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FCC TEST REPORT

Report No: STS1503015F03

Issued for

Eclipse Software Systems, LLC

8201 W 20th Street – Greeley, CO 80634

Product Name:	RapidLog ELD 200
Brand Name:	RapidLog
Model No.:	200
Series Model:	N/A
FCC ID:	2ADUX-ELD200
Test Standard:	FCC Part 15.247

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Shenzhen STS Test Services Co., Ltd.

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TEST RESULT CERTIFICATION

Applicant's name: Eclipse Software Systems, LLC
Address: 8201 W 20th Street – Greeley, CO 80634
Manufacture's Name: Shenzhen Unistrong Science & Technology Co., Ltd.
Address: No.4, Zhengcheng 2nd Rd., Xintian Village, Fuyong Town, Bao'an District, Shenzhen, China

Product description

Product name: RapidLog ELD 200
Model and/or type reference ..: 200
Serial Model: N/A
Standards: FCC Part 15.247

Test procedure: ANSI C63.4-2009

This device described above has been tested by STS, 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.

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Date of Test:
Date (s) of performance of tests: 01 Mar. 2015 ~15 July 2015
Date of Issue: 16 July 2015
Test Result: **Pass**

Testing Engineer :

(Jin Ming)

Report writing :

(Sunny zheng)

Authorized Signatory :

(Bovey Yang)





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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C		
FCC RULES	Test Item	Judgment
15.207	Conducted Emission	PASS
15.247 (a)(2)	6dB Bandwidth	PASS
15.247 (b) (reference KDB 558074 d05 v02. /9.1.2)	Peak Output Power	PASS
15.247 (c)	Radiated Spurious Emission	PASS
15.247 (d)	Conducted Spurious Emission	PASS
15.247 (e)	Power Spectral Density	PASS
15.205	Band Edge Emission	PASS
15.203	Antenna Requirement	PASS

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

Shenzhen STS Test Services Co., Ltd.

Add. : 1/F, Building 2, Zhuoke Science Park, Chongqing Road, Fuyong, Baoan District, Shenzhen, China.

FCC Registration No.: 842334

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	RapidLog ELD 200	
Trade Name	RapidLog	
Model Name	200	
Serial Model	N/A	
Model Difference	N/A	
Product Description	The EUT is a RapidLog ELD 200	
	Operation Frequency:	802.11b/g 20: 2412~2462 MHz
	Modulation Type:	CCK/OFDM/DBPSK/DAPSK
	Bit Rate of Transmitter	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps
	Number Of Channel	802.11b/g: 11CH
	Antenna Designation:	Please see Note 3.
	Antenna Gain (dBi)	0 dBi
Channel List	Please refer to the Note 2.	
Ratings	DC 12V from power supply	
Hardware version number	E9616_V1.3	
Software versioning number	V2.8	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.

Channel List for 802.11b/g(20MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		



3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	PIFA Antenna	NA	0	N/A





2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	Link Mode

For Conducted Emission	
Final Test Mode	Description
Mode 3	Link Mode

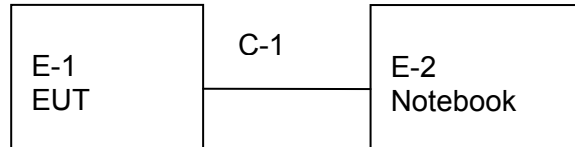
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	Link Mode

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported



2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TEST



2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	RapidLog ELD 200	RapidLog	200	N/A	EUT
E-2	Notebook	Lenovo	B460	WB03928113	accessories

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.5m	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Spectrum Analyzer	Agilent	E4407B	MY50140340	2014.10.25	2015.10.24
Test Receiver	R&S	ESCI	101427	2014.10.25	2015.10.24
Bilog Antenna	TESEQ	CBL6111D	34678	2014.10.27	2015.10.26
Horn Antenna	R&S	9120D	152265	2014.10.27	2015.10.26
Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2015.07.06	2016.07.05
Amplifier	Agilent	8449B	60538	2014.10.25	2015.10.24
Loop Antenna	ARA	PLA-1030/B	1029	2015.06.08	2016.06.07
Power Meter	Anritsu	ML2495A	1204003	2014.10.25	2015.10.24
Power Sensor	Anritsu	MA2411B	100309	2014.10.25	2015.10.24
Low frequency cable	MURATA	R-03	130627	2014.10.25	2015.10.24
High frequency cable	HARBOUR	R-02	FL0000175	2014.10.25	2015.10.24

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	102086	2014.10.25	2015.10.24
LISN	R&S	ENV216	101242	2014.10.25	2015.10.24
LISN	EMCO	3810/2NM	000-23625	2014.10.25	2015.10.24
Conduction Cable	HUBER+SUHNER	C01	N/A	2014.10.25	2015.10.24



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 15.247&207(a) limit in the table below has to be followed.

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

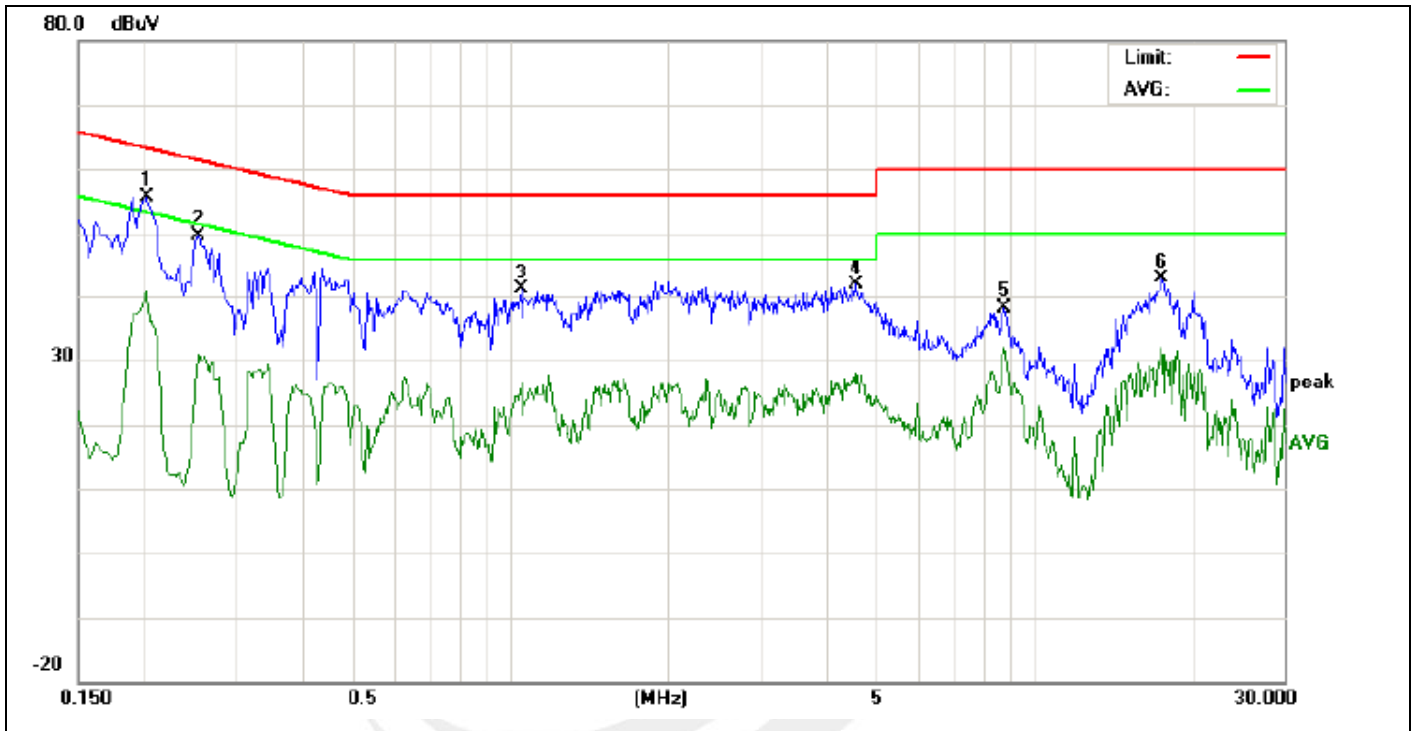
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



3.1.2 TEST RESULTS

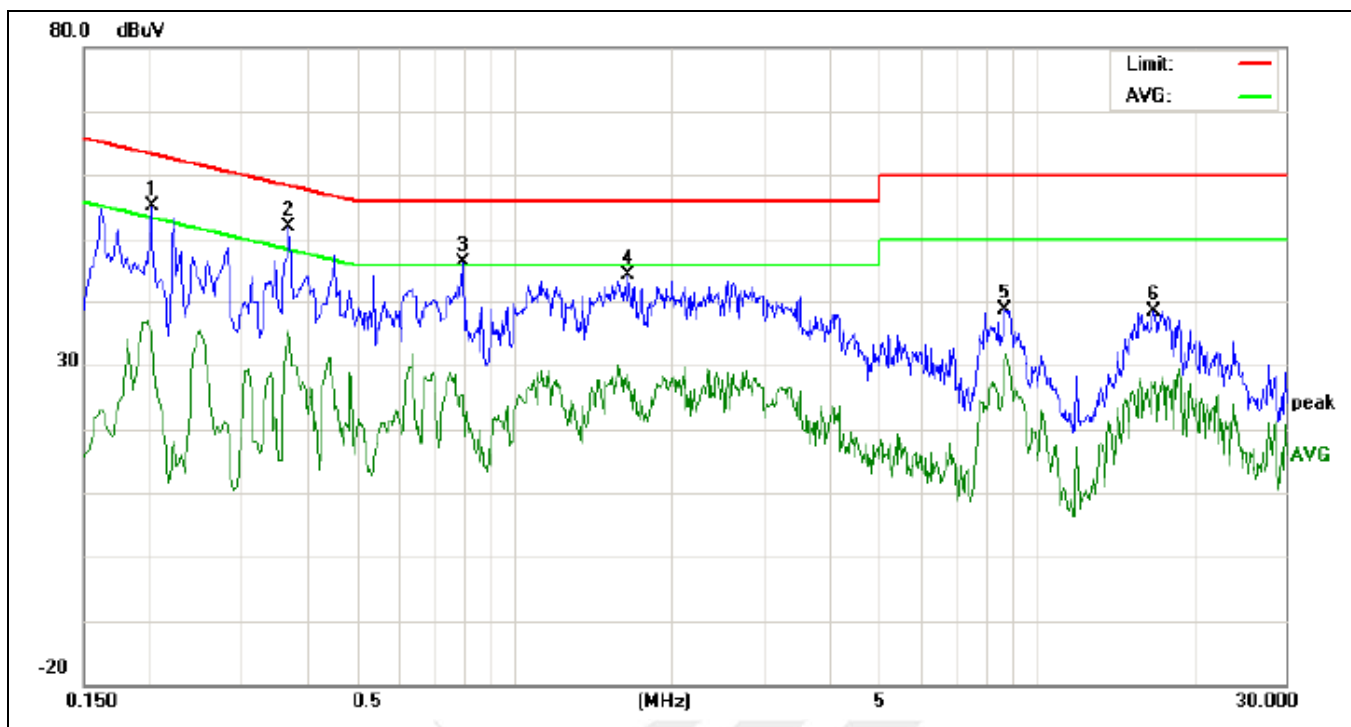
Job No.:	STS1503015	Ant.Polar.:	L1
Standard:	FCC Part15 CE-Class B_QP	Date:2015/6/29	Time:10:11:49
Test item:	Conducted Emission	Distance:	
Company:	RapidLog ELD 200	Temp.(C)/Hum.(%RH):	26(C)/60%RH
Model:	200	Power:	
Mode:	WIFI	Test By:	
Description:			



No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor (dB)	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2020	45.40		30.57	10.22	55.62		40.79	63.52	53.52	-7.90	-12.73	P	
2	0.2540	39.27		20.59	10.27	49.54		30.86	61.62	51.62	-12.08	-20.76	P	
3	1.0500	30.74		16.17	10.37	41.11		26.54	56.00	46.00	-14.89	-19.46	P	
4	4.5696	31.58		16.15	10.21	41.79		26.36	56.00	46.00	-14.21	-19.64	P	
5	8.7698	27.82		21.61	10.27	38.09		31.88	60.00	50.00	-21.91	-18.12	P	
6	17.5379	32.66		21.76	10.12	42.78		31.88	60.00	50.00	-17.22	-18.12	P	



Job No.:	STS1503015	Ant.Polar.:	N
Standard:	FCC Part15 CE-Class B_QP	Date:2015/6/29	Time:10:15:28
Test item:	Conducted Emission	Distance:	
Company:	RapidLog ELD 200	Temp.(C)/Hum.(%RH):	26(C)/60%RH
Model:	200	Power:	
Mode:	WIFI	Test By:	
Description:			



No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor (dB)	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2020	44.99		25.16	10.22	55.21		35.38	63.52	53.52	-8.31	-18.14	P	
2	0.3699	41.46		25.03	10.32	51.78		35.35	58.50	48.50	-6.72	-13.15	P	
3	0.7980	36.20		15.08	10.28	46.48		25.36	56.00	46.00	-9.52	-20.64	P	
4	1.6577	34.09		18.24	10.33	44.42		28.57	56.00	46.00	-11.58	-17.43	P	
5	8.6936	28.32		19.90	10.29	38.61		30.19	60.00	50.00	-21.39	-19.81	P	
6	16.7698	28.35		16.37	10.13	38.48		26.50	60.00	50.00	-21.52	-23.50	P	



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

6 dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15.247&205(a), then the Part 15.247&209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower



Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier harmonic(Peak/AV)
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz / 10Hz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

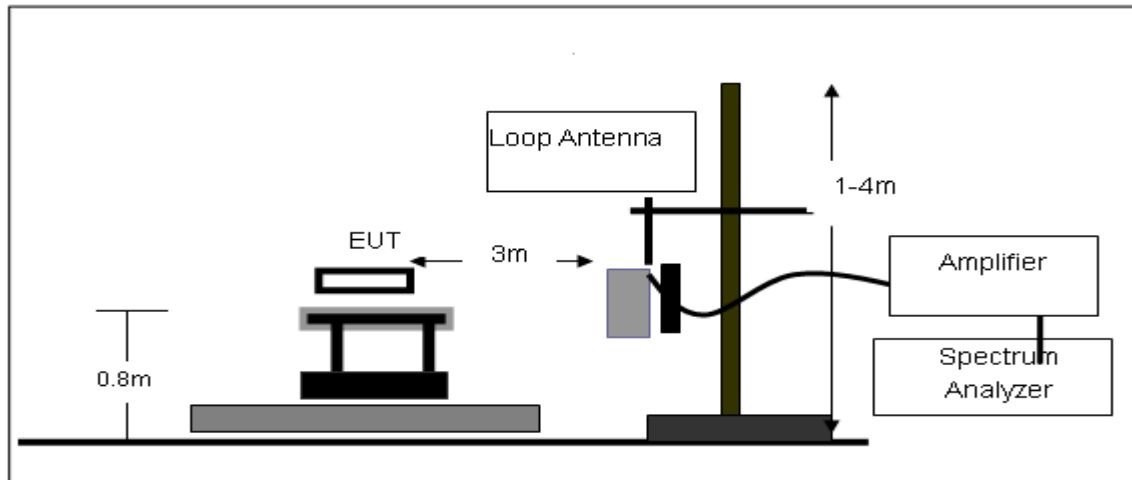
- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

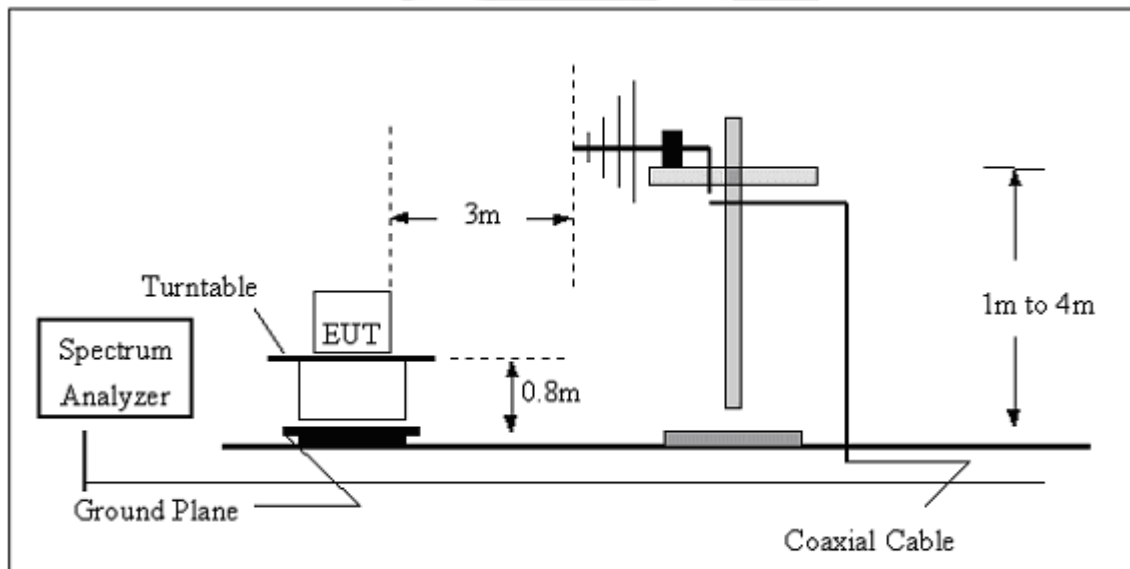
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 TEST SETUP

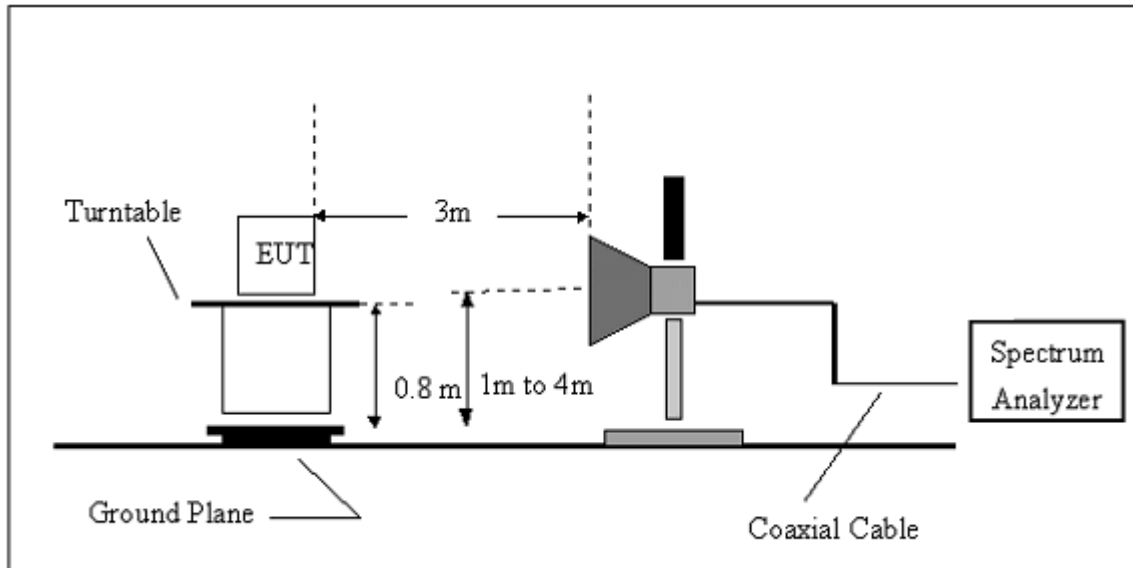
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



3.2.5 TEST RESULT

9KHz-30MHz

EUT:	RapidLog ELD 200	Model Name. :	200
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 12V
Test Mode :	Link mode	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

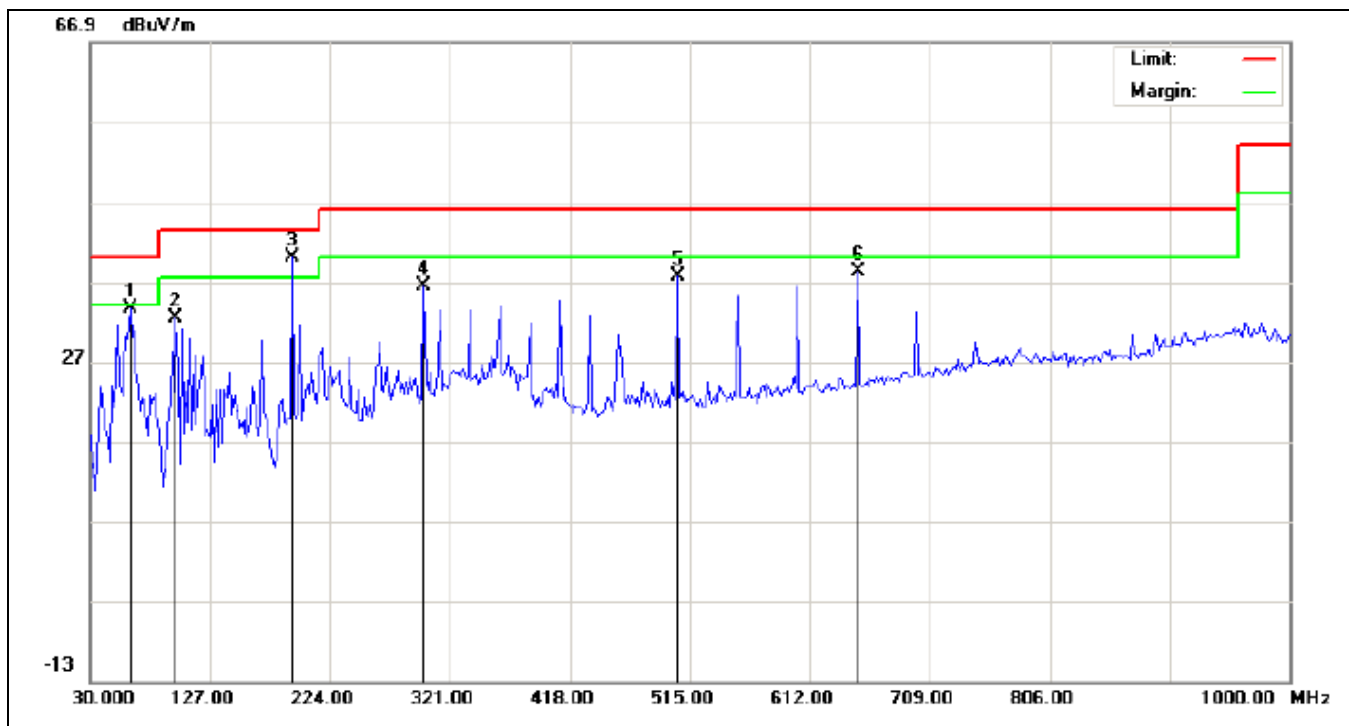
Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits(dBuV) + distance extrapolation factor.



30MHz - 1000MHz

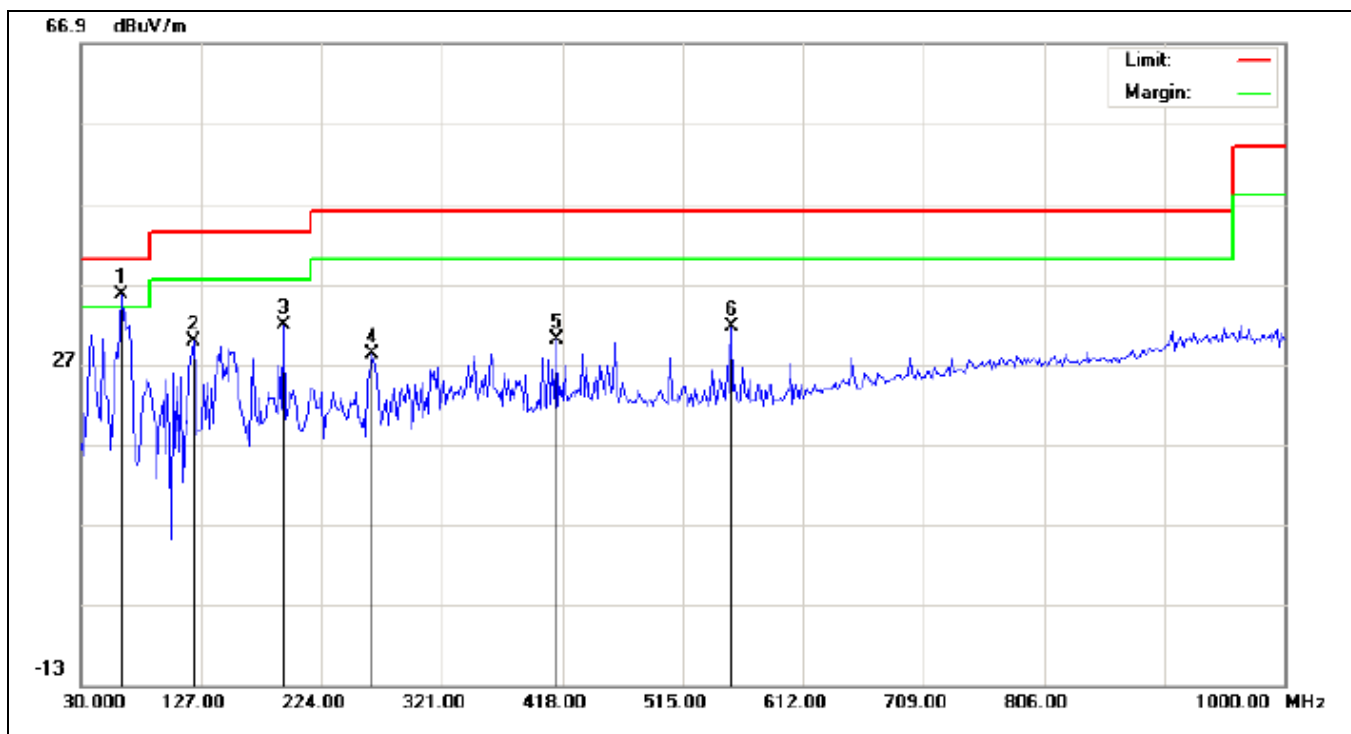
Job No.:	STS1503015	Ant.Polar.:	Horizontal
Standard:	FCC_PART15_B_03m_QP	Date:2015/6/19	Time:16:12:58
Test item:	Radiated Emission	Distance:	3m
Company:	RapidLog ELD 200	Temp.(C)/Hum.(%RH):	26(C)/60%RH
Model:	200	Power:	
Mode:	WIFI	Test By:	
Description:			



No.	Mk	Freq. MHz	Reading dBuV	Factor dB/m	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		62.3333	22.74	10.94	33.68	40.00	-6.32	peak			
2		99.5167	21.90	10.43	32.33	43.50	-11.17	peak			
3	*	193.2833	28.37	11.69	40.06	43.50	-3.44	peak			
4		299.9833	21.00	15.41	36.41	46.00	-9.59	peak			
5		505.3000	16.37	21.27	37.64	46.00	-8.36	peak			
6		650.8000	14.24	23.87	38.11	46.00	-7.89	peak			



Job No.:	STS1503015	Ant.Polar.:	Vertical
Standard:	FCC_PART15_B_03m_QP	Date:2015/6/19	Time:16:27:14
Test item:	Radiated Emission	Distance:	3m
Company:	RapidLog ELD 200	Temp.(C)/Hum.(%RH):	26(C)/60%RH
Model:	200	Power:	
Mode:	WIFI	Test By:	
Description:			



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	62.3333	28.43	7.24	35.67	40.00	-4.33	peak			
2		120.5333	22.80	7.08	29.88	43.50	-13.62	peak			
3		193.2833	21.12	10.70	31.82	43.50	-11.68	peak			
4		264.4167	13.83	14.34	28.17	46.00	-17.83	peak			
5		413.1500	10.63	19.47	30.10	46.00	-15.90	peak			
6		553.8000	9.07	22.50	31.57	46.00	-14.43	peak			



Above 1000MHz

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH1 (802.11b Mode)/2412	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4824.127	46.27	10.44	56.71	74	-17.29	peak
4824.127	31.66	10.44	42.1	54	-11.9	AVG
7236.114	43.41	12.39	55.8	74	-18.2	peak
7236.114	33.37	12.39	45.76	54	-8.24	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH1 (802.11b Mode)/2412	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4824.129	49.58	10.39	59.97	74	-14.03	peak
4824.110	33.91	10.39	44.3	54	-9.7	AVG
7236.118	48.43	12.68	61.11	74	-12.89	peak
7236.052	30.77	12.68	43.45	54	-10.55	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH6 (802.11b Mode)/2437	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.080	49.81	10.39	60.2	74	-13.8	peak
4874.135	33.23	10.39	43.62	54	-10.38	AVG
7311.106	48.61	12.68	61.29	74	-12.71	peak
7311.127	30.15	12.68	42.83	54	-11.17	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH6 (802.11b Mode)/2437	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.040	49.26	10.39	59.65	74	-14.35	peak
4874.121	33.71	10.39	44.1	54	-9.9	AVG
7311.123	48.91	12.68	61.59	74	-12.41	peak
7311.103	30.17	12.68	42.85	54	-11.15	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH11 (802.11b Mode)/2462	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4924.064	49.28	10.39	59.67	74	-14.33	peak
4924.083	32.27	10.39	42.66	54	-11.34	AVG
7386.104	48.61	12.68	61.29	74	-12.71	peak
7386.096	31.37	12.68	44.05	54	-9.95	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH11 (802.11b Mode)/2462	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4924.054	49.17	10.39	59.56	74	-14.44	peak
4924.065	33.15	10.39	43.54	54	-10.46	AVG
7386.135	48.32	12.68	61	74	-13	peak
7386.133	30.64	12.68	43.32	54	-10.68	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH1 (802.11g Mode)/2412	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4824.128	46.27	10.44	56.71	74	-17.29	peak
4824.106	36.45	10.44	46.89	54	-7.11	AVG
7236.068	42.49	12.39	54.88	74	-19.12	peak
7236.085	28.32	12.39	40.71	54	-13.29	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH1 (802.11g Mode)/2412	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4824.090	46.28	10.44	56.72	74	-17.28	peak
4824.048	36.45	10.44	46.89	54	-7.11	AVG
7236.107	42.47	12.39	54.86	74	-19.14	peak
7236.112	28.31	12.39	40.7	54	-13.3	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH6 (802.11g Mode)/2437	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4874.057	45.28	10.4	55.68	74	-18.32	peak
4874.078	36.29	10.4	46.69	54	-7.31	AVG
7311.106	44.49	12.75	57.24	74	-16.76	peak
7311.098	32.62	12.75	45.37	54	-8.63	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH6 (802.11g Mode)/2437	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4874.063	48.27	10.4	58.67	74	-15.33	peak
4874.079	35.81	10.4	46.21	54	-7.79	AVG
7311.083	48.35	12.75	61.1	74	-12.9	peak
7311.104	33.44	12.75	46.19	54	-7.81	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH11 (802.11g Mode)/2462	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4924.100	49.37	10.39	59.76	74	-14.24	peak
4924.107	34.23	10.39	44.62	54	-9.38	AVG
7386.147	48.77	12.68	61.45	74	-12.55	peak
7386.103	30.51	12.68	43.19	54	-10.81	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH11(802.11g Mode)/2462	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4924.086	46.28	10.39	56.67	74	-17.33	peak
4924.071	34.61	10.39	45	54	-9	AVG
7386.046	46.74	12.68	59.42	74	-14.58	peak
7386.042	33.19	12.68	45.87	54	-8.13	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



3.2.6 TEST RESULTS (BAND EDGE)

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH1(802.11b Mode)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2399.900	82.27	-13	69.27	74	-4.73	peak
2399.900	61.39	-13	48.39	54	-5.54	AVG
2400.000	82.48	-12.99	69.49	74	-4.41	peak
2400.000	61.27	-12.99	48.28	54	-5.74	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH1(802.11b Mode)	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2399.900	81.28	-13	68.28	74	-5.72	peak
2399.900	61.36	-13	48.36	54	-5.64	AVG
2400.000	78.71	-12.99	65.72	74	-8.28	peak
2400.000	59.45	-12.99	46.46	54	-7.54	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH11(802.11b Mode)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2483.500	78.33	-12.78	65.55	74	-8.45	peak
2483.500	60.58	-12.78	47.8	54	-6.2	AVG
2483.600	76.61	-12.77	63.84	74	-10.16	peak
2483.600	60.42	-12.78	47.64	54	-6.36	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH11(802.11b Mode)	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2483.500	77.39	-12.78	64.61	74	-9.39	peak
2483.500	60.61	-12.78	47.83	54	-6.17	AVG
2483.600	78.57	-12.77	65.8	74	-8.2	peak
2483.600	59.59	-12.77	46.82	54	-7.18	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						



EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH1(802.11g Mode)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2399.900	77.38	-13	64.38	74	-9.62	peak
2399.900	59.17	-13	46.17	54	-7.83	AVG
2400.000	78.68	-12.99	65.69	74	-8.31	peak
2400.000	58.43	-12.99	45.44	54	-8.56	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH1(802.11gMode)	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2399.900	77.23	-13	64.23	74	-9.77	peak
2399.900	60.64	-13	47.64	54	-6.36	AVG
2400.000	78.82	-12.99	65.83	74	-8.17	peak
2400.000	62.48	-12.99	49.49	54	-4.51	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						



EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH11(802.11g Mode)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2483.500	77.27	-12.78	64.49	74	-9.51	peak
2483.500	63.92	-12.78	51.14	54	-2.86	AVG
2483.600	76.37	-12.77	63.6	74	-10.4	peak
2483.600	61.46	-12.77	48.69	54	-5.31	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	CH11(802.11g Mode)	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2483.500	76.63	-12.78	63.85	74	-10.15	peak
2483.500	60.27	-12.78	47.49	54	-6.51	AVG
2483.600	75.45	-12.77	62.68	74	-11.32	peak
2483.600	61.68	-12.77	48.91	54	-5.09	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

4. CONDUCTED SPURIOUS EMISSIONS

4.1 APPLIED PROCEDURES / LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

4.2 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

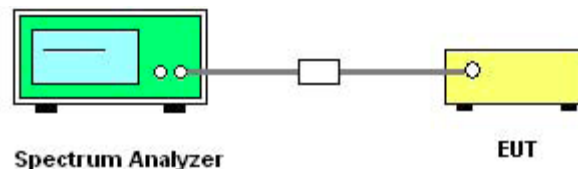
For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 2300 to 2430 MHz Upper Band Edge: 2450 to 2500 MHz
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

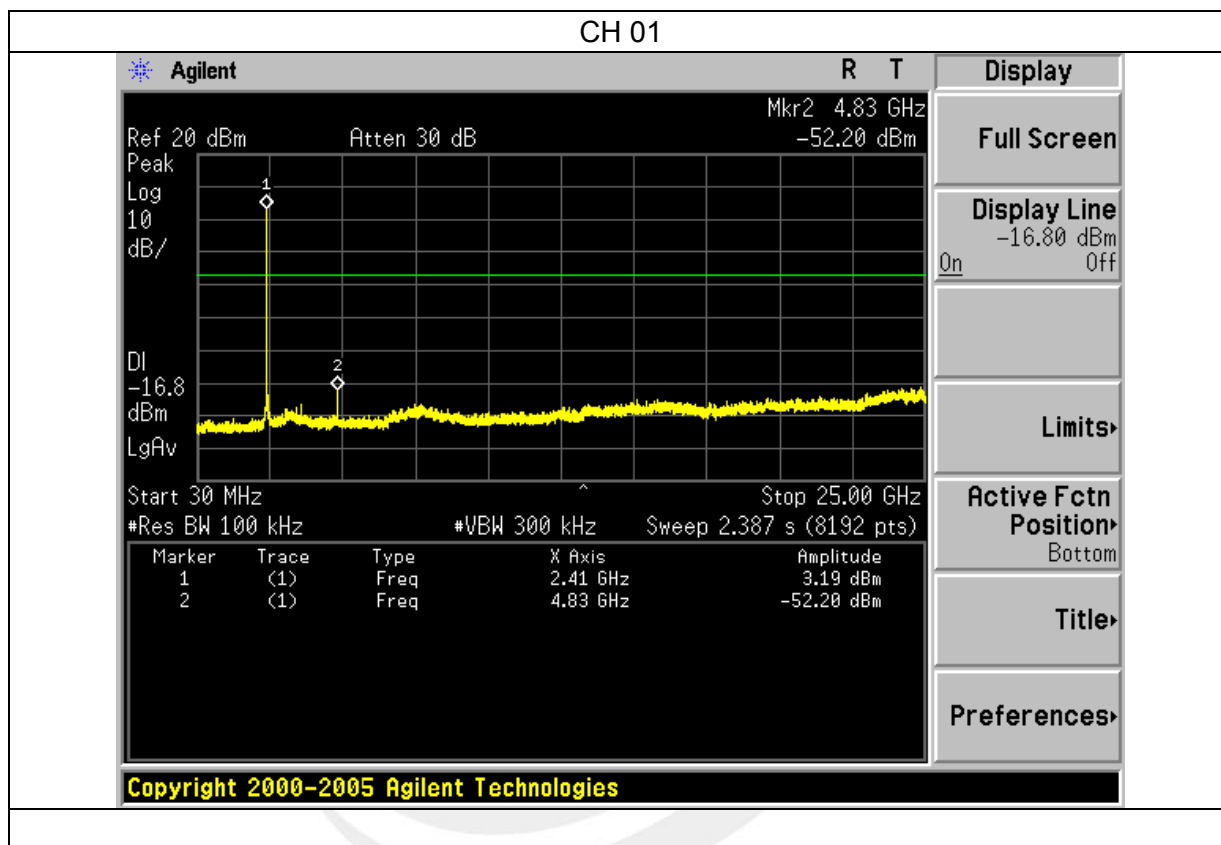
4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



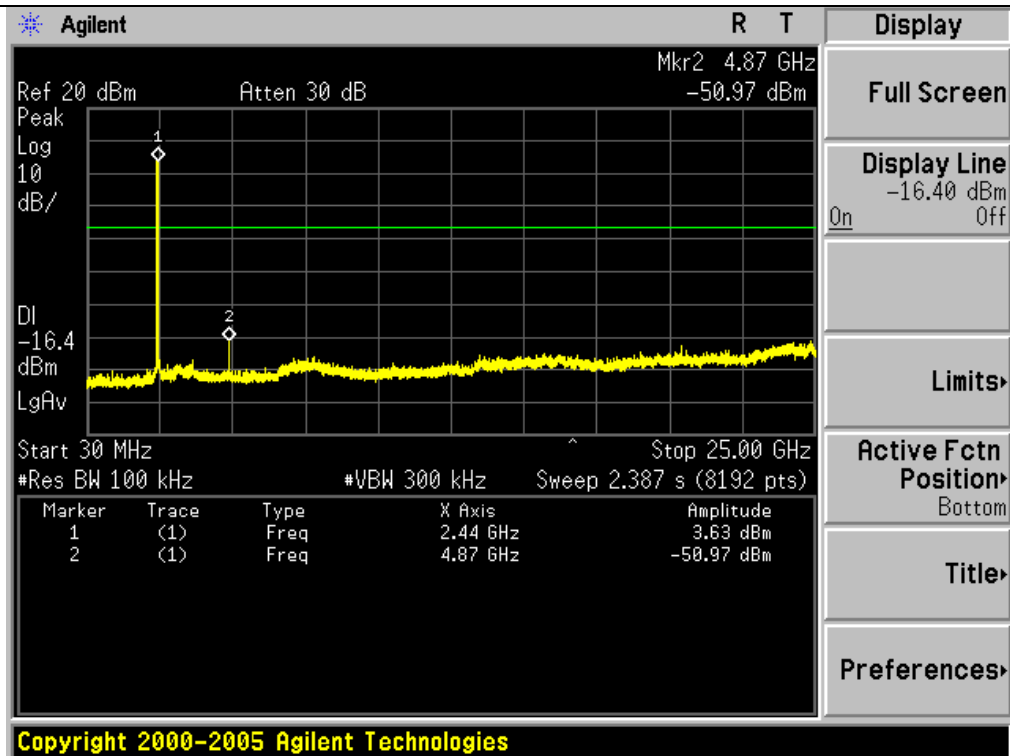
4.6 TEST RESULTS

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 12V
Test Mode :	TX b Mode /CH01, CH06, CH11		

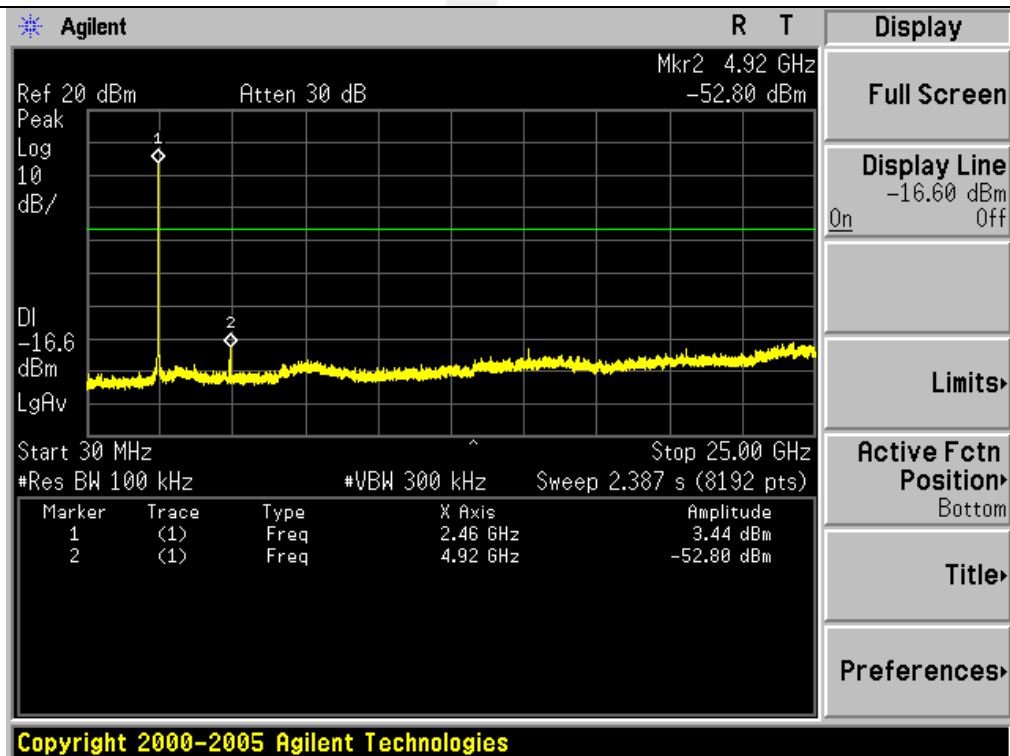




CH 06



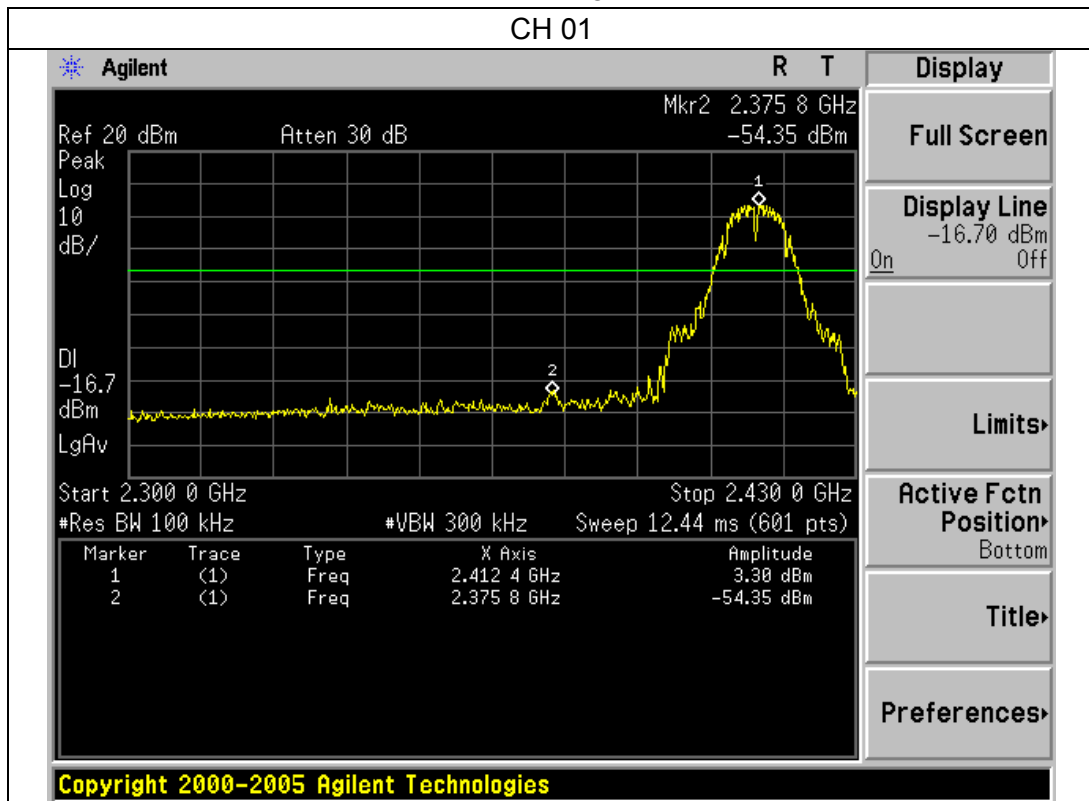
CH 11



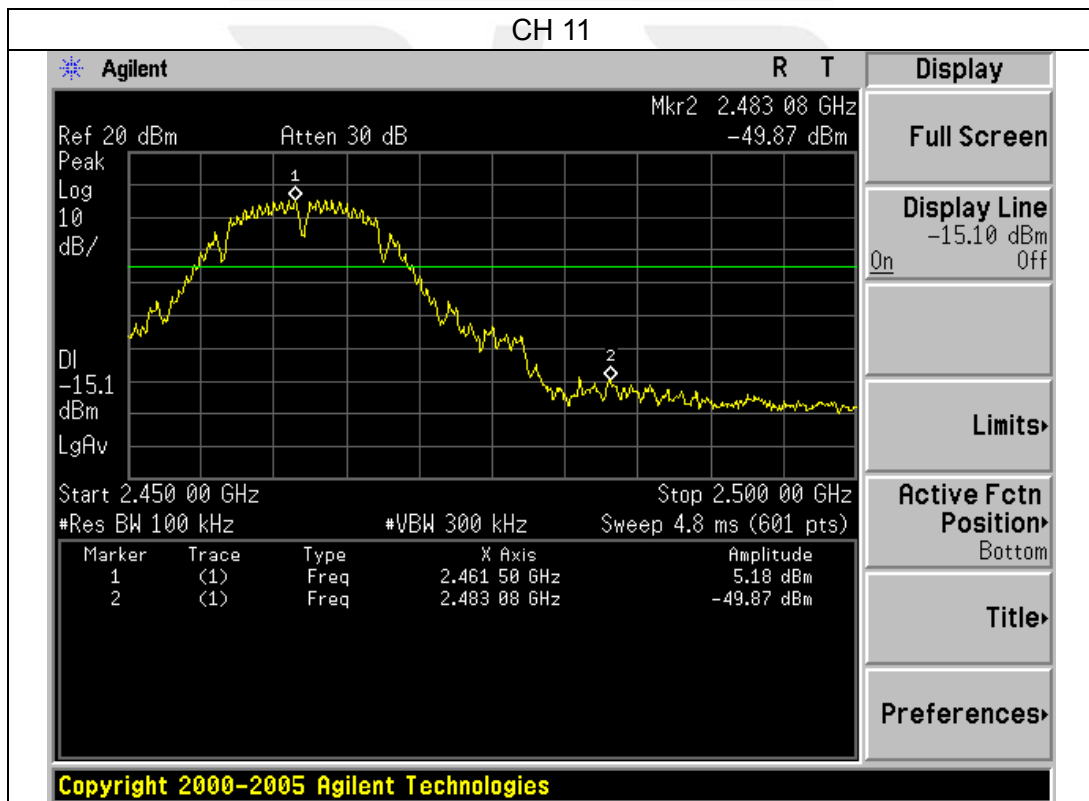


Band edge

CH 01

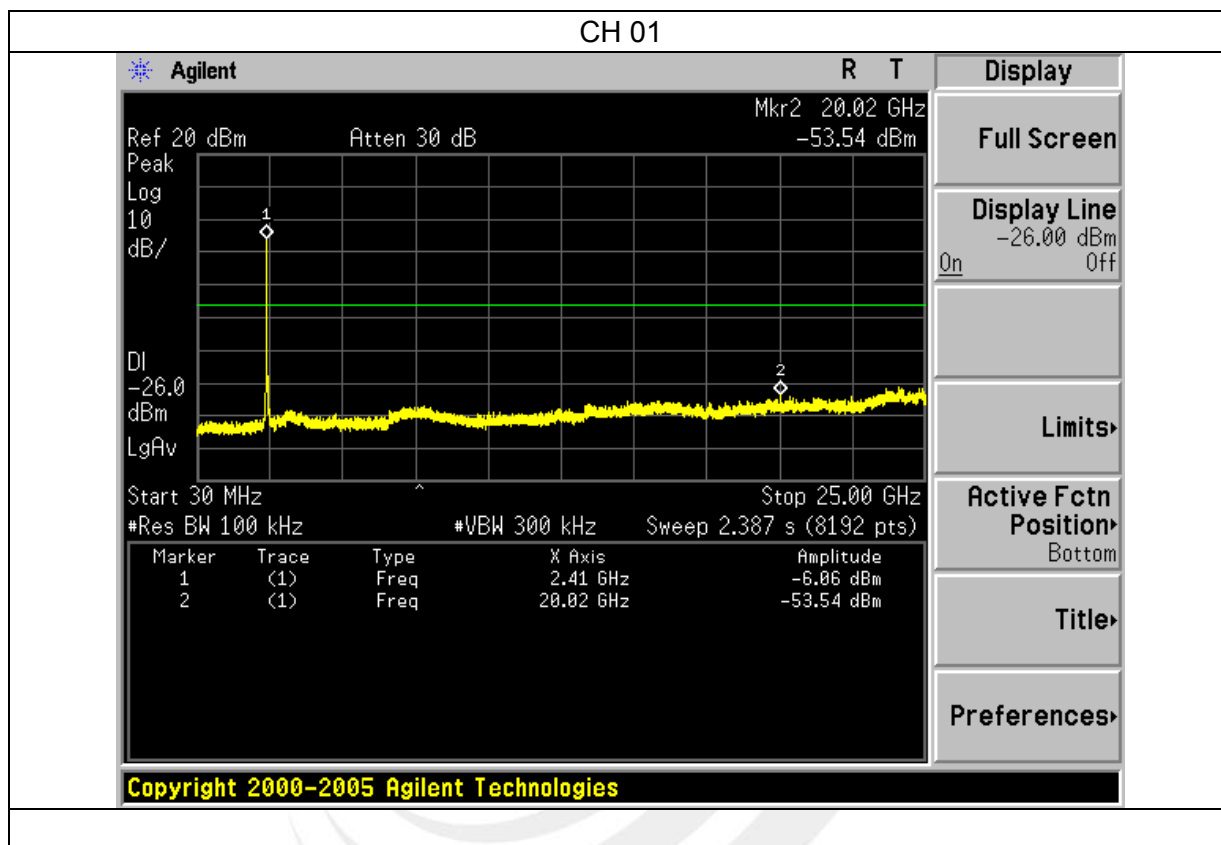


CH 11



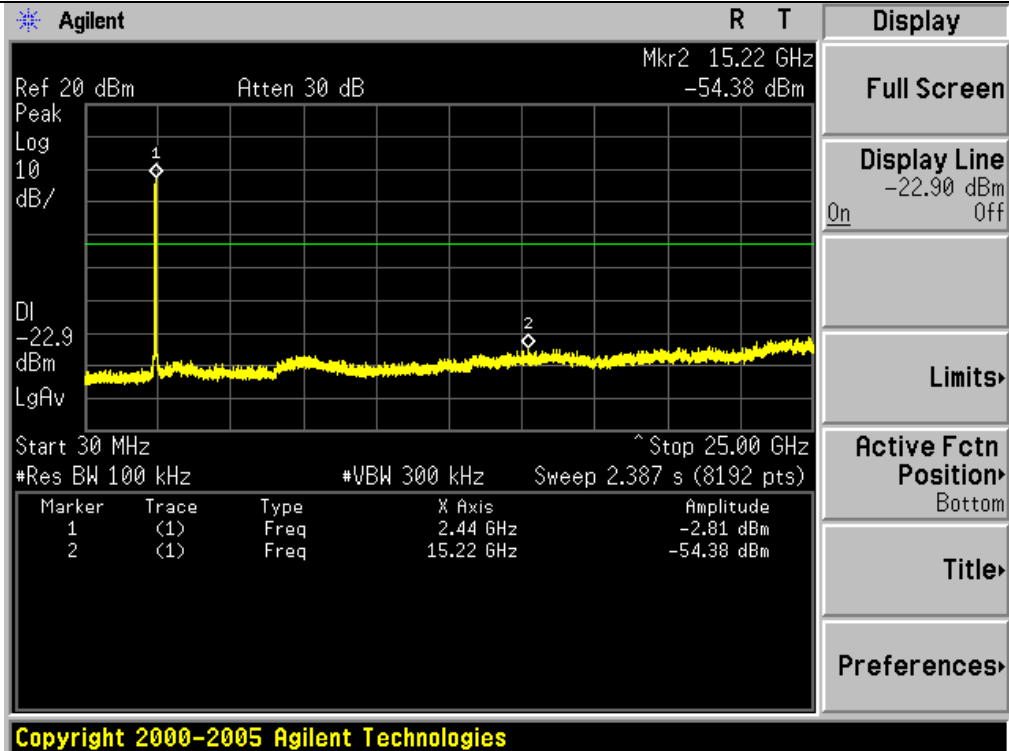


EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 12V
Test Mode :	TX g Mode /CH01, CH06, CH11		

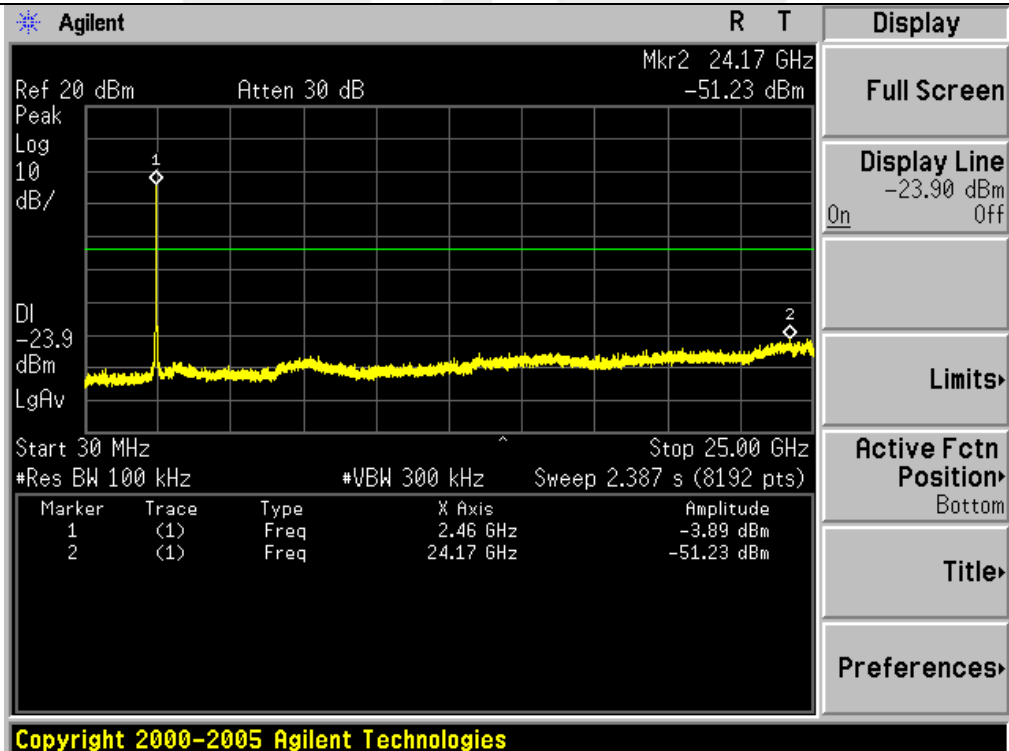




CH 06

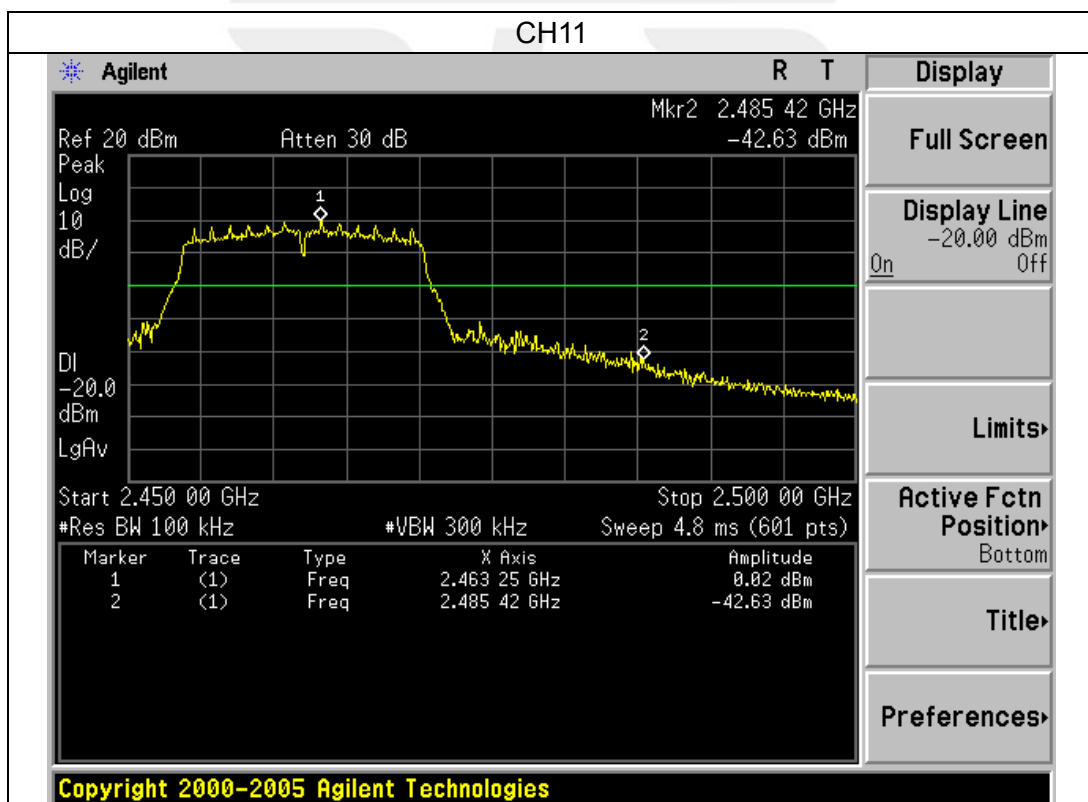
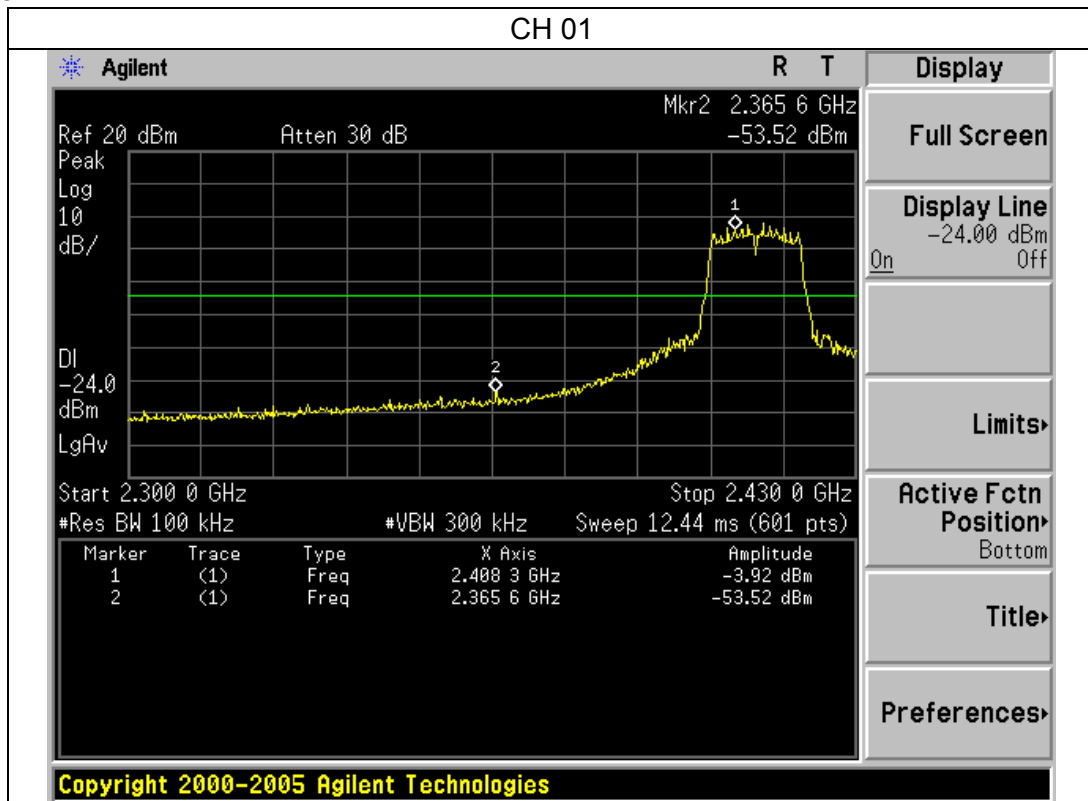


CH 11





Band edge





5. POWER SPECTRAL DENSITY TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

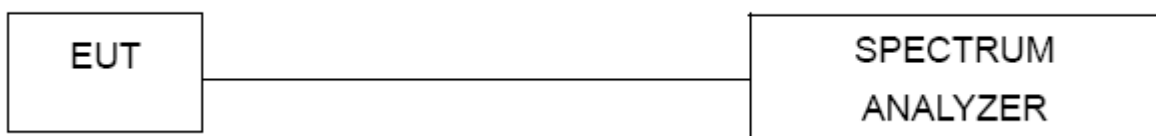
5.2 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW ≥ 3 kHz.
4. Set the VBW $\geq 3 \times$ RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

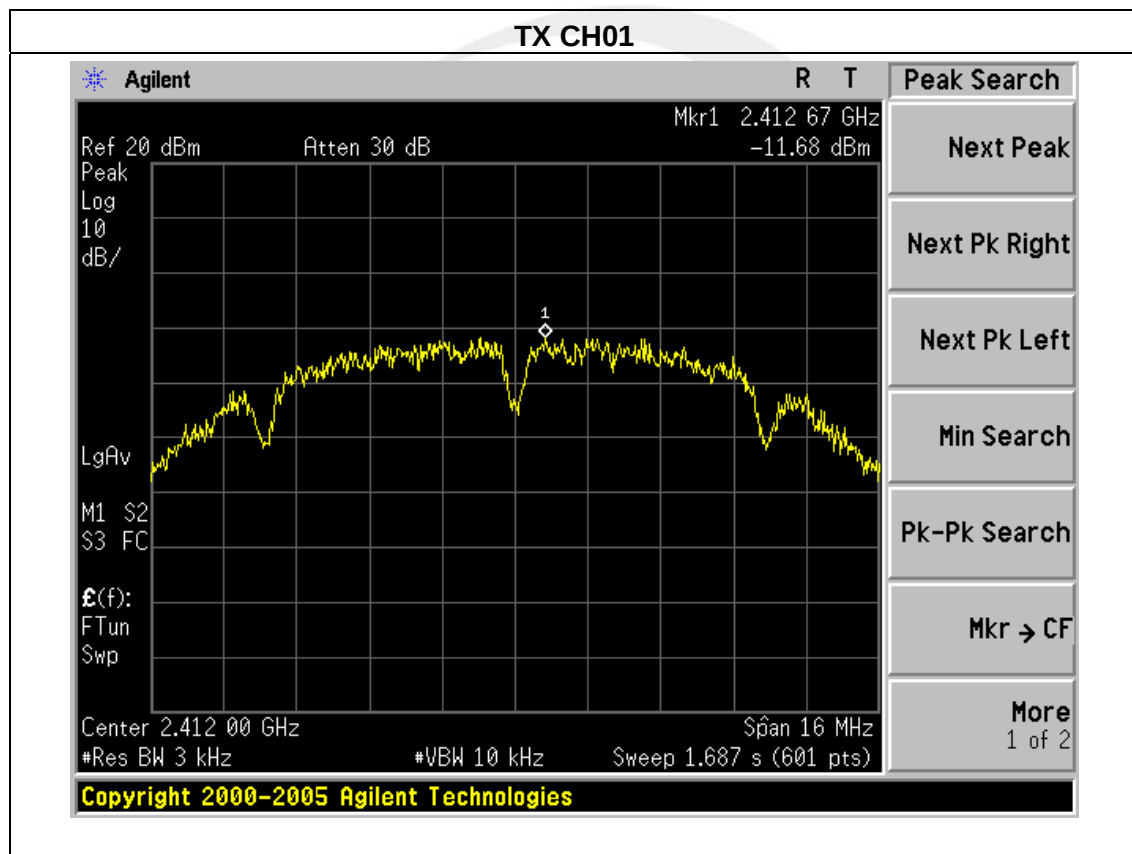
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



5.6 TEST RESULTS

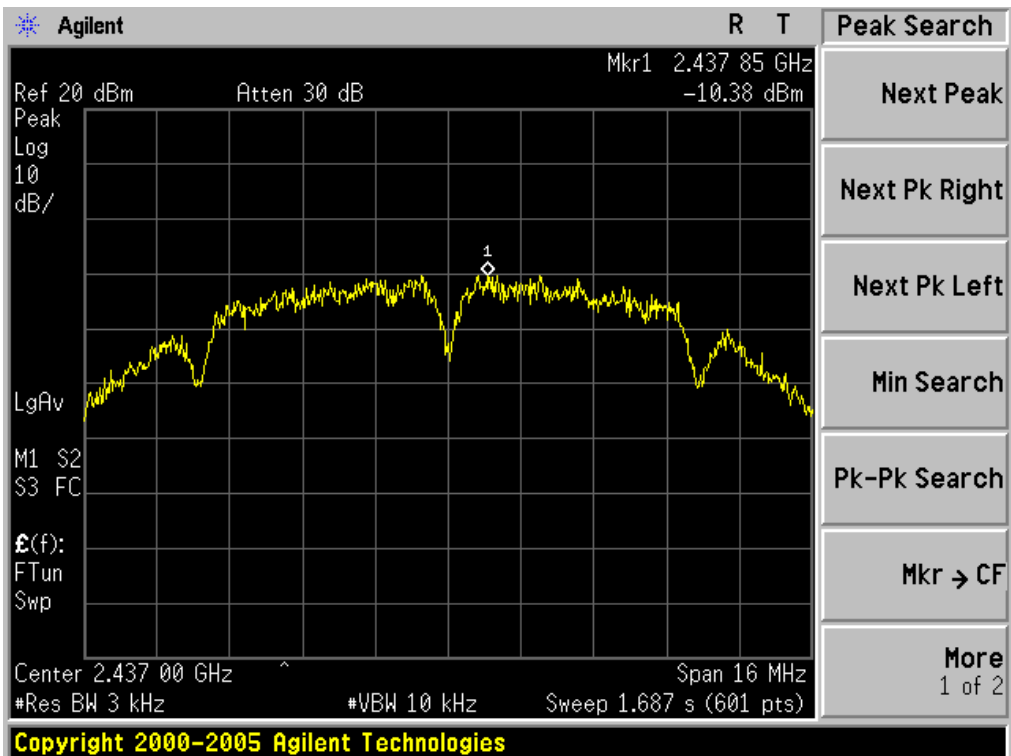
EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 12V
Test Mode :	TX b Mode /CH01, CH06, CH11		

Frequency	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412 MHz	-11.68	8	PASS
2437 MHz	-10.38	8	PASS
2462 MHz	-9.60	8	PASS

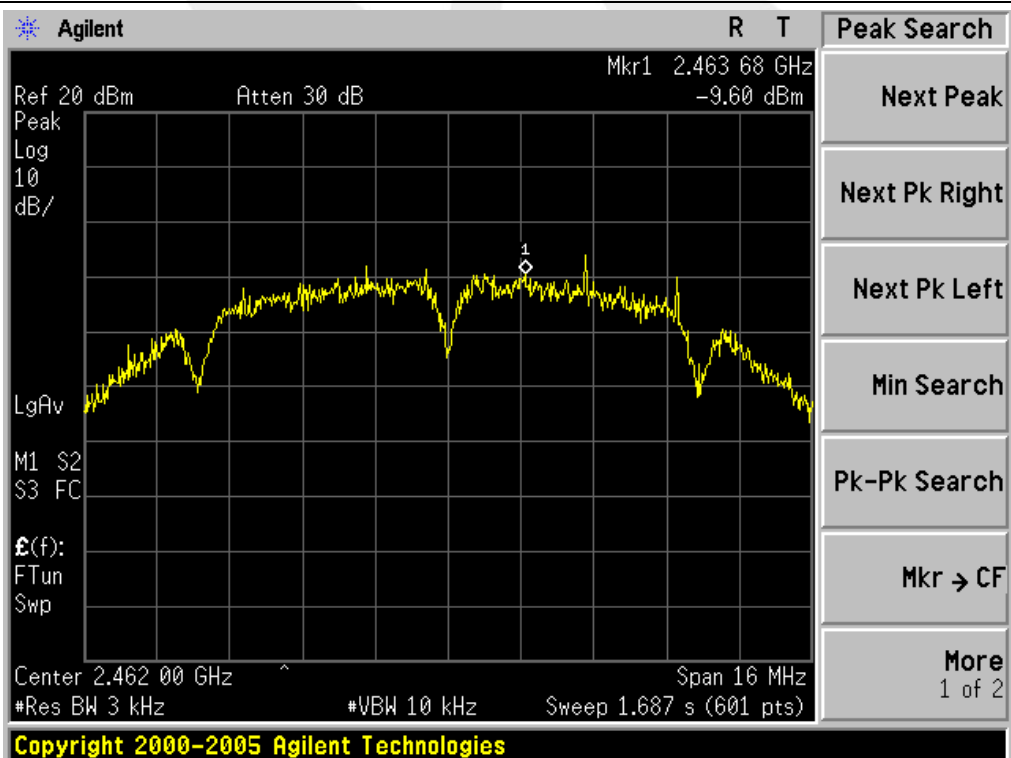




TX CH06



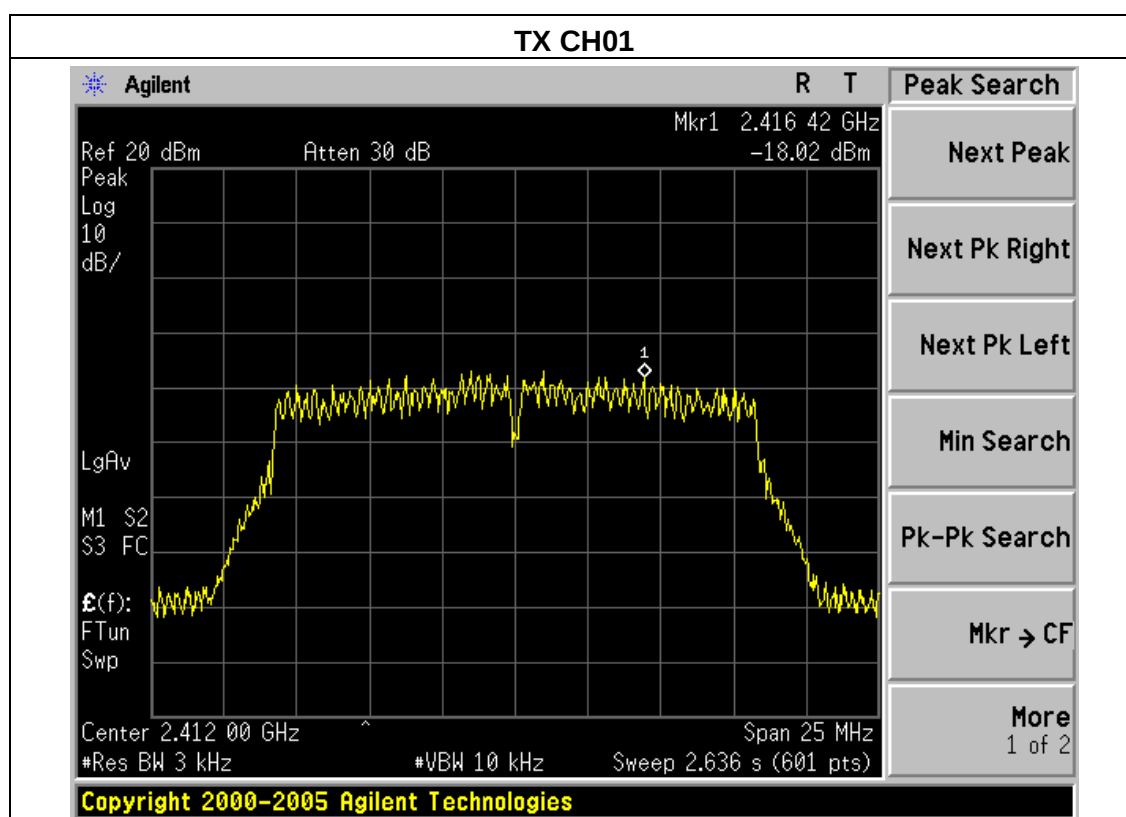
TX CH11

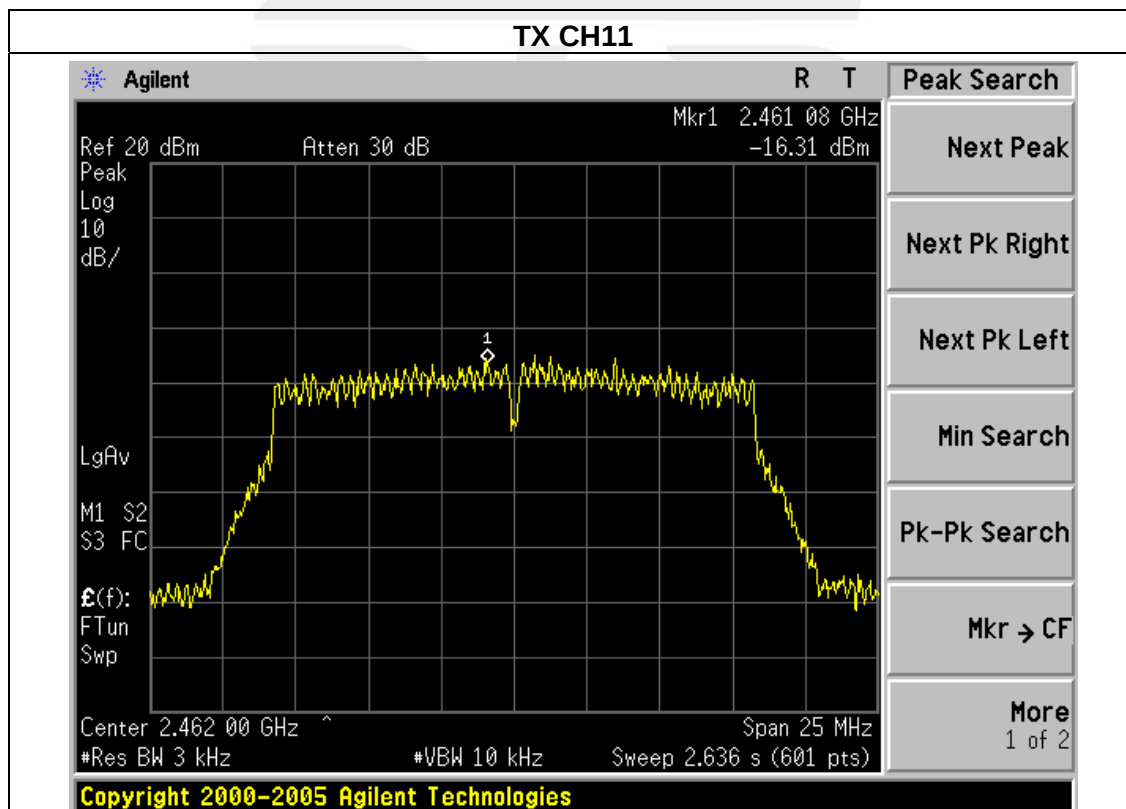
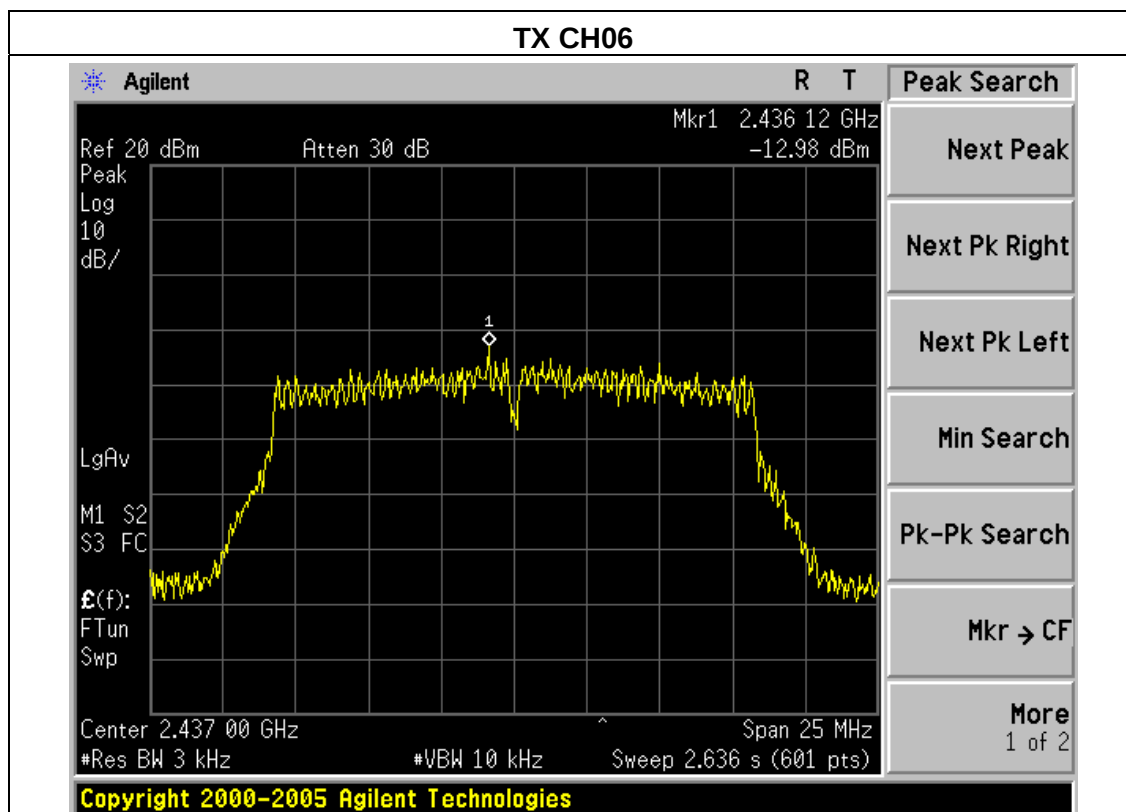




EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 12V
Test Mode :	TX g Mode /CH01, CH06, CH11		

Frequency	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412 MHz	-18.02	8	PASS
2437 MHz	-12.98	8	PASS
2462 MHz	-16.31	8	PASS







6. BANDWIDTH TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

6.2 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

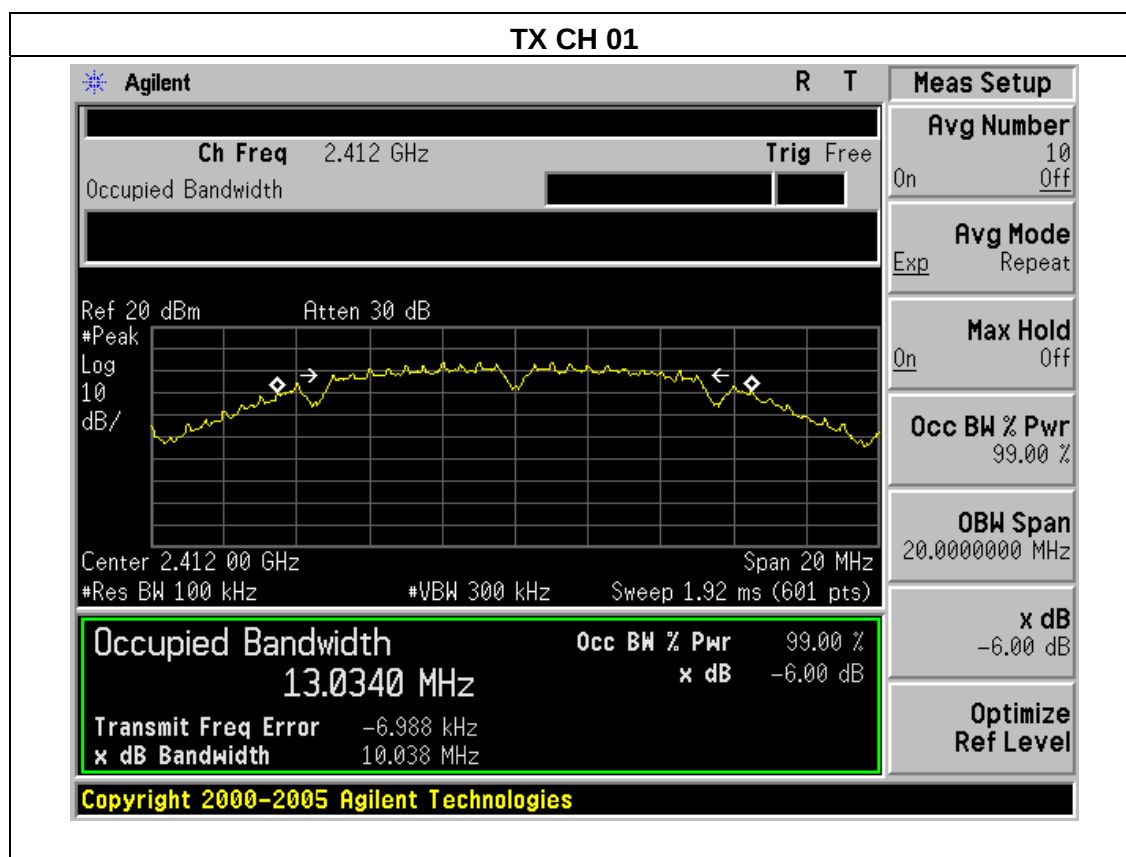
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



6.6 TEST RESULTS

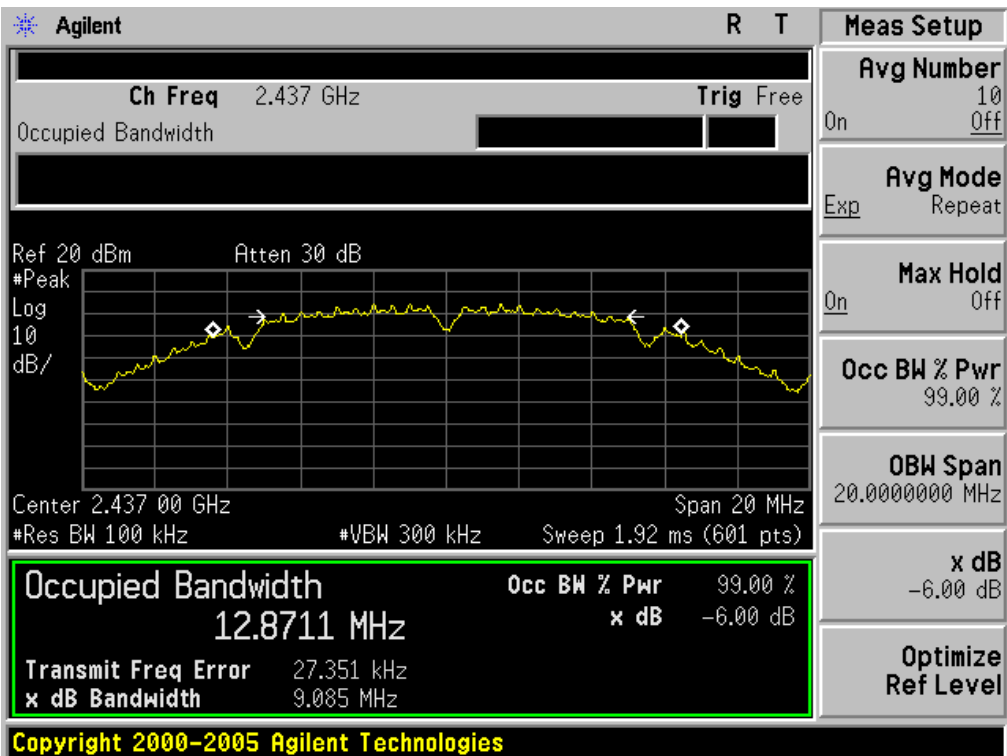
EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 12V
Test Mode :	TX b Mode /CH01, CH06, CH11		

Frequency	6dB Bandwidth (MHz)	Channel Separation	Result
2412 MHz	10.038	>=500KHz	PASS
2437 MHz	9.085	>=500KHz	PASS
2462 MHz	9.136	>=500KHz	PASS

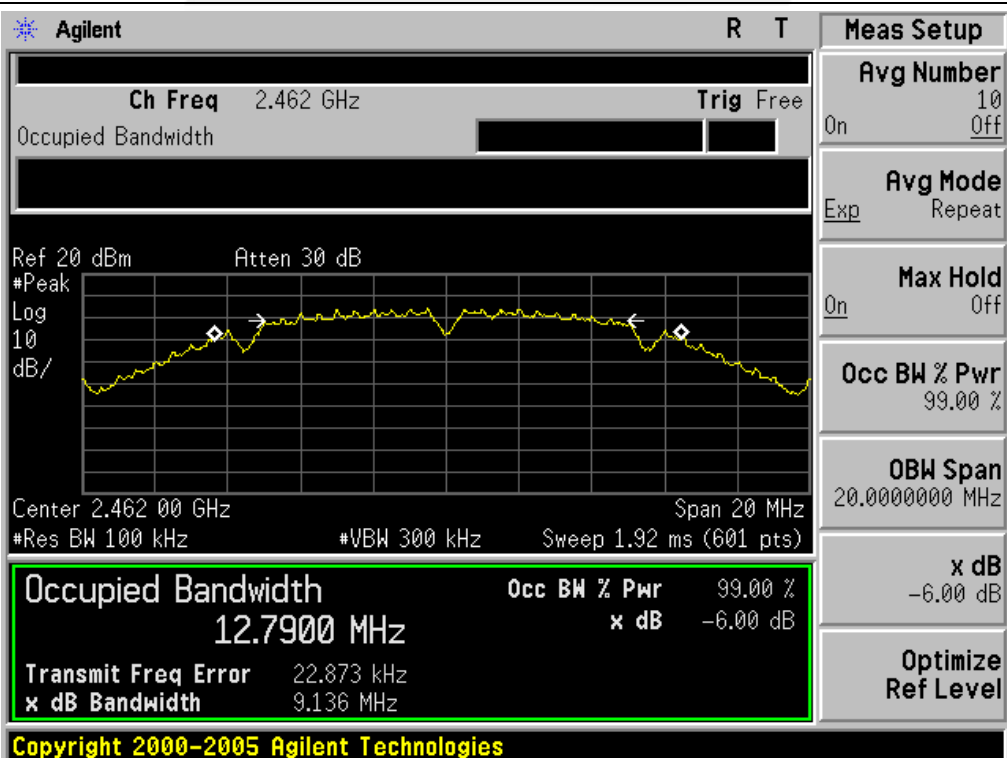




TX CH 06



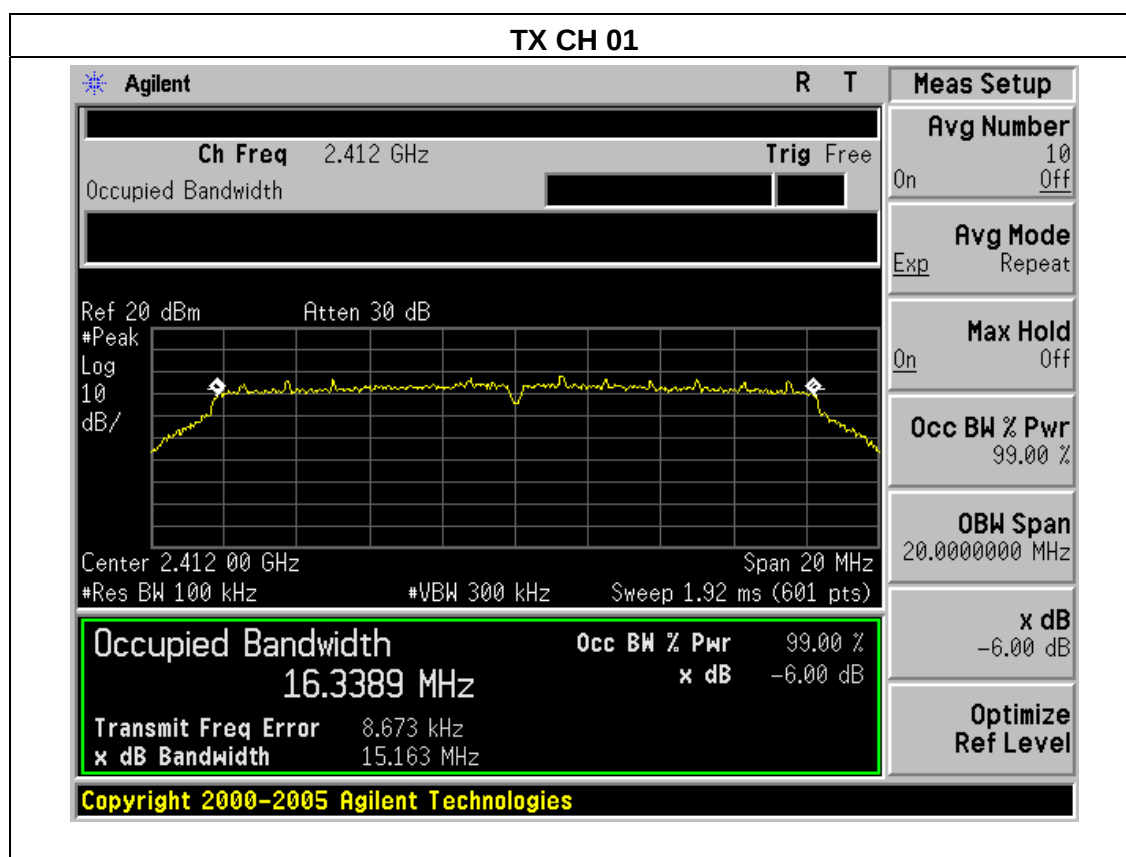
TX CH 11





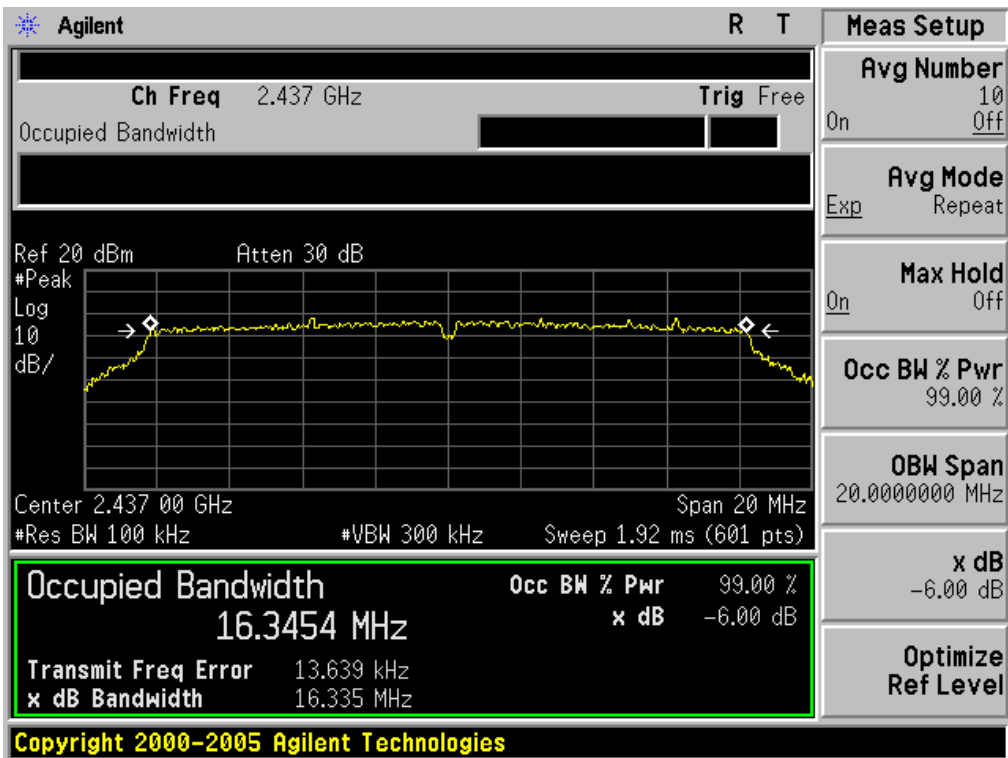
EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 12V
Test Mode :	TX g Mode /CH01, CH06, CH11		

Frequency	6dB Bandwidth (MHz)	Channel Separation	Result
2412 MHz	15.163	>=500KHz	PASS
2437 MHz	16.335	>=500KHz	PASS
2462 MHz	15.058	>=500KHz	PASS

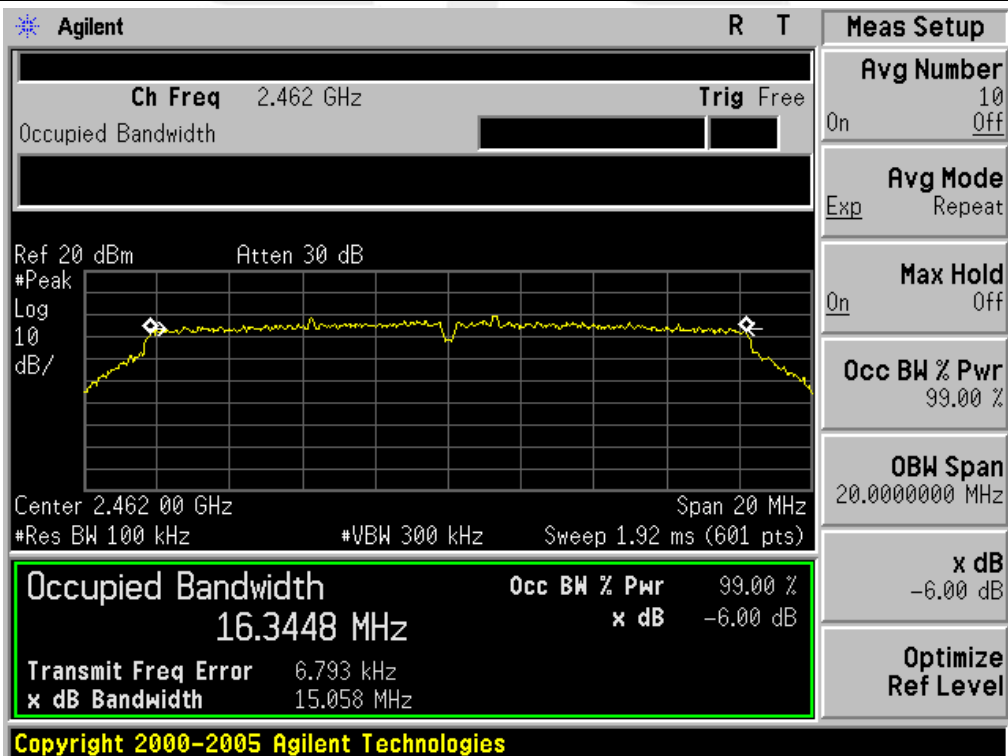




TX CH 06



TX CH 11





7. PEAK OUTPUT POWER TEST

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

7.2 TEST PROCEDURE

- The EUT was directly connected to the Power Sensor&Power meter

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



7.5 TEST RESULTS

EUT :	RapidLog ELD 200	Model Name :	200
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 12V
Test Mode :	TX 802.11b/g /CH01, CH06, CH11		

TX 802.11b Mode			
Test Channe	Frequency	Peak Conducted Output Power	LIMIT
	(MHz)	(dBm)	dBm
CH01	2412	11.72	30
CH06	2437	11.58	30
CH11	2462	11.63	30

TX 802.11g Mode			
Test Channe	Frequency	Peak Conducted Output Power	LIMIT
	(MHz)	(dBm)	dBm
CH01	2412	10.12	30
CH06	2437	10.08	30
CH11	2462	10.06	30



8. ANTENNA REQUIREMENT

8.1 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.

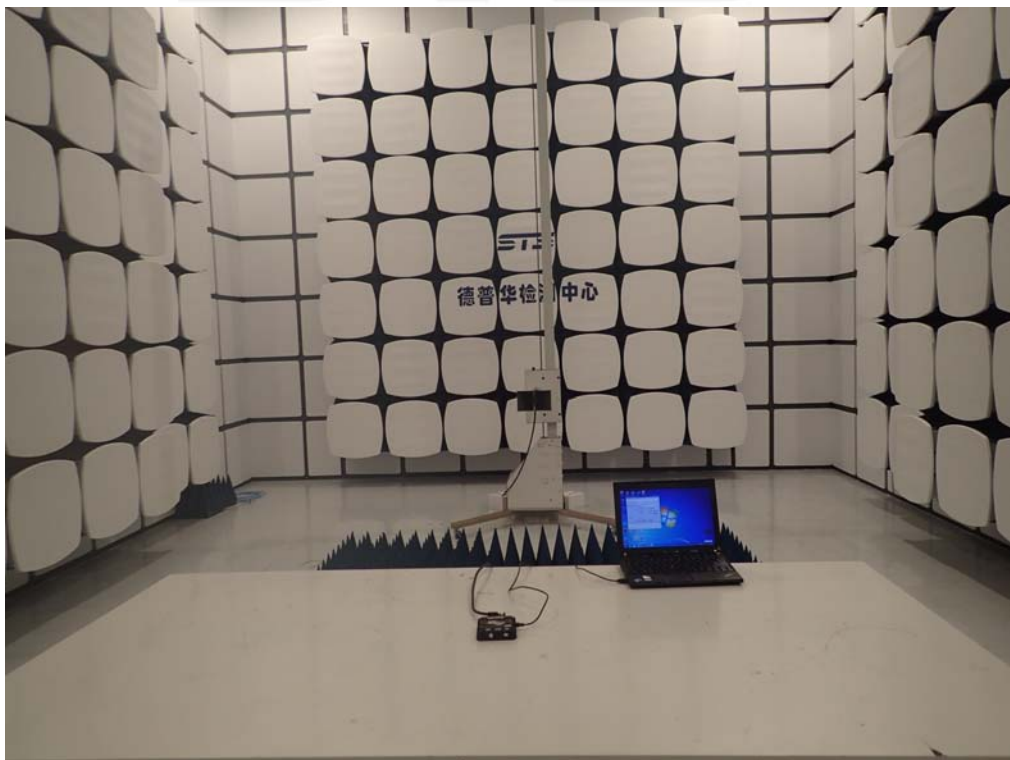
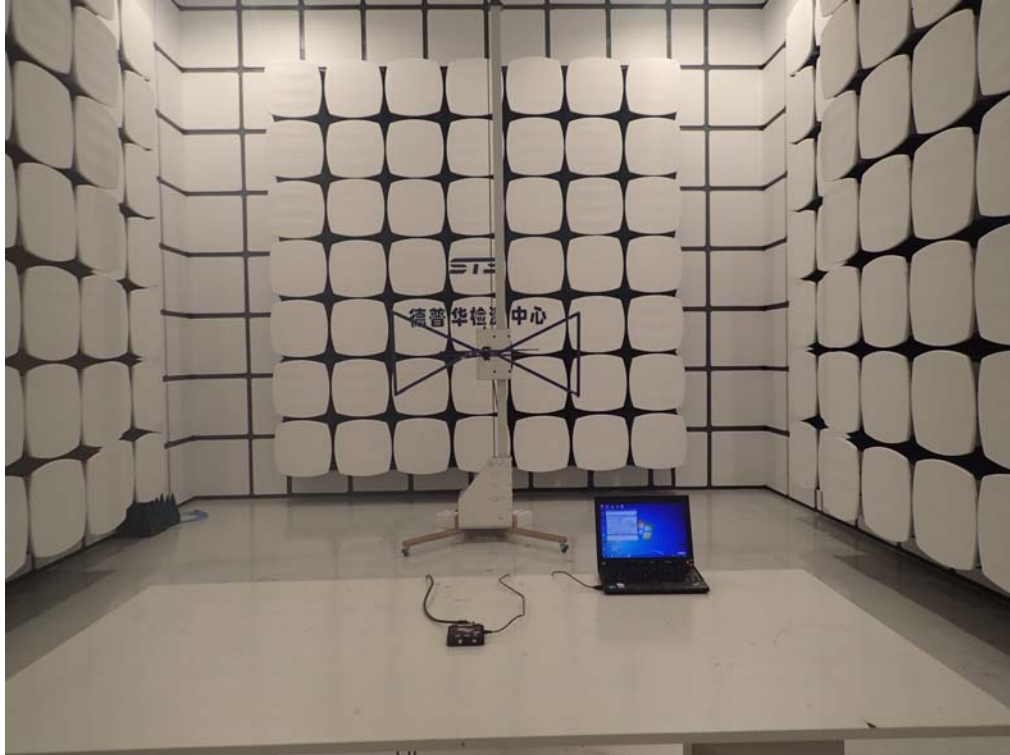
8.2 EUT ANTENNA

The EUT antenna is PIFA Antenna. It comply with the standard requirement.



APPENDIX A: PHOTOS OF TEST SETUP

Radiated Measurement Photos



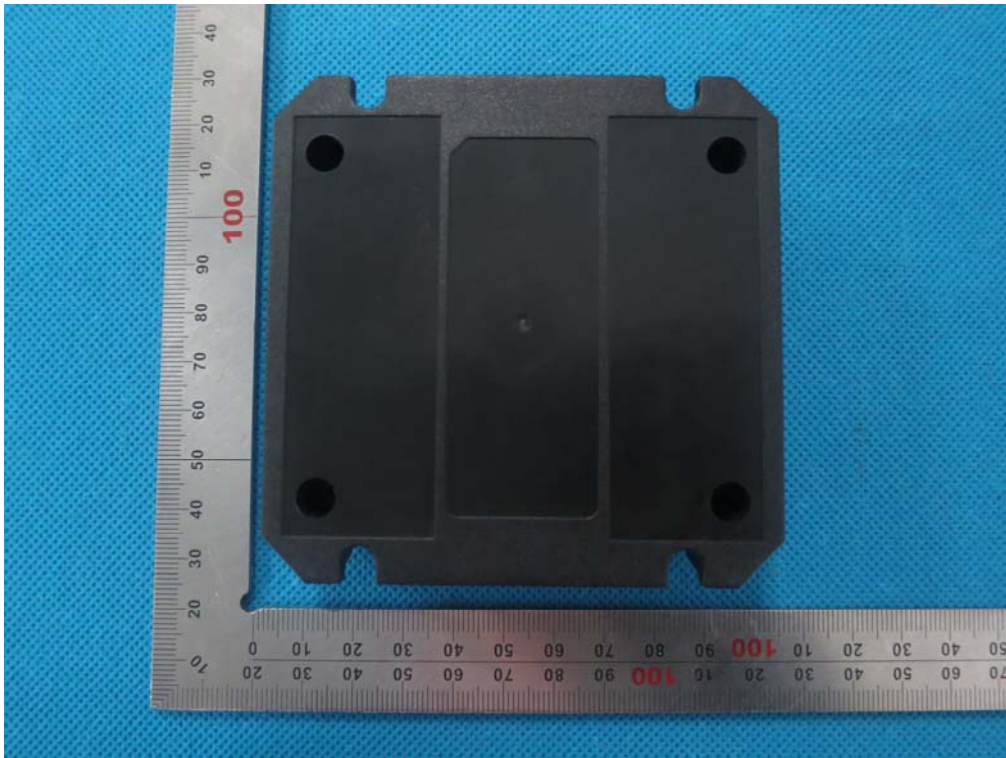


Conducted Measurement Photos



APPENDIX B: PHOTOGRAPHS OF EUT**TOTAL VIEW OF EUT****TOP VIEW OF EUT**

BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



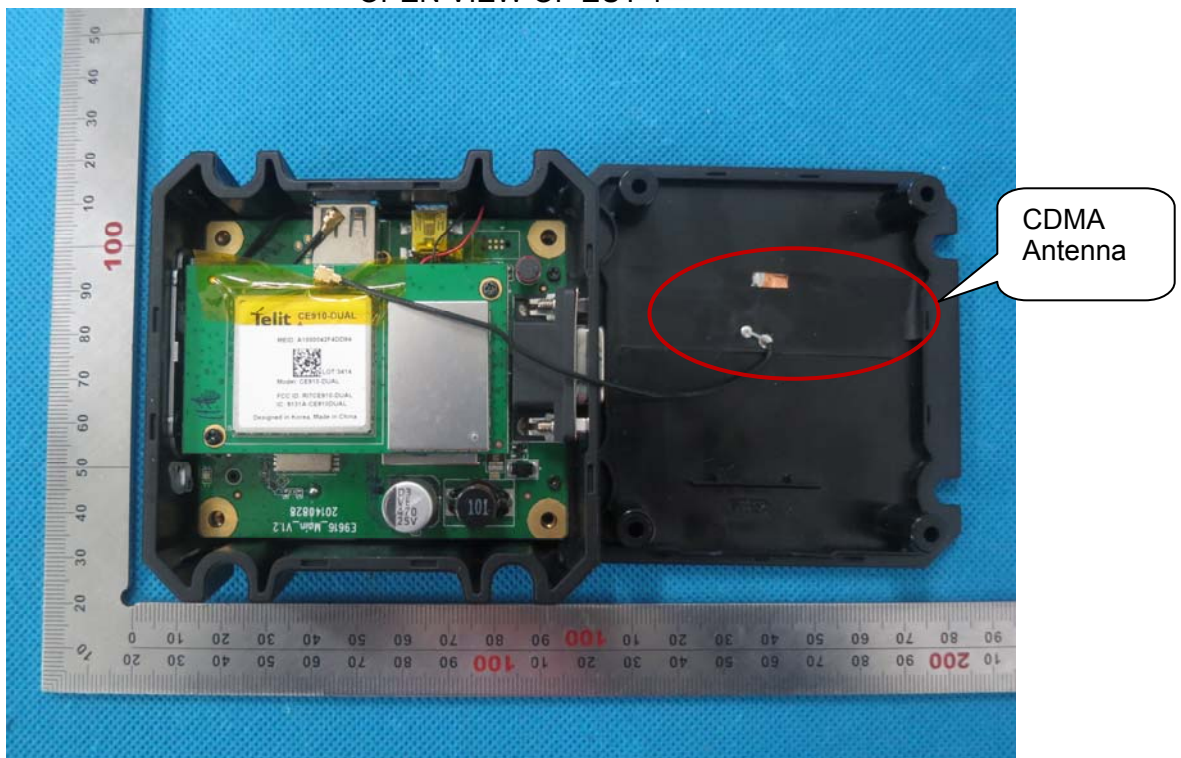
LEFT VIEW OF EUT



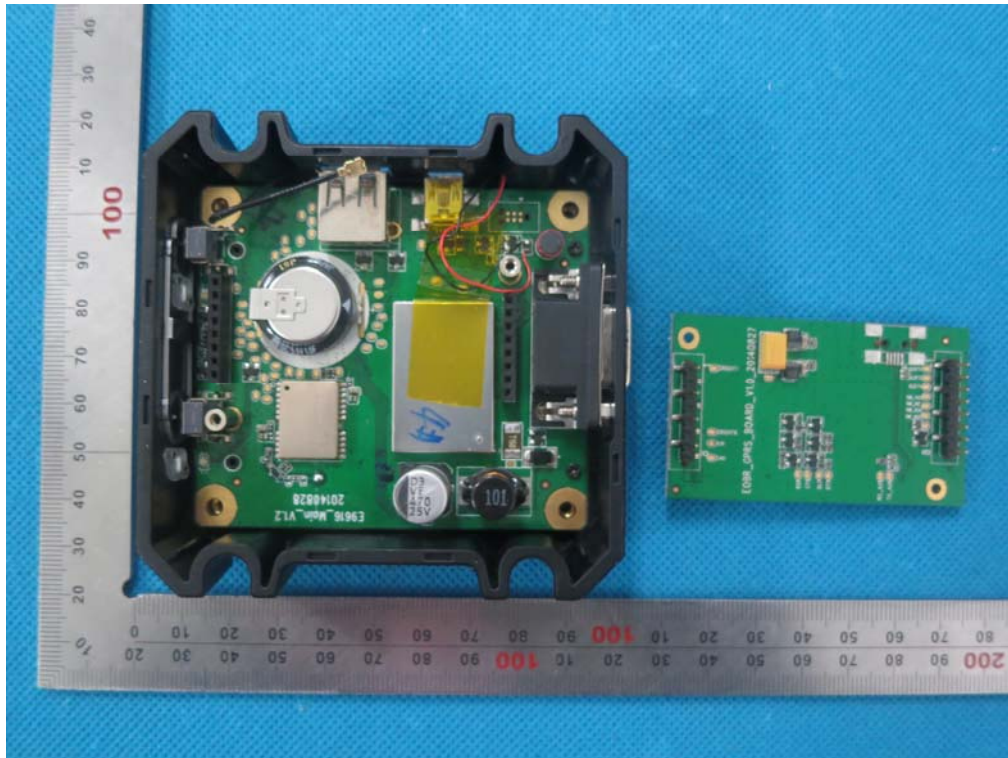
RIGHT VIEW OF EUT



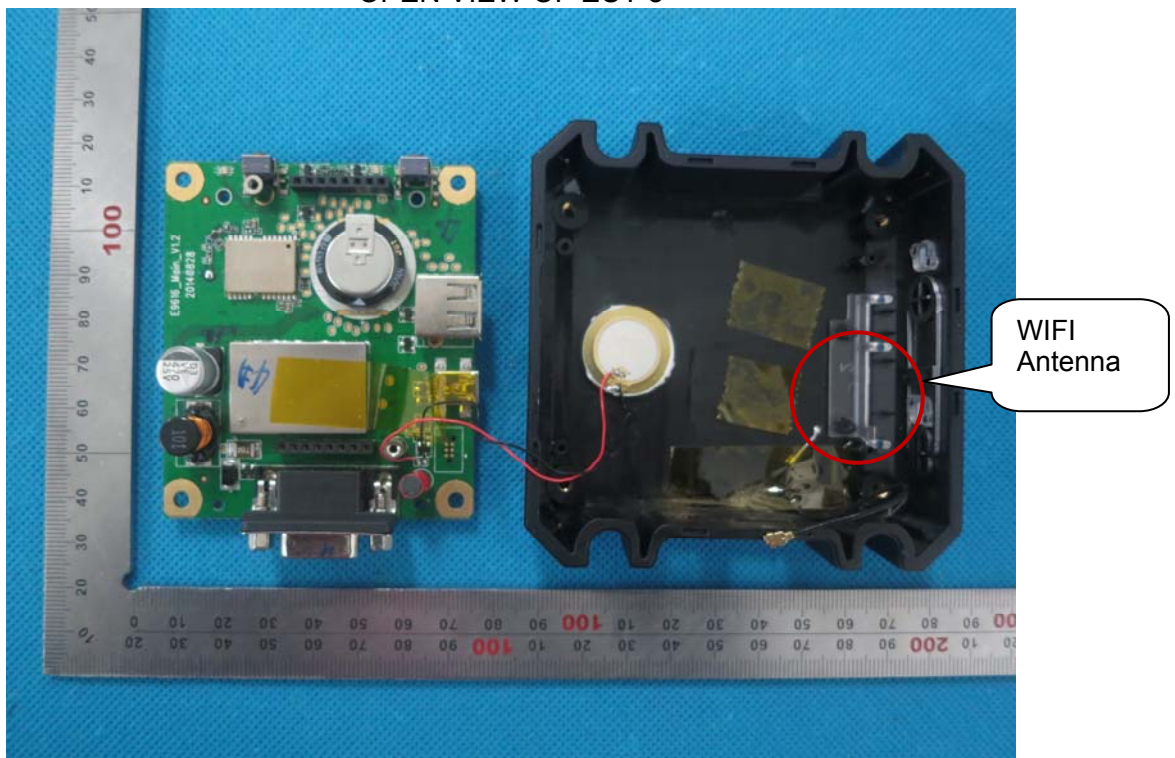
OPEN VIEW OF EUT-1



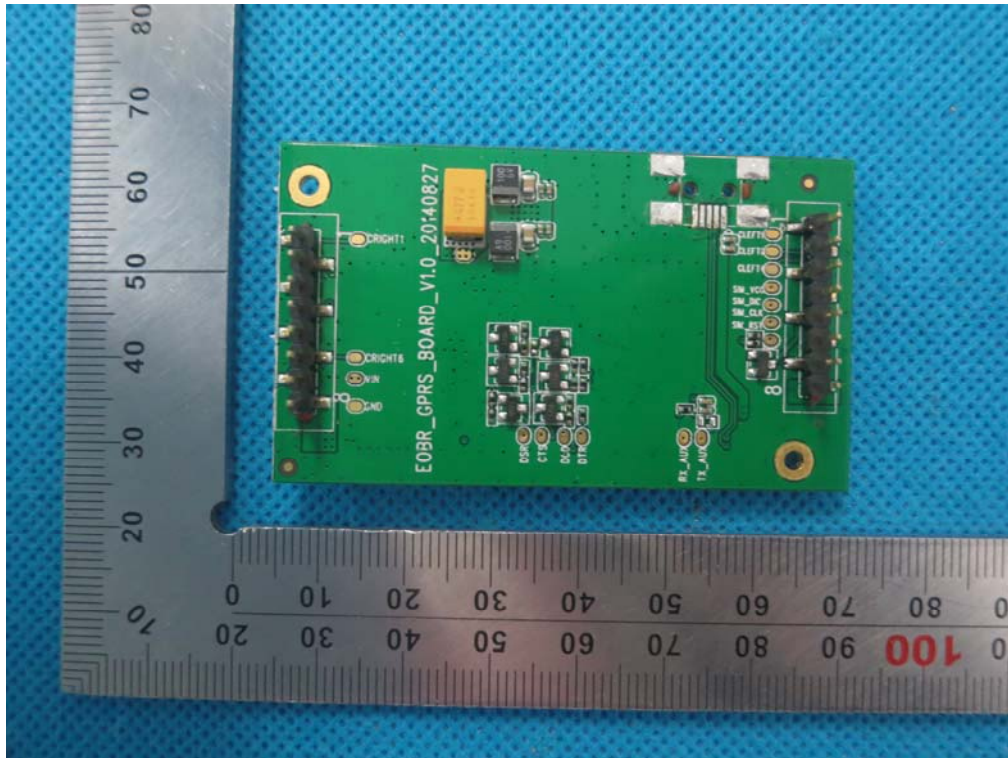
OPEN VIEW OF EUT-2



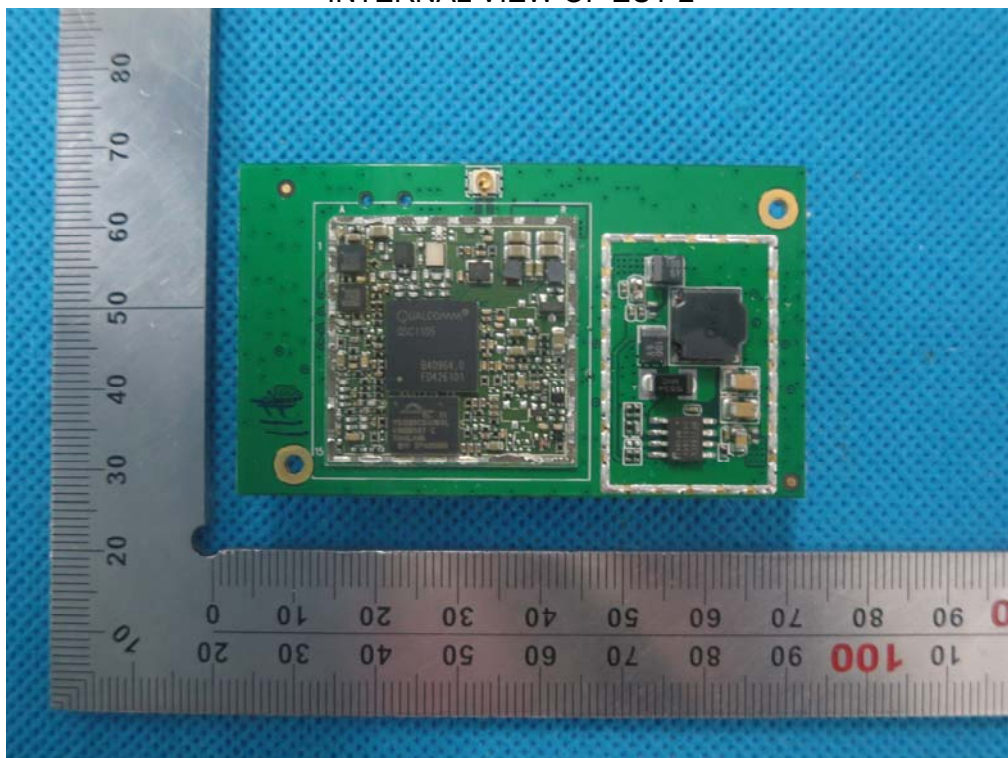
OPEN VIEW OF EUT-3



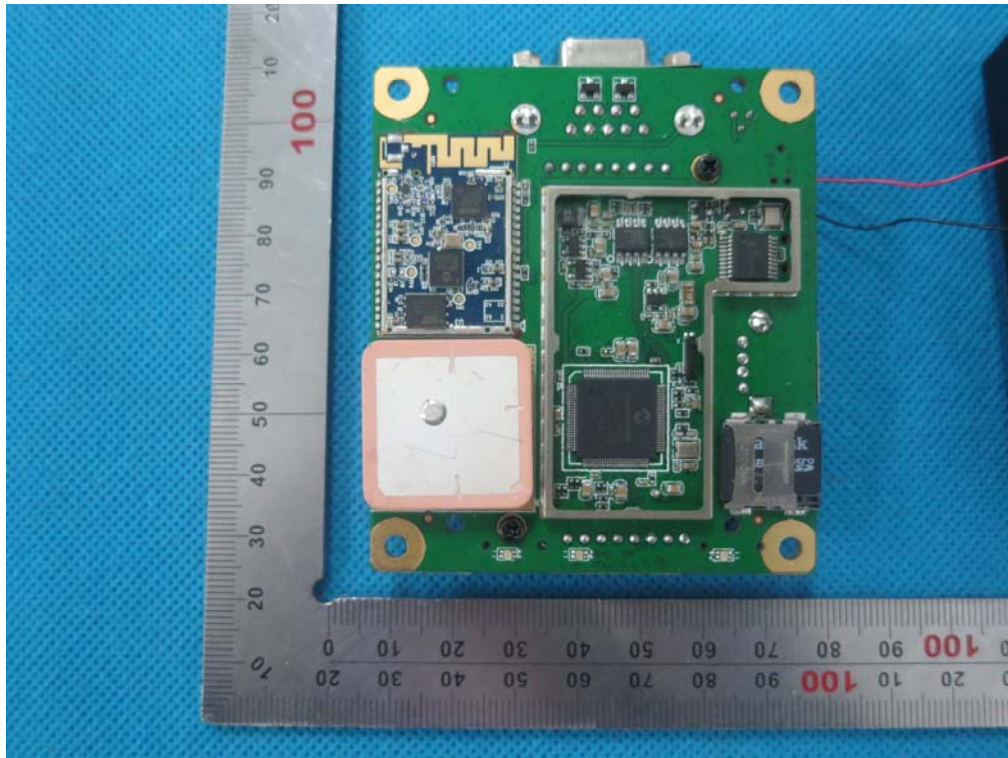
INTERNAL VIEW OF EUT-1



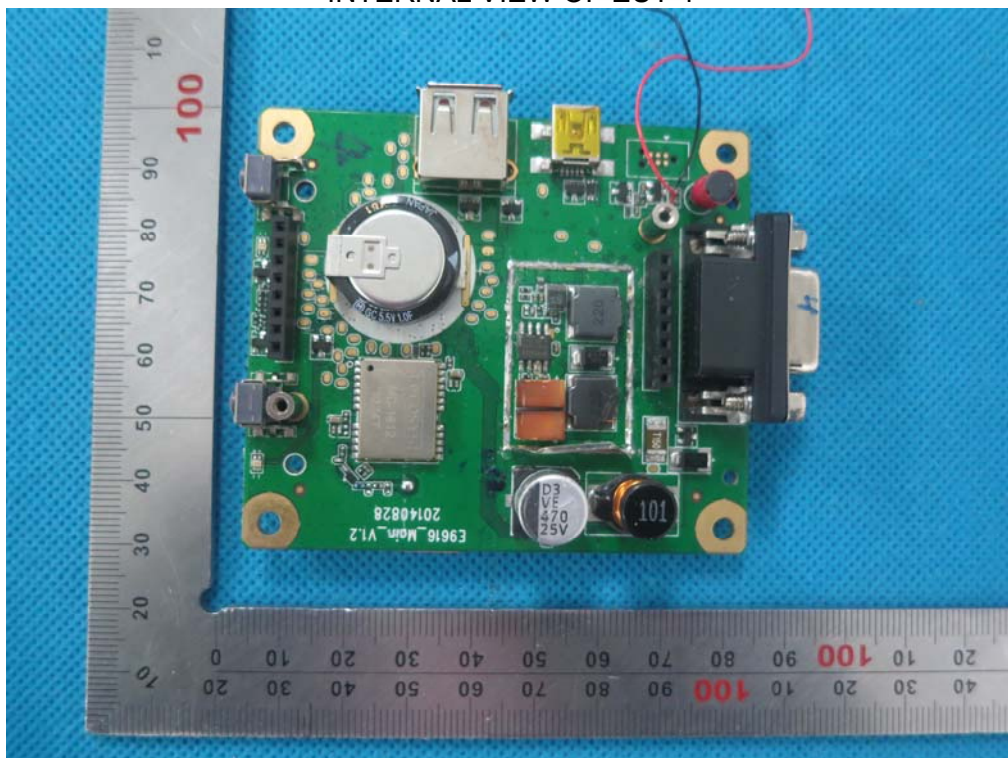
INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



INTERNAL VIEW OF EUT-4



-----END OF REPORT-----