

Test Report

Client Information:

Applicant: Clarity'a Division of Plantronics.Inc.
Applicant add.: 4289 Bonny Oaks Drive106,Chattanooga,Tennessee 37406,USA

EUT Information:

EUT Name: Doorbell
Model No.: D100
Brand Name: N/A
FCC ID ACED100TXS
IC ID 1186C-D100TXS

Prepared By:

Asia Institute Technology (Dongguan) Limited
Add. : No.6 Binhe Road, Tianxin Village, Huangjiang,
Dongguan, Guangdong, China.

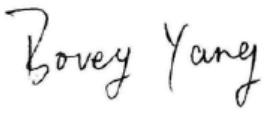
Date of Receipt: May 30, 2010 Date of Test: May 31. ~ Jun.16, 2010
Date of Issue: Jun.28, 2010 Test Result: **Pass**

Test procedure used: ANSI C63.4-2003,RSS-Gen Issue 2

This device described above has been tested by Asia Institute Technology (Dongguan) Limited, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

*This test report must not be used by the client to claim product endorsement by any agency of the U.S. government.

Reviewed by: 
Test director

Approved by: 
Technical director

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2 Test Summary

2.1 Compliance with FCC Part 15 subpart C/RSS-Gen/RSS-210

Test	RSS rule part	FCC rule part	Result
Conduction Emissions	RSS-gen 7.2.2	Section 15.207	N/A
Antenna Requirement	N/A	Section 15.203	PASS
Radiated Emissions	RSS-210 Table2/5	Section 15.231	PASS
Occupied Bandwidth	RSS-210A1.1.3	Section 15.231	PASS
Transmitter Timeout	RSS-210 A1.1.1	Section 15.231	PASS

2.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties. The following measurements uncertainty Level have estimated based on ANSI C63.4:2003, the maximum value of the uncertainty as below

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	Radiated Emission Test	±3.57dB

3 Test Facility

The test facility is recognized, certified or accredited by the following organizations:

.FCC- Registration No: 248337

The 3m Semi-Anechoic Chamber, 3m/10m Open Area Test Site and Shielding Room of Asia Institute Technology (Dong guan) Limited have been registered by Federal Communications Commission (FCC) on Dec.07, 2006.

.Industry Canada(IC)-Registration No: IC6819A-1 & IC6819A-2

The 3m Semi-Anechoic Chamber and 3m/10m Open Area Test Site of Asia Institute Technology (Dongguan) Limited have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing on Nov.07, 2006.

.VCCI- Registration No: R-2482 & C-2730

The 3m/10m Open Area Test Site and Shielding Room of Asia Institute Technology (Dongguan) Limited have been registered by Voluntary Control Council for Interference on Jan.24, 2007.

.TUV Rhineland

Asia Institute Technology (Dongguan) Limited has been assessed on Jan.16, 2007 that it can carry out EMC tests by order and under supervision of TUV Rhineland.

.ITS- Registration No: TMPSHA031

Asia Institute Technology (Dongguan) Limited has been assessed and included in Intertek Shanghai TMP Program regarding Laboratory facilities and test equipment on Nov.10, 2006.

3.1 Deviation from standard

None

3.2 Abnormalities from standard conditions

None

4 General Information

4.1 General Description of EUT

Manufacturer:	Clarity'a Division of Plantronics.Inc.
Manufacturer Address:	4289 Bonny Oaks Drive106,Chattanooga,Tennessee 37406,USA
EUT Name:	Doorbell
Model No:	D100
Operation frequency:	303.875MHz
Channel Number:	1
AntennaType:	Prined on PCB
Brand Name:	N/A
Serial No:	N/A
Power Supply Range:	DC 12V
Power Supply:	DC 12V
Power Cord:	N/A
Signal Cable:	N/A
Description of Channel:	
Channel No.	Frequency(MHz)
1	303.875

4.2 Description of Test conditions

(1) EUT was tested in normal configuration (Please See following Block diagram)

1. Block diagram of EUT configuration



(2) E.U.T. test conditions:

15.31(e) :For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

(3) Test frequencies:

According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

(4) Frequency range of radiated measurements:

According to the 15.33, The test range will be up to the tenth harmonic of the highest fundamental frequency

4.3 Peripheral List

No.	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1	N/A	N/A	N/A	N/A	N/A	N/A

5 Equipments List for All Test Items

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	ADVANTEST	R3182	150900201	2010.04.17	2011.04.16
2	EMI Measuring Receiver	Schaffner	SCR3501	235	2010.04.07	2011.04.06
3	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-27	1205323	2010.03.07	2010.09.06
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2010.04.08	2011.04.07
5	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2009.07.02	2010.07.01
6	Broadband Horn Antenna	SCHWARZBECK	BBHA9120A	451	2009.07.15	2010.07.14
7	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2010.03.07	2010.09.06
8	EMI Test Receiver	R&S	ESCI	100124	2009.12.28	2010.12.27
9	LISN	Kyoritsu	KNW-242	8-837-4	2010.04.07	2011.04.06
10	LISN	Kyoritsu	KNW-407	8-1789-3	2010.04.07	2011.04.06
11	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2010.03.07	2010.09.06

6 Test Result

6.1 Antenna Requirement

6.1.1 Standard requirement

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

6.1.2 EUT Antenna

The antenna is integrated on the main PCB and no consideration of replacement.

6.2 Conduction Emissions Measurement

6.2.1 limit

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

Note:Decreases with the logarithm of the frequency.

6.2.2 Test procedure

EUT was placed upon a wooden test table 0.8m above the horizontal metal reference plane and 0.4m from the vertical ground plane, and it was connected to an AMN. The closest distance between the boundary of the EUT and the surface of the AMN is 0.8m. All peripherals were connected to another AMN, and placed at a distance of 10cm from each other. A spectrum and receiver was connected to the RF output port of the AMN. Both average and quasi-peak value were detected.

6.2.3 Test result

Cause the EUT only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Measurements to demonstrate compliance with the conducted limits are not required for devices

6.3 Radiated Emissions Measurement

6.3.1 Limit

Fcc part15.231 (b) the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of fundamental (microvolts/meter)	Field Strength of Unwanted Emissions (microvolts/meter)
40.66 - 40.70	2250.00	225.00
70 - 130	1250.00	125.00
130 - 174	1,250 to 3,750 **	125 to 375 **
174 - 260	3750.00	375.00
260 - 470	3,750 to 12,500 **	375 to 1,250 **
Above 470	12500.00	1250.00

** linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = $56.81818(F) - 6136.3636$; for the band 260-470 MHz, uV/m at 3 meters = $41.6667(F) - 7083.3333$. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in 93 Section 15.209, whichever limit permits a higher field strength.

Frequency of Emission (MHz)	Field Strength		Measurement Distance (meters)
	μV/m	dBμV/m	
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

6.3.2 Test procedure

EUT was placed upon a wooden test table which was placed on the turn table 0.8m above the horizontal metal ground plane, and operating in the mode as mentioned above. A receiving antenna was placed 3m away from the EUT. During testing, turn around the turn table and move the antenna from 1m to 4m to find the maximum field-strength reading. All peripherals were placed at a distance of 10cm between each other. Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

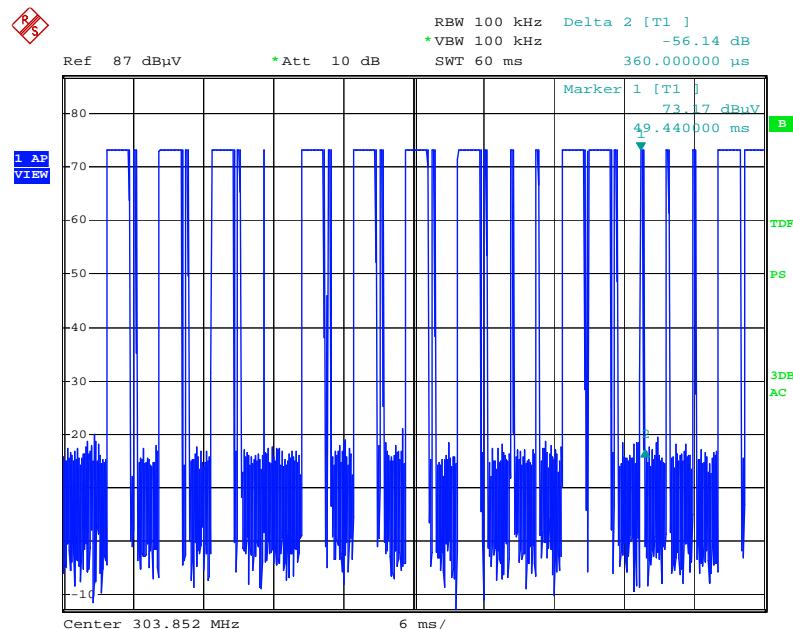
And according 15.35(a) On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified. The specifications for the measuring instrument using the CISPR quasi-peak detector can be found in Publication 16 of the International Special Committee on Radio Interference (CISPR) of the International Electrotechnical Commission. As an alternative to CISPR quasi-peak measurements, the responsible party, at its option, may demonstrate compliance with the emission limits using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, as long as the same bandwidths as indicated for CISPR quasi-peak measurements are employed.

Note: For pulse modulated devices with a pulse-repetition frequency of 20 Hz or less and for which CISPR quasi-peak measurements are specified, compliance with the regulations shall be demonstrated using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, using the same measurement bandwidths that are indicated for CISPR quasi-peak measurements.

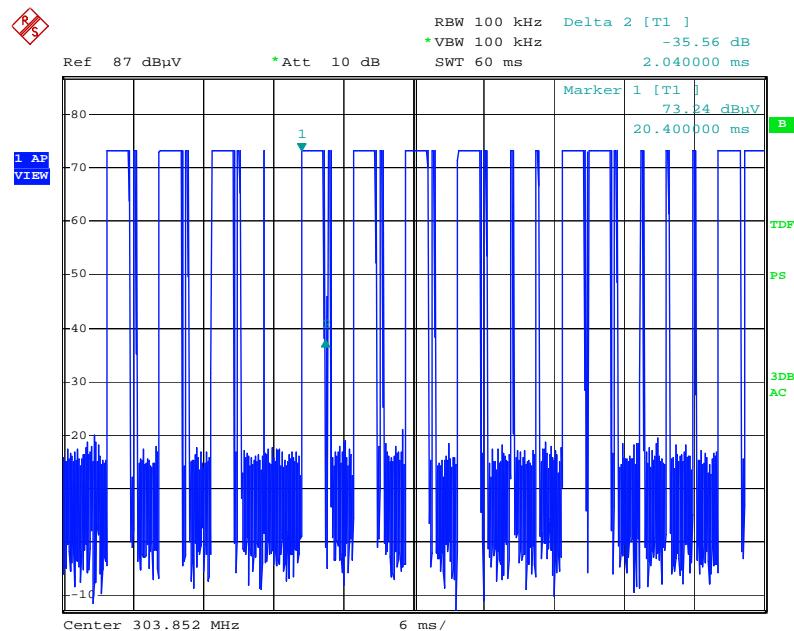
The Value of fundamental frequency is: Average = Peak value + 20log(Duty cycle), where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log(11 \cdot 2.04\text{ms} + 14 \cdot 0.36\text{ms} / 60\text{ms}) = -6.783\text{dB}$$

Please refer to below for more detail:



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6.3.3 Test Result

Test Data: 2010-6-15

Frequency Range: 30MHz to 1GHz

RBW/VBW: 100KHz/300KHz for spectrum, RBW=120KHz for receiver

Measurement Distance: 3 m

Operating Environment: 25.3°C, 58% RH, 102 Kpa

(a) Antenna polarization: Horizontal

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
303.875	17.200	45.872	63.072	-30.928	95.000	PEAK
303.875	-6.783	63.072	56.289	-18.711	75.000	AVERAGE
*446.130	21.140	20.629	41.769	-4.231	46.000	QUASIPEAK
607.150	24.880	25.617	50.497	-25.503	75.000	PEAK
607.750	-6.783	50.497	43.714	-11.286	55.000	AVERAGE
676.990	25.890	14.389	40.279	-5.721	46.000	QUASIPEAK
911.730	29.990	19.734	49.724	-26.276	75.000	PEAK
911.625	-6.783	49.724	42.941	-12.059	55.000	AVERAGE

(b) Antenna polarization: vertical

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
303.540	17.200	41.781	58.981	-37.019	95.000	PEAK
303.875	-6.783	58.981	52.198	-22.802	75.000	AVERAGE
375.320	19.170	11.249	30.419	-15.581	46.000	QUASIPEAK
*446.130	21.140	20.762	41.902	-4.098	46.000	QUASIPEAK
607.150	24.880	24.015	48.895	-26.105	75.000	PEAK
607.85	-6.783	48.895	42.112	-12.888	55.000	AVERAGE
678.930	25.930	13.620	39.550	-6.450	46.000	QUASIPEAK
910.760	29.970	20.099	50.069	-24.931	75.000	PEAK
911.625	-6.783	50.069	43.286	-11.714	55.000	AVERAGE

Note: '*' means the worst case

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss

Test Data: 2010-6-16

Frequency Range: 1GHz to 3GHz

RBW/VBW:1MHz/1MHz for Peak

Measurement Distance: 3 m

Operating Environment: 25.3°C, 58% RH, 102 Kpa

(a) Antenna polarization: Horizontal

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1214.000	29.321	18.790	48.112	-26.888	75.000	PEAK
1215.5	-6.783	48.112	41.329	-13.671	55.000	AVERAGE
1518.000	29.919	21.217	51.136	-23.864	75.000	PEAK
1519.375	-6.783	51.136	44.353	-10.647	55.000	AVERAGE
1822.000	31.165	16.628	47.793	-27.207	75.000	PEAK
1823.25	-6.783	47.793	41.010	-13.99	55.000	AVERAGE
2126.000	32.415	19.698	52.113	-22.887	75.000	PEAK
*2127.125	-6.783	52.113	45.330	-9.670	55.000	AVERAGE
2430.000	33.985	12.797	46.782	-28.218	75.000	PEAK
2431.000	-6.783	46.782	39.999	-15.001	55.000	AVERAGE

(b) Antenna polarization: vertical

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1214.000	29.321	18.892	48.214	-26.786	75.000	PEAK
*1215.500	-6.783	48.214	41.431	-14.208	55.000	AVERAGE
1518.000	29.919	12.654	42.573	-32.427	75.000	PEAK
1519.375	-6.783	42.573	35.790	-19.210	55.000	AVERAGE
2126.000	32.415	4.737	37.152	-37.848	75.000	PEAK
2127.125	-6.783	37.152	30.369	-24.631	55.000	AVERAGE
2430.000	33.985	13.250	47.235	-27.765	75.000	PEAK
2431.000	-6.783	47.235	40.452	-14.548	55.000	AVERAGE
2734.000	35.124	6.646	41.770	-33.230	75.000	PEAK
2734.875	-6.783	41.770	34.787	-20.013	55.000	AVERAGE

Note: '*' means the worst case

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss

6.4 Occupied Bandwidth

6.4.1 Limit

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

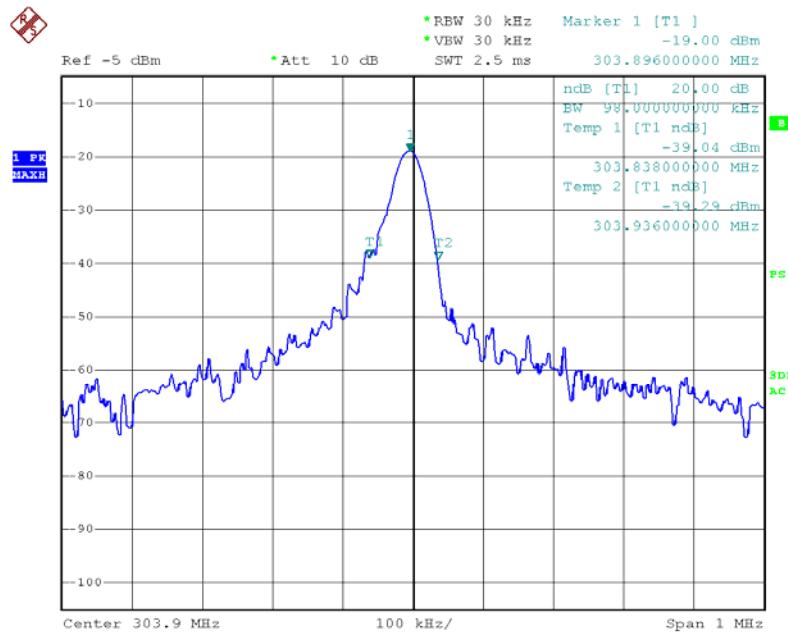
6.4.2 Test procedure:

- (1) Connected the antenna port to the Spectrum Analyzer , set the Spectrum Analyzer as RBW=30kHz,VBW \geq RBW,Sweep time=Auto, Detector Function=Peak
- (2) The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission.
- (3) The above procedure shall be repeated at the lowest, the middle, and the highest frequency of the stated frequency range with modulated mode. also shall be performed at different modes of operation

6.4.3 Test Result

channel	Channel frequency (MHz)	20dB bandwidth (KHz)	Limit (MHz)	Result
1	303.875	98	0.7597	Pass

Channel:303.875MHz



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Low Frenqucy is 303.838MHz High Frenqucy is 303.936 MHz
 The 20dB bandwidth is 98kHz

6.5 Transmitter Timeout

6.5.1 Requirements

The provisions of this Section are restricted to periodic operation within the band 40.66 - 40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this Section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:

Result: The signal of the EUT is remote data. The EUT meet the above requirement.

(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Result: The EUT has a manually activated transmitter, when press doorbell button, the home receiver will get this signal then ring, please refer to below detail data. I have press three times.

(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

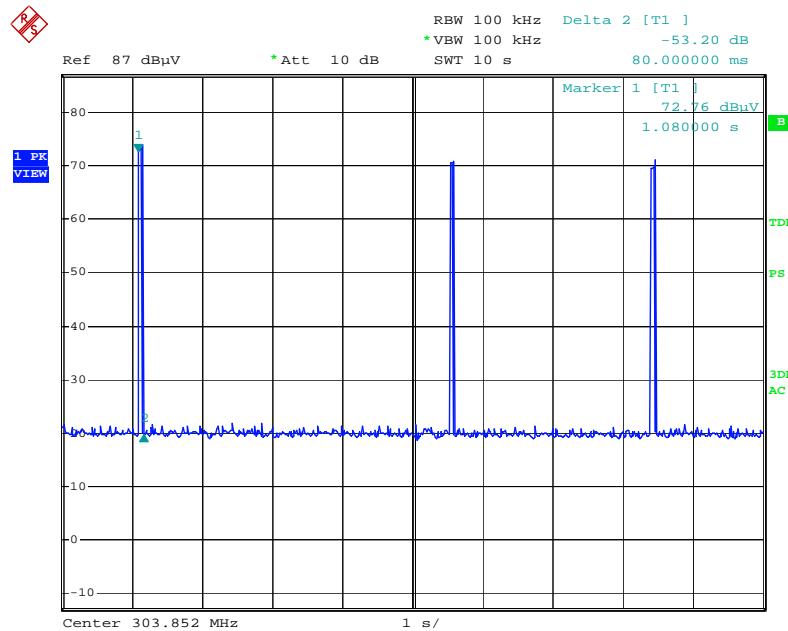
Result: The EUT does not have a automatically activated transmitter

(3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

Result: The EUT does not employ periodic transmission.

(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

Result: The section is not applicable to EUT.



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