



**Wistron NeWeb Corporation**

# Pebble Antenna Regulatory Information

Document Revision: 1

|               |                                |
|---------------|--------------------------------|
| Customer Name | Wistron Corporation            |
| Customer P/N  | 25.90077.001 / 25.90078.001    |
| WNC P/N       | 81.CAB15.001 / 81.CAB15.002    |
| Description   | Triple-band antenna for Pebble |

| Provided By<br>Wistron NeWeb Corp | Reviewed By<br>Wistron NeWeb Corp |
|-----------------------------------|-----------------------------------|
| Sophia Lin                        | Weili Cheng                       |

**wistron**

Wistron NeWeb Corporation  
No.10-1, Li-hsin Road I,  
Science-based Industrial Park,  
Hsinchu 300, Taiwan, R.O.C.  
Telephone: 886-3-666-7799  
Facsimile: 886-3-666-7711  
<http://www.wnweb.com>

聯碁科技股份有限公司  
新竹市 300 科學園路力行一路 10-1 號  
電話：(03) 666-7799  
傳真：(03) 666-7711

Release Date: 2003/3/20



## Wistron NeWeb Corporation

### 1. Antenna Model Number

Model number: CAB-A

### 2. Manufacturing Information

Wistron NeWeb Corporation

No. 10-1, Li-hsin Road I, Science-base Industrial Park, Hsinchu 300, Taiwan, R.O.C.

### 3. Antenna Configuration

|                 | Main Antenna                                                                                                            | Aux Antenna                                                                                                             |
|-----------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Position        | Left-side                                                                                                               | Right-side                                                                                                              |
| Antenna Type    | PIFA                                                                                                                    | PIFA                                                                                                                    |
| Material        | 1. Stamped metal<br>2. Junkosha cable and IPEX connector<br>(Or Nissei cable and HRS connector)<br>3. Sponge<br>4. Tape | 1. Stamped metal<br>2. Junkosha cable and IPEX connector<br>(Or Nissei cable and HRS connector)<br>3. Sponge<br>4. Tape |
| Cable Length #1 | 1.13 (dia.) x 273 mm                                                                                                    | 1.13 (dia.) x 325 mm                                                                                                    |

#1: Cable length is measured from the center of connector to the end of cable.

### 4. Pictures of Antennas

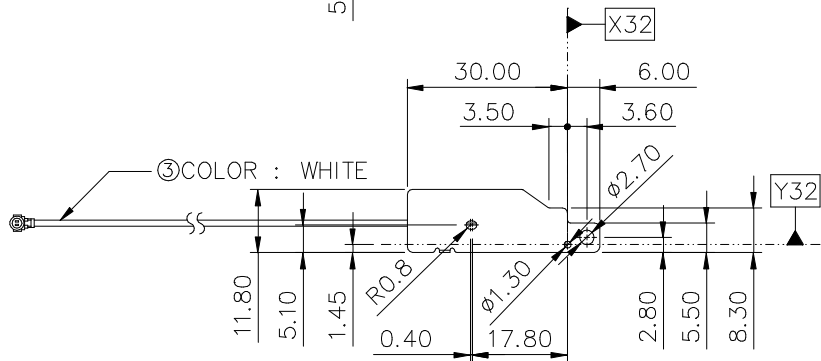
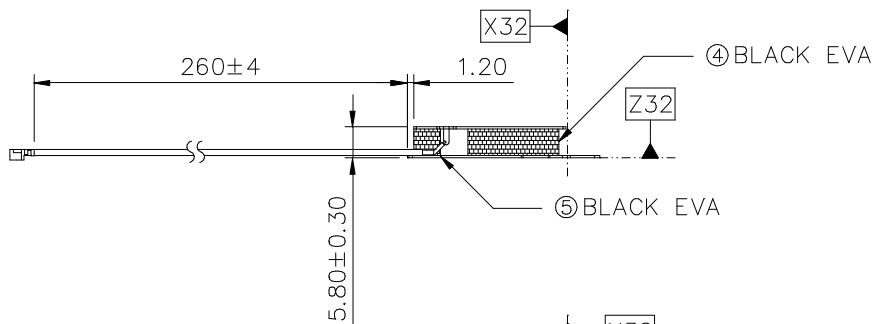
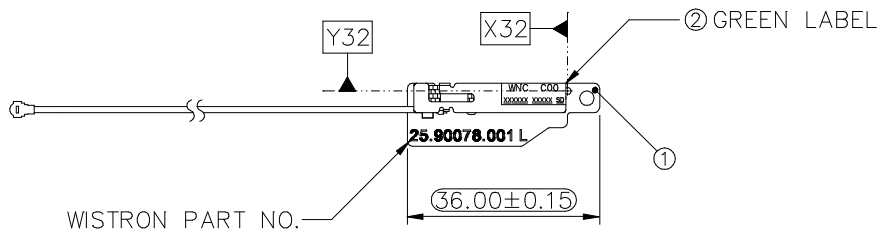
| Main Antenna                                                                        | Aux Antenna                                                                          |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |

### 5. Antenna Dimensions (Mechanical drawings)

(See Next 2 Pages)

1

| PART NUMBER BLOCK |     |
|-------------------|-----|
| PART NUMBER       | REV |
| 57.CAB15.001      | SD  |



NOTES :  
1.  ARE CPK DIMENSIONS.

| 5    | 3B.CAB80.111 | BUFFER, CAB-A                  | EA   | 1   | CHEVAL CO.                                   |
|------|--------------|--------------------------------|------|-----|----------------------------------------------|
| 4    | 3B.CZ280.111 | BUFFER, ANTENNA, CZ2-A         | EA   | 1   |                                              |
| 3    | 50.CAB05.001 | CABLE WN-S-1.13W-273mm-(2-2-1) | EA   | 1   | CABLE : JUNKOSHA CO.<br>CONNECTOR : IPEX CO. |
| 2    | 45.CA513.002 | LABEL, GREEN, 12x4, CA5-Q      | EA   | 1   | JENG LONG<br>TECHNOLOGY CO.                  |
| 1    | 3A.CAB45.111 | ANTENNA, LEFT, CAB-A           | EA   | 1   | MUTUAL SUPPORT<br>PRESS CO.                  |
| ITEM | PART NO.     | DESCRIPTION                    | UNIT | QTY | SUPPLIER                                     |

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS  
ARE IN mm AND TOLERANCES ARE:  
INTEGRAL DIMENSIONS ±  
1 PLACE DECIMAL ±  
2 PLACE DECIMALS ±0.3  
ANGULAR DIMENSIONS ±1°  
HOLES UNDER Ø5.00 ±0.05

MATERIAL: NA

FINISH: NA

THIRD ANGLE PROJECTION



DRAWN

ARSENE YU

02/26/03

ENGR

ARSENE YU

02/26/03

APVD

**wistron** 啟碁科技股份有限公司  
**Wistron NeWeb Corp.**  
No. 10-1, Li-hsin Road I, Science-based Industrial Park,  
Hsinchu 300, Taiwan, R.O.C.  
Tel: 886-3-6667799 Fax: 886-3-6667711

DWG TITLE

OUTLINE, MAIN, CAB-A

SIZE DWG NO.

A3

57.CAB15.001

REV

SD

SCALE

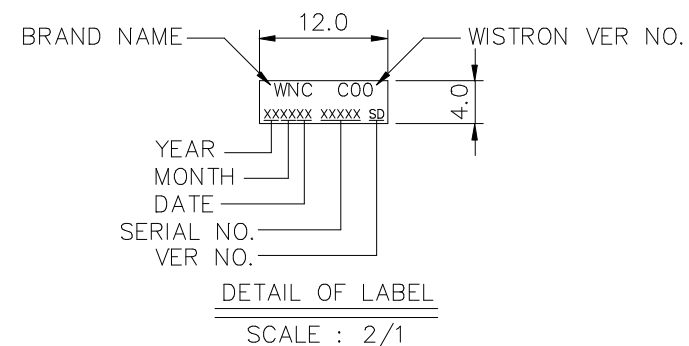
1/1

SHEET

1 OF 1

2

| REVISIONS |     |               |          |          |
|-----------|-----|---------------|----------|----------|
| ZONE      | REV | DESCRIPTION   | DATE     | APPROVED |
|           | SA  | APPROVE SHEET | 08/14/02 |          |
|           | SB  | APPROVE SHEET | 11/14/02 |          |
|           | SC  | APPROVE SHEET | 01/30/03 |          |
|           | SD  | APPROVE SHEET | 02/26/03 |          |



| Frequency Specification    |             |              |
|----------------------------|-------------|--------------|
| Applicable Frequency (GHz) | 2.4 - 2.484 | 5.15 - 5.725 |
| V.S.W.R.                   | < 2.0       | < 2.5        |

1

2

1

2

## PART NUMBER BLOCK

| PART NUMBER  | REV |
|--------------|-----|
| 57.CAB15.002 | SD  |

## REVISIONS

| ZONE | REV | DESCRIPTION   | DATE     | APPROVED |
|------|-----|---------------|----------|----------|
|      | SA  | APPROVE SHEET | 08/14/02 |          |
|      | SB  | APPROVE SHEET | 11/14/02 |          |
|      | SC  | APPROVE SHEET | 01/30/03 |          |
|      | SD  | APPROVE SHEET | 02/26/03 |          |

② WHITE LABEL

WISTRON PART NO.

25.90077.001 R

(36.00±0.15)

310±4

5.35

X33

④ BLACK EVA

Z33

③ COLOR : BLACK

⑤ BLACK EVA

4.50

25.50

X33

R0.8

φ2.70

φ1.30

3.60

6.00

15.50

6.50

5.10

2.80

1.45

0.40

18.80

Y33

## NOTES :

1.  ARE CPK DIMENSIONS.

5.80±0.30

5.50

Z33

Y33

BRAND NAME

12.0

WISTRON VER NO.

WNC C00

XXXXXX XXXXX SP

YEAR

MONTH

DATE

SERIAL NO.

VER NO.

DETAIL OF LABEL

SCALE : 2/1

## Frequency Specification

| Applicable Frequency (GHz) | 2.4 - 2.484 | 5.15 - 5.725 |
|----------------------------|-------------|--------------|
| V.S.W.R.                   | < 2.0       | < 2.5        |

| 5    | 3B.CAB80.111 | BUFFER, CAB-A                  | EA   | 1   | CHEVAL CO.                                   |
|------|--------------|--------------------------------|------|-----|----------------------------------------------|
| 4    | 3B.CZ280.111 | BUFFER, ANTENNA, CZ2-A         | EA   | 1   |                                              |
| 3    | 50.CAB02.001 | CABLE WN-S-1.13B-325MM-(2-2-1) | EA   | 1   | CABLE : JUNKOSHA CO.<br>CONNECTOR : IPEX CO. |
| 2    | 45.CA513.001 | LABEL, WHITE, 12x4, CA5-Q      | EA   | 1   | JENG LONG<br>TECHNOLOGY CO.                  |
| 1    | 3A.CAB45.112 | ANTENNA, RIGHT, CAB-A          | EA   | 1   | MUTUAL SUPPORT<br>PRESS CO.                  |
| ITEM | PART NO.     | DESCRIPTION                    | UNIT | QTY | SUPPLIER                                     |

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS  
ARE IN mm AND TOLERANCES ARE:

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1 PLACE DECIMAL ±

2 PLACE DECIMALS ±0.3

ANGULAR DIMENSIONS ±1°

HOLES UNDER Ø5.00 ±0.05

MATERIAL: NA

FINISH: NA

THIRD ANGLE PROJECTION



DRAWN

ARSENE YU

02/26/03

ENGR

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DWG TITLE

OUTLINE, AUX, CAB-A

SIZE DWG NO.

A3

57.CAB15.002

REV

SD

SCALE

1/1

SHEET

1 OF 1

1

2



## Wistron NeWeb Corporation

### 6. Antenna Gain

| Antenna Gain<br>dBi @ GHz |           | 2G4 ISM band |       |       | U-NII band |       |       | HyperLAN band |        |       |
|---------------------------|-----------|--------------|-------|-------|------------|-------|-------|---------------|--------|-------|
|                           |           | 2.40         | 2.45  | 2.50  | 5.15       | 5.25  | 5.35  | 5.47          | 5.5975 | 5.725 |
| MAIN                      | Peak Gain | 0.01         | 2.25  | 2.59  | 4.09       | 3.44  | 3.97  | 3.65          | 3.03   | 1.81  |
|                           | Avg. Gain | -3.71        | -2.86 | -3.84 | -3.50      | -2.90 | -3.39 | -2.81         | -3.90  | -3.32 |
| AUX                       | Peak Gain | 0.34         | 0.86  | 0.82  | 1.80       | 0.61  | 2.64  | 3.85          | 3.89   | 2.53  |
|                           | Avg. Gain | -3.27        | -3.18 | -2.92 | -3.50      | -3.53 | -1.97 | -2.90         | -2.73  | -4.69 |

### 7. Cable Loss (including connector)

| Unit: dBm     | 2G4 band | U-NII band | HyperLAN band |
|---------------|----------|------------|---------------|
| 273 mm (MAIN) | -1.13    | -1.69      | -1.74         |
| 325 mm (AUX)  | -1.29    | -1.94      | -2.00         |

### 8. Connector Info (general description)

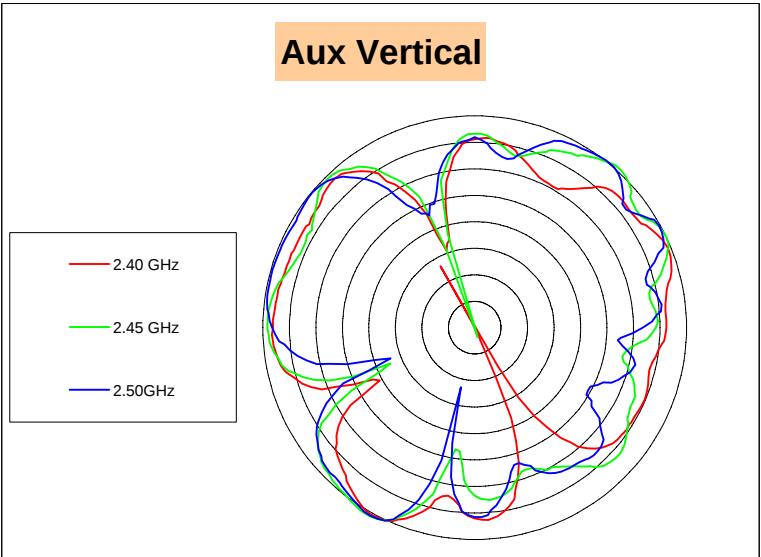
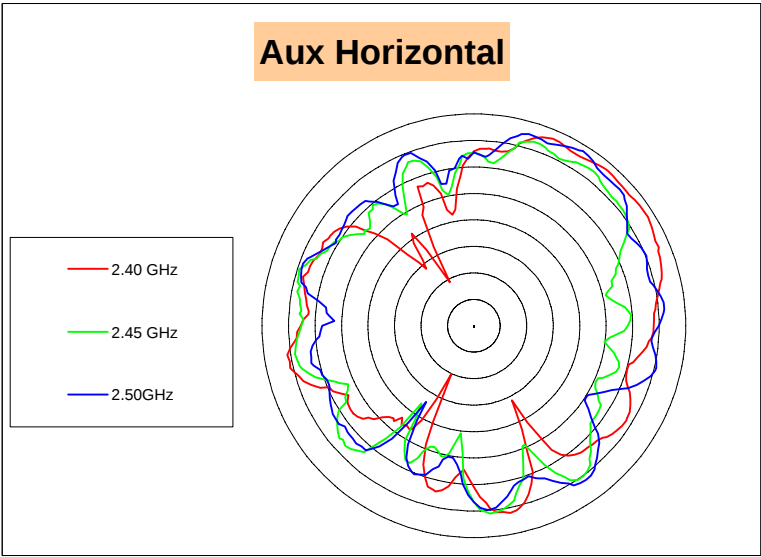
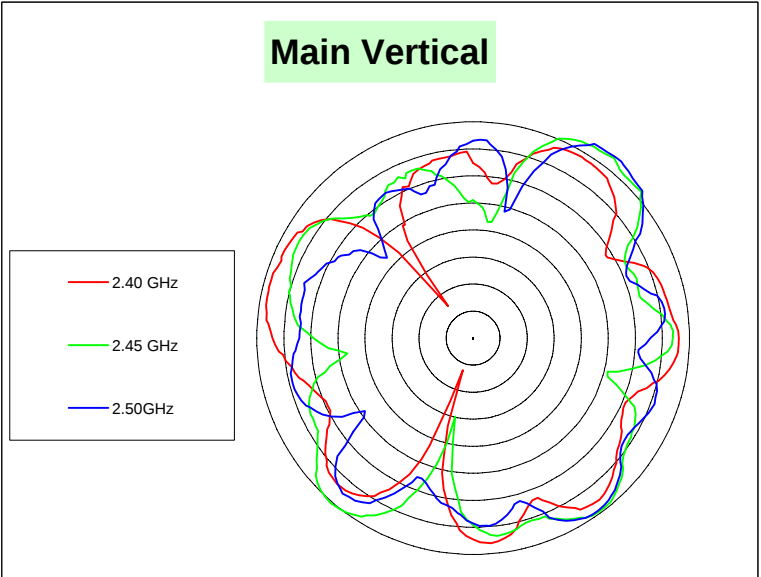
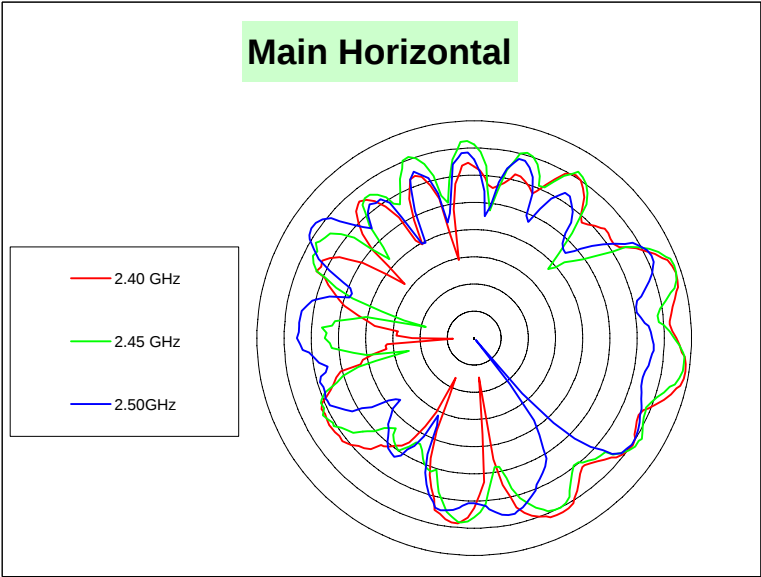
|                             |                                                                                                                                                                                                                                                                 |                                                  |                                                         |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------|
| Description<br>(Cable)      | Inner Conductor: AWG#32(7/0.8), Silver plating annealed copper wire<br>Dielectric core: D0.68mm<br>Outer conductor: 16/4/0.05 D0.93mm, Silver plating annealed copper wire<br>Jacket: D1.13mm                                                                   |                                                  |                                                         |
| Requirements                | Characteristic impedance: 50(+2, -2) ohm<br>Nominal capacitance: 97pF/m<br>Conductor resistance of inner conductor at 293K(20 ): 520ohm/km MAX<br>Insulation resistance: 1500mega-ohm.km MIN<br>Dielectric withstand voltage: no breakdown at AC1000V for 1min. |                                                  |                                                         |
| Ratings                     | Rated voltage: AC60Vrms<br>Nominal characteristics impedance: 50ohm<br>VSWR: 1.3MAX DC~3GHz, 1.7MAX 3~6GHz                                                                                                                                                      |                                                  |                                                         |
| Electric<br>characteristics | Contact resistance                                                                                                                                                                                                                                              | 10mA MAX<br>(DC or 1000Hz)                       | Center contact 74mohm MAX.<br>Outer contact 27mohm MAX. |
|                             | Insulation resistance                                                                                                                                                                                                                                           | 100V DC                                          | 500Mohm MIN                                             |
|                             | Voltage proof                                                                                                                                                                                                                                                   | 200V AC for 1 min.<br>Current leakage 2mA<br>MAX | No flashover or breakdown                               |

### 9. Radiation Pattern

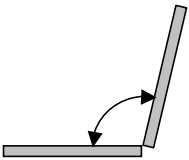
(See the following Pages)

Platform: Pebble Configuration:1  
Supplier: Wistron NeWeb coporation  
Date: 2003/3/17

2G4 ISM (2.400 GHz - 2.4835 GHz) Antenna Radiation Patterns



| 2G4 ISM (2.400 GHz - 2.4835 GHz) |          |         |        |
|----------------------------------|----------|---------|--------|
| CONFIG                           | FREQ GHz | Avg dBi | Pk dBi |
| Main Horz                        | 2.4      | -7.24   | -0.63  |
|                                  | 2.45     | -7.12   | -0.82  |
|                                  | 2.5      | -8.99   | -3.82  |
| Main Vert                        | 2.4      | -4.70   | -0.94  |
|                                  | 2.45     | -3.78   | 2.25   |
|                                  | 2.5      | -4.45   | 2.59   |
| Aux Horz                         | 2.4      | -6.46   | -1.25  |
|                                  | 2.45     | -8.01   | -3.17  |
|                                  | 2.5      | -6.57   | -1.10  |
| Aux Vert                         | 2.4      | -4.33   | 0.34   |
|                                  | 2.45     | -3.64   | 0.80   |
|                                  | 2.5      | -3.77   | 0.59   |



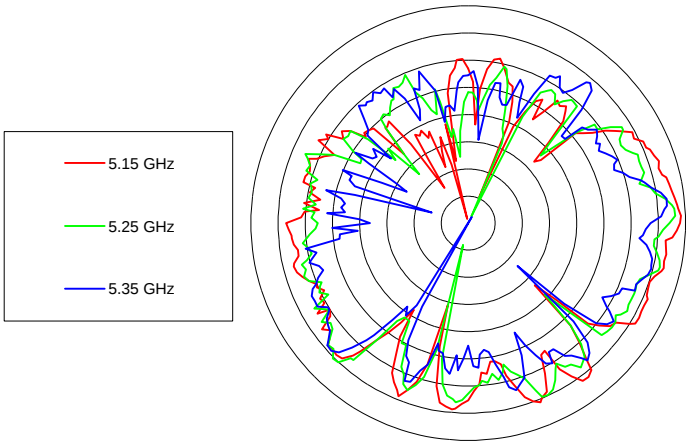
VSWR open = lid/keyboard angle 110°

Note: The outer circle approximately represents the 0 dBi gain circle  
Each circle with 5 dBi difference (Max=0 dBi and Min=-40 dBi)

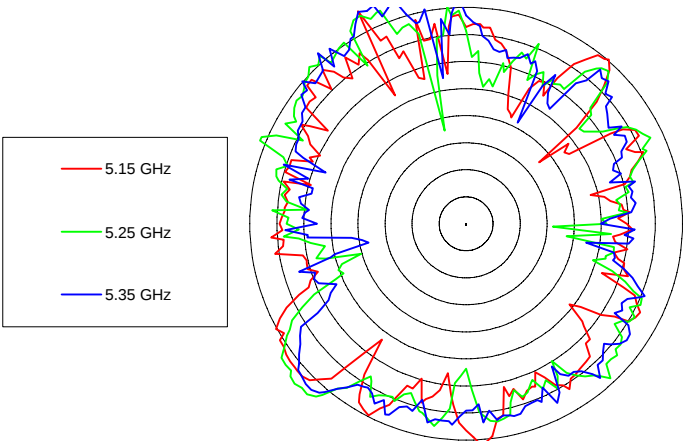
Platform: Pebble Configuration:1  
Supplier: Wistron NeWeb coporation  
Date: 2003/3/17

U-NII (5.150 GHz - 5.350 GHz) Antenna Radiation Patterns

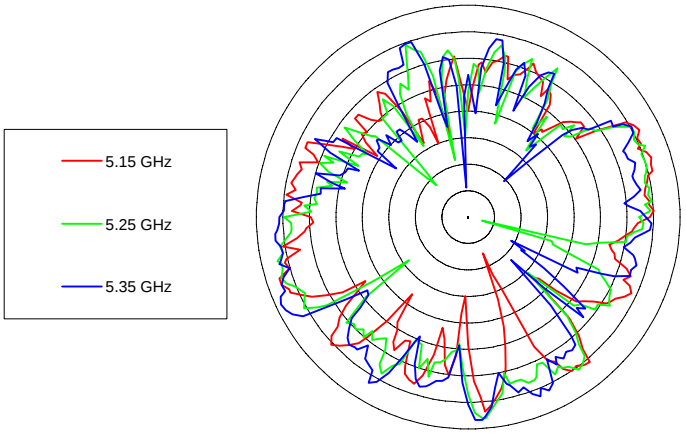
Main Horizontal



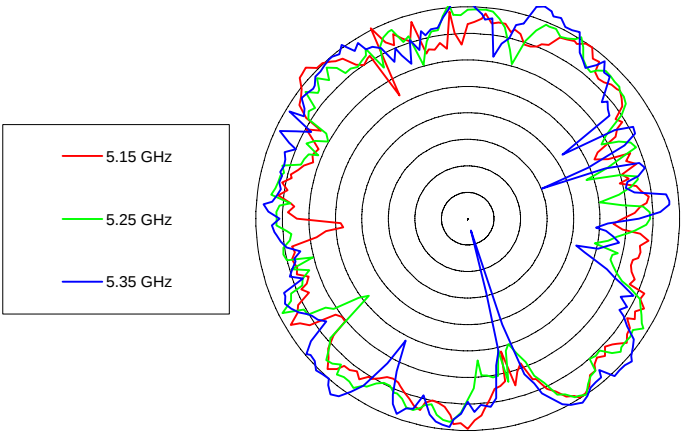
Main Vertical



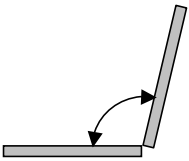
Aux Horizontal



Aux Vertical



| U-NII (5.150 GHz - 5.350 GHz) |          |         |        |
|-------------------------------|----------|---------|--------|
| CONFIG                        | FREQ GHz | Avg dBi | Pk dBi |
| Main Horz                     | 5.15     | -7.69   | -0.83  |
|                               | 5.25     | -8.99   | -1.86  |
|                               | 5.35     | -10.42  | -3.19  |
| Main Vert                     | 5.15     | -4.57   | 4.09   |
|                               | 5.25     | -3.54   | 3.38   |
|                               | 5.35     | -3.74   | 3.96   |
| Aux Horz                      | 5.15     | -8.70   | -2.53  |
|                               | 5.25     | -8.62   | -1.89  |
|                               | 5.35     | -7.86   | -0.98  |
| Aux Vert                      | 5.15     | -4.01   | 1.80   |
|                               | 5.25     | -3.95   | 0.61   |
|                               | 5.35     | -2.66   | 2.64   |



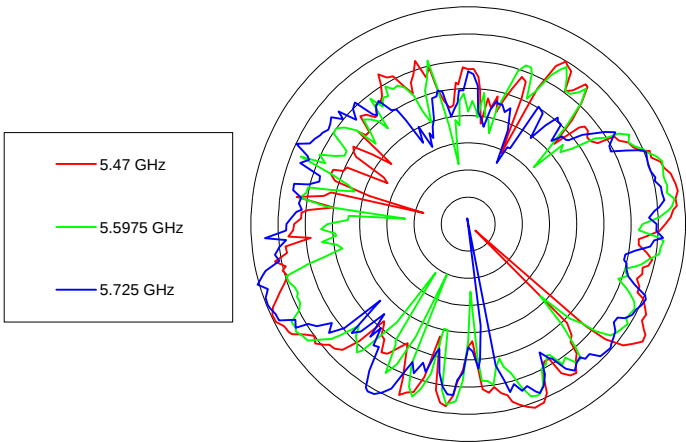
VSWR open = lid/keyboard angle 110°

Note: The outer circle approximately represents the 0 dBi gain circle  
Each circle with 5 dBi difference (Max=0 dBi and Min=-40 dBi)

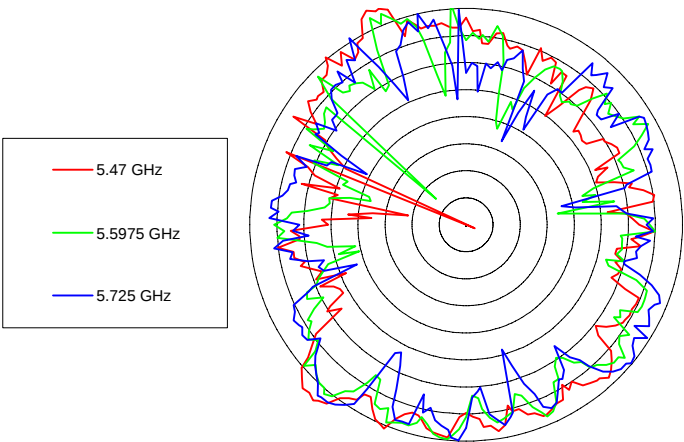
Platform: Pebble Configuration:1  
Supplier: Wistron NeWeb coporation  
Date: 2003/3/17

HyperLAN (5.470 GHz - 5.725 GHz) Antenna Radiation Patterns

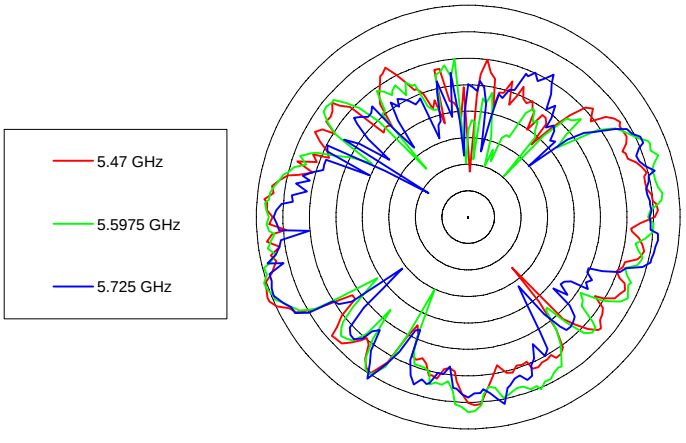
Main Horizontal



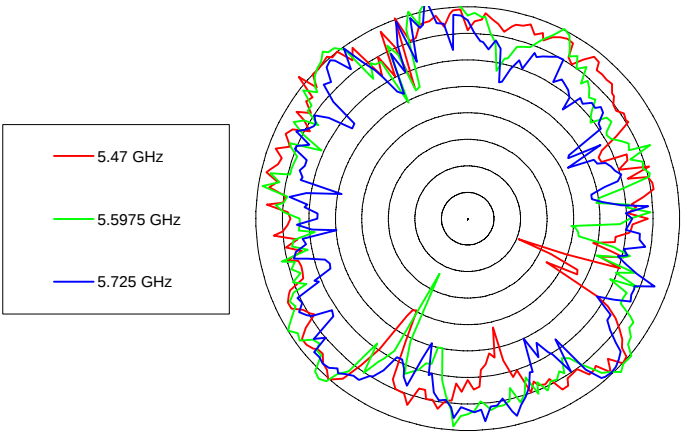
Main Vertical



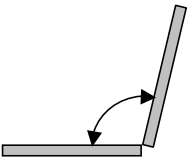
Aux Horizontal



Aux Vertical



| HyperLAN (5.470 GHz - 5.725 GHz) |          |         |        |
|----------------------------------|----------|---------|--------|
| CONFIG                           | FREQ GHz | Avg dBi | Pk dBi |
| Main Horz                        | 5.47     | -7.04   | -0.21  |
|                                  | 5.5975   | -8.56   | -1.69  |
|                                  | 5.725    | -7.66   | 0.32   |
| Main Vert                        | 5.47     | -3.72   | 3.65   |
|                                  | 5.5975   | -5.00   | 2.17   |
|                                  | 5.725    | -4.51   | 1.81   |
| Aux Horz                         | 5.47     | -7.26   | 0.86   |
|                                  | 5.5975   | -6.73   | 0.52   |
|                                  | 5.725    | -8.03   | -0.35  |
| Aux Vert                         | 5.47     | -3.93   | 1.66   |
|                                  | 5.5975   | -3.75   | 3.89   |
|                                  | 5.725    | -5.58   | 2.53   |



VSWR open = lid/keyboard angle 110°

Note: The outer circle approximately represents the 0 dBi gain circle  
Each circle with 5 dBi difference (Max=0 dBi and Min=-40 dBi)