

Intellectual Property Rights Relating to Integrated Circuit Layout Design: India, Bangladesh, and United States Perspectives

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ABSTRACT

The purpose of this study is to discuss the current situation of legal protection of integrated circuit layout design, to identify various international legal instruments on integrated circuit layout design and to highlight the need and importance of the entry into force of a new law on integrated circuit layout. Secondary sources have been used in this study. The research method used in this study is a type of qualitative research as a research procedure which produces descriptive data in the form of written and spoken words of individuals or groups as well as observable behavior. In this case to research and find specifics about Intellectual Property Rights Related to Integrated Circuit Layout Design: India, Bangladesh and United States Perspectives. The writing uses a quantitative research approach. The focus of the research is Intellectual Property Rights and Layout Design of Integrated Circuits. Piracy of layout designs of Integrated Circuits is a very common issue in most cases in Bangladesh. Intellectual property protection is not up to standard in Bangladesh, causing many violations. This is because the laws related to IPR in Bangladesh are still very premature and few in number. That's why most IP rights cannot be protected. There are no special provisions for the protection of integrated circuit layout designs. As integrated circuit layout design is at an early stage in Bangladesh, it is important for the country to promote strong protection policies by enacting the Integrated Circuit Layout Design Act. The number of Bangladeshi companies focusing on integrated circuit layout design is starting to grow and this will force large semiconductor companies to set up their offices and cater to the needs of the domestic market. This will encourage more companies to base their operations in Bangladesh.

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1. INTRODUCTION

Intellectual property rights (IPR) have been defined as ideas, inventions, and creative expressions based on the public's willingness to grant property status. Intellectual Property Rights grant certain exclusive rights to the inventor or creator of the property so that they can derive commercial benefits from their creative endeavors or reputation. There are several types of intellectual property protection such as patents, copyrights, trademarks, etc. A patent is an acknowledgment of an invention, which meets the criteria of global novelty, obscurity, and industrial application. IPR is a prerequisite for better identification, planning, commercialization, rendering, and thus protection of inventions or creativity. Each industry must develop its IPR policies, management styles, strategies, and so on depending on the area of specialization. The pharmaceutical industry currently has an IPR strategy that continues to evolve which requires a better focus and approach in the coming era.

The protection of intellectual property rights (IPR) in developing countries has become a much-debated issue in recent years. This debate is often placed in a North-South framework, where the dominant view is that southern (developing) countries tend to lose out in protecting IPR. The reason for the static and partial balance for this disadvantage is that IPR protection will strengthen the market power of firms that innovate in the north and raise prices in developing countries [1]. Dynamic and general equilibrium factors are taken into account, the South need not benefit from an increase in IPR [2].

Integrated circuit layout design is a creation of human intelligence and that is why it is known as intellectual property (IP). It takes a huge investment of time and money to create a new integrated circuit layout design or to renovate an existing integrated circuit. But chip pirates can easily replicate chip layout designs within months by removing the chip's plastic/ceramic casing and photographing each layer of see-through

silicon material at a fraction of the cost. The purpose of this study is to discuss the current situation of the legal protection of integrated circuit layout design, to identify various international legal instruments on the integrated circuit layout design, and to highlight the need and importance of the entry into force of a new law on the integrated circuit layout.

2. LITERATURE REVIEW

Over the long term, we have seen how innovation has found a way to press itself into more minimized and compact constructions. The main PC built, for example, was the size of the 1,000 central delivery workstations we have today. How can that be imagined? It is the product of a regulated circuit. Previously produced circuits were very large and complex, consisting of circuit components such as resistances, condensers, inducers, semiconductors, diodes, etc., and which were connected to copper wires.

The use of large engine circuits is limited for this reason. With this large circuit, it is not practical to make small and small devices. Moreover, they are not completely stunned and strong. As said, the mother is needed, it's all the same. Circuits in smaller sizes must be made with greater strength and safety to incorporate them into gadgets. Three US pioneers envisioned semiconductors to take things seriously, but the improvement of organized circuits completely changed the substance of hardware inventions. Organized circuits are small semi-track chips that mount the entire circuit. In the regular circuit of the free circuit segment, the fingernail size is small in comparison. The most frequently used circuits are powerful built-in circuits.

Integrated Circuit Type:

Integrated circuits can be categorized into two types based on the nature of the input signal:

1. Linear or Analog ICs: In Analog signal types, they have continuously varying feedback. The linear function of the input is the output signal. They are widely used in amplifiers for radio frequency and audio frequency.

2. Digital IC: Digital input is specified at two levels and not for a continuous array of values. This includes logical gates with a 0 (low state) or 1 (high state) input signal. It was found on the computer. The layout design (topography) of an integrated circuit is a three-dimensional action of the components that frame an integrated circuit that is planned to be assembled.

The planning and demand for these components follow the electronic capacity to be carried out by the coordinated circuit. Merriam-Webster characterizes circuits as "a total way of electrical flow including usually a source of electrical energy" and integrated circuits as "slightly confusing electronic segments and their associations conveyed in or on small pieces of material (such as silicon)". The incorporated circuit is a device with a distinctive surface, on which certain components with electrical capacity are installed, including semiconductors, resistors, capacitors, diodes, and so on. intensify, or in any case, adjust it. Depending on the capacity they perform, integrated circuits require tremendous demand and planning, that is, they require a plan of components that compose a coordinated circuit. This is referred to as an integrated circuit plan (geology) format. Layout design (topography) which is a continuation effect of the scientific efforts of the manufacturer and is not basic information between the maker and the manufacturer of the format plan or the geology of the integrated circuit, at the time of manufacture, will be considered unique.

The layout design (topography) of a coordinated circuit consisting of a mixture of normal or interconnected components may be secured if the entire mixture satisfies the conditions indicated in the previous section. can be properly secured under intellectual property laws (with possible exceptions such as skill upgrades). Likewise, because individual lithographic veil work is not a highly protected topic; they also cannot be successfully secured under patent law, although there are cycles that are carried out

in the work that may be patentable. So, since the 1990s, the public government has given rights restrictions such as copyright giving the elite limited time for the generation of certain formats. Coordinated circuit rights requirements are usually more limited than copyright.

3. METHODS

The research method used in this study is a type of qualitative research as a research procedure that produces descriptive data in the form of written and spoken words of individuals or groups as well as observable behavior [3]. In this case to research and find specifics about Intellectual Property Rights Related to Integrated Circuit Layout Design: India, Bangladesh and United States Perspectives. The writing uses a quantitative research approach. The focus of the research is Intellectual Property Rights and Layout Design of Integrated Circuits

4. RESULTS AND DISCUSSION

4.1 International Instrument on Protection of Integrated Circuit Layout Designs

The 1948 Universal Declaration of Human Rights (UDHR) states: Everyone has the right to the protection of moral and material interests resulting from scientific, literary, or artistic productions of his own making. Protection against semiconductor chips was first granted in the US through the Semiconductor Chip Protection Act (SCPA) in 1984 and its impact is felt almost worldwide. Japan introduced similar protection in 1985, namely, the Japan Circuit Layout Rights Act (JCLRA). An EC Directive⁵ by implementing legislation in all Member States of the European Union accelerated international efforts that resulted in the formulation of the 1989 Treaty on Intellectual Property to Integrated Circuits (IPIC Agreement) under the auspices of WIPO. The IPIC Agreement was later made part of the TRIPS Agreement.

A diplomatic conference was held in Washington, DC, in 1989, which adopted the Treaty on Intellectual Property to the Integrated Circuit, also called the Washington Treaty or IPIC Agreement. The treaty, signed

in Washington on May 26, 1989, is open to Member States of WIPO or the United Nations and to intergovernmental organizations that meet certain criteria. The agreement has been entered into by the World Trade Organization (WTO) TRIPS Agreement, subject to the following modification: the term of protection is at least 10 years from the date of submission of the application or the world's first commercial exploitation. But Members can provide a period of protection of 15 years from the creation of the layout design. The rights holder's exclusive rights also cover items incorporating an integrated circuit in which a protected layout design is incorporated, to the extent that it continues to contain an unauthorized reproduced layout design. Circumstances under which layout designs can be used without the consent of the rights holder are more restricted. However, certain actions taken unknowingly or for research purposes are not a violation.

The IPIC agreement is currently not in effect but was partially integrated into the TRIPS agreement. Article 35 of TRIPs Related to the IPIC Treaty states:

“Members agree to protect the layout design (topography) of the integrated circuit (in this Agreement referred to as “layout design”) under Articles 2 to 7 (other than paragraph 3 of Article 6), Article 12, and paragraph 3 of Article 16 of the Agreement. concerning Intellectual Property in connection with the Integrated Circuit and, in addition, to comply with the following provisions”.

Article 2 of the IPIC Treaty provides the following definitions of integrated circuits and layout designs:

- An integrated circuit is a product, in a final or intermediate form, in which the elements, at least one of which is an active element, and some or all of the interconnections are integrally formed in and/or on a piece of material and which are intended to perform a function electronically.
- 'Layout design (topography)' means the three-dimensional disposition, however, stated, of the elements, at

least one of which is an active element, and some or all of the integrated circuit interconnects, or similar three-dimensional elements. dimensional disposition prepared for the integrated circuit intended for manufacture.

Based on the IPIC Treaty, each party is obliged to secure, throughout its territory, exclusive rights in the layout design (topography) of integrated circuits, whether the integrated circuit concerned is incorporated in an article or not. The obligation applies to original layout designs in the sense that they are the result of the intellectual efforts of the creators themselves and are unusual among layout design creators and integrated circuit manufacturers at the time of their creation.

Contracting parties should, at a minimum, consider the following acts which are unlawful if carried out without the permission of the rights holder: reproduction of layout designs, and import, sale, or other distribution for commercial purposes of layout designs or integrated circuits in where layout design is entered. However, certain actions may be taken freely for personal purposes or evaluation, analysis, research, or teaching purposes only. In the case of the US *Brooktree Corp. v. Advanced Micro Devices Inc.*, 977 F.2d 1555, 1564-65 (Fed. Cir. 1992), the court held that breaches under the SCPA did not require that all parts of the chip be copied. In particular, mask works installed on a chip are considered infringing protected mask work even though the infringing mask work is only eighty percent similar to protected mask work. Two problems remain with the Federal Circuit's reliance on copyright law. First, the appropriateness of applying copyright laws, which protect aesthetics over functional designs, is still in question because masks are functional. Second, the interpretation of offenses under the SCPA remains uncertain even after *Brooktree* because courts have not articulated a specific standard for finding offenses under the SCPA. which protects aesthetics rather than functional design, is still questionable

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4.2 Indian Perspective

India has enacted a special law on the Layout Design of Semiconductor Integrated Circuits Act, 2000. The law gives recognition to a new form of intellectual property, i.e., 'layout designs' used in semiconductor integrated circuits as has been defined in section 2(h) of the Act. As a member of the TRIPS Agreement, India has enacted the Semiconductor Integrated Circuit Layout Design Act, of 2000. The Semiconductor Integrated Circuit Layout Design Act 2000, protects original layout designs which have not been commercially exploited and registration is pre-required for protection. The law makes provision for registration to be presided over by the Registrar for registration of layout designs. Protection under the law is valid for ten years and starts from the date of application for registration in the case of layout designs that have not been used commercially. For layout designs, which have been commercially exploited (less than two years) before the date of application for registration, protection commences retrospectively from the date of the first commercial exploitation.

The registered owner has the exclusive right to reproduce in any way the registered layout design or any part thereof. But the Act permits 'reverse engineering' of layout designs for limited purposes. The registered owner also has the exclusive right to import, sell or distribute for commercial purposes any semiconductor chip product in which the registered layout design is embodied. The law provides for criminal remedies for violations of layout design

expressly, civil remedies are also available for enforcing rights under the Act. A registered layout design may be commissioned or submitted with or without the goodwill of the business in question. Assignment registration or transmission is required to assign rights to registered layout designs. The law also regulates reciprocal arrangements between convention countries. Following are the highlights of Indian legislation (SICLD Act 2000).

- There is layout protection and semiconductor integrated circuit design with the registration process.
- There is a mechanism for distinguishing which layout designs can be protected.
- There are rules to prohibit the registration of layout designs that are not original or that have been exploited commercially.
- A 10-year term of protection is provided for layout designs.
- Provisions regarding violations and proof of validity are mentioned.
- There is a provision for determining royalty payments for registered layout designs in the event of an unintentional or unintentional infringement.
- Sanctions in the form of imprisonment and fines are imposed for intentional violations and other violations of the Act.
- Registrars are appointed for ICLD registration and an Appeals Body is formed to facilitate legal remedies.

4.3 Bangladesh Perspective

The Bangladesh Constitution in Article 42 guarantees the rights of citizens to property. And in the general definition of property, properties generated through creative thinking can also be included. In support of this proposition, it is better to state that the concept of property has been extended by the courts to cover almost all rights. Thus, patents, licenses, trademarks, copyrights, industrial designs, and layout designs of integrated circuits are considered

properties distinct from the physical or material property.¹⁰ Following this proposition it can be said that the Constitution, the supreme law of the state provides for the recognition of intellectual property rights explicitly.

In Bangladesh, there are several laws on the protection of intellectual property rights, such as the Patent Act 1911, Trademark Act 2009, Copyright Act 2000, Geographical Indications Act 2013, etc. However, there is no law on the layout design of integrated circuits in Bangladesh. Legal Consultants are trying to draft the Layout (Topographic) Draft of the Integrated Circuit Bill. Integrated circuits are used in almost all electronic equipment today and have revolutionized the world of electronics. Computers, cell phones, and other digital household appliances are now an integral part of the fabric of modern society. This became possible due to the low cost, small size, and lighter weight of integrated circuits. These integrated circuits enhance the functional performance of each gadget where they are installed.

The main problem here that is also common to all IPs is the issue of piracy, as it is clear that the structure and components of the integrated circuit are unprotected. In Bangladesh, the electronic goods market is flooded with counterfeit and substandard goods due to legal loopholes and inaction by law enforcement against unscrupulous importers and traders, and stakeholders. The main reason behind the growth of counterfeit products is the lack of consumer awareness and understanding of the difference between counterfeit and genuine products and intellectual property. It can be said that Bangladesh suffers from the absence of a specific law on the protection of the layout design of integrated circuits.

4.4. US perspective

TRIPS accommodate the security format (or geography) used in organized circuits. This warranty applies to organized circuits containing these plans or geographies, as well as modern products that incorporate integrated circuits under such circumstances. This Agreement relies heavily on the

Integrated Circuit security standards (the "Washington Agreement") as set out in the Washington Agreement, because this Agreement, as adopted in 1989, never entered into force. According to Articles 2 to 7, the Convention requires Members to provide a (geographical) format plan for integrated circuits. In addition to some of the additional obligations set out in the treaty, (except Article 6.3), Article 12 and Article 16.3 of the Washington Treaty.

The security of the organized circuit format plan was launched as a special issue in the United States in 1984 by the Semiconductor Chip Protection Act ("SCPA"). The decline in chip production by the US Congress in the 1980s led to a sui generis security situation. In particular, the industry was concerned that Japanese competitors would grow stronger and eventually be able to duplicate American plans. While the US Congress is contemplating securing the integrated circuit plan under copyright, the SCPA established a sui generis scheme that takes into account 10 years of protection, requiring registration within two years of the primary 'corporate infringement' of the 'veil work. .' Since the attempt to win in the semiconductor industry, a unique arrangement is entered that requires "regulation". Furthermore, The SCPA includes a serious correspondence provision that will provide coverage of a format plan initiated in separate countries only if these countries provide a guarantee comparable to that of an American plan in the United States. This correspondence has forced Japan, led by the European Community of 990 and other developed countries, to quickly get a law of comparison. WIPO initiated studies and conferences on this issue soon after the formation of the SCPA, to develop a global resolution. It met with a diplomatic conference that included the Washington Treaty, depending on the sui generis strategy originally introduced in US law, without, in any case, preventing the use of various types of defense.

By TRIPS, the Washington Agreement is traded. Despite their deception

of parts of the agreement, in particular from those identifying with mandatory licenses and obtaining products containing blocking semi-conductive devices, the United States and Japan did not sign the Agreement in 1989. This was the main area that was dealt with during the TRIPS transaction. Agreements in this area at the Uruguay Round are not as troubling and questionable as in many regions, except for the issue of extension and inconvenience of real buyers' payment obligations (currently under Article 37 TRIPS). These commitments, such as at the 1989 diplomatic conference that drafted the Washington Agreement, were reluctant to be recognized by agrarian countries. Anell's designs show an unusual contrast.

Exceptional cases similar to the basic demonstration of an integrated circuit format/geography design carried out by an observer are taken into account in Article 6(2) of the Washington Treaty. This article explicitly addresses the question of identifying, i.e. evaluating existing built-in circuits to independently construct serious items that may be comparable or indistinguishable from the former. In the semiconductor industry, figuring out is a common practice. Article 6.2(a) provides that, for 'personal reasons' or 'the primary motivation behind the assessment, investigation, review or training,' neither Party shall deem the process inappropriate without the consent of the champion.' The rate of finding exceptions is also described in Article 6.2(b). It states that as long as there is free effort included (which is essential to agree to the copyright prerequisites) the title rights of a given plan cannot be exercised against the designer of the next plan, regardless of whether they are indistinguishable. This implies that rights, as accommodated by the Treaty and TRIPS, present an elite both in the functionality of the plan/geographical format and in its particular articulation. They are only safe, generally, against conquered duplication. Finally, Article 6.2(c) stipulates that the special case of search applies even in situations where the second format map/ geography is

"indistinguishable" from the confirmed configuration, given that the former was "autonomously generated".

Article 6.5 of the Washington Treaty specifically provides for protection from "exhaustion from freedom" for the Contracting States: further monitoring of certain matters may not take place at this stage with the consent of the champion until the champion or an outsider has given the winner's consent. Article 6.5 of the Washington Treaty provides for the establishment, without limitation of its properties, "open" coordinated circuits in the domestic market. Members may subsequently receive the exercise of public, territorial, or worldwide privileges, as indicated by this clause 1005 and in Article 6 of TRIPS.

5. CONCLUSION

Piracy of Integrated Circuit layout designs is a very common affair in most cases occurring in Bangladesh. Intellectual property protection is not up to standard in Bangladesh, causing many violations. This is because the laws related to IPR in Bangladesh are still very premature and few. That's why most IP rights cannot be protected. There are no special provisions for the protection of integrated circuit layout designs. The level of skills and awareness of the general public, government officials, and professionals about IP rights are at a marginal position. Government agencies are not well equipped to fight the enemies of IP rights, especially for IC-related crimes. Integrated circuit layout design experts do not have sufficient knowledge and thoughts about legal protection. Lack of manpower in government and private institutions related to intellectual property rights.

Intellectual property protection for integrated circuit layout design is a key factor worldwide, and even more so in Bangladesh, as it does not have a strong intellectual property protection policy for software. Bangladesh is a developing country to turn it into a developing country; there is no alternative to prioritizing IP rights and laws. By removing the current challenges that have

been demonstrated in this paper, better IP protection can be ensured for entrepreneurs who can turn Bangladesh into a developed industrial nation. The SICLD law fulfills India's obligations under the TRIPS agreement approved by WTO members. Therefore, Indian law provides comprehensive protection of semiconductor integrated circuit layout designs as a recognized intellectual property and bundle of rights to registered layout design owners. As integrated circuit layout design is at an early stage in Bangladesh, the country needs to promote strong protection policies by enacting the Integrated Circuit Layout Design Act.

The number of Bangladeshi companies focusing on integrated circuit layout design is starting to grow and this will force large semiconductor companies to set up their offices and cater to the needs of the domestic market. This will encourage more companies to base their operations on Bangladesh. As integrated circuit layout design is at an early stage in Bangladesh, the country needs to promote strong protection policies by enacting the Integrated Circuit Layout Design Act. The number of Bangladeshi companies focusing on integrated circuit layout design is starting to grow and this will force large semiconductor

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