

FCC Radio Test Report

FCC ID: 2APBP-CM30

Original Grant

Report No. : TBR-C-202311-0170-84
Applicant : Ciontek Technology Corp.
Equipment Under Test (EUT)
EUT Name : Smart POS Payment Terminal
Model No. : CM30
Series Model No. : CM30P, CM30L, CM30S, CM30M, CM30C, CM30A, CM30V, CM30X, CM30G
Brand Name : Ciontek
Sample ID : 202311-0170-7-1# & 202311-0170-7-2#
Receipt Date : 2023-11-28
Test Date : 2023-11-28 to 2024-01-25
Issue Date : 2024-01-25
Standards : FCC Part 15, Subpart C 15.225
Test Method : ANSI C63.10: 2013
Conclusions : **PASS**

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

Test/Witness Engineer : 

Engineer Supervisor : 

Engineer Manager : 



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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Revision History

Report No.	Version	Description	Issued Date
TBR-C-202311-0170-84	Rev.01	Initial issue of report	2024-01-25

1. General Information about EUT

1.1 Client Information

Applicant	:	Ciontek Technology Corp.
Address	:	B501, Chanxueyan Building Wuhan University, No.6 Of Yuexing 2nd Road, Yuehai Street, Nanshan District, Shenzhen, China
Manufacturer	:	Ciontek Technology Corp.
Address	:	B501, Chanxueyan Building Wuhan University, No.6 Of Yuexing 2nd Road, Yuehai Street, Nanshan District, Shenzhen, China

1.2 General Description of EUT (Equipment Under Test)

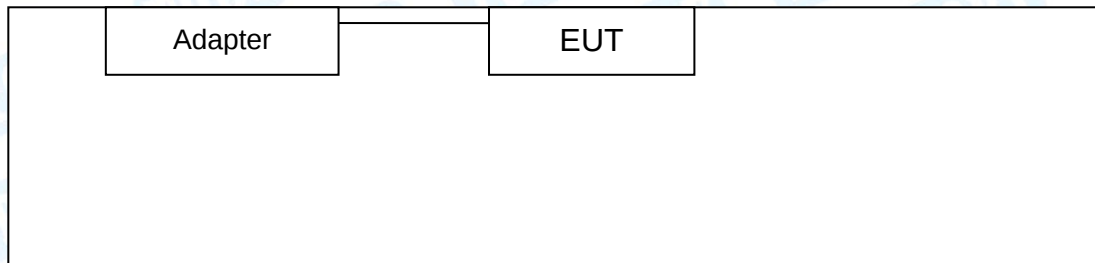
EUT Name	:	Smart POS Payment Terminal
Models No.	:	CM30, CM30P, CM30L, CM30S, CM30M, CM30C, CM30A, CM30V, CM30X, CM30G
Model Difference	:	All PCB boards and circuit diagrams are the same, the only difference is that colors.
Product Description	:	Operation Frequency: NFC: 13.56MHz
	:	Antenna: 0.5dBi FPC Antenna
Power Supply	:	Input: AC 100-240V Output: DC 24V, 1A
Software Version	:	a62_v0.08_20231110g
Hardware Version	:	CM30HWV2.0
Remark	:	The antenna gain provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.

Note:

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

1.3 Block Diagram Showing the Configuration of System Tested

Charging + TX Mode



1.4 Description of Support Units

Equipment Information				
Name	Model	FCC ID/VOC	Manufacturer	Used “√”
Adapter	----	-----	----	√
Cable Information				
Number	Shielded Type	Ferrite Core	Length	Note
-----	-----	-----	-----	-----
Remark: The adapter is provided by applicant.				

1.5 Description of Test Mode

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

For Conducted Test	
Final Test Mode	Description
Mode 1	Charging + TX Mode
For Radiated Test	
Final Test Mode	Description
Mode 2	Charging + TX Mode
Remark : For the Conducted Emission and Radiated Emission test used the EUT-2(Sample ID: 202202_0108-01-1). For the OBW test used the EUT-1(Sample ID: 202202_0108-01-2).	

Note:

- (1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.
According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:
TX Mode: Transmitting mode.
- (2) During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.
- (3) The EUT is considered a portable unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.

1.6 Description of Test Software Setting

During testing channel& Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of RF setting.

Test Software Version	Engineering model
Frequency	13.56 MHz
NFC	DEF

1.7 Measurement Uncertainty

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

Test Item	Parameters	Expanded Uncertainty (U_{Lab})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	± 3.50 dB ± 3.10 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	± 4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	± 4.50 dB
Radiated Emission	Level Accuracy: Above 1000MHz	± 4.20 dB

1.8 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1/F., Building 6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an District, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01.FCC Accredited Test Site Number: 854351. Designation Number: CN1223.

IC Registration No.: (11950A)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A. CAB identifier: CN0056.

2. Test Summary

FCC Part 15 Subpart C(15.225)/RSS 210 Issue 9			
Standard Section	Test Item	Judgment	Remark
FCC			
15.207(a)	Conducted Emission	PASS	N/A
15.209(a)&15.225	Radiated emissions	PASS	N/A
15.225(a)	Fundamental field strength limit	PASS	N/A
15.225(e)	Fundamental frequency tolerance	PASS	N/A
15.225	Band edge compliance	PASS	N/A
15.215(c)	Occupied bandwidth	PASS	N/A
Note: N/A is an abbreviation for Not Applicable.			

3. Test Software

Test Item	Test Software	Manufacturer	Version No.
Conducted Emission	EZ-EMC	EZ	CDI-03A2
Radiation Emission	EZ-EMC	EZ	FA-03A2RE
RF Conducted Measurement	MTS-8310	MWRFTtest	V2.0.0.0

4. Test Equipment

Conducted Emission Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jun. 20, 2023	Jun. 19, 2024
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jun. 20, 2023	Jun. 19, 2024
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jun. 20, 2023	Jun. 19, 2024
LISN	Rohde & Schwarz	ENV216	101131	Jun. 20, 2023	Jun. 19, 2024
ISN	SCHWARZBECK	NTFM 8131	8131-193	Jun. 20, 2023	Jun. 19, 2024
ISN	SCHWARZBECK	CAT3 8158	cat3 5158-0094	Jun. 20, 2023	Jun. 19, 2024
ISN	SCHWARZBECK	NTFM5158	NTFM5158 0145	Jun. 20, 2023	Jun. 19, 2024
ISN	SCHWARZBECK	CAT 8158	cat5 8158-179	Jun. 20, 2023	Jun. 19, 2024
Radiation Emission Test (A Site)					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jun. 20, 2023	Jun. 19, 2024
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jun. 20, 2023	Jun. 19, 2024
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Feb. 27, 2022	Feb.26, 2024
Horn Antenna	ETS-LINDGREN	3117	00143207	Feb. 26, 2022	Feb.25, 2024
Horn Antenna	SCHWARZBECK	BBHA 9170	1118	Feb. 26, 2022	Feb.25, 2024
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jun. 26, 2022	Jun.25, 2024
Pre-amplifier	SONOMA	310N	185903	Feb. 23, 2023	Feb.22, 2024
Pre-amplifier	HP	8449B	3008A00849	Feb. 23, 2023	Feb.22, 2024
HF Amplifier	Tonscend	TAP0184050	AP21C806129	Aug. 30, 2023	Aug. 29, 2024
Antenna Conducted Emission					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jun. 20, 2023	Jun. 19, 2024
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jun. 20, 2023	Jun. 19, 2024
MXA Signal Analyzer	KEYSIGHT	N9020B	MY60110172	Aug. 30, 2023	Aug. 29, 2024
MXA Signal Analyzer	Agilent	N9020A	MY47380425	Aug. 30, 2023	Aug. 29, 2024
Vector Signal Generator	Agilent	N5182A	MY50141294	Aug. 30, 2023	Aug. 29, 2024
Analog Signal Generator	Agilent	N5181A	MY48180463	Aug. 30, 2023	Aug. 29, 2024
Vector Signal Generator	KEYSIGHT	N5182B	MY59101429	Aug. 30, 2023	Aug. 29, 2024
Analog Signal Generator	KEYSIGHT	N5173B	MY61252685	Aug. 30, 2023	Aug. 29, 2024
RF Power Sensor	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO26	Aug. 30, 2023	Aug. 29, 2024
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO29	Aug. 30, 2023	Aug. 29, 2024
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO31	Aug. 30, 2023	Aug. 29, 2024
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO33	Aug. 30, 2023	Aug. 29, 2024

RF Control Unit	Tonsced	JS0806-1	21C8060380	N/A	N/A
RF Control Unit	Tonsced	JS0806-2	21F8060439	Aug. 30, 2023	Aug. 29, 2024
Power Control Box	Tonsced	JS0806-4ADC	21C8060387	N/A	N/A
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	144382	Aug. 30, 2023	Aug. 29, 2024
Universal Radio Communication Tester	Rohde&Schwarz	CMW500	168796	Feb. 23, 2023	Feb.22, 2024
Temperature and Humidity Chamber	ZhengHang	ZH-QTH-1500	ZH2107264	Jun. 20, 2023	Jun. 19, 2024

5. Conducted Emission Test

5.1 Test Standard and Limit

5.1.1 Test Standard

FCC Part 15.207

5.1.2 Test Limit

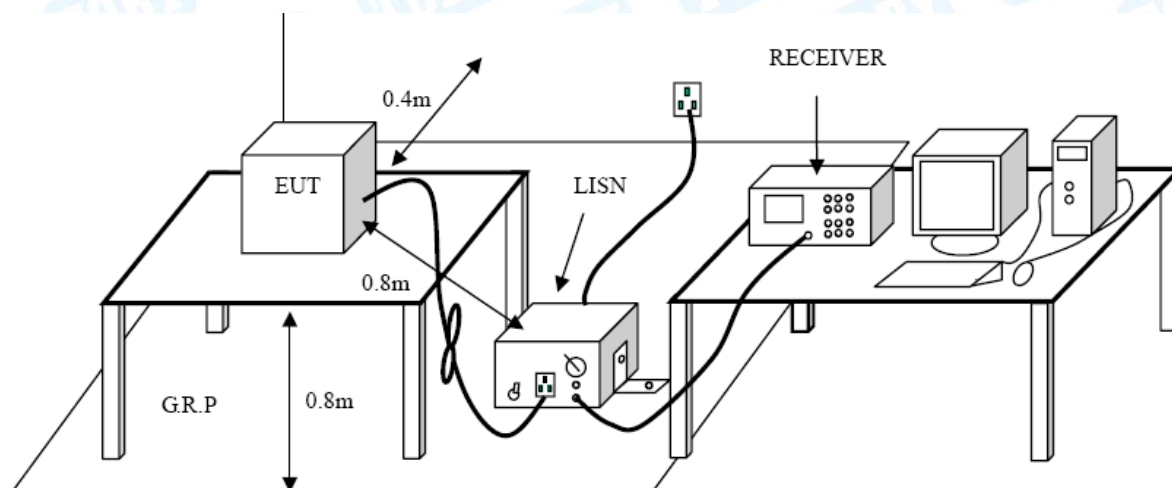
Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Notes:

- (1) *Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.2 Test Setup



5.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

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.

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 overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9 kHz, and the test frequency band is from 0.15MHz to 30MHz.

5.4 Deviation From Test Standard

No deviation

5.5 EUT Operating Mode

Please refer to the description of test mode.

5.6 Test Data

Please refer to the Attachment A.

6. Radiated Emission Test

6.1 Test Standard and Limit

6.1.1 Test Standard

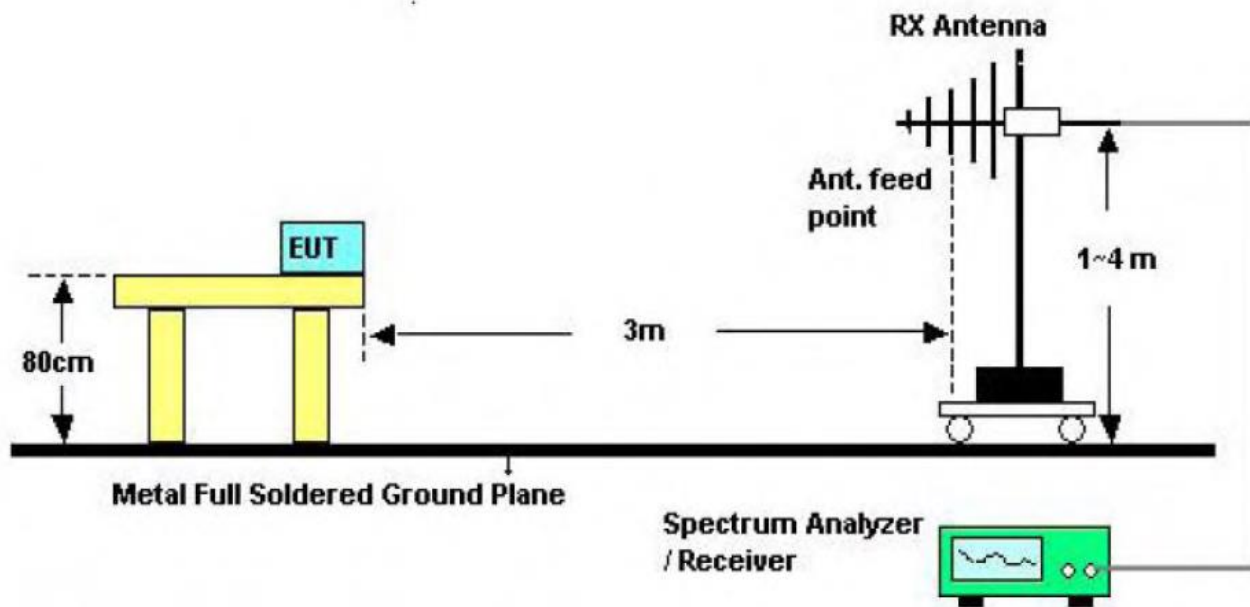
FCC Part 15.209(a)&15.225

6.1.2 Test Limit

Radiated Emission Limits (30MHz~1000MHz)

Frequency Range (MHz)	E-field Strength Limit @ 3m (mV/m)	E-field Strength Limit @ 3m (dB μ V/m)	E-field Strength Limit @ 10m (dB μ V/m)
30-88	100	40	30
88-216	150	43.5	33.5
216-960	200	46	36
960-1000	500	54	44

5.2 Test Setup



Below 1000MHz Test Setup

6.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (3) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (4) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (5) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (6) For the actual test configuration, please see the test setup photo.

6.4 Deviation From Test Standard

No deviation

6.5 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

6.6 Test Data

Please refer to the Attachment B.

7. Electric Field Strength of Fundamental and Outside the Allocated bands

7.1 Test Standard and Limit

7.1.1 Test Standard

FCC Part 15.225(a)

FCC Part 15.225

7.1.2 Test Limit

Electric Field Strength of Fundamental

Frequency Range (MHz)	E-field Strength Limit @ 30m ($\mu\text{V/m}$)	E-field Strength Limit @ 3m ($\text{dB}\mu\text{V/m}$)
0.009-0.490	2400/F(kHz)	129-94
0.490-1.705	24000/F(kHz)	74-63
1.705-30	30	70

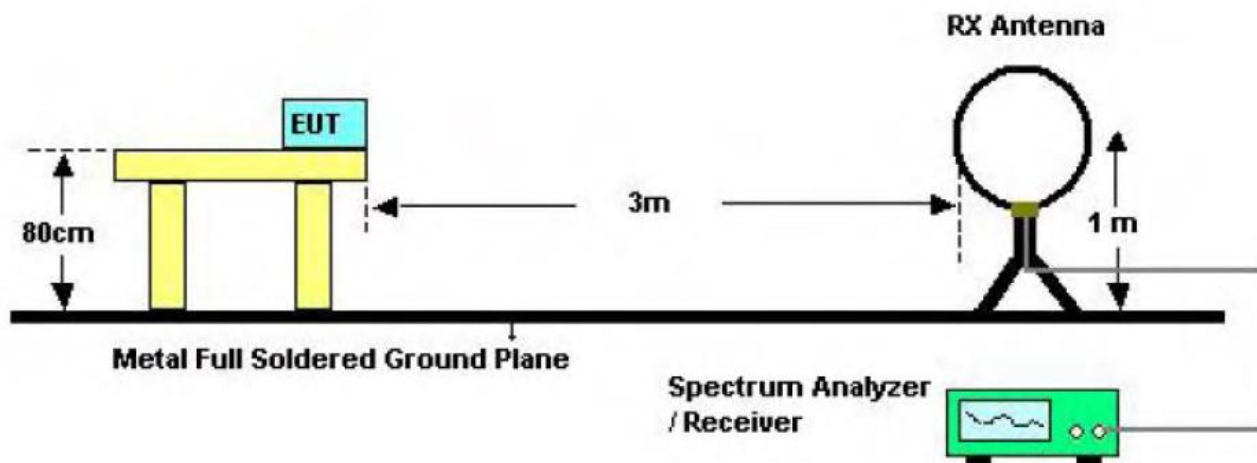
Note: Where the limits have been defined at one distance, and a signal level measured at another, the limits have been extrapolated using the following formula:
 $\text{Extrapolation(dB)} = 40\log_{10}(\text{Measurement Distance/Specification Distance})$

Outside the Allocated bands

Frequency Range (MHz)	E-field Strength Limit @ 30 m ($\mu\text{V/m}$)	E-field Strength Limit @ 3 m ($\text{dB}\mu\text{V/m}$)
13.560 $\pm$ 0.007	+15,848	124
13.410 to 13.553 13.567 to 13.710	+334	90
13.110 to 13.410 13.710 to 14.010	+106	81

Note: Where the limits have been defined at one distance, and a signal level measured at another, the limits have been extrapolated using the following formula:
 $\text{Extrapolation(dB)} = 40\log_{10}(\text{Measurement Distance/Specification Distance})$

7.2 Test Setup



7.3 Test Procedure

The transmitter carrier output levels (E-Field) from the EUT are measured in a semi-anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 3m from the receiving antenna. The center of the receiving loop antenna is 1.0 meter above the ground. The E-field is measured with a shielded loop antenna connected to a measurement receiver. Detected E-field was maximized by rotating the EUT through 360° and adjusting the receiving antenna polarizations. The maximization processes were repeated with the EUT positioned respectively in its three orthogonal axes. The measurements were performed with the peak detector and if required, the quasi-peak detector.

7.4 Deviation From Test Standard

No deviation

7.5 EUT Operating Condition

The measurement of EUT is carried out under the transmit state of NFC.

7.6 Test Data

Please refer to the Attachment C.

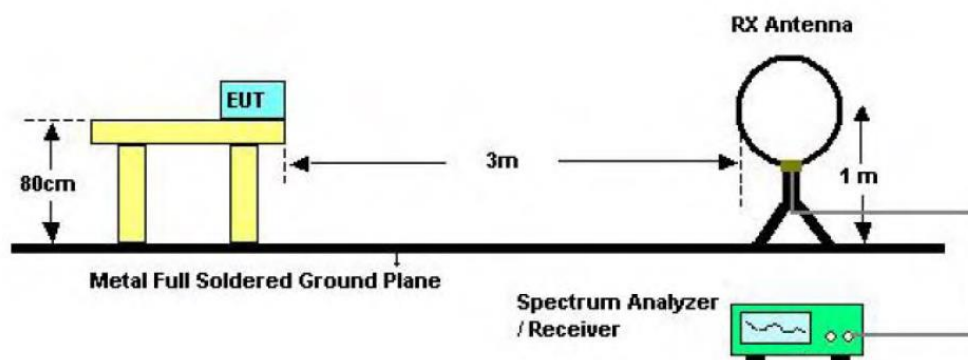
8. Occupied Bandwidth Test

8.1 Test Standard and Limit

8.1.1 Test Standard

FCC Part 15.215 (c)

8.2 Test Setup



8.3 Test Procedure

The EUT is turned ON and connected to measurement instrument; the center frequency of the spectrum analyzer is set to the fundamental frequency. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.

1. RBW used in the range of 1% to 5% of the anticipated emission bandwidth
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = Max Hold.
5. Sweep = Auto couple.
6. Allow the trace to stabilize.
7. OBW 99% function of spectrum analyzer used

8.4 Deviation From Test Standard

No deviation

8.5 EUT Operating Condition

The measurement of EUT is carried out under the transmit state of NFC.

8.6 Test Data

Please refer to the Attachment D.

9. Fundamental Frequency Tolerance

9.1 Test Standard and Limit

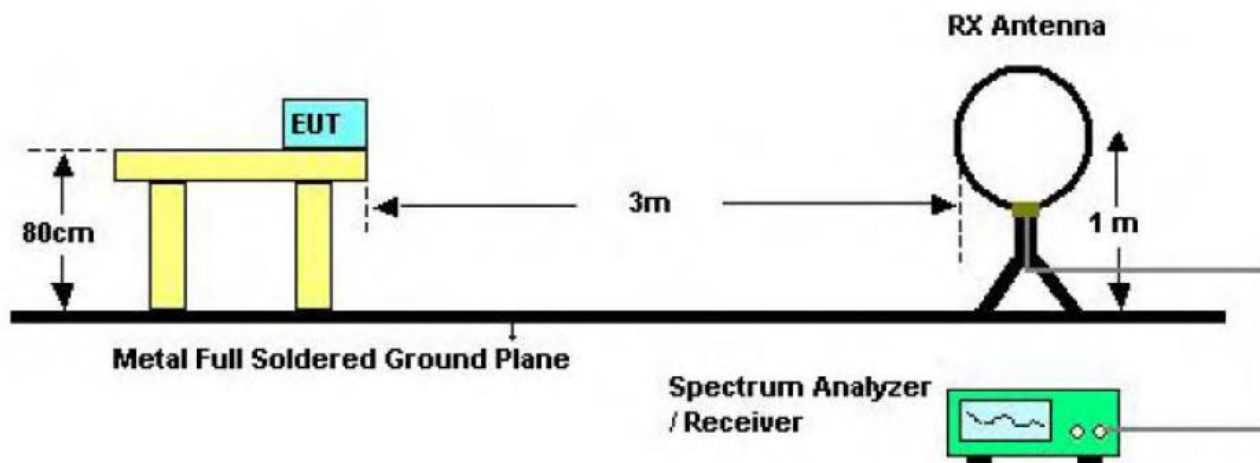
9.1.1 Test Standard

FCC Part 15.225 (e)

9.1.2 Test Limit

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency.

9.2 Test Setup



9.3 Test Procedure

The transmitter output signal was picked up by coil antenna connected to the frequency counter. The center frequency was measured with 30Hz RBW and 1kHz span. During the test, the EUT was placed in a thermal chamber until thermal balance and lasting appropriate time.

9.4 Deviation From Test Standard

No deviation

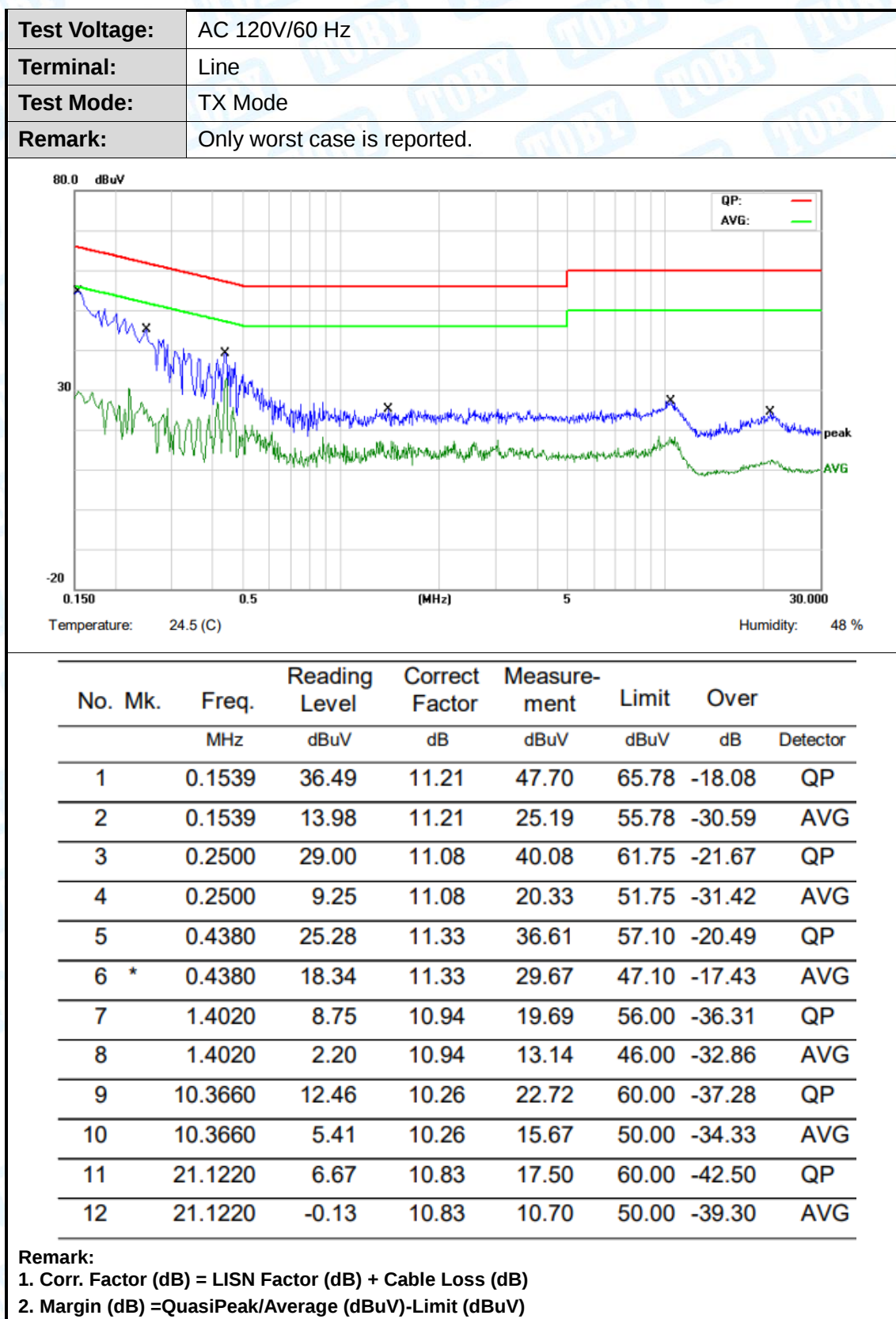
9.5 EUT Operating Condition

The EUT was set to continuously transmitting in the max power during the test.

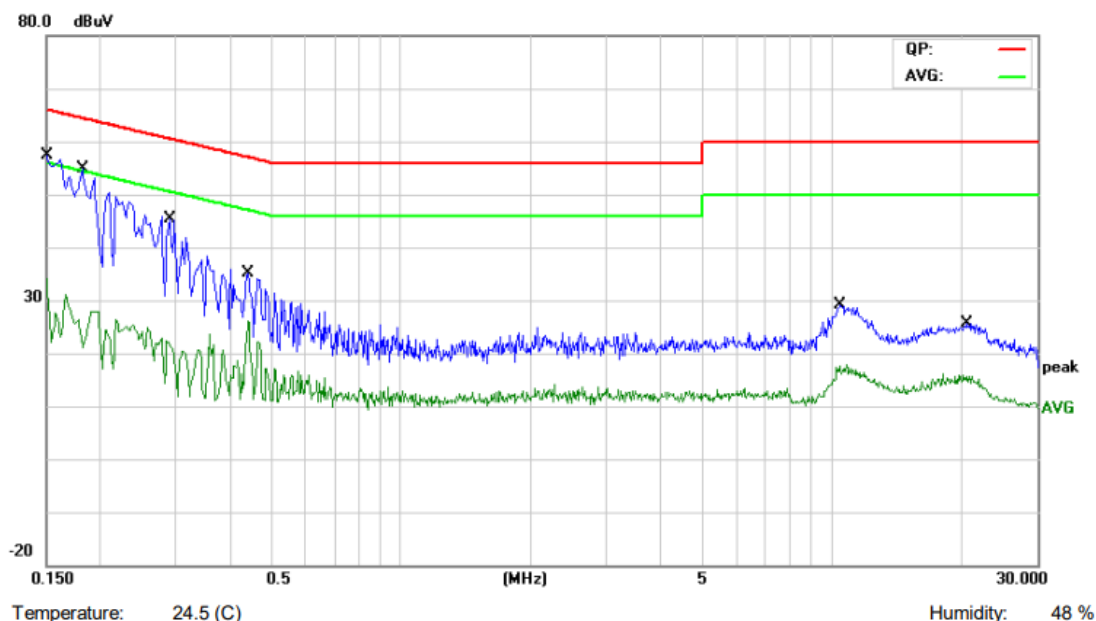
9.6 Test Data

Please refer to the Attachment E.

Attachment A-- Conducted Emission Test Data



Test Voltage:	AC 120V/60 Hz
Terminal:	Neutral
Test Mode:	TX Mode
Remark:	Only worst case is reported.



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1500	34.87	11.20	46.07	65.99	-19.92	QP
2		0.1500	14.75	11.20	25.95	55.99	-30.04	AVG
3	*	0.1819	33.51	11.18	44.69	64.39	-19.70	QP
4		0.1819	10.72	11.18	21.90	54.39	-32.49	AVG
5		0.2900	24.77	11.34	36.11	60.52	-24.41	QP
6		0.2900	10.02	11.34	21.36	50.52	-29.16	AVG
7		0.4420	20.97	10.99	31.96	57.02	-25.06	QP
8		0.4420	12.47	10.99	23.46	47.02	-23.56	AVG
9		10.4780	13.17	10.41	23.58	60.00	-36.42	QP
10		10.4780	4.15	10.41	14.56	50.00	-35.44	AVG
11		20.6460	10.52	10.48	21.00	60.00	-39.00	QP
12		20.6460	3.10	10.48	13.58	50.00	-36.42	AVG

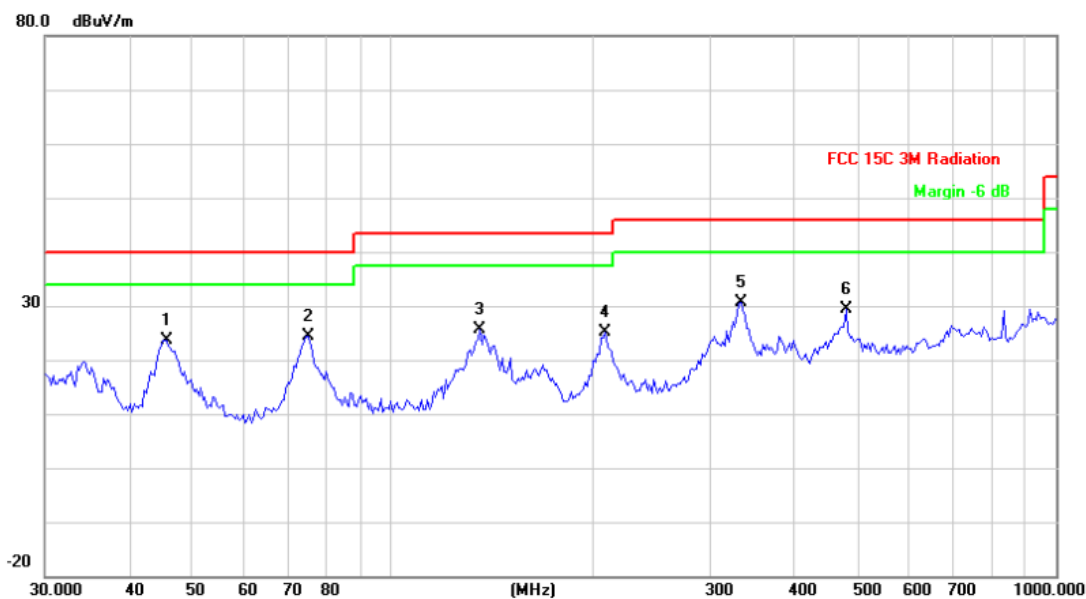
Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = QuasiPeak/Average (dBuV)-Limit (dBuV)

Attachment B-- Radiated Emission Test Data

30MHz~1GHz

Temperature:	24.6℃	Relative Humidity:	52%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX Mode		
Remark:	Only worst case is reported.		



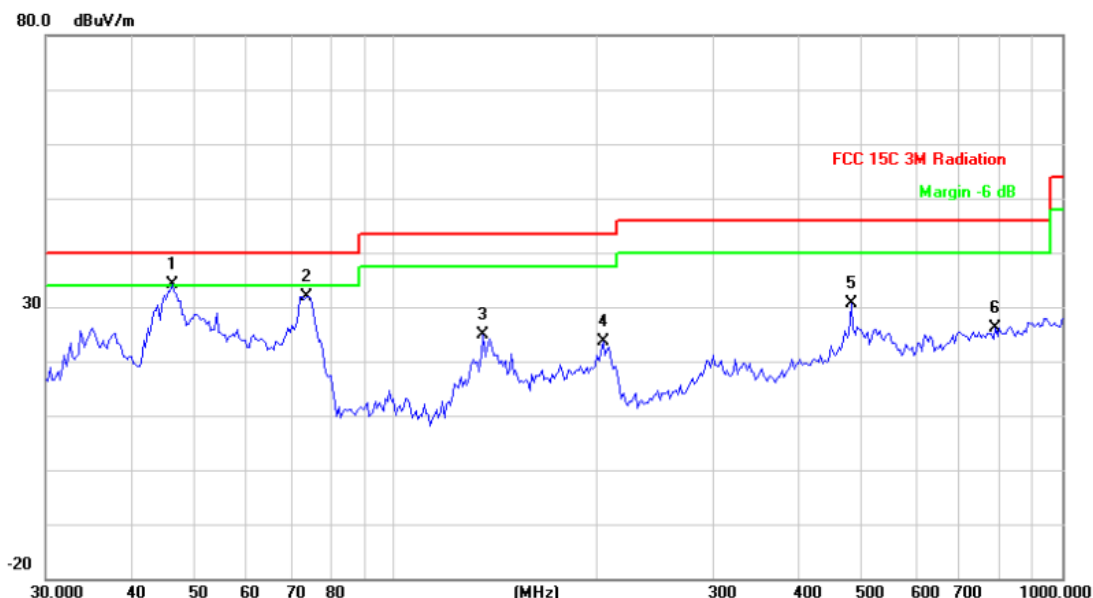
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		45.6948	41.02	-17.31	23.71	40.00	-16.29	peak
2		74.6569	41.23	-16.95	24.28	40.00	-15.72	peak
3		135.5062	41.38	-15.79	25.59	43.50	-17.91	peak
4		209.3129	39.66	-14.44	25.22	43.50	-18.28	peak
5	*	334.8589	40.00	-9.44	30.56	46.00	-15.44	peak
6		482.2156	35.68	-6.25	29.43	46.00	-16.57	peak

*:Maximum data x:Over limit !:over margin

Remark:

1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
3. Margin (dB) = QuasiPeak (dBμV/m)-Limit QPK(dBμV/m)

Temperature:	24.6°C	Relative Humidity:	52%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX Mode		
Remark:	Only worst case is reported.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	46.3402	51.43	-17.33	34.10	40.00	-5.90	peak
2		73.6170	48.82	-16.96	31.86	40.00	-8.14	peak
3		135.5062	40.69	-15.79	24.90	43.50	-18.60	peak
4		204.9551	37.97	-14.43	23.54	43.50	-19.96	peak
5		482.2156	36.99	-6.25	30.74	46.00	-15.26	peak
6		793.3960	28.09	-1.93	26.16	46.00	-19.84	peak

*:Maximum data x:Over limit !:over margin

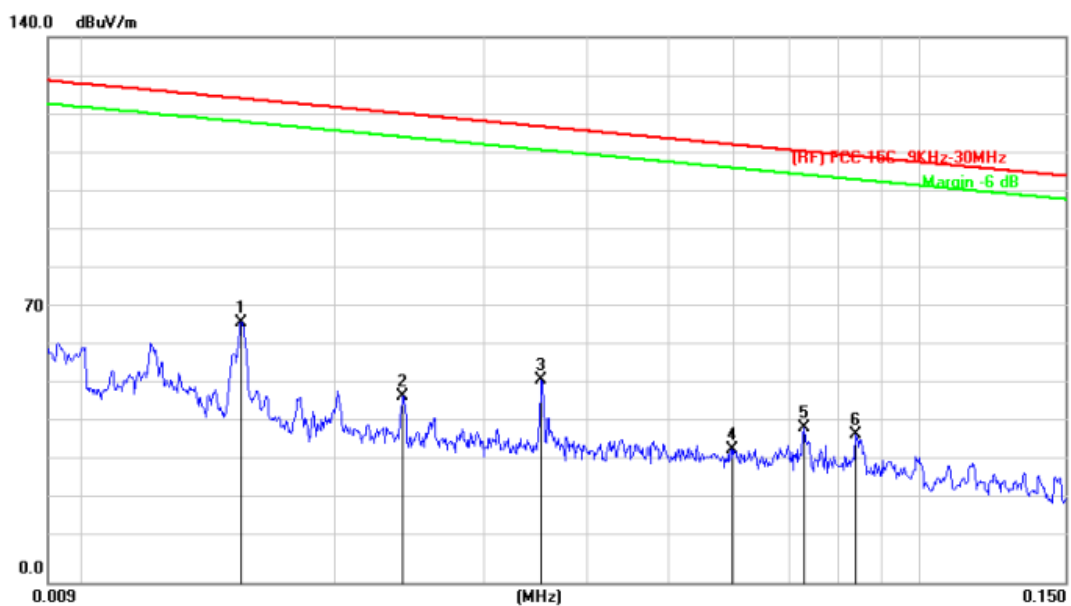
Remark:

1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
3. Margin (dB) = QuasiPeak (dBμV/m)-Limit QPK(dBμV/m)

Attachment C--Electric Field Strength of Fundamental and Outside the Allocated bands

(1) Electric Field Strength of Fundamental

Temperature:	24.6°C	Relative Humidity:	52%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Ant. 0°		
Test Mode:	TX Mode		
Remark:	N/A		

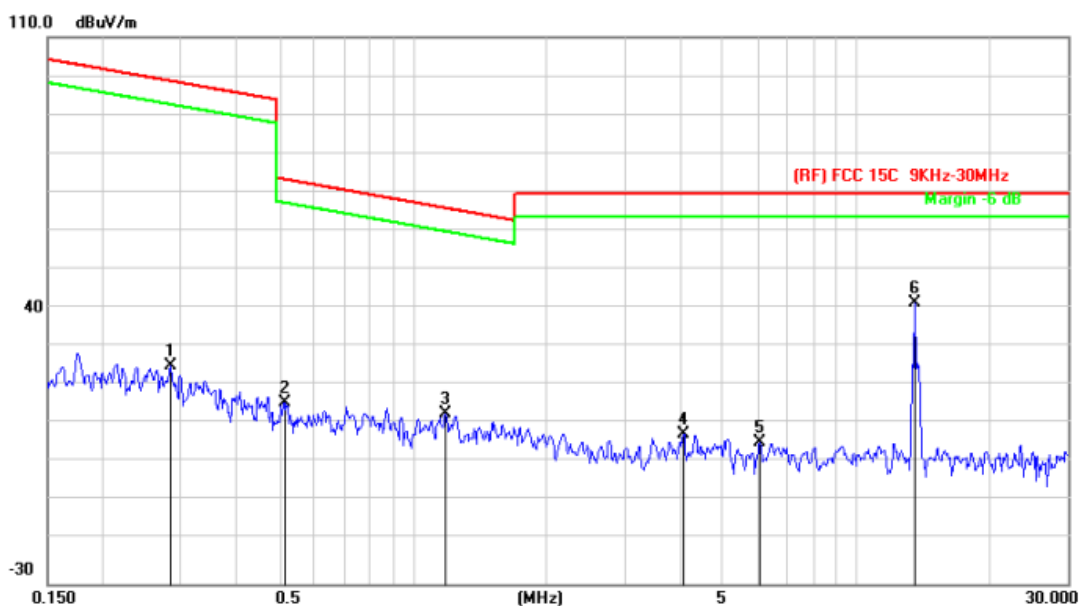


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	0.0154	78.02	-11.17	66.85	124.21	-57.36	peak
2		0.0240	59.03	-11.14	47.89	120.34	-72.45	peak
3		0.0352	63.02	-11.09	51.93	116.99	-65.06	peak
4		0.0596	45.28	-11.13	34.15	112.40	-78.25	peak
5		0.0728	51.00	-11.24	39.76	110.65	-70.89	peak
6		0.0840	49.30	-11.25	38.05	109.40	-71.35	peak

Remark:

1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
3. Margin (dB) = QuasiPeak (dBμV/m)-Limit QPK(dBμV/m)

Temperature:	24.6°C	Relative Humidity:	52%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Ant. 0°		
Test Mode:	TX Mode		
Remark:	N/A		

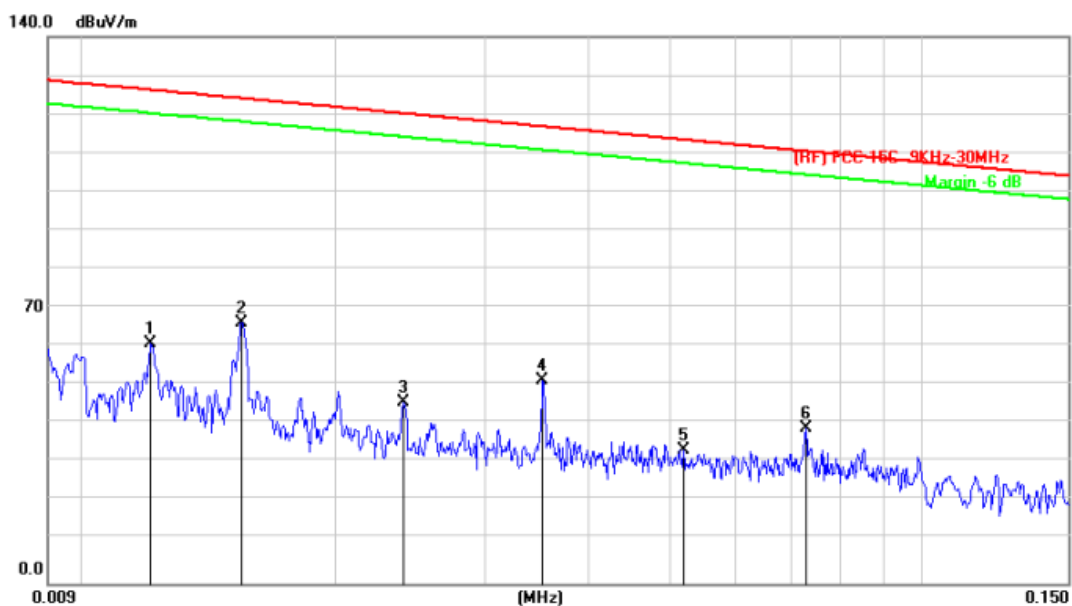


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		0.2833	36.72	-11.03	25.69	98.77	-73.08	peak
2		0.5128	27.53	-11.10	16.43	73.60	-57.17	peak
3		1.1844	24.61	-11.12	13.49	66.21	-52.72	peak
4		4.0704	19.71	-11.30	8.41	70.00	-61.59	peak
5		6.0562	17.50	-11.42	6.08	70.00	-63.92	peak
6	*	13.5509	54.10	-12.32	41.78	70.00	-28.22	peak

Remark:

1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
3. Margin (dB) = QuasiPeak (dBμV/m)-Limit QPK(dBμV/m)

Temperature:	24.6°C	Relative Humidity:	52%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Ant. 90°		
Test Mode:	TX Mode		
Remark:	N/A		

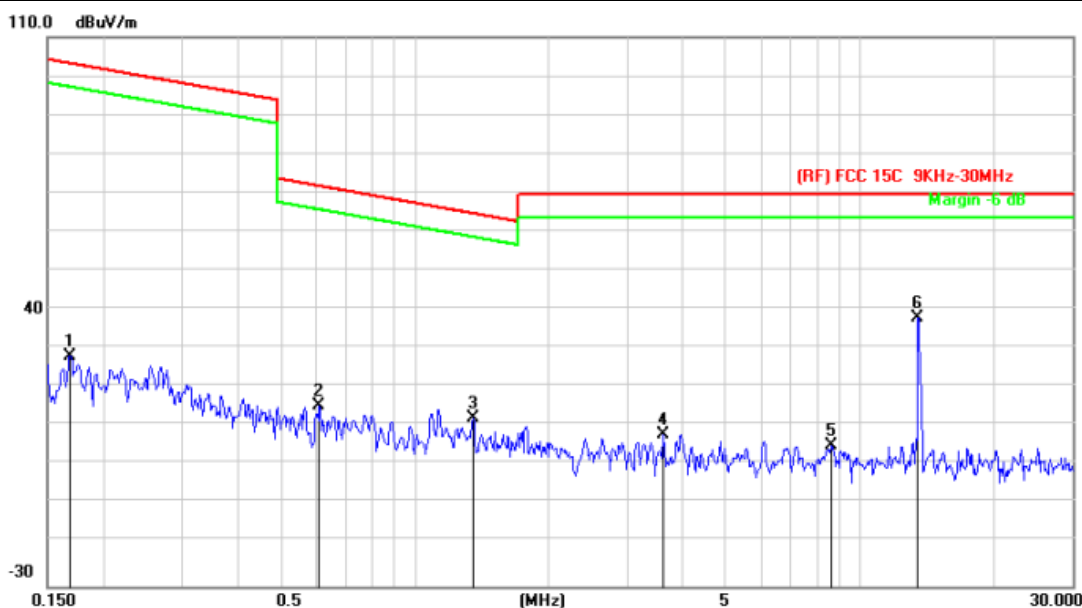


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		0.0120	72.45	-11.19	61.26	126.39	-65.13	peak
2	*	0.0154	78.02	-11.17	66.85	124.21	-57.36	peak
3		0.0240	57.43	-11.14	46.29	120.34	-74.05	peak
4		0.0352	63.02	-11.09	51.93	116.99	-65.06	peak
5		0.0519	45.32	-11.05	34.27	113.60	-79.33	peak
6		0.0728	51.00	-11.24	39.76	110.65	-70.89	peak

Remark:

1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
3. Margin (dB) = QuasiPeak (dBμV/m)-Limit QPK(dBμV/m)

Temperature:	24.6°C	Relative Humidity:	52%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Ant. 90°		
Test Mode:	TX Mode		
Remark:	N/A		



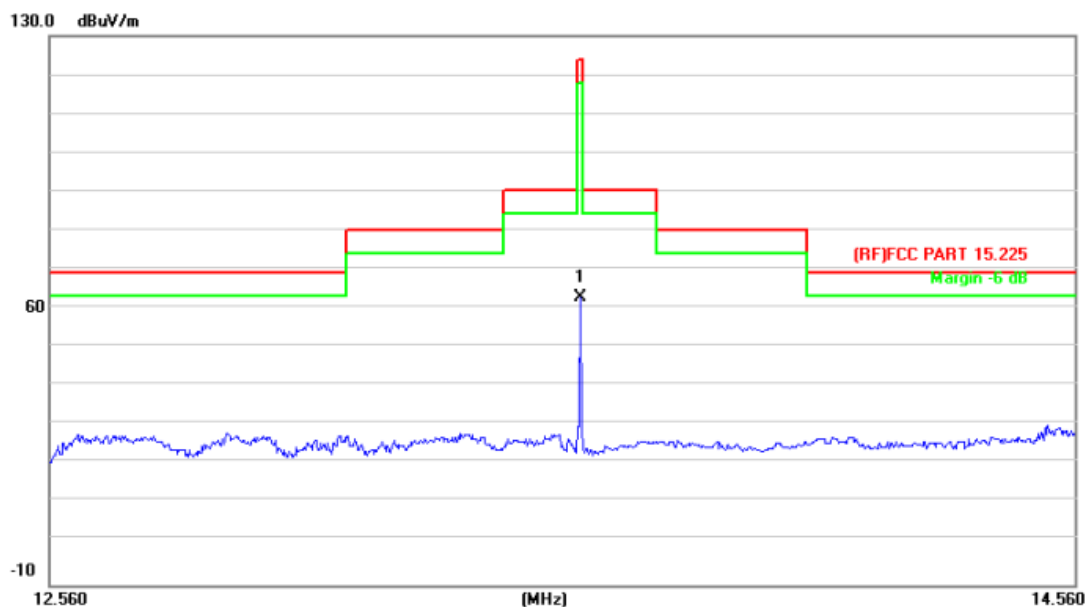
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		0.1685	39.71	-10.92	28.79	103.32	-74.53	peak
2		0.6108	27.11	-11.10	16.01	72.06	-56.05	peak
3		1.3521	23.89	-11.13	12.76	65.05	-52.29	peak
4		3.6034	19.91	-11.29	8.62	70.00	-61.38	peak
5		8.6373	17.38	-11.63	5.75	70.00	-64.25	peak
6	*	13.4792	50.77	-12.32	38.45	70.00	-31.55	peak

Remark:

1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
3. Margin (dB) = QuasiPeak (dBμV/m)-Limit QPK(dBμV/m)

(2) Test Fundamental and Outside the Allocated bands

Temperature:	24.6°C	Relative Humidity:	52%
Test Voltage:	AC 120/60Hz		
Test Mode:	TX Mode		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	13.5600	75.75	-12.32	63.43	124.00	-60.57	peak

Remark:

1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBμV/m) = Corr. (dB/m) + Read Level (dBμV)
3. Margin (dB) = QuasiPeak (dBμV/m) - Limit QPK (dBμV/m)

Attachment D-- Bandwidth Test Data

Temperature:	24.6 °C	Relative Humidity:	52%
Test Voltage:	DC 24V		
Test Mode:	TX Mode		
Channel Frequency(MHz)		99% Bandwidth(KHz)	
13.56		5.978	
13.56 MHz			

Keysight Spectrum Analyzer - Occupied BW

Marker 1 13.557580 MHz

#IF Gain: Low

Center Freq: 13.560000 MHz

Trig: Free Run

#Atten: 10 dB

Avg/Hold: >10/10

Radio Std: None

Radio Device: BTS

10 dB/div

Ref 10.00 dBm

Log

0.00

-10.0

-20.0

-30.0

-40.0

-50.0

-60.0

-70.0

-80.0

Mkr1 13.55758 MHz

-47.521 dBm

Center 13.560000 MHz

#Res BW 1 kHz

#VBW 3 kHz

Span 10.00 kHz

Sweep 12.4 ms

Occupied Bandwidth

5.978 kHz

Total Power

-23.1 dBm

Transmit Freq Error

594 Hz

% of OBW Power

99.00 %

x dB Bandwidth

8.335 kHz

x dB

-26.00 dB

MSG

STATUS

Mode

Mode Setup

Meas

Marker →

Marker Function

Single

Cont

SPAN

X Scale

Auto Couple

Source

File

Print

Full Screen

Return

Attachment E--Fundamental Frequency Tolerance

Frequency Stability Versus Temperature			
Temperature(℃)	Power Supply(V)	Measured Frequency	Frequency Drift
		(MHz)	%
50	DC 24V	13.55763	-0.0174779
40		13.56002	0.0001475
30		13.55841	-0.0117257
20		13.55879	-0.0089233
10		13.56065	0.0047935
0		13.56047	0.0034661
-10		13.56028	0.0020649
-20		13.55914	-0.0063422
Frequency Stability Versus Temperature			
Temperature(℃)	Power Supply(V)	Measured Frequency	Frequency Drift
		(MHz)	%
20	DC 12	13.56077	0.0056785
	DC 24	13.56089	0.0065634
	DC 48	13.56063	0.0046460

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