

Information about the Applicant

Company Name	The Watt Stopper, Inc.
Address	6120 Paseo Del Norte, Suite 1-2
City, State, Zip	Carlsbad, CA 92009
Requested By	Bertrand Debever
Job Number	WATT0013
Model	MRR2G
FCC ID	Q4B-TDREP
Agent	The Watt Stopper, Inc., Bertrand Debever
Approval Type	Certification
Equipment Type	Low Power Unlicensed Transmitter
Rule Part	15.247

Overview

The equipment is the Watt Stopper MRR2G Repeater 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. The approval for this type of device is being approved as outlined in the FCC Public Notice of May 16, 2002.

Recommendation

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



August 15, 2003

Dean Ghizzone, President

Date

Findings and Resolution

Item	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.
Resolution	The client has provided an updated letter with corrections.
Item	Only Front view photos were provided of the EUT exterior, please provide photos of the rear of the EUT exterior.
Resolution	The client has provided additional photographs.
Item	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.
Resolution	The client has provided additional photographs.
Item	<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>
Resolution	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.

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. Radiated emissions were used to demonstrate compliance with the requirement as specified in DA-00705.

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.

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