

Evaluation of LTE essential patents declared to ETSI – Summary –

Version 3.0

1 Objectives of the survey

Mobile communication service is migrating from the third generation (3G) to LTE (Long Term Evolution) rapidly. In Japan, NTT DOCOMO launched the first LTE service in Japan, in December 2010, under the name of Xi (pronounced “Crossy”). The number of Xi subscribers exceeded 12 million as of April 2013.

In contrast, the number of subscribers of FOMA, a 3G service, declined below 60 million and decreasing. It shows that the migration to LTE is in progress.

In April 2012, ITU-R (Radio communication Sector of International Telecommunication Union) recommended two technologies as standards for the fourth generation mobile communication (IMT-Advanced), i.e., LTE-Advanced and WiMAX2. Of the two technologies, LTE-Advanced allows for the use of telecommunications services of high-speed, large-capacity, while maintaining compatibility with the current LTE, and is expected to be used widely in the future. NTT DOCOMO plans to start its commercial service in 2015 in Japan.

Standard specifications for LTE-Advanced and LTE have been being carried out in the Third Generation Partnership Project (3GPP), which is an international standards development project organized by the standards developing organizations in various countries. Keeping pace with the standardization activities, a number of patents have been filed by companies involved in the standardization. For a patented technology to be adopted in standards, its holder has to declare to the organizations, in relevant countries, its willingness to make its licenses available to all third parties under fair, reasonable and non-discriminatory (FRAND) terms.

This paper evaluates the number of patents that are essential to LTE and LTE-Advanced standards based on the patents declared to ETSI.

Although ETSI is a European standards developing organization, not only European companies but many non-European ones have declared their patents as essential to LTE. This is because Europe has long been a large telecom market and has fostered many prominent companies. As such, the number of patents declared to ETSI, by participating companies, should be an important indicator of the company’s “IPR power.”

ETSI discloses the list of patents that have been declared, by member companies, as essential to LTE standards. To evaluate true “IPR power”, however, simply counting the number of declared patents, as listed in the ETSI list, is not a good measure, due to the following two reasons.

1. Objectives of the survey

- Duplication of the same invention
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. With divisional applications, those, which have different scopes, may well be counted separately. But, in most cases, it is more appropriate to count them as a single patent family.
- Difference in company's criteria for declaration
According to ETSI policy, companies can declare essential patents at their discretion. ETSI does not confirm or deny whether the declared patents are really essential or not. As a result, the definition of relevance to the standard varies, resulting in considerable differences in the number of the declared patents.

In order to cope with these difficulties, this survey, first, sorts out the ETSI list, by grouping the patents on a patent family basis, to derive the effective set of declared patents to be used for evaluation. It, then, evaluates the resulting set based on common criteria to determine the number of truly essential patents.

This survey is done based on the patents contained in the latest ETSI declaration list and is an update to our previous report.

2 Survey results

The main results of this survey are as follows:

- i) The original list of patents declared to ETSI was obtained from the ETSI website. By sorting them based on patent families, a total of 5,919 patents have been identified as the subjects for this study. This is the effective number of declared patents. The number of companies that have made declarations is 49.
- ii) The number of declared patents for each company are as follows:
Qualcomm has the largest number of declared patents (655, 11.1%) and is followed by Samsung (652, 11.0%), Huawei (603, 10.2%), Nokia (505, 8.5%), InterDigital (418, 7.1%), Ericsson (399, 6.7%), ZTE (368, 6.2%), and LG(317, 5.4%). 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 have been filed after 2005, when LTE standardization work began. In particular, the applications filed between 2006 and 2010 are dominant, and the declarations of the applications filed between 1999 and 2004 are also significant. Some companies have made declarations for the patents filed in 2011. (especially Huawei and InterDigital)
- iv) Three types of companies have been identified, 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 began), and c) those who have declared patents filed earlier years, but not after 2005.
- v) The countries, where the applications have been filed with, have been surveyed. Qualcomm, Nokia, InterDigital, Ericsson, and Motorola have been filing their applications with various countries in the world. Japanese and Korean companies have also been filing their applications evenly among BRICs and other countries.
- vi) Sample patents have been extracted from the list for evaluation. Average essentiality ratios are identified to be 56.0% for declaration-based evaluation and 51.5% for registration-based evaluation. With regard to registration-based essentiality evaluation, LG, NTT DOCOMO, TI, and InnovativeSonic shows high essentiality ratios while possessing a large number of registered patents.

2. Survey Results

- vii) Legal statuses of evaluated patents in respective application countries have been studied. The results show that Siemens, Sony, IPR Licensing, and General Dynamics show the highest registration ratio of 100%, and Apple and Nortel also show high ratios of over 95%. In contrast, CATT and ZTE show low ratios of around 10% and 15%, respectively, reflecting the fact that patent examinations have not progressed well.
- viii) The gross numbers of essential patents have been estimated by multiplying the derived essentiality ratios by the entire number of declared patents. Qualcomm is estimated to have the largest number of essential patents (318), followed by Huawei (273), ZTE (253), Nokia (245), LG (237), Samsung (233), NTT DOCOMO (211), InterDigital (206), Ericsson (177), CATT (141), and Motorola (111).

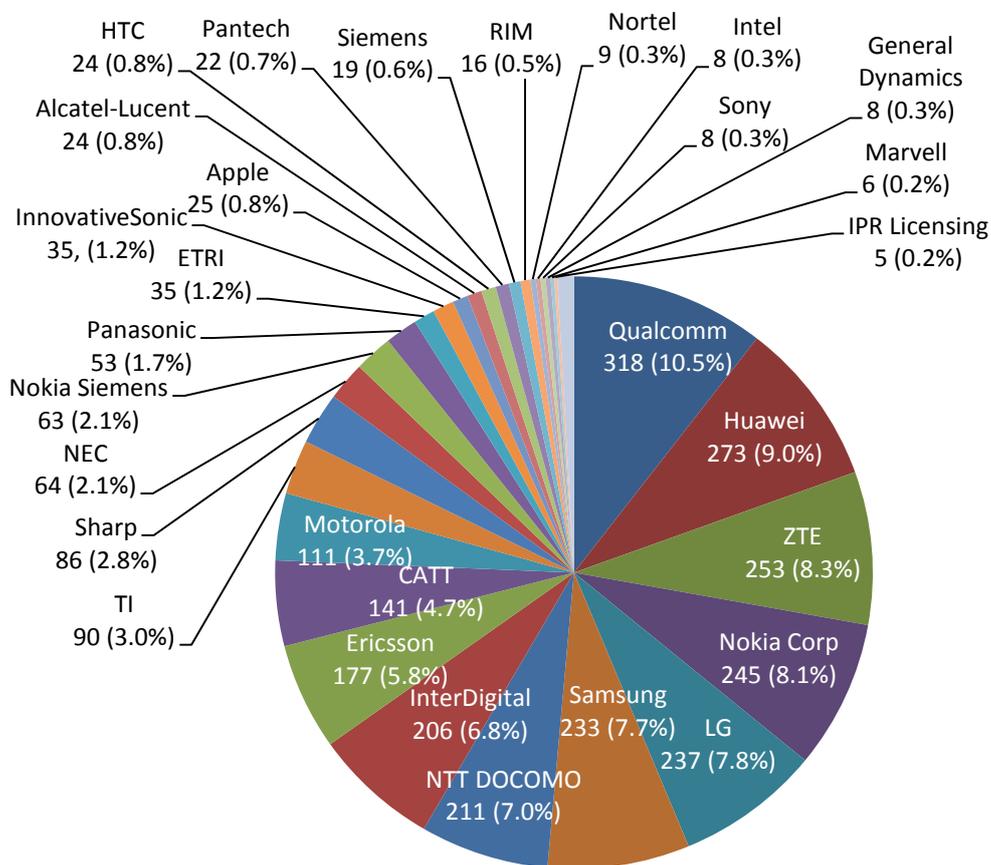


Figure - Estimated number of essential patents