

# ETSI TS 137 355 V17.9.0 (2025-01)



**LTE;  
5G;  
LTE Positioning Protocol (LPP)  
(3GPP TS 37.355 version 17.9.0 Release 17)**

[ETSI TS 137 355 V17.9.0 \(2025-01\)](https://standards.iteh.ai/catalog/standards/etsi/4a9e7c48-b8c6-4fc7-8c8a-b231708bcf5e/etsi-ts-137-355-v17-9-0-2025-01)

<https://standards.iteh.ai/catalog/standards/etsi/4a9e7c48-b8c6-4fc7-8c8a-b231708bcf5e/etsi-ts-137-355-v17-9-0-2025-01>



---

**Reference**

RTS/TSGR-0237355vh90

---

**Keywords**

5G,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 2025.  
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. (2025-01)

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.....	13
1 Scope .....	14
2 References .....	14
3 Definitions and Abbreviations.....	16
3.1 Definitions .....	16
3.2 Abbreviations .....	17
4 Functionality of Protocol.....	19
4.1 General .....	19
4.1.1 LPP Configuration .....	19
4.1.2 LPP Sessions and Transactions.....	20
4.1.3 LPP Position Methods .....	20
4.1.4 LPP Messages .....	20
4.2 Common LPP Session Procedure .....	21
4.3 LPP Transport .....	22
4.3.1 Transport Layer Requirements .....	22
4.3.2 LPP Duplicate Detection .....	22
4.3.3 LPP Acknowledgement .....	22
4.3.3.1 General .....	22
4.3.3.2 Procedure related to Acknowledgement.....	22
4.3.4 LPP Retransmission.....	23
4.3.4.1 General .....	23
4.3.4.2 Procedure related to Retransmission.....	23
4.3.5 LPP Message Segmentation.....	24
5 LPP Procedures .....	25
5.1 Procedures related to capability transfer .....	25
5.1.1 Capability Transfer procedure .....	25
5.1.2 Capability Indication procedure.....	26
5.1.3 Reception of LPP Request Capabilities .....	26
5.1.4 Transmission of LPP Provide Capabilities .....	27
5.2 Procedures related to Assistance Data Transfer .....	27
5.2.1 Assistance Data Transfer procedure .....	27
5.2.1a Periodic Assistance Data Transfer procedure .....	27
5.2.1b Periodic Assistance Data Transfer with Update procedure.....	29
5.2.2 Assistance Data Delivery procedure .....	30
5.2.2a Periodic Assistance Data Delivery procedure.....	30
5.2.3 Transmission of LPP Request Assistance Data .....	32
5.2.4 Reception of LPP Provide Assistance Data .....	32
5.3 Procedures related to Location Information Transfer.....	32
5.3.1 Location Information Transfer procedure.....	32
5.3.2 Location Information Delivery procedure .....	33
5.3.3 Reception of Request Location Information.....	33
5.3.4 Transmission of Provide Location Information .....	34
5.4 Error Handling Procedures .....	34
5.4.1 General.....	34
5.4.2 Procedures related to Error Indication .....	34
5.4.3 LPP Error Detection.....	34
5.4.4 Reception of an LPP Error Message .....	35
5.5 Abort Procedure .....	36
5.5.1 General.....	36
5.5.2 Procedures related to Abort .....	36

5.5.3	Reception of an LPP Abort Message .....	36
6	Information Element Abstract Syntax Definition.....	36
6.1	General .....	36
6.2	LPP PDU Structure .....	37
–	<i>LPP-PDU-Definitions</i> .....	37
–	<i>LPP-Message</i> .....	37
–	<i>LPP-MessageBody</i> .....	38
–	<i>LPP-TransactionID</i> .....	38
6.3	Message Body IEs .....	39
–	<i>RequestCapabilities</i> .....	39
–	<i>ProvideCapabilities</i> .....	39
–	<i>RequestAssistanceData</i> .....	40
–	<i>ProvideAssistanceData</i> .....	40
–	<i>RequestLocationInformation</i> .....	41
–	<i>ProvideLocationInformation</i> .....	42
–	<i>Abort</i> .....	42
–	<i>Error</i> .....	43
6.4	Common IEs.....	43
6.4.1	Common Lower-Level IEs .....	43
–	<i>AccessTypes</i> .....	43
–	<i>ARFCN-ValueEUTRA</i> .....	43
–	<i>ARFCN-ValueNR</i> .....	44
–	<i>ARFCN-ValueUTRA</i> .....	44
–	<i>CarrierFreq-NB</i> .....	44
–	<i>CellGlobalIdEUTRA-AndUTRA</i> .....	45
–	<i>CellGlobalIdGERAN</i> .....	45
–	<i>ECGI</i> .....	46
–	<i>Ellipsoid-Point</i> .....	46
–	<i>Ellipsoid-PointWithUncertaintyCircle</i> .....	46
–	<i>EllipsoidPointWithUncertaintyEllipse</i> .....	46
–	<i>EllipsoidPointWithAltitude</i> .....	47
–	<i>EllipsoidPointWithAltitudeAndUncertaintyEllipsoid</i> .....	47
–	<i>EllipsoidArc</i> .....	47
–	<i>EPDU-Sequence</i> .....	47
–	<i>FreqBandIndicatorNR</i> .....	48
–	<i>HA-EllipsoidPointWithAltitudeAndScalableUncertaintyEllipsoid</i> .....	48
–	<i>HA-EllipsoidPointWithScalableUncertaintyEllipse</i> .....	49
–	<i>HighAccuracyEllipsoidPointWithUncertaintyEllipse</i> .....	49
–	<i>HighAccuracyEllipsoidPointWithAltitudeAndUncertaintyEllipsoid</i> .....	49
–	<i>HorizontalVelocity</i> .....	49
–	<i>HorizontalWithVerticalVelocity</i> .....	50
–	<i>HorizontalVelocityWithUncertainty</i> .....	50
–	<i>HorizontalWithVerticalVelocityAndUncertainty</i> .....	50
–	<i>LocationCoordinateTypes</i> .....	50
–	<i>NCGI</i> .....	51
–	<i>NR-PhysCellId</i> .....	51
–	<i>PeriodicAssistanceDataControlParameters</i> .....	51
–	<i>Polygon</i> .....	52
–	<i>PositioningModes</i> .....	52
–	<i>ScheduledLocationTimeSupport</i> .....	52
–	<i>ScheduledLocationTimeSupportPerMode</i> .....	53
–	<i>SegmentationInfo</i> .....	53
–	<i>VelocityTypes</i> .....	53
6.4.2	Common Positioning .....	53
–	<i>CommonIEsRequestCapabilities</i> .....	53
–	<i>CommonIEsProvideCapabilities</i> .....	54
–	<i>CommonIEsRequestAssistanceData</i> .....	54
–	<i>CommonIEsProvideAssistanceData</i> .....	55
–	<i>CommonIEsRequestLocationInformation</i> .....	55
–	<i>CommonIEsProvideLocationInformation</i> .....	60
–	<i>CommonIEsAbort</i> .....	62

–	<i>CommonIEsError</i> .....	63
6.4.3	Common NR Positioning Information Elements .....	63
–	<i>AreaID-CellList</i> .....	63
–	<i>DL-PRS-ID-Info</i> .....	64
–	<i>LCS-GCS-TranslationParameter</i> .....	64
–	<i>LOS-NLOS-Indicator</i> .....	65
–	<i>LOS-NLOS-IndicatorGranularity1</i> .....	65
–	<i>LOS-NLOS-IndicatorGranularity2</i> .....	65
–	<i>LOS-NLOS-IndicatorType1</i> .....	66
–	<i>LOS-NLOS-IndicatorType2</i> .....	66
–	<i>NR-AdditionalPathList</i> .....	66
–	<i>NR-DL-PRS-AssistanceData</i> .....	67
–	<i>NR-DL-PRS-BeamInfo</i> .....	70
–	<i>NR-DL-PRS-ExpectedLOS-NLOS-Assistance</i> .....	71
–	<i>NR-DL-PRS-Info</i> .....	72
–	<i>NR-DL-PRS-ProcessingCapability</i> .....	76
–	<i>NR-DL-PRS-QCL-ProcessingCapability</i> .....	80
–	<i>NR-DL-PRS-ResourceID</i> .....	81
–	<i>NR-DL-PRS-ResourcesCapability</i> .....	81
–	<i>NR-DL-PRS-ResourceSetID</i> .....	82
–	<i>NR-DL-PRS-TRP-TEG-Info</i> .....	82
–	<i>NR-On-Demand-DL-PRS-Configurations</i> .....	83
–	<i>NR-On-Demand-DL-PRS-Information</i> .....	84
–	<i>NR-On-Demand-DL-PRS-Request</i> .....	85
–	<i>NR-On-Demand-DL-PRS-Configurations-Selected-IndexList</i> .....	86
–	<i>NR-On-Demand-DL-PRS-Support</i> .....	86
–	<i>NR-PositionCalculationAssistance</i> .....	86
–	<i>NR-RTD-Info</i> .....	87
–	<i>NR-SelectedDL-PRS-IndexList</i> .....	88
–	<i>NR-SSB-Config</i> .....	89
–	<i>NR-TimeStamp</i> .....	90
–	<i>NR-TimingQuality</i> .....	91
–	<i>NR-TRP-BeamAntennaInfo</i> .....	91
–	<i>NR-TRP-LocationInfo</i> .....	94
–	<i>NR-UE-TEG-Capability</i> .....	95
–	<i>NR-UL-SRS-Capability</i> .....	96
–	<i>ReferencePoint</i> .....	101
–	<i>RelativeLocation</i> .....	102
–	<i>TEG-TimingErrorMargin</i> .....	103
–	<i>RxTxTEG-TimingErrorMargin</i> .....	103
6.5	Positioning Method IEs .....	103
6.5.1	OTDOA Positioning .....	103
6.5.1.1	OTDOA Assistance Data .....	104
–	<i>OTDOA-ProvideAssistanceData</i> .....	104
6.5.1.2	OTDOA Assistance Data Elements .....	104
–	<i>OTDOA-ReferenceCellInfo</i> .....	104
–	<i>PRS-Info</i> .....	106
–	<i>TDD-Config</i> .....	107
–	<i>OTDOA-NeighbourCellInfoList</i> .....	108
–	<i>OTDOA-ReferenceCellInfoNB</i> .....	111
–	<i>PRS-Info-NB</i> .....	113
–	<i>OTDOA-NeighbourCellInfoListNB</i> .....	116
6.5.1.3	OTDOA Assistance Data Request .....	119
–	<i>OTDOA-RequestAssistanceData</i> .....	119
6.5.1.4	OTDOA Location Information .....	119
–	<i>OTDOA-ProvideLocationInformation</i> .....	119
6.5.1.5	OTDOA Location Information Elements .....	120
–	<i>OTDOA-SignalMeasurementInformation</i> .....	120
–	<i>OTDOA-SignalMeasurementInformation-NB</i> .....	123
–	<i>OTDOA-MeasQuality</i> .....	125
–	<i>AdditionalPath</i> .....	126
6.5.1.6	OTDOA Location Information Request .....	126

–	<i>OTDOA-RequestLocationInformation</i> .....	126
6.5.1.7	<i>OTDOA Capability Information</i> .....	127
–	<i>OTDOA-ProvideCapabilities</i> .....	127
6.5.1.8	<i>OTDOA Capability Information Request</i> .....	130
–	<i>OTDOA-RequestCapabilities</i> .....	130
6.5.1.9	<i>OTDOA Error Elements</i> .....	130
–	<i>OTDOA-Error</i> .....	130
–	<i>OTDOA-LocationServerErrorCauses</i> .....	130
–	<i>OTDOA-TargetDeviceErrorCauses</i> .....	131
6.5.2	<i>A-GNSS Positioning</i> .....	131
6.5.2.1	<i>GNSS Assistance Data</i> .....	131
–	<i>A-GNSS-ProvideAssistanceData</i> .....	131
–	<i>GNSS-CommonAssistData</i> .....	131
–	<i>GNSS-GenericAssistData</i> .....	132
–	<i>GNSS-PeriodicAssistData</i> .....	133
6.5.2.2	<i>GNSS Assistance Data Elements</i> .....	134
–	<i>GNSS-ReferenceTime</i> .....	134
–	<i>GNSS-SystemTime</i> .....	135
–	<i>GPS-TOW-Assist</i> .....	136
–	<i>NetworkTime</i> .....	136
–	<i>GNSS-ReferenceLocation</i> .....	139
–	<i>GNSS-IonosphericModel</i> .....	139
–	<i>KlobucharModelParameter</i> .....	139
–	<i>KlobucharModel2Parameter</i> .....	140
–	<i>NeQuickModelParameter</i> .....	141
–	<i>GNSS-EarthOrientationParameters</i> .....	141
–	<i>GNSS-RTK-ReferenceStationInfo</i> .....	142
–	<i>GNSS-RTK-CommonObservationInfo</i> .....	144
–	<i>GNSS-RTK-AuxiliaryStationData</i> .....	145
–	<i>GNSS-SSR-CorrectionPoints</i> .....	147
–	<i>GNSS-Integrity-ServiceParameters</i> .....	148
–	<i>GNSS-Integrity-ServiceAlert</i> .....	148
–	<i>GNSS-TimeModelList</i> .....	149
–	<i>GNSS-DifferentialCorrections</i> .....	150
–	<i>GNSS-NavigationModel</i> .....	153
–	<i>StandardClockModelList</i> .....	155
–	<i>NAV-ClockModel</i> .....	156
–	<i>CNAV-ClockModel</i> .....	156
–	<i>GLONASS-ClockModel</i> .....	157
–	<i>SBAS-ClockModel</i> .....	158
–	<i>BDS-ClockModel</i> .....	158
–	<i>BDS-ClockModel2</i> .....	159
–	<i>NavIC-ClockModel</i> .....	160
–	<i>NavModelKeplerianSet</i> .....	160
–	<i>NavModelNAV-KeplerianSet</i> .....	162
–	<i>NavModelCNAV-KeplerianSet</i> .....	163
–	<i>NavModel-GLONASS-ECEF</i> .....	164
–	<i>NavModel-SBAS-ECEF</i> .....	165
–	<i>NavModel-BDS-KeplerianSet</i> .....	166
–	<i>NavModel-BDS-KeplerianSet2</i> .....	168
–	<i>NavModel-NavIC-KeplerianSet</i> .....	170
–	<i>GNSS-RealTimeIntegrity</i> .....	171
–	<i>GNSS-DataBitAssistance</i> .....	172
–	<i>GNSS-AcquisitionAssistance</i> .....	173
–	<i>GNSS-Almanac</i> .....	176
–	<i>AlmanacKeplerianSet</i> .....	177
–	<i>AlmanacNAV-KeplerianSet</i> .....	178
–	<i>AlmanacReducedKeplerianSet</i> .....	179
–	<i>AlmanacMidiAlmanacSet</i> .....	180
–	<i>AlmanacGLONASS-AlmanacSet</i> .....	181
–	<i>AlmanacECEF-SBAS-AlmanacSet</i> .....	182
–	<i>AlmanacBDS-AlmanacSet</i> .....	183

–	<i>AlmanacNavIC-AlmanacSet</i> .....	184
–	<i>GNSS-UTC-Model</i> .....	185
–	<i>UTC-ModelSet1</i> .....	186
–	<i>UTC-ModelSet2</i> .....	186
–	<i>UTC-ModelSet3</i> .....	187
–	<i>UTC-ModelSet4</i> .....	187
–	<i>UTC-ModelSet5</i> .....	188
–	<i>GNSS-AuxiliaryInformation</i> .....	189
–	<i>BDS-DifferentialCorrections</i> .....	190
–	<i>BDS-GridModelParameter</i> .....	191
–	<i>GNSS-RTK-Observations</i> .....	191
–	<i>GLO-RTK-BiasInformation</i> .....	194
–	<i>GNSS-RTK-MAC-CorrectionDifferences</i> .....	195
–	<i>GNSS-RTK-Residuals</i> .....	197
–	<i>GNSS-RTK-FKP-Gradients</i> .....	198
–	<i>GNSS-SSR-OrbitCorrections</i> .....	200
–	<i>GNSS-SSR-ClockCorrections</i> .....	203
–	<i>GNSS-SSR-CodeBias</i> .....	205
–	<i>GNSS-SSR-URA</i> .....	206
–	<i>GNSS-SSR-PhaseBias</i> .....	207
–	<i>GNSS-SSR-STECCorrection</i> .....	209
–	<i>GNSS-SSR-GriddedCorrection</i> .....	213
–	<i>NavIC-DifferentialCorrections</i> .....	218
–	<i>NavIC-GridModelParameter</i> .....	219
–	<i>GNSS-SSR-OrbitCorrectionsSet2</i> .....	220
–	<i>GNSS-SSR-ClockCorrectionsSet2</i> .....	221
–	<i>GNSS-SSR-URA-Set2</i> .....	221
6.5.2.3	<i>GNSS Assistance Data Request</i> .....	222
–	<i>A-GNSS-RequestAssistanceData</i> .....	222
–	<i>GNSS-CommonAssistDataReq</i> .....	222
–	<i>GNSS-GenericAssistDataReq</i> .....	223
–	<i>GNSS-PeriodicAssistDataReq</i> .....	225
6.5.2.4	<i>GNSS Assistance Data Request Elements</i> .....	226
–	<i>GNSS-ReferenceTimeReq</i> .....	226
–	<i>GNSS-ReferenceLocationReq</i> .....	227
–	<i>GNSS-IonosphericModelReq</i> .....	227
–	<i>GNSS-EarthOrientationParametersReq</i> .....	227
–	<i>GNSS-RTK-ReferenceStationInfoReq</i> .....	228
–	<i>GNSS-RTK-AuxiliaryStationDataReq</i> .....	228
–	<i>GNSS-SSR-CorrectionPointsReq</i> .....	228
–	<i>GNSS-Integrity-ServiceParametersReq</i> .....	229
–	<i>GNSS-Integrity-ServiceAlertReq</i> .....	229
–	<i>GNSS-TimeModelListReq</i> .....	229
–	<i>GNSS-DifferentialCorrectionsReq</i> .....	229
–	<i>GNSS-NavigationModelReq</i> .....	230
–	<i>GNSS-RealTimeIntegrityReq</i> .....	232
–	<i>GNSS-DataBitAssistanceReq</i> .....	232
–	<i>GNSS-AcquisitionAssistanceReq</i> .....	233
–	<i>GNSS-AlmanacReq</i> .....	233
–	<i>GNSS-UTC-ModelReq</i> .....	233
–	<i>GNSS-AuxiliaryInformationReq</i> .....	234
–	<i>BDS-DifferentialCorrectionsReq</i> .....	234
–	<i>BDS-GridModelReq</i> .....	234
–	<i>GNSS-RTK-ObservationsReq</i> .....	235
–	<i>GLO-RTK-BiasInformationReq</i> .....	235
–	<i>GNSS-RTK-MAC-CorrectionDifferencesReq</i> .....	235
–	<i>GNSS-RTK-ResidualsReq</i> .....	236
–	<i>GNSS-RTK-FKP-GradientsReq</i> .....	236
–	<i>GNSS-SSR-OrbitCorrectionsReq</i> .....	237
–	<i>GNSS-SSR-ClockCorrectionsReq</i> .....	237
–	<i>GNSS-SSR-CodeBiasReq</i> .....	238
–	<i>GNSS-SSR-URA-Req</i> .....	238

–	<i>GNSS-SSR-PhaseBiasReq</i> .....	238
–	<i>GNSS-SSR-STECCorrectionReq</i> .....	239
–	<i>GNSS-SSR-GriddedCorrectionReq</i> .....	239
–	<i>NavIC-DifferentialCorrectionsReq</i> .....	239
–	<i>NavIC-GridModelReq</i> .....	240
–	<i>GNSS-SSR-OrbitCorrectionsSet2Req</i> .....	240
–	<i>GNSS-SSR-ClockCorrectionsSet2Req</i> .....	240
–	<i>GNSS-SSR-URA-Set2Req</i> .....	241
6.5.2.5	GNSS Location Information .....	241
–	<i>A-GNSS-ProvideLocationInformation</i> .....	241
6.5.2.6	GNSS Location Information Elements .....	241
–	<i>GNSS-SignalMeasurementInformation</i> .....	241
–	<i>MeasurementReferenceTime</i> .....	242
–	<i>GNSS-MeasurementList</i> .....	244
–	<i>GNSS-LocationInformation</i> .....	248
–	<i>HA-GNSS-Metrics</i> .....	249
6.5.2.7	GNSS Location Information Request .....	249
–	<i>A-GNSS-RequestLocationInformation</i> .....	249
6.5.2.8	GNSS Location Information Request Elements .....	250
–	<i>GNSS-PositioningInstructions</i> .....	250
6.5.2.9	GNSS Capability Information .....	250
–	<i>A-GNSS-ProvideCapabilities</i> .....	250
6.5.2.10	GNSS Capability Information Elements .....	253
–	<i>GNSS-CommonAssistanceDataSupport</i> .....	253
–	<i>GNSS-ReferenceTimeSupport</i> .....	253
–	<i>GNSS-ReferenceLocationSupport</i> .....	254
–	<i>GNSS-IonosphericModelSupport</i> .....	254
–	<i>GNSS-EarthOrientationParametersSupport</i> .....	254
–	<i>GNSS-RTK-ReferenceStationInfoSupport</i> .....	254
–	<i>GNSS-RTK-AuxiliaryStationDataSupport</i> .....	255
–	<i>GNSS-Integrity-ServiceParametersSupport</i> .....	255
–	<i>GNSS-Integrity-ServiceAlertSupport</i> .....	255
–	<i>GNSS-GenericAssistanceDataSupport</i> .....	255
–	<i>GNSS-TimeModelListSupport</i> .....	257
–	<i>GNSS-DifferentialCorrectionSupport</i> .....	257
–	<i>GNSS-NavigationModelSupport</i> .....	258
–	<i>GNSS-RealTimeIntegritySupport</i> .....	259
–	<i>GNSS-DataBitAssistanceSupport</i> .....	259
–	<i>GNSS-AcquisitionAssistanceSupport</i> .....	259
–	<i>GNSS-AlmanacSupport</i> .....	259
–	<i>GNSS-UTC-ModelSupport</i> .....	260
–	<i>GNSS-AuxiliaryInformationSupport</i> .....	260
–	<i>BDS-DifferentialCorrectionsSupport</i> .....	260
–	<i>BDS-GridModelSupport</i> .....	261
–	<i>GNSS-RTK-ObservationsSupport</i> .....	261
–	<i>GLO-RTK-BiasInformationSupport</i> .....	261
–	<i>GNSS-RTK-MAC-CorrectionDifferencesSupport</i> .....	261
–	<i>GNSS-RTK-ResidualsSupport</i> .....	262
–	<i>GNSS-RTK-FKP-GradientsSupport</i> .....	262
–	<i>GNSS-SSR-OrbitCorrectionsSupport</i> .....	262
–	<i>GNSS-SSR-ClockCorrectionsSupport</i> .....	262
–	<i>GNSS-SSR-URA-Support</i> .....	263
–	<i>GNSS-SSR-STECCorrectionSupport</i> .....	264
–	<i>GNSS-SSR-GriddedCorrectionSupport</i> .....	264
–	<i>NavIC-DifferentialCorrectionsSupport</i> .....	264
–	<i>NavIC-GridModelSupport</i> .....	264
–	<i>GNSS-SSR-OrbitCorrectionsSet2Support</i> .....	265
–	<i>GNSS-SSR-ClockCorrectionsSet2Support</i> .....	265
–	<i>GNSS-SSR-URA-Set2Support</i> .....	265
6.5.2.11	GNSS Capability Information Request .....	265
–	<i>A-GNSS-RequestCapabilities</i> .....	265
6.5.2.12	GNSS Error Elements .....	266

–	<i>A-GNSS-Error</i> .....	266
–	<i>GNSS-LocationServerErrorCauses</i> .....	266
–	<i>GNSS-TargetDeviceErrorCauses</i> .....	266
6.5.2.13	Common GNSS Information Elements .....	267
–	<i>GNSS-FrequencyID</i> .....	267
–	<i>GNSS-ID</i> .....	268
–	<i>GNSS-ID-Bitmap</i> .....	268
–	<i>GNSS-Link-CombinationsList</i> .....	268
–	<i>GNSS-NavListInfo</i> .....	268
–	<i>GNSS-NetworkID</i> .....	269
–	<i>GNSS-PeriodicControlParam</i> .....	269
–	<i>GNSS-ReferenceStationID</i> .....	269
–	<i>GNSS-SignalID</i> .....	270
–	<i>GNSS-SignalIDs</i> .....	272
–	<i>GNSS-SubNetworkID</i> .....	273
–	<i>SBAS-ID</i> .....	273
–	<i>SBAS-IDs</i> .....	273
–	<i>SV-ID</i> .....	273
6.5.3	Enhanced Cell ID Positioning .....	274
6.5.3.1	E-CID Location Information .....	274
–	<i>ECID-ProvideLocationInformation</i> .....	274
6.5.3.2	E-CID Location Information Elements .....	274
–	<i>ECID-SignalMeasurementInformation</i> .....	274
6.5.3.3	E-CID Location Information Request .....	276
–	<i>ECID-RequestLocationInformation</i> .....	276
6.5.3.4	E-CID Capability Information .....	276
–	<i>ECID-ProvideCapabilities</i> .....	276
6.5.3.5	E-CID Capability Information Request .....	277
–	<i>ECID-RequestCapabilities</i> .....	277
6.5.3.6	E-CID Error Elements .....	277
–	<i>ECID-Error</i> .....	277
–	<i>ECID-LocationServerErrorCauses</i> .....	278
–	<i>ECID-TargetDeviceErrorCauses</i> .....	278
6.5.4	Terrestrial Beacon System Positioning .....	278
6.5.4.1	TBS Location Information .....	278
–	<i>TBS-ProvideLocationInformation</i> .....	278
6.5.4.2	TBS Location Information Elements .....	279
–	<i>TBS-MeasurementInformation</i> .....	279
–	<i>MBS-BeaconMeasList</i> .....	279
6.5.4.3	TBS Location Information Request .....	280
–	<i>TBS-RequestLocationInformation</i> .....	280
6.5.4.4	TBS Capability Information .....	280
–	<i>TBS-ProvideCapabilities</i> .....	280
–	<i>MBS-AssistanceDataSupportList</i> .....	281
6.5.4.5	TBS Capability Information Request .....	282
–	<i>TBS-RequestCapabilities</i> .....	282
6.5.4.6	TBS Error Elements .....	282
–	<i>TBS-Error</i> .....	282
–	<i>TBS-LocationServerErrorCauses</i> .....	282
–	<i>TBS-TargetDeviceErrorCauses</i> .....	282
6.5.4.7	TBS Assistance Data .....	283
–	<i>TBS-ProvideAssistanceData</i> .....	283
6.5.4.8	TBS Assistance Data Elements .....	283
–	<i>TBS-AssistanceDataList</i> .....	283
–	<i>MBS-AlmanacAssistance</i> .....	283
–	<i>MBS-AcquisitionAssistance</i> .....	284
6.5.4.9	TBS Assistance Data Request .....	284
–	<i>TBS-RequestAssistanceData</i> .....	284
6.5.5	Sensor based Positioning .....	285
6.5.5.0	Introduction .....	285
6.5.5.1	Sensor Location Information .....	285
–	<i>Sensor-ProvideLocationInformation</i> .....	285

6.5.5.2	Sensor Location Information Elements .....	285
–	<i>Sensor-MeasurementInformation</i> .....	285
–	<i>Sensor-MotionInformation</i> .....	286
6.5.5.3	Sensor Location Information Request .....	287
–	<i>Sensor-RequestLocationInformation</i> .....	287
6.5.5.4	Sensor Capability Information .....	288
–	<i>Sensor-ProvideCapabilities</i> .....	288
6.5.5.5	Sensor Capability Information Request .....	289
–	<i>Sensor-RequestCapabilities</i> .....	289
6.5.5.6	Sensor Error Elements .....	289
–	<i>Sensor-Error</i> .....	289
–	<i>Sensor-LocationServerErrorCauses</i> .....	289
–	<i>Sensor-TargetDeviceErrorCauses</i> .....	290
6.5.5.7	Sensor Assistance Data .....	290
–	<i>Sensor-ProvideAssistanceData</i> .....	290
6.5.5.8	Sensor Assistance Data Elements .....	290
–	<i>Sensor-AssistanceDataList</i> .....	290
6.5.5.9	Sensor Assistance Data Request .....	291
–	<i>Sensor-RequestAssistanceData</i> .....	291
6.5.6	WLAN-based Positioning .....	292
6.5.6.1	WLAN Location Information .....	292
–	<i>WLAN-ProvideLocationInformation</i> .....	292
6.5.6.2	WLAN Location Information Elements .....	292
–	<i>WLAN-MeasurementInformation</i> .....	292
6.5.6.3	WLAN Location Information Request .....	293
–	<i>WLAN-RequestLocationInformation</i> .....	293
6.5.6.4	WLAN Capability Information .....	294
–	<i>WLAN-ProvideCapabilities</i> .....	294
6.5.6.5	WLAN Capability Information Request .....	295
–	<i>WLAN-RequestCapabilities</i> .....	295
6.5.6.6	WLAN Error Elements .....	295
–	<i>WLAN-Error</i> .....	295
–	<i>WLAN-LocationServerErrorCauses</i> .....	295
–	<i>WLAN-TargetDeviceErrorCauses</i> .....	296
6.5.7	Bluetooth-based Positioning .....	299
6.5.7.1	Bluetooth Location Information .....	299
–	<i>BT-ProvideLocationInformation</i> .....	299
6.5.7.2	Bluetooth Location Information Elements .....	299
–	<i>BT-MeasurementInformation</i> .....	299
6.5.7.3	Bluetooth Location Information Request .....	300
–	<i>BT-RequestLocationInformation</i> .....	300
6.5.7.4	Bluetooth Capability Information .....	300
–	<i>BT-ProvideCapabilities</i> .....	300
6.5.7.5	Bluetooth Capability Information Request .....	301
–	<i>BT-RequestCapabilities</i> .....	301
6.5.7.6	BT Error Elements .....	301
–	<i>BT-Error</i> .....	301
–	<i>BT-LocationServerErrorCauses</i> .....	301
–	<i>BT-TargetDeviceErrorCauses</i> .....	302
6.5.8	NR UL Positioning .....	302
6.5.8.1	NR UL Capability Information .....	302
–	<i>NR-UL-ProvideCapabilities</i> .....	302
6.5.8.2	NR UL Capability Information Request .....	303
–	<i>NR-UL-RequestCapabilities</i> .....	303
6.5.9	NR E-CID Positioning .....	303
6.5.9.1	NR E-CID Location Information .....	303
–	<i>NR-ECID-ProvideLocationInformation</i> .....	303
6.5.9.2	NR E-CID Location Information Elements .....	303
–	<i>NR-ECID-SignalMeasurementInformation</i> .....	303
6.5.9.3	NR E-CID Location Information Request .....	304
–	<i>NR-ECID-RequestLocationInformation</i> .....	304
6.5.9.4	NR E-CID Capability Information .....	305

–	<i>NR-ECID-ProvideCapabilities</i> .....	305
6.5.9.5	NR E-CID Capability Information Request .....	305
–	<i>NR-ECID-RequestCapabilities</i> .....	305
6.5.9.6	NR E-CID Error Elements .....	306
–	<i>NR-ECID-Error</i> .....	306
–	<i>NR-ECID-LocationServerErrorCauses</i> .....	306
–	<i>NR-ECID-TargetDeviceErrorCauses</i> .....	306
6.5.10	NR DL-TDOA Positioning.....	307
6.5.10.1	NR DL-TDOA Assistance Data.....	307
–	<i>NR-DL-TDOA-ProvideAssistanceData</i> .....	307
6.5.10.2	NR DL-TDOA Assistance Data Request .....	308
–	<i>NR-DL-TDOA-RequestAssistanceData</i> .....	308
6.5.10.3	NR DL-TDOA Location Information .....	309
–	<i>NR-DL-TDOA-ProvideLocationInformation</i> .....	309
6.5.10.4	NR DL-TDOA Location Information Elements.....	309
–	<i>NR-DL-TDOA-SignalMeasurementInformation</i> .....	309
–	<i>NR-DL-TDOA-LocationInformation</i> .....	312
6.5.10.5	NR DL-TDOA Location Information Request.....	313
–	<i>NR-DL-TDOA-RequestLocationInformation</i> .....	313
6.5.10.6	NR DL-TDOA Capability Information.....	314
–	<i>NR-DL-TDOA-ProvideCapabilities</i> .....	314
6.5.10.6a	NR DL-TDOA Capability Information Elements .....	316
–	<i>NR-DL-TDOA-MeasurementCapability</i> .....	316
6.5.10.7	NR DL-TDOA Capability Information Request .....	317
–	<i>NR-DL-TDOA-RequestCapabilities</i> .....	317
6.5.10.8	NR DL-TDOA Error Elements .....	317
–	<i>NR-DL-TDOA-Error</i> .....	317
–	<i>NR-DL-TDOA-LocationServerErrorCauses</i> .....	318
–	<i>NR-DL-TDOA-TargetDeviceErrorCauses</i> .....	318
6.5.11	NR DL-AoD Positioning .....	318
6.5.11.1	NR DL-AoD Assistance Data .....	318
–	<i>NR-DL-AoD-ProvideAssistanceData</i> .....	318
6.5.11.2	NR DL-AoD Assistance Data Request .....	319
–	<i>NR-DL-AoD-RequestAssistanceData</i> .....	319
6.5.11.3	NR DL-AoD Location Information.....	320
–	<i>NR-DL-AoD-ProvideLocationInformation</i> .....	320
6.5.11.4	NR DL-AoD Location Information Elements.....	321
–	<i>NR-DL-AoD-SignalMeasurementInformation</i> .....	321
–	<i>NR-DL-AoD-LocationInformation</i> .....	323
6.5.11.5	NR DL-AoD Location Information Request.....	323
–	<i>NR-DL-AoD-RequestLocationInformation</i> .....	323
6.5.11.6	NR DL-AoD Capability Information .....	324
–	<i>NR-DL-AoD-ProvideCapabilities</i> .....	324
6.5.11.6a	NR DL-AoD Capability Information Elements .....	326
–	<i>NR-DL-AoD-MeasurementCapability</i> .....	326
6.5.11.7	NR DL-AoD Capability Information Request .....	327
–	<i>NR-DL-AoD-RequestCapabilities</i> .....	327
6.5.11.8	NR DL-AoD Error Elements.....	327
–	<i>NR-DL-AoD-Error</i> .....	327
–	<i>NR-DL-AoD-LocationServerErrorCauses</i> .....	328
–	<i>NR-DL-AoD-TargetDeviceErrorCauses</i> .....	328
6.5.12	NR Multi-RTT Positioning.....	328
6.5.12.1	NR Multi-RTT Assistance Data.....	328
–	<i>NR-Multi-RTT-ProvideAssistanceData</i> .....	328
6.5.12.2	NR Multi-RTT Assistance Data Request .....	329
–	<i>NR-Multi-RTT-RequestAssistanceData</i> .....	329
6.5.12.3	NR Multi-RTT Location Information .....	330
–	<i>NR-Multi-RTT-ProvideLocationInformation</i> .....	330
6.5.12.4	NR Multi-RTT Location Information Elements.....	330
–	<i>NR-Multi-RTT-SignalMeasurementInformation</i> .....	330
6.5.12.5	NR Multi-RTT Location Information Request.....	334
–	<i>NR-Multi-RTT-RequestLocationInformation</i> .....	334

6.5.12.6	NR Multi-RTT Capability Information.....	335
–	<i>NR-Multi-RTT-ProvideCapabilities</i> .....	335
6.5.12.6a	NR Multi-RTT Capability Information Elements .....	337
–	<i>NR-Multi-RTT-MeasurementCapability</i> .....	337
6.5.12.7	NR Multi-RTT Capability Information Request .....	338
–	<i>NR-Multi-RTT-RequestCapabilities</i> .....	338
6.5.12.8	NR Multi-RTT Error Elements .....	339
–	<i>NR-Multi-RTT-Error</i> .....	339
–	<i>NR-Multi-RTT-LocationServerErrorCauses</i> .....	339
–	<i>NR-Multi-RTT-TargetDeviceErrorCauses</i> .....	339
6.6	Multiplicity and type constraint values .....	340
–	<i>Multiplicity and type constraint definitions</i> .....	340
–	<i>End of LPP-PDU-Definitions</i> .....	340
7	Broadcast of assistance data .....	341
7.1	General .....	341
7.2	Mapping of <i>posSibType</i> to assistance data element.....	341
7.3	Procedures related to broadcast information elements .....	342
7.4	Broadcast information elements .....	344
7.4.1	Basic production .....	344
–	<i>LPP-Broadcast-Definitions</i> .....	344
7.4.2	Element definitions .....	344
–	<i>AssistanceDataSIBelement</i> .....	344
–	<i>OTDOA-UE-Assisted</i> .....	345
–	<i>NR-UEB-TRP-LocationData</i> .....	346
–	<i>NR-UEB-TRP-RTD-Info</i> .....	346
–	<i>End of LPP-Broadcast-Definitions</i> .....	346
7.5	Broadcast ciphering (informative).....	346
<b>Annex A (informative):</b>	<b>Change History .....</b>	<b>349</b>
History .....		354

ETSI TS 137 355 V17.9.0 (2025-01)

<https://standards.iteh.ai/catalog/standards/etsi/4a9e7c48-b8c6-4fc7-8c8a-b231708bcf5e/etsi-ts-137-355-v17-9-0-2025-01>

---

# Foreword

This Technical Specification has been produced by the 3<sup>rd</sup> Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

**iTeh Standards**  
**(<https://standards.iteh.ai>)**  
**Document Preview**

[ETSI TS 137 355 V17.9.0 \(2025-01\)](https://standards.iteh.ai/catalog/standards/etsi/4a9e7c48-b8c6-4fc7-8c8a-b231708bcf5e/etsi-ts-137-355-v17-9-0-2025-01)

<https://standards.iteh.ai/catalog/standards/etsi/4a9e7c48-b8c6-4fc7-8c8a-b231708bcf5e/etsi-ts-137-355-v17-9-0-2025-01>