



FCC LISTED, REGISTRATION
NUMBER: 2764.01

ISED LISTED REGISTRATION
NUMBER: 23595-1

Test report No:
4052ERM.002

Test report

USA FCC Part 15.225 and Part 15.209

CANADA RSS-210, RSS-Gen

(*) Identification of item tested	Qi 1.3 Wireless Charger with NFC
(*) Trademark	Panasonic
(*) Model and /or type reference	WCPM2
(*) Other identification of the product	Hw: PP2 Sw: v6.2 FCC: ACJ932A-WCPM2 ISED: 216A-WCPM2
(*) Features	Qi 1.3 and NFC
Manufacturer	PANASONIC AUTOMOTIVE 776 Hwy 74 South Peachtree City, GA 30269 USA
Test method requested, standard	USA FCC Part 15.225 (10–1–21 Edition): Operation within the band 13.110 -14.010 USA FCC Part 15.209 (10–1–21 Edition): Radiated emission limits, general requirements. CANADA RSS-210 Issue 10 (Dec 2019). CANADA RSS-Gen Issue 5 (March 2019). ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager
Date of issue	08-10-2023
Report template No	FDT08_23 (*) "Data provided by the client"

Index

Competences and guarantees3

General conditions3

Uncertainty3

Data provided by the client.....4

Usage of samples4

Test sample description5

Identification of the client.....5

Testing period and place6

Document history6

Environmental conditions7

Remarks and comments7

Testing verdicts.....8

Summary8

List of equipment used during the test.....8

Appendix A: Test results10

Competences and guarantees

DEKRA Certification Inc. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation), to perform the tests indicated in the Certificate 2764.01

DEKRA Certification Inc. is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA Certification Inc. has a calibration and maintenance program for its measurement equipment.

DEKRA Certification Inc. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Certification at the time of performance of the test.

DEKRA Certification Inc. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Certification Inc.

General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Certification Inc.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Certification Inc. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Certification internal document PODT000.

Test case	Frequency (MHz)	U(k=2)	Units
Radiated Spurious Emission	0,009 - 30	2.69	dB
	30-180	3.82	dB
	180-1000	2.61	dB
	1000-18000	2.92	dB
	18000-40000	2.15	dB

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample consists of Qi 1.3 Wireless Charger with NFC.

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples used for test have been selected by: The client.

Sample S/01 is composed of the following elements:

Id	Control N°	Description	Model	Serial N°	Date of reception	Application
S/01	4052/07	Wireless Charger with NFC	Panasonic / WCPM2	101577	5/26/2023	Element Under Test
S/01	4052/10	4mm Spacer	Panasonic	-	5/26/2023	Accessory
S/01	4052/12	Smart Card	NXP/MIFARE, DESFire/EV2-J	-	5/26/2023	Accessory
S/01	4052/13	Laptop	Dell/Latitude 7490	GL85MQ2	5/26/2023	Accessory
S/01	4052/14	Computer power supply	-	-	5/26/2023	Accessory
S/01	4052/17	Harness	Panasonic	-	5/26/2023	Accessory
S/01	4052/18	Vehicle Network Interfaces with OBDII, DB9, DB25 and USB Type A interface cable to the PC	Intrepid Control Systems / ValueCAN 4-2EL	-	5/26/2023	Accessory
S/01	4052/19	Resistance box	Panasonic	-	6/15/2023	Accessory

Sample S/01 was used for the following test(s): All conducted and radiated tests indicated in appendix A.

Test sample description

Ports..... :	Port name and description		Cable					
			Specified length [m]	Attached during test	Shielded			
	1 - BATT+		3m	☒	☐			
	2 - CANFD+		3m	☒	☐			
	3 - CANFD-		3m	☒	☐			
	4 - LIN		3m	☒	☐			
	5 - NC		-	☐	☐			
	6 - GND		3m	☒	☐			
Supplementary information to the ports..... :		Setting for CANFD and LIN are already set by included test software.						
Rated power supply :	Voltage and Frequency		Reference poles					
			L1	L2	L3	N	PE	
	☐	AC:	☐	☐	☐	☐	☐	
	☐	AC:	☐	☐	☐	☐	☐	
	☒	DC: 13.5Vdc nom.; 9Vdc min, 16Vdc max						
☐	DC:							
Rated Power :		15W						
Clock frequencies..... :		MCU crystal - 20MHz; NFC crystal - 27.12MHz						
Other parameters..... :		-						
Software version :		v6.2						
Hardware version :		PP2						
Dimensions in cm (L x W x D)..... :		9.8 x 9.2 x 4.9						
Mounting position..... :	☐	Table top equipment						
	☐	Wall/Ceiling mounted equipment						
	☐	Floor standing equipment						
	☐	Hand-held equipment						
	☒	Other: Automotive centre console						
Modules/parts..... :	Module/parts of test item		Type			Manufacturer		
	68516749AC		DUT			Panasonic		
Accessories (not part of the test item)..... :	Description		Type			Manufacturer		
	NA							

Documents as provided by the applicant..... :	Description	File name	Issue date
	Declaration Equipment Data	FDT30_18 Declaration Equipment Data_PASA_20230705	07/05/2023
	WCPM2 Compliance Testing Setup.docx	setup	06/14/2023
	WCPM2 Compliance Testing Operation.docx	operation	06/14/2023

Copy of marking plate:



Identification of the client

PANASONIC AUTOMOTIVE
776 Hwy 74 South, Peachtree City
GA, 30269
USA

Testing period and place

Test Location	DEKRA Certification Inc.
Date (start)	06-19-2023
Date (finish)	06-20-2023

Document history

Report number	Date	Description
4052ERM.002	08-10-2023	First release

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The tests have been performed by the technical personnel: Sravani Gollamudi, Qi Zhang, and Koji Nishimoto.

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

Summary

FCC PART 15 PARAGRAPH / RSS-210					
Report Section	15.225 Spec Clause	RSS Spec Clause	Test Description	Verdict	Remark
A.1		RSS-Gen 6.7	99% Occupied Bandwidth	P	N/A
A.2	§ 15.225 (a)	RSS-210 Clause B.6 (a).	Field Strength of emissions within the band 13.553 MHz – 13.567 MHz	P	N/A
A.3	§ 15.225 (b)	RSS-210 Clause B.6 (b).	Field Strength of emissions within the band 13.410 MHz – 13.553 MHz and 13.567 – 13.710 MHz	P	N/A
A.4	§ 15.225 (c)	RSS-210 Clause B.6 (c).	Field Strength of emissions within the band 13.110 MHz – 13.410 MHz and 13.710 – 14.010 MHz	P	N/A
A.5	§ 15.225 (d)	RSS-210 Clause B.6 (d).	Field Strength of emissions outside of the band 13.110 MHz – 13.410 MHz	P	N/A
A.6	§ 15.225 (e)	RSS-210 Clause B.6	Frequency Tolerance of the carrier signal.	P	N/A

List of equipment used during the test

Conducted Measurements

Control Number	Description	Manufacturer	Serial	Model	Next Calibration
1107	Ethernet SNMP Thermometer	Hw Group	60038026952	HWg-STE Plain	2024/10
1391	Signal analyzer	Rohde & Schwarz	101281	FSW50	2024/01
1386	Power supply 0-30V, 0-3A (x2)	Gwinstek	GEV875131	GPS3030D	N/A
1488	Climatic Chamber T10-F40-C	TPS	-	T10-F40-C	2023/12

Radiated Measurements

Control Num	Equipment	Manufacturer	Serial	Model	Next calibration
878	DC Power supply	Ametek Prog	1707A01783	PROG-DC-PS	N/A
1012	ESR26 EMI Test Receiver	Rohde & Schwarz	101478	ESR26	2025/01
1014	FSV40 Signal Analyzer 40GHz	Rhode & Schwarz	101626	FSV40	2024/08
1062	Active loop Antenna	Ets Lindgren	208517	6502	2023/07
1065	3142E Biconilog Antenna	Ets Lindgren	208587	3142E	2023/08
1108	Ethernet SNMP Thermometer-CR Room	Hw Group	60038026954	HWg-STE Plain	2024/10
1111	Ethernet SNMP Thermometer-SAC	Hw Group	60038026577	HWg-STE Plain	2024/10
1179	Semi-Anechoic Chamber	Frankonia	F169021	SAC 3plus 'L'	N/A
1314	Wireless Measurement Software R&S EMC32	Rohde & Schwarz	1040-OT102236	-	N/A

Appendix A: Test results

Appendix A Content

PRODUCT INFORMATION..... 12

DESCRIPTION OF TEST CONDITIONS13

TEST A.1: 99% OCCUPIED BANDWIDTH14

TEST A.2: FIELD STRENGTH OF EMISSIONS WITHIN THE BAND 13.553 MHZ – 13.567 MHZ.....16

TEST A.3: FIELD STRENGTH OF EMISSIONS WITHIN THE BAND 13.410 MHZ – 13.553 MHZ AND
13.567 – 13.710 MHZ21

TEST A.4: FIELD STRENGTH OF EMISSIONS WITHIN THE BAND 13.110 MHZ – 13.410 MHZ AND
13.710 – 14.010 MHZ21

TEST A.5: FIELD STRENGTH OF EMISSIONS OUTSIDE OF THE BAND 13.110 MHZ – 13.410 MHZ .31

TEST A.6: FREQUENCY TOLERANCE OF THE CARRIER SIGNAL28

PRODUCT INFORMATION

The following information is provided by the client:

Information	Description
Operating Frequency Band or Bands	13.56 MHz
Operating Frequency or Frequencies	13.56 MHz
Channel Bandwidth	--
Extreme operating conditions	
- Temperature range	-20 °C to +50 °C
Nominal Voltage	
- Supply Voltage	13.5V DC
- Voltage range	9Vdc to 16Vdc

Test modes available:

- Nominal Operating Frequency: 13.56 MHz

DESCRIPTION OF TEST CONDITIONS

TEST CONDITIONS	DESCRIPTION
TC#01	<u>Power supply (V):</u> $V_{\text{nom}} = 13.5 \text{ V}$ $V_{\text{min}} = 11.5 \text{ V}$ $V_{\text{max}} = 15.5 \text{ V}$ <u>Temperature (°C):</u> Temperature range: -20°C to +50 °C The subscript nom indicates normal test conditions. The subscripts min and max indicate extreme test conditions (minimum and maximum respectively). <u>Test Frequencies for Conducted and Radiated tests:</u> 13.56 MHz

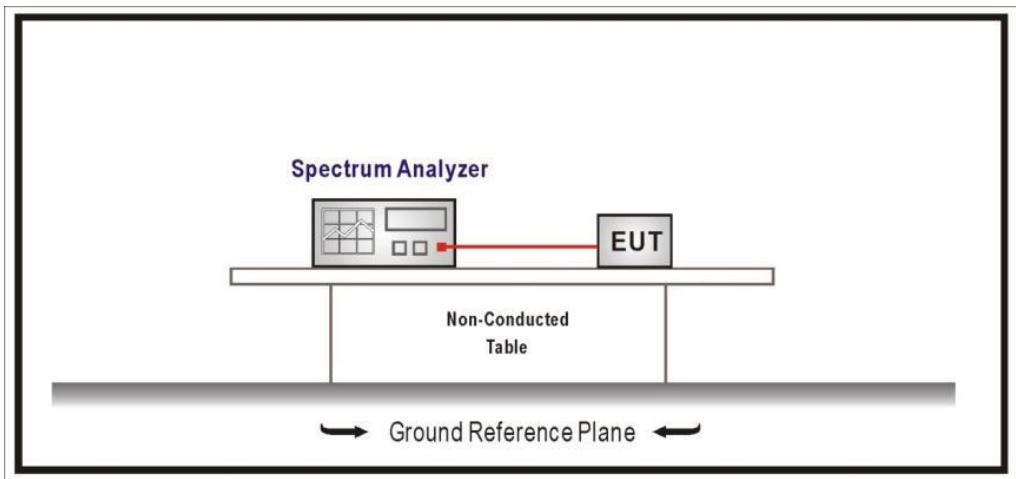
TEST A.1: 99% OCCUPIED BANDWIDTH

LIMITS:	Product standard:	RSS-Gen
	Test standard:	RSS-Gen 6.7

LIMITS

The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs

TEST SETUP

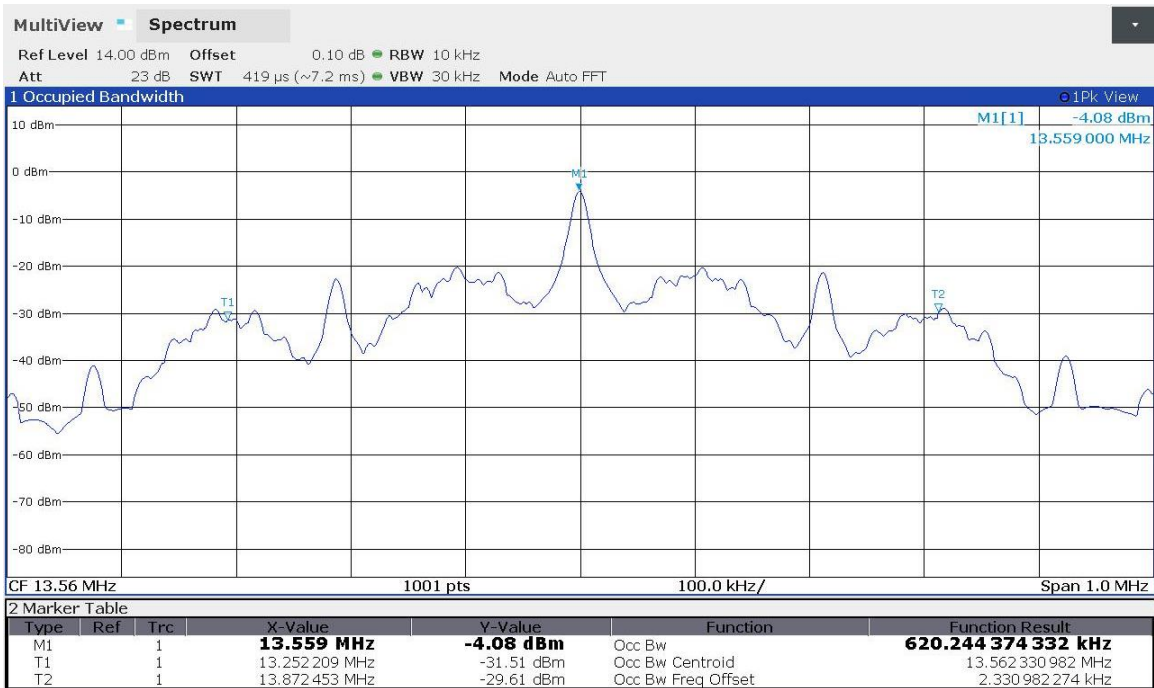


TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

NFC Operating Frequency: 13.56MHz

Center Frequency (MHz)	13.559
99% bandwidth (KHz)	620.2

TEST RESULTS (Cont.):



TEST A.2: FIELD STRENGTH OF EMISSIONS WITHIN THE BAND 13.553 MHZ – 13.567 MHZ

LIMITS:	Product standard:	Part 15 Subpart C §15.225 and RSS-210
	Test standard:	Part 15 Subpart C §15.225(a) and RSS-210 clause B.6 (a)

LIMITS

The field strength of any emissions within the band 13.553 – 13.567 MHz shall not exceed 15,848 microvolts/meter (84 dB μ V/m) at 30 meters.

TEST SETUP

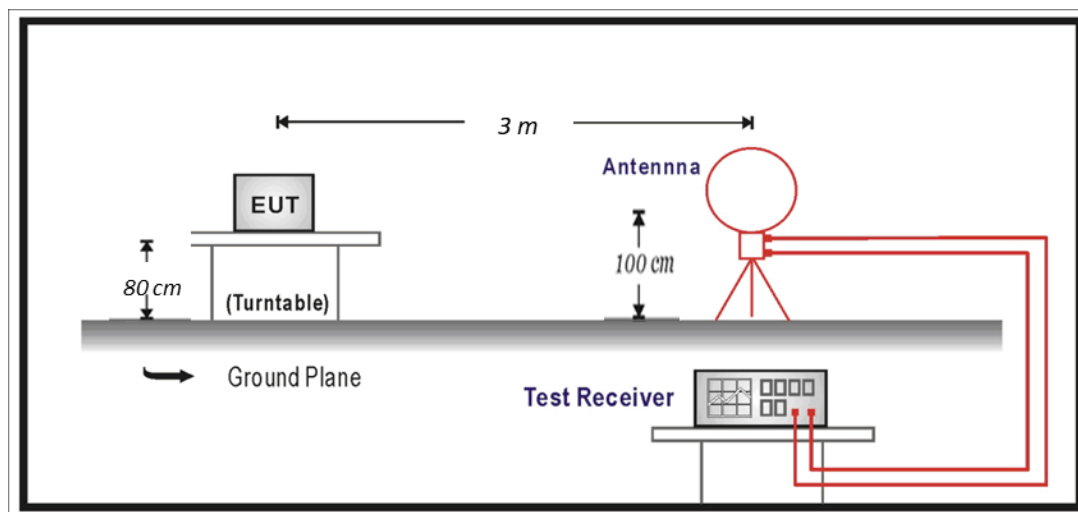
All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Loop antenna for the range between 9 kHz to 30 MHz) is situated at a distance of 3 m.

For radiated emissions in the range 9 kHz to 30 MHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 40 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° to find the maximum radiated emission.

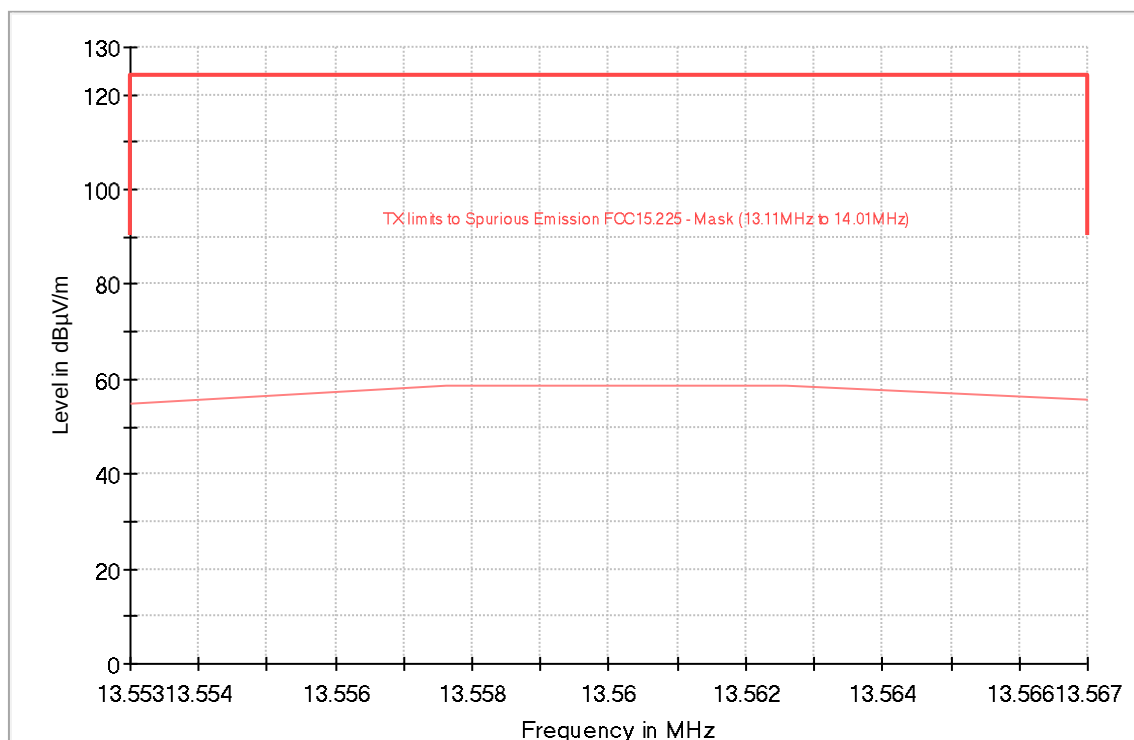
Three different orientations (X, Y, and Z) of receiving loop antenna orientation were tested to determine the worst case shown in the following test results.

Radiated measurements setup 9 kHz to 30 MHz.



TESTED SAMPLES:	S/02
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

Band 13.553 MHz – 13.567 MHz



PK+_MAXH TX limits to Spurious Emission FCC15.225 - Mask (13.11MHz to 14.01MHz)

Limit and Margin

Frequency (MHz)	PK+_MAXH (dBμV/m)	Pol	Margin - PK+ (dB)	Limit - PK+ (dBμV/m)
13.562600	58.7	H	65.3	124.0

TEST A.3: FIELD STRENGTH OF EMISSIONS WITHIN THE BAND 13.410 MHZ – 13.553 MHZ AND 13.567 – 13.710 MHZ

LIMITS:	Product standard:	Part 15 Subpart C §15.225 and RSS-210
	Test standard:	Part 15 Subpart C §15.225(b) and RSS-210 clause B.6 (b)

LIMITS

The field strength of any emissions within the band 13.553 – 13.567 MHz shall not exceed 334 microvolts/meter (50.47 dB μ V/m at 30 meters).

TEST SETUP

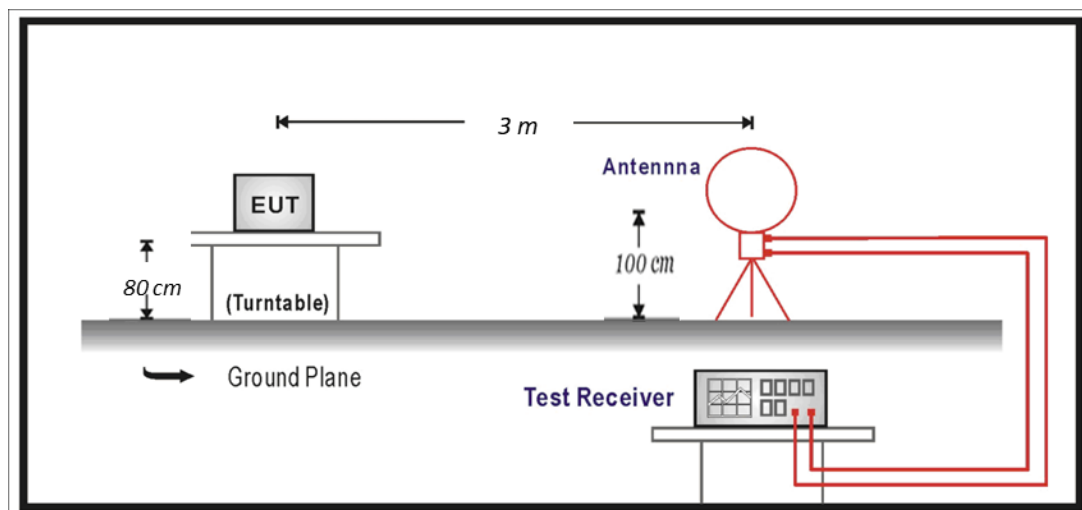
All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Loop antenna for the range between 9 kHz to 30 MHz) is situated at a distance of 3 m.

For radiated emissions in the range 9 kHz to 30 MHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 40 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° to find the maximum radiated emission.

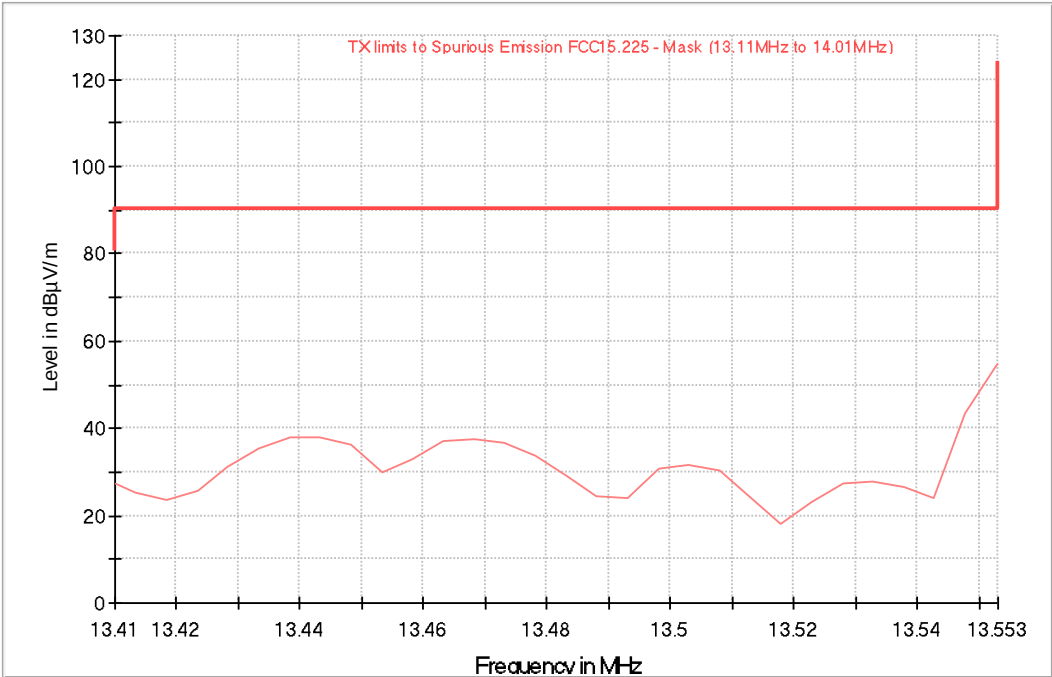
Three different orientations (X, Y, and Z) of receiving loop antenna orientation were tested to determine the worst case shown in the following test results.

Radiated measurements setup 9 kHz to 30 MHz.



TESTED SAMPLES:	S/02
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

Band 13.410 MHz – 13.553 MHz

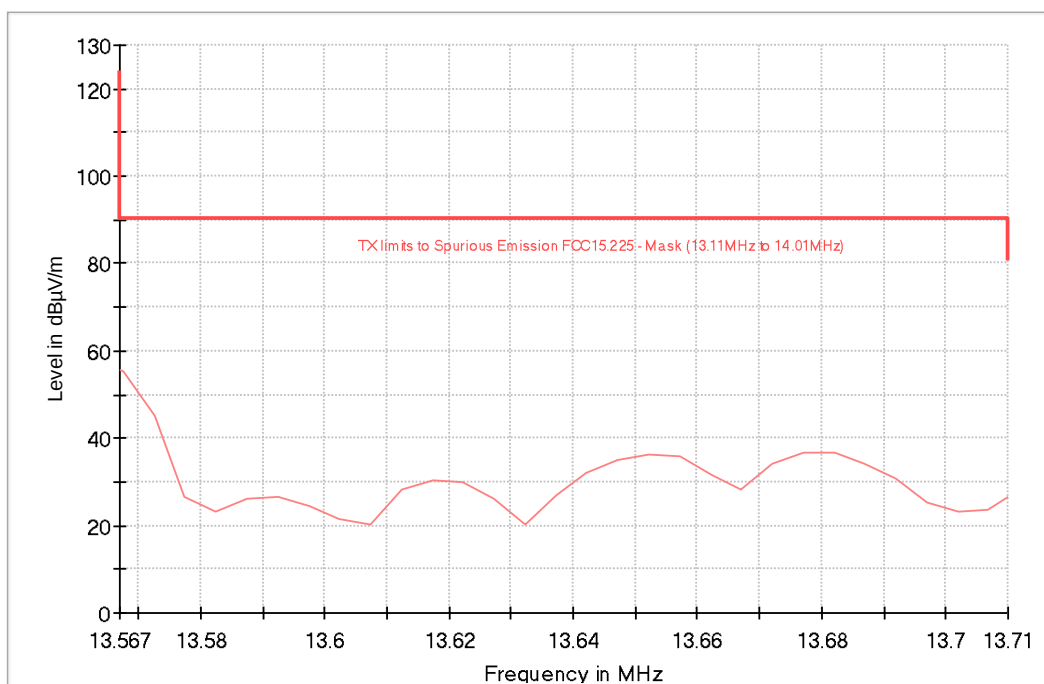


Limit and Margin

Frequency (MHz)	PK+ MAXH (dBµV/m)	Pol	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
13.552650	54.5	H	36.0	90.5

TESTED SAMPLES:	S/02
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

Band 13.567 MHz – 13.710 MHz



PK+_MAXH TX limits to Spurious Emission FCC15.225 - Mask (13.11MHz to 14.01MHz)

Limit and Margin

Frequency (MHz)	PK+_MAXH (dBµV/m)	Pol	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
13.552650	55.2	H	35.3	90.5

TEST A.4: FIELD STRENGTH OF EMISSIONS WITHIN THE BAND 13.110 MHZ – 13.410 MHZ AND 13.710 – 14.010 MHZ

LIMITS:	Product standard:	Part 15 Subpart C §15.225 and RSS-210
	Test standard:	Part 15 Subpart C §15.225(c) and RSS-210 clause B.6 (c)

LIMITS

The field strength of any emissions within the band 13.553 – 13.567 MHz shall not exceed 106 microvolts/meter (40.51 dB μ V/m) at 30 meters.

TEST SETUP

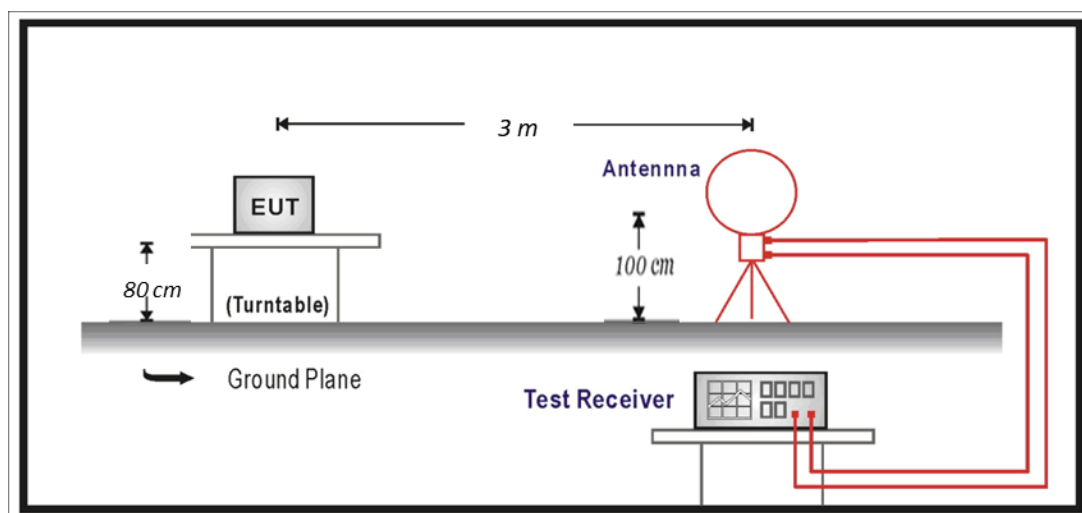
All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Loop antenna for the range between 9 kHz to 30 MHz) is situated at a distance of 3 m.

For radiated emissions in the range 9 kHz to 30 MHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 40 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° to find the maximum radiated emission.

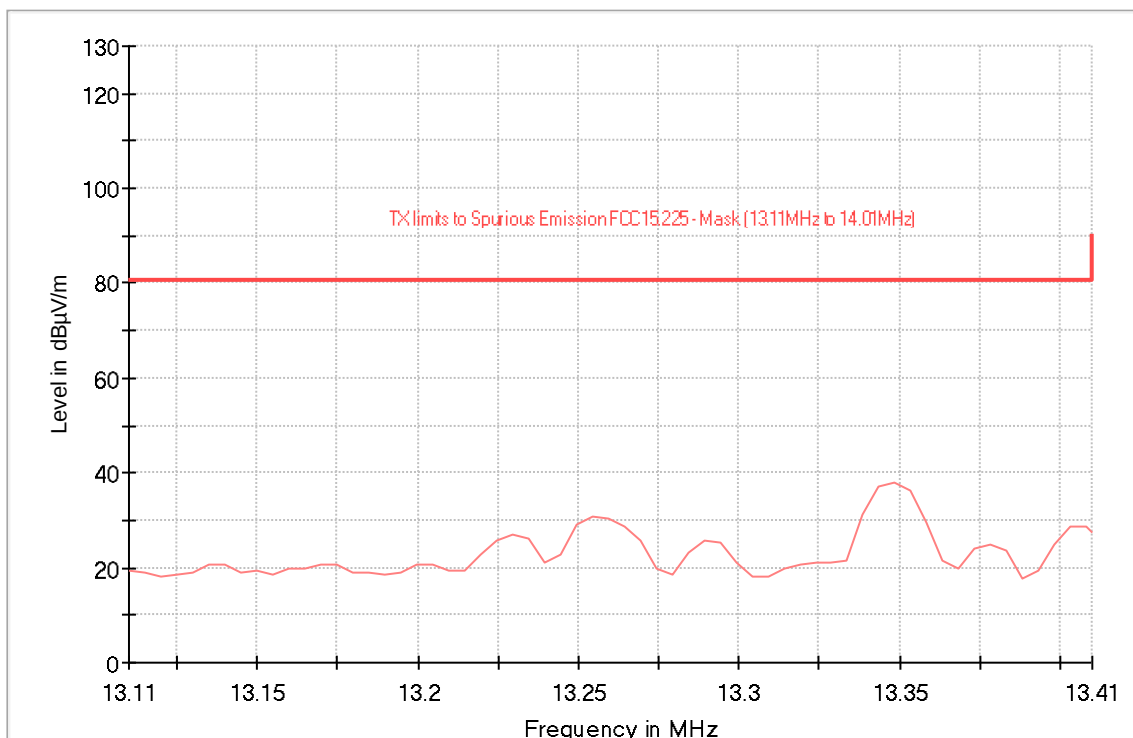
Three different orientations (X, Y, and Z) of receiving loop antenna orientation were tested to determine the worst case shown in the following test results.

Radiated measurements setup 9 kHz to 30 MHz.



TESTED SAMPLES:	S/02
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

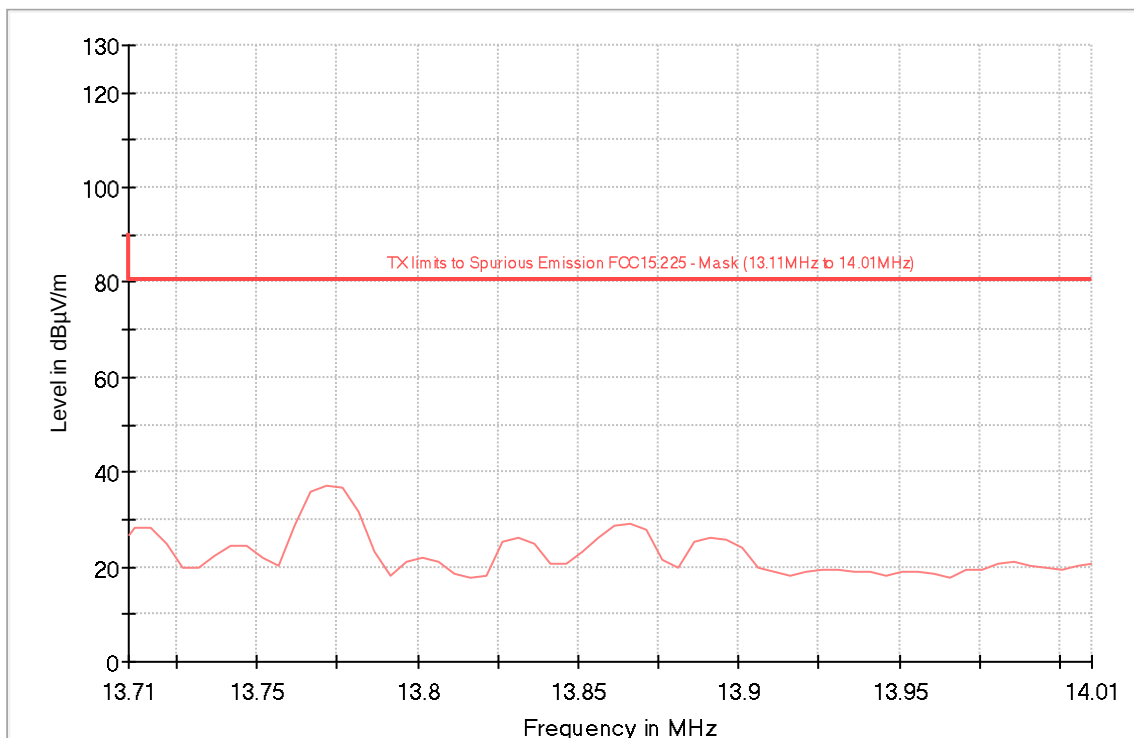
Band 13.110 MHz – 13.410 MHz



PK+_MAXH TX limits to Spurious Emission FCC15.225 - Mask (13.11MHz to 14.01MHz)

Frequency (MHz)	PK+_MAXH (dBμV/m)	Pol	Margin - PK+ (dB)	Limit - PK+ (dBμV/m)
13.348675	37.8	H	42.7	80.5

Band 13.710 MHz – 14.010 MHz



PK+_MAXH TX limits to Spurious Emission FCC15.225 - Mask (13.11MHz to 14.01MHz)

Frequency (MHz)	PK+_MAXH (dBµV/m)	Pol	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
13.771550	37.2	H	43.3	80.5

TEST A.5: FIELD STRENGTH OF EMISSIONS OUTSIDE OF THE BAND 13.110 MHZ – 13.410 MHZ

LIMITS:	Product standard:	Part 15 Subpart C §15.225 and RSS-210
	Test standard:	Part 15 Subpart C §15.225(d) and RSS-210 clause B.6 (d)

LIMITS

Frequency Range (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	29.54	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

TEST SETUP

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Loop antenna for the range between 9 kHz to 30 MHz and Bilog antenna for the range between 30 MHz to 1 GHz) is situated at a distance of 3 m.

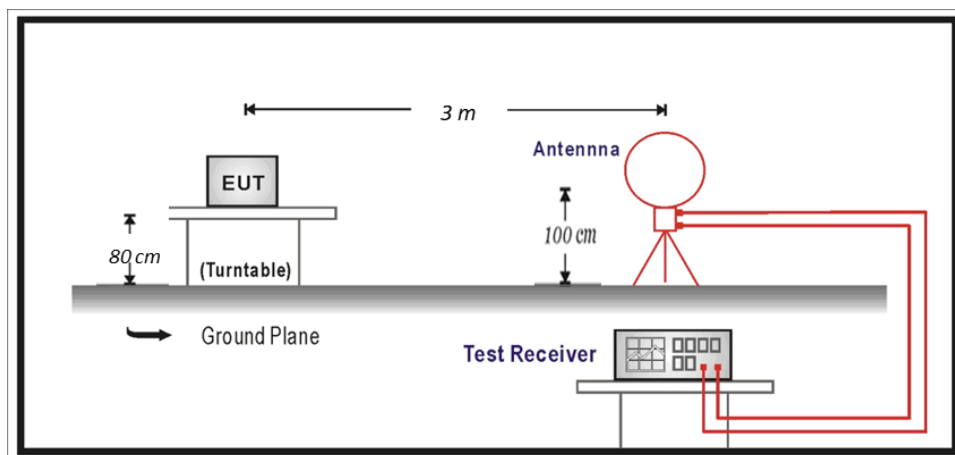
For radiated emissions in the range 9 kHz to 30 MHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 40 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and in the range between 30 MHz and 200 MHz the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

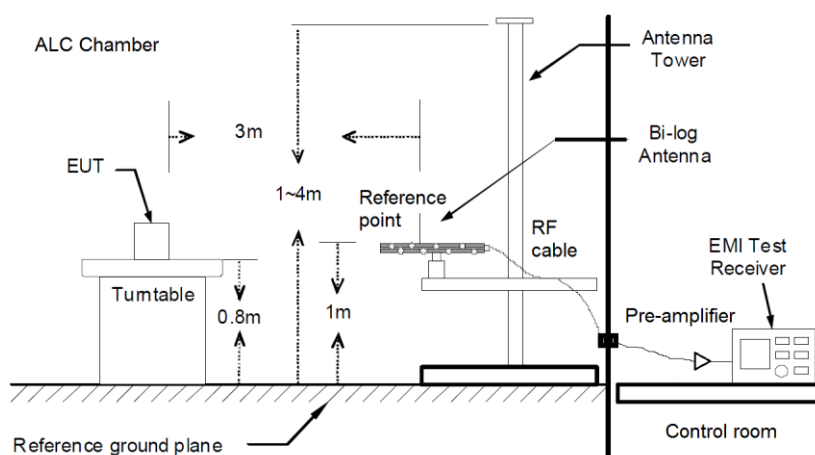
In the range between 9 kHz and 30 MHz three different orientations (X, Y, and Z) of receiving loop antenna were tested to determine the worst case shown in the following test results.

TEST SETUP (cont.):

Radiated measurements setup 9 kHz to 30 MHz

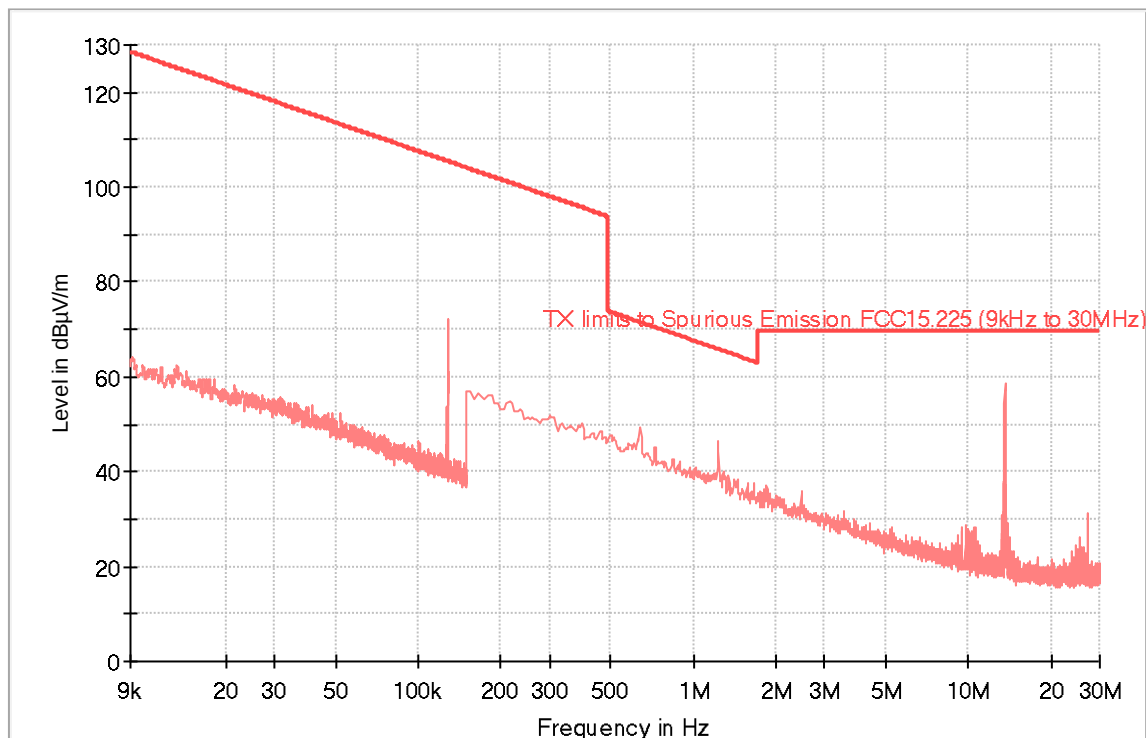


Radiated measurements setup 30 MHz to 200 MHz



TESTED SAMPLES:	S/02
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

Frequency Range: 9 kHz – 30 MHz



PK+_MAXH TX limits to Spurious Emission FCC15.225 (9kHz to 30MHz)

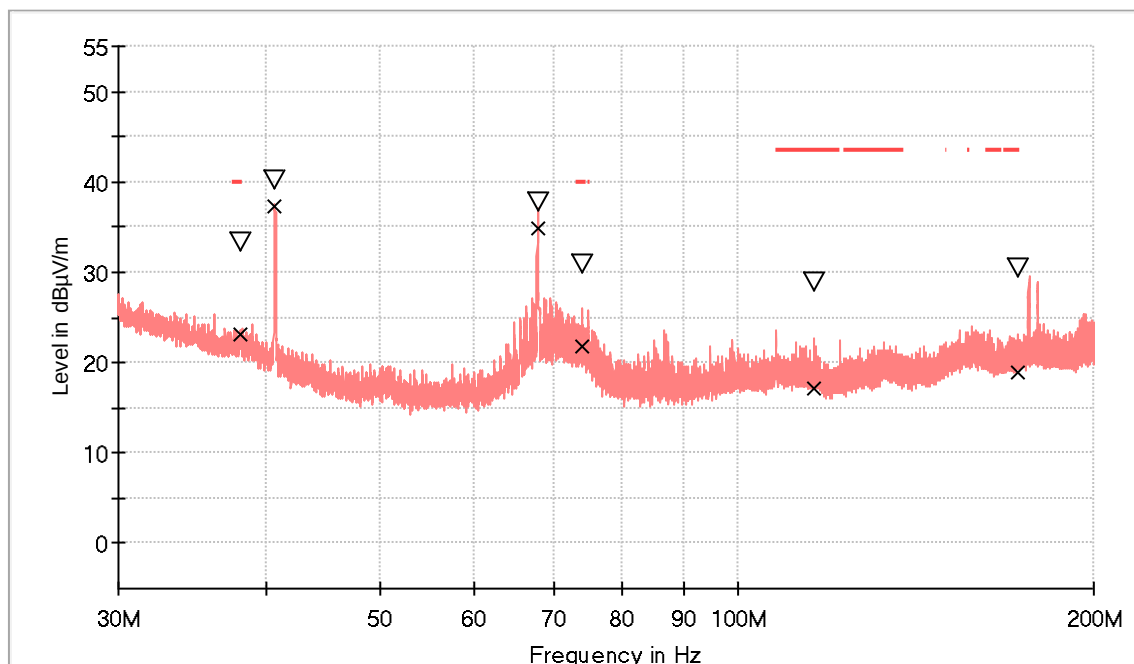
Maximizations

Frequency (MHz)	PK+_MAXH (dBµV/m)	Pol	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)	Comment
0.127797	71.0	H	34.5	105.5	Fundamental QI
0.637550	49.2	H	22.3	71.5	
1.234550	46.5	H	19.3	65.8	
9.711950	28.5	H	41.0	69.5	
13.562600	51.8	H	-	-	Fundamental
27.119475	30.6	H	38.9	69.5	

TEST RESULTS:

PASS

Frequency Range: 30 MHz – 200 MHz



- PK+ _MAXH
- TX limits to Spurious Emission FCC15.225 (30MHz to 1GHz) Restricted Bands QPK Limit
- ▽ MaxPeak-PK+ (Single)
- x QuasiPeak-QPK (Single)

Maximizations

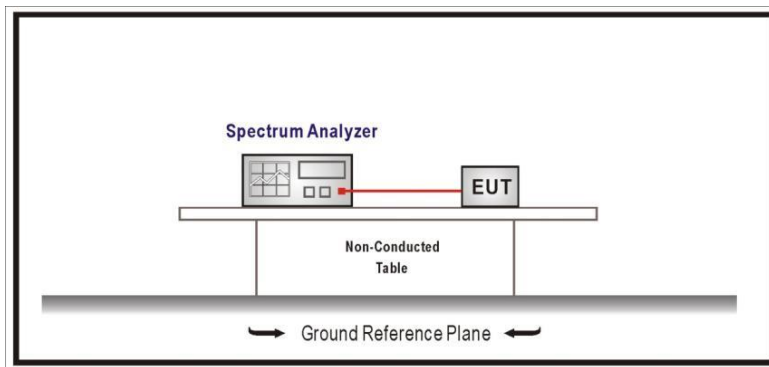
Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Pol	Margin - QPK (dB)	Limit - QPK (dBμV/m)
38.075000	33.3	23.2	V	16.8	40.0
40.676000	40.1	37.2	V	---	---
67.808000	37.7	34.8	V	---	---
74.064000	30.9	21.8	V	18.2	40.0
115.943500	28.8	17.1	V	26.4	43.5
172.375000	30.5	18.9	H	24.6	43.5

TEST A.6: FREQUENCY TOLERANCE OF THE CARRIER SIGNAL

LIMITS:	Product standard:	Part 15 Subpart C §15.225 and RSS-210
	Test standard:	Part 15 Subpart C §15.225(e) and RSS-210 clause B.6

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 hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

TEST SETUP



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

Nominal Operating Frequency: 13.56 MHz

Frequency stability over temperature variations.

Temperature (°C)	Frequency Error (kHz)	Frequency Error (%)
+50	-0.3	-0.0021
+40	-0.2	-0.0018
+30	-0.3	-0.0020
+20	0.0	0.0001
+10	-0.2	-0.0017
0	-0.2	-0.0018
-10	-0.3	-0.0021
-20	0.2	0.0015

Frequency stability over voltage variations.

AC Supply voltage	Voltage (V)	Frequency Error (kHz)	Frequency Error (%)
Vmin	11.5	-1.0	-0.0072
Vmax	15.5	0.1	0.0007