

---

# Integrated Circuit Layout Design Protection Law: Bangladesh and International Perspective

*Dr. Md. Nayem Alimul Hyder<sup>1</sup>*

*Dr. Md. Abdul Jalil<sup>2</sup>*

---

## Abstract

The layout designs of integrated circuits are creations of human intellect and that is why it is known as intellectual property (IP). It takes enormous investment of time and money to invent a new layout design of integrated circuits or to renovate the existing integrated circuits. But a chip pirate can easily replicate the layout design of a chip in a few months by removing the chips plastic/ceramic casing and photographing each layer of the translucent silicon material at a fraction of the original cost. The objectives of this study are to discuss the current situation of legal protection of integrated circuit layout designs in Bangladesh, to identify various international legal instruments on integrated circuit layout design and to highlight the necessity and significance of enactment of a new law on integrated circuit layout designs in Bangladesh. Secondary sources have been used in this research. The article has been written based on the Washington treaty, TRIPS Agreement, the Semiconductor Integrated Circuit Layout Design Act 2000 in India, different books, articles of prominent researches, newspaper reports and websites. Some important findings have been stated at the end of the research. The article suggests introducing a new legislation on layout design (topographies) of integrated circuits in Bangladesh.

**Keywords:** IP Law, TRIPS Agreement, Semiconductor Integrated Circuit Layout Design Rights, Piracy, New Legislation, Lack of Awareness, Expert Training.

---

<sup>1</sup> The author is an Assistant Professor and Head at Department of Law of Cox's Bazar International University (CBIU). Before joining in CBIU, he has served at Department of Law of Khwaja Yunus Ali University. However, he has started his teaching career as Lecturer at World University of Bangladesh (WUB). He has written many law text books. His several articles have already been published on reputed national and international journals. He is a regular column writer in various daily newspapers in Bangladesh. Dr. Hyder has completed his Ph.D in Law from Commonwealth Open University, UK. He has concluded LL.B (Hon's) from University of London, UK and LL.M from Liverpool John Moores University, UK. He has also completed M.S.S from University of Dhaka. His email address is [lawmnahyder@yahoo.com](mailto:lawmnahyder@yahoo.com)

<sup>2</sup> The author is a Professor & Head at Department of Law of World University of Bangladesh. Since starting his career as a Lecturer, he served in various leading private universities in Bangladesh. Before joining in WUB, he served at Department of Law of Northern University of Bangladesh (NUB) as Associate Professor & Head of the Department. He has written many law text books. Several articles of him have also been published on reputed national and international journals. Dr. Jalil has completed his Ph.D in Law from National University of Malaysia. He has concluded LL.B (Hon's) from International Islamic University Malaysia (IIUM) and LL.M from University of Malaya, Malaysia. His email address is [dearbangla2011@gmail.com](mailto:dearbangla2011@gmail.com)

## **Methodology**

The paper shows the present situation of integrated circuit layout design protection law under the current IP laws of Bangladesh. Qualitative research methodology has been adopted in this research. The study is basically literary based with an overall combination of analytical reasoning. Secondary sources have been used in the research. The article is mainly based on Washington treaty, TRIPS Agreement, the Semiconductor Integrated Circuit Layout Design Act 2000 in India, books, articles of prominent researches, newspaper reports and websites.

## **Objectives of the Study**

The objectives of the research are as follows:

1. To discuss the current situation of legal protection of integrated circuit layout designs in Bangladesh;
2. To identify various international legal instruments especially Indian legislation on the protection of integrated circuit layout designs;
3. To recommend the enactment of a new legislation on integrated circuit layout designs for Bangladesh.

## **Introduction**

In intellectual property arena integrated circuit layout design are playing a significant role. In modern technology, integrated circuits are essential elements for a wide range of electrical products including articles of everyday use, such as watches, television sets, washing machines, cars, sophisticated computers, smart phones and other digital devices. Developing innovative layout designs of integrated circuits is essential for the production of ever-smaller digital devices with more functions. While the creation of a new layout design is usually the result of an enormous investment, in terms of finance and time required from highly qualified experts, the copying of such a layout design may cost only a fraction of the original investment. Such copying or infringement of integrated circuit design will discourage research, invention, development and investment of huge amount of money.

In order to prevent unauthorized copying of layout designs and to provide incentives for investing in this field, the layout design (topography) of integrated circuits is protected under a sui generis intellectual property

system. The objective of this article inter alia is to evaluate the present position of integrated circuit layout design law in Bangladesh and to suggest for the enactment of a new legislation on integrated circuit layout design in Bangladesh which will encourage the entrepreneurs to invest money in this field of technology.

### **Meaning of Technical Terms**

An integrated circuit (or "chip") is an electronic device that incorporates individual electronic components within a single "integrated" platform of semiconductor material, typically silicon, configured so as to perform a complex electronic function. Typically, an integrated circuit comprises active elements such as electronic switches and gates (like transistors or diodes) and passive electronic components (such as resistors and capacitors). Broadly speaking, integrated circuits are classified into microprocessors and memories. A microprocessor typically performs information-processing functions because it has logic circuits capable of electronically performing information processing. Memories enable storing and retrieval of data. An integrated circuit is thus formed when a miniaturized electrical circuit is embodied within a chip. All the active and passive components are created in the semiconductor wafer during the fabrication process itself and are therefore inseparable once the chip has been produced. For the purpose of intellectual property protection, the terms 'integrated circuits' and 'layout design (topography)' are defined as follows:

- An 'integrated circuit' means a product, in its final form or an 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 is intended to perform an electronic function.
- 'Layout-design (topography)' means the three-dimensional disposition, however expressed, of the elements, at least one of which is an active element, and of some or all of the interconnections of an integrated circuit, or such a three-dimensional disposition prepared for an integrated circuit intended for manufacture.
- Layout-designs of integrated circuits are also called topographies of integrated circuits or mask works of semiconductor chip products.



**Picture 01: Integrated circuit layout design**

A layout design of an integrated circuit can be protected if it is original and new in the sense that it is the result of the creator's own intellectual effort and not commonplace among creators of layout designs and manufacturers of integrated circuits at the time of the creation.

In general, protection of the topography requires that an integrated circuit be registered or commercially exploited. In general, the owner has the exclusive right to prevent or stop others from commercially using the protected layout designs. In other words, the original layout design cannot be reproduced entirely or partly for commercial purposes by others, without the authorization of the holder of the right. Further, without the authorization of the owner a protected layout design of integrated circuits cannot be incorporated on any article or an article incorporating such a layout design cannot be imported, sold or otherwise distributed for commercial purposes in Bangladesh.

The terms of protection vary from one country to another. According to the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS Agreement), members must provide for a minimum protection of at least ten years from the filing of the application for registration or from the first commercial exploitation of integrated circuits.

### **Importance of the Protection of Layout Designs of Integrated Circuits**

The layout designs of integrated circuits are creations of human thinking. Entrepreneurs invest huge amount of money, time and energy to produce a new layout design. But a chip infringer can easily replicate the layout design of a chip in few months without investing money, time and energy. Integrated circuits are manufactured in accordance with very detailed plans or layout designs. They are usually the result of vast investment, of both expertise and financial resources. There is a continuing need for the

creation of new layout designs that reduce the dimensions of existing integrated circuits and simultaneously increase their functions and facilities. Whilst creating a new layout design for an integrated circuit involves a major investment, it is possible to copy such a layout design for a small fraction of that cost. Copying may be done by cloning each layer of an integrated circuit and preparing masks for the production of the integrated circuit on the basis of the cloning obtained. The high cost of the creation of such layout designs and the relative ease of copying are the main reasons why layout designs need protection in order to foster sustainable investment and innovation in the field. While the exclusive right to the topography is intended to encourage creativity, the possibility of reverse engineering by others for the purpose of evaluation, analysis, research or teaching is meant to strike a balance in order to enable improvements of existing integrated circuits and their compatibility.<sup>3</sup>

Hence, we can say that it is essential to protect integrated circuit layout design to encourage investors to invest money for research and invention of new integrated circuit layout design or to renovate the existing integrated circuit layout design for better functions and services.

### **International Instruments regarding Protection of Integrated Circuit Layout Designs**

The Universal Declaration of Human Rights (UDHR) 1948 provides: “Everyone has the right to the protection of moral and material interests resulting from scientific, literary or artistic production of which he is the author.”<sup>4</sup>

Protection to semiconductor chips was first given in the US through Semiconductor Chip Protection Act (SCPA) in 1984 and its impact was felt virtually throughout the world. Japan introduced similar protection in 1985, viz., Japanese Circuit Layout Right Act (JCLRA). An EC Directive,<sup>5</sup> with implementing legislation in all Member States of the EU accelerated international efforts resulting in formulation of 1989 Treaty on Intellectual Property in Respect of Integrated Circuits (IPIC Treaty) under the auspices of WIPO. The IPIC Treaty was later made part of the TRIPS

---

<sup>3</sup> Patent Expert Issues: Layout Designs (Topographies) of Integrated Circuits, available online: [http://www.wipo.int/patents/en/topics/integrated\\_circuits.html](http://www.wipo.int/patents/en/topics/integrated_circuits.html), accessed on 10.07.17

<sup>4</sup> Article 27(ii), The Universal Declaration of Human Rights (UDHR), 1948.

<sup>5</sup> [1987] 24 OJL 30.

Agreement. TRIPS called for adherence to most of the substantive provisions of the IPIC Treaty.<sup>6</sup>

A diplomatic conference was held at Washington, D.C., in 1989, which adopted a Treaty on Intellectual Property in Respect of Integrated Circuits, also called the Washington Treaty or IPIC Treaty. The Treaty, signed at Washington on May 26, 1989, is open to Members States of WIPO or the United Nations and to intergovernmental organizations meeting certain criteria. The Treaty has been incorporated by reference into the TRIPS Agreement of the World Trade Organization (WTO), subject to the following modifications: the term of protection is at least 10 years from the date of filing an application or of the first commercial exploitation in the world. But Members may provide a term of protection of 15 years from the creation of the layout design. The exclusive right of the right-holder extends also to articles incorporating integrated circuits in which a protected layout design is incorporated, in so far as it continues to contain an unlawfully reproduced layout design. The circumstances in which layout designs may be used without the consent of right-holders are more restricted. However, certain acts engaged in unknowingly or for research purpose will not constitute infringement.

The IPIC Treaty is currently not in force, but was partially integrated into the TRIPS agreement. Article 35 of TRIPS in Relation to the IPIC Treaty states:

“Members agree to provide protection to the layout-designs (topographies) of integrated circuits (referred to in this Agreement as "layout-designs") in accordance with Articles 2 through 7 (other than paragraph 3 of Article 6), Article 12 and paragraph 3 of Article 16 of the Treaty on Intellectual Property in Respect of Integrated Circuits and, in addition, to comply with the following provisions.”

Article 2 of the IPIC Treaty gives the following definitions of integrated circuit and layout design:

- (i) 'integrated circuit' means a product, in its final form or an intermediate form, in which the elements, at least one of which is an active element, and some or all of the inter-connections are integrally formed in and/or on a piece of material and which is intended to perform an electronic function.

---

<sup>6</sup> Article 35 of TRIPS Agreement obliges adherence to Article 2 to 7 [other than Article 6(3) on compulsory licences], Article 12 and Article 16(3) of the IPIC.

- (ii) 'layout-design (topography)' means the three-dimensional disposition, however expressed, of the elements, at least one of which is an active element, and of some or all of the interconnections of an integrated circuit, or such a three-dimensional disposition prepared for an integrated circuit intended for manufacture ...,

Under the IPIC Treaty, each contracting party is obliged to secure, throughout its territory, exclusive rights in layout designs (topographies) of integrated circuits, whether or not the integrated circuit concerned is incorporated in an article. Such obligation applies to layout designs that are original in the sense that they are the result of their creator's own intellectual effort and are not commonplace among creators of layout designs and manufacturers of integrated circuits at the time of their creation.

The contracting parties must, as a minimum, consider the following acts to be unlawful if performed without the authorization of the holder of the right: the reproduction of the lay-out design, and the importation, sale or other distribution for commercial purposes of the layout-design or an integrated circuit in which the layout-design is incorporated. However, certain acts may be freely performed for private purposes or for the sole purpose of evaluation, analysis, research or teaching.<sup>7</sup>

In a US case *Brooktree Corp. v. Advanced Micro Devices Inc.*, 977 F.2d 1555, 1564-65 (Fed. Cir. 1992), the court held that infringement under the SCPA does not require that all parts of the chip be copied. Specifically, mask works fixed in a chip were held to infringe a protected mask work even though the infringing mask works were only eighty percent similar to the protected mask work. Two problems remain with the Federal Circuit's reliance on copyright law. First, the appropriateness of applying copyright law, which protects aesthetic rather than functional designs, remains in question since mask works are functional. Second, the interpretation of infringement under the SCPA remains uncertain even after *Brooktree* because the courts have yet to articulate a certain standard for finding infringement under the SCPA.

## Indian Perspective

India has enacted a special legislation on the Semiconductor Integrated Circuits Layout Design Act, 2000. It gives recognition to a new form of

<sup>7</sup> Ahmed, Rajin, "Layout Designs of Integrated Circuits". Law Help BD(May 27, 2017), downloaded from <http://lawhelpbd.com/intellectual-property/layout-designs-integrated-circuits>, accessed on 15.07.17.

intellectual property, namely, the ‘layout-designs’ used in semiconductor integrated circuits as has been defined under section 2(h) of the Act. As a member of TRIPS Agreement, India has enacted the Semiconductor Integrated Circuit Layout Design Act, 2000. The Semiconductor Integrated Circuit Layout Design Act 2000, protects original, inherently distinctive layout designs that have not been previously commercially exploited and registration is a necessary pre-requisite for protection. The Act makes provision for a registry to be headed by a Registrar for the purpose of registration of layout designs. Protection under the Act extends for ten years and commences from the date of application for registration in case of layout designs which have not been commercially exploited. For layout designs, which have been commercially exploited (for less than two years) before the date of application for registration, protection commences retrospectively from date of first commercial exploitation. The registered-proprietor has the exclusive right to reproduce by any means the registered layout design or any substantial portion of it. But the Act permits ‘reverse-engineering’ of a layout design for limited purposes. The registered proprietor also has the exclusive right to import, sell or distribute for commercial purpose any semiconductor chip products in which the registered layout design is embodied. The Act provides for criminal remedies for the infringement of a layout design expressly, civil remedies too are available to enforce rights under the Act. A registered layout design can be assigned or transmitted with or without the goodwill of the business concerned. Registration of assignment or transmission is necessary to establish title to the registered layout design. The Act also provides for reciprocal arrangements between convention countries.<sup>8</sup> Following are the highlights of Indian legislation (SICLD Act 2000)<sup>9</sup>:

- There is protection of semiconductor integrated circuits layout and designs by a registration process.
- There is a mechanism for distinguishing which layout designs can be protected.
- There are rules to prohibit registration of layout designs which are not original or which have been commercially exploited.
- Protection of 10 years period is provided to layout designs.

---

<sup>8</sup> Gupta, Atul, “Integrated Circuits and Intellectual Property Rights in India”, *Journal of Intellectual Property Rights*, Vol. 10, November 2005, pp. 474-479.

<sup>9</sup> Rajkumar, Dubey, *Semiconductor Integrated Circuits Layout Design In Indian IP Regime* (24 September 2004), downloaded from <http://www.mondaq.com/india/x/28601/technology/Semiconductor+Integrated+Circuits+Layout+Design+In+Indian+IP+Regime>



- Provisions regarding infringement and evidence of validity are mentioned.
- There are provisions for determining payment of royalty for registered layout designs in case of innocent or unintentional infringement.
- Penalties in the form of imprisonment and fine are imposed for willful infringement and other offences in the Act.
- The Registrar is appointed for the purpose of registration of ICLD and the Appellate Board is established for facilitating the legal remedies.

### **Current Situation in Bangladesh**

The Constitution of Bangladesh in its Article 42 guaranteed the citizens' right to property. And within the general definition of property, property produced through creative thoughts can also be included. To support this proposition it is better to argue that 'the concept property has been expanded by courts to include practically all rights. Thus patents, licenses, trademarks, copyrights, industrial designs and integrated circuits layout designs are held to be property distinct from physical or material property.'<sup>10</sup> Following this proposition it can be argued that, Constitution, the supreme law of the land gives recognition of the intellectual property rights in express terms. In Bangladesh there are some laws regarding protection of intellectual property rights, such as Patent Act 1911, Trademark Act 2009, Copyright Act 2000, Geographical Indications Act 2013 etc. However, there are no laws on integrated circuit layout design in Bangladesh. The Law Consultants are trying to make a draft for the Layout Design (Topographies) of Integrated Circuit Bill. Integrated circuits are used in virtually all electronic equipment today and have revolutionized the world of electronics. Computers, mobile phones and other digital home appliances are now inextricable part of the structure of modern societies. It became possible due to the low cost, small size and less weight of integrated circuits. These integrated circuits improved the functional performance of every gadget in which they were being attached. When these integrated circuits became so much important, the need for protecting them also aroused. The main problem here which is also common to all IPs is the problem of piracy, as it is clear that the structure

---

<sup>10</sup> Munim, F. K. M. A., *Rights of the Citizen under the Constitution and Law*, Bangladesh Institute of Legal and International Affairs (BILIA), Dhaka, 1975.

and components of integrated circuits are not protected. In Bangladesh electronic goods market is flooded with counterfeit and substandard items due to legal loopholes and inaction of the law enforcers against the unscrupulous importers and traders, stakeholders.<sup>11</sup> The primary reason behind the growth of counterfeit products is the consumer's lack of awareness and understanding of the difference between fake and original products and intellectual properties. It can be said that Bangladesh is suffering from the absence of any specific law on the protection of integrated circuit layout designs.

## **Findings**

1. Piracy of Integrated Circuit layout design is very common affair in Bangladesh.
2. Intellectual property protection is not up to the mark in Bangladesh. The IP related laws in Bangladesh are in a very premature form and few in number. That's why a large area of IP rights cannot be protected.
3. There is no specific law or provision for the protection of integrated circuit layout design.
4. Level of skill and awareness of public in general, government officials and professionals on IP rights is at a marginal stand.
5. Government agencies are not well equipped to combat the enemies of IP rights especially for IC related crimes.
6. Even experts on integrated circuit layout design have inadequate knowledge and idea on the legal protection.
7. There is lack of manpower in the government and private agencies regarding IP rights.

---

<sup>11</sup> Ahsan, Badrul, "Fake, substandard electronic goods flood local market", The Financial Express (25 August 2013), available online: [http://print.thefinancialexpress bd.com/old/index.php?ref=MjBfMDhfMjVfMTNfMV8xXzE4MDk1Ng==](http://print.thefinancialexpress.bd.com/old/index.php?ref=MjBfMDhfMjVfMTNfMV8xXzE4MDk1Ng==)

## **Suggestions**

Under the above circumstances, the following steps should be taken to protect integrated circuit layout design (ICLD):

1. Introducing basic concept on IP laws to the undergraduate and postgraduates students in colleges and universities.
2. Enacting new laws on layout design (topographies) of integrated circuits by the parliament.
3. Creating awareness through seminar, symposiums and national workshops among the all classes of educated people of the country. Both government as well as private sectors may be involved here.
4. Establishing IP Protection courts, at least, in the divisional level and training the judges and advocates and thus making experts in this field.
5. Developing ADR mechanism to ensure speedy and cheap resolution of disputes and litigation related to infringement.
6. Employing special teams of the members of law forces for the implementation of the IP laws and providing them adequate training.
7. Recruiting necessary officers and staff for integrated circuit layout design (ICLD) office and training them on IP laws at home and abroad.

## **Conclusion**

The intellectual property protection for integrated circuit layout design is a key factor throughout the world, and more so in Bangladesh because it does not have a strong intellectual property protection policy in software. Bangladesh is a developing country in order to turn her into mid-developed one; there is no alternative to give priority on IP rights and laws. By removing the present challenges which have been shown in the paper, better IP protection can be ensured for the entrepreneurs who can turn Bangladesh into an industrially developed country. The SICLD Act fulfils India's obligation under the TRIPS agreement as approved by the members of WTO. The Indian legislation therefore provides a comprehensive protection to the layout designs of the semiconductor integrated circuits as recognized intellectual property and bundle of rights to the proprietor of the registered layout design. As integrated circuit

layout designs are in its early stage in Bangladesh, it is important that the country should boost strong protection policy by enacting Integrated Circuit Layout Design Act. The number of Bangladeshi companies focusing on integrated circuit layout designs is beginning to grow and this would force major semiconductor companies to set up their offices and to address the needs of the domestic market. This will encourage a lot more companies to base their operations in Bangladesh.

## REFERENCES

### Legislations

- Universal Declaration on Human Rights (UDHR) 1948.
- Washington Treaty.
- TRIPS Agreement.
- The Semiconductor Integrated Circuit Layout Design Act 2000 [India].

### Books

- P. Narayanan, *Intellectual Property Law*, New Delhi: Eastern Law House, Third edition, 2001.
- Bently, Lionel and Sherman, Brad. *Intellectual Property Law*, Oxford University Press, 4th Edition, 2014.

### Articles

- Ahmed, Rajin. “Layout Designs of Integratd Circuits”. Law Help BD (May 27, 2017).
- Gupta, Atul. “Integrated Circuits and Intellectual Property Rights in India”, Journal of Intellectual Property Rights, Vol 10, November 2005.
- Munim, F. K. M. A. Rights of the Citizens under the Constitution and Law, Bangladesh Institute of Legal and International Affairs (BILIA), Dhaka, 1975.
- Rajkumar, Dubey. Semiconductor Integrated Circuits Layout Design in Indian IP Regime (24 September 2004).

### Websites

- [www.wipo.int/patents/en/topics/integrated\\_circuits.html](http://www.wipo.int/patents/en/topics/integrated_circuits.html)
- [www.lawhelpbd.com/intellectual-property/layout-designs-integrated-circuits](http://www.lawhelpbd.com/intellectual-property/layout-designs-integrated-circuits)
- [www.mondaq.com/india/x/28601/technology/Semiconductor+Integrated+Circuits+Layout+Design+In+Indian+IP+Regime](http://www.mondaq.com/india/x/28601/technology/Semiconductor+Integrated+Circuits+Layout+Design+In+Indian+IP+Regime)