TEST REPORT

of

FCC Part 15 Subpart B &
INDUSTRY CANADA ICES-003, CLASS B

☐ New Application; ☐ Class I PC; ☒ Class II PC

Product :	**Skorpio X3**
Brand:	**Datalogic**
Model:	**Skorpio X3**
Model Difference:	**N/A**
FCC Rule Part:	**Part 15 B Certification**
IC Rule Part:	**ICES-003: Issue 5, 2012**
	FCC ID: U4G0060
Applicant:	**Datalogic ADC S.r.l.**
Address:	**Via S. Vitalino 13, Lippo di Calderara di Reno, 40012, Italy**

Test Performed by:

International Standards Laboratory

<Lung-Tan LAB>
*Site Registration No.
BSMI: SL2-IN-E-0013; MRA TW1036; TAF: 0997; IC: IC4067B-3;
*Address:
No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.
Lung-Tan Hsiang, Tao Yuan County 325, Taiwan
*Tel : 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-14LR265FB**

Issue Date : **2014/12/01**

Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.

This report MUST not be used to claim product endorsement by TAF, NVLAP or any agency of the Government.

CERTIFICATION OF COMPLIANCE

Applicant:	Datalogic ADC S.r.l.
Product Description:	Skorpio X3
Brand Name:	Datalogic
Model No.:	Skorpio X3
Model Difference:	N/A
FCC Rule Part:	Part 15 B Certification
IC Rule Part:	ICES-003: Issue 5, 2012
Date of test:	2014/11/03 ~ 2014/11/28
Date of EUT Received:	2014/11/03

We hereby certify that:

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Test By:	Jason Chao	***Date:***	2014/12/01
	Jason Chao / Engineer		
Prepared By:	Elisa Chen	***Date:***	2014/12/01
	Elisa Chen / Specialist		
Approved By:	Vincent Su	***Date:***	2014/12/01
	Vincent Su / Technical Manager		

Version

Version No.	Date	Description
00	2014/12/01	Initial creation of document

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1. GENERAL INFORMATION

General:

Product Name:	Skorpio X3
Brand Name:	Datalogic
Model No.:	Skorpio X3
Li-ion Battery:	3.7V 5200mAh, Model: BT-0016
Adaptor:	Model: PSM08R-050 Input: 100~240V/50~60Hz, Output: 5V/1600mA
RS232 port:	One provided for data link
Mini USB port:	One provided for battery charger
RF function:	802.11 abgn wifi + BT

Remark: The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.1. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for Part15 Subpart B, is authorized under Certification and Industry Canada ICES-003: Issue 5, 2012 procedure.

1.2. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2009) and RSS-Gen. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.3. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of **International Standards Laboratory** <Lung-Tan LAB> No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd., Lung-Tan Hsiang, Tao Yuan County 325, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2009. FCC Registration Number is: TW1036, Canada Registration Number: 4067B-3.

1.4. Special Accessories

Not available for this EUT intended for grant.

1.5. Equipment Modifications

Not available for this EUT intended for grant.

2. System Test Configuration

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the normal mode.

2.3. Test Procedure

2.3.1 Conducted Emissions

The EUT was connected to 110Vac/60Hz and placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 of ANSI C63.4: 2009. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

2.3.2 Radiated Emissions

The EUT was connected to 110Vac/60Hz and placed on turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna. according to the requirements in Section 8 of ANSI C63.4: 2009.

2.4. Limitation

(1) Conducted Emission

According to section 15.107(a), ICES-003, RSS-GEN, Section 7.2.4. Conducted Emission Limits is as following.

Frequency range MHz	Class B Limits dB (uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

(2) Radiated Emission

According to section 15.109(a). Radiated Emission Class B Limits is as following:

Frequency (MHz)	Field strength μV/m	Distance (m)	Field strength at 3m dBμV/m
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

Standard	Date	Description
CISPR 22	2010	Limits and methods of measurement of radio interference characteristics of information technology equipment.

CISPR 22 Limit:

Frequency range	Limits dBuV/m (10m)
MHz	Quasi-peak
30 to 230	30
230 to 1000	37

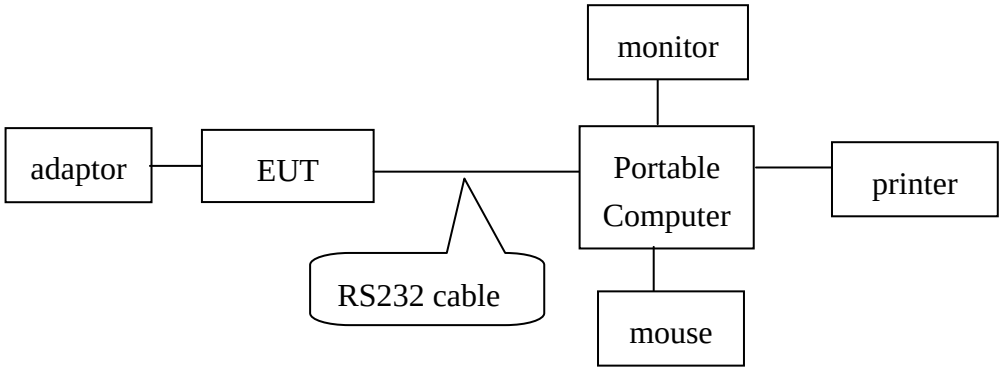
Frequency range	Limits dBuV/m (3m)	
GHz	Average	Peak
1 to 3	50	70
3 to 6	54	74

Remark: 1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of 3 meters.

2.5. Configuration of Tested System

Fig. 1-1 Configuration

Configuration 1



Remote Side

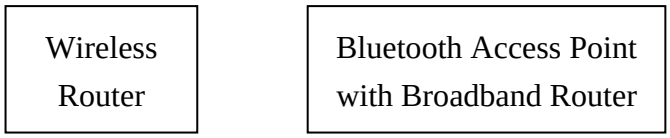


Table 1-1 Support Equipment Used in Tested System

Item	Equipment	Mrf/Brand	Model name	Series No	Data Cable	Power Cable
1	Portable Computer	IBM	2371	AA-GGYHK	N/A	Non-shielded /1.8M
2	24” LCD Monitor	DELL	ST2420Lb	N/A	Shielded /1.8M	Non-shielded /1.8M
3	DELL USB mouse	DELL	MO56UC	G17009ZJ	Shielded /1.8M	N/A
4	Printer	LEXMARK	Z43	4101002	Shielded /1.8M	Non-shielded /1.8M
5	Wireless Router	D-Link	DI-624	N/A	N/A	Non-shielded /1.8M
6	Bluetooth Access Point with Broadband Router	Billionton	GAPBTCS1-BUS	N/A	N/A	Non-shielded /1.8M

I/O Cable Condition of EUT and Support Units

Description	Path	Cable Length	Cable Type	Connector Type
AC Power Cable	110V (~240V) to Portable Computer SPS	1.8M	Non-shielded	Plastic Head
USB mouse Data Cable	USB mouse to Portable Computer USB Port	1.8M	Shielded	Metal Head
Monitor Data Cable	24” LCD Monitor D-SUB Port to Portable Computer D-SUB Port	1.8M	Shielded (with core)	Metal Head
Printer Data Cable	Print to Personal Compute Parallel Port	1.8M	Shielded	Metal Head
RS232 Data Cable	PC RS232 port to EUT RS232 port	2M	Shielded	Metal Head

Note: All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

Grounding: Grounding was in accordance with the manufacturer’s requirements and conditions for the intended use.

3. Summary of Test Results

FCC Rules	Description Of Test	Result
§15.107 ICES-003 CISPR 22	Conducted Emission Class B	Compliant
§15.109 ICES-003 CISPR 22	Radiated Emission(Below 1GHz) Class B	Compliant
§15.109 ICES-003 CISPR 22	Radiated Emission(above 1GHz) Class B	Compliant

4. Description of test modes

This is a modular application and the EUT was stayed in normal operation mode.

Test Plan

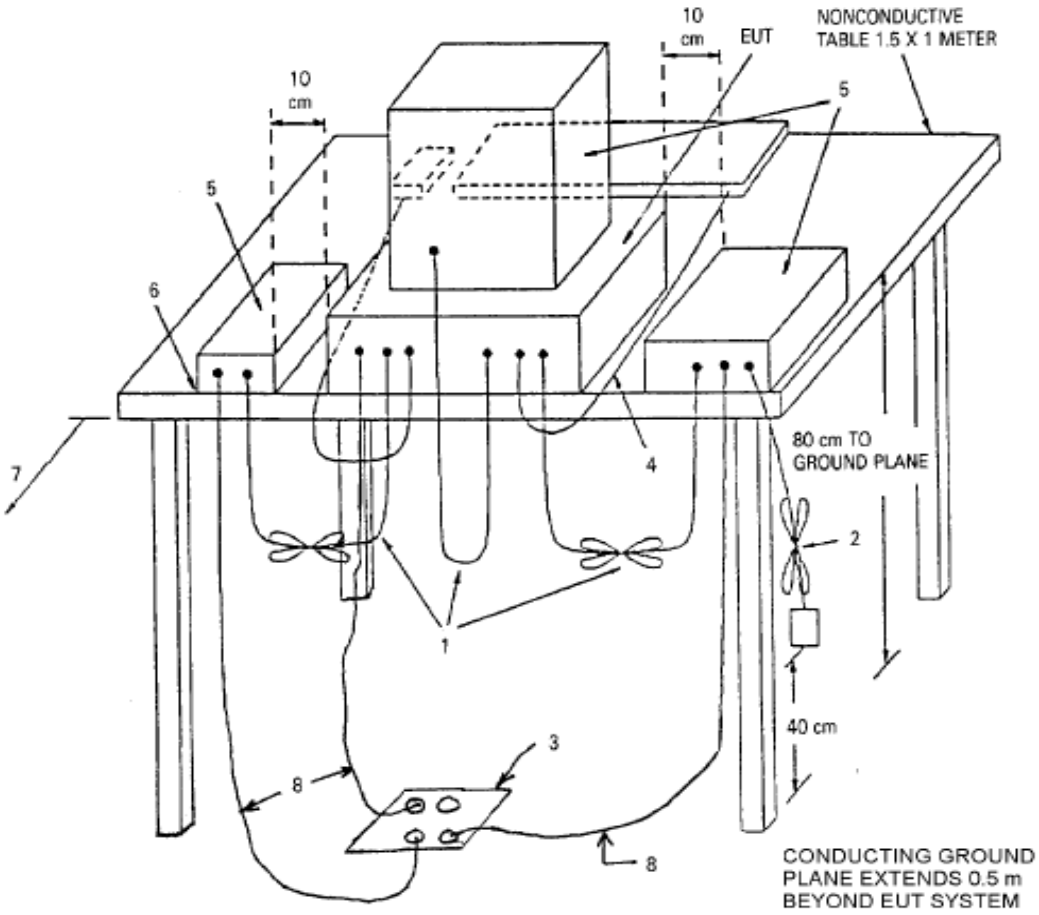
	config 1
Applicable standard	FCC 15B、ICES003
Accessories	UE
	+Battery
	+ AC Adaptor
	Model:PSM08R-050
Description	UE with direct charge and RS232 link with Wifi + BT
Radiated emission	measured
Conducted emission (AC Power)	measured
Telecommunication emission	N/A

5. Conducted Emissions Test

5.1. Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

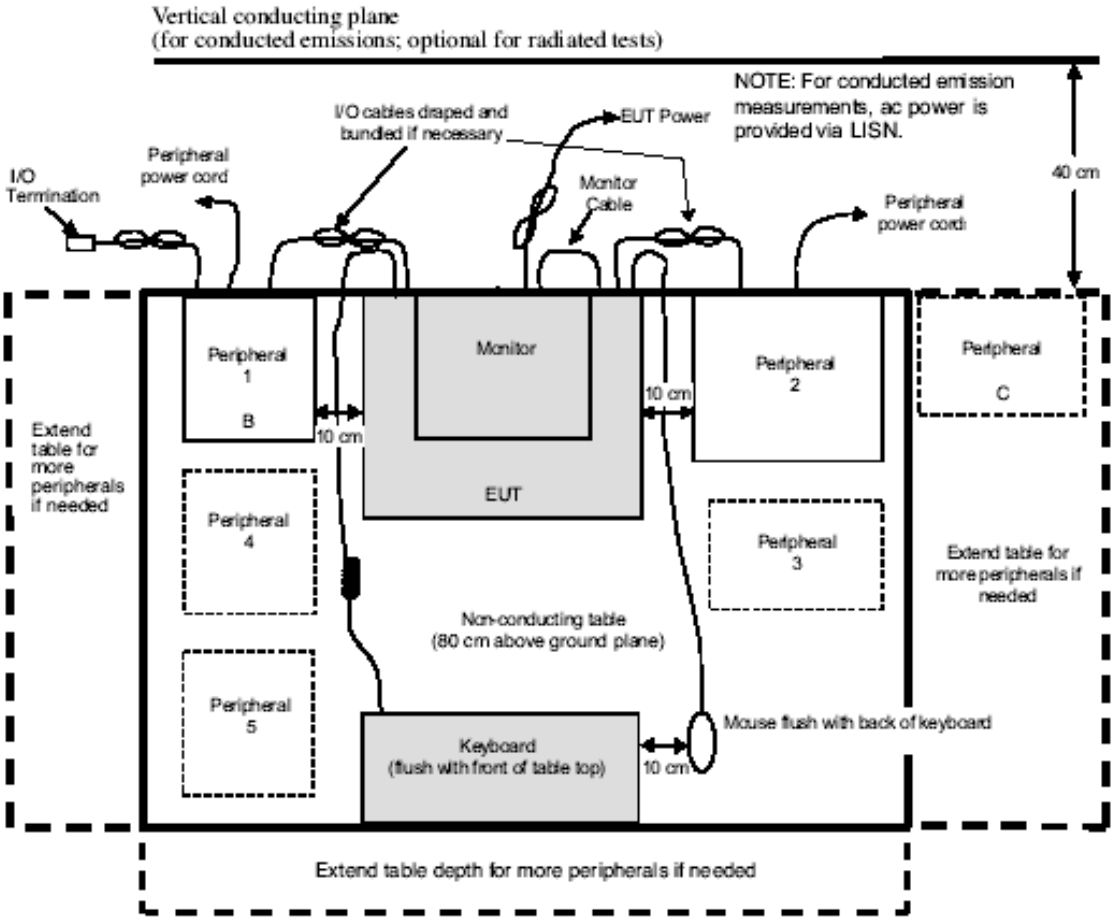
5.2. Test SET-UP (Block Diagram of Configuration)



LEGEND:

1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center, forming a bundle 30 to 40 cm long (see 6.1.4 and 11.2.4).
2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated if required using the correct terminating impedance. The total length shall not exceed 1 m (see 6.1.4).
3) If LISNs are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground plane with the receptacle flush with the ground plane (see 6.1.4).
4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use (see 6.2.1.3 and 11.2.4).
5) Non-EUT components of EUT system being tested (see also Figure 13).
6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop (see 6.2.1.1 and 6.2.1.2).
7) No vertical conducting plane used (see 5.2.2).

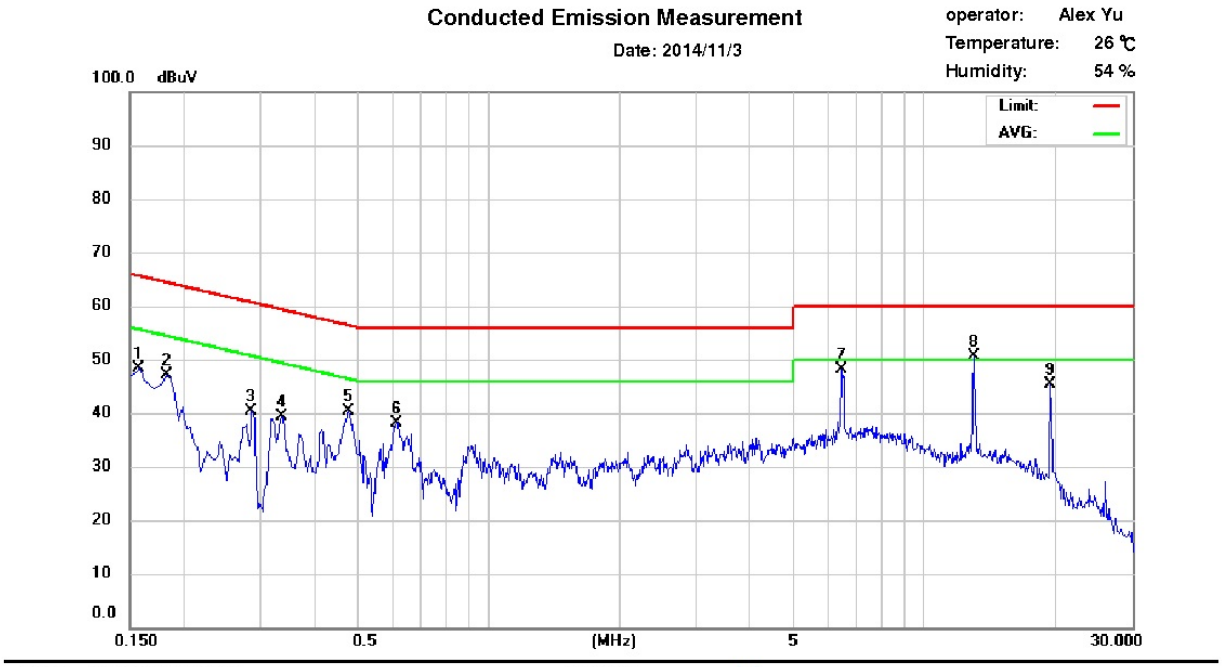
Figure 11a—Test arrangement for radiated emissions tabletop equipment



5.3. Measurement Equipment Used:

Location Con02	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conduction 02	LISN 15	R&S	ENV216	101335	10/08/2014	10/08/2015
Conduction 02	LISN 06	ROHDE&SCHWARZ	ESH3/Z5	828874/009	02/25/2014	02/25/2015
Conduction 02	Conduction 02-1 Cable	WOKEN	CFD 300-NL	Conduction 02 -1	07/01/2014	07/01/2015
Conduction 02	EMI Receiver 18	ROHDE& SCHWARZ	ESCI	101392	11/11/2014	11/11/2015
Conduction 02	ISN T2 01	FCC	FCC-TLISN-T2-02	20253	11/21/2014	11/21/2015
Conduction 02	ISN T8 05	Teseq GmbH	ISN T800	30305	04/23/2014	04/23/2015

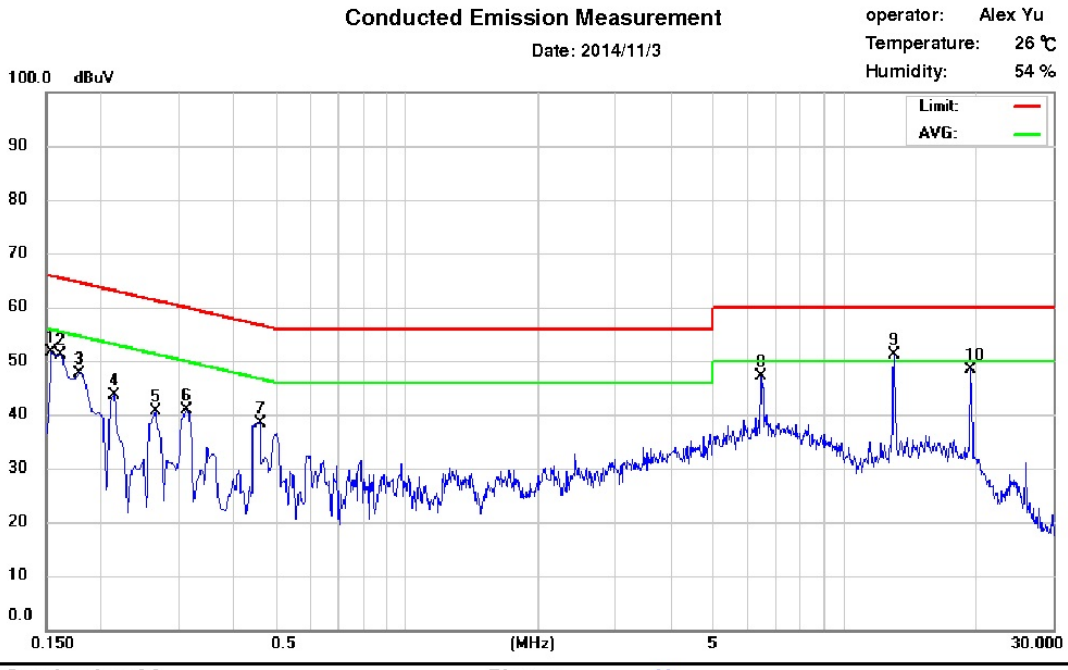
5.4. Measurement Result:



Site: Conduction 04 Phase: *L1*

Limit: CISPR22 Class B Conduction(QP)

No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.158	9.63	47.93	65.57	-17.64	36.17	55.57	-19.40	
2	0.182	9.61	44.31	64.39	-20.08	33.27	54.39	-21.12	
3	0.286	9.60	35.88	60.64	-24.76	22.95	50.64	-27.69	
4	0.334	9.60	36.11	59.35	-23.24	25.38	49.35	-23.97	
5	0.478	9.61	37.64	56.37	-18.73	29.38	46.37	-16.99	
6	0.614	9.61	34.12	56.00	-21.88	25.43	46.00	-20.57	
7	6.482	9.79	45.51	60.00	-14.49	40.15	50.00	-9.85	
8	13.014	9.94	48.94	60.00	-11.06	43.86	50.00	-6.14	
9	19.494	10.07	44.65	60.00	-15.35	39.55	50.00	-10.45	



Site: Conduction 04 Phase: *N*

Limit: CISPR22 Class B Conduction(QP)

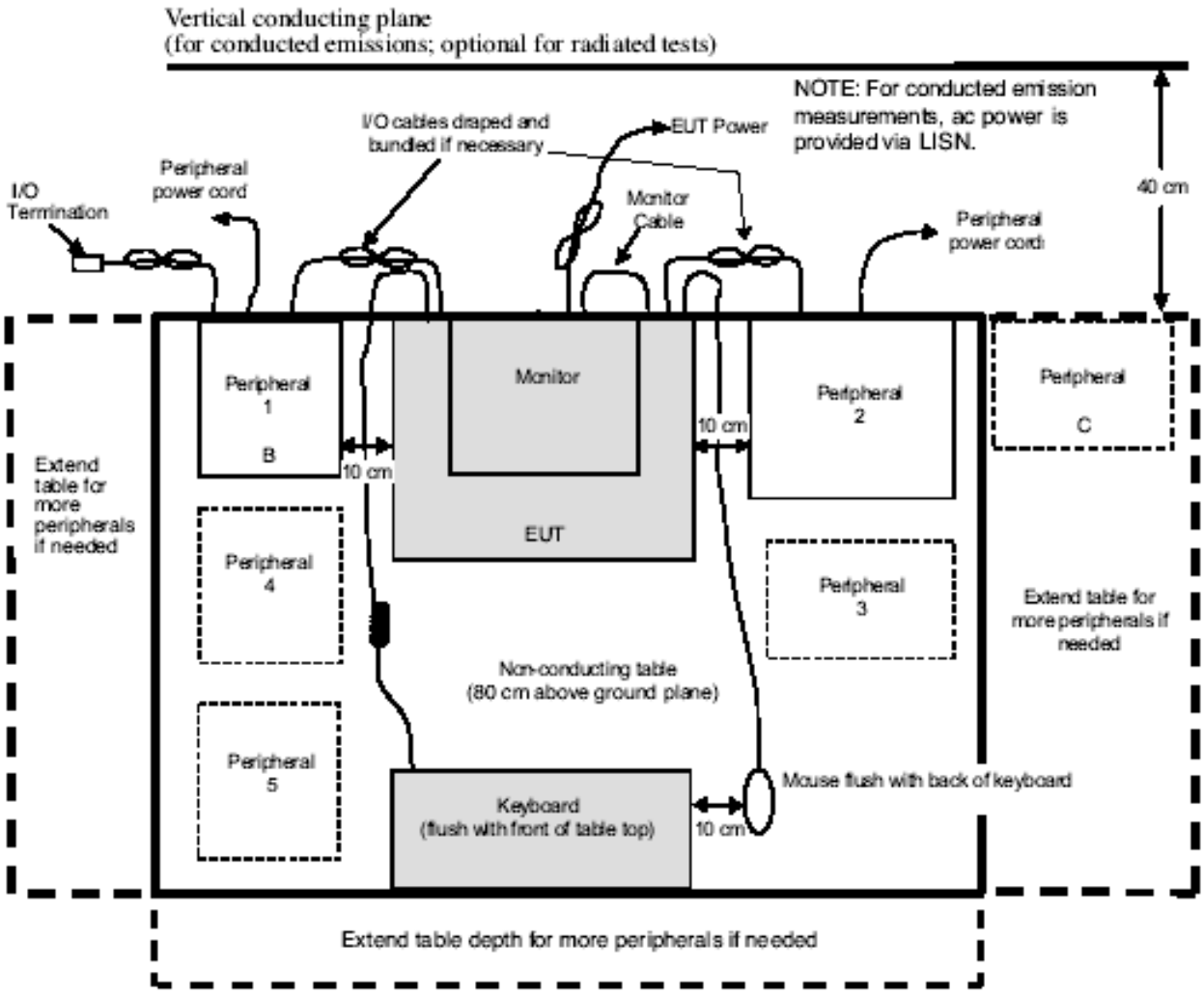
No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.154	9.62	49.65	65.78	-16.13	34.98	55.78	-20.80	
2	0.162	9.62	47.41	65.36	-17.95	34.90	55.36	-20.46	
3	0.178	9.62	44.41	64.58	-20.17	30.01	54.58	-24.57	
4	0.214	9.62	38.85	63.05	-24.20	22.57	53.05	-30.48	
5	0.266	9.62	34.75	61.24	-26.49	19.94	51.24	-31.30	
6	0.314	9.61	37.22	59.86	-22.64	23.26	49.86	-26.60	
7	0.462	9.62	34.83	56.66	-21.83	23.64	46.66	-23.02	
8	6.482	9.81	44.68	60.00	-15.32	39.99	50.00	-10.01	
9	13.010	9.96	50.58	60.00	-9.42	44.49	50.00	-5.51	
10	19.494	10.09	47.74	60.00	-12.26	42.55	50.00	-7.45	

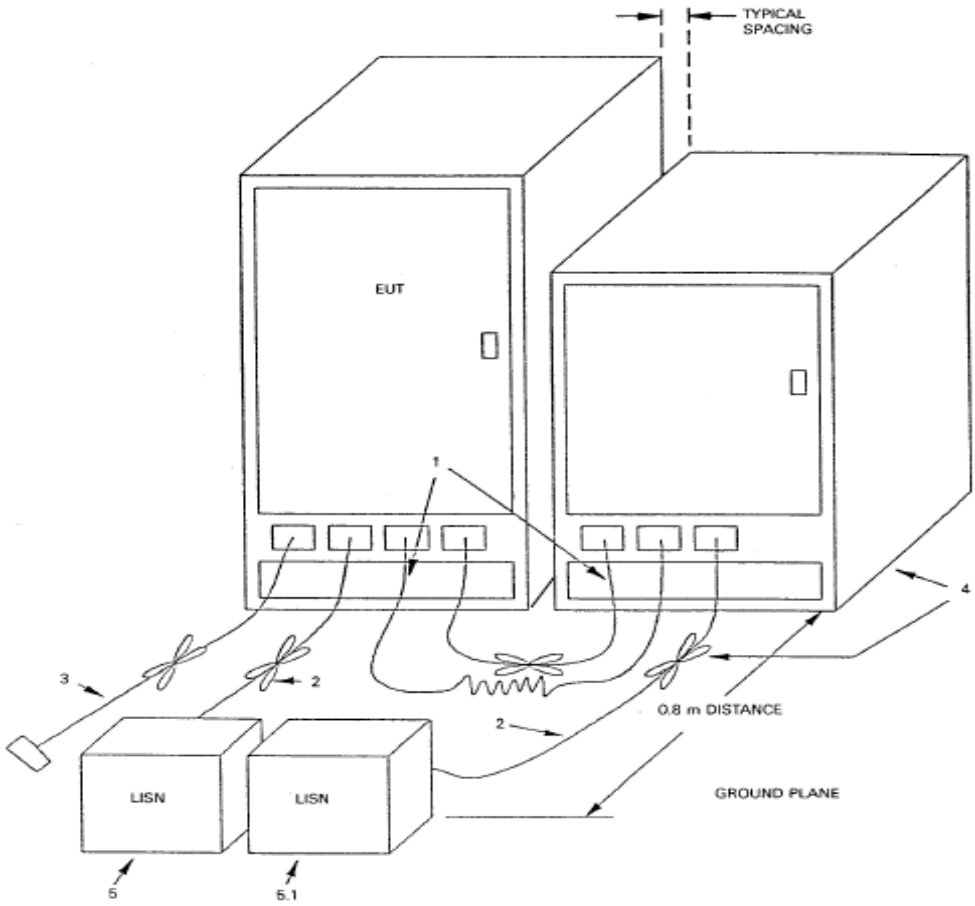
6. Radiated Emission Test

6.1. Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

6.2. Test SET-UP (Block Diagram of Configuration)





LEGEND:

1) Excess I/O cables shall be bundled in the center. If bundling is not possible, the cables shall be arranged in serpentine fashion. Bundling shall not exceed 40 cm in length (see 6.1.4 and 11.2.4).
2) Excess power cords shall be bundled in the center or shortened to appropriate length (see 7.2.1).
3) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. If bundling is not possible, the cable shall be arranged in serpentine fashion (see 6.1.4).
4) EUT and all cables shall be insulated, if required, from the groundplane by up to 12 mm of insulating material (see 6.1.4 and 6.2.2).
5) EUT connected to one LISN. LISN can be placed on top of, or immediately beneath, the groundplane. 5.1) All other equipment powered from a second LISN or additional LISN(s) (see 5.2.3 and 7.2.1). 5.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.

Figure 10b—Test arrangement for conducted emissions floor-standing equipment

6.3. Measurement Equipment Used:

Location Chamber12	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Radiation (Chamber12)	BILOG Antenna 04	Schaffner	CBL6112B	2764	02/18/2014	02/18/2015
Radiation (Chamber12)	Coaxial Cable Chmb 12-10M-01	PEWC	CFD400-NL	Chmb 12-10M-01	07/10/2014	07/10/2015
Radiation (Chamber12)	EMI Receiver 10	ROHDE & SCHWARZ	ESCI	100567	07/25/2014	07/25/2015

Location Chamber14	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Rad. Above 1GHz	Spectrum Analyzer 22(chamber12)	R&S	FSU43	100143	05/07/2014	05/07/2015
Rad. Above 1GHz	Spectrum Analyzer 24 (1G~26.5GHz)	Agilent	N9010A	MY49060537	07/29/2014	07/29/2015
Rad. Above 1GHz	Horn Antenna 04 (18G~26G)	Com-Power	AH-826	081-001	05/14/2013	05/14/2015
Rad. Above 1GHz	Horn Antenna 05 (26G~40G)	Com-Power	AH-640	100A	01/09/2013	01/09/2015
Rad. Above 1GHz	Horn Antenna 06 (1G~18G)	ETS	3117	00066665	11/04/2014	11/04/2015
Rad. Above 1GHz	Preamplifier 13	MITEQ	JS44-00101800-25-10P-44	1329256	07/30/2014	07/30/2015
Rad. Above 1GHz	Preamplifier 23 (18G~40G)	EMC I	EMC184045B	980158	06/11/2014	06/11/2015
Rad. Above 1GHz	Microwave Cable 22 (1G~18G)	HUBER SUHNER	SUCOFLEX 106	501360/6 and 501361/6	02/17/2014	02/17/2015
Rad. Above 1GHz	Microwave Cable-01_2010	HUBER SUHNER	SUCOFLEX 102	35145/2	10/09/2014	10/09/2015
Rad. Above 1GHz	Microwave Cable-08	HUBER SUHNER	SUCOFLEX 102	35633/2	10/09/2014	10/09/2015

6.4. Field Strength Calculation

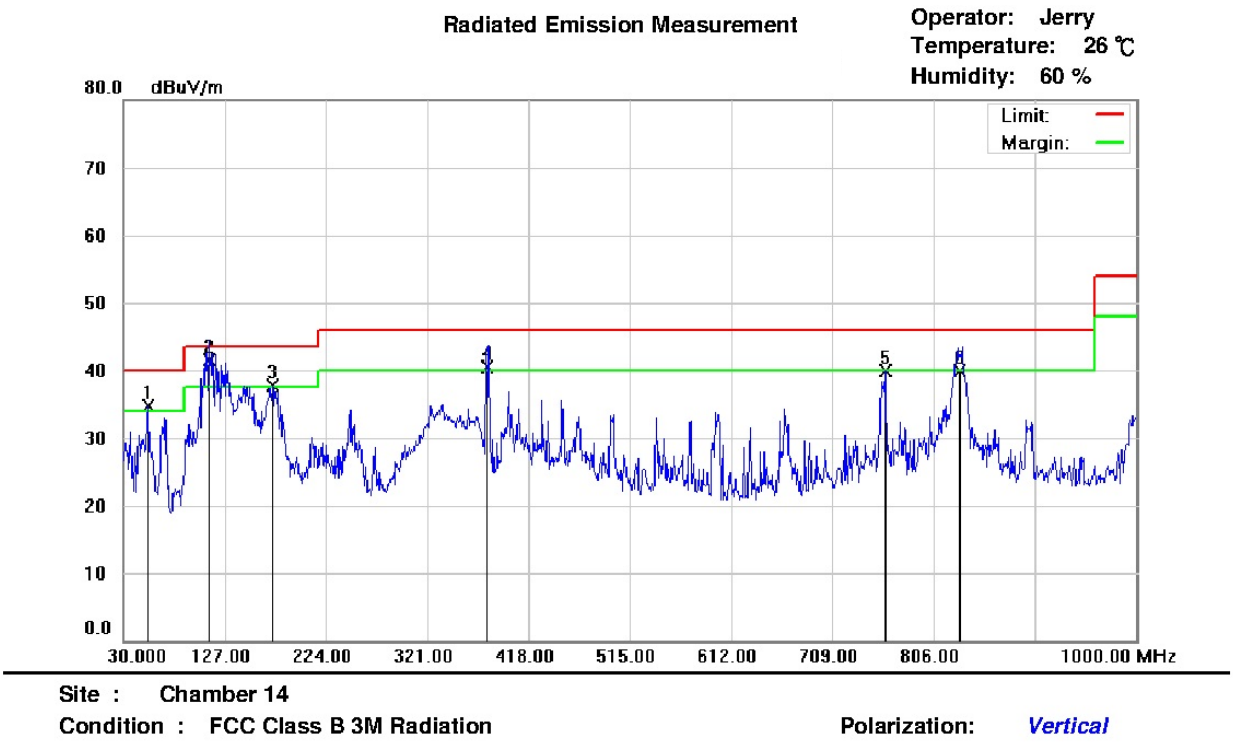
The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

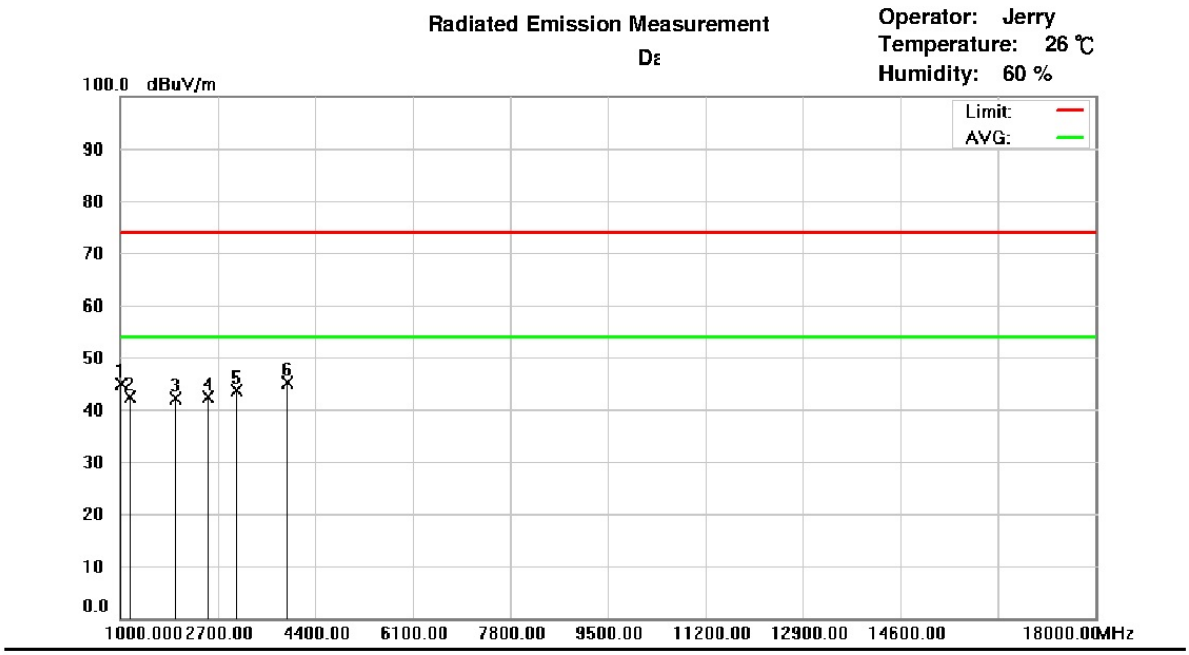
Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

Measurement Result:

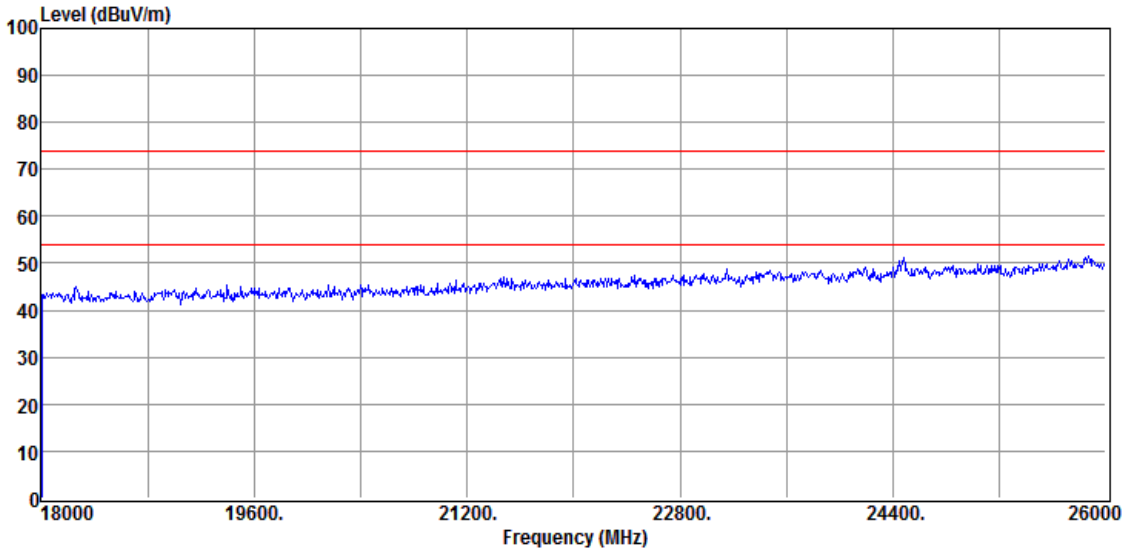
Operation Mode:	Config 1	Test Date:	2014/11/26
Test By:	Jason		



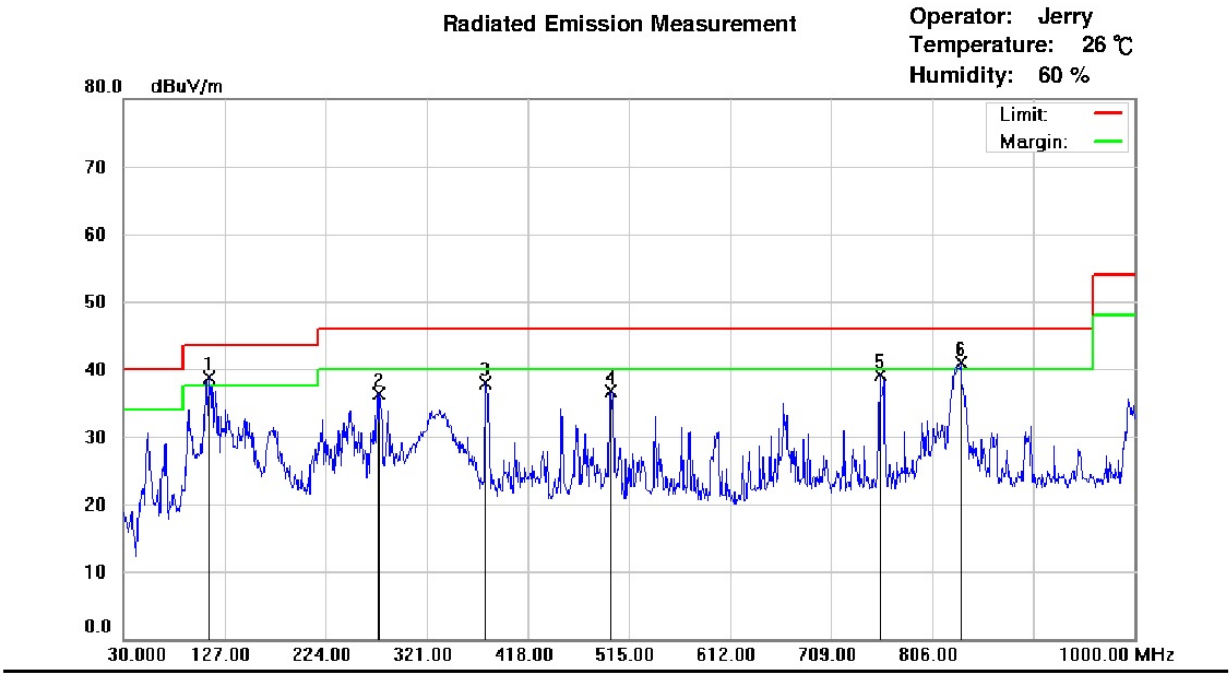
Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	53.28	53.10	-18.41	34.69	40.00	-5.31	310	82	peak
2	111.74	56.12	-14.64	41.48	43.50	-2.02	100	272	QP
3	172.59	54.29	-16.56	37.73	43.50	-5.77	112	251	peak
4	377.73	50.56	-9.97	40.59	46.00	-5.41	100	136	QP
5	759.44	45.91	-5.99	39.92	46.00	-6.08	100	130	peak
6	830.60	44.83	-4.90	39.93	46.00	-6.07	111	162	QP



Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	1000.00	61.26	-16.26	45.00	74.00	-29.00	303	82	peak
2	1170.00	58.50	-16.13	42.37	74.00	-31.63	100	205	peak
3	1969.00	54.39	-12.31	42.08	74.00	-31.92	203	175	peak
4	2530.00	53.35	-11.03	42.32	74.00	-31.68	291	79	peak
5	3023.00	53.50	-9.99	43.51	74.00	-30.49	270	30	peak
6	3907.00	54.42	-9.31	45.11	74.00	-28.89	144	346	peak



Operation Mode:	Config 1	Test Date:	2014/11/26
Test By:	Jason		

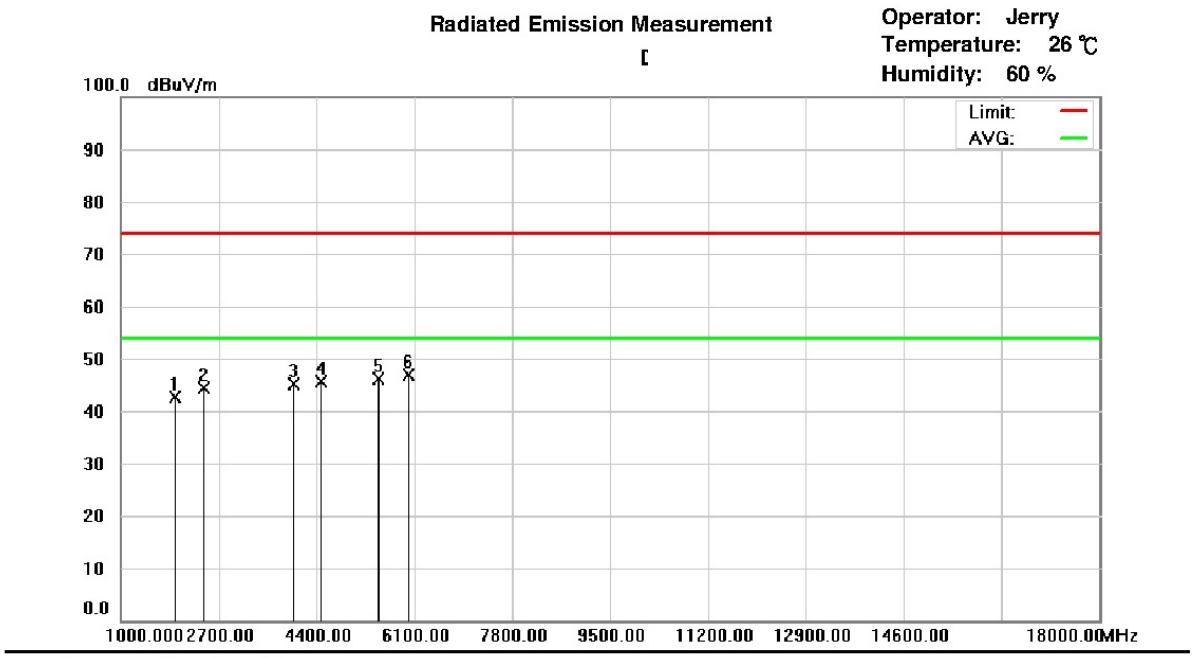


Site : Chamber 14

Condition : FCC Class B 3M Radiation

Polarization: *Horizontal*

Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	111.48	53.43	-14.64	38.79	43.50	-4.71	100	330	peak
2	275.41	48.53	-12.22	36.31	46.00	-9.69	100	202	peak
3	377.26	47.95	-9.98	37.97	46.00	-8.03	280	308	peak
4	497.54	45.25	-8.55	36.70	46.00	-9.30	261	66	peak
5	755.56	45.18	-6.04	39.14	46.00	-6.86	354	323	peak
6	833.16	45.79	-4.86	40.93	46.00	-5.07	144	348	peak



Site : Chamber 14

Condition : FCC Class B Radiation(Peak) Polarization: *Horizontal*

Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	1935.00	55.20	-12.57	42.63	74.00	-31.37	112	137	peak
2	2428.00	55.53	-11.24	44.29	74.00	-29.71	119	106	peak
3	3992.00	54.29	-9.18	45.11	74.00	-28.89	399	50	peak
4	4468.00	54.62	-9.09	45.53	74.00	-28.47	320	226	peak
5	5471.00	54.25	-8.21	46.04	74.00	-27.96	121	276	peak
6	5998.00	54.19	-7.31	46.88	74.00	-27.12	232	34	peak