

Data Sheet

ı	Product Type	ı	WLAN(MIMO)+BT Antenna
I	Notebook Model Number	I	INVENTEC / Dante
I I	Part No. / Yageo / WLAN(MIMO) Antenna: 280mm (Side Left)	ſ	CAN4313 767 032501B
I I	Part No. / Yageo / BT ANTENNA: 330mm (Side Left)	ı	CAN4313 767 042501B
ı	Part No. /INVENTEC / WLAN(MIMO) Antenna: 280mm (Side Left)	ı	6036B0039701
I I	Part No. /INVENTEC / BT ANTENNA: 330mm (Side Left)	ı	6036B0041801

Yageo (Taiwan) Ltd.

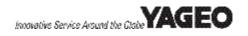
16, West 3rd Street, N.E.P.Z Kaohsiung, 811 Taiwan, R.O.C

Yageo Electronics (China) Co, Ltd.

No. 10, Zhu Yuan Road, Suzhou New District, Suzhou, PRC

2.40 ~ 2.50 & 5.15~5.85 GHz for	Yageo	Part Number:	R01	July 10, 2008
WLAN(MIMO) application.	CAN4	313 767 032501B		
2.40 ~ 2.50 GHz for BT	CAN4	313 767 042501B		
application.				
BY / Grace Chen	DATE	July 10, 2008		

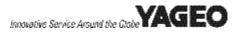
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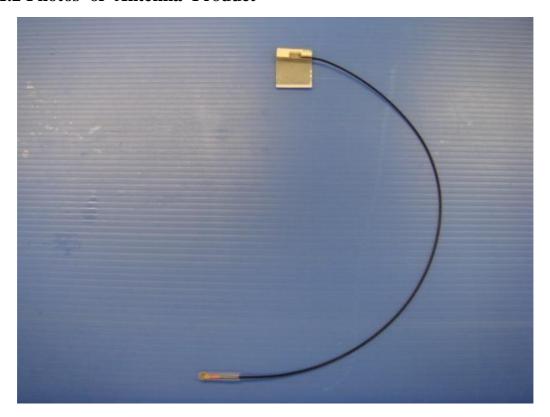
1. Specifications

1.1 Specification of WLAN(MIMO)+BT Antenna

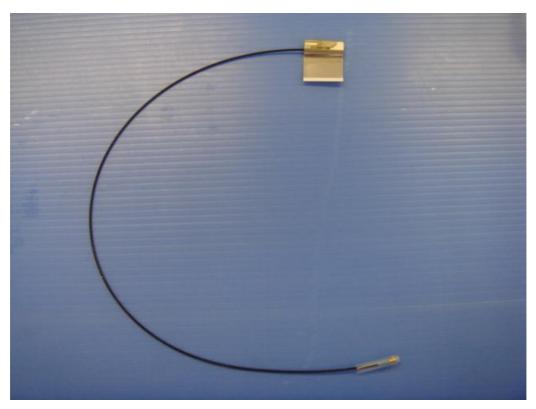
THE Specification of the	
Frequency Range	2.40 ~ 2.50 & 5.15~5.85 GHz for WLAN(MIMO)
(GHz)	2.40 ~ 2.50 GHz for BT
VCVID	2.0: 1 max for WLAN(MIMO)
VSWR	2.0: 1 max for BT
	1.68dBi for 2.40~2.50 for WLAN(MIMO) & BT GHz
Peak Gain	band
(GHz)	3.21dBi for 5.15~5.85 for WLAN(MIMO) GHz
	band
Radio Connector	Hirose, IPex, Technova or equivalent
Coaxial Cable	Nissei, Kurabe, GBE, HL or equivalent
Impedance	50Ω Nominal.
Cable Diameter	1.13mm for WLAN(MIMO)
Cable Diameter	1.13mm for BT
Cable Calen	Black for WLAN(MIMO)
Cable Color	Black for BT
Operating Temperature	-40~90°C
Maximum Power	1W
Polarization	Linear
Radiation Pattern	Omni-directional



1.2 Photos of Antenna Product



WLAN-MIMO (Side Left) Antenna (CAN4313 767 032501B)



BT (Side Left) Antenna (CAN4313 767 042501B)

2. Test Methodology

2.1 Test Equipment

The equipment for the antenna measurement we used is as follows:

- A. Network Analyzer, support up to 8GHz, to measure the VSWR and input impedance of antenna.
- B. Three-dimensional anechoic chamber to measure antenna gain and radiation pattern (Standard horn antenna was used to calibrate the chamber)
- C. Digital caliper to measure the dimensions.
- D. Climatic chamber for mechanical tests.

2.2 Test Setup

- 2.2.1 Frequency Range
 - 2.40 ~ 2.50 & 5.15~5.85 GHz for WLAN(MIMO) application.
 - 2.40 ~ 2.50 GHz for BT application.

2.2.2 Antenna Configuration

The antenna basically has two parts; the stamping and the cable assembly with the connector on one side. The detailed drawing is attached.

2.2.3 **VSWR**

The VSWR is measured with network analyzer that support up to 8GHz. All the measurements are performed with the customer provided fixture. Figure 1 shows the typical schematic diagram for measuring VSWR.

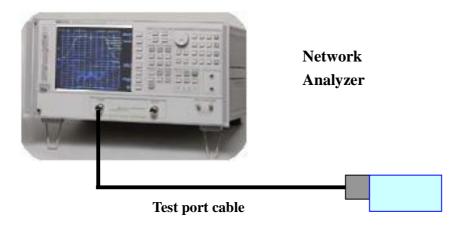
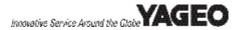


Figure 1. The schematic diagram for measuring VSWR



2.2.4 Radiation Pattern and Gain

The radiation pattern of antenna is measured in both horizontal polarization and vertical polarization. The radiation pattern measurements are performed in the three-dimensional anechoic chamber. The chamber provides less than $-30 \, \mathrm{dB}$ reflectivity from 800MHz through 8GHz. The chamber is calibrated using both standard dipole antenna and horn antenna. The Gain here is expressed as dBi that standardizes the isotropic antenna. The Gain measurements and antenna radiation pattern are also performed in the same chamber described previously. Figure 2 shows the schematic diagram for measuring radiation pattern and Gain.

3D Anechoic Chamber

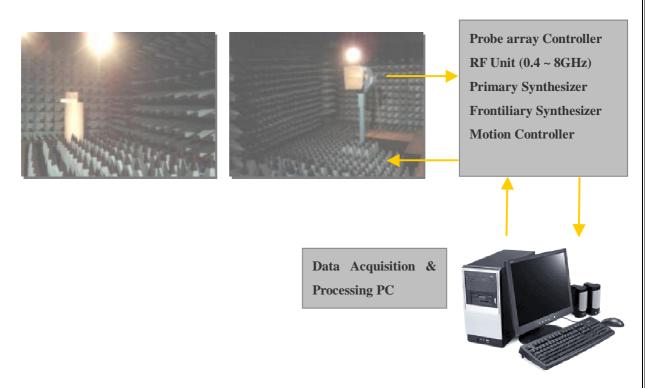


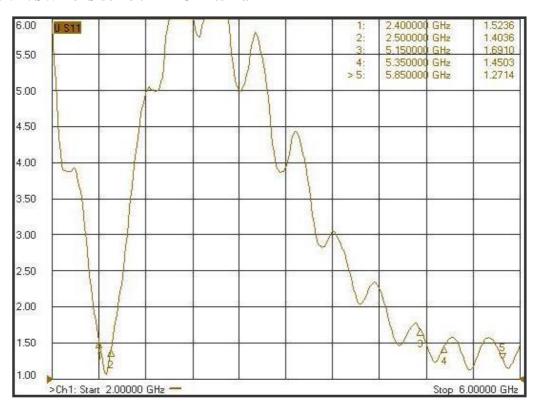
Figure 2. The schematic diagram for measuring radiation pattern and Gain



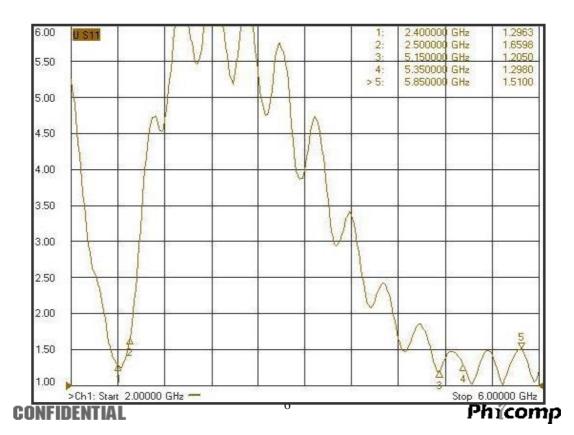
3. Performance Data

3.1 VSWR of Antenna in the Fixture

3.1.1 VSWR of Side Left MIMO Antenna



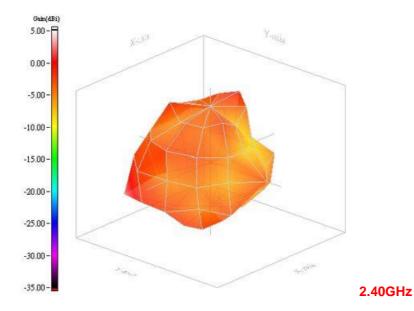
3.1.2 VSWR of Side Left BT Antenna

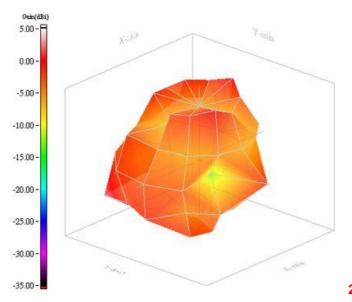


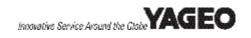


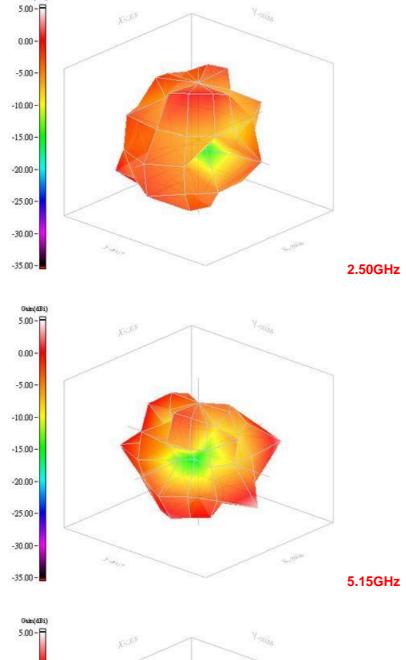
3.2 Radiation Pattern and Gain /3D DATA

3.2.1 Frequency (2.40GHz~2.50GHz & 5.15GHz~5.85GHz) of Side Left / WLAN(MIMO) Antenna $\,$

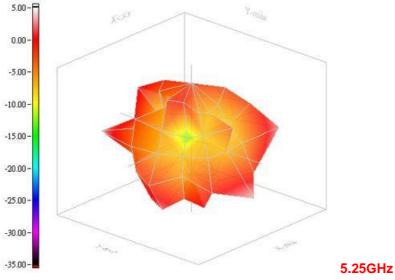






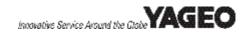


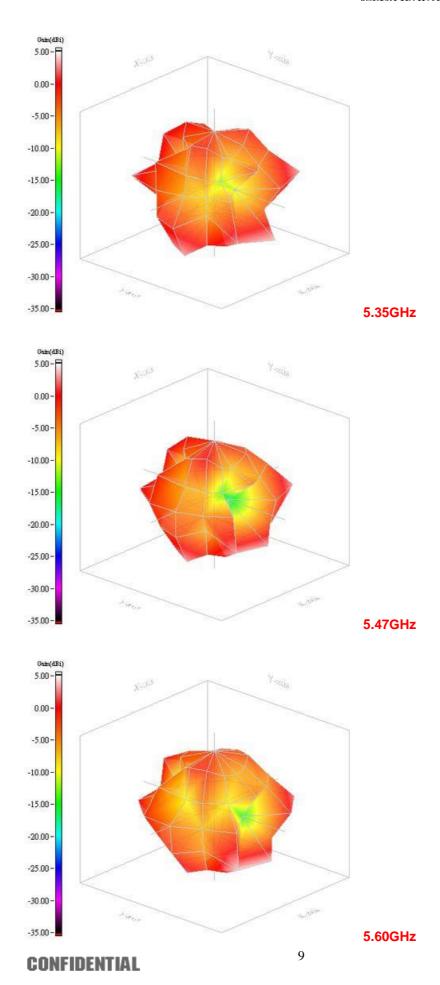
Gain(dBi)



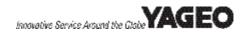
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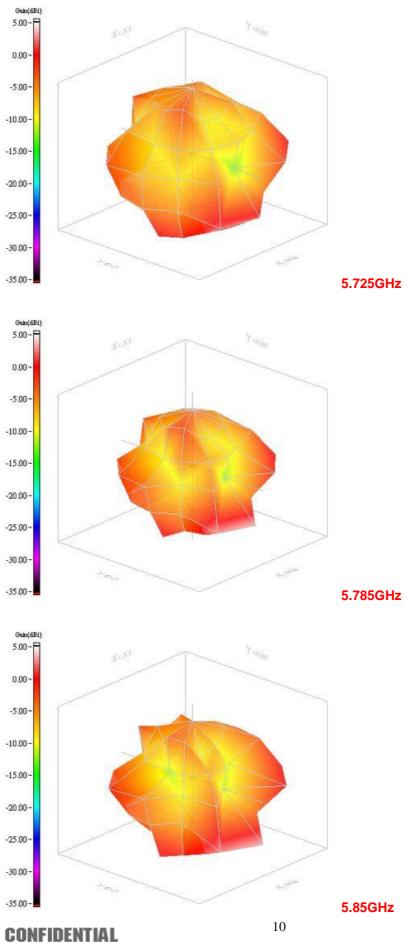
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Phicomp



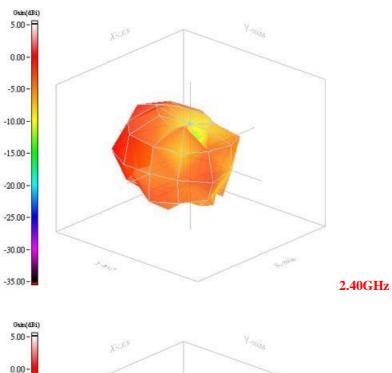


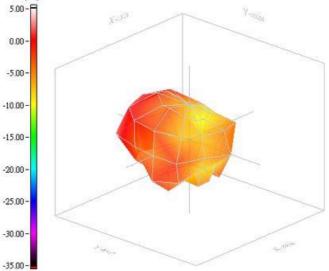
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Phicomp

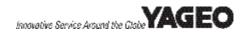


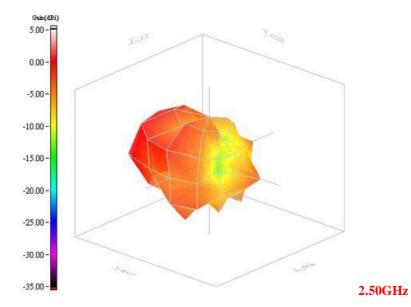
3.2.2 Low Frequency (2.40GHz~2.50GHz) of Side Left / BT Antenna





2.45GHz







3.2.3 Average Gain (dBi) Summary

WLAN-MIMO (Side Left) Antenna

	(MILL—)	Max	(dBi)	Ave	erage (c	iBi)	Efficiency (%)	Smaa	Efficiency (Min.	(8411-)
	(MHz)	H-pol	V-pol	H-pol	V-pol	Total	Efficiency (%)	Spec	Eniciency (win.	(MHz)
	2400	0.43	-1.08	-7.05	-6.48	-3.74	42.27	37		2400
	2450	-0.32	-0.16	-7.31	-6.02	-3.61	43.55	37	40.74	2450
S	2500	-2.31	0.1	-7.82	-6.16	-3.9	40.74	37		2500
pu	5150	1.54	-0.2	-6.63	-6.02	-3.3	46.77	29		5150
Ba	5250	2.28	1.3	-6.12	-5.79	-2.94	50.82	29		5250
۲	5350	2.76	1.58	-5.39	-5.26	-2.32	58.61	29		5350
	5470	2.5	0.96	-5.29	-5.69	-2.48	56.49	29	34.67	5470
	5600	3.21	-0.9	-5.17	-6.25	-2.67	54.08	29	34.07	5600
	5725	0.5	-2.74	-7.22	-8.04	-4.6	34.67	29		5725
	5785	2.55	-2.39	-6.15	-7.62	-3.81	41.59	29		5785
	5850	2.55	-2.27	-6.17	-7.65	-3.83	41.40	29		5850

BT (Side Left) Antenna

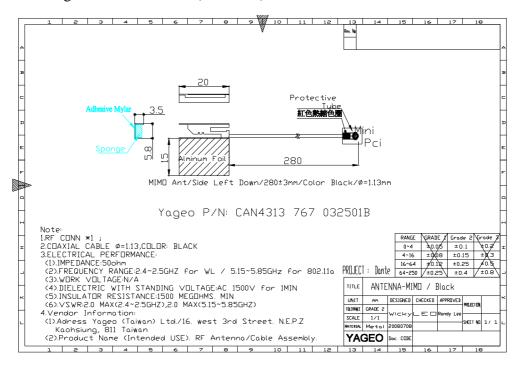
	(MHz)		Max Value (dBi) Average (dBi)				Efficiency (%)	Spec	(MHz)		
put			H-pol	V-pol	Total	H-pol	V-pol	Total	Efficiency (76)	Spec	(IVITIZ)
Ba	2400	li	0.56	-0.01	0.96	-8.07	-6	-3.9	40.74	29	2400
BT	2450		1.25	1.68	2.36	-7.52	-5.55	-3.41	45.60	29	2450
	2500		0.35	0.87	1.91	-7.73	-5.91	-3.72	42.46	29	2500

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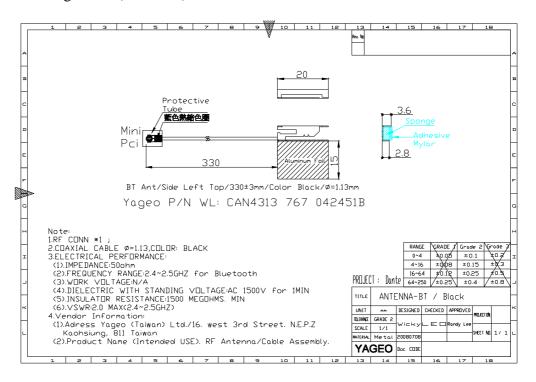


4.Antenna Drawing

4.1 Drawing of WLAN-MIMO (Side Left) Antenna



4.2 Drawing of BT (Side Left) Antenna





5. Reliability Data For Antenna Patch (Reference To

<u>IEC)</u>

IEC 384-10/ CECC 32 100 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
4.12	4(Na)	Rapid change of temperature	-40 °C (30 minutes) to +90 °C (30 minutes); 5 cycles	No visible damage Central Freq. Change $\pm 6\%$
4.14	3(Ca)	Damp heat	500 ± 12 hours at 40 °C; 90 to 95 % RH	No visible damage 2 hours recovery Central Freq. Change \pm 6%
4.15		Endurance	500 ± 12 hours at 90 °C;	No visible damage 2 hours recovery Central Freq. Change ± 6%

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6. Ordering Information: Yageo Ordering P/N Code

The antennas may be ordered by using the Yageo P/N ordering code. These code numbers can be determined by the following rules:

CAN<u>43</u>13 7 <u>67</u> <u>03 250 1B</u> F C M S T A P

F. Family Code

CAN43 = Antenna

C. Packing Type Code

13 = Carton

M. Materials Code

7 = Coaxial Cable

S. Size/Series Code

67 = Dante

T. Side Left Antenna

03 = WLAN-MIMO (Side Left) Antenna

04 = BT (Side Left) Antenna

A. Working Frequency

250 = WLAN

P. Packing

1B = 1000 pcs packing



7. Revision Control

Revision	Date	Content	Remark
R01	July.10, 2008	New Issue	N/A



8. UL Card

Cable

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AVLV2 July 24, 2004 Appliance Wiring Material - Component NISSEI ELECTRIC CO LTO Table of Recognited Styles 5140 Marking: Company name, voltage rating, temperature rating, conductor size, conductor material if other than copper, and use. LOOK FOR THE RECOGNITION MARK See General Information Preceding These Recognitions For use only with equipment where the acceptability of the combination is determined by	AVLV2 Appliance Wiring Material - Component NISSEI ELECTRIC CO LTD ES6198 Table of Resignated Styles S140 Marking: Company pame, voltage rating, temperature rating, conductor state, conductor material if other than copper, and use. LOOK FOR THE RECUGNITION MARK See General Information Preceding These Recognitions For use only with equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.		Single and out	iple-conductor speci	alty Items.	5796	5926	5230	5239		
AVLV2 Appliance Wiring Material - Component NISSEL ELECTRIC CO LTO Table of Rempised Styles 5340 Marking: Company name, voltage rating, temperature rating, conductor size, conductor material if other than copper, and use. LOOK FOR THE RECUGNITION MARK See General Information Preceding These Recognitions For use only with equipment where the acceptability of the combination is determined by	AVLV2 July 24, 2004 Appliance Wiring Material - Component NISSEI ELECTRIC CO LTO E56198 Table of Recognised Styles 5340 8223 8775 5227 8229 8271 8447 Marking: Company name, voltage rating, temperature rating, conductor size, conductor material if other than copper, and use. LOOK FOR THE RECUGNITION MARK See General Information Preceding These Recognitions For use only with equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.		SIRS	Seen	360	JAMES .	,,,,,,	-	200		
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For use only with equipment where the acceptability of the combination is determined by	For use only with equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.		LOOK FO	nterial if other R THE RECOG	NITION I	MARK See	General l	Informati	on Precedi	ing These	
			For use onl	y with equipme	nt where th	ne acceptab	uity of the	combunat	gon is dete	milited by	
	0.42.42										



I-Pex Connector

OMFZ2 Component - Plastics

E106764 POLYPLASTICS CO LTD VECTRA DÍV 18-1 KONAN 2-CHOME MINATO-KU TOKYO 108-8280 JAPAN Material Designation: A430 Product Description: Liquid Crystal Polymer (LCP), thermotropic argmatic polyester, designated "Vectra" furnished as peliets. Color Min. Thick. (mm) Flame HWI HAI RTI RTI RTI **IEC GWIT** IEC GWFI Class Elec Imp Str NC, BK 0.43 V-0 130 130 130 0.81 V-0 130 130 130

Friday, May 21, 2004

HVTR: -CTI: -D495: -IEC Ball Pressure (°C): -Dimensional Stability(%): -Volume Resistivity (10 chm-cm): -Dielectric Strength (kV/mm): -

ISO Tensile Strangth (MPa): -ISO Flexural Strength (MPa); -ISO Tensile Impact (kJ/m²): -ISO Izod Impact (kl/m2): - ____

ISO Heat Deflection (°C): -ISO Charpy Impact (k)/m2): -

Report Date: 8/19/1992 Underwriters Laboratories Inc®

194 small-scale test data does not pertain to building materials, furnishings and related contents. UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in components and parts of end-product devices and appliances, where the acceptability of the combination is determined by ULI.

MFZ2 Comp	onent - Plastics			Fr	iday, October 24	. 2003			E213445
MINTECH PO	LYMER LTD								
8-1 KONAN	2-CHOME MINATO-KU TO	KYO 108-8280 JP							
Material Desig	gnation: 3116(e)								
Product Desc	ription: Polybutylene Tereph	thalate (PBT), desig	mated "Dur	renex" fumic	hed as pellets.				
Color	Min, Thick, (mm)	Flame Class	низ	IAH	RTI Eles	RTI Imp	RTI Str	IEC GWIT	IEC GWF1
ALL	0,75	V-0	4	0	130	-	130	-	
	1.5	V-0	3	0	130	120	130	-	-
NC, BK	3	5VA	2	0	130	120	130	-	-
TE 2	IEC CTI (V): -	HVTR: 3			D495: 6			IEC Ball Pres	sure (* C); -
Dielectric Str	ength (kV/mm); 23	Volume Resisti	ivity (10°ohr	m-am): 16				Dimensional :	Stability(%):0.0
SO Tensile S	Strength (MPa): -	ISO Flexural St	trength (MP	a): -				ISO Heat De	flection (C): -
SO Tensile Ir	mpact (kJ/m²): -	ISO Izod Impac	t (kJ/m²):					ISO Charpy I	mpact(kJ/m²):
(e)	Virgin and regrind from 1 310EP which has a lower						imum thickne	ss of 0.75 mm),	except for
Report Date:	11/15/2000			Underwriter	s Laboratories In	ie B			
	scale test data does not per mability of plastic materials		and parts		uct devices and				



MFZ2 Compone	ent - Plastics				Friday, O	etober 24, 2	003		E10676
OLYPLASTIC ECTRA DIV 18	S CO LTD 1-1 KONAN 2-CHOME MIN.	что-ки токуо	108-828	10 JAP	AN:				
Material Designat	tion: E130i(d)(e)								
roduct Description	on: Liquid Crystal Polymer (E	CP), thermotropic	aromati	e polye	ster, designa	ted "Vectra"	furnished as p	sellets.	
Color	Min. Thick. (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str	IEC GWIT	IEC GWFI
ALL	0.75	V-0	2	4	240	220	240		
	1.5	V-0	1	4	240	220	240		
	3.0	V-0	0	4	240	220	240		
	CTI: 4	HVTR: 0			D495: 5		11	EC Ball Pressure (°C):	
Dielectric Streng SO Tensile Stre SO Tensile Imp	ngth (MPa): -	Volume Resist ISO Flexural : ISO Izod Imp	Strengtl	h (MPa			12	imensional Stability(5 60 Heat Deflection (*C 60 Charpy Impact (k)):-
d)	Virgin and regrind up to 509	6 by weight incl. he	ave the s	ame ba	sic material	eharacteristi	es for colors ?	C and BK.	
0	In addition, regrind at 26 to 180C.	50% have the same	basic c	haracter	ristics at a m	inimum of I	.5mm except	RTI's for the Mechanica	al w/Impact property is
Report Date: 8/19	/1992		Under	writers	Laboratorie	s Inc®			
FII 94 small-see	ale test data does not pertain to	halldine materials	forei el	nings or	nd related co	otents LT 9	4 small-scale	test data is intended sol	ely for determining th
	lastic materials used in compe								

QMMY2

August 18, 2004

Fabricated Parts - Component

NICHIAS INDUSTRIAL PRODUCTS CO LTD

E249493

Fabricated plastic parts, Recognition based on material traceability, UL assigned designation F1071.

Marking: Company name and UL assigned code designation on part, shipping carton, or spec sheet in shipping carton.

See General Information Preceding These Recognitions

For use only in equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

10/28/2004

Underwriters Laboratories Inc.

Card 1 of 1

ファン英位变材深举之表 Mr. 2191-1996

From-SE



Protective Tube



YDPU2/E255532

Tubing, Extruded Insulating - Component

See General Information for Tubing, Extruded Insulating - Component

E255532

Max V	Max Oper Temp	Shrinkdown Class	Col Recognized	Max Temp Rated Oil	vw-1
nkable	polyolef	In tubing.		Tresistance - C	Rated #
600	125	nin _	ALL C CY		
600	125		The same of the sa		Yes##
			Black, only	_	
600	105	Clubing			
	Nakable 600 600 Shrink	Max V Temp nkable polyolef 600 125 600 125 Shrinkable PV	Max V Temp Oper Class nkable polyolefin tubing. 600 125 600 125 III Shrinkable PVC Tubing	Max V Temp Class Recognized	Max V Temp Class Col Recognized Resistance * C Resi

^{*}Tubing is considered to comply with the optional oil resistant requirements only if it is so marked.

#Tubing is considered to comply with the optional VW-1 flammability requirements only if it is so marked.

VW-1 flammability rating limited to Black color only.

- + in the designation represents CTMS/TMS.
- (\$) with meltable liner, may be followed by optional suffix (Z), (2X), (3X) or (4X).

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Aluminum Foil

OANZ2.E200008

Insulating Tape - Component

Insulating Tape - Component

see General Information for Insulating Tape - Component

TAIPEL LAMINATION INDUSTRIES INC

E200008

TH FL-6

.07 CHUNG SHAN RD, SEC 1

HIN CHUANG, TAIPEI HSIEN 242 TAIWAN

ÆT film tape with non woven cotton fiber reinforcement and acrylic adhesive, Cat. No. TA-131A, cated 60C.

'lame Retardant Aluminum tape with acrylic or conductive acrylic adhesive, Cat. No. TA-050A.

Tame Retardant Copper tape with acrylic or conductive acrylic adhesive, Cat. No. TA-035A.

Marking: Company name or "E200008", catalog designation and "Flame Retardant" if authorized printed on carton, vrapper and/or core.

Last Updated on 2003-04-15

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OCDT2.E246964 Insulating Devices and Materials, Miscellaneous - Component

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Insulating Devices and Materials, Miscellaneous - Component

See General Information for Insulating Devices and Materials, Miscellaneous - Component

FORMOSA TAFFETA CO LTD

E246964

317 SHU LIU RD

TOULIU, 640 TAIWAN

Mtl Dsg	Col	Min Thk (mm)	UL94 Flame Class					
EMI Shielding Conductive Fabric, furnished in the form of rolls.								
FCN-R470FR	@	0.12	V-0					
	@	0.15	V-0					

^{@ -} White PU material with silver cover fabric.

Marking: Company name and material designation on container, wrapper or molded on finished part. Last Updated on 2004-05-25

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