

Evaluation of LTE essential patents declared to ETSI ~Summary~

Version 1.0

1 Objectives of this survey

In Japan, an instance of LTE (Long Term Evolution) services was launched in December, 2010, by NTT DOCOMO under the name of Xi (pronounced “Crossy”) to pave the way to the 4th generation mobile communication services, which will succeed the 3rd generation services that are currently widely deployed.

In implementing the 3rd generation mobile communication systems, different technical standards, such as W-CDMA and cdma2000, have been adopted by different carriers, resulting in incompatibility problems. The deployment of LTE is expected to remedy such problems by enforcing a single international standard.

Standardization of LTE, as was the case with that for W-CDMA, has been being carried out in 3GPP (Third Generation Partnership Project), which is an international standards development project organized by the standards developing organizations such as ETSI (European Telecommunications Standards Institute) and ARIB (Association of Radio Industries and Businesses). During the course of these standardization activities, telecom companies may acquire related patents. In order for a patented technology to be adopted in a standard, its holder has to declare to the standards developing organizations in each country its willingness to make licenses available to all third parties under fair, reasonable and non-discriminatory (FRAND) terms. The patents (including patent applications) to be studied in this survey are those notified to ETSI as being essential to LTE.

Although ETSI is a European standards developing organization, not only European companies but many non-European ones have declared LTE-essential patents to ETSI, because Europe has long been a large telecom market and has fostered many prominent companies. As such, it should be reasonable to regard the number of LTE-essential patents, declared to ETSI by a specific company, as one of important indicators of the “patenting power” of each company.

In order to evaluate true “patenting power”, the simple count of LTE-essential patents, as declared to and listed by ETSI, is not a good measure, due to the following two reasons.

- Duplicate count of patents

A single patent may appear multiple times in the declaration list if the following types of applications are issued: provisional applications in the U.S., divisional applications, or applications to foreign countries. With divisional applications, there may be such cases that individual applications should be counted separately provided

1. Objectives of the survey

that the scopes of the applications are different from each other, but, in most cases, it is more appropriate to count them as a single patent family.

- Difference in declaration policy of each company

Decision, whether a particular patent is essential or not, is solely at a company's discretion. ETSI does not confirm or deny that the declared patents are, in fact, essential or potentially essential. As a result, patents of similar importance may be declared by one company but not by another, resulting in considerable difference in the number of the declarations made by each company.

Based on these observations, this survey aims at estimating the number of truly "essential" patents held by each company, taking the following processes:

- to identify effective number of declared patents by grouping related patents as a family to remove duplications from the declared patent list,
- to derive the number of "essential" patents by determining the relevance of each declared patent to the standards, applying a common evaluation criteria,.

2 Major survey results

In this survey, the effective number of patents pertinent to this evaluation has been identified to be 2,999. These patents have been studied to see application trends and their relevance to the standards.

Results are summarized as follows:

- 1) The list of LTE-essential patents notified to ETSI (original list) was obtained from their website and duplicate patents were removed from the list by grouping the related patents into patent families. A total of 2,999 patents have been identified to be pertinent to our study. This is the effective number of declared patents for further analysis. The number of companies that made declarations was 32.
- 2) In terms of the applicant companies, Qualcomm has the largest number of patents (441, 14.7%) and is followed by Ericsson (310, 10.3%), InterDigital (295, 9.8%), Samsung (294, 9.8%), Motorola (241, 8.0%) and ZTE (230, 7.7%). Nine companies have more than 5% shares each, which shows that the declarations are not limited to just several major companies but spread among many companies, each making declarations in roughly equal numbers. The nationalities of the companies are also spread among USA, Europe and Asia in a balanced manner.
- 3) Many of the declared patents have been filed after 2005, when LTE standardization work began. In particular, the patents filed between 2006 and 2008 are dominant. Whereas, the number of declared patents filed between 1999 and 2004 is not insignificant.
- 4) Companies under this survey can be classified into four groups, namely, a) those who have declared patents filed during a long period of time (from the early days, around 1990, to now), b) those who have declared patents filed mainly after 2005 (when LTE standardization started), c) those who have declared patents filed mainly before 2005, and d) those who do not fall into any of the above categories.
- 5) Regarding the countries where the patent applications have been made, Qualcomm, Ericsson, InterDigital, Motorola and Nokia have been filing their applications in various countries in the world. Japanese and Korean companies also have been filing their applications in BRICs as well as in the U.S. and Europe in a balanced manner.
- 6) Samples were taken from 2,999 effective patents to apply essentiality evaluation. It has been estimated that 55% of them are “essential” patents conforming to ETSI standards. In terms of the essentiality ratio (i.e. the ratio of “essential” patents to the total number of patents declared by the subject company), ZTE, NTT DOCOMO

2. Major survey results

and Nokia Siemens have the highest scores which are over 80%.

- 7) The numbers of “essential” patents have been derived based on the numbers of declared patents and the essentiality ratios. Qualcomm is estimated to have the largest number of “essential” patents (240) followed by ZTE (189), Ericsson (159), InterDigital (149), NTT DOCOMO (142), Samsung (142), Nokia (132) and Huawei (105). Regarding companies such as ZTE and Huawei who have many unregistered patents, those numbers may be reduced because of the possible decline of the essentiality ratio.

This survey was conducted by an internal Project Team in Cyber Creative Institute working on ETSI essential patents evaluation.