SAMSUNG

Unlicensed Band Antenna Gain

FCC ID: A3LSMA253JPN
Model: SC-53F, SCG33

1. Antenna Gain

WIFI 2.4G/5G/BT Sub3 (ANT F)						
Frequency (MHz)	2400	2485	5150-5250	5250-5350	5470-5725	5725-5850
Efficiency (dB)	-7.2	-8.7	-7.3	-8.0	-8.0	-8.5
Efficiency (%)	19.1	13.6	18.8	15.9	16.0	14.1
Peak Gain (dBi)	-3.4	-4.9	-1.5	-2.5	-2.7	-3.0

2. Antenna Measurement information

Measurement: KYOCERA AVX Ant Lab

Equipment: KSS Chamber, E5071B Network Analyzer, KSS-HA600, KSS-ANT

*KSS Chamber

The Test Systems is the ideal choice for developers of wireless devices and components as well as operators wanting to verify their suppliers' wireless devices. Over-The-Air (OTA) measurements reflect the true performance of the device and ensure that the tested product performs as intended once released to the market. The patented design creates a rich and isotropic multipath environment inside the chamber allowing for fast, easy and realistic performance measurements on SISO as well as MIMO devices like LTE and WLAN. The RTS is capable of performing passive measurements like antenna efficiency, diversity and MIMO gain as well as active measurements like TRP, TIS and Throughput (TPUT).

Location : Kyocera-Avx

Size : 3 x 2.5 x 2.5m

Frequency : 600MHz to 6000MHz

Tx Antenna : KSS-HA600 (Double Rigid Horn Antenna)

KSS 3D Motion Controller

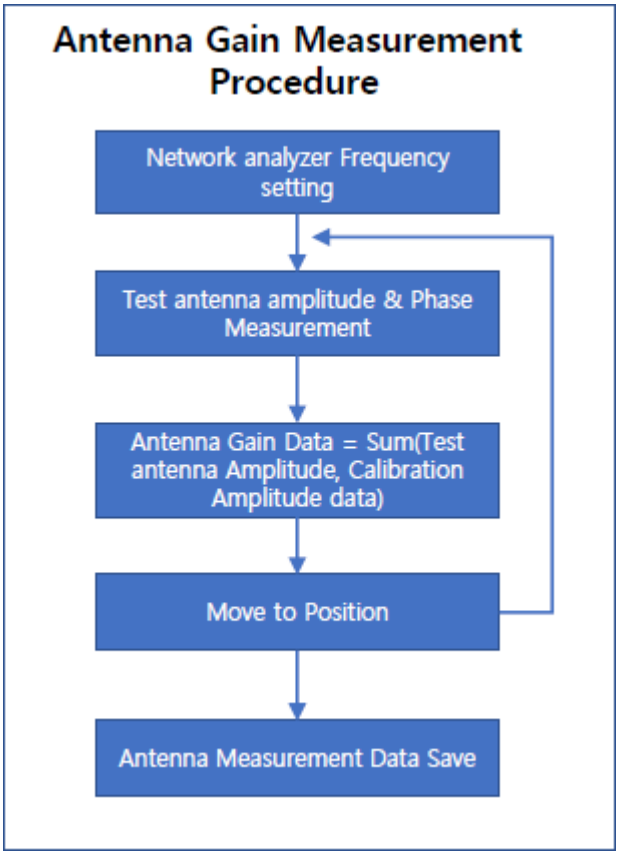
* **Test Equipment list**

Part	Model Name	Specification	
Tx Antenna	KSS-HA600	600MHz to 6000MHz	
Reference Antenna	KSS-HA600	600MHz to 6000MHz	
Network Analyzer	Agilent E5071B	300kHz to 8.5GHz	Cal. Due : 2025.07.24
Measurement Software	KSS-ANT		

Test dates : 2024. 09. 20

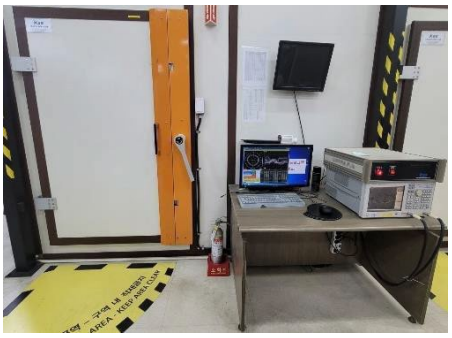
Names of test personnel : Sanghyuk Seo, Signature: 

Antenna Gain Measurement Procedure



Return Loss & VSWR Test

The VSWR measurement of antennas assembled into a fully operating SC-53F Phone is measured on the Network Analyzer. The Phone is set up with a 50 Ohm coaxial cable connected to the 50 Ohm point. Calibration is done at the end of the 50 Ohm coaxial cable connection. The other end of the 50 Ohm coaxial cable is connected to a network analyzer. The phone is positioned on a non-conductive table for free space measurements.



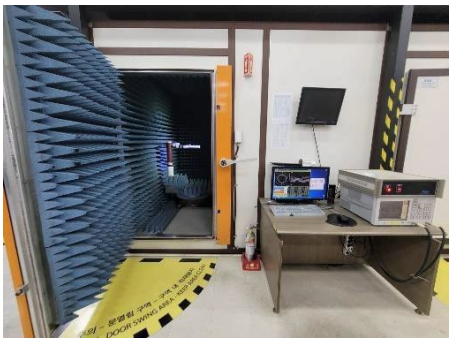


Figure 1: Testing with network analyzer

Return Loss & VSWR Test

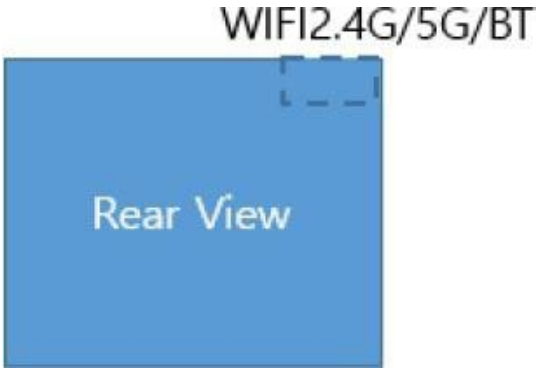
Antenna Lab has a system that can measure VSWR using KSS chamber and E5071B network analyzer. In order to measure the VSWR of each antenna, the lab connects the coaxial cable to the point in contact with the antenna on the Sub board. The VSWR is measured through the coaxial cable connected in the set. At this time, SC-53F is assembled in the same state as the user environment.

Radiation Pattern Test

Antennas tested for Gain and Efficiency must be assembled into the enclosure and tested in the fully assembled and operating SC-53F Phone. The antenna is tested in free space in the anechoic chamber in the H, E1 and, E2 planes. The radiation patterns are measured at the center of transmit and receive bands.

A picture showing the geometry for this device is included in the test setup photos.

Detailed Antenna Description



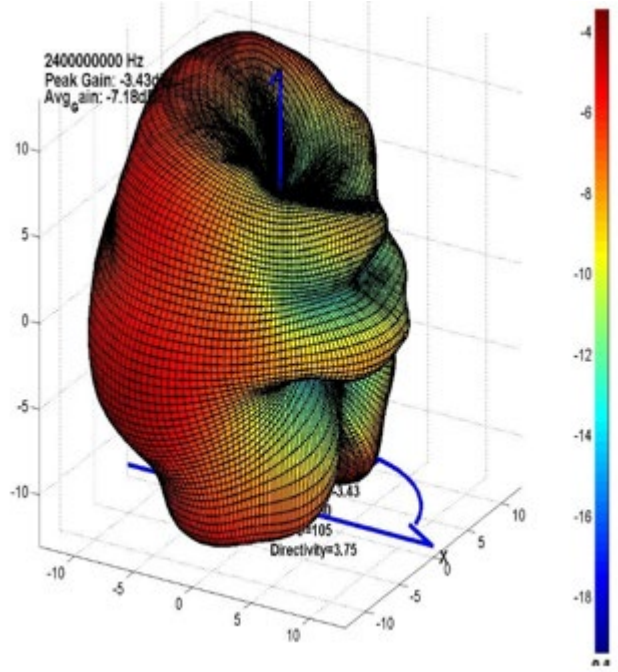
The antenna can be seen in the internal photos.
(Sub3 (ANT F))

Test Method (Manufacturing)

All measurements are done with SC-53F fully assembled. Measure in consideration of the customer's usage environment. Use a fully shielded chamber environment to prevent any noise-induced errors. Typically, the electrical properties of the antenna are measured using a jig that can hold the set.

Radiation plots for max gain plane (3D)

Wifi 2.4GHz



Wifi 5GHz