

APPLICANT Beyerdynamics 56 Central Avenue Farmingdale, NY 11735	MANUFACTURER Beyerdynamic GmbH & Co. TheresienstraBe 8 D-74072 Heilbronn, Germany
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TEST SPECIFICATION: FCC Rules and Regulations Part 15, Subpart C, Para. 15.231

TEST PROCEDURE: ANSI C63.4:1992

TEST SAMPLE DESCRIPTION

BRANDNAME: Beyerdynamics. MODEL: N/A

TYPE: Pulsed RF Transmitter

POWER REQUIREMENTS: 115 VAC, 60 Hz

FREQUENCY OF OPERATION: 433 MHz

TESTS PERFORMED

Para. 15.231(a), Radiated Emissions, Fundamental and Harmonics

Para. 15.231(c), Occupied Bandwidth

Duty Cycle Determination

REPORT OF MEASUREMENTS

Applicant: Beyerdynamics

Device: Pulsed RF Transmitter

FCC ID: OSDMCW-Control-1

Applicable Rule Section: Part 15, Subpart C, Section 15.231

REPORT OF MEASUREMENTS (continued)

TEST RESULTS

- 15.231 (a) - The device is used as a transmitter for security purposes.
- 15.231 (a)(1) & - The transmitter is automatically operated and ceases transmission within 5
15.231(2) seconds after activation.
- 15.231 (a)(3) - The transmitter does not perform periodic transmissions.
- 15.231 (a)(4)- Not applicable
- 15.231 (b) - The fundamental field strength did not exceed 11,000 $\mu\text{V/M}$ (Average) at a test distance of 3 meters. In addition, the requirements of section 15.35 for averaging pulsed emissions and for limiting peak emissions were met.
- The field strength of harmonic and spurious emissions did not exceed 1,100 $\mu\text{V/M}$ (AVERAGE).
- 15.231 (c) - The device operates at 433.92 MHz. The bandwidth of emissions did not exceed 0.25% of the operating frequency (1.08 MHz).

DETERMINATION OF FIELD STRENGTH LIMITS

The field strength limits shown below are found in Section 15.231.

Frequency		Limit	
F1	=	260	3750 = L1
Fo	=	433.92	Lo
F2	=	470	12500 = L2

The formula below was utilized to determine the limits:

$$\text{Limit} = L1 + [(Fo-F1)(L2-L1)/(F2-F1)]$$

Solving yields:

$$\text{Fundamental Limit} = 11,000 \mu\text{V/M (AVERAGE) @ 3 Meters}$$

$$\text{Harmonic Limit} = 1,100 \mu\text{V/M (AVERAGE) @ 3 Meters}$$

DETERMINATION OF DUTY CYCLE

Through analysis of timing diagrams supplied by Beyerdynamics, it was determined that the worst case duty cycle in any 100 msec period was 50%, yielding a duty cycle correction factor of -6.0 dB.

SPECTRUM ANALYZER DESENSITIZATION CONSIDERATIONS

Due to the nature of the emissions being measured, care was taken to ensure that the resolution bandwidth of the spectrum analyzer was adequate to provide accurate measurements. The following formula was utilized:

Setting pulse desensitization equal to zero and utilizing the minimum observed pulse width of 500 μ s yields a minimum required bandwidth of 1333 Hz. FCC specified bandwidths of 100kHz and 1MHz were utilized below and above 1GHz, respectively.

GENERAL NOTES

1. All readings were taken utilizing a peak detector function at a test distance of 3 meters.
2. The duty cycle was applied to the peak readings in order to determine the average value of the emissions.
3. The frequency range was scanned from 30 MHz to 3.1 GHz. All emissions not reported were more than 20 dB below the specified limit.

EQUIPMENT LIST

FCC 15.207 (a) Conducted Emissions 450 kHz to 30 MHz

EN	Type	Manufacturer	Frequency Range	Model No.	Cal Date	Due Date
078	LISN	Solar Electronics	10 kHz - 30 MHz	8028-50-TS24BNC	5/11/99	5/11/00
202	Transient Limiter	Hewlett Packard	.009 MHz - 200 MHz	11947A	7/19/99	7/19/00
513	LISN	Solar Electronics	10 kHz - 30 MHz	8028-50-TS24BNC	11/2/98	11/2/99
575	Graphics Plotter	Hewlett Packard	N/A	7470A	4/22/99	4/22/00
7016	EMC Analyzer	Hewlett Packard	9kHz - 1.8GHz	8591EM	5/13/99	5/13/00

FCC 15.231 (c) Occupied Bandwidth

EN	Type	Manufacturer	Frequency Range	Model No.	Cal Date	Due Date
575	Graphics Plotter	Hewlett Packard	N/A	7470A	4/22/99	4/22/00
7016	EMC Analyzer	Hewlett Packard	9kHz - 1.8GHz	8591EM	5/13/99	5/13/00

FCC 15.231(b)

RADIATED EMISSIONS, FUNDAMENTAL & SPURIOUS CASE

(Please see separate e-file attachment named 433.92MHz231.doc)

Test Report No. R-8170-2A
FCC ID:

FCC 15.231(c)

OCCUPIED BANDWIDTH

(Please see separate e-file attachment named Occbw.pdf)

CONDUCTED EMISSIONS

(Please see separate e-file attachment named CE data.pdf)