

Evaluation of LTE essential patents declared to ETSI ~Summary~

Version 2.0

1 Objectives of this survey

LTE (Long Term Evolution) is the precursor technology for the 4th generation mobile communication services, which succeeds the 3rd generation services that are now widely used. In Japan, NTT DOCOMO launched its LTE service in December, 2010, under the name of Xi (pronounced “Crossy”). Other companies have started their services as well, or have announced their service release in the near future.

As for the 3rd generation mobile communication systems, mobile carriers adopted different technical standards for their networks, resulting in incompatibility problems. LTE is to be used as a single international standard for the 4th generation mobile services and remedy these problems. Standardization of LTE, like W-CDMA, has been being carried out in 3GPP (Third Generation Partnership Project). 3GPP is an international standards development project organized by the standards developing organizations in various countries, such as ETSI (European Telecommunications Standards Institute) in Europe and ARIB (Association of Radio Industries and Businesses) in Japan.

Telecom companies may acquire patents related to the forthcoming standards. In order for a patented technology to be adopted in standards, its holder has to declare to the organizations in respective country their willingness to make its licenses available to all third parties under fair, reasonable and non-discriminatory (FRAND) terms. This paper aims to evaluate the “patenting power” of participating companies by studying those patents (including patent applications) that are declared to ETSI as being essential to LTE standards.

Although ETSI is a European 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, the number of patents, declared to ETSI, held by each company should be an important indicator of the company’s “patenting power.”

To evaluate true “patenting power”, the number of LTE-essential patents, as have been declared to and listed by ETSI, is not a good measure, due to the following two reasons.

-Duplicate count of patents

ETSI list contains multiple patents that share a common priority, such as provisional applications in the U.S., divisional applications, or applications to other countries. Divisional applications, which have different scopes, may well be counted separately.

1. Objectives of the survey

But, in most cases, it is more appropriate to count the related patents as a single patent family.

-Difference in declaration policy of each company

According to ETSI policy, companies can declare essential patents at their discretion. ETSI does not confirm or deny that the declared patents are really essential. As a result, the definition of relevance to the standard varies, resulting in considerable difference in the number of the declared patents.

Therefore, this survey estimates 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 into a family,
- to select patents to be evaluated from all the declared patents,
- to estimate essentiality ratio (the percentage of standard-relevant patents within all the evaluated patents for each company, and
- to derive the gross number of essential patents, for each company, by multiplying the number of declared patents by the essentiality ratio.

This survey is an updated version of the previous report and is based on the information obtained from the latest ETSI declaration list.

2 Major survey results

The main results of this survey are as follows:

- i) The original list of essential patents notified to ETSI (original list) was obtained from the ETSI website. By extracting only relevant patents from the list and grouping them into patent families, a total of 5,013 patents were identified to be subject to this study. This is the effective number of declared patents. The number of companies that made declarations was 43.
- ii) Samsung has the largest number of declared patents (612, 12.2%) and is followed by Qualcomm (544, 10.9%), Huawei (527, 10.5%), Nokia (464, 9.3%), InterDigital (382, 7.6%), ZTE (352, 7.2%), Ericsson (352, 7.0%), and CATT (265, 5.3%). In the present survey, CATT newly came in the ranking as one of major companies. Declarations are not limited to major companies, but are evenly distributed among many companies. The nationalities of the companies are also evenly distributed among USA, Europe and Asia.
- iii) Many of the declared patents had been filed after 2005, when LTE standardization work began. In particular, the applications filed between 2006 and 2009 are dominant, and the number of declarations made on the applications filed between 1999 and 2004 are also significant. The majority of patents subject to the current survey are those filed in 2009 and 2010.
- iv) Companies can be classified into four types, 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 (the year when LTE standardization started), c) those who have declared patents filed earlier times, but not after 2005, and d) those who do not fall into any of the above categories.
- v) The countries, where the applications were filed with, were surveyed. Qualcomm, Ericsson, InterDigital, Motorola and Nokia have been filing their applications with various countries in the world. Japanese and Korean companies have also been filing there applications evenly among BRICs and other countries.
- vi) Essentiality has been determined for each patent selected, for evaluation, from 5,013 patents. It has been estimated that 58% of them are truly “essential”, conforming to ETSI standards. With ZTE, NTT DOCOMO NEC, InnovativeSonic, HTC, and RIM, more than 80% of their evaluated patents are identified to be “essential.”
- vii) Legal statuses of evaluated patents in respective application countries have been studied. The results show that Motorola scores the highest registration ratio of over

2. Major survey results

70%. Nokia, NTT DOCOMO, and Sharp each scores over 50%, Huawei and Samsung each scores under 10%, and ZTE has no patents legally examined yet. This means that evaluations on Motorola have been done mostly based on claims of registered ones, whereas evaluations on ZTE have been done based on unexamined ones.

- viii) The numbers of “essential” patents have been derived by multiplying the numbers of declared patents by the essentiality ratios. When the ratios are determined based on all the evaluated patents, ZTE is estimated to have the largest number of “essential” patents (311) followed by Qualcomm (297), Samsung (296), Nokia (273), Huawei (257), NTT DOCOMO (206), LG (196), InterDigital (193), Ericsson (180), and CATT (152). 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 during the course of legal examinations.
- ix) When the essentiality ratios are determined based on registered patents, Qualcomm owns the largest number of “essential” patents (260), followed by Nokia(230), Huawei(226), NTT DOCOMO and Samsung(204 each), ZTE(195), Ericsson(156), CATT(144), LG(139), and InterDigital(127). It should be noted that evaluation samples are small with non-negligible number of companies, and accumulation of samples are important for the future.