

■ FCC ID: A3LSMG990B2

■ Antenna Manufacturer

- Main Metal Ant : SAMSUNG / SUB METAL Ant : Ethertronics

MAIN1 LTE B2, NR N2, PCS 1900, W2	1	2
Frequency(MHz)	1880	1960
Efficiency(dB)	-3.2	-4.3
Efficiency(%)	48.0	37.2
Peak Gain(dBi)	-3.0	-3.8

MAIN1 LTE B4, W4	1	2
Frequency(MHz)	1747.5	1842.5
Efficiency(dB)	-4.0	-4.2
Efficiency(%)	40.2	38.2
Peak Gain(dBi)	-3.5	-3.7

MAIN1 B1, NR N1, W1	1	2
Frequency(MHz)	1920	1980
Efficiency(dB)	-3.8	-5.0
Efficiency(%)	41.8	31.9
Peak Gain(dBi)	-3.3	-4.2

MAIN1 B3, NR N3, DCS1800	1	2
Frequency(MHz)	1710	1785
Efficiency(dB)	-4.0	-3.9
Efficiency(%)	39.8	40.6
Peak Gain(dBi)	-3.5	-3.4

MAIN1 B28, NR N28	1	2
Frequency(MHz)	703	748
Efficiency(dB)	-7.9	-8.0
Efficiency(%)	16.4	15.8
Peak Gain(dBi)	-6.9	-7.1

MAIN1 LTE B5, NR N5, GSM 850, W5	1	2
Frequency(MHz)	836.5	881.5
Efficiency(dB)	-6.0	-7.5
Efficiency(%)	25.0	17.7
Peak Gain(dBi)	-5.5	-6.3

MAIN1 LTE B8, NR N8, W8, GSM900	1	2
Frequency(MHz)	880	915
Efficiency(dB)	-6.6	-6.1
Efficiency(%)	21.7	24.6
Peak Gain(dBi)	-6.1	-5.6

MAIN1 LTE B12, B17	1	2
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Frequency(MHz)	707.5	737.5
Efficiency(dB)	-7.6	-7.1
Efficiency(%)	17.4	19.6
Peak Gain(dBi)	-6.6	-6.1

MAIN1 LTE B26, B20, NR N20	1	2
Frequency(MHz)	831.5	876.5
Efficiency(dB)	-6.2	-7.0
Efficiency(%)	30.7	20.2
Peak Gain(dBi)	-5.5	-6.4

MAIN1 LTE B66, NR N66	1	2
Frequency(MHz)	1745	2155
Efficiency(dB)	-4.1	-6.6
Efficiency(%)	38.6	21.9
Peak Gain(dBi)	-3.1	-5.6

MAIN2 LTE B7, NR N7	1	2
Frequency(MHz)	2535	2655
Efficiency(dB)	-5.2	-6.6
Efficiency(%)	32.4	21.8
Peak Gain(dBi)	-4.3	-5.8

MAIN2 LTE B38, B41 NR N38, N41	1	2
Frequency(MHz)	2595	
Efficiency(dB)	-5.7	
Efficiency(%)	27.2	
Peak Gain(dBi)	-4.7	

MAIN2 LTE B40, NR N40	1	2
Frequency(MHz)	2350	
Efficiency(dB)	-4.9	
Efficiency(%)	32.3	
Peak Gain(dBi)	-4.4	

MAIN2 LTE N78	1	2
Frequency(MHz)	3300	3800
Efficiency(dB)	-6.4	-8.3
Efficiency(%)	22.9	14.7
Peak Gain(dBi)	-5.9	-7.3

SUB2 2.4G_ANT1	1	2	3
Frequency(MHz)	2400	2440	2480
Efficiency(dB)	-3.7	-4.3	-4.5
Efficiency(%)	43.3	37.6	34.0
Peak Gain(dBi)	-2.0	-2.3	-2.4

SUB3 5G_ANT1	4	5	6
Frequency(MHz)	5150	5500	5825
Efficiency(dB)	-6.4	-6.9	-6.7
Efficiency(%)	22.7	20.5	21.5
Peak Gain(dBi)	-1.8	-2.1	-1.9

SUB4 2.4G_ANT2, 5G_ANT2	1	2	3	1	2	3
Frequency(MHz)	2400	2440	2480	5150	5500	5825
Efficiency(dB)	-6.2	-6.1	-6.4	-11.1	-10.7	-10.6
Efficiency(%)	24.8	22.8	22.8	7.8	8.5	8.8
Peak Gain(dBi)	-3.9	-4.2	-4.2	-6.0	-5.8	-5.2

■ Antenna Measurement information

- **Measurement information**

Gain value is measured by Samsung Electronics.

Gain Value is measured in active call & Antenna selection.

Antenna gain is measured in RTS60 Chamber.

*Test Equipment list

Description	Manufacturer	Model	S/N	Cal Due
Network Analyzer	R&S	ZNB 8	105157	2023.04.21.

- **Return Loss & VSWR Test**

The VSWR measurement of antennas assembled into a fully operating SM-G990B2/DS phone handset is measured on the Network Analyzer. The handset 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 handset is positioned on a non-conductive table for free space measurements.

[See Photo #1](#)

- **Return Loss & VSWR Test**

Samsung has a system that can measure VSWR using RTS60 chamber and ZNB 8 network analyzer for passive measurement. 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 main board. The VSWR is measured through the coaxial cable connected in the set. At this time, SM-G990B2/DS is assembled in the same state as the user environment

[See Photo #2](#)

- **Radiation Pattern Test**

The AC chamber has an axis because the cradle moves left and right up and down, and the RC chamber (RTS60) we use does not have an axis because the cradle does not move.

- **Test Method (Manufacturing)**

All measurements are done with SM-G990B2/DS 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 antenna are measured using a jig that can hold the set.

- **Radiation Pattern**

There is no Radiation Pattern due to passive measurement with RC chamber.