

2011.03.15

RA-N0315-03

# Data Sheet

( APPLICATION )

MODEL : GRANT

**Antenna layout**

(주) Pantech 貴中



라 디 나 주 식 회 사  
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|                                                                                   |                        |           |       |     |      |       |
|-----------------------------------------------------------------------------------|------------------------|-----------|-------|-----|------|-------|
|  | PRODUCT APPROVAL SHEET |           | GRANT |     |      |       |
|                                                                                   | MODEL                  | <b>D4</b> | REV.  | 1.0 | Page | 2 / 8 |

## Table of contents

1. Revision History
2. Product Information
  - 2.1 General Features
  - 2.2 Electrical Specifications
3. Pattern Specifications
4. Matching Network
5. Electrical Characteristics
  - 5.1 VSWR
  - 5.2 Smith chart
  - 5.3 3D-PLOTS
  - 5.4 2D-GAIN
6. Passive Measurement

|                                                                                   |                        |    |       |     |      |       |
|-----------------------------------------------------------------------------------|------------------------|----|-------|-----|------|-------|
|  | PRODUCT APPROVAL SHEET |    | GRANT |     |      |       |
|                                                                                   | MODEL                  | D4 | REV.  | 1.0 | Page | 3 / 8 |

## 1.Revision History

| NO. | Before | After | Reason | Date |
|-----|--------|-------|--------|------|
| 1   |        |       |        |      |
| 2   |        |       |        |      |
| 3   |        |       |        |      |
| 4   |        |       |        |      |
| 5   |        |       |        |      |
| 6   |        |       |        |      |
| 7   |        |       |        |      |
| 8   |        |       |        |      |
| 9   |        |       |        |      |
| 10  |        |       |        |      |
| 11  |        |       |        |      |
| 12  |        |       |        |      |
| 13  |        |       |        |      |

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|  | PRODUCT APPROVAL SHEET |    | GRANT |     |      |       |
|                                                                                   | MODEL                  | D4 | REV.  | 1.0 | Page | 4 / 8 |

## 2. Product Information

### 2.1 General Features

|              |                  |
|--------------|------------------|
| PRODUCT NAME | GRANT            |
| ANTENNA TYPE | Pattern , layout |
| APPLICATIONS | Bluetooth        |

### 2.2 Electrical Specifications

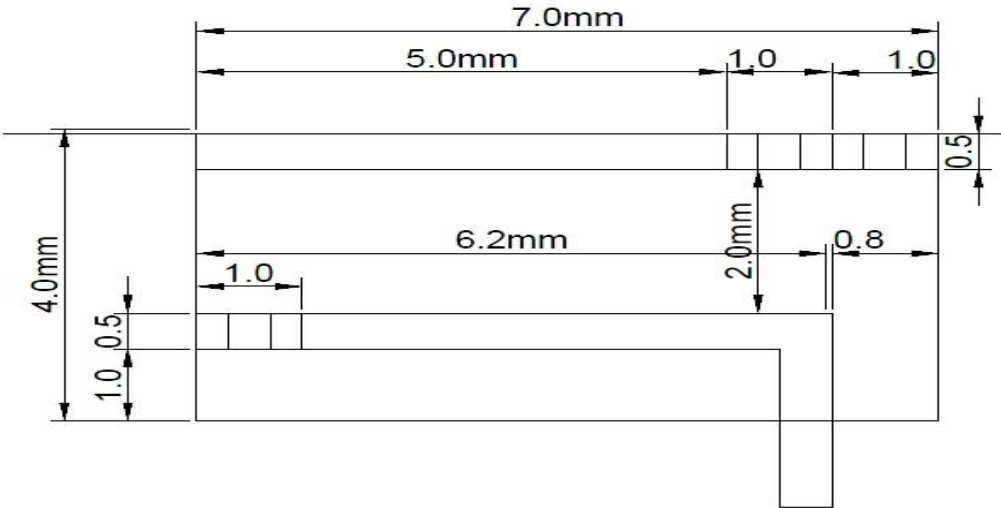
|                       |    |                  |         |
|-----------------------|----|------------------|---------|
| Frequency Range1 (TX) |    | 2400MHz~2485MHz  |         |
| Frequency Range1 (RX) |    | 2400MHz~2485MHz  |         |
| IMPEDANCE             |    | 50 Ω             |         |
| V.S.W.R               | TX | 2400MHz          | 2485MHz |
|                       |    | 3:1 <↓           | 3:1 <↓  |
|                       | RX | 2400MHz          | 2485MHz |
|                       |    | 3:1 <↓           | 3:1 <↓  |
| RADIATION PATTERN     |    | Omni-directional |         |
| POLARIZATION          |    | Linear           |         |

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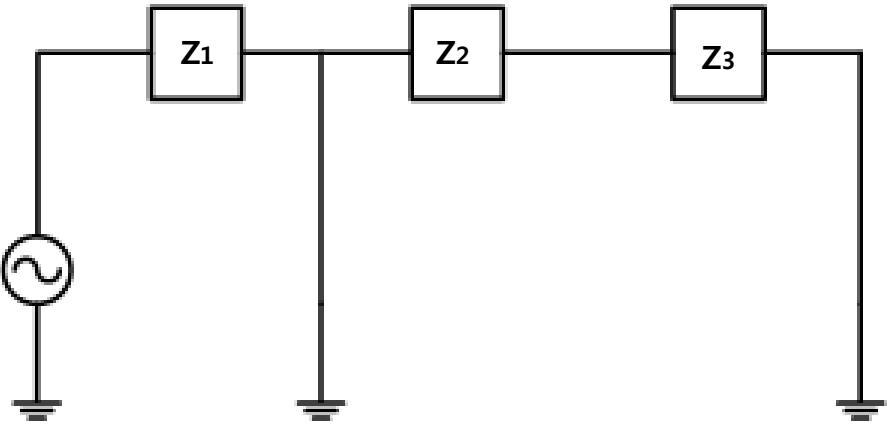
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|                                                                                   |                        |    |       |     |      |       |
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|  | PRODUCT APPROVAL SHEET |    | GRANT |     |      |       |
|                                                                                   | MODEL                  | D4 | REV.  | 1.0 | Page | 5 / 8 |

3. Pattern Specifications



4. Matching Network



|       |       |       |
|-------|-------|-------|
| Z1    | Z2    | Z3    |
| 0.5pF | 0.5pF | 1.5pF |

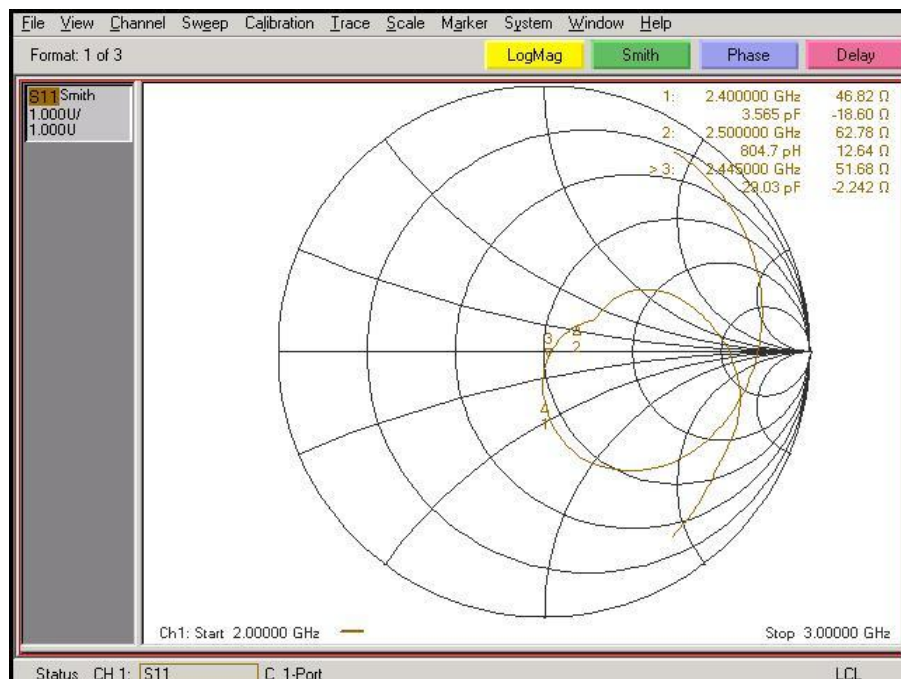
|                                                                                   |                        |    |       |     |      |       |
|-----------------------------------------------------------------------------------|------------------------|----|-------|-----|------|-------|
|  | PRODUCT APPROVAL SHEET |    | GRANT |     |      |       |
|                                                                                   | MODEL                  | D4 | REV.  | 1.0 | Page | 6 / 8 |

## 5. Electrical Characteristics

### 5.1 VSWR



### 5.2 SMITH CHART

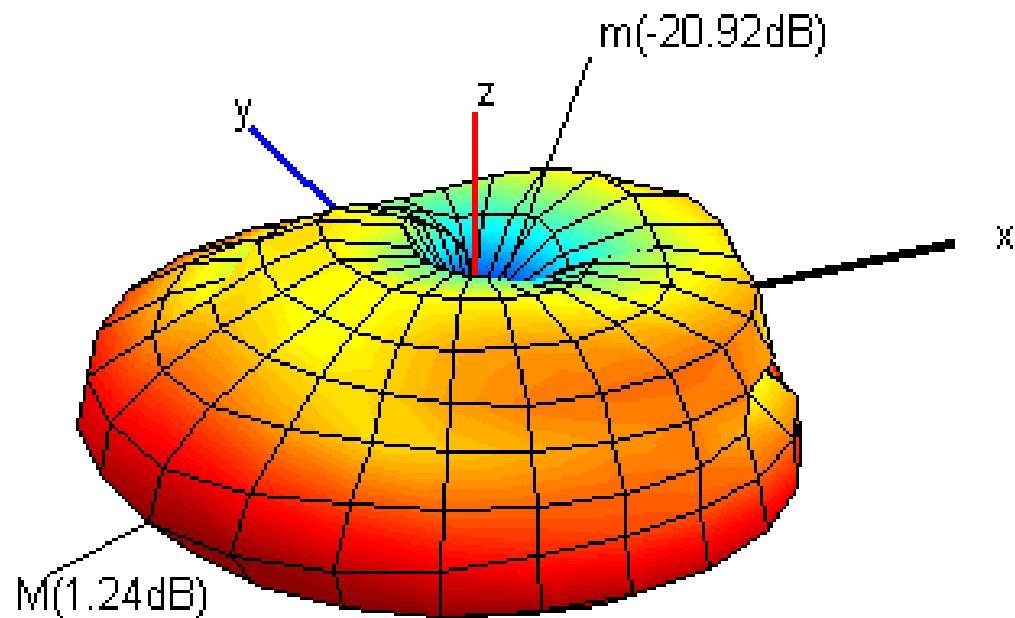


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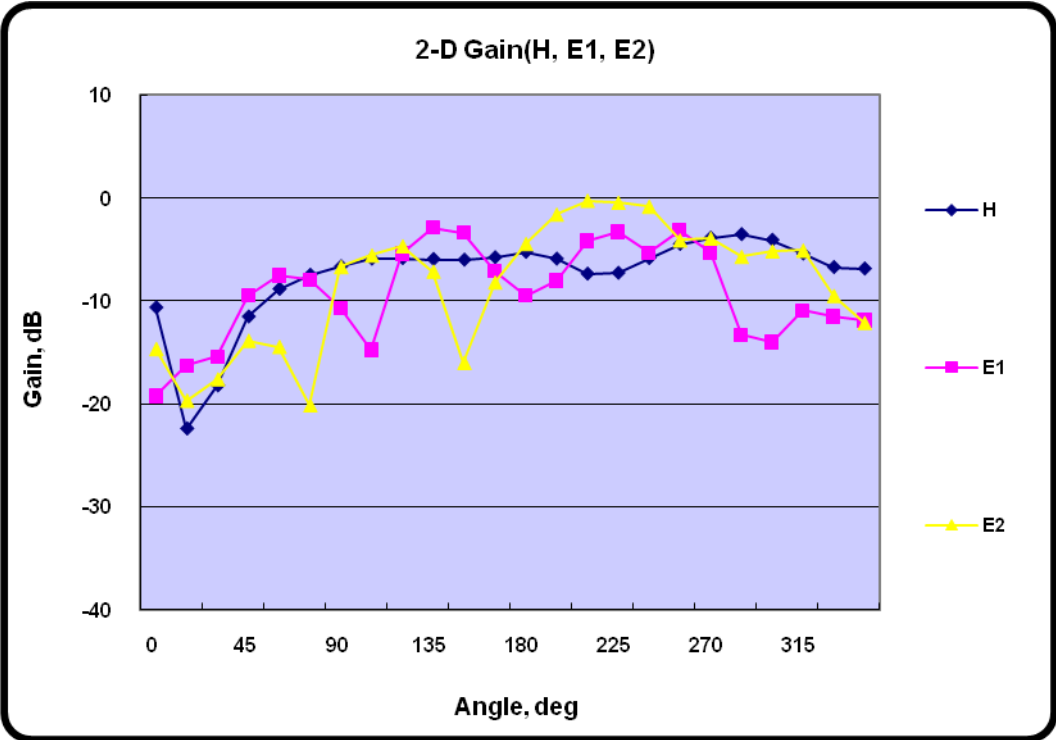
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|                                                                                   |                        |    |       |     |      |       |
|-----------------------------------------------------------------------------------|------------------------|----|-------|-----|------|-------|
|  | PRODUCT APPROVAL SHEET |    | GRANT |     |      |       |
|                                                                                   | MODEL                  | D4 | REV.  | 1.0 | Page | 7 / 8 |

5.3 3D PLOTs



5.4 2-D Gain



|                                                                                   |                        |    |  |  |       |     |            |
|-----------------------------------------------------------------------------------|------------------------|----|--|--|-------|-----|------------|
|  | PRODUCT APPROVAL SHEET |    |  |  | GRANT |     |            |
|                                                                                   | MODEL                  | D4 |  |  | REV.  | 1.0 | Page 8 / 8 |

## 6. Passive Measurement

| Frequency(MHz)            | 2400   | 2405   | 2410   | 2415   | 2420   | 2425   | 2430   | 2435   | 2440   | 2445   | 2450   |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Efficiency(dB)            | -3.98  | -3.97  | -4.06  | -4.04  | -4.17  | -4.21  | -4.29  | -4.29  | -4.33  | -4.46  | -4.39  |
| Efficiency(%)             | 40.01  | 40.07  | 39.29  | 39.41  | 38.27  | 37.90  | 37.23  | 37.23  | 36.86  | 35.79  | 36.42  |
| TRG(dB)                   | -3.98  | -3.97  | -4.06  | -4.04  | -4.17  | -4.21  | -4.29  | -4.29  | -4.33  | -4.46  | -4.39  |
| TRG <sub>Theta</sub> (dB) | -5.28  | -5.33  | -5.42  | -5.41  | -5.59  | -5.66  | -5.77  | -5.78  | -5.83  | -5.99  | -5.93  |
| TRG <sub>Phi</sub> (dB)   | -9.84  | -9.69  | -9.76  | -9.72  | -9.72  | -9.69  | -9.70  | -9.66  | -9.68  | -9.73  | -9.64  |
| UHRG(dB)                  | -10.50 | -10.43 | -10.48 | -10.40 | -10.49 | -10.49 | -10.52 | -10.53 | -10.54 | -10.68 | -10.57 |
| UHRG/TRG(%)               | 22.30  | 22.60  | 22.79  | 23.16  | 23.37  | 23.55  | 23.81  | 23.75  | 23.94  | 23.87  | 24.08  |
| H-Plane, AVG(dB)          | -6.30  | -6.28  | -6.32  | -6.27  | -6.40  | -6.42  | -6.47  | -6.36  | -6.44  | -6.47  | -6.43  |
| E1-Plane, AVG(dB)         | -6.38  | -6.47  | -6.56  | -6.58  | -6.80  | -6.85  | -7.04  | -6.99  | -7.07  | -7.28  | -7.18  |
| E2-Plane, AVG(dB)         | -5.07  | -5.10  | -5.12  | -5.08  | -5.22  | -5.29  | -5.33  | -5.33  | -5.32  | -5.44  | -5.38  |
| Peak Gain(dB)             | 1.24   | 1.17   | 1.04   | 0.93   | 0.76   | 0.69   | 0.61   | 0.71   | 0.65   | 0.65   | 0.61   |
| Directivity(dB)           | 5.22   | 5.14   | 5.10   | 4.98   | 4.93   | 4.90   | 4.91   | 5.00   | 4.98   | 5.11   | 5.00   |
| Minimum Gain(dB)          | -20.93 | -21.12 | -20.31 | -20.23 | -19.43 | -20.53 | -19.75 | -20.46 | -19.13 | -18.54 | -18.43 |

| Frequency(MHz)            | 2455   | 2460   | 2465   | 2470   | 2475   | 2480   | 2485   |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|
| Efficiency(dB)            | -4.58  | -4.51  | -4.61  | -4.44  | -4.58  | -4.45  | -4.59  |
| Efficiency (%)            | 34.86  | 35.43  | 34.62  | 36.01  | 34.86  | 35.93  | 34.78  |
| TRG(dB)                   | -4.58  | -4.51  | -4.61  | -4.44  | -4.58  | -4.45  | -4.59  |
| TRG <sub>Theta</sub> (dB) | -6.13  | -6.08  | -6.19  | -6.06  | -6.20  | -6.06  | -6.22  |
| TRG <sub>Phi</sub> (dB)   | -9.78  | -9.68  | -9.75  | -9.50  | -9.64  | -9.52  | -9.63  |
| UHRG(dB)                  | -10.78 | -10.68 | -10.79 | -10.60 | -10.72 | -10.54 | -10.63 |
| UHRG/TRG (%)              | 23.98  | 24.12  | 24.10  | 24.20  | 24.30  | 24.55  | 24.90  |
| H-Plane                   | -6.55  | -6.55  | -6.61  | -6.52  | -6.64  | -6.59  | -6.68  |
| E1-Plane, AVG(dB)         | -7.50  | -7.39  | -7.68  | -7.40  | -7.71  | -7.52  | -7.81  |
| E2-Plane, AVG(dB)         | -5.52  | -5.48  | -5.49  | -5.36  | -5.48  | -5.33  | -5.43  |
| Peak Gain(dB)             | 0.56   | 0.57   | 0.43   | 0.69   | 0.57   | 0.57   | 0.53   |
| Directivity(dB)           | 5.14   | 5.08   | 5.04   | 5.12   | 5.15   | 5.01   | 5.12   |
| Minimum Gain(dB)          | -20.02 | -18.62 | -18.84 | -18.99 | -18.26 | -18.13 | -17.41 |

**Average Efficiency**

**-4.32 dB, 36.94 %**

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