

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



EUT Description DS-X Series ECG, Respiration and SpO2 Transmitter
Applicant: Fukuda Denshi Co Ltd
3-39-4Hongo, Bunkyo-ku, Tokyo, 113-8483, Japan
Manufacturer: Fukuda Denshi Co Ltd
3-39-4Hongo, Bunkyo-ku, Tokyo, 113-8483, Japan
Brand Name: N/A
Model No.: DS-X1F
Family Model No.: DS-X1M, DS-X1N
Report Number: TERF2508002644ER
FCC ID DV8DSX1N
Date of EUT Received: August 15, 2025
Date of Test: August 15, 2025~September 18, 2025
Issue Date: December 12, 2025

Approved By CHUN-CHIEH, CHEN
Chun Chieh Chen

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2020 and the energy emitted by the sample EUT comply with FCC rule part §15.225.

The results of this report relate only to the sample identified in this report.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2508002644ER	00	Original	October 3, 2025	Karen Huang	
TERF2508002644ER	01	Add note in section 1.1	December 12, 2025	Susan Lin	*

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.
- 2、Variant information of model numbers is provided by the applicant, test results of this report are applicable to the sample EUT(s) received.
And are assessed as electrically identical in RF characteristics, therefore, no further assessment required for the variant(s).

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1 GENERAL INFORMATION

1.1 Product Description

EUT Description	DS-X Series ECG, Respiration and SpO2 Transmitter
Brand Name:	N/A
Model No.:	DS-X1F
Family Model No.:	DS-X1M, DS-X1N
Model Difference:	Difference is only SPO2(saturation of percutaneous oxygen) module. All other things are common and same.
Hardware Version:	N/A
Firmware Version:	N/A
Power Supply:	3.8 Vdc
Test Software (Name/Version)	N/A

Note: The EUT is a portable medical device with operation capability in the NFC and WLAN/BLE, via inclusion of certified module (FCC ID: DV8DSX1).

1.2 RF specification

Radio Technology:	NFC
Operating Frequency	13.56MHz
Transmit Power	< 12.74dBuV/m at 30m.
Number of Channels	1
Modulation Type	ASK
Antenna Type	Loop Antenna

Note:

1. The antenna information is provided by the applicant, and the laboratory shall not be held liable for the accuracy, completeness, or reliability of any applicant-supplied data.
2. The antenna complies with part 15.203 requirement and no consideration of replacement. Please see EUT photo for details.

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1.3 EUT Availability and The Worst Test Modes

1. The EUT has been tested under operating condition.
2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
3. The field strength of radiation emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst-case scenario.
4. The frequency 13.56 MHz is the default channel to test, where it is the only manipulative channel as this application supports.
5. Only one configuration is supported/applicable as follows.

RADIATED EMISSION TEST			
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION
NFC	1	1	ASK
FREQUENCY STABILITY			
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION
NFC	1	1	ASK
20dB and 99% BANDWIDTH			
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION
NFC	1	1	ASK

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2 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207	AC Power Line Conducted Emission	N/A
§15.225 (a)-(d)	Radiated Emission	Compliant
§15.209	Radiated Emission Limits, general requirement	Compliant
§15.225 (e)	Frequency Stability	Compliant
§2.1049 §15.215 (c)	Emission Bandwidth	Compliant
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Bands	Compliant

2.1 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.225

ANSI C63.10:2020.

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2.2 Measurement Uncertainty

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 1.54 dB
Frequency Stability	+/- 1.48 Hz
Emission Bandwidth	+/- 1.38 Hz
Temperature	+/- 0.60 °C
Humidity	+/- 3.00 %
DC / AC Power Source	+/- 1.00 %

Radiated Spurious Emission Measurement Uncertainty		
Polarization: Vertical	+/- 1.89 dB	9kHz - 30MHz
	+/- 4.10 dB	30MHz - 1000MHz
	+/- 3.37 dB	1GHz - 18GHz
	+/- 3.83 dB	18GHz - 40GHz
Polarization: Horizontal	+/- 1.89 dB	9kHz - 30MHz
	+/- 4.10 dB	30MHz - 1000MHz
	+/- 3.37 dB	1GHz - 18GHz
	+/- 3.83 dB	18GHz - 40GHz
Radiated Spurious Emission	+/- 2.00 dB	33GHz - 50GHz
	+/- 1.59 dB	50GHz - 60GHz
	+/- 1.71 dB	60GHz - 90GHz
	+/- 1.64 dB	90GHz - 140GHz
	+/- 3.84 dB	140GHz - 220GHz

Note:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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2.3 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number / Registration Number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803	SAC 1 / SAC 2 / SAC 3 Conduction 1 / Conducted 1 Conducted 2 / Conducted 3 Conducted 4 / Conducted 5 Conducted 6	TW0027 / 891563	TW3702
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.2, Keji 1st Rd, Guishan District, Taoyuan City, Taiwan 333	SAC C / SAC D / SAC G Conduction C/ Conducted A Conducted B / Conducted C Conducted D / Conducted E Conducted F / Conducted G	TW0028 / 200037	TW3702

Note: The test site name is noted on the equipment list to indicate where the measurements were conducted.

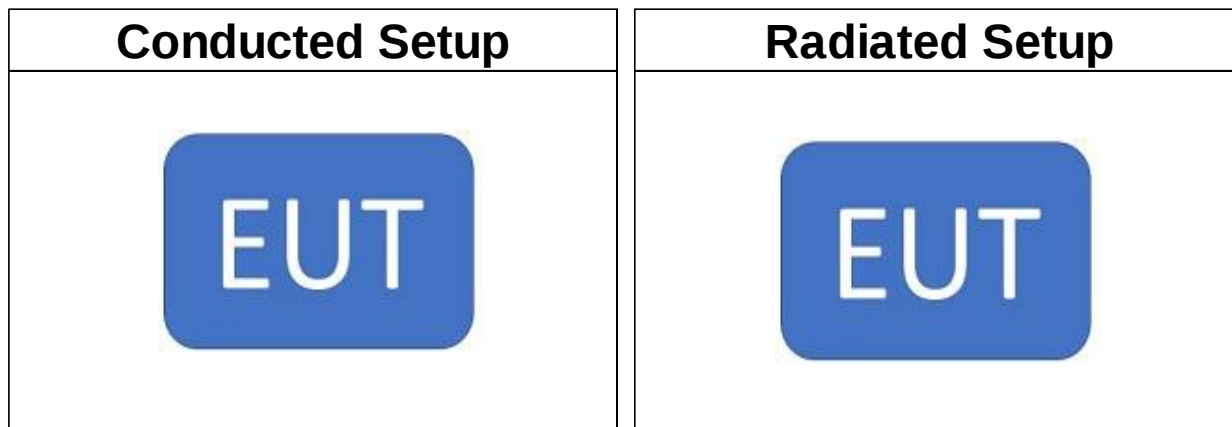
Temperature:	22-26	°C	Relative Humidity:	55-60	%
Test site	Conducted 1		Test Start:	09/15/2025	
Test Engineer:	Teddy_Lu		Test Done:	09/18/2025	

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3 CONTROL UNIT(S) AND PERIPHERAL(S)

3.1 Diagram



3.2 List

3.2.1 Conduction Setup

N/A

3.2.2 Conducted Setup

Conducted Emission Test Site: Conducted 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
H-Loop Near Field Antenna	EMCI	LF-R 400	02-1637	N/A	N/A

3.2.1 Radiated Setup

N/A

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4 TEST INSTRUMENT

4.1 Conducted Measurement

Conducted Emission Test Site: Conducted 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
DC Block	Mini-Circuits	BLK-18-S+	2	12/11/2024	12/10/2025
DC Power Supply	Gwinstek	SPS-3610	GEV856733	12/04/2024	12/03/2025
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY59071571	06/24/2025	06/23/2026
Temperature Chamber	TERCHY	MHG-120LE	1110435	06/04/2025	06/03/2026
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R

4.2 Radiated Measurement

Radiated Emission Test Site: SAC 2					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Bi-log Antenna	SCHWARZBECK	VULB9168	9168-1278	03/10/2025	03/09/2026
EMI Test Receiver	R&S	ESR 7	102525	02/08/2025	02/07/2026
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY59071570	07/04/2025	07/03/2026
Loop Antenna	COM-POWER	AL-130R	10160104	12/19/2024	12/18/2025
Pre-Amplifier	EMCI	EMC330N	980826	07/14/2025	07/13/2026
Site Cal	SGS	SAC 2	N/A	07/14/2025	07/13/2026
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R

4.3 Emission from AC power line

N/A

NOTE: N.C.R refers to Not Calibrated Required.

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5 REGULATORY REQUIREMENTS

5.1 Radiated Emission

5.1.1 Field Strength of Fundamental Emission

KDB 414788 D01 OATS and 3m semi-anechoic chamber Justification:

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. OATS and 3m SAC chamber testing had been performed and 3m SAC measured test result is the worst case test result.

Frequency of Emission (MHz)	Field Strength (μV/m)at 30m	Field Strength (dBμV/m)at 30m
1.705~13.110	30	29.5
13.110~13.410	106	40.5
13.410~13.553	334	50.5
13.553~13.567	15848	84
13.567~13.710	334	50.5
13.710~14.010	106	40.5
14.010~30.00	30	29.5

Distance Extrapolation Factor

30m to 3m: Distance extrapolation = $40 \cdot \log(30/3) = 40$ dB

30m to 10m: Distance extrapolation = $40 \cdot \log(30/10) = 19.08$ dB

10m to 3m: Distance extrapolation = $40 \cdot \log(10/3) = 20.92$ dB

Note:

1. Distance extrapolation factor = $40 \log(\text{required distance} / \text{test distance})$ (dB)
2. The lower limit shall apply at the transition frequencies.

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5.2 Radiated Spurious Emission Measurement

The field strength of any emissions appearing outside of the 13.110-14.010 MHz shall not exceed the general radiated emission limits as below.

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

1. Emission level in $\text{dB}\mu\text{V/m}=20 \log (\mu\text{V/m})$
2. Distance extrapolation factor = $40 \log (\text{required distance/ test distance})$ (dB)
3. $20*\log(30\mu\text{V/m}) = 29.54 \text{ dB}\mu\text{V/m}$
4. The lower limit shall apply at the transition frequencies.
5. The measurement was undertaken in closer distance at 3m, where extrapolation factor is offset to convert the limit of the measurement.
6. The general radiated emission limits apply to spurious emissions generated by the UE, except for fundamental emissions where specific provisions are stated in the relevant sections.

5.3 Frequency Stability

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.

5.4 Emission Bandwidth

The 20 dB and 99% bandwidth shall be specified in operating frequency band.

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5.5 AC Power Line Conducted Emission

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits (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 lower limit shall apply at the transition frequencies
- 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

5.6 Antenna Requirement

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

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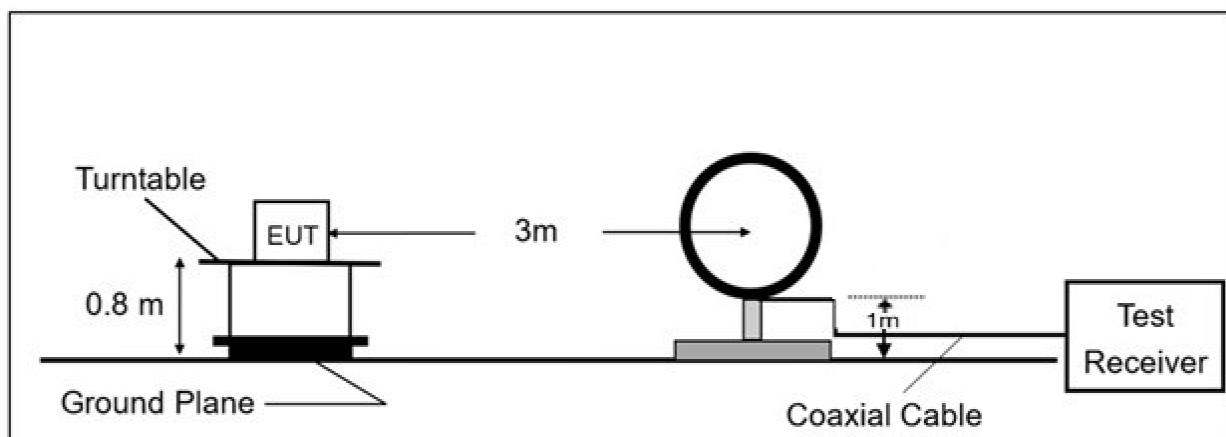
6 TEST CONFIGURATION

6.1 Radiated Emission

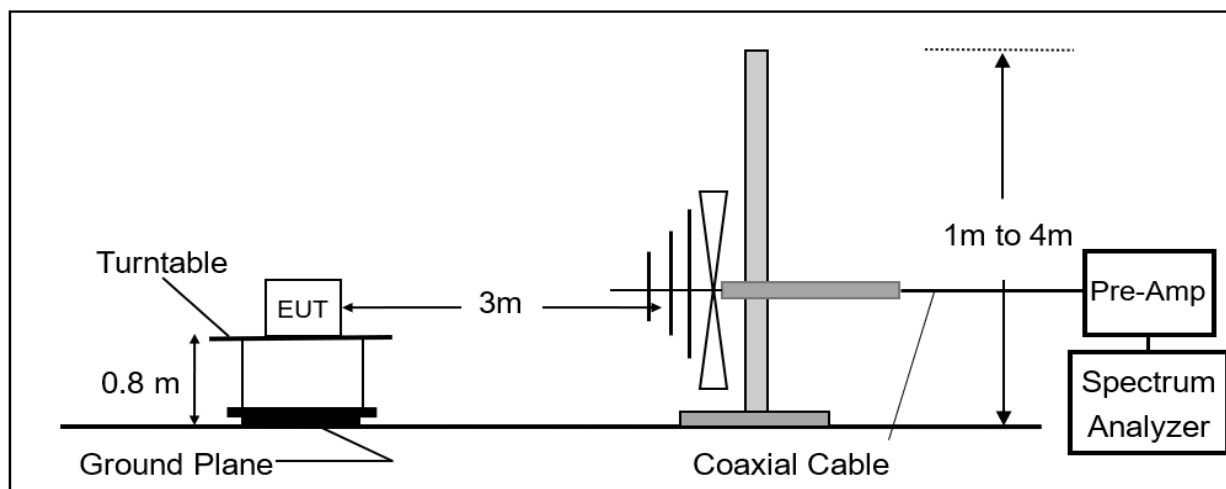
Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz.



(B) Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz.



1. Configure the EUT according to ANSI C63.10.
2. The EUT was placed on a turn table which is 0.8m above ground plane and been measured in the frequency range between 0.009MHz to 30MHz and 30MHz to 1GHz.
3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission.

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5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Repeat above procedures until all default test channel measured were complete.

Note: The emissions from 9 kHz to 30MHz was pre-scanned as 20dB lower than the limits and hence not reported.

6.1.1 Field Strength Calculation

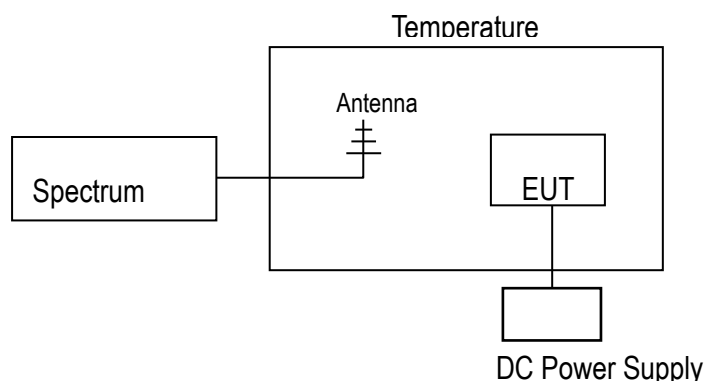
The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where *FS* = Field Strength(dBμV/m) *CL* = Cable Attenuation Factor (Cable Loss) (dB)
RA = Reading Amplitude(dBμV) *AG* = Amplifier Gain (dB)
AF = Antenna Factor (dBμV/m)

*The limit of the emission level is expressed in dBuV/m, which converts 20*log(uV/m)*

6.2 Frequency Stability

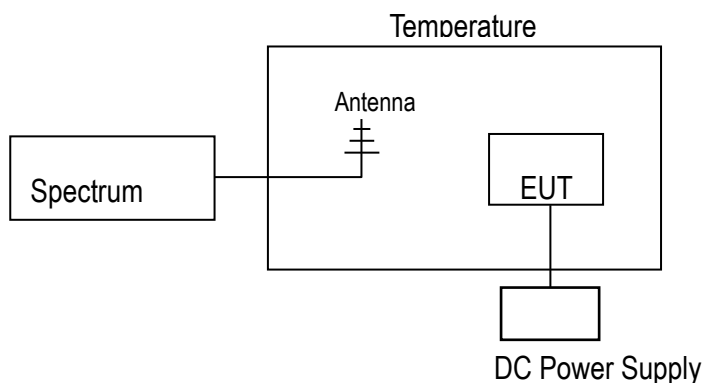


1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Set the spectrum analyzer as
Center Frequency = fundamental frequency,
RBW= 10kHz,
VBW= 10kHz,
Span =100kHz.
4. Set SPA Max hold. Mark peak.

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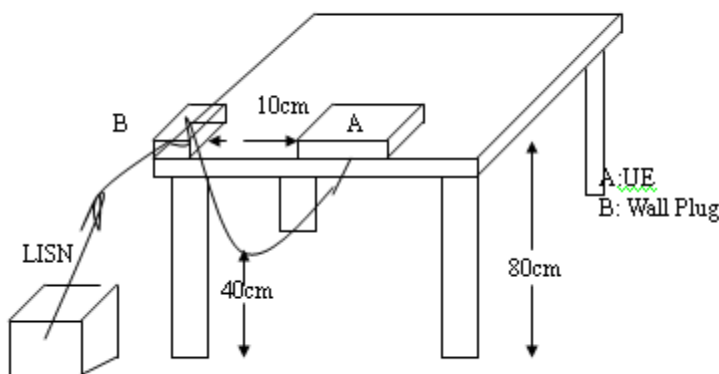
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6.3 Emission Bandwidth



1. Placed the EUT on the testing table.
2. Set the EUT under transmission condition continuously at specific channel frequency.
3. Set the spectrum analyzer as
Center Frequency = fundamental frequency,
RBW=1% to 5% OBW and without going below 0.1kHz,
VBW $\geq$ 3 x RBW,
Span = 2 to 5 times OBW
4. Use the 99% power bandwidth and X dB bandwidth mode function of the spectrum analyzer and set to 20dB

6.4 AC Power Line Conducted Emission



1. The conducted emission tests were performed at the designated test site using a setup in accordance with ANSI C63.10.
2. The EUT was placed on a non-conductive table that is 0.8 meters above the ground plane. Conducted emissions were measured in the frequency range from 0.15 MHz to 30 MHz using CISPR Quasi-Peak and Average detector modes. The two LISNs

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provided 50 μ H / 50 ohm coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

3. The AC/DC power adaptor of the EUT was connected to the LISN. The EUT was positioned flush with the rear edge of the table, with a minimum 0.4-meter distance from the shielding wall.
4. The LISNs were connected to the power source and configured according to the test requirements.
5. The maximum emission levels were investigated for each mode of operation. The six highest emissions were further maximized to ensure compliance.
6. The above procedures were repeated for all power supply configurations of the EUT.

Level = Read Level + Factor

Factor = (LISN, ISN, or current probe)Factor + Cable Loss + Attenuator

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7 TEST RESULTS

7.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

Actual FS(dBμV/m) = Spectrum. Reading level(dBμV) + Factor(dB)

Below 30 MHz of Factor(dB) = Antenna Factor(dB/m) + Cable Loss(dB) – Distance Factor (dB)

Above 30 MHz of Factor(dB) = Antenna Factor(dB/m) + Cable Loss(dB) – Pre_Amp Gain (dB)

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

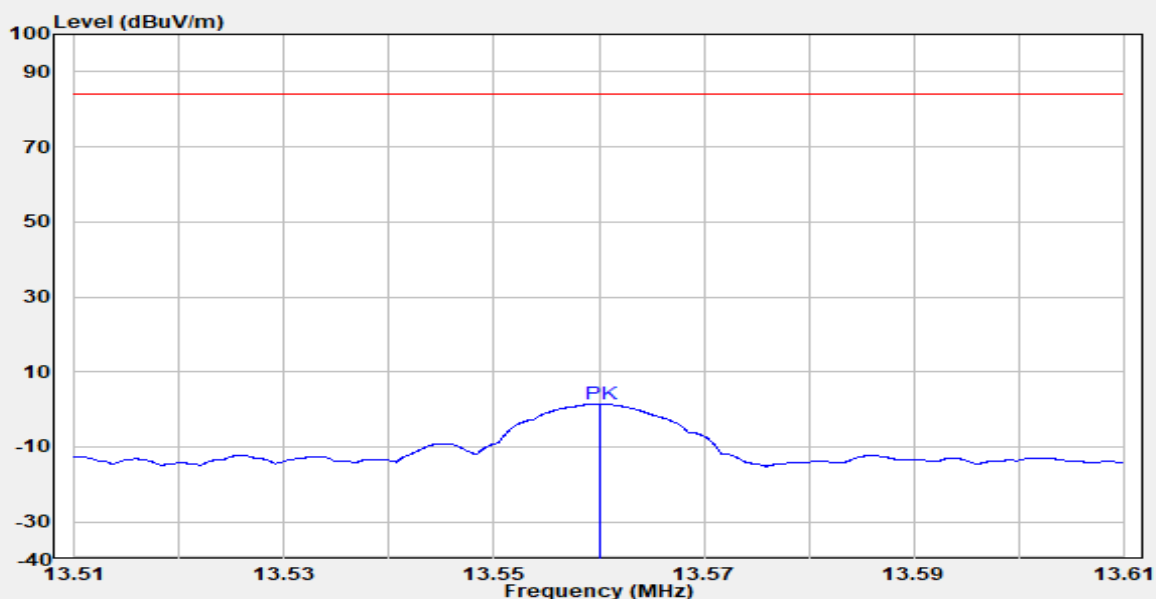
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7.1.1 Field Strength of Fundamental Emission Measurement Result

Report Number :TERF2508002644ER
Operation Mode :NFC
Test Frequency :13.56 MHz
Test Mode :Main
EUT Pol :E1 Plane

Test Site :SAC 2
Test Date :2025-08-29
Temp./Humi. :24.1°C/53%
Antenna Pol. :Ground Parallel
Engineer :Bob Chao



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
13.56	Peak	25.89	-24.51	1.38	84.00	-82.62

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m,within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m,within the band 490 kHz - 30 MHz.

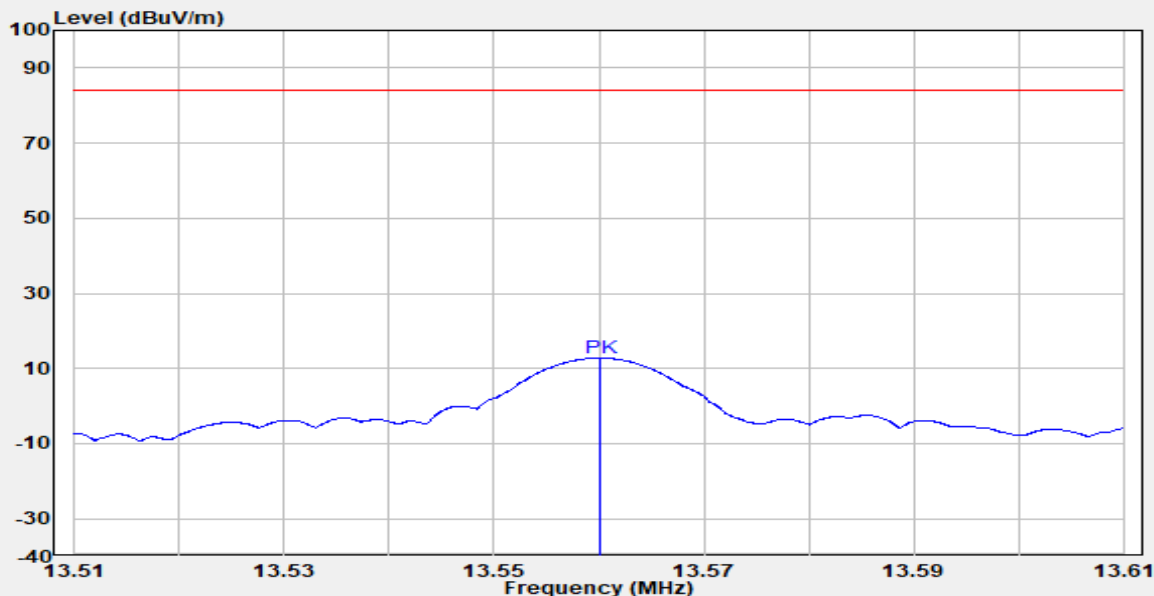
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Report Number :TERF2508002644ER
Operation Mode :NFC
Test Frequency :13.56 MHz
Test Mode :Main
EUT Pol :E1 Plane

Test Site :SAC 2
Test Date :2025-08-29
Temp./Humi. :24.1°C/53%
Antenna Pol. :Parallel
Engineer :Bob Chao



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
13.56	Peak	37.25	-24.51	12.74	84.00	-71.26

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m,within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m,within the band 490 kHz - 30 MHz.

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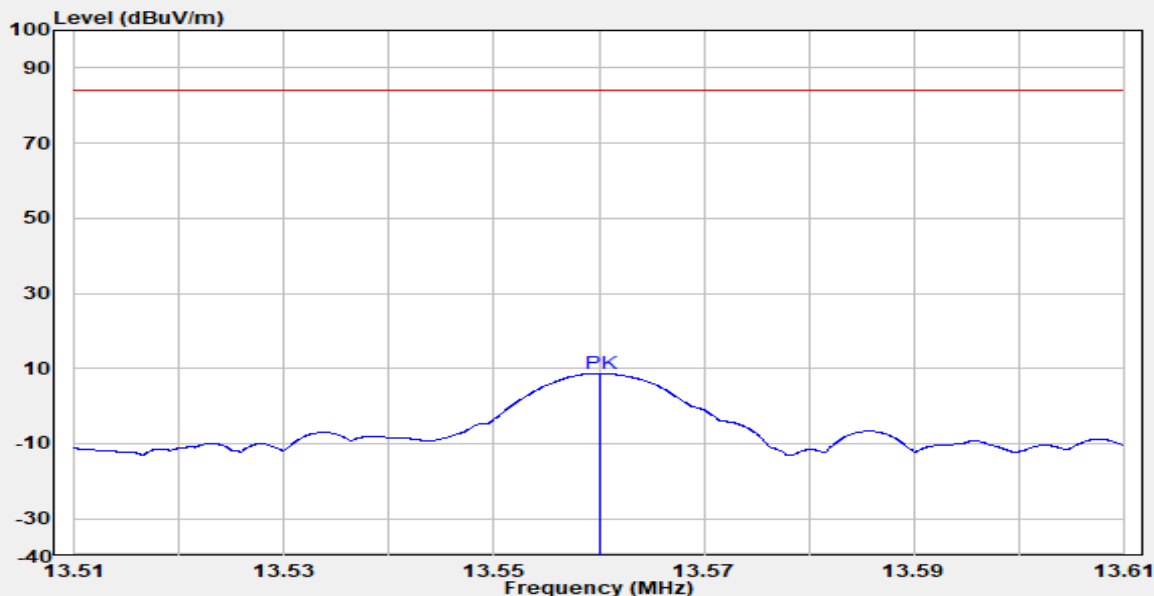
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Report Number :TERF2508002644ER
Operation Mode :NFC
Test Frequency :13.56 MHz
Test Mode :Main
EUT Pol :E1 Plane

Test Site :SAC 2
Test Date :2025-08-29
Temp./Humi. :24.1°C/53%
Antenna Pol. :Perpendicular
Engineer :Bob Chao



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
13.56	Peak	33.22	-24.51	8.71	84.00	-75.29

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m,within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m,within the band 490 kHz - 30 MHz.

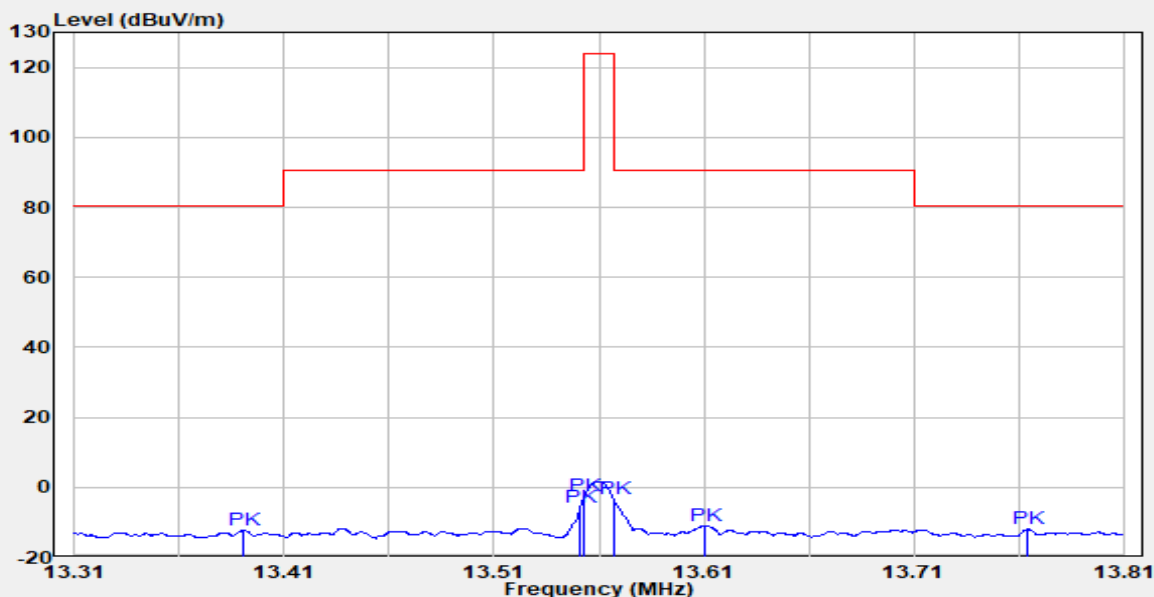
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Report Number :TERF2508002644ER
Operation Mode :NFC
Test Frequency :13.56 MHz
Test Mode :Mask
EUT Pol :E1 Plane

Test Site :SAC 2
Test Date :2025-08-29
Temp./Humi. :24.1°C/53%
Antenna Pol. :Ground Parallel
Engineer :Bob Chao



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit dB μ V/m	Margin dB
13.391	Peak	12.07	-24.46	-12.39	80.54	-92.93
13.551	Peak	18.65	-24.51	-5.86	90.47	-96.33
13.553	Peak	21.83	-24.51	-2.68	90.47	-93.15
13.567	Peak	21.27	-24.51	-3.24	90.47	-93.71
13.611	Peak	13.37	-24.51	-11.14	90.47	-101.61
13.764	Peak	12.51	-24.56	-12.05	80.50	-92.55

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m,within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m,within the band 490 kHz - 30 MHz.

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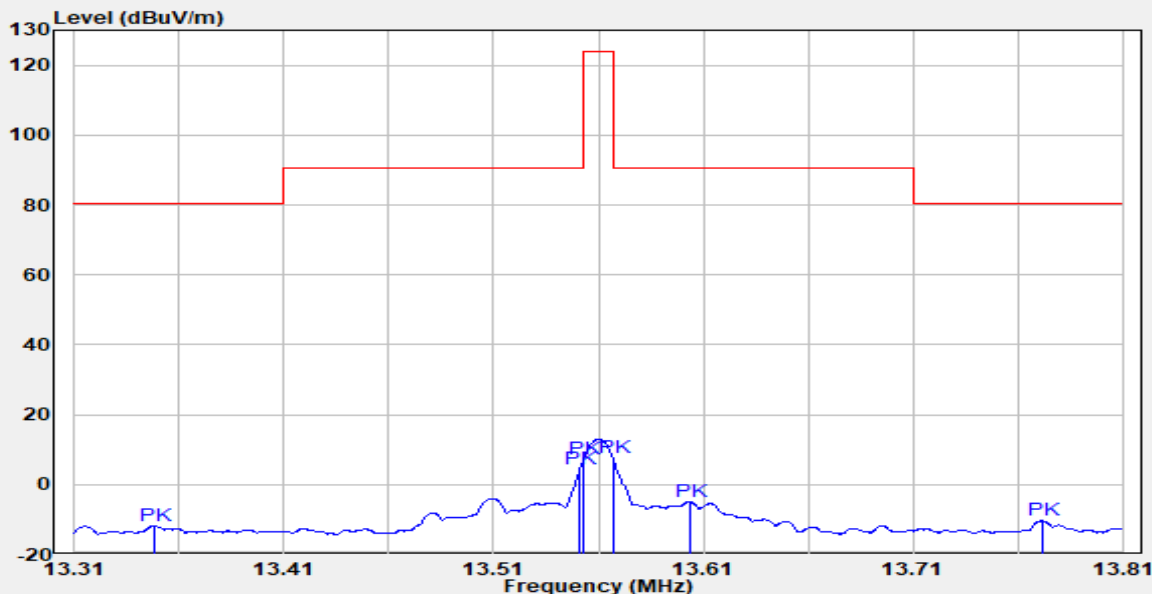
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Report Number :TERF2508002644ER
Operation Mode :NFC
Test Frequency :13.56 MHz
Test Mode :Mask
EUT Pol :E1 Plane

Test Site :SAC 2
Test Date :2025-08-29
Temp./Humi. :24.1°C/53%
Antenna Pol. :Parallel
Engineer :Bob Chao



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
13.348	Peak	12.52	-24.44	-11.92	80.54	-92.46
13.551	Peak	28.72	-24.51	4.21	90.47	-86.26
13.553	Peak	31.84	-24.51	7.33	90.47	-83.14
13.567	Peak	31.97	-24.51	7.46	90.47	-83.01
13.604	Peak	19.53	-24.51	-4.98	90.47	-95.45
13.771	Peak	14.13	-24.56	-10.43	80.50	-90.93

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m,within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m,within the band 490 kHz - 30 MHz.

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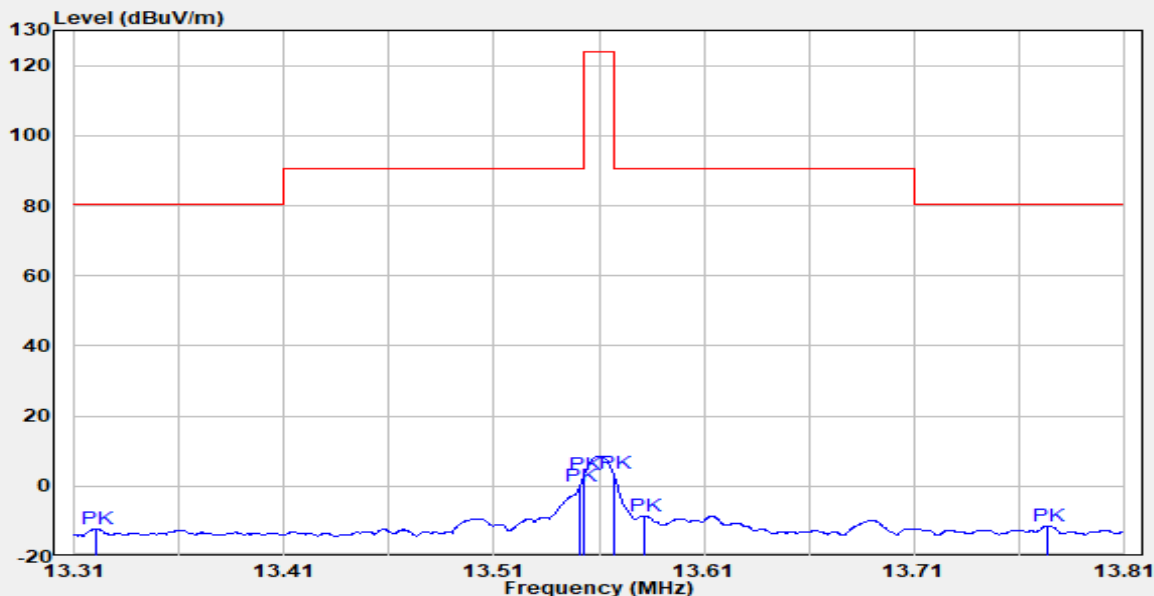
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Report Number :TERF2508002644ER
 Operation Mode :NFC
 Test Frequency :13.56 MHz
 Test Mode :Mask
 EUT Pol :E1 Plane

Test Site :SAC 2
 Test Date :2025-08-29
 Temp./Humi. :24.1°C/53%
 Antenna Pol. :Perpendicular
 Engineer :Bob Chao



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
13.321	Peak	12.16	-24.44	-12.28	80.54	-92.82
13.551	Peak	24.61	-24.51	0.10	90.47	-90.37
13.553	Peak	27.65	-24.51	3.14	90.47	-87.33
13.567	Peak	28.06	-24.51	3.55	90.47	-86.92
13.582	Peak	16.07	-24.50	-8.43	90.47	-98.90
13.774	Peak	13.23	-24.56	-11.33	80.50	-91.83

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m,within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m,within the band 490 kHz - 30 MHz.

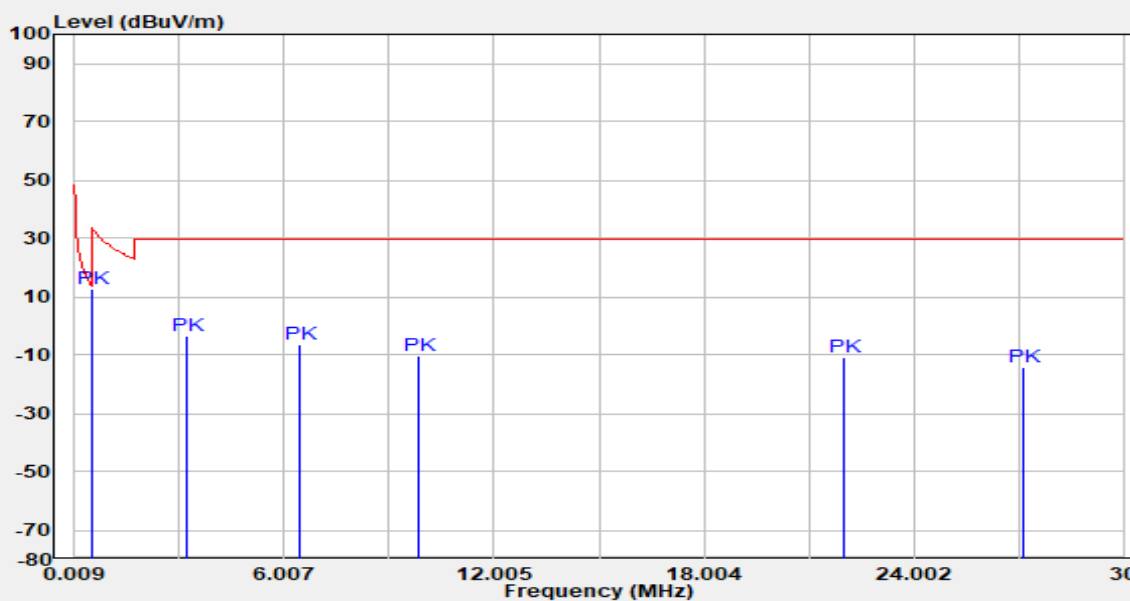
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7.1.2 Radiated Spurious Emission Measurement Result

Report Number :TERF2508002644ER
 Operation Mode :NFC
 Test Frequency :13.56 MHz
 Test Mode :Tx
 EUT Pol :E1 Plane

Test Site :SAC 2
 Test Date :2025-08-29
 Temp./Humi. :24.1°C/53%
 Antenna Pol. :Ground Parallel
 Engineer :Bob Chao



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
0.51885	Peak	38.87	-26.33	12.54	33.31	-20.77
3.188	Peak	22.33	-25.53	-3.20	29.54	-32.74
6.427	Peak	18.18	-24.42	-6.24	29.54	-35.78
9.816	Peak	13.92	-24.39	-10.47	29.54	-40.01
21.992	Peak	14.69	-25.39	-10.70	29.54	-40.24
27.12	Peak	11.62	-25.73	-14.11	29.54	-43.65

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m, within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m, within the band 490 kHz - 30 MHz.

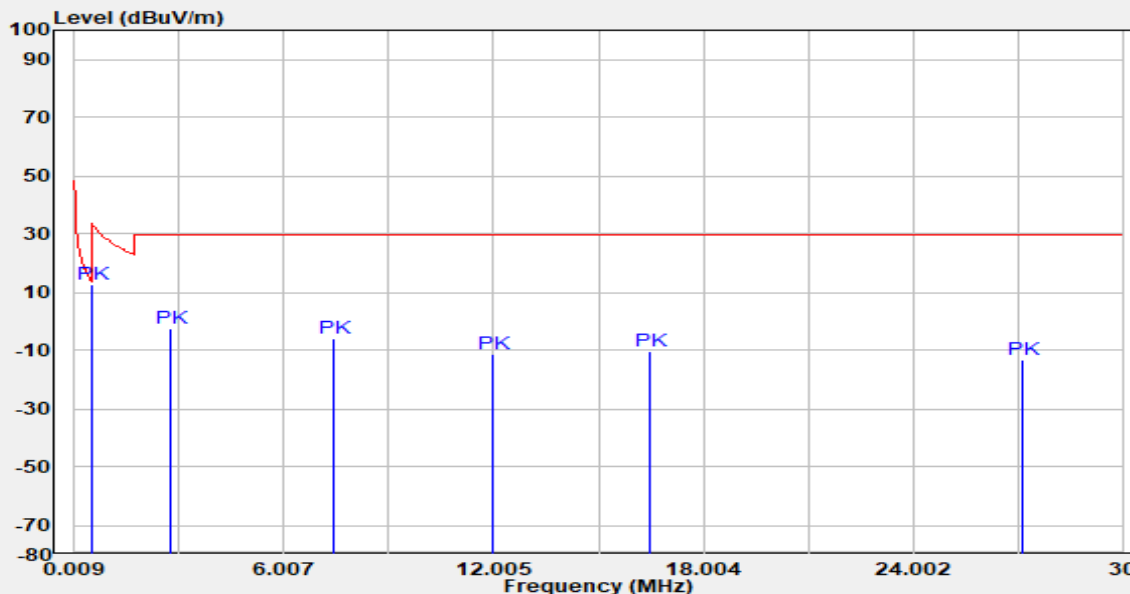
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Report Number :TERF2508002644ER
Operation Mode :NFC
Test Frequency :13.56 MHz
Test Mode :Tx
EUT Pol :E1 Plane

Test Site :SAC 2
Test Date :2025-08-29
Temp./Humi. :24.1°C/53%
Antenna Pol. :Parallel
Engineer :Bob Chao



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit dB μ V/m	Margin dB
0.51885	Peak	38.82	-26.33	12.49	33.31	-20.82
2.768	Peak	23.38	-25.69	-2.31	29.54	-31.85
7.417	Peak	18.79	-24.77	-5.98	29.54	-35.52
11.975	Peak	12.68	-23.96	-11.28	29.54	-40.82
16.474	Peak	13.87	-24.25	-10.38	29.54	-39.92
27.12	Peak	12.43	-25.73	-13.30	29.54	-42.84

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m,within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m,within the band 490 kHz - 30 MHz.

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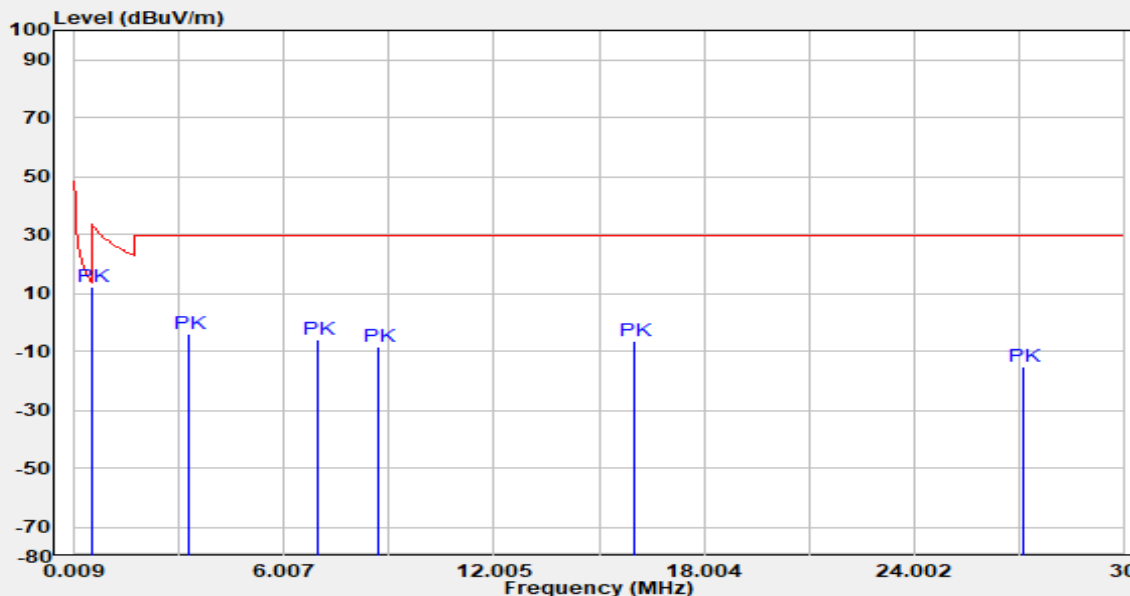
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Report Number :TERF2508002644ER
Operation Mode :NFC
Test Frequency :13.56 MHz
Test Mode :Tx
EUT Pol :E1 Plane

Test Site :SAC 2
Test Date :2025-08-29
Temp./Humi. :24.1°C/53%
Antenna Pol. :Perpendicular
Engineer :Bob Chao



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
0.51885	Peak	38.75	-26.33	12.42	33.31	-20.89
3.278	Peak	21.81	-25.50	-3.69	29.54	-33.23
6.937	Peak	18.57	-24.62	-6.05	29.54	-35.59
8.706	Peak	16.78	-24.85	-8.07	29.54	-37.61
15.994	Peak	17.87	-24.39	-6.52	29.54	-36.06
27.12	Peak	10.64	-25.73	-15.09	29.54	-44.63

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m,within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m,within the band 490 kHz - 30 MHz.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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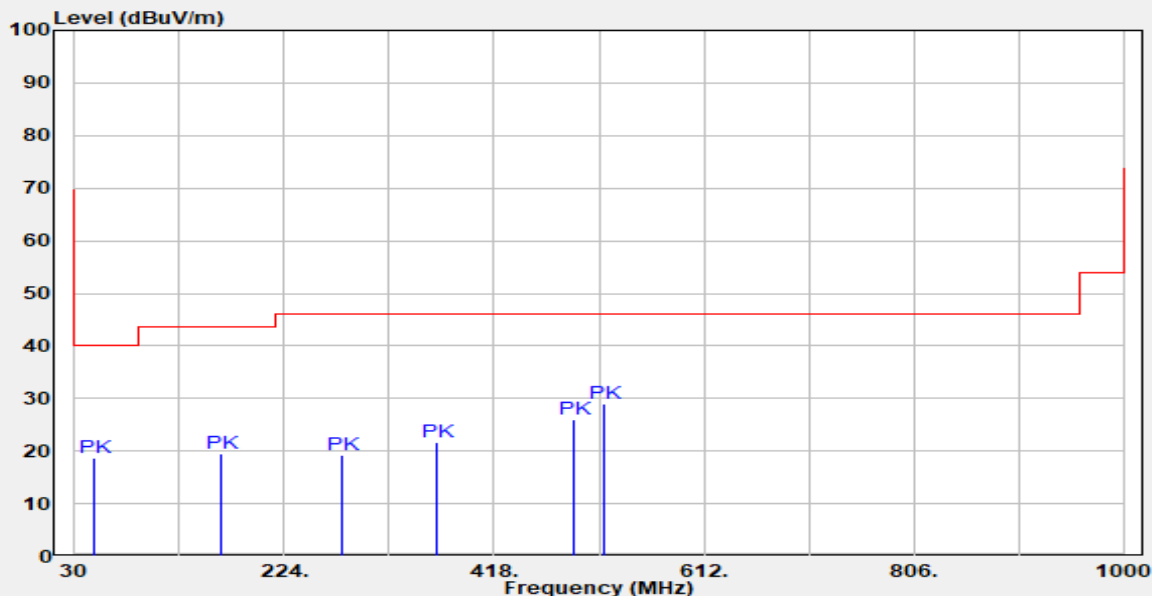
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Report Number :TERF2508002644ER
 Operation Mode :NFC
 Test Frequency :13.56 MHz
 Test Mode :Tx
 EUT Pol :E1 Plane

Test Site :SAC 2
 Test Date :2025-08-29
 Temp./Humi. :24.1°C/53%
 Antenna Pol. :Vertical
 Engineer :Bob Chao



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
48.43	Peak	31.17	-12.50	18.67	40.00	-21.33
165.80	Peak	32.25	-12.76	19.49	43.50	-24.01
277.35	Peak	31.68	-12.55	19.13	46.00	-26.87
365.62	Peak	31.94	-10.39	21.55	46.00	-24.45
491.72	Peak	33.17	-7.12	26.05	46.00	-19.95
519.85	Peak	35.60	-6.51	29.09	46.00	-16.91

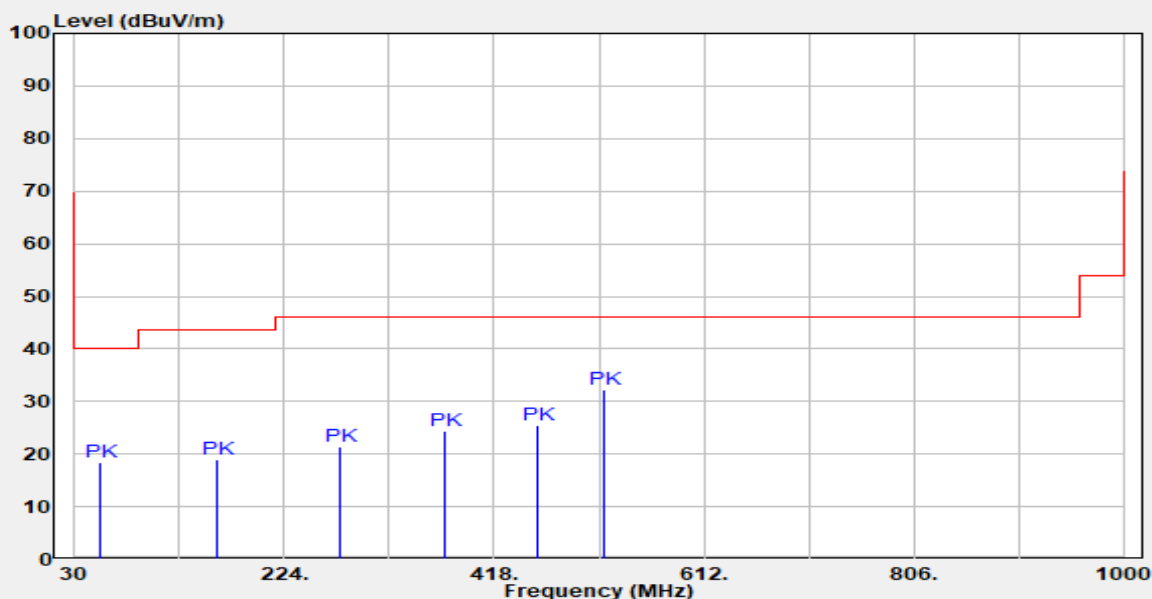
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Report Number :TERF2508002644ER
 Operation Mode :NFC
 Test Frequency :13.56 MHz
 Test Mode :Tx
 EUT Pol :E1 Plane

Test Site :SAC 2
 Test Date :2025-08-29
 Temp./Humi. :24.1°C/53%
 Antenna Pol. :Horizontal
 Engineer :Bob Chao



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBUV	Factor dB	Actual FS dBUV/m	Limit dBUV/m	Margin dB
54.25	Peak	31.02	-12.51	18.51	40.00	-21.49
160.95	Peak	31.67	-12.57	19.10	43.50	-24.40
275.41	Peak	34.09	-12.62	21.47	46.00	-24.53
371.44	Peak	34.43	-10.07	24.36	46.00	-21.64
457.77	Peak	32.90	-7.54	25.36	46.00	-20.64
518.88	Peak	38.72	-6.51	32.21	46.00	-13.79

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7.2 Frequency Stability

Startup

A. Temperature Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
3.8	-20	13.5599675	-0.03250	+/- 1.356
3.8	-10	13.5599475	-0.05250	+/- 1.356
3.8	0	13.5599575	-0.04250	+/- 1.356
3.8	10	13.5599575	-0.04250	+/- 1.356
3.8	20	13.5599875	-0.01250	+/- 1.356
3.8	30	13.5599575	-0.04250	+/- 1.356
3.8	40	13.5600075	0.00750	+/- 1.356
3.8	50	13.5599775	-0.02250	+/- 1.356

B. Supply Voltage Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
4.37	20	13.5599575	-0.04250	+/- 1.356
3.8	20	13.5599875	-0.01250	+/- 1.356
3.23	20	13.5599675	-0.03250	+/- 1.356

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2 minutes

A. Temperature Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
3.8	-20	13.5599675	-0.03250	+/- 1.356
3.8	-10	13.5599675	-0.03250	+/- 1.356
3.8	0	13.5599575	-0.04250	+/- 1.356
3.8	10	13.5599775	-0.02250	+/- 1.356
3.8	20	13.5599875	-0.01250	+/- 1.356
3.8	30	13.5599775	-0.02250	+/- 1.356
3.8	40	13.5599575	-0.04250	+/- 1.356
3.8	50	13.5600075	0.00750	+/- 1.356

B. Supply Voltage Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
4.37	20	13.5599575	-0.04250	+/- 1.356
3.8	20	13.5599875	-0.01250	+/- 1.356
3.23	20	13.5600075	0.00750	+/- 1.356

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5 minutes

A. Temperature Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
3.8	-20	13.5599675	-0.03250	+/- 1.356
3.8	-10	13.5599475	-0.05250	+/- 1.356
3.8	0	13.5599675	-0.03250	+/- 1.356
3.8	10	13.5599875	-0.01250	+/- 1.356
3.8	20	13.5599875	-0.01250	+/- 1.356
3.8	30	13.5599975	-0.00250	+/- 1.356
3.8	40	13.5599575	-0.04250	+/- 1.356
3.8	50	13.5599875	-0.01250	+/- 1.356

B. Supply Voltage Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
4.37	20	13.5600075	0.00750	+/- 1.356
3.8	20	13.5599875	-0.01250	+/- 1.356
3.23	20	13.5599975	-0.00250	+/- 1.356

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10 minutes

A. Temperature Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
3.8	-20	13.5599475	-0.05250	+/- 1.356
3.8	-10	13.5599575	-0.04250	+/- 1.356
3.8	0	13.5599575	-0.04250	+/- 1.356
3.8	10	13.5599675	-0.03250	+/- 1.356
3.8	20	13.5599875	-0.01250	+/- 1.356
3.8	30	13.5599775	-0.02250	+/- 1.356
3.8	40	13.5599775	-0.02250	+/- 1.356
3.8	50	13.5599875	-0.01250	+/- 1.356

B. Supply Voltage Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
4.37	20	13.5599575	-0.04250	+/- 1.356
3.8	20	13.5599875	-0.01250	+/- 1.356
3.23	20	13.5599675	-0.03250	+/- 1.356

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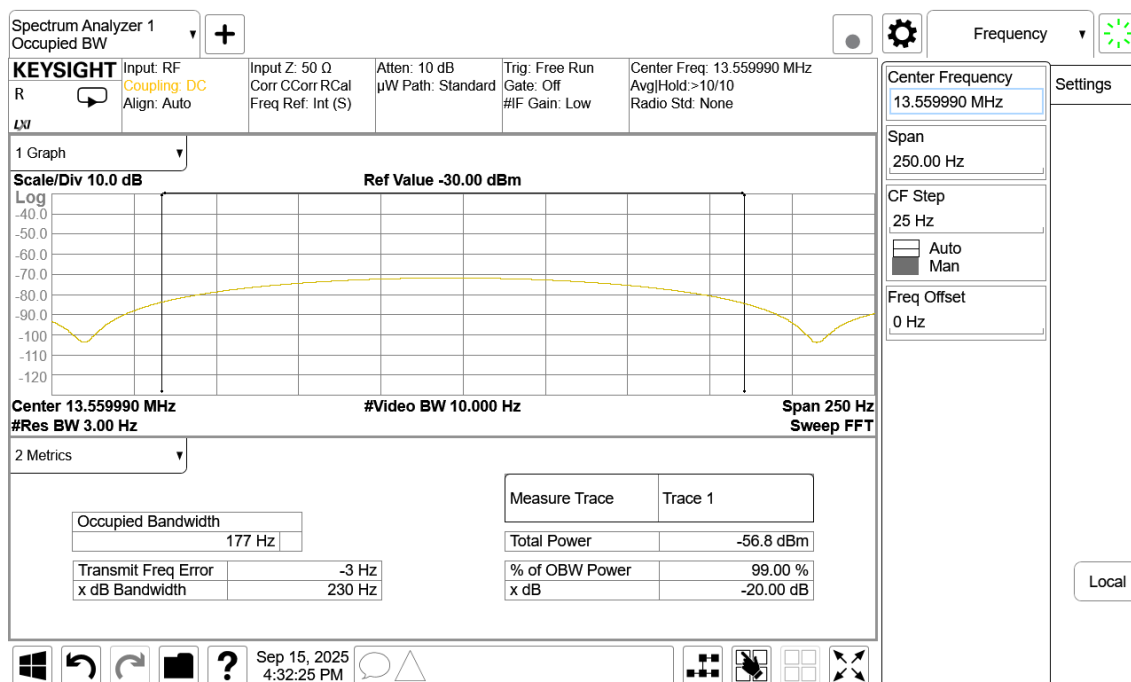
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7.3 Emission Bandwidth

FCC	Operation range	Frequency (MHz)	Limit (MHz)
20dB BW (kHz)	Low	13.55990	>13.11
31.8	High	13.56008	<14.01

7.3.1 Bandwidth



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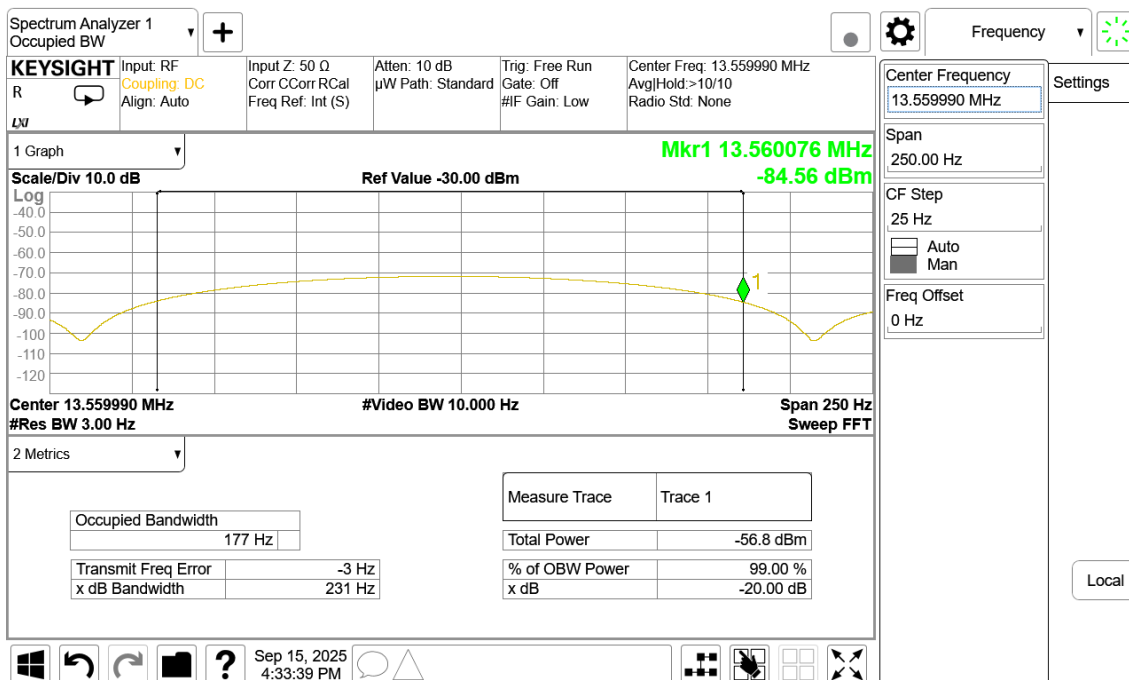
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7.3.2 Operation range low



7.3.3 Operation range High



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7.4 AC Power Line Conducted

Level = Read Level + Factor

Factor = (LISN, ISN, or current probe)Factor + Cable Loss +Attenuator

N/A; Powered from AA battery.

~ End of Report ~

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