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**FEDERAL COMMUNICATIONS COMMISSION**  
Registration number: 282399

Report No.: GZEM110300068801  
Page: 1 of 24  
FCC ID: ZD3FTR50X

## TEST REPORT

Application No.:	GZEM1103000688RF
Applicant:	Feitian Technologies Co., Ltd.
FCC ID:	ZD3FTR50X
Product Name:	USB CardReader
Product Description:	Radio CardReader
Model No.:	R(Rockey)5XX ♣
♣	XX = be 00 to 99, Please refer to section 3 of this report for more details.
Standards:	FCC PART 15 SUBPART C:2010 section 15.225 ANSI C63.10:2009
Date of Receipt:	2011-03-17
Date of Test:	2011-06-21 to 2011-08-18
Date of Issue:	2011-10-25
Test Result :	<b>PASS *</b>

\* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 3 of this report for further details.



**Strong Yao**  
**Manager**

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

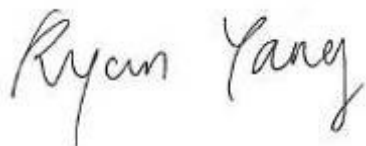
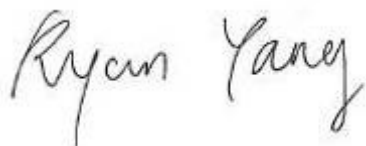

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## 2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2011-10-25		Original

Authorized for issue by:			
Tested By	 <hr/> <b>(Ryan Yang) /Project Engineer</b>	2011-03-18 to 2011-08-18 <hr/> <b>Date</b>	
Prepared By	 <hr/> <b>(Ryan Yang) /Clerk</b>	2011-10-25 <hr/> <b>Date</b>	
Checked By	 <hr/> <b>(Strong Yao)/Reviewer</b>	2011-10-25 <hr/> <b>Date</b>	



### 3 Test Summary

Test	Test Requirement	Test method	Result
Conducted Emissions at Mains Terminals	FCC PART 15 C section 15.207	ANSI C63.10: Clause 6.2	PASS
Radiated Emission (9 kHz to 1 GHz)	FCC PART 15 C section 15.225	ANSI C 63.10: Clasue 6.4, 6.5	PASS**
Occupied Bandwidth	FCC PART 15 C section 15.215	ANSI C 63.10 Clasue 6.9	PASS
Frequency Stability	FCC PART 15 C section 15.225	ANSI C 63.10 Clasue 6.8	PASS
Label Requirement	FCC PART 15 C section 15.19	N/A	N/A

**Remark:**

N/A: not applicable. Refer to the relative section for the details.

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.

♣ Model No.: R(Rockey)5XX

According to the declaration from the applicant, all models are identical. The first X ranges from 0 to 9 and stands for the color choice of the top half of the outer casing; and the second X ranges from 0 to 9 and stands for the color choice of the bottom half of the outer casing which is labelled with product tag.

Therefore only one model **R(Rockey)501** was tested in this report.

\*\* The EUT passed Radiated Emissions after retest.



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## 5 General Information

### 5.1 Client Information

Applicant: Feitian Technologies Co., Ltd.  
Address of Applicant: Floor 17th, Tower B, Huizhi Mansion, No.9 Xueqing Road, Haidian District Beijing China

### 5.2 General Description of E.U.T.

Product Name: USB CardReader  
Model No.: R(Rockey)501

### 5.3 Details of E.U.T.

Frequency: 13.561MHz  
Modulation and Antenna Type: The Tx is a ASK modulation by internal signal with integral antenna.  
Power Supply: DC 5V from PC USB port

### 5.4 Deviation from Standards

None.

### 5.5 Abnormalities from Standard Conditions

The EUT passed Radiated Emissions after retest.

### 5.6 Other Information Requested by the Customer

None.

### 5.7 Test Location

All tests were performed at:  
SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory,  
198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,  
Guangzhou, China 510663  
Tel: +86 20 82155555 Fax: +86 20 82075059  
No tests were sub-contracted.



### 5.8 Description of Support Units

The EUT has been tested with and IC card supplied by applicant and associated equipment as a typical PC system supplied by SGS..

IC Card:



PC:

Description	Manufacturer	Model No.	SN/Certificate NO
<b>Test PC 1</b>			
Personal Computer	DELL	WORKSTATION 690	3R5592X
Monitor	SAMSUNG	225MS	CR22HVMP900646W
Mouse	DELL	MOC5UO	G1B02ZP5
Keyboard	DELL	SK-8115	CN-ODJ331-71616-7B1-109J
<b>Test PC 2</b>			
Personal Computer	DELL	OPTIPLEX 755	D6JF82X
Monitor	DELL	SP2208WFPt(B)	CN-OPK573-71618-831-119U
Mouse	DELL	M-WDEL1	OT0943
Keyboard	DELL	SK-8115	CN-ODJ331-71616-7B1-109J
<b>Test PC 3</b>			
Personal Computer	DELL	OPTIPLEX 330	7JZ382X
Monitor	DELL	E228WFPc	CN-OPN380-64180-7CJ-1DXL
Mouse	DELL	MOC5UO	G1B02ZP5
Keyboard	CHERRY	RS 6000M	G 00005662 Q242 III
<b>Test PC 4</b>			
Personal Computer	DELL	OPTIPLEX 980	GXVZV2X
Monitor	DELL	P2210f	FGL-00000714011207500-09BO02490-A
Mouse	DELL	M-WDEL1	OT0943
Keyboard	DELL	SK-8135	N/A
<b>Test PC 5</b>			
Personal Computer	Lenovo	M6600N	SS12594403
Monitor	HP	D8904	L0204H094
Mouse	DELL	MOC5UO	G1B02ZP5
Keyboard	DELL	SK-8135	N/A
<b>Notebook</b>			
NoteBook	IBM	T40	99-FBAF9 03/09
NoteBook	IBM	T60	L3-F3755
NoteBook	Lenovo	R400	L3-ABB9E

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Description	Manufacturer	Model No.	SN/Certificate NO
<b>Printer</b>			
Printer	DELL	4470-AD1 (926B)	CN-OGH204-48734-69Q-7K78
Printer	HP	C5884A	SG78D1H18F
<b>Other Peripheral</b>			
DV	SONY	DCR-HC28	375383
Portable Hard disk	MSI	2.5" USB2.0 MOBILE HDD(250GB)	HKC08-J/L8022438329
Portable Hard disk	SAMSUNG	HM320JI(320GB)	S16LJD0Q543275
ROM Programmer	DASI Electronics	EMP-100A	N/A
Faxmodem	3Com U.S. Robotics	56K Faxmodem	715630-01
HP Colorado T1000e External Parallel Tape Backup System	Hewlett Packard	T1000e	US035980
GROUP PHONE SYSTEM	HB	WS824(1)	241342207120130
Fast Ethernet Switch	TP-Link	TL-SF1005D	7126101589
Fast Ethernet Switch	TP-Link	TL-SF1008D	7126001251
MIC	VoiceAO	N/A	N/A
MIC	VoiceAO	N/A	N/A
Flash Disk	Kingston	DTI/2GB	CH 092908
Flash Disk	Kingston	DTI/1GB	CH 042007
SD Memory Card	SanDisk	128MB	AK0531802339D
MiniSD Memory Card	SanDisk	1024MB	BB063010TE
MMCmobile	Richlight	1GB	MM8GH01GRMCA-9A
Headphone	COBY	CV-230	N/A
Headphone	Philips	N/A	N/A
Ipod classic	Apple	MB147CH	JQ74121YMV
Ipod nano	Apple	A1137	JQ63803RV9M
Ipod nano	Apple	A1137	5Z50163JXUY
Ipod nano	Apple	A1137	YM601DN0SZB
Ipod nano	Apple	MC688CH/A	DCYDWE22DDVX
Ipod touch	Apple	A1288	1B9070RW203
Iphone	Apple	A1203	87810HJBWH8
Iphone 3GS	Apple	A1303	579C-A1303A
Projector	Sony	VPL-CX61	5004355
Wii console	Nintendo	RVL-001(JPN)	N/A
Xbox 360 Console	Microsoft	Xbox 360 Console	328731122665682000
Xbox Video Game System	Microsoft	F23-00064	111100623241005
HDMI 1 (EMCA002)	SGS	10m	N/A
HDMI 2 (EMCA003)	SGS	5m	N/A
USB (EMCA004)	SGS	5m	N/A
VGA (EMCA005)	SGS	1.8m	N/A



## 5.9 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 recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **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 and C-2584)**

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 and C-2584 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 01:2006-10 and Rules of procedure IECEE 02:2006-10, and the relevant IECEE CB-Scheme Operational documents.





## 6 Equipment Used during Test

RE in Chamber						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date	Calibration Interval
					(YYYY-MM-DD)	
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2011-09-06	2Y
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2012-01-17	1Y
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	10036	2012-06-01	1Y
EMC0514	Coaxial cable	SGS	N/A	N/A	2011-12-08	1Y
EMC2025	Trilog Broadband Antenna 30-3000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9163	9163-450	2011-10-28	1Y
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	2011-12-20	1Y
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	2011-12-20	1Y
EMC2026	Horn Antenna 1-18GHz	R&S	BBHA 9120D	9120D-841	2011-10-28	1Y
EMC0518	Horn Antenna	Rohde & Schwarz	HF906	100096	2011-09-11	1Y
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2012-01-17	1Y
EMC0049	Amplifier	Agilent	8447D	2944A10862	2012-04-21	1Y
EMC0075	310N Amplifier	Sonama	310N	272683	2011-10-25	1Y
EMC0523	Active Loop Antenna	EMCO	6502	42963	2011-11-17	1Y
EMC2041	Broad-Band Horn Antenna(14)15-26.5(40)GHZ	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9170	9170-375	2012-06-01	1Y
EMC0530	10m Semi- Anechoic Chamber	ETS	N/A	N/A	2012-05-10	2Y

General used equipment						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date	Calibration Interval
					(YYYY-MM-DD)	
EMC0006	DMM	Fluke	73	70681569	2011-12-16	1Y
EMC0007	DMM	Fluke	73	70671122	2011-12-16	1Y



## 7 Test Results

### 7.1 E.U.T. test conditions

- Power supply: DC 5.0 V
- Requirements: **15.31(e):** 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. For battery operated equipment, the equipment tests shall be performed using a new battery.
- Type of antenna: Integral
- Operating Environment:
- Temperature: 22-25.0 °C
- Humidity: 48-55% RH
- Atmospheric Pressure: 1001-1010 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	10 <sup>th</sup> harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5 <sup>th</sup> harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5 <sup>th</sup> harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

Remark: Test frequency is 13.561 MHz.

## 7.2 Antenna Requirement

### Standard requirement

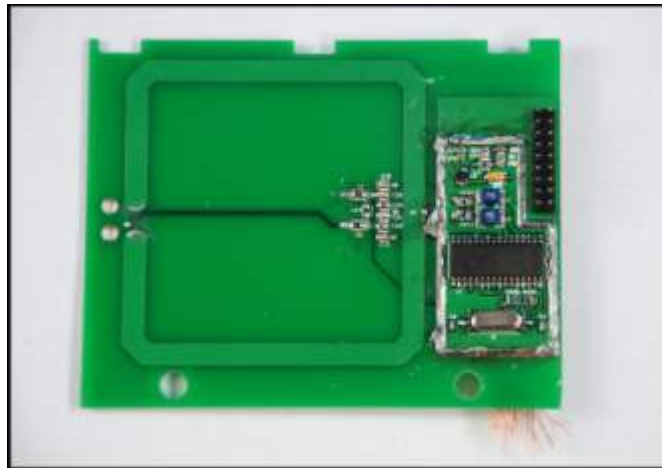
15.203 requirement:

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 a loop antenna integrated on the main PCB and no consideration of replacement.

The best case gain of the antenna is 1.5 dBi.



**Test result: The unit does meet the FCC requirements.**



### 7.3 Conducted Emissions at Mains Terminals 150 kHz to 30MHz

**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 (9kHz Resolution Bandwidth)  
**Test Limit**

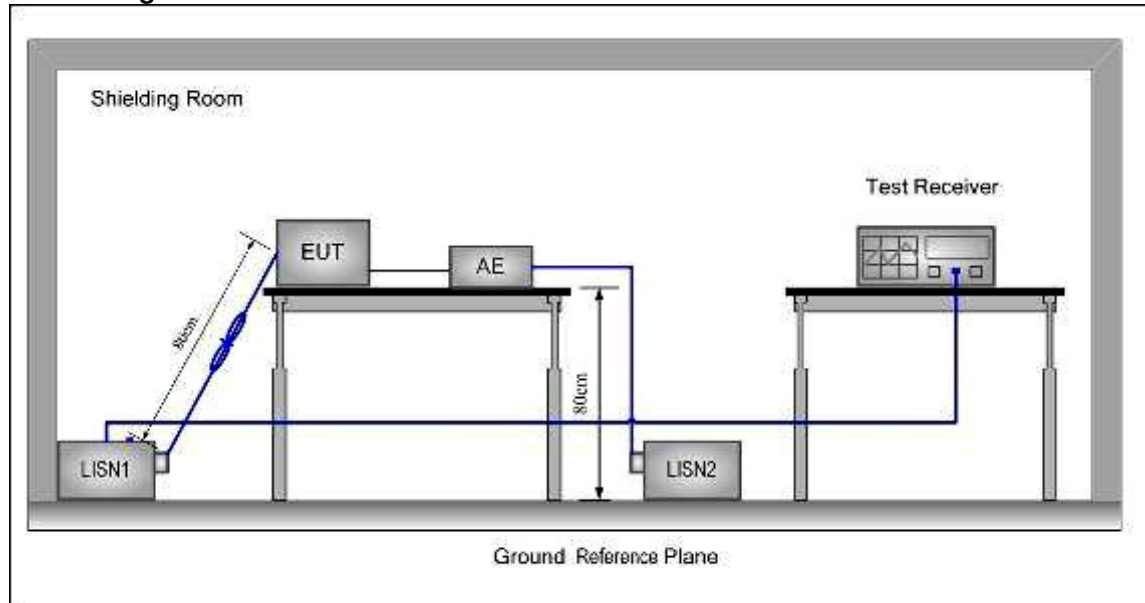
#### Limits for conducted disturbance at the mains ports of class B

Frequency Range (MHz)	Class B Limit (dBuV)	
	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 the EUT in transmitting mode.

**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  $50\Omega/50\mu\text{H} + 5\Omega$  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.



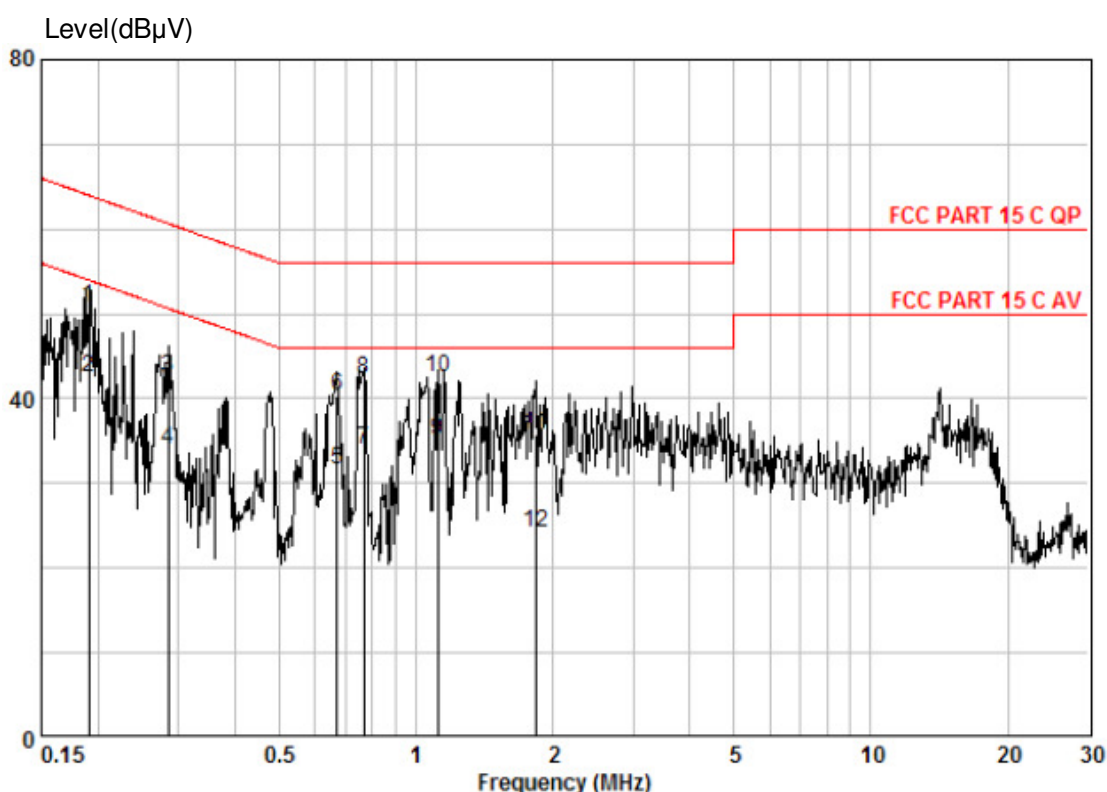
### 7.3.1 Measurement Data

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

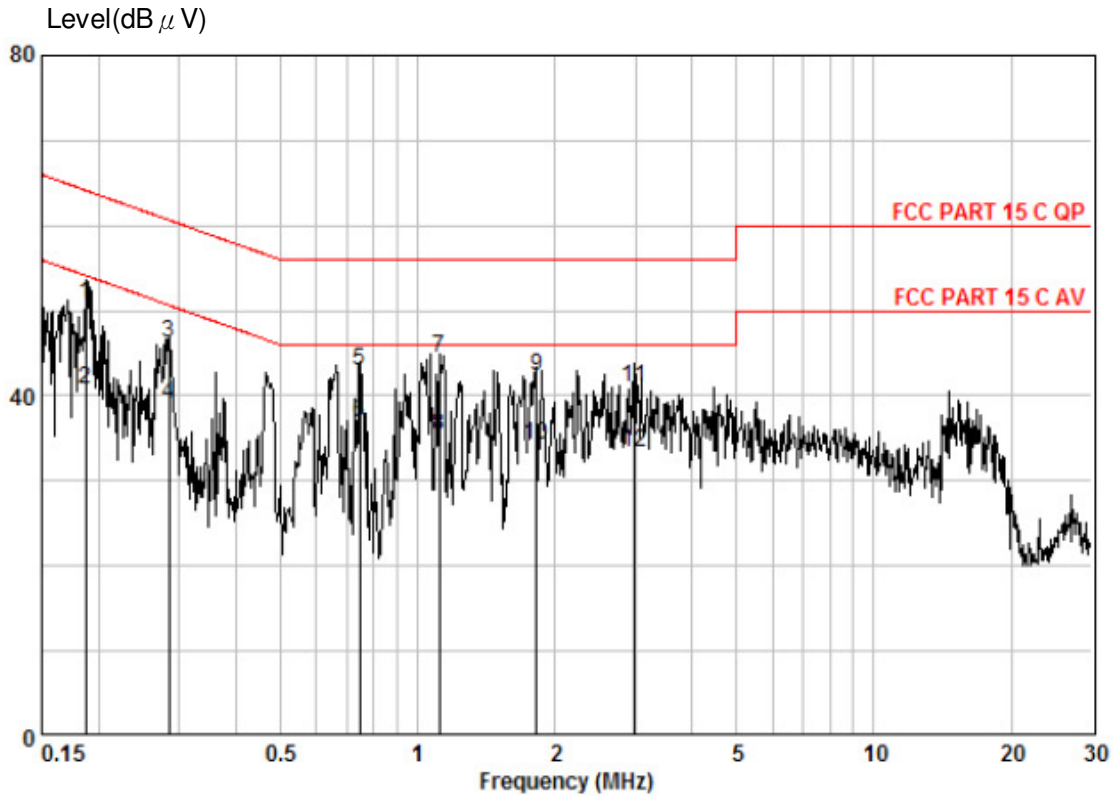


Measure data:

Freq	Read Level	Cable Loss	LISN Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.190	41.04	0.12	9.64	50.80	64.02	-13.22	QP
0.190	32.66	0.12	9.64	42.42	54.02	-11.60	AVERAGE
0.285	32.82	0.09	9.63	42.54	60.68	-18.14	QP
0.285	24.18	0.09	9.63	33.90	50.68	-16.78	AVERAGE
0.672	21.98	0.04	9.68	31.70	46.00	-14.30	AVERAGE
0.672	30.66	0.04	9.68	40.38	56.00	-15.62	QP
0.767	24.32	0.05	9.68	34.05	46.00	-11.95	AVERAGE
0.767	32.46	0.05	9.68	42.19	56.00	-13.81	QP
1.117	25.41	0.03	9.69	35.12	46.00	-10.88	AVERAGE
1.117	32.88	0.03	9.69	42.59	56.00	-13.41	QP
1.829	25.96	0.05	9.70	35.72	56.00	-20.28	QP
1.829	14.34	0.05	9.70	24.10	46.00	-21.90	AVERAGE



Live Line



Measure result:

Freq	Read Level	Cable Loss	LISN Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.187	41.02	0.11	9.62	50.76	64.15	-13.39	QP
0.187	30.93	0.11	9.62	40.67	54.15	-13.48	AVERAGE
0.285	36.56	0.09	9.64	46.28	60.68	-14.39	QP
0.285	29.32	0.09	9.64	39.04	50.68	-11.63	AVERAGE
0.747	33.26	0.05	9.64	42.95	56.00	-13.06	QP
0.747	27.15	0.05	9.64	36.84	46.00	-9.17	AVERAGE
1.117	34.84	0.03	9.64	44.51	56.00	-11.49	QP
1.117	25.70	0.03	9.64	35.37	46.00	-10.63	AVERAGE
1.819	32.52	0.05	9.64	42.21	56.00	-13.79	QP
1.819	24.48	0.05	9.64	34.17	46.00	-11.83	AVERAGE
2.993	31.22	0.12	9.70	41.04	56.00	-14.96	QP
2.993	23.53	0.12	9.70	33.35	46.00	-12.65	AVERAGE



7.4 Radiated Emissions

- Test Requirement: FCC Part 15 C section 15.225
Test Method: ANSI C63.10: Clause 6.4, 6.5 and 6.6
Measurement Distance: 3 m (Semi-Anechoic Chamber)
Test Status: Test the EUT in transmitting mode.

Requirements:

the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

- 15.225(a): The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.i.e. 124.0dBµV/m @ 3 m.
15.225(b): Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters. i.e. 90.5dBµV/m @ 3 m.
15.225I: Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters. i.e. 80.5dBµV/m @ 3 m.
15.225(d) :The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209

Out of band emissions shall not exceed:

Table with 2 columns: Frequency range (MHz) and Quasi-peak limits(dBµV/m). Rows include ranges from 1.705-30.0 MHz to Above 960 MHz with corresponding limits like 69.5, 40, 43.5, 46, and 54.

Test Procedure:

1) 9 kHz to 30 MHz emissions:

For testing performed with the loop antenna. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specied 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. The measurement is performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

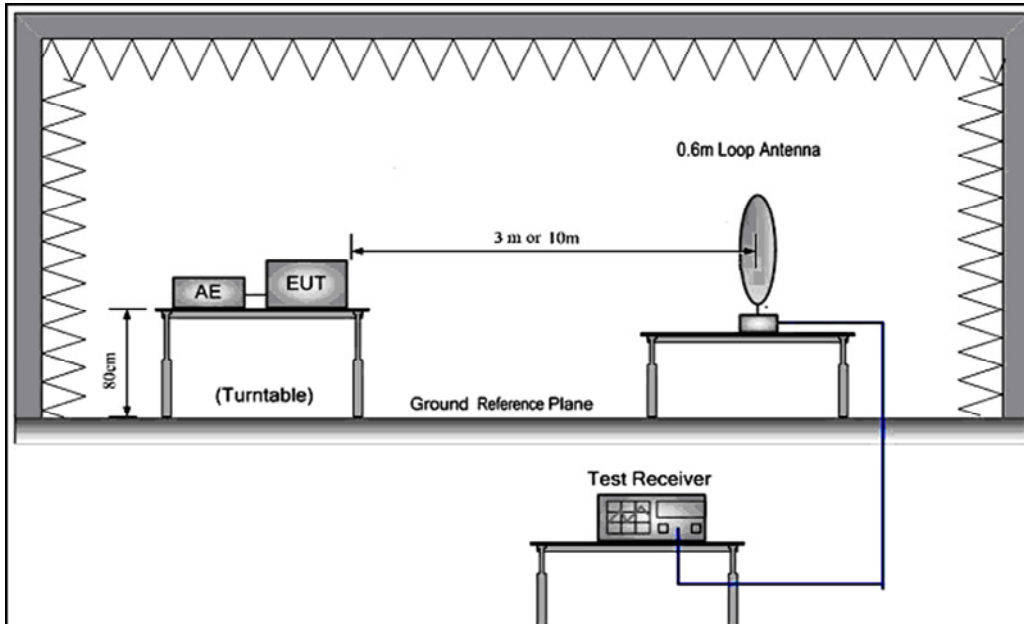
Detector: Peak for pre-scan

Table with 4 columns: Test Receiver test setup, and three Detector columns (9 kHz-150 kHz, 150 kHz-30 MHz, 30 MHz-1000 MHz). Rows include RBW, VBW, Sweep, Detector function, and Trace.

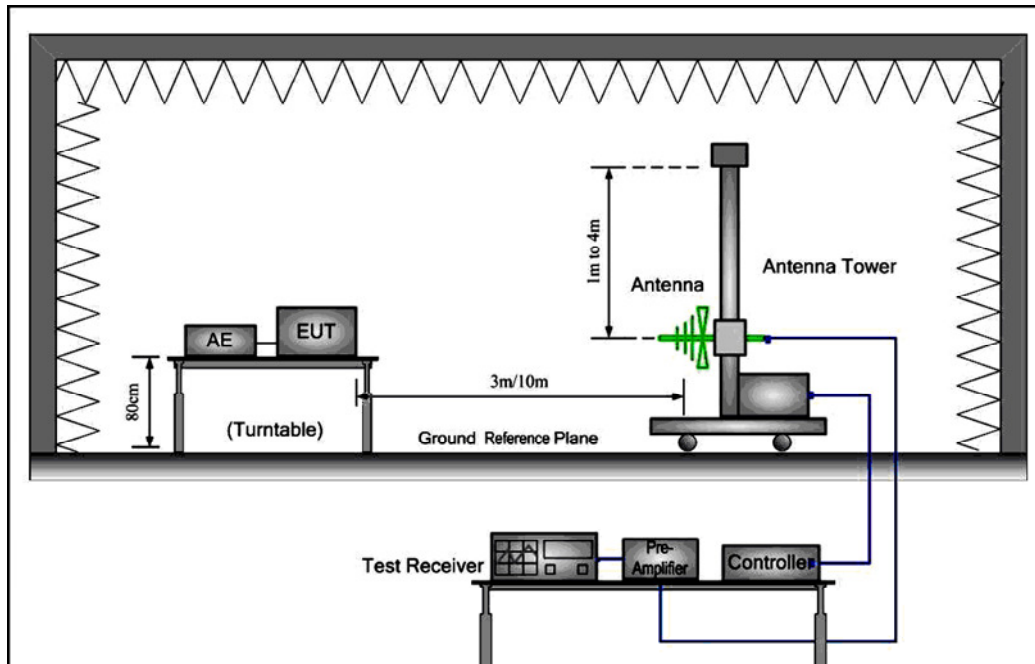


**Test Configuration:**

- 1) 9 kHz to 30 MHz emissions:



- 2) 30 MHz to 1 GHz emissions:





**1) Intentional Emission and Spectrum Mask**

Test Frequency (MHz)	Quasi-Peak (dB $\mu$ V/m)		Limits (dB $\mu$ V/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
13.110	11.8	12.7	69.5	57.7	56.8
13.410	15.2	15.9	80.5	65.3	64.6
13.553	23.5	21.4	90.5	67.0	69.1
13.561	29.3	34.8	124.0	94.7	89.2
13.567	20.7	22.0	90.5	69.8	68.5
13.710	12.9	14.5	80.5	67.6	66.0
14.010	21.0	22.3	69.5	48.5	47.2

**2) Spurious Emission: below 30 MHz**

Test Frequency (MHz)	Quasi-Peak (dB $\mu$ V/m)		Limits (dB $\mu$ V/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
17.325	22.15	23.24	69.5	47.35	46.26
19.251	21.65	22.42	69.5	47.85	47.08
24.001	21.30	20.40	69.5	48.20	49.10

**3) Spurious Emission: above 30 MHz**

The following test results were performed on the EUT.

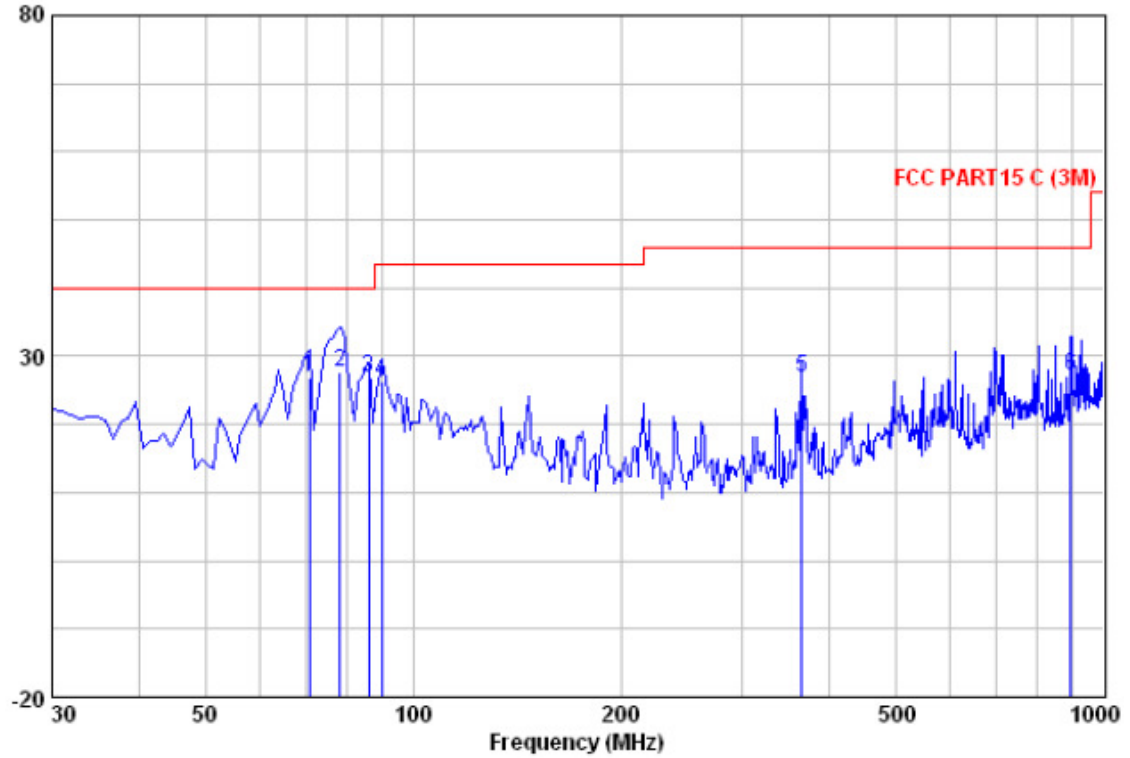
Test the EUT in transmitting mode:



Vertical:

Peak scan

Level (dB $\mu$ V/m)



Quasi-peak measurement

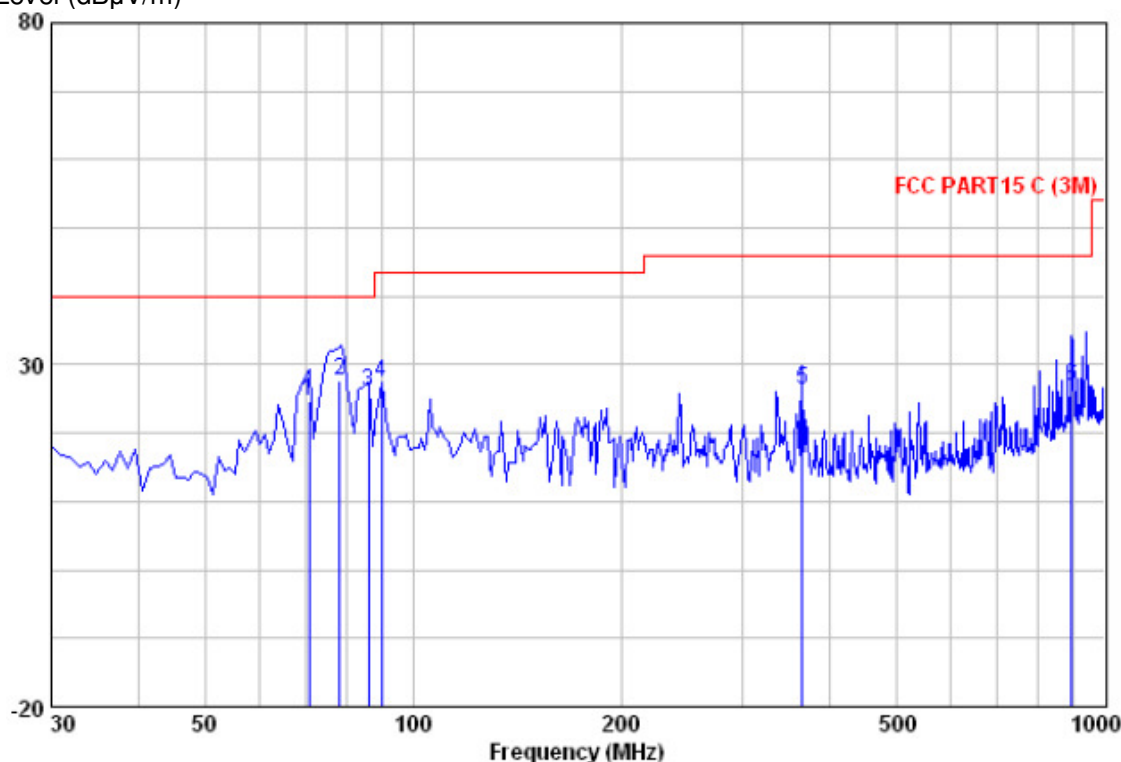
Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dB $\mu$ V	dB/m	dB	dB	dB $\mu$ V/m	dB $\mu$ V/m	dB	
70.740	47.12	8.52	0.70	29.60	26.74	40.00	-13.26	QP
78.400	48.25	8.31	0.70	29.63	27.63	40.00	-12.37	QP
86.260	44.98	10.74	0.80	29.66	26.87	40.00	-13.13	QP
90.140	43.32	11.99	0.80	29.67	26.44	43.50	-17.06	QP
365.620	40.33	14.48	1.70	29.60	26.91	46.00	-19.09	QP
897.180	31.65	21.05	2.80	28.32	27.17	46.00	-18.83	QP



Horizontal:

Peak scan

Level (dBµV/m)



Quasi-peak measurement

Freq	ReadAntenna	Cable	Preamp	Limit	Over	Remark		
MHz	Level	Factor	Loss	Factor	Line	Limit		
	dBµV	dB/m	dB	dB	dBµV/m	dBµV/m	dB	
70.740	45.18	8.52	0.70	29.60	24.80	40.00	-15.20	QP
78.380	48.24	8.31	0.70	29.63	27.63	40.00	-12.37	QP
86.260	44.24	10.74	0.80	29.66	26.13	40.00	-13.87	QP
90.140	44.26	11.99	0.80	29.67	27.37	43.50	-16.13	QP
365.620	39.87	14.48	1.70	29.60	26.45	46.00	-19.55	QP
897.180	31.24	21.05	2.80	28.32	26.76	46.00	-19.24	QP

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

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

Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.



## 7.5 Occupied Bandwidth

**Test Requirement:** FCC Part 15 C section 15.215

**Test Method:** ANSI C63.10: Clause 6.9  
Operation within the band 13.110 –14.010 MHz

**Test Status:** Test the EUT in transmitting mode.

### Requirements:

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 is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the 20 dB 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 Procedure:

The useful radiated emission from the EUT was detected by the spectrum analyzer with peak detector. Record the 20 dB bandwidth of the carrier.

The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector. The vertical Scale is set to 10dB per division. The horizontal scale is set to 20 kHz per division. Read the down 20dB bandwidth of the carrier.

Set the spectrum analyzer: Span = 50 kHz

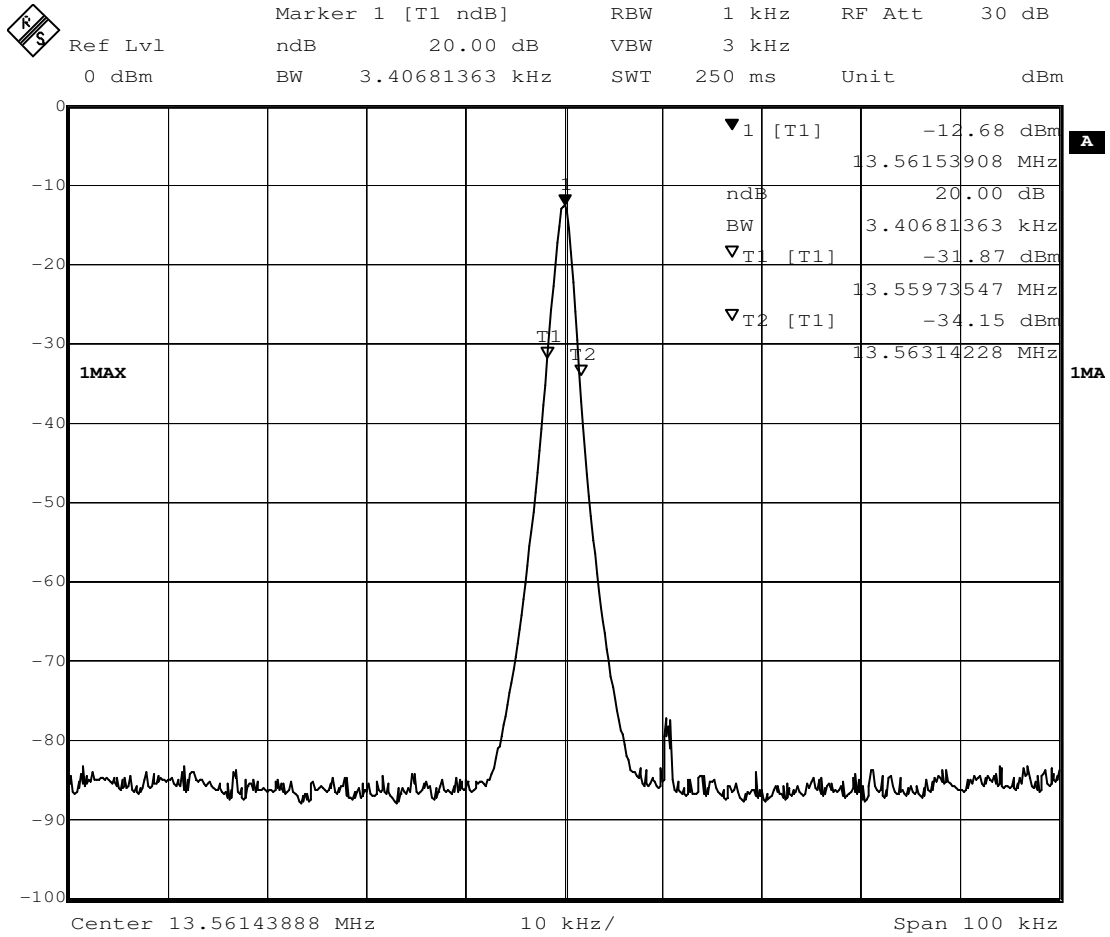
Set the spectrum analyzer: RBW = 1 kHz, VBW = 3 kHz

Sweep = auto; Detector Function = Peak. Trace = Max Hold.

Mark the peak frequency and -20dB points bandwidth.



Test plot as below:



20dB bandwidth lower frequency : 13.5597 MHz

20dB bandwidth upper frequency : 13.5631 MHz



## 7.6 Frequency Stability

**Test Requirement:** FCC Part 15 C section 15.225 (e)  
**Test Method:** ANSI C63.10: Clause 6.8  
**Test Status:** Test the EUT in transmitting mode.

**Requirements:**

**15.225(e):** The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

**Test Procedure:**

1. The EUT was turn-up.
2. With all power removed, the temperature was decreased to -20°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
3. The temperature tests were performed for the worst case.
4. Variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20°C. The maximum frequency change was recorded.

**Test Result:**

Operating Frequency: 13.561 MHz,  
 Limit: total emission within +/- 0.013561 kHz(+/- 0.01% of the operating frequency)

Frequency stability vs. temperature		
Environment Temperature (°C)	Measured Frequency (MHz)	Frequency Measure with Time Elapsed Total emission within kHz
50	13.56152	+0.00383
40	13.56152	+0.00383
30	13.56151	+0.00376
20	13.56149	+0.00361
10	13.56149	+0.00361
0	13.56147	+0.00347
-10	13.56148	+0.00354
-20	13.56148	+0.00354

Frequency stability vs. input voltage		
Power Supplied (Vdc)	Measured Frequency (MHz)	Frequency Measure with Time Elapsed Total emission within Max kHz
3.825	13.56149	+0.00361
4.500	13.56149	+0.00361
4.900	13.56148	+0.00354
5.175	13.56147	+0.00347



## 7.7 Label Requirement

**Label requirement:** FCC Part 15 C Section 15.19

**Base standard:** FCC Part 2, § 2.925 & § 2.926

**For Certification:**

**FCC identifier:** Identifier consists of the two elements. It shall be preceded by the term FCC ID in capital letters on a single line, and shall be of a type size large enough to be legible without the aid of magnification.  
Example:  
FCC ID: XXX123

Here, XXX means Grantee Code, and 123 means Equipment Product Code. Grantee Code is issued by FCC, A grantee code will have three characters consisting of Arabic numerals, capital letters, or combination thereof.  
while Equipment Product code be defined by the applicant.

The use of “wild card” characters, such as @, ( ), !, &, \$ or / , in the Product Code is not allowed.

Whole the FCC ID numbers are no more than 14.

**Compliance statement:**

The FCC identifier shall be of a type size large enough to be legible without the aid of magnification.  
All other devices shall bear the following statement in a conspicuous location on the device:  
This device complies with Part 15 of the FCC Rules.Operation is subject to the following two conditions:  
1. This device may not cause harmful interference, and  
2. This device must accept any interference received, including interference that may cause undesired operation.  
**But it is allowed to put it in the user manual for the device’s size smaller than 8cm\*10cm.**

**Location:**

The label shall be located in a conspicuous location on the device.  
Label text and information should be in a size of type large enough to be readily legible, consistent with the dimensions of the equipment and the label. However, the type size for the text is not required to be larger than eight point.

**--The End of Report--**