

Product Number: K212-10045-A

Product Name: FPC Antenna(FPC 天线)

Version: A1

SPECIFICATION FOR APPROVAL

CUSTOMER(客户名称)	Hunan Ouzhitong Technology Co. , Ltd. (湖南欧智通科技有限公司)							
CS P/N(客户机种)								
PART NAME(品名)	FPC Antenna 40*8MM 2.4~2.5GHz L=260MM IPEX ROHS							
FREQUENCY(频率)	2.4-2.5GHz							
RTANT NO.(物料编号)	K212-10045-A							
DATE(日期)	2021.07.23							
Sample signature (出样签章) <table border="1"><tr><td>APPROVED BY 核</td><td>CHECKED BY 角</td><td>DRAWED BY 伟J</td></tr><tr><td>DRAGON</td><td>LIU</td><td>JOHN</td></tr></table>			APPROVED BY 核	CHECKED BY 角	DRAWED BY 伟J	DRAGON	LIU	JOHN
APPROVED BY 核	CHECKED BY 角	DRAWED BY 伟J						
DRAGON	LIU	JOHN						
Remark(备注):								
The client acknowledges the signature (客户承认签章) <table border="1"><tr><td>APPROVED BY 核 准</td><td>CHECKED BY 确认</td><td>TESTED BY 检测</td></tr><tr><td></td><td></td><td></td></tr></table>			APPROVED BY 核 准	CHECKED BY 确认	TESTED BY 检测			
APPROVED BY 核 准	CHECKED BY 确认	TESTED BY 检测						
Sign(客户确认签字盖章): _____								

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Address: Building E, Industrial Innovation Park, Shallong road, Shatang industrial zone, Houjie Town, Dongguan City

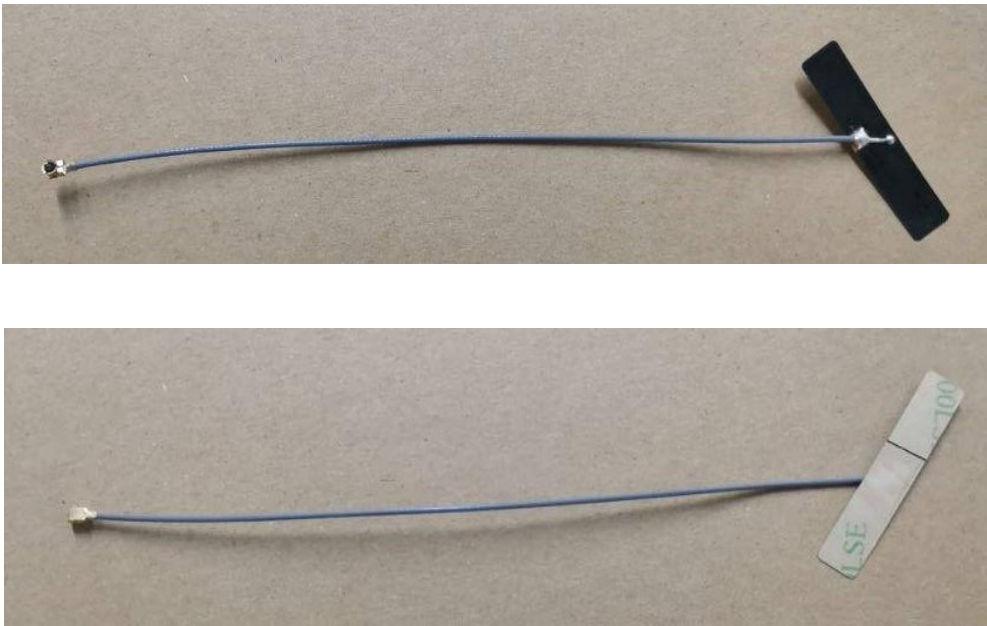
1.Contents 项目表

No.	content 内容	Pages 页数
0	The cover of the confession(承认书封面)	1
1	List of items (项目表)	2
2	Change your resume (变更履历)	2
3	Physical drawing of product(产品实物图)	3
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5	Electrical test report(电性测试报告)	4-8
6	Performance and reliability testin (特性和可靠性测试)	9-10
7	Sample inspection report (样品检验报告)	11
8	Material proof (材质证明)	12-14
9	2Dillustration/packaging (2D 图/包装)	Appendices (附件)

2. Revision history 变更履历

Revision 版本	Date 日期	Change the content 变更内容
A0	21.06.24	New Edition (新版)
A1	21.07.23	Change Line length (变更线长度)

3.产品实物图片 Product picture



4.规格表 Specification

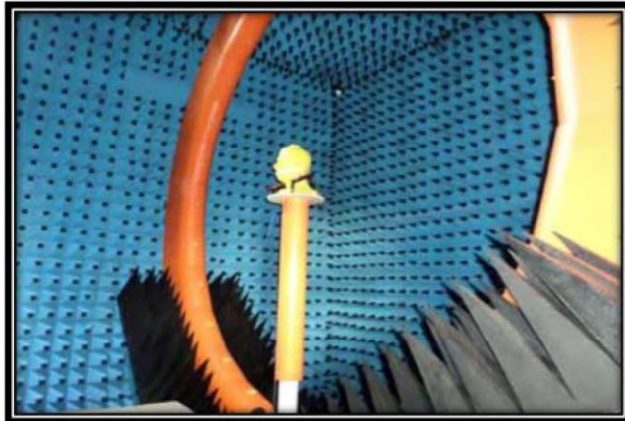
A.Electrical Properties	
Frequency Rang 频段范围	2.4~2.5GHz
Impedance 特性阻抗	50Ω Nominal
VSWR 电压驻波比	2.0Max.
Gain(peak)增益（峰值）	2.59dBi
Out of roundness 不圆度	3.0 dBi（Max.）
Radiation 辐射方式	Omni-Directional/全向
Polarization 极化方式	Linear Vertical/垂直
B.Physical Properties	
Connector Type 连接方式	IPEX
Cable 线材	Φ1.13mm Gray
Antenna Radiator 天线振子体	FPC
C.Environmental	
Storage Temp 存储环境范围	-10℃~+60℃
Operating Temp 工作环境	-40℃~+65℃
Storage humidity 存储湿度	95%

Working humidity 工作湿度

5%-95%

5. 电性测试报告 Electrical Test Report

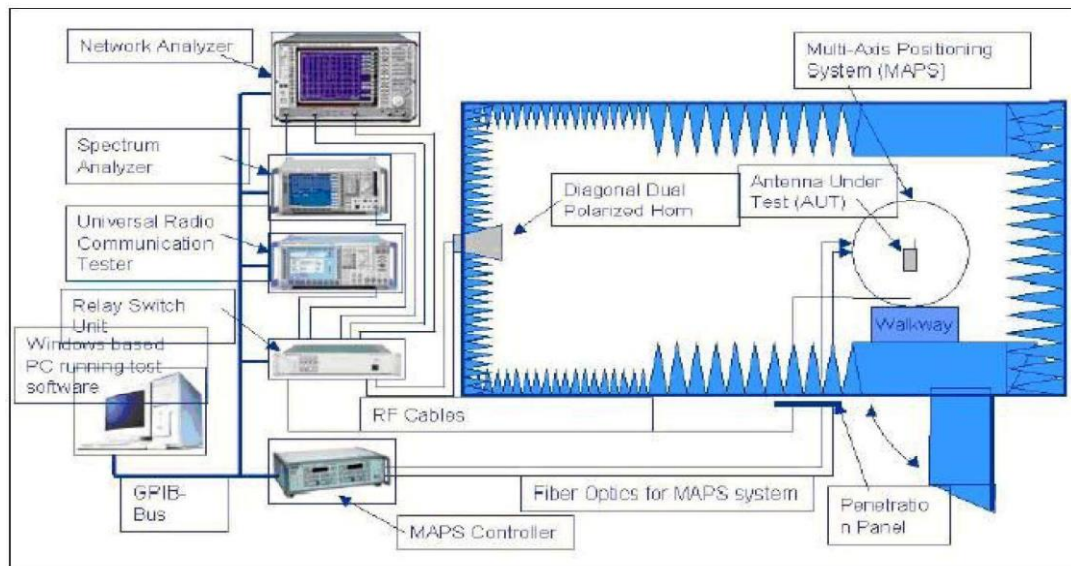
5.1 Test equipment



Owned 6 microwave dark room, equipped 2 sets world leading France Satimo SG24 OTA certification test systems (one in SHENZHEN, another one in Shanghai), ETS OTA Standard test system, Blue test reverberation test system which is High repeatability, high accuracy and high resolution. It can quickly provide accurate test reports, fully meet the CITA standards.

Testing range:

Support active, passive testing of
GSM/CDMA/WCDMA/TD-
SCDMA/LTE/WIFI/WLAN/WiMax/BT
/GPS/MIMO/UWB within 0.4-6G.



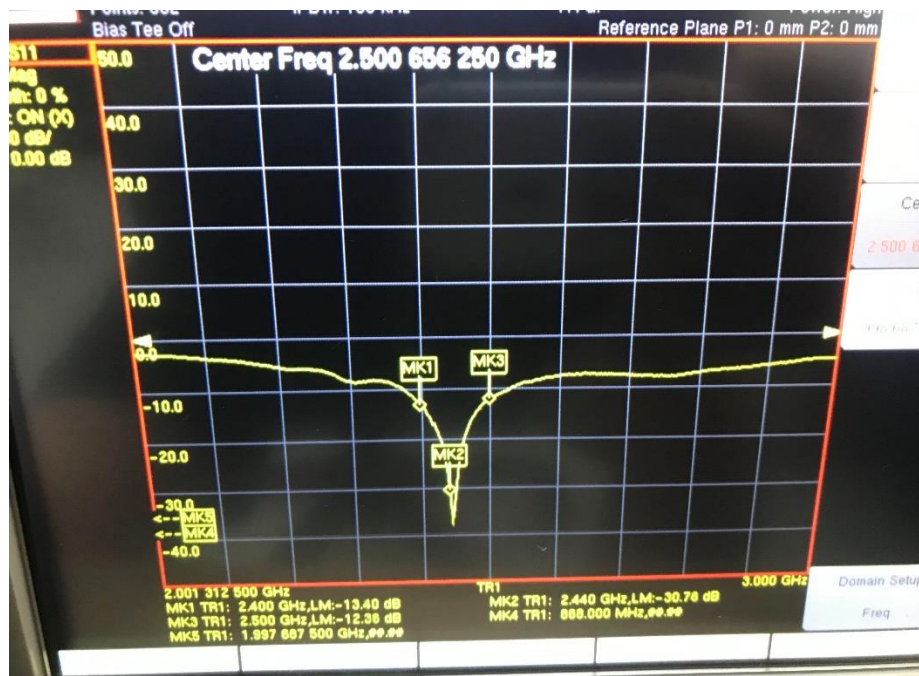
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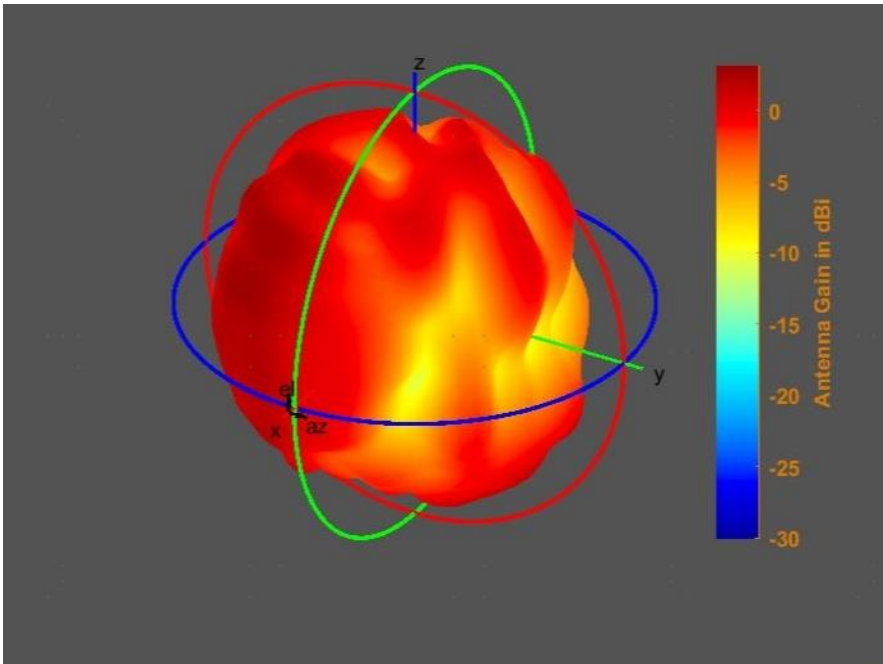
5.2 Antenna pasting position (天线粘贴位置)



5.3 Network Analyzer(网络分析仪测试报告)



5.4 暗室 2D、3DRaditation Pattern



5.5 暗室无源测试数据

Frequency	Directivity(dBi)	Gain(dB)	Efficiency(%)	Efficiency(%)	BW@Phi=0°	BW@phi=90°
2400	5.8535	2.2126	-2.6409	54.4393	86.2276	78.7391
2405	5.8848	2.3179	-2.5669	55.3745	86.1668	80.4503
2410	5.8043	2.1804	-2.6239	54.6529	88.8029	77.0985
2415	5.836	2.1113	-2.7247	53.3985	89.7089	78.9531
2420	5.7297	1.7941	-2.9356	50.8674	89.4871	74.7347
2425	5.5458	1.7721	-2.7738	52.7984	88.6061	74.474
2430	5.679	2.1676	-2.5114	56.0864	88.1211	71.0776
2435	5.5603	2.2236	-2.3367	58.3883	65.5412	74.351
2440	5.5352	2.354	-2.1812	60.5176	75.8156	79.405
2445	5.4468	2.3884	-2.0585	62.2521	71.3174	72.7495
2450	5.3921	2.3925	-1.9996	63.1014	72.1746	69.4969
2455	5.2977	2.0768	-2.221	59.9657	71.2546	71.7359
2460	5.3565	1.892	-2.4644	56.6966	76.1695	73.5694
2465	5.2949	1.9317	-2.3632	58.0338	75.5813	75.7497
2470	5.3689	2.1711	-2.1977	60.2875	77.5875	79.9823
2475	5.4425	2.4265	-2.016	62.8639	82.7592	84.9459
2480	5.3662	2.463	-1.9032	64.5172	16.6521	92.0813
2485	5.4449	2.588	-1.8569	65.21	16.9057	100.247
2490	5.3888	2.5652	-1.8236	65.7112	16.4438	100.9263
2495	5.4627	2.558	-1.8047	65.9985	16.7103	95.9782
2500	5.455	2.5101	-1.8449	65.3896	17.1076	100.1966

6.特性和可靠性测试 Characteristics and Reliability Test

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Test Items 测试项目	Test Condition and Procedure 测试方法	Requirements 要求	Result 结果
V.S.W.R. 电压驻波比	Set DUT on Network Analyzer; make individual calibration to test 设置网络分析仪参数进行测试	Directive DUT specification 符合待测物规范	PASS
Insertion Loss 插入损失	Set DUT on Network Analyzer; make individual calibration to test 设置网络分析仪参数进行测试	Directive DUT specification 符合待测物规范	N/A
Antenna Gain 天线增益	Set DUT on Antenna Chamber; make individual calibration to test 设置天线暗室参数进行测试	Directive DUT specification 符合待测物规范	PASS
Voltage Breakdown 耐电压	Test voltage should be applied between insulated portions, or between ground as specified. 在绝缘部分测试电压,或指定接地面之间	Max Voltage $\geq$ 500 V or directive material specification 最大电压 $\geq$ 500V 或符合材料规范	N/A
Insulation Resistance 绝缘阻抗	Set Voltage: 500 $\pm$ 50V; between the insulated portions, or between ground as specified. 设置电压 500 $\pm$ 50V,在绝缘部份测试或指定接地面之间	Resistance $\geq$ 500 M ohm or directive material specification 阻抗 $\geq$ 500M ohm 或符合材料规范	N/A
Contact Resistance 接触阻抗	Air Temp: 26°C; measured with test equipment 室温 26°C, 指定量测设备	Directive material specification 符合材料规范	N/A
Vibration 震动	GB / T2423.48-2008 Amplitude: 0.03 inch (1.5mm); Freq: 20 to 80 to 20 Hz 3 directions; 2 hours for each direction 振幅 1.5mm; 频率 20~80~20Hz; 3 个方向各 2H	1. No Visual Damage 2. Frequency Tol. $\leq$ 5% 无明显外观不良;频率偏移 $\leq$ 5%	PASS
Random Drop 跌落	GB / T2423.8-1995 Single: Height: 1.0 Meter; 3 directions; 1 time for each direction 单支天线, 高 1m; 3 个方向各 1 次	1. No parts separated、fracture 2. Frequency Tol. $\leq$ 5%	PASS

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	Packing: Height: 0.76 Meter; 1 corner, 3 edges, 6 surface 包装: 高 0.76m, 一角、三棱、六面各一次	产品无脱落、断裂;频率偏移 $\leq 5\%$	PASS
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	Antenna+Machine:Height: 0.76 Meter; 1 corner, 3 edges, 6 surface.整机: 高 0.76m, 一角、三棱、六面各一次		N/A
Solderability 可焊性	GB / T2423.28-2005 Temp: $260\pm 5^{\circ}\text{C}$;Duration: 5 seconds 温度 $260\pm 5^{\circ}\text{C}$;持续 5 秒	Tin evenly on full 上锡均匀饱满	N/A
Pull Test 拉力	Holding with individual specification; force applied to axis of terminal .单独定义产品端子拉力	1. Directive DUTspecification 2. Frequency Tol. $\leq 5\%$ 符合待测物规范;频率偏移 $\leq 5\%$	PASS
Torque Test 扭力	Holding with individual specification; applied clockwise and counterclockwise to the axis of terminal 单独定义产品端子之顺时针及逆时针扭力	1. Directive DUTspecification 2. Frequency Tol. $\leq 5\%$ 符合待测物规范;频率偏移 $\leq 5\%$	N/A
Dimension 尺寸	Inspection of dimension, color, material, package, surface process.检查尺寸,颜色,材料,包装,表面处理	Directive DUT specification 符合待测物规范	PASS
Waterproof 防水	With Reference to IEC 60529 // IP Code Definition 参考 IEC60529 IP 定义	Directive DUT specification 符合待测物规范	N/A
Salt Spray 盐雾	GB / T 2423.17-2008 Temp: 35°C ; RH: $\geq 95\%$; NaCl solution: $\geq 5\%$;Time: 24H 温度 35°C ; 湿度 $\geq 95\%$;盐水浓度 $\geq 5\%$; 测试 24H	1. No Visual Damage 2. Frequency Tol. $\leq 5\%$ 无明显外观不良;频率偏移 $\leq 5\%$	PASS

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Temperature and Humidity Chamber 恒温恒湿	GB / T 2423.3-2006 Temp: 80°C / 12 H; -40°C / 12H RH: ≥ 90%; Time: 24H 温度 80°C 测试 12H 转-40°C 测试 12H; 湿度≥ 90%; 时间 24H	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.≤5% 恢复 2H 后, 无明显外观不良;频率偏移≤5%	PASS
Thermal Shock 冷热冲击	GB / T 2423.22 - 2008 -40°C (30 minutes) to + 80°C (30 minutes); Cycles: 24 - 40°C 测试 30 分转 80°C 测试 30 分为一个周期; 共 24 周期	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.≤5% 恢复 2H 后, 无明显外观不良;频率偏移≤5%	PASS
Aging test 老化	GB / T 2423.2 - 2008 Temp: 80°C; Time: 24 hours 温度 80°C, 测试 24H	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.≤5% 恢复 2H 后, 无明显外观不良;频率偏移≤5%	PASS

		良;频率偏移≤5%	
High Temp.高温	Temp. 270±10°C; Times: 120 seconds 温度 270±10°C, 测试时间 120 秒	No Visual Damage 无明显外观不良	N/A
RoHS	With Reference to IEC 62321:2008 with flow chart 参考 IEC 62321 测试流程	Directive RoHS 2011/65/EU 符合 RoHS 2011/65/EU 标准	PASS
PFOS	With Reference to USA EPA 3550C:1996 by LC/MS 参考 USA EPA 3550C 测试流程	Directive RoHS 2006/122/EC 符合 RoHS 2011/65/EU 标准	PASS

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7.样品检验报告 Sample inspection report

日期: 2021.07.23

送检数量		5PCS	合格数量		5PCS			
检验项目		检验标准及说明	检验结果					判定
			No.1	No.2	No.3	No.4	No.5	
外观	FPC	无脏污、无破损，无刮伤	pass	pass	pass	pass	pass	☒ OK ☐ NG
	CABLE	对比无色差、无脏污、无破损，无刮伤	pass	pass	pass	pass	pass	☒ OK ☐ NG
	IPEX	对比无脏污、无破损，无刮伤	pass	pass	pass	pass	pass	☒ OK ☐ NG
	焊锡	饱满，光滑	pass	pass	pass	pass	pass	☒ OK ☐ NG
	其他							☐ OK ☐ NG
主要尺寸	1	260±5mm	260	260	260	260	260	☒ OK ☐ NG
电气及功能测	Frequency Rang	2.4~2.5GHz						
	VSWR	<2.0	pass	pass	pass	pass	pass	☒ OK ☐ NG

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试								
机械性能	Cable 与 IPEX 拉力	大于 1.5kg	1.73	1.68	1.72	1.65	1.78	☒ OK ☐ NG
备注								
最终判定		☒ 合格 ☐ 不合格 ☐ 条件认可						

8.零件规格&材质证明 Part spec.&Material certificate

1. 适用范围:

Scope
本规格书制定了 50Ω FEP 绝缘射频电缆 YD113 系列的结构和电气特性。
This specification covers the construction and the electrical properties of YD113 series of 50Ω FEP Insulation Coaxial Cable.

2. 结构/Construction: 单位/Unit:mm

项目/Item		详细资料/Details
导体/Conductor	材料/Material	镀锡铜线/Tinned Copper Wire
	构成(根/mm) Composition(No./mm)	7/0.083
	标称直径/NOM. O.D	0.24±0.03
绝缘层 /Insulation	材料/Material	聚全氟乙丙烯(自然色) /FEP(Natural)
	标称绝缘厚度/Nom. Thick. (mm)	0.23
	标称外径/NOM. O.D	0.695±0.03
屏蔽层/Shield	材料/Material	镀锡铜线/Tinned annealed copper wire
	构成/Composition	0.05 单线编织/Single Braid of 0.05
护套/Jacket	材料/Material	聚全氟乙丙烯/FEP
	标称护套厚度/ Nom. Thick (mm)	0.10
	标称外径/Nom. O.D (mm)	1.13±0.05
	颜色/Color	按与客户确认的颜色/According to corresponding have approved by the suppliers and customers

3. 电气特性(20℃时)/Electrical Properties(at 20℃)

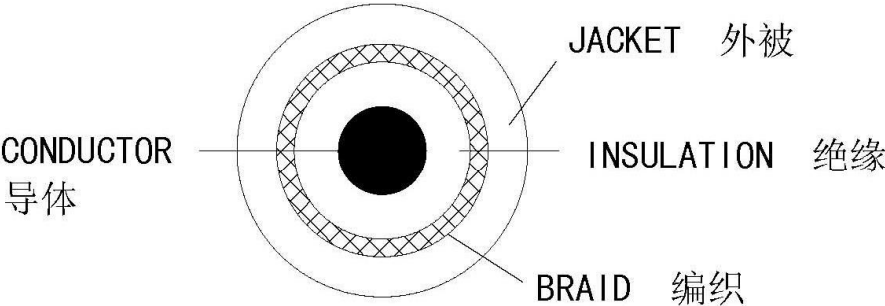
项目/Item	单位/Unit	详细资料/Details
导体电阻/Conductor Resistance	Ω/km	Max. 560
绝缘电阻/Insulation Resistance	MΩ.km	Min. 200
耐压强度/Dielectric Strength	V(AC)/min	1000
静电容/Capacitance	pF/m	98
特性阻抗 /Characteristic Impedance	Ω	50±2.0

衰减/Attenuation	dB/m	1GHz	2. 20
		2GHz	3. 15
		3GHz	3. 90
		4GHz	4. 60
		5GHz	5. 20
		6GHz	5. 70
驻波比/Standing wave(0-6GHz)	/	≤1. 35	

4. 包装 Packing

标准单位包装长度为 1000 米/盘, 每盘最多允许 5 个接头, 接头最短长度 20 米, 在搬运过程中不能损坏包装.

Standard unit length of finished cable shall be 1000m on reel, frequency of joint max.5/reel, the mini length is 20m. The finished cable shall be packed not be damaged during transportation



本产品有时不适合车载用途的情况也有,所以使用前请先和本公司业务部门进行商谈.

This product is not suitable for automobile application in some cases.Please contact with our sales department before you use this product.

