SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch

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TEST REPORT

The following sample(s) was/were submitted and identified on behalf of the client as:

Application No.:	GZEM1608005888ME
Applicant:	Sunray Medical Apparatus Co.,Ltd
Manufacturer:	Sunray Medical Apparatus Co.,Ltd
Factory:	Sunray Medical Apparatus Co.,Ltd
FCC ID:	ZPB618B6HOST
Product Description:	Host of Fetal Monitor
Model No.:	SRF618B6Host
Trade Mark:	Sunray
Standards:	CFR 47 PART 15 Subpart C: 2015 section 15.249
Date of Receipt:	2016-08-22
Date of Test:	2016-09-13 to 2016-09-23
Date of Issue:	2016-10-21
Test Result :	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Jerry Chan
Manager

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00		2016-10-21		Original Report

Authorized for issue by:				
Tested By		 **(Curry Wu) / Project Engineer**		2016-09-13 to 2016-09-23 **Date**
Prepared By		 **(Millie Li) / Clerk**		2016-10-09 **Date**
Checked By		 **(Ricky Liu) / Reviewer**		2016-10-17 **Date**

3 Test Summary

Test	Test Requirement	Test method	Result
Field Strength of Fundamental	FCC PART 15 C section 15.249 (a)	ANSI C63.10: Clause 6.6	PASS
Field Strength of Unwanted Emissions	FCC PART 15 C section 15.249 (a) section 15.249 (d)	ANSI C63.10: Clause 6.4, 6.5 and 6.6	PASS**
Band Edges	FCC PART 15 C section 15.249 (d)	ANSI C63.10: Clause 6.10	PASS
Occupied Bandwidth	FCC PART 15 C section 15.215(c)	ANSI C63.10: Clause 6.9.	PASS
Conducted Emissions at Mains Terminals	FCC PART 15 C section 15.207	ANSI C63.10: Clause 6.2	PASS
Remark: EUT: In this whole report EUT means Equipment Under Test. Tx: In this whole report Tx (or tx) means Transmitter. Rx: In this whole report Rx (or rx) means Receiver. RF: In this whole report RF means Radio Frequency. ANSI C63.10: the detail version is ANSI C63.10:2013 in the whole report.			
** The EUT passed S Field Strength of Unwanted Emissions test after modification carried out by applicant.			

4 Contents

5 General Information

5.1 Client Information

Applicant:	Sunray Medical Apparatus Co., Ltd
Address of Applicant:	4/F No.242 Tianhe Dong Road Guangzhou 510620 China
Manufacturer:	Sunray Medical Apparatus Co., Ltd
Address of Manufacturer:	4/F No.242 Tianhe Dong Road Guangzhou 510620 China
Factory:	Sunray Medical Apparatus Co., Ltd
Address of Factory:	38 Gaoke Road, Gaotang Industry District, Guangshan Er Road, Guangzhou, PEOPLE'S REPUBLICA OF CHINA

5.2 General Description of E.U.T.

Product Description:	Host of Fetal Monitor
Model No.:	SRF618B6Host

5.3 Details of E.U.T.

Operating Frequency	2405MHz to 2478MHz
Type of Modulation:	GFSK
Number of Channels	14
Antenna Type	Integrated antenna
Function:	The EUT was a set of equipment: The Tx(SRF618B6Host) have 14 frequencies between 2.405GHz to 2.470GHz, Tx(SRF618B6Host) will fixed in one channel as the actual work channel, same time, probe 1(SRFFHR: 2405MHz to 2470MHz) or probe 2(SRFTOCO: 2413MHz to 2478MHz)can also change the channel through a special setting. Tx(SRF618B6Host) receives the signal from probe 1 or probe 2 and collects the relevant information.
Power Supply:	AC 100-240V 50/60Hz, 100VA
Power cord:	1.0 m x 2 wires unscreened AC cable (supplied by SGS)

5.4 Description of Support Units

The EUT has been test as an independent unit.

5.5 Other Information Requested by the Customer

None.

5.6 Deviation from Standards

Biconical and log periodic antennas were used instead of dipole antennas.

5.7 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663
Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

5.6 Test Facility

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

- **NVLAP (Lab Code: 200611-0)**

  SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

  The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

  Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

- **FCC (Registration No.: 282399)**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002.

- **Industry Canada (Registration No.: 4620B-1)**

  The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Certification and Engineering of Industry Canada for radio equipment testing with Registration No. 4620B-1.

- **VCCI (Registration No.: R-2460, C-2584, G-449 and T-1179)**

  The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co. Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2460, C-2584，G-449 and T-1179 respectively.

- **CBTL (Lab Code: TL129)**

  SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

6 Equipment List

RE in Chamber						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2014-12-05	2016-12-04
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2016-02-01	2017-01-31
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	100236	2016-02-01	2017-01-31
EMC0528	RI High frequency Cable	SGS	20 m	N/A	2016-04-19	2018-04-18
EMC2025	Trilog Broadband Antenna 30-1000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9160	9160-3372	2016-09-08	2019-09-07
SEM003-18	Trilog Broadband Antenna 25-2000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	665	2016-06-29	2019-06-28
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	2016-09-08	2019-09-07
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	2014-05-04	2017-05-03
EMC2026	Horn Antenna 1-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	9120D-841	2016-09-09	2019-09-08
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2016-01-25	2017-01-24
EMC2065	Amplifier	HP	8447F	N/A	2016-07-04	2017-07-03
EMC2086	PRE AMPLIFIER MH648A	ANRITSU CORP	MH648A	N/A	2015-12-19	2016-12-18
EMC2063	Pre-amplifier 1GHz-26GHz	Compliance Direction Systems Lnc.	PAP-1G26-48	6279.628	2016-01-06	2017-01-05
EMC0523	Active Loop Antenna	EMCO	6502	42963	2016-02-27	2018-02-26
EMC2041	Broad-Band Horn Antenna (14)15-26.5(40)GHz	SCHWARZBECK MESS-ELEKTRONI	BBHA 9170	9170-375	2014-05-26	2017-05-25
EMC2079	High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	009	2016-01-25	2017-01-24
EMC2069	2.4GHz Filter	Micro-Tronics	BRM50702	149	2016-01-25	2017-01-24
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	2016-04-30	2018-04-29

Conducted Emission						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m^3	N/A	N/A	N/A
EMC0118	Two-line v-netwok	R&S	ENV216	100359	2016-01-25	2017-01-24
EMC0102	LISN	SCHAFFNER CHASE	MN2050D/1	1421	2016-09-20	2017-09-19
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	2015-12-19	2016-12-18
EMC0107	Coaxial Cable	SGS	2m	N/A	2016-07-24	2018-07-23
EMC0106	Voltage Probe	SGS	N/A	N/A	2016-04-05	2018-04-04
EMC0120	8 Line ISN	Fischer Custom Communications	FCC-TLISN-T8-02	20550	2016-09-26	2017-09-25
EMC0121	4 Line ISN	Fischer Custom Communications	FCC-TLISN-T4-02	20549	2016-09-28	2017-09-27
EMC0122	2 Line ISN	Fischer Custom Communications	FCC-TLISN-T2-02	20548	2016-09-26	2017-09-25
EMC2047	CDN	Elektronik-Feinmechanik	L-801:AF2	2793	2015-09-19	2018-09-18
EMC2048	CDN	Elektronik-Feinmechanik	L-801:M2/M3	2738	2015-09-25	2018-09-24
EMC2062	6dB Attenuator	HP	8491A	24487	2016-04-05	2018-04-04
EMC0167	Conical metal housing	SGS-EMC	N/A	N/A	2016-04-19	2018-04-18

General used equipment						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC0006	DMM	Fluke	73	70681569	2016-09-01	2017-08-31
EMC0007	DMM	Fluke	73	70671122	2016-08-22	2017-08-21

7 Test Results

7.1 E.U.T. Operation

Test Voltage: AC 120V, 60Hz

Temperature: 20.0 -25.0 °C

Humidity: 38-50 % RH

Atmospheric Pressure: 1000 -1010 mbar

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

According to the 15.33 (a) For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in the following table:

Number of fundamental frequencies to be tested in EUT transmit band

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

Frequency range of radiated emission measurements

Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

EUT channels and frequencies list:

Operation Frequency each of channel							
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
1	/	5	2420	**9**	**2440**	13	2460
2	**2405**	6	2425	10	2445	14	2465
3	2410	7	2430	11	2450	**15**	**2470**
4	2415	8	2435	12	2455	16	/

Test frequencies are the lowest channel: 2 channel(2405 MHz), middle channel: 9 channel(2440 MHz) and highest channel: 15 channel(2470 MHz)

7.2 Antenna Requirement

Standard requirement

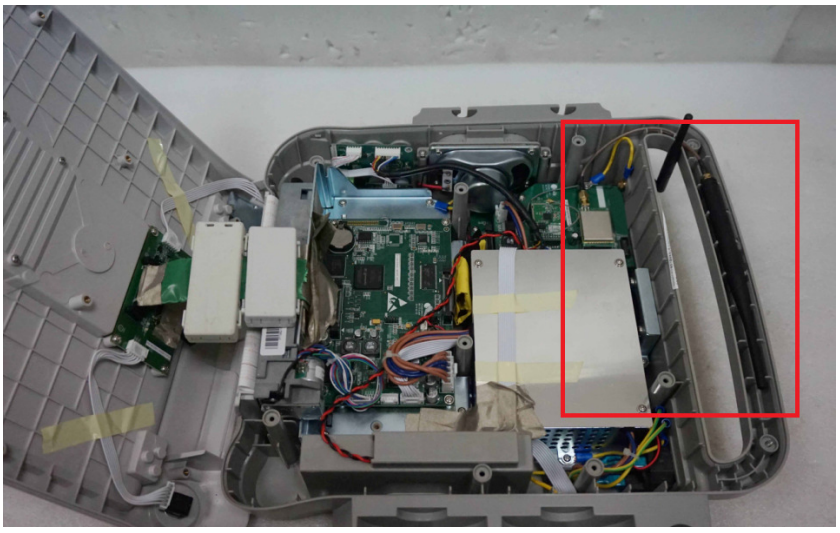
15.203 requirement:

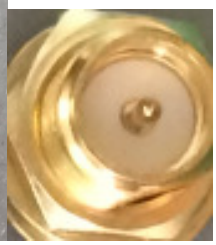
For intentional device. According to 15.203. an intentional radiator shall be designed to

Ensure that no antenna other than that furnished by the responsible party shall be used with the device.

EUT Antenna

The antenna is an external Antenna and no consideration of replacement. The best case gain of the antenna is 3.0 dBi.





Test result: The unit does meet the FCC requirements.

7.3 Field Strength of Fundamental& Field Strength of Unwanted Emissions& Band Edge

Test Requirement: FCC Part15 C section 15.249

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBμV/m @ 3m)	Field Strength of Harmonics (dBμV/m @ 3m)
902 to 928	94.0	54.0
2400 to 2483.5	94.0	54.0
5725 to 5875	94.0	54.0
24000 to 24250	108.0	68.0

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Limits: The fundamental frequency rang is in the frequency band of the EUT is 2405MHz ~ 2470MHz.

The limit for Average field strength dBμV/m for the fundamental frequency = 94.0 dBμV/m.

The limit for Peak field strength dBμV/m for the fundamental frequency = 114.0 dBμV/m.

No fundamental is allowed in the restricted bands.

The limit for average field strength dBμV/m for the harmonics = 54.0 dBμV/m.

The limit for peak field strength dBμV/m for the harmonics = 74.0 dBμV/m.

Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or 54.0 dBμV/m in 15.209. Here the limit for the other emission is 54.0 dBμV/m.

Test Method: ANSI C63.10: Clause 6.4, 6.5 and 6.6 for Field Strength of Fundamental& Field Strength of Unwanted Emissions

ANSI C63.10: Clause 6.10 for Band Edge

Status: Pre-test the EUT in continuous transmitting mode with setup as stand-alone in X, Y, Z threes axes, found the worst case is X axes and report the data.

Measurement Distance: 3m (Semi-Anechoic Chamber)

Frequency range: 9 kHz – 25 GHz for transmitting mode.

Test instrumentation resolution bandwidth
9 kHz (9 kHz - 30 MHz), 120 kHz (30 MHz - 1000 MHz), 1 MHz (1000 MHz – 25 GHz)

Test Procedure:

1)9 kHz to 30 MHz emissions:

For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.10. The centre of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT, During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

2)30 MHz to 1 GHz emissions:

For testing performed with the bi-log type antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360º, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

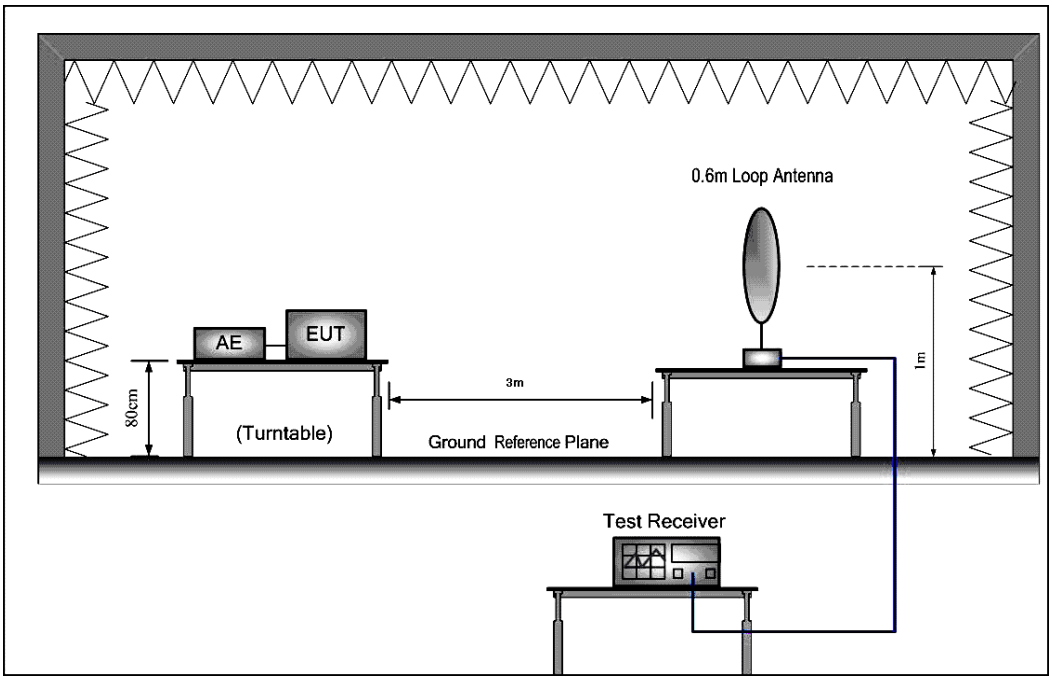
3)1 GHz to 25 GHz emissions:

Test site with RF absorbing material covering the ground plane that met the site validation criterion called out in CISPR 16-1-4:2010 was used to perform radiated emission test above 1 GHz.

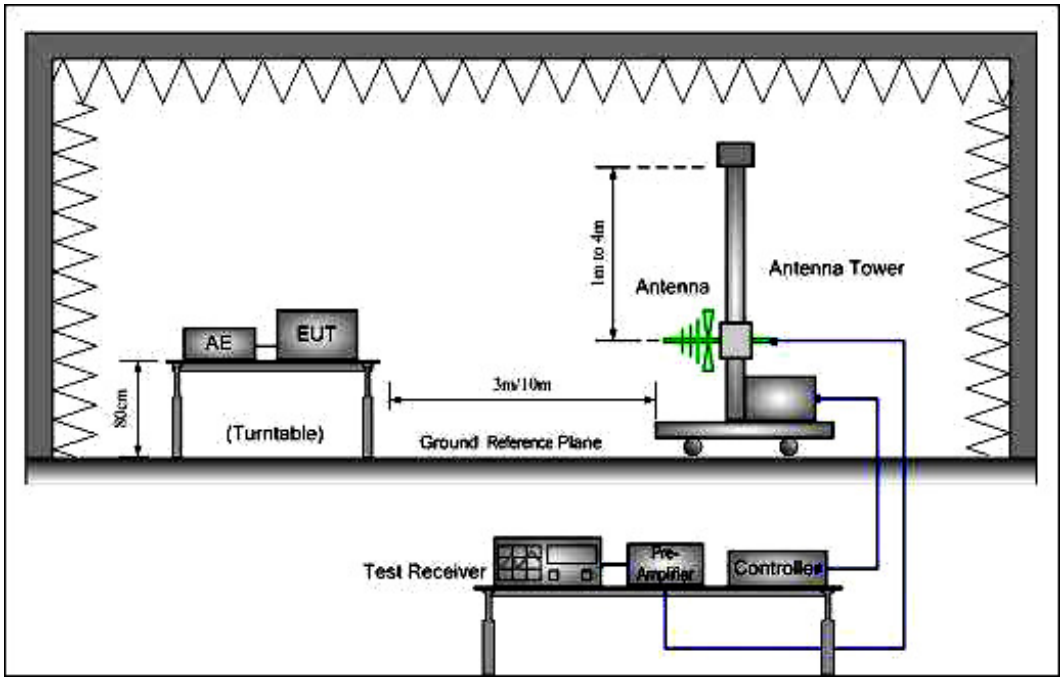
For testing performed with the horn antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360º, the antenna height scan between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

Test Configuration:

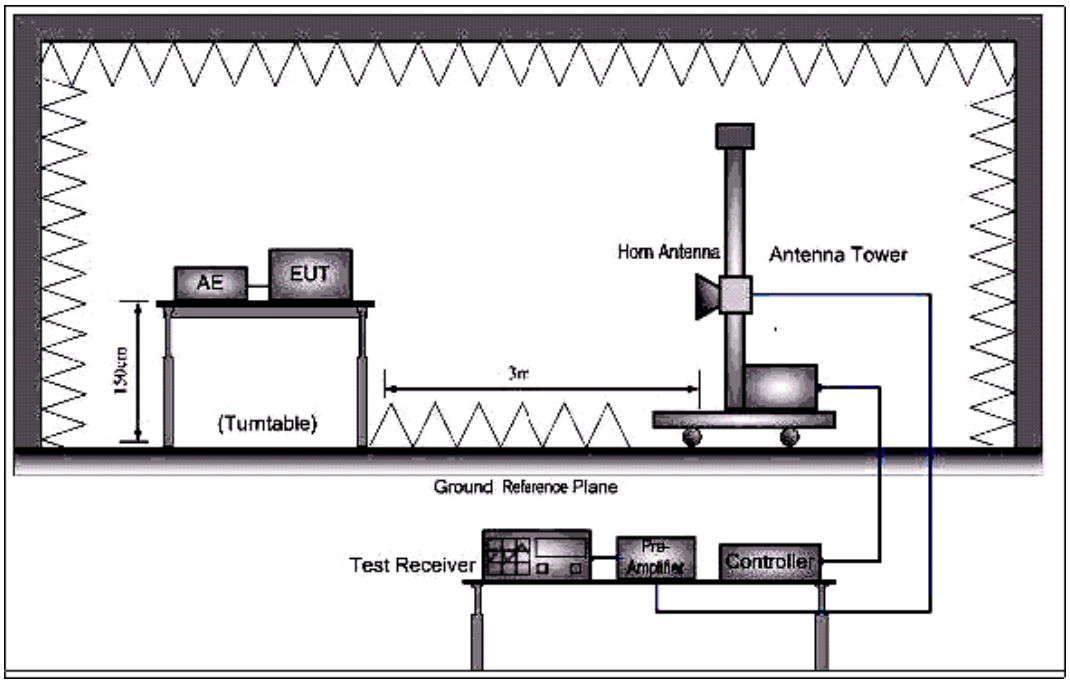
1) 9 kHz to 30 MHz emissions:



2) 30 MHz to 1 GHz emissions:



3) 1 GHz to 25 GHz emissions:



The field strength is calculated by adding the Antenna Factor, Cable Loss & Per-amplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Loss – Preamplifier Factor

Test at low Channel in transmitting status

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

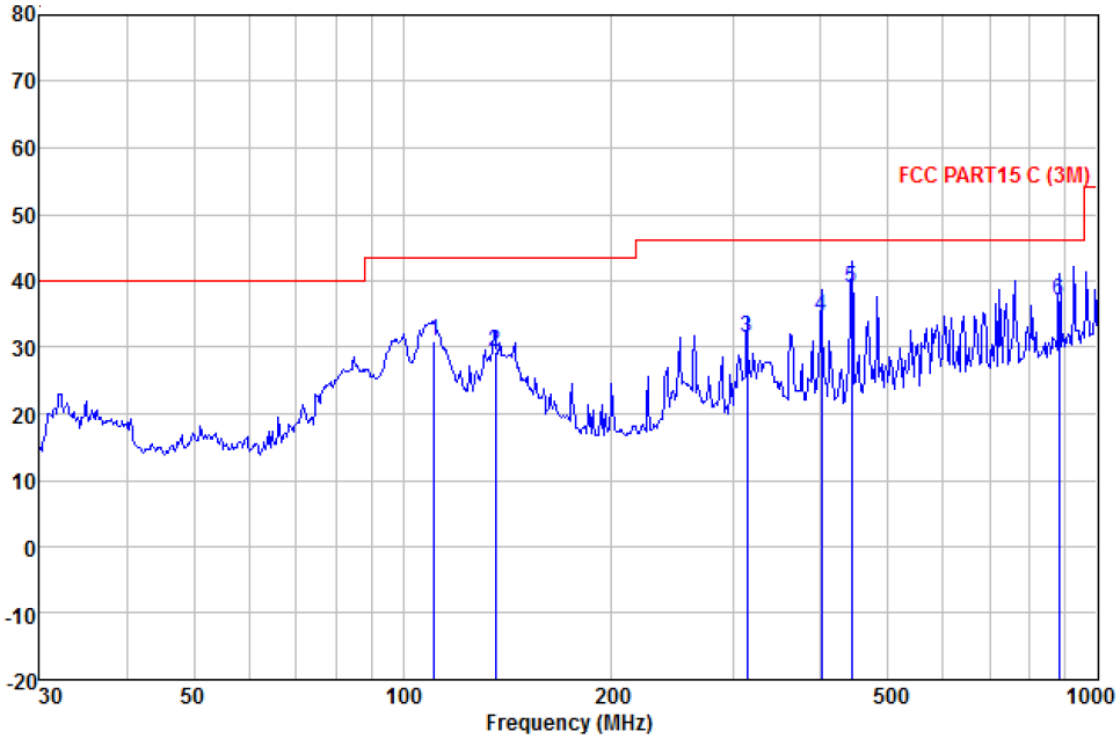
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

30 MHz~1 GHz Field Strength of Unwanted Emissions.Quasi-Peak Measurement

Vertical:

Peak scan

Level (dBμV/m)



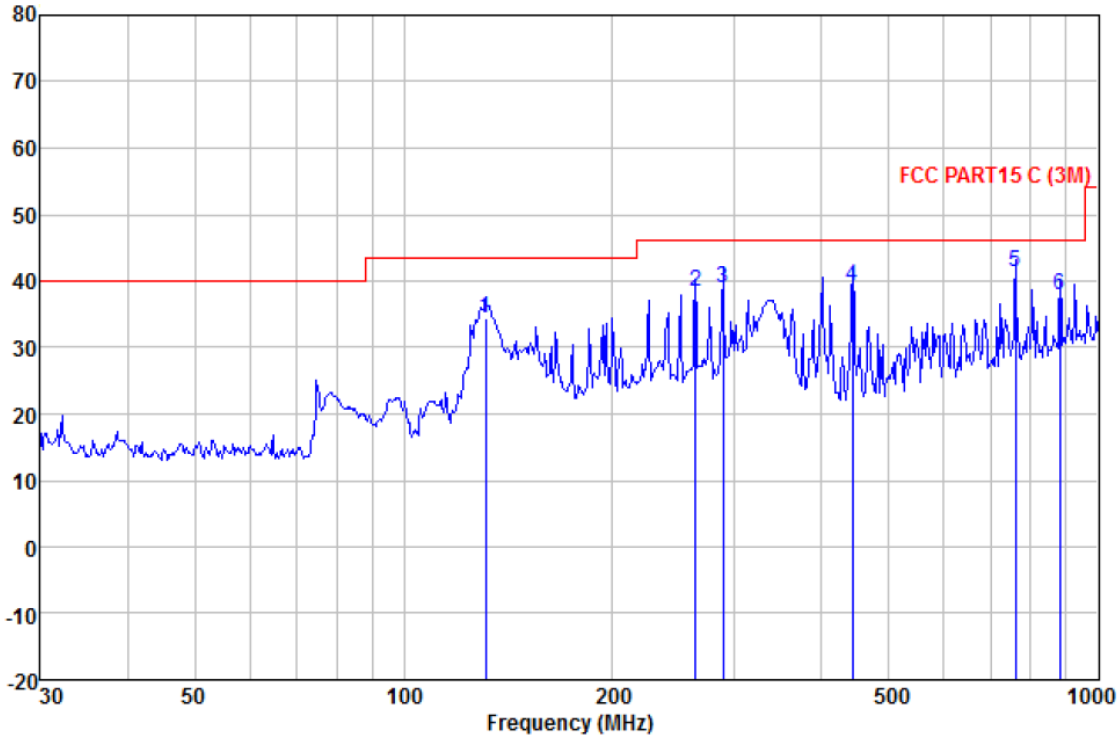
Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
110.957	45.50	10.34	1.97	26.90	30.91	43.50	-12.59	QP
135.982	41.28	12.75	2.20	26.84	29.39	43.50	-14.11	QP
313.276	40.42	14.10	3.45	26.49	31.48	46.00	-14.52	QP
400.432	41.56	16.30	3.90	27.20	34.56	46.00	-11.44	QP
443.294	45.20	17.08	4.13	27.48	38.93	46.00	-7.07	QP
881.407	35.61	23.27	5.90	27.80	36.98	46.00	-9.02	QP

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
131.297	46.89	12.29	2.16	26.87	34.47	43.50	-9.03	QP
262.896	48.79	12.81	3.16	26.41	38.35	46.00	-7.65	QP
287.990	48.43	13.71	3.26	26.40	39.00	46.00	-7.00	QP
443.294	45.45	17.08	4.13	27.48	39.18	46.00	-6.82	QP
760.704	41.78	22.06	5.43	28.00	41.27	46.00	-4.73	QP
881.407	36.61	23.27	5.90	27.80	37.98	46.00	-8.02	QP

1~25 GHz Field Strength of Fundamental & Field Strength of Unwanted Emissions.

Peak & Average Measurement

Peak Measurement:								
Frequency (MHz)	**Antenna factors (dB/m)**	**Cable loss (dB)**	**Preamp factor (dB)**	**Reading Level (dBμV)**	**Emission Level (dBμV/m)**	**Limit (dBμV/m)**	**Over limit**	**Antenna polarization**
2405.300	28.85	6.92	39.11	94.16	90.82	114.00	-23.18	V
4810.300	32.83	9.95	40.21	56.11	58.68	74.00	-15.32	V
7215.040	36.12	12.76	39.25	47.10	56.73	74.00	-17.27	V
9620.350	37.74	14.48	37.97	36.30	50.55	74.00	-23.45	V
2405.100	28.85	6.92	39.11	92.16	88.82	114.00	-25.18	H
4810.560	32.83	9.95	40.21	46.30	48.87	74.00	-25.13	H
7215.630	36.12	12.76	39.25	36.51	46.14	74.00	-27.86	H
9620.300	37.74	14.48	37.97	34.37	48.62	74.00	-25.38	H
Average Measurement:								
Frequency (MHz)	**Antenna factors (dB/m)**	**Cable loss (dB)**	**Preamp factor (dB)**	**Reading Level (dBμV)**	**Emission Level (dBμV/m)**	**Limit (dBμV/m)**	**Over limit**	**Antenna polarization**
2405.300	28.85	6.92	39.11	83.87	80.53	94.00	-13.47	V
4810.300	32.83	9.95	40.21	46.32	48.89	54.00	-5.11	V
7215.040	36.12	12.76	39.25	36.05	45.68	54.00	-8.32	V
9620.350	37.74	14.48	37.97	25.37	39.62	54.00	-14.38	V
2405.100	28.85	6.92	39.11	81.25	77.91	94.00	-16.09	H
4810.560	32.83	9.95	40.21	35.10	37.67	54.00	-16.33	H
7215.630	36.12	12.76	39.25	26.74	36.37	54.00	-17.63	H
9620.300	37.74	14.48	37.97	23.65	37.90	54.00	-16.10	H

Band Edge:

Peak Measurement:								
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	Antenna polarization
2400.000	28.84	6.90	39.11	51.04	47.67	74.00	-26.33	V
2483.500	28.98	7.07	39.14	48.26	45.17	74.00	-28.83	V
2400.000	28.84	6.90	39.11	56.10	52.73	74.00	-21.27	H
2483.500	28.98	7.07	39.14	45.61	42.52	74.00	-31.48	H
Average Measurement:								
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	Antenna polarization
2400.000	28.84	6.90	39.11	40.89	37.52	54.00	-16.48	V
2483.500	28.98	7.07	39.14	38.44	35.35	54.00	-18.65	V
2400.000	28.84	6.90	39.11	45.27	41.90	54.00	-12.10	H
2483.500	28.98	7.07	39.14	35.63	32.54	54.00	-21.46	H

Test at middle Channel in transmitting status

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

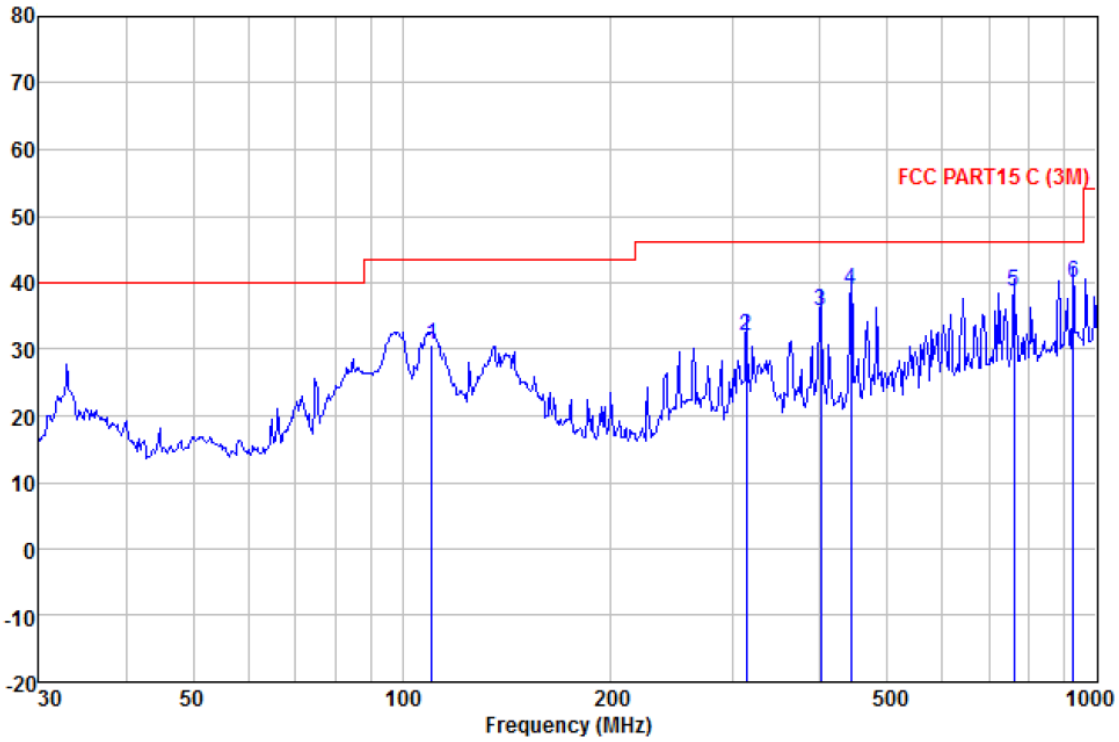
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

30 MHz~1 GHz Field Strength of Unwanted Emissions.Quasi-Peak Measurement

Vertical:

Peak scan

Level (dBμV/m)



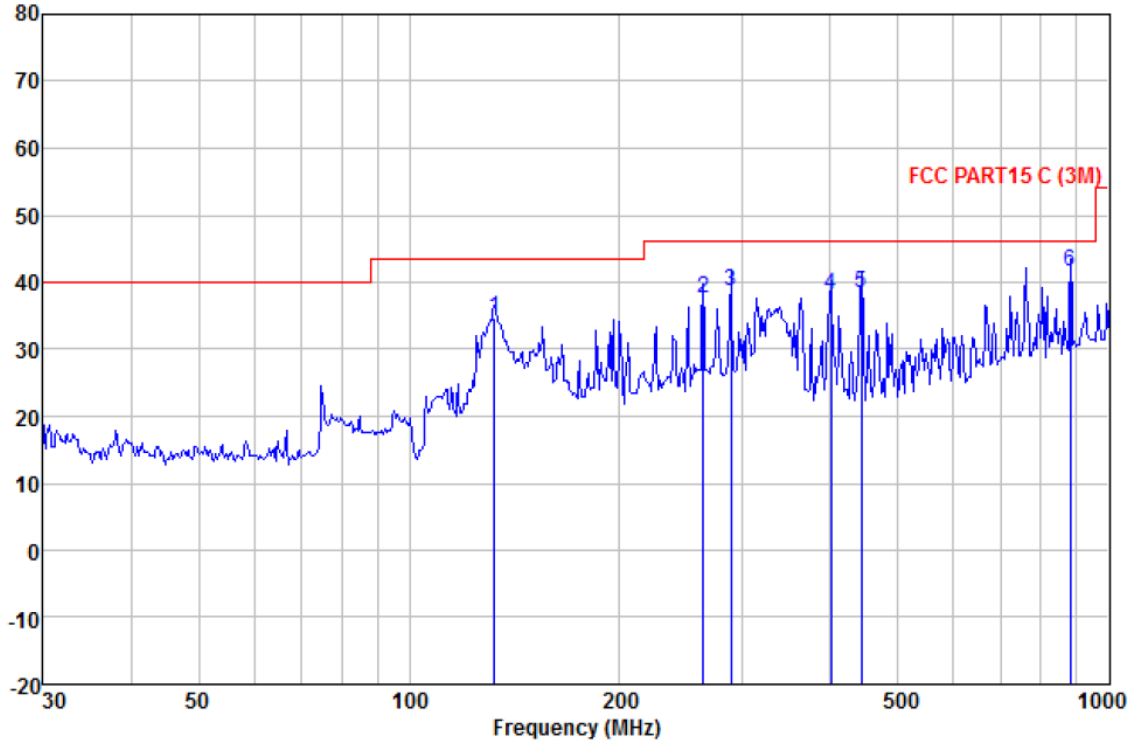
Quasi-peak measurement

Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
110.182	45.30	10.23	1.95	26.90	30.58	43.50	-12.92	QP
313.276	40.82	14.10	3.45	26.49	31.88	46.00	-14.12	QP
400.432	42.81	16.30	3.90	27.20	35.81	46.00	-10.19	QP
443.294	45.21	17.08	4.13	27.48	38.94	46.00	-7.06	QP
760.704	39.15	22.06	5.43	28.00	38.64	46.00	-7.36	QP
925.756	38.16	23.65	5.97	27.70	40.08	46.00	-5.92	QP

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
132.221	46.90	12.40	2.17	26.86	34.61	43.50	-8.89	QP
262.896	48.10	12.81	3.16	26.41	37.66	46.00	-8.34	QP
287.990	48.00	13.71	3.26	26.40	38.57	46.00	-7.43	QP
400.432	45.22	16.30	3.90	27.20	38.22	46.00	-7.78	QP
443.294	44.63	17.08	4.13	27.48	38.36	46.00	-7.64	QP
881.407	40.19	23.27	5.90	27.80	41.56	46.00	-4.44	QP

1~25 GHz Field Strength of Fundamental & Field Strength of Unwanted Emissions.

Peak & Average Measurement

Peak Measurement:								
Frequency (MHz)	**Antenna factors (dB/m)**	**Cable loss (dB)**	**Preamp factor (dB)**	**Reading Level (dBμV)**	**Emission Level (dBμV/m)**	**Limit (dBμV/m)**	**Over limit**	**Antenna polarization**
2440.300	28.92	6.99	39.12	94.03	90.82	114.00	-23.18	V
4800.600	32.83	9.95	40.21	56.11	58.68	74.00	-15.32	V
7200.800	36.09	12.73	39.26	47.17	56.73	74.00	-17.27	V
9600.520	37.74	14.48	37.97	34.44	48.69	74.00	-25.31	V
2440.100	28.92	6.99	39.12	95.70	92.49	114.00	-21.51	H
4800.400	32.83	9.95	40.21	57.58	60.15	74.00	-13.85	H
7200.500	36.09	12.73	39.26	42.87	52.43	74.00	-21.57	H
9600.400	37.74	14.48	37.97	35.01	49.26	74.00	-24.74	H
Average Measurement:								
Frequency (MHz)	**Antenna factors (dB/m)**	**Cable loss (dB)**	**Preamp factor (dB)**	**Reading Level (dBμV)**	**Emission Level (dBμV/m)**	**Limit (dBμV/m)**	**Over limit**	**Antenna polarization**
2440.300	28.92	6.99	39.12	84.45	81.24	94.00	-12.76	V
4800.600	32.83	9.95	40.21	46.96	49.53	54.00	-4.47	V
7200.800	36.09	12.73	39.26	37.49	47.05	54.00	-6.95	V
9600.520	37.74	14.48	37.97	24.49	38.74	54.00	-15.26	V
2440.100	28.92	6.99	39.12	85.01	81.80	94.00	-12.20	H
4800.400	32.83	9.95	40.21	45.93	48.50	54.00	-5.50	H
7200.500	36.09	12.73	39.26	31.35	40.91	54.00	-13.09	H
9600.400	37.74	14.48	37.97	26.37	40.62	54.00	-13.38	H

Band Edge:

Peak Measurement:								
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	Antenna polarization
2400.000	28.84	6.90	39.11	46.61	43.24	74.00	-30.76	V
2483.500	28.98	7.07	39.14	53.25	50.16	74.00	-23.84	V
2400.000	28.84	6.90	39.11	56.54	53.17	74.00	-20.83	H
2483.500	28.98	7.07	39.14	49.23	46.14	74.00	-27.86	H
Average Measurement:								
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	Antenna polarization
2400.000	28.84	6.90	39.11	35.77	32.40	54.00	-21.60	V
2483.500	28.98	7.07	39.14	42.61	39.52	54.00	-14.48	V
2400.000	28.84	6.90	39.11	38.27	34.90	54.00	-19.10	H
2483.500	28.98	7.07	39.14	38.02	34.93	54.00	-19.07	H

Test at high Channel in transmitting status

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

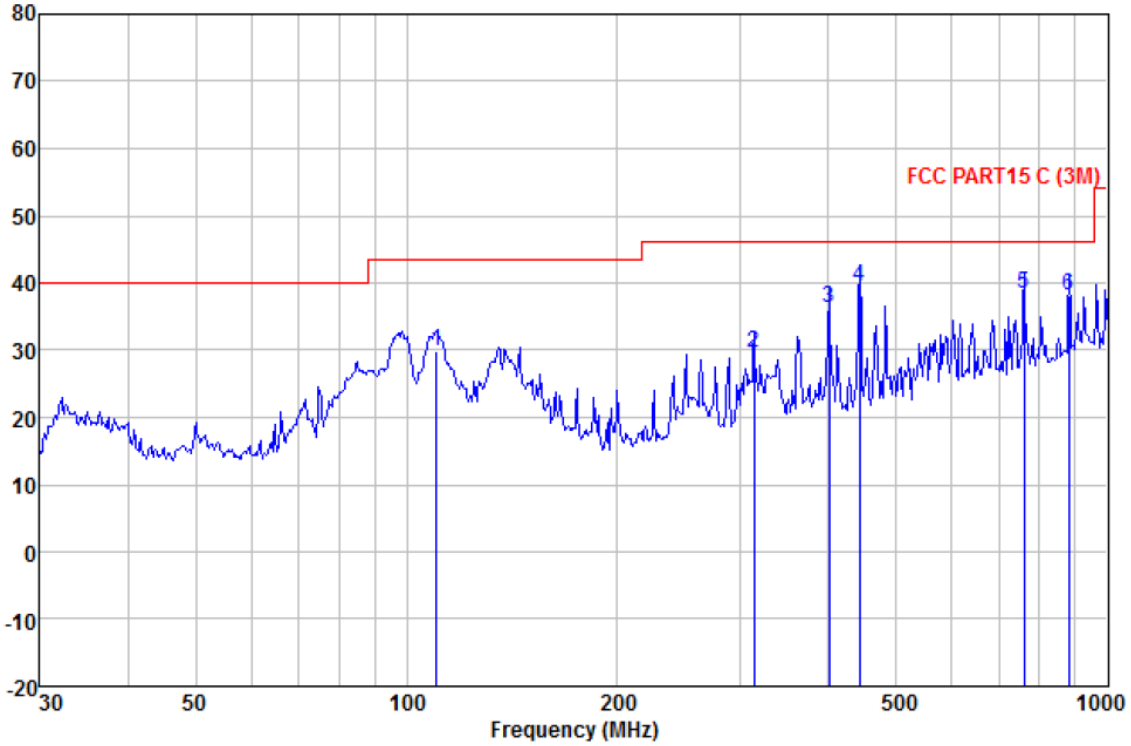
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

30 MHz~1 GHz Field Strength of Unwanted Emissions.Quasi-Peak Measurement

Vertical:

Peak scan

Level (dBμV/m)



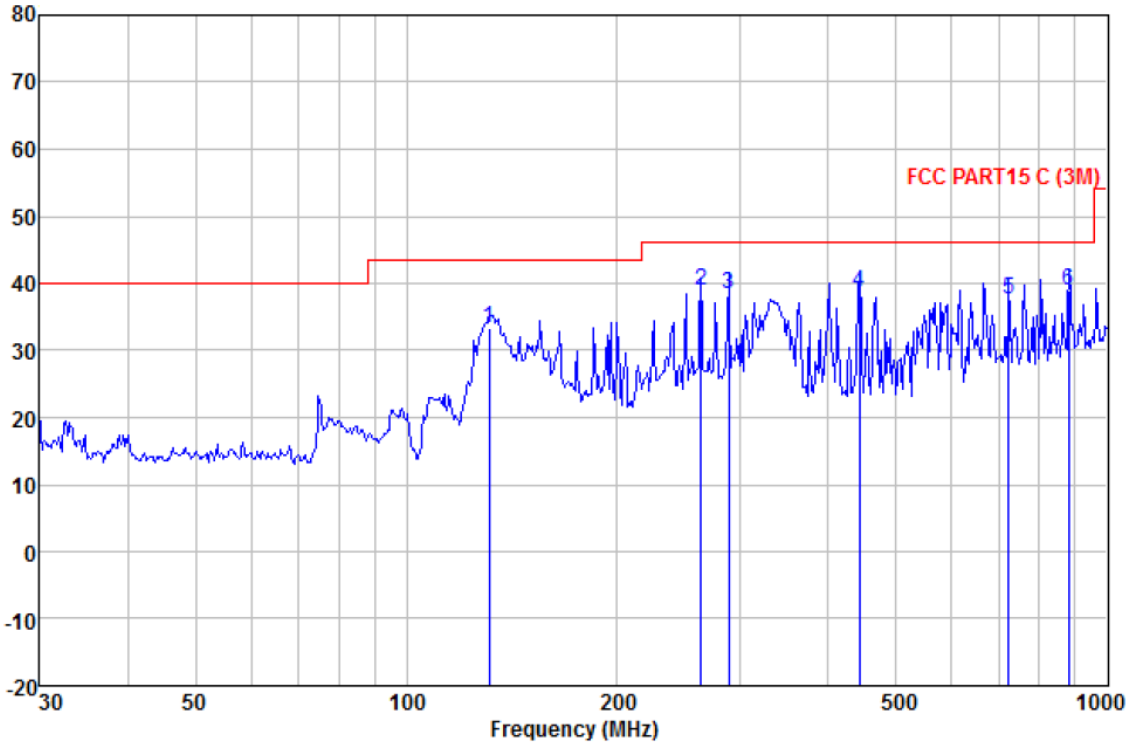
Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
110.182	44.58	10.23	1.95	26.90	29.86	43.50	-13.64	QP
313.276	38.62	14.10	3.45	26.49	29.68	46.00	-16.32	QP
400.432	43.23	16.30	3.90	27.20	36.23	46.00	-9.77	QP
443.294	45.87	17.08	4.13	27.48	39.60	46.00	-6.40	QP
760.704	38.88	22.06	5.43	28.00	38.37	46.00	-7.63	QP
881.407	36.71	23.27	5.90	27.80	38.08	46.00	-7.92	QP

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
131.297	45.66	12.29	2.16	26.87	33.24	43.50	-10.26	QP
262.896	49.26	12.81	3.16	26.41	38.82	46.00	-7.18	QP
287.990	47.82	13.71	3.26	26.40	38.39	46.00	-7.61	QP
443.294	45.05	17.08	4.13	27.48	38.78	46.00	-7.22	QP
724.261	38.83	21.52	5.25	28.00	37.60	46.00	-8.40	QP
881.407	37.67	23.27	5.90	27.80	39.04	46.00	-6.96	QP

1~25 GHz Field Strength of Fundamental & Field Strength of Unwanted Emissions.

Peak & Average Measurement

Peak Measurement:								
Frequency (MHz)	**Antenna factors (dB/m)**	**Cable loss (dB)**	**Preamp factor (dB)**	**Reading Level (dBμV)**	**Emission Level (dBμV/m)**	**Limit (dBμV/m)**	**Over limit**	**Antenna polarization**
2470.500	28.96	7.04	39.13	95.66	92.53	114.00	-21.47	V
4940.300	33.12	10.07	40.22	39.85	42.82	74.00	-31.18	V
7410.100	36.34	13.02	39.20	39.20	49.36	74.00	-24.64	V
9880.500	37.57	14.42	37.86	34.56	48.69	74.00	-25.31	V
2470.300	28.96	7.04	39.13	96.62	93.49	114.00	-20.51	H
4940.560	33.12	10.07	40.22	38.78	41.75	74.00	-32.25	H
7410.030	36.34	13.02	39.20	37.16	47.32	74.00	-26.68	H
9880.050	37.57	14.42	37.86	35.13	49.26	74.00	-24.74	H
Average Measurement:								
Frequency (MHz)	**Antenna factors (dB/m)**	**Cable loss (dB)**	**Preamp factor (dB)**	**Reading Level (dBμV)**	**Emission Level (dBμV/m)**	**Limit (dBμV/m)**	**Over limit**	**Antenna polarization**
2470.500	28.96	7.04	39.13	85.74	82.61	94.00	-11.39	V
4940.300	33.12	10.07	40.22	29.56	32.53	54.00	-21.47	V
7410.100	36.34	13.02	39.20	29.24	39.40	54.00	-14.60	V
9880.500	37.57	14.42	37.86	24.23	38.36	54.00	-15.64	V
2470.300	28.96	7.04	39.13	85.65	82.52	94.00	-11.48	H
4940.560	33.12	10.07	40.22	28.52	31.49	54.00	-22.51	H
7410.030	36.34	13.02	39.20	25.19	35.35	54.00	-18.65	H
9880.050	37.57	14.42	37.86	23.30	37.43	54.00	-16.57	H

Band Edge:

Peak Measurement:								
Frequency (MHz)	**Antenna factors (dB/m)**	**Cable loss (dB)**	**Preamp factor (dB)**	**Reading Level (dBμV)**	**Emission Level (dBμV/m)**	**Limit (dBμV/m)**	**Over limit**	**Antenna polarization**
2400.000	28.84	6.90	39.11	51.04	47.67	74.00	-26.33	V
2483.500	28.98	7.07	39.14	48.26	45.17	74.00	-28.83	V
2400.000	28.84	6.90	39.11	49.27	45.90	74.00	-28.10	H
2483.500	28.98	7.07	39.14	49.23	46.14	74.00	-27.86	H
Average Measurement:								
Frequency (MHz)	**Antenna factors (dB/m)**	**Cable loss (dB)**	**Preamp factor (dB)**	**Reading Level (dBμV)**	**Emission Level (dBμV/m)**	**Limit (dBμV/m)**	**Over limit**	**Antenna polarization**
2400.000	28.84	6.90	39.11	41.89	38.52	54.00	-15.48	V
2483.500	28.98	7.07	39.14	39.44	36.35	54.00	-17.65	V
2400.000	28.84	6.90	39.11	39.54	36.17	54.00	-17.83	H
2483.500	28.98	7.07	39.14	39.72	36.63	54.00	-17.37	H

Remark:

1). The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Loss –Preamplifier Factor.

2). As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

3). The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

4). For Radiated Emissions fall in the restricted bands (2400MHz is worse case than 2390MHz and report it as above), which set out in Section 15.205 Restricted bands.

Also there is not any other emission which falls in restricted bands can be detected and reported.

Test result: The unit does meet the FCC requirements.

7.4 Occupied Bandwidth

Test Requirement: FCC Part 15 C section 15.215(c)

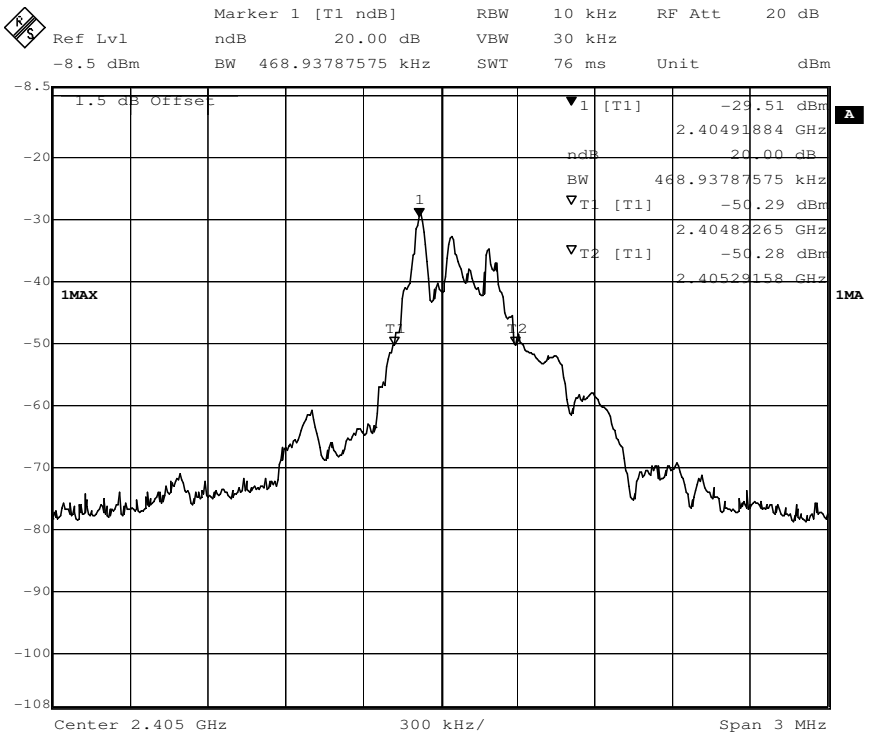
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Test Method: ANSI C63.10: Clause 6.9.

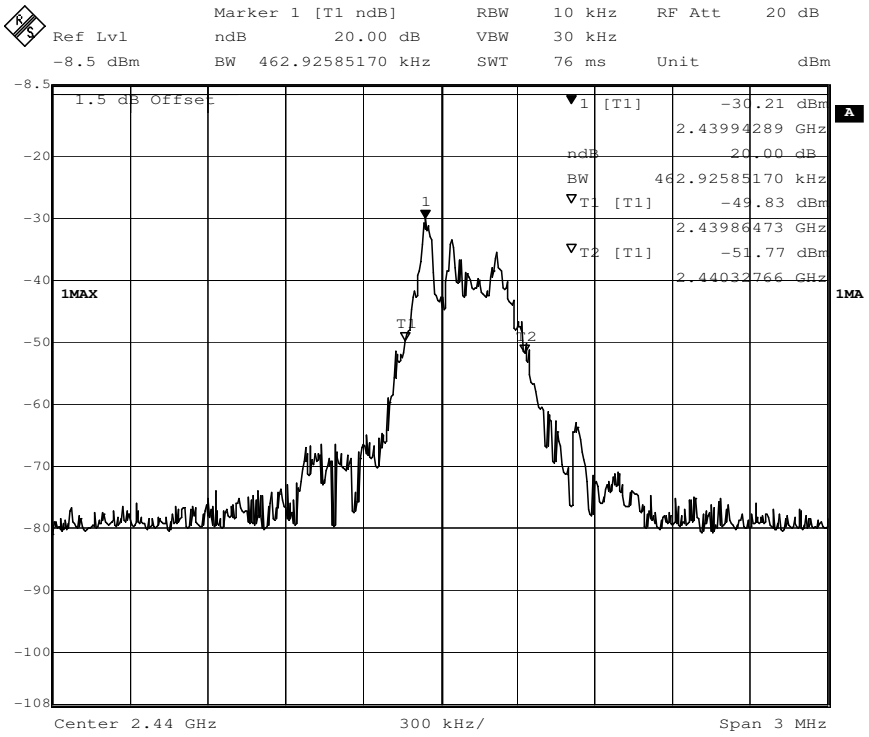
Operation within the band 2.400 to 2.4835 GHz

Method of measurement: A small sample of the transmitter output was fed into the Spectrum Analyzer and the attached plot was taken.

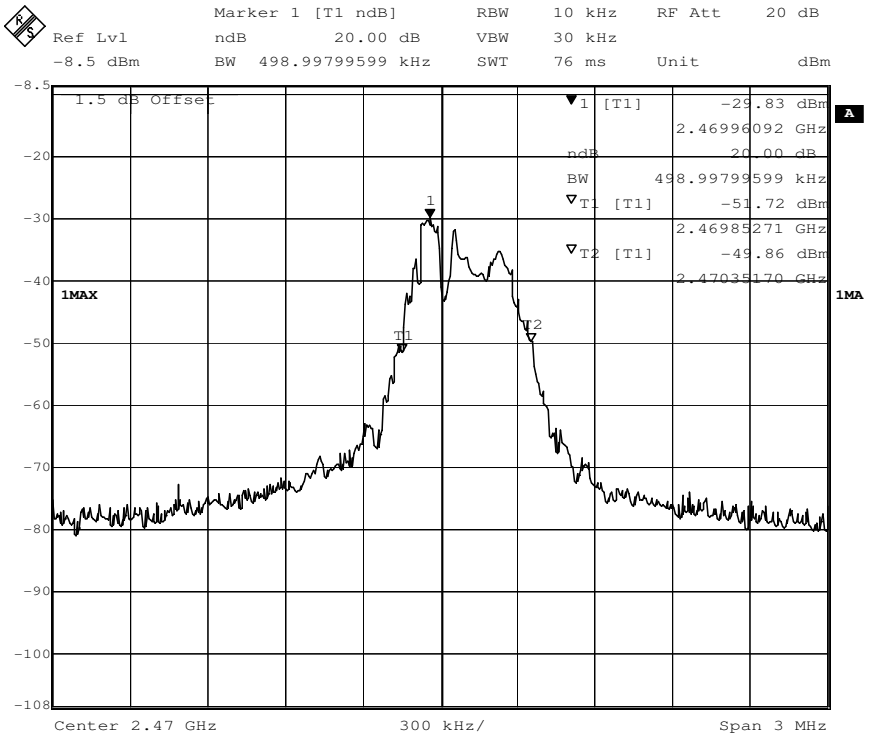
1.Test in the lowest frequency 2.405 GHz



2.Test in the middle frequency 2.440 GHz



3.Test in the highest frequency 2.470 GHz



The results: The unit does meet the FCC requirements.

7.5 Conducted Emissions at Mains Terminals 150 kHz to 30 MHz

Test Requirement: FCC Part 15 C section 15.207

Test Method: ANSI C63.10: Clause 6.2

Frequency Range: 150 kHz to 30 MHz

Detector: Peak for pre-scan (9 kHz Resolution Bandwidth)

Test Limit

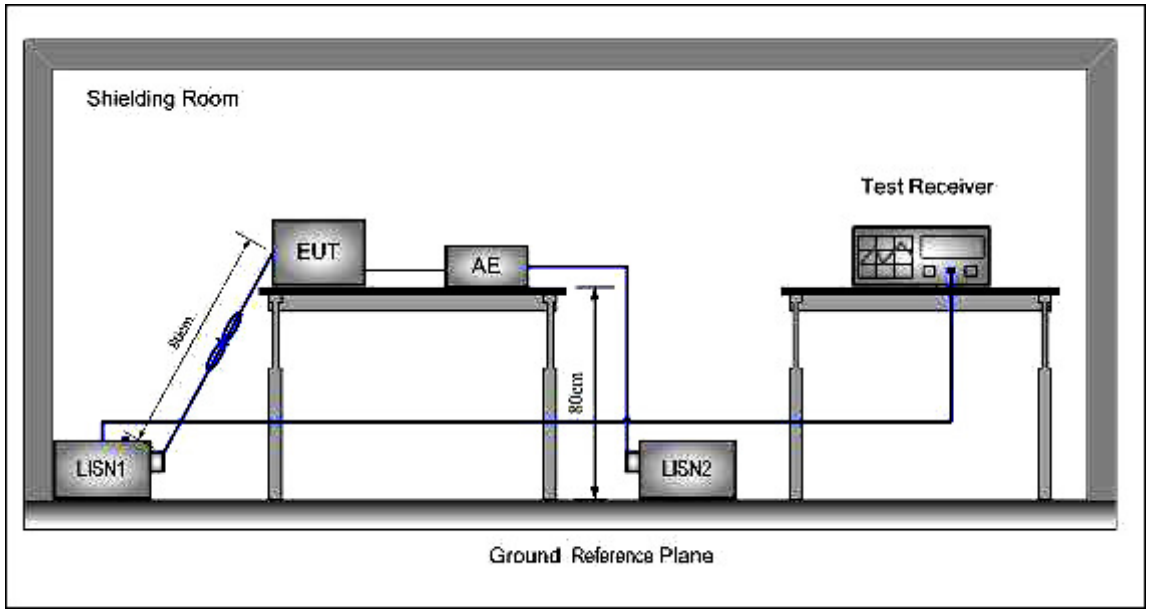
Limits for conducted disturbance at the mains ports of class B

Frequency Range (MHz)	Class B Limit dB(μV)	
	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 limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

EUT Operation: Test in normal operating mode. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Test Configuration:



Test procedure:

1. The mains terminal disturbance voltage test was conducted in a shielded room.

2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.

4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0,4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0,8 m from the LISN 2.

Measurement Data

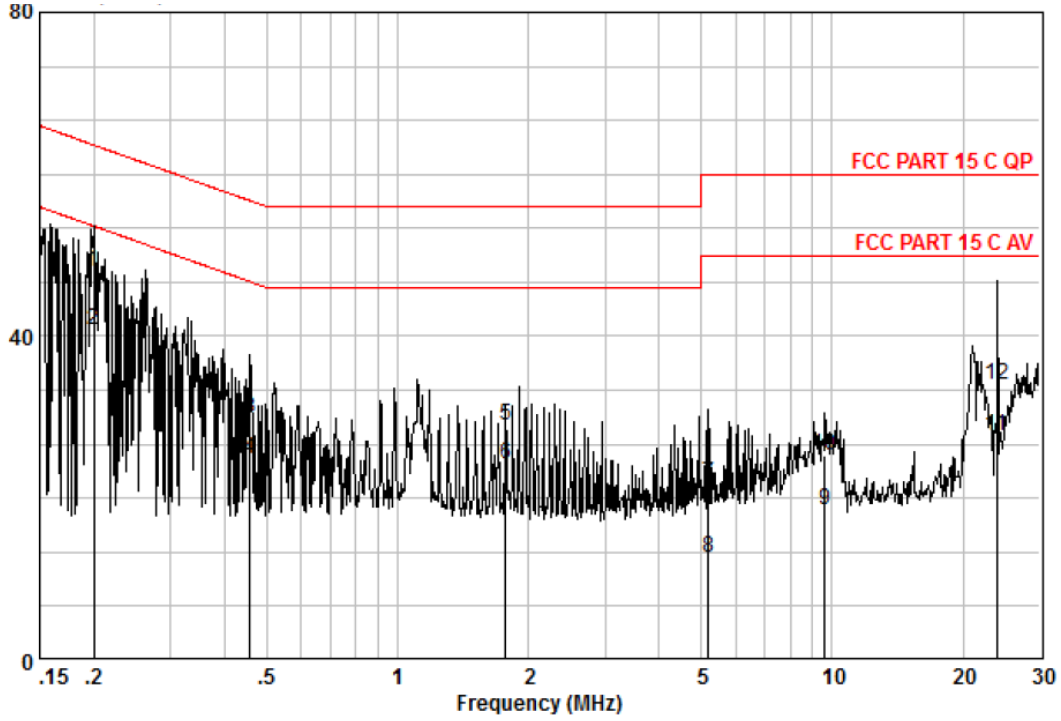
An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected. For EUT the communicating was worst case mode.

The following Quasi-Peak and Average measurements were performed on the EUT:

Neutral Line

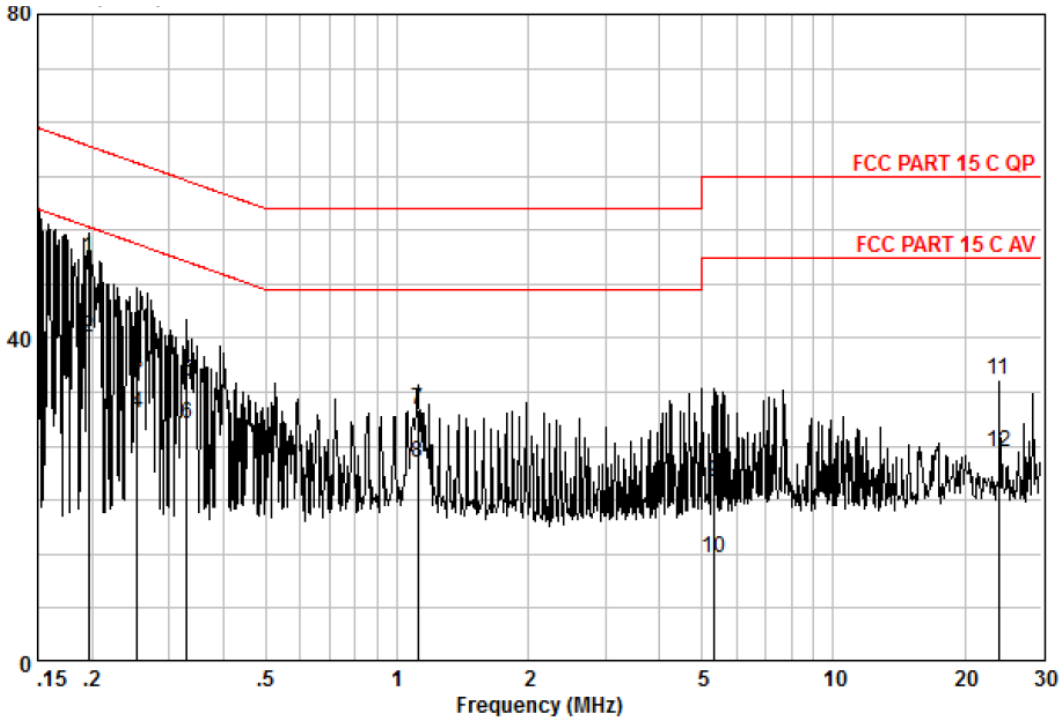
Level(dBµV)



Measure data:

Freq	Read Level	Cable Loss	LISN Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.200	38.18	0.10	9.69	47.97	63.62	-15.65	QP
0.200	30.88	0.10	9.69	40.67	53.62	-12.95	AVERAGE
0.456	20.03	0.19	9.71	29.93	56.76	-26.83	QP
0.456	14.94	0.19	9.71	24.84	46.76	-21.92	AVERAGE
1.770	18.85	0.36	9.71	28.91	46.00	-17.09	AVERAGE
1.770	14.14	0.36	9.71	24.20	56.00	-31.80	QP
5.194	11.45	0.69	9.76	21.91	60.00	-38.09	QP
5.194	2.09	0.69	9.76	12.55	50.00	-37.45	AVERAGE
9.603	8.15	0.61	9.82	18.58	50.00	-31.42	AVERAGE
9.603	14.90	0.61	9.82	25.33	60.00	-34.67	QP
23.970	16.92	0.70	10.09	27.71	50.00	-22.29	AVERAGE
23.970	23.24	0.70	10.09	34.03	60.00	-25.97	QP

Live Line
Level(dBμV)



Measure result:

Freq	Read Level	Cable Loss	LISN Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.197	40.16	0.10	9.57	49.83	63.76	-13.93	QP
0.197	30.42	0.10	9.57	40.09	53.76	-13.67	AVERAGE
0.253	25.83	0.13	9.55	35.51	61.64	-26.14	QP
0.253	21.10	0.13	9.55	30.78	51.64	-20.87	AVERAGE
0.330	24.99	0.15	9.55	34.69	59.44	-24.75	QP
0.330	19.63	0.15	9.55	29.33	49.44	-20.11	AVERAGE
1.117	21.36	0.30	9.56	31.22	56.00	-24.78	QP
1.117	14.71	0.30	9.56	24.57	46.00	-21.43	AVERAGE
5.333	11.96	0.69	9.63	22.28	60.00	-37.72	QP
5.333	2.47	0.69	9.63	12.79	50.00	-37.21	AVERAGE
23.962	24.19	0.70	10.09	34.98	60.00	-25.02	QP
23.962	15.10	0.70	10.09	25.89	50.00	-24.11	AVERAGE

--End of the report--