

# Internal Antenna

## **Product Specification**

Model : ZEPHYR

Maker Part Number : **712479.0001**

Laird Technologies Korea / Antenna SBU

Written by Dae-Hyun, Jung

March 13, 2009



Laird Technologies Korea



Specification No. LHP-B2-B010	Description ZEPHYR - Antenna Product Specification		
Customer Pantech Co., Ltd.	Date March 13, 2009	Rev 1.0	Reference NA

<b>Product Family:</b>	<b>Internal Antenna</b>	
<b>Model Name:</b>	<b>ZEPHYR</b>	
<b>Maker Part No.:</b>	<b>712479.0001</b>	<b>Revision: 1.0</b>
<b>Customer :</b>	<b>Pantech Co., Ltd.</b>	
<b>Customer Part No.:</b>		<b>Revision:</b>

## Revision History

REV.	DATA	Previous	After	Reason
1.0	March 13, 2009			Pre-Approval

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# 1 GENERAL

## 1.1 PRODUCT DESCRIPTION

An Internal Antenna for Handset.

## 1.2 PRODUCT NUMBER

Laird Technologies Korea Part Number	712479.0001
Customer Model Name	ZEPHYR

## 1.3 SI UNITS

Unless otherwise stated, SI units are used.

Tx	Transmit Band
Rx	Receive Band
PCB	Printed Circuit Board
VSWR	Voltage Standing Wave Ratio
dBi	Antenna gain in dB (Isotropic)
CW	Continuous Wave
g	Acceleration of gravity (approx. 9.8 m/s <sup>2</sup> )
RH	Relative Humidity

## 1.4 COORDINATE SYSTEM

The coordinate system for the phone is defined as follows:

- Origin in center of gravity.
- Positive X axis is perpendicular to, and directed from, front plane.
- Positive Y axis is perpendicular to, and directed from, right side plane (as seen from front).
- Positive Z axis is perpendicular to, and directed from, top plane.

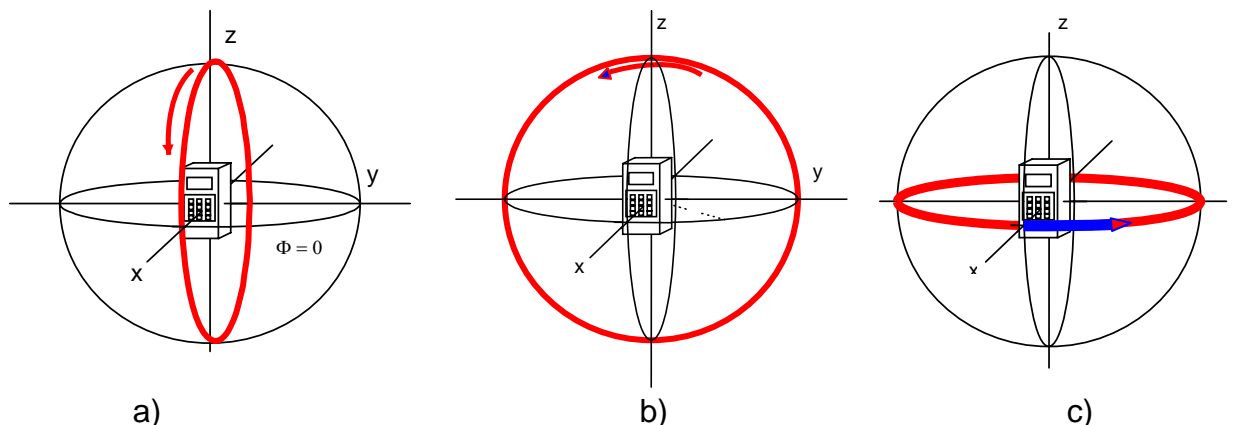


Figure 1-1: a) E2-plane b) E1-plane c) H-plane

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## 2 ELECTRICAL PROPERTIES

### 2.1 FREQUENCY BANDS

BAND	TX	RX
CDMA & GSM850	824MHz~849MHz	869MHz~894MHz
GSM900	880MHz~915MHz	925MHz~960MHz
DCS1800	1710MHz~1785MHz	1805MHz~1880MHz
USPCS & PCS1900	1850MHz~1910MHz	1930MHz~1990MHz

### 2.2 IMPEDANCE

Input Impedance : 50Ω

### 2.3 MATCHING CIRCUIT

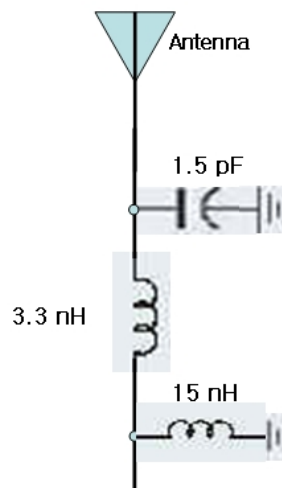
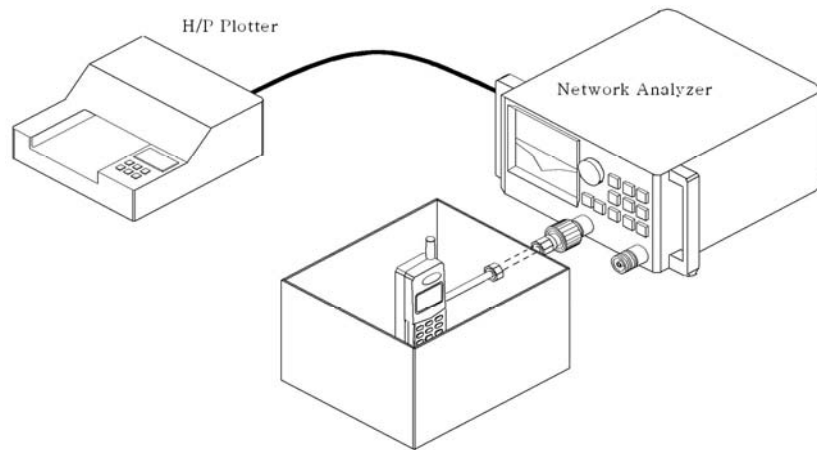


Figure 2-1 Matching Circuit

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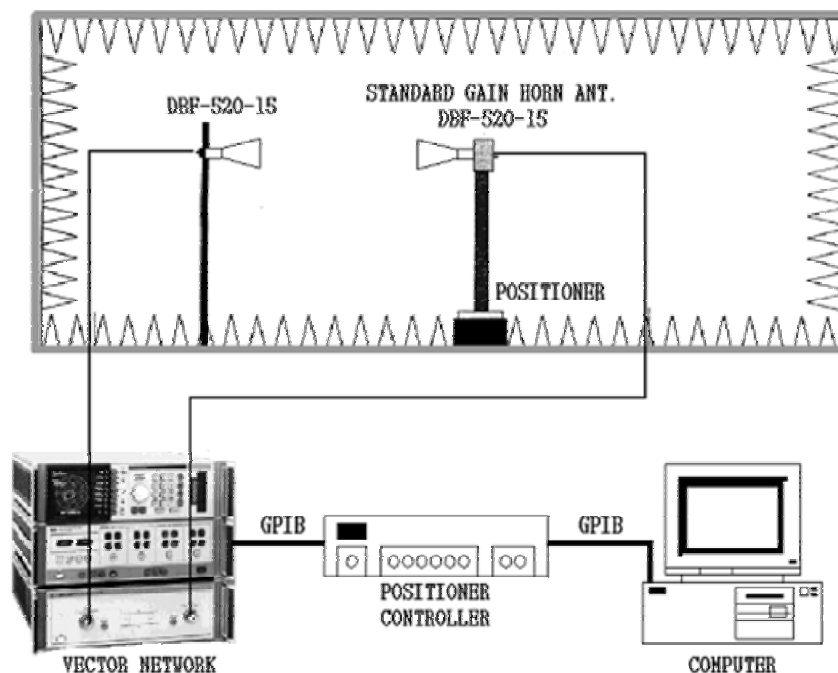
## 2.4 VSWR

Typical values of VSWR were tested with engineering samples using Network Analyzer.



## 2.5 GAIN (PEAK, AVERAGE)

Typical antenna gains were tested by anechoic chamber system.



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## 2.6 ELECTRICAL SPECIFICATION & TEST DATA

VSWR SPEC.		CDMA & GSM850 & GSM900		DCS1800 & USPCS & PCS1900	
		824 MHz	960 MHz	1710 MHz	1990 MHz
VSWR	Folder Close	Less than 3.4 : 1	Less than 7.8 : 1	Less than 6.4 : 1	Less than 3.5 : 1
	Folder Open	Less than 5.5 : 1	Less than 5.2 : 1	Less than 7.4 : 1	Less than 3.2 : 1

GAIN SPEC.			CDMA&GSM850		GSM900		DCS1800		USPCS & PCS1900	
			824~849 MHz	869~894 MHz	880~915 MHz	925~960 MHz	1710~1785 MHz	1805~1880 MHz	1850~1910 MHz	1930~1990 MHz
Avg. gain (min)	Folder Close	H	-4.3 dBi	-3.8 dBi	-5.2 dBi	-6.6 dBi	-12.4 dBi	-9.3 dBi	-9.4 dBi	-11.7 dBi
		E1	-7.1 dBi	-7.4 dBi	-8.3 dBi	-9.1 dBi	-9.2 dBi	-7.0 dBi	-6.7 dBi	-5.8 dBi
		E2	-7.5 dBi	-6.4 dBi	-7.9 dBi	-9.9 dBi	-16.9 dBi	-13.4 dBi	-12.6 dBi	-13.7 dBi
	Folder Open	H	-6.7 dBi	-2.5 dBi	-3.1 dBi	-4.6 dBi	-13.3 dBi	-9.2 dBi	-7.4 dBi	-6.8 dBi
		E1	-9.4 dBi	-6.3 dBi	-6.4 dBi	-7.2 dBi	-8.6 dBi	-5.5 dBi	-4.5 dBi	-4.4 dBi
		E2	-9.9 dBi	-5.6 dBi	-6.0 dBi	-7.9 dBi	-14.9 dBi	-10.9 dBi	-9.7 dBi	-10.2 dBi

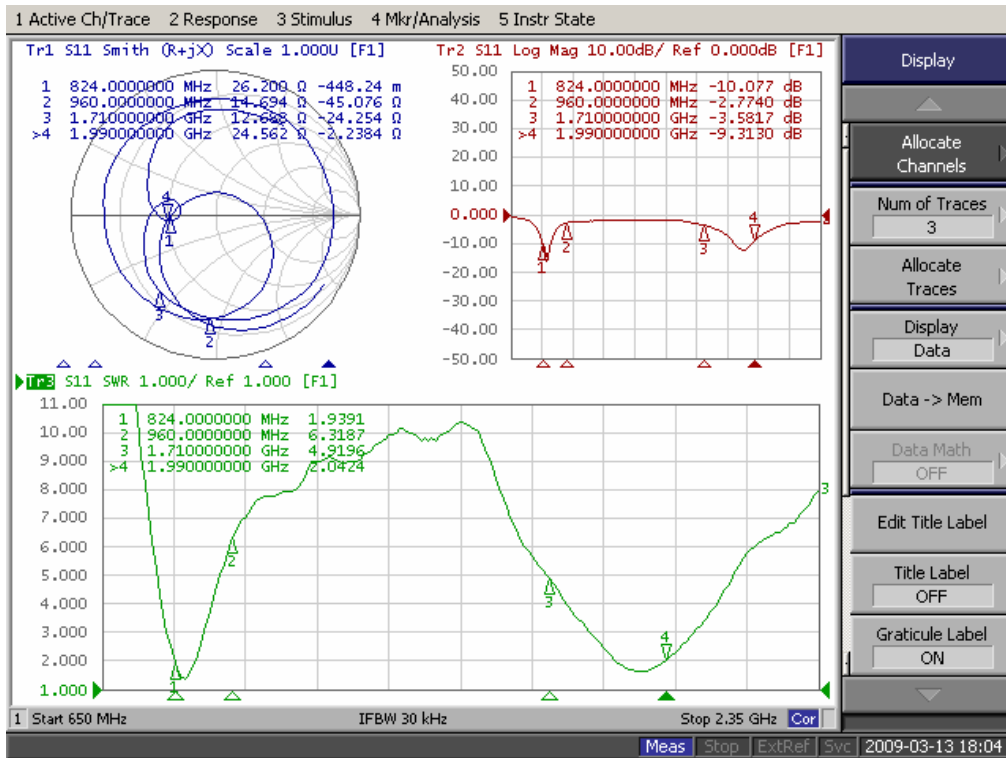
(Value : More than XX dBi)

VSWR Test Data.		CDMA & GSM850 & GSM900		DCS1800 & USPCS & PCS1900	
		824 MHz	960 MHz	1710 MHz	1990 MHz
VSWR	Folder Close	1.9 : 1	6.3 : 1	4.9 : 1	2.0 : 1
	Folder Open	4.0 : 1	3.7 : 1	5.9 : 1	1.7 : 1

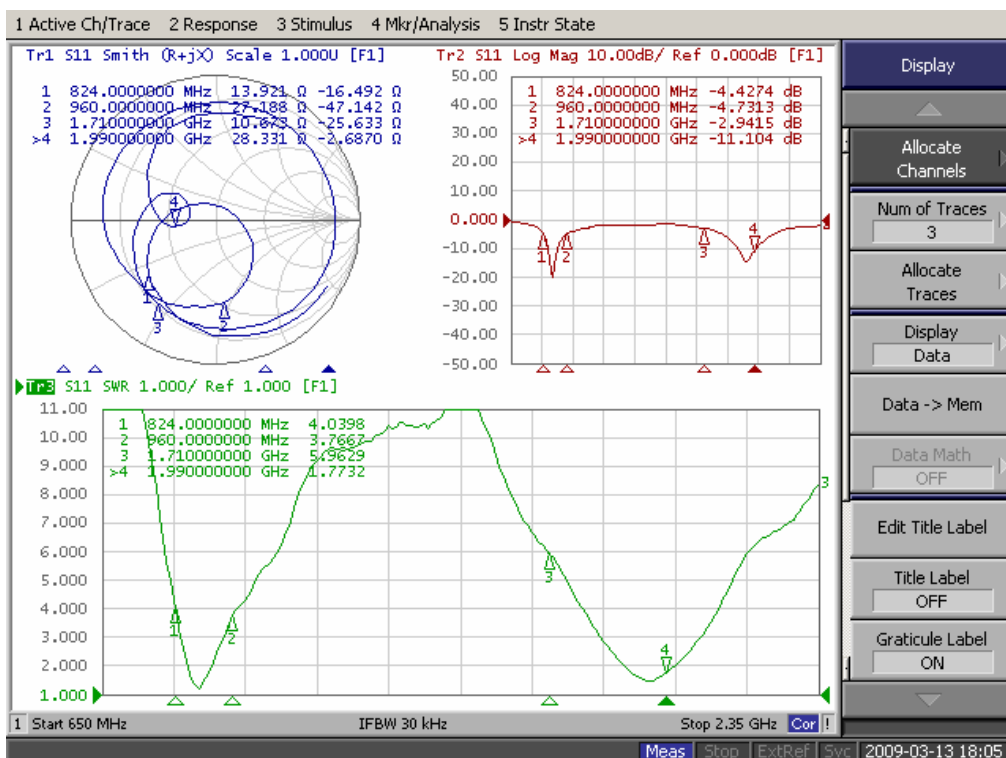
GAIN Data.			CDMA&GSM850		GSM900		DCS1800		USPCS & PCS1900	
			824~849 MHz	869~894 MHz	880~915 MHz	925~960 MHz	1710~1785 MHz	1805~1880 MHz	1850~1910 MHz	1930~1990 MHz
Avg. gain (min)	Folder Close	H	-3.3 dBi	-2.8 dBi	-4.2 dBi	-5.6 dBi	-11.4 dBi	-8.3 dBi	-8.4 dBi	-10.7 dBi
		E1	-6.1 dBi	-6.4 dBi	-7.3 dBi	-8.1 dBi	-8.2 dBi	-6.0 dBi	-5.7 dBi	-4.8 dBi
		E2	-6.5 dBi	-5.4 dBi	-6.9 dBi	-8.9 dBi	-15.9 dBi	-12.4 dBi	-11.6 dBi	-12.7 dBi
	Folder Open	H	-5.7 dBi	-1.5 dBi	-2.1 dBi	-3.6 dBi	-12.3 dBi	-8.2 dBi	-6.4 dBi	-5.8 dBi
		E1	-8.4 dBi	-5.3 dBi	-5.4 dBi	-6.2 dBi	-7.6 dBi	-4.5 dBi	-3.5 dBi	-3.4 dBi
		E2	-8.9 dBi	-4.6 dBi	-5.0 dBi	-6.9 dBi	-13.9 dBi	-9.9 dBi	-8.7 dBi	-9.2 dBi

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**- Smith Chart & Return Loss & VSWR**



**Folder Close**

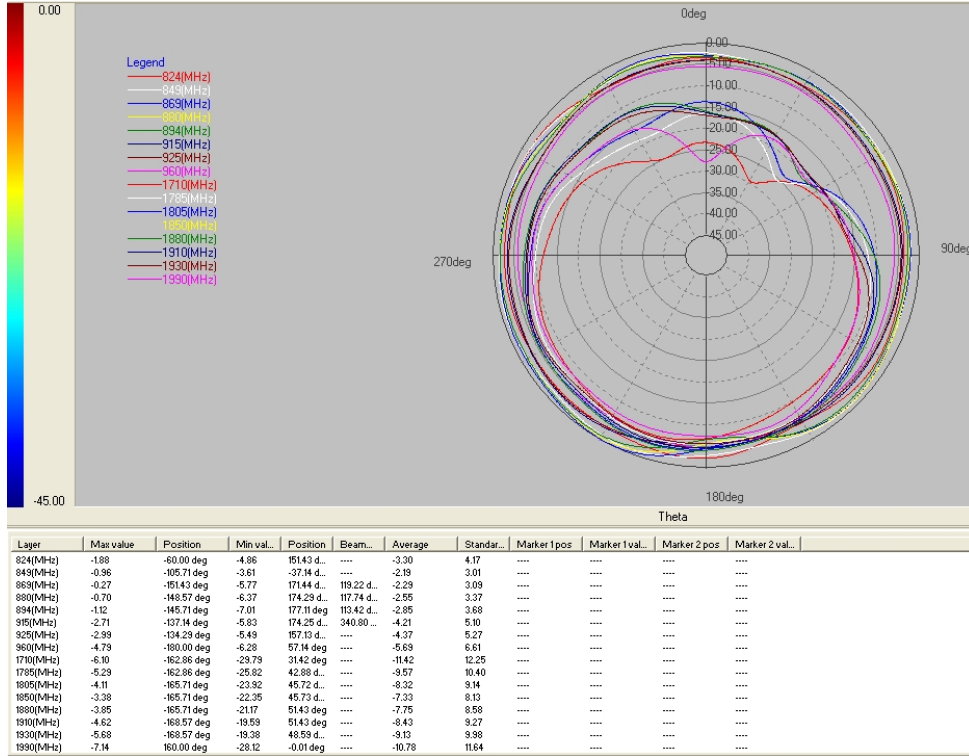


**Folder Open**

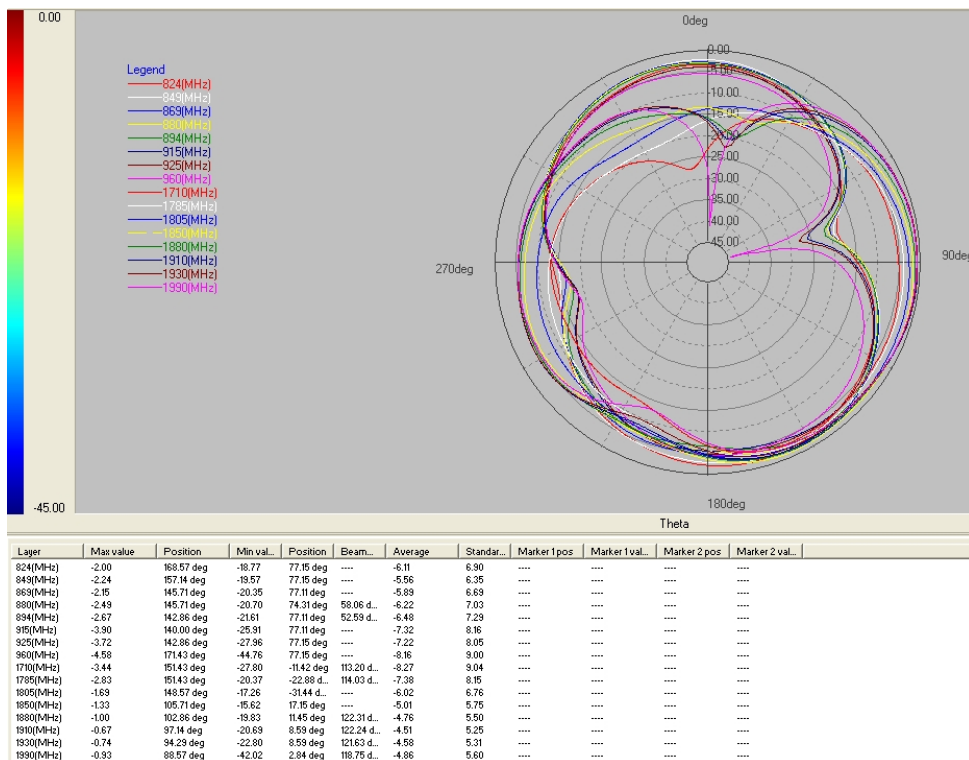


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**-Radiation Pattern (Folder Close)**

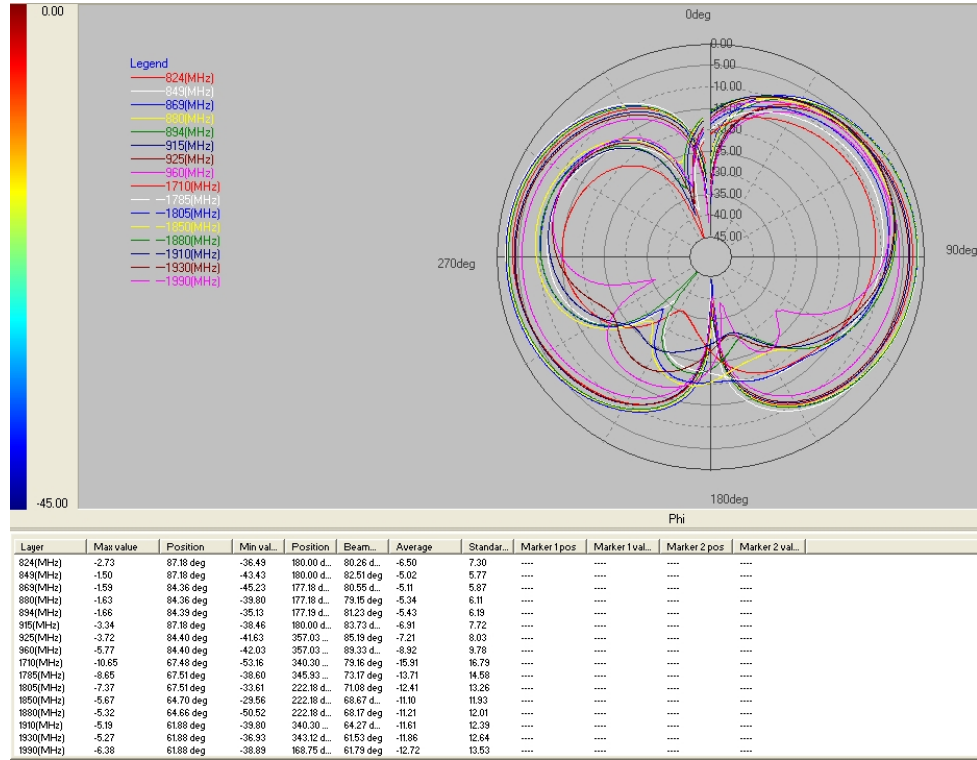


**H-plane**



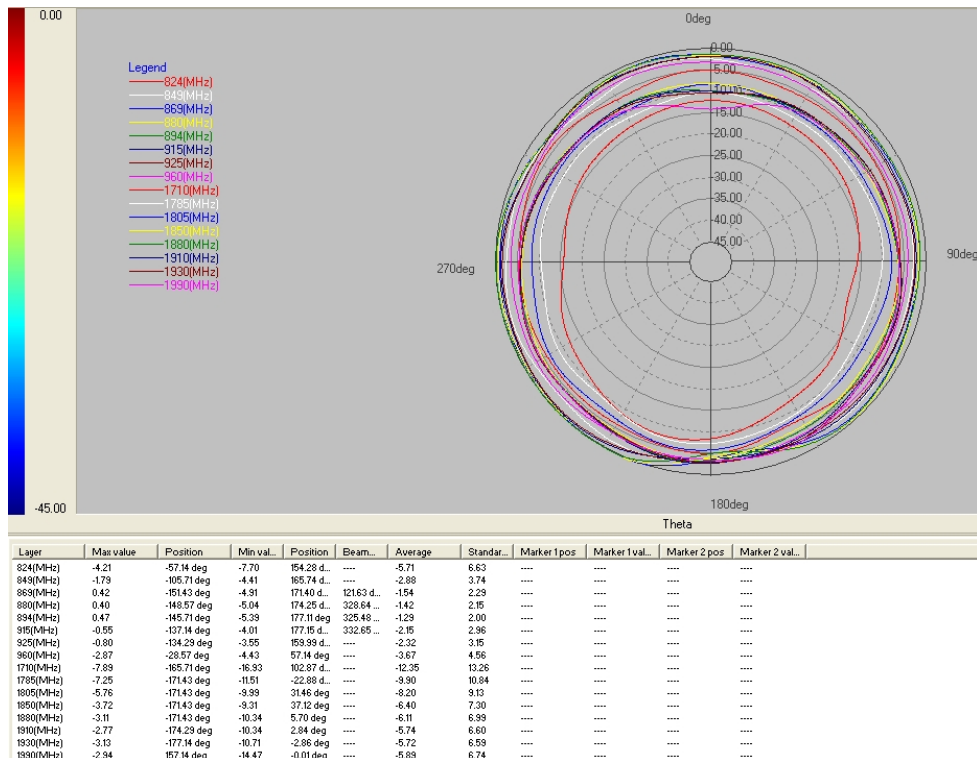
**E1-plane**

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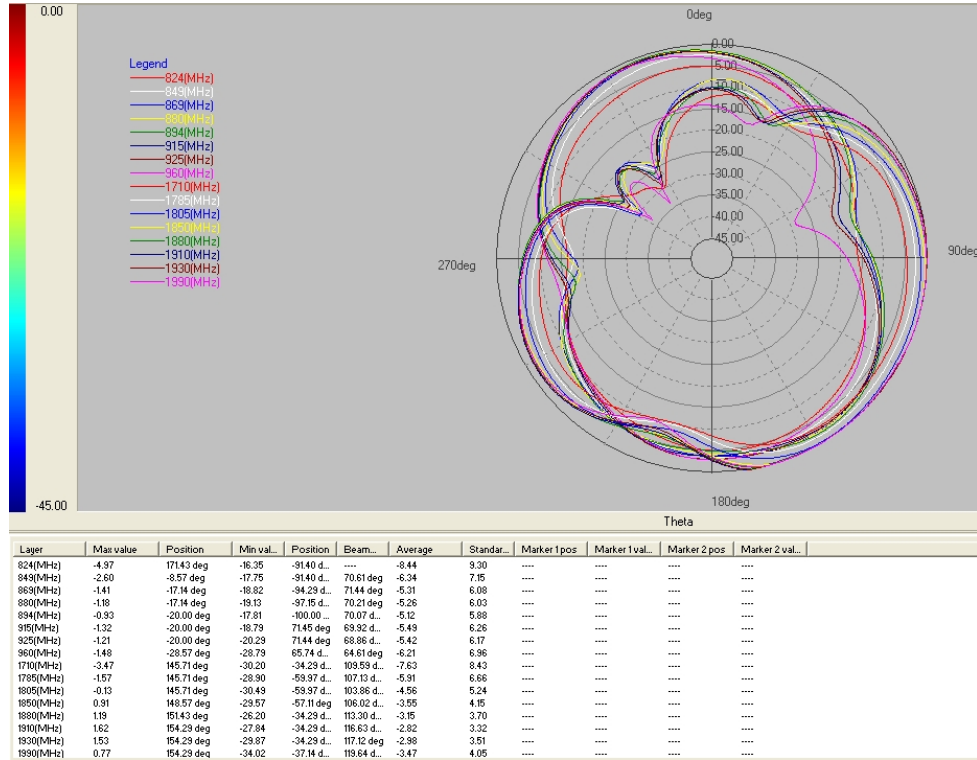
E2-plane

**-Radiation Pattern (Folder Open)**

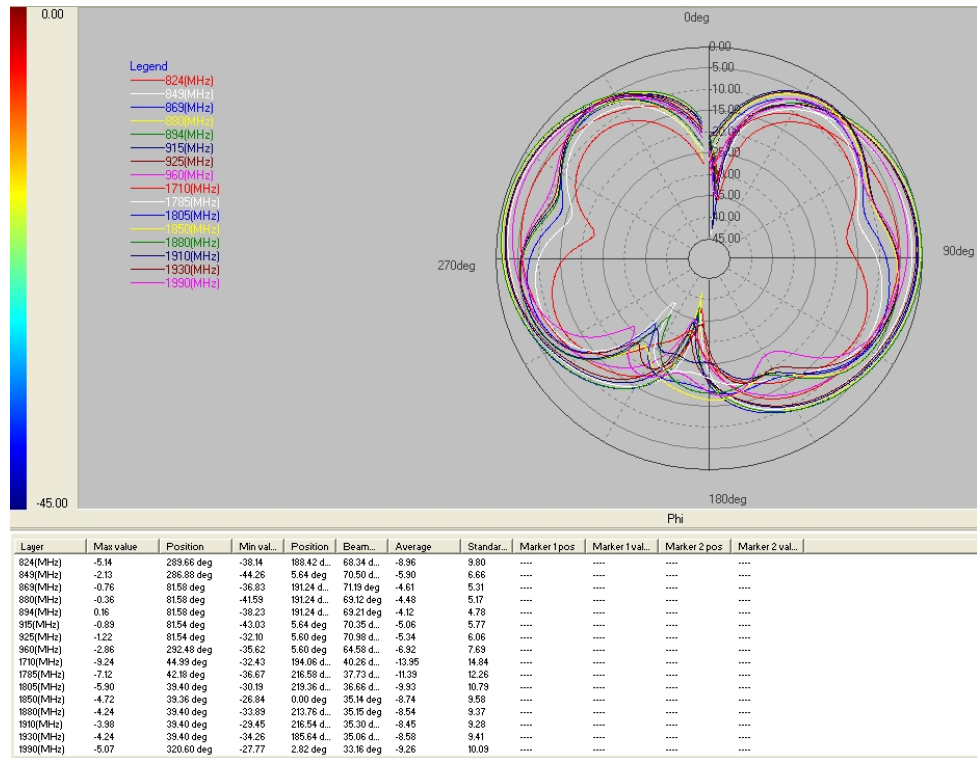


H-plane

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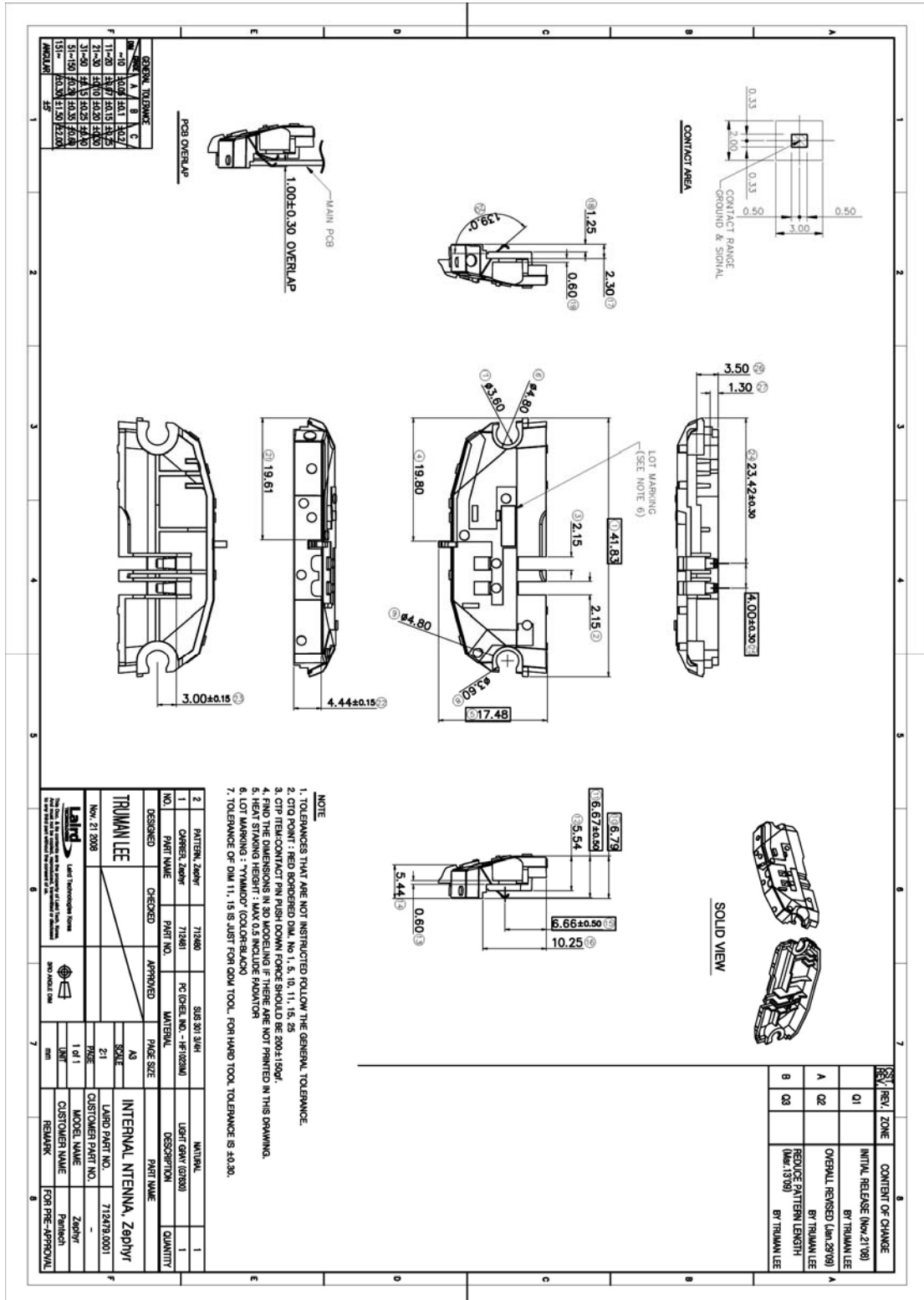
E1-plane



E2-plane

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### 3. SPECIFICATION DRAWING



[ Assembly Drawing ]