D149	Quick voltage rise method 1.6mm thick	30	30	30
Volume resistivity	× 10 <sup>14</sup> Ω-cm	ASTM D257	—	3	3	3
Dielectric constant	—	ASTM D150	60Hz	2.95	2.95	2.95
			10 <sup>6</sup> Hz	2.9	2.9	2.9
Dielectric loss tangent	—	ASTM D150	60Hz	0.0004	0.0004	0.0004
			10 <sup>6</sup> Hz	0.009	0.009	0.009
Arc resistance	sec	ASTM D485	—	100	100	100
Anti-tracking (CTI)	V	IEC 112	—	300	300	300
Flame resistance	—	UL 94	1.47mm thick	94V-2	94V-2	94V-2
			3.05mm thick	94V-2	94V-2	94V-2
Temperature Index	°C	UL 746B	Electric 1.47mm thick	125	125	125
			Impact 1.47mm thick	115	115	115
			Non-impact 1.47mm thick	125	125	125

All figures entered in this table are the typical values and not guaranteed.



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# Antenna Base Polycarbonate

## Grades of **Panlite**

Grades	Viscosity	Characteristics	Main molding methods	Principal applications
K-1300	High	Standard	Extruding/blow molding/ injection molding	<ul style="list-style-type: none"> <li>• Sheet, film, pipe and other extruded products.</li> <li>• Bottles and other direct blow molded products.</li> <li>• Large tanks and other rotational molded products.</li> </ul>
K-1300Y	-	Mold release/ice color	Extruding/blow molding/ injection molding	
K-1300Z	-	Weather resistance/ ice color	Extruding/blow molding/ injection molding	
K-1300W	-	Powder	Extruding/rotational molding	
K-1285	-	Standard	Extruding/blow molding/ injection molding	<ul style="list-style-type: none"> <li>• Machine parts, electric and electronics appliance parts, medical apparatuses, protective equipment parts, industrial parts in general.</li> <li>• Lighting fixture parts requiring transparency and heat resistance.</li> <li>• Table wares and mechanical parts requiring cold and heat resistance.</li> <li>• Large tanks and other rotational molded products.</li> <li>• Thin-wall products requiring high flowability, electric &amp; electronics appliance parts, machine parts, protective equipment parts, medical apparatuses, lighting fixtures, lamp shade, table wares and containers.</li> <li>• Suitable for injection blow molding uses.</li> </ul>
L-1260	Medium	Standard	Injection molding	
L-1250R	-	Mold release	Injection molding	
L-1260Y	-	Mold release/ice color	Injection molding	
L-1250Z	-	Weather resistance/ ice color	Injection molding	
L-1250J	-	Boiling water resistance	Injection molding	
L-1260T	-	Boiling water resistance/mold release/ice color	Injection molding	
L-1250W	-	Powder	Injection molding/ rotational molding	
L-1225	Low	Standard	Injection molding	
L-1225R	-	Mold release	Injection molding/ injection blow molding	
L-1225Y	-	Mold release/ice color	Injection molding/ injection blow molding	
L-1225Z	-	Weather resistance/ ice color	Injection molding	
L-1225J	-	Boiling water resistance	Injection molding	
L-1225T	-	Boiling water resistance/mold release/ice color	Injection molding/injection blow molding	
L-1225W	-	Powder	Injection molding/ rotational molding	
L-1225L	Ultra low	Mold release/ice color	Injection molding	<ul style="list-style-type: none"> <li>• Ultra-thin wall parts of electric &amp; electronic appliances.</li> </ul>
L-1225ZL 100	-	Mold release/ weather resistance/ ice color	Injection molding	<ul style="list-style-type: none"> <li>• Ultra-thin lamp lenses.</li> </ul>
AD-6503	-	Optical properties, low contamination	Injection molding	<ul style="list-style-type: none"> <li>• Compact disks, CD-ROM, optical lenses.</li> </ul>



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**Test Report**

No.: GZ0605065981/CHEM

Date: MAY 16, 2006

Page 1 of 2

LUCKY OPTO PRECISION CO., LTD  
46-2 GAOXIN WESTROAD JIANG HAI DISTRICT JIANG WEN GUANG CHINA

Report on the submitted sample said to be TPC


SGS Ref No. : SZ060420922RS-13.9  
Model No. : 430N-DV  
Sample Receiving Date : MAY 10, 2006  
Testing Period : MAY 10, 2006 TO MAY 16, 2006

Test Requested : (1) As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample.  
(2) Determination of PBBs (Polybrominated Biphenyls), PBDEs (Polybrominated Diphenylethers) of the submitted sample.

Test Method : (1) Lead content - With reference to EPA method 3050B: 1996 / other acid digestion.  
Cadmium content - With reference to BS EN1122: 2001 method B / other acid digestion.  
Mercury content - With reference to EPA 3052: 1996 / 7473: 1998 / other acid digestion.  
Hexavalent Chromium content - With reference to EPA 3060A : 1996 & EPA 7196A : 1992.  
Analysis was performed by Atomic Absorption Spectrometer / Inductively Coupled Plasma Atomic Emission Spectrometer (ICP-AES) / Direct Mercury analyzer / UV-VIS Spectrophotometer.  
(2) With reference to EPA 3540C / 3550C. Analysis was performed by GC/MS.

Results : Please refer to next page

Signed for and on behalf of  
SGS-GSTC Ltd.

  
Zhang Li, Amy  
Sr. Engineer

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GZCM 605976

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