

DAFTAR PUSTAKA

- [1] S. Sugiyatno, P. Sidiq, and I. F. Edrisy, "Pengaruh Teknologi 5G Pada Evolusi Komunikasi: Sebuah Kajian Terhadap Perkembangan Dan Implikasinya Di Bidang Sains," *Nucleus*, vol. 4, no. 2, pp. 115–120, 2024, doi: 10.37010/nuc.v4i2.1448.
- [2] ITU-R, "M.2410 - Minimum Requirements Related To Technical Performance For IMT-2020 Radio Interface(S)," *Report ITU-R M.2410-0*, pp. 1–11, Nov. 2020. [Online]. Available: <https://www.itu.int/pub/R-REP-M.2410>
- [3] Y. Rahayu and S. MZ, "Investigasi Perancangan Simulasi Antena MIMO 64 Elemen Untuk Aplikasi 5G," *J. Telekomun. dan Komput.*, vol. 11, no. 2, p. 143, 2021, doi: 10.22441/incomtech.v11i2.10903.
- [4] B. Bagus and A. Y. Bagaskara, "Perancangan Antena Mikrostrip Rectangular Patch Sebagai Penerima Televisi," *J. Penelit.*, vol. 5, no. 1, pp. 11–20, 2020, doi: 10.46491/jp.v5e1.482.11-20.
- [5] T. Sabtiawan, M. R. Hidayat, Y. P. Saputera, and N. T. Somantri, "Antena Multiple-Input Multiple-Output (MIMO) Array 1×4 Axe Patch Microstip Pada Frekuensi 2.4 GHz," *J. Tek. Media Pengemb. Ilmu dan Apl. Tek.*, vol. 23, no. 1, pp. 01–15, 2024, doi: 10.55893/jt.vol23no1.585.
- [6] E. Sandi, W. Djatmiko, and R. K. Putri, "Desain U-Slot Ganda Untuk Meningkatkan Bandwidth Antena MIMO 5G Millimeter-Wave," *ELKOMIKA J. Tek. Energi Elektr. Tek. Telekomun. Tek. Elektron.*, vol. 8, no. 1, p. 150, 2020, doi: 10.26760/elkomika.v8i1.150.
- [7] A. Shirpay, M. R. Rohaninezhad, M. Tavakoli, and E. Zarezadeh, "Reduction Of Mutual Coupling In A Microstrip Array Antenna With Circular Polarization In The C-Frequency Band Using A Combination Of DGS And EBG Methods," *Eng. Res. Express*, vol. 5, no. 1, 2023, doi: 10.1088/2631-8695/aca6c1.
- [8] H. Xing *et al.*, "Efficient Isolation Of An MIMO Antenna Using Defected Ground Structure," *Electronics*, vol. 9, no. 8, pp. 1–13, 2020, doi: 10.3390/electronics9081265.
- [9] M. J. Kang, S. Park, K. G. Cho, and K. Y. Jung, "High-Isolation 5G Repeater Antenna Using A Novel DGS And An EBG," *J. Electromagn. Eng. Sci.*, vol. 23, no. 3, pp. 275–282, 2023, doi: 10.26866/jees.2023.3.r.168.
- [10] D. Sugianto and T. Hariyadi, "Design Of Microstrip Antenna For LTE (Long Term Evolution) 700 MHz Applications," in *Proc. 2013 Int. Conf. Inf. Commun. Technol. (ICoICT)*, Bandung, Indonesia, Mar. 2013, pp. 328–331, doi: 10.1109/ICoICT.2013.6574595.

- [11] R. Meneses González, R. Linares Y Miranda, and R. Leyva Hernández, "Spiral Slotted Microstrip Antenna Design For 700 MHz Band Application," *Int. J. Antennas Propag.*, vol. 2016, pp. 1–7, 2016, doi: 10.1155/2016/1879287.
- [12] S. T. Anggraini, D. A. Nurmantris, and Y. Wahyu, "Perancangan Dan Realisasi Antena Mikrostrip MIMO Bowtie 4×4 Pada Frekuensi 28 GHz Untuk Aplikasi 5G," *eProceedings of Engineering*, vol. 8, no. 5, pp. 4887-4896, Oct. 2021, ISSN: 2355-9365.
- [13] N. L. Yusup, E. S. Nugraha, and P. K. Goran, "Perancangan Antena Mikrostrip Rectangular Array Untuk Teknologi 5G Pada Frekuensi 28 GHz," *J. Telekomun. dan Komput.*, vol. 11, no. 2, p. 100, Aug. 2021, doi: 10.22441/incomtech.v11i2.10814.
- [14] M. Anthoni, R. S. Asthan, A. Pascawati, D. Maryopi, and M. R. K. Aziz, "Perancangan Dan Simulasi Antena Mikrostrip MIMO 4×4 Rectangular Patch Dengan Double U-Slot Dan DGS Pada Frekuensi 26 GHz Untuk Aplikasi 5G," *J. Sci. Appl. Technol.*, vol. 5, no. 2, p. 371, Jul. 2021, doi: 10.35472/jsat.v5i2.336.
- [15] E. Y. D. Utami, J. C. Novaldy, and A. A. Febrianto, "Antena Mikrostrip Lingkaran Untuk Komunikasi MIMO 4x4 Pada Frekuensi 15 GHz," *J. Telekomun. dan Komput.*, vol. 11, no. 3, p. 221, Dec. 2021, doi: 10.22441/incomtech.v11i3.11900.
- [16] F. S. Akbar and A. Saharani, "Rancang Bangun Antena Mikrostrip MIMO 4 Elemen Untuk Komunikasi 5G Pada Frekuensi Band N40," *Emitor J. Tek. Elektro*, vol. 22, no. 2, pp. 126–133, Aug. 2022, doi: 10.23917/emitor.v22i2.19491.
- [17] R. Ruliyanta, R. Nugroho, and D. Asyifa, "Design Of Rectangular Patch Array 2x4 Microstrip Antenna On C-Band For Weather Radar Applications," *J. Telecommun. Electron. Comput. Eng. (JTEC)*, vol. 16, no. 1, pp. 7–11, Mar. 2024, doi: 10.54554/jtec.2024.16.01.002.
- [18] E. J. Pranata and R. Dewantara, "Analisis Dan Pengukuran Quality Of Service (QoS) Jaringan 4G (Operator Telkomsel, XL, Dan Indosat)," *Cyber Secur. dan Forensik Digit.*, vol. 6, no. 2, pp. 69–75, 2024, doi: 10.14421/csecurity.2023.6.2.4246.
- [19] P. Kumar and Sumit, "Review Paper On Development Of Mobile Wireless Technology," *J. Phys. Conf. Ser.*, vol. 1979, no. 1, p. 012024, 2021, doi: 10.1088/1742-6596/1979/1/012024.
- [20] N. H. Hari, F. P. E. Putra, U. Hasanah, S. R. Sutarsih, and Riyan, "Transformasi Jaringan Telekomunikasi Dengan Teknologi 5G: Tantangan, Potensi, Dan Implikasi," *J. Inf. dan Teknol.*, pp. 146–150, 2023, doi: 10.37034/jidt.v5i2.357.
- [21] T. Trikolos, A. Sungkowo, R. R. A. Hakim, and A. Jaenul, "Kelebihan, Kekurangan, Peluang Teknologi 5G Di Indonesia," *INSOLOGI J. Sains dan Teknol.*, vol. 1, no. 1, pp. 43–49, 2022, doi: 10.55123/insologi.v1i1.145.
- [22] T. Sabtiawan, D. I. Saputra, and Y. P. Saputera, "Pemodelan Dan Simulasi Antenna Mikrostrip Array Untuk Aplikasi Radar Manpack PT. Radar Telekomunikasi

Indonesia,” *Epsilon J. Electr. Eng. Inf. Technol.*, vol. 21, no. 2, pp. 59–69, 2023, ISSN: 1693-4245.

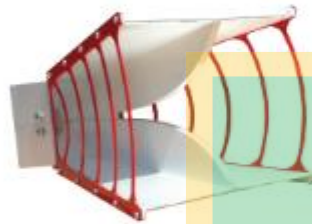
- [23] K. E. Kedze, H. Wang, Y. B. Park, and I. Park, “Substrate Dielectric Constant Effects On The Performances Of A Metasurface-Based Circularly Polarized Microstrip Patch Antenna,” *Int. J. Antennas Propag.*, vol. 2022, pp. 1–13, 2022, doi: 10.1155/2022/3026677.
- [24] B. Mohamadzade, A. Lalbakhsh, R. B. V. B. Simorangkir, A. Rezaee, and R. M. Hashmi, “Mutual Coupling Reduction In Microstrip Array Antenna By Employing Cut Side Patches And EBG Structures,” *Prog. Electromagn. Res. M*, vol. 89, pp. 179–187, 2020, doi: 10.2528/pierm19100703.



LAMPIRAN

Lampiran 1 Data Sheet Antena Horn

ANTENNA MODEL 3115



MODEL 3115

- Frequency Range 750 MHz to 18 GHz
- Uniform Gain
- Individually Calibrated
- Low VSWR Continuous Power Handling Capability 300W

ETS-Lindgren's 3115 Double-Ridged Guide Horn Antenna has been an industry standard for many years. This antenna has excellent gain and VSWR characteristics, it is small and portable with a width of 24.4 cm (9.6 in), and is now calibrated to 750 MHz.

Ultra Broadband

The Model 3115 sweeps from 750 MHz to 18 GHz without stopping for band breaks, making it ideal for automated testing. It has the widest usable frequency range of any antenna in its class, with no performance degradation from high order modes.

Power Input

This horn antenna uses a Type N precision connector and accepts up to 300 watts of continuous input power. The antenna's high gain and low VSWR over its operating frequency translates into efficient amplifier use and higher field strengths.

Construction

An antenna constructed to maximize structural integrity is better able to maintain its electrical properties. The benefits are better measurement repeatability, lower uncertainty values and longer calibration validity. Constructed of powder coated aluminum plate, the Model 3115 Double-Ridged Guide Antenna will provide years of trouble-free indoor and outdoor service.

Standard Configuration

- Model 3115 Antenna
- Mounting bracket drilled, accepts an ETS-Lindgren or Other Tripod Mount with Standard 1/4 in x 20 Threads
- Individually calibrated at 1 m per SAE APR 958. Actual antenna factors and a signed Certificate of Conformance are included with manual

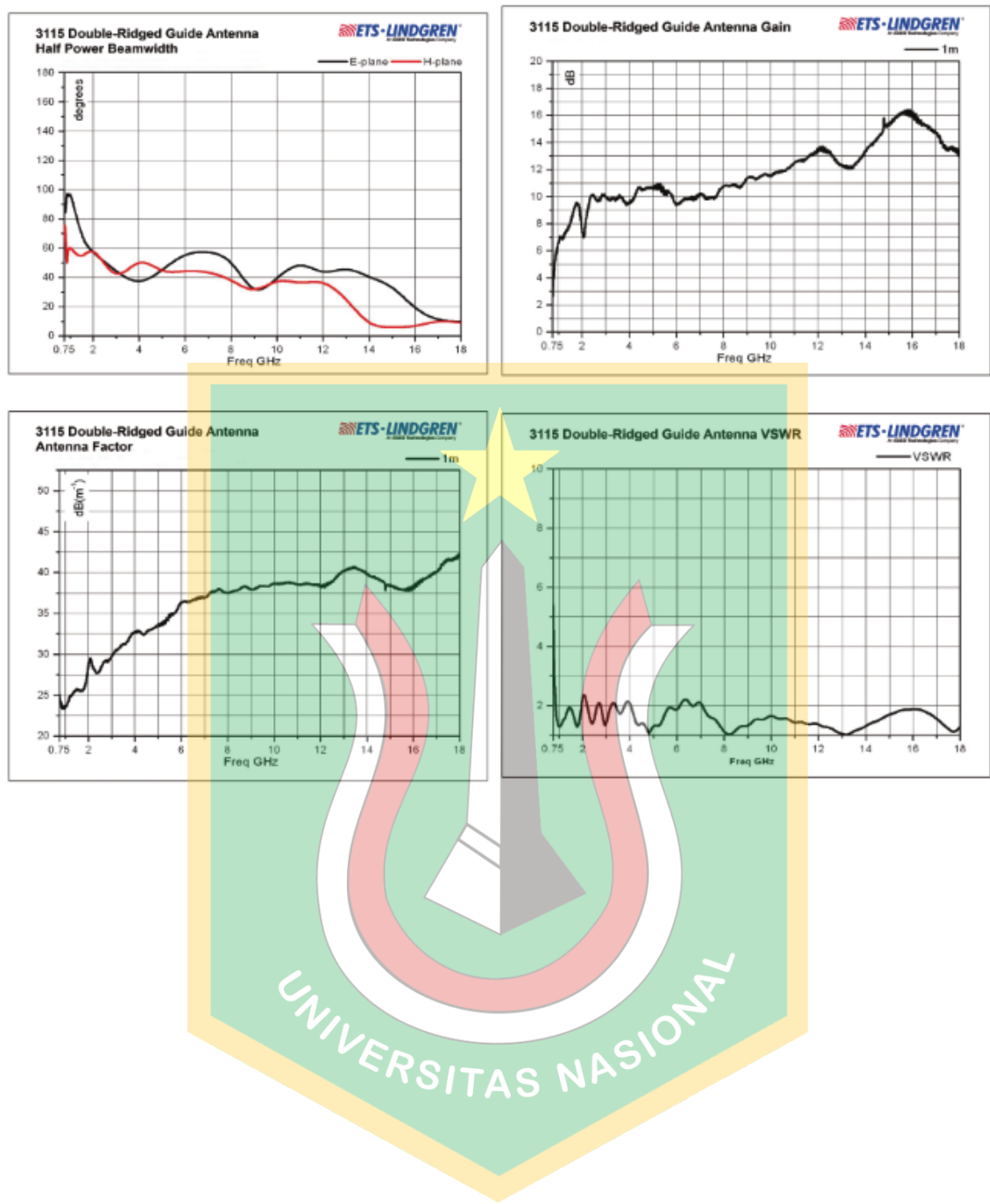
Options

- ETS-Lindgren Offers Several Non-metallic, Non-reflective Tripods

Technical Specifications

Electrical	
Frequency Minimum	750 MHz
Frequency Maximum	18 GHz
Connectors	Precision N (f)
Impedance (Nominal)	50
Maximum Continuous Power	300 W
Peak Power	500 W
VSWR	2:1 (3:1 Max) > 1 GHz & 1 (Typical) @ 750 MHz
Pattern Type	Directional
Polarization	Linear
Physical	
Width	24.4 cm (9.6 in)
Length	20.6 cm (8.1 in)
Height	15.9 cm (6.2 in)
Weight	1.8 kg (4 lb)

Lampiran 2 Data Sheet Typical Data





UNIVERSITAS NASIONAL

FAKULTAS TEKNIK DAN SAINS

S1 - Fisika, S1 - Teknik Elektro, S1 - Teknik Fisika, S1 - Teknik Mesin

JL. Sawo Manila No. 61 Pejaten, Pasar Minggu, Jakarta 12520 Telp. (021) 78833307, 7806700 (Hunting) Fax. 7802718, 7802719

P.O. Box 4741 Jakarta 12047 Homepage : <http://www.unas.ac.id>. E-mail : febunas49@gmail.com

KONSULTASI BIMBINGAN

Npm : 197002416040
Nama : FITRIA NURARIFIN
Program Studi : Teknik Elektro
Konsentrasi : Telekomunikasi

KONSULTASI PEMBIMBING PROPOSAL

Tanggal	Materi Konsultasi	Status
6 May, 2025	berikut adalah bab 1-3	Sudah Ditanggapi

KONSULTASI PEMBIMBING TUGAS AKHIR

Tanggal	Materi Konsultasi	Status
20 October, 2025	dear pak rinto dan pak rully, mohon bimbingannya pak, berikut adalah bab 1-3 dari proposal yang telah dibuat. terima kasih	Sudah Ditanggapi
27 October, 2025	dear pak rianto dan pak rully, berikut adalah revisi proposal saya. pada percobaan array 1x1 tanpa menggunakan dgs, bandwidth yang di dapat 20 mhz dan gain 4,6. apabila saya merubah array apakah boleh? mohon bimbingannya. terima kasih,	Sudah Ditanggapi
20 November, 2025	dear pak rianto dan pak rully, mohon izin, jika saya izin mengganti array yang sebelum nya 4x4 menjadi 2x1 boleh di lanjutkan?	Sudah Ditanggapi

Tanggal	Materi Konsultasi	Status
22 November, 2025	dear pak rianto dan pa rully, berikut file skripsi saya.	Sudah Ditanggapi
8 December, 2025	dear pak rianto dan pak rully, mohon izin berikut update ta saya	Sudah Ditanggapi
11 February, 2026	dear pak rianto dan pak rully, pada pengujian vswr terdapat hasil yang lebih baik dari hasil simulasi. apakah tidak apa jika di jalan kan?	Sudah Ditanggapi
11 February, 2026	dear pak rianto dan pak rully, dalam hasil pengujian dan simulasi pola radiasi mendapatkan hasil directional	Sudah Ditanggapi
16 February, 2026	dear pak rianto dan pak rully, pada hasil simulasi dan pengujian mendapatkan nilai yang berbeda, khusus nya pada pengujian mendapatkan nilai lebih baik dari ssimulasi	Sudah Ditanggapi
16 February, 2026	selamat malam pak rianto dan pak rully, mengenai hassil dari pola radiasi tersebut merupakan pada sudut 90 derajat, ssehingga mendapatkan hasil 140 derajat dan pola radias nya directional.	Sudah Ditanggapi
23 February, 2026	dear pak rianto dan pak rully. berikut adalah skripsi saya. mohon di revisi apabila ada yang kurang. terima kasih	Sudah Ditanggapi
7 March, 2026	terlampir update skripsi saya.	Sudah Ditanggapi

rully rully bab 1 (3).pdf

 Universitas Nasional

Document Details

Submission ID

trn:oid::3618:129781233

Submission Date

Mar 3, 2026, 10:04 PM GMT+7

Download Date

Mar 3, 2026, 10:09 PM GMT+7

File Name

bab 1 (3).pdf

File Size

3.2 MB



79 Pages

16,618 Words

101,600 Characters

19% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

Filtered from the Report

- Bibliography
- Small Matches (less than 10 words)
- Abstract

Top Sources

- 13%  Internet sources
- 2%  Publications
- 17%  Submitted works (Student Papers)

Integrity Flags

0 Integrity Flags for Review

No suspicious text manipulations found.



Our system's algorithms look deeply at a document for any inconsistencies that would set it apart from a normal submission. If we notice something strange, we flag it for you to review.

A Flag is not necessarily an indicator of a problem. However, we'd recommend you focus your attention there for further review.