

DAFTAR PUSTAKA

- [1] R. Resti *et al.*, “Rancang Bangun Antena Mikrostrip Segiempat Dual Band Dengan Menggunakan Teknik Pencatutan Proximity Coupled,” vol. 3, no. 1, 2019.
- [2] M. P. Deshmukh, “Evolution of wireless technology from 0G to 5G : A review,” *Int. J. Comput. Sci. Inf. Technol.*, vol. 6, no. 3, pp. 2545–2551, 2015.
- [3] R. A. Mulyadi and U. K. Usman, “Komunikasi Device-to-Device pada Jaringan Seluler 5G menggunakan mmWave,” *Avitec*, vol. 2, no. 1, pp. 65–73, 2020, doi: 10.28989/avitec.v2i1.614.
- [4] N. A. Fauzan *et al.*, “Rancang Bangun Antena Mikrostrip Multi Band Dengan Rectangular Patch Untuk Frekuensi 2.4GHz, 2.6GHz, dan 3.5GHz,” no. November 2020, pp. 93–100.
- [5] F. Abdurrahman, “DESAIN ANTENA MICROSTRIP RECTANGULAR UNTUK WIFI PADA FREKUENSI 2,462 GHz DAN 5,52 GHz,” pp. 1–38, 2018.
- [6] Y. Lee, D. Ga, and J. Choi, “Design of a MIMO antenna with improved isolation using MNG metamaterial,” *Int. J. Antennas Propag.*, vol. 2012, 2012, doi: 10.1155/2012/864306.
- [7] A. B. Adipurnama, Y. Wahyu, and H. Wijanto, “Perancangan dan Realisasi Antena MIMO 4x4 Mikrostrip Patch Persegi Panjang 5.2GHz Untuk WiFi 802.11N,” vol. 3, no. April, p. 233, 2016.
- [8] J. R. Hallas, *[Book] Basic Antennas - Understanding Practical Antennas and Design*. Newington: American Radio Relay League, 2009.
- [9] M. Alaydrus, *Antena Prinsip dan Aplikasi*. Yogyakarta: GRAHA ILMU, 2011.
- [10] R. C. Johnson, *Antenna Engineering Handbook*, vol. 23, no. 2. New York: McGraw-Hill, Inc., 1993.
- [11] C. A. Balanis, *Antenna Theory: Analysis and Design*, 4th ed. New Jersey: John Wiley & Sons, Inc, 2016.
- [12] A. A. Kishk, “Fundamentals of Antennas,” 2009.
- [13] I. Hajar, “DESAIN ANTENA MIKROSTRIP PATCH ARRAY 28 GHz DENGAN CST MICROWAVE STUDIO,” 2018.

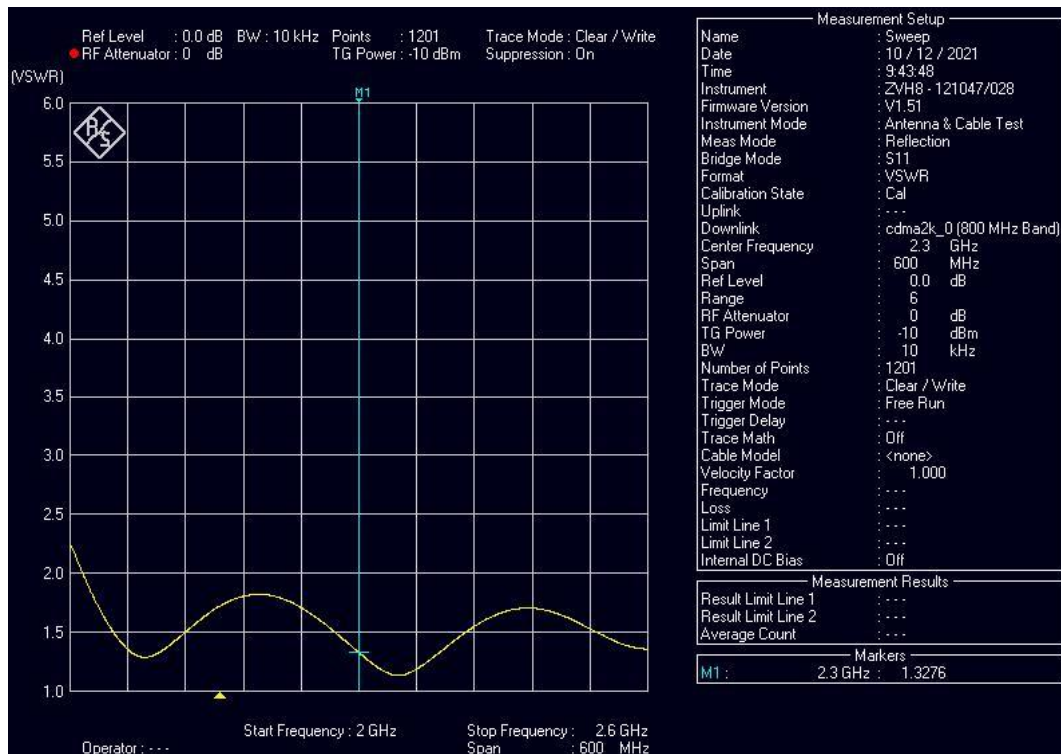
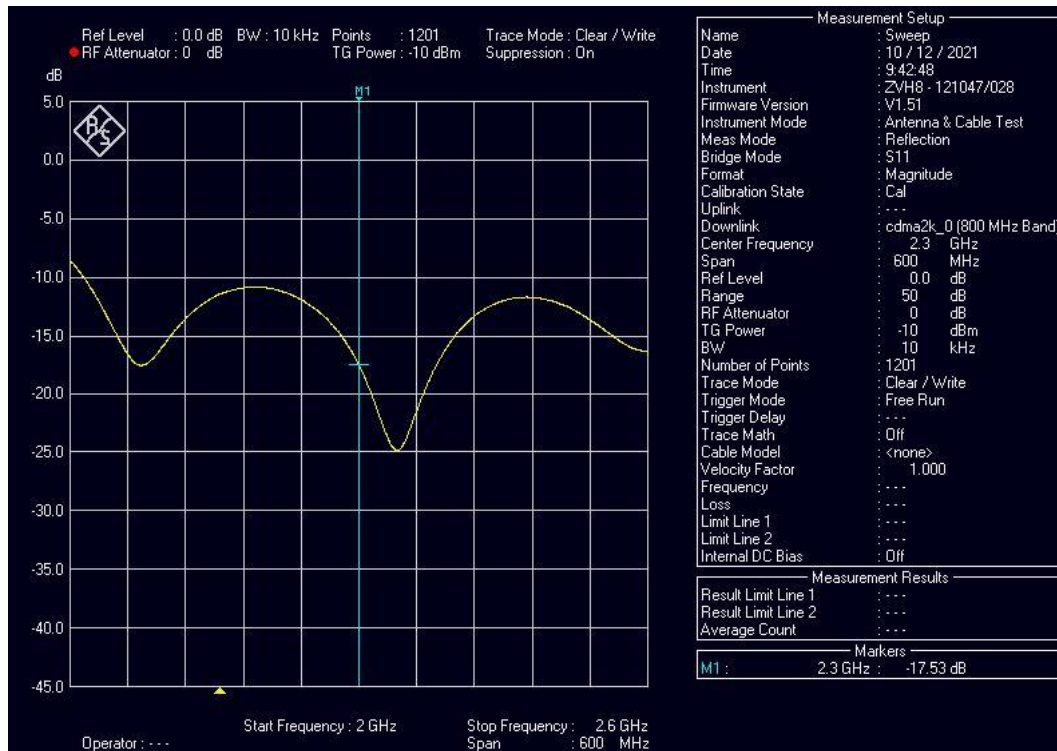
- [14] J. Wardhianto, "Desain Antena Dengan Teknologi Ultra Wideband Pada Frekuensi 5.6 GHz," p. 9, 2018.
- [15] Y. Wulandari, "Perancangan dan Pembuatan Antena Patch segiempat untuk meningkatkan Bandwith dengan Metode Defected Ground Structure (DGS)," vol. 2, pp. 6–21, 2015.
- [16] A. Ma'ruf, S. Soim, and E. Hesti, "Perancangan Antena Mikrostrip Patch Square Pada Frekuensi 2.4 GHz," vol. 6, no. 2, pp. 157–160, 2018.
- [17] A. Herudin, "Perancangan Antena Mikrostrip Patch Segi Empat Frekuensi 3 , 3 GHz Untuk Aplikasi WiMAX," pp. 75–78, 2009.
- [18] I. G. P. Senky, "Spatial Multiplexing Mimo OFDM Dengan Model Kanal SVD Untuk Mobile WIMAX," 2008.
- [19] V. Thakur, N. Jaglan, and S. D. Gupta, "Design of a dual-band 12-element mimo antenna array for 5g mobile applications," *Prog. Electromagn. Res. Lett.*, vol. 95, no. December 2020, pp. 73–81, 2021, doi: 10.2528/PIERL20102004.
- [20] U. S. Zulpratita, "Kunci Teknologi 5G," *J. Ilm. Teknol. Infomasi Terap.*, vol. 4, no. 2, pp. 166–173, 2018, doi: 10.33197/jitter.vol4.iss2.2018.163.
- [21] E. Wijanto, "Analisis Kesiapan Teknologi Dalam Penerapan Teknologi Telekomunikasi Generasi Kelima (5G)," *J. Tek. Inform. dan Ilmu Komput.*, vol. 06, pp. 243–255, 2017.
- [22] S. Arunachalam, S. Kumar, and H. Kshatriya, "Analyzing 5G: Prospects of Future Technological Advancements in Mobile," *IOSR J. Eng. www.iosrjen.org ISSN*, vol. 1, no. May, pp. 6–11, 2018, [Online]. Available: www.iosrjen.org.
- [23] R. G. R. Tobing, B. Sumajudin, and Y. Wahyu, "Analisa Pengaruh Mutual Coupling Terhadap Susunan Dua Antena Mikrostrip Segitiga Sama Sisi Dengan Frekuensi Resonan Yang Berbeda (1.5 GHz dan 1.7 GHz)," 2012.
- [24] N. Amelia, "Rancang Bangun Antena MIMO Untuk Teknologi 5G," Universitas Hasanuddin, 2020.
- [25] M. Anthoni *et al.*, "Perancangan dan Simulasi Antena Mikrostrip MIMO 4×4 Rectangular Patch dengan Double U-Slot dan DGS pada Frekuensi 26 GHz untuk Aplikasi 5G," *Orig. Artic. J. Sci. Appl. Technol.*, vol. 5, no. 2, p. 16350, 2021, doi: 10.35472/jsat.v5i2.336.
- [26] S. Andrian, "Penjelasan Lengkap Massive MIMO 5G." <https://www.5g-indonesia.com/2020/08/penjelasan-lengkap-massive-mimo-5g.html> (accessed Dec. 19, 2021).

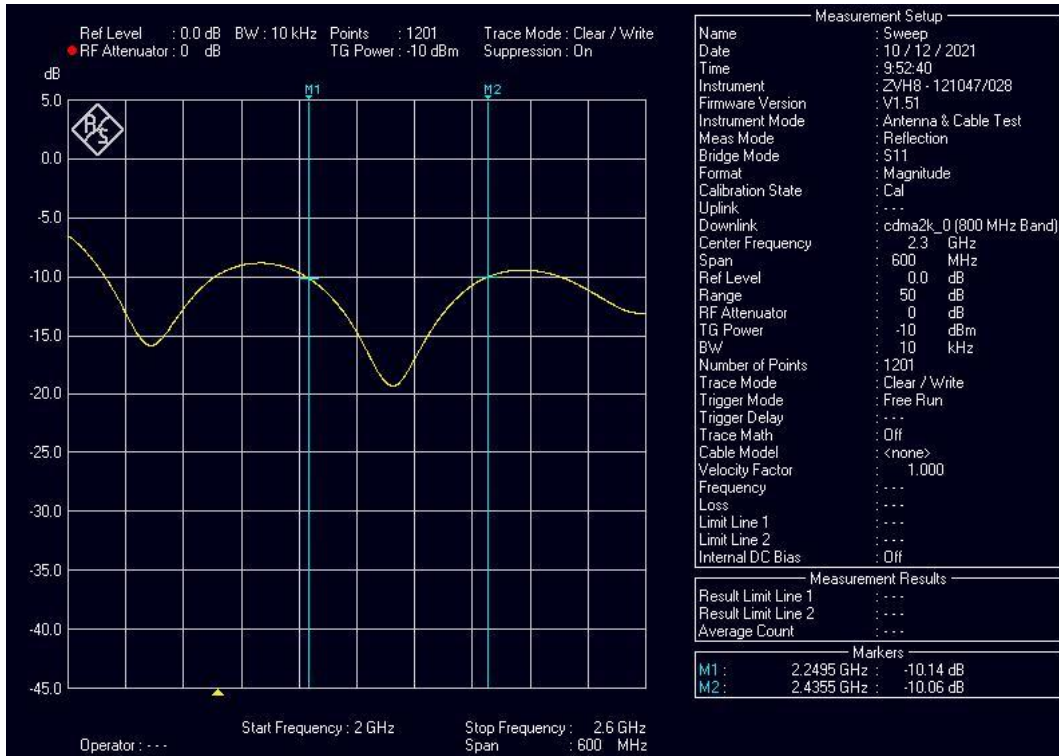
- [27] J. Sanders, "Why 5G requires new antenna designs to deliver faster speeds - TechRepublic." <https://www.techrepublic.com/article/why-5g-requires-new-antenna-designs-to-deliver-faster-speeds/> (accessed Dec. 19, 2021).
- [28] R. Aditya, "Beda 4G dan 5G: Kecepatan hingga Ponsel yang Mensupport," 2021. <https://www.suara.com/tekno/2021/06/02/180409/beda-4g-dan-5g-kecepatan-hingga-ponsel-yang-mensupport?page=all> (accessed Dec. 19, 2021).

LAMPIRAN

Lampiran 1

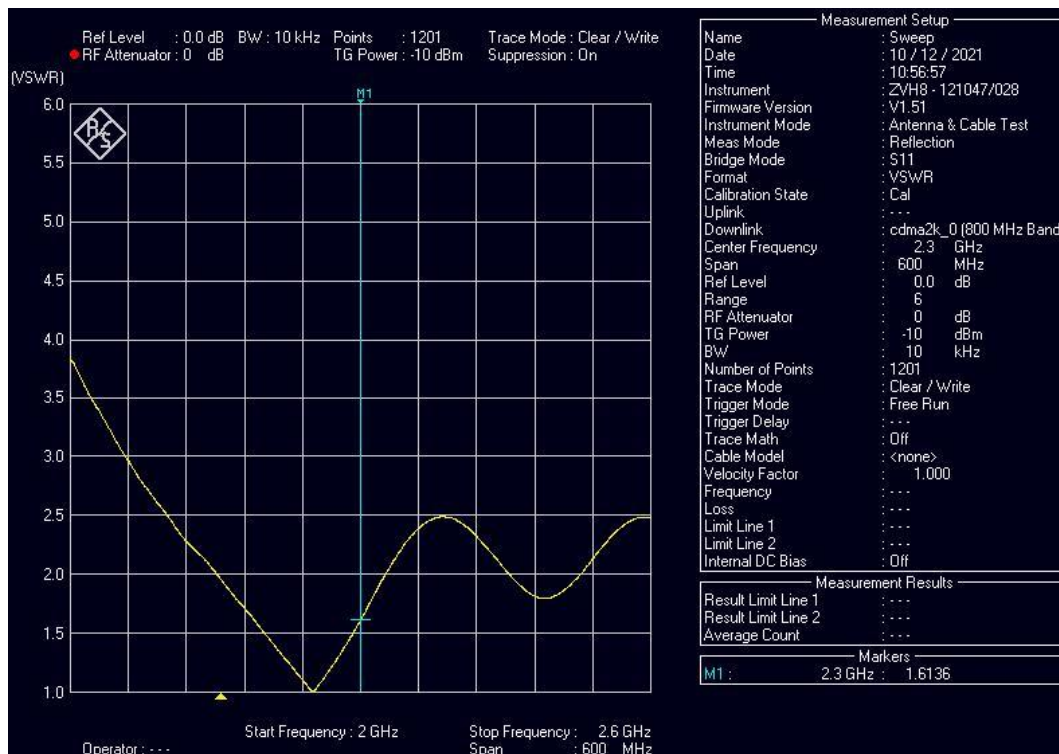
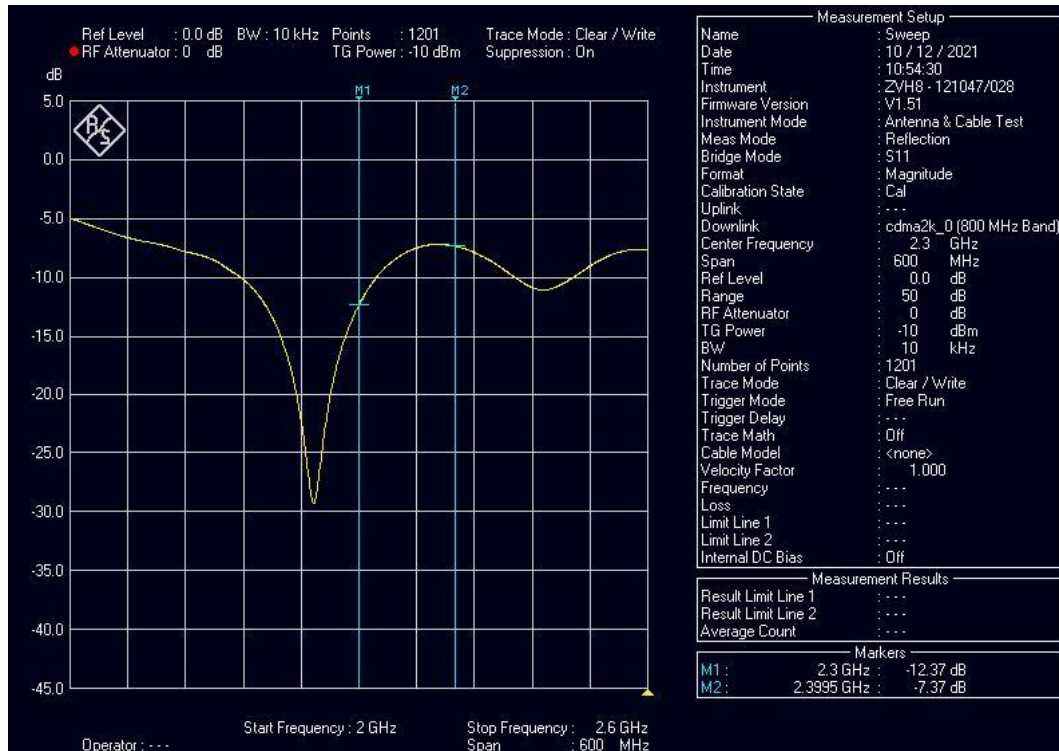
Nilai S_{11} , VSWR, dan Bandwidth pada Port 1

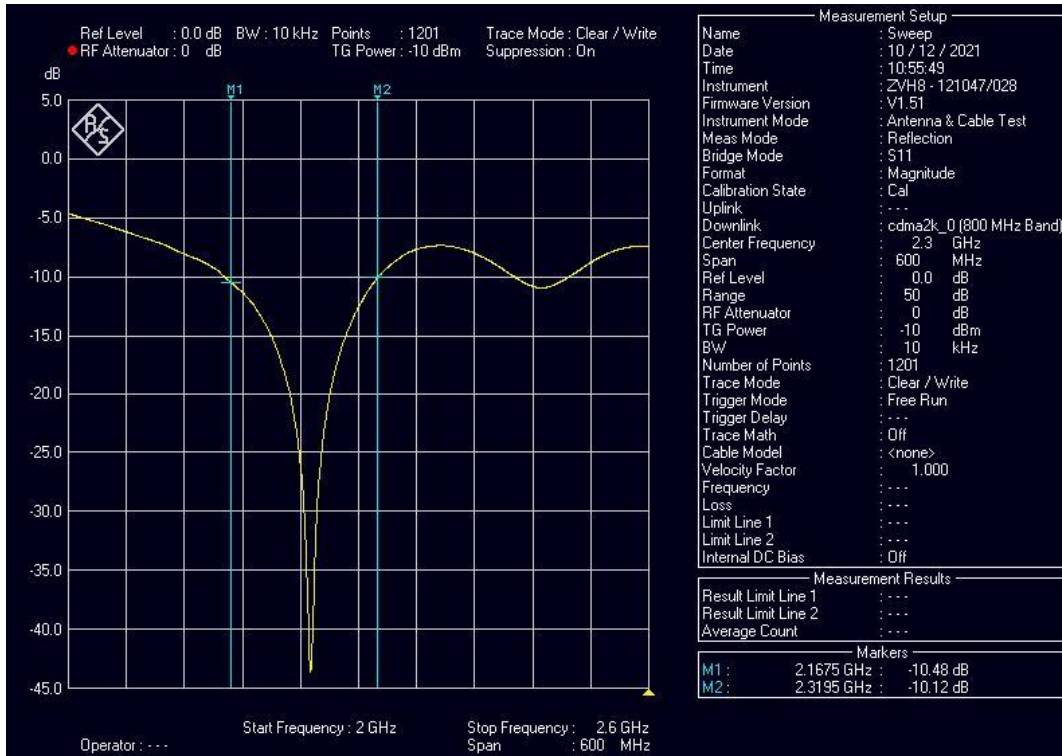




Lampiran 2

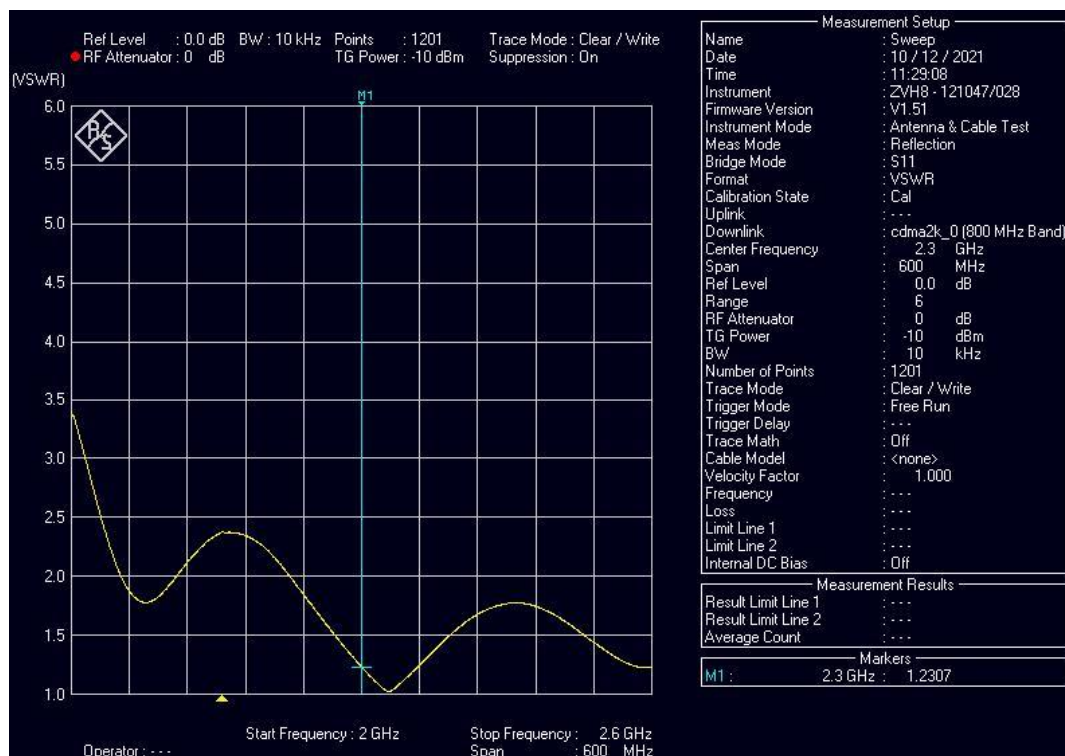
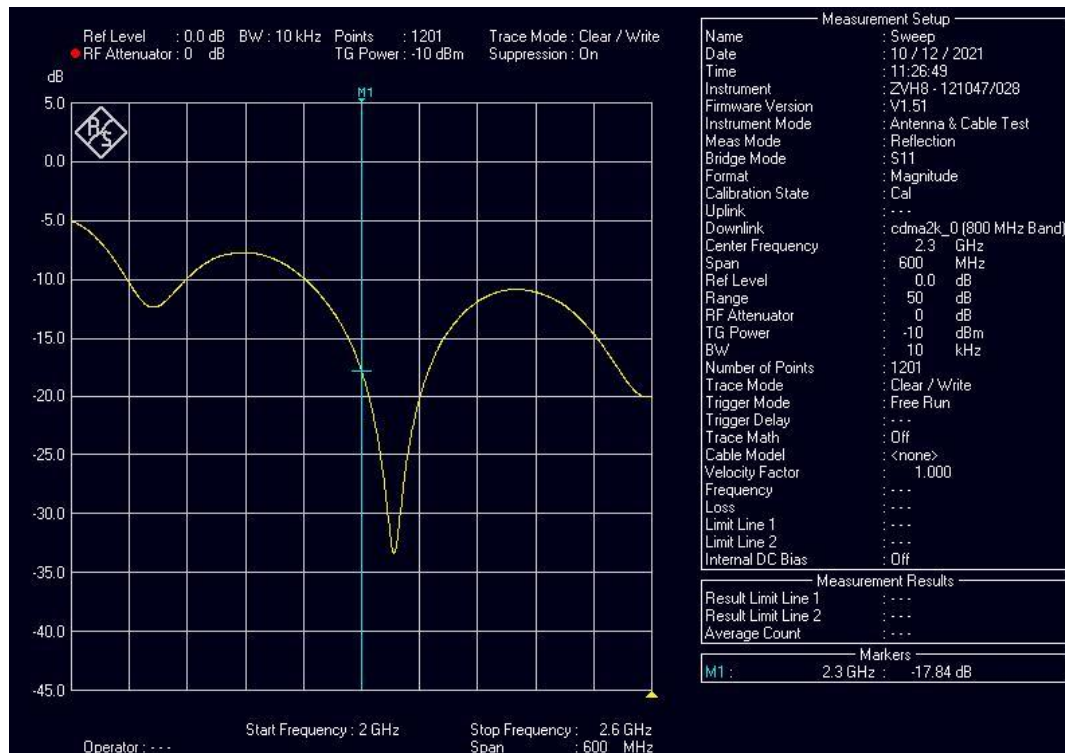
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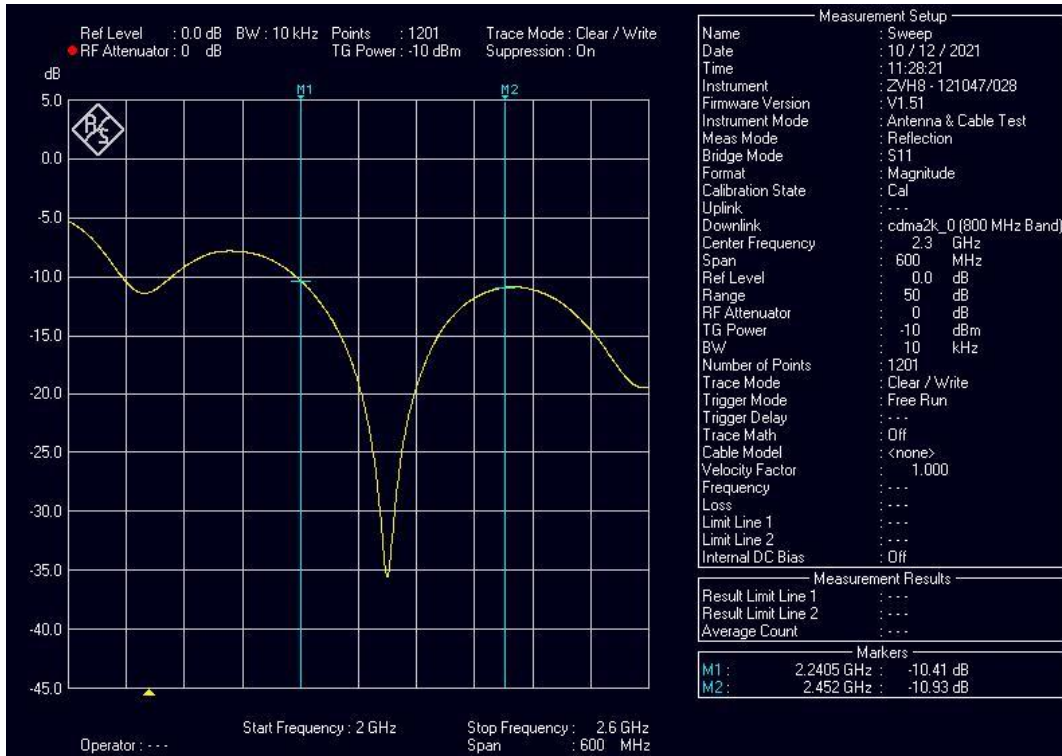




Lampiran 3

Nilai S_{11} , VSWR, dan $Bandwidth$ pada Port 3





Lampiran 4

Nilai S_{11} , VSWR, dan $Bandwidth$ pada Port 4

