

EMC TEST REPORT

Report No. : EME-040461

Model No. : 51183

Issued Date : July 5, 2004

Applicant : SHENZHEN CHUANGJIEXING ELECTRONICS
3/F., BLDG. A6, LAODONG 1ST INDUSTRIAL Zone
XIXIANG, SHENZHEN

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Project Engineer

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Reviewed By

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Summary of Tests**Outdoor Remotely Operated Switch -Model: 51183**
FCC ID: R3X0010819159

Test	Reference	Results
Conducted Emission of AC Power	15.207	Complies
Radiated Emission test	15.231(b), 15.209	Complies
Measured bandwidth	15.231(c)	Complies

1. General information

1.1 Identification of the EUT

Manufacturer	: SHENZHEN CHUANGJIEXING ELECTRONICS
Product	: Outdoor Remotely Operated Switch
Model No.	: 51183
FCC ID.	: R3X0010819159
Frequency Range	: 315MHz
Channel Number	: Single
Frequency of each channel	: 315 MHz
Type of Modulation	: PCM
Power Supply (Tx)	: 12 Vdc
Power Supply (Rx)	: 120Vac, 60Hz
Power Cord	: N/A
Sample Received	: Apr. 27, 2004
Test Date(s)	: June 24, 2004 ~ June 29, 2004

1.2 Additional information about the EUT

The EUT is an Outdoor Remotely Operated Switch, and was defined as information technology equipment.

The EUT has only one radio channel 315MHz. It used 16 kinds of different codes for different receiver and used channel label here only for different code, but frequency is still 315MHz.

51183 series model

	Model no. (Difference just in model no. for marketing purpose)				Function
Main model	51183	RS103K	28070	28069	Outdoor use
Series model	RS101	28068	-	-	Indoor use
Series model	TM313R	28468R	-	-	Outdoor use+Timing function

The difference between 51183, RS101 and TM313R are in receiver, the transmitters are the same. There are two types of transmitters; the difference of them only in the communication code that can be changed by setup the address pins of the demodulation IC of receiver

For more detail features, please refer to User's manual as file name "Installation guide.pdf"

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain : 0dBi

Antenna Type : Loop antenna

Connector Type : N/A

1.4 Peripherals equipment

Lamp (1000W for 51183/ TM313R; 600W for RS101)

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section 15.231.

2.2 Operation mode

The EUT has types of transmitters (includes two buttons and four-buttons).

After verifying two types of transmitters, we found the worst case was occurred at the four buttons' transmitter with setup 1, so the final test was executed under this condition and recorded in this report.

During all of the tests, the EUT (Tx) was operated in transmitting continuously.

Once the button is released, the transmission will be stopped within 1 second.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.	Series No.	Last Cal.Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	825788/014	June 6, 2004
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI	825428/005	June 24, 2004
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	100137	July 19, 2003
Horn Antenna	EMCO	1GHz~18GHz	3115	9906-5890	Sep. 19, 2003
Bilog Antenna	SCHWARZBECK	25MHz~1.7GHz	VULB 9160	3133	Feb. 21, 2004
Turn Table	HDGmbH	N/A	DS 420S	420/669/01	N/A
Antenna Tower	HDGmbH	N/A	MA 240	240/573	N/A
Microwave Amplifier	Agilent	2GHz~26.5GHz	8348A	3111A00567	Dec. 20, 2003
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5	EC344	Jan. 20, 2004

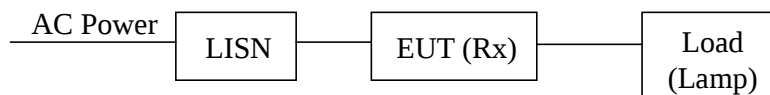
Note: The above equipments are within the valid calibration period.

3. Conducted emission test FCC 15.207

3.1 Operating environment

Temperature:	23	°C	(10-40°C)
Relative Humidity:	54	%	(10-90%)
Atmospheric Pressure	1023	hPa	(860-1061hPa)

3.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/1992 on conducted measurement.

The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

3.3 Emission limit

Freq. (MHz)	Maximum RF Line Voltage			
	Class A (dB μ V)		Class B (dB μ V)	
	Q.P.	Ave.	Q.P.	Ave.
0.15~0.50	79	66	66~56	56~46
0.50~5.00	73	60	56	46
5.00~30.0	73	60	60	50

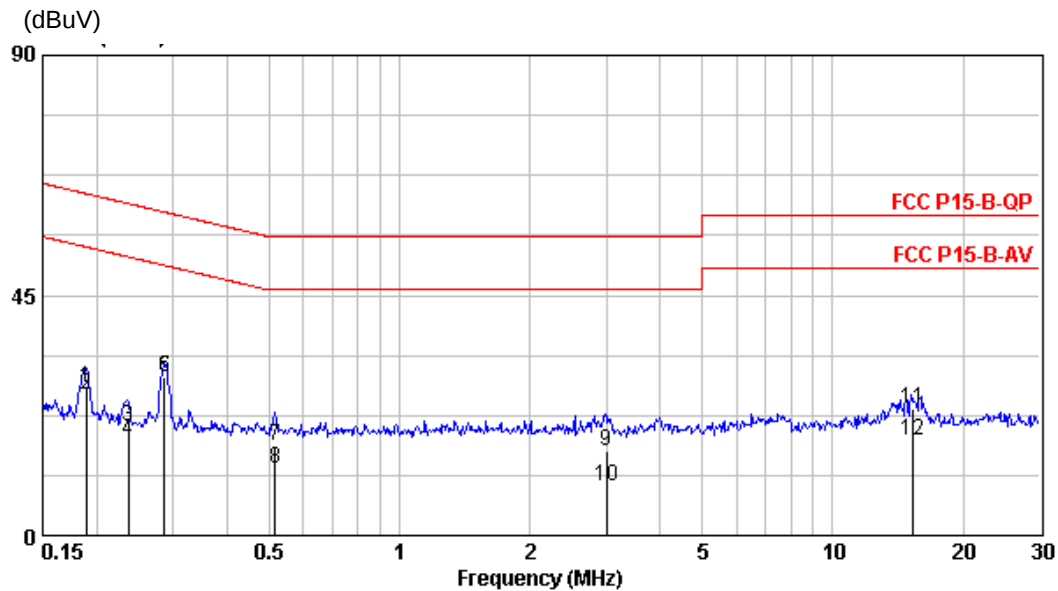
3.4 Conducted emission data FCC 15.207

Phase: Line
 Test Unit: 51183 (Rx)
 Test Condition: Power on with 1000W

Freq. (MHz)	Correction Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
0.189	0.10	27.56	64.08	-36.52	QP
0.189	0.10	26.51	54.08	-27.57	AVERAGE
0.236	0.10	20.59	62.23	-41.64	QP
0.236	0.10	17.64	52.23	-34.59	AVERAGE
0.286	0.10	29.81	60.64	-30.83	QP
0.286	0.10	29.64	50.64	-21.00	AVERAGE
0.516	0.10	16.78	56.00	-39.22	QP
0.516	0.10	12.59	46.00	-33.41	AVERAGE
3.001	0.15	15.86	56.00	-40.14	QP
3.001	0.15	9.10	46.00	-36.90	AVERAGE
15.248	0.70	23.59	60.00	-36.41	QP
15.248	0.70	17.71	50.00	-32.29	AVERAGE

Remark:

1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

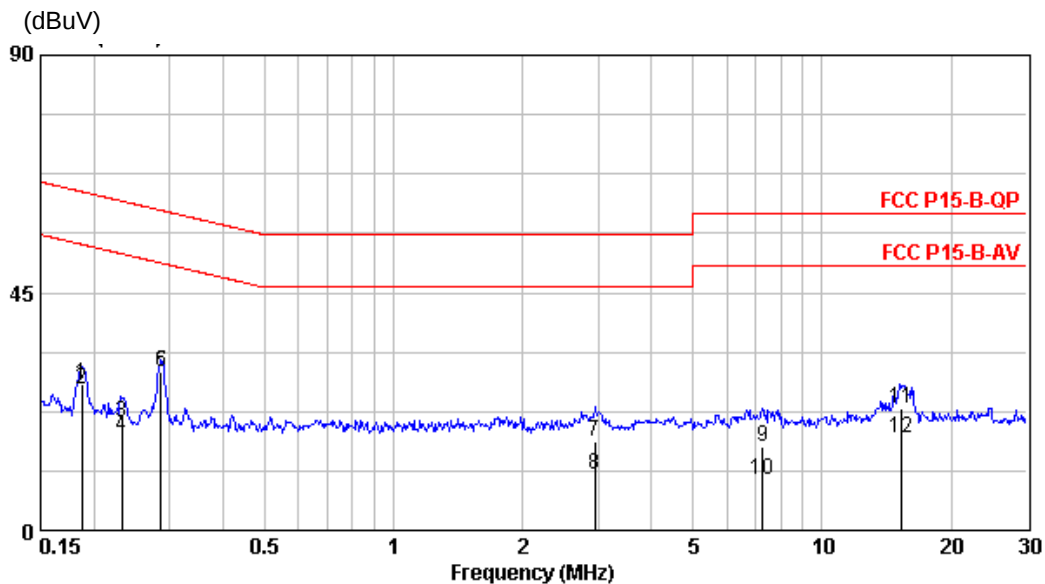


Phase: Neutral
 Test Unit: 51183 (Rx)
 Test Condition: Power on with 1000W

Freq. (MHz)	Correction Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
0.187	0.10	27.66	64.15	-36.49	QP
0.187	0.10	26.68	54.15	-27.47	AVERAGE
0.233	0.10	20.49	62.36	-41.87	QP
0.233	0.10	17.64	52.36	-34.72	AVERAGE
0.286	0.10	30.11	60.64	-30.53	QP
0.286	0.10	29.99	50.64	-20.65	AVERAGE
2.953	0.15	16.71	56.00	-39.29	QP
2.953	0.15	10.50	46.00	-35.50	AVERAGE
7.267	0.20	15.68	60.00	-44.32	QP
7.267	0.20	9.40	50.00	-40.60	AVERAGE
15.248	0.41	22.95	60.00	-37.05	QP
15.248	0.41	17.42	50.00	-32.58	AVERAGE

Remark:

1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

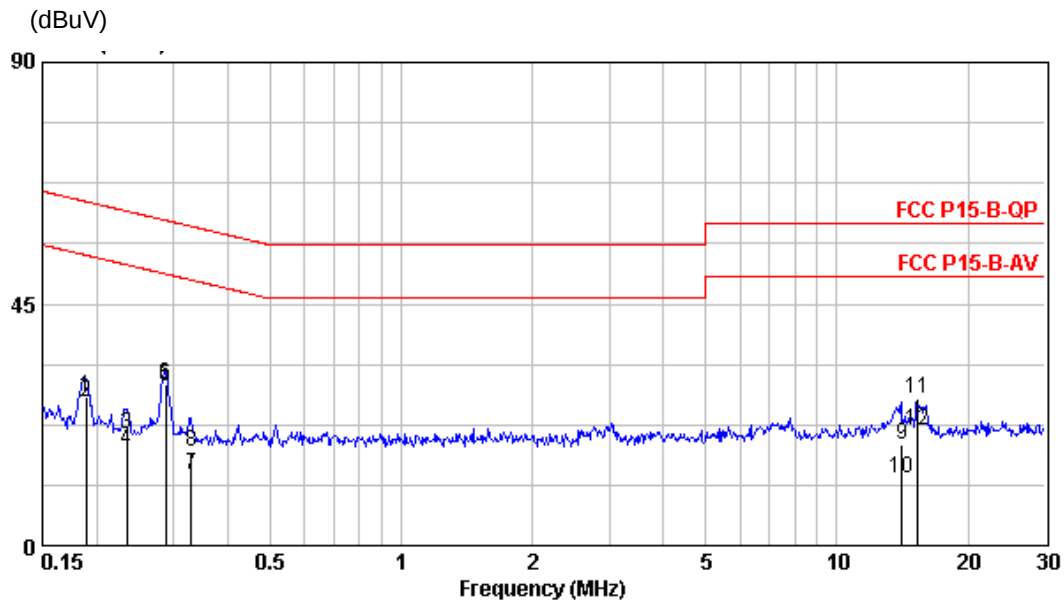


Phase: Line
 Test Unit: TM313R (Rx)
 Test Condition: Power on with 1000W

Freq. (MHz)	Correction Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
0.189	0.10	27.82	64.08	-36.26	QP
0.189	0.10	26.73	54.08	-27.35	AVERAGE
0.234	0.10	20.69	62.29	-41.60	QP
0.234	0.10	17.71	52.29	-34.58	AVERAGE
0.288	0.10	29.89	60.60	-30.71	QP
0.288	0.10	29.70	50.60	-20.90	AVERAGE
0.330	0.10	17.37	59.45	-42.08	QP
0.330	0.10	13.31	49.45	-36.14	AVERAGE
14.080	0.64	18.87	60.00	-41.13	QP
14.080	0.64	12.38	50.00	-37.62	AVERAGE
15.248	0.70	27.41	60.00	-32.59	QP
15.248	0.70	21.55	50.00	-28.45	AVERAGE

Remark:

1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

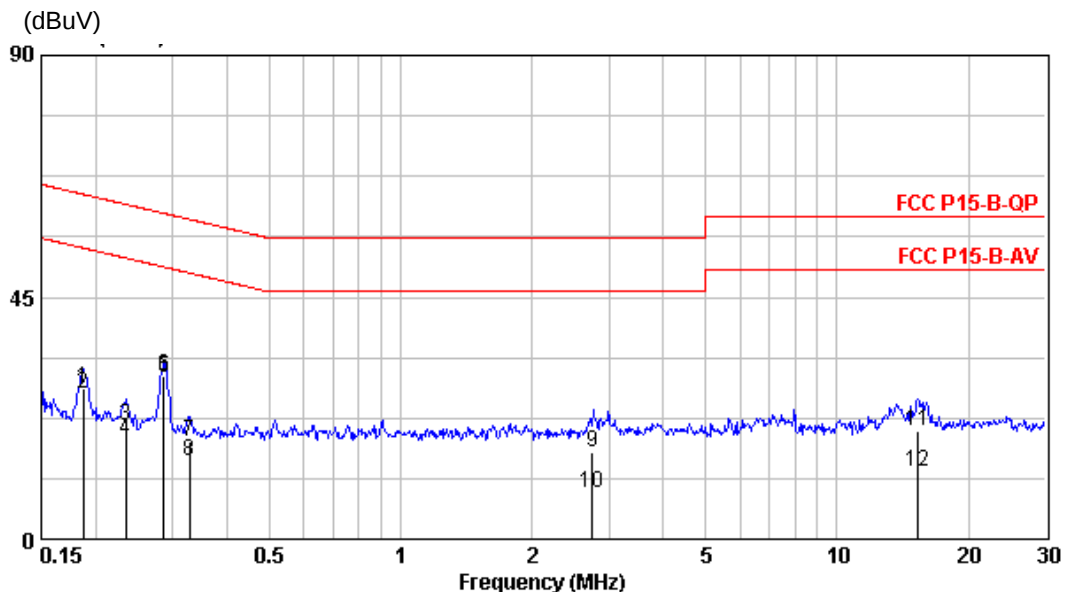


Phase: Neutral
 Test Unit: TM313R (Rx)
 Test Condition: Power on with 1000W

Freq. (MHz)	Correction Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
0.187	0.10	27.92	64.15	-36.23	QP
0.187	0.10	26.95	54.15	-27.20	AVERAGE
0.234	0.10	21.12	62.29	-41.17	QP
0.234	0.10	18.39	52.29	-33.90	AVERAGE
0.286	0.10	30.34	60.64	-30.30	QP
0.286	0.10	30.15	50.64	-20.49	AVERAGE
0.328	0.10	18.10	59.51	-41.41	QP
0.328	0.10	14.40	49.51	-35.11	AVERAGE
2.749	0.14	16.02	56.00	-39.98	QP
2.749	0.14	8.49	46.00	-37.51	AVERAGE
15.248	0.41	20.22	60.00	-39.78	QP
15.248	0.41	12.56	50.00	-37.44	AVERAGE

Remark:

1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



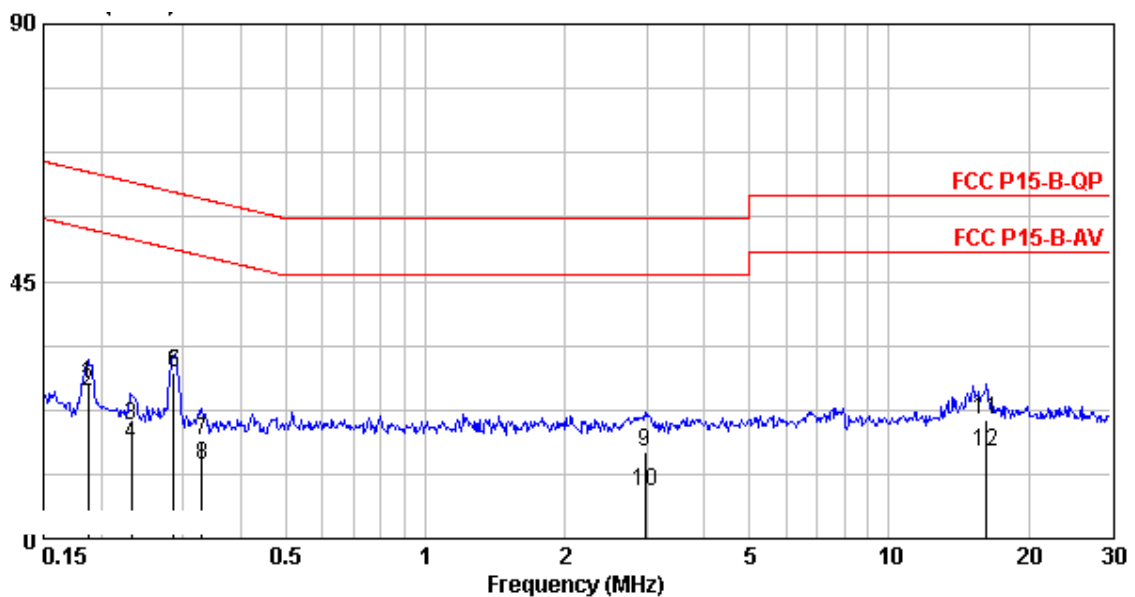
Phase: Line
 Test Unit: RS101 (Rx)
 Test Condition: Power on with 600W

Freq. (MHz)	Correction Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
0.187	0.10	27.01	64.15	-37.14	QP
0.187	0.10	25.87	54.15	-28.28	AVERAGE
0.233	0.10	19.73	62.36	-42.63	QP
0.233	0.10	16.64	52.36	-35.72	AVERAGE
0.286	0.10	29.16	60.64	-31.48	QP
0.286	0.10	29.09	50.64	-21.55	AVERAGE
0.330	0.10	17.01	59.45	-42.44	QP
0.330	0.10	12.81	49.45	-36.64	AVERAGE
2.977	0.15	15.32	56.00	-40.68	QP
2.977	0.15	8.34	46.00	-37.66	AVERAGE
16.251	0.73	20.83	60.00	-39.17	QP
16.251	0.73	15.16	50.00	-34.84	AVERAGE

Remark:

1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

(dBuV)

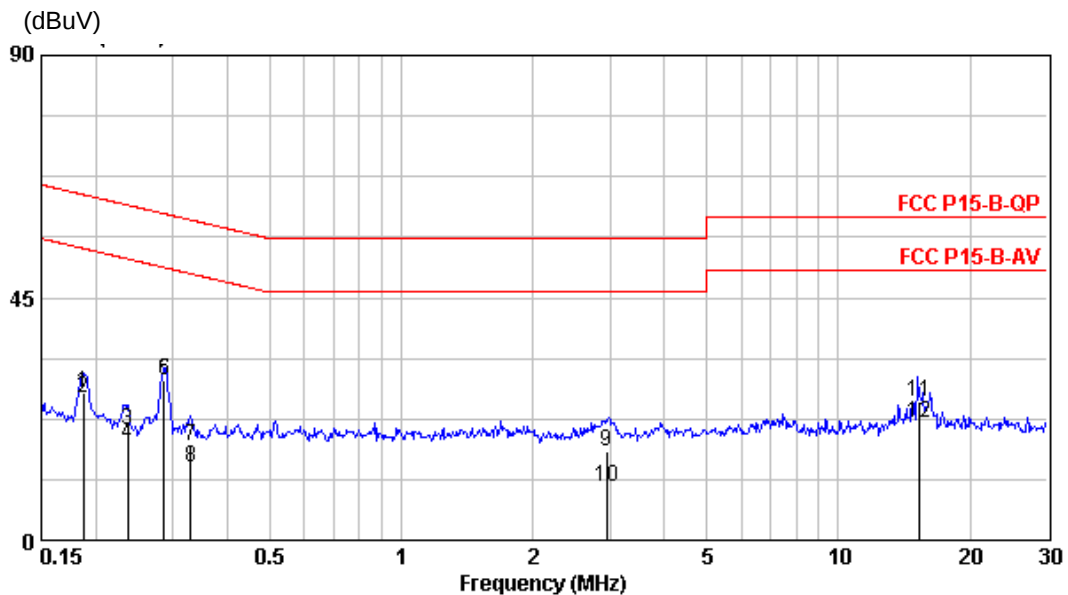


Phase: Neutral
 Test Unit.: RS101 (Rx)
 Test Condition: Power on with 600W

Freq. (MHz)	Correction Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
0.187	0.10	27.40	64.15	-36.75	QP
0.187	0.10	26.33	54.15	-27.82	AVERAGE
0.236	0.10	20.31	62.23	-41.92	QP
0.236	0.10	17.86	52.23	-34.37	AVERAGE
0.286	0.10	29.57	60.64	-31.07	QP
0.286	0.10	29.54	50.64	-21.10	AVERAGE
0.330	0.10	17.51	59.45	-41.94	QP
0.330	0.10	13.40	49.45	-36.05	AVERAGE
2.953	0.15	16.65	56.00	-39.35	QP
2.953	0.15	9.78	46.00	-36.22	AVERAGE
15.248	0.41	25.63	60.00	-34.37	QP
15.248	0.41	21.92	50.00	-28.08	AVERAGE

Remark:

1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



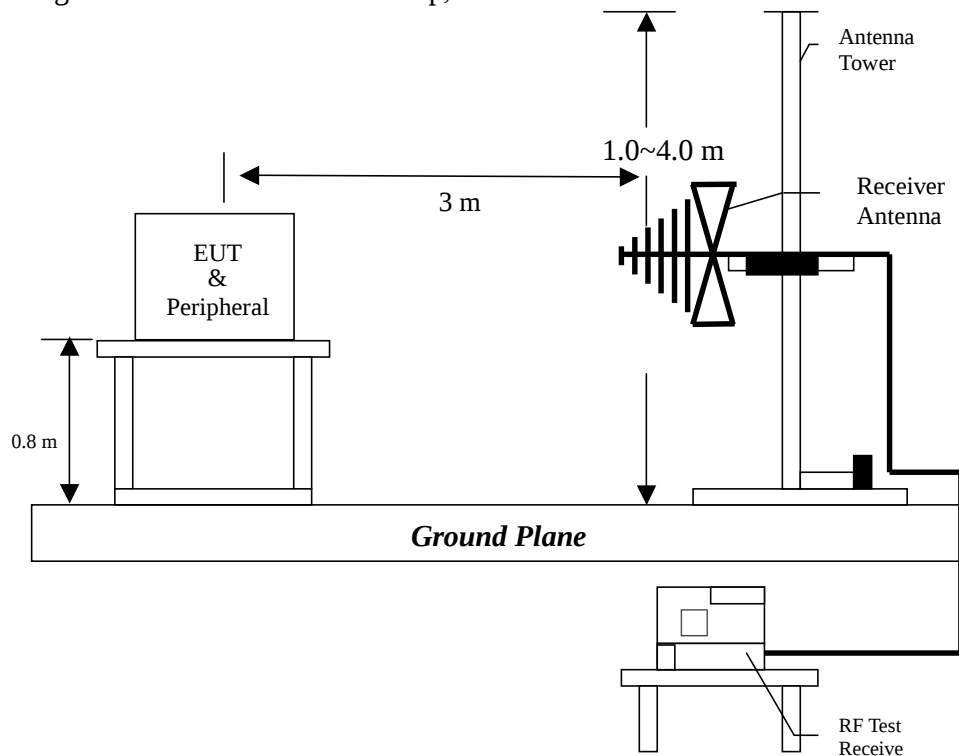
4. Radiated emission test FCC 15.231 (b)

4.1 Operating environment

Temperature:	24	°C	(10-40°C)
Relative Humidity:	43	%	(10-90%)
Atmospheric Pressure	1023	hPa	(860-1060hPa)

4.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



Radiated emission measurements were performed from 30MHz to 25GHz. Spectrum Analyzer Resolution Bandwidth is 100kHz or greater for frequencies 30MHz to 1GHz, 1MHz – for frequencies above 1GHz.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three-meter reading using inverse scaling with distance.



Setup 1



Setup 2



Setup 3

The EUT configurations please refer to the “Spurious set-up photo.pdf”.

4.3 Radiated emission limit

4.3.1 Fundamental and harmonics emission limits

Frequency (MHz)	Field Strength of Fundamental		Field Strength of Harmonics	
	(uV/m@3m)	(dBuV/m@3m)	(uV/m@3m)	(dBuV/m@3m)
315	6041.68	75.62	604.17	55.62

4.3.2 General radiated emission limit

The spurious Emission shall test through the 10th harmonic. 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).

Frequency MHz	15.209 Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Uncertainty was calculated in accordance with NAMAS NIS 81. Expanded uncertainty ($k=2$) of radiated emission measurement is ± 3.078 dB.

4.5 Radiated emission test data FCC 15.231

4.5.1 Fundamental & Harmonics Radiated Emission Data

EUT : 51183

Worst Case Condition : Tx at 315MHz with setup 1

Polarization	Frequency (MHz)	Spectrum Analyzer Detector	Corr. Factor (dB/m)	Reading (dBuV)	Calculated dBuV/m	Limit (dBuV/m)	Margin (dB)	Antenna Height (Meter)	Turn Table (Degree)
Vertical	315.050	PK	14.45	46.06	60.51	95.62	-35.11	100.00	360.00
Vertical	315.050	AV	14.45	32.90	47.35	75.62	-28.27	100.00	360.00
Horizontal	315.050	PK	14.45	65.09	79.54	95.62	-16.08	100.00	132.00
Horizontal	315.050	AV	14.45	51.96	66.41	75.62	-9.21	100.00	132.00

Remark:

1. Corrected Level = Reading Level + Correction Factor
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:

1GHz-3GHz: 50dBuV

3GHz-14GHz: 54dBuV

14GHz-26.5GHz: 60dBuV

For AV:

1GHz-3GHz: 41.5dBuV

3GHz-14GHz: 46dBuV

14GHz-26.5GHz: 46.5dBuV

4.5.2 Measurement results: frequencies equal to or less than 1 GHz

EUT : 51183

Worst Case Condition : Tx at 315MHz with setup 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
377.340	QP	V	15.82	9.54	25.36	55.62	-30.26	100.00	0.00
449.070	QP	V	17.63	9.08	26.71	55.62	-28.91	100.00	0.00
495.580	QP	V	18.78	9.55	28.33	55.62	-27.29	100.00	0.00
630.100	QP	V	21.21	20.46	41.67	55.62	-13.95	100.00	94.00
714.850	QP	V	22.38	8.88	31.26	55.62	-24.36	100.00	0.00
945.170	QP	V	25.73	15.00	40.73	55.62	-14.89	100.00	14.00
402.470	QP	H	16.46	9.51	25.97	55.62	-29.65	100.00	0.00
468.450	QP	H	18.07	9.14	27.21	55.62	-28.41	100.00	0.00
563.470	QP	H	19.90	8.36	28.26	55.62	-27.36	100.00	0.00
630.110	QP	H	21.21	30.17	51.38	55.62	-4.24	122.00	122.00
747.790	QP	H	23.43	8.69	32.12	55.62	-23.50	100.00	0.00
945.170	QP	H	25.73	26.20	51.93	55.62	-3.69	100.00	0.00

Remark:

1. Corrected Level = Reading Level + Correction Factor

2. Correction Factor = Antenna Factor + Cable Loss

EUT : 51183 (Rx)
Worst Case Condition : Power on with 1000W

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
95.870	QP	V	10.32	11.80	22.12	43.50	-21.38	154.00	211.00
264.780	QP	V	12.99	7.35	20.34	46.00	-25.66	124.00	152.00
307.430	QP	V	14.12	14.25	28.37	46.00	-17.63	144.00	177.00
548.110	QP	V	19.63	3.51	23.14	46.00	-22.86	100.00	0.00
672.110	QP	V	21.62	2.20	23.82	46.00	-22.18	100.00	0.00
759.470	QP	V	23.64	2.50	26.14	46.00	-19.86	100.00	0.00
165.740	QP	H	14.58	6.68	21.26	43.50	-22.24	110.00	214.00
307.420	QP	H	14.12	20.89	35.01	46.00	-10.99	108.00	118.00
559.640	QP	H	19.78	4.40	24.18	46.00	-21.82	100.00	0.00
627.570	QP	H	21.17	1.90	23.07	46.00	-22.93	100.00	0.00
697.450	QP	H	21.99	2.19	24.18	46.00	-21.82	100.00	0.00
769.880	QP	H	23.81	2.10	25.91	46.00	-20.09	100.00	0.00

Remark:

1. Corrected Level = Reading Level + Correction Factor

2. Correction Factor = Antenna Factor + Cable Loss

EUT : RS101K (Rx)
Worst Case Condition : Power on with 600W

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
96.770	QP	V	10.32	12.54	22.86	43.50	-20.64	144.00	171.00
107.570	QP	V	11.31	6.18	17.49	43.50	-26.01	151.00	332.00
156.140	QP	V	14.90	1.70	16.60	43.50	-26.90	100.00	0.00
315.240	QP	V	14.31	6.20	20.51	46.00	-25.49	100.00	0.00
546.040	QP	V	19.62	2.91	22.53	46.00	-23.47	100.00	0.00
581.330	QP	V	20.31	2.80	23.11	46.00	-22.89	100.00	0.00
171.350	QP	H	14.24	5.20	19.44	43.50	-24.06	101.00	177.00
278.330	QP	H	13.31	9.82	23.13	46.00	-22.87	141.00	125.00
315.220	QP	H	14.31	10.57	24.88	46.00	-21.12	100.00	282.00
418.530	QP	H	16.87	3.97	20.84	46.00	-25.16	100.00	0.00
524.710	QP	H	19.27	1.44	20.71	46.00	-25.29	100.00	0.00
625.640	QP	H	21.07	1.95	23.02	46.00	-22.98	100.00	0.00

Remark:

1. Corrected Level = Reading Level + Correction Factor
2. Correction Factor = Antenna Factor + Cable Loss

EUT : TM313R (Rx)
Worst Case Condition : Power on with 1000W

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
37.880	QP	V	12.74	10.51	23.25	40.00	-16.75	144.00	197.00
95.470	QP	V	10.32	10.84	21.16	43.50	-22.34	109.00	213.00
107.440	QP	V	11.29	4.86	16.15	43.50	-27.35	100.00	157.00
311.320	QP	V	14.21	6.71	20.92	46.00	-25.08	105.00	114.00
499.540	QP	V	18.80	3.90	22.70	46.00	-23.30	100.00	0.00
650.880	QP	V	21.33	3.97	25.30	46.00	-20.70	100.00	0.00
167.540	QP	H	14.44	5.88	20.32	43.50	-23.18	121.00	254.00
251.240	QP	H	12.71	9.57	22.28	46.00	-23.72	151.00	107.00
311.340	QP	H	14.21	11.88	26.09	46.00	-19.91	102.00	306.00
532.410	QP	H	19.47	3.33	22.80	46.00	-23.20	100.00	0.00
598.410	QP	H	20.29	3.85	24.14	46.00	-21.86	100.00	0.00
709.020	QP	H	22.26	3.52	25.78	46.00	-20.22	100.00	0.00

Remark:

1. Corrected Level = Reading Level + Correction Factor
2. Correction Factor = Antenna Factor + Cable Loss

4.5.1 Measurement results: frequency above 1GHz

EUT : 51183

Worst Case Condition : Tx at 315MHz with setup 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
1260.230	PK	V	0.00	27.04	15.92	42.96	75.62	-32.66	100.00	306.00
1260.230	AV	V	0.00	27.04	2.44	29.48	55.62	-26.14	100.00	306.00
*1575.280	PK	V	0.00	28.54	20.48	49.02	74.00	-24.98	100.00	180.00
*1575.280	AV	V	0.00	28.54	7.00	35.54	54.00	-18.46	100.00	180.00
1890.340	PK	V	0.00	28.54	26.63	55.17	75.62	-20.45	272.00	312.00
1890.340	AV	V	0.00	28.54	13.20	41.74	55.62	-13.88	272.00	312.00
1260.230	PK	H	0.00	27.04	22.27	49.31	75.62	-26.31	119.00	0.00
1260.230	AV	H	0.00	27.04	8.63	35.67	55.62	-19.95	119.00	0.00
*1575.280	PK	H	0.00	28.54	25.89	54.43	74.00	-19.57	100.00	2.00
*1575.280	AV	H	0.00	28.54	12.38	40.92	54.00	-13.08	100.00	2.00
1890.340	PK	H	0.00	28.54	29.60	58.14	75.62	-17.48	126.00	360.00
1890.340	AV	H	0.00	28.54	15.94	44.48	55.62	-11.14	126.00	360.00

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. “*” means the emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209.
4. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:

1GHz-3GHz: 20dBuV

3GHz-14GHz: 27dBuV

14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV

3GHz-14GHz: 16dBuV

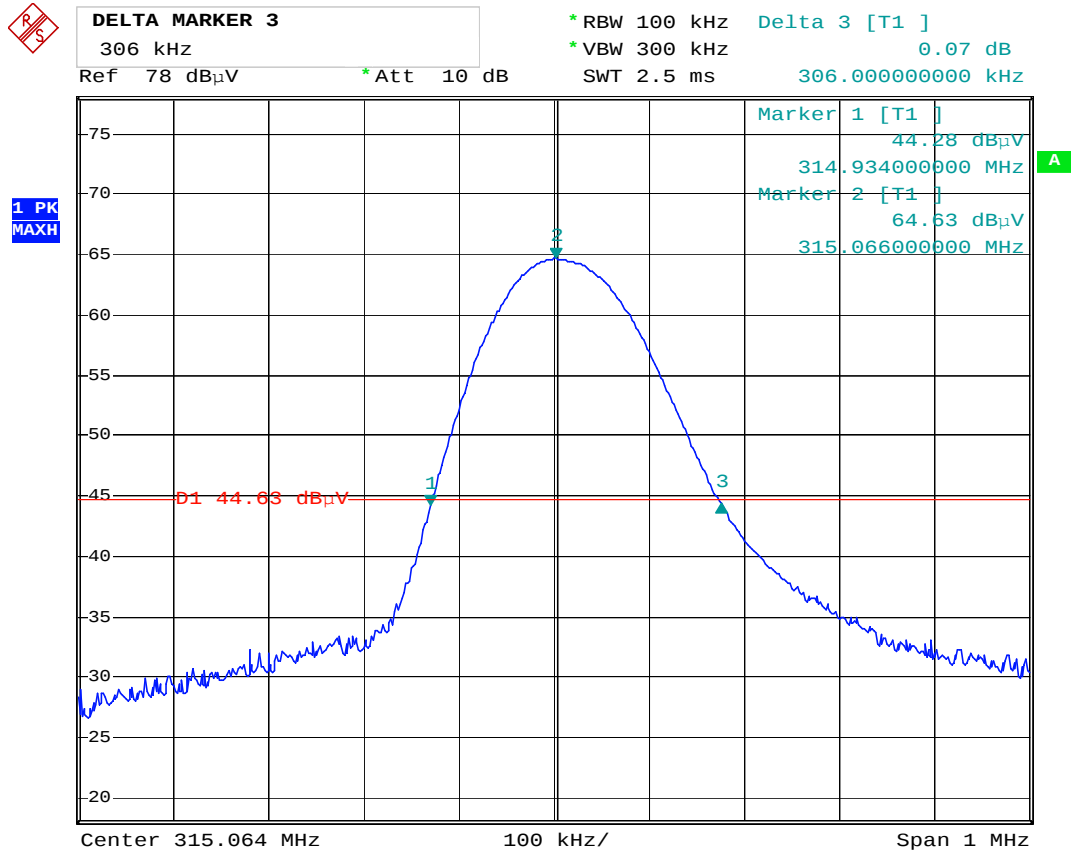
14GHz-26.5GHz: 28dBuV

4.6 Measured bandwidth FCC 15.231(C)

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

$$\text{B.W (20dBc) Limit} = 0.25\% \times f(\text{MHz}) = 0.25\% \times 315\text{MHz} = 0.7875\text{MHz}$$

From the plot, the bandwidth is observed to be 306kHz, at 20dBc where the bandwidth limit is 0.7875MHz and the plot showed below.



Comment: 20dB bandwidth

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