



EARBUDS\_ANT(LEFT)  
[HWI-BTL-UW100MK2]

Dreamus Corp.

# APPROVAL SHEET

| UW100MK2 |                  |           |                   |
|----------|------------------|-----------|-------------------|
| NO       | MODEL            | FREQUENCY |                   |
| 1        | HWI-BTL-UW100MK2 | BLUETOOTH | 2400 ~ 2483.5 MHz |

| SUPPLIER  |        |   | CUSTOMER |        |          |
|---|--------|---|----------|--------|----------|
| Engineer  | Review | Approved  | Engineer | Review | Approved |
|  |        |  |          |        |          |
| 23/03/02  |        | 23/03/02  |          |        |          |



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



# ANTENNA SPECIFICATION

1. MODEL: HWI-BTL-UW100MK2

2. APPLICATION:

This specification is provided for BLUETOOTH 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          | 2400 ~ 2483.5 MHz  |              |
| 5. 2 | IMPEDANCE         | 50 Ω NOMINAL       |                    |              |
| 5. 3 | V. S. W. R        | BLUETOOTH          | Less than 1 : 2.78 | #1. Attached |
| 5. 4 | PEAK GAIN         | BLUETOOTH          | -3.46 dBi          | #2. Attached |
| 5. 5 | RADIATION PATTERN | OMNI - DIRECTIONAL |                    |              |
| 5. 6 | POLARIZATION      | LINEAR             |                    |              |

6. Hardware specification and mechanical

| No.     | MECHANICAL            | SPECIFICATIONS            | REMARK |
|---------|-----------------------|---------------------------|--------|
| 2. 6. 1 | FPCB Size [W X H X T] | 13.40 X 13.80 X 0.15 (mm) |        |

## 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 : - 40℃ / +70℃

Demands : Set Antenna and Cable for 72 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 : 95% / +70℃

Measuring method

Antenna is placed in climatic chamber for 72 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.

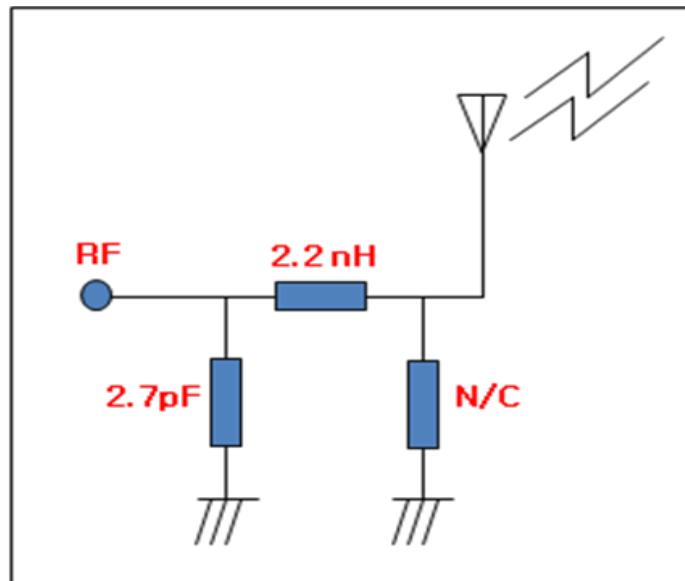
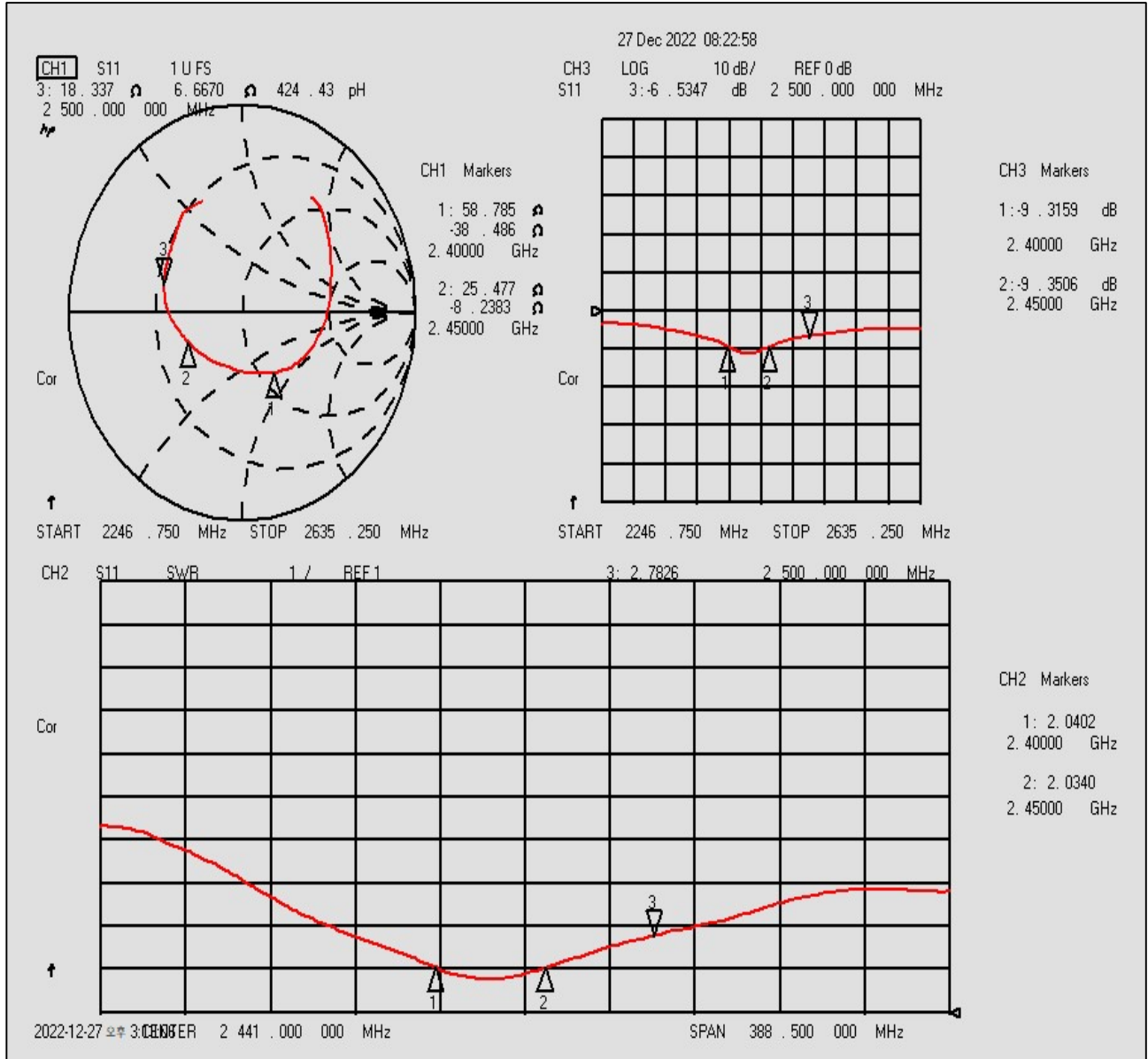
The antenna shall satisfy the electrical data.

## 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.

- #1. Attached : VSWR + Matching Value



2022-10-26 오후 4:09:32
KTM
Calibration
Wi-Fi
Select Frequency
Wi-Fi
Motor

3D Measurement

Measurement Setup

START

STOP

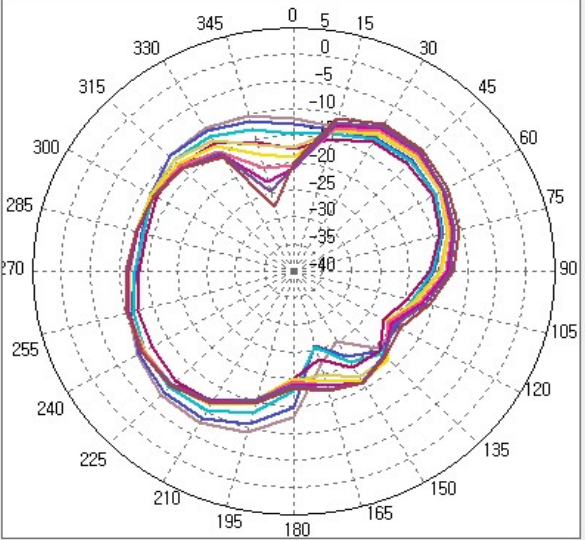
EXIT

User Info

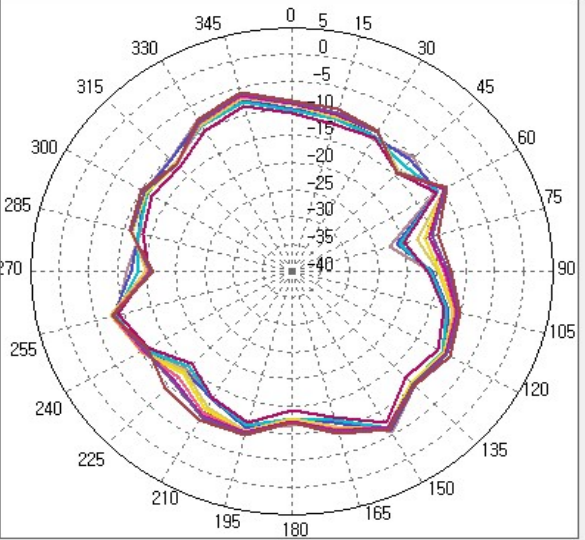
Print

Data
HV Sum Line
H Line
V Line
Polar
Plan
Plan - Horizontal
Plan - Vertical

H plan



E1 plan



E2 plan



Hor+Ver

Horizontal

Vertical

H plan

E1 plan

E2 plan

|  | Frequency[MHz] | PeakValue | Theta[deg] | Phi[deg] | MinValue | Theta[deg] | Phi[deg] | 3D Avg[dBi] | 2D Avg[dBi] | Efficiency[%] |
|--|----------------|-----------|------------|----------|----------|------------|----------|-------------|-------------|---------------|
|  | 2400.000       | -3.684    | 150        | 195      | -26.244  | 105        | 150      | -9.706      | 0           | 10.652%       |
|  | 2412.000       | -3.654    | 150        | 195      | -28.584  | 105        | 150      | -9.762      | 0           | 10.514%       |
|  | 2424.000       | -4.267    | 150        | 195      | -27.546  | 60         | 345      | -10.377     | 0           | 9.127%        |
|  | 2436.000       | -5.128    | 150        | 210      | -29.391  | 60         | 345      | -11.272     | 0           | 7.427%        |
|  | 2448.000       | -3.901    | 150        | 210      | -26.275  | 60         | 345      | -9.996      | 0           | 9.963%        |
|  | 2460.000       | -3.963    | 150        | 195      | -22.571  | 60         | 345      | -9.987      | 0           | 9.983%        |
|  | 2472.000       | -3.972    | 150        | 195      | -21.161  | 90         | 120      | -9.875      | 0           | 10.244%       |
|  | 2480.000       | -3.928    | 150        | 195      | -23.082  | 90         | 345      | -9.844      | 0           | 10.317%       |
|  | 2484.000       | -3.735    | 150        | 30       | -24.695  | 90         | 345      | -9.659      | 0           | 10.767%       |
|  | 2500.000       | -3.467    | 150        | 45       | -27.788  | 90         | 345      | -9.350      | 0           | 11.561%       |

Frequency

Add
Delete

Sort
Save

File

Save as
Open









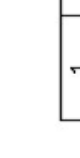
Delete
Screen capture

Result

Summary
 Report

Select Graph
3D Graph

- #2. Attached : RADIATION PATTERN(GAIN)\_BLUETOOTH

| No  | Revision Note | Checked              | Date             |
|---|---------------|----------------------|------------------|
| 1   |               |                      |                  |
| <p><u>Silk print : White Color</u></p> <p><b>TOP</b></p> <p>HanwoolTech (드림머스)<br/>HWI-BTL-UW100MK2 (V.0)</p>  <p>1.  표시는 패턴 Area임.<br/>                 2.  표시는 금도금 Area임.<br/>                 3.  표시는 COVERLAY 영역임.<br/>                 4.  표시는 3M 467 영역임.<br/>                 5. 1/2 OZ, 1/2 MIL 적용.</p> |               |                      |                  |
| <p><u>COVERLAY : YELLOW</u></p> <p><b>TOP</b></p>  <p><b>BOTTOM</b></p>   |               |                      |                  |
| <p><u>Pattern :</u></p> <p><b>TOP</b></p>  <p><b>BOTTOM</b></p>    |               |                      |                  |
| 1   |               | 1                    |                  |
| No  | Part Name     | Material Description | Q'ty             |
| Scale   | Title         | FPCB                 | HWI-BTL-UW100MK2 |
| 1/1   | mm            | Checked by           | 드림머스             |
| Decimal   | Angle         | Approved by          |                  |
| X ±0.1  | J.G.LIM       | H,CHOI               |                  |
| XX ±0.05  | N/A           | 230302-56            |                  |
| <p><b>Hanwool Technology</b></p>  |               |                      |                  |





EARBUDS\_ANT(RIGHT)  
[HWI-BTR-UW100MK2]

Dreamus Corp.

# APPROVAL SHEET

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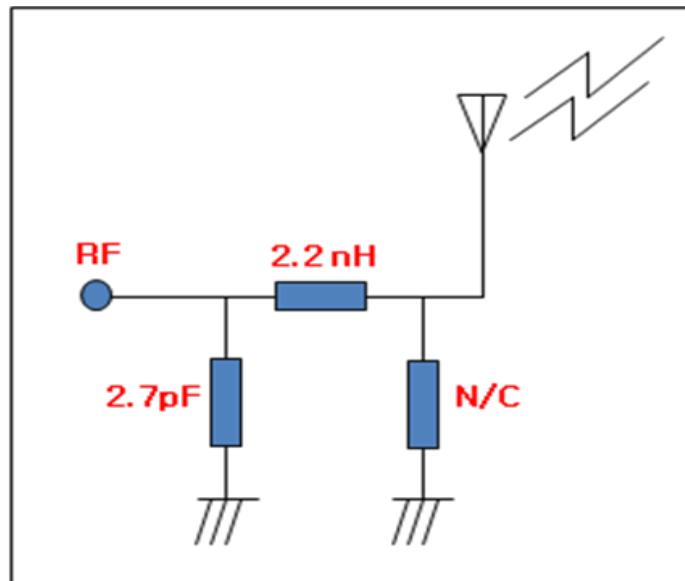
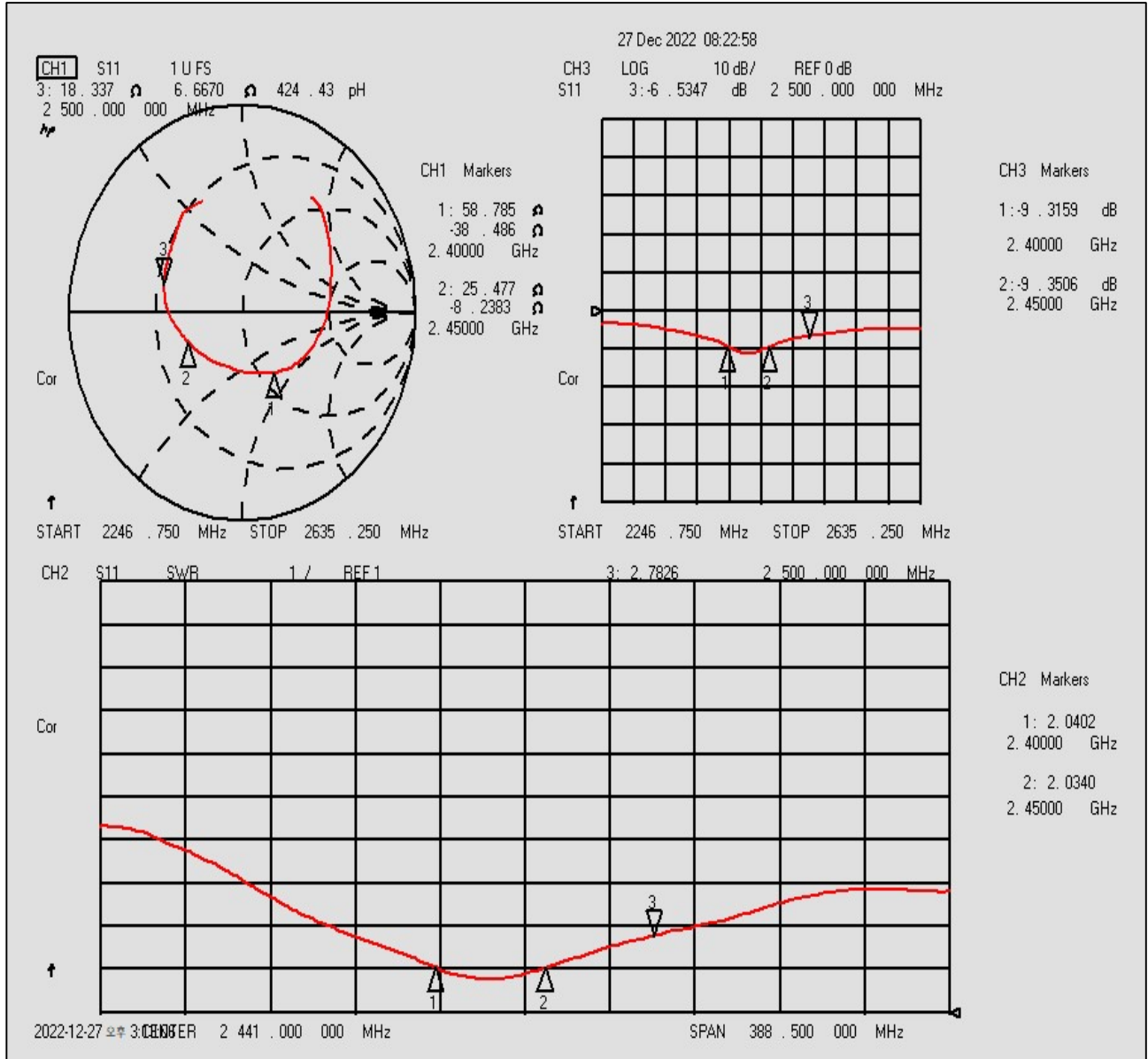
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2022-10-26 오후 4:09:32 **KTM** Calibration Wi-Fi Select Frequency WI-FI **Motor**

Measurement Setup Angle Step 15 Measurement Pol H+V POL **START STOP EXIT** **User Info Print**

Data HV Sum Line H Line V Line Polar Plan Plan - Horizontal Plan - Vertical

H plan

E1 plan

E2 plan

Hor+Ver Horizontal Vertical H plan E1 plan E2 plan

|  | Frequency[MHz] | PeakValue | Theta[deg] | Phi[deg] | MinValue | Theta[deg] | Phi[deg] | 3D Avg[dBi] | 2D Avg[dBi] | Efficiency[%] |
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Frequency

Add Delete

Sort Save

File

Save as Open

Delete Screen capture

Result

Summary Report

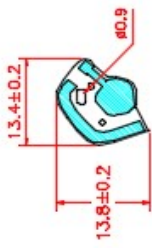







Select Graph 3D Graph

- #2. Attached : RADIATION PATTERN(GAIN)\_BLUETOOTH

- #3. Drawing paper

| No | Revision Note | Checked | Date |
|----|---------------|---------|------|
| 1  |               |         |      |

|                          |   |                                 |  |
|--------------------------|---|---------------------------------|--|
| <u>Pattern :</u>         |   | <u>Silk print : White Color</u> |  |
| <u>TOP</u>               |  | <u>TOP</u>                      |  <p>HanwoolTech (드림머스)<br/>HWI-BTR-UW100MK2 (V.0)</p> |
| <u>BOTTOM</u>            |  | <u>BOTTOM</u>                   |   |
| <u>COVERLAY : YELLOW</u> |   | <u>Silk print : White Color</u> |  |
| <u>TOP</u>               |  | <u>TOP</u>                      |   |
| <u>BOTTOM</u>            |  | <u>BOTTOM</u>                   |   |

|           |           |                      |             |                  |
|-----------|-----------|----------------------|-------------|------------------|
| 1         |           | Material Description | Q'ty        | Finish           |
| No        | Part Name |                      |             |                  |
| Scale     | Unit      | FPCB                 | Model       | HWI-BTR-UW100MK2 |
| 1 / 1     | mm        | Checked by           | Approved by | 드림머스             |
| Decimal   | Angle     | J.O,LIM              | File Name   |                  |
| .X ±0.1   |           |                      |             |                  |
| .XX ±0.05 | N/A       | 230302-57            |             |                  |

|                    |  |
|--------------------|--|
| HanwoolTech        |  |
| Hanwool Technology |  |

1.  표시는 패턴 Area임.
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