

ETSI TS 124 281 V16.12.0 (2026-03)



TECHNICAL SPECIFICATION

**LTE;
Mission Critical Video (MCVideo) signalling control;
Protocol specification
(3GPP TS 24.281 version 16.12.0 Release 16)**

get full document from standards.iteh.ai



Reference

RTS/TSGC-0124281vgc0

Keywords

LTE

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from the
[ETSI Search & Browse Standards](#) application.

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format on [ETSI deliver](#) repository.

Users should be aware that the present document may be revised or have its status changed, this information is available in the [Milestones listing](#).

If you find errors in the present document, please send your comments to the relevant service listed under [Committee Support Staff](#).

If you find a security vulnerability in the present document, please report it through our [Coordinated Vulnerability Disclosure \(CVD\)](#) program.

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2026.
All rights reserved.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the [ETSI IPR online database](#).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™**, **LTE™** and **5G™** logo are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Legal Notice

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found at [3GPP to ETSI numbering cross-referencing](#).

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.

Contents

Intellectual Property Rights	2
Legal Notice	2
Modal verbs terminology.....	2
Foreword.....	18
1 Scope	19
2 References	19
3 Definitions, symbols and abbreviations	22
3.1 Definitions	22
3.2 Symbols.....	24
3.3 Abbreviations	24
4 General	25
4.1 MCVideo overview	25
4.2 URI and address assignments.....	26
4.3 MCVideo media	26
4.4 Warning header field	26
4.4.1 General.....	26
4.4.2 Warning texts.....	26
4.5 MCVideo session identity	31
4.6 MCVideo priority calls and alerts	31
4.6.1 MCVideo emergency group calls	31
4.6.2 MCVideo emergency private calls.....	32
4.6.3 MCVideo emergency alerts	34
4.6.4 MCVideo imminent peril group call.....	35
4.7 Communication security.....	36
4.7.1 Media security	36
4.7.2 Signalling security	36
4.8 Protection of sensitive application data	37
4.9 MCVideo client ID.....	37
4.10 Off-network MCVideo	38
5 Functional entities	38
5.1 General	38
5.2 MCVideo client.....	38
5.3 MCVideo server	39
5.3.1 General.....	39
5.3.2 Functional connectivity models	40
5.3.3 Failure case	41
5.4 MCVideo UE-to-network relay.....	41
6 Common procedures.....	41
6.1 Introduction	41
6.2 MCVideo client procedures.....	42
6.2.0 Distinction of requests at the MCVideo client.....	42
6.2.0.1 SIP MESSAGE request.....	42
6.2.1 SDP offer generation	42
6.2.2 SDP answer generation.....	43
6.2.3 Commencement modes.....	44
6.2.3.1 Automatic commencement mode.....	44
6.2.3.1.1 Automatic commencement mode for private calls	44
6.2.3.1.2 Automatic commencement mode for group calls	45
6.2.3.2 Manual commencement mode	45
6.2.3.2.1 Manual commencement mode for private calls	45
6.2.3.2.2 Manual commencement mode for group calls.....	45
6.2.4 Leaving an MCVideo session initiated by MCVideo client	46

6.2.4.1	On-demand session case	46
6.2.5	Releasing an MCVideo session initiated by MCVideo client.....	46
6.2.5.1	On-demand session case	46
6.2.5.2	Pre-established session case	46
6.2.6	Receiving an MCVideo session release request.....	47
6.2.7	Void	47
6.2.8	Priority call conditions.....	47
6.2.8.0	General	47
6.2.8.1	MCVideo emergency group call conditions.....	47
6.2.8.1.1	SIP INVITE request for originating MCVideo emergency group calls.....	47
6.2.8.1.2	Resource-Priority header field for MCVideo emergency group calls	48
6.2.8.1.3	SIP re-INVITE request for cancelling MCVideo in-progress emergency group state.....	48
6.2.8.1.4	Receiving a SIP 2xx response to a SIP request for a priority call	49
6.2.8.1.5	Receiving a SIP 4xx response, SIP 5xx response or SIP 6xx response to a SIP request for a priority group call	50
6.2.8.1.6	Determining authorisation for initiating or cancelling an MCVideo emergency alert.....	50
6.2.8.1.7	Determining authorisation for cancelling the in-progress emergency state of an MCVideo group.....	51
6.2.8.1.8	Determining authorisation for originating a priority group call	51
6.2.8.1.9	SIP request for originating MCVideo imminent peril group calls.....	52
6.2.8.1.10	Determining authorisation for cancelling an imminent peril group call	52
6.2.8.1.11	SIP re-INVITE request for cancelling MCVideo in-progress imminent peril group state	52
6.2.8.1.12	Resource-Priority header field for MCVideo imminent peril group calls	53
6.2.8.1.13	Receiving a SIP INFO request in the dialog of a SIP request for a priority group call	53
6.2.8.1.14	SIP re-INVITE request for cancelling the in-progress emergency group state of a group by a third-party	54
6.2.8.1.15	Retrieving Resource-Priority header field values	54
6.2.8.1.16	Resource-priority header field namespaces for MCVideo.....	55
6.2.8.1.17	Priority group call conditions upon receiving call release	55
6.2.8.1.18	Emergency private call conditions upon receiving call release	55
6.2.8.2	Request for an originating broadcast group call.....	56
6.2.8.3	MCVideo emergency private call conditions	56
6.2.8.3.1	Authorisations	56
6.2.8.3.2	SIP request for originating MCVideo emergency private calls	57
6.2.8.3.3	Resource-Priority header field for MCVideo emergency private calls.....	57
6.2.8.3.4	Receiving a SIP 2xx response to a SIP request for an MCVideo emergency private call	58
6.2.8.3.5	Receiving a SIP 4xx response, SIP 5xx response or SIP 6xx response to a SIP request for an MCVideo emergency private call.....	58
6.2.8.3.6	SIP re-INVITE request for cancelling MCVideo emergency private call state.....	58
6.2.8.3.7	Receiving a SIP INFO request in the dialog of a SIP request for a priority private call.....	59
6.2.8.3.8	SIP re-INVITE request for cancelling the MCVideo emergency private call state by a third- party	60
6.2.8.3.9	Retrieving a KMS URI associated with an MCVideo ID.....	60
6.2.9	Location information	61
6.2.9.1	Location information for location reporting.....	61
6.3	MCVideo server procedures.....	61
6.3.1	Distinction of requests sent to the MCVideo server	61
6.3.1.1	SIP INVITE request	61
6.3.1.2	SIP MESSAGE request.....	62
6.3.1.3	SIP SUBSCRIBE request.....	63
6.3.2	Participating MCVideo Function	64
6.3.2.1	Requests initiated by the served MCVideo user.....	64
6.3.2.1.1	SDP offer generation	64
6.3.2.1.2	SDP answer generation.....	64
6.3.2.1.3	Sending an INVITE request on receipt of an INVITE request	65
6.3.2.1.4	Response to an INVITE request	65
6.3.2.1.5	Sending a SIP BYE request on receipt of a SIP BYE request	66
6.3.2.1.6	Priority call conditions	66
6.3.2.1.7	Generating a SIP re-INVITE request on receipt of a SIP re-INVITE request	68
6.3.2.1.8	Sending a SIP INVITE request on receipt of SIP 3xx response	68
6.3.2.2	Requests terminated to the served MCVideo user	69
6.3.2.2.1	SDP offer generation	69

6.3.2.2.2	SDP answer generation.....	69
6.3.2.2.3	SIP INVITE request towards the terminating MCVideo client	69
6.3.2.2.4	Response to a SIP INVITE request	70
6.3.2.2.5	Automatic Commencement Mode.....	71
6.3.2.2.6	Manual Commencement Mode	73
6.3.2.2.7	Void.....	74
6.3.2.2.8	SIP BYE request towards the terminating MCVideo client	74
6.3.2.2.9	Populate MIME bodies.....	75
6.3.2.2.10	Generating a SIP re-INVITE request towards the terminating MCVideo client	75
6.3.2.2.11	Generating a SIP MESSAGE request towards the terminating MCVideo client	75
6.3.2.3	Processing I_MESSAGES containing MKFC and MKFC-ID	76
6.3.2.3.1	General	76
6.3.2.3.2	Processing an I_MESSAGE containing MKFC and MKFC-ID.....	76
6.3.3	Controlling MCVideo function.....	76
6.3.3.1	Request initiated by the controlling MCVideo function	76
6.3.3.1.1	SDP offer generation	76
6.3.3.1.2	Sending an INVITE request	77
6.3.3.1.3	Receipt of a SIP response to a SIP INVITE request.....	78
6.3.3.1.4	Sending a SIP BYE request.....	78
6.3.3.1.5	Sending a SIP re-INVITE request for MCVideo emergency group call	78
6.3.3.1.6	Sending a SIP INVITE request for MCVideo emergency group call.....	79
6.3.3.1.7	Sending a SIP UPDATE request for Resource-Priority header field correction.....	80
6.3.3.1.8	Generating a SIP re-INVITE request.....	81
6.3.3.1.9	Generating a SIP re-INVITE request to cancel an in-progress emergency	81
6.3.3.1.10	Generating a SIP MESSAGE request for notification of in-progress emergency or imminent peril status change	81
6.3.3.1.11	Populate mcvideo-info and location-info MIME bodies for emergency alert	82
6.3.3.1.12	Authorisations	83
6.3.3.1.13	Generating a SIP 403 response for priority call request rejection	86
6.3.3.1.14	Sending a SIP re-INVITE request for MCVideo imminent peril group call	86
6.3.3.1.15	Handling the expiry of timer TNG2 (in-progress emergency group call timer)	87
6.3.3.1.16	Validate priority request parameters.....	87
6.3.3.1.17	Sending a SIP INFO request in the dialog of a SIP request for a priority call.....	88
6.3.3.1.18	Retrieving Resource-Priority header field values.....	88
6.3.3.1.19	Generating a SIP MESSAGE request to indicate successful receipt of an emergency alert or emergency cancellation	89
6.3.3.2	Requests terminated by the controlling MCVideo function.....	89
6.3.3.2.1	SDP answer generation.....	89
6.3.3.2.2	Receipt of a SIP INVITE request	89
6.3.3.2.3	Sending a SIP response to a SIP INVITE request	90
6.3.3.2.4	Receiving a SIP BYE request.....	91
6.3.3.3	Handling of the acknowledged call setup timer (TNG1)	91
6.3.3.4	Generating a SIP NOTIFY request	93
6.3.3.5	Handling of the group call timer (TNG3)	94
6.3.3.5.1	General	94
6.3.3.5.2	Interaction with the in-progress emergency group call timer (TNG2)	95
6.3.3.6	Generation of I_MESSAGES containing MKFC and MKFC-ID.....	95
6.3.3.6.1	General	95
6.3.3.6.2	Creation of an I_MESSAGE containing MKFC	95
6.3.4	Non-controlling MCVideo function of an MCVideo group	96
6.3.4.1	Request initiated by the non-controlling MCVideo function of an MCVideo group	96
6.3.4.1.1	SDP offer generation	96
6.3.4.1.2	Sending an INVITE request towards the MCVideo client	96
6.3.4.1.3	Sending a SIP INFO request.....	97
6.3.4.1.4	Sending an INVITE request towards the controlling MCVideo function.....	98
6.3.4.2	Requests terminated by the non-controlling MCVideo function of an MCVideo group	99
6.3.4.2.1	SDP answer generation.....	99
6.3.4.2.2	Sending a SIP response to the SIP INVITE request	99
6.3.4.3	Generating a SIP NOTIFY request	100
6.3.5	Retrieving and processing a group document	101
6.3.5.1	General.....	101
6.3.5.2	Rules for retrieving Group Document(s).....	101

6.3.5.3	Rules for joining a group session	104
6.3.5.4	Rules for initiating a prearranged group session	105
6.3.5.5	Determining the group members to invite	105
6.3.6	Affiliation check	106
6.3.7	Error handling	106
6.3.7.1	Public service identity does not exist	106
6.3.8	Session release policy	106
6.3.8.1	Session release policy for group call	106
6.3.8.2	Session release policy for private call	107
6.4	Implicit transmit media request	107
6.5	Handling of MIME bodies in a SIP message	107
6.6	Confidentiality and Integrity Protection	108
6.6.1	General	108
6.6.1.1	Applicability and exclusions	108
6.6.1.2	Performing XML content encryption	108
6.6.1.3	Performing integrity protection on an XML body	108
6.6.1.4	Verifying integrity of an XML body and decrypting XML elements	108
6.6.2	Confidentiality Protection	109
6.6.2.1	General	109
6.6.2.2	Keys used in confidentiality protection procedures	109
6.6.2.3	Procedures for sending confidentiality protected content	109
6.6.2.3.1	MCVideo client	109
6.6.2.3.2	MCVideo server	110
6.6.2.3.3	Content Encryption in XML elements	110
6.6.2.3.4	Attribute URI Encryption	110
6.6.2.4	Procedures for receiving confidentiality protected content	111
6.6.2.4.1	Determination of confidentiality protected content	111
6.6.2.4.2	Decrypting confidentiality protected content in XML elements	111
6.6.2.4.3	Decrypting confidentiality protected URIs in XML attributes	111
6.6.2.5	MCVideo server copying received XML content	112
6.6.3	Integrity Protection of XML documents	112
6.6.3.1	General	112
6.6.3.2	Keys used in integrity protection procedures	114
6.6.3.3	Sending integrity protected content	114
6.6.3.3.1	MCVideo client	114
6.6.3.3.2	MCVideo server	114
6.6.3.3.3	Integrity protection procedure	115
6.6.3.4	Receiving integrity protected content	115
6.6.3.4.1	Determination of integrity protected content	115
6.6.3.4.2	Verification of integrity protected content	115
6.7	Priority sharing	116
6.8	Support for multiple devices	116
7	Registration and service authorisation	116
7.1	General	116
7.2	MCVideo client procedures	116
7.2.1	SIP REGISTER request for service authorisation	116
7.2.1AA	SIP REGISTER request without service authorisation	118
7.2.1A	Common SIP PUBLISH procedure	118
7.2.2	SIP PUBLISH request for service authorisation and MCVideo service settings	118
7.2.3	Sending SIP PUBLISH for MCVideo service settings only	119
7.2.4	Determination of MCVideo service settings	120
7.2.5	Receiving a CSK key download message	121
7.3	MCVideo server procedures	122
7.3.1	General	122
7.3.1A	Confidentiality and Integrity Protection	122
7.3.2	SIP REGISTER request for service authorisation	123
7.3.3	SIP PUBLISH request for service authorisation and service settings	124
7.3.4	Receiving SIP PUBLISH request for MCVideo service settings only	126
7.3.5	Receiving SIP PUBLISH request with "Expires=0"	127
7.3.6	Subscription to and notification of MCVideo service settings	127
7.3.6.1	Receiving subscription to MCVideo service settings	127

7.3.6.2	Sending notification of change of MCVideo service settings	127
7.3.7	Sending a CSK key download message	128
7.4	Coding	128
7.4.1	Extension of MIME types	128
7.4.1.1	General	128
7.4.1.2	Extension of application/poc-settings+xml MIME type	128
7.4.1.2.1	Introduction	128
7.4.1.2.2	Syntax	128
8	Affiliation	130
8.1	General	130
8.2	Procedures	130
8.2.1	MCVideo client procedures	130
8.2.1.1	General	130
8.2.1.2	Affiliation status change procedure.....	131
8.2.1.3	Affiliation status determination procedure.....	131
8.2.1.4	Procedure for sending affiliation status change request in negotiated mode to target MCVideo user	132
8.2.1.5	Procedure for receiving affiliation status change request in negotiated mode from authorized MCVideo user	133
8.2.1.6	Subscription to group dynamic data.....	133
8.2.2	MCVideo server procedures	134
8.2.2.1	General	134
8.2.2.2	Procedures of MCVideo server serving the MCVideo user	134
8.2.2.2.1	General	134
8.2.2.2.2	Stored information.....	135
8.2.2.2.3	Receiving affiliation status change from MCVideo client procedure.....	135
8.2.2.2.4	Receiving subscription to affiliation status procedure.....	138
8.2.2.2.5	Sending notification of change of affiliation status procedure	139
8.2.2.2.6	Sending affiliation status change towards MCVideo server owning MCVideo group procedure.....	140
8.2.2.2.7	Affiliation status determination from MCVideo server owning MCVideo group procedure.....	141
8.2.2.2.8	Procedure for authorizing affiliation status change request in negotiated mode sent to served MCVideo user	143
8.2.2.2.9	Forwarding affiliation status change towards another MCVideo user procedure.....	144
8.2.2.2.10	Forwarding subscription to affiliation status towards another MCVideo user procedure	145
8.2.2.2.11	Affiliation status determination	145
8.2.2.2.12	Affiliation status change by implicit affiliation	146
8.2.2.2.13	Implicit affiliation status change completion.....	147
8.2.2.2.14	Implicit affiliation status change cancellation	148
8.2.2.2.15	Implicit affiliation to configured groups procedure.....	148
8.2.2.2.16	Forwarding subscription to group dynamic data towards the controlling MCVideo server procedure	149
8.2.2.3	Procedures of MCVideo server owning the MCVideo group	150
8.2.2.3.1	General	150
8.2.2.3.2	Stored information.....	151
8.2.2.3.3	Receiving group affiliation status change procedure.....	151
8.2.2.3.4	Receiving subscription to affiliation status procedure.....	153
8.2.2.3.5	Sending notification of change of affiliation status procedure	153
8.2.2.3.6	Implicit affiliation eligibility check procedure	154
8.2.2.3.7	Affiliation status change by implicit affiliation procedure	154
8.2.2.3.8	Affiliation eligibility check procedure.....	155
8.2.2.3.9	Receiving subscription to group dynamic data procedure.....	155
8.2.2.3.10	Sending notification of change of group dynamic data procedure	156
8.3	Coding	156
8.3.1	Extension of application/pidf+xml MIME type.....	156
8.3.1.1	Introduction	156
8.3.1.2	Syntax	157
8.3.2	Extension of application/simple-filter+xml MIME type.....	159
8.3.2.1	Introduction	159
8.3.2.2	Syntax	159

9	Group call.....	161
9.1	General.....	161
9.2	On-network group call.....	162
9.2.1	Prearranged group call.....	162
9.2.1.1	General.....	162
9.2.1.2	MCVideo client procedures.....	162
9.2.1.2.1	On-demand prearranged group call.....	162
9.2.1.2.3	End group call.....	169
9.2.1.2.4	Re-join procedure.....	170
9.2.1.3	Participating MCVideo function procedures.....	170
9.2.1.3.1	Originating procedures.....	170
9.2.1.3.2	Terminating Procedures.....	173
9.2.1.3.3	End group call at the originating participating MCVideo function.....	174
9.2.1.3.4	End group call at the terminating participating MCVideo function.....	174
9.2.1.3.5	Re-join procedures.....	175
9.2.1.3.6	Reception of a SIP re-INVITE request for terminating MCVideo client for priority call.....	175
9.2.1.4	Controlling MCVideo function procedures.....	175
9.2.1.4.1	Originating Procedures.....	175
9.2.1.4.2	Terminating Procedures.....	178
9.2.1.4.3	End group call at the terminating controlling MCVideo function.....	186
9.2.1.4.4	End group call initiated by the controlling MCVideo function.....	186
9.2.1.4.5	Re-join procedures.....	187
9.2.1.4.6	Late call entry initiated by controlling MCVideo function.....	188
9.2.1.4.7	Receipt of a SIP re-INVITE request.....	188
9.2.1.4.8	Handling of a SIP re-INVITE request for imminent peril session.....	191
9.2.1.5	Non-controlling function of an MCVideo group procedures.....	193
9.2.1.5.1	Originating procedures.....	193
9.2.1.5.2	Terminating procedures.....	194
9.2.1.5.3	Rejoin procedures.....	197
9.2.1.5.4	SIP OPTIONS request authorization procedure.....	197
9.2.1.5.5	Initiating a temporary group session.....	198
9.2.2	Chat group (restricted) call.....	200
9.2.2.1	General.....	200
9.2.2.2	MCVideo client procedures.....	200
9.2.2.2.1	On-demand chat group call.....	200
9.2.2.2.2	End group call.....	207
9.2.2.3	Participating MCVideo function procedures.....	207
9.2.2.3.1	On-demand chat group call.....	207
9.2.2.4	Controlling MCVideo function procedures.....	212
9.2.2.4.1	On-demand chat group call.....	212
9.2.2.4.2	End group call at the terminating controlling MCVideo function.....	222
9.2.2.4.3	End group call initiated by the controlling MCVideo function.....	222
9.2.2.5	Non-controlling function of an MCVideo group procedures.....	223
9.2.2.5.1	Terminating procedures.....	223
9.2.3	Subscription to the conference event package.....	226
9.2.3.1	General.....	226
9.2.3.2	MCVideo client.....	227
9.2.3.3	Participating MCVideo function.....	228
9.2.3.4	Controlling MCVideo function.....	229
9.2.3.4.1	Receiving a subscription to the conference event package.....	229
9.2.3.4.2	Sending notifications to the conference event package.....	229
9.2.3.4.3	Sending subscriptions to the conference event package.....	230
9.2.3.4.4	Terminating a subscription.....	231
9.2.4	Remote change of an MCVideo user's selected group.....	231
9.2.4.1	General.....	231
9.2.4.2	Client procedures.....	231
9.2.4.2.1	Remote selected group change initiation.....	231
9.2.4.2.2	Target client procedures for handling remote selected group change request.....	232
9.2.4.3	Participating MCVideo function procedures.....	233
9.2.4.3.1	Originating procedures.....	233
9.2.4.3.2	Terminating procedures.....	234
9.2.4.4	Controlling MCVideo function procedures.....	235

9.3	Off-network group call	236
9.3.1	General	236
9.3.1.1	Common Procedures	236
9.3.1.1.1	MONP MCVideo message transport	236
9.3.1.1.2	Session description	237
9.3.2	Basic call control	237
9.3.2.1	General	237
9.3.2.2	Basic call control state machine	238
9.3.2.3	Call Control states	239
9.3.2.3.1	S1: start-stop	239
9.3.2.3.2	S2: waiting for call announcement	239
9.3.2.3.3	S3: part of ongoing call	239
9.3.2.3.4	S4: pending user action without confirm indication	239
9.3.2.3.5	S5: pending user action with confirm indication	239
9.3.2.3.6	S6: ignoring incoming call announcements	239
9.3.2.3.7	S7: waiting for call announcement after call release	239
9.3.2.4	Procedures	239
9.3.2.4.1	General	239
9.3.2.4.2	Call Probe	240
9.3.2.4.3	Call setup	241
9.3.2.4.4	Periodic group call announcement	244
9.3.2.4.5	Call release	245
9.3.2.4.6	Merge of calls	248
9.3.2.4.7	Error handling	249
9.3.3	Call type control	249
9.3.3.1	General	249
9.3.3.2	Call type control state machine	249
9.3.3.3	Call type control states	250
9.3.3.3.1	T0: waiting for call to establish	250
9.3.3.3.2	T1: in-progress emergency group call	251
9.3.3.3.3	T2: in-progress basic group call	251
9.3.3.3.4	T3: in-progress imminent peril group call	251
9.3.3.4	Procedures	251
9.3.3.4.1	General	251
9.3.3.4.2	User initiated the call probe	251
9.3.3.4.3	Received GROUP CALL ANNOUNCEMENT message as a response to GROUP CALL PROBE message	252
9.3.3.4.4	Received GROUP CALL ANNOUNCEMENT with MCVideo user acknowledgement required	253
9.3.3.4.5	Received GROUP CALL ANNOUNCEMENT without MCVideo user acknowledgement required	253
9.3.3.4.6	Call started	254
9.3.3.4.7	Upgrade call	255
9.3.3.4.8	Downgrade call	257
9.3.3.4.9	Merge of two calls	261
9.3.3.4.10	Call release after call establishment	261
9.3.3.4.11	Call release or reject before call establishment	262
9.3.3.4.12	Error handling	262
9.4	Off-network Broadcast group call	262
9.4.1	General	262
9.4.2	Basic call control	262
9.4.2.1	General	262
9.4.2.2	Broadcast group call control state machine	262
9.4.2.3	Broadcast group call Control states	263
9.4.2.3.1	B1: start-stop	263
9.4.2.3.2	B2: in-progress broadcast group call	263
9.4.2.3.3	B3: pending user action	263
9.4.2.3.4	B4: ignoring same call ID	263
9.4.2.4	Procedures	264
9.4.2.4.1	User initiating a broadcast group call	264
9.4.2.4.2	Terminating UE receiving a GROUP CALL BROADCAST message when not participating in the in-progress broadcast group call	264

9.4.2.4.3	MCVideo user accepts the terminating call	265
9.4.2.4.4	MCVideo user rejects the terminating call	265
9.4.2.4.5	MCVideo user does not act on terminating call	265
9.4.2.4.6	Terminating user releasing the call	265
9.4.2.4.7	Originating user releasing the call	265
9.4.2.4.8	Receiving GROUP CALL BROADCAST END message	266
9.4.2.4.9	Originating UE retransmitting GROUP CALL BROADCAST message	266
9.4.2.4.10	Ignoring same call ID	266
9.4.2.4.11	Releasing the call	266
10	Private call	267
10.1	General	267
10.2	Private call in on-network	267
10.2.1	General	267
10.2.2	Private call with transmission control	267
10.2.2.1	General	267
10.2.2.2	MCVideo client procedures	268
10.2.2.2.1	Client originating procedures	268
10.2.2.2.2	Client terminating procedures	269
10.2.2.2.3	Client terminating procedures for reception of SIP re-INVITE request	271
10.2.2.2.4	MCVideo in-progress emergency cancel	272
10.2.2.2.5	Upgrade to MCVideo emergency private call	273
10.2.2.3	Participating MCVideo function procedures	274
10.2.2.3.1	Originating procedures	274
10.2.2.3.2	Terminating procedures	281
10.2.2.3.3	Receipt of SIP re-INVITE request by terminating participating function	282
10.2.2.4	Controlling MCVideo function procedures	283
10.2.2.4.1	Originating procedures	283
10.2.2.4.2	Terminating procedures	284
10.2.2.4.3	Receiving a SIP re-INVITE for upgrade to emergency private call	286
10.2.2.4.4	Receiving a SIP re-INVITE for cancellation of emergency private call	288
10.2.2.4.5	Sending a SIP re-INVITE for upgrade to emergency private call	289
10.2.2.4.6	Sending a SIP re-INVITE for cancellation of emergency private call	290
10.2.3	Private call without transmission control	290
10.2.3.1	MCVideo client procedures	290
10.2.3.2	Participating MCVideo function procedures	291
10.2.3.2.1	Originating procedures	291
10.2.3.2.2	Terminating procedures	291
10.2.3.3	Controlling MCVideo function procedures	291
10.2.3.3.1	Originating procedures	291
10.2.3.3.2	Terminating procedures	291
10.2.4	Ending the private call initiated by MCVideo client	291
10.2.4.1	MCVideo client procedures	291
10.2.4.1.1	On-demand private call	291
10.2.4.2	Participating MCVideo function procedures	292
10.2.4.2.1	Originating procedures	292
10.2.4.2.2	Terminating procedures	292
10.2.4.3	Controlling MCVideo function procedures	292
10.2.4.3.1	Terminating procedures	292
10.2.5	Ending the private call initiated by the MCVideo server	292
10.2.5.1	General	292
10.2.5.2	MCVideo client procedures	292
10.2.5.3	Participating MCVideo function procedures	292
10.2.5.3.1	Originating procedures	292
10.2.5.3.2	Terminating procedures	292
10.2.5.4	Controlling MCVideo function procedures	292
10.3	Off-network private call	293
10.3.1	General	293
10.3.1.1	Common procedures	293
10.3.1.1.1	Sending/Receiving a message	293
10.3.1.1.2	Session description	293
10.3.2	Basic call control	294

10.3.2.1	General	294
10.3.2.2	Private call control state machine.....	294
10.3.2.3	Private call control states	295
10.3.2.3.1	P0: start-stop.....	295
10.3.2.3.2	P1: ignoring same call id	295
10.3.2.3.3	P2: waiting for call response	295
10.3.2.3.4	P3: waiting for release response	295
10.3.2.3.5	P4: part of ongoing call	295
10.3.2.3.6	P5: pending.....	296
10.3.2.4	Procedures.....	296
10.3.2.4.1	General	296
10.3.2.4.2	Private call setup.....	296
10.3.2.4.3	Private call setup in automatic commencement mode.....	299
10.3.2.4.4	Private call setup in manual commencement mode.....	302
10.3.2.4.5	Private call release.....	306
10.3.2.4.6	Error handling.....	308
11	Emergency Alert	308
11.1	General	308
11.2	On-network emergency alert	308
11.2.1	Client procedures	308
11.2.1.1	Emergency alert origination	308
11.2.1.2	Emergency alert cancellation	309
11.2.1.3	MCVideo client receives an MCVideo emergency alert or call notification	311
11.2.2	Participating MCVideo function procedures	313
11.2.2.1	Receipt of a SIP MESSAGE request for emergency notification from the served MCVideo client...313	
11.2.2.2	Receipt of a SIP MESSAGE request for emergency notification for terminating MCVideo client...314	
11.2.2.3	Receipt of a SIP MESSAGE request indicating successful delivery of emergency notification	315
11.2.3	Controlling MCVideo function procedures	315
11.2.3.1	Handling of a SIP MESSAGE request for emergency notification.....	315
11.2.3.2	Handling of a SIP MESSAGE request for emergency alert cancellation.....	317
11.3	Off-network emergency alert	320
11.3.1	General.....	320
11.3.2	Basic state machine.....	320
11.3.2.1	General	320
11.3.2.2	Emergency alert state machine.....	320
11.3.2.3	Emergency alert states.....	320
11.3.2.3.1	E1: Not in emergency state.....	320
11.3.2.3.2	E2: Emergency state	320
11.3.3	Procedures.....	321
11.3.3.1	Originating user sending emergency alert.....	321
11.3.3.2	Emergency alert retransmission	321
11.3.3.3	Terminating user receiving emergency alert	321
11.3.3.4	Terminating user receiving retransmitted emergency alert	322
11.3.3.5	Originating user cancels emergency alert	322
11.3.3.6	Terminating user receives GROUP EMERGENCY ALERT CANCEL message	322
11.3.3.7	Implicit emergency alert cancel	323
12	Video Pull.....	323
12.1	General	323
12.2	On-network video pull.....	323
12.2.1	General.....	323
12.2.2	MCVideo client procedures	323
12.2.2.1	One-to-one video pull originating procedures.....	323
12.2.2.2	One-to-one video pull terminating procedures.....	323
12.2.2.3	One-to-one video pull release procedures	323
12.2.2.4	One-from-server video pull originating procedures	324
12.2.2.5	One-from-server video pull terminating procedures	324
12.2.2.6	One-from-server video pull release procedures	324
12.2.3	MCVideo server procedures	324
12.2.3.1	Participating MCVideo function procedures.....	324
12.2.3.1.1	One-to-one video pull originating procedures	324

12.2.3.1.2	One-to-one video pull terminating procedures	324
12.2.3.1.3	One-to-one video pull release procedures	324
12.2.3.1.4	One-from-server video pull originating procedures	324
12.2.3.1.5	One-from-server video pull terminating procedures.....	325
12.2.3.1.6	One-from-server video pull release procedures.....	325
12.2.3.2	Controlling MCVideo function procedures.....	325
12.2.3.2.1	One-to-one video pull originating procedures	325
12.2.3.2.2	One-to-one video pull terminating procedures	325
12.2.3.2.3	One-to-one video pull release procedures	325
12.2.3.2.4	One-from-server video pull originating procedures	325
12.2.3.2.5	One-from-server video pull terminating procedures.....	325
12.2.3.2.6	One-from-server video pull release procedures.....	326
12.3	Off-network video pull.....	326
12.3.1	General.....	326
12.3.2	MCVideo client procedures	326
12.3.2.1	Off network video pull setup.....	326
12.3.2.1.1	Initiating video pull	326
12.3.2.1.2	Video pull setup request accepted	326
12.3.2.2	Off network video pull setup in automatic commencement mode.....	326
12.3.2.2.1	Responding to video pull setup request when not participating in the ongoing call.....	326
12.3.2.2.2	Establishing the video pull call.....	326
13	Video Push	327
13.1	General	327
13.2	On-network video push	327
13.2.1	General.....	327
13.2.2	MCVideo client procedures	327
13.2.2.1	One-to-one video push originating procedures	327
13.2.2.2	One-to-one video push terminating procedures	327
13.2.2.3	One-to-one video push release procedures.....	327
13.2.2.4	One-to-server video push originating procedures	327
13.2.2.5	One-to-server video push release procedures.....	328
13.2.3	MCVideo server procedures	328
13.2.3.1	Participating MCVideo function procedures.....	328
13.2.3.1.1	One-to-one video push originating procedures.....	328
13.2.3.1.2	One-to-one video push terminating procedures.....	328
13.2.3.1.3	One-to-one video push release procedures	328
13.2.3.1.4	One-to-server video push originating procedures.....	328
13.2.3.1.5	One-to-server video push release procedures	328
13.2.3.2	Controlling MCVideo function procedures.....	329
13.2.3.2.1	One-to-one video push terminating procedures.....	329
13.2.3.2.2	One-to-one video push release procedures	329
13.2.3.2.3	One-to-server video push terminating procedures.....	329
13.2.3.2.4	One-to-server video push release procedures	330
13.3	Off-network video push.....	330
13.3.1	General.....	330
13.3.1.1	Common Procedures	330
13.3.1.1.1	Sending/Receiving a message	330
13.3.2	MCVideo client procedures	330
13.3.2.1	Video push to another MCVideo user.....	330
13.3.2.1.1	Private video push call setup	330
13.3.2.1.2	Private video push call setup in manual commencement mode.....	330
13.3.2.1.3	Private video push call release.....	330
13.3.2.1.4	Sending video push notification	330
13.3.2.1.5	Receiving video push notification	331
13.3.2.2	Remotely initiated video push.....	331
13.3.2.2.1	Initiating a remote video push request.....	331
13.3.2.2.2	Sending video push trying response	332
13.3.2.2.3	Private video push call setup	332
13.3.2.2.4	Private video push call setup in manual commencement mode.....	332
13.3.2.2.5	Private video push call release.....	332
13.3.2.2.6	Sending video push notification	332

13.3.2.2.7	Receiving video push notification	333
13.3.2.3	Remotely initiated video push to a group.....	333
13.3.2.3.1	Initiating a remote video push request to a group.....	333
13.3.2.3.2	Group video push call setup	334
13.3.3	Void	335
14	Capability information sharing.....	335
14.1	General	335
14.2	On-network capability information sharing	335
14.2.1	General.....	335
14.2.2	MCVideo client procedures	335
14.2.3	MCVideo server procedures	335
14.3	Off-network capability information sharing.....	335
14.3.1	General.....	335
14.3.2	MCVideo client procedures	335
14.3.3	MCVideo server procedures	335
15	Ambient viewing call	335
15.1	General	335
15.2	MCVideo client procedures.....	336
15.2.1	On-demand ambient viewing call	336
15.2.1.1	Client originating procedures for remote-initiated call	336
15.2.1.2	Client terminating procedures	338
15.2.1.3	Client release origination procedure.....	339
15.2.1.4	Client session release termination procedure	340
15.2.2	Ambient viewing call using pre-established session.....	340
15.2.2.1	Client originating procedures	340
15.2.2.2	Client terminating procedures	342
15.2.2.3	Client release origination procedure.....	342
15.2.2.4	Reception of SIP INFO request with release-reason.....	343
15.2.2.5	Client session release termination procedure	343
15.3	Participating MCVideo function procedures	343
15.3.1	Originating procedures	343
15.3.1.1	On-demand ambient viewing call	343
15.3.1.2	Receipt of SIP BYE request for on-demand ambient viewing call	345
15.3.1.3	Receipt of REFER "BYE" request for private call using pre-established session.....	345
15.3.1.4	Ambient viewing call initiation using pre-established session.....	345
15.3.2	Terminating procedures	347
15.3.2.1	Terminating procedures for ambient viewing call.....	347
15.3.2.2	Receipt of SIP BYE request for on-demand ambient viewing call	348
15.3.2.3	Receipt of SIP BYE request for an ongoing pre-established session	348
15.4	Controlling MCVideo function procedures.....	348
15.4.1	Originating procedures	348
15.4.2	Terminating procedures	349
15.4.3	Server initiated ambient call release	350
15.4.4	Reception of a SIP BYE request	351
16	Use of MBMS transmission (on-network)	352
16.1	General	352
16.2	MCVideo client procedures.....	352
16.2.1	General.....	352
16.2.2	Receiving an MBMS bearer announcement	352
16.2.3	The MBMS bearer listening status and suspension report procedures	353
16.2.3.1	Conditions for sending an MBMS listening status report	353
16.2.3.2	Sending the MBMS bearer listening or suspension status report.....	355
16.2.4	Receiving a MuSiK download message.....	356
16.3	Participating MCVideo server procedures.....	358
16.3.1	General.....	358
16.3.2	Sending MBMS bearer announcement procedures.....	358
16.3.2.1	General	358
16.3.2.2	Sending an initial MBMS bearer announcement procedure.....	358
16.3.2.3	Updating an announcement	361
16.3.2.4	Cancelling an MBMS bearer announcement.....	361

16.3.2.5	Sending a MuSiK download message	361
16.3.3	Receiving an MBMS bearer listening status from an MCVideo client.....	362
16.3.4	Abnormal cases.....	364
17	Off-network message formats	364
17.1	MONP MCVIDEO message functional definitions and contents	364
17.1.1	General.....	364
17.1.2	GROUP CALL PROBE message	364
17.1.2.1	Message definition	364
17.1.3	GROUP CALL ANNOUNCEMENT message	364
17.1.3.1	Message definition	364
17.1.4	GROUP CALL ACCEPT message.....	365
17.1.4.1	Message definition	365
17.1.5	PRIVATE CALL SETUP REQUEST message.....	365
17.1.5.1	Message definition	365
17.1.6	PRIVATE CALL RINGING message.....	366
17.1.6.1	Message definition	366
17.1.7	PRIVATE CALL ACCEPT message	366
17.1.7.1	Message definition	366
17.1.8	PRIVATE CALL REJECT message	367
17.1.8.1	Message definition	367
17.1.9	PRIVATE CALL RELEASE message	367
17.1.9.1	Message definition	367
17.1.10	PRIVATE CALL RELEASE ACK message.....	368
17.1.10.1	Message definition	368
17.1.11	PRIVATE CALL ACCEPT ACK message.....	368
17.1.11.1	Message definition	368
17.1.12	GROUP CALL IMMINENT PERIL END message	369
17.1.12.1	Message definition	369
17.1.13	GROUP CALL EMERGENCY END message	369
17.1.13.1	Message definition	369
17.1.14	GROUP EMERGENCY ALERT message.....	370
17.1.14.1	Message definition	370
17.1.15	GROUP EMERGENCY ALERT ACK message	370
17.1.15.1	Message definition	370
17.1.16	GROUP EMERGENCY ALERT CANCEL message.....	370
17.1.16.1	Message definition	370
17.1.17	GROUP EMERGENCY ALERT CANCEL ACK message.....	371
17.1.17.1	Message definition	371
17.1.18	GROUP CALL BROADCAST message.....	371
17.1.18.1	Message definition	371
17.1.19	GROUP CALL BROADCAST END message.....	372
17.1.19.1	Message definition	372
17.1.20	PRIVATE REMOTE VIDEO PUSH REQUEST message	372
17.1.20.1	Message definition	372
17.1.21	GROUP REMOTE VIDEO PUSH REQUEST message.....	373
17.1.21.1	Message definition	373
17.1.22	VIDEO PUSH TRYING RESPONSE message	373
17.1.22.1	Message definition	373
17.1.23	NOTIFY VIDEO PUSH message.....	374
17.1.23.1	Message definition	374
17.2	General message format and information elements coding.....	374
17.2.1	General.....	374
17.2.2	Message type	375
17.2.3	Call identifier	376
17.2.4	Refresh interval.....	376
17.2.5	MCVideo group ID.....	377
17.2.6	SDP	377
17.2.7	Commencement mode	378
17.2.8	Reason	378
17.2.9	Confirm mode indication	378
17.2.10	MCVideo user ID	379