Final draft ETSI ES 203 811-2 V1.1.1 (2022-07)

Integrated broadband cable telecommunication networks (CABLE); Sixth generation transmission systems for interactive cable television services - IP cable modem; Part 2: Physical layer; DOCSIS® 4.0 [ANSI/SCTE 262-1 2020]

Reference
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Contents

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Foreword

This final draft ETSI Standard (ES) has been produced by ETSI Technical Committee Integrated broadband cable telecommunication networks (CABLE), and is now submitted for the ETSI standards Membership Approval Procedure.

The present document is part 2 of a multi-part deliverable. Full details of the entire series can be found in part 1 [2].

DOCSIS® is a registered trade mark of Cable Television Laboratories, Inc., and is used in the present document with permission.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document provides the ETSI endorsement of ANSI/SCTE standard ANSI/SCTE 262-1 [1].

ANSI/SCTE 262-1 is part of a series of standards that defines the sixth generation of high-speed data-over-cable systems and is based on a set of specifications commonly referred to as DOCSIS 4.0 specifications. This generation of the DOCSIS specifications builds upon the previous generations of DOCSIS specifications (commonly referred to as the DOCSIS 3.1 and earlier specifications), leveraging the existing Media Access Control (MAC) and Physical (PHY) layers. It includes backward compatibility for the existing PHY layers in order to enable a seamless migration to the new technology. Further, the DOCSIS 4.0 specifications introduce Full Duplex (FDX) DOCSIS PHY layer technology as an expansion of the OFDM PHY layer introduced in the DOCSIS 3.1 PHY specification to increase upstream capacity without significant loss of downstream capacity versus DOCSIS 3.1. The DOCSIS 4.0 specification also builds upon DOCSIS 3.1 OFDM and OFDMA technology with an extended Frequency Division Duplex (FDD) DOCSIS alternative. DOCSIS 4.0 FDD supports legacy high split and also provides extended splits up to 684 MHz in an operational band plan which is referred to as Ultra-High Split (UHS). DOCSIS 4.0 FDD also introduces expansion of usable downstream spectrum up to 1 794 MHz. Both the FDX and FDD DOCSIS 4.0 alternatives are based on OFDM PHY.

There are differences in the cable spectrum planning practices adopted for different networks in the world. For the OFDM PHY layer defined in the present document, there is flexibility to deploy the technology in any spectrum plan; therefore, no special accommodation for different regions of the world is required for this PHY layer.

However, due to the inclusion of the DOCSIS 3.0 PHY layers for backward compatibility purposes, there is still a need for different region-specific physical layer technologies. Therefore, three options for physical layer technologies are included in the present document, which have equal priority and are not required to be interoperable. One technology option is based on the downstream channel identification plan that is deployed in North America using 6 MHz spacing. The second technology option is based on the corresponding European multi-program television distribution. The third technology option is based on the corresponding Chinese multi-program television distribution. All three options have the same status, notwithstanding that the document structure does not reflect this equal priority. The first of these options is defined in clauses 5 and 6 of [i.1], whereas the second is defined by replacing the content of those clauses with the content of Annex C of [i.2]. The third is defined by replacing the content of those clauses with the content of Annex D of [i.2]. Correspondingly, [13] and [i.3] apply only to the first option, and [4] applies to the second and third. Compliance with the present document requires compliance with one of these implementations, but not with all three. It is not required that equipment built to one option interoperates with equipment built to the other.

Compliance with frequency planning and EMC requirements is not covered by the present document and remains the operators' responsibility. In this respect, [10] and [11] are relevant to the USA; [3] and [i.4] to Canada; [i.6], [5], [6], [7], [8] and [9] are relevant to the European Union; [12] and [i.5] are relevant to China.

ANSI/SCTE 262-1 [1] defines the interface for the physical layer, and corresponds to the CableLabs specification CM-SP-PHYv4.0-I02-200429 [i.1].

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference/.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] ANSI/SCTE 262-1 2020: "DOCSIS 4.0 Part 1: Physical Layer Specification".

[2] ETSI ES 203 811-1: "Integrated broadband cable telecommunication networks (CABLE); Sixth generation transmission systems for interactive cable television services - IP cable modem; Part 1: General; DOCSIS® 4.0".

[3] IEC CISPR 22:2008 (2008): "Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement".

NOTE: IEC CISPR 22:2008 has been withdrawn; see also EN 55032 produced by CENELEC and ETSI EN 300 386.

[4] ETSI EN 300 429 (V1.2.1): "Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for cable systems".

[5] EN 60728-11:2017 (2002): "Cabled distribution systems for television, sound and interactive multimedia signals - Part 1: Safety requirements", produced by CENELEC.

[6] EN 50083-2 (2005): "Cable networks for television signals, sound signals and interactive services -- Part 2: Electromagnetic compatibility for equipment".

[7] EN 60728-1:2014: "Cable networks for television signals, sound signals and interactive services -- Part 7: System performance", produced by CENELEC.

[8] EN 61000-6-4 (2001): "Electromagnetic compatibility (EMC) -- Part 6-4: Generic standards - Emission standard for industrial environments", produced by CENELEC.

[9] EN 61000-6-3 (2001): "Electromagnetic compatibility (EMC) -- Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments", produced by CENELEC.

[10] Code of Federal Regulations, Title 47, Part 15 (October 2005).

[11] Code of Federal Regulations, Title 47, Part 76 (October 2005).

[12] Standardization Administration of People's Republic of China (SAC): "Audio, video and similar electronic apparatus-Safety requirements".

NOTE: Available at www.sac.gov.cn.

[13] Recommendation ITU-T J.83 (2007): "Digital multi-program systems for television sound and data services for cable distribution", Annex B.

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] Cable Television Laboratories, Inc.: "DOCSIS 4.0 Physical Layer Specification", CM-SP-PHYv4.0-I02-200429.

[i.2] Cable Television Laboratories, Inc.: "DOCSIS 3.1 Physical Layer Specification", CM-SP-PHYv3.1-I17-190917.

[i.3] CTA-542-D (2013): "Consumer Technology Association Standard: Cable Television Channel Identification Plan".

[i.4] Information Technology Equipment (ITE): "Limits and methods of measurement".

[i.5] Standardization Administration of People's Republic of China (SAC): "Equipments and components used in cabled distribution systems primarily intended for television and sound signals--Part 1: Generic specifications".

NOTE: Available at www.sac.gov.cn.

[i.6] ETSI EG 201 212 (V1.2.1): "Electrical safety; Classification of interfaces for equipment to be connected to telecommunication networks".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ANSI/SCTE 262-1 [1] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in ANSI/SCTE 262-1 [1] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ANSI/SCTE 262-1 [1] apply.

Endorsement notice

All elements of ANSI/SCTE 262-1 [1] shall apply without modifications.

History

Document history			
V1.1.1	July 2022	Membership Approval Procedure	MV 20220923: 2022-07-25 to 2022-09-23