

Millimetre Wave Transmission

What is Millimetre Wave Transmission?

Millimetre Wave Transmission concerns the use of millimetre wave spectrum for radio transmission. Millimetre wave spectrum lies in the 30GHz to 300GHz range (with wavelengths from 10mm to 1mm).

This spectrum is of interest for a number of reasons:

- Lots of spectrum available: There is one order of magnitude of more spectrum available in this band than in lower "traditional microwave bands"
- Very large bandwidth channels are possible, up to 2.5GHz in the E-Band (71 to 86 GHz) and even more, up to 5 GHz, when considering D-Band (130 to 175 GHz) allowing fibre-like capacity
- The very high spectrum permits a much higher "geographical" efficiency thanks to the propagation characteristics and higher directivity of the antennas that grant a very high re-usability of the channels
- Lower spectrum license costs lead to a lower total cost of ownership and lower cost per bit of radio systems using millimetre-wave bands

ETSI Millimetre Waveband Standardization

ETSI has established a millimetre Wave Transmission (mWT) Industry Specification Group (ISG) to provide a platform and opportunity for companies and organizations involved in the microwave and millimetre-wave industry chain to address the challenges involved in using this spectrum.

ETSI ATTM TM4, ETSI BRAN and ETSI ERM have already developed Harmonized Standards in the mm wave range to allow Fixed Radio Link products to be placed on the market in Europe:

- EN 302 217 multipart standard for point-to-point links: This includes fixed links up to 86GHz.
- EN 302 326 multipart standard for multipoint links: It covers frequencies roughly up to 35GHz.

ETSI has developed standards for automotive radar systems in the 77GHz and 79GHz bands. Automatic cruise control 'long-range radar' operates at 77 GHz while anti-collision 'short-range radar' operates at 79 GHz (as well as a temporary frequency of 24GHz) bands.

ETSI Millimetre Wave Transmission ISG

ETSI's mWT Industry Specification Group aims to be a worldwide initiative with global reach and will address the whole industry: national regulators, standards organizations, telecom operators, product vendors and key component vendors.

The mWT ISG aims to facilitate the use of:

- E-band (71 to 76 & 81 to 86 GHz) and
- in the mid-term future the higher frequency bands of W-band (92 to 114 GHz) and D-Band (130 to 175 GHz)
- in the long-term future frequency bands above 175 GHz

for large volume applications in back-hauling and front-hauling to support mobile network implementation, wireless local loop and any other service benefitting from high speed wireless transmission.

During the last few years, ISG MWT had enlarged the scope of work by covering also the traditional microwave bands and networking aspects with particular emphasis to SDN.

High Priority Topics

- Enhance the confidence in the use of millimetre-wave technologies: sharing the amount of information derived by trials and early roll-outs on E-band, W-Band and D-Band regarding propagation impairments and availability calculation methods can improve operators' confidence
- Definitions of key requirements for most important transmission applications: macro backhaul, small cell backhaul, front-haul, etc.
- Identification of most suitable (target) millimetre wave bands for most important transmission applications
- Identification of new KPI for the planning of wireless backhaul in order to fit better both the 5G requirements and the type of traffic transported

For further details on Millimetre Wave Transmission please visit:

www.etsi.org/mwt

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