

**DATE: 05 October 2010**

**I.T.L. (PRODUCT TESTING) LTD.**

**FCC Radio Test Report**


for

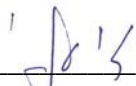
**ElmoTech Ltd.**

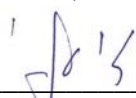
**Equipment under test:**

**Repeater**

**iDEU-830**

Written by:   
D. Shidlow, Documentation

Approved by: For/   
A. Sharabi, Test Engineer

Approved by:   
I. Raz, EMC Laboratory Manager

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This report relates only to items tested.



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# 1. General Information

## 1.1 Administrative Information

Manufacturer:	ElmoTech Ltd.
Manufacturer's Address:	P.O.B. 13236 2 Habarzel St., Tel-Aviv, 61132 Israel Tel: +972-3-767-1700 Fax: +972-3-767-1701
Manufacturer's Representative:	Shai Avigdori Arad Dudkevitz
Equipment Under Test (E.U.T):	Repeater
Equipment Model No.:	iDEU-830
Equipment Serial No.:	Not Designated
Date of Receipt of E.U.T:	24.08.10
Start of Test:	24.08.10
End of Test:	24.08.10
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 99780
Test Specifications:	FCC Part 15 Subpart C

## **1.2 List of Accreditations**

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), File No. IC 4025.
6. TUV Product Services, England, ASLLAS No. 97201.
7. Nemko (Norway), Authorization No. ELA 207.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

### **1.3 Product Description**

The iDEU-830 is a table-top mounted device for use in various offender presence monitoring applications.

The unit is primarily designed as a repeater to extend the range of bracelet transmitters attached to the ankle of the person monitored by the system.

Transmissions received by the iDEU-830 are forwarded to a home unit installed at the offender's home. Violations to the offender's curfew schedule generate events that are uploaded to the central monitoring station via various communication interfaces.

### **1.4 Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

### **1.5 Test Facility**

The radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing September 03, 2009).

I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

### **1.6 Measurement Uncertainty**

Conducted Emission

The uncertainty for this test is  $\pm 2$  dB.

Radiated Emission

The Open Site complies with the  $\pm 4$  dB Normalized Site Attenuation requirements of ANSI C63.4-2003. In accordance with Paragraph 5.4.6.1 of this standard, this tolerance includes instrumentation calibration errors, measurement technique errors, and errors due to site anomalies.

## 2. System Test Configuration

### 2.1 Justification

Radiated emission was performed in typical orientations. Since installation is only as desktop.

Unit operated with WMTD unit in typical way in order to determine average factor and timing tests.

### 2.2 Special Accessories

No special accessories were needed.

### 2.3 Equipment Modifications

No modifications were needed in order to achieve compliance

### 2.4 Configuration of Tested System

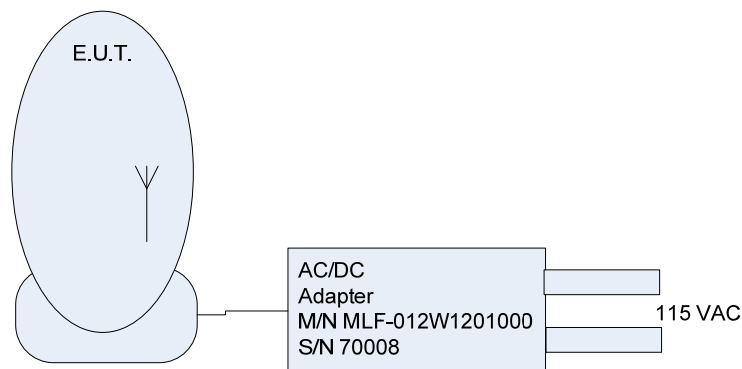


Figure 1. Configuration of Tested System

### 3. Conducted and Radiated Measurement Test Set-up Photo



Figure 2. Conducted Emission Test



Figure 3. Radiated Emission Test



## 4. Conducted Emission Data

### 4.1 Test Specification

F.C.C., Part 15, Subpart C

### 4.2 Test Procedure

The E.U.T operation mode and test set-up are as described in Section 3.1. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room, with the E.U.T placed on an 0.8 meter high wooden table, 0.4 meter from the room's vertical wall.

The E.U.T was powered from 115 V AC / 60 Hz via a 50 Ohm / 50  $\mu$ Hn Line Impedance Stabilization Network (LISN) on the phase and neutral lines. The LISN's were grounded to the shielded room ground plane (floor), and were kept at least 0.8 meters from the nearest boundary of the E.U.T

The center of the E.U.T AC cable was folded back and forth, in order to form a bundle less than 0.40 meters and a total cable length of 1 meter.

The emission voltages at the LISN's outputs were measured using a computerized receiver, complying with CISPR 16 requirements. The specification limits are loaded to the receiver via a 3.5" floppy disk and are displayed on the receiver's spectrum display.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, and using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

### 4.3 Measured Data

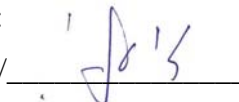
JUDGEMENT: Passed by 18.3 dB

The margin between the emission levels and the specification limit is, in the worst case, 18.3 dB for the phase line at 0.21 MHz and 19.7 dB at 0.18 MHz for the neutral line.

The EUT met the F.C.C. Part 15, Subpart C specification requirements.

The details of the highest emissions are given in *Figure 4* to *Figure 7*.

TEST PERSONNEL:

Tester Signature: For/  Date: 28.09.10

Typed/Printed Name: A. Sharabi

# Conducted Emission

E.U.T Description      Repeater  
 Type                      iDEU-830  
 Serial Number:         Not Designated

Specification:    F.C.C., Part 15, Subpart C  
 Lead:                Phase  
 Detectors:         Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuV)	QP (dBuV)	QP Delta L 1 (dB)	Avg (dBuV)	Av Delta L 2 (dB)	Corr (dB)
1	0.208853	46.4	45.0	-18.3	26.8	-26.5	0.0
2	0.549465	41.6	35.0	-21.0	18.7	-27.3	0.0
3	1.197260	31.5	25.1	-30.9	7.1	-38.9	0.0
4	3.308246	38.2	29.4	-26.6	16.2	-29.8	0.0
5	4.824437	30.0	24.9	-31.1	12.1	-33.9	0.0
6	7.104770	25.3	17.9	-42.1	5.2	-44.8	0.0

**Figure 4. Detectors: Peak, Quasi-peak, AVERAGE .**

*Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.*

# Conducted Emission

E.U.T Description Repeater  
 Type iDEU-830  
 Serial Number: Not Designated

Specification: F.C.C., Part 15, Subpart C  
 Lead: Phase  
 Detectors: Peak, Quasi-peak, Average



ACTV DET: PEAK  
 MEAS DET: PEAK QP AVG  
 MKR 170 kHz  
 46.23 dB $\mu$ V

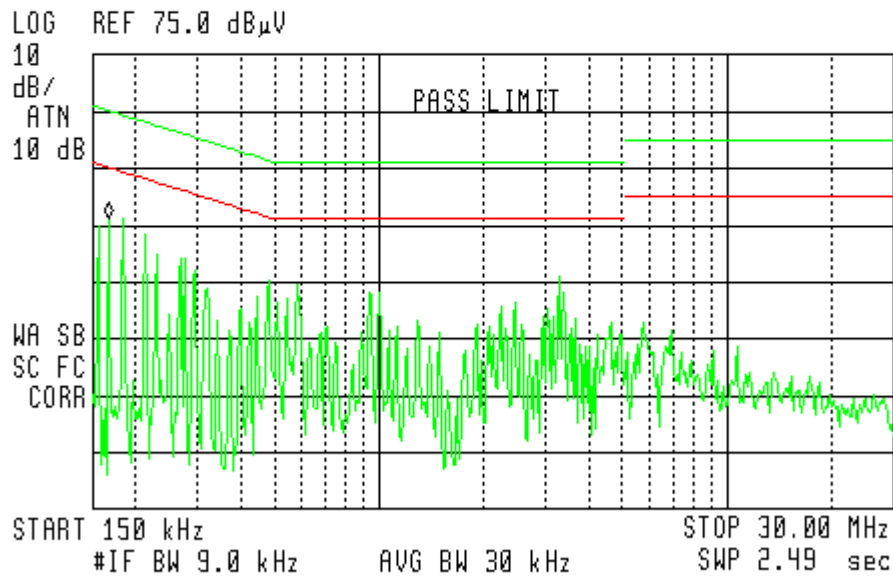


Figure 5. Detectors: Peak, Quasi-peak, Average

# Conducted Emission

E.U.T Description Repeater  
 Type iDEU-830  
 Serial Number: Not Designated

Specification: F.C.C., Part 15, Subpart C  
 Lead: Neutral  
 Detectors: Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuV)	QP (dBuV)	QP Delta L 1 (dB)	Avg (dBuV)	Av Delta L 2 (dB)	Corr (dB)
1	0.183002	46.1	44.7	-19.7	26.7	-27.7	0.0
2	0.491496	36.5	31.4	-24.8	15.3	-30.9	0.0
3	1.016258	26.4	22.5	-33.5	10.4	-35.5	0.0
4	2.182957	23.0	19.4	-36.6	5.9	-40.1	0.0
5	3.127244	28.3	24.5	-31.5	11.1	-34.9	0.0
6	5.828133	20.8	17.3	-42.7	5.7	-44.3	0.0

**Figure 6. Detectors: Peak, Quasi-peak, AVERAGE**

*Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.*

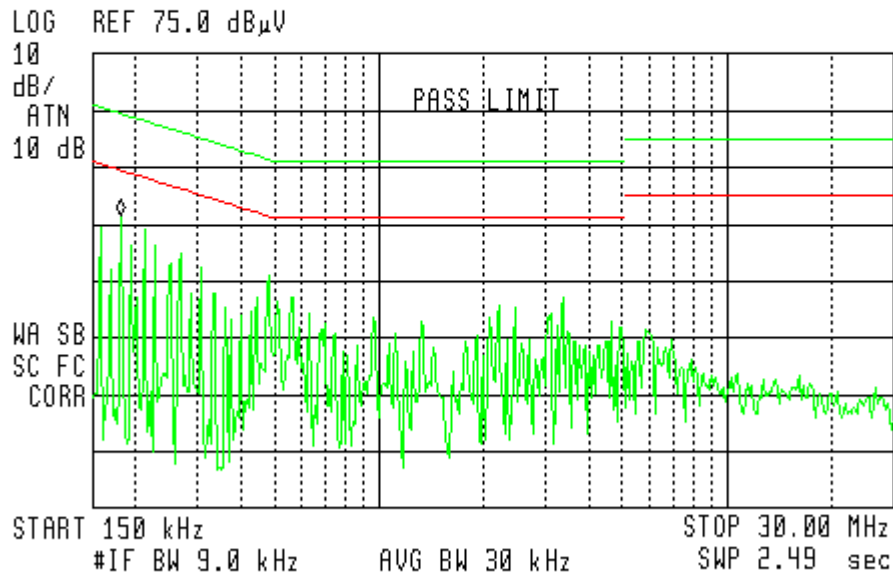
# Conducted Emission

E.U.T Description Repeater  
 Type iDEU-830  
 Serial Number: Not Designated

Specification: F.C.C., Part 15, Subpart C  
 Lead: Neutral  
 Detectors: Peak, Quasi-peak, Average



ACTV DET: PEAK  
 MEAS DET: PEAK QP AVG  
 MKR 100 kHz  
 46.30 dBμV



**Figure 7 Conducted Emission: NEUTRAL**  
**Detectors: Peak, Quasi-peak, Average**

#### 4.4 Test Instrumentation Used, Conducted Measurement

<b>Instrument</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Last Calibration Date</b>	<b>Period</b>
LISN	Fischer	FCC-LISN-2A	127	March 3, 2010	1 Year
LISN	Fischer	FCC-LISN-2A	128	March 3, 2010	1 Year
EMI Receiver	HP	85422E	3906A00276	November 10, 2009	1 Year
RF Filter Section	HP	85420E	3705A00248	November 10, 2009	1 Year
Printer	HP	LaserJet 2200	JPKG19982	N/A	N/A

## 5. Average Factor Calculation

1. Burst duration = 3.112msec
2. Time between bursts = 15sec >100ms
3. Average Factor =  $20 \log \left[ \frac{\text{Pulse duration}}{\text{Pulse period}} \times \frac{\text{burst duration}}{100\text{msec}} \times \text{Num of burst within 100msec} \right]$

Note Pulse duration and pulse period was considered worst case always ON cines unit transmits randomly.

$$\text{Average Factor} = 20 \log \left[ 1 \times \frac{3.112}{100} \times 1 \right] = -30\text{dB}$$

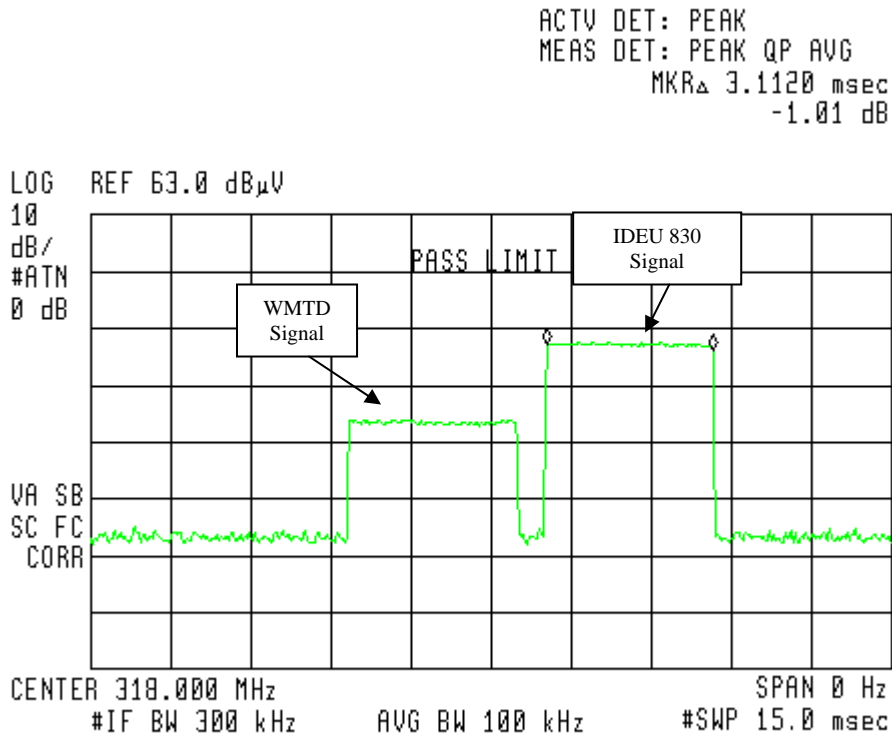


Figure 8. Burst Duration = 3.112msec



ACTV DET: PEAK  
 MEAS DET: PEAK QP AVG  
 MKR 3.9377 sec  
 48.46 dB $\mu$ V

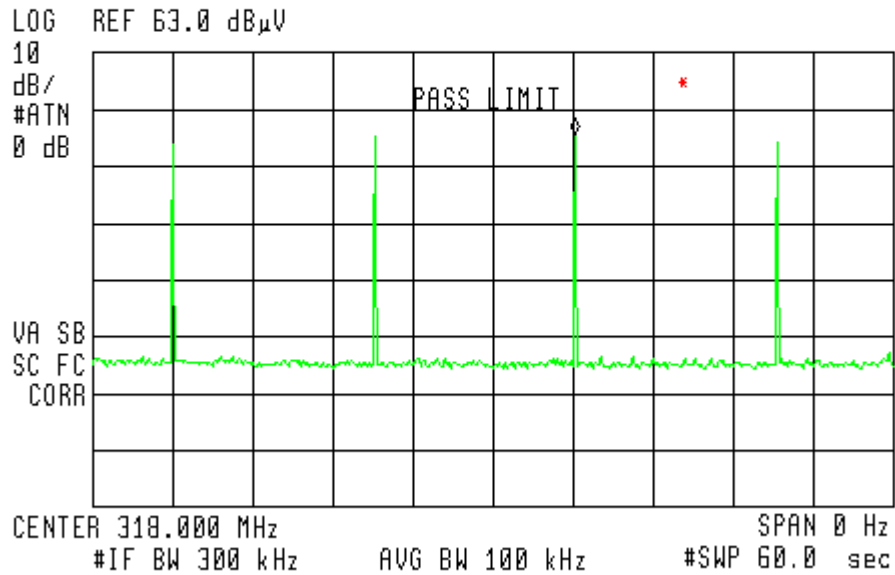


Figure 9. Time Between Bursts (Worst Case) = 15sec >100ms



### 5.1 Test Instrumentation Used

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 10, 2009	EMI Receiver
RF Section	HP	85420E	3705A00248	November 10, 2009	RF Section
Antenna Bioconical	ARA	BCD 235/B	1041	August 1, 2010	Antenna Bioconical
Antenna Log Periodic	ARA	LPD-2010/A	1038	March 24, 2010	Antenna Log Periodic
Antenna-Log Periodic	A.H.System	SAS-200/511	253	January 29, 2009	Antenna-Log Periodic
Antenna Mast	ARA	AAM-4A	1001	N/A	Antenna Mast
Turntable	ARA	ART-1001/4	1001	N/A	Turntable



## Periodic Operation

E.U.T Description Repeater  
 Type iDEU-830  
 Serial Number: Not Designated

Specification: F.C.C., Part 15, Subpart C, 15.231(a)

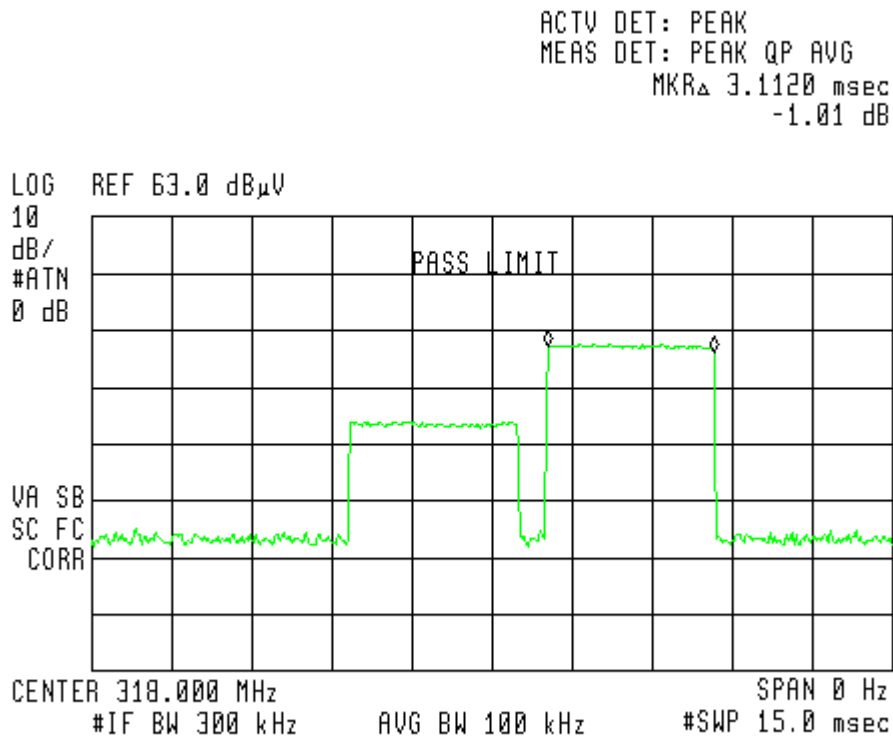


Figure 10. Supervision Signal Once Every 15sec (3.112msec Single Burst)

# Periodic Operation

E.U.T Description Repeater  
 Type iDEU-830  
 Serial Number: Not Designated

Specification: F.C.C., Part 15, Subpart C, 15.231(a)



ACTV DET: PEAK  
 MEAS DET: PEAK QP AVG  
 MKR 3.9377 sec  
 48.46 dB $\mu$ V

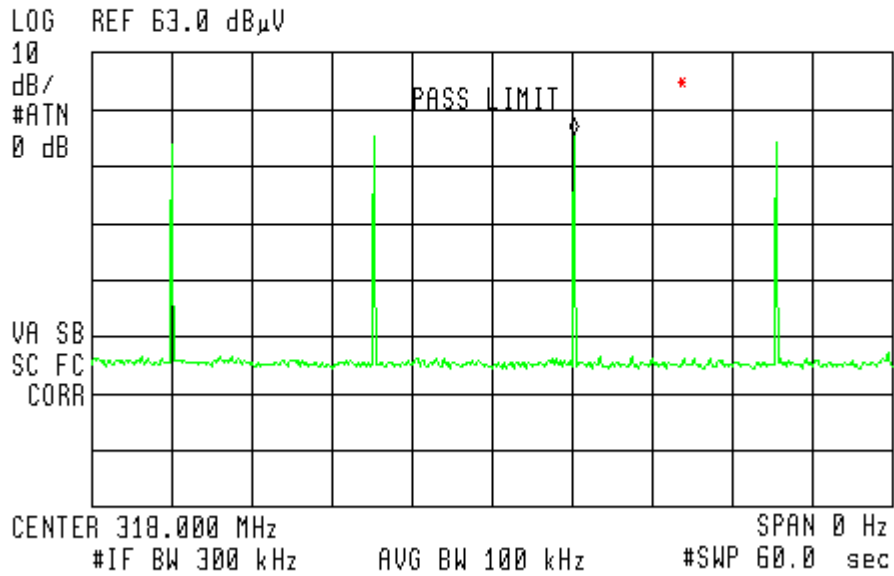


Figure 11. Supervision Signal Once Every 15sec (3.112msec Single Burst)



## Field Strength of Fundamental

E.U.T Description    Repeater  
 Type                    iDEU-830  
 Serial Number:        Not Designated

Specification: F.C.C., Part 15, Subpart C, 15.231(b)

Antenna Polarization: Horizontal/Vertical

Test Distance: 3 meters

Detector: Peak

<b>Freq.</b> (MHz)	<b>Pol.</b> V/H	<b>Peak Reading</b> (dBμV/m)	<b>Average Factor</b> (dB)	<b>AVG Result</b> (dBμV/m)	<b>AVG Specification</b> (dBμV/m)	<b>Margin</b> (dB)
318.0	H	89.2	-30.0	59.2	75.8	-16.6
318.0	V	86.6	-30.0	56.6	75.8	-19.2

**Figure 12. Field Strength of Fundamental. Antenna Polarization: HORIZONTAL/VERTICAL. Detector: Peak**

Notes:

1. Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.
2. “Peak Reading.” (dBμV/m) included the “Correction Factors”.
3. “Correction Factors” (dB) = Test Antenna Correction Factor(dB) + Cable Loss.
4. “Average Result” (dBμV/m) = Peak Reading (dBμV/m) + Average Factor (dB)

# Field Strength of Fundamental

E.U.T Description Repeater  
 Type iDEU-830  
 Serial Number: Not Designated

Specification: F.C.C., Part 15, Subpart C, 15.231(b)

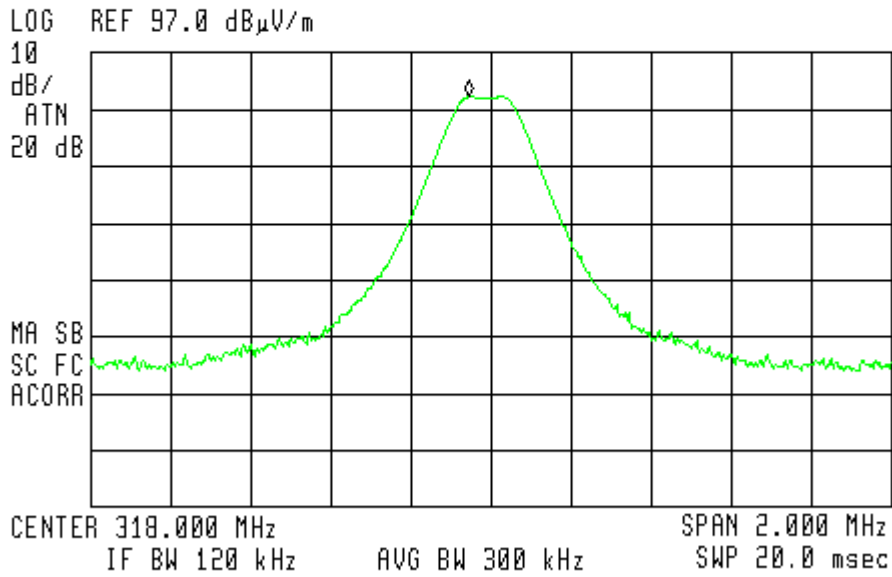
Antenna Polarization: Horizontal

Test Distance: 3 meters

Detector: Peak



ACTV DET: PEAK  
 MEAS DET: PEAK QP AVG  
 MKR 317.945 MHz  
 89.23 dB $\mu$ V/m



**Figure 13. Field Strength of Fundamental. Antenna Polarization: HORIZONTAL. Detector: Peak**

# Field Strength of Fundamental

E.U.T Description Repeater  
 Type iDEU-830  
 Serial Number: Not Designated

Specification: F.C.C., Part 15, Subpart C, 15.231(b)

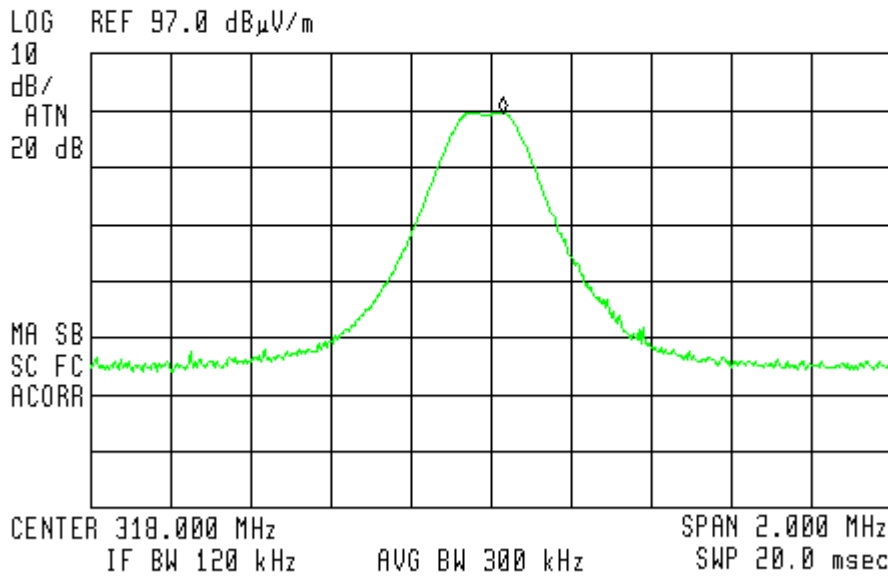
Antenna Polarization: Vertical

Test Distance: 3 meters

Detector: Peak



ACTV DET: PEAK  
 MEAS DET: PEAK QP AVG  
 MKR 318.030 MHz  
 86.60 dB $\mu$ V/m



**Figure 14. Field Strength of Fundamental. Antenna Polarization: VERTICAL. Detector: Peak**



#### 7.4 Test Instrumentation Used, Field Strength of Fundamental

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 10, 2009	1 year
RF Section	HP	85420E	3705A00248	November 10, 2009	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	March 24, 2010	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKG19982	N/A	N/A

## 8. Radiated Emission, 9 kHz – 30 MHz

### 8.1 Test Specification

9 kHz-30 MHz, FCC, Part 15, Subpart C, Section 209

### 8.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 2.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 1.

The frequency range 9 kHz-30 MHz was scanned.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 9 kHz-30MHz, the loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter at a distance of 3 meters.

The E.U.T. was operated at the frequency of kHz. This frequency was measured using a peak detector.

### 8.3 Measured Data

JUDGEMENT: Passed

The EUT was tested and it met the requirements of the FCC Part 15, Subpart C, specification.

No signals were detected in the frequency range of 9 kHz – 30 MHz.

TEST PERSONNEL:

Tester Signature: For/ 

Date: 28.09.10

Typed/Printed Name: A. Sharabi

#### 8.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 10, 2009	1 year
RF Section	HP	85420E	3705A00248	November 10, 2009	1 year
Active Loop Antenna	EMCO	6502	9506-2950	October 19, 2009	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A

#### 8.5 Field Strength Calculation

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$FS = RA + AF + CF$$

- FS: Field Strength [dB $\mu$ v/m]
- RA: Receiver Amplitude [dB $\mu$ v]
- AF: Receiving Antenna Correction Factor [dB/m]
- CF: Cable Attenuation Factor [dB]

No external pre-amplifiers are used.

## 9. Spurious Radiated Emission, 30 – 4330 MHz

### 9.1 Test Specification

30 - 4330 MHz, F.C.C., Part 15, Subpart C

### 9.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 2. See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 1. The signals from the list of the highest emissions were verified and the list was updated accordingly.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 2.9 –4.33 GHz, a spectrum analyzer including a low noise amplifier was used. During peak measurements, the I.F. bandwidth was 1 MHz, and video bandwidth 3 MHz. During average measurements, the I.F. bandwidth was 1 MHz and video bandwidth was 100 Hz.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization. Verification of the E.U.T emissions was based on the following methods: turning the E.U.T on and off; using a frequency span less than 10 MHz; observation of the signal level during turntable rotation. (Background noise is not affected by the rotation of the E.U.T.)

The emissions were measured at a distance of 3 meters.



# Radiated Emission

E.U.T Description Repeater  
 Type iDEU-830  
 Serial Number: Not Designated

Specification: FCC Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 30 MHz to 4330 MHz  
 Antenna: 3 meters distance Detector: Peak

Frequency (MHz)	Peak Reading (dBμV/m)	Average Factor (dB)	Average Result (dBμV/m)	Antenna Polarity (H/V)	Average Specification (dBμV/m)	Margin (dB)
636.03	38.07	-30.0	8.07	V	55.8	-47.73
954.03	49.57	-30.0	19.57	V	55.8	-36.23
1272.03	44.97	-30.0	14.97	V	55.8	-40.83

**Figure 15. Radiated Emission. Antenna Polarization: VERTICAL.  
 Detectors: Peak, Quasi-peak**

Notes:

1. Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.
2. “Peak Reading.” (dBμV/m) included the “Correction Factors”.
3. “Correction Factors” (dB) = Test Antenna Correction Factor(dB) + Cable Loss.
4. “Average Result” (dBμV/m)=Peak Reading (dBμV/m) + Average Factor (dB)

#### 9.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 10, 2009	1 year
RF Section	HP	85420E	3705A00248	November 10, 2009	1 year
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	January 13, 2010	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	March 14, 2010	1 Year
Antenna Bioconical	ARA	BCD 235/B	1041	August 1, 2010	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	March 24, 2010	1 year
Antenna-Log Periodic	A.H.System	SAS-200/511	253	January 29, 2009	2 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKG19982	N/A	N/A

# 10. Bandwidth

## 10.1 Test procedure

The transmitter unit operated with normal modulation. The spectrum analyzer was set to 120 kHz resolution BW and center frequency of the transmitter fundamental. The spectrum bandwidth of the transmitter unit was measured and recorded. The BW was measured at 20Bc points.

The EUT was set up as shown in Figure 1, and its proper operation was checked. The transmitter occupied bandwidth was measured with the EMI receiver as frequency delta between reference points on the modulation envelope.

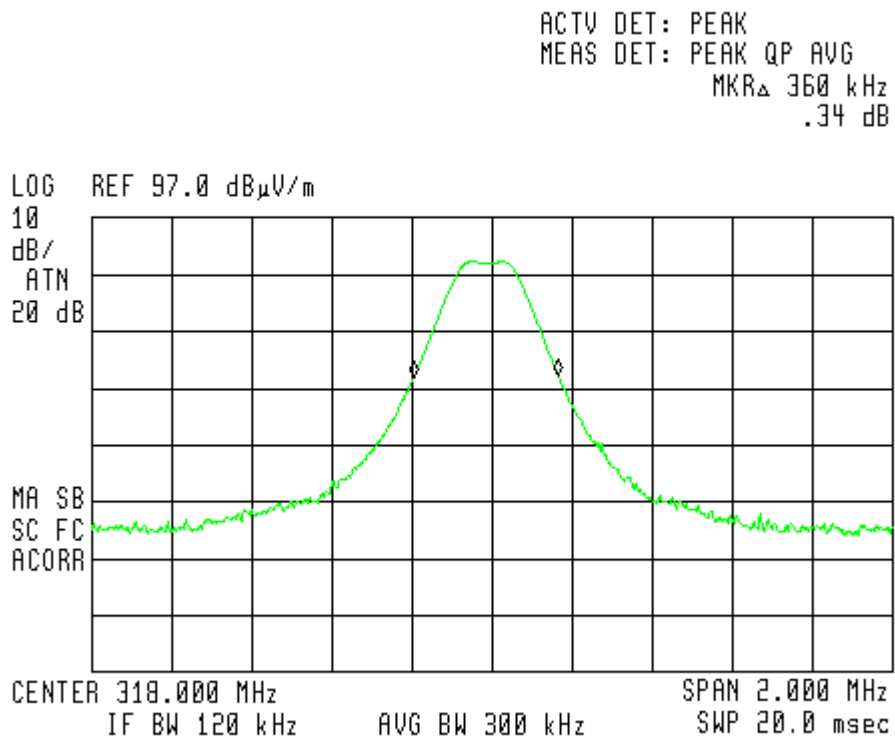


Figure 16



**10.2 Results table**

E.U.T Description: Repeater  
 Model: iDEU-830  
 Serial Number: Not Designated  
 Specification: F.C.C. Part 15, Subpart C: (15.231(c))

Bandwidth Reading	Specification (kHz)	Margin (kHz)
360.0	795.0	-435.0

**Figure 17 Bandwidth**

JUDGEMENT: Passed by 435.0 kHz

TEST PERSONNEL:

Tester Signature: For/ 

Date: 28.09.10

Typed/Printed Name: A. Sharabi

(1) 0.25% of the E.U.T. fundamental frequency, Section 15.231(c).

### 10.3 Test Equipment Used.

Bandwidth

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 10, 2009	1 year
RF Section	HP	85420E	3705A00248	November 10, 2009	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	March 24, 2010	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKG19982	N/A	N/A

**Figure 18 Test Equipment Used**

# 11. 11. APPENDIX A - CORRECTION FACTORS

**11.1 Correction factors for CABLE from EMI receiver to test antenna at 3 meter range.**

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3	1200.0	7.3
20.0	0.6	1400.0	7.8
30.0	0.8	1600.0	8.4
40.0	0.9	1800.0	9.1
50.0	1.1	2000.0	9.9
60.0	1.2	2300.0	11.2
70.0	1.3	2600.0	12.2
80.0	1.4	2900.0	13.0
90.0	1.6		
100.0	1.7		
150.0	2.0		
200.0	2.3		
250.0	2.7		
300.0	3.1		
350.0	3.4		
400.0	3.7		
450.0	4.0		
500.0	4.3		
600.0	4.7		
700.0	5.3		
800.0	5.9		
900.0	6.3		
1000.0	6.7		

**NOTES:**

1. The cable type is RG-214.
2. The overall length of the cable is 27 meters.
3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".

**11.2 Correction factors for CABLE**  
**from EMI receiver**  
**to test antenna**  
**at 3 meter range.**

FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.2
2.0	1.6
3.0	2.0
4.0	2.4
5.0	3.0
6.0	3.4
7.0	3.8
8.0	4.2
9.0	4.6
10.0	5.0
12.0	5.8

*NOTES:*

- 1. The cable type is RG-8.*
- 2. The overall length of the cable is 10 meters.*

**11.3 Correction factors for CABLE**  
**from spectrum analyzer**  
**to test antenna above 2.9 GHz**

FREQUENCY (GHz)	CORRECTION FACTOR (dB)	FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.9	14.0	9.1
2.0	2.7	15.0	9.5
3.0	3.5	16.0	9.9
4.0	4.2	17.0	10.2
5.0	4.9	18.0	10.4
6.0	5.5	19.0	10.7
7.0	6.0	20.0	10.9
8.0	6.5	21.0	11.2
9.0	7.0	22.0	11.6
10.0	7.5	23.0	11.9
11.0	7.9	24.0	12.3
12.0	8.3	25.0	12.6
13.0	8.7	26.0	13.0

*NOTES:*

- 1. The cable type is SUCOFLEX 104 E manufactured by SUHNER.*
- 2. The cable is used for measurements above 2.9 GHz.*
- 3. The overall length of the cable is 10 meters.*

#### 11.4 Correction factors for LOG PERIODIC ANTENNA

#### Type LPD 2010/A at 3 and 10 meter ranges.

##### Distance of 3 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.1
250.0	10.2
300.0	12.5
400.0	15.4
500.0	16.1
600.0	19.2
700.0	19.4
800.0	19.9
900.0	21.2
1000.0	23.5

##### Distance of 10 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.0
250.0	10.1
300.0	11.8
400.0	15.3
500.0	15.6
600.0	18.7
700.0	19.1
800.0	20.2
900.0	21.1
1000.0	23.2

**NOTES:**

1. Antenna serial number is 1038.
2. The above lists are located in file number 38M30.ANT for a 3 meter range, and file number 38M100.ANT for a 10 meter range.
3. The files mentioned above are located on the disk marked "Radiated Emission Test EMI Receiver".

**11.5 Correction factors for**

**LOG PERIODIC ANTENNA**

**Type SAS-200/511  
at 3 meter range.**

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
1.0	24.9
1.5	27.8
2.0	29.9
2.5	31.2
3.0	32.8
3.5	33.6
4.0	34.3
4.5	35.2
5.0	36.2
5.5	36.7
6.0	37.2
6.5	38.1

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
7.0	38.6
7.5	39.2
8.0	39.9
8.5	40.4
9.0	40.8
9.5	41.1
10.0	41.7
10.5	42.4
11.0	42.5
11.5	43.1
12.0	43.4
12.5	44.4
13.0	44.6

**NOTES:**

1. Antenna serial number is 253.
2. The above lists are located in file number SAS3M0.ANT for a 3 meter range.
3. The files mentioned above are located on the disk marked "Antenna Factors".

**11.6 Correction factors for BICONICAL ANTENNA  
Type BCD-235/B,  
at 3 meter range**

<b>FREQUENCY (MHz)</b>	<b>AFE (dB/m)</b>
20.0	19.4
30.0	14.8
40.0	11.9
50.0	10.2
60.0	9.1
70.0	8.5
80.0	8.9
90.0	9.6
100.0	10.3
110.0	11.0
120.0	11.5
130.0	11.7
140.0	12.1
150.0	12.6
160.0	12.8
170.0	13.0
180.0	13.5
190.0	14.0
200.0	14.8
210.0	15.3
220.0	15.8
230.0	16.2
240.0	16.6
250.0	17.6
260.0	18.2
270.0	18.4
280.0	18.7
290.0	19.2
300.0	19.9
310	20.7
320	21.9
330	23.4
340	25.1
350	27.0

**NOTES:**

1. Antenna serial number is 1041.
2. The above list is located in file 19BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".



**11.7 Correction factors for ACTIVE LOOP ANTENNA**  
**Model 6502**  
**S/N 9506-2950**

<b>FREQUENCY</b> (MHz)	<b>Magnetic Antenna Factor</b> (dB)	<b>Electric Antenna Factor</b> (dB)
.009	-35.1	16.4
.010	-35.7	15.8
.020	-38.5	13.0
.050	-39.6	11.9
.075	-39.8	11.8
.100	-40.0	11.6
.150	-40.0	11.5
.250	-40.0	11.6
.500	-40.0	11.5
.750	-40.1	11.5
1.000	-39.9	11.7
2.000	-39.5	12.0
3.000	-39.4	12.1
4.000	-39.7	11.9
5.000	-39.7	11.8
10.000	40.2	11.3
15.000	-40.7	10.8
20.000	-40.5	11.0
25.000	-41.3	10.2
30.000	42.3	9.2