



APPROVAL SHEET

MODEL : TB-800/1900-T

AXESSTEL KOREA APPROVAL		CHECKED	APPROVED
	SIGNATURE		
	DATE	/ /	/ /
HANKOOK ANTENNA CO., LTD APPROVAL		CHECKED	APPROVED
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HANKOOK ANTENNA CO., LTD.

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1.4 Units and Definitions

Tx	Transmit Band
Rx	Receive Band
V.S.W.R	Voltage Standing Wave Ratio
dBd	Antenna gain in dB relative to a dipole
g	Acceleration of gravity (about 9.8 m/sec ²)
RH	Relative Humidity

1.4 Conditions

Unless otherwise stated all temperature tolerance are $\pm 3^{\circ}\text{C}$ and all RH tolerance are ± 5 percentage units

Unless otherwise stated all values are valid at $+20^{\circ}\text{C}$ and 50%RH.

2. ELECTRICAL PROPERTIES

2.1 Frequency Band(Dual)

Low band

Transmit (Tx) : 824 – 849 MHz

Receive (Rx) : 869 – 894 MHz

High band

Transmit (Tx) : 1850 – 1910 MHz

Receive (Rx) : 1930 – 1990 MHz

2.2 Impedance

Nominal Value : 50Ω

2.3 VSWR

2.3.1 Maximum Values

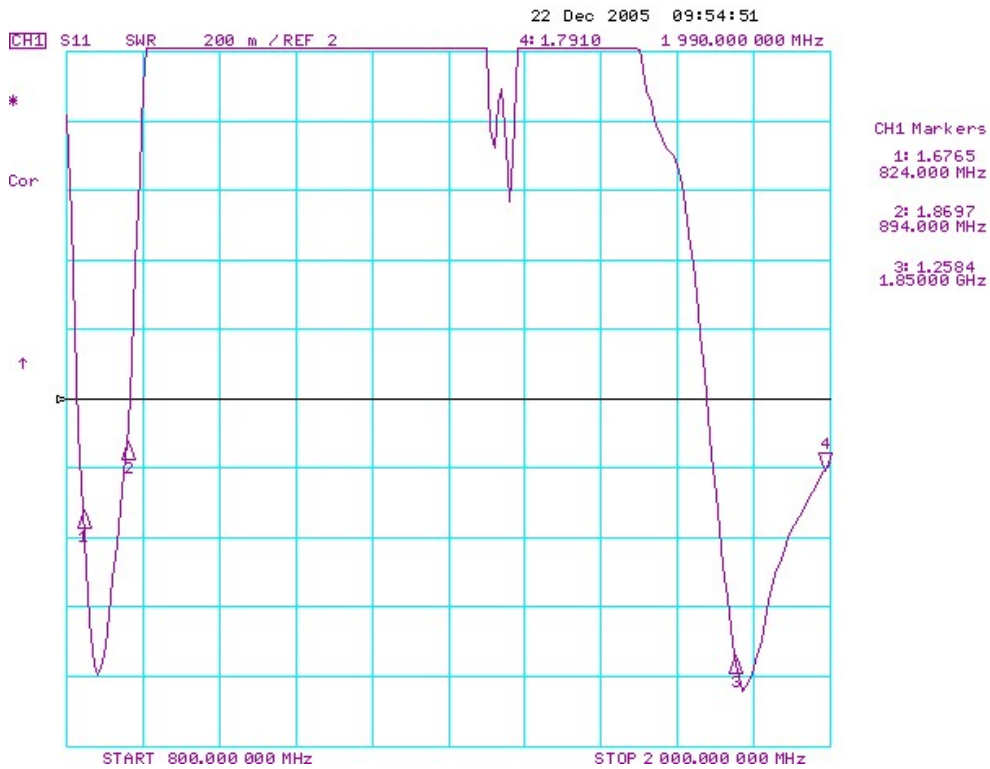
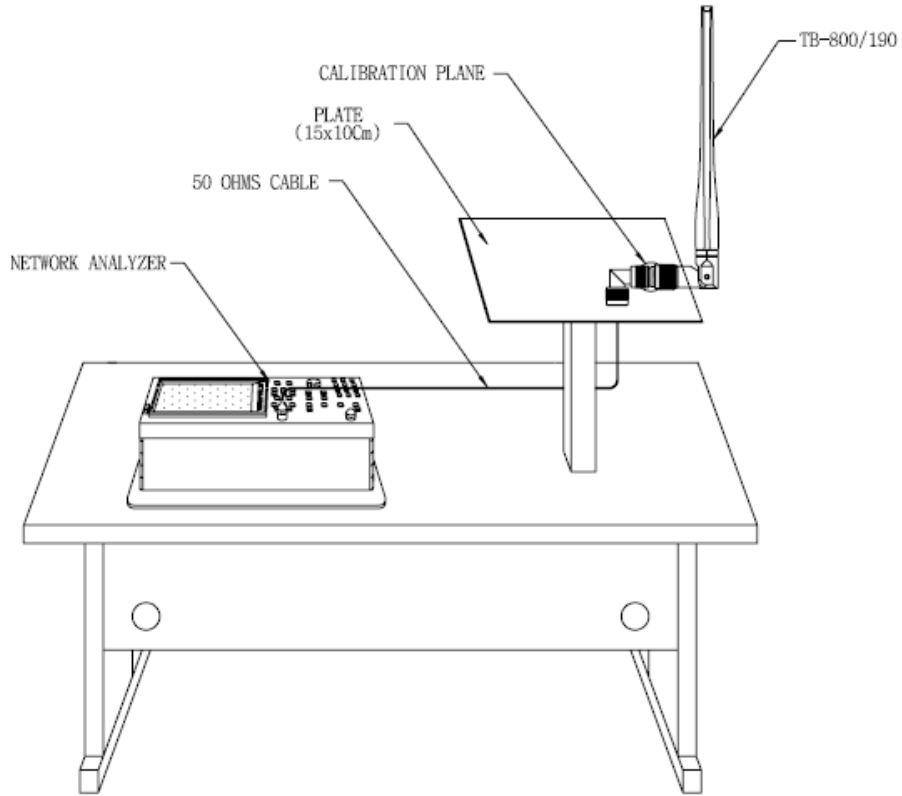
2.0 : 1(Low Band, High Band)

2.3.2 Measuring Method

A 50 ohms coaxial cable is connected to the antenna connector.

In the other end the coaxial cable is connected to a network analyzer.

The analyzer calibrated so that the reference plane is at the end the coaxial cable connected to the antenna.



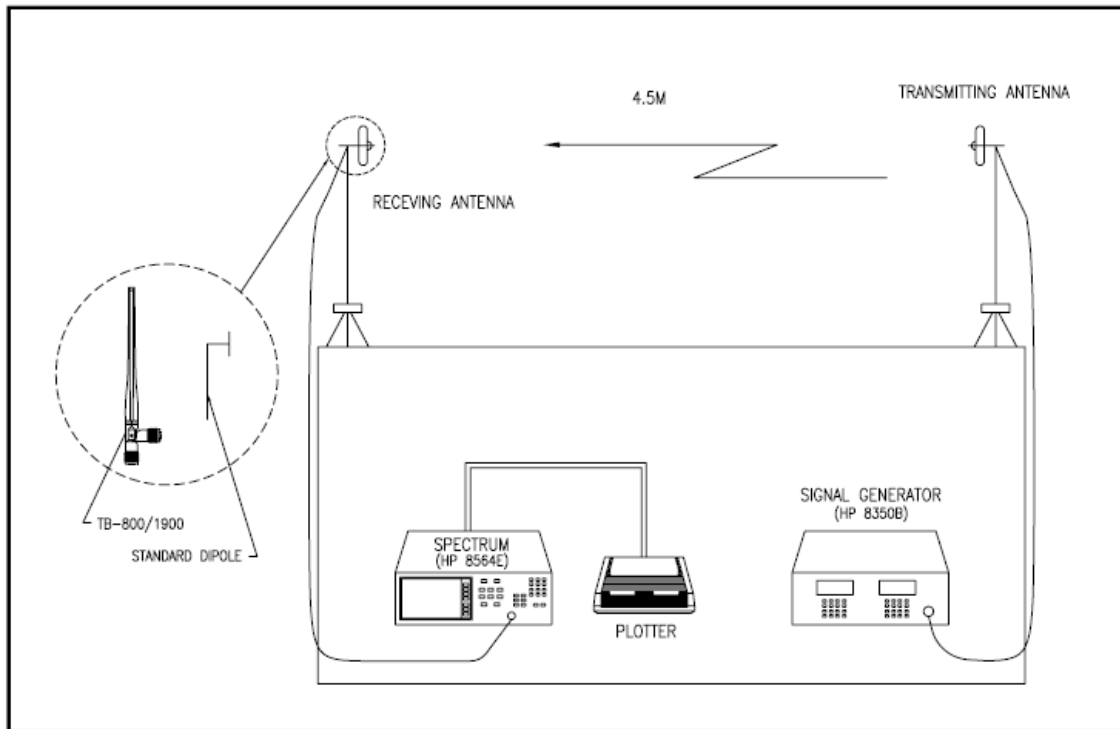
2.4 Gain

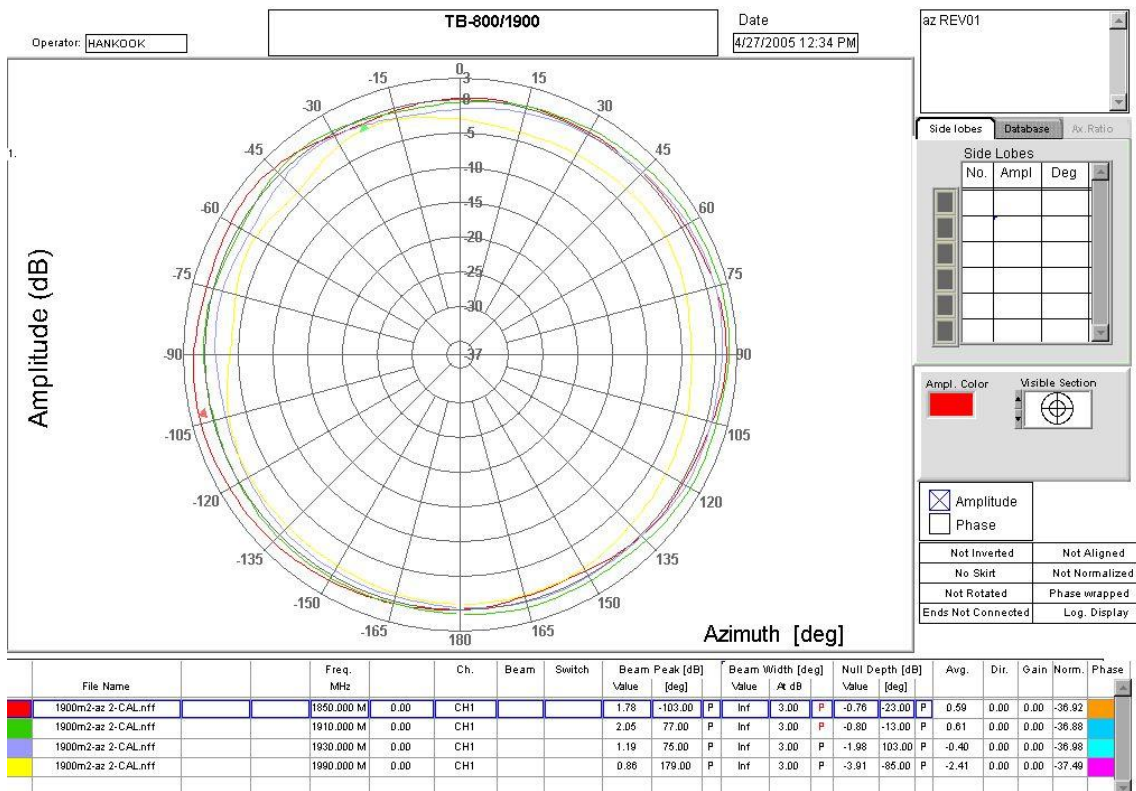
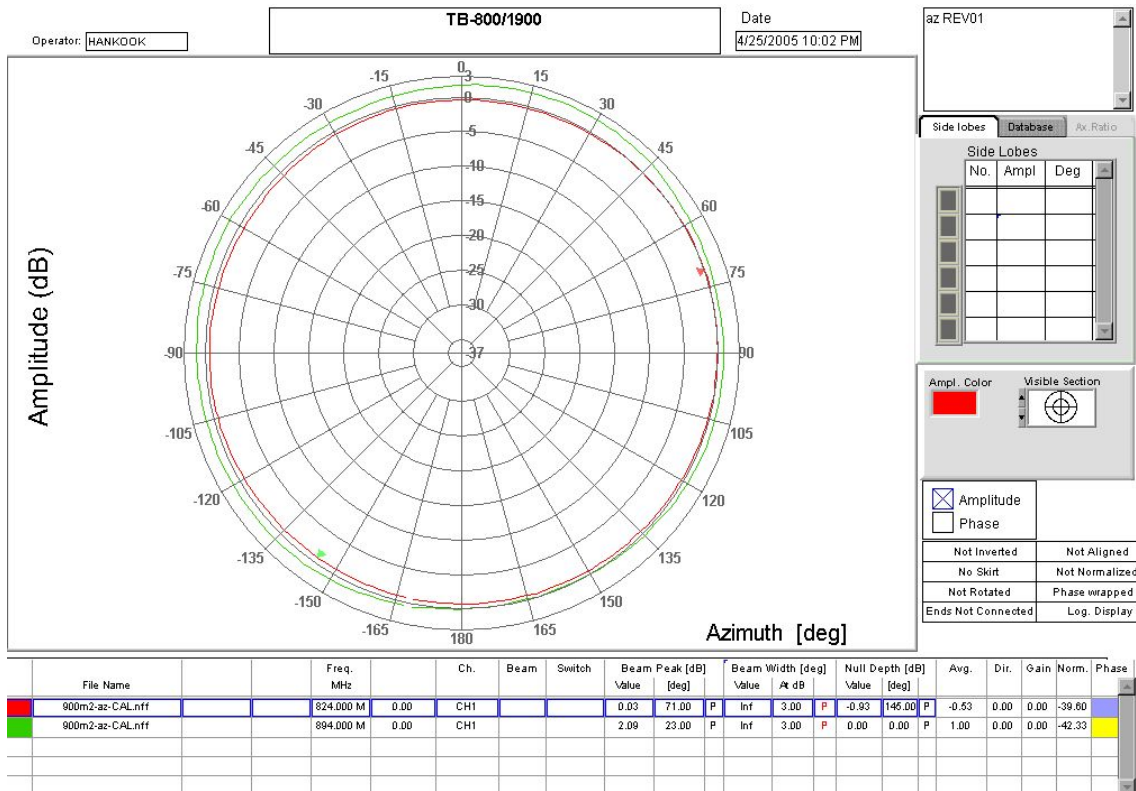
2.4.1 Peak Gain 0 dBi min

Average Gain -1.5 dBi min

2.4.2 Measuring Method

The connection is done according to figure. Radiation patterns are measured at the lowest, middle and highest frequency for each band (Tx and Rx band). The measurement performed so as to minimize the influence of the cables. Calibration for absolute measurements is done with a reference antenna, which is in turn calibrated by a certified calibration company.





3. MECHANICAL PROPERTIES

3.1 Appearance

The appearance shall be according to specification drawing as attached.

3.2. Tensile Load

3.2.1 Force

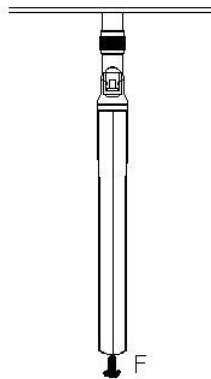
5 Kgf

3.2.2 Demands

Without mechanical damage, electrical performance according to 2.3.1 and 2.4.1 after test.

3.2.3 Measuring Method

The antenna is assembled to the test equipment according to figure. The specified force is applied during 30sec to the top of the sleeve parallel to the antenna axis.



3.3 Drop

3.3.1 Drop height

0.75 m

3.3.2 Number of Drops

1 drop to ensure set lands on antenna

3.3.3 Set weight

2 Kg

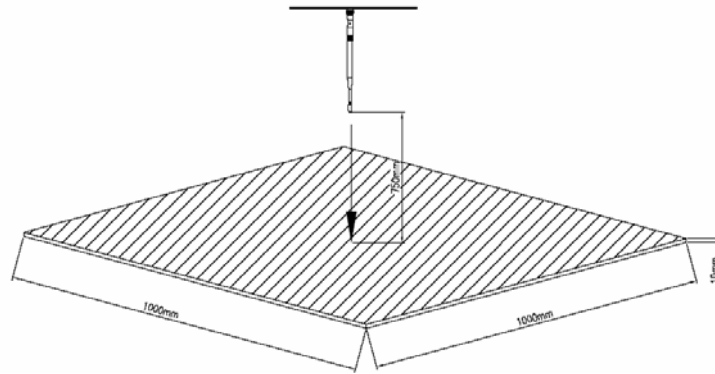
3.3.4 Demand

No visual change and the fitting and mold shall be unchanged mechanically and satisfy the electrical data after test.

3.3.5 Measuring Method

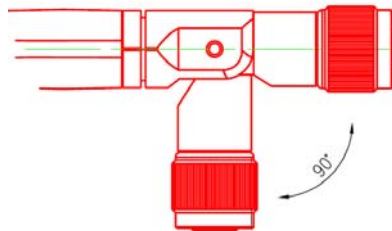
The antenna is attached to set (if available, otherwise to test

fixture of equal weight). The set is dropped with antenna downwards onto a steel surface covered with 20 sheets of copy paper .



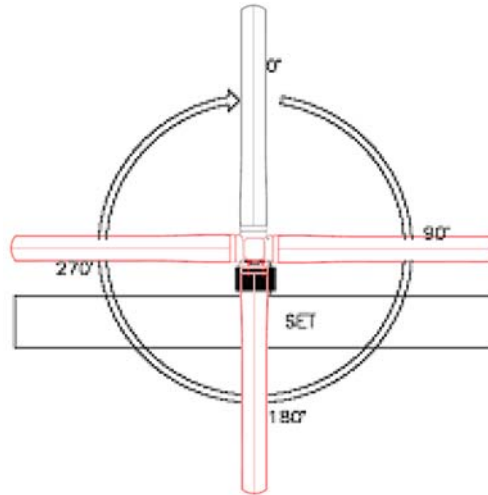
3.4 Tilt

It should not have problem on cable and base part after 100 times of Bending tests ($0^{\circ}\sim 90^{\circ}$)of knuckle part.



3.5 ROTATION

There should be no mechanical problems on the base and connector when The antenna connector part is connected to jig and tested 100 times(360° rotation)



4. ENVIRONMENTAL RESISTANCE PROPERTIES

4.1 Operational Temperature

4.1.1 Temperature : $-30^{\circ}\text{C} \sim +70^{\circ}\text{C}$ at 50%RH

4.1.2 Demand

No visual change and the fitting and mold shall be unchanged mechanically and satisfy the electrical data during the test.

4.1.3 Measuring method

The antenna is kept at $+20^{\circ}\text{C}$ and 50%RH for at least 1 hour.

The antenna is placed at low temperature. The antenna is taken out after 1 hour, and the V.S.W.R is immediately measured.

The antenna is kept at $+20^{\circ}\text{C}$ and 50%RH for at least 1 hour.

The antenna is placed at high temperature. The antenna is taken out after 1 hour, and the V.S.W.R is immediately measured.

4.2 Temperature Cycling

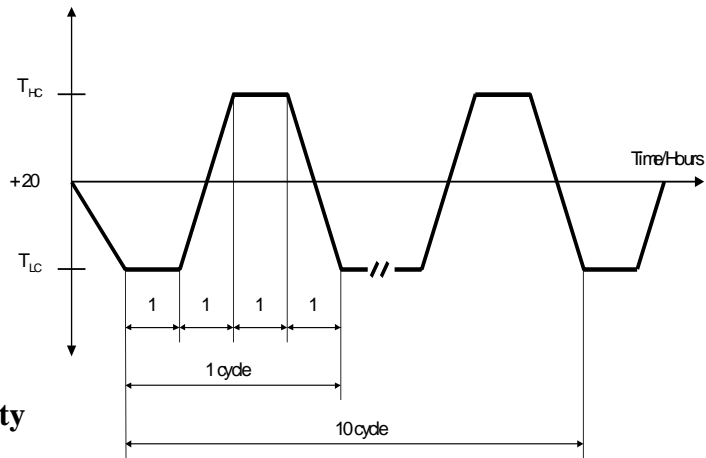
4.2.1 Cycling Temperature : $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ at 50%RH

4.2.2 Demand

No visual change and the fitting and mold shall be unchanged mechanically and satisfy the electrical data after a 1 hour relaxing period at $+20^{\circ}\text{C}$ and 50%RH .

4.2.3 Measuring method

The antenna is placed in a climatic chamber. The temperature is cycled as follows: The temperature is kept constant at low cycling temperature for 1 hour, increased to high cycling temperature during 1 hour, kept constant for 1 hour and then decreased to low cycling temperature during 1 hour. This procedure is repeated 10 times ending at room temperature, see figure



4.3 Humidity

4.3.1 Condition : $+40^{\circ}\text{C}$ and 95%RH

4.3.2 Demand

No visual change and the fitting and mold shall be unchanged mechanically and satisfy the electrical data after the test.

4.3.3 Measuring method

The antenna is placed in climatic chamber for 24 hours. The antenna is taken out from the chamber and measured after another 24 hours in room temperature.

4.4 Sinusoidal Vibration

4.4.1 Vibration Frequencies : 8 - 25 - 8 Hz (1 cycle)

4.4.2 Sweep Rate : 1 octave/min (logarithmic)

4.4.3 Maximum Amplitude

$$A = 1.5 \text{ mm}$$

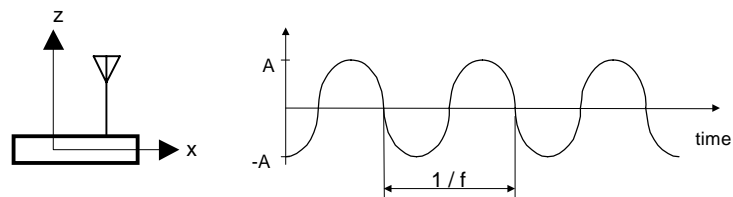
4.4.4 Maximum Acceleration : 2 g

4.4.5 Demand

No visual change and the fitting and mold shall be unchanged mechanically and satisfy the electrical data after the test.

4.4.6 Measuring method

The antenna is assembled in the test equipment. The vibration is done both in x- and z- directions, according to figure, with a duration of 1 hours in each direction.



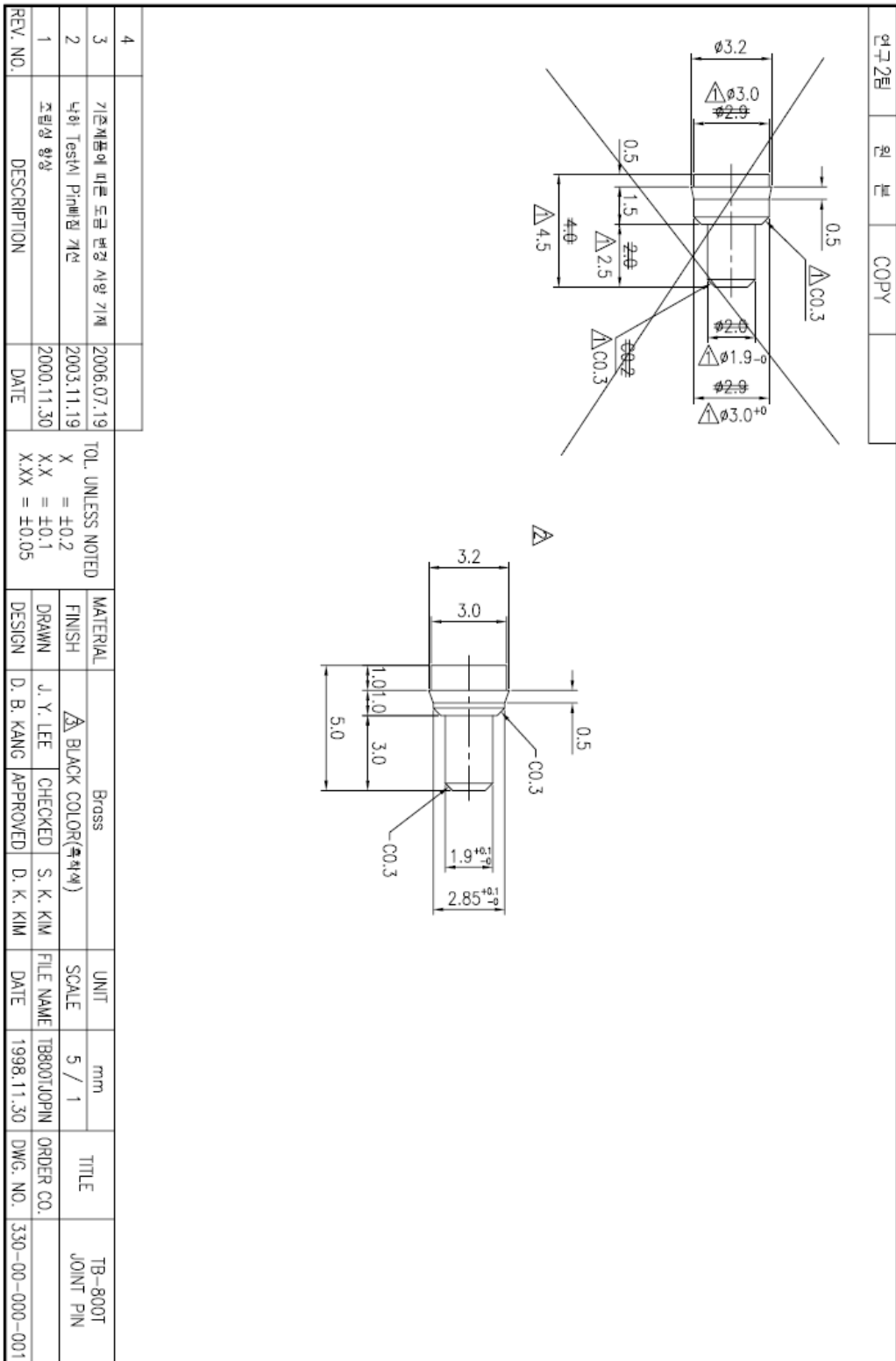
a) Vibration directions.

b) Vibration form.

-TEST EQUIPMENTS

Network Analyzer (HP-8753C)	:	VSWR, Impedance
RF Signal Generator(HP-8350B)	:	Required signal
Spectrum Analyzer (HP-8563A)	:	Receiving signal

5.2 JOINT PIN



7. MEASUREMENT AND INSPECTION

It should be followed by this specification and be suited to our quality control rules. However, article No.6 can be abbreviated in case of agreement with a purchaser.

8. PACKING

The products packing should be followed by the designated packing instruction.

9. GUARANTEE

If design or manufacturing defects happen within 1 year, it has a duty to repair the goods free of charge or exchange.