



Specification for Approval

Part name : WF-24Rx Antenna

Part No : HTR24-002

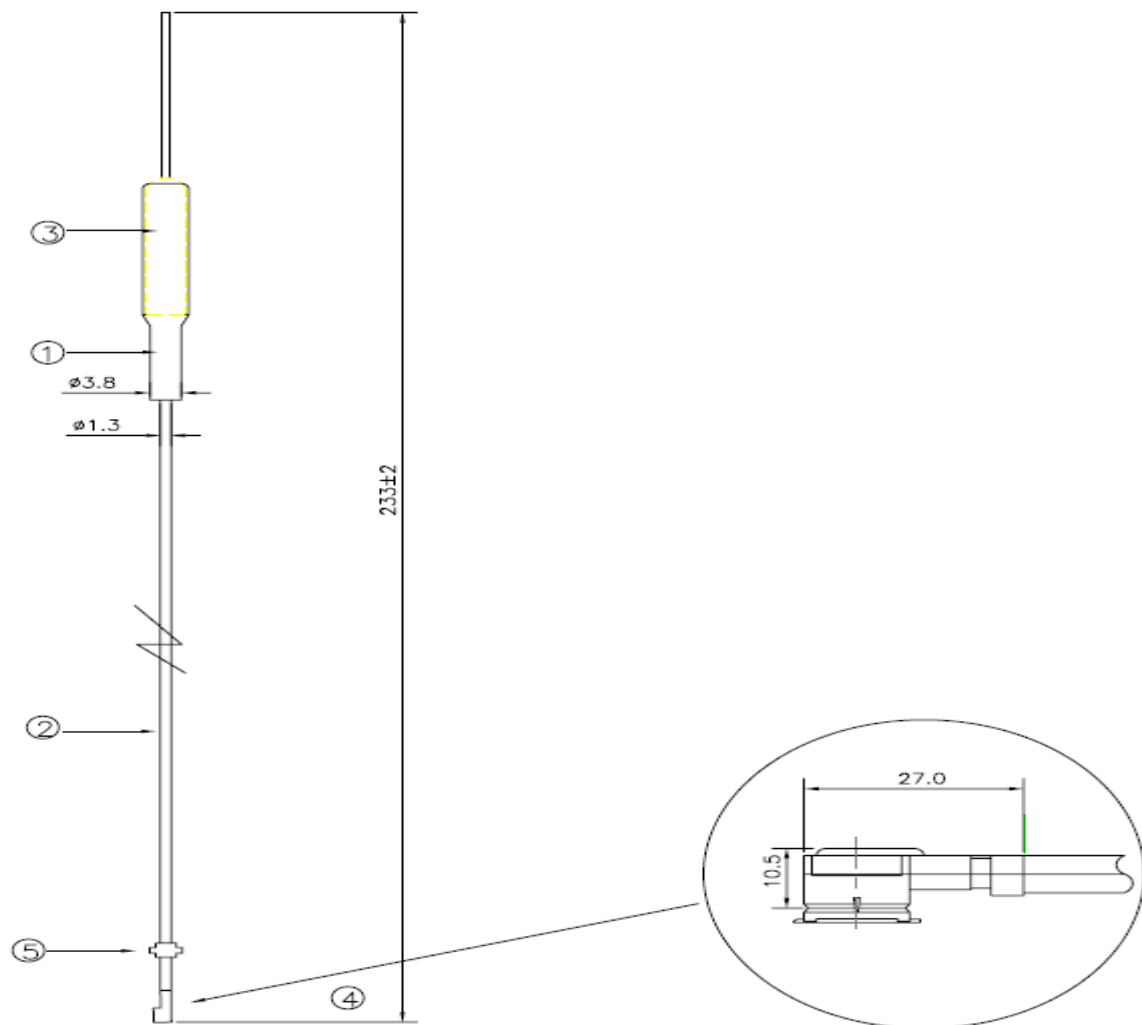
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Date	June. 23. 09.	
SAE HAN ANTENNA CO.,LTD		

DIRECT FEED 1/2 WAVE DIPOLE FOR QUALIFICATION

SaeHan Part Name WF-24Rx

Series : Antenna

SPECIFICATION DRAWING



NO	Description	Material
1	Tube	PVC / Black
2	Coaxial Cable	PVC, Teflon, Cu, Plated Wire
3	Ground Plane	BsBM
4	Connector	Shell, Contact terminal : Phosphor Bronze, Insulator : PBT Series
5	Bushing	PVC / Black

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ELECTRICAL CHARACTERISTICS

- . Center Frequency 2450 MHz
- . Frequency Range 2400~2500 MHz
- . Nominal Impedance 50 Ω
- . VSWR..... Less Than 2.0:1
- . Type 1/2 wave dipole
- . Gain
 - Peak Gain 0 dBi
- . Radiation Pattern Omni Directional
 - 3dB Beam width :
- . Horizontal Plane 360°
- . Vertical Plane 85±10°
- . Polarization :..... Vertical
- . Maximum input power 3 W

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MECHANICAL CHARACTERISTICS

Sleeve Material Shrinkable Tube / black

Weight : 4 g

Connector type : U.FL Male (Micro Connector)

Temperature : -40 / + 85℃

Drop Test 1m / 10 Times

Humidity + 30℃&95% RH 24Hours

Vibration	Frequency	3-500-3Hz(1cycle)
	Sweep rate	5 db / octave
	Amplitude	1.12G-rms
	Acceleration	1.5g

Overall Length of Antenna 233 mm +/- 2mm

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1. GENERAL

1.1 Product description

This antenna is to account for the measurement setup and results of 2.4GHz Type Dipole Antenna.

1.2 Product Number

SaeHan Antenna Product Name. : WF-24Rx Antenna

1.3 Units and Definitions

V.S.W.R	Voltage Standing Wave Ratio
dBi	Antenna gain in dB relative to a isotropic antenna
g	Acceleration of gravity(about 9.8 m/sec 2)
RH.....	Relative Humidity
Dimensions	mm

1.4 Test 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 2400 ~ 2500 MHz

2.2 Impedance Nominal Value : 50Ω

2.3 V S W R

2.3.1 Maximum Values Less than 2.0 : 1

2.3.2 Measuring Method

A 50ohms 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

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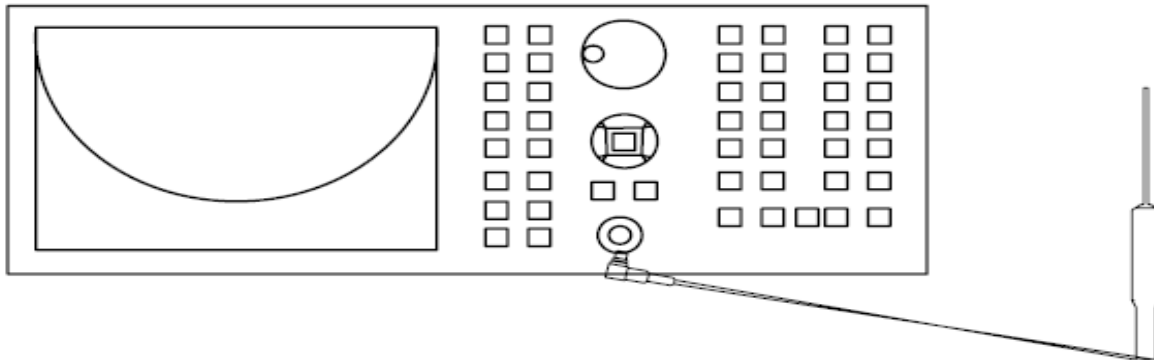


Figure 1. Network Analyzer Measuring

V S W R

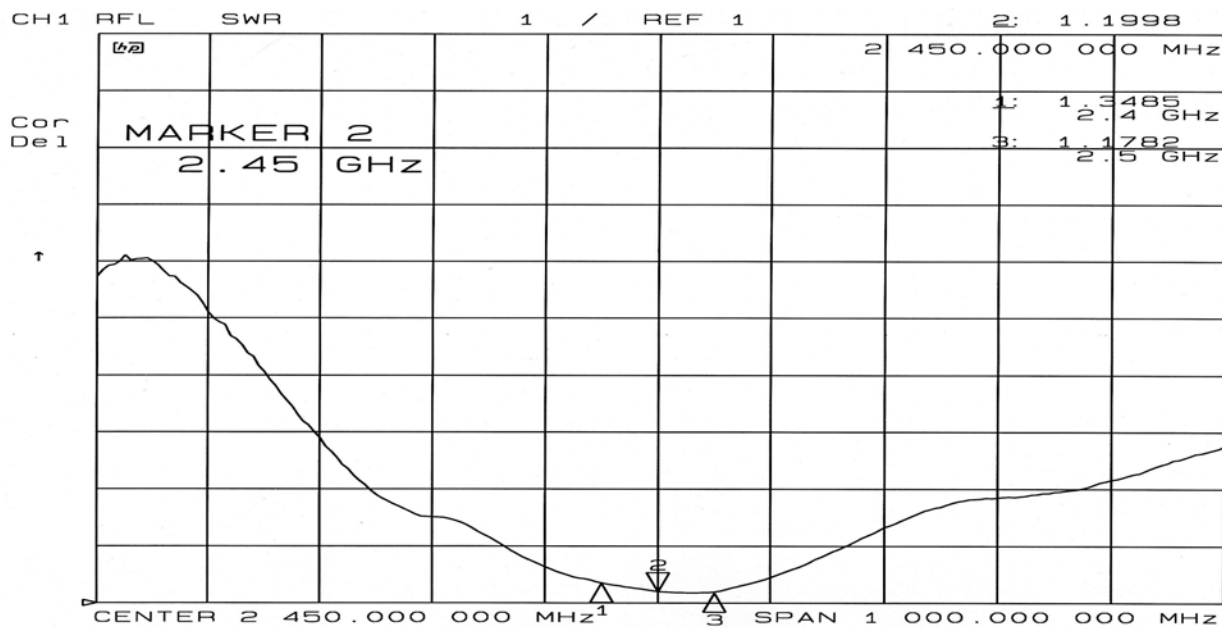


Figure 2. V. S. W. R Testing

Frequency	V.S.W.R	Remarks
2.40GHz	1.34	
2.45GHz	1.19	
2.50GHz	1.17	

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2.4 Gain

2.4.1 Measuring Method

The connection is done according to figure. Radiation patterns are measured at the lowest, middle and highest frequency for frequency band.

The measurement performed so as to minimize

Measurement frequency: 2400,2450,2500MHz

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

Chamber Size	16(L)m X 11(W)m X 9.5(H)m
Frequency Range	400MHz - 60GHz (Far Field)
Quiet Zon	1.2m X 1.2 m @ 1GHz
Type	Rectangular

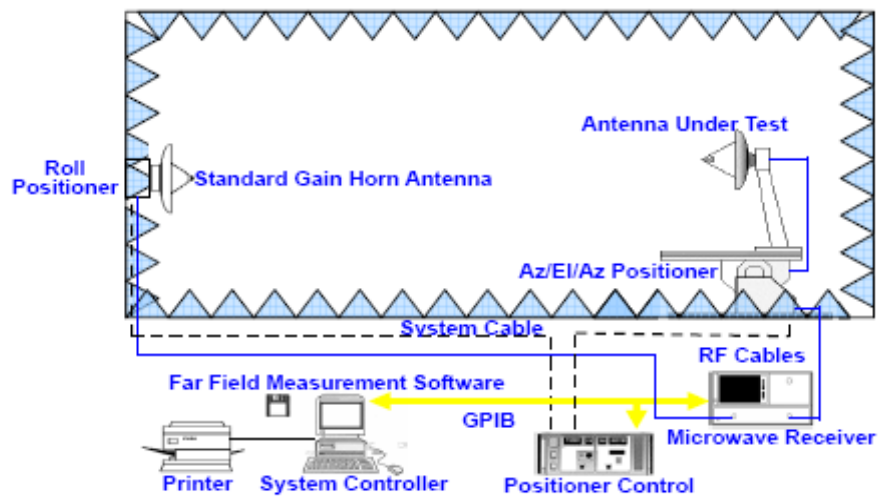


Figure 3 Anechoic Chamber Measuring

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SaeHan Part Name WF-24Rx

Series : Antenna

Gain (H-plane)

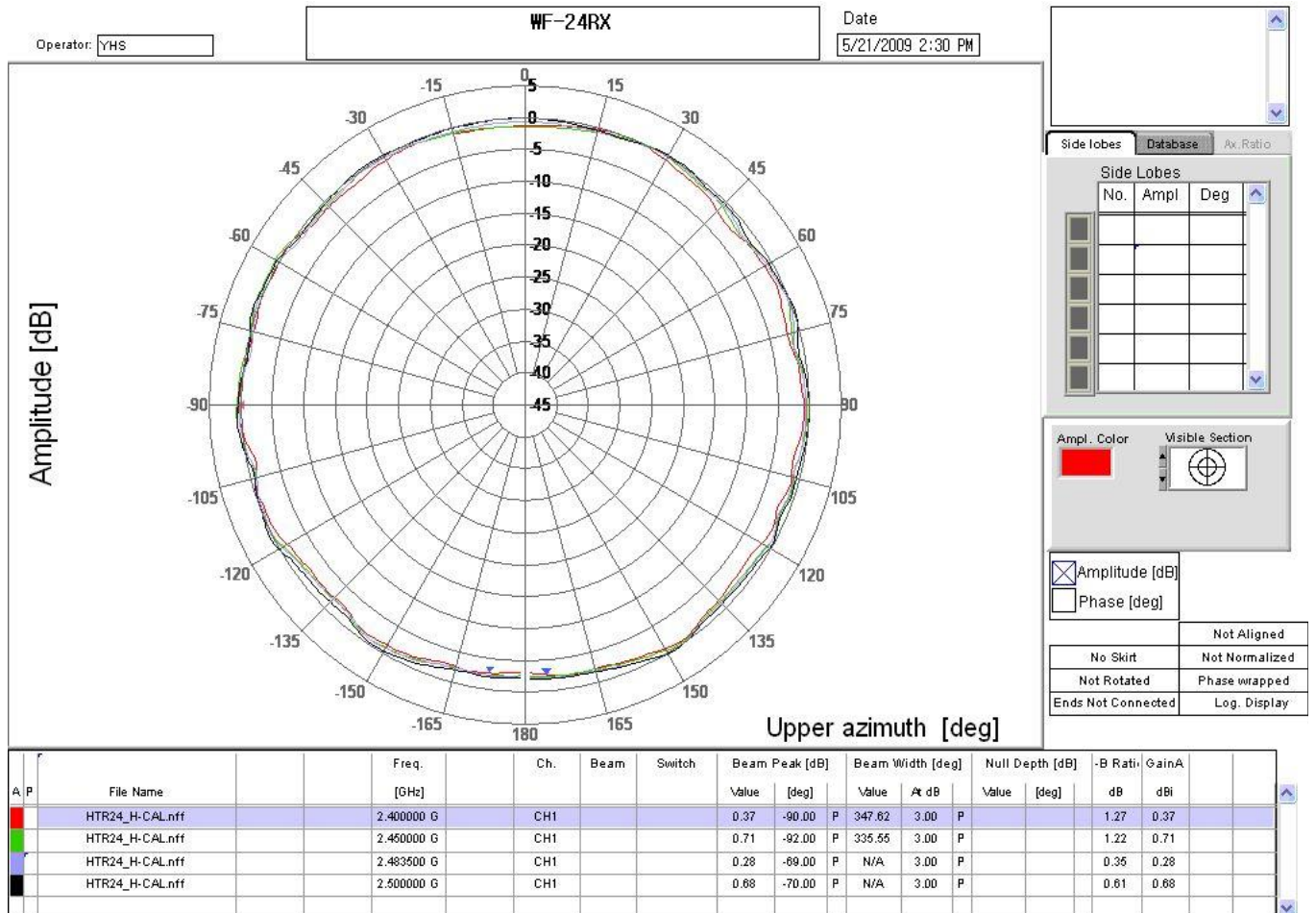


Figure 4 Anechoic Chamber Measuring (H-plane)

Frequency	Gain(Max)	Remarks
2.40GHz	0.37dBi	
2.45GHz	0.71dBi	
2.50GHz	0.68dBi	

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Gain(E-plane)

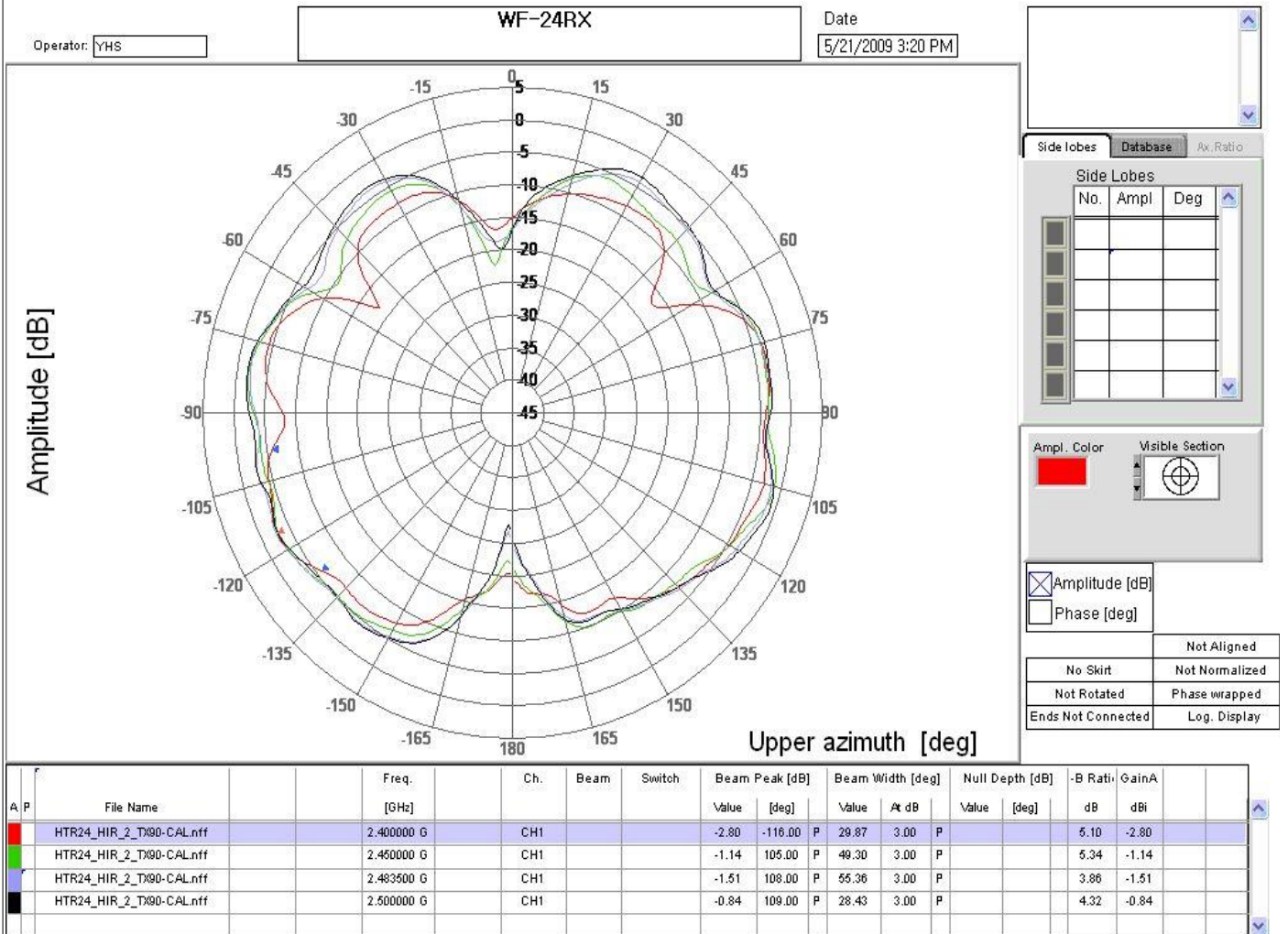


Figure 5 Anechoic Chamber Measuring (E-plane)

Frequency	Gain(Max)	Remarks
2.40GHz	-2.80dBi	
2.45GHz	-1.14dBi	
2.50GHz	-0.84dBi	

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3. MECHANICAL PROPERTIES

3.1 Drop

3.1.1 Drop height 1 m

3.1.2 Number of Drops 10 times

3.1.3 Demand

Without mechanical damage. VSWR performance 2.0:1

3.1.4 Measuring Method

The antenna is dropped downwards onto a steel surface covered with 20 sheets of copy paper

3.2 Flexure

3.2.1 Number of cycle

50 on each direction (4 directions at $\pm 20^\circ$)

3.2.2 Demands

VSWR : Less than 2.0:1

No permanent deformations, kinks/ creases no breakage or visible gap between parts during or after the force is applied

Note : The antenna under test is allowed to bend at the point of least resistance

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4. ENVIRONMENTAL RESISTANCE PROPERTIES

4.1. Temperature

4.1.1 Temperature - 40°C ~ 85°C at 50%RH (10cycle)

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°C and 50%RH for at least 1hour.

The antenna is placed at low temperature. The antenna is taken out after 1 hour, and VSWR performance 2.0:1

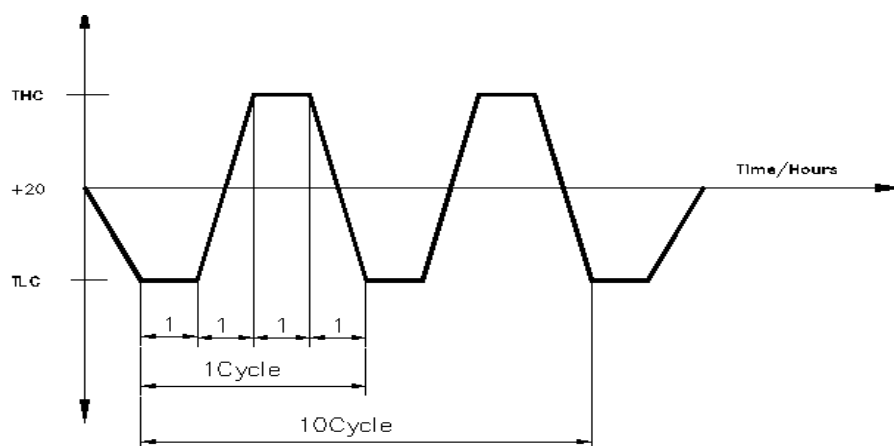


Figure 6. Temperature Cycling test

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4.2 Humidity

4.2.1 Condition + 30°C and 95%RH

4.2.2 Demand

No visual change and fitting and mold shall be unchanged
mechanically and VSWR performance 2.0:1

4.2.3 Measuring method

The antenna is placed in climatic chamber for 24hours.

4.3 Vibration

4.3.1 Vibration Frequencies 3- 500 - 3Hz(1 cycle)

4.3.2 Sweep Rate 5db / octave (logarithmic)

4.3.3 Maximum Amplitude A = 1.12G-rms

4.3.4 Maximum Acceleration 1.5g

4.3.5 Demand

No visual change and the fitting and mold shall be unchanged
mechanically and VSWR performance 2.0:1

4.3.6 Measuring method

Frequency

Spectral Break profile

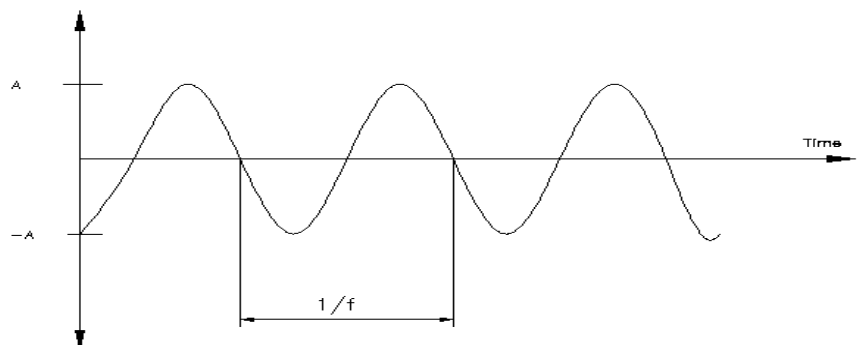
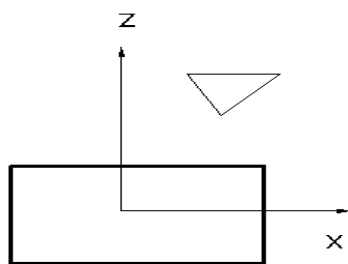
Slope

3-10Hz

5 db / octave

10-100Hz

0.0065G²/Hz



100-500Hz

5 db / octave

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 30minute in each direction.

Figure 7. a) Vibration directions

Figure 8. Vibration form