

Data Sheet

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

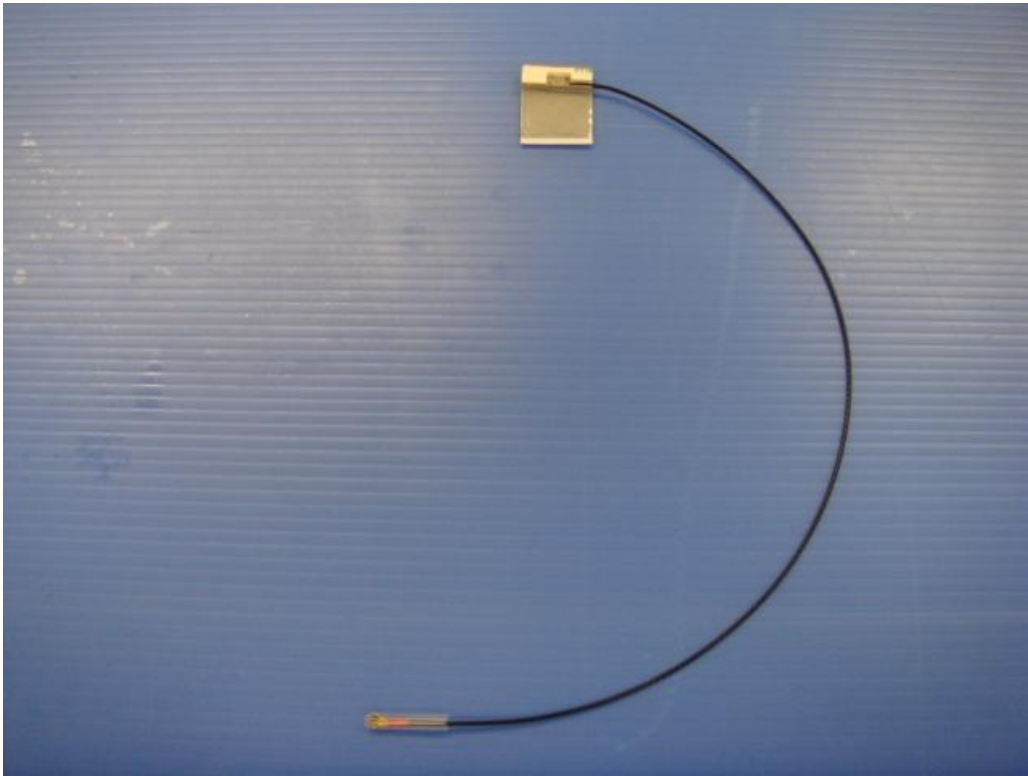
| | | | | | |
|--|------------|---|---------------|-----|---------------|
| 2.40 ~ 2.50 & 5.15~5.85 GHz for WLAN(MIMO) application. 2.40 ~ 2.50 GHz for BT application. | | Yageo Part Number: CAN4313 767 032501B CAN4313 767 042501B | | R01 | July 10, 2008 |
| | | | | | |
| | | | | | |
| | | | | | |
| BY / | Grace Chen | DATE | July 10, 2008 | | |

1. Specifications

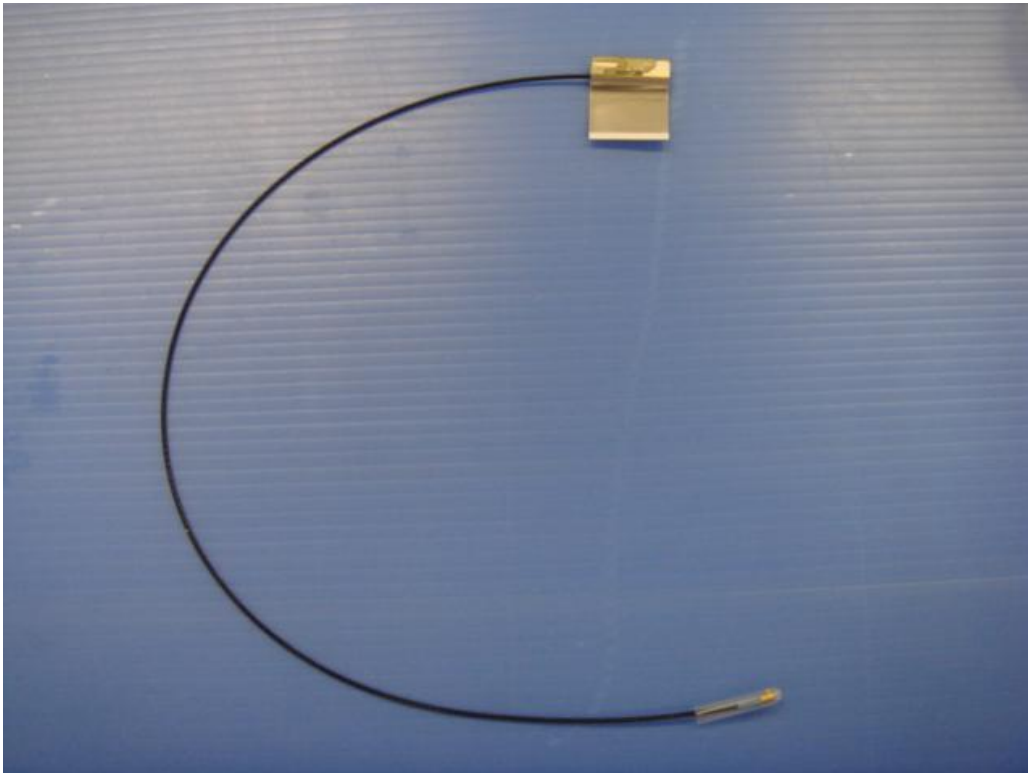
1.1 Specification of WLAN(MIMO)+BT Antenna

| | |
|-----------------------------------|---|
| Frequency Range (GHz) | 2.40 ~ 2.50 & 5.15~5.85 GHz for WLAN(MIMO) 2.40 ~ 2.50 GHz for BT |
| VSWR | 2.0: 1 max for WLAN(MIMO) 2.0: 1 max for BT |
| Peak Gain (GHz) | 1.68dBi for 2.40~2.50 for WLAN(MIMO) & BT GHz band 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) 1.13mm for BT |
| Cable Color | Black for WLAN(MIMO) Black for BT |
| Operating Temperature | -40~90℃ |
| 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.

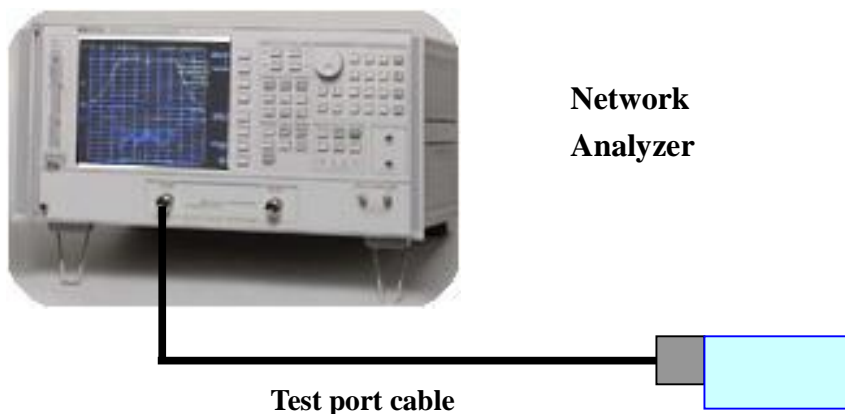


Figure 1. The schematic diagram for measuring VSWR

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 -30dB 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

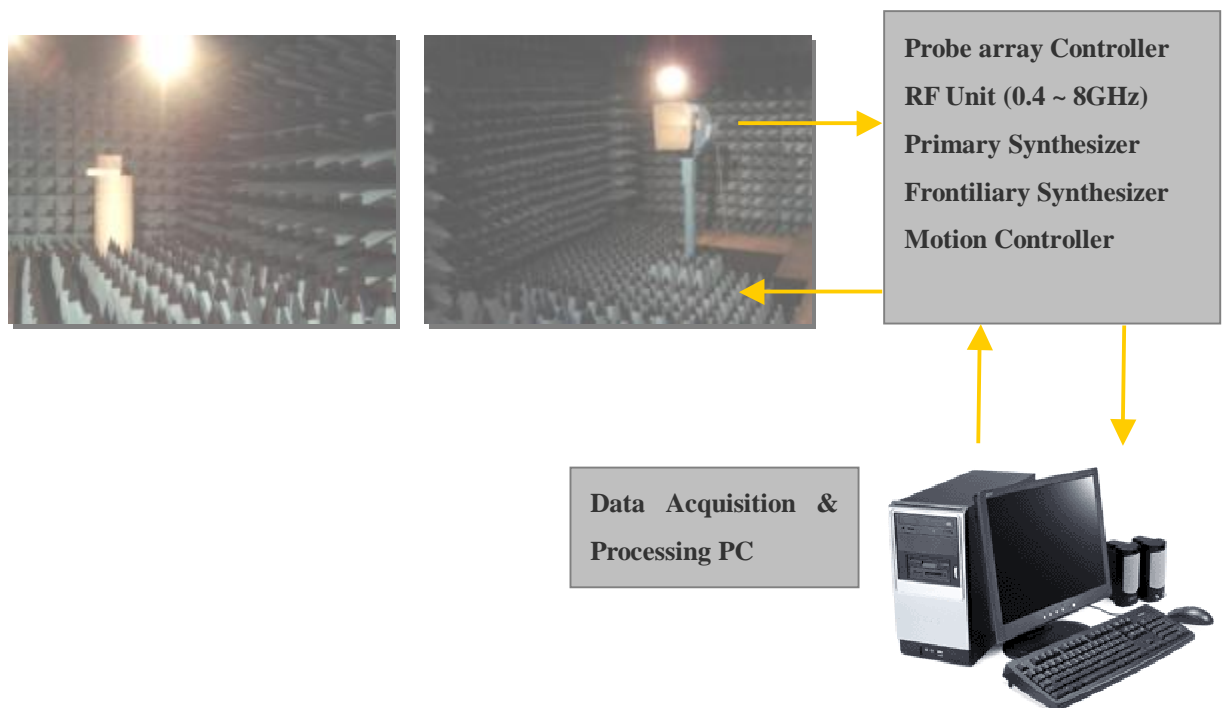
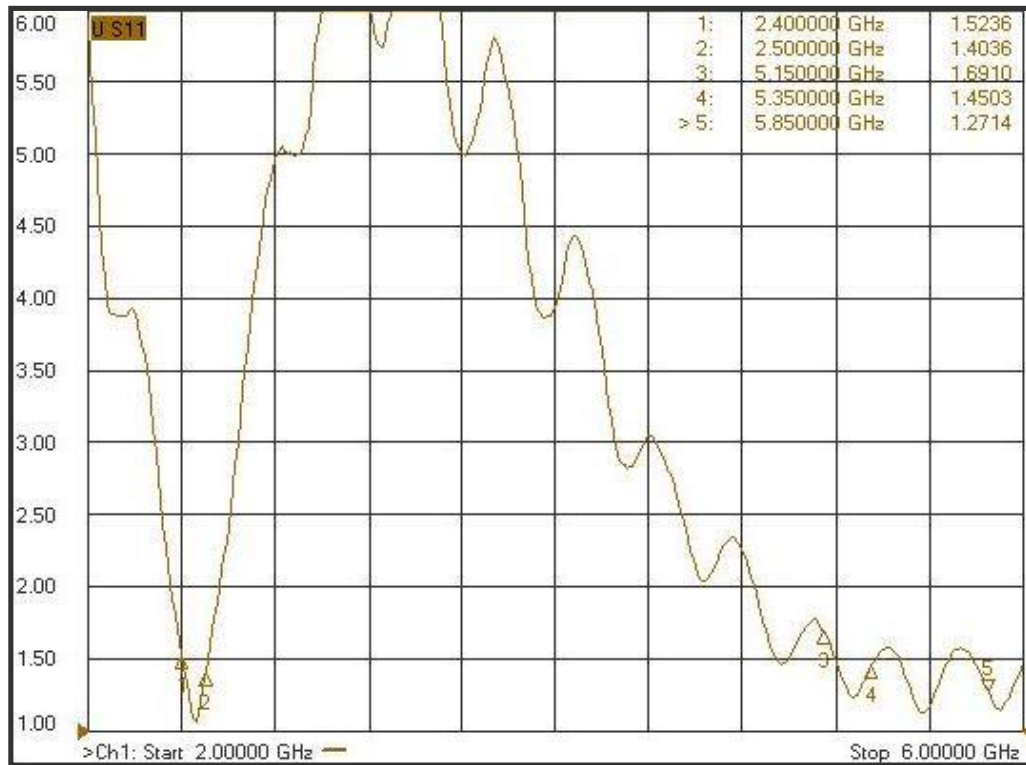


Figure 2. The schematic diagram for measuring radiation pattern and Gain

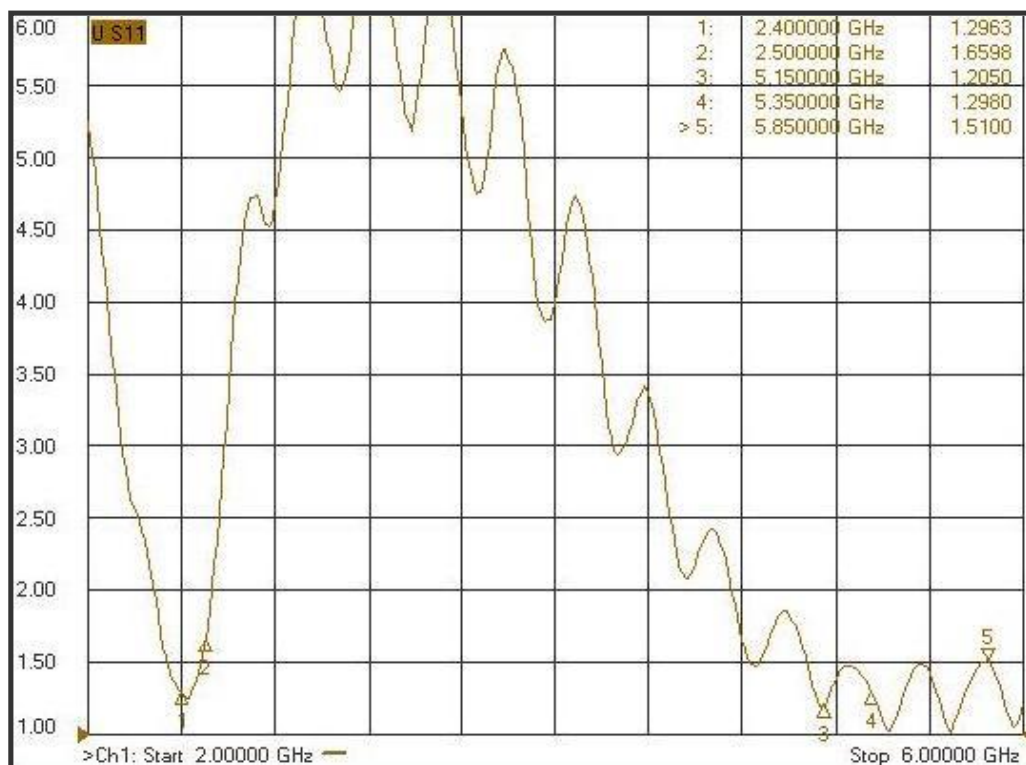
3. Performance Data

3.1 VSWR of Antenna in the Fixture

3.1.1 VSWR of Side Left MIMO Antenna

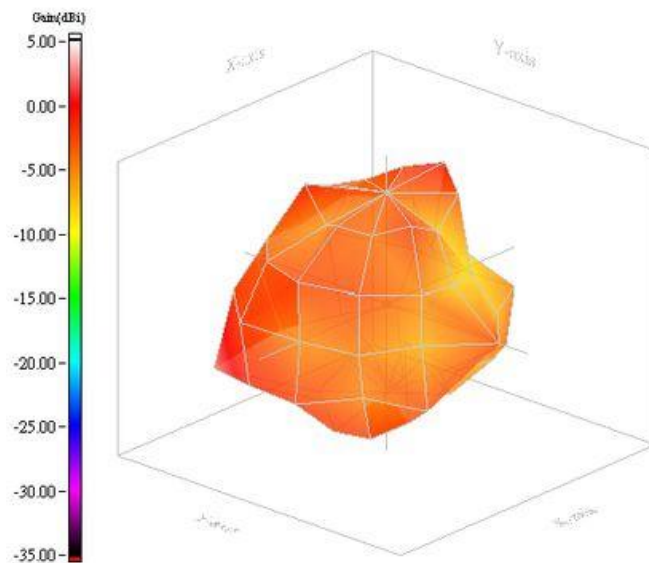


3.1.2 VSWR of Side Left BT Antenna

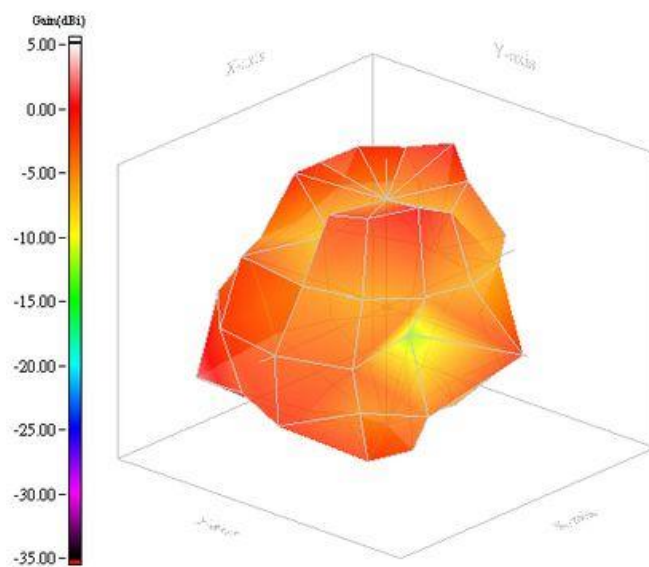


3.2 Radiation Pattern and Gain /3D DATA

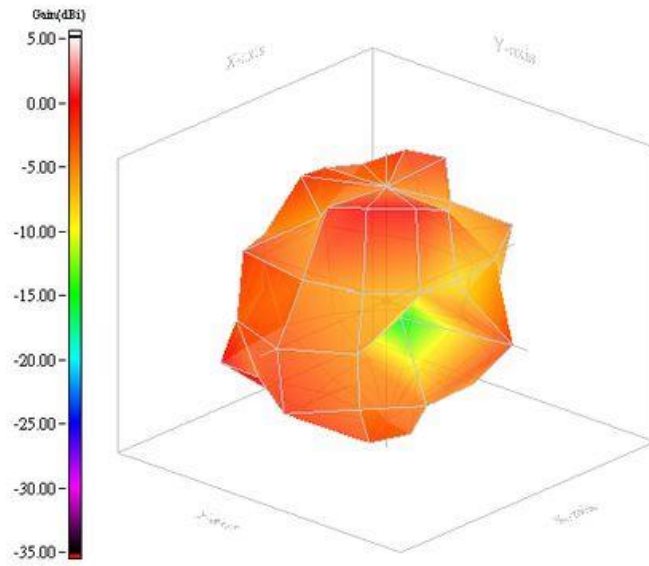
3.2.1 Frequency (2.40GHz~2.50GHz & 5.15GHz~5.85GHz) of Side Left / WLAN(MIMO) Antenna



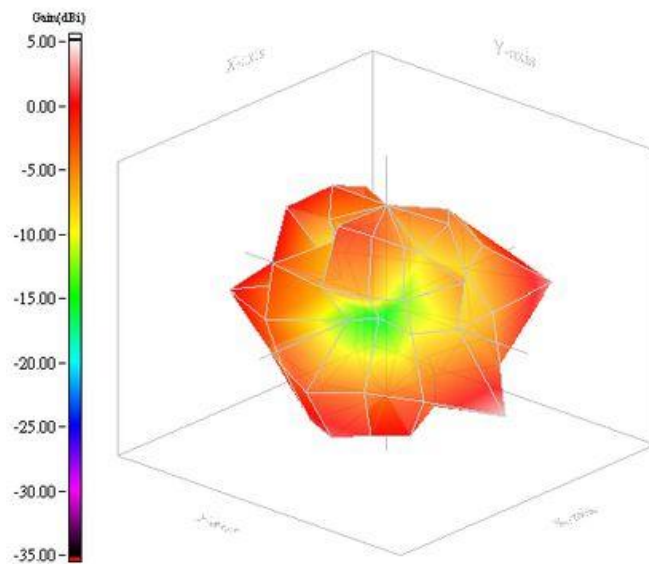
2.40GHz



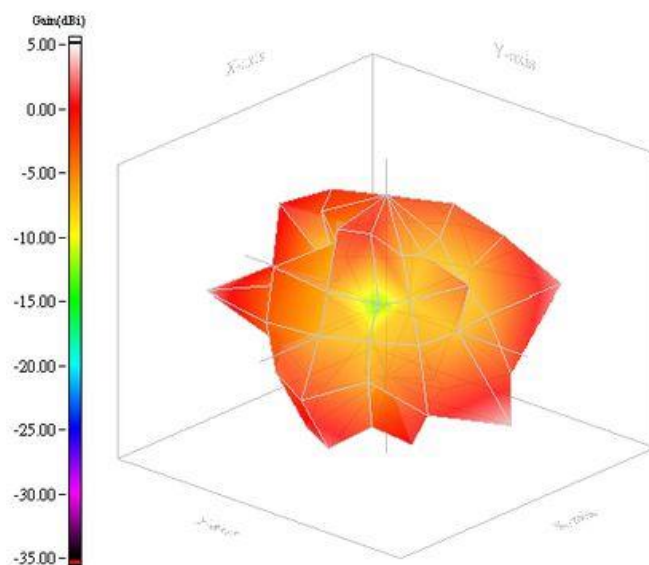
2.45GHz



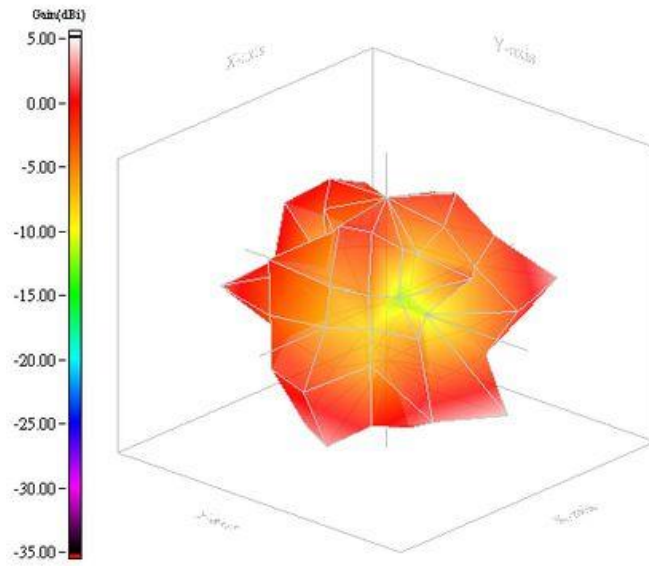
2.50GHz



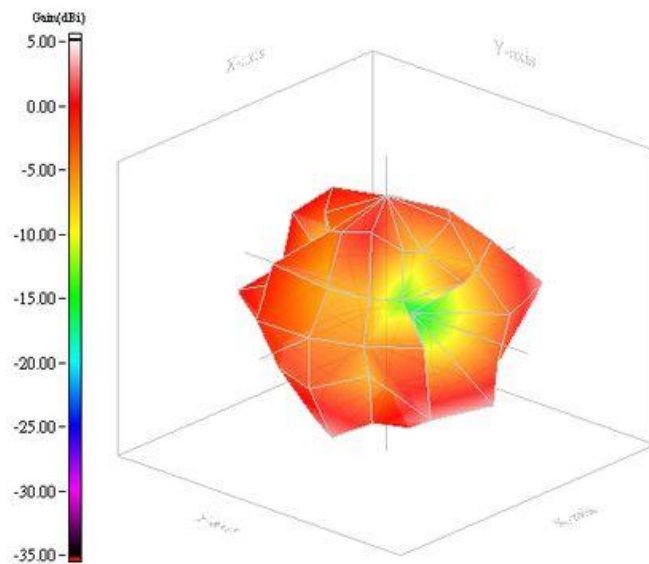
5.15GHz



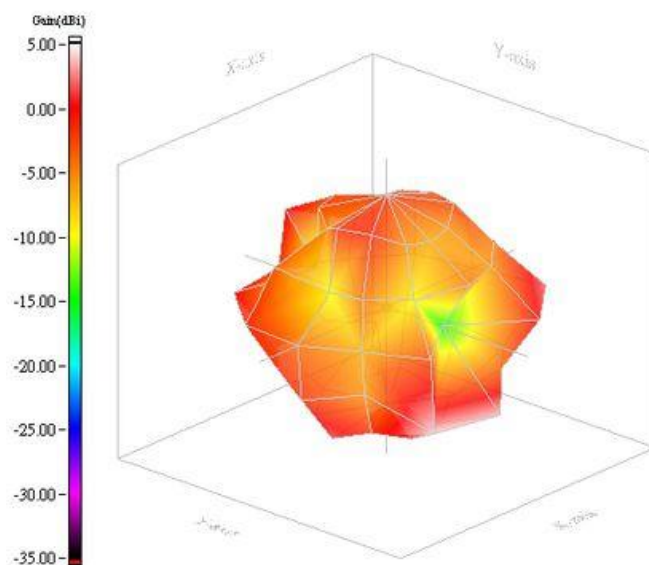
5.25GHz



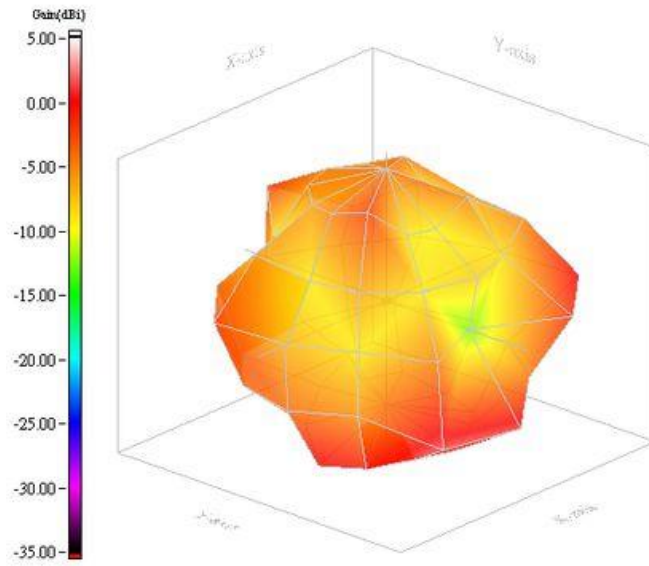
5.35GHz



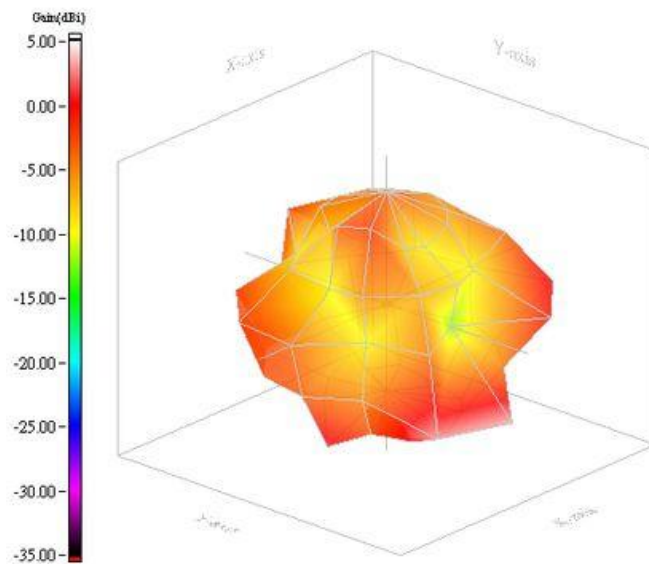
5.47GHz



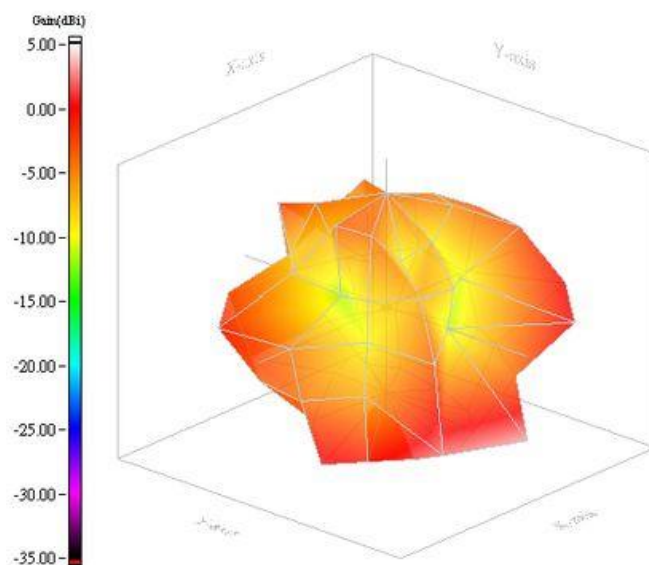
5.60GHz



5.725GHz

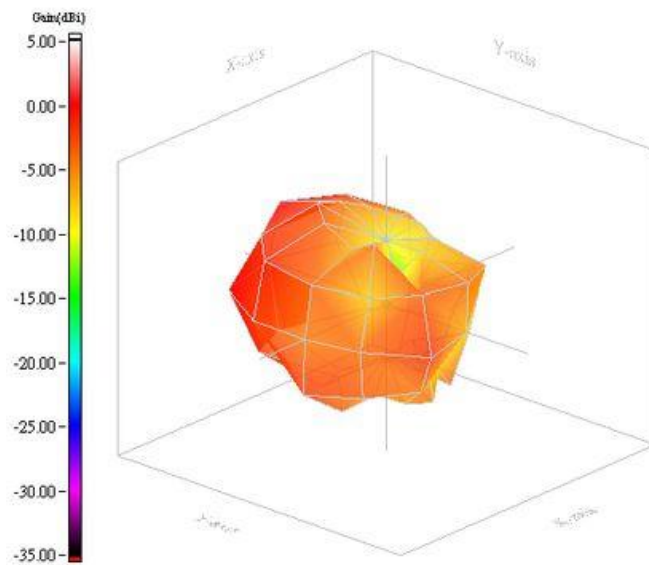


5.785GHz

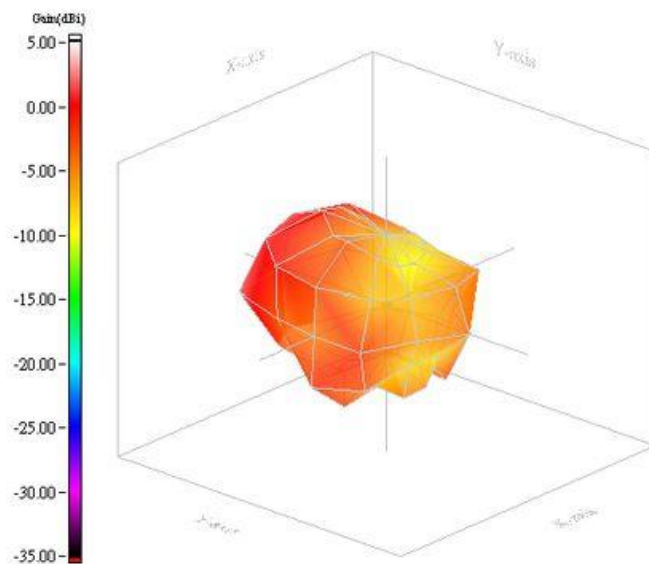


5.85GHz

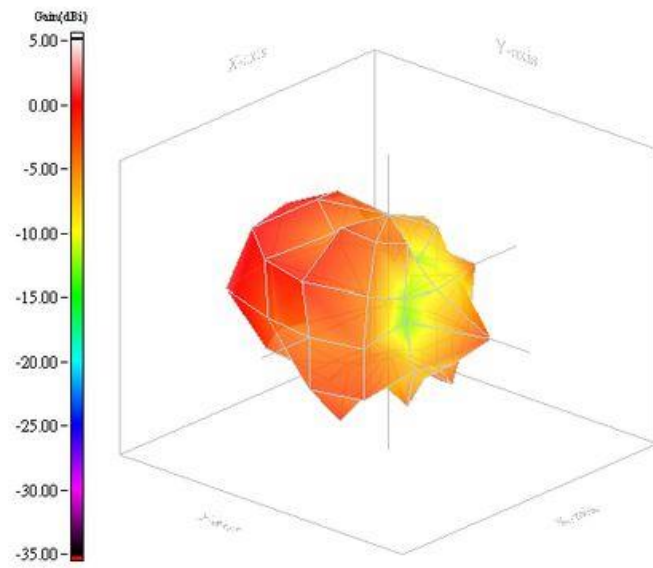
3.2.2 Low Frequency (2.40GHz~2.50GHz) of Side Left / BT Antenna



2.40GHz



2.45GHz



2.50GHz

3.2.3 Average Gain (dBi) Summary

WLAN-MIMO (Side Left) Antenna

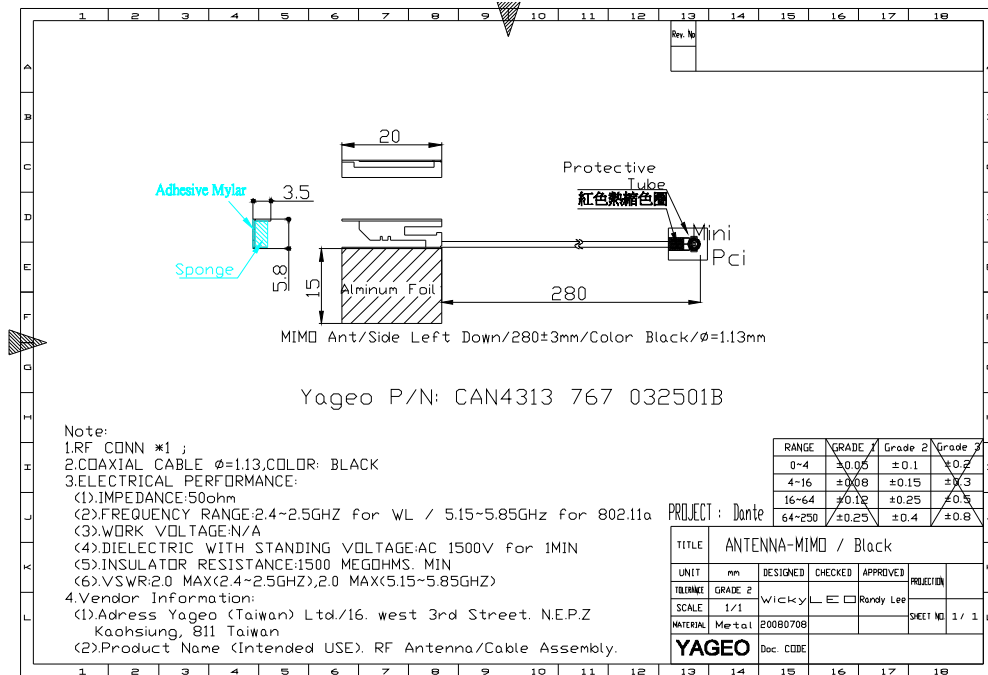
| | (MHz) | Max (dBi) | | Average (dBi) | | | Efficiency (%) | Spec | Efficiency (Min.) | (MHz) |
|----------|-------|-----------|-------|---------------|-------|-------|----------------|------|-------------------|-------|
| | | H-pol | V-pol | H-pol | V-pol | Total | | | | |
| WL Bands | 2400 | 0.43 | -1.08 | -7.05 | -6.48 | -3.74 | 42.27 | 37 | 40.74 | 2400 |
| | 2450 | -0.32 | -0.16 | -7.31 | -6.02 | -3.61 | 43.55 | 37 | | 2450 |
| | 2500 | -2.31 | 0.1 | -7.82 | -6.16 | -3.9 | 40.74 | 37 | | 2500 |
| | 5150 | 1.54 | -0.2 | -6.63 | -6.02 | -3.3 | 46.77 | 29 | 34.67 | 5150 |
| | 5250 | 2.28 | 1.3 | -6.12 | -5.79 | -2.94 | 50.82 | 29 | | 5250 |
| | 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 | | 5470 |
| | 5600 | 3.21 | -0.9 | -5.17 | -6.25 | -2.67 | 54.08 | 29 | | 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

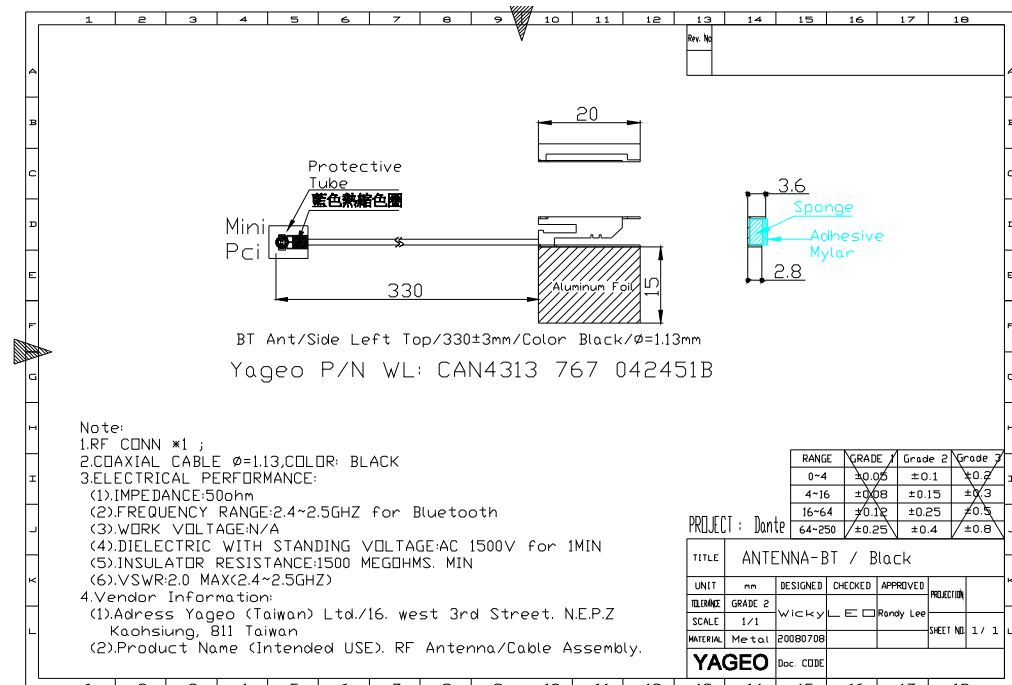
| | (MHz) | Max Value (dBi) | | | Average (dBi) | | | Efficiency (%) | Spec | (MHz) |
|---------|-------|-----------------|-------|-------|---------------|-------|-------|----------------|------|-------|
| | | H-pol | V-pol | Total | H-pol | V-pol | Total | | | |
| BT Band | 2400 | 0.56 | -0.01 | 0.96 | -8.07 | -6 | -3.9 | 40.74 | 29 | 2400 |
| | 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 |

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 IEC)

| 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 ± 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 ± 6% |
| 4.15 | | Endurance | 500 ± 12 hours at 90 °C; | No visible damage 2 hours recovery Central Freq. Change ± 6% |

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:

CAN4313 7 67 03 250 1B
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

04-12-2014:18 NISSEI ELECTRIC GOLDEN TACT :053 485 8908 # 1/ 1

AVLV2 July 24, 2004
Appliance Wiring Material - Component
NISSEI ELECTRIC CO LTD E56198
RYUYO FACTORY 206-1 AZA-OHNISHI, MATSUMOTO IWATA-
GUN, RYUYO-CHO, SHIZUOKA 438-0206 JAPAN

Table of Recognized Styles

| | | | | | | |
|---|------|------|------|------|------|------|
| Single-conductor, thermoplastic insulation. | | | | | | |
| 1144 | 1351 | 1516 | 1629 | 1727 | 1837 | 1954 |
| 1180 | 1332 | 1517 | 1610 | 1827 | 1939 | 1958 |
| 1198 | 1333 | 1523 | 1637 | 1838 | 1931 | 1959 |
| 1199 | 1354 | 1528 | 1671 | 1829 | 1948 | 1970 |
| 1212 | 1356 | 1572 | 1684 | 1847 | 1915 | 1976 |
| 1213 | 1371 | 1584 | 1709 | 1943 | 1944 | 1978 |
| 1226 | 1508 | 1586 | 1710 | 1948 | 1936 | 1974 |
| 1227 | 1512 | 1591 | 1723 | 1950 | 1949 | 1975 |
| 1330 | 1513 | 1592 | 1726 | 1984 | 1945 | 1976 |
| Multiple-conductor, thermoplastic insulation. | | | | | | |
| 2095 | 2384 | 2516 | 2608 | 2658 | 2835 | 2993 |
| 2096 | 2385 | 2517 | 2614 | 2704 | 2834 | 2994 |

8/10/2004 Underwriters Laboratories Inc. Card 1 of 3

AVLV2 July 24, 2004
Appliance Wiring Material - Component
NISSEI ELECTRIC CO LTD E56198

Table of Recognized Styles

| | | | | | | |
|--|------|------|------|------|------|------|
| 2097 | 2386 | 2502 | 2626 | 2709 | 2836 | 2997 |
| 2098 | 2387 | 2519 | 2630 | 2725 | 2834 | 2998 |
| 2099 | 2388 | 2550 | 2631 | 2726 | 2935 | 2999 |
| 2180 | 2446 | 2570 | 2637 | 2778 | 2936 | 2999 |
| 2181 | 2452 | 2571 | 2633 | 2785 | 2937 | 2999 |
| 2182 | 2453 | 2574 | 2634 | 2786 | 2938 | 2999 |
| 2183 | 2454 | 2576 | 2635 | 2787 | 2941 | 2999 |
| 2343 | 2490 | 2584 | 2636 | 2789 | 2949 | 2999 |
| 2344 | 2495 | 2586 | 2660 | 2803 | 2950 | 2999 |
| 2345 | 2501 | 2587 | 2661 | 2841 | 2951 | 2999 |
| 2346 | 2502 | 2589 | 2662 | 2842 | 2951 | 2999 |
| Single-conductor, thermoplastic insulation. | | | | | | |
| 3064 | 3074 | 3128 | 3138 | 3243 | 3323 | 3580 |
| 3069 | 3075 | 3132 | 3139 | 3301 | 3367 | 3581 |
| 3070 | 3122 | 3133 | 3172 | 3305 | 3422 | 3582 |
| 3071 | 3125 | 3135 | 3179 | 3318 | 3468 | 3583 |
| Single and multiple-conductor specialty items. | | | | | | |
| 5048 | 5187 | 5224 | 5226 | 5228 | 5230 | 5233 |

8/10/2004 Underwriters Laboratories Inc. Card 2 of 3

AVLV2 July 24, 2004
Appliance Wiring Material - Component
NISSEI ELECTRIC CO LTD E56198

Table of Recognized Styles

| | | | | | | |
|------|------|------|------|------|------|------|
| 5140 | 5223 | 5225 | 5227 | 5229 | 5231 | 5247 |
|------|------|------|------|------|------|------|

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 Underwriters Laboratories Inc.

8/10/2004 Underwriters Laboratories Inc. Card 3 of 3

I-Pex Connector

| | | | | | | | | | |
|--|------------------|--|--------------------------------|---------|----------|---------|---|----------|----------|
| QMF22 Component - Plastics | | | Friday, May 21, 2004 | | | | | E106764 | |
| POLYPLASTICS CO LTD | | | | | | | | | |
| VECTRA DIV 18-1 KONAN 2-CHOME MINATO-KU TOKYO 108-8280 JAPAN | | | | | | | | | |
| Material Designation: A430 | | | | | | | | | |
| Product Description: Liquid Crystal Polymer (LCP), thermotropic aromatic polyester, designated "Vectra" furnished as pellets. | | | | | | | | | |
| Color | Min. Thick. (mm) | Flame Class | HWI | HAI | RTI Elec | RTI Imp | RTI Str | IEC GWIT | IEC GWF1 |
| NC, BK | 0.43 | V-0 | - | - | 130 | 130 | 130 | - | - |
| | 0.81 | V-0 | - | - | 130 | 130 | 130 | - | - |
| CTI: - | | HVTR: - | | D495: - | | | IEC Ball Pressure (°C): - | | |
| Dielectric Strength (kV/mm): - | | Volume Resistivity (10 ⁸ ohm-cm): - | | | | | Dimensional Stability(%): - | | |
| ISO Tensile Strength (MPa): - | | ISO Flexural Strength (MPa): - | | | | | ISO Heat Deflection (°C): - | | |
| ISO Tensile Impact (kJ/m ²): - | | ISO Izod Impact (kJ/m ²): - | | | | | ISO Charpy Impact (kJ/m ²): - | | |
| Report Date: 8/19/1992 | | | Underwriters Laboratories Inc® | | | | | | |
| UL94 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. | | | | | | | | | |

| | | | | | | | | | |
|--|--|---|--------------------------------|-----|----------|---------|--|----------|----------|
| QMF22 Component - Plastics | | | Friday, October 24, 2003 | | | | E213445 | | |
| WINTECH POLYMER LTD | | | | | | | | | |
| 18-1 KONAN 2-CHOME MINATO-KU TOKYO 108-8280 JP | | | | | | | | | |
| Material Designation: 3118(e) | | | | | | | | | |
| Product Description: Polybutylene Terephthalate (PBT), designated "Duranex" furnished as pellets. | | | | | | | | | |
| Color | Min. Thick. (mm) | Flame Class | HWI | HAI | RTI Elec | 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 | - | - |
| CTI: 2 | IEC CTI (V): - | | HVTR: 3 | | D495: 6 | | IEC Ball Pressure (° C): - | | |
| Dielectric Strength (kV/mm): 23 | | Volume Resistivity (10 ⁸ ohm-cm): 15 | | | | | Dimensional Stability(%): 0.0 | | |
| ISO Tensile Strength (MPa): - | | ISO Flexural Strength (MPa): - | | | | | ISO Heat Deflection (C): - | | |
| ISO Tensile Impact (kJ/m ²): - | | ISO Izod Impact (kJ/m ²): - | | | | | ISO Charpy Impact(kJ/m ²): - | | |
| (e) | Virgin and regrind from 1 to 50 by weight incl. have the same basic material characteristics (at a minimum thickness of 0.75 mm), except for 310EP which has a lower as received Tensile Impact value from 26 to 50 percent regrind. | | | | | | | | |
| Report Date: 11/15/2000 | | | Underwriters Laboratories Inc® | | | | | | |
| UL94 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. | | | | | | | | | |

E106764

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E249493

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

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

Card 1 of 1

Fiore-花序

Protective Tube



YDPU2/E255532

Tubing, Extruded Insulating - Component

See General Information for Tubing, Extruded Insulating - Component

E255532

| Cat. No. | Max V | Max Oper Temp | Shrinkdown Class | Col Recognized | Max Temp Rated Oil Resistance * C | VW-1 Rated # |
|---|-------|---------------|------------------|----------------|-----------------------------------|--------------|
| Heat shrinkable polyolefin tubing. | | | | | | |
| G5(+) | 600 | 125 | — | ALL Except CL | — | Yes## |
| AIS(\$) | 600 | 125 | II | Black, only | — | — |
| Not-Heat-Shrinkable PVC Tubing | | | | | | |
| NSPVC | 600 | 105 | — | ALL | — | Yes |

*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](#)

TAIPEI LAMINATION INDUSTRIES INC

E200008

TH FL-6

07 CHUNG SHAN RD, SEC 1

SHIN CHUANG, TAIPEI HSIEN 242 TAIWAN

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

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

Flame 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, wrapper and/or core.

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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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[Page Top](#)

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