

GEN2WAVE CO.,LTD

# APPROVAL SHEET

| RP-1600 |                |                        |                                    |
|---------|----------------|------------------------|------------------------------------|
| NO      | MODEL          | FREQUENCY              |                                    |
| 1       | HWI-WFD-RP1600 | Bluetooth<br>WIFI Dual | 2402 ~ 2484 MHz<br>5200 ~ 5800 MHz |

| SUPPLIER                                                                            |        |                                                                                     | CUSTOMER |        |          |
|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|----------|--------|----------|
| Engineer                                                                            | Review | Approved                                                                            | Engineer | Review | Approved |
|  |        |  |          |        |          |
|                                                                                     |        |                                                                                     |          |        |          |



HANWOOL TECHNOLOGY CO., LTD  
#1002 IT303-DONG, PUCHONTECHNOPARK III 36-1  
SAMJUNG-DONG, OHJUNG-GU, KYOUNG GI-DO, KOREA  
TEL: 032) 624-2555  
FAX: 032) 624-2559

## HISTORY SHEET

[illegible]

## ANTENNA SPECIFICATION

1. MODEL: HWI-WFD-RP1600

2. APPLICATION:

This specification is provided for Bluetooth and WIFI Dual Band ANTENNA.

3 ANTENNA used condition

■Portable ■Fixing ■Movement ■Out-door ■In-door ■Etc( )

4. ANTENNA Drawing

#3. Attached : Drawing paper

5. Electrical specification and performance

Satisfied next data with real used or similar environment conditions.

| No.  | ELECTRICAL DATA   | SPECIFICATIONS         |                                    | REMARK       |
|------|-------------------|------------------------|------------------------------------|--------------|
| 5. 1 | FREQUENCY RANGE   | Bluetooth<br>WIFI Dual | 2402 ~ 2484 MHz<br>5200 ~ 5800 MHz |              |
| 5. 2 | IMPEDANCE         | 50 $\Omega$ NOMINAL    |                                    |              |
| 5. 3 | V. S. W. R        | Bluetooth<br>WIFI Dual | Less than 1:2.5                    | #1. Attached |
| 5. 4 | PEAK GAIN(Min)    | Bluetooth<br>WIFI Dual | -2.0dBi                            | #2. Attached |
| 5. 5 | RADIATION PATTERN | OMNI - DIRECTIONAL     |                                    |              |
| 5. 6 | POLARIZATION      | LINEAR                 |                                    |              |

6. Hardware specification and mechanical

| No.  | MECHANICAL  | SPECIFICATIONS                | REMARK |
|------|-------------|-------------------------------|--------|
| 6. 1 | Carrier     | PC(Poly-Carbonate)            | Black  |
| 6. 2 | FCCL        | Halogen Free CCL              |        |
| 6. 3 | PSR INK     | INK                           | Black  |
| 6. 4 | Marking INK | INK (S-200W WITH HD-3)        | White  |
| 6. 5 | Tape        | 3M 9199                       |        |
| 6. 6 | Plating     | Electronics Ni Immersion Gold |        |

#### 7. SINUSOIDAL VIBRATION

Vibration Frequencies : 5- 55 Hz (1 cycle)

Sweep Rate : 1 cycle/min

Maximum Amplitude : A - 1 mm

Maximum Acceleration : 2 g

Measuring method

Antenna is combined in the test equipment.

The vibration is done X and Y direction (left, right, up and down) according to below image.

It continued for 2 hours each direction.

#### 8. OPERATING TEMPERATURE

Temperature : - 30℃ / +70℃

Demands : Set Antenna and Cable for 48 hours each temperature.

No visual and mechanical changes.

The fitting and mold will be unchanged mechanically during the test.

The antenna shall satisfy the electrical data

#### 9. HUMIDITY

Condition : 90% ~ 95% / +40℃

Measuring method

Antenna is placed in climatic chamber for 48 hours.

Antenna is taken out from the chamber and measured  
after another 24 hours in room temperature

Demands : No visual and mechanical changes.

The fitting and mold will be unchanged mechanically during the test.

The antenna shall satisfy the electrical data.

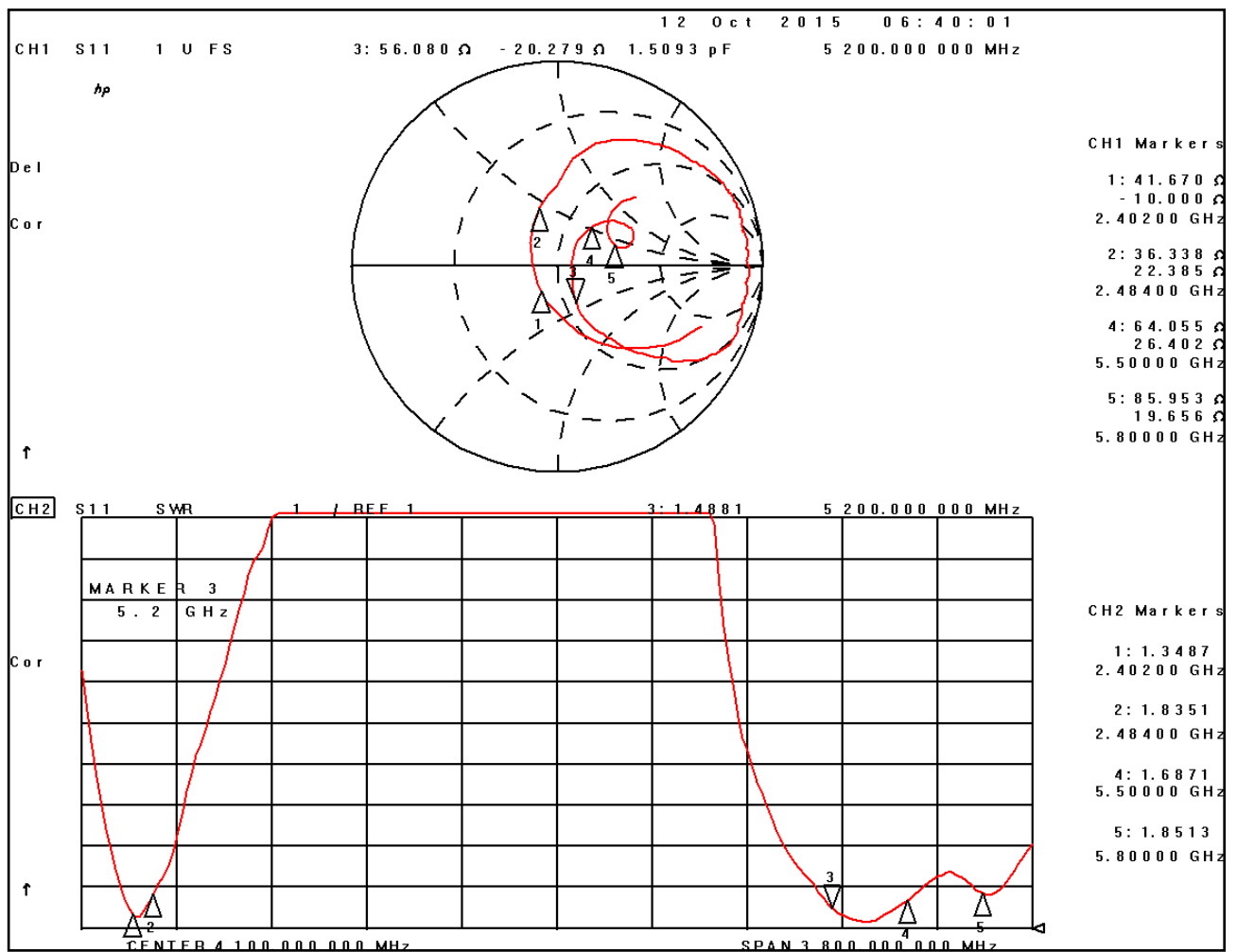
#### 10. TEST and Q/C

This specification is according to fixed demands and suitable Hanwool technology Q/C provision.

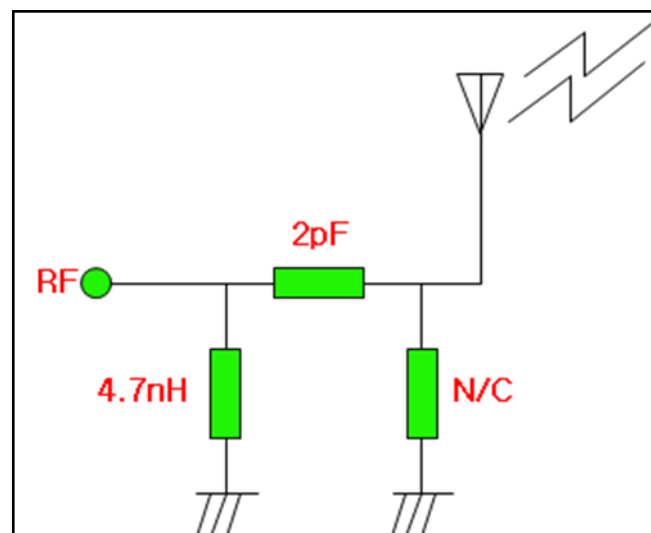
But it is possible to skip No. 7~9 demands, after consultation with buyer.

|           |                      |            |            |          |               |
|-----------|----------------------|------------|------------|----------|---------------|
| DQ No.    | HW-151012-20         | Modify No. |            | Write    | Hwan. Choi    |
| Supply to | GEN2WAVE<br>CO., LTD | Date       | 2015-10-12 | Approval | Chang-gi. Nam |

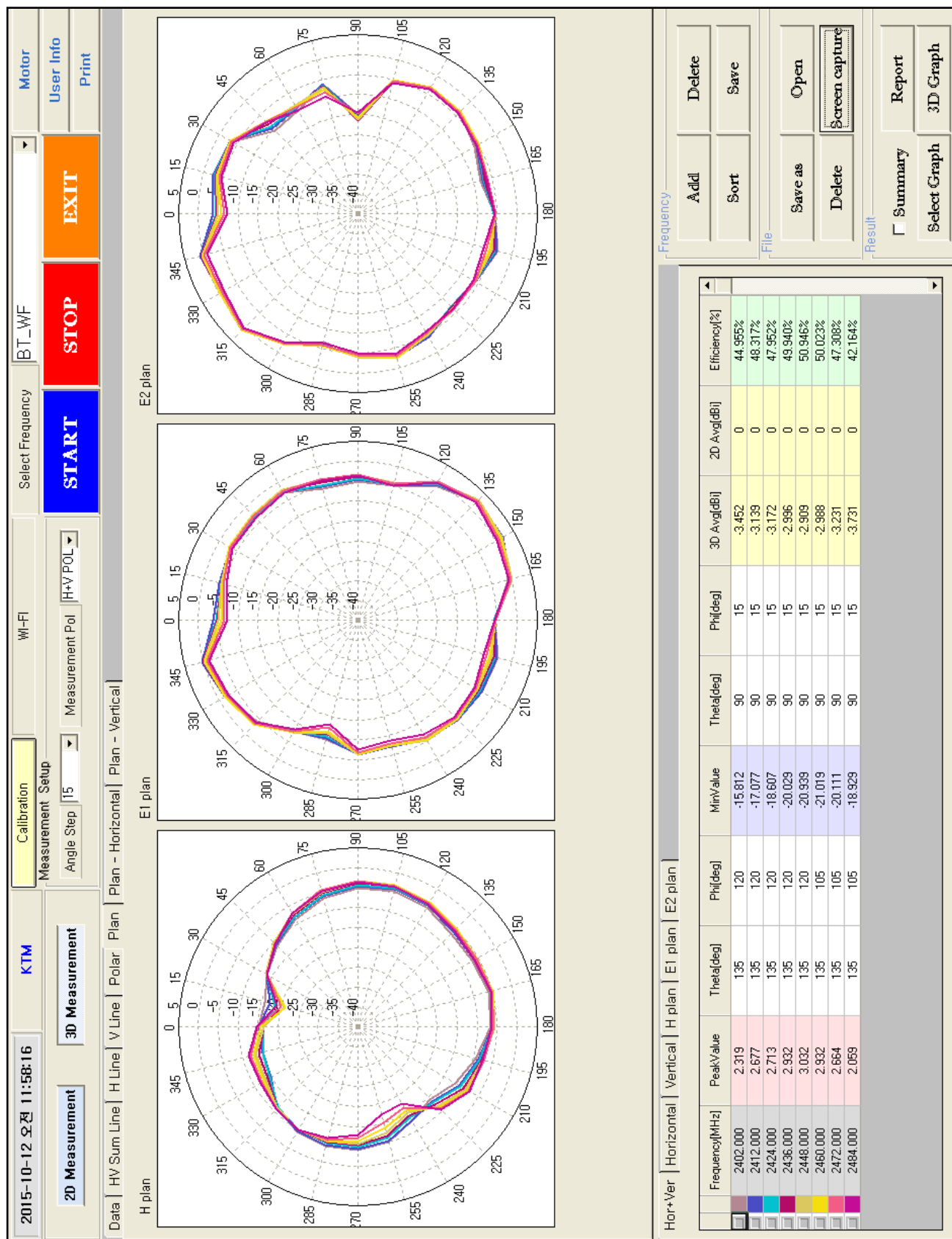
- #1. Attached : VSWR



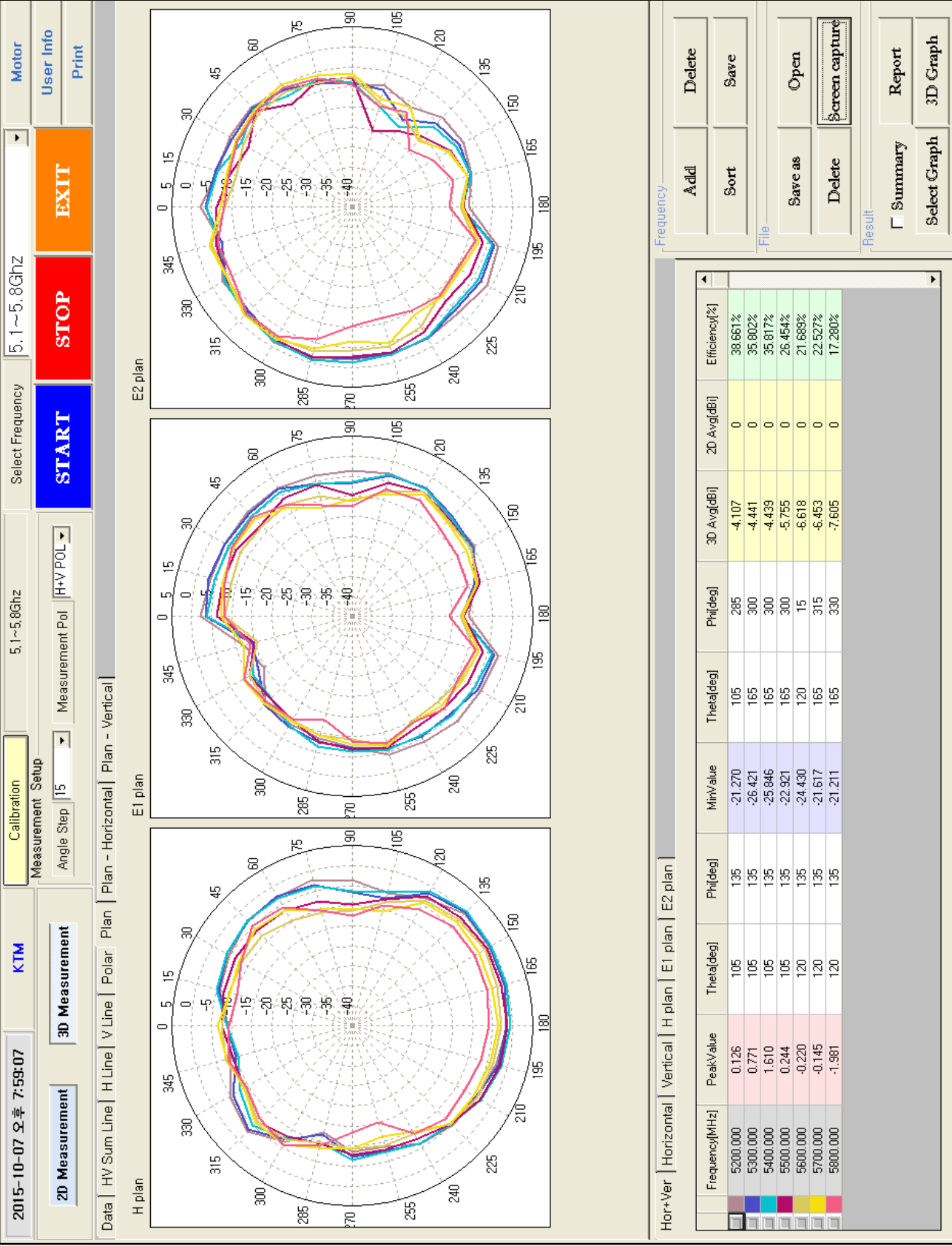
- . Matching Circuit



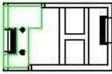
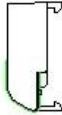
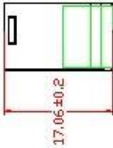
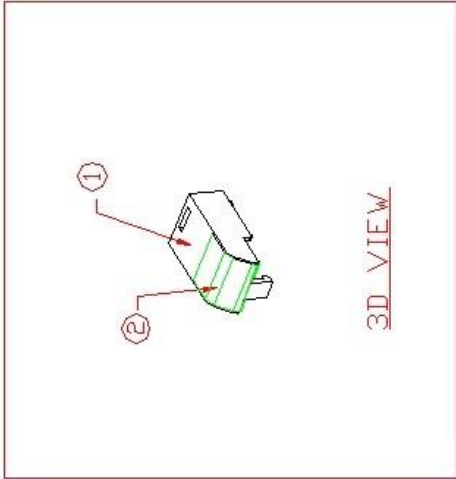
- #2. Attached : RADIATION PATTERN(GAIN)\_BT/WF 2.4GHz



-. RADIATION PATTERN(GAIN)\_WF 5GHz



- #3. Attached : Drawing paper

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |                  |            |                |     |           |                   |          |          |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------------|------------|----------------|-----|-----------|-------------------|----------|----------|---------|
| <div>Hanwool<br/>Technology</div>                                                                                                                                                                                                                                                                                                                                                                                                                                              |         | TOL Unless Noted |            | DIMENSION      |     | mm        | No                | DATE     | REVISION | CHECKER |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         | X. =             |            | SCALE          | 1/1 |           | △                 | 20 . . . |          |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         | X.X =            |            | MATERIAL       |     | △         | 20 . . .          |          |          |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         | X.XX =           |            | FINISH         |     |           |                   |          |          |         |
| <div><div></div><div><p>3D VIEW</p></div></div> |         |                  |            |                |     |           |                   |          |          |         |
| TITLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ASSY    |                  | MODEL      | HWM-WFD-FP1600 | ②   | F-PCB     | IR BLACK, 3M 9199 |          |          |         |
| Drawn                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Checked | Approval         | Date       | File Name      | ①   | CARRIER   | PC <BLACK>        |          |          |         |
| J.O.LIM                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         | C.G.NAM          | 2015.10.08 | 전투웨이브          | No. | PART NAME | MATERIAL          | FINISH   |          |         |
| 한울테크놀로지                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |                  |            |                |     |           |                   |          |          |         |