

# 3GPP TS 36.571-2 V1.0.0 (2011-09)

---

*Technical Specification*

**3rd Generation Partnership Project;  
Technical Specification Group Radio Access Network;  
Evolved Universal Terrestrial Radio Access (E-UTRA)  
and Evolved Packet Core (EPC);  
User Equipment (UE) conformance specification for  
UE positioning;  
Part 2: Protocol conformance;  
(Release 9)**



Keywords

---

<keyword[, keyword, ...]>

**3GPP**

---

Postal address

---

3GPP support office address

---

650 Route des Lucioles - Sophia Antipolis  
Valbonne - FRANCE  
Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

---

Internet

---

<http://www.3gpp.org>

---

**Copyright Notification**

No part may be reproduced except as authorized by written permission.  
The copyright and the foregoing restriction extend to reproduction in all media.

© 2010, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TTA, TTC).  
All rights reserved.

UMTS™ is a Trade Mark of ETSI registered for the benefit of its members  
3GPP™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners  
LTE™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners  
GSM® and the GSM logo are registered and owned by the GSM Association

# Contents

Foreword .....	5
Introduction .....	5
1 Scope .....	6
2 References.....	6
3 Definitions and abbreviations .....	7
3.1 Definitions .....	7
3.2 Abbreviations.....	7
4 Default Conditions .....	7
4.1 LCS Sub-Test Cases.....	7
4.2 Default signal conditions.....	8
4.2.1 Simulated GNSS environment .....	8
4.2.2 Simulated OTDOA environment.....	8
4.2.3 Simulated ECID environment .....	8
4.3 Default RRC and NAS message and information elements contents.....	8
- ATTACH ACCEPT .....	9
4.4 Default LPP message and information elements contents.....	9
- LPP REQUEST CAPABILITIES .....	10
- LPP PROVIDE ASSISTANCE DATA .....	11
- LPP REQUEST LOCATION INFORMATION .....	12
- A-GNSS REQUEST LOCATION INFORMATION .....	13
- OTDOA REQUEST LOCATION INFORMATION .....	13
- ECID REQUEST LOCATION INFORMATION .....	13
4.4.1 Default assistance data information elements .....	13
- GNSS REFERENCE TIME.....	14
- GNSS REFERENCE LOCATION .....	14
- GNSS IONOSPHERIC MODEL .....	15
- GNSS TIME MODEL .....	15
- GNSS NAVIGATION MODEL .....	15
- GNSS ACQUISITION ASSISTANCE.....	16
- GNSS ALMANAC.....	16
- GNSS UTC MODEL .....	16
- GNSS AUXILIARY INFORMATION .....	17
- OTDOA REFERENCE CELL INFO .....	17
- OTDOA NEIGHBOUR CELL INFO LIST .....	18
5 NAS Protocol Procedures .....	18
5.1 UE Network Capability .....	18
6 LCS Procedures.....	22
6.1 Location Notification and Privacy Verification .....	22
6.1.1 Location Notification.....	22
6.1.2 Privacy Verification – Location Allowed if no Response.....	25
6.1.3 Privacy Verification – Location not Allowed if No Response.....	31
6.2 EPC-MO-LR .....	36
6.2.1 Autonomous Self Location: UE-based.....	36
6.2.2 Basic Self Location: UE-assisted.....	42
7 LPP Procedures.....	53
7.1 LPP Common Procedures .....	53
7.1.1 Position Capability Transfer.....	53
7.2 LPP Transport.....	61
7.2.1 LPP Duplicated Message.....	61
7.2.2 LPP Acknowledgment.....	65
7.2.3 LPP Retransmission.....	71
7.3 LPP Error Handling.....	75

7.3.1	LPP Requested Method not Supported – UE-Assisted.....	75
7.4	LPP Positioning Procedures .....	81
7.4.1	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Based.....	81
7.4.2	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted.....	81
7.4.3	E-SMLC Initiated Position Measurement without assistance data: UE-Based .....	81
7.4.4	E-SMLC Initiated Position Measurement without assistance data: UE-Assisted.....	81
7.5	LPP Abort .....	81
7.5.1	E-SMLC initiated Abort.....	81
7.6	LPP Positioning Error.....	84
7.6.1	Error - Not Enough Reference Source Signals .....	84
8	Circuit Switched (CS) Fallback .....	84
8.1	MO-LR Procedure .....	84
8.1.1	CS fallback: Network does not support EPC-MO-LR.....	84
8.1.2	CS fallback: UE does not support EPC-MO-LR .....	87
<b>Annex A (informative): Change history .....</b>		<b>91</b>

---

## 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.

---

## Introduction

The present document is part 2 of a multi-parts TS:

3GPP TS 36.571-1: Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification for UE positioning; Part 1: Terminal conformance.

**3GPP TS 36.571-2: Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification for UE positioning; Part 2: Protocol conformance.**

3GPP TS 36.571-3: Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification for UE positioning; Part 3: Implementation Conformance Statement (ICS).

3GPP TS 36.571-4: Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification for UE positioning; Part 4: Test suites.

3GPP TS 37.571-5: Universal Terrestrial Radio Access (UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification for UE positioning; Part 5: Test scenarios and assistance data.

---

# 1 Scope

The present document specifies the protocol conformance testing for the 3<sup>rd</sup> Generation E-UTRAN User Equipment (UE) supporting UE positioning.

This is the second part of a multi-part test specification. The following information can be found in this part:

- the overall protocol conformance test structure;
- the protocol conformance test configurations;
- the conformance requirement and reference to the core specifications;
- the test purposes; and
- a brief description of the test procedure, the specific test requirements and short message exchange table.

The Implementation Conformance Statement (ICS) pro-forma could be found in the 3<sup>rd</sup> part of the present document.

The present document is valid for UE implemented according to 3GPP Release 9.

---

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 23.271: "Functional stage 2 description of Location Services (LCS)".
- [3] 3GPP TS 36.305: "Stage 2 functional specification of User Equipment (UE) positioning in E-UTRAN".
- [4] 3GPP TS 36.355: "LTE Positioning Protocol (LPP)".
- [5] 3GPP TS 24.171: "Control Plane Location Services (LCS) procedures in the Evolved Packet System (EPS)".
- [6] 3GPP TS 24.030: "Location Services (LCS); Supplementary service operations; Stage 3".
- [7] 3GPP TS 24.080: "Mobile radio interface layer 3 supplementary services specification; Formats and coding".
- [8] 3GPP TS 36.508: "Common test environments for User Equipment (UE)".
- [9] 3GPP TS 36.571-1: "User Equipment (UE) conformance specification for UE positioning; Part 1: Terminal conformance".
- [10] 3GPP TS 36.571-3: "User Equipment (UE) conformance specification for UE positioning; Part 3: Implementation Conformance Statement (ICS)".
- [11] 3GPP TS 36.571-4: "User Equipment (UE) conformance specification for UE positioning; Part 4: Test suites".

- [12] 3GPP TS 37.571-5: "User Equipment (UE) conformance specification for UE positioning; Part 5: Test scenarios and assistance data".
- [13] 3GPP TS 36.509: "Special conformance testing functions for User Equipment (UE)".
- [14] 3GPP TS 34.123-1: "User Equipment (UE) conformance specification; Part 1: Protocol conformance specification".
- [15] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".

## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1], TS 23.271 [2], TS 36.305 [3], TS 36.355 [4] apply.

### 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

DL	Downlink
LCS	Location Services
LPP	LTE Positioning Protocol
MO-LR	Mobile Originated Location Request
NAS	Non-Access-Stratum
NI-LR	Network Induced Location Request
UL	Uplink

## 4 Default Conditions

### 4.1 LCS Sub-Test Cases

Some test cases defined in this specification may include several sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a sub-test case number as defined in Table 4.1-1. The applicable sub-tests for each test case are specified in the test procedure sequence clause of each test case. If no sub-tests are defined for a specific test case it means that this particular test case is not dependent on a specific positioning method.

**Table 4.1-1: Sub-Test Case Numbers**

Sub-Test Case Number	Supported Positioning Methods
1	UE supporting GNSS with A-GPS only
2	UE supporting GNSS with A-GLONASS only
3	UE supporting GNSS with A-Galileo only
4	UE supporting GNSS with A-GPS and A-GLONASS only
5	UE supporting OTDOA
6	UE supporting ECID
7	UE supporting GNSS <sup>(1)</sup> and OTDOA
NOTE 1: Any GNSS of GPS, GLONASS, Galileo (FFS)	

## 4.2 Default signal conditions

### 4.2.1 Simulated GNSS environment

During A-GNSS signalling tests (Sub-tests 1-4, 7) the SS shall generate all UE supported satellite signals and shall provide assistance data dependent on UE capabilities defined in sub-clause 4.4.1.1. The levels of the simulated satellites shall be at -125 dBm +/- 6 dBm.

GNSS scenarios together with associated assistance data are defined in TS 37.571-5 [12].

The accuracy of the GNSS time in the provided assistance data shall be within +/- 2 seconds relative to the GNSS time in the system simulator.

### 4.2.2 Simulated OTDOA environment

For OTDOA signalling test cases a multi cell environment with Cell 1, Cell 2 and Cell 4 is used, as defined in 3GPP TS 36.508 [8].

All cells transmit PRS according to the PRS configuration provided in the OTDOA assistance data defined in subclause 4.4.1.2. The positioning subframes are low-interference subframes, i.e. contain no PDSCH transmissions.

Normal propagation condition is used for all cells. Cell 1 is the serving cell, and Cells 2 and 4 are neighbor cells.

The three Cells 1,2 and 4 shall be synchronized, and the timing offset between the cells, referenced to the UE's antenna input, shall be less than [ $\pm 30$ ] ns.

The E-UTRA frequency to be tested and other default conditions are as specified for signalling test cases in 3GPP TS 36.508 [8].

The true RSTD as observed at the UE antenna input is set equal to the *expectedRSTD* value provided in the OTDOA assistance data, as defined in sub-clause 4.4.1.2.

OTDOA assistance data are defined in TS 37.571-5 [12].

### 4.2.3 Simulated ECID environment

FFS

## 4.3 Default RRC and NAS message and information elements contents

The default values of common RRC and NAS messages and information elements are used as defined in 3GPP TS 36.508 [8] with the following exceptions.



- ATTACH ACCEPT

Table 4.3-1: ATTACH ACCEPT

Derivation Path: 24.301 clause 8.2.1			
Information Element	Value/remark	Comment	Condition
EPS network feature support	Set according to Table 4.3-2		

Table 4.3-2: EPS network feature support

Derivation Path: 24.301 clause 9.9.3.12A			
Information Element	Value/remark	Comment	Condition
IMS voice over PS session indicator (IMS VoPS) (octet 3, bit 1)			
Emergency bearer services indicator (EMC BS) (octet 3, bit 2)			
Location services indicator in EPC (EPC-LCS) (octet 3, bit 3)	1	location services via EPC supported	
Location services indicator in CS (CS-LCS) (octet 3, bit 4 to 5)	01	location services via CS domain not supported	

## 4.4 Default LPP message and information elements contents

This clause contains the default values of LPP messages and information elements used, unless indicated otherwise in specific clauses of this specification.

## LPP REQUEST CAPABILITIES

Table 4.4-1: RequestCapabilities

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
Initiator	locationServer		
transactionNumber	(0..255)		
}			
endTransaction	FALSE		
sequenceNumber	Not present		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestCapabilities-r9 SEQUENCE {			
commonIEsRequestCapabilities	Not present		
a-gnss-RequestCapabilities SEQUENCE {			
gnss-SupportListReq	TRUE		
assistanceDataSupportListReq	TRUE		
locationVelocityTypesReq	TRUE		
}			
otdoa-RequestCapabilities SEQUENCE {	Present		
}			
ecid-RequestCapabilities SEQUENCE {	Present		
}			
epdu-RequestCapabilities	Not present		
}			
}			
}			
}			
}			
}			

## - LPP PROVIDE ASSISTANCE DATA

Table 4.4-2: ProvideAssistanceData

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {	Dependent on test case.		
initiator			
transactionNumber			
}			
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideAssistanceData-r9 SEQUENCE {			
commonIEsProvideAssistanceData	Not present		
a-gnss-ProvideAssistanceData SEQUENCE {			Sub-tests 1-4, and 7 only, and as defined in Table 4.4.1.1-1.
gnss-CommonAssistanceData SEQUENCE {			
gnss-ReferenceTime	As defined in Table 4.4.1.1-2		
gnss-ReferenceLocation	As defined in Table 4.4.1.1-3		
gnss-IonosphericModel	As defined in Table 4.4.1.1-4		
gnss-EarthOrientationParameters	Not present		
}			
gnss-GenericAssistanceData(SIZE(1..2))OF{	SIZE 1: Sub-tests 1,2,3 SIZE 2: Sub-test 4		
gnss-ID	Dependent on test case.		
sbas-ID	Not present		
gnss-TimeModels	As defined in Table 4.4.1.1-5		
gnss-DifferentialCorrections	Not present		
gnss-NavigationModel	As defined in Table 4.4.1.1-6		
gnss-RealTimeIntegrity	Not present		
gnss-DataBitAssistance	Not present		
gnss-AcquisitionAssistance	As defined in Table 4.4.1.1-7		
gnss-Almanac	As defined in Table 4.4.1.1-8		
gnss-UTC-Model	As defined in Table 4.4.1.1-9		
gnss-AuxiliaryInformation	As defined in Table 4.4.1.1-10		
}			
gnss-Error	Not present		
}			
otdoa-ProvideAssistanceData SEQUENCE {			Subtest 5 and 7 only
otdoa-ReferenceCellInfo	As defined in Table 4.4.1.2-1		
otdoa-NeighbourCellInfo	As defined in Table 4.4.1.2-2		
otdoa-Error	Not present		
}			



- A-GNSS REQUEST LOCATION INFORMATION

**Table 4.4-5: A-GNSS-RequestLocationInformation**

Derivation Path: 36.355 clause 6.5.2.7			
Information Element	Value/remark	Comment	Condition
A-GNSS-RequestLocationInformation ::= SEQUENCE			
{			
gnss-PositioningInstructions SEQUENCE {			
gnss-Methods SEQUENCE {			
gnss-ids	Sub-test 1: bit 0 = 1 Sub-test 2: bit 4 = 1 Sub-test 3: bit 3 = 1 Sub-test 4: bits 0 & 4 = 1 Sub-test 7: any (FFS)		
}			
fineTimeAssistanceMeasReq	FALSE		
adrMeasReq	FALSE		
multiFreqMeasReq	FALSE		
assistanceAvailability	FALSE		
}			
}			

- OTDOA REQUEST LOCATION INFORMATION

**Table 4.4-6: OTDOA-RequestLocationInformation**

Derivation Path: 36.355 clause 6.5.1.6			
Information Element	Value/remark	Comment	Condition
OTDOA-RequestLocationInformation ::= SEQUENCE			
{			
assistanceAvailability	FALSE		
}			

- ECID REQUEST LOCATION INFORMATION

**Table 4.4-7: ECID-RequestLocationInformation**

Derivation Path: 36.355 clause 6.5.1.6			
Information Element	Value/remark	Comment	Condition
ECID-RequestLocationInformation ::= SEQUENCE {			
requestedMeasurements	All measurements supported by the UE		
}			

#### 4.4.1 Default assistance data information elements

##### 4.4.1.1 GNSS Assistance Data Elements

Table 4.4.1.1-1 defines the GNSS assistance data elements which shall be provided to the UE in the tests in LPP Provide Assistance Data messages in absence of a corresponding LPP Request Assistance Data message. The GNSS assistance data provided depends on the mode being used in the test case, the assistance data supported by the UE and the GNSSs supported by the UE. GNSS assistance data IEs not supported by the UE shall not be sent. GNSS assistance data IEs supported by the UE but not listed in Table 4.4.1.1-1 shall not be sent.

Table 4.4.1.1-1: GNSS assistance data to be provided to the UE

GNSS Assistance Data IE supported by UE	Mode used in test case		
	UE-based	UE-assisted, GNSS-Acquisition Assistance supported by UE	UE-assisted, GNSS-Acquisition Assistance not supported by UE
GNSS-ReferenceTime	Yes	Yes	Yes
GNSS-ReferenceLocation	Yes	No	Yes
GNSS-IonosphericModel	Yes	No	No
GNSS-TimeModelList	Yes <sup>(1)</sup>	No	Yes <sup>(1)</sup>
GNSS-NavigationModel	Yes	No	Yes
GNSS-AcquisitionAssistance	No	Yes	No
GNSS-Almanac	No	No	Yes
GNSS-UTC-Model	Yes <sup>(1)</sup>	No	No
GNSS-AuxiliaryInformation	Yes <sup>(2)</sup>	Yes <sup>(2)</sup>	Yes <sup>(2)</sup>
NOTE 1: Sub-test 4 only.			
NOTE 2: Sub-tests 2 and 4, and if UE supports multiple signals per GNSS only.			

## - GNSS REFERENCE TIME

Table 4.4.1.1-2: GNSS-ReferenceTime

Derivation Path: 36.355 clause 6.5.2.2			
Information Element	Value/remark	Comment	Condition
GNSS-ReferenceTime ::= SEQUENCE {			
gnss-SystemTime SEQUENCE {			
gnss-TimeID	Sub-test 1: gps (0) Sub-test 2: glonass (4) Sub-test 3: galileo (3) Sub-test 4: gps (0)		
gnss-DayNumber	As defined in 37.571-5 [12]		
gnss-TimeOfDay	As defined in 37.571-5 [12]		
gnss-TimeOfDayFrac-msec	Not present		
notificationOfLeapSecond	As defined in 37.571-5 [12]		Sub-test 2 only
gps-TOW-Assist	As defined in 37.571-5 [12]		Sub-tests 1 and 4 only
}			
referenceTimeUnc	116	1.9950 seconds	
gnss-ReferenceTimeForCells	Not present		
}			

## - GNSS REFERENCE LOCATION

Table 4.4.1.1-3: GNSS-ReferenceLocation

Derivation Path: 36.355 clause 6.5.2.2			
Information Element	Value/remark	Comment	Condition
GNSS-ReferenceLocation ::= SEQUENCE {			
threeDlocation	As defined in 37.571-5 [12]		
}			

## - GNSS IONOSPHERIC MODEL

Table 4.4.1.1-4: *GNSS-IonosphericModel*

Derivation Path: 36.355 clause 6.5.2.2			
Information Element	Value/remark	Comment	Condition
GNSS-IonosphericModel ::= SEQUENCE {			
klobucharModel	As defined in 37.571-5 [12]		Sub-tests 1 and 4
neQuickModel	As defined in 37.571-5 [12]		Sub-test 3
}			

## - GNSS TIME MODEL

Table 4.3.1.1-5: *GNSS-TimeModelList*

Derivation Path: 36.355 clause 6.5.2.2			
Information Element	Value/remark	Comment	Condition
GNSS-TimeModelList ::= SEQUENCE (SIZE (1)) OF {			
gnss-TimeModelRefTime	As defined in 37.571-5 [12]		
tA0	As defined in 37.571-5 [12]		
tA1	As defined in 37.571-5 [12]		
tA2	As defined in 37.571-5 [12]		
gnss-TO-ID	4	GLONASS	Sub-test 4
weekNumber	As defined in 37.571-5 [12]		
deltaT	As defined in 37.571-5 [12]		
}			

## - GNSS NAVIGATION MODEL

Table 4.4.1.1-6: *GNSS-NavigationModel*

Derivation Path: 36.355 clause 6.5.2.2			
Information Element	Value/remark	Comment	Condition
GNSS-NavigationModel ::= SEQUENCE {			
nonBroadcastFlag	0		
gnss-SatelliteList	SEQUENCE (SIZE(1..64)) OF {		
svID	SIZE defined in 37.571-5 [12]		
svHealth	As defined in 37.571-5 [12]		
iod	As defined in 37.571-5 [12]		
gnss-ClockModel	CHOICE {		
standardClockModelList	As defined in 37.571-5 [12]		Sub-test 3
nav-ClockModel	As defined in 37.571-5 [12]		Sub-tests 1,4
cnav-ClockModel	As defined in 37.571-5 [12]		
glonass-ClockModel	As defined in 37.571-5 [12]		Sub-tests 2,4
sbas-ClockModel	As defined in 37.571-5 [12]		
}			
gnss-OrbitModel	CHOICE {		
keplerianSet	As defined in 37.571-5 [12]		Sub-test 3
nav-KeplerianSet	As defined in 37.571-5 [12]		Sub-tests 1,4
cnav-KeplerianSet	As defined in 37.571-5 [12]		
glonass-ECEF	As defined in 37.571-5 [12]		Sub-tests 2,4
sbas-ECEF	As defined in 37.571-5 [12]		
}			
}			
}			

## - GNSS ACQUISITION ASSISTANCE

Table 4.4.1.1-7: GNSS-Acquisition Assistance

Derivation Path: 36.355 clause 6.5.2.2			
Information Element	Value/remark	Comment	Condition
GNSS-AcquisitionAssistance ::= SEQUENCE {			
gnss-SignalID	As defined in 37.571-5 [12]		
gnss-AcquisitionAssistList (SIZE(1..64)) OF {	SIZE defined in 37.571-5 [12]		
svID	As defined in 37.571-5 [12]		
doppler0	As defined in 37.571-5 [12]		
doppler1	As defined in 37.571-5 [12]		
dopplerUncertainty	As defined in 37.571-5 [12]		
codePhase	As defined in 37.571-5 [12]		
intCodePhase	As defined in 37.571-5 [12]		
codePhaseSearchWindow	As defined in 37.571-5 [12]		
azimuth	As defined in 37.571-5 [12]		
elevation	As defined in 37.571-5 [12]		
codePhase1023	As defined in 37.571-5 [12]		
}			
}			

## - GNSS ALMANAC

Table 4.4.1.1-8: GNSS-Almanac

Derivation Path: 36.355 clause 6.5.2.2			
Information Element	Value/remark	Comment	Condition
GNSS-Almanac ::= SEQUENCE {			
weekNumber	As defined in 37.571-5 [12]		
toa	As defined in 37.571-5 [12]		
iota	As defined in 37.571-5 [12]		
completeAlmanacProvided	TRUE		
gnss-AlmanacList (SIZE(1..64)) OF CHOICE {	SIZE defined in 37.571-5 [12]		
keplerianAlmanacSet	As defined in 37.571-5 [12]		Sub-test 3
keplerianNAV-Almanac	As defined in 37.571-5 [12]		Sub-tests 1,4
keplerianReducedAlmanac	As defined in 37.571-5 [12]		
keplerianMidiAlmanac	As defined in 37.571-5 [12]		
keplerianGLONASS	As defined in 37.571-5 [12]		Sub-test 2, 4
ecef-SBAS-Almanac	As defined in 37.571-5 [12]		
}			
}			

## - GNSS UTC MODEL

Table 4.4.1.1-9: GNSS-UTC-Model

Derivation Path: 36.355 clause 6.5.2.2			
Information Element	Value/remark	Comment	Condition
GNSS-UTC-Model ::= CHOICE {			
utcModel1	As defined in 37.571-5 [12]		Sub-test 1, 3, 4
utcModel2	As defined in 37.571-5 [12]		
utcModel3	As defined in 37.571-5 [12]		Sub-test 2, 4
utcModel4	As defined in 37.571-5 [12]		
}			



## - GNSS AUXILIARY INFORMATION

**Table 4.4.1.1-10: GNSS-AuxiliaryInformation**

Derivation Path: 36.355 clause 6.5.2.2			
Information Element	Value/remark	Comment	Condition
GNSS-AuxiliaryInformation ::= CHOICE {			
gnss-ID-GPS	As defined in 37.571-5 [12]		Sub-test 1, 4
gnss-ID-GLONASS	As defined in 37.571-5 [12]		Sub-test 2, 4
}			

## 4.4.1.2 OTDOA Assistance Data Elements

This sub-clause defines the OTDOA assistance data elements which shall be provided to the UE in the tests in LPP Provide Assistance Data messages.

## - OTDOA REFERENCE CELL INFO

**Table 4.4.1.2-1: OTDOA-ReferenceCellInfo**

Derivation Path: 36.355 clause 6.5.1.2			
Information Element	Value/remark	Comment	Condition
OTDOA-ReferenceCellInfo ::= SEQUENCE {			
physCellId	0	Cell 1	
cellGlobalId	'0000 0000'B		
earfcnRef	Not present	Same as the serving cell	
antennaPortConfig	Not present	Same as the serving cell	
cpLength	Normal		
prsInfo SEQUENCE {			
prs-Bandwidth	PRS are transmitted over the used system bandwidth (see sub-clause 4.2.2)		
prs-ConfigurationIndex	2		
numDL-Frames	sf-1		
prs-MutingInfo-r9	Not present	PRS muting is not used.	
}			
}			

## - OTDOA NEIGHBOUR CELL INFO LIST

Table 4.4.1.2-2: OTDOA-NeighbourCellInfoList

Derivation Path: 36.355 clause 6.5.1.2			
Information Element	Value/remark	Comment	Condition
OTDOA-NeighbourCellInfoList ::= SEQUENCE (SIZE(1)) OF SEQUENCE {			
SEQUENCE (SIZE(2)) OF SEQUENCE {		Cell 2	
physCellId	2		
cellGlobalId	'0000 0010'B		
earfcn	Not present	Same as for the reference cell	
cpLength	Not present	Same as for the reference cell	
prsInfo	Not present	Same as for the reference cell	
antennaPortConfig	Not present	Same as for the reference cell	
slotNumberOffset	Not present	Slot timing is the same as for reference cell	
prs-SubframeOffset	Not present		
expectedRSTD	8192	Value 0	
expectedRSTD-Uncertainty	10	About 1 $\mu$ s	
}			
SEQUENCE {		Cell 4	
physCellId	4		
cellGlobalId	'0000 0100'B		
earfcn	Not present	Same as for the reference cell	
cpLength	Not present	Same as for the reference cell	
prsInfo	Not present	Same as for the reference cell	
antennaPortConfig	Not present	Same as for the reference cell	
slotNumberOffset	Not present	Slot timing is the same as for reference cell	
prs-SubframeOffset	Not present		
expectedRSTD	8192	Value 0	
expectedRSTD-Uncertainty	10	About 1 $\mu$ s	
}			
}			
}			

---

## 5 NAS Protocol Procedures

### 5.1 UE Network Capability

#### 5.1.1 Test Purpose (TP)

(1)

```
with { the UE having received an RRCConnectionSetup message. }
ensure that {
  when { the UE transmits ATTACH REQUEST }
  then { the UE correctly sets UE Network Capability IE values for LCS and LPP }
```

}

## 5.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.171 clause 4.2.1 and TS 24.301 clause 9.9.3.3.

[TS 24.171, clause 4.2.1]

The UE announces to the network its ability to support LCS notification mechanism and/or LPP messages using the UE Network Capability IE defined in 3GPP TS 24.301.

[TS 24.301, clause 9.9.3.3]

The purpose of the UE network capability information element is to provide the network with information concerning aspects of the UE related to EPS or interworking with GPRS. The contents might affect the manner in which the network handles the operation of the UE. The UE network capability information indicates general UE characteristics and it shall therefore, except for fields explicitly indicated, be independent of the frequency band of the channel it is sent on.

...

## 5.1.3 Test description

### 5.1.3.1 Pre-test conditions

System Simulator:

- Cell 1.

UE:

-

Preamble:

- the UE is in state Switched OFF (state 1) according to 3GPP 36.508 [8].

Related PICS/PIXIT Statements:

-

## 5.1.3.2 Test procedure sequence

Table 5.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1		<--	RRC: SYSTEM INFORMATION (BCCH)	-	-
2	UE transmits an <i>RRCCONNECTIONREQUEST</i> message.	-->	RRC: <i>RRCCONNECTIONREQUEST</i>	-	-
3	SS transmits an <i>RRCCONNECTIONSETUP</i> message.	<--	RRC: <i>RRCCONNECTIONSETUP</i>	-	-
4	The UE transmits an <i>RRCCONNECTIONSETUPCOMPLETE</i> message to confirm the successful completion of the connection establishment and to initiate the Attach procedure by including the ATTACH REQUEST message. The PDN CONNECTIVITY REQUEST message is piggybacked in ATTACH REQUEST	-->	RRC: <i>RRCCONNECTIONSETUPCOMPLETE</i> NAS: ATTACH REQUEST NAS: PDN CONNECTIVITY REQUEST	1	P
5 to 17	Steps 5 to 17 of the registration procedure described in TS 36.508 subclause 4.5.2.3 are performed. NOTE: The UE performs registration and the RRC connection is released.				

## 5.1.3.3 Specific message contents

**Table 5.1.3.3-1: ATTACH REQUEST (step 4, Table 5.1.3.2-1)**

Derivation Path: 24.301 clause 8.2.4			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	EMM		
Security header type	'0000'B	Plain NAS message, not security protected	
Attach request message identity	'0100 0001'B	Attach request	
EPS attach type	'0001'B	EPS attach	EPS_only
	'0010'B	combined EPS/IMSI attach	combined_EPS_IMSI
NAS key set identifier	Any allowed value		
Old GUTI or IMSI	Any allowed value		
UE network capability	Set according to Table 5.1.3.3-2		
ESM message container	PDN CONNECTIVITY REQUEST message to request PDN connectivity to the default PDN		
Old P-TMSI signature	Not present or any allowed value		
Additional GUTI	Not present or any allowed value		
Last visited registered TAI	Not present or any allowed value		
DRX parameter	Not present or any allowed value		
MS network capability	Not present or any allowed value		
Old location area identification	Not present or any allowed value		
TMSI status	Not present or any allowed value		
Mobile station classmark 2	Not present or any allowed value		
Mobile station classmark 3	Not present or any allowed value		
Supported Codecs	Not present or any allowed value		
Additional update type	Not present		EPS_only
Additional update type	Not present or any allowed value		combined_EPS_IMSI

Condition	Explanation
EPS_only	See the definition below table 4.7.2-1 in TS 36.508.
combined_EPS_IMSI	See the definition below table 4.7.2-1 in TS 36.508.

NOTE: This message is sent integrity protected when a valid security context exists and without integrity protection otherwise.

Table 5.1.3.3-2: UE network capability (step 4, Table 5.1.3.2-1)

Derivation Path: 24.301 clause 9.9.3.34			
Information Element Contents	Value/remark	Comment	Condition
Octet 7, bit 3	Set according to pc_MT_LR_loc_notif	Location services (LCS) notification mechanisms capability	
Octet 7, bit 4	1 (LPP supported)	LTE Positioning Protocol (LPP) capability	
All other octets/bits	Any allowed value		

## 6 LCS Procedures

### 6.1 Location Notification and Privacy Verification

#### 6.1.1 Location Notification

##### 6.1.1.1 Test Purpose (TP)

(1)

```

with { a NAS signalling connection existing }
ensure that {
  when { UE receives a REGISTER message containing the LCS-LocationNotification Invoke component set to NotifyLocationAllowed }
  then { UE notifies the user of the location procedure and terminates the dialogue by sending a RELEASE COMPLETE message }
}

```

##### 6.1.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.171, clause 5.2.1.1.1.

[TS 24.171, clause 5.2.1.1.1]

The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

...

In the case of location notification no response is required from the UE, the UE shall terminate the dialogue by sending a RELEASE COMPLETE message containing a LocationNotification return result.

...

##### 6.1.1.3 Test description

###### 6.1.1.3.1 Pre-test conditions

System Simulator:

- Cell 1.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP 36.508 [8].

Related PICS/PIXIT Statements:

- UE supporting LCS value added location request notification capability.

#### 6.1.1.3.2 Test procedure sequence

**Table 6.1.1.3.2-1: Main behaviour**

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	<i>DLInformationTransfer</i> (REGISTER)	-	-
2	The UE notifies the user of the location procedure			1	P
3	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	<i>ULInformationTransfer</i> (RELEASE COMPLETE)	1	P

#### 6.1.1.3.3 Specific message contents

**Table 6.1.1.3.3-1: *DLInformationTransfer* (step 1, Table 6.1.1.3.2-1)**

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
<i>DLInformationTransfer</i> ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
<i>dlInformationTransfer-r8</i> SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 6.1.1.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

**Table 6.1.1.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (step 1, Table 6.1.1.3.2-1)**

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	Set according to Table 6.1.1.3.3-3	REGISTER	
Additional information	Not present.		

Table 6.1.1.3.3-3: REGISTER (step 1, Table 6.1.1.3.2-1)

Derivation Path: 24.080 Table 2.3			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Register message type	xx11 1011	REGISTER	
Facility	Invoke = Ics-LocationNotification	Set according to Table 6.1.1.3.3-4	

Table 6.1.1.3.3-4: LCS-LocationNotification (step 1, Table 6.1.1.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	Value/remark	Comment	Condition
LocationNotificationArg ::= SEQUENCE {			
notificationType	notifyLocationAllowed		
locationType	currentLocation		
IcsClientExternalID SEQUENCE {			
externalAddress	ISDN-AddressString		
}			
IcsClientName SEQUENCE {			
dataCodingScheme	USSD-DataCodingScheme		
nameString	NameString		
}			
}			

Table 6.1.1.3.3-5: ULInformationTransfer (step 3, Table 6.1.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 6.1.1.3.3-6	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			



**Table 6.1.1.3.3-6: UPLINK GENERIC NAS TRANSPORT (step 3, Table 6.1.1.3.2-1)**

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	Set according to Table 6.1.1.3.3-7	RELEASE COMPLETE	
Additional information	Not present		

**Table 6.1.1.3.3-7: RELEASE COMPLETE (step 3, Table 6.1.1.3.2-1)**

Derivation Path: 24.080 Table 2.5			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	
Facility	Return result = LocationNotificationRes	Set according to Table 6.1.1.3.3-8	

**Table 6.1.1.3.3-8: LocationNotificationRes (step 3, Table 6.1.1.3.2-1)**

Derivation Path: 24.080 clause 4.4.2			
Information Element	Value/remark	Comment	Condition
LocationNotificationRes ::= SEQUENCE {			
verificationResponse	permissionGranted		
}			

## 6.1.2 Privacy Verification – Location Allowed if no Response

### 6.1.2.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE receives a REGISTER message containing the LCS-LocationNotification Invoke component set to NotifyAndVerify-LocationAllowedIfNoResponse }
  then { UE notifies the user of the location procedure and indicates that the default response is location allowed, allows the user to accept or deny the request and terminates the dialogue by sending a RELEASE COMPLETE message with verificationResponse set as appropriate }
}
```

(2)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE receives a REGISTER message containing the LCS-LocationNotification Invoke component set to NotifyAndVerify-LocationAllowedIfNoResponse }
  then { UE notifies the user of the location procedure and indicates that the default response is location allowed, allows the user to accept or deny the request and waits for the user to respond }
}
```

### 6.1.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.171, clause 5.2.1.1.1.

[TS 24.171, clause 5.2.1.1.1]

The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

In case of privacy verification the UE shall respond to the request by sending a RELEASE COMPLETE message containing the mobile subscriber's response in a return result component.

If the timer T(LCSN) expires in the network before any response from the UE (e.g. due to no response from the user), the network shall interpret this by applying the default treatment defined in 3GPP TS 23.271 (i.e. disallow location if barred by subscription and allow location if allowed by subscription).

...

### 6.1.2.3 Test description

#### 6.1.2.3.1 Pre-test conditions

System Simulator:

- Cell 1.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP 36.508 [8].

Related PICS/PIXIT Statements:

- UE supporting LCS value added location request notification capability.
- px\_UeLcsNotification: value for UE LCS Notification timeout timer.

## 6.1.2.3.2 Test procedure sequence

Table 6.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	<i>DLInformationTransfer</i> (REGISTER)	-	-
2	SS starts timer T(LCSN) set to 90% of px_UeLcsNotification			-	-
3	The UE notifies the user of the location procedure and indicates that location will be allowed in the absence of a response			1	P
4	The user accepts the location request before timer T(LCSN) expires			-	-
5	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	<i>ULInformationTransfer</i> (RELEASE COMPLETE)	1	P
6	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	<i>DLInformationTransfer</i> (REGISTER)	-	-
7	SS starts timer T(LCSN) set to 90% of px_UeLcsNotification			-	-
8	The UE notifies the user of the location procedure and indicates that location will be allowed in the absence of a response			1	P
9	The user denies the location request before timer T(LCSN) expires			-	-
10	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	<i>ULInformationTransfer</i> (RELEASE COMPLETE)	1	P
11	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	<i>DLInformationTransfer</i> (REGISTER)	-	-
12	SS starts timer T(LCSN) set to 90% of px_UeLcsNotification			-	-
13	The UE notifies the user of the location procedure and indicates that location will be allowed in the absence of a response			2	P
14	The user does not reply			-	-
15	SS waits until T(LCSN) expires to ensure that the UE does not send a RELEASE COMPLETE message.			2	P
16	The SS terminates the dialogue by sending a RELEASE COMPLETE message.	<--	<i>DLInformationTransfer</i> (RELEASE COMPLETE)	-	-

## 6.1.2.3.3 Specific message contents

**Table 6.1.2.3.3-1: DLInformationTransfer (steps 1, 6, 11 and 16, Table 6.1.2.3.2-1)**

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 6.1.2.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

**Table 6.1.2.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 1, 6, 11 and 16, Table 6.1.2.3.2-1)**

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	<b>Step 1, 6, 11:</b> Set according to Table 6.1.2.3.3-3	REGISTER	
	<b>Step 16:</b> Set according to Table 6.1.2.3.3-11	RELEASE COMPLETE	
Additional information	Not present.		

**Table 6.1.2.3.3-3: REGISTER (steps 1, 6, and 11, Table 6.1.2.3.2-1)**

Derivation Path: 24.080 Table 2.3			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Register message type	xx11 1011	REGISTER	
Facility	Invoke = lcs-LocationNotification	Set according to Table 6.1.2.3.3-4	

**Table 6.1.2.3.3-4: LCS-LocationNotification (step 1, 6 and 11, Table 6.1.2.3.2-1)**

Derivation Path: 24.080 clause 4.4.2			
Information Element	Value/remark	Comment	Condition
LocationNotificationArg ::= SEQUENCE {			
notificationType	notifyAndVerify-LocationAllowedIfNoResponse		
locationType	currentLocation		
lcsClientExternalID SEQUENCE {			
externalAddress	ISDN-AddressString		
}			
lcsClientName SEQUENCE {			
dataCodingScheme	USSD-DataCodingScheme		
nameString	NameString		
}			
}			

**Table 6.1.2.3.3-5: ULInformationTransfer (steps 5 and 10, Table 6.1.2.3.2-1)**

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 6.1.2.3.3-6	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

**Table 6.1.2.3.3-6: UPLINK GENERIC NAS TRANSPORT (steps 5 and 10, Table 6.1.2.3.2-1)**

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	<b>Step 5:</b> Set according to Table 6.1.2.3.3-7	RELEASE COMPLETE	
	<b>Step 10:</b> Set according to Table 6.1.2.3.3-9	RELEASE COMPLETE	
Additional information	Not present		

**Table 6.1.2.3.3-7: RELEASE COMPLETE (step 5, Table 6.1.2.3.2-1)**

Derivation Path: 24.080 Table 2.5			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	
Facility	Return result = LocationNotificationRes	Set according to Table 6.1.2.3.3-8	

**Table 6.1.2.3.3-8: LocationNotificationRes (step 5, Table 6.1.2.3.2-1)**

Derivation Path: 24.080 clause 4.4.2			
Information Element	Value/remark	Comment	Condition
LocationNotificationRes ::= SEQUENCE {			
verificationResponse	permissionGranted		
}			

**Table 6.1.2.3.3-9: RELEASE COMPLETE (step 10, Table 6.1.2.3.2-1)**

Derivation Path: 24.080 Table 2.5			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	
Facility	Return result = LocationNotificationRes	Set according to Table 6.1.2.3.3-10	

**Table 6.1.2.3.3-10: LocationNotificationRes (step 10, Table 6.1.2.3.2-1)**

Derivation Path: 24.080 clause 4.4.2			
Information Element	Value/remark	Comment	Condition
LocationNotificationRes ::= SEQUENCE {			
verificationResponse	permissionDenied		
}			

**Table 6.1.2.3.3-11: RELEASE COMPLETE (step 16, Table 6.1.2.3.2-1)**

Derivation Path: 24.080 Table 2.5			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	

## 6.1.3 Privacy Verification – Location not Allowed if No Response

### 6.1.3.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE receives a REGISTER message containing the LCS-LocationNotification Invoke component
         set to NotifyAndVerify-LocationNotAllowedIfNoResponse }
  then { UE notifies the user of the location procedure and indicates that the default response
         is location not allowed, allows the user to accept or deny the request and terminates
         the dialogue by sending a RELEASE COMPLETE message with verificationResponse set as
         appropriate }
}
```

(2)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE receives a REGISTER message containing the LCS-LocationNotification Invoke component
         set to NotifyAndVerify-LocationNotAllowedIfNoResponse }
  then { UE notifies the user of the location procedure and indicates that the default response
         is location not allowed, allows the user to accept or deny the request and waits for the
         user to respond }
}
```

### 6.1.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.171, clause 5.2.1.1.1.

[TS 24.171, clause 5.2.1.1.1]

The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

In case of privacy verification the UE shall respond to the request by sending a RELEASE COMPLETE message containing the mobile subscriber's response in a return result component.

If the timer T(LCSN) expires in the network before any response from the UE (e.g. due to no response from the user), the network shall interpret this by applying the default treatment defined in 3GPP TS 23.271 (i.e. disallow location if barred by subscription and allow location if allowed by subscription).

...

### 6.1.3.3 Test description

#### 6.1.3.3.1 Pre-test conditions

System Simulator:

- Cell 1.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP 36.508 [8].

## Related PICS/PIXIT Statements:

- UE supporting LCS value added location request notification capability.
- px\_UeLcsNotification: value for UE LCS Notification timeout timer.

## 6.1.3.3.2 Test procedure sequence

Table 6.1.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	<i>DLInformationTransfer</i> (REGISTER)	-	-
2	SS starts timer T(LCSN) set to 90% of px_UeLcsNotification			-	-
3	The UE notifies the user of the location procedure and indicates that location will be not allowed in the absence of a response			1	P
4	The user accepts the location request before timer T(LCSN) expires			-	-
5	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	<i>ULInformationTransfer</i> (RELEASE COMPLETE)	1	P
6	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	<i>DLInformationTransfer</i> (REGISTER)	-	-
7	SS starts timer T(LCSN) set to 90% of px_UeLcsNotification			-	-
8	The UE notifies the user of the location procedure and indicates that location will be not allowed in the absence of a response			1	P
9	The user denies the location request before timer T(LCSN) expires			-	-
10	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	<i>ULInformationTransfer</i> (RELEASE COMPLETE)	1	P
11	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	<i>DLInformationTransfer</i> (REGISTER)	-	-
12	SS starts timer T(LCSN) set to 90% of px_UeLcsNotification			-	-
13	The UE notifies the user of the location procedure and indicates that location will be not allowed in the absence of a response			2	P
14	The user does not reply			-	-
15	SS waits until T(LCSN) expires to ensure that the UE does not send a RELEASE COMPLETE message.			2	P
16	The SS terminates the dialogue by sending a RELEASE COMPLETE message.	<--	<i>DLInformationTransfer</i> (RELEASE COMPLETE)	-	-



## 6.1.3.3.3 Specific message contents

**Table 6.1.3.3.3-1: DLInformationTransfer (steps 1, 6, 11 and 16, Table 6.1.3.3.2-1)**

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 6.1.3.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

**Table 6.1.3.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 1, 6, 11 and 16, Table 6.1.3.3.2-1)**

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	<b>Step 1, 6, 11:</b> Set according to Table 6.1.3.3.3-3	REGISTER	
	<b>Step 16:</b> Set according to Table 6.1.3.3.3-11	RELEASE COMPLETE	
Additional information	Not present.		

**Table 6.1.3.3.3-3: REGISTER (steps 1, 6, and 11, Table 6.1.3.3.2-1)**

Derivation Path: 24.080 Table 2.3			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Register message type	xx11 1011	REGISTER	
Facility	Invoke = lcs-LocationNotification	Set according to Table 6.1.3.3.3-4	

**Table 6.1.3.3.3-4: LCS-LocationNotification (step 1, 6 and 11, Table 6.1.3.3.2-1)**

Derivation Path: 24.080 clause 4.4.2			
Information Element	Value/remark	Comment	Condition
LocationNotificationArg ::= SEQUENCE {			
notificationType	notifyAndVerify-LocationNotAllowedIfNoResponse		
locationType	currentLocation		
lcsClientExternalID SEQUENCE {			
externalAddress	ISDN-AddressString		
}			
lcsClientName SEQUENCE {			
dataCodingScheme	USSD-DataCodingScheme		
nameString	NameString		
}			
}			

**Table 6.1.3.3.3-5: ULInformationTransfer (steps 5 and 10, Table 6.1.3.3.2-1)**

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 6.1.3.3.3-6	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

**Table 6.1.3.3.3-6: UPLINK GENERIC NAS TRANSPORT (steps 5 and 10, Table 6.1.3.3.2-1)**

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	<b>Step 5:</b> Set according to Table 6.1.3.3.3-7	RELEASE COMPLETE	
	<b>Step 10:</b> Set according to Table 6.1.3.3.3-9	RELEASE COMPLETE	
Additional information	Not present		

**Table 6.1.3.3.3-7: RELEASE COMPLETE (step 5, Table 6.1.3.3.2-1)**

Derivation Path: 24.080 Table 2.5			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	
Facility	Return result = LocationNotificationRes	Set according to Table 6.1.3.3.3-8	

**Table 6.1.3.3.3-8: LocationNotificationRes (step 5, Table 6.1.3.3.2-1)**

Derivation Path: 24.080 clause 4.4.2			
Information Element	Value/remark	Comment	Condition
LocationNotificationRes ::= SEQUENCE {			
verificationResponse	permissionGranted		
}			

**Table 6.1.3.3.3-9: RELEASE COMPLETE (step 10, Table 6.1.3.3.2-1)**

Derivation Path: 24.080 Table 2.5			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	
Facility	Return result = LocationNotificationRes	Set according to Table 6.1.3.3.3-10	

**Table 6.1.3.3.3-10: LocationNotificationRes (step 10, Table 6.1.3.3.2-1)**

Derivation Path: 24.080 clause 4.4.2			
Information Element	Value/remark	Comment	Condition
LocationNotificationRes ::= SEQUENCE {			
verificationResponse	permissionDenied		
}			

**Table 6.1.3.3.3-11: RELEASE COMPLETE (step 16, Table 6.1.3.3.2-1)**

Derivation Path: 24.080 Table 2.5			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	

## 6.2 EPC-MO-LR

### 6.2.1 Autonomous Self Location: UE-based

#### 6.2.1.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { an EPC-MO-LR location session is initiated at the UE of type "assistanceData" }
  then { UE sends a REGISTER message containing a LCS-MOLR invoke component }
}
```

(2)

```
with { UE having performed the last location request operation }
ensure that {
  when { UE has received a FACILITY message containing the LCS-MOLR return result component }
  then { UE terminates the dialogue by sending a RELEASE COMPLETE message }
}
```

#### 6.2.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.171, clause 5.2.2.1.

[TS 24.171, clause 5.2.2.1.1]

The UE invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component. SS Version Indicator value 1 or above shall be used.

...

The network shall pass the result of the location procedure to the UE by sending a FACILITY message to the UE containing a LCS-MOLR return result component.

...

After the last location request operation the UE shall terminate the dialogue by sending a RELEASE COMPLETE message.

...

#### 6.2.1.3 Test description

##### 6.2.1.3.1 Pre-test conditions

System Simulator:

- Cell 1.
- Satellite signals: As specified in 4.2.1.

UE:

- The UE shall begin the test with no assistance data stored.

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP 36.508 [8].

Related PICS/PIXIT Statements:

- Method of clearing stored assistance data.
- Method of triggering an EPC-MO-LR request for assistance data.

#### 6.2.1.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the GNSS supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined below:

Sub-Test Case Number	Supported Positioning Methods
1	UE supporting GNSS with A-GPS only
2	UE supporting GNSS with A-GLONASS only
3	UE supporting GNSS with A-Galileo only
4	UE supporting GNSS with A-GPS and A-GLONASS only

**Table 6.2.1.3.2-1: Main behaviour**

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The UE sends a NAS PDU containing an MO-LR Request of type "assistanceData" inside an RRC UL Information Transfer message. The embedded LPP message specifies the type of assistance data.	-->	<i>ULInformationTransfer</i> (REGISTER)	1	P
2	The SS provides the requested assistance data in an LPP message of type "Assistance Data".	<--	<i>DLInformationTransfer</i> (LPP PROVIDE ASSISTANCE DATA)	-	-
3	The SS sends a FACILITY message containing a LCS-MOLR return result component.	<--	<i>DLInformationTransfer</i> (FACILITY)	-	-
4	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	<i>ULInformationTransfer</i> (RELEASE COMPLETE)	2	P

## 6.2.1.3.3 Specific message contents

**Table 6.2.1.3.3-1: UL Information Transfer (steps 1 and 4, Table 6.2.1.3.2-1)**

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 6.2.1.3.3-2	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

**Table 6.2.1.3.3-2: UPLINK GENERIC NAS TRANSPORT (steps 1 and 4, Table 6.2.1.3.2-1)**

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	<b>Step 1:</b> Set according to Table 6.2.1.3.3-3	REGISTER	
	<b>Step 4:</b> Set according to Table 6.2.1.3.3-11	RELEASE COMPLETE	
Additional information	Not present		

**Table 6.2.1.3.3-3: REGISTER (step 1, Table 6.2.1.3.2-1)**

Derivation Path: 24.080 Table 2.4			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Register message type	xx11 1011	REGISTER	
Facility	Invoke=LCS-MOLR	Set according to Table 6.2.1.3.3-4	
SS version	Version 1 or above		

Table 6.2.1.3.3-4: LCS-MOLRArg (step 1, Table 6.2.1.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	Value/remark	Comment	Condition
LCS-MOLRArg ::= SEQUENCE {			
molr-Type	assistanceData		
multiplePositioningProtocolPDUs SEQUENCE (SIZE (1..3)) OF OCTET STRING	At least one LPP message of type Request Assistance Data (UE may include additional LPP messages)	Set according to Table 6.2.1.3.3-5	
}			

Table 6.2.1.3.3-5: LPP Request Assistance Data (step 1, Table 6.2.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	targetDevice		
transactionNumber	(0..255)		
}			
endTransaction	FALSE		
sequenceNumber	(0..255)		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestAssistanceData-r9 SEQUENCE {			
commonIEsRequestAssistanceData			
a-gnss-RequestAssistanceData	Present.		
otdoa-RequestAssistanceData			
epdu-RequestAssistanceData			
}			
}			
}			
}			
}			
}			
}			

Table 6.2.1.3.3-6: DLInformationTransfer (steps 2 and 3, Table 6.2.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 6.2.1.3.3-7	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

**Table 6.2.1.3.3-7: DOWNLINK GENERIC NAS TRANSPORT (steps 2 and 3, Table 6.2.1.3.2-1)**

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	<b>Step 2:</b> 00000001	LTE Positioning Protocol (LPP) message container	
	<b>Step 3:</b> 00000010	Location services message container	
Generic message container	<b>Step 2:</b> Set according to Table 6.2.1.3.3-8	LPP Provide Assistance Data	
	<b>Step 3:</b> Set according to Table 6.2.1.3.3-9	FACILITY	
Additional information	<b>Step 2:</b> present	Routing Identifier/Correlation ID	
	<b>Step 3:</b> Not present.		



**Table 6.2.1.3.3-8: LPP Provide Assistance Data (step 2, Table 6.2.1.3.2-1)**

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	targetDevice		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Assistance Data message in step 1 Table 6.2.1.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideAssistanceData-r9 SEQUENCE {			
a-gnss-ProvideAssistanceData	The SS provides the assistance data requested by the UE at step 1, Table 6.2.1.3.2-1 which are available according to TS 37.571-5 [12].		
}			
}			
}			
}			
}			
}			
}			

**Table 6.2.1.3.3-9: FACILITY (step 3, Table 6.2.1.3.2-1)**

Derivation Path: 24.080 Table 2.3			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Facility message type	xx11 1010	FACILITY	
Facility	Return Result=LCS-MOLRRes	Set according to Table 6.2.1.3.3-10	

**Table 6.2.1.3.3-10: LCS-MOLRRes (step 3, Table 6.2.1.3.2-1)**

Derivation Path: 24.080 clause 4.4.2			
Information Element	Value/remark	Comment	Condition
LCS-MOLRRes ::= SEQUENCE {	empty		
}			

Table 6.2.1.3.3-11: RELEASE COMPLETE (step 4, Table 6.2.1.3.2-1)

Derivation Path: 24.080 Table 2.5			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	

## 6.2.2 Basic Self Location: UE-assisted

### 6.2.2.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { an EPC-MO-LR location session is initiated at the UE of type "locationEstimate" }
  then { UE sends a REGISTER message containing a LCS-MOLR invoke component }
}
```

(2)

```
with { UE having performed the last location request operation }
ensure that {
  when { UE has received a FACILITY message containing the LCS-MOLR return result component }
  then { UE terminates the dialogue by sending a RELEASE COMPLETE message }
}
```

### 6.2.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.171, clause 5.2.2.1.

[TS 24.171, clause 5.2.2.1.1]

The UE invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component. SS Version Indicator value 1 or above shall be used.

...

The network shall pass the result of the location procedure to the UE by sending a FACILITY message to the UE containing a LCS-MOLR return result component.

...

After the last location request operation the UE shall terminate the dialogue by sending a RELEASE COMPLETE message.

...

### 6.2.2.3 Test description

#### 6.2.2.3.1 Pre-test conditions

System Simulator:

- Subtests 1-4: Cell 1.
- Subtest 5: Cell 1, Cell 2, Cell 4 as specified in 4.2.2.
- Subtest 6: TBD

- Satellite signals (Subtests 1-4): As specified in 4.2.1.

UE:

- The UE shall begin the test with no assistance data stored.

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

- Method of clearing stored assistance data.
- Method of triggering an EPC-MO-LR request for a location estimate.

#### 6.2.2.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined below:

<b>Sub-Test Case Number</b>	<b>Supported Positioning Methods</b>
1	UE supporting GNSS with A-GPS only
2	UE supporting GNSS with A-GLONASS only
3	UE supporting GNSS with A-Galileo only
4	UE supporting GNSS with A-GPS and A-GLONASS only
5	UE supporting OTDOA
6	UE supporting ECID

Table 6.2.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The UE sends a NAS PDU containing an MO-LR Request of type "locationEstimate" inside an RRC UL Information Transfer message. The MO-LR message may optionally include up to three LPP positioning messages.	-->	<i>ULInformationTransfer</i> (REGISTER)	1	P
2a	IF the UE does not include a LPP Provide Capabilities message in step 1 THEN the SS sends a LPP message of type Request Capabilities.	<--	<i>DLInformationTransfer</i> (LPP REQUEST CAPABILITIES)	-	-
2b	IF the SS performed step 2a THEN the UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	<i>ULInformationTransfer</i> (LPP PROVIDE CAPABILITIES)	-	-
2c	IF the UE LPP message at step 2b includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	<i>DLInformationTransfer</i> (LPP ACKNOWLEDGEMENT)	-	-
2d	IF the UE included a LPP message of type Request Assistance Data in step 1 THEN SS sends a LPP message of type Provide Assistance Data including an error indication without assistance data.	<--	<i>DLInformationTransfer</i> (LPP PROVIDE ASSISTANCE DATA)	-	-
3	IF NOT sub-test-6 THEN The SS sends a LPP message of type Provide Assistance Data including the assistance data as defined in sub-clause 4.4.1, dependent on UE capabilities and sub-test.	<--	<i>DLInformationTransfer</i> (LPP PROVIDE ASSISTANCE DATA)	-	-
4	The SS sends a LPP message of type Request Location Information.	<--	<i>DLInformationTransfer</i> (LPP REQUEST LOCATION INFORMATION)	-	-
5	The UE sends a LPP message of type Provide Location Information including measurements as requested at step 4.	-->	<i>ULInformationTransfer</i> (LPP PROVIDE LOCATION INFORMATION)	-	-
5a	IF the UE LPP message at step 5 includes an acknowledgment request THEN the SS sends a LPP Acknowledgement response.	<--	<i>DLInformationTransfer</i> (LPP ACKNOWLEDGEMENT)	-	-
6	The SS sends a FACILITY message containing a LCS-MOLR return result component.	<--	<i>DLInformationTransfer</i> (FACILITY)	-	-
7	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	<i>ULInformationTransfer</i> (RELEASE COMPLETE)	2	P

## 6.2.2.3.3 Specific message contents

**Table 6.2.2.3.3-1: UL InformationTransfer (steps 1, 2b, 5 and 7, Table 6.2.2.3.2-1)**

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 6.2.2.3.3-2	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

**Table 6.2.2.3.3-2: UPLINK GENERIC NAS TRANSPORT (steps 1, 2b, 5 and 7, Table 6.2.2.3.2-1)**

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	<b>Steps 1 and 7:</b> 00000010	Location services message container	
	<b>Step 2b, and 5:</b> 00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	<b>Step 1:</b> Set according to Table 6.2.2.3.3-3	REGISTER	
	<b>Step 2b:</b> Set according to Table 6.2.2.3.3-8	LPP Provide Capabilities	
	<b>Step 5:</b> Set according to Table 6.2.2.3.3-13	LPP Provide Location Information	
	<b>Step 7:</b> Set according to Table 6.2.2.3.3-16	RELEASE COMPLETE	
Additional information	<b>Steps 1 and 7:</b> Not present		
	<b>Step 2b:</b> present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 2a Table 6.2.2.3.2-1)	
	<b>Step 5:</b>	The UE includes the Routing	

		Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 4 Table 6.2.2.3.2-1)	
--	--	---	--

Table 6.2.2.3.3-3: REGISTER (step 1, Table 6.2.2.3.2-1)

Derivation Path: 24.080 Table 2.4			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Register message type	xx11 1011	REGISTER	
Facility	Invoke=LCS-MOLR	Set according to Table 6.2.2.3.3-4	
SS version	Version 1 or above		

Table 6.2.2.3.3-4: LCS-MOLRArg (step 1, Table 6.2.2.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	Value/remark	Comment	Condition
LCS-MOLRArg ::= SEQUENCE {			
molr-Type	locationEstimate		
multiplePositioningProtocolPDUs SEQUENCE (SIZE (1..3)) OF OCTET STRING	May include up to three LPP messages		
}			

Table 6.2.2.3.3-5: DLInformationTransfer (steps 2a, 2c, 2d, 3, 4, 5a and 6, Table 6.2.2.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 6.2.2.3.3-6	DOWNLINK GENERIC NAS TRANSPORT	
}			
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			

**Table 6.2.2.3.3-6: DOWNLINK GENERIC NAS TRANSPORT (steps 2a, 2c, 2d, 3, 4, 5a and 6, Table 6.2.2.3.2-1)**

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	<b>Step 2a, 2c, 2d, 3, 4, 5a:</b> 00000001	LTE Positioning Protocol (LPP) message container	
	<b>Step 6:</b> 00000010	Location services message container	
Generic message container	<b>Step 2a:</b> Set according to Table 6.2.2.3.3-7	LPP Request Capabilities	
	<b>Step 2c, 5a:</b> Set according to Table 6.2.2.3.3-9	LPP Acknowledgement	
	<b>Step 2d:</b> Set according to Table 6.2.2.3.3-10	LPP Provide Assistance Data	
	<b>Step 3:</b> Set according to Table 6.2.2.3.3-11	LPP Provide Assistance Data	
	<b>Step 4:</b> Set according to Table 6.2.2.3.3-12	LPP Request Location Information	
	<b>Step 6:</b> Set according to Table 6.2.2.3.3-14	FACILITY	
Additional information	<b>Steps 2a, 2c, 2d, 3, 4, 5a:</b> Present	Routing Identifier/Correlation ID	
	<b>Step 6:</b> Not present.		

**Table 6.2.2.3.3-7: LPP Request Capabilities (step 2a, Table 6.2.2.3.2-1)**

Derivation Path: Table 4.4-1			
Information Element	Value/remark	Comment	Condition
As defined in Table 4.4-1			

Table 6.2.2.3.3-8: LPP Provide Capabilities (step 2b, Table 6.2.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 2a Table 6.2.2.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)	Contains a different value compared to any other UL message already sent by the UE.	
acknowledgement SEQUENCE {	Present, or not present.		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Not present		
a-gnss-ProvideCapabilities SEQUENCE{			
gnss-SupportList	Present for sub-tests 1-4		
assistanceDataSupportList	Present for sub-tests 1-4		
locationCoordinateTypes	Present for sub-tests 1-4		
velocityTypes	Present for sub-tests 1-4		
}			
otdoa-ProvideCapabilities	Present for sub-test 5		
ecid-ProvideCapabilities	Present for sub-test 6		
epdu-ProvideCapabilities			
}			
}			
}			
}			
}			
}			



**Table 6.2.2.3.3-9: LPP Acknowledgement (steps 2c and 5a, Table 6.2.2.3.2-1)**

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	<b>Step 2c:</b> (0..255)	Contains the same value of the sequenceNumber field as received by the SS in the LPP Provide Capabilities message in step 2b, Table 6.2.2.3.2-1.	
	<b>Step 5a:</b> (0..255)	Contains the same value of the sequenceNumber field as received by the SS in the LPP Provide Location Information message in step 5, Table 6.2.2.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			

**Table 6.2.2.3.3-10: LPP Provide Assistance Data (step 2d, Table 6.2.2.3.2-1)**

Derivation Path: Table 4.4-2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {		Contains the same value as any potential LPP Request Assistance Data message included by the UE at step 1, Table 6.2.2.3.2-1.	
}			
Initiator	targetDevice		
transactionNumber	(0..255)		
}			
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement	Not present.		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideAssistanceData-r9 SEQUENCE {			
commonIESProvideAssistanceData	Not present		
a-gnss-ProvideAssistanceData SEQUENCE {	Present, if UE requested GNSS assistance data at step 1, Table 6.2.2.3.2-1.		
gnss-CommonAssistData			
gnss-GenericAssistData	Not present		
gnss-Error CHOICE {			
locationServerErrorCauses SEQUENCE {			
cause	undefined		
}			
}			
}			
}			
otdoa-ProvideAssistanceData SEQUENCE {	Present, if UE requested OTDOA assistance data at step 1, Table 6.2.2.3.2-1.		
otdoa-ReferenceCellInfo			
otdoa-NeighbourCellInfo	Not present		
otdoa-Error CHOICE {			
locationServerErrorCauses SEQUENCE {			
cause	undefined		
}			
}			
}			
epdu-ProvideAssistanceData	Not present		
}			
}			
}			
}			
}			
}			
}			

**Table 6.2.2.3.3-11: LPP Provide Assistance Data (step 3, Table 6.2.2.3.2-1)**

Derivation Path: Table 4.4-2			
Information Element	Value/remark	Comment	Condition
As defined in Table 4.4-2 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			

**Table 6.2.2.3.3-12: LPP Request Location Information (step 4, Table 6.2.2.3.2-1)**

Derivation Path: Table 4.4-4			
Information Element	Value/remark	Comment	Condition
As defined in Table 4.4-4 with the following exceptions:			
locationInformationType	locationMeasurementsRe quired		

Table 6.2.2.3.3-13: LPP ProvideLocation Information (step 5, Table 6.2.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Location Information message in step 4 Table 6.2.2.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)	Contains a different value compared to any other UL message already sent by the UE.	
acknowledgement SEQUENCE {	Present, or not present.		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation	Not present.		
a-gnss-ProvideLocationInformation	Present for sub-tests 1-4. Any value acceptable		
otdoa-ProvideLocationInformation	Present for sub-test 5. Any value acceptable		
ecid-ProvideLocationInformation	Present for sub-test 6. Any value acceptable		
epdu-ProvideLocationInformation			
}			
}			
}			
}			
}			
}			
}			

Table 6.2.2.3.3-14: FACILITY (step 6, Table 6.2.2.3.2-1)

Derivation Path: 24.080 Table 2.3			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Facility message type	xx11 1010	FACILITY	
Facility	Return Result=LCS-MOLRRes	Set according to Table 6.2.2.3.3-15	

Table 6.2.2.3.3-15: LCS-MOLRRes (step 6, Table 6.2.2.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	Value/remark	Comment	Condition
LCS-MOLRRes ::= SEQUENCE {			
locationEstimate	Any value. The SS shall not be required to calculate the value from the returned measurements.		
}			

Table 6.2.2.3.3-16: RELEASE COMPLETE (step 7, Table 6.2.2.3.2-1)

Derivation Path: 24.080 Table 2.5			
Information Element	Value/remark	Comment	Condition
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	

## 7 LPP Procedures

### 7.1 LPP Common Procedures

#### 7.1.1 Position Capability Transfer

##### 7.1.1.1 Test Purpose (TP)

(1)

```

with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when { UE receives a LPP message of type REQUEST CAPABILITIES }
  then { UE sends a LPP message of type PROVIDE CAPABILITIES with the correct supported
         capabilities }
}

```

##### 7.1.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 5.1.

[TS 36.355, clause 5.1.3]

Upon receiving a *RequestCapabilities* message, the target device shall generate a *ProvideCapabilities* message as a response.

The target device shall:

- 1> for each positioning method for which a request for capabilities is included in the message:
  - 2> if the target device supports this positioning method:
    - 3> include the capabilities of the device for that supported positioning method in the response message;
- 1> set the IE *LPP-TransactionID* in the response message to the same value as the IE *LPP-TransactionID* in the received message;

...

[TS 36.355, clause 5.1.4]

When triggered to transmit a *ProvideCapabilities* message, the target device shall:

- 1> for each positioning method whose capabilities are to be indicated:
  - 2> set the corresponding IE to include the device's capabilities;
  - 2> if OTDOA capabilities are to be indicated:
    - 3> include the IE *supportedBandListEUTRA*;

...

7.1.1.3 Test description

7.1.1.3.1 Pre-test conditions

System Simulator:

- Cell 1.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

-

7.1.1.3.2 Test procedure sequence

**Table 7.1.1.3.2-1: Main behaviour**

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a LPP message of type Request Capabilities.	<--	<i>DLInformationTransfer</i> (LPP REQUEST CAPABILITIES)	-	-
2	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	<i>ULInformationTransfer</i> (LPP PROVIDE CAPABILITIES)	1	P
2a	IF the UE LPP message at step 2 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	<i>DLInformationTransfer</i> (LPP ACKNOWLEDGEMENT)	-	-

## 7.1.1.3.3 Specific message contents

**Table 7.1.1.3.3-1: DLInformationTransfer (steps 1 and 2a, Table 7.1.1.3.2-1)**

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.1.1.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

**Table 7.1.1.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 1 and 2a, Table 7.1.1.3.2-1)**

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	<b>Step 1:</b> Set according to Table 7.1.1.3.3-3	LPP Request Capabilities	
	<b>Step 2a:</b> Set according to Table 7.1.1.3.3-14	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

**Table 7.1.1.3.3-3: LPP Request Capabilities (step 1, Table 7.1.1.3.2-1)**

Derivation Path: Table 4.4-1			
Information Element	Value/remark	Comment	Condition
As defined in Table 4.4-1 with the following exception:			
epdu-ProvideCapabilities SEQUENCE (SIZE (1)) OF SEQUENCE{			
ePDU-Identifier SEQUENCE {			
ePDU-ID	1	OMA LPPe	
ePDU-Name	Not present		
}			
ePDU-Body	FFS		
}			

**Table 7.1.1.3.3-4: ULInformationTransfer (step 2, Table 7.1.1.3.2-1)**

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.1.1.3.3-5	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

**Table 7.1.1.3.3-5: UPLINK GENERIC NAS TRANSPORT (step 2, Table 7.1.1.3.2-1)**

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	Set according to Table 7.1.1.3.3-6	LPP Provide Capabilities	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.1.1.3.2-1)	



Table 7.1.1.3.3-6: LPP Provide Capabilities (step 2, Table 7.1.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1, Table 7.1.1.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonEsProvideCapabilities	Not present		
a-gnss-ProvideCapabilities SEQUENCE {	Present or not present dependent on (pc_UEB_AGNSS OR pc_UEA_AGNSS)		
gnss-SupportList	Set according to Table 7.1.1.3.3-7		
assistanceDataSupportList	Set according to Table 7.1.1.3.3-8		
locationCoordinateTypes	Present or not present dependent on pc_UEB_AGNSS. Set according to Table 7.1.1.3.3-9		
velocityTypes	Present or not present dependent on pc_UEB_AGNSS. Set according to Table 7.1.1.3.3-10		
}			
otdoa-ProvideCapabilities	Present or not present dependent on pc_OTDOA. Set according to Table 7.1.1.3.3-11		
ecid-ProvideCapabilities	Present or not present dependent on pc_ECID. Set according to Table 7.1.1.3.3-12		
epdu-ProvideCapabilities	Present or not present dependent on UE capabilities. Set according to Table 7.1.1.3.3-13		
}			
}			
}			
}			
}			
}			
}			

}			
}			

**Table 7.1.1.3.3-7: gnss-SupportList (step 2, Table 7.1.1.3.2-1)**

Derivation Path: 36.355 clause 6.5.2.9			
Information Element	Value/remark	Comment	Condition
gnss-SupportList SEQUENCE (SIZE(1..n)) OF SEQUENCE{		Size n of SEQUENCE is dependent on UE capabilities	
gnss-ID	Dependent on UE capabilities		
sbas-IDs	Dependent on UE capabilities	Present only if gnss-ID = sbas	
agnss-Modes	Dependent on UE capabilities		
gnss-Signals	Dependent on UE capabilities		
fta-MeasSupport SEQUENCE {	Present or not present dependent on pc_GNSS_FTA		
cellTime	Dependent on UE capabilities		
mode	Dependent on UE capabilities		
}			
adr-Support	Dependent on UE capabilities		
velocityMeasurementSupport	Dependent on UE capabilities		
}			

Table 7.1.1.3.3-8: assistanceDataSupportList (step 2, Table 7.1.1.3.2-1)

Derivation Path: 36.355 clause 6.5.2.9			
Information Element	Value/remark	Comment	Condition
assistanceDataSupportList SEQUENCE{			
gnss-CommonAssistanceDataSupport SEQUENCE{			
gnss-ReferenceTimeSupport	Present or not present and value dependent on UE capabilities.		
gnss-ReferenceLocationSupport	Present or not present and value dependent on UE capabilities.		
gnss-IonosphericModelSupport	Present or not present and value dependent on UE capabilities.		
gnss-EarthOrientationParametersSupport	Present or not present and value dependent on UE capabilities.		
}			
gnss-GenericAssistanceDataSupport SEQUENCE (SIZE (1..n)) OF SEQUENCE{		Size n of SEQUENCE is dependent on UE capabilities	
gnss-ID	Dependent on UE capabilities		
sbas-ID	Dependent on UE capabilities	Present only if gnss-ID = sbas	
gnss-TimeModelsSupport	Present or not present and value dependent on UE capabilities.		
gnss-DifferentialCorrectionsSupport	Present or not present and value dependent on UE capabilities.		
gnss-NavigationModelSupport	Present or not present and value dependent on UE capabilities.		
gnss-RealTimeIntegritySupport	Present or not present and value dependent on UE capabilities.		
gnss-DataBitAssistanceSupport	Present or not present and value dependent on UE capabilities.		
gnss-AcquisitionAssistanceSupport	Present or not present and value dependent on UE capabilities.		
gnss-AlmanacSupport	Present or not present and value dependent on UE capabilities.		
gnss-UTC-ModelSupport	Present or not present and value dependent on UE capabilities.		
gnss-AuxiliaryInformationSupport	Present or not present and value dependent on UE capabilities.		
}			
}			

Table 7.1.1.3.3-9: locationCoordinateTypes (step 2, Table 7.1.1.3.2-1)

Derivation Path: 36.355 clause 6.4.1			
Information Element	Value/remark	Comment	Condition
locationCoordinateTypes SEQUENCE {			
ellipsoidPoint	Dependent on UE capabilities		
ellipsoidPointWithUncertaintyCircle	Dependent on UE capabilities		
ellipsoidPointWithUncertaintyEllipse	Dependent on UE capabilities		
polygon	Dependent on UE capabilities		
ellipsoidPointWithAltitude	Dependent on UE capabilities		
ellipsoidPointWithAltitudeAndUncertaintyEllipsoid	Dependent on UE capabilities		
ellipsoidArc	Dependent on UE capabilities		
}			

Table 7.1.1.3.3-10: velocityTypes (step 2, Table 7.1.1.3.2-1)

Derivation Path: 36.355 clause 6.4.1			
Information Element	Value/remark	Comment	Condition
velocityTypes SEQUENCE {			
horizontalVelocity	Dependent on UE capabilities		
horizontalWithVerticalVelocity	Dependent on UE capabilities		
horizontalVelocityWithUncertainty	Dependent on UE capabilities		
horizontalWithVerticalVelocityAndUncertainty	Dependent on UE capabilities		
}			

Table 7.1.1.3.3-11: otdoa-ProvideCapabilities (step 2, Table 7.1.1.3.2-1)

Derivation Path: 36.355 clause 6.5.1.7			
Information Element	Value/remark	Comment	Condition
otdoa-ProvideCapabilities SEQUENCE {			
otdoa-Mode	Dependent on UE capabilities		
supportedBandListEUTRA SEQUENCE (SIZE (1..n)) OF SEQUENCE {	Shall be present if otdoa-ProvideCapabilities is present	Size n of SEQUENCE is dependent on UE capabilities	
bandEUTRA	Dependent on UE capabilities		
}			
}			

Table 7.1.1.3.3-12: ecid-ProvideCapabilities (step 2, Table 7.1.1.3.2-1)

Derivation Path: 36.355 clause 6.5.3.4			
Information Element	Value/remark	Comment	Condition
ecid-ProvideCapabilities SEQUENCE {			
ecid-MeasSupported	Dependent on UE capabilities		
..}			
}			

Table 7.1.1.3.3-13: epdu-ProvideCapabilities (step 2, Table 7.1.1.3.2-1)

Derivation Path: 36.355 clause 6.4.1			
Information Element	Value/remark	Comment	Condition
epdu-ProvideCapabilities SEQUENCE (SIZE (1)) OF SEQUENCE{			
ePDU-Identifier SEQUENCE {			
ePDU-ID	Dependent on UE capabilities		
ePDU-Name	Present or not present. Value dependent on UE capabilities		
}			
ePDU-Body	Dependent on UE capabilities		
}			

Table 7.1.1.3.3-14: LPP Acknowledgement (step 2a, Table 7.1.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 2, Table 7.1.1.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			

## 7.2 LPP Transport

### 7.2.1 LPP Duplicated Message

#### 7.2.1.1 Test Purpose (TP)

(1)

```

with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when { UE receives a LPP message carrying the same sequence number as that last received for the
          associated location session }
    then { UE discards the LPP message }
}

```

#### 7.2.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 4.3.

[TS 36.355, clause 4.3.1]

A UE implementing LPP for the control plane solution shall support LPP reliable transport (including all three of duplicate detection, acknowledgement, and retransmission).

The following requirements in subclauses 4.3.2, 4.3.3, and 4.3.4 [LPP] for LPP reliable transport apply only when the capability is supported.

[TS 36.355, clause 4.3.2]

A sender shall include a sequence number in all LPP messages sent for a particular location session. The sequence number shall be distinct for different LPP messages sent in the same direction in the same location session.

...

A receiver shall record the most recent received sequence number for each location session. If a message is received carrying the same sequence number as that last received for the associated location session, it shall be discarded.

### 7.2.1.3 Test description

#### 7.2.1.3.1 Pre-test conditions

System Simulator:

- Cell 1.
- Satellite signals: Not present.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

-

#### 7.2.1.3.2 Test procedure sequence

**Table 7.2.1.3.2-1: Main behaviour**

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a LPP message of type Request Capabilities including a sequence number.	<--	<i>DLInformationTransfer</i> (LPP REQUEST CAPABILITIES)	-	-
2	Immediately after step 1, the SS sends the same LPP message as in step 1.	<--	<i>DLInformationTransfer</i> (LPP REQUEST CAPABILITIES)	-	-
3	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	<i>ULInformationTransfer</i> (LPP PROVIDE CAPABILITIES)	-	-
3a	IF the UE LPP message at step 3 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	<i>DLInformationTransfer</i> (LPP ACKNOWLEDGEMENT)	-	-
4	The SS waits for 10 seconds to ensure the UE does not send another LPP message of type Provide Capabilities with the same transaction ID as received in step 1 or 2.			1	P

## 7.2.1.3.3 Specific message contents

**Table 7.2.1.3.3-1: DLInformationTransfer (steps 1, 2, and 3a, Table 7.2.1.3.2-1)**

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.1.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

**Table 7.2.1.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 1, 2 and 3a, Table 7.2.1.3.2-1)**

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	<b>Steps 1 and 2:</b> Set according to Table 7.2.1.3.3-3	LPP Request Capabilities	
	<b>Step 3a:</b> Set according to Table 7.2.1.3.3-7	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

**Table 7.2.1.3.3-3: LPP Request Capabilities (steps 1 and 2, Table 7.2.1.3.2-1)**

Derivation Path: Table 4.4-1			
Information Element	Value/remark	Comment	Condition
As defined in Table 4.4-1 with the following exceptions:			
sequenceNumber	0		

Table 7.2.1.3.3-4: *ULInformationTransfer* (step 3, Table 7.2.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.1.3.3-5	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 7.2.1.3.3-5: UPLINK GENERIC NAS TRANSPORT (step 3, Table 7.2.1.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	Set according to Table 7.2.1.3.3-6	LPP Provide Capabilities	
Additional information	present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.2.1.3.2-1)	

Table 7.2.1.3.3-6: LPP Provide Capabilities (step 3, Table 7.2.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1, Table 7.2.1.3.2-1.	



}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonEsProvideCapabilities	Not present		
a-gnss-ProvideCapabilities SEQUENCE{	Dependent on UE capabilities		
gnss-SupportList			
assistanceDataSupportList			
locationCoordinateTypes			
velocityTypes			
}			
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities	Dependent on UE capabilities		
epdu-ProvideCapabilities			
}			
}			
}			
}			
}			
}			

Table 7.2.1.3.3-7: LPP Acknowledgement (step 3a, Table 7.2.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 3, Table 7.2.1.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			

## 7.2.2 LPP Acknowledgment

### 7.2.2.1 Test Purpose (TP)

(1)

```

with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when { UE receives a LPP message carrying an acknowledgement request indicator }
  then { UE returns an acknowledgement response }
}

```

### 7.2.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 4.3.

[TS 36.355, clause 4.3.1]

A UE implementing LPP for the control plane solution shall support LPP reliable transport (including all three of duplicate detection, acknowledgement, and retransmission).

The following requirements in subclauses 4.3.2, 4.3.3, and 4.3.4 [LPP] for LPP reliable transport apply only when the capability is supported.

[TS 36.355, clause 4.3.3.1]

Upon reception of an LPP message which includes the IE *ackRequested* set to TRUE, a receiver returns an LPP message with an acknowledgement response, i.e., that includes the *ackIndicator* IE set to the same sequence number of the message being acknowledged.

An acknowledgment response may contain no LPP message body (in which case only the sequence number being acknowledged is significant); alternatively, the acknowledgment may be sent in an LPP message along with an LPP message body.

### 7.2.2.3 Test description

#### 7.2.2.3.1 Pre-test conditions

System Simulator:

- Cell 1.
- Satellite signals: Not present.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

-

## 7.2.2.3.2 Test procedure sequence

Table 7.2.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a LPP message of type Request Capabilities including a request for acknowledgement.	<--	<i>DLInformationTransfer</i> (LPP REQUEST CAPABILITIES)	-	-
2 Option 1	Option 1: The UE sends an acknowledgement along with an LPP message of type Provide Capabilities.	-->	<i>ULInformationTransfer</i> (LPP PROVIDE CAPABILITIES, incl. acknowledgement response)	1	P
2 Option 2	Option 2: The UE sends a LPP Acknowledgement response, followed by a LPP message of type Provide Capabilities.	-->  -->	<i>ULInformationTransfer</i> (LPP ACKNOWLEDGEMENT)  <i>ULInformationTransfer</i> (LPP PROVIDE CAPABILITIES)	1	P
3	IF the UE LPP message at step 2 includes an acknowledgement request THEN SS sends a LPP Acknowledgement response.	<--	<i>DLInformationTransfer</i> (LPP ACKNOWLEDGEMENT)	-	-

## 7.2.2.3.3 Specific message contents

Table 7.2.2.3.3-1: *DLInformationTransfer* (steps 1, and 3, Table 7.2.2.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
<i>DLInformationTransfer</i> ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
<i>dLInformationTransfer-r8</i> SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.2.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

**Table 7.2.2.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 1, and 3, Table 7.2.2.3.2-1)**

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	<b>Step 1:</b> Set according to Table 7.2.2.3.3-3	LPP Request Capabilities	
	<b>Step 3:</b> Set according to Table 7.2.2.3.3-8	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

**Table 7.2.2.3.3-3: LPP Request Capabilities (step 1, Table 7.2.2.3.2-1)**

Derivation Path: Table 4.4-1			
Information Element	Value/remark	Comment	Condition
As defined in Table 4.4-1 with the following exceptions:			
sequenceNumber	0		
acknowledgement SEQUENCE {			
ackRequested	TRUE		
ackIndicator	Not present		
}			

Table 7.2.2.3.3-4: *ULInformationTransfer* (step 2, Table 7.2.2.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.2.3.3-5	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 7.2.2.3.3-5: UPLINK GENERIC NAS TRANSPORT (step 2, Table 7.2.2.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	<b>Step 2:</b> Set according to Table 7.2.2.3.3-6	LPP Provide Capabilities	
	<b>Step 2 (Option 2),</b> Set according to Table 7.2.2.3.3-7	LPP Acknowledgement	
Additional information	present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message	

Table 7.2.2.3.3-6: LPP Provide Capabilities (step 2, Table 7.2.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities	

		message in step 1, Table 7.2.2.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present. Present for Option 1.		
ackRequested	TRUE or FALSE		
ackIndicator	0 (Option 1) Not present (Option 2)		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonEsProvideCapabilities	Not present		
a-gnss-ProvideCapabilities SEQUENCE{	Dependent on UE capabilities		
gnss-SupportList			
assistanceDataSupportList			
locationCoordinateTypes			
velocityTypes			
}			
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities	Dependent on UE capabilities		
epdu-ProvideCapabilities			
}			
}			
}			
}			
}			

Table 7.2.2.3.3-7: LPP Acknowledgement (step 2 – Option 2, Table 7.2.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	FALSE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	0		
}			
lpp-MessageBody	Not present.		
}			

Table 7.2.2.3.3-8: LPP Acknowledgement (step 3, Table 7.2.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 2, Table 7.2.2.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			

## 7.2.3 LPP Retransmission

### 7.2.3.1 Test Purpose (TP)

(1)

```

with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when { UE does not receive an LPP acknowledgement for an LPP message which requires
    acknowledgement }
  then { UE retransmits the LPP message up to three times. If still unacknowledged after that, the
    UE aborts all LPP activity for the associated session }
}

```

### 7.2.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 4.3.

[TS 36.355, clause 4.3.1]

A UE implementing LPP for the control plane solution shall support LPP reliable transport (including all three of duplicate detection, acknowledgement, and retransmission).

The following requirements in subclauses 4.3.2, 4.3.3, and 4.3.4 [LPP] for LPP reliable transport apply only when the capability is supported.

[TS 36.355, clause 4.3.4.1]

When an LPP message which requires acknowledgement is sent and not acknowledged, it is resent by the sender following a timeout period up to three times. If still unacknowledged after that, the sender aborts all LPP activity for the associated session.

### 7.2.3.3 Test description

#### 7.2.3.3.1 Pre-test conditions

System Simulator:

- Cell 1.
- Satellite signals: Not present.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

- Method of triggering an LPP message with acknowledgement request.

#### 7.2.3.3.2 Test procedure sequence

**Table 7.2.3.3.2-1: Main behaviour**

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a LPP message of type Request Capabilities.	<--	<i>DLInformationTransfer</i> (LPP REQUEST CAPABILITIES)	-	-
2	The UE sends a LPP message of type Provide Capabilities including a request for acknowledgement along with a sequence number. NOTE: This requires a method of triggering an acknowledgement request.	-->	<i>ULInformationTransfer</i> (LPP PROVIDE CAPABILITIES)	-	-
3	SS does not send an acknowledgement			-	-
4	After an implementation specific timeout period, the UE retransmits the LPP message from step 2 and includes the same sequence number as in step 2.	-->	<i>ULInformationTransfer</i> (LPP PROVIDE CAPABILITIES)	-	-
5	SS does not send an acknowledgement			-	-
6	After an implementation specific timeout period, the UE retransmits the LPP message from step 2 and includes the same sequence number as in step 2.	-->	<i>ULInformationTransfer</i> (LPP PROVIDE CAPABILITIES)	-	-
7	SS does not send an acknowledgement			-	-
8	After an implementation specific timeout period, the UE retransmits the LPP message from step 2 and includes the same sequence number as in step 2.	-->	<i>ULInformationTransfer</i> (LPP PROVIDE CAPABILITIES)	-	-
9	SS does not send an acknowledgement			-	-
10	UE aborts all procedures and activity associated with LPP support for the location session. SS waits for 10 seconds to ensure the UE does not send another LPP message.			1	P



## 7.2.3.3.3 Specific message contents

**Table 7.2.3.3.3-1: DLInformationTransfer (step 1, Table 7.2.3.3.2-1)**

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.3.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

**Table 7.2.3.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (step 1, Table 7.2.3.3.2-1)**

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	Set according to Table 7.2.3.3.3-3	LPP Request Capabilities	
Additional information	Present	Routing Identifier/Correlation ID	

**Table 7.2.3.3.3-3: LPP Request Capabilities (step 1, Table 7.2.3.3.2-1)**

Derivation Path: Table 4.4-1			
Information Element	Value/remark	Comment	Condition
As defined in Table 4.4-1.			

Table 7.2.3.3.3-4: *ULInformationTransfer* (steps 2, 4, 6, and 8, Table 7.2.3.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.3.3.3-5	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 7.2.3.3.3-5: UPLINK GENERIC NAS TRANSPORT (steps 2, 4, 6, and 8, Table 7.2.3.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	Set according to Table 7.2.3.3.3-6	LPP Provide Capabilities	
Additional information	present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message	

Table 7.2.3.3.3-6: LPP Provide Capabilities (steps 2, 4, 6, and 8, Table 7.2.3.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1 Table 7.2.3.3.2-1.	
}			

endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {			
ackRequested	TRUE	Requires a method to set this to TRUE	
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonEsProvideCapabilities	Not present		
a-gnss-ProvideCapabilities SEQUENCE{	Dependent on UE capabilities		
gnss-SupportList			
assistanceDataSupportList			
locationCoordinateTypes			
velocityTypes			
}			
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities	Dependent on UE capabilities		
epdu-ProvideCapabilities			
}			
}			
}			
}			
}			
}			

## 7.3 LPP Error Handling

### 7.3.1 LPP Requested Method not Supported – UE-Assisted

#### 7.3.1.1 Test Purpose (TP)

(1)

```

with { a UE supporting at least one of UE-assisted GNSS, UE-assisted OTDOA, or UE-assisted ECID,
but not all of them }
and with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when { UE receives a LPP message requesting at least one location method not supported }
  then { the UE provides location information for the supported methods }
}

```

#### 7.3.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clauses 5.3.3 and 5.4.3.

[TS 36.355, clause 5.3.3]

Upon receiving a *RequestLocationInformation* message, the target device shall:

1> if the requested information is compatible with the target device capabilities and configuration:

[...]

1> otherwise:

- 2> if one or more positioning methods are included that the target device does not support:
- 3> continue to process the message as if it contained only information for the supported positioning methods;
- 3> handle the signaling content of the unsupported positioning methods by LPP error detection as in 5.4.3.

[TS 36.355, clause 5.4.3]

Upon receiving any LPP message, the receiving entity shall attempt to decode the message and verify the presence of any errors prior to using the following procedure:

- 1> if the message type is an LPP *RequestAssistanceData* or *RequestLocationInformation* and some or all of the requested information is not supported:
- 2> return any information that can be provided in a normal response, which includes indications on other information that is not supported.

### 7.3.1.3 Test description

#### 7.3.1.3.1 Pre-test conditions

System Simulator:

- Cells 1; 2 and 4, as specified in 4.2.2.
- Satellite signals present, as specified in 4.2.1.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

-

#### 7.3.1.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method supported by the UE. Each sub-test case is identified by a sub-test case number as defined in Table 4.1-1.

**Table 7.3.1.3.2-1: Main behaviour**

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a LPP message of type Provide Assistance Data.	<--	<i>DLInformationTransfer</i> (LPP PROVIDE ASSISTANCE DATA)		
2	The SS sends a LPP message of type Request Location Information including all specified positioning methods.	<--	<i>DLInformationTransfer</i> (LPP REQUEST LOCATION INFORMATION)	-	-
3	The UE sends a LPP message of type Provide Location Information including information for the supported method(s).	-->	<i>ULInformationTransfer</i> (LPP PROVIDE LOCATION INFORMATION)	1	P
3a	IF the UE LPP message at step 3 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	<i>DLInformationTransfer</i> (LPP ACKNOWLEDGEMENT)	-	-

## 7.3.1.3.3 Specific message contents

**Table 7.3.1.3.3-1: DLInformationTransfer (steps 1, 2 and 3a, Table 7.3.1.3.2-1)**

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.1.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

**Table 7.3.1.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 1, 2 and 3a, Table 7.3.1.3.2-1)**

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	<b>Step 1 :</b> Set according to Table 7.3.1.3.3-3	LPP Provide Assistance Data	
	<b>Step 2 :</b> Set according to Table 7.3.1.3.3-4	LPP Request Location Information	
	<b>Step 3a:</b> Set according to Table 7.3.1.3.3-8	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

**Table 7.3.1.3.3-3: LPP Provide Assistance data (step 1, Table 7.6.1.3.2-1)**

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
As defined in Table 4.4-2 with the following exceptions:			
a-gnss-ProvideAssistanceData	As defined in clause 4.4	Present for all sub-tests	
otdoa-ProvideAssistanceData	As defined in clause 4.4	Present for all sub-tests	

**Table 7.3.1.3.3-4: LPP Request Location Information (step 2, Table 7.3.1.3.2-1)**

Derivation Path: Table 4.4-4			
Information Element	Value/remark	Comment	Condition
As defined in Table 4.4-4 with the following exceptions:			
locationInformationType	locationMeasurementsRequired		
a-gnss-RequestLocationInformation	As defined in Table 4.4-5	Present for all sub-tests	
gnss-ids	bits 0 & 4 = 1		
otdoa-RequestLocationInformation	As defined in Table 4.4-6	Present for all sub-tests	
ecid-RequestLocationInformation	As defined in Table 4.4-7	Present for all sub-tests	
requestedMeasurements	bits 0, 1, 2 = 1		

**Table 7.3.1.3.3-5: ULInformationTransfer (step 3, Table 7.3.1.3.2-1)**

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.1.3.3-6	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

**Table 7.3.1.3.3-6: UPLINK GENERIC NAS TRANSPORT (step 3, Table 7.3.1.3.2-1)**

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	Set according to Table 7.3.1.3.3-7	LPP Provide Location Information	
Additional information	present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 2 Table 7.3.1.3.2-1)	

**Table 7.3.1.3.3-7: LPP Provide Location Information (step 3, Table 7.3.1.3.2-1)**

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
Initiator	locationServer		
transactionNumber	(0..255)		
}			
endTransaction	TRUE		
sequenceNumber	(0..255) Present, or not present.		
acknowledgement SEQUENCE {	present, or not present		
ackRequested	TRUE or FALSE		
ackIndicator	Not present		
}			

lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9			
SEQUENCE {			
commonEsProvideLocationInformation			
SEQUENCE {			
locationEstimate	Not present		
velocityEstimate	Not present		
locationError	Maybe present		
}			
}			
a-gnss-ProvideLocationInformation	Present if UE supports UE-assisted A-GNSS		
otdoa-ProvideLocationInformation	Present if UE supports UE-assisted OTDOA		
ecid-ProvideLocationInformation	Present if UE supports UE-assisted ECID		
epdu-ProvideLocationInformation	Not present		
}			
}			
}			
}			

Table 7.3.1.3.3-8: LPP Acknowledgement (step 3a, Table 7.3.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 3, Table 7.3.1.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			



## 7.4 LPP Positioning Procedures

### 7.4.1 E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Based

### 7.4.2 E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted

### 7.4.3 E-SMLC Initiated Position Measurement without assistance data: UE-Based

### 7.4.4 E-SMLC Initiated Position Measurement without assistance data: UE-Assisted

## 7.5 LPP Abort

### 7.5.1 E-SMLC initiated Abort

#### 7.5.1.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when { UE receives a LPP Abort message carrying the transaction ID of an on-going procedure }
  then { UE aborts the on-going procedure }
}
```

#### 7.5.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 5.5.3.

[TS 36.355, clause 5.5.3]

Upon receiving an *Abort* message, a device shall:

- 1> abort any ongoing procedure associated with the transaction ID indicated in the message.

#### 7.5.1.3 Test description

##### 7.5.1.3.1 Pre-test conditions

System Simulator:

- Cell 1.
- Satellite signals: Not present.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

-

### 7.5.1.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined below:

Sub-Test Case Number	Supported Positioning Methods
1	UE supporting GNSS with A-GPS only
2	UE supporting GNSS with A-GLONASS only
3	UE supporting GNSS with A-Galileo only
4	UE supporting GNSS with A-GPS and A-GLONASS only
5	UE supporting OTDOA
6	UE supporting ECID

**Table 7.5.1.3.2-1: Main behaviour**

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a LPP message of type Request Location Information including a transaction ID.	<--	<i>DLInformationTransfer</i> (LPP REQUEST LOCATION INFORMATION)		
2	Immediately after step 2, the SS sends a LPP message of type Abort using the same transaction ID chosen in step 1.	<--	<i>DLInformationTransfer</i> (LPP ABORT)	-	-
3	The SS waits for 10 seconds to ensure the UE does not send a LPP message of type Provide Location Information with the same transaction ID as in step 1.			1	P

### 7.5.1.3.3 Specific message contents

**Table 7.5.1.3.3-1: *DLInformationTransfer* (steps 1 and 2, Table 7.5.1.3.2-1)**

Information Element	Value/remark	Comment	Condition
Derivation Path: 36.331 clause 6.2.2			
<i>DLInformationTransfer</i> ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
<i>dlInformationTransfer-r8</i> SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.5.1.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

**Table 7.5.1.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 1 and 2, Table 7.5.1.3.2-1)**

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	0010	EPS session management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	<b>Step 1:</b> Set according to Table 7.5.1.3.3-3	LPP Request Location Information	
	<b>Step 2:</b> Set according to Table 7.5.1.3.3-4	LPP Abort	
Additional information	Present	Routing Identifier/Correlation ID	

**Table 7.5.1.3.3-3: LPP Request Location Information (step 1, Table 7.5.1.3.2-1)**

Derivation Path: Table 4.4-4			
Information Element	Value/remark	Comment	Condition
As defined in Table 4.4-4 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	0		
}			
locationInformationType	locationEstimateRequired	In case of "UE-based" Location method supported by the UE	
	locationMeasurementsRequired	In case of "UE-assisted" Location method supported by the UE	
responseTime	10		

Table 7.5.1.3.3-4: LPP Abort (step 2, Table 7.5.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	Value/remark	Comment	Condition
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	0		
}			
endTransaction	TRUE		
sequenceNumber	Not present.		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
abort SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
abort-r9 SEQUENCE {			
commonEsAbort SEQUENCE {			
abortCause	networkAbort		
}			
epdu-Abort	Not present		
}			
}			
}			
}			
}			
}			

## 7.6 LPP Positioning Error

### 7.6.1 Error - Not Enough Reference Source Signals

## 8 Circuit Switched (CS) Fallback

### 8.1 MO-LR Procedure

#### 8.1.1 CS fallback: Network does not support EPC-MO-LR

##### 8.1.1.1 Test Purpose (TP)

(1)

```

with { UE in E-UTRA RRC_IDLE state having received an ATTACH ACCEPT message indicating location
      services via EPC not supported and location services via CS domain supported }
ensure that {
  when { UE initiates MO-LR procedure }
  then { UE transmits an EXTENDED SERVICE REQUEST message }
}

```

##### 8.1.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 23.272, clause 8.3.1.

[TS 23.272, clause 8.3.1]

MO-LR procedure in the CS fallback in EPS is performed as specified in TS 23.271 [8].

When the MO-LR procedure is triggered by the UE's application, UE will check the LCS Support Indication provided by the Attach and TAU procedures as specified in TS 23.401 [2]:

- If the LCS Support Indication indicates EPC-MO-LR is supported, and if the UE supports EPC-MO-LR, the UE stays in LTE and initiates the EPC-MO-LR procedure.
- If EPC-MO-LR is not supported by either the network or the UE and if the LCS Support Indication indicates CS-MO-LR is supported, and the UE supports CS-MO-LR, the UE assumes CS-MO-LR is provided. Also, if EPC-MO-LR is not supported by either the network or the UE and if network does not provide information on whether CS-MO-LR is supported, then UE assumes CS-MO-LR may be provided. In these cases, if the previous combined EPS/IMSI Attach or Combined TA/LA Update is accepted with no "SMS only" indication, then the UE initiates CS Fallback to perform CS-MO-LR.

NOTE: Based on UE implementation, UE may avoid initiating CS-MO-LR when an IMS VoIP session is active.

- Otherwise, the UE shall not attempt the EPC-MO-LR procedure, i.e. neither EPC-MO-LR nor CS-MO-LR with CS Fallback.

If the UE decided to initiate the CS Fallback for the LCS based on LCS Support Indication check, then, the following is applied:

- When UE is in active mode, UE and the network follows the procedure in clause 6.2 "Mobile Originating Call in Active-Mode". After UE changes its RAT from E-UTRAN to UTRAN/GERAN, it performs CS-MO-LR procedures as specified in TS 23.271 [8].
- When UE is in active mode but there's no need for PS-Handover, then UE and the network follows the procedure in clause 6.3 "Mobile Originating Call in Active Mode - No PS HO Support in GERAN". After UE changes its RAT from E-UTRAN to UTRAN/GERAN, it performs CS-MO-LR procedure as specified in TS 23.271 [8].
- When UE is in idle mode, UE follows the procedure in clause 6.4 "Mobile Originating Call in Idle Mode". After UE changes its RAT from E-UTRAN to UTRAN/GERAN, it performs CS-MO-LR procedure as specified in TS 23.271 [8].

#### 8.1.1.3 Test description

##### 8.1.1.3.1 Pre-test conditions

System Simulator:

- Cell 1 (E-UTRA) and Cell 5 (UTRA)

UE:

- The UE is configured to initiate combined EPS/IMSI attach.

Preamble:

- The UE is in state Registered, Idle Mode (state 2) on cell 1 according to TS 36.508 [8].

Related PICS/PIXIT Statements:

- Method of triggering a CS-MO-LR request for a location estimate.

## 8.1.1.3.2 Test procedure sequence

Table 8.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Cause the UE to initiate MO-LR procedure.	-	-	-	-
2	The UE transmits an <i>RRCCONNECTIONREQUEST</i> message on Cell 1.	-->	<i>RRCCONNECTIONREQUEST</i>	-	-
3	The SS transmits an <i>RRCCONNECTIONSETUP</i> message on Cell 1.	<--	<i>RRCCONNECTIONSETUP</i>	-	-
4	The UE transmits an <i>RRCCONNECTIONSETUPCOMPLETE</i> message on Cell 1. This message includes an EXTENDED SERVICE REQUEST message.	-->	<i>RRCCONNECTIONSETUPCOMPLETE</i>	1	P
5	The SS transmits a <i>SECURITYMODECOMMAND</i> message on Cell 1.	<--	<i>SECURITYMODECOMMAND</i>	-	-
6	The UE transmits a <i>SECURITYMODECOMPLETE</i> message on Cell 1.	-->	<i>SECURITYMODECOMPLETE</i>	-	-
7	The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message on Cell 1.	<--	<i>RRCCONNECTIONRECONFIGURATION</i>	-	-
8	The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 1.	-->	<i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i>	-	-
9	The SS transmits an <i>RRCCONNECTIONRELEASE</i> message for redirection to UTRAN carrier on Cell 1.	<--	<i>RRCCONNECTIONRELEASE</i>	-	-
10-18	Steps 1 to 6 and steps 10 to 12 of the test procedure in TS 34.123-1 [14] subclause 17.2.3.2 are performed on Cell 5. Note: RRC connection establishment procedure and LCS procedure are performed in UTRAN cell.	-	-	-	-

## 8.1.1.3.3 Specific message contents

Table 8.1.1.3.3-1: Message ATTACH ACCEPT (preamble, Table 8.1.1.3.2-1)

Derivation Path: TS 36.571-2 Table 4.3-2			
Information Element	Value/remark	Comment	Condition
Location services indicator in EPC (EPC-LCS) (octet 3, bit 3)	0	location services via EPC not supported	
Location services indicator in CS (CS-LCS) (octet 3, bit 4 to 5)	10	location services via CS domain supported	

**Table 8.1.1.3.3-2: Message *RRCConnectionRelease* (step 9, Table 8.1.1.3.2-1)**

Derivation Path: TS 36.508 Table 4.6.1-15			
Information Element	Value/remark	Comment	Condition
RRCConnectionRelease ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
redirectedCarrierInfo CHOICE {			
utra-FDD	Downlink UARFCN of cell 5		UTRA-FDD
utra-TDD	Downlink UARFCN of cell 5		UTRA-TDD
}			
}			
}			
}			

Condition	Explanation
UTRA-FDD	UTRA FDD cell environment
UTRA-TDD	UTRA TDD cell environment

## 8.1.2 CS fallback: UE does not support EPC-MO-LR

### 8.1.2.1 Test Purpose (TP)

(1)

```

with { UE in E-UTRA RRC_IDLE state having received an ATTACH ACCEPT message indicating location
       services via EPC supported and location services via CS domain supported }
ensure that {
  when { UE initiates MO-LR procedure }
  then { UE transmits an EXTENDED SERVICE REQUEST message }
}

```

### 8.1.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 23.272, clause 8.3.1.

[TS 23.272, clause 8.3.1]

MO-LR procedure in the CS fallback in EPS is performed as specified in TS 23.271 [8].

When the MO-LR procedure is triggered by the UE's application, UE will check the LCS Support Indication provided by the Attach and TAU procedures as specified in TS 23.401 [2]:

- If the LCS Support Indication indicates EPC-MO-LR is supported, and if the UE supports EPC-MO-LR, the UE stays in LTE and initiates the EPC-MO-LR procedure.
- If EPC-MO-LR is not supported by either the network or the UE and if the LCS Support Indication indicates CS-MO-LR is supported, and the UE supports CS-MO-LR, the UE assumes CS-MO-LR is provided. Also, if EPC-MO-LR is not supported by either the network or the UE and if network does not provide information on whether CS-MO-LR is supported, then UE assumes CS-MO-LR may be provided. In these cases, if the previous combined EPS/IMSI Attach or Combined TA/LA Update is accepted with no "SMS only" indication, then the UE initiates CS Fallback to perform CS-MO-LR.

NOTE: Based on UE implementation, UE may avoid initiating CS-MO-LR when an IMS VoIP session is active.

- Otherwise, the UE shall not attempt the EPC-MO-LR procedure, i.e. neither EPC-MO-LR nor CS-MO-LR with CS Fallback.

If the UE decided to initiate the CS Fallback for the LCS based on LCS Support Indication check, then, the following is applied:

- When UE is in active mode, UE and the network follows the procedure in clause 6.2 "Mobile Originating Call in Active-Mode". After UE changes its RAT from E-UTRAN to UTRAN/GERAN, it performs CS-MO-LR procedures as specified in TS 23.271 [8].
- When UE is in active mode but there's no need for PS-Handover, then UE and the network follows the procedure in clause 6.3 "Mobile Originating Call in Active Mode - No PS HO Support in GERAN". After UE changes its RAT from E-UTRAN to UTRAN/GERAN, it performs CS-MO-LR procedure as specified in TS 23.271 [8].
- When UE is in idle mode, UE follows the procedure in clause 6.4 "Mobile Originating Call in Idle Mode". After UE changes its RAT from E-UTRAN to UTRAN/GERAN, it performs CS-MO-LR procedure as specified in TS 23.271 [8].

#### 8.1.2.3 Test description

##### 8.1.2.3.1 Pre-test conditions

#### System Simulator:

- Cell 1 (E-UTRA) and Cell 5 (UTRA)

#### UE:

- The UE is configured to initiate combined EPS/IMSI attach.

#### Preamble:

- The UE is in state Registered, Idle Mode (state 2) on cell 1 according to TS 36.508 [8].

#### Related PICS/PIXIT Statements:

- Method of triggering a CS-MO-LR request for a location estimate.



## 8.1.2.3.2 Test procedure sequence

Table 8.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Cause the UE to initiate MO-LR procedure.	-	-	-	-
2	The UE transmits an <i>RRCCONNECTIONREQUEST</i> message on Cell 1.	-->	<i>RRCCONNECTIONREQUEST</i>	-	-
3	The SS transmits an <i>RRCCONNECTIONSETUP</i> message on Cell 1.	<--	<i>RRCCONNECTIONSETUP</i>	-	-
4	The UE transmits an <i>RRCCONNECTIONSETUPCOMPLETE</i> message on Cell 1. This message includes an EXTENDED SERVICE REQUEST message.	-->	<i>RRCCONNECTIONSETUPCOMPLETE</i>	1	P
5	The SS transmits a <i>SECURITYMODECOMMAND</i> message on Cell 1.	<--	<i>SECURITYMODECOMMAND</i>	-	-
6	The UE transmits a <i>SECURITYMODECOMPLETE</i> message on Cell 1.	-->	<i>SECURITYMODECOMPLETE</i>	-	-
7	The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message on Cell 1.	<--	<i>RRCCONNECTIONRECONFIGURATION</i>	-	-
8	The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 1.	-->	<i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i>	-	-
9	The SS transmits an <i>RRCCONNECTIONRELEASE</i> message for redirection to UTRAN carrier on Cell 1.	<--	<i>RRCCONNECTIONRELEASE</i>	-	-
10-18	Steps 1 to 6 and steps 10 to 12 of the test procedure in TS 34.123-1 [14] subclause 17.2.3.2 are performed on Cell 5. Note: RRC connection establishment procedure and LCS procedure are performed in UTRAN cell.	-	-	-	-

## 8.1.2.3.3 Specific message contents

Table 8.1.2.3.3-1: Message ATTACH ACCEPT (preamble, Table 8.1.2.3.2-1)

Derivation Path: TS 36.571-2 Table 4.3-2			
Information Element	Value/remark	Comment	Condition
Location services indicator in CS (CS-LCS) (octet 3, bit 4 to 5)	10	location services via CS domain supported	

**Table 8.1.2.3.3-2: Message *RRCConnectionRelease* (step 9, Table 8.1.2.3.2-1)**

Derivation Path: TS 36.508 Table 4.6.1-15			
Information Element	Value/remark	Comment	Condition
RRCConnectionRelease ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
redirectedCarrierInfo CHOICE {			
utra-FDD	Downlink UARFCN of cell 5		UTRA-FDD
utra-TDD	Downlink UARFCN of cell 5		UTRA-TDD
}			
}			
}			
}			
}			

Condition	Explanation
UTRA-FDD	UTRA FDD cell environment
UTRA-TDD	UTRA TDD cell environment

## Annex A (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2010-08	R5#48	R5-104119			Initial skeleton proposal		0.0.0
	R5#48	R5-104741			Merge of documents R5-104119, R5-104120, R5-104121, R5-104122, together with small editorial modifications	0.0.0	0.0.1
2011-02	R5#50	R5-110250			Various corrections based on LPP v9.3.0 (R5-106431)	0.0.1	
					New test cases: LPP Reliable Transport (R5-106433)		
					New test cases: CS fallback (R5-106698)		0.1.0
2011-05	R5#51	R5-112388			Various corrections (R5-110251)	0.1.0	
					OTDOA default conditions (R5-110252)		0.2.0
2011-08	R5#52	R5-113770			Small corrections to 36.571-2 baseline text	0.2.0	
		R5-113771			Addition of LPP abort test case		
		R5-113147			Addition of Position Capability Transfer test case		
		R5-113140			Addition of Notification test cases		
		R5-113769			Addition of UE Network Capability test case		
		R5-113802r1			Addition of LPP Error handling test cases		1.0.0