

Class B digital device part 15 of the FCC rules

The Federal Code Of Regulation (CFR) FCC Part 15 is a common testing standard for most electronic equipment. FCC Part 15 covers the regulations under which an intentional, unintentional, or incidental radiator that can be operated without an individual license. FCC Part 15 covers as well the technical specifications, administrative requirements and other conditions relating to the marketing of FCC Part 15 devices. Depending on the type of the equipment, verification, declaration of conformity, or certification is the process for FCC Part 15 compliance.

Verification is a procedure where the manufacturer makes measurements or takes the necessary steps to insure that the equipment complies with the appropriate technical standards. Submittal of a sample unit or representative data to the Commission demonstrating compliance is not required unless specifically requested the Commission. Verification attached to the equipment a label showing that compliance is met.

Declaration of Conformity is a procedure where the responsible party makes measurements or takes other necessary steps to ensure that the equipment complies with the appropriate technical standards. Submittal of a sample unit or representative data to the Commissions demonstrating compliance is not required unless specifically requested. The Declaration of Conformity attaches to the equipment a label showing that the sample has been tested and found acceptable by the responsible party.

Certification is an equipment authorization issued by the Commission, based on representations and test data submitted by eh applicant. Certification attaches to the units subsequently marketed by the grantee which are identical to the sample tested an FCC ID number to show compliance.

FCC Part 15 Subpart A contains specific information regarding testing and certification. Information like, scope of the rules and legal implications, definitions, prohibition against eavesdropping, labeling, and other sections.

Some more interesting descriptions used in the FCC Part 15 as listed in Subpart A.

Digital Device. "An unintentional radiator (device or system) that generates and uses timing signals or pulses at a rate in excess of 9,000 pulses (cycles) per second and uses digital techniques; inclusive of telephone equipment that uses digital techniques or any device or system that generates and uses radio frequency energy for the purpose of performing data processing functions such as electronics computations, operations, transformations, recording, filing, sorting, storage, retrieval, or transfer. A radio frequency device that is specifically subject to an emanation requirement in any other FCC Rule part or an intentional radiator subject to Subpart C of this part that contains a digital device is not subject to the standards for digital devices, provided the digital device is used only the enable operation of the radio frequency device and the digital device does not control additional functions or capabilities."

Intentional radiator. "A device that intentionally generates and emits radio frequency energy by radiation or induction."

Class A Digital Device. “A digital device that is marketed for use in a commercial, industrial or business environment, exclusive of a device which is marketed for use by the general public or is intended to be used in the home.”

Class B Digital Device. “A digital device that is marketed for use in a residential environment notwithstanding use in commercial, business and industrial environments. Examples of such devices included, but are not limited to, personal computers, calculators, and similar electronics devices that are marketed for use by the general public.

FCC Part 15 Subpart B is for unintentional radiators. The category of unintentional radiators includes a wide variety of devices that contain clocks or oscillators and logic circuitry but that do not deliberately generate radio frequencies emissions. Among the common unintentional radiators are personal computers, peripherals, receivers, radios, TV sets, and cable TV home terminals. FCC Part 15 Section 15.101 has a very informative table for unintentional radiators. Two levels of radiation and conducted emissions limits for unintentional radiators are specified in FCC Part 15 Subpart B. The two levels are Class A digital devices, the higher less strict limits, and Class B digital devices, the lower more strict limits. Manufacturers are encouraged to meet the Class B digital device limits.

FCC Part 15 Subpart C is for intentional radiators. The various types of intentional radiators covered by Subpart C include cable-locating equipment, cordless telephones, remote control and alarm transmitters, field-disturbance sensors for opening doors, and spread-spectrum systems for wideband data transmission. Intentional radiators governed by FCC Part 15 Subpart C must either have a permanently attached antenna or provide a unique coupler to prevent the use of unauthorized antennas. The FCC Part 15 Subpart C rules for operation of radio transmitters for the most part are very detailed regarding fundamental field strength, power and/or power density, frequency accuracy, and permitted harmonic and spurious emissions.

FCC Part 15 Subpart D outlines the regulations for unlicensed personal communication service (UPCS) devices operating in the 1910 – 1930 MHz frequencies bands.

FCC Part 15 Subpart E sets out the regulations for unlicensed National Information Infrastructure (U-NII) devices operating in the 5.15 – 5.35 GHz, 5.47 – 5.725 GHz, and 5.725 – 5.825 GHz bands.

FCC Part 15 Subpart G sets out the regulations for Access Broadband over Power Line (Access BPL) devices operating in the 1.705-80 MHz band over medium or low voltage lines. This section outlines the geographical area within which Access BPS operations are not permitted in certain frequencies bands.

2.909 FCC rules

Are you confused by the Federal Communications Commission's (FCC) new streamlined Declaration of Conformity (DoC) authorization procedure, Report and Order in ET Docket No. 95-19? If so, you may not be alone.

The intent of this procedure is to help manufacturers and importers of digital devices get their products to market in a more timely manner. It is truly a helpful document. But because of the vast amount of information needed to make it worthwhile, your introduction to this material could overwhelm you.

Before the procedure became effective on Aug. 19, 1996, the FCC required all personal computers and associated peripherals to be certified by filing an application with the Commission. It generally took more than 30 days for the Commission to act upon the application and cost \$845 in fees. The manufacturer was not allowed to sell the product until a grant of authority was issued.

The most important aspect of the new procedure is the time-to-market savings of at least 30 days per product. This procedure does not reduce the requirements or obligations of the manufacturer. The manufacturer or importer, if the device is foreign made, must still determine whether the product complies with the requirements.

Some of the important points of the procedure include the compliance information statement and the DoC. It also defines the obligation of the person signing the DoC.

A product is tested the same as in the past, except that an accredited test lab is required. At this time, accreditation means NVLAP or A2LA. The laboratory must be located in the United States or a country having a mutual recognition agreement (MRA) with the United States. Until Aug. 19, 1997, the FCC is permitting labs with pending accreditation requests to perform DoC testing.

Responsible Party

Section 2.909 of the FCC rules defines the responsible party and how the party is responsible for the compliance of radio frequency equipment with the applicable standards. For equipment that requires a grant of equipment authorization from the Commission, the responsible party is the entity to whom that authorization is granted (referred to as the grantee).

In the case of equipment subject to authorization under the verification procedure, the manufacturer (or in the case of imported equipment, the importer) is the responsible party. When the equipment is subject to authorization under the DoC procedure, the responsible party is:

The manufacturer or, if the equipment is assembled from modular components that were subject to a DoC and the resulting system is subject to authorization under a DoC, the *assembler*.

The importer if the equipment, by itself, is subject to a DoC and that equipment is imported. Remember, if a product is imported, the importer is the responsible party, not the foreign manufacturer.

Obligations

According to the FCC Rules for self-certification of a product using the DoC, the manufacturer has the following obligations:

Compliance Information Statement—A statement must be shipped with each product. This can be accomplished either as a separate document shipped with the product or as part of the instruction manual accompanying the product.

The choice of address and phone number listed on the compliance information statement is very important. The FCC expects this party to respond in 14 days if there is a problem.

Retention of Records—Except for equipment authorized using modular components that were individually subject to a DoC (see 2.1077(b) of the FCC Rules), for each product subject to a DoC, the responsible party (as shown in Section 2.909 of the FCC Rules) must maintain the following records:

The record of the original design drawings, specifications and all changes that have been made which might affect compliance with the requirements.

A record of the procedure used for production inspection and testing (if additional tests are performed) to ensure conformance.

Record of measurements made on an appropriate test site that demonstrates compliance with the regulation. The record of measurements should contain:

- a) The actual date or dates testing was performed.
- b) The name of the test laboratory, company or individual performing the testing. The Commission may request additional information regarding the test site, the test equipment or the qualifications of the company or individual performing the tests.
- c) A description of how the device was actually tested, identifying the measurement procedure and test equipment that was used.

- d) A description of the equipment under test (EUT) and support equipment connected to, or installed within, the EUT.
- e) The identification of the EUT and support equipment by trade name and model number and, if appropriate, by FCC identifier and serial number.
- f) The types and lengths of connecting cables used and how they were arranged or moved during testing.
- g) At least two photographs showing the test setup for the highest line-conducted emission and the test setup for the highest radiated emission. These photographs must show enough detail to confirm other information contained in the test report.
- h) A description of any modifications made to the EUT by the testing company or individuals to achieve compliance with the regulations.
- i) All of the data required to show compliance with the appropriate regulations.
- j) The signature of the individual responsible for testing the product along with the name and signature of an official of the responsible party, as designated in Section 2.909 of the FCC Rules.
- k) A copy of the compliance information, as described in Section 2.1077 of the FCC Rules, required to be provided with the equipment.

All records should be in English.

The records (technical file containing the DoC and the compliance information statement) must be retained for at least two years after manufacturing has been discontinued or after the conclusion of an investigation or a proceeding involving the equipment.

The technical file and test data must be provided within 14 days of delivery of a request from the FCC. (This would not normally be requested.)

Testing—Testing of your product must be performed at an accredited testing laboratory located in the United States or a country having an MRA with the United States.

Labeling Requirements

Besides preparing the records in support of the DoC, you also must supply the label (Section 15.19) (**Figure 1**). For products authorized, based on assembly using separately authorized components and the resulting product is not separately tested, a different label is required.

The label must be located in a conspicuous location on the device and must contain the unique identification. Devices subject only to a DoC must be identified by the responsible party. This identification must not be of a format which could be confused with the FCC identifier required on certified, notified, type-accepted or type-approved equipment.

The responsible party must maintain adequate records to facilitate positive identification for each device. Basically, use the label with a unique trade name and model number and have each device contain a serial number.

When a device is constructed in two or more sections connected by wires and marketed together, the label is required to be affixed only to the main control unit.

When the device is too small or when it is not practical to place the statement specified on it, the required information may be placed in a prominent location in the instruction manual or pamphlet supplied to the user or be placed on the container in which the device is marketed. However, the FCC identifier such as the logo and unique identification (trade name and model number) must be displayed on the device.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and be readily visible at the time of purchase. "Permanently affixed" means that the label is etched, engraved, stamped, silk-screened, indelibly printed or otherwise permanently marked on a permanently attached part of the equipment or on a nameplate of metal, plastic or other material fastened to the equipment by welding, riveting or a permanent adhesive. The label must last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.

Information to the User

This statement must be placed in the User's Manual or Instruction Manual (Section 15.21): "The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment."

For a Class B digital device or peripheral, the instructions furnished to the user shall include this statement, placed in a prominent location in the text of the manual (Section 15.105):

"Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the

instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that of the receiver.

Consult the dealer or an experienced radio/TV technician for help.

If shielded cables were used to show compliance, the following statement must also be added (Section 15.27 of the FCC Rules): "Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance."

Acknowledgment

The author thanks David Hilliard of Wiley, Rein & Fielding, Washington, D.C., for his help in reviewing this article.

Note: This is to accompany the product either as a loose sheet in the box or in the instruction manual supplied with the product.