

ETSI TS 102 721-5 V1.2.1 (2013-08)



Satellite Earth Stations and Systems (SES); Air Interface for S-band Mobile Interactive Multimedia (S-MIM); Part 5: Protocol Specifications, Link Layer

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Reference

RTS/SES-00337

Keywords

MSS, satellite

ETSI

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Satellite Earth Stations and Systems (SES).

The present document is part 5 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.10].

Introduction

The S-MIM system specified herein is designed to provide:

- Interactive mobile broadcast services.
- Messaging services for handhelds and vehicular terminals, capable of serving millions of terminals due to a novel optimized air-interface in the RTN link.
- Real-time emergency services such as voice and file transfer, mainly addressing institutional users on-the-move such as fire brigades, civil protection, etc.

Inside the S-band, the 2 GHz MSS band is of particular interest for interactive multimedia, since it allows two-way transmission. Typically, the DVB-SH standard [i.9] is applied for broadcast transmission; ETSI SDR [i.5] or DVB-NGH [i.15] standards are other alternatives. Essential requirements under the R&TTE directive are covered by the harmonized standard EN 302 574 [i.6], [i.7] and [i.8].

The technology applied has been developed in the framework of the ESA funded project "DENISE" (ESTEC/Contract Number 22439/09/NL/US).

1 Scope

The present document specifies the S-MIM (S-band Mobile Interactive Multimedia) system in which a standardized S-band satellite mobile broadcast system is complemented by the addition of a return channel.

The present document is part 5 of a multi-part deliverable and concerns aspects of the air interface for the S-band Mobile Interactive Multimedia (S-MIM) system, and in particular it specifies the Link Layer protocols.

The other parts are listed in the foreword of part 1 [i.10].

2 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 <http://docbox.etsi.org/Reference>.

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2.1 Normative references

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

- [1] ETSI EN 301 192: "Digital Video Broadcasting (DVB); DVB specification for data broadcasting".
- [2] ETSI TS 102 721-3: "Satellite Earth Stations and Systems (SES); Air Interface for S-band Mobile Interactive Multimedia (S-MIM); Part 3: Physical Layer Specification, Return Link Asynchronous Access".
- [3] ETSI TS 102 721-4: "Satellite Earth Stations and Systems (SES); Air Interface for S-band Mobile Interactive Multimedia (S-MIM); Part 4: Physical Layer Specification, Return Link Synchronous Access".
- [4] ETSI TS 102 721-6: "Satellite Earth Stations and Systems (SES); Air Interface for S-band Mobile Interactive Multimedia (S-MIM); Part 6: Protocol Specifications, System Signalling".
- [5] ETSI TS 133 102 (V10.0.0): "Universal Mobile Telecommunications System (UMTS); LTE; 3G security; Security architecture (3GPP TS 33.102 version 10.0.0 Release 10)".
- [6] ETSI TS 133 105 (V10.0.0): "Universal Mobile Telecommunications System (UMTS); LTE; Cryptographic algorithm requirements (3GPP TS 33.105 version 10.0.0 Release 10)".
- [7] IETF RFC 2406: "IP Encapsulating Security Payload (ESP)".
- [8] IETF RFC 2464: "Transmission of IPv6 Packets over Ethernet Networks".
- [9] IETF RFC 3409: "Lower Layer Guidelines for Robust RTP/UDP/IP Header Compression".
- [10] IETF RFC 4306: "Internet Key Exchange (IKEv2) Protocol".
- [11] IETF RFC 4815: "RObust Header Compression (ROHC): Corrections and Clarifications to RFC 3095".
- [12] IEEE Std 802-2001 "IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture".
- [13] IETF Internet Draft 6LowPAN-hc-15: "Compression Format for IPv6 Datagrams in Low Power and Lossy Networks (6LowPAN)".

- [14] ETSI TS 102 606: "Digital Video Broadcasting (DVB); Generic Stream Encapsulation (GSE) Protocol".
- [15] ETSI TS 103 179: "Satellite Earth Stations and Systems (SES); Return Link Encapsulation Protocol (RLE)".

2.2 Informative references

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] ETSI TS 102 611-1: "Digital Video Broadcasting (DVB); IP Datacast: Implementation Guidelines for Mobility; Part 1: IP Datacast over DVB-H".
- [i.2] ETSI TS 102 611-2: "Digital Video Broadcasting (DVB); IP Datacast: Implementation Guidelines for Mobility; Part 2: IP Datacast over DVB-SH".
- [i.3] ETSI TS 102 470-1: "Digital Video Broadcasting (DVB); IP Datacast: Program Specific Information (PSI)/Service Information (SI); Part 1: IP Datacast over DVB-H".
- [i.4] IANA: "Robust Header Compression (ROHC) Profile identifiers".

NOTE: Available at <http://www.iana.org/assignments/rohc-pro-ids/>.

- [i.5] ETSI EN 302 550 (all parts and sub-parts): "Satellite Earth Stations and Systems (SES); Satellite Digital Radio (SDR) Systems".
- [i.6] ETSI EN 302 574-1: "Satellite Earth Stations and Systems (SES); Harmonized standard for satellite earth stations for MSS operating in the 1 980 MHz to 2 010 MHz (earth-to-space) and 2 170 MHz to 2 200 MHz (space-to-earth) frequency bands; Part 1: Complementary Ground Component (CGC) for wideband systems: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".
- [i.7] ETSI EN 302 574-2: "Satellite Earth Stations and Systems (SES); Harmonized standard for satellite earth stations for MSS operating in the 1 980 MHz to 2 010 MHz (earth-to-space) and 2 170 MHz to 2 200 MHz (space-to-earth) frequency bands; Part 2: User Equipment (UE) for wideband systems: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".
- [i.8] ETSI EN 302 574-3: "Satellite Earth Stations and Systems (SES); Harmonized standard for satellite earth stations for MSS operating in the 1 980 MHz to 2 010 MHz (earth-to-space) and 2 170 MHz to 2 200 MHz (space-to-earth) frequency bands; Part 3: User Equipment (UE) for narrowband systems: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".
- [i.9] ETSI TS 102 585: "Digital Video Broadcasting (DVB); System Specifications for Satellite services to Handheld devices (SH) below 3 GHz".
- [i.10] ETSI TS 102 721-1: "Satellite Earth Stations and Systems (SES); Air Interface for S-band Mobile Interactive Multimedia (S-MIM); Part 1: General System Architecture and Configurations".
- [i.11] IETF RFC 4193: "Unique Local IPv6 Unicast Addresses".
- [i.12] IETF RFC 2462: "IPv6 Stateless Address Autoconfiguration".
- [i.13] IETF RFC 3095: "RObust Header Compression (ROHC): Framework and four profiles: RTP, UDP, ESP, and uncompressed".
- [i.14] IETF RFC 6282: "Compression Format for IPv6 Datagrams over IEEE 802.15.4-Based Networks".
- [i.15] DVB BlueBook A160: "Next Generation broadcasting system to Handheld, physical layer specification (DVB-NGH)".