3GPP Specs:

How to navigate self-help

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The 3rd Generation Partnership Project (3GPP) is collaboration between groups of telecommunications associations, known as the Organizational Partners. The initial scope of 3GPP was to make a globally applicable third-generation (3G) mobile phone system specification based on evolved Global System for Mobile Communications (GSM) specifications within the scope of the International Mobile Telecommunications-2000 project of the International Telecommunication Union (ITU). The scope was later enlarged to include the development and maintenance of:

- Global System for Mobile Communications (GSM) including GSM evolved radio access technologies (e.g. General Packet Radio Service (GPRS) and Enhanced Data Rates for GSM Evolution (EDGE))
- Evolved third Generation and beyond Mobile System based on the evolved 3GPP core networks, and the radio access technologies supported by the Partners (i.e., UTRA both FDD and TDD modes).
- an evolved IP Multimedia Subsystem (IMS) developed in an access independent manner
- 3GPP standardization encompasses Radio, Core Network and Service architecture.

The Organizational Partners are the European Telecommunications Standards Institute, Association of Radio Industries and Businesses/Telecommunication Technology Committee (ARIB/TTC) (Japan), China Communications Standards Association,[3] Alliance for Telecommunications Industry Solutions (North America) and Telecommunications Technology Association (South Korea).[2] The project was established in December 1998.

3GPP should not be confused with 3rd Generation Partnership Project 2 (3GPP2), which specifies standards for another 3G technology based on IS-95 (CDMA), commonly known as CDMA2000.

The 3GPP support team (also known as the "Mobile Competence Centre") is located at the ETSI headquarters in Sophia-Antipolis (France).

How to read the Specs:

3GPP standardization work is contribution-driven. Companies ("individual members") participate through their membership to a 3GPP Organizational Partner. As of April 2011, 3GPP is composed of more than 370 individual members.

Specification work is done at WG and at TSG level. The 3GPP WGs hold several meetings a year. They prepare and discuss change requests against 3GPP specifications. A change request accepted at WG level is called "agreed". 3GPP TSGs hold plenary meetings quarterly. The TSGs can "approve" the change requests that were agreed at WG level. Some specifications are under the direct responsibility of TSGs and therefore, change requests can also be handled at TSG level. The approved change requests are subsequently incorporated in 3GPP specifications.

3GPP follows a three-stage methodology as defined in ITU-T Recommendation I.130:

- Stage 1 specifications define the service requirements from the user point of view.
- Stage 2 specifications define architecture to support the service requirements.

- Stage 3 specifications define an implementation of the architecture by specifying protocols in details.

Test specifications are sometimes defined as stage 4, as they follow stage 3.

Specifications are grouped into releases. A release consists of a set of internally consistent set of features and specifications.

Timeframes are defined for each release by specifying freezing dates. Once a release is frozen, only essential corrections are allowed (i.e. addition and modifications of functions are forbidden). Freezing dates are defined for each stage.

All specification numbers for 3G and above are 4 or 5 digits. Eg. 09.02, 29.002 etc.
Take them as   XX.YY or   XX.YYY, Where XX denotes series number and YY will be used when 01 < XX < 13 & YYY will be used when 21 < XX < 55.

Every specification has title and specification group to define them. All the details related to specification groups, and abbreviations related to 3GPP can be found in specification no 21.905 (Vocabulary) Standardization process.

The 3GPP specifications are transposed into deliverables by the Organizational Partners.

A click on the **36 series link** will bring up all the important E-UTRAN specifications. Among the 36 series, the best spec to download and read for your beginning LTE studies must be the **TS 36.300** E-UTRAN Overall Description, Stage2. It gives the bird's eye view of the entire subject (click on version numbers to start the downloading). Unfortunately this general spec may not always up to date with the other more detailed specifications. A few discrepancies in use of terminology and other details may linger in 36.300, but by and large it is the place to go to for an overview of LTE. This spec does a decent job of treating some of the basic aspects of the LTE Core Network, better known as Evolved Packet Core (EPC), as well. The role of the Mobility Management Entity (MME) and the Serving Gateway (S-GW) is listed, alongside a good description of the security functions which involve the EPC. Using the 36.300 as spring board, you will find your way to a long list of list of references for further LTE studies. Most of these are concerned with the E-UTRAN or the EPC portion of the LTE architecture. Below is a summary. E-UTRAN and Air Interface related topics are in the 36.2xx series where the xx can be 11 (Physical Channels and Modulation), 12 (Multiplexing and Channel coding), 13 (Physical Layer Procedures) and 14 (Physical Layer measurements).

For EPC related and Interworking topics there are two important specs **TS23.401** and its companion **TS23.402**. TS23.401 is a comprehensive description of EPC architecture, functions, protocols, and procedures. If you want to know how LTE will interact with UMTS and GSM/GPRS networks, this is the place to go. TS23.402 on the other hand tackles the challenge of inter-operability with the 1xEV-DO and other non-3GPP networks. There are a number of "auxiliary" specs that support these two. An important one among these is the **TS25.304** which describes the mobile's behavior in idle mode. When

opening these non-36 series specs you should make sure that you pick Rel-8 versions.
3GPP still adheres to the MS Word format for the specifications. Just click on the last column on a specs page, where you see ETSI (European Telecommunications Standards Institute). This link will take you to ETSI's webpage from where you can get a PDF version of your favorite LTE specification.

LTE & 36 Series of 3GPP

TS 36.101 E-UTRA: User Equipment (UE) radio transmission and reception.

TS 36.104 E-UTRA: Base Station (BS) radio transmission and reception

TS 36.106 E-UTRA: Repeater radio transmission and reception

TS 36.113 E-UTRA: Base Station (BS) and repeater ElectroMagnetic Compatibility (EMC)

TS 36.124 E-UTRA: EMC requirements for mobile terminals and ancillary equipment

TS 36.133 E-UTRA: Requirements for support of radio resource management

TS 36.141 E-UTRA: Base Station (BS) conformance testing

TS 36.143 E-UTRA: Repeater conformance testing

TS 36.201 E-UTRA: Long Term Evolution (LTE) physical layer: General description

TS 36.211 E-UTRA: Physical channels and modulation

TS 36.212 E-UTRA: Multiplexing and channel coding

TS 36.213 E-UTRA: Physical layer procedures

TS 36.214 E-UTRA: Physical layer - Measurements

TS 36.302 E-UTRA: Services provided by the physical layer

TS 36.304 E-UTRA: User Equipment (UE) procedures in idle mode

TS 36.306 E-UTRA: User Equipment (UE) radio access capabilities

TS 36.314 E-UTRAN: Layer 2 - Measurements

TS 36.321 E-UTRA: Medium Access Control (MAC) protocol specification

TS 36.322 E-UTRA: Radio Link Control (RLC) protocol specification

TS 36.323 E-UTRA: Packet Data Convergence Protocol (PDCP) specification

TS 36.331 E-UTRA: Radio Resource Control (RRC): Protocol specification

TS 36.401 E-UTRAN: Architecture description

TS 36.410 E-UTRAN: S1 layer 1 general aspects and principles

TS 36.411 E-UTRAN: S1 layer 1

TS 36.412 E-UTRAN: S1 signaling transport

TS 36.413 E-UTRA: S1 Application Protocol (S1AP)

TS 36.414 E-UTRAN: S1 data transport

TS 36.420 E-UTRAN: X2 general aspects and principles

TS 36.421 E-UTRAN: X2 layer 1

TS 36.422 E-UTRAN: X2 signaling transport

TS 36.423 E-UTRAN: X2 Application Protocol (X2AP)

TS 36.424 E-UTRAN: X2 data transport

TS 36.440 E-UTRAN: General aspects and principles for interfaces supporting Multimedia Broadcast Multicast Service (MBMS) within E-UTRAN

TS 36.441 E-UTRAN: Layer 1 for interfaces supporting Multimedia Broadcast Multicast Service (MBMS) within E-UTRAN

TS 36.442 E-UTRAN: Signaling Transport for interfaces supporting Multimedia Broadcast Multicast Service (MBMS) within E-UTRAN

TS 36.443 E-UTRAN: M2 Application Protocol (M2AP)

TS 36.444 E-UTRAN: M3 Application Protocol (M3AP)

TS 36.445 E-UTRAN: M1 Data Transport

TS 36.446 E-UTRAN: M1 User Plane protocol

TS 36.508 E-UTRA and Evolved Packet Core (EPC): Common test environments for User Equipment (UE) conformance testing

TS 36.509 E-UTRA: Special conformance testing function for User Equipment (UE)

TS 36.521-1 E-UTRA: User Equipment (UE) conformance specification: Radio transmission and reception: Part 1: conformance testing

TS 36.521-2 E-UTRA: User Equipment (UE) conformance specification: Radio transmission and reception: Part 2: Implementation Conformance Statement (ICS)

TS 36.521-3 E-UTRA: User Equipment (UE) conformance specification: Radio transmission and reception: Part 3: Radio Resource Management conformance testing

TS 36.523-1 E-UTRAN: User Equipment (UE) conformance specification: Part 1: Protocol conformance specification

TS 36.523-2 E-UTRAN: User Equipment (UE) conformance specification: Part 2: ICS

TS 36.523-3 E-UTRAN: User Equipment (UE) conformance specification: Part 3: Abstract Test Suites (ATS)

TR 36.801 E-UTRA: Measurement Requirements

TR 36.803 E-UTRA: User Equipment (UE) radio transmission and reception

TR 36.804 E-UTRA: Base Station (BS) radio transmission and reception

TR 36.814 E-UTRAN: Further advancements for E-UTRA Physical layer aspects

TR 36.902 E-UTRAN: Self-configuring and self-optimizing network (SON) use cases and solutions

TS 36.903 E-UTRA: Derivation of test tolerances for multi-cell Radio Resource Management (RRM) conformance tests