

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNIFIED PATENTS, LLC

v.

TOGAIL TECHNOLOGIES LTD.,
Patent Owner

U.S. PATENT NO. 10,791,502

DECLARATION OF FRIEDHELM RODERMUND
IN SUPPORT OF A REQUEST FOR INTER PARTES REVIEW OF U.S.
PATENT NO. 10,791,502 UNDER 35 U.S.C. § 311

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I, Friedhelm Rodermund, do hereby declare as follows:

I. INTRODUCTION AND ENGAGEMENT

1. I have been retained in this matter by the Petitioner, Unified Patents, LLC, as an independent, expert declarant to provide testimony regarding 3GPP's standard business practices for record keeping and publishing technical specifications, change request proposals, reports, and other documents developed during the course of standards activities carried out by the 3rd Generation Partnership Project ("3GPP") and the European Telecommunications Standards Institute ("ETSI"). I am being compensated at my rate of €450 per hour for my services. No part of my compensation is dependent on my opinions or on the outcome of this proceeding. I have no financial interest in any of the parties to this proceeding.

2. I have been asked to provide my opinions regarding the authenticity and dates of public accessibility of the following 3GPP document:

- TDoc R2-1801795, which represents a document with the title "Discussion on SI Request Prohibit Timer" and identifying "Source: OPPO") (hereinafter "Oppo") (Ex-1005)
- TS 36.331 v14.5.1 (2018-01) "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) Protocol Specification (Release 14)," (Ex-1024);

- TS 38.300 v15.0.0 (2017-12) “NR; NR and NG-RAN Overall description; Stage 2 (Release 15),” (Ex-1025); and
- TS 38.331 v15.0.0 (2017-12) “NR Radio Resource Control (RRC) protocol specification (Release 15),” (Ex-1026).

3. As an ETSI Project Manager and Secretary, from June 1998 to December 2004, I have personal knowledge of 3GPP’s standard business and records keeping practices. I continued following 3GPP’s work ever since. Thus, based on my experience, personal knowledge, and review of 3GPP’s business records, I am able to testify regarding the authenticity of certain documents published by 3GPP and the timing of their publication.

4. I am also knowledgeable about document management practices of e.g. in TSG RAN WG2. This is due to the fact that all 3GPP working groups use the same document repositories on ftp.3gpp.org and portal.3gpp.org. Thus, I am able to testify regarding the availability and authenticity of any 3GPP documents.

5. I have been informed that Togail Technologies Ltd. (collectively, “Togail” or “Patent Owner”) alleges ownership of U.S. Patent No. 10,791,502 (“the ’502 Patent”) (Ex-1001). I have no financial interest in the Patent Owner or the ’502 patent. I was asked to provide my opinions based on documents published in the timeframe from 2016 through April 2, 2018, which I understand is the earliest claimed priority date of the ’502 Patent. The 3GPP website, systems and practices

that I discuss are applicable to that time period, and have not changed over the last decade in a manner that would alter the opinions that I provide in this declaration.

6. In forming my opinions I relied upon the documents that I reference in this declaration, as well as those listed in Appendix A.

II. BACKGROUND AND QUALIFICATIONS

7. I have more than 20 years of experience working with standards development organizations including the Third Generation Partnership Project (“3GPP”), the European Telecommunications Standards Institute (“ETSI”), and the Open Mobile Alliance (“OMA”). I have particular experience with the development of standards related to cellular telecommunications, including the standards for the Universal Mobile Telecommunications System (“UMTS”), Long Term Evolution (“LTE”), and 5G, which are all standards developed by the 3GPP.

8. I attended the University of Technology Aachen in Aachen, Germany, where I performed graduate studies in Electrical Engineering with a focus on telecommunications technologies (“Dipl.-Ing. TH” degree). I also attended the University of Technology Trondheim in Trondheim, Norway, and completed my Diploma thesis, “Design of a dual processor computer for digital signal processing in power electronics,” in 1993.

9. From December 1993 to June 1998, I worked at Mannesmann Mobilfunk as a System Engineer and Project Manager in Quality Assurance and

Technical Standards. One of my responsibilities was to ensure that cellular network equipment was compatible with the Global System for Mobile Communications (“GSM”) standard developed by ETSI, and I did so by managing and performing related test activities. During that time, I also started working as a standards delegate. I attended my first ETSI meeting in 1996 (although I was already following ETSI developments from 1992 during my studies).

10. From June 1998 to December 2004, I worked at ETSI as a project manager for various ETSI Special Mobile Group (“SMG”) and 3GPP working groups. First, I served as a secretary of SMG4 “Data Services” and SMG8 “Base Stations Testing.” Then, as a project manager with the ETSI Mobile Competence Center (“MCC”), I supported establishing 3GPP as the new international standards development organization for cellular telecommunications. One of my roles was acting as Secretary for 3GPP’s Technical Specifications Group Terminals, Working Group (“T2”), the group which played a leading role in the creation of standards for Multimedia such as the Multimedia Messaging Service (“MMS”).

11. Later, I was a secretary of the highest-level Technical Specifications Group “Terminals” which was, besides other things, responsible for the development of test specifications including tests for the radio interface including functions related to Radio Resource Control (RRC).

12. I edited all technical specifications produced by my working groups and presented results to the parent body for approval. I attended all meetings (apart from some sub-working group meetings) and was also responsible for compiling meeting reports, for handling all the meeting documents, and managing the work plan. It was also my role to guide the groups and to advise the chairmen regarding 3GPP working methods and procedures including document handling, and to make sure delegates were aware of their company's obligations under the 3GPP Intellectual Property Rights policy.

13. As part of my responsibilities at ETSI, I acted as a 3GPP custodian of records by personally managing 3GPP's public File Transfer Protocol (ftp) folders, which I used to make publicly accessible various 3GPP documents, including versions of 3GPP specifications, technical reports, liaison statements, change requests, contributions, agendas, meeting reports, and other 3GPP documents from my working groups. I am also knowledgeable about document management practices used in other working groups and within 3GPP in general with regard to making documents publicly accessible through the same, public FTP server of 3GPP.

14. Since I left ETSI as a staff member in 2005, I have been continuously involved in standardization activities, including with Open Mobile Alliance, ETSI, and 3GPP. Since 2017, I also have been attending the ETSI Intellectual Property

Rights Special Committee, which is responsible for the maintenance of the ETSI Intellectual Property Rights Policy.

15. After I left ETSI, I worked from January 2005 to October 2014 at Vodafone, first as a Project Manager for Mobile Broadcast Standards, and then as Vice Chairman of the Device Management working group of the Open Mobile Alliance, and then as a Senior Standards Strategist, all with responsibilities as described on my C.V. At Vodafone, I was deeply involved in standards work with ETSI and 3GPP and other standards setting organizations, including as a delegate to 3GPP SA1 “Services.” As part of my responsibilities, I attended selected 3GPP meetings, submitted documents to 3GPP, used 3GPP resources (including 3GPP’s FTP server) extensively, and remained knowledgeable about 3GPP policies and procedures with regard to document management and public accessibility. I was also involved in the creation of patents, defense activities related to patent litigations, and patent evaluation, mostly in the context of standards development.

16. Since leaving Vodafone in 2014, I have performed consulting work regarding Internet of Things (IoT) and Machine to Machine (M2M) technology and standards, first at Friedhelm Rodermund Consulting and then as the Founder and Director of IOTECC GmbH. In connection with my work, I regularly deal with standards such as OMA’s Lightweight M2M (LwM2M), 3GPP’s LTE, Narrowband IoT (NB-IoT) and 5G standards. And I continue to extensively use 3GPP resources

and therefore remain knowledgeable about 3GPP policies and procedures with regard to document management and public accessibility.

17. I also provide consulting services related to patents, in particular around 3GPP Standard Essential Patents (“SEPs”), and I have been working as an expert witness on a number of occasions. I continue to closely follow the maintenance of the ETSI IPR Policy as a delegate to the ETSI IPR Special Committee. Furthermore, I am conducting a seminar on SEPs and the Internet of Things at the Technical University of Ilmenau, Germany.

18. At the time of writing this declaration, I am following—including attending selected meetings—the following standards committees: ETSI oneM2M, ETSI IPR Special Committee, Open Mobile Alliance, and 3GPP.

19. A copy of my curriculum vitae, which includes a detailed description of my experience and education, is attached as Appendix B. A list of litigation matters on which I have worked over the last five years is also included in my curriculum vitae.

III. SUMMARY OF MY OPINIONS

20. It is my opinion that Oppo (Ex-1005) is an authentic 3GPP TDoc and would have been publicly accessible through <ftp.3gpp.org> no later than February 13, 2018.

21. It is further my opinion that the 3GPP technical specifications at Ex-1024 to 1026 are authentic 3GPP technical specifications that would have been publicly accessible from the 3GPP website no later than the upload date shown on the website.

IV. PUBLICATION OF 3GPP SPECIFICATIONS AND RELATED DOCUMENTS

A. General Practices

22. Unless otherwise noted, the following is an accurate description of 3GPP general practices from 1998 to the present, regardless of whether I use the present or past tense to describe those practices.

23. 3GPP was established in 1998 by a group of telecommunications standard development organizations from Japan, Korea, China, Europe, and the United States to jointly develop worldwide standards for mobile telecommunications. Today, 3GPP consists of seven partners: Association of Radio Industries and Businesses, Japan (“ARIB”), Alliance for Telecommunications Industry Solutions, USA (“ATIS”), China Communications Standards Association (“CCSA”), European Telecommunications Standards Institute (“ETSI”), Telecommunications Standards Development Society, India (“TSDSI”), Telecommunications Technology Association, Korea (“TTA”), and

Telecommunication Technology Committee, Japan (“TTC”)¹. In addition to being one of the founding partners, ETSI hosts the Mobile Competence Centre (“MCC”), which provides administrative and technical support for the day-to-day work of 3GPP. Furthermore, ETSI manages 3GPP’s IT services such as the 3GPP website, FTP server, and email exploders.

24. 3GPP is the world’s leading organization for developing and maintaining cellular telecommunications standards, which it has done since its foundation in 1998. As noted above and in my C.V., I began working for 3GPP, as part of my work at ETSI, the European-based organizational partner of 3GPP.

25. In the ordinary course of its regularly conducted business activities, and pursuant to its standard business practices, 3GPP publishes technical specifications, proposals, reports, and other documents related to the development of cellular telecommunications standards. Such documents are published for the purposes of discussion and establishment of industry standards for cellular telecommunications. This has been 3GPP’s ordinary course of business since when I began working at ETSI in 1998.

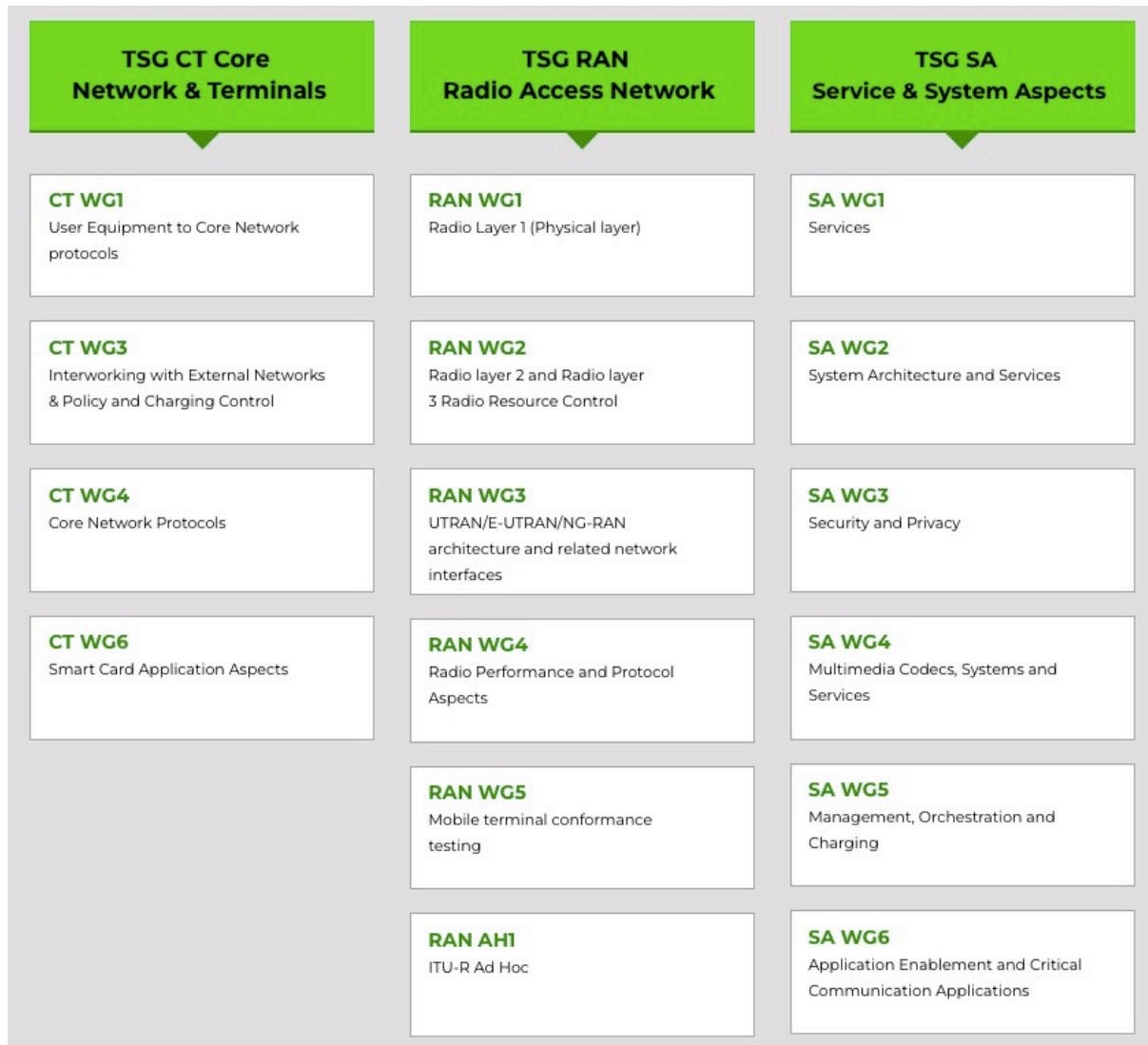
26. In the ordinary course of 3GPP’s regularly conducted business activities, and pursuant to its standard business practices, all draft technical

¹ For the 3GPP Partners see also Ex-1009.

specifications, proposals, reports, and other temporary documents to be discussed or considered in relation to 3GPP's telecommunications standards activities were, and continue to be, assigned a temporary document number and made publicly available, including on the FTP server associated with the 3GPP website, currently residing at [ftp.3gpp.org](ftp://ftp.3gpp.org). Such documents are referred to as "TDocs." Final versions of the technical specifications also were, and continue to be, publicly available from that same FTP server.

27. The names and the structure of 3GPP working groups is reproduced below:²

² <https://www.3gpp.org/3gpp-groups>



Of particular relevance to this declaration, note that the “RAN WG2” is the 3GPP working group responsible for Radio Layer 2 and Radio Layer 3. Anyone interested in developments pertinent to these layers would follow the work on RAN WG2.

28. Each Technical Specification Group (“TSG”) or Working Group (“WG”) adopts a structured numbering system for the documents associated with their meetings, and those systems typically follow a consistent numbering system as

shown in the following example: xminnnzzzz. The numbering system normally comprises five logical elements: (1) x: a single letter corresponding to the TSG; wherein in the 2016 to 2018 timeframe, x was one of R (Radio Access Network), C (Core and Terminals), or S (Service and System Aspects); (2) m: a single character corresponding to the Working Group identity (typically 1, 2, 3, etc.) or, in the case of the TSG itself, the letter “P”; (3) i: normally the hyphen character “-”; (4) nn: the calendar year of the meeting to which the document was submitted; and (5) zzzz: a running number (some working groups use 5 digits).

29. In the ordinary course of 3GPP’s regularly conducted business activities, and pursuant to its standard business practices, from December 1998 onwards, 3GPP published all its TDocs and all final versions of its technical specifications on its FTP server, which has always been easily and publicly accessible from its website and currently resides at <ftp.3gpp.org>.

30. As early as December 1998, 3GPP’s FTP server was freely accessible to the general public with no login, password, or membership requirement.

31. By 1999, at least 100 companies were members of 3GPP (817 companies by December 2022³), ranging from Bosch to Ericsson to Nokia to

³ For current 3GPP members see <https://www.3gpp.org/get-involved>; *see also* Ex-1012 (3GPP Membership database).

Samsung and generally including those interested in the discussion, creation, and adoption of cellular telecommunications standards, including UMTS. Each of these companies typically delegated multiple individuals to regularly participate in 3GPP meetings. Further, pursuant to 3GPP's standard business practices, 3GPP working groups sent emails notifying these individuals as soon as new or additional documents had been uploaded to 3GPP's FTP server. Thus, not only did the general public have access to the documents on the FTP server, but some of the most interested members of the public—those working to develop standards for cellular telecommunication or working to implement the standards—were personally informed of their availability by email.

32. Based on my experience with 3GPP and the telecommunications industry, I would expect any person implementing a cellular network or device, e.g., an 5G network or device, to consult the corresponding specifications on the 3GPP FTP server, as well as other related documents. The whole purpose of 3GPP creating and making these specifications available was so that engineers and other individuals would have ready access to them when developing and implementing cellular networks and devices.

33. In addition, any person from a 3GPP member company may suggest changes and additions to a 3GPP standard. Of course, that again requires following the ongoing work in 3GPP by either attending meetings in person or by following

discussions on the email reflectors, and by consulting specifications, TDocs and other documents related to the subject areas of interest. For more than two decades, the 3GPP website has been widely known in the mobile telecommunications industry and provides access to all 3GPP documents in a structured manner. For example, since the early days of 3GPP, the TDocs are grouped by Technical Specification Groups (TSG) and Working Groups (WG) and each TSG or WG meeting has a dedicated folder on <ftp.3gpp.org>. The FTP server may also be accessed via the 3GPP web site www.3gpp.org. In addition, the 3GPP web site and the 3GPP portal portal.3gpp.org provide various search and filter functions which are useful when looking for information and documents on specific topics. Thus, everybody interested in the development of technical standards related to mobile communications was very likely aware of 3GPP and could easily find and access the desired information and documents.

34. 3GPP specifications bear a specification number consisting of four or five digits, e.g., 09.02 or 29.002. The first two digits define the specification series which are defined to group the different aspects of the 3GPP system into, e.g. requirements, service aspects, radio aspects codecs, security aspects, and test specifications. The series digits are followed by two additional digits for the 01 to 13 series or three further digits for the 21 to 55 series. The subjects of the individual specification series are explained on 3GPP's website at

<https://www.3gpp.org/specifications-technologies/specifications-by-series>, and
reproduced below:

Subject of specification series	3G and beyond / GSM (R99 and later)	GSM only (Rel-4 and later)	GSM only (before Rel-4)
Requirements	21 series	41 series	01 series
Service aspects ("stage 1")	22 series	42 series	02 series
Technical realization ("stage 2")	23 series	43 series	03 series
Signalling protocols ("stage 3") - user equipment to network	24 series	44 series	04 series
Radio aspects	25 series	45 series	05 series
CODECs	26 series	46 series	06 series
Data	27 series	47 series (none exists)	07 series
Signalling protocols ("stage 3") - (RSS-CN) and OAM&P and Charging (overflow from 32- range)	28 series	48 series	08 series
Signalling protocols ("stage 3") - intra-fixed- network	29 series	49 series	09 series
Programme management	30 series	50 series	10 series
Subscriber Identity Module (SIM / USIM), IC Cards. Test specs.	31 series	51 series	11 series
OAM&P and Charging	32 series	52 series	12 series
Access requirements and test specifications		13 series ⁽¹⁾	13 series ⁽¹⁾
Security aspects	33 series	(2)	(2)
UE and (U)SIM test specifications	34 series	(2)	11 series
Security algorithms ⁽³⁾	35 series	55 series	(4)
LTE (Evolved UTRA), LTE-Advanced, LTE- Advanced Pro radio technology	36 series		
Multiple radio access technology aspects	37 series		
Radio technology beyond LTE	38 series		

35. For instance, the 5G New Radio (NR) standard is covered in the “38 series” and is further subdivided into separate sections or specifications. Selecting the “38 series” link on the page above leads to the 3GPP portal (portal.3gpp.org) page for all of the 38 series technical specifications.⁴ These 5G NR specifications start at TS 38.101 and end at TR 38.921. Excluding withdrawn specifications, the 5G NR standard consists of more than 140 specifications. Each specification can span from a few pages to hundreds of pages. One full version of the 5G standard is massive, spanning tens of thousands of pages across the particular series of technical specifications.

36. 3GPP periodically posts the current version of each 3GPP technical specification to the 3GPP portal, where it is immediately available for download by the public. See <https://portal.3gpp.org/Specifications.aspx>. 3GPP preserves the posted document indefinitely on its server for future reference. *Id.* As detailed below, the 3GPP website provides the date that a particular version of a technical specification was uploaded, using the date convention YYYY-MM-DD. The 3GPP portal also provides a login function to unlock full features, however, login is not required for searching and downloading technical specifications. Based on my

4

<https://portal.3gpp.org/Specifications.aspx?q=1&series=45&releases=all&draft=False&underCC=False&withACC=False&withBCC=False&numberNYA=False>

personal experience, throughout the 2016-2018 timeframe, anyone interested in a particular 3GPP specification could search the 3GPP portal to find and download the latest version of a technical specification using the 3GPP portal in substantially the same manner as they would today:

The screenshot shows the 3GPP Portal website. At the top, there is a navigation bar with the 3GPP logo and the word "Portal". Below the navigation bar, there is a green banner with the text "This site is 3GPP working area. Log in to access full features. For general information go to the public site www.3gpp.org". Below the banner, there is a search form with the following fields: "Title/Specification number" (with value "23.008"), "Release" (with value "All Releases"), "Series" (with a dropdown menu), "Type" (with checkboxes for "Technical Specification (TS)" and "Technical Report (TR)"), "Publication" (with checkboxes for "Internal" and "For Publication"), "Technology" (with checkboxes for "2G", "3G", "LTE", and "5G"), and "Status" (with checkboxes for "Draft", "Under change control", "Withdrawn before change control", and "Withdrawn under change control"). There is a "Search" button at the bottom right of the search form. Below the search form, there is a "Data pager" section with the text "0 specifications found, displaying 0 to 0". Below the data pager, there is a table with the following columns: "Specification Number", "Type", "Title", "Status", "Primary Responsible Group", and "Group". The table is currently empty, with the text "No records to display." below it.

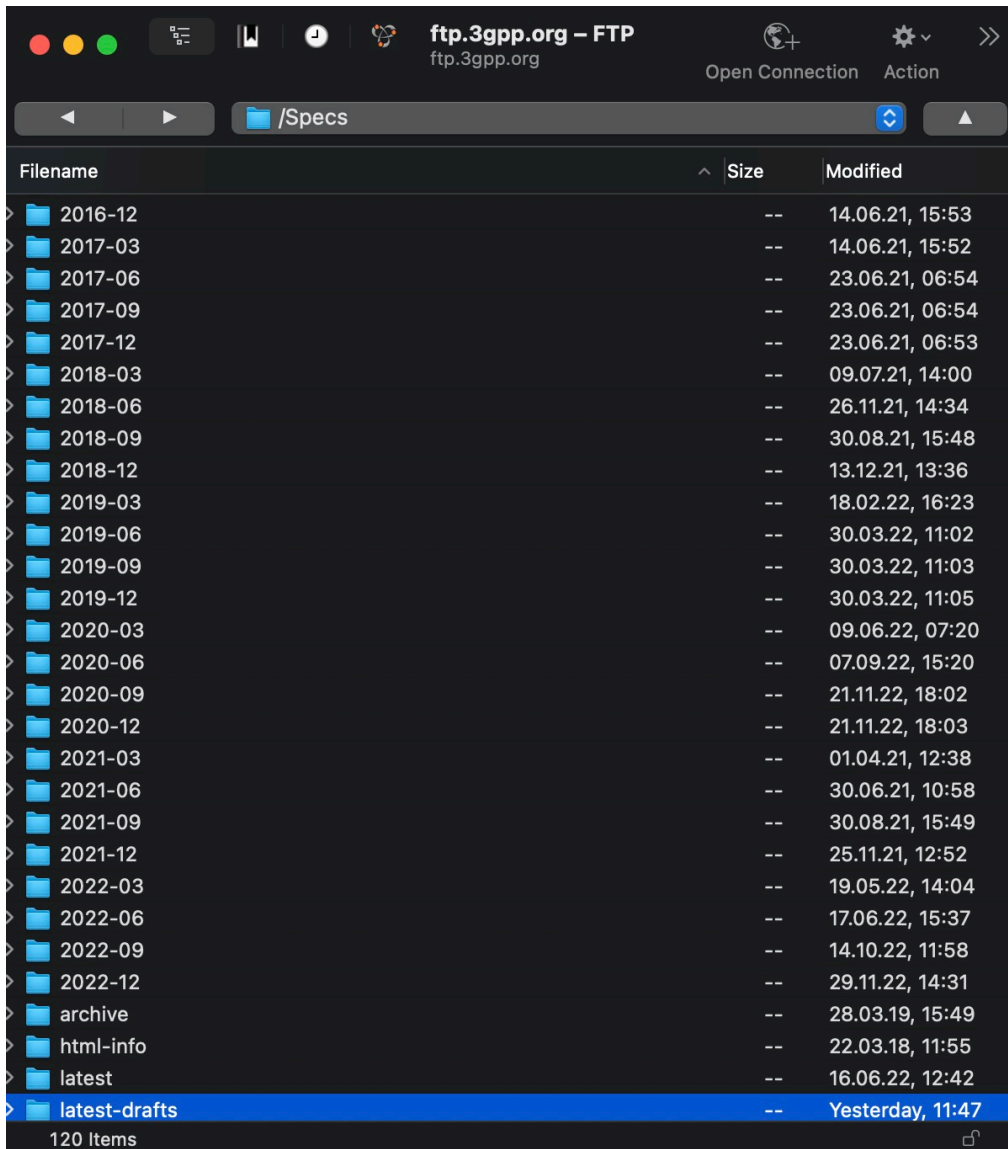
<https://portal.3gpp.org/Specifications.aspx>; *see, e.g.*, 2015 internet archive <https://web.archive.org/web/20150924200802/https://portal.3gpp.org/>.

37. In the ordinary course of 3GPP's regularly conducted business activities, and pursuant to its standard business practices, TDocs are usually uploaded to 3GPP's FTP server and website before the meeting where they are to be discussed. Documents created or revised during the course of a meeting are normally uploaded at the latest during the week following the meeting (e.g., the meeting report

of the meeting is usually published for review during the week following the meeting).

38. In the ordinary course of 3GPP's regularly conducted business activities, and pursuant to its standard business practices, 3GPP maintains archives that include different versions of the specifications, as well as email communications to its membership, including emails announcing the uploading of new or additional documents to 3GPP's FTP server. These archives are created at the time the emails are initially sent.

39. 3GPP specifications almost always are duplicated in at least two and sometime more locations on the FTP server. One location corresponds to a "snapshot" of the specifications corresponding to a particular plenary meeting cycle—for instance, the 2018-12 snapshot contains a snapshot of numerous specifications after the December 2018 3GPP plenary meetings. The second location is an "archive" that contains all versions over time for a given specification. The screenshot below shows an excerpt of the "Spec" folder at <ftp.3gpp.org>:



Filename	Size	Modified
> 2016-12	--	14.06.21, 15:53
> 2017-03	--	14.06.21, 15:52
> 2017-06	--	23.06.21, 06:54
> 2017-09	--	23.06.21, 06:54
> 2017-12	--	23.06.21, 06:53
> 2018-03	--	09.07.21, 14:00
> 2018-06	--	26.11.21, 14:34
> 2018-09	--	30.08.21, 15:48
> 2018-12	--	13.12.21, 13:36
> 2019-03	--	18.02.22, 16:23
> 2019-06	--	30.03.22, 11:02
> 2019-09	--	30.03.22, 11:03
> 2019-12	--	30.03.22, 11:05
> 2020-03	--	09.06.22, 07:20
> 2020-06	--	07.09.22, 15:20
> 2020-09	--	21.11.22, 18:02
> 2020-12	--	21.11.22, 18:03
> 2021-03	--	01.04.21, 12:38
> 2021-06	--	30.06.21, 10:58
> 2021-09	--	30.08.21, 15:49
> 2021-12	--	25.11.21, 12:52
> 2022-03	--	19.05.22, 14:04
> 2022-06	--	17.06.22, 15:37
> 2022-09	--	14.10.22, 11:58
> 2022-12	--	29.11.22, 14:31
> archive	--	28.03.19, 15:49
> html-info	--	22.03.18, 11:55
> latest	--	16.06.22, 12:42
> latest-drafts	--	Yesterday, 11:47

120 Items

40. While 3GPP aims to upload the updated specifications to both locations at the same time, occasionally there may be a small difference in the upload date, and thus the date stamp, for the same specification uploaded to the two locations. Additionally, specifications which are not yet approved (so called “draft” specifications) are presented as TDocs at working group and at plenary meetings (as

soon as the working group decides to submit the specification to the plenary meeting for information or approval). In many cases, the TDocs are also distributed on the email exploder of the working group prior to the meeting, making the TDocs available to all those subscribed to the email distribution list.

41. The timestamp on 3GPP's FTP server shows the date when the document was uploaded the last time. Thus, the timestamp shows the latest possible date the document became publicly available and accessible on 3GPP's FTP server. The given document might have been available earlier and the original timestamp might have been overwritten because the document was uploaded again. According to my experience, this is something which happened quite frequently. Thus, the ftp timestamp is reliable as the latest possible upload date but one cannot determine whether it represents the first upload of a document to the FTP server.

42. 3GPP's working practice to store their documents on its FTP server, as described above, has not changed over time. Starting from the first 3GPP meetings in 1998 until present, all WGs and plenary meetings are represented by dedicated meeting folders on the FTP server. These meeting folders include the documents discussed at the meetings. Both the folders and the documents are accessible to the public. Almost every week, a new meeting folder with the respective documents is added. In addition to the plenary and WG meeting folders, and some other folders, there is also the "Specs" folder, which holds all 3GPP specifications including the

aforementioned “snapshot” and archive folders. Since the early days of 3GPP a new folder is added inside the “Specs” folder after each TSG plenary meeting to hold the latest versions of specifications approved at those TSG plenary meetings. This is still 3GPP’s working practice today; thus, this practice has not changed over time.

43. 3GPP maintains a set of publicly accessible documents providing further details on its way of working:

- 3GPP Working Procedures (Ex-1010)
- Vocabulary for 3GPP Specifications 3GPP TR 21.905 (Ex-1020)
- Working Methods 3GPP TR 21.900⁵
- Specification Drafting Rules 3GPP TR 21.801⁶

⁵ Available from

<https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=555>

⁶ Available from

<https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=552>

B. Specific Documents

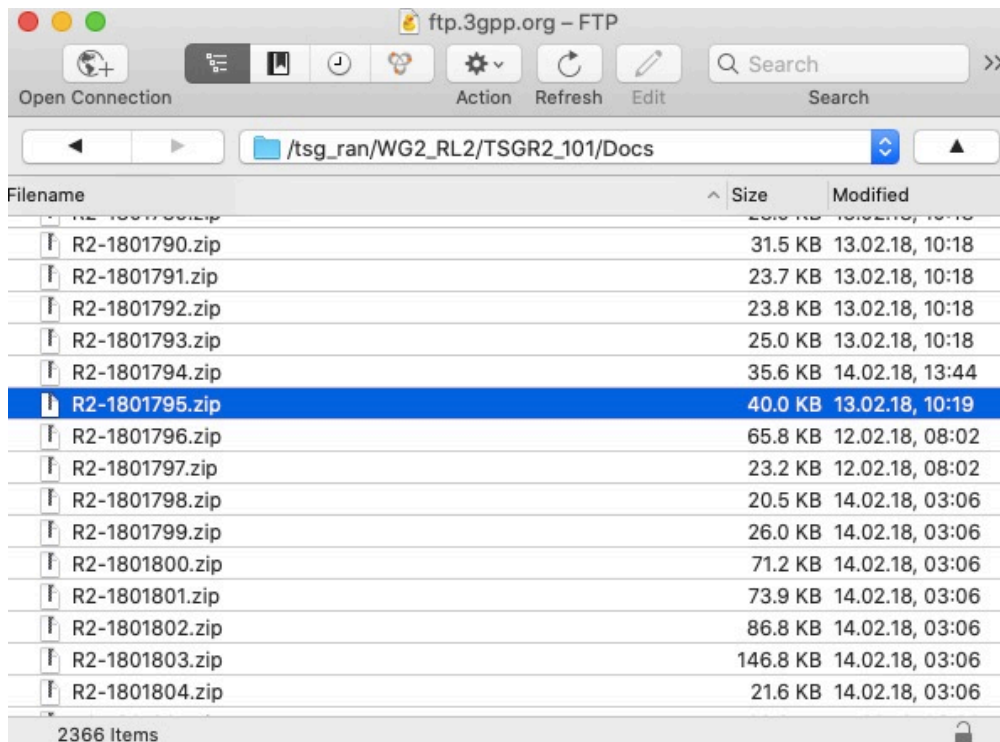
1. Oppo (R2-1801795)

44. Based on my personal knowledge and my review of 3GPP's business records, I recognize Ex-1005 as a true and correct copy of a 3GPP TDoc with document number R2-1801795, which represents a document with the title "Discussion on SI Request Prohibit Timer." The document identifies its "source" as "OPPO." Ex-1005. The 3GPP membership database identifies "OPPO" as Guangdong OPPO Mobile Telecommunications Corp., Ltd. Ex-1012. I refer to the technical contribution (R2-1801795, Ex-1005) as Oppo. Based on 3GPP numbering conventions, the "R2-18" in R2-1801795 means that this TDoc was submitted to a 2018 RAN2 working group meeting.

45. Oppo discussed the SI (System Information) prohibit timer for on-demand SI requests. On its face, Oppo refers to the RAN WG2 meeting #101 held on 26th February – 2nd March 2018, in Athens, Greece. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that Oppo was available either prior to or during that meeting to at least all attending 3GPP members. The RAN WG2 group (abbreviated RAN2 or R2) was responsible for the Radio Layer 2 and Layer 3 Radio Resource Control specifications. <https://www.3gpp.org/3gpp-groups/radio-access-networks-ran/ran-wg2> (Ex-1013); 3GPP Specifications for Working Group RAN2, *available at*

<https://www.3gpp.org/dynareport?code=TSG-WG--R2.htm> (Ex-1014). Thus, anyone interested in keeping abreast of developments of Radio Layer 2 and Layer 3 including the Radio Resource Control procedures being developed by the 3GPP would participate or be interested in the meetings and technical documents of RAN2, including the RAN2 #101 meeting in held in Greece and a document like Oppo discussed there. Such a person browsing the 3GPP website would understand that the website is structured to serve the purpose of the 3GPP organization, that is, to develop 3GPP standards through member meetings and communications such as RAN2#101 and its associated TDocs. Such person browsing the 3GPP website would recognize that documents are hosted under the meeting pages and organized by topic, just as they were for RAN2#101 and Oppo.

46. The public availability of Oppo is further confirmed by the date stamp, February 13, 2018, shown using format DD.MM.YY on the 3GPP FTP server at https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_101/Docs (Ex-1031), captured in the screenshot below:



The screenshot shows an FTP client window titled 'ftp.3gpp.org - FTP'. The address bar displays '/tsg_ran/WG2_RL2/TSGR2_101/Docs'. A table of files is listed with columns for 'Filename', 'Size', and 'Modified'. The file 'R2-1801795.zip' is highlighted in blue. The status bar at the bottom indicates '2366 Items'.

Filename	Size	Modified
R2-1801790.zip	31.5 KB	13.02.18, 10:18
R2-1801791.zip	23.7 KB	13.02.18, 10:18
R2-1801792.zip	23.8 KB	13.02.18, 10:18
R2-1801793.zip	25.0 KB	13.02.18, 10:18
R2-1801794.zip	35.6 KB	14.02.18, 13:44
R2-1801795.zip	40.0 KB	13.02.18, 10:19
R2-1801796.zip	65.8 KB	12.02.18, 08:02
R2-1801797.zip	23.2 KB	12.02.18, 08:02
R2-1801798.zip	20.5 KB	14.02.18, 03:06
R2-1801799.zip	26.0 KB	14.02.18, 03:06
R2-1801800.zip	71.2 KB	14.02.18, 03:06
R2-1801801.zip	73.9 KB	14.02.18, 03:06
R2-1801802.zip	86.8 KB	14.02.18, 03:06
R2-1801803.zip	146.8 KB	14.02.18, 03:06
R2-1801804.zip	21.6 KB	14.02.18, 03:06

47. Based on my experience and knowledge, the R2-1801795.zip file has been publicly available for download from the 3GPP server page shown above no later than February 13, 2018.

48. In addition, metadata information for the downloaded and extracted TDoc file states a last Modified date of “13. February 2018,” as shown in the screenshot below:



R2-1801795 Discussion on SI Request Prohibit Timer.doc

92 KB

Information

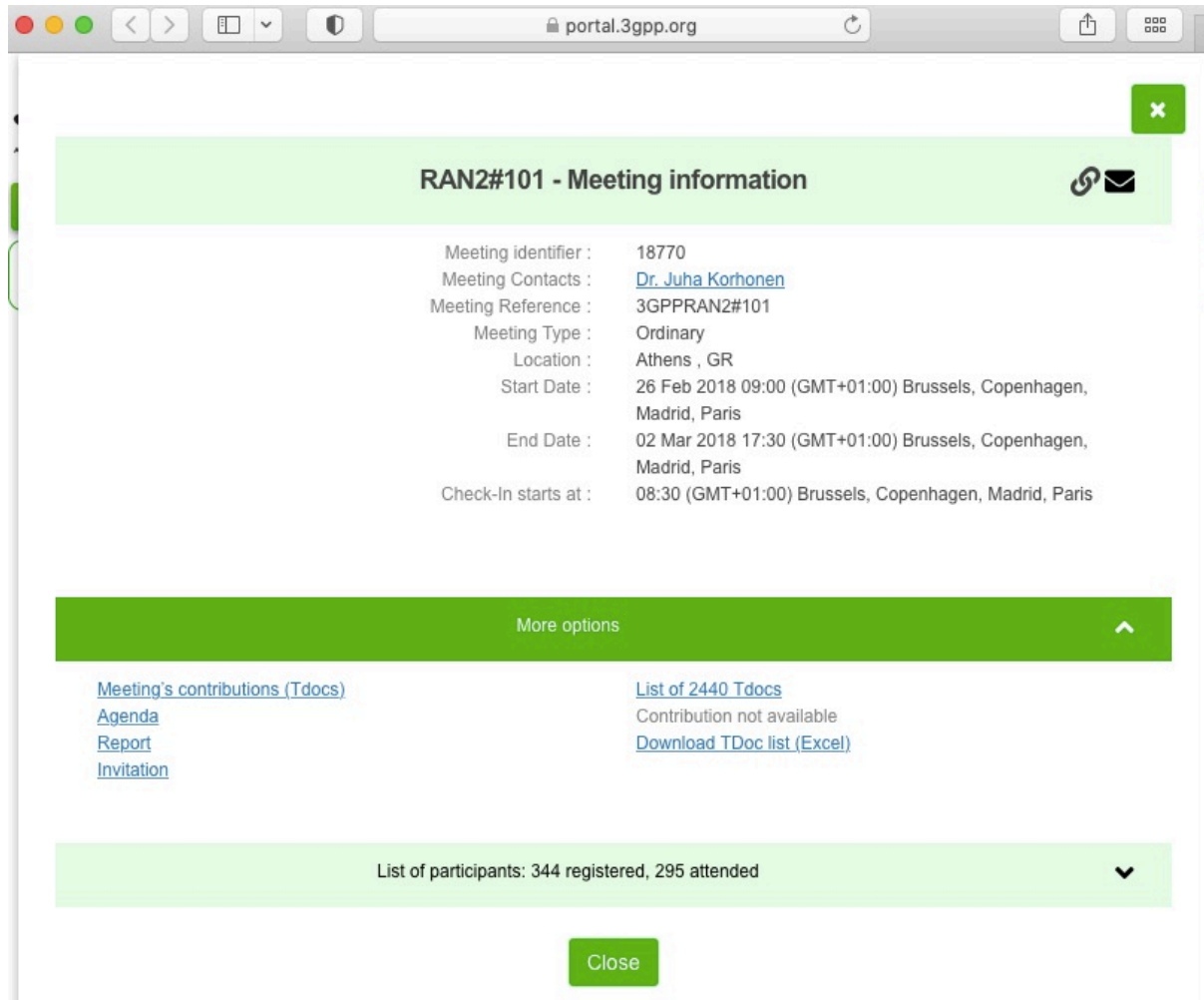
Show Less

Created 13. February 2018 at 17:52

Modified 13. February 2018 at 17:52

49. The official meeting report of the RAN WG2 meeting #101 held on 26th February – 2nd March 2018, can be found in Ex-1035. According to the 3GPP website at <https://portal.3gpp.org/Meetings.aspx#/meeting?MtgId=18770> (Ex-

1030).which is shown by the screenshot below, that meeting was attended by 295 individuals (out of 344 registered participants):



50. The meeting report shows document R2-1801795, *i.e.* Oppo, listed on page 188 which clearly shows the document was a registered TDoc at this meeting. Ex-1035. Furthermore, the meeting report has a TDoc-list attached which can be

found in Ex-1036. There, Oppo is included and the “TDoc Status” is mentioned as “available” and the “Uploaded” date is shown as “2018-02-13”. The relevant excerpt of the TDoc-list can be found below, which is a screen capture of my copy of the native excel file corresponding to Ex-1036:

	A	B	C	N	O	P
	TDoc	Title	Source	TDoc Status	Reservation date	Uploaded
1						
97	R2-1801795	Discussion on SI request prohibit timer	OPPO	available	2018-02-11 03:17:44	2018-02-13 10:19:38

See Ex-1036, pgs. 007-008 (row 97). Columns K and L of the TDoc-list identified the agenda item associated with the Tdoc. *Id.* The list matched Oppo to the agenda topic of “On demand system information.” *Id.*

51. Similarly, the 3GPP FTP server (Ex-1031) that provided Oppo as a publicly downloadable file (“R2-1801795.zip”) on February 13, 2018 also provided an index (file “tdocList_Friday_18h30_eom.zip”) (“R2-101 Documents Index” of the Tdocs on the server, https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_101/Tdoclists. (Ex-1032):



52. The March 2, 2018 date stamp of the RAN2#101 Document Index means that it was freely available to the public no later than that date. March 2, 2018 was a Friday,⁷ consistent with the filename (tdocList_**Friday**_18h30_eom.zip). March 2, 2018 was the last day of the RAN2#101 meeting which also matches with the “eom” in the filename, which stands for “end of meeting”. Ex-1005, Ex-1029. Thus, in my opinion and based on my experience, the RAN2#101 Document Index was available to the public no later than March 2, 2018.

53. I downloaded a copy of the zip file (tdocList_Friday_18h30_eom.zip) from the above FTP server, which contained the excel file “tdocList_Friday_18h30_eom.xls.” I confirmed that the RAN2#101 Document Index (Ex-1032) is a true and correct copy of the file

⁷ See <https://www.dayoftheweek.org/?m=March&d=2&y=2018&go=Go>.

“tdocList_Friday_18h30_eom.xls” available from the 3GPP FTP server at https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_101/Tdoclists.

54. The RAN2#101 Document Index matched each technical contribution to the corresponding subject matter of the agenda item for the RAN2 working group meeting. Ex-1032. The RAN2#101 Document Index matched the document’s key information (TDoc number, title, source, etc.) to the topic of 3GPP cellular technology scheduled for discussion by the working group. Ex-1032. *Id.* Row 97 of the RAN2#101 Document Index identified Oppo by TDoc number (“R2-1801795”), title (“Discussion of SI request prohibit timer”), source (“OPPO”) and matched it to the agenda item (10.4.1.6.6 “On demand system information”). Ex-1032, pg. 013, row 97.

55. Ex-1033 is a filtered version of Ex-1032, in which the excel file “tdocList_Friday_18h30_eom.xls” is filtered to just show the rows having “On demand system information” identified as the “Agenda item description” (column L) and showing just the following columns: Tdoc, Title, Source, Agenda item, Agenda item description, and Uploaded. Ex-1033. Applying these filters to my copy of “tdocList_Friday_18h30_eom.xls”, I confirmed that Ex-1033 is a true and accurate copy of the excel file “tdocList_Friday_18h30_eom.xls,” filtered as described above. *Oppo* is on row 97:

1	A	B	C	K	L	P
	Tdoc	Title	Source	Agenda item	Agenda item description	Uploaded
82	R2-1801780	Clarifications on Upper Layer Actions Upon RACH Problem for SI Request	OPPO	10.4.1.6.6	On demand system information	13-Feb-18
93	R2-1801791	Discussion on Indication of On-Demand SI in RMSI and TP to TS 38.331	OPPO	10.4.1.6.6	On demand system information	13-Feb-18
97	R2-1801795	Discussion on SI request prohibit timer	OPPO	10.4.1.6.6	On demand system information	13-Feb-18
111	R2-1801809	Remain issues of on-demand SI	Beijing Xiaomi Mobi	10.4.1.6.6	On demand system information	12-Feb-18

56. The data in the “Uploaded” column of the RAN2#101 Document Index further corroborates the upload date of February 13, 2018. Ex-1032, pg. 013, cell P97; Ex-1033, pg. 001, cell P97.

57. Thus, not only was Oppo made available to attendees and registered members of the cellular industry involved in the RAN2 working group and the public at large by February 13, 2018, but anyone interested in new developments in the 3GPP’s “on demand system information” procedures would have readily been able to search for and find Oppo using the 3GPP website, use the RAN2#101 Document Index to locate *Oppo* and review it. For example, an interested person would easily browse or search the index to locate Oppo as a document about 3GPP “on demand system information” procedures, and note from Oppo’s title that it was directed to “SI requests” involving a “prohibit timer.” Ex-1032. Likewise, anyone interested would have readily browsed or keyword searched the titles of the RAN2#101 Document Index, easily locating Oppo. If interested in any of these topics (on-demand system information procedures, SI requests, or prohibit timers), such a person would readily use the TDoc number (R2-1801795) to download a copy of

Oppo for review. Ex-1031. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that this document was available via the public 3GPP FTP server by February 13, 2018, at the latest. Furthermore, the document was publicly indexed no later than March 2, 2018, the last day of the relevant working group meeting (RAN2#101) and the day that the Document Index was available on the 3GPP website.

2. Technical Specifications

58. In addition, the following 3GPP technical specifications are true and accurate copies of the versions publicly available for download from the 3GPP portal on the dates indicated below.

59. Ex-1024 is a true and correct copy of TS 36.331 v14.5.1 (2018-01) "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) Protocol Specification (Release 14)," publicly available on January 9, 2018, as evidenced by the "Upload date" on the 3GPP portal page for that technical specification:

portal.3gpp.org

3GPP Portal
A GLOBAL INITIATIVE

General Versions Responsibility Related

Specification #: 36.331

Release 17(Spec is UCC for this Release) **Latest Remark:**

Meetings	Version	Upload date	Comment
RAN#98-e	17.3.0	2023-01-13	  
RAN#97-e	17.2.0	2022-10-04	  
RAN#96	17.1.0	2022-07-20	  
RAN#95-e	17.0.0	2022-04-13	  

Release 16(Spec is UCC for this Release) **Latest Remark:**

Meetings	Version	Upload date	Comment
RAN#98-e	16.11.0	2023-01-13	  

The screenshot shows the 3GPP Portal interface. At the top, the browser address bar displays 'portal.3gpp.org'. Below the navigation tabs (General, Versions, Responsibility, Related), the 'Specification #: 36.331' is highlighted in a red box. The 'Versions' tab is active, displaying a table of specifications. The table has columns for RAN#, Version, Date, Description, and icons for ETSI, TDOT, and CR. The version 14.5.1 is highlighted with a red box.

RAN#	Version	Date	Description	ETSI	TDOT	CR
RAN#86	14.13.0	2020-01-08		ETSI	TDOT	CR
RAN#85	14.12.0	2019-09-27		ETSI	TDOT	CR
RAN#84	14.11.0	2019-06-29		ETSI	TDOT	CR
RAN#83	14.10.0	2019-04-11		ETSI	TDOT	CR
RAN#82	14.9.0	2019-01-16		ETSI	TDOT	CR
RAN#81	14.8.0	2018-09-27		ETSI	TDOT	CR
RAN#80	14.7.0	2018-07-10		ETSI	TDOT	CR
RAN#79	14.6.2	2018-04-04	To maintain the compatibility...	ETSI	TDOT	CR
RAN#79	14.6.1	2018-04-03	New version to fix ASN.1 form...	ETSI	TDOT	CR
RAN#79	14.6.0	2018-04-03		ETSI	TDOT	CR
RAN#78	14.5.1	2018-01-09	A NB-IoT UE or network vendor...	ETSI	TDOT	CR
RAN#78	14.5.0	2018-01-08		ETSI	TDOT	CR
RAN#77	14.4.0	2017-09-26		ETSI	TDOT	CR
RAN#76	14.3.0	2017-07-13		ETSI	TDOT	CR
RAN#75	14.2.2	2017-04-20		ETSI	TDOT	CR
RAN#75	14.2.1	2017-03-23		ETSI	TDOT	CR
RAN#75	14.2.0	2017-03-23		ETSI	TDOT	CR
RAN#74	14.1.0	2017-01-12		ETSI	TDOT	CR
RAN#73	14.0.0	2016-10-04		ETSI	TDOT	CR

An 'Exit' button is located at the bottom left of the page.

<https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=2440>. Ex-1024 was obtained by searching for the TS 36.331 specification, opening the page for the specification, selecting the “Version” tab, and

then selecting the “14.5.1” link next to the upload date of “2018-01-09”, i.e., January 9, 2018.

60. Similarly, Ex-1025 is a true and correct copy of 3GPP TS 38.300 v15.0.0 (2017-12) “NR; NR and NG-RAN Overall description; Stage 2 (Release 15),” made publicly available on January 4, 2018, as can be seen at <https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3191> (selecting the “Versions” tab, and then selecting the “15.0.0”

link next to the “2018-01-04” upload date, i.e., January 4, 2018), as shown below:

The screenshot shows the 3GPP Portal interface. At the top, the browser address bar displays 'portal.3gpp.org'. The portal header includes the 3GPP logo and the word 'Portal'. Below the header, there are four tabs: 'General', 'Versions', 'Responsibility', and 'Related'. The 'Versions' tab is selected. A red box highlights the text 'Specification #: 38.300' in the top right corner. Below the tabs, a table lists various specifications. The table has columns for 'RAN#', 'Version', 'Date', and 'Status'. The row for RAN#78 with version 15.0.0 and date 2018-01-04 is highlighted with a red box. The table also includes a 'CR' column with icons for each specification.

RAN#	Version	Date	CR
RAN#85	15.7.0	2019-09-26	ETS I TDoc CR
RAN#84	15.6.0	2019-06-28	ETS I TDoc CR
RAN#83	15.5.0	2019-04-09	ETS I TDoc CR
RAN#82	15.4.0	2019-01-11	ETS I TDoc CR
RAN#82	15.3.1	2018-10-07	CR0035 rev3 (R2-1813223) was ... ETS I TDoc CR
RAN#81	15.3.0	2018-09-26	CR 0035 r3 not included in CR... ETS I TDoc CR
RAN#80	15.2.0	2018-06-20	ETS I TDoc CR
RAN#79	15.1.0	2018-04-02	ETS I TDoc CR
RAN#78	15.0.0	2018-01-04	ETS I TDoc CR
RAN#78	2.0.0	2017-12-12	ETS I TDoc CR
RAN2#100	1.3.0	2017-12-08	ETS I TDoc CR
RAN2#100	1.2.2	2017-12-08	ETS I TDoc CR
RAN2#100	1.2.1	2017-11-17	ETS I TDoc CR
RAN2#100	1.2.0	2017-11-14	ETS I TDoc CR
RAN2#99-Bis	1.1.1	2017-10-27	ETS I TDoc CR
RAN2#99-Bis	1.1.0	2018-01-15	ETS I TDoc CR
RAN2#99-Bis	1.0.1	2017-09-29	ETS I TDoc CR
RAN#77	1.0.0	2017-09-01	ETS I TDoc CR
RAN2#99	0.7.0	2017-09-01	ETS I TDoc CR

Exit

61. Similarly, Ex-1026 is a true and correct copy of 3GPP TS 38.331 v15.0.0 (2017-12) “NR Radio Resource Control (RRC) protocol specification

(Release 15),” made publicly available on January 4, 2018, as can be seen at <https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3197> (selecting the “Versions” tab, and then selecting the “15.0.0” link next to the “2018-01-04” upload date, i.e., January 4, 2018), as shown below:

portal.3gpp.org

3GPP Portal

General Versions Responsibility Related

Specification #: 38.331

RAN#	Version	Date	Description	ETSI	TDoc	CR
RAN#84	15.6.0	2019-06-29				
RAN#83	15.5.1	2019-04-16	Added missing carriage return...			
RAN#83	15.5.0	2019-04-04	Note that approved CR#0906rev...			
RAN#82	15.4.0	2019-01-14				
RAN#81	15.3.0	2018-09-26				
RAN#80	15.2.1	2018-06-21	Removed duplicate Foreword se...			
RAN#80	15.2.0	2018-06-20				
RAN#79	15.1.0	2018-04-02				
RAN#78	15.0.0	2018-01-04				
RAN#78	1.0.0	2017-12-14				
RAN2#100	0.4.0	2017-12-13				
RAN2#100	0.3.0	2018-01-01				
RAN2#100	0.2.0	2017-11-21				
RAN2#99-Bis	0.1.0	2017-09-28				
RAN2#99	0.0.5	2017-08-11				
RAN2-NR#2	0.0.4	2017-06-16				
RAN2#98	0.0.3	2017-05-10				
RAN2#97-Bis	0.0.2	2017-04-16				
RAN2#97-Bis	0.0.1	2017-04-16				

Exit

V. AVAILABILITY FOR CROSS-EXAMINATION

62. In signing this declaration, I recognize that the declaration may be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place within the United States. If cross examination is required of me, I will cooperate to the best of my ability to appear for cross examination within the United States during the time allotted for cross examination.

A. Right To Supplement

63. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises and to take into account new information as it becomes available to me.

B. Signature

64. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

65. I declare under penalty of perjury that the foregoing is true and correct.

Dated: February 1, 2023

A handwritten signature in black ink, appearing to read "F. Rodermund", written in a cursive style.

Friedhelm Rodermund

APPENDIX A – MATERIALS CONSIDERED

In addition to the materials referenced in my declaration, I considered the following documents:

<i>Exhibit #</i>	<i>Description</i>
1001	U.S. Patent 10,791,502 (“the ’502 Patent”)
1005	OPPO, <i>Discussion on SI Request Prohibit Timer</i> , 3GPP TSG-RAN WG2#101, R2-1801795, Athens, Greece, (Feb. 26 – Mar. 2, 2018), (“ <i>Oppo</i> ”)
1009	3GPP Partners, <i>available at</i> https://www.3gpp.org/about-us/partners
1010	3GPP Working Procedures, 20 October 2016
1012	3GPP Membership database, identifying individual members from “all partners”, <i>report available at</i> https://webapp.etsi.org/3gppmembership/Results.asp?Member=ALL_PARTNERS&SortMember=Name&DirMember=ASC&SortPartner=Name&DirPartner=ASC&SortMarket=Name&DirMarket=ASC&SortObserver=Name&DirObserver=ASC&SortGuest=Name&DirGuest=ASC&Name=&search=Search
1013	3GPP RAN2 – Radio Layer 2 and Radio Layer 3 RRC, <i>available at</i> https://www.3gpp.org/3gpp-groups/radio-access-networks-ran/ran-wg2
1014	3GPP Specifications for Working Group RAN2, <i>available at</i> https://www.3gpp.org/dynareport?code=TSG-WG--R2.htm
1020	3GPP TR 21.905 v15.0.0 (2018-03), Vocabulary for 3GPP Specifications (Release 15), <i>available at</i> https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=558 (“Versions” tab, link “15.0.0” uploaded April 1, 2018)

<i>Exhibit #</i>	<i>Description</i>
1024	3GPP TS 36.331 v14.5.1 (2018-01), Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) Protocol Specification (Release 14), (“ <i>4G RRC Specification</i> ”), <i>available at</i> https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=2440 (“Versions” tab, link “14.5.1” uploaded January 9, 2018)
1025	3GPP TS 38.300 v15.0.0 (2017-12), NR; NR and NG-RAN Overall description; Stage 2 (Release 15), <i>available at</i> https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3191 (“Versions” tab, link “15.0.0” uploaded January 4, 2018)
1026	3GPP TS 38.331 v15.0.0 (2017-12), NR Radio Resource Control (RRC) protocol specification (Release 15), (“ <i>5G RRC Specification</i> ”), <i>available at</i> https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3197 (“Versions” tab, link “15.0.0” uploaded January 4, 2018)
1029	3GPP FTP page for the 101 st meeting of RAN2 WG, held Feb. 26-2018 to March 2, 2018, <i>available at</i> https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_101/
1030	3GPP RAN2#101 Meeting Information page, <i>available at</i> https://portal.3gpp.org/Meetings.aspx#/meeting?MtgId=18770
1031	3GPP FTP page publishing each technical contribution associated with the RAN2#101 meeting of RAN2 WG, held Feb. 26-2018 to March 2, 2018, <i>available at</i> https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_101/Docs
1032	<i>RAN2#101 Documents Index</i> - 3GPP index of the technical contributions associated with the RAN2#101 meeting of RAN2 WG (last modified March 2, 2018), <i>available at</i> https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_101/Tdoclists (uploaded March 2, 2018).

<i>Exhibit #</i>	<i>Description</i>
1033	<i>Filtered RAN2#101 Documents Index</i> - Filtered version of 3GPP index of the technical contributions associated with the RAN2#101 meeting of RAN2 WG (last modified March 2, 2018), <i>available at</i> https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_101/Tdoclists (uploaded March 2, 2018) (filtered to documents indexed to “On demand system information”).
1035	<i>RAN2#101 Report</i> - Report of 3GPP TSG RAN WG2 meeting #101 Athens, Greece, 26 February - 2 March, 2018, <i>available at</i> https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_101/Report
1036	<i>RAN2#101 Report TDoc_List</i> - TDoc-list attached to <i>RAN2#101 Report</i> , <i>available at</i> https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_101/Report

APPENDIX B – RESUME

CURRICULUM VITAE

I. PERSONAL DATA

Name: **Friedhelm RODERMUND**

Mailing address: Am Steiner Graben 18
56077 Koblenz, Germany

Phone: +49 172 2606489

Email: fred@iotecc.com

II. PROFESSIONAL EXPERIENCE

Summary

Senior expert in telecommunications and Internet of Things (IoT) technology. 25 years of experience within the mobile communications industry, and several years in the IoT domain in various roles such as project management, technology innovation and evolution, standards development, technology strategy, patent creation and patent litigations, and development/introduction of new services.

Recognized standards expert who was actively involved in leading roles in the development of key standards for mobile telephony/data and service enablers across standards development organizations such as 3GPP, ETSI, GSMA, IETF, OMA, and oneM2M. Currently focussing on standards for the Internet of Things.

Founder and director of IOTECC GmbH which provides consulting services around technologies and standards enabling the Internet of Things, and consulting and expert services related to patents for mobile telecommunications and IoT.

01/2015 – present IOTECC GmbH Koblenz, Germany

Founder and CEO

- Mobile telecommunications, Internet of Things (IoT) technology and standards consulting
- Telecommunications and IoT patent consulting
 - Consulting services around telecommunications and IoT patents in particular related to 3GPP, ETSI and OMA standards
 - State of the art/prior art research services related to patent creation e.g. for new 5G patents
 - Prior art research, essentiality assessment, patent infringement analysis related to litigations and validity actions
 - Advising on IP strategy
 - Advising on Standards Development Organisations (SDO) working processes and IPR policy
 - Experienced expert witness (please see section III for a list of supported actions)

11/2014 – 12/2014 Friedhelm Rodermund Consulting Koblenz, Germany

Internet of Things (IoT) Consultant

- IoT standards development and introduction of new IoT services

CURRICULUM VITAE

- 01/2011 – 10/2014** **Vodafone Germany / Vodafone Group R&D** **Düsseldorf, Germany**
- Senior Standards Strategist
- Representing Vodafone in various standardisation bodies
 - Creating technical standards for the Internet of Things
 - Work item lead, technical editor and key contributor of Open Mobile Alliance (OMA) “Lightweight M2M (LwM2M)” – the new standard for the Internet of Things
 - Advising and supporting various IoT/M2M projects related to e.g. automotive, smart metering, health, industry
 - Advising on the introduction of new IoT/M2M technologies and services
 - Leading Proof of Concepts of emerging technologies
 - Involved in innovation projects
 - Supporting the creation and protection of Intellectual Property
- 01/2009 – 12/2010** **Vodafone Germany** **Düsseldorf, Germany**
- Vice Chairman Open Mobile Alliance (OMA) Device Management (DM)
- Responsible for Vodafone’s Device Management standardisation
 - As OMA DM Vice Chairman, co-leading the group, chairing committee meetings and web conferences, steering the technical direction, management of the different work items
 - Editor of several specifications, rapporteur of various work items
 - Support of projects for the introduction of device management
 - Delegate to 3GPP SA1 with responsibility for the introduction of MTC (machine type communications) related service/network requirements
- 01/2005 – 12/2008** **Vodafone Germany** **Düsseldorf, Germany**
- Project Manager Mobile Broadcast Standards
- Responsible for Mobile Broadcast standardisation across different broadcast systems/standards bodies and across all Vodafone local operations
 - Responsible for Mobile Broadcast standardisation strategy development and implementation
 - Delegation Lead for the Open Mobile Alliance (OMA) BCAST working group
 - Initiated and managed the BCAST device profile development in the BMCO Forum
 - Leading the “Service Protection” (pay-TV) stream of the German DVB-H Consortium
 - Filed several patents
 - Supporting patent litigations and patent portfolio evaluation (various technical areas)
- 04/2003 – 12/2003** **GSM Association** **London, United Kingdom**
- Member of the MMS Task Force
- Verification of the MMS operator interworking framework
 - Supporting the definition and specification of the MMS functional evolution
 - Acting as a “link” between 3GPP and GSMA in the area of MMS
- 06/1998 – 12/2004** **European Telecommunications Standards Institute (ETSI)**
Sophia Antipolis, France
- 01/2002 – 12/2004: Secretary 3GPP Technical Specifications Group “Terminals” and Terminals Working Group 2 “Terminal Services and Capabilities”
- 01/1999 – 12/2001: Secretary 3GPP Terminals Working Group 2 “Terminal Services and Capabilities” and GERAN 3 “Base Station Testing”

CURRICULUM VITAE

06/1998 – 03/1999: Secretary ETSI SMG4 “Data Services” and SMG8 “Base Station Testing”

- Supported the establishment of 3GPP (3rd Generation Partnership Project) as the leading standards organization for mobile telecommunications
- Project manager and secretary of TSG “Terminals” responsible for Terminal Conformance Testing, Terminal Services and Capabilities, Universal Subscriber Identity Module (USIM)
- Project manager and secretary of Terminals Working Group 2 “Terminal Services and Capabilities” that was responsible for Terminal Execution Environments, Messaging including Short Message Service (SMS), Cell Broadcast Service (CBS), Enhanced Messaging Service (EMS), Multimedia Messaging Service (MMS), Terminal Interfaces incl. AT-commands, Generic User Profile, Data Synchronization and others
- Establishment and management of the Work Plan and follow-up and report on the progress of the related work items
- Advising the chairmen and the standards groups on technical, procedural and political issues
- Editorship of various GSM and UMTS technical specifications
- Responsible for presenting the technical results of the working groups to the parent body
- Responsible for the communication with other standards bodies inside and outside 3GPP
- PR activities (articles, interviews)

12/1993 – 06/1998 Mannesmann Mobilfunk GmbH

Düsseldorf, Germany

System Engineer and Project Manager in Quality Assurance and Technical Standards

- Leadership and management of acceptance test projects in the area of GSM Base Station Controller (BSC) and GSM Base Station (BTS) hardware and software.
- Leading project teams of around 15 people
- Responsible for the clearance of releasing new software/hardware into the network
- Supported Request for Quotations, supplier evaluation and pre-selection, project manager of System Verification as a central part of the supplier selection process.
- Representation of Mannesmann Mobilfunk to the ETSI standardization group “Standardization Technical Committee SMG3 System Architecture”
- Conduction of product and hardware development quality audits
- Representative of Mannesmann Mobilfunk in A-interface interoperability testing activities
- Member of BSS product planning group which was defining operator requirements for future BSS releases
- Development of process improvements for type acceptance

CURRICULUM VITAE

III. LIST OF SUPPORTED PATENT LITIGATIONS AND VALIDITY ACTIONS

2022

Ericsson v. Apple

Certain Mobile Telephones, Tablet Computers With Cellular Connectivity, And Smart Watches With Cellular Connectivity, Components Thereof, And Products Containing Same, Inv. No. 337-TA-1299 (U.S.I.T.C.)

On behalf of Apple

Counsel: WilmerHale

Role: Expert and consulting services

2022

Ericsson v. Apple

Civil Action No. 2:21-cv-376 (E.D. Tex.)

On behalf of Apple

Counsel: WilmerHale

Role: Expert and consulting services

2022

Intellectual Ventures II LLC v. Toyota Motor Cooperation.

Inter Partes Review matters

On behalf of Toyota

Counsel: Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P.

Role: Expert witness and consulting services

2022

Ericsson v. Apple

2nd Business Court, Rio de Janeiro, Brazil

On behalf of Apple

Counsel: WilmerHale

Role: Expert and consulting services

2022

Ericsson v. Apple

Civil Court, Bogotá, Columbia

On behalf of Apple

Counsel: WilmerHale

Role: Expert and consulting services

2022

Proven Networks LLC. v. NetApp Inc.

Inter Partes Review matters

On behalf of NetApp

Counsel: Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., Ropes & Gray LLP

Role: Expert witness and consulting services

2022

Ericsson v. Apple

Inter Partes Review matters

On behalf of Apple

Counsel: Fish&Richardson, Erise IP

Role: Expert witness and consulting services

2021

AEGIS 11 LLC v. Hisense Company, Ltd. and Hisense USA Corporation

Inter Partes Review matters

On behalf of Hisense

CURRICULUM VITAE

Counsel: Orrik Herrington & Sutcliffe LLP
Role: Expert witness and consulting services

2021

Nokia v. Lenovo

Certain Electronic Devices, Including Computers, Tablet Computers, and Components and Modules Thereof, Inv. No. 337-TA-1208 (U.S.I.T.C.)

On behalf of Lenovo

Counsel: WilmerHale

Role: Expert witness and consulting services

2021

Optis Cellular Technology LLC et al. v. Apple

Claim No. HP-2019-000006 (High Court of Justice, Business and Property Courts of England and Wales)

On behalf of Apple

Counsel: WilmerHale

Role: Expert witness and consulting services

2021

Ericsson v. Samsung

Inter Partes Review matters

On behalf of Samsung

Counsel: Kirkland&Ellis LLP, Fish&Richardson

Role: Expert witness and consulting services

2020

Panoptis Patent Management LLC et al. v. Apple Inc.

Civil Action No. 2:19-cv-66 (E.D. Tex.)

On behalf of Apple

Counsel: WilmerHale

Role: Expert witness at bench trial

2020

Sol IP, LLC v. AT&T Mobility, LLC et al.

Civil Action No. 2:18-cv-526 (E.D. Tex.)

On behalf of AT&T, Verizon, Sprint

Counsel: Gibson Dunn

Role: Expert witness and consulting services

2020

Bell Northern Research LLC v. LG Electronics Inc. et al.

Civil Action No. 18-CV-2864-CAB-BLM (S.D. Cal.)

On behalf of LG Electronics Inc.

Counsel: Fish&Richardson

Role: Expert witness and consulting services

2019

Conversant Wireless Licensing S.a.r.l. v. LG Electronics Deutschland GmbH

Civil Action No. 7 O 3277/18 (Landgericht Munich, Germany)

On behalf of LG Electronics Deutschland GmbH

Counsel: Wildanger Kehrwald Graf von Schwerin & Partner mbB

Role: Expert witness and consulting services

2019

Bell Northern Research, LLC v. Huawei Device Co., Ltd. et al.

Civil Action No. 3:18-cv-01784-CAB-BLM

On behalf of Huawei

Counsel: Fish&Richardson

Role: Expert witness and consulting services

2019

CURRICULUM VITAE

Uniloc USA, Inc., et al. v. Samsung Electronics America, Inc. and Samsung Electronics Co. Ltd.

Civil Action Nos. 2:18-cv-00040-JRG, 2:18-cv-00041-JRG, 2:18-cv-00042-JRG and 2:18-cv-00044-JRG (United States District Court for the Eastern District of Texas)

On behalf of Samsung

Counsel: Greenberg Traurig

Role: Expert witness and consulting services

2019

Uniloc USA, Inc., et al. v. Huawei Device USA, Inc. et al.

Civil Action No. 2:18-cv- 00072-JRG-RSP (E.D. Tex.)

On behalf of Huawei

Counsel: McGuireWoods

Role: Expert witness and consulting services

2019

Microsoft Corporation v. Uniloc 2017 LLC

Inter Partes Review of U.S. Pat. No. 7,167,487

Inter Partes Review of U.S. Pat. No. 7,075,917

On behalf of Microsoft and on behalf of Apple as joinder petitioner

Counsel: Klarquist Sparkman (Microsoft), Erise IP (Apple)

Role: Expert witness and consulting services

2019

Qualcomm v. KFTC

South Korean Case, Seoul High Court

On behalf of intervenor Apple supporting the KFTC

Counsel: Boies Schiller Flexner

Role: Expert witness

2018/19

Evolved Wireless, LLC v. Apple, Inc.

Civil Action No. 1:15-cv-00542-JFB-SRF

On behalf of Apple

Counsel: DLA Piper

Role: Expert witness and consulting services

2018/19

Cisco Systems Inc. v. Traxcell Technologies

Inter Partes Review of Traxcell Technologies patents

On behalf of Cisco

Counsel: King&Spalding

Role: Expert witness and consulting services

2018/19

Qualcomm Inc. v. Apple Inc.

Civil Action No. 3:17- cv-02398-DMS-MDD (United States District Court for the Southern District of California)

Civil Action No. 3:17-cv-02402-WQH-MDD

Certain Mobile Electronic Devices and Radio Frequency and Processing Components Thereof (II), Inv. No. 337-TA-1093

Inter Partes Review of U.S. PATENT NO. 9,154,356

Cases IPR2019-00047, IPR2019-00048, IPR2019-00049, IPR2019-00128, IPR2019-00129

On behalf of Apple and Intel

Counsel: WilmerHale

Role: Expert witness and consulting services

2018/19

Apple Inc. v. Qualcomm Inc.

Civil Action No. 3:17-CV-00108-GPC-MDD (United States District Court for the Southern District of California)

On behalf of Apple

CURRICULUM VITAE

Counsel: Fish&Richardson, Boies Schiller Flexner
Role: Expert witness and consulting services

2018

3G Licensing, S.A. et al. v. LG Electronics Inc. et al
Inter Partes Review of U.S. Patent No. 7,995,091
On behalf of LG Electronics
Counsel: Fish&Richardson
Role: Expert witness

2017

Huawei Technologies Co. LTD. v. T-Mobile US, Inc. & T-Mobile USA, Inc.
E.D. Tex. Case Nos. 2:16-cv-00052-JRG-RSP; 2:16-cv-00055-JRG-RSP; 2:16-cv-00056-JRG-RSP; and 2:16-cv-00057-JRG-RSP
On behalf of T-Mobile
Counsel: Gibson Dunn
Role: Expert witness and consulting services

2016

Koninklijke KPN N.V. v. Samsung Electronics America, Inc. et al.
Civil Action No. 14-cv-1165
On behalf of Samsung Electronics
Counsel: Baker Botts
Role: Expert witness and consulting services

2016

SSH v. Sony
OLG Düsseldorf, Germany
On behalf of SSH
Counsel: Cohausz&Florack
Role: Technical expert support

2015/16

LG Electronics v. Core Wireless Licensing S.A.R.L.
Inter Partes Review of U.S. Patent No. 8,165,049
On behalf of LG Electronics
Counsel: Greenberg Traurig
Role: Expert witness

2015/16

Core Wireless Licensing S.A.R.L. v. LG Electronics Inc. and LG Electronics MobileComm U.S.A., Inc
Civil Action No. 2:14-cv-911 (lead case) and Civil Action No. 2:14-cv-912 (consolidated)
On behalf of LG Electronics
Counsel: Greenberg Traurig, Sidley Austin
Role: Expert witness

2015

Intellectual Ventures I LLC v. T-Mobile USA, Inc. & T-Mobile US, Inc.
D. Del. Case No. 1:13-cv-01632
Intellectual Ventures II LLC v. T-Mobile USA, Inc. & T-Mobile US, Inc.
D. Del. Case No. 1:13-cv-01633
On behalf of T-Mobile
Counsel: Gibson Dunn
Role: Technical expert support

IV. EDUCATION

10/1984 – 10/1993 **University of Technology Aachen**

Aachen, Germany

CURRICULUM VITAE

Graduate of Electrical Engineering with a focus on telecommunications technologies
(Dipl.-Ing. TH)

10/1992 – 04/1993 University of Technology Trondheim Trondheim, Norway
Diploma Thesis "Design of a dual processor computer for digital signal processing in
power electronics"

V. LANGUAGES

German, English, French

VI. RECENT PUBLICATIONS

- "Unlocking the internet of things and driving the need for interoperability", Global Telecoms Business, December 2013
- "The need for standardisation in the M2M services layer", Global Telecoms Business, February 2014
- Co-authored white paper "Lightweight M2M: Enabling device management and applications for the internet of things", Open Mobile Alliance, March 2014
- "Objects are a new way to create M2M applications", Global Telecoms Business, April 2014
- "The need for standardisation in the M2M services layer", M2M Now, July 2015