承　認　書

APPROVAL SHEET

客戶名稱
Customer : **Wistron Corporation**

客戶料號
Customer P/N : **25.90143.001**

適用機種
Model No. : **GANNET**

送件日期
Submitted Date : **September. 05,**

承認日期
Approved Date :

瀚宇料號
HannStar P/N : **WA00101**

品　名
Description : **BLUETOOTH for GANNET system**

APPROVED	承認編號
	承認人簽章

瀚宇電子股份有限公司

HannStar Electronics Corp.

台北縣 242 **新莊市化成路** 211 **巷** 5 **號**

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Tel: 886-2-22779377 Fax: 886-2-2994-4240

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瀚宇電子股份有限公司
HannStar Electronics Corp.
承認書索引

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Customer P/N: 25.90143.001

Model: GANNET

HSE P/N: WA00101

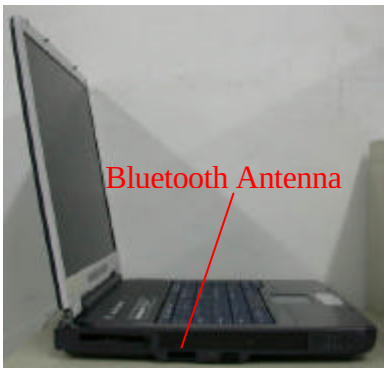
HannStar Electronics Corp.

1. Introduction

Antennas for Bluetooth system

Bluetooth Antenna (PCB type)

1. Application: Left side in motherboard location
2. Cable length: 150mm, White
   (IPEX connector with φ1.13mm RF cable)



2. Revision History

Date	Version	Change Description
09/05/2003	A	New Release

3. Product Spec.

3.1 Antenna Design Specification

Measure environment LCD angle 110 degree

3.1.1 VSWR

VSWR	2G4 ISM (2.40GHz-2.483GHz)		
	2.40GHz	2.45GHz	2.50GHz
Bluetooth antenna	≦2		

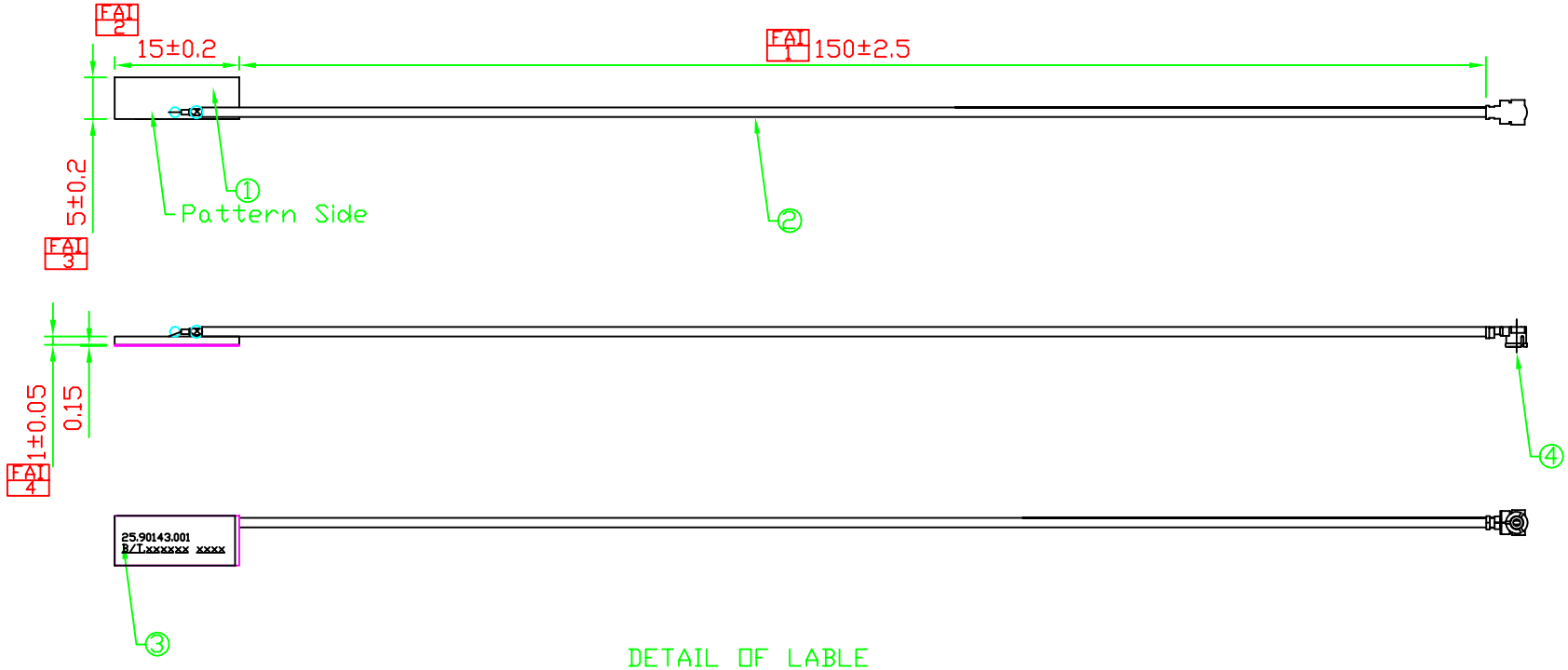
3.1.2 Average gain

Average Gain	2G4 ISM (2.40GHz-2.483GHz)		
	2.40GHz	2.45GHz	2.50GHz
Bluetooth Antenna	≧-5		

3.2 Mechanical Spec.

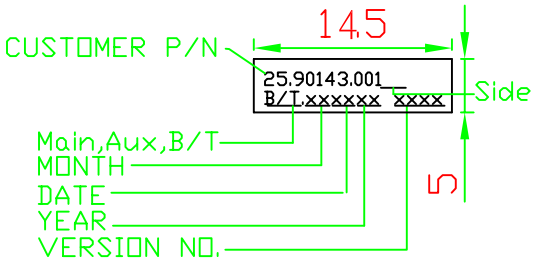
See the attached drawing

REVISIONS				
REV.	ECN NO.	ECN BY.	DESCRIPTION	DATE
A	EP030309	Leo	New Release	09/05'03



DETAIL OF LABLE

SCALE 1.5 : 1



ITEM NO.	QTY REQD	PART NUMBER	DESCRIPTION
1	1	U010-007-0059	PCB Antenna 5x15 t=1.0
2	1	U011-002-0013-3	Coaxial Cable ø1.13 White
3	1	U013-011-0026	TAPE Sony T4000 t=0.15
4	1	U006-002-0010	I-PEX Connector

.X ± 0.3
.XX ± 0.2

UNIT: mm (Inch)

SCALE: NONE

HannStar Electronics Corp.

APPD: James 08/25'03

CHKD: Allen 08/25'03

DR: Leo 08/25'03

Title : WA00101 成品圖

DWG NO.: WA00101

SHEET: 1 of 1 REV: A

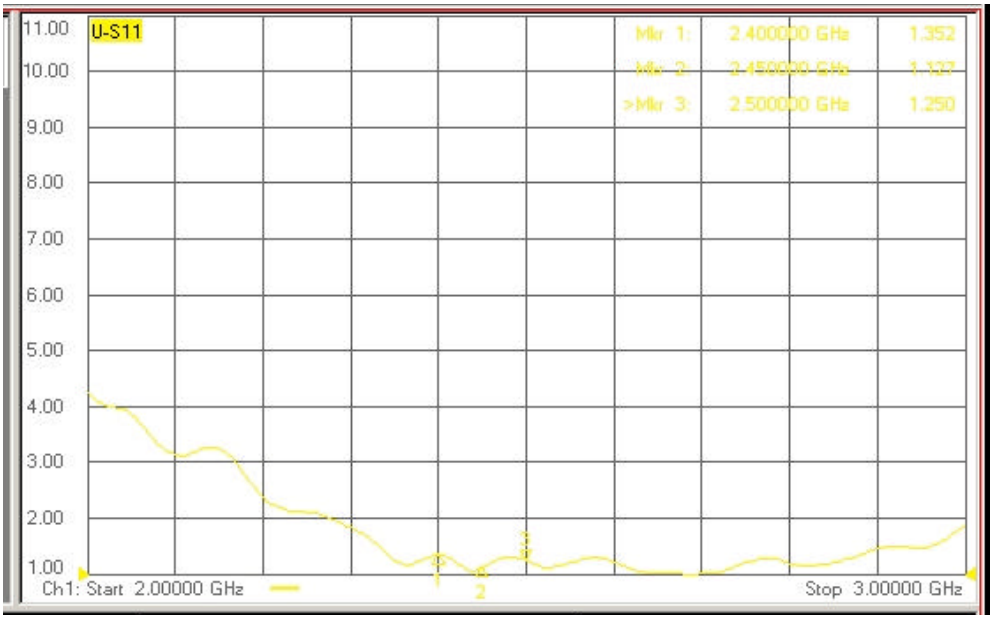
ED001-980729

3.3 Antenna BOM structure

NO.	Part NO.	Description	Q ' ty
1	U011-002-0013-2	Hitachi Cable O1.13 White 150mm	1
2	U010-007-0059	PCB 5x15mm	1
3	U006-002-0010	I-PEX Connector	1
4	U013-011-0026	Type SONY T4000	1

3.4 Antenna Test Results

3.4.1 VSWR



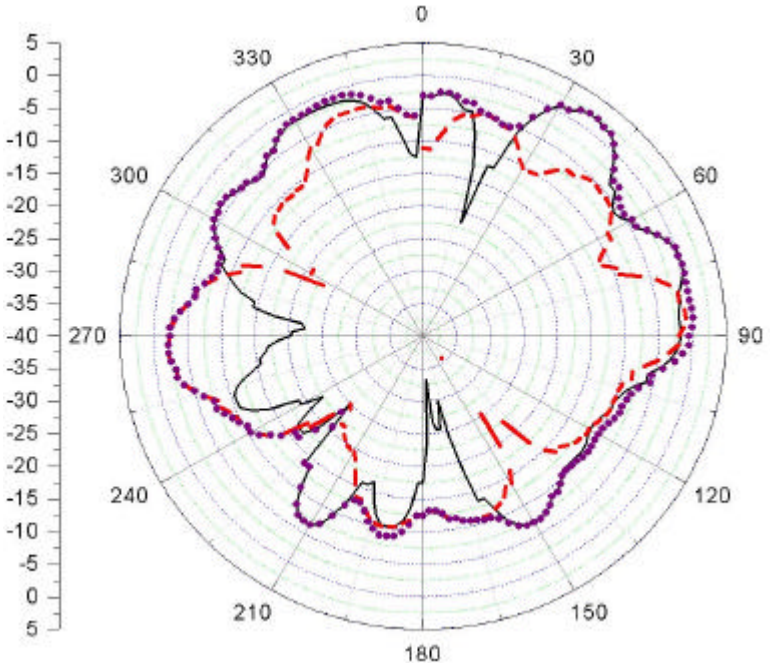
VSWR	2G4 ISM (2.40GHz-2.483GHz)		
	2.40GHz	2.45GHz	2.50GHz
Bluetooth Antenna	1.1218	1.1227	1.1244

3.4.2 Radiation Pattern

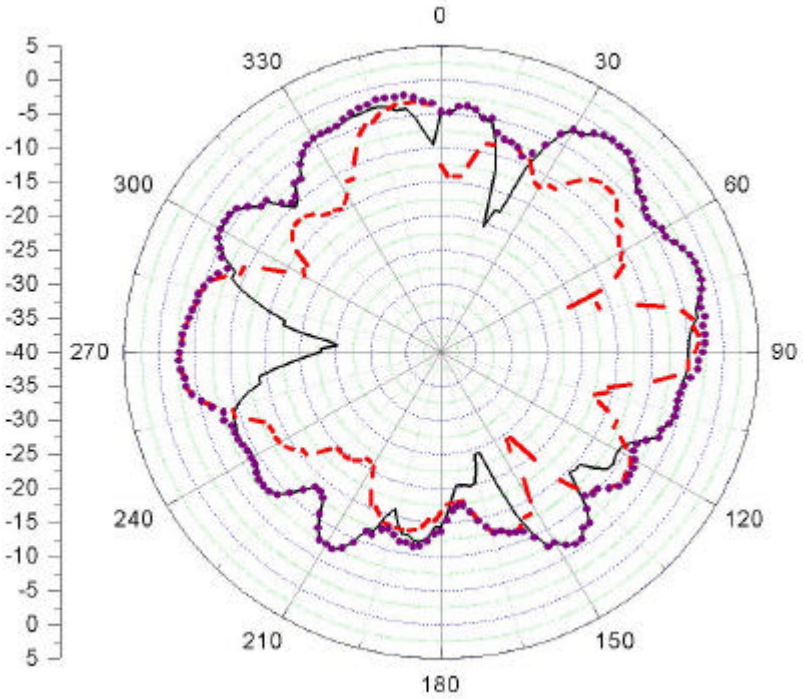
Gain(dBi)		2G4 ISM (2.40GHz-2.483GHz)		
		2.40GHz	2.45GHz	2.50GHz
Bluetooth Antenna	Peak	1.23	-0.49	0.15
	Average	-4.08	-4.19	-4.47

HannStar Electronics Corp.

Bluetooth Antenna @- 2.40 GHz

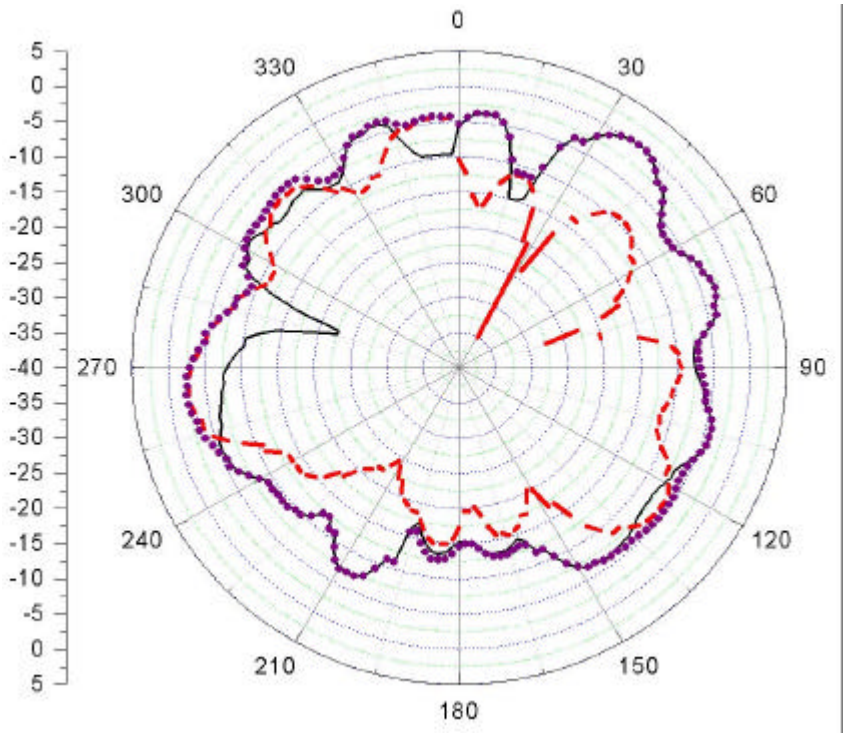


Bluetooth Antenna @- 2.45 GHz



HannStar Electronics Corp.

Bluetooth Antenna @- 2.483 GHz



270 °

4. Environment Performance Test

4.1 Introduction

This EQT (Environment Qualification Test) report is used to describe the final status of PCB type Antenna about the EQT test results.

4.2 Test Items and Results

4.2.1 the following table is used to show the final status of PCB type Antenna.

Test Item	Specification	Test Result	Tested By	Remark
Thermal Shock	Temperature range:-20°C~80°C Hold Time:30 min Total cycle:20 cycles	Pass	HSE	
Vibration (Need NB)	Frequency 5 to 500Hz Overall rms level : 0.6G P-P~2.0G P-P Duration of test : 1 Hr/cycle Number of axes : X,Y,Z 1 cycle/axis	Pass	HSE	
Salt Spray	Chamber temperature : 35°C Salt : 5% Hold time : 48 Hr	Pass	HSE	
Contact Engagement & Separation Forces	Speed : 22 mm/mint Inspection Item : Soldering Pull strength Soldering pull strength > 1 kgw	Pass	HSE	

VSWR	2G4 ISM (2.40GHz-2.483GHz)			
	S/N	2.40GHz	2.45GHz	2.50GHz
Before Thermal Shock Test	01	1.1218	1.1227	1.1244
	02	1.1352	1.1312	1.1364
	03	1.3122	1.1532	1.2123
After Thermal Shock Test	01	1.5623	1.4313	1.6325
	02	1.5325	1.3256	1.5421
	03	1.4562	1.4121	1.5213

VSWR	Bluetooth Antenna			
	2G4 ISM (2.40GHz-2.483GHz)			
	S/N	2.40GHz	2.45GHz	2.50GHz
Before Vibration Test	01	1.21	1.23	1.22
	02	1.25	1.26	1.28
	03	1.13	1.11	1.16
After Vibration Test	01	1.46	1.35	1.50
	02	1.48	1.45	1.55
	03	1.54	1.50	1.61

VSWR	Bluetooth Antenna (Right)			
	2G4 ISM (2.40GHz-2.483GHz)			
	S/N	2.40GHz	2.45GHz	2.50GHz
Before Salt Spray Test	01	1.25	1.23	1.26
	02	1.16	1.12	1.13
	03	1.19	1.17	1.18
After Salt Spray Test	01	1.50	1.44	1.48
	02	1.45	1.46	1.42
	03	1.50	1.49	1.53

Main Antenna (Right)						
Number	1	2	3	Max	Min	Avg
Soldering Pull strength (Unit:kg)	3.985	3.957	3.967	3.985	3.957	3.696

5. Package

See the attached drawing.

HannStar	類別	包裝作業標準	適用客戶	國內一般客戶	適用產品	Wireless Lan	包裝類別	Tray 盤

編　　號: P899-T007
制定日期: 90.07.10
修訂日期:
版　　次: 00
頁　　次: 01

包裝作業說明:

一.成品包裝方式:

每個TRAY盤共裝15PCS成品,每小格放3PCS,方向如圖(一)所示.

每疊20個TRAY盤,最上層用一個空TRAY做上蓋每疊成品300PCS,如圖(二)所示.

再用膠帶將TRAY 盤小邊纏繞一圈,以防 脫落,如圖(三)所示.

二.紙箱包裝方式:

裝箱前,先放一片隔板在箱底,放入成品二疊 中間須以隔板分開,如圖示(四)所示,完成後封箱前再放一片隔板.蓋上箱子用膠帶封合,在側 面貼上標籤紙一張如有零 箱部分,出貨 時須以緩衝 物填滿.

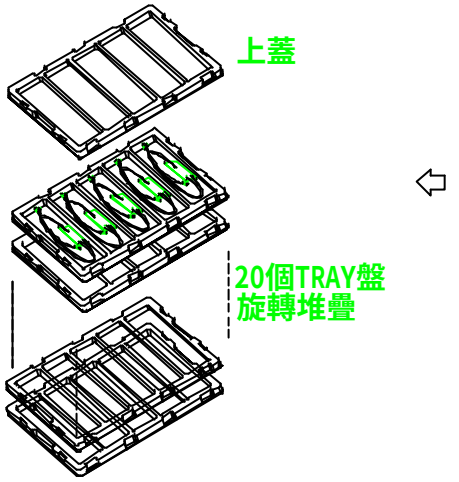


圖 二

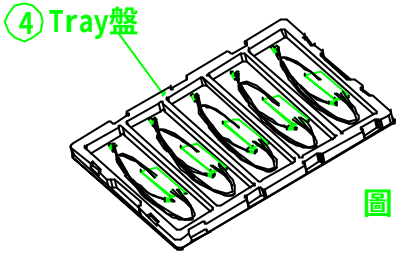


圖 一

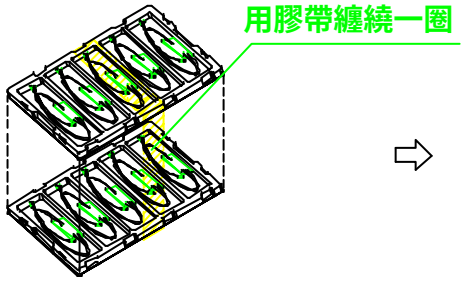


圖 三

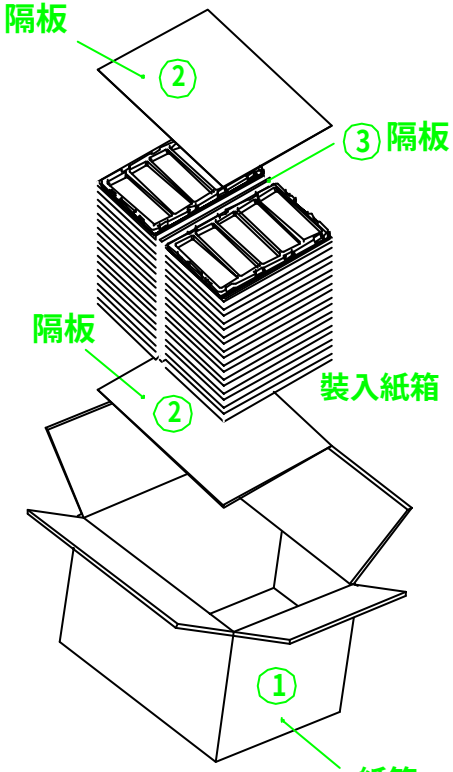


圖 四

備註:

注意事項:

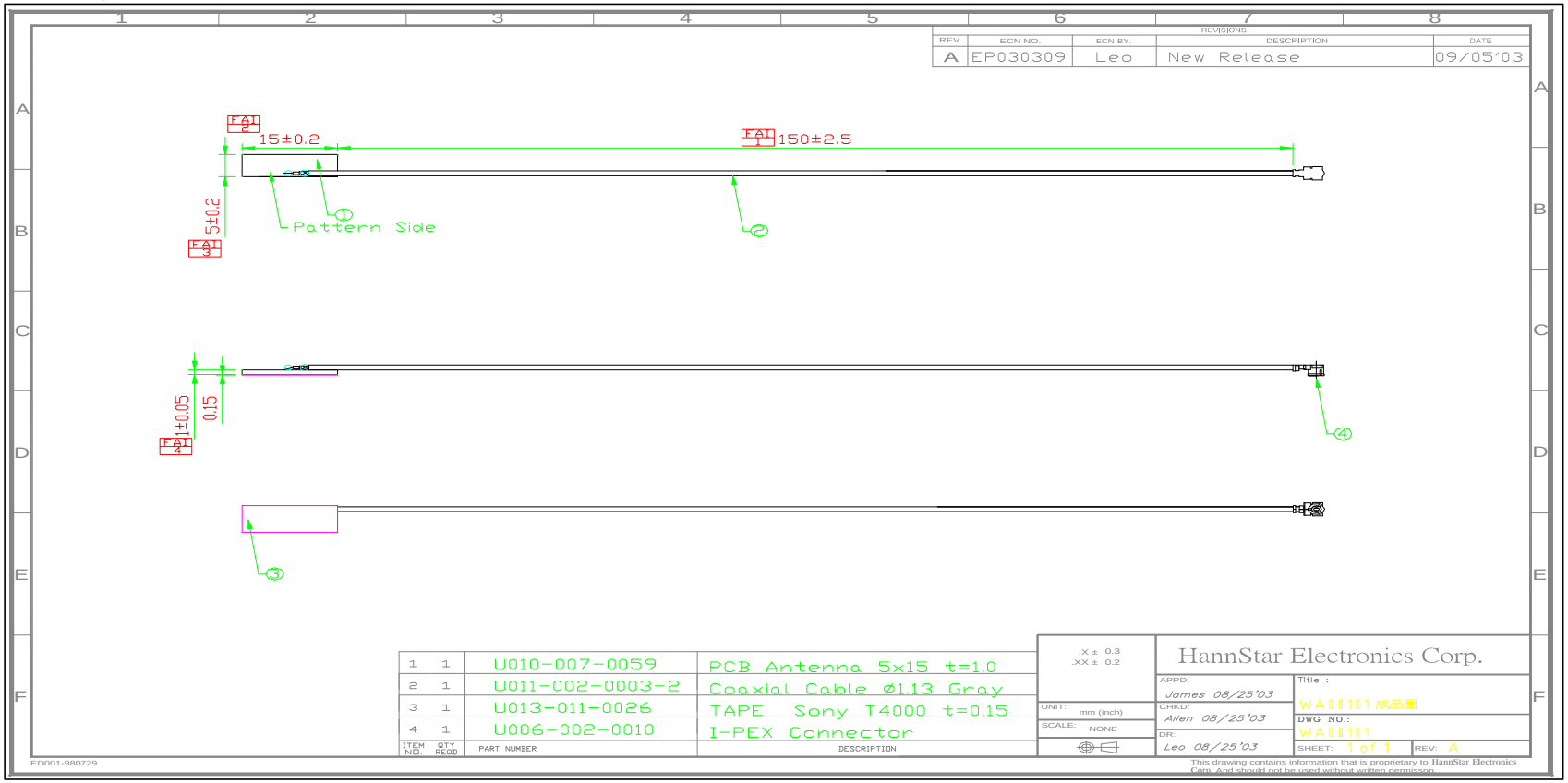
1. 包裝前請確認成品無夾帶綿絮或污染物.
2. 包裝時不得有毀損以及污染成品之情形發生.
3. 包裝時必須注意成品與包材之方向性,不得有方向錯誤之情形發生.
4. TRAY是否有變形破裂情況發生.
5. TRAY和TRAY結合是否有過緊或鬆脫情況發生.

核　定:
覆　核:
制　定: 蔡麗文

FAI DATA SHEET

Drawing Number: **25.90117.001**					Supplier : **HSE**							Date: **2003/5/16**						
Part Description: **Yuhina Antenna**					Inspected by: **Leo** Manufacturing Site:HSE							Gauge#/Unit: **游標卡尺** **(mm)**						
Revision: **A**					Approved by: **Allen Lin** Production Line:							Gauge/Unit **尺** **(mm)**						
DRAWING SPECIFICATIONS					**INSPECTION RESULTS**							**INSPECTION ANALYSIS**						
					Sample Number			Deviation from Nominal				% Tolerance		Acc/Rej				
ITEM	LOCATION	NOMINAL	+TOL	-TOL	1	2	3	1	2	3	Mean	UPPER	LOWER	HIGH	LOW	Inspection Method	Precision of Gauge	
	1	**150.0**	2.5	2.5	151.0	150.0	149.0	-0.05	0.05	0	***150.00***	**40%**	**40%**			**尺**	1mm	
	2	**15.0**	0.2	0.2	15.1	14.9	15.100	-0.1	0	-0.02	***15.03***	**50%**	**50%**			**游標卡尺**	0.01mm	
	3	**5.0**	0.2	0.2	5.12	5.11	4.99	-1	1	1	***5.07***	**60%**	**5%**			**游標卡尺**	0.01mm	
	4	**1.0**	0.05	0.05	**0.97**	0.98	0.98	***0.01***	***-0.02***	***-0.05***	***1.0***	**0%**	**60%**			**游標卡尺**	0.01mm	

Drawing



7. VSWR CPK

Cpk of Antenna

Part Number: 25.90019.001

Item	Spec.	Torance +	Torance -	Measurement Value 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VSWR (b)	2.00	0	0	1.32	1.42	1.36	1.52	1.42	1.48	1.36	1.54	1.63	1.57	1.36	1.29	1.38	1.54	1.27	1.43	1.55	1.38	1.37	1.25	1.31	1.45	1.46	1.43	1.45
				26	27	28	29	30	31	32	33	34	35															
				1.49	1.39	1.33	1.48	1.47																				
組界			5	1.25	1.33	1.40	1.48	1.55	1.63	1.71																		
				26	27	28	29	30	31	32	33	34	35															
組界																												
				26	27	28	29	30	31	32	33	34	35															
組界																												
組界																												

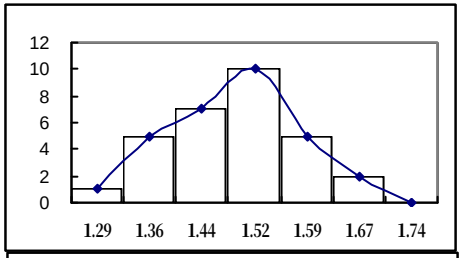
Engineering Specification					
工程尺寸		VSWR (b			
工程規格	Product spec	1.5000	1.7500		
正公差	Tolerence	0.5000	0.7500		
負公差	Tolerence	0.5000	0.7500		
工程上限	USL	2	2.5		
工程下限	LSL	1	1		
Actual Data					
量測尺寸		VSWR (b			
平均數	X bar	1.4233			
標準差	Sigma	0.0940			
中間值	Median	1.4250			
眾數	Mode	1.3600			
最大值	Max	1.6300			
最小值	Min	1.2500			
UCL 3個標準差	1 Sigma	1.5173			
	2 Sigma	1.6113			
	3 Sigma	1.7052			
LCL 3個標準差	1 Sigma	1.3294			
	2 Sigma	1.2354			
	3 Sigma	1.1414			
製程能力	雙邊CP	1.77			
	單邊CPL	1.50			
	單邊CPU	2.05			
	單邊CP	1.50			
	Ca	0.00			
	Cpk	1.77			

VSWR		B		C	
組別	次數	組別	次數	組別	次數
1.29	1	######	0	#####	0
1.36	5	######	0	#####	0
1.44	7	######	0	#####	0
1.52	10	######	0	#####	0
1.59	5	######	0	#####	0
1.67	2	######	0	#####	0
1.74	0	######	0	#####	0

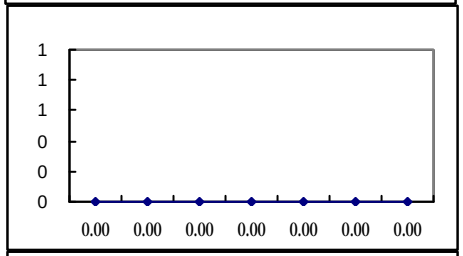
Remark:

Gauge:

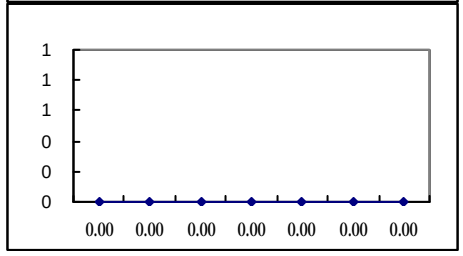
VSWR (b)



VSWR (a)



Dimension C



HannStar
瀚宇電子

● Cable – Hitachi

No. ; SP01-23-47235 Rev.1

Date ; Nov. 16, 2001

SPECIFICATION

FOR

UL RECOGNIZED FEP INSULATED HIGH FREQUENCY COAXIAL CABLE

[P/N ;UL1745]

Quantity

Your Ref. No.

Our Ref. No.

Signed by F. Shimizu

Fumio Shimizu

Manager

Electronic Wire & Cable design department
Hitaka works, Electronic Supplies Group

Hitachi Cable, Ltd.

Issue and revision record

Rev. No.	Issue date	Item	Prepared by	Reviewed by	Approved by
—	Nov. 8, 2001	Initial issue	H. Tanaka	H.Ito	F. Shimizu
1	Nov. 16, 2001	Revised Point 【UL1745-SB CX-50 1×32AWG(7/0.08)D=1.13】 ・Change Diameter of Insulation 0.66 → 0.68 ・Outer conductor material is Changed tinned annealed copper wire ↓ Silver planted annealed copper wire ・Construction of Outer conductor 5×16 → 4×16 ・Change Diameter of Jacket $1.13\pm0.1 \rightarrow 1.13^{+0.08}_{-0.05}$ ・Nominal attenuation is changed 【UL1745-SB CX-50 1×32AWG(7/0.08)D=1.32】 ・Change Diameter of Insulation 0.66 → 0.68 ・Construction of Outer conductor 5×16 → 4×16 ・Nominal attenuation is changed	N. Ono	H.Ito	F. Shimizu

1. Scope

This specification covers UL recognized Fluoroethylene-propylene insulated high frequency coaxial cable.
[UL1745 : 90℃、30V]
Use : Internal wiring of Class 2 Circuits of Electronic Equipment.

2. Construction and Properties

HCL P/N	HCLI-TPE P/N	Construction and Properties
UL1745-SB CX-50 1×30AWG(1/0.26)D=1.25	RFX50-SS30-125	Table 1
UL1745-SB CX-50 1×30AWG(7/0.102)D=1.48	RFX50-SS30-148	
UL1745-SB CX-50 1×32AWG(7/0.08)D=1.13	RFX50-SS32-113	Table 2
UL1745-SB CX-50 1×32AWG(7/0.08)D=1.32	RFX50-SS32-132	
UL1745-DSB CX-50 1×32AWG(7/0.08)D=1.32	RFX50-DS32-132	
UL1745-SB CX-50 1×34AWG(7/0.064)D=0.98	RFX50-SS34-098	Table 3
UL1745-SB CX-50 1×36AWG(7/0.05)D=0.81	RFX50-SS36-081	

3.Marking

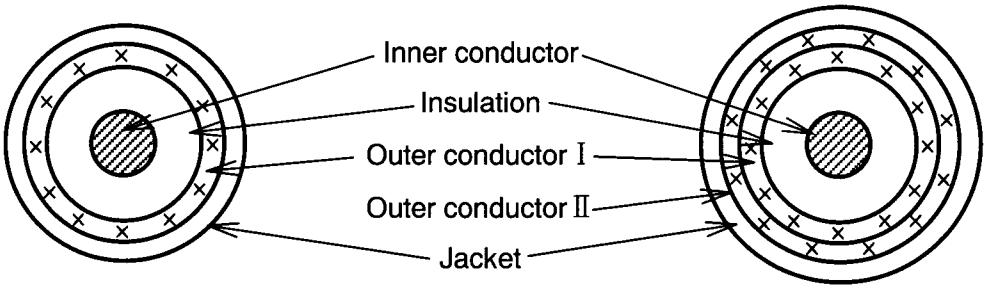
3.1 Marking on the wire

No marking on the wires.

3.2 Marking on the tag attached to reel

Each reel shall be tagged to show the following information with UL stamp.

(1) UL Style
(2) Conductor size
(3) No. of conductor
(4) Color
(5) Lot No.
(6) Length
(7) Use
(8) File No.
(9) Rating temperature
(10) Rating voltage
(11) Date of manufacture
(12) Insulation thickness
(13) Name of manufacture



Single braid TYPE　　Double braid TYPE

Fig.1 Cross-section of cable

Table 1 Construction and Properties (30AWG)

Item		Unit	Specified Value	
HCL P/N		—	UL1745-SB CX-50 1×30AWG(1/0.26)D=1.25	UL1745-SB CX-50 1×30AWG(7/0.102)D=1.48
HCLI-TPE P/N		—	RFX50-SS30-125	RFX50-SS30-148
Inner Conductor	Material	—	silver plated copper clad steel wire	
	AWG size	—	30	
	Stranding	No./mm	1/0.26	7/0.102
	Diameter	mm	0.26±0.008	0.30±0.03
	Number	—	1	
Insulation	Material	—	Fluoroethylene-propylene(FEP)	
	Thickness	mm	Nom. 0.27	Nom. 0.27
	Diameter	mm	0.80±0.05	0.84±0.06
	Color	—	natural	
Outer Conductor I	Material	—	Tinned annealed copper wire	silver plated annealed copper wire
	Form	—	braid	
	Strand	mm	0.05	0.08
	Construction	—	6×16	3×16
	Coverage	%	Min. 90	
	Diameter	mm	Nom. 1.05	1.24±0.07
Jacket	Material	—	Fluoroethylene-propylene(FEP)	Ethylene-tetrafluoroethylene(ETFE)
	Thickness	mm	Nom. 0.10	0.12
	Diameter	mm	1.25±0.13	1.48±0.08
	Color	—	Black, White, Red, Green, Yellow, Brown, Blue, Orange, Gray, Violet	
Unit length		m	305	100
Package		—	paper reel	paper reel
Approx. mass		kg/km	4.0	5.1
Inner Conductor resistance at 20℃		Ω/km	Max. 844	Max. 832
Dielectric strength*		—	A.C. 1000V for 1minute	
Insulation resistance* at 20℃		MΩ-km	Min. 1000	
Characteristic impedance by TDR		Ω	50±2	
Capacitance * at 1kHz		pF/m	Nom. 100	95±10
Nominal attenuation	at 1GHz	dB/m	1.56	1.8
	at 2GHz	dB/m	2.3	2.5
	at 3GHz	dB/m	2.9	3.1
	at 4GHz	dB/m	3.5	4.1
	at 5GHz	dB/m	4.5	4.6
	at 6GHz	dB/m	5.2	5.3

* Between inner conductor and outer conductor

Table 2 Construction and Properties (32AWG)

Item		Unit	Specified Value		
HCL P/N		—	UL1745-SB CX-50 1×32AWG(7/0.08)D=1.13	UL1745-SB CX-50 1×32AWG(7/0.08)D=1.32	UL1745-DSB CX-50 1×32AWG(7/0.08)D=1.32
HCLI-TPE P/N		—	RFX50-SS32-113	RFX50-SS32-132	RFX50-DS32-132
Inner Conductor	Material	—	silver plated annealed copper wire		
	AWG size	—	32		
	Stranding	No./mm	7/0.08		
	Diameter	mm	0.24		
	Number	—	1		
Insulation	Material	—	Fluoroethylene-propylene(FEP)		
	Thickness	mm	Nom. 0.21		
	Diameter	mm	$0.68^{+0.04}_{-0.02}$		
	Color	—	Natural		
Outer Conductor Ⅰ	Material	—	Silver plated annealed copper wire		Tinned annealed copper wire
	Form	—	Braid		
	Strand	mm	0.05		
	Construction	—	4×16		
	Coverage	%	Min. 90		
	Diameter	mm	Nom. 0.88		
Outer Conductor Ⅱ	Material	—	—		Tinned annealed copper wire
	Form	—	—		braid
	Strand	mm	—		0.05
	Construction	—	—		6×16
	Coverage	%	—		Min. 90
	Diameter	mm	—		Nom. 1.12
Jacket	Material	—	Fluoroethylene-propylene(FEP)		
	Thickness	mm	Nom. 0.125	Nom. 0.22	Nom. 0.10
	Diameter	mm	$1.13^{+0.08}_{-0.05}$	1.32 (Max. 1.45)	1.32±0.1
	Color	—	Black, White, Red, Green, Yellow, Brown, Blue, Orange, Gray, Violet		
Unit length		m	305		200
Package		—	paper reel		Coil
Approx. mass		kg/km	4.0		5.0
Inner Conductor resistance at 20℃		Ω/km	Max. 597		
Dielectric strength*		—	A.C. 500V for 1minute		
Insulation resistance* at 20℃		MΩ-km	Min. 1000		
Characteristic impedance by TDR		Ω	50±2		
Capacitance * at 1kHz		pF/m	Nom. 95		
Nominal attenuation	at 1GHz	dB/m	2.0		
	at 2GHz	dB/m	2.9		
	at 3GHz	dB/m	3.6		
	at 4GHz	dB/m	4.2		
	at 5GHz	dB/m	4.7		
	at 6GHz	dB/m	5.2		

* Between inner conductor and outer conductor

Table 3 Construction and Properties (34AWG, 36AWG)

Item		Unit	Specified Value	
HCL P/N		—	UL1745-SB CX-50 1×34AWG(7/0.064)D=0.98	UL1745-SB CX-50 1×36AWG(7/0.05)D=0.81
HCLI-TPE P/N		—	RFX50-SS34-098	RFX50-SS36-081
Inner Conductor	Material	—	silver plated annealed copper wire	
	AWG size	—	34	36
	Stranding	No./mm	7/0.064	7./0.05
	Diameter	mm	0.192	0.15
	Number	—	1	
Insulation	Material	—	Fluoroethylene-propylene(FEP)	
	Thickness	mm	Nom. 0.169	Nom. 0.125
	Diameter	mm	0.53	$0.4^{+0.04}_{-0.02}$
	Color	—	natural	
Outer Conductor I	Material	—	Tinned annealed copper wire	silver plated annealed copper wire
	Form	—	braid	
	Strand	mm	0.05	
	Construction	—	4×16	3×16
	Coverage	%	Min. 90	
	Diameter	mm	Nom. 0.78	Nom. 0.65
Jacket	Material	—	Fluoroethylene-propylene(FEP)	Perfluoroalkoxy(PFA)
	Thickness	mm	Nom. 0.10	Nom. 0.08
	Diameter	mm	0.98 (Max. 1.1)	$0.81^{+0.04}_{-0.02}$
	Color	—	Black, White, Red, Green, Yellow, Brown, Blue, Orange, Gray, Violet	
Unit length		m	305	305
Package		—	paper reel	paper reel
Approx. mass		kg/km	2.4	1.6
Inner Conductor resistance at 20℃		Ω/km	Max. 868	Max. 1400
Dielectric strength*		—	A.C. 500V for 1minute	A.C. 1000V for 1minute
Insulation resistance* at 20℃		MΩ-km	Min. 1500	Min. 1000
Characteristic impedance by TDR		Ω	50±5	50±3
Capacitance * at 1kHz		pF/m	Nom. 100	Nom. 100
Nominal attenuation	at 1GHz	dB/m	2.6	3.1
	at 2GHz	dB/m	3.9	4.7
	at 3GHz	dB/m	5.0	5.8
	at 4GHz	dB/m	6.1	6.9
	at 5GHz	dB/m	7.0	8.2
	at 6GHz	dB/m	7.9	9.4

* Between inner conductor and outer conductor

HannStar
瀚宇電子

● I-PEX Connector

PRODUCT SPECIFICATION
製 品 規 格

No. PRS-1180

MHF series micro coaxial connector
(at 6GHz)

Qualification Test Report No. TR-1037

REV.	ECN	BY	DATE	APP.	Prepared by	Reviewed by	Approved by
2	S2031	K.O	May/17/'02	K.K	K.Ohbayashi Nov/16/'01	E.Kawabe Nov/20/'01	K.Katabuchi Nov/21/'01
1	S1063	K.O	Dec/25/'01	K.K			
0	S1055	K.O	Nov/16/'01				
REVISION RECORD							

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1. Scope ／ 序言

MHF series micro coaxial connector is a wire to board connector for AWG#32 coaxial cable .
MHF series micro coaxial connector は、AWG＃32同軸ケーブルの基板対ワイヤーコネクタである。

2. Objectives ／ 目的

This specification covers the requirements for product performance and test methods of MHF series microcoaxial connector
本規格は、MHF series micro coaxial connector の性能と試験条件について規定する。

3. Part No. , construction , material and finish ／ 構成、材料及び仕上げ

(1) Part No. Plug : 20278-101R-13, 20278-111R-13 Receptacle : 20279-001E-01
(2) Construction, material and finish of the connector are covered as each drawings.
構成、材料及び仕上げは、各図面に指定されている通りとする。

4. Applicable cable ／ 適合ケーブル

4-1 Part No. 20278-101R-13, 20278-111R-13

(1) Description

Inner conductor : AWG#32(7/0.08)
Silver plating annealed copper wire or silver plating tin-copper alloy
Dielectric core : Fluoro-plastics , diameter 0.68(+0.04,-0.02)mm , nominal thickness 0.22mm
Outer conductor : 16/4/0.05 , nominal diameter 0.93mm , silver plating annealed copper wire
Jacket : Fluoro-plastics , diameter 1.13(+0.08,-0.05)mm , nominal thickness 0.1mm

(2) Requirements

Characteristic impedance : 50(+2,-2)ohm by TDR method (raise time 40ps)
Nominal capacitance: 97 pF/m
Conductor resistance of inner conductor at 293K (20℃) : 520 ohm/km MAX.
Insulation resistance : 1500 mega-ohm.km MIN.
Dielectric withstand voltage : no breakdown at AC1000V for 1 minutes.

(1) 構成

中心導体 ： AWG＃32(7／0．08),銀メッキ軟銅線または銀メッキすず入り銅線
誘電体 ： フッ素樹脂,外径0．68(＋0．04,－0．02),標準厚さ0．22mm
外部導体 ： 16／4／0．05,標準外径0．93mm, 銀メッキ軟銅線
ジャケット ： フッ素樹脂,外径1．13(＋0．08,－0．05)mm, 標準厚さ0．1mm

(2) 仕様

特性インピーダンス ： 50±2Ω (TDR,ライズタイム40ps)
標準静電容量 ： 97pF／m
293K(20℃)時の中心導体導体抵抗 ： 520Ω ／km以下
絶縁抵抗 ： 1500MΩ ・km以上
耐電圧 ： AC1000V・1分間にて絶縁破壊の無い事

5. Ratings ／ 定格

(1) Rated voltage / 電圧 ： AC60Vrms
(2) Nominal characteristic impedance／公称特性インピーダンス ： 50Ω
(3) Frequency / 周波数 ： DC～6GHz
(4) VSWR ： 1．3 MAX. DC～3GHz, 1．5 MAX. 3～6GHz
(5) Service Temperature / 使用温度範囲 ： 233～363K(－40～＋90℃)

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6. Test methods and performance ／ 試験及び性能

6-1 Test condition / 試験条件

Unless otherwise specified, all tests and measurements shall be performed under the following conditions in accordance with MIL-STD-202

全ての測定と試験は、MIL-STD-202 に基づき以下の条件で行う。.

Temperature / 温度 ： 288～308K （15～35℃）

Humidity / 湿度 ： 45～75%RH

6-2 Sample quantity / 試料数

(1) Insulation resistance / 絶縁抵抗 ： 10pcs.
(2) Dielectric withstanding voltage / 耐電圧 ： 10pcs.
(3) VSWR ： 5pcs.
(4) Unmating force / 抜去力 ： 10pcs
(5) Durability / 耐久性 ： 10pcs.
(6) Cable retention force / ケーブル保持力 ： 10pcs.
(7) Vibration / 振動 ： 10pcs.
(8) Shock / 衝撃 ： 10pcs.
(9) Thermal shock / 温度サイクル ： 10pcs.
(10) Humidity / 湿度 ： 10pcs.
(11) Salt water spray / 塩水噴霧 ： 10pcs.
(12) Solderability / 半田付け性 ： 10pcs.
(13) Reflow soldering heat resistance / 半田耐熱性 ： 10pcs.

6-3-1 Electrical / 電気的性能

(1) Contact Resistance / 接触抵抗

A.Testing:Solder the receptacle connector to the test board and mate the plug connector together, then measure the contact resistance as shown in Fig.1 by the four terminal method. Apply the low level condition in accordance with MIL-STD-202, Method 307.

Open circuit voltage : 20mV MAX
Circuit current : 10mA MAX. (DC or AC1kHz)
Contact resistance of inner contact : <resistance of A-E> - <resistance of B-E>
Contact resistance of ground contact : <resistance of A-D> - <resistance of B-D>

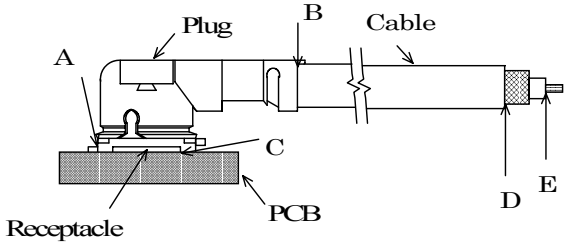

Fig.1

B.Requirements :

Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX.
Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX.

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A.試験法:テスト基板にリセプタクルコネクタを半田付けし、プラグコネクタと嵌合させ、Fig. 1のように4端子法にて下記の条件で測定する。 MIL-STD-202 試験法 307 に準拠。
開回路電圧: 20mV以下
試験電流 : 10mA(DCもしくはAC1kHz)
中心導体 : ＜A－E間の電気抵抗＞－＜B－E間の電気抵抗＞
外部導体 : ＜A－D間の電気抵抗＞－＜B－D間の電気抵抗＞
B.必要条件: 中心導体 初期 20mΩ 以下, 試験後 25mΩ 以下
外部導体 初期 10mΩ 以下, 試験後 15mΩ 以下

(2) Insulation resistance / 絶縁抵抗
A. Testing : Mate the plug and receptacle connector together, then apply DC 100 V between the inner contact and the ground contact in accordance with MIL-STD-202, Method 302.
B.Requirements : Initial 500 Mohm MIN. after testing 100 Mohm MIN.
A.試験法: リセプタクル及びプラグコネクタを互いに嵌合させ、中心導体と外部導体の間に DC 100Vを印加し、測定する。MIL-STD-202 試験法 302 に準拠。
B.必要条件: 初期 500MΩ 以上 試験後 100MΩ 以上

(3) Dielectric withstanding voltage / 耐電圧
A. Testing : Mate the receptacle and plug connector together, then apply AC 200 Vrms between the inner contact and the ground contact for a minute in accordance with MIL-STD-202, Method 301.
B.Requirements : No creeping discharge, flashover, nor insulator breakdown shall occur.
A.試験法: リセプタクル及びプラグコネクタを互いに嵌合させ、中心導体と外部導体の間にAC200V(実効値)を一分間印加する。 MIL-STD-202 試験法 301 に準拠。
B.必要条件: 沿面放電、空中放電、絶縁破壊等の異常のないこと。

(4) VSWR
A. Testing : Measure the VSWR as shown in Fig.3 by the network analyzer.
Frequency :100M~6GHz

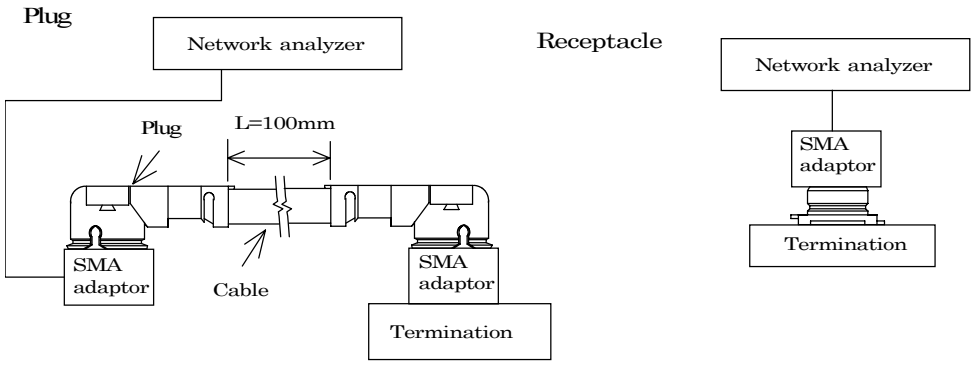

Fig.3

B.Requirements : Plug1.3 MAX at 0.1~3GHz, . 1.5 MAX at 3~6GHz
Receptacle 1.3 MAX at 0.1~3GHz, . 1.4 MAX at 3~6GHz
A.試験法: ネットワークアナライザーにて Fig.3 のようにVSWRを測定する。
周波数 : 100M～6GHz
B.必要条件: Plug 1．3以下 0．1～3GHz 1．5以下 3～6GHz
Receptacle 1．3以下 0．1～3GHz 1．4以下 3～6GHz

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(5) Insertion loss / インサーションロス

A. Testing : Measure the insertion loss as shown in Fig.5 by the network analyzer.
Frequency :100M~6GHz

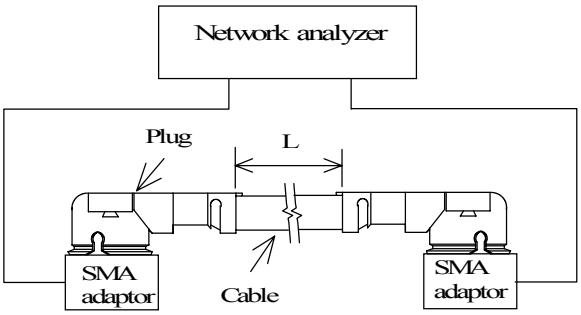

Fig.5

B.Requirements At 0.1~3GHz L=100mm : –1.0dB MIN. L=200mm : –1.4dB MIN.
L=300mm : –1.8dB MIN. L=400mm : –2.1 dB MIN. L=500mm : –2.4 dB MIN.
At 3~6GHz L=100mm : –1.6dB MIN. L=200mm : –2.1dB MIN.
L=300mm : –2.6dB MIN. L=400mm : –3.0 dB MIN. L=500mm : –3.4 dB MIN.

A.試験法: ネットワークアナライザーにて Fig.5のようにインサーションロスを測定する。
周波数 : 100M～6GHz

B.必要条件: 周波数100M～3GHz L=100mm : –1.0dB MIN. L=200mm : –1.4dB MIN.
L=300mm : –1.8dB MIN. L=400mm : –2.1 dB MIN. L=500mm : –2.4 dB MIN.
周波数3～6GHz L=100mm : –1.6dB MIN. L=200mm : –2.1dB MIN.
L=300mm : –2.6dB MIN. L=400mm : –3.0 dB MIN. L=500mm : –3.4 dB MIN.

6-3-2 Mechanical / 機械的性能

(1)Unmating force / 挿抜力

A. Testing : Unmate the receptacle connector (soldered to the test board) and plug at a speed 25±3mm/minutes along the mating by the push-on/pull-off machine .

B.Requirements :

Total unmating force : Initial 5N MIN. after 30 cycles 3N MIN.
Unmating force of inner contact : Initial 0.15N MIN. after 30 cycles 0.1N MIN

A.試験法:挿抜試験機を用いて、基板に半田付けしたリセプタクルとプラグを嵌合軸と平行に毎分25±3mmの速度で挿抜する。

B.必要条件:
初回抜去力: 5N以上 ,30回後抜去力 3N以上
中心導体 :初回抜去力 0．15N以上 ,30回後抜去力 0．1N以上

(2) Durability / 耐久性

A. Testing : Mate and umate the receptacle connector (soldered to the test board) and plug 30 cycles at a speed 25±3mm/minutes along the mating by the push-on/pull-off machine .

B.Requirements :
Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX.
Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX.

A.試験法:挿抜試験機を用いて、基板に半田付けしたリセプタクルとプラグを嵌合軸と平行に毎分25±3mmの速度で30回挿抜する。

B.必要条件 中心導体接触抵抗 : 初期 20mΩ 以下, 試験後 25mΩ 以下
外部導体接触抵抗 : 初期 10mΩ 以下, 試験後 15mΩ 以下

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(3) Cable retention force / ケーブル保持力

A. Testing : Apply force on the cable as shown in Fig.2.

During the testing, run 100mA DC to check electrical discontinuity

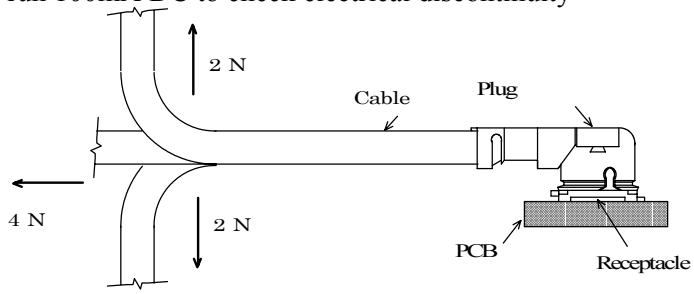

Fig.2

B.Requirements

Appearance : Looseness between the parts, chipping, breakage or other abnormality shall not occur.
Electrical discontinuity : No electrical discontinuity grater than 1 micro-sec. shall occur.
Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX.
Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX.

A.試験法:Fig. 2のようにケーブルに力を加える。尚、試験中にDC100mAの電流を流して電気的瞬断を確認する。

B.必要条件 外観 : 部品のゆるみ、欠け、割れ、その他外観上の異常の無いこと。
電流瞬断 : 試験中、1 マイクロ秒を超える電気的瞬断の無いこと。
中心導体接触抵抗 : 初期 20mΩ 以下, 試験後 25mΩ 以下
外部導体接触抵抗 : 初期 10mΩ 以下, 試験後 15mΩ 以下

(4) Vibration / 振動

A. Testing : Apply the following vibration to the mating connector .

During the testing, run 100mA DC to check electrical discontinuity.
Frequency : 10Hz → 100Hz → 10Hz / approx 15 minutes.
Half amplitude ,Peak value of acceleration: 1.5mm or 59m/s^2 (6G)
Directions , cycle : 3 mutually perpendicular direction ,
5 cycles(approx 75min)about each direction

B.Requirements

Appearance : Looseness between the parts, chipping, breakage or other abnormality shall not occur.
Electrical discontinuity : No electrical discontinuity grater than 1micro-sec. shall occur.
Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX.
Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX.

A.試験法:嵌合状態のコネクタを、下記の振動を加える。尚、試験中にDC100mAの電流を流して電気的瞬断を確認する。
周波数 :10Hz→100Hz→10Hz ／ 約15分間
片振幅,加速度:1．5mm or 59m／s^2（6G）
方向,サイクル:3 つの互いに直角な方向について各5サイクル(約75分)実施

B.必要条件 外観 : 部品のゆるみ、欠け、割れ、その他外観上の異常の無いこと。
電流瞬断 : 試験中、1 マイクロ秒を超える電気的瞬断の無いこと。
中心導体接触抵抗 : 初期 20mΩ 以下, 試験後 25mΩ 以下
外部導体接触抵抗 : 初期 10mΩ 以下, 試験後 15mΩ 以下

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(5) Shock / 衝撃

A. Testing : Apply the following vibration to the mating connector in accordance with MIL-STD-202, Method 213, Condition B. During the testing, run 100mA DC to check electrical discontinuity.

Peak value of acceleration: 735m/s^2 (75G)
Duration : 11msec
Wave Form : half sinusoidal
Directions , cycle : 6 mutually perpendicular direction , 3 cycles about each direction

B.Requirements

Appearance : Looseness between the parts, chipping, breakage or other abnormality shall not occur.
Electrical discontinuity : No electrical discontinuity grater than 1 micro-sec. shall occur.
Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX.
Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX.

A.試験法:嵌合状態のコネクタを、衝撃試験機に取り付け、下記の衝撃を加える。尚、試験中にDC100mAの電流を流して電気的瞬断を確認する。MIN-STD-202 試験法 213 試験条件 B に準拠。

最大加速度:735m／s^2(75G)
標準持続時間:11msec.
波形: 半波正弦波
方向:直交する6方向、各3回

B.必要条件 外観 : 部品のゆるみ、欠け、割れ、その他外観上の異常の無いこと。
電流瞬断 : 試験中、1 マイクロ秒を超える電気的瞬断の無いこと。
中心導体接触抵抗 : 初期 20mΩ 以下, 試験後 25mΩ 以下
外部導体接触抵抗 : 初期 10mΩ 以下, 試験後 15mΩ 以下

6-3-3 Environmental / 耐環境性

(1) Thermal shock/ 温度サイクル

A. Testing : Apply the following environment to the mating connector .

Temperature ,duration
:233K/30minutes→278~308K/5minutes MAX.→363K/30minutes→278~308K/5minutes MAX.
(-40℃) (5~35℃) (90℃) (5~35℃)
No. of cycles : 5 cycles

B.Requirements

Appearance : Looseness between the parts, chipping, breakage or other abnormality shall not occur.
Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX.
Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX.
Insulation resistance : initial 500 mega-ohm MIN. after testing 100 mega-ohm MIN.

A.試験法:嵌合状態のコネクタを、下記の雰囲気に放置する。

1サイクルの条件
:233K／30分→278～308K／5分以下→363K／30分→278～308K／5分以下
(－40℃) (5～35℃) (90℃) (5～35℃)
実施サイクル :5サイクル

B.必要条件 外観 : 部品のゆるみ、欠け、割れ、その他外観上の異常の無いこと。
中心導体接触抵抗 : 初期 20mΩ 以下, 試験後 25mΩ 以下
外部導体接触抵抗 : 初期 10mΩ 以下, 試験後 15mΩ 以下
絶縁抵抗 : 初期 500MΩ 以上 試験後 100MΩ 以上

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(2) Humidity / 湿度

A. Testing : Apply the following environment to the mating connector in accordance with MIL-STD-202, Method 103, Condition B .
Temperature : 313±2 K (40±2℃)
Humidity : 90～95%RH
Duration : 96 hours

B.Requirements
Appearance : Looseness between the parts, chipping, breakage or other abnormality shall not occur.
Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX.
Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX.
Insulation resistance : initial 500 mega-ohm MIN. after testing 100 mega-ohm MIN.

A.試験法:嵌合状態のコネクタを、下記の雰囲気に放置する。MIL-STD-202 試験法 103 条件 B に準拠。
温度:313±2K（40±2℃）
湿度:90～95%RH
時間:96時間

B.必要条件 外観 : 部品のゆるみ、欠け、割れ、その他外観上の異常の無いこと。
中心導体接触抵抗 : 初期 20mΩ 以下, 試験後 25mΩ 以下
外部導体接触抵抗 : 初期 10mΩ 以下, 試験後 15mΩ 以下
絶縁抵抗 : 初期 500MΩ 以上 試験後 100MΩ 以上

(3) Salt water spray / 塩水噴霧

A. Testing : Apply the following environment to the mating connector in accordance with MIL-STD-202, Method 101, Condition B.
Temperature : 308±2 K (35±2℃)
Salt water density by weight : 5±1%
Duration : 48 hours

B.Requirements : Appearance no abnormality adversely affecting the performance shall occur.

A.試験法:嵌合状態のコネクタを、下記の雰囲気に放置する。
温度 :308±2K（35±2℃）
塩水濃度:5±1%（重量比）
時間 :48時間

B.必要条件 : 外観 著しい腐食の無い事。

6-3-4 Solder / 半田付け関連

(1) Solderability / 半田付け性

A. Testing : Dip the solder tine of the contact in the solder bath at 518±5(245±5℃) for 5±0.5 sec. After immersing the tine in the flux of RMA or R type for 5 to 10 seconds in accordance with MIL-STD-202, Method 208.

B.Requirements : More than 95% of the dipped surface shall be evenly wet.

A.試験法:コンタクトの半田付け部を518±5K（245±5℃）の半田漕内に5±0．5秒浸す。フラックスは、RMA 又は R 型を使用し 5～10 秒間浸すものとする。MIL-STD-202, 試験法 208 に準拠。

B.必要条件:浸した面積の 95%以上に半田がむらなく付着すること。

(2) Reflow soldering heat resistance / 半田耐熱性

A. Testing : Put on the receptacle connector to PCB , apply the heat 2 cycles as shown in Fig. 4

B.Requirements : Appearance no abnormality adversely affecting the performance shall occur.

A.試験法:基板にリセプタクルコネクタを置き、Fig．4の条件で2回リフローを行う。

B.必要条件:機能を損なう変形及び欠陥の無い事。

DOCUMENT CLASSIFICATION	TITLE	No.
Product Specification 製品規格	MHF series micro coaxial connector	PRS-1180

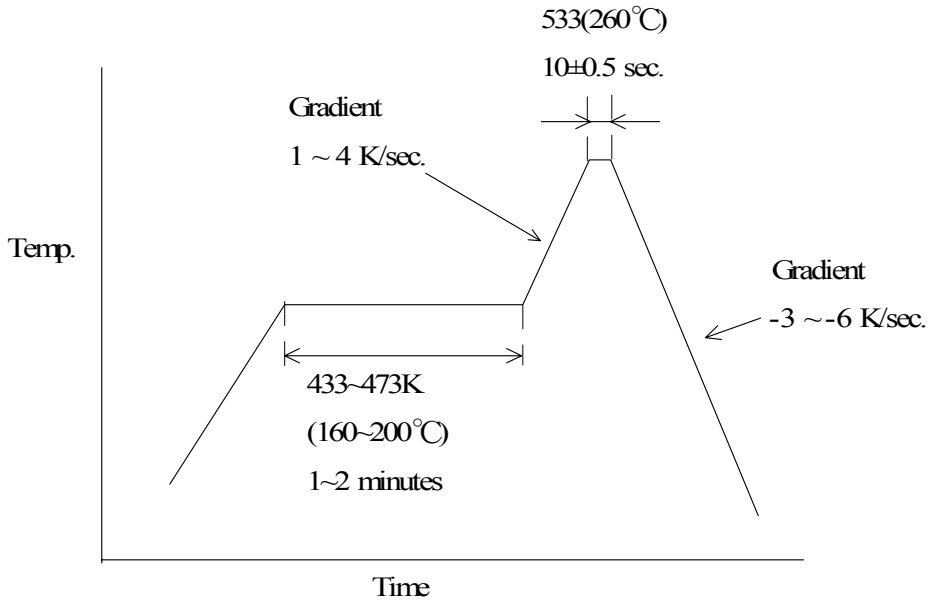

Fig.4

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● PCB

NAN YA PLASTICS CORPORATION
ELECTRONIC MATERIALS DIVISION
COPPER CLAD LAMINATE DEPARTMENT

NO. 201. TUNG HWA N. ROAD,
TAIPEI, TAIWAN, ROC

Glass cloth base epoxy resin
flame retardant copper clad laminate

FEATURES

- High Tg-175°C (DSC)
- Excellent dimensional stability through-hole reliability
- Excellent electrical, chemical and heat resistance properties
- IPC-4101A specification is applicable
- U.L. designation:ANSI grade FR-5
- U.L. file number E98983(s)
- Outstanding heat resistance
- High luminance of multi-functional epoxy contrast with copper for A.O.I.
- Traditional FR-4 methods processability

PERFORMANCE LIST

Characteristics	Unit	Conditioning		Typical Values	SPEC
Volume resistivity	MΩ-cm	C-96/35/90		5.0×10^9	10^7 ↑
Surface resistivity	MΩ	C-96/35/90		4.1×10^9	10^8 ↑
Permittivity 1MHZ	-	C-24/23/50		4.2-4.8	5.4 ↓
Loss Tangent 1MHZ	-	C-24/23/50		0.010-0.016	0.035 ↓
Arc resistance	SEC	D-48/50+D-0.5/23		120 ↑	90 ↑
Dielectric breakdown	KV	D-48/50		60 ↑	40 ↑
Moisture absorption	%	D-24/23	< 0.78mm	0.18	0.80 ↓
			≥ 0.78mm	0.15	0.35 ↓
Flammability	-	C-24/23/50+E-24/125		94V0	94V0
Peel strength 1oz	lb/in	288°C x 10" solder floating		10	8 ↑
heat resistance	SEC	288°C dipping		600 ↑	10 ↑
Glass transition temp	°C	DSC		175 ± 5	N/A
Dimensional stability X-Y axis	%	E 4/105		0.01-0.03	0.05 ↓
Coefficient of thermal expansion					
Z-axis before Tg	in/in/°C	TMA		5.0×10^{-5}	N/A
Z-axis after Tg	in/in/°C	TMA		25.0×10^{-5}	

Data shown are nominal values for reference only.

■CONSTRUCTION:

THICKNESS mm	THICKNESS Mil	CONSTRUCTION	
0.10	4	1080	2 plies
0.11	4	2116	1 ply
0.13	5	1080	2 plies
0.13sp	5	2116	1 ply
0.15	6	1506	1 ply
0.16	6	2112	2 plies
0.21	8	7628	1 ply
0.26	10	2116	2 plies
0.30	12	2116	3 plies
0.30sp	12	1506	2 plies
0.35	14	7628	2 plies

THICKNESS mm	THICKNESS mil	CONSTRUCTION	
0.38	15	7628	2 plies
0.45	18	7628x2+1080x1	
0.50	20	7628	3 plies
√0.53	21	7628	3 plies
√0.60	24	7628	3 plies
0.77	31	7628	4 plies
0.8	32	7628	4 plies
0.9	36	7628	5 plies
1.0	39	7628	5 plies
1.1	43	7628	6 plies
1.2	47	7628	6 plies

*1.2,1.1,1.0,0.9,0.77mm, THICKNESS INCLUDES CLADDING. ALL OTHERS EXCLUDE CLADDING.

■PRODUCT SIZE & THICKNESS

THICKNESS INCH (mm)	COPPER CLADDING OZ (μm)	SIZE INCH	SIZE mm	THICKNESS TOLERANCE
0.004(0.1)	0.5(17)	48.8 x 36.6	1240 x 0930	
to	1.0(35)	48.8 x 40.5	1240 x 1030	IPC-4101A SPEC CLASS C/M
0.039(1.0)	2.0(70)	48.8 x 42.5	1240 x 1080	

■Keeping the core and prepreg in the same grain direction is crucial to ensure the flatness of multilayer boards.

Grain direction is shown on the Certificate of Conformance.

■This material can not be used in horizontal brown oxide process.

■CERTIFICATION UL : E98983 (S)

Minimum Material Thickness Inch (mm)	Clad cond. Thickness min. max. mils mils (mic) (mic)	Max. Area Diameter Inch (mm)	Sold Lts Temp Time ℃ sec	UL 94 Flame class	Max. Operating Temp
0.004 (0.101)	0.68 4.08 (17) (102)	2.0 (50.8)	300 30	94V-0	140

Dk-Df Table

Frequency	Dk	Min Dk	Max Dk	Df	Min Df	Max Df
1 MHz	3.92	3.82	4.02	0.0089	0.0087	0.0091
500 MHz	3.92	3.82	4.02	0.0090	0.0088	0.0092
1 GHz	3.92	3.82	4.02	0.0091	0.0090	0.0093
1.5 GHz	3.92	3.82	4.02	0.0092	0.0091	0.0094
2 GHz	3.92	3.82	4.02	0.0094	0.0092	0.0095
2.5 GHz	3.92	3.82	4.02	0.0095	0.0093	0.0097
3 GHz	3.92	3.82	4.02	0.0096	0.0094	0.0098
3.5 GHz	3.92	3.82	4.02	0.0097	0.0096	0.0099
4 GHz	3.92	3.82	4.02	0.0099	0.0097	0.0100
4.5 GHz	3.92	3.82	4.02	0.0100	0.0098	0.0101
5 GHz	3.92	3.82	4.02	0.0101	0.0099	0.0103
5.5 GHz	3.92	3.82	4.02	0.0102	0.0100	0.0104
6 GHz	3.92	3.82	4.01	0.0103	0.0102	0.0105
6.5 GHz	3.92	3.82	4.01	0.0105	0.0103	0.0106
7 GHz	3.92	3.82	4.01	0.0106	0.0104	0.0107
7.5 GHz	3.92	3.82	4.01	0.0107	0.0105	0.0109
8 GHz	3.92	3.82	4.01	0.0108	0.0106	0.0110
8.5 GHz	3.92	3.82	4.01	0.0109	0.0108	0.0111
9 GHz	3.92	3.82	4.01	0.0111	0.0109	0.0112
9.5 GHz	3.91	3.82	4.01	0.0112	0.0110	0.0114
10 GHz	3.91	3.82	4.01	0.0113	0.0111	0.0115
10.5 GHz	3.91	3.82	4.01	0.0114	0.0112	0.0116
11 GHz	3.91	3.82	4.01	0.0115	0.0114	0.0117
11.5 GHz	3.91	3.82	4.01	0.0117	0.0115	0.0118
12 GHz	3.91	3.82	4.01	0.0118	0.0116	0.0120

HannStar
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● Sony T4000

TECHNICAL REPORT

Industrial Adhesive Tape T4000

Industrial Adhesive Tape T4000

Doudle-Faced Adhesive Tape

T4000 is a double-faced adhesive tape developed for the requirement of strong and permanent bonding. It is a highly selected doudle-faced adhesive tape with outstanding reliability, having high low-temperature adhesion.

SPECIFICATIONS

Coating amounts (N/m²)	1.40~1.70
Coating thickness (mm)	approx. 0.15
Thickness of release paper (mm)	approx. 0.14

FEATURES

- Excellent in thermal holding strength
- Excellent in low-temperature adhesion
- High bonding strength in the widest temperature range
- No smell
- Outstanding reliability and durability

APPLICATION

T4000 is most suitable for the adhesion to surface decorative sheet, rating plate and escutcheon, etc. made of metal and plastic material for the automobiles and household electric appliances.
T4000 is also recommendable for use as a double-faced permanent adhesive tape for various substrates.

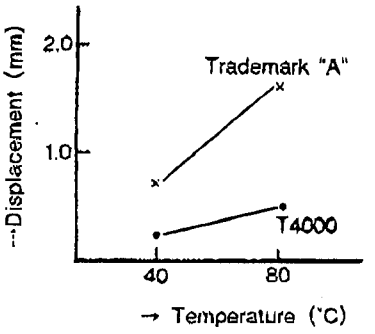
Sony Chemicals Corporation

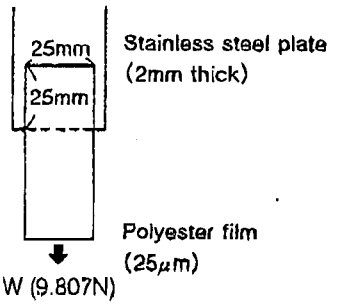
Industrial Adhesive Tape T4000

SPECIFICATIONS

1. Holding strength at elevated temperatures

T4000 demonstrates an excellent holding strength even under severe conditions.

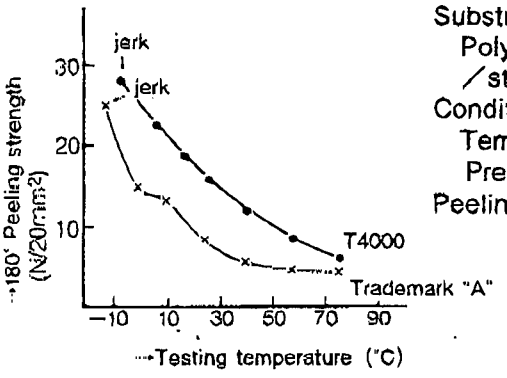




Conditions for preparing test pieces
Temperature : 20°C
Pressure : 20N/cm² (one stroke)
Conditions for test peeling
60minutes ; 9.80N of loading

2. Temperature change of 180° peeling strength

T4000 provides a high bonding strength at various temperatures



Substrate :
Polyester film (25μm)
/stainless steel plate (2mm thick)
Conditions for preparing test pieces
Temperature : 20°C
Pressure : 20N/cm² (one stroke)
Peeling speed : 300mm/min.

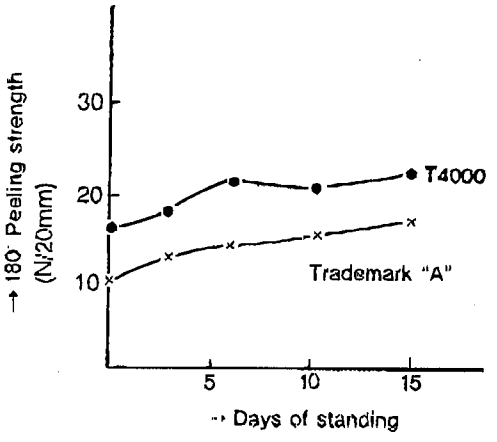
3. Peeling strength after aging

T4000 has excellent thermal aging resistance, and high resistances to moisture, water, oil and weather.

Substrate : Polyester film (25μm)/stainless steel plate (2mm thick)
Conditions for preparing test pieces :
Temperature : 20°C
Pressure : 20N/cm² (one stroke)
Test peeling speed : 300m/min.

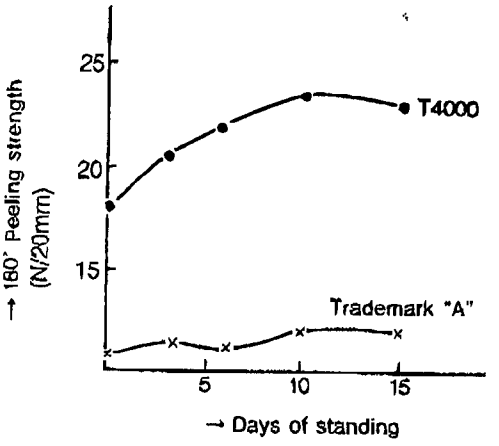
● THERMAL AGING

Standing test in the atmosphere



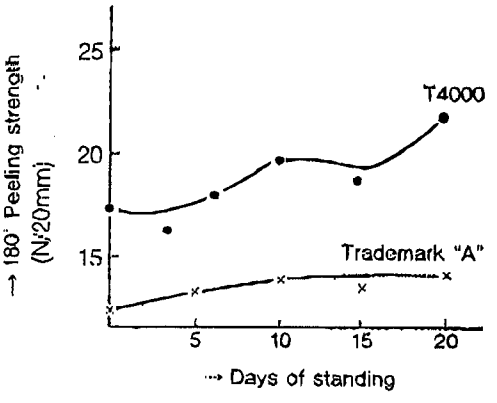
● MOISTURE RESISTANCE

Standing test in the atmosphere of 50°C and relative humidity of 90 %



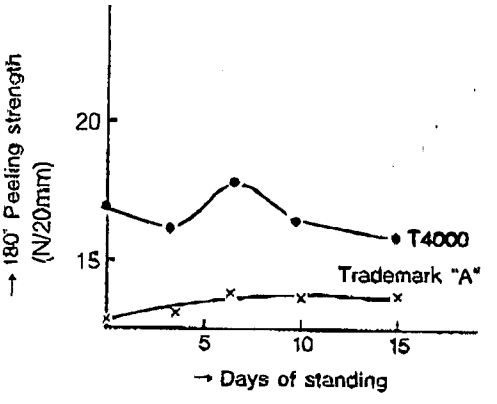
● WATER RESISTANCE

standing test in water at 40°C

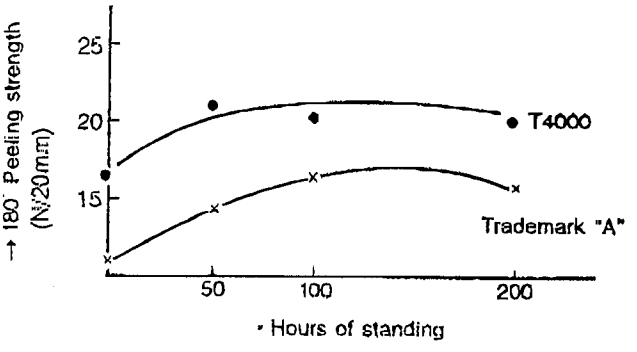


● OIL RESISTANCE

Standing test in machine oil at 40°C



● WEATHERING

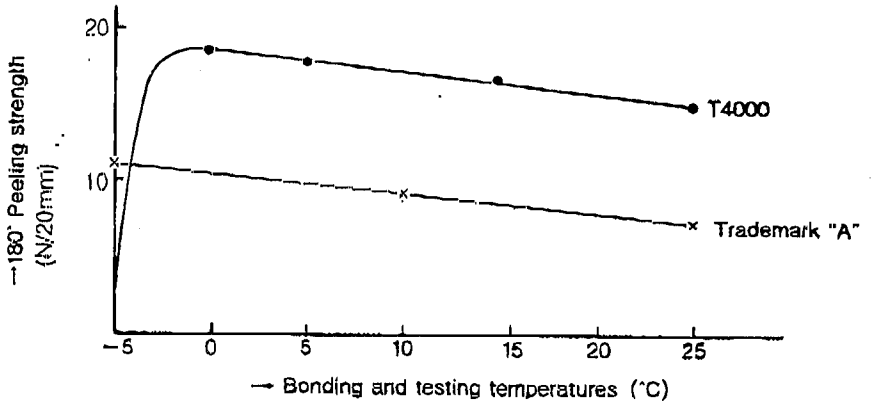


Industrial Adhesive Tape T4000

WORKABILITY

Low-temperature adhesion

T4000 provides high adhesion even in the bonding work at low temperatures.



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Sony Chemicals Corporation

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Sony Chemicals Europe B.V.	Diamantlaan 27 2132 WV Hoofddorp The Netherlands Tel.31-23-565-0606
Sony Chemicals (Suzhou) Co.,Ltd.	19 Zhu Yuan Road, New District, Suzhou, Jiangsu, 215011 China Tel.86-512-8252005

ONY CHEMICALS CORP
ANUMA FACTORY
8 SATSUKI-CHO
ANUMA-SHI
OCHIGI-KEN 322-8501, JAPAN

ressure sensitive laminating adhesives:NP203, NP203W. For bonding aluminum (thickness.007 to 0.020 in), polycarbonate (thickness.019 to.079 in) and acrylic (thickness.019 to.079 in) to acrylonitrile butadi yrene (ABS) plastic, maximum surface temperature 80 C (176 F), minimum temperature -40 C (-40 F). Suitable where exposed indoors to high humidity and occasional exposure to water.

P303, NP303W. For bonding aluminum (thickness.007 to 0.020 in), polycarbonate (thickness.019 to.079 in) and acrylic (thickness.019 to.079 in) to acrylonitrile butadiene styrene (ABS) plastic, aximum surface temperature 80 C (176 F), minimum temperature -40 C (-40 F). Suitable where exposed indoors to high humidity and occasional exposure to water.
3500, T3500S, T3500SW, T3500W. For bonding aluminum (thickness.007 to 0.020 in), polycarbonate (thickness.019 to.079 in) and acrylic (thickness.019 to.079 in) to acrylonitrile butadiene styrer BS) plastic, maximum surface temperature 80 C (176 F), minimum temperature -40 C (-40 F). Suitable where exposed indoors to high humidity and occasional exposure to water.
4000, T4000W. For bonding aluminum (thickness.007 to 0.020 in), polycarbonate (thickness.019 to.079 in) and acrylic (thickness.019 to.079 in) to acrylonitrile butadiene styrene (ABS) plastic, aximum surface temperature 80 C (176 F), minimum temperature -40 C (-40 F). Suitable where exposed indoors to high humidity and occasional exposure to water.
f000B, T4000BW. For bonding aluminum (thickness.007 to 0.020 in), polycarbonate (thickness.019 to.079 in) and acrylic (thickness.019 to.079 in) to acrylonitrile butadiene styrene (ABS) plastic, aximum surface temperature 80 C (176 F), minimum temperature -40 C (-40 F). Suitable where exposed indoors to high humidity and occasional exposure to water.
4500B, T4500BW. For bonding aluminum (thickness.007 to 0.020 in), polycarbonate (thickness.019 to.079 in) and acrylic (thickness.019 to.079 in) to acrylonitrile butadiene styrene (ABS) plastic, aximum surface temperature 80 C (176 F), minimum temperature -40 C (-40 F). Suitable where exposed indoors to high humidity and occasional exposure to water.
1700M. For bonding aluminum (thickness 0.002 to 0.032 in) to aluminum, and galvanized steel, max temperature 150 C (302 F) min temperature -40 C (-40 F); Acrylonitrile Butadiene Stylene (AB d Polypropylene plastics; max temperature 80 C (176 F) min temperature -40 C (-40 F); Polystyrene plastics; max temperature 60 C(140 F) min temperature -40 C (-40 F). Suitable where exposed loors to high humidity or occasional exposure to water.
)0XX$$. For bonding aluminum (thickness.007 to 0.020 in), polycarbonate (thickness.019 to.079 in) and acrylic (thickness.019 to.079 in) to acrylonitrile butadiene styrene (ABS) plastic, maximun rface temperature 80 C (176 F), minimum temperature -40 C (-40 F). Suitable where exposed indoors to high humidity and occasional exposure to water.
:700M. For bonding aluminum (thickness 0.002 to 0.032 in.) to aluminum, and galvanized steel, max temperature 150 C (302 F) min temperature -40 C (-40 F); Acrylonitrile Buatdiene Stylene (AB d Polypropylene plastics; maximum temperature 80 C (176 F), minimum temperature -40 (-40 F); polystyrene plastics, maximum temperature 60 C (140 F), minimum temperature -40 C (-40 F). itable where exposed indoors to high humidity or occasional exposure to water.
410, T4410W, T4411, T4411W. For bonding aluminum (thickness 0.002 to 0.032 in.) to aluminum, stainless steel, galvanized steel, alkyd enamel and porcelain, maximum temperature 150 C (302 I nimum temperature -40 C (-40 F); polycarbonate, maximum temperature 100 C (212 F), minimum temperature -40 C (-40 F); polyphenylene oxide, nylon and ABS plastic, maximum temperature 8 (176 F), minimum temperature 40 C (-40 F). Suitable where exposed indoors to high humidity or occasional exposure to water. Also suitable where exposed outdoors, affixed to all the surfaces ntioned above except aluminum, stainless steel, polycarbonate, polyphenylene oxide and nylon.
720. For bonding aluminum (thickness 0.002-0.032 inch) to aluminum and galvanized steel, maximum temperature 150 C (302 F), minimum temperature -40 C (-40 F); ABS plastic, maximum nperature 80 C (176 F), minimum temperature -40 C (-40 F) and polystyrene, maximum temperature 60 C (140 F), minimum temperature -40 C (-40 F). Suitable for indoor use where exposed to hig midity or occasional exposure to water.
720. For bonding aluminum (thickness 0.032 inch) to polypropylene, maximum temperature 80 C (176 F). Suitable for indoor use where exposed to high humidity or occasional exposure to water. IXX$$, for bonding aluminum thickness 0.008 thru 0.020 in., acrylic 0.020 thru 0.079 in. and polycarbonate 0.020 thru 0.079 in. to ABS plastic, maximum temperature 80 C (176 F), minimum nperature -40 C (-40 F). Suitable for indoor use where exposed to high humidity or occasional exposure to water. 99XX$$". For bonding aluminum face stock 0.007 inch - 0.020 inch thick, polycarbonate face stock 0.020 inch - 0.079 inch thick and acrylic face stock 0.020 inch - 0.079 inch thick to ABS plastic, ximum temperature 80 C (176 F), minimum temperature -40 C (-40 F). Suitable for indoor use where exposed to high humidity or occasional exposure to water.

te:

May be replaced by alpha characters denoting release liner type.

-Replaced by digits denoting product thickness.

rking: Company name or trademark "SC" in a square and laminating adhesive designation on packaging, roll core or release liner.