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SERIES G: TRANSMISSION SYSTEMS AND MEDIA,
DIGITAL SYSTEMS AND NETWORKS

Access networks – Metallic access networks

Multi-gigabit fast access to subscriber terminals (MGfast) – Power spectral density specification

Recommendation ITU-T G.9710



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Recommendation ITU-T G.9710

Multi-gigabit fast access to subscriber terminals (MGfast) – Power spectral density specification

Summary

Recommendation ITU-T G.9710 specifies power spectral density (PSD) mask requirements for multi-gigabit fast access to subscriber terminals (MGfast), a set of tools to support reduction of the transmit PSD mask, and a methodology for transmit PSD verification. It supports operation over both twisted pair and coaxial cable media.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T G.9710	2020-02-07	15	11.1002/1000/14022

Keywords

PSD, MGfast.

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Recommendation ITU-T G.9710

Multi-gigabit fast access to subscriber terminals (MGfast) – Power spectral density specification

1 Scope

This Recommendation specifies the power spectral density for multi-gigabit fast access to subscriber terminals (MGfast), which supports transmission at an aggregate net data rate (the sum of upstream and downstream rates) up to approximately 10 Gbit/s on metallic wires, including twisted pairs and coaxial cables. The adaptations to these two media are specified in Annexes P and Q respectively. In this edition of the Recommendation, only one peer MTU-R/NT is connected to the MTU at the optical network unit (MTU-O); multiple MTU-R/NTs connecting to a single MTU-O is out of scope of this edition of the Recommendation. MGfast spectral usage complies with the 424 MHz and 848 MHz PSD types, while in this edition of the Recommendation only the 424 MHz power spectral density (PSD) type is specified.

It specifies:

- power spectral density (PSD) limit mask requirements;
- a set of tools to support reduction of the transmit PSD mask; and
- a methodology and termination impedance requirements for transmit PSD verification.

This ensures that the technology can address:

- regional requirements;
- operator deployment requirements, for example, compatibility with other digital subscriber line (DSL) technologies;
- applicable electromagnetic compatibility (EMC) regulations or standards; and
- local EMC issues.

Conformance of equipment with this ITU-T Recommendation may not ensure compliance with specific national or regional regulations on electromagnetic compatibility when installations are taken into service.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [ITU-T G.993.2] Recommendation ITU-T G.993.2 (2019), *Very high speed digital subscriber line transceivers 2 (VDSL2)*.
- [ITU-T G.997.2] Recommendation ITU-T 997.2 (2019), *Physical layer management for G.fast transceivers*.

3 Definitions

3.1 Terms defined elsewhere

None.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 ceiling(x): The smallest integer which is not less than x .

3.2.2 floor(x): The largest integer which is not greater than x .

3.2.3 f_{sc} : A parameter representing the frequency of subcarrier spacing.

3.2.4 subcarrier: A fundamental element of a discrete multitone (DMT) modulator. The modulator partitions the channel bandwidth into a set of parallel subchannels. The centre frequency of each subchannel is a subcarrier onto which bits may be modulated for transmission over a channel.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

DAB	Digital Audio Broadcasting
DMT	Discrete Multitone
EMC	Electromagnetic Compatibility
ESD	Energy Spectral Density
FDS	Full duplex compatible Downstream Sub-frame
FDX	Full Duplex
FM	Frequency Modulation
FUS	Full duplex compatible Upstream Sub-frame
IAR	International Amateur Radio
LESM	Low-frequency Edge Stop-band Mask
LPM	Limit PSD Mask
MGfast	Multi-gigabit Fast Access to Subscriber Terminals
MIB	Management Information Base
MTU	MGfast Transceiver Unit
MTU-O	MTU at the Optical Network Unit
MTU-R	MTU at the Remote Site (i.e., subscriber end of the loop)
NM	Notching Mask
PSD	Power Spectral Density
PSM	PSD Shaping Mask
RFI	Radio Frequency Interference
SM	Subcarrier Mask
TDD	Time-Division Duplexing
TxPSDM	Transmit PSD Mask