

**Information about the Applicant**

<b>Company Name</b>	The Watt Stopper, Inc.
<b>Address</b>	6120 Paseo Del Norte, Suite 1-2
<b>City, State, Zip</b>	Carlsbad, CA 92009
<b>Requested By</b>	Bertrand Debever
<b>Job Number</b>	WATT0014
<b>Model</b>	MRD2, MRD3, MRD4, MRD5, MRD6, MRD8 and MRD9
<b>FCC ID</b>	Q4B-TDWALL
<b>Agent</b>	The Watt Stopper, Inc., Bertrand Debever
<b>Approval Type</b>	Certification
<b>Equipment Type</b>	Low Power Unlicensed Transmitter
<b>Rule Part</b>	15.247

**Overview**

The equipment is the Watt Stopper MRD2, MRD3, MRD4, MRD5, MRD6, MRD8 and MRD9 Wireless Wall Product controllers operating in the 902-928 MHz band as a 15.247(f) hybrid system. All products use a fully integrated transceiver, the CC1000 from Chipcon, almost no external components are needed. These devices are seeking Limited Modular Approval, where the Grantee can demonstrate that it will retain control over the final installation of the device. Testing was conducted on two models that represent the two different enclosure configurations to demonstrate compliance. To demonstrate compliance with the conducted emissions requirements, the equipment was modified to accept an AC adapter to power the EUT. The AC adapter used to power the EUT during the tests was unmodified and commercially available.

**Recommendation**

All items have been resolved and completed to my satisfaction; therefore I recommend this application for approval.



Dean Ghizzone, President

September 8, 2003

Date

## Findings and Resolution

<b>Item</b>	The client cover letter specifically requests approval under FCC Part 15.249, yet all testing and applications reflect 15.247. Please provide the proper reference in the cover letter.
<b>Resolution</b>	The client has provided an updated letter with corrections.
<b>Item</b>	Only Front view photos were provided of the EUT exterior, please provide photos of the rear of the EUT exterior.
<b>Resolution</b>	The client has provided additional photographs.
<b>Item</b>	Internal photos have only been provided with one view. Please provide photos that show both sides of the PCB as well as both internal views of the enclosure.
<b>Resolution</b>	The client has provided additional photographs.
<b>Item</b>	<p>A hybrid system uses both digital modulation and frequency hopping techniques at the same time on the same carrier. This is similar to the combination DTS/FHSS system described above in the first example but the system is subject to slightly different standards. As indicated in Section 15.247(f), a hybrid system must comply with the power density standard of 8 dBm in any 3 kHz band when the frequency hopping function is turned off. The transmission also must comply with a 0.4 second/channel maximum dwell time when the hopping function is turned on. There is no requirement for this type of hybrid system to comply with the 500 kHz minimum bandwidth normally associated with a DTS transmission; and, there is no minimum number of hopping channels associated with this type of hybrid system. However, the hopping function must be a true hopping system, as described in Section 15.247(a)(1). The specific requirements in Section 15.247(a)(1) are: 1) A minimum channel separation. 2) Pseudorandom hop sequence. 3) Equal use of each frequency. 4) Receiver matching bandwidth and Synchronization. The additional requirements in Section 15.247 for a hybrid transmitter include the requirements the 1 watt output limit and RF safety requirements in Section 15.247(b) and the spurious emission limits of Section 15.247(c).</p> <p>Specifically, please describe how you meet the requirements of being a "true hopping system". Please describe how you meet the Pseudorandom hop sequence, Equal use of each frequency, and the receiver matching bandwidth and Synchronization.</p>
<b>Resolution</b>	The client has provided updated information supporting the requirements above. In addition, we requested and received confirmation from Joe Dichoso of the FCC confirming this equipment meets the requirements outlined above and in the requirements.
<b>Item</b>	As required by the Public Notice DA 00-1407, no letter demonstrating compliance with the itemized requirements was provided.
<b>Resolution</b>	The client has provided a letter.
<b>Item</b>	The FCC ID Labels need to be consistent with the requirements of limited modular approval.
<b>Resolution</b>	The client has provided new labels that are consistent with the label requirements of LMR.

## Opinion

Specification Requirements	Description
15.247(b)(5)	RF Exposure

**Opinion:** The Equipment meets the intent specified by the requirements listed above.

**Discussion:** The Applicant has submitted an RF Exposure exhibit demonstrating compliance.

**Reference:** RF Exposure Exhibit

Specification Requirements	Description
15.247(a)	Occupied Bandwidth

**Opinion:** The Equipment meets the intent specified by the requirements listed above.

**Discussion:** The Applicant has submitted test results in the form of a test report.

**Reference:** Technical Report

Specification Requirements	Description
15.247(b)(3)	Power Output

**Opinion:** The Equipment meets the intent specified by the requirements listed above.

**Discussion:** The Applicant has submitted test results in the form of a test report.

**Reference:** Technical Report

Specification Requirements	Description
15.247(c)	Spurious Emissions, Antenna Conducted

**Opinion:** The Equipment meets the intent specified by the requirements listed above.

**Discussion:** The Applicant has submitted test results in the form of a test report.

**Reference:** Technical Report

Specification Requirements	Description
15.247; 15.205; 15.209	Spurious Emissions, Radiated Emissions

**Opinion:** The Equipment meets the intent specified by the requirements listed above.

**Discussion:** The Applicant has submitted test results in the form of a test report.

**Reference:** Technical Report

Specification Requirements	Description
15.247(d)	Power Spectral Density

**Opinion:** The Equipment meets the intent specified by the requirements listed above.

**Discussion:** The Applicant has submitted test results in the form of a test report.

**Reference:** Technical Report

Specification Requirements	Description
15.207	Conducted Emissions

**Opinion:** The Equipment meets the intent specified by the requirements listed above.

**Discussion:** The Applicant has submitted test results in the form of a test report. Unless the transmitter module will be battery powered, it must comply with the AC line conducted requirements found in Section 15.207. To demonstrate compliance the equipment was modified to accept an AC adapter to power the EUT. The AC adapter used to power the EUT during the tests was unmodified and commercially available.

**Reference:** Technical Report

Specification Requirements	Description
15.247	Minimum Channel Separation

**Opinion:** The Equipment meets the intent specified by the requirements listed above.

**Discussion:** The operational description shows the equipment meets the requirements shown above.

**Reference:** Operational Description, Technical Report, and e-mail from Joe Dichoso

Specification Requirements	Description
15.247	Pseudorandom hop sequence

**Opinion:** The Equipment meets the intent specified by the requirements listed above.

**Discussion:** The operational description shows the equipment meets the requirements shown above.

**Reference:** Operational Description and e-mail from Joe Dichoso

Specification Requirements	Description
15.247	Equal use of each frequency

**Opinion:** The Equipment meets the intent specified by the requirements listed above.

**Discussion:** The operational description shows the equipment meets the requirements shown above.

**Reference:** Operational Description and e-mail from Joe Dichoso

Specification Requirements	Description
15.247	Band Edge Compliance

**Opinion:** The Equipment meets the intent specified by the requirements listed above.

**Discussion:** The Applicant has submitted test results in the form of a test report.

**Reference:** Technical Report

Specification Requirements	Description
15.247	The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals

**Opinion:** The Equipment meets the intent specified by the requirements listed above.

**Discussion:** The operational description shows the equipment meets the requirements shown above.

**Reference:** Operational Description and e-mail from Joe Dichoso