

Terms of Reference (ToR) for ETSI ISG TeraHertz (ISG THz)

Approved by the Director-General on **15 January 2025**, following ETSI Board#150 consultation

Scope

ETSI ISG THz provides the opportunity for ETSI members to share their pre-standardization efforts on THz technology resulting from various collaborative research projects and being extended with relevant global initiatives, towards paving the way for future standardization of the THz technology.

ETSI ISG THz concentrates on establishing the technical foundation for the development and standardization of THz communications (0.1 - 10 THz).

The scope of the ISG THz can be summarized as follows:

- Define target scenarios;
- Define frequency bands of interest;
- Analyze specific radio propagation aspects for THz communication, such as molecular absorption, effect of micro-mobility, specific considerations for scattering, reflections, and diffractions, and considerations for near-field propagation;
- Analyze data from earlier measurement campaigns published in relevant literature;
- Perform channel measurements for the selected scenarios and frequency bands;
- Develop channel models for the selected scenarios and frequency bands;
- Establish baseline for THz technology fundamentals, including antenna assumptions, simulation assumptions, and deployment strategies
- Provide a report of testing methods and evaluation methods.

Areas of Activity

ETSI ISG THz performs pre-standards work covering the following areas:

- Definition and selection of relevant use cases for THz communications;
- Mapping of selected use cases to relevant channel measurement scenarios;
- Definition of frequency bands of interest;
- Analysis of existing work in the area of THz channel measurements and modeling
- Performing of radio channel measurements and modeling, including:
 - indoor and outdoor environments, with and without mobility,
 - intra/inter device measurements and models,
 - sounding for integrated sensing and communication (ISAC),
 - sounding including reconfigurable intelligent surfaces (RIS),
 - machine learning (ML) methods to generate and analyze radio channels;
- Specification of the evaluation methodology for THz communication systems.

ISG THz prepares systematic output on channel models, system parameters, and evaluation assumptions for the evaluation of THz communication systems.

ISG THz encourages a continual exchange with relevant standardisation groups/bodies (either inside or outside of ETSI) to ensure they are informed and consider the work of ISG THz in their further relevant technology specifications developments.

Outreach and engagement (collaboration with other stakeholders)

ETSI ISG THz activities and deliverables are complementary to existing ETSI work. ETSI ISG THz will establish relationships with other ETSI bodies and the wider industry in order to avoid duplication, maximize synergies and ensure broad industry adoption.

Of particular note are the relationships with the ETSI bodies and external bodies as listed in the following Annex.

Annex (informative): collaboration with other bodies

ISG THz will set up appropriate communication channels to the following groups:

ETSI groups

- EPP 3GPP;
 - TC ERM;
 - ISG mWT;
 - ISG RIS;
 - ISG ISAC
- and others as identified during the progression of the work.

External groups

- Relevant EC Horizon Europe/H2020 projects;
 - COST CA20120 INTERACT ;
 - Relevant IEEE and ACM Initiatives;
 - ITU-R (ITU Radiocommunication Sector);
 - ITU-T (ITU Telecommunication Standardization Sector);
 - IMT-2030 (6G) Promotion Group;
 - Next G Alliance;
 - one6G;
 - 6GIA
- and others as identified during the progression of the work.