FCC Certification of Low Power Wireless Devices
April 13, 2015

Steve Laya
Elite Electronic Engineering, Inc.
Elite Overview

Services EMC Since 1954, ENV Since 1973
Downers Grove Facility 45,000 Square Feet

- EMC Testing
- Environmental Stress Testing
- Wireless Certification
- Electrical Safety Services
- EMC Design Consulting & Training
- Regulatory Consulting & Training

Automotive
Military
FCC/ CE Mark
Commercial Aviation
Medical
Power Industry
Marine

EMC Testing
ENV Stress Testing
Agenda

1. FCC Rule Parts - General
2. Part 15.231, 15.249, 15.247
3. Equipment Authorization
4. Informational Sites
5. Typical Costs & Timing
6. Questions
FCC Regulations- What do they cover?

Cellular Phone  
Land Mobile Radio  
Microwave Communication  
Radio & TV Broadcast  
Maritime, EPIRB,  
Aviation Comms, Navigation

Generally  
Greater than 1W  
Licensed Services
FCC Part 15C Regulations

Remote Control
RFID
Cordless Phones
WiFi
Bluetooth
Zigbee

Typically less than 1 watt
Unlicensed
FCC Certification Overview

Select Band & Identify Requirement
- Available bands
- Application
- Performance
- Single vs. Modular

Perform Test
- In-band
- Spurious
- Digital Devices
- RF Exposure

Certification
- Grantee Registration
- Application
- Exhibits
- TCB

Post-Certification
- Permissive Changes
- Surveillance
FCC Rule Parts

Code of Federal Regulations

50 Titles
• 29 CFR (OSHA workplace safety rules)
• 40 CFR (tail pipe emissions and pollutants)
• 47 CFR Telecommunications
FCC Rule Parts

47 CFR Telecommunications
- Part 2 - General Rules
- Part 15 - Low Power Devices

Subpart A General Requirements
Subpart B Unintentional Radiators
Subpart C Intentional Radiators
Subpart E UNII

Equipment Authorization Procedures
Certification Processes
Verification
Declaration of Conformity
SAR/MPE requirements
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

<table>
<thead>
<tr>
<th>Xmit Range</th>
<th>Test Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1MHz &lt;</td>
<td>Center</td>
</tr>
<tr>
<td>1-10MHz</td>
<td>Low &amp; High</td>
</tr>
<tr>
<td>&gt;10MHz</td>
<td>Low, Mid, High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Highest Freq</th>
<th>Upper Msmt, MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1.705</td>
<td>30.</td>
</tr>
<tr>
<td>1.705-108</td>
<td>1000.</td>
</tr>
<tr>
<td>500-1000</td>
<td>5000.</td>
</tr>
<tr>
<td>Above 1000</td>
<td>5th Harm or 40 GHz</td>
</tr>
</tbody>
</table>

Transmitters 10\textsuperscript{th} harmonic
### Part 15 Rules

#### Subpart B—Unintentional Radiators

15.101 Equipment authorization of unintentional radiators.
15.102 CPU boards and power supplies used in personal computers.
15.103 Exempted devices.
15.105 Information to the user.
15.107 Conducted limits.
15.109 Radiated emission limits.
15.111 Antenna power conduction limits for receivers.
15.113 Power line carrier systems.
15.115 TV interface devices, including cable system terminal devices.
15.117 TV broadcast receivers.
15.118 Cable ready consumer electronics equipment.
15.120 Program blocking technology requirements for television receivers.
15.121 Scanning receivers and frequency converters used with scanning receivers.
15.123 Labeling of digital cable ready products.
Part 15 Rules

Subpart B—Unintentional Radiators

15.101  Equipment authorization of unintentional radiators.
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15.123  Labeling of digital cable ready products.
### Part 15 Rules

<table>
<thead>
<tr>
<th>Type of device</th>
<th>Part 15B</th>
<th>15B Equipment authorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV broadcast receiver</td>
<td></td>
<td>Verification.</td>
</tr>
<tr>
<td>FM broadcast receiver</td>
<td></td>
<td>Verification.</td>
</tr>
<tr>
<td>CB receiver</td>
<td></td>
<td>DoC</td>
</tr>
<tr>
<td>Superregenerative receiver</td>
<td></td>
<td>DoC</td>
</tr>
<tr>
<td>Scanning receiver</td>
<td></td>
<td>Certification.</td>
</tr>
<tr>
<td>Radar receiver</td>
<td></td>
<td>Verification.</td>
</tr>
<tr>
<td>All other receivers</td>
<td></td>
<td>Verification.</td>
</tr>
<tr>
<td>TV interface device</td>
<td></td>
<td>Verification.</td>
</tr>
<tr>
<td>Cable system terminal device</td>
<td></td>
<td>DoC</td>
</tr>
<tr>
<td>Stand-alone cable input selector switch</td>
<td></td>
<td>Declaration of Conformity.</td>
</tr>
<tr>
<td>Class B personal computers &amp; peripherals</td>
<td></td>
<td>Verification.</td>
</tr>
<tr>
<td>CPU boards &amp; internal power supplies</td>
<td></td>
<td>DoC</td>
</tr>
<tr>
<td>Class B PCs assembled using authorized CPU boards or pwr supplies</td>
<td></td>
<td>Certification.</td>
</tr>
<tr>
<td>Class B external switching power supplies</td>
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<td>Verification.</td>
</tr>
<tr>
<td>Other Class B digital devices &amp; peripherals</td>
<td></td>
<td>Verification.</td>
</tr>
<tr>
<td>Class A digital devices, peripherals &amp; external switching power supplies</td>
<td></td>
<td>Verification.</td>
</tr>
<tr>
<td>All other devices</td>
<td></td>
<td>Verification.</td>
</tr>
</tbody>
</table>

Unintentional Radiators- digital devices and receivers

Intentional Radiators- Always Certification

- Measure Conducted & Radiated Emissions
- Have results on file
- Label Accordingly
- Information for users
Part 15 Rules

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15.111 Antenna power conduction limits for receivers.

Exempt if,
(a) used exclusively in autos, truck, planes.
(b) used exclusively in public utility or industrial plant.
(c) industrial, commercial, or medical test equipment.
(d) appliances, e.g., microwave oven, dishwasher, clothes dryer
(e) Specialized medical digital devices
(f) Power consumption not exceeding 6 nW.
(h) battery powered and less than 1.705 MHz
Part 15 Rules

15.105 Information to the user.

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 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 to which the receiver is connected.
— Consult the dealer or an experienced radio/TV technician for help.
Part 15 Rules

Subpart B—Unintentional Radiators

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15.109 Radiated emission limits.

Conducted Emissions "QP" Limits

Conducted Emissions "Ave" Limits
### Part 15 Rules

#### Restricted Bands—No Fundamental and Spurious Emissions per 15.209

<table>
<thead>
<tr>
<th>MHz</th>
<th>MHz</th>
<th>MHz</th>
<th>GHz</th>
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<tbody>
<tr>
<td>0.090-0.110</td>
<td>16.42-16.423</td>
<td>399.9-410</td>
<td>4.5-5.15</td>
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<tr>
<td>0.495-0.505</td>
<td>16.69475-16.69525</td>
<td>608-614</td>
<td>5.35-5.46</td>
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<td>4.125-4.128</td>
<td>25.5-25.67</td>
<td>1300-1427</td>
<td>8.025-8.5</td>
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<tr>
<td>4.17725-4.17775</td>
<td>37.5-38.25</td>
<td>1435-1626.5</td>
<td>9.0-9.2</td>
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<tr>
<td>4.20725-4.20775</td>
<td>73-74.6</td>
<td>1645.5-1646.5</td>
<td>9.3-9.5</td>
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<td>6.215-6.218</td>
<td>74.8-75.2</td>
<td>1660-1710</td>
<td>10.6-12.7</td>
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<tr>
<td>6.26775-6.26825</td>
<td>108-121.94</td>
<td>1718.8-1722.2</td>
<td>13.25-13.4</td>
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<tr>
<td>8.291-8.294</td>
<td>149.9-150.05</td>
<td>2310-2390</td>
<td>15.35-16.2</td>
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<tr>
<td>8.362-8.366</td>
<td>156.52475-156.52525</td>
<td>2483.5-2500</td>
<td>17.7-21.4</td>
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<tr>
<td>8.37625-8.38675</td>
<td>156.7-156.9</td>
<td>2690-2900</td>
<td>22.01-23.12</td>
</tr>
<tr>
<td>8.41425-8.41475</td>
<td>162.0125-167.17</td>
<td>3260-3267</td>
<td>23.6-24.0</td>
</tr>
<tr>
<td>12.29-12.293</td>
<td>167.72-173.2</td>
<td>3332-3339</td>
<td>31.2-31.8</td>
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<tr>
<td>12.51975-12.52025</td>
<td>240-285</td>
<td>3345.8-3358</td>
<td>36.43-36.5</td>
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<td>12.57675-12.57725</td>
<td>322-335.4</td>
<td>3600-4400</td>
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<tr>
<td>13.36-13.41</td>
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<td></td>
</tr>
</tbody>
</table>
Part 15 Rules

Subpart C—Intentional Radiators

Single Modular (Any user, any host)
Limited Modular (Specific host)

1) Shielding
2) Buffered I/O
3) Regulated power
4) Antenna requirements
5) Tested stand alone
6) Labeled
7) Instructions
8) RF Exposure

15.212 Modular transmitters.
Radiated Emission Limits, Additional Provisions

15.215 Additional provisions to the general radiated emission limitations.
15.217 Operation in the band 160-190 kHz.
15.219 Operation in the band 510-1705 kHz.
15.221 Operation in the band 525-1705 kHz.
15.223 Operation in the band 1.705-10 MHz.
15.225 Operation within the band 13.110-14.010 MHz.
15.227 Operation within the band 26.96-27.28 MHz.
15.229 Operation within the band 40.66-40.70 MHz.
15.231 Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.
15.233 Operation within 43.71-44.49 MHz, 46.60-46.98 MHz, 48.75-49.51 MHz & 49.66-50.0 MHz.
15.235 Operation within the band 49.82-49.90 MHz.
15.237 Operation in the bands 72.0-73.0 MHz, 74.6-74.8 MHz and 75.2-76.0 MHz.
15.239 Operation in the band 88-108 MHz.
15.240 Operation in the band 433.5-434.5 MHz.
15.241 Operation in the band 174-216 MHz.
15.242 Operation in the bands 174-216 MHz and 470-668 MHz.
15.243 Operation in the band 890-940 MHz.
15.245 Operation 902-928 MHz, 2435-2465 MHz, 5785-5815 MHz, 10500-10550 MHz, and 24075-24175 MHz.
15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
15.249 Operation within 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz.
15.250 Operation of wideband systems within the band 5925-7250 MHz.
15.252 Operation of wideband vehicular radar systems within 16.2-17.7 GHz and 23.12-29.0 GHz.
15.253 Operation within the bands 46.7-46.9 GHz and 76.0-77.0 GHz.
15.255 Operation within the band 57-64 GHz.
15.256 Operation of level probing radars within 5.925-7.250 GHz, 24.05-29.00 GHz, and 75-85 GHz.
15.257 Operation within the band 92-95 GHz.
Radiated Emission Limits, Additional Provisions

15.231   Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.

15.247   Operation within 902-928MHz, 2400-2483.5MHz, and 5725-5850 MHz.
15.249   Operation within 902-928MHz, 2400-2483.5MHz, 5725-5875 MHZ, & 24.0-24.25GHz.
15.231 Remote Control Applications

Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.

Intermittent Control Signals 15.231(a)-(d)
- Control or command signals, alarm systems, door openers, remote switches.
- No voice, video, or RC toys. No data (unless sent with control signal)
- Transmission must cease within 5 seconds
- No regular predetermined transmissions (except safety system polling)
- Radio control purposes only during emergencies

Periodic Transmission 15.231(e)
- No restrictions on type of operation
- Transmission must cease within 1 second
- Silent period at least 30x transmission period or 10sec.

[Field Strength approx 2x greater for Intermittent Control Signals vs. Periodic Transmission]

15.231(c) emissions BW less than 0.25% of Center Frequency, (70-900MHz)
15.249 Narrowband Transmitters in ISM Bands

902-928MHz
2400-2483.5MHz
5725-5875MHz
24.0-24.25GHz

Fundamental Field Strength 50mV/m at 3meters

\[
\frac{PG}{4\pi D^2} \equiv \frac{E^2}{120\pi}
\]

\[P = 0.3E^2\]

P = EIRP (Watts)
E = V/m at 3meters

15.231(b) 12,500uV/m
15.231(e) 5,000uV/m
15.209 200uV/m

P = 0.75mV/m = +1.25dbm

No direct limitations on voice, data, or periodic/intermittent use

15.247 Wideband Transmitters in ISM Bands

902-928MHz
2400-2483.5MHz
5725-5875MHz

Up to 1Watt (30dBm) conducted
(4W EIRP, with antenna gain)

FHSS or Digital Modulation to spread energy

No direct limitations on voice, data, or periodic/intermittent use
15.249 Narrowband Transmitters in ISM Bands

- 902-928MHz
- 2400-2483.5MHz
- 5725-5875MHz
- 24.0-24.25GHz

- Fundamental Field Strength & Harmonics 15.249(a)
  - Measure Duty Cycle
  - Measure Fundamental & Harmonics with Peak Detector 15.249(e)
  - Report Average value using Peak + duty cycle
  - Band Edge Compliance 15.249(d)
- AC Mains Conducted Emissions 15.207
- Radiated Spurious Emissions 15.209
15.247  Wideband Transmitters in ISM Bands

902-928MHz
2400-2483.5MHz
5725-5875MHz

Frequency Hopping
Bluetooth (Basic Rate, EDR)

Digitally Modulated
802.11 WiFi
802.15.4 Zigbee,
Bluetooth (BLE)

20dB Channel Bandwidth
<500kHz 900MHz,
<1MHz 2.4/5GHz
Number of Hopping Channels
Channel separation
Time of Occupancy
Hop Randomness
Equal Use of Channels

Transmit power
Band edge compliance
Radiated Spurious Emissions
Conducted AC Mains Emissions

6dB Bandwidth >500kHz
Power Spectral Density 8dBm/3kHz
Transmit power
Band edge compliance
Radiated Spurious Emissions
Conducted AC Mains Emissions
Equipment Authorization

Initial Steps
1. FRN Number
2. Grantee Code
3. FCC ID

FCC Certification Process

Technical Evaluation
- Preparation, Testing, & Reports
- Technical Approval (impartial evaluator)

Administrative Evaluation
- Collect & Review Exhibits
- Administrative Approval (impartial evaluator)

Certification Approval (impartial evaluator)

Post exhibits to FCC Data Base

Issue Equipment Authorization Grant

Elite Electronic Engineering, Inc.
C Registration

You wish to conduct business with the FCC, you must first register through the FCC’s Commission REGistration System (CORES). Upon registration, you will be assigned a FCC Registration Number (FRN). This number will be used to uniquely identify you in all transactions with FCC.

You can register, update your registration, or search for public FRN information.

FRN Help Line: 877-480-3201 (Mon.-Fri. 8 a.m.-6 p.m. ET)

The FRN Help desk has a dedicated staff of customer service representatives standing by to answer your questions or concerns. You can also email the FRN Help desk with your questions and concerns.
Equipment Authorization System Grantee Registration

Upon completion of this filing, you will receive a five-character Grantee Code to be used when completing the FCC Form 731, Application for Equipment Authorization (there will be no digits zero and/or one in the Code). Please retain this Code for future reference. After successful completion of the Grantee Registration you will be presented with the Fee Remittance Advice, FCC Form 159. The Form 159 may be submitted electronically (at least 128-bit encryption is required) or in paper form, along with payment to: Federal Communications Commission, Equipment Approval Services, P. O. Box 358315, Pittsburgh, PA 15251-3150.

Grantee’s FCC Registration Number (FRN): *

Grantee’s Complete, Legal Business Name: *

Grantee’s Mailing Address (Either line one or P.O. Box is required):

Line 1: *

Line 2:

P.O. Box:

City: *

State:

Country: *

Zip/Postal Code:
Equipment Authorization

Certification

1. **FRN FCC Registration Number** (FCC.gov/CORES)
2. **Grantee Code**
3. **Exhibits**

- Application
- Agent & Anti-Drug Letter
- Confidentiality Agreement
- Certification Agreement (TCB)
- Description of Labels
- Schematic, Technical Description, Block Diagram
- Internal & External Photographs
- Operating & Users Manual
EXAMPLE OF FCC/IC CONFIDENTIALITY LETTER
(PLACE ON APPLICANT LETTERHEAD)

Date: 

Subject: Confidentiality Request for: (Insert FCC ID and/or IC ID)

Pursuant to FCC 47 CFR 0.457(d) and 0.459 and IC RSP-100, Section 10, the applicant requests that a part of the subject FCC application be held confidential.

Type of Confidentiality Requested

- Short Term
- Permanent
- Permanent*
- Temporary
- External Photos
- Internal Photos
- Parts List & Placement/BOM
- Operation Description/Theory of Operation
- System Design/Build
- Test Setup Procedure
- Schematics
- Test Setup Photos
- User’s Manual

*Note: (Insert Explanation as Necessary)

(Insert Company Name) has spent substantial effort in developing this product and it is one of the first of its kind in industry. Having the subject information easily available to “competition” would negate the advantage they have achieved by developing this product. Not protecting the details of the design will result in financial hardship.

Permanent Confidentiality:

DSC Part 15.231 Transmitter
DSR Part 15.231 Security Transmitter
DSS Part 15C Spread Spectrum Xmitter
DTS Part 15C Digital Transmission System

NOTE for Industry Canada Applications:

The applicant understands that until such time that IC distinguishes between Short Term and Permanent Confidentiality, either type of marked exhibit above will simply be marked Confidential when submitted to IC.

Sincerely,

By: ____________________________ (Signature/Title*)         ____________________________ (Print name)

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1. The asterisked items (*) require further justification before permanent confidentiality will be allowed. These are currently reviewed by the FCC under their Permit-List-Aka policy before the grant is issued and can delay completion of an application. Further justification should be added to the note above. One such example for a polled device would be: “The RUT is FULLY polled using a non-removable epoxy-based material. Removal of potting material causes irreparable damage to internal circuitry. See photographs exhibit that outline the device before and after potting.”

2. Must be signed by applicant contact given on the FCC ID or by the authorized agent if an appropriate authorized agent letter has been provided. Letters should be placed on appropriate letterhead.

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Elite Electronic Engineering, Inc.
1516 Centre Circle, Downers Grove, IL 60515
Ph: 630-465-5770 • Fax: 630-465-5786 • www.eliteelectronics.com
FCC Label

- “FCC ID” must precede number
- 6 point font or larger
- Must be permanent
- Identify attachment process
- Must be visible to customer at time of purchase
- Cannot be on a removable part
- Provide label exhibit
- Provide location on transmitter exhibit
Exhibits

Theory of Operation
Schematics
Parts List
Block Diagram
External Photos
Internal Photos
Operators Manual

TECHNICAL DESCRIPTION
(theory of operation)

Radio Characteristics
- Radio module name and type
- Output Power (conducted)
- Lowest/highest Frequency
- Number of Channels
- Channel Bandwidth
- Channel Spacing
- Transmitter duty cycle
- Actuation (manual/auto)
- Hop dwell time & Pseudo-Random table
- Modulation types
- Data rates
- Frequency deviation
- Grounding systems

Antenna System
- Antenna type
- Gain
- Connector type
- Mounting location from transmitter
- Antenna cable length and loss
- Spacing distance from operator

Receivers
- Receiver type, i.e super-het
- High/Low Freq
- Local Oscillator Frequency
- Sensitivity
- Number of Channels
Equipment Authorization

Final Steps
1. Submit all exhibits
2. Respond to findings
3. Receive Grant
4. Begin Marketing

FCC Certification Process

- Technical Evaluation
  - Preparation, Testing, & Reports
  - Technical Approval (impartial evaluator)
- Administrative Evaluation
  - Collect & Review Exhibits
  - Administrative Approval (impartial evaluator)

- Certification Approval (impartial evaluator)
- Post exhibits to FCC Data Base
- Issue Equipment Authorization Grant

Elite Electronic Engineering, Inc.
1 Changes to a certified device
   – New Certification
     • Change frequency, power, modulation schemes
   – Class II permissive change
     • Add an antenna type
     • Requires filing

   – Class 1 permissive change
     • Minor changes to non-transmitter parameters
     • Testing, but no filing.

2 Surveillance
Equipment Authorization Search

Application Information:

- **Grantee Code:**
- **Product Code:**
- **Applicant Name:**
- **Final Action Date Range (mm/dd/yyyy):**
- **Grant Comments:**
- **Application Purpose:**
- **Software Defined Radios:**
- **FCC Approved Applications Only:**
- **TCB Approved Applications Only:**
- **Composite Applications Only:**
- **Grant Note:**
- **Test Firm**
- **Application Status:**

Equipment Information:

- **Equipment Class:**
- **Frequency Range in MHz:**
- **Necessary Bandwidth:**
- **Emission Designator:**
- **Frequency Tolerance:**
- **Power Output (in Watts):**
GRANT OF EQUIPMENT AUTHORIZATION

Issued Under the Authority of the Federal Communications Commission

By:

Elite Electronic Engineering, Inc.
1516 Centre Circle
Downers Grove, IL 60515

Date of Grant: 01/15/2013

Motorola Solutions, Inc.
1301 East Algonquin Road
Schaumburg, IL 60196

Application Dated: 01/15/2013

Attention: Ken Weiss, Senior Staff Engineer

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: ABZ99FT7016
Name of Grantee: Motorola Solutions, Inc.
Equipment Class: Part 15 Spread Spectrum Transmitter
Notes: Part 15 Transmitter

<table>
<thead>
<tr>
<th>Grant Notes</th>
<th>FCC Rule Parts</th>
<th>Frequency Range (MHz)</th>
<th>Output Watts</th>
<th>Frequency Tolerance</th>
<th>Emission Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15C</td>
<td>2400.0 - 2483.5</td>
<td>0.001</td>
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</tbody>
</table>

Elite Electronic Engineering, Inc.
Office of Engineering and Technology Laboratory Division Knowledge Database (KDB)

Welcome to the OET Laboratory Division Knowledge Database (KDB). The FCC Office of Engineering and Technology (OET) publishes equipment authorization procedures and measurement guidance in the form of FCC Public Notices and Knowledge Database (KDB) publications. The staff guidance provided in the KDB is intended to assist the public in following Commission requirements and does not constitute rules. Accordingly, the guidance is not binding on the Commission and will not prevent the Commission from making a different decision in any matter that comes to its attention for resolution.

The Basic KDB Search is a full text search and the Advanced KDB Search allows for input of multiple search criteria. The KDB Publication Number search is a quick search for a specific publication. We hope that your visit is both timely and useful.

Publication Searches:

**Basic KDB Search**: Enter a text string in the field below. This search scans the Knowledge Database for any publications that include the text entered. Alternative search results can be obtained by using the syntax described by clicking here.

**Advanced KDB Search**: Search for publications that meet one or more identified criteria.

**Major Guidance Publications**: View publications associated with major guidance categories.

**KDB Publication Number Search**: Search for a specific publication by entering the publication number:

Didn’t find a conclusive answer? Submit an Inquiry

Recent KDB Publications:

<table>
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<tr>
<th>Publication Number</th>
<th>Question</th>
<th>Answer</th>
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<tr>
<td>628591</td>
<td>What equipment cannot be certified by a Telecommunications Certification Body?</td>
<td>The attached document 628591 D01 TCB Exclusion List v16 identifies equipment that are excluded from being certified by a TCB. At t the present time, the TCBs are allowed to certify the items previously included on the TCB Exclusion List under the Permit-B...</td>
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</table>
Every Product is Unique
- Conformity services are priced after review of product and requirements.

But.... Typical range of prices are

Digital Device per 15.107 & 15.109
- 1 day test and report $2,700

15.231(e) Remote Control Periodic Transmitter
- 1.5 days test and report $4,000
- TCB Certification $1,250, IC Certification $1,000

15.247 2.4GHz Frequency Hopping Spread Spectrum (BT)
- 3-4 day test and report $8,000
- TCB Certification $1,250, IC Certification $1,000

15.247 2.4GHz DTS (802.11b/g)
- 4-5 day test and report $9,000
- TCB Certification $1,250, IC Certification $1,000
A Word About Canada, Europe & Global

- Canada- requirements mirror FCC, but a separate declaration is required.

- Europe- Manufacturers self declaration, tests are different than FCC & Canada

Global- Every country has a spectrum management agency

...Not all countries accept foreign test reports
§15.201 Equipment authorization requirement.

(b) Except as otherwise exempted in paragraph (c) of this section and in §15.23 of this part, all intentional radiators operating under the provisions of this part shall be certificated by the Commission pursuant to the procedures in subpart J of part 2 of this chapter prior to marketing.

§15.3 Definitions (p) Kit.

Any number of electronic parts, usually provided with a schematic diagram or printed circuit board, which, when assembled in accordance with instructions, results in a device subject to the regulations in this part, even if additional parts of any type are required to complete assembly.

§15.23 Home-built devices.

(a) Equipment authorization is not required for devices that are not marketed, are not constructed from a kit, and are built in quantities of five or less for personal use.

(b) It is recognized that the individual builder of home-built equipment may not possess the means to perform the measurements for determining compliance with the regulations. In this case, the builder is expected to employ good engineering practices to meet the specified technical standards to the greatest extent practicable. The provisions of §15.5 apply to this equipment.
FCC Certification of Wireless Devices
Final Points & Questions

• Requirements may not always be clear
• Rules can seem complicated
• The first one is a pain, but they get easier each time

• Any Questions??