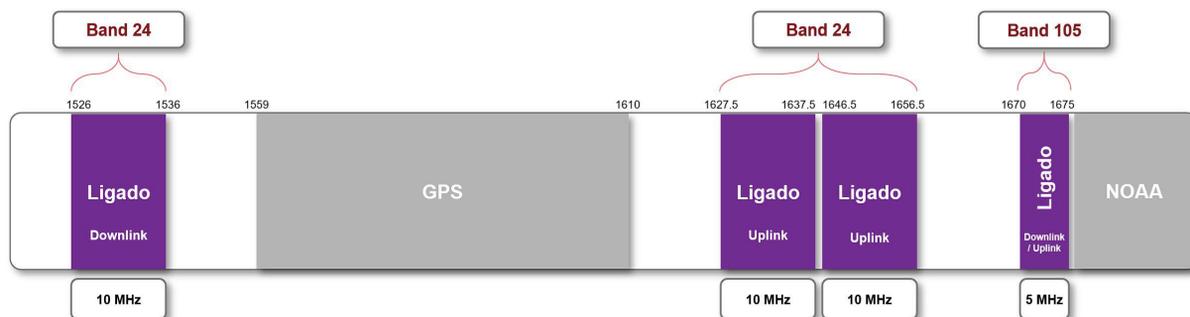




Wireless Spectrum Licenses in the 1.6 GHz Band Ideal for Private 4G and 5G Networks Utility and Critical Infrastructure Applications Up to 35 MHz of Broadband Capacity Available Nationwide

On behalf of Ligado Networks (Ligado), Select Spectrum offers 35 MHz of FCC licensed broadband spectrum in the 1.6 GHz band. These prime mid-band frequencies are available on a nationwide basis for lease via Select Spectrum. **The 1.6 GHz band is ideal for companies in the Utility and Critical Infrastructure Industry (UCII) sector for a range of applications that can benefit from next-generation 5G technology capabilities.** Ligado's spectrum is available for localized leasing to match UCII organization operator areas and requirements.

The 1.6 GHz offering consists of spectrum in two bands: Band 24 and Band 105. **Band 24** consists of a total 30 MHz of capacity (10 MHz downlink / 20 MHz uplink), including 1526-1536 MHz / 1627.5-1637.5 MHz / 1646.5-1656.5 MHz. **Band 105** consists of 5 MHz of contiguous licensed capacity from 1670-1675 MHz. The 1.6 GHz band is shown highlighted below:



Spectrum in the 1.6 GHz band offers the ideal combination of capacity and coverage characteristics that deliver cost-effective and superior performance for 4G and 5G service deployments, creating the opportunity to decrease OPEX without sacrificing bandwidth due to enhanced propagation. **Ligado's terrestrial spectrum in the 1.6 GHz band is the only option available to UCII entities that provides unique benefits including private access (direct lease), 5G compatibility, optimal capacity/propagation via its location in the lower mid-band 1-2 GHz range, ubiquitous geographic coverage, and 5 or 10 MHz wide carriers. These benefits come with no clearing required (greenfield spectrum that is available nationwide for localized leasing now).**

UCII organizations can leverage the 1.6 GHz band for a wide array of power grid modernization projects including Smart City and Internet of Things (IoT) initiatives, operations monitoring and control use cases – all on dedicated, secure licensed spectrum supporting Private 4G and 5G network deployments.

The 1.6 GHz offering will support many key applications for UCII's including Mobile & Fixed Data Services (4G LTE & 5G NR), Field Area Network (FAN), Internet of Things (IoT), Distributed Energy Resources (DER), Advanced Metering Infrastructure (AMI), Electric Vehicle (EV) Charging Stations, Direct Transfer Trip, Supervisory Control and Data Acquisition (SCADA), Distribution Automation (DA), UAV / Drones, Video Monitoring, Volt VAR, VoLTE / Push-to-Talk (PTT), Smart Grid monitoring and control, and more.

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Visit our website at <http://selectspectrum.com> to learn more

Band 105 Overview

Ligado has initiated the process to standardize the 1670-1675 MHz frequencies as Band 105 in 3GPP for 4G/5G and anticipates approval later in 2022.

#	3GPP Work Item	Technology	WID Status
1	Band Introduction WID	LTE	WID Approved at March 2022 Plenary
2	IoT Support	LTE-M/NB-IoT	Planned
3	5G	5G-NR	Future

Band 105 is utilized in Time Division Duplex (TDD) mode. TDD mode provides users with flexibility to apportion the bandwidth between Uplink and Downlink according to their application's requirements.

The band has authorized power of 2000 Watts peak EIRP for base stations and fixed units. Within 30 CMAs (Cellular Market Areas), this authorized power limit is further raised to 4000 Watts/MHz in non-rural and 8000 Watts/MHz in rural areas. The Band 105 channel has authorized power of 4 Watts peak EIRP for mobile stations and fixed device uplink power.

Ligado is working with ecosystem vendors to develop support for Band 105 in their products. Vendors interested in discussing Band 105 opportunities should contact Select Spectrum.

Band 24 Overview

After receiving **unanimous, bipartisan FCC approval** for terrestrial operations, Ligado completed 3GPP standardization of Band 24 spectrum in 2021. 3GPP has designated these frequencies as part of its 4G (b24) and 5G (n24) designations.

#	3GPP Approved Item	Technology
1	Band 24 modifications	LTE
2	Band n24 for 5G NR	5G-NR
3	Band n99 for 5G NR	5G-NR SUL
4	CA & SUL combinations w/ n77, n48, n41	5G-NR, 5G-NR SUL
5	NB-IoT/LTE-M support for Band 24	LTE-M/NB-IoT

As such, Band 24 spectrum supports a range of deployment options and technologies that may be leveraged under the standard. 3GPP standardized spectrum allows for reduced cost equipment through economies of scale, an increased number of devices from a diverse set of suppliers, scalability (to millions of remotes, if desired), interoperability between base stations and devices from a variety of suppliers, and continued support and upgrades.

The Band 24 downlink channel (1526-1536 MHz) is authorized at a power level of 9.8 dBW (10 W) EIRP, while the uplink channels (1627.5-1637.5 MHz / 1646.5-1656.5 MHz) are authorized at a power level of 23 dBm (200 mW) EIRP. Band 24 channels allow for two-way transmissions that may be divided between remote and base frequencies (Frequency Division Duplex) and utilized in fixed or mobile configurations.

For UCII's utilizing the Citizen's Broadband Radio Service (CBRS/Band 48) in the 3.55-3.70 GHz range, 1.6 GHz is well-suited for pairing and can enhance existing private networks through additional capacity, coverage, and redundancy. Band 24 is approved for Carrier Aggregation (CA) and Supplemental Uplink with Band 48. Where CBRS is unavailable, 1.6 GHz licenses are the ideal alternative for UCII's.

[Nokia](#) and [Mavenir](#) are supporting Band 24 frequencies in their 4G LTE and 5G base-station products, with a focus on private networks.

Please contact Select Spectrum to learn more about 1.6 GHz opportunities for your organization.

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