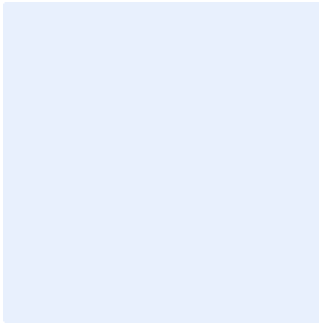


Prüfbericht-Nr.: <i>Test report no.:</i>	IN25S64J 001	Auftrags-Nr.: <i>Order no.:</i>	146976468 010	Seite 1 von 38 Page 1 of 38
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	2384903	Auftragsdatum: <i>Order date:</i>	2024-10-22	
Auftraggeber: <i>Client:</i>	Devic Earth Private Limited Villa 7, Ground Floor Parkway Tivoli Apartment. Kadugodi Main Road.Seegehalli Whitefield Bangalore,560067.			
Prüfgegenstand: <i>Test item:</i>	Air Pollution Control Equipment			
Bezeichnung <i>Identification</i>	Transmitter PSDEACE			
Auftrags-Inhalt: <i>Order content:</i>	Testing and issue of Test Report with Grant Certificate			
Prüfgrundlage: <i>Test specification:</i>	FCC Part15 Subpart C 15.247, 15.205, 15.209, 15.207 RSS 247 Issue 3 & RSS Gen Issue 5			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-11-04			
Prüfmuster-Nr.: Serien -Nr.: <i>Test sample no:</i> <i>Serial no.:</i>	A003846786-002 0036			
Prüfzeitraum: <i>Testing period:</i>	2024-11-04 - 2024-11-14			
Ort der Prüfung: <i>Place of testing:</i>	Wireless laboratory, Bangalore			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (India) Pvt. Ltd. 27/B,2nd cross road, Electronic city Phase1, Bangalore-560100, India FCC Test Site Registration No: 496599 IC Test Site Registration No: 27711			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i>	2025-01-17	Ausstellatum: <i>Issue date:</i>	2025-01-17	
Stellung / Position:	M.V.Naveen Kumar Senior Engineer	Stellung / Position:	Madhu K.N Assistant Manager	
Sonstiges / Other:	FCC ID: 2BL5B-PSDEACE IC: 33453-PSDEACE HVIN: Transmitter PSDEACE			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar N/T = nicht getestet
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

Prüfbericht - Nr.:

Test Report No.:

IN25S64J 001

Seite 2 von 38

Page 2 of 38

- | | |
|---|---|
| 1 | <p>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.</p> <p>Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i></p> |
| 2 | <p>Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben.</p> <p><i>As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged.</i></p> |
| 3 | <p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben.</p> <p>Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i></p> <p><i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p> |
| 4 | <p>Die Entscheidungsregel für Konformitätserklärungen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird.</p> <p><i>The decision rule for statements of conformity in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report.</i></p> |

Prüfbericht - Nr.:

Test Report No.:

IN25S64J 001

Seite 3 von 38

Page 3 of 38

TEST SUMMARY

Test Item	FCC	ISED	Result
Maximum conducted (Peak) output power	15.247 (b)(3)	RSS 247 Issue 3 Section 5.4(d)	Pass
Maximum Power Spectral Density	15.247(e)	RSS 247 Issue 3 Section 5.2(b)	Pass
DTS Bandwidth & 99% Bandwidth	15.247(a)(2)	RSS 247 Issue 3 Section 5.2(a) RSS Gen Issue 5 Section 6.7	Pass
Emissions in non-restricted frequency bands	15.247 (d)	RSS 247 Issue 3 Section 5.5	Pass
Spurious Radiated Emissions and Restricted Bands of Operation	15.247 (d) / 15.209 / 15.205	RSS-Gen Issue 5, Section 8.9 /8.10	Pass
AC Power lines Conducted emission	15.207	RSS Gen Issue 5 Section 8.8	Pass
Antenna Requirement	15.203	RSS Gen Issue 5 Section 6.8	Pass

Product Category: Electronics Testing

Test Discipline: EMC Test Facility

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 4 von 38
Page 4 of 38

REVISION HISTORY OF THIS REPORT

Report Number	Version	Description	Issue date
IN25S64J 001	01	Initial issue of report	2025-01-17

Table of Contents

1	GENERAL REMARKS	6
1.1	Attachments	6
2	TEST SITES	7
2.1	Testing Facilities.....	7
2.2	List of Test and Measurement Instruments.....	7
3	GENERAL PRODUCT INFORMATION.....	8
3.1	Product Function and Intended Use.....	8
3.2	Ratings and System Details of Equipment under Test	8
3.3	Measurement Uncertainty:	9
4	TEST SET-UP AND OPERATION MODE.....	10
4.1	Principle of Configuration Selection	10
4.2	Test Operation and Test Software	10
4.3	Special Accessories and Auxiliary Equipment	10
4.4	Countermeasures to achieve EMC Compliance	10
4.5	Simultaneous Operation.....	10
4.6	TUV Sample Identification.....	10
4.7	Report Reference	10
5	Operational Description	11
6	TEST METHODOLOGY	12
6.1	AC Power lines Conducted emission	12
6.1.1	Test Setup Configuration	12
6.2	Radiated Emission Test	13
6.2.1	Test Setup Configuration	13
7	TEST RESULTS	15
7.1	Maximum Peak Conducted Output Power	15
7.2	DTS Bandwidth & 99% Bandwidth	17
7.3	Power Spectral Density	20
7.4	Emissions in non-restricted frequency bands and Conducted Spurious Emission.....	22
7.4.1	Out-Of-Band Emissions.....	25
7.5	Spurious Radiated Emissions & Restricted Bands of Operation	26
7.6	AC Power lines Conducted Emission.....	34
8	LIST OF TABLES.....	38
9	List of Figures	38

Prüfbericht - Nr.:

Test Report No.:

IN25S64J 001

Seite 6 von 38

Page 6 of 38

1 GENERAL REMARKS

1.1 Attachments

All attachments are part of this test report and are issued in separate document

1. Test Setup photos
2. EUT External Photos
3. EUT Internal Photos
4. FCC Label and Label Location
5. Block Diagram
6. Specification of EUT
7. Schematic Diagrams
8. Bill of Material
9. User Manual
10. Maximum Permissible Exposure Information

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 7 von 38
Page 7 of 38

2 TEST SITES

2.1 Testing Facilities

1. TÜV Rheinland (India) Pvt.Ltd.,
27/B, 2nd Cross,
ElectronicCityPhase1
Bangalore – 560 100,
India
2. TUV Rheinland (India) Pvt.Ltd.,
108 , Beside ISBR Business School,
Electronic city Phase I
Bangalore - 560 100,
India

2.2 List of Test and Measurement Instruments

Table 1: List of test and measurement instruments

Equipment	Manufacturer	Model Name	Serial Number	Firmware Versions	Calibration Due Date	Periodicity	Test Facility
EMI Receiver	Rohde & Schwarz	ESW 44	101732	4.73 SP5	17.09.2025	Yearly	Radiated Spurious Emission
Active loop antenna	Frankonia	LAX-10	LAX-10-800	-	23-03-2025	Yearly	
Balun & Biconical Antenna	Schwarzbeck mess-elektronik	BBA 9106+VH BB 9124	9124-1117	-	06.03.2025	Yearly	
Log-Periodic Antenna	Schwarzbeck mess-elektronik	VUSLP 9111B	9111B-324	-	31.05.2025	Yearly	
Horn Antenna	Schwarzbeck	BBHA 9120 D	2117	-	26.01.2025	Yearly	
EMI Test Receiver	Rohde & Schwarz	ESW44	101773	1.72.SP1	26.01.2025	Yearly	
Semi Anechoic Chamber	Frankonia	-	-	-	-	-	
Fully Anechoic Chamber	Albatross	-	-	-	-	-	Conducted Test Parameters
Spectrum Analyzer	Agilent	E4407B	US411927 72	A.14.07	04-01-2025	Yearly	
10dB Attenuator	H+S Electronics Pvt. Ltd	6810.17. A	770041	-	08-03-2025	Yearly	Conducted AC Power line Test
EMI Receiver	Rohde & Schwarz	ESR7	101133	3.48 SP3	16.09.2025	Yearly	
Two Line V-Network (LISN)	Rohde & Schwarz	ENV 216	100022	-	15-04-2025	Yearly	
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100811	-	08-07-2025	Yearly	

Table 2: Instrument application Software versions

SL. No.	Test Type	Application software	Version
1	Radiated spurious emission measurement in FAC	EMC 32	10.60.20
2	Radiated spurious emission measurement in 10mtr SAC	BAT EMC	3.20.0.17

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 8 von 38
Page 8 of 38

3 GENERAL PRODUCT INFORMATION

3.1 Product Function and Intended Use

PURE SKIES IS AN ADVANCED AIR-CLEANING TECHNOLOGY THAT REDUCES PM2.5 AND PM10 PARTICULATE MATTER CONCENTRATIONS OVER A LARGE AREA IN AMBIENT CONDITIONS. IT IS ESPECIALLY SUITED FOR CITIES, HEAVY INDUSTRIES, POWER PLANTS, MINES, AIRPORTS, AND PORTS.

3.2 Ratings and System Details of Equipment under Test

Table 3: Ratings and System Details as declared by Client*

Radio Protocol		Proprietary protocol(2425MHz)
Operating Frequency Range		2425MHz
No. of Channels		1
Transmitter Power level(dBm)		8dBm
Measured e.i.r.p (dBm)		13.06dBm
Modulation		Pulse Modulation
Number of antennas		1
Antenna Gain		5dBi
Antenna Type		Omni directional Whip Antenna
Supply Voltage to Product		100V-240 AC, 50/60Hz through power supply
Environmental conditions	Storage(°C)	-20°C to 85° C 30% to 65% RH, non-condensing
	Operating(°C)	15°C to 50° C 30% to 65% RH, non-condensing
EUT Dimension (H x W x D) inch		10.14 x 8.26 x 4 inch

***Disclaimer:** The information/data is supplied by the client and the same is considered to arrive at the final value. Any changes made apart from the specified specification, can directly impact on the tests results. Refer the products user manual for more details.

Prüfbericht - Nr.:

Test Report No.:

IN25S64J 001

Seite 9 von 38

Page 9 of 38

3.3 Measurement Uncertainty:

Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$

Table 4: Measurement Uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	$\pm 5 \%$
RF output power, conducted	$\pm 1.5 \text{ dB}$
Power Spectral Density, conducted	$\pm 3 \text{ dB}$
Unwanted Emissions, conducted	$\pm 3 \text{ dB}$
All emissions, radiated	$\pm 6 \text{ dB}$
Temperature	$\pm 3 \text{ }^{\circ}\text{C}$
Supply Voltages	$\pm 3 \%$
Time	$\pm 5 \%$

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 10 von 38
Page 10 of 38

4 TEST SET-UP AND OPERATION MODE

4.1 Principle of Configuration Selection

Transmission was enabled with highest possible duty cycle transmission on channel.

4.2 Test Operation and Test Software

Sl. No	Board Name	Hardware Name	Hardware Version	Software Name	Software Version
1	RF Board	MPLAB	PIC KIT TM4 in-CIRCUIT DEBUGGER	MPLAB X	IDE v6.20
2	Security Board	Arduino Programmer	IDE 2.3.2	Arduino	Arduino IDE 2.3.2

Hardware version Identification number (HVIN): Refer Cover sheet

4.3 Special Accessories and Auxiliary Equipment

- None

4.4 Countermeasures to achieve EMC Compliance

- None

4.5 Simultaneous Operation

- This Product supports simultaneous operation

4.6 TUV Sample Identification

1. TUV Sample Identification number: A003846786-002 – Radiated & Conducted test Sample.

4.7 Report Reference

Note: Air Pollution Control Equipment has multiple protocols. All the supported wireless protocols and their respective test results are issued in separate test reports, following table lists the report numbers.

Radio Protocol	Report Number
RF test report for FCC Part22 Subpart H & RSS Gen Issue 5, RSS 132 Issue 4	IN25CSFD 001
RF test report for FCC Part24 Subpart E & RSS Gen Issue 5, RSS-133 Issue 6	IN258K1F 001
RF test report for FCC Part27 Subpart C & RSS Gen Issue 5, RSS 139 Issue 4, RSS 199 Issue 4, RSS 130 Issue 2	IN258337 001
RF test report for FCC Part90 Subpart S & RSS Gen Issue 5	IN25DWD0 001
RF Test report for FCC Part15 Subpart C & RSS 247 Issue 3, RSS Gen Issue 5	IN25S64J 001

Prüfbericht - Nr.:

Test Report No.:

IN25S64J 001

Seite 11 von 38

Page 11 of 38

5 Operational Description

THE PURE SKIES 2.0 SYSTEM INCLUDES BOTH A TRANSMITTER AND A RECEIVER UNIT. THE TRANSMITTER UNIT TRANSMITS PROPRIETARY ALGORITHM-BASED PULSED RADIO WAVES (2.4GHZ). THE RECEIVER UNIT HAS AN OMNIDIRECTIONAL ANTENNA TUNED TO THE ISM BAND (2.4GHZ) AND IT RECEIVES PULSED RADIO WAVES AND CREATES AN ELECTROMAGNETIC FIELD. THAT ACCELERATES THE CLEARANCE OF TARGET POLLUTANTS IN THE SURROUNDING AREA.

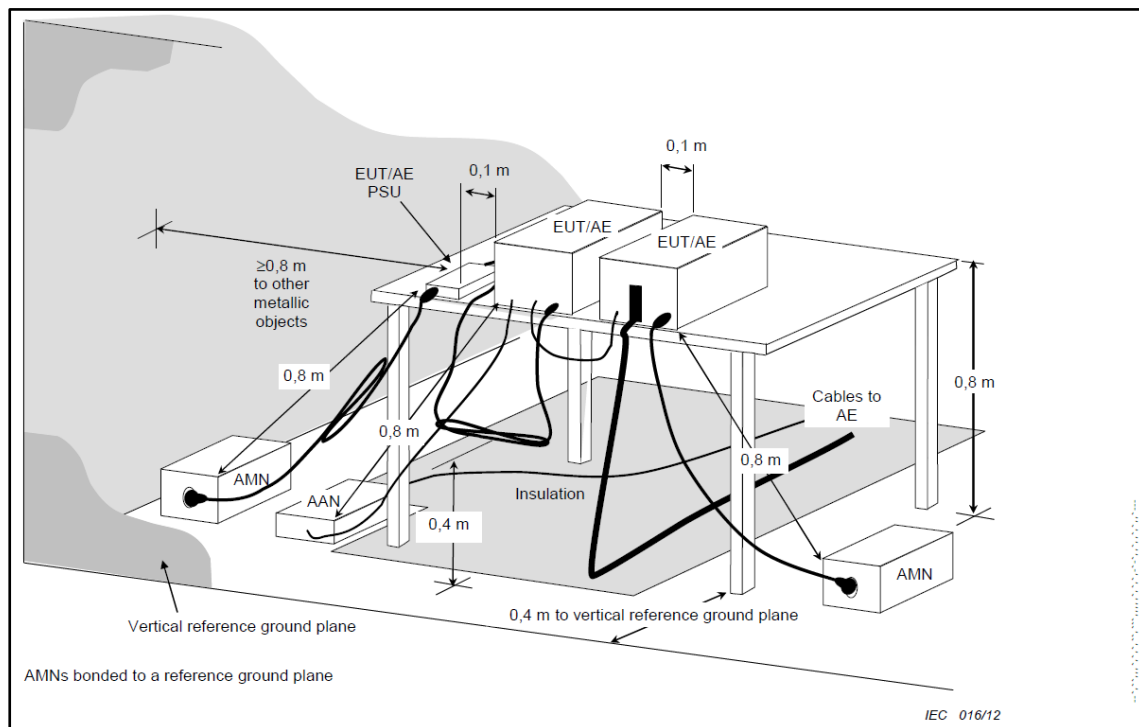
6 TEST METHODOLOGY

6.1 AC Power lines Conducted emission

Measured levels of ac powerline conducted emission across the 50Ω LISN port (to which the EUT is connected). All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer.

The device is placed on the test table, raised 80cm above the reference ground plane. The vertical conducting plane is located 40cm to the rear of the device. AC Conducted emission measurement is made over frequency range from 150 kHz to 30MHz, this measurement was performed an AC adaptor 110V AC 60Hz supply

6.1.1 Test Setup Configuration



6.2 Radiated Emission Test

The radiated emission measurement was performed according to the procedures in ANSI C63.10-2013. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable for below 1 GHz & 1.5 m height for above 1 GHz measurement, and the EUT is 3 meters far from the measuring antenna. The turntable was rotated 360° for obtaining the maximum emission. The height of the measuring antennas was scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained. The measurement above 1000 MHz was performed by horn antenna, the measurement below 30 MHz was performed by loop antenna, Measurement from 30 MHz to 200 MHz was performed by Balloon and Biconical Antenna, and measurement from 200 MHz to 1 GHz was performed by Log-Periodic Antenna.

The EUT was rotated around the X-, Y-, and Z-Axis and the results from worst case axis are recorded

6.2.1 Test Setup Configuration

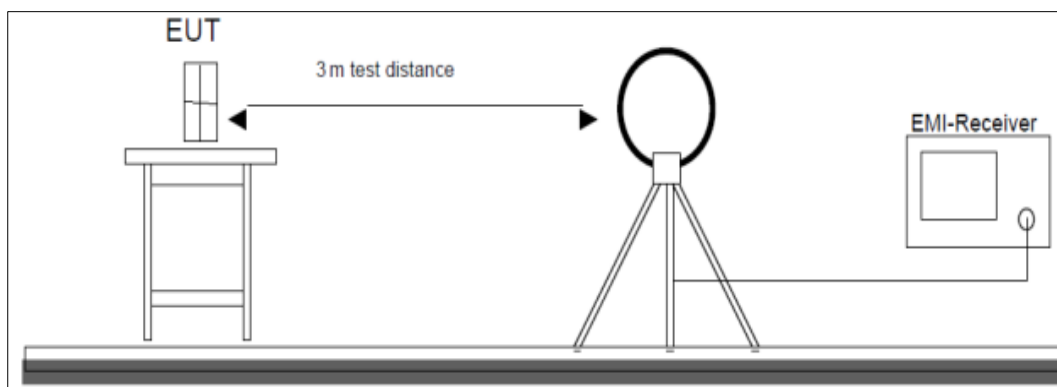


Figure 1: Frequency Range 9 kHz- 30 MHz

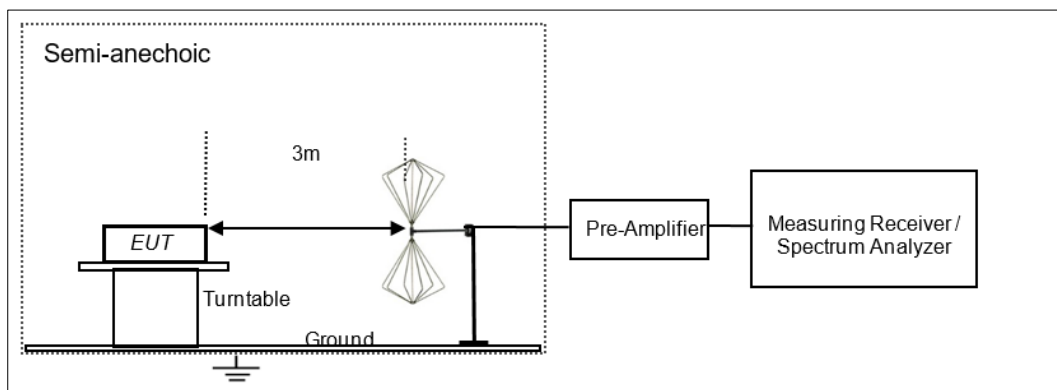


Figure 2: Frequency Range 30 MHz – 200 MHz

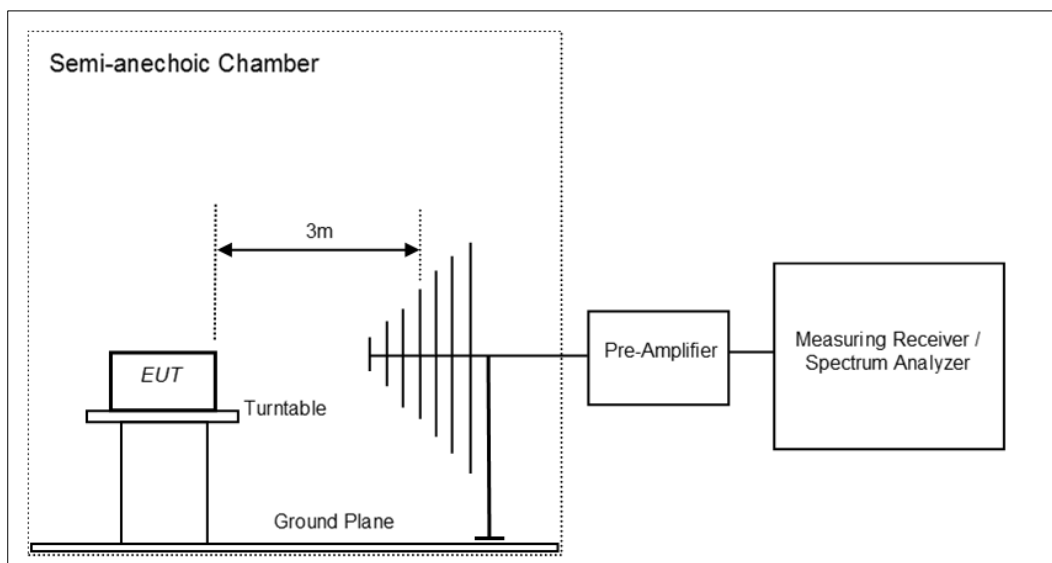


Figure 3: Frequency Range 200 MHz - 1GHz

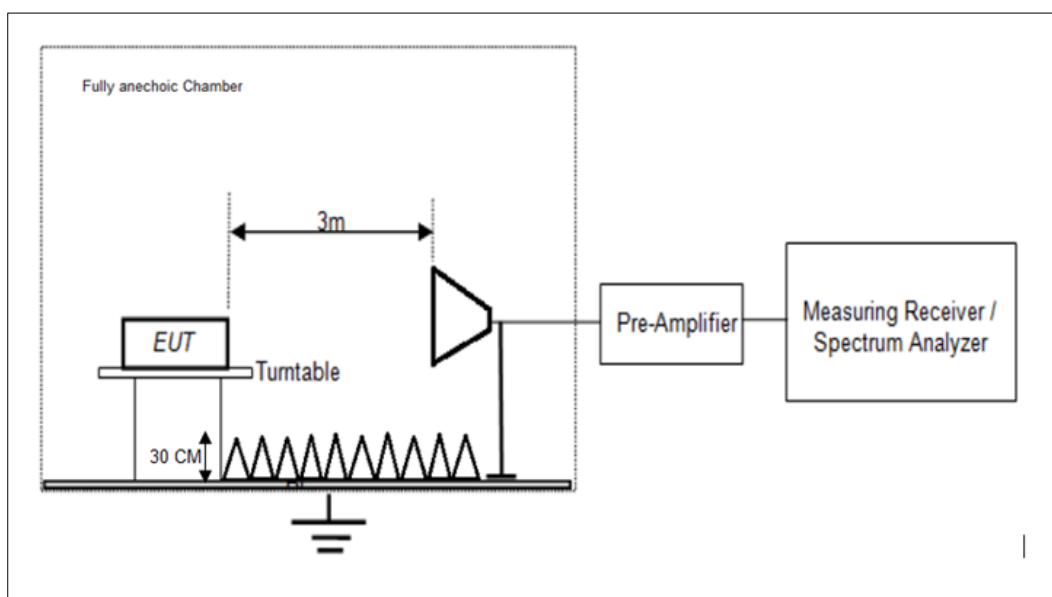


Figure 4: Frequency Range above 1 GHz

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 15 von 38
Page 15 of 38

7 TEST RESULTS

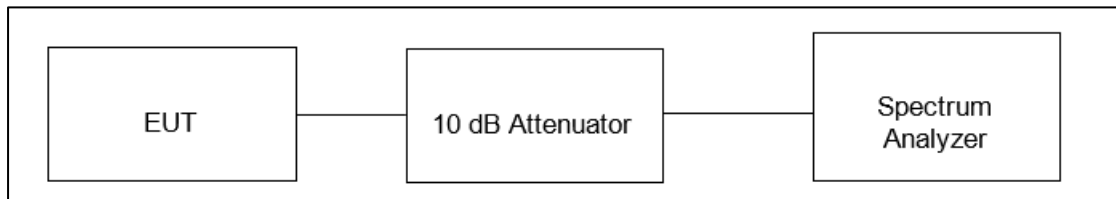
7.1 Maximum Peak Conducted Output Power

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (b)(3) / RSS 247 Issue 3 5.4 (d)
Test Method	Subclause 11.9.1.1 of ANSI C63.10
Measurement Bandwidth	1MHz
Detector	Peak
Port of testing	Antenna Port
Requirement	Power ≤ 1 W (30 dBm) & e.i.r.p ≤ 4 W (36dBm)

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.1 °C Voltage = 110VAC through AC mains Relative humidity: 65%

KDB Guidelines applied:

Measurements were made as per section 8.3.1.1 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 16 von 38
Page 16 of 38

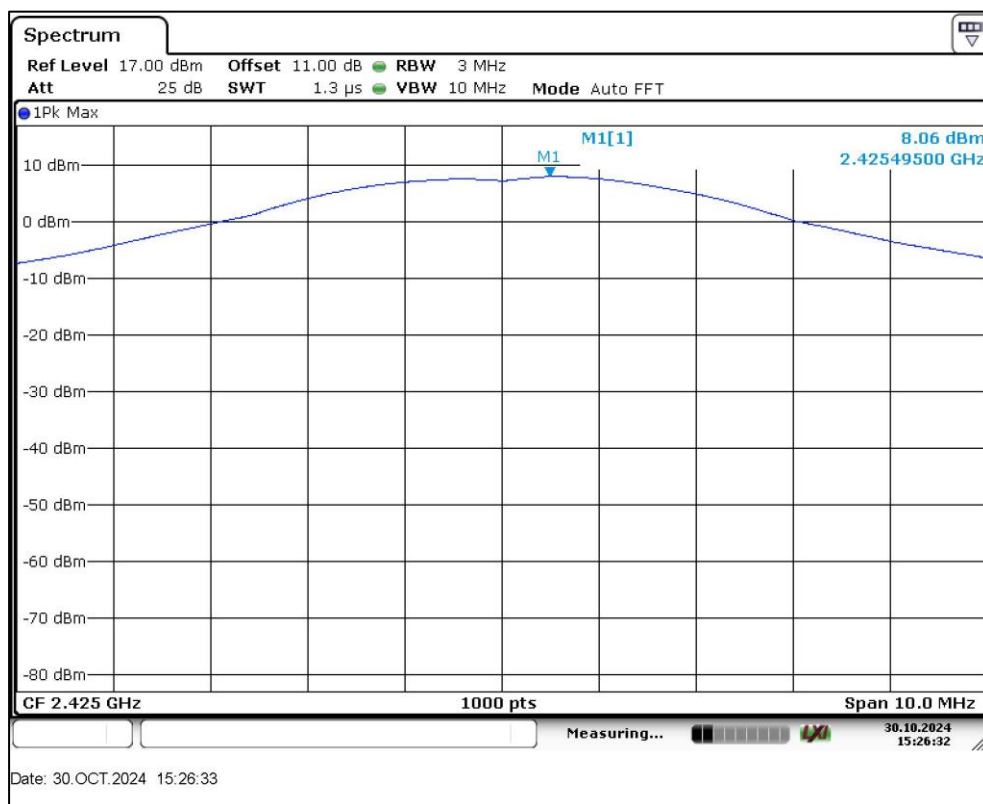
Test results:

Note:

1. All the losses are included during measurement and final values are mentioned in the test report
2. Total Peak Output power (dBm) = Measured Peak power (dBm) + Cable loss (1dB)
3. This product do not support additional beamforming gain / directional gain, it uses single antenna and hence Directional gain of the single antenna is 5 dBi

Channel Frequency (MHz)	Measured Power (dBm)	Antenna Gain (dBi)	Measured e.i.r.p (dBm)	Limit (dBm)	e.i.r.p (dBm)
2425	8.06	5.00	13.06	30.00	36.00

Test Plots:



Channel Frequency: 2425MHz

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 17 von 38
Page 17 of 38

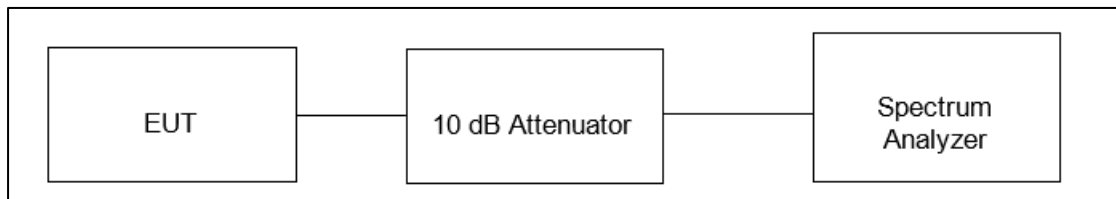
7.2 DTS Bandwidth & 99% Bandwidth

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (a) (2) / RSS 247 Issue 3 Section 5.2(a)/ RSS Gen Issue 5 Section 6.7
Test Method	Subclause 11.8.2 & 6.9.3 of ANSI C63.10
Measurement Bandwidth	100 kHz for DTS Bandwidth 1% to 5% of OBW
Detector	Peak
Port of testing	Antenna Port
Requirement	Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.1 °C

Voltage = 110VAC through AC mains

Relative humidity: 65%

KDB Guidelines applied:

Measurements were made as per section 8.2 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 18 von 38
Page 18 of 38

Test results:

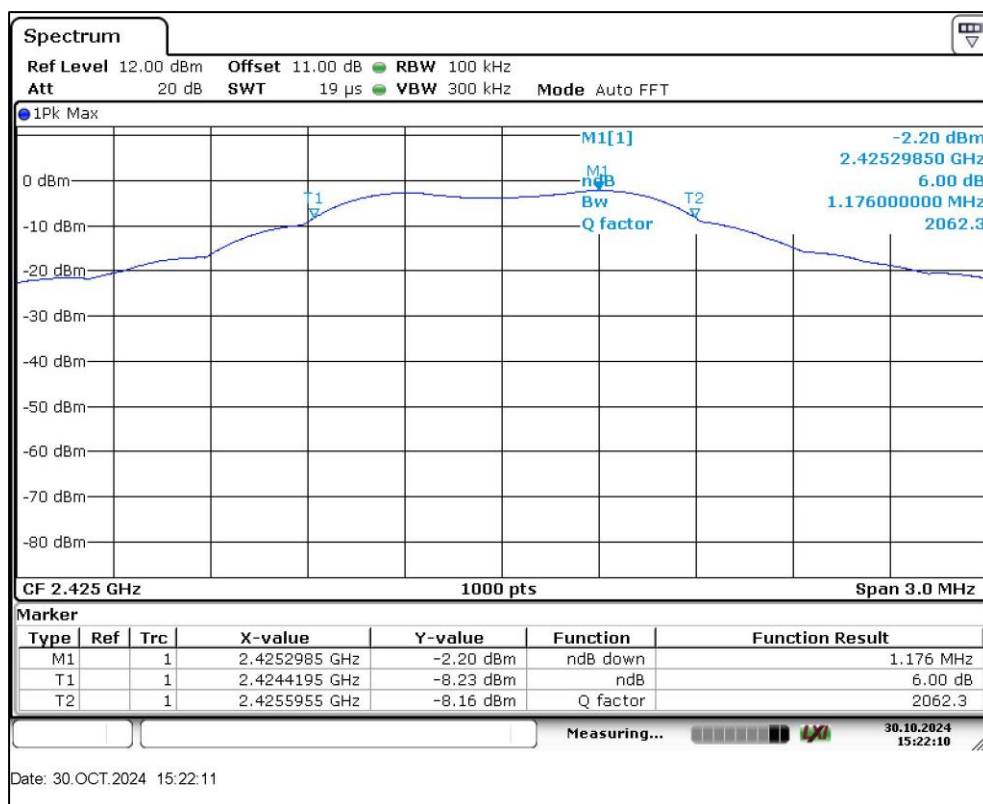
Note:

1. All the losses are included during measurement and final values are mentioned in the test report.
2. This product do not support additional beamforming gain / directional gain, it uses single antenna and hence directional gain of the single antenna is 5dBi.

Channel Frequency (MHz)	Measured 99% Bandwidth (MHz)	Measured 6dB Bandwidth (MHz)	Limit (MHz)
2425	2.346	1.176	0.5

Test Plots:

DTS Bandwidth:



Prüfbericht - Nr.:

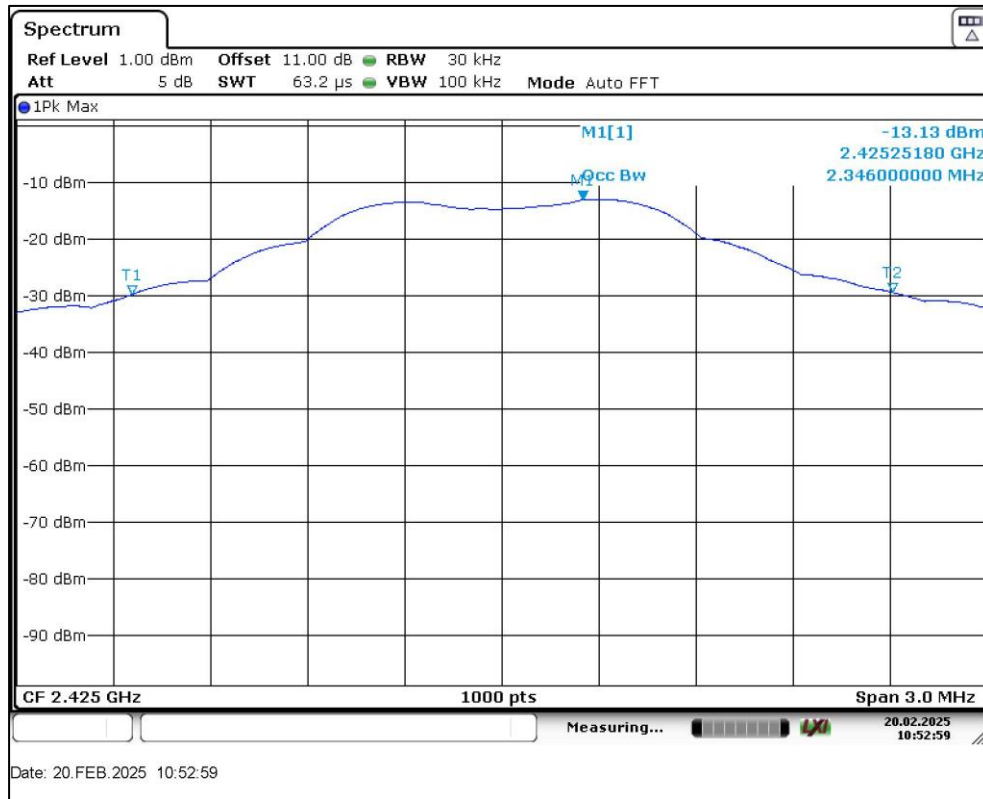
Test Report No.:

IN25S64J 001

Seite 19 von 38

Page 19 of 38

99% Bandwidth:



Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 20 von 38
Page 20 of 38

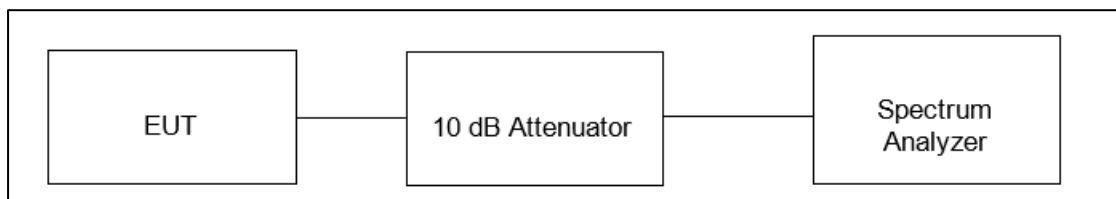
7.3 Power Spectral Density

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (e) / RSS 247 Issue 3 Section 5.2(b)
Test Method	Subclause 11.10.2 of ANSI C63.10
Measurement Bandwidth	100 kHz
Detector	Peak
Port of testing	Conducted mode
Requirement	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 100 kHz band during any time interval of continuous transmission.

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.1 °C Voltage = 110VAC through AC mains Relative humidity: 65%

KDB Guidelines applied:

Measurements were made as per section 8.4 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

Prüfbericht - Nr.:

Test Report No.:

IN25S64J 001

Seite 21 von 38

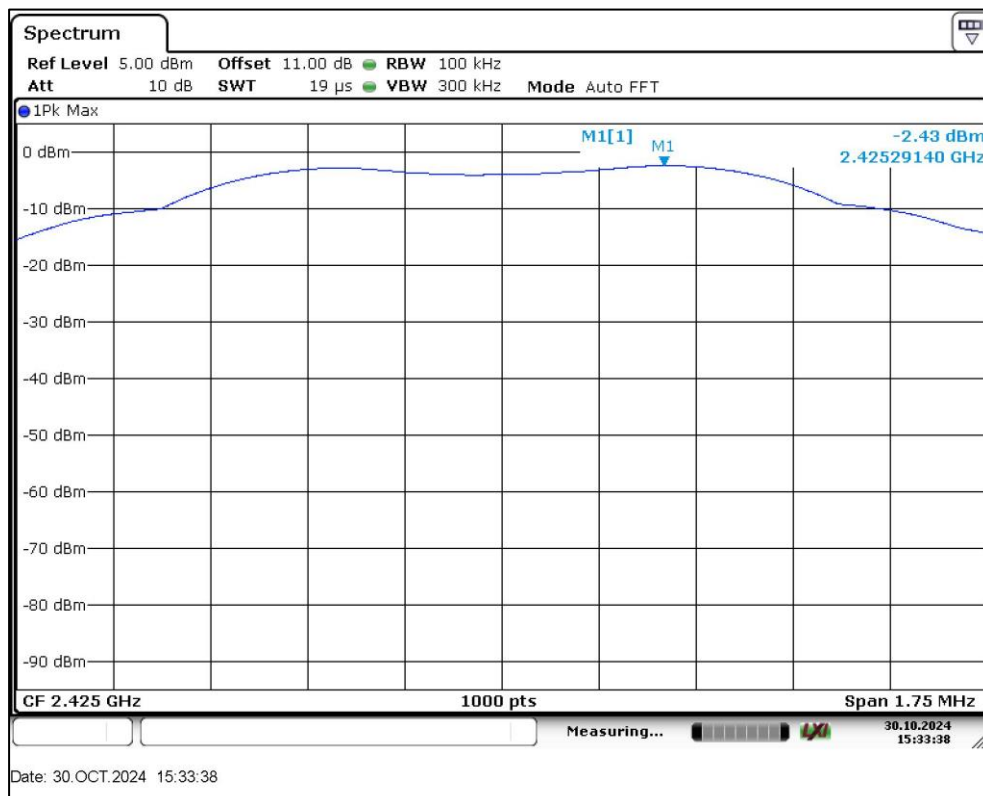
Page 21 of 38

Test results:

Note: All the losses are included during measurement and final values are mentioned in the test report.

Channel Frequency (MHz)	Measured PSD (dBm/kHz)	Limit PSD (dBm/kHz)	Margin (dB)
2425	-2.43	8.00	-5.57

Test Plots:



Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 22 von 38
Page 22 of 38

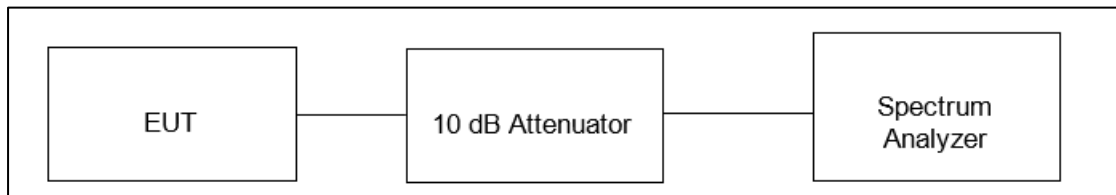
7.4 Emissions in non-restricted frequency bands and Conducted Spurious Emission

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (d) / RSS 247 Issue 3 Section 5.5
Test Method	Subclause 11.11.3 of ANSI C63.10
Measurement Bandwidth	100 kHz
Detector	Peak
Port of testing	Antenna Port
Requirement	In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.1 °C Voltage = 110VAC through mains Relative humidity: 65%

KDB Guidelines applied:

Measurements were made as per section 8.5 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

Prüfbericht - Nr.:

Test Report No.:

IN25S64J 001

Seite 23 von 38

Page 23 of 38

Test results:

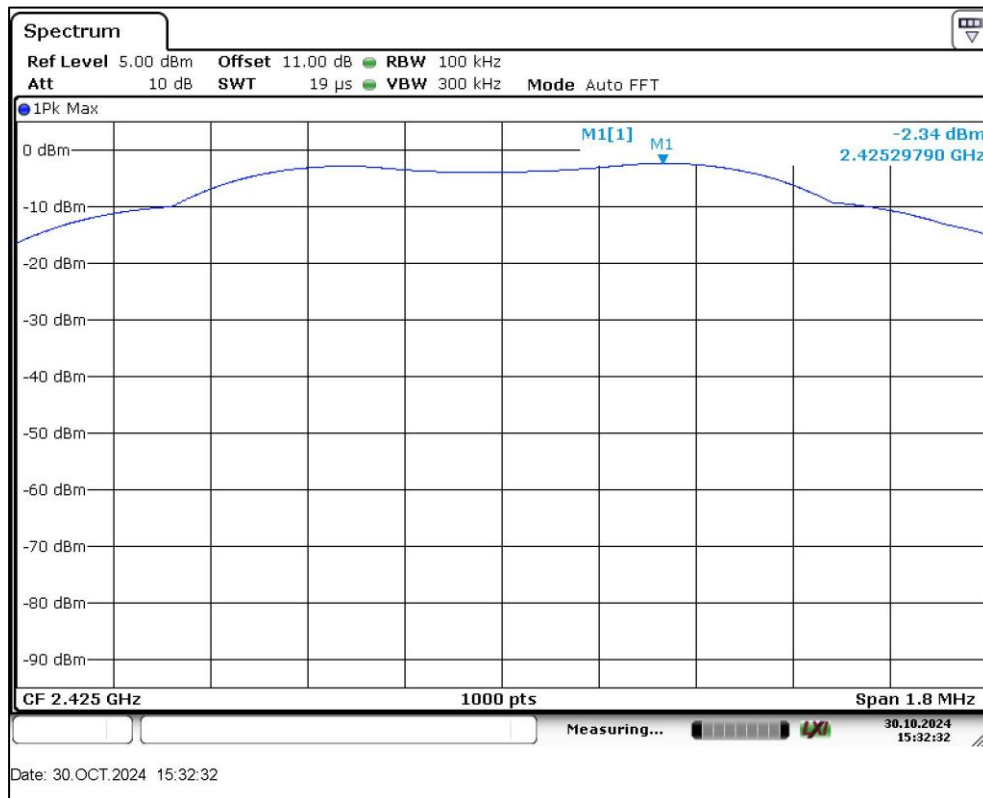
Note:

1. All the losses are included during measurement and final values are mentioned in the test report

Band edge

Channel Frequency (MHz)	Band edge frequency (MHz)	Value at Band edge (A) (dBm)	Reference Value (B) (dBm)	A-B (dBc)	Minimum Limit (dBc)
2425	2400.00	-46.41	-2.34	-48.75	-20.00
	2483.5	-56.24	-2.34	-58.58	-20.00

Reference Plots:

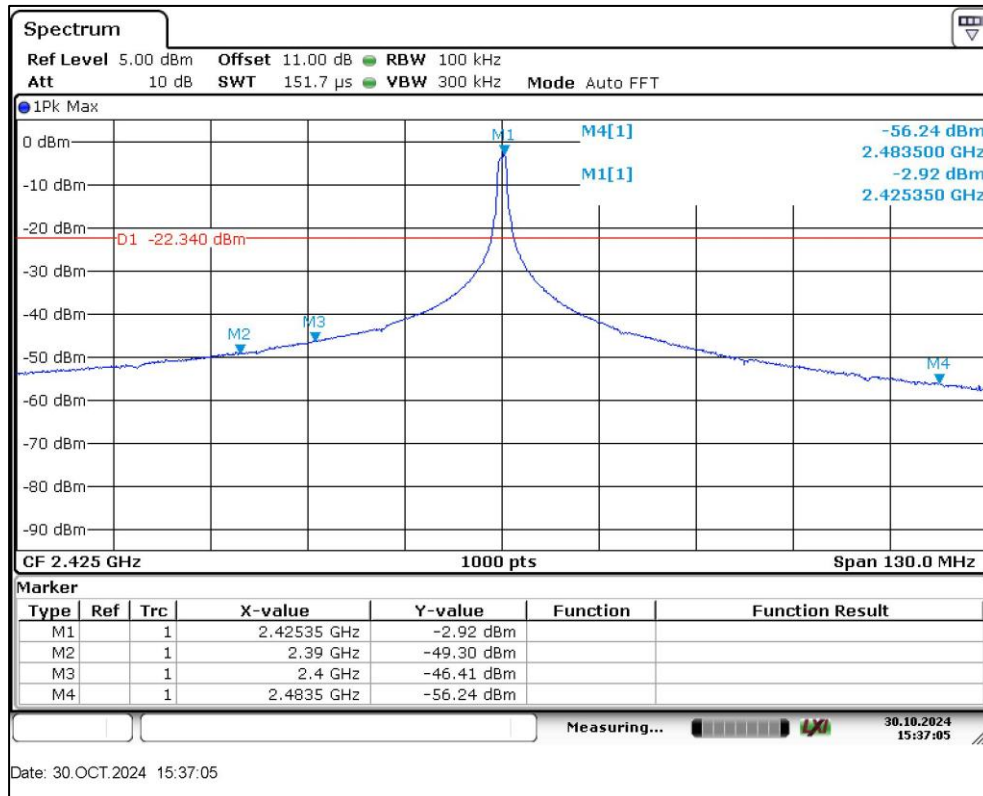


Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

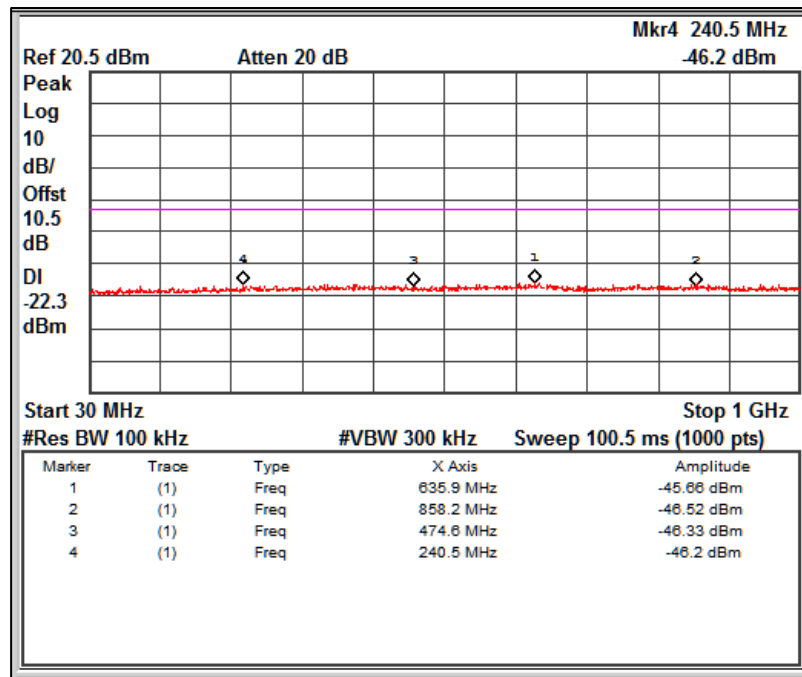
Seite 24 von 38
Page 24 of 38

Bandedge Plot:

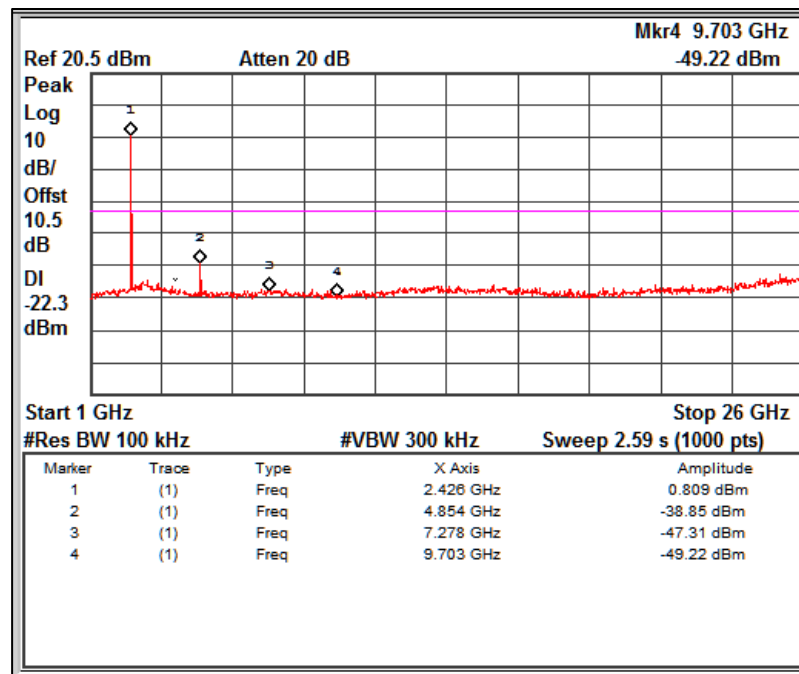


Channel Frequency: 2425MHz

7.4.1 Out-Of-Band Emissions



Channel Frequency: 2425 MHz Frequency Range 30 MHz – 1 GHz



Channel Frequency: 2425 MHz Frequency Range 1 GHz to 26 GHz

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 26 von 38
Page 26 of 38

7.5 Spurious Radiated Emissions & Restricted Bands of Operation

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (d) / (15.209 & 15.205) / RSS-Gen Issue 5, Section 8.9 /8.10
Test Method	ANSI C63.10
Measurement Location	Semi Anechoic Chamber 9kHz - 1 GHz Fully Anechoic Chamber 1 GHz - 26GHz
Measurement Bandwidth	100 kHz for frequency range < 1GHz 1 MHz for Frequency range >1GHz
Detector	Refer remarks below
Measuring Distance	3 m
Requirement	As per the limits mentioned in the below table
Test setup	Refer TEST METHODOLOGY

Table 5: Transmitter limits for Radiated emission

Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Distance of Measurement (m)
0.009 – 0.490	2400/F(kHz)	48.50 – 13.80	300*
0.490 – 1.705	24000/F(kHz)	33.80 – 23.00	30*
1.705 -30	30	29.54	30*
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Remark: * The limit shows in the table above of frequency range 0.009 – 0.490, 0.490 – 1.705 MHz and 1.705-30MHz is at 300 meter, 30 meter and 30 meter range respectively, which corresponds to 128.51 – 93.80, 73.80 – 62.96 and 69.54 dBμV/m at 3m range by extrapolation calculation and the measurement of loop antenna.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Conditions:

Temperature (Norm) = +21.5 °C

Voltage = 110VAC through AC mains

Relative humidity: 63%

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 27 von 38
Page 27 of 38

Test results:

Note: All the losses are included during measurement and final values are mentioned in the test report. Refer TEST METHODOLOGY for more details

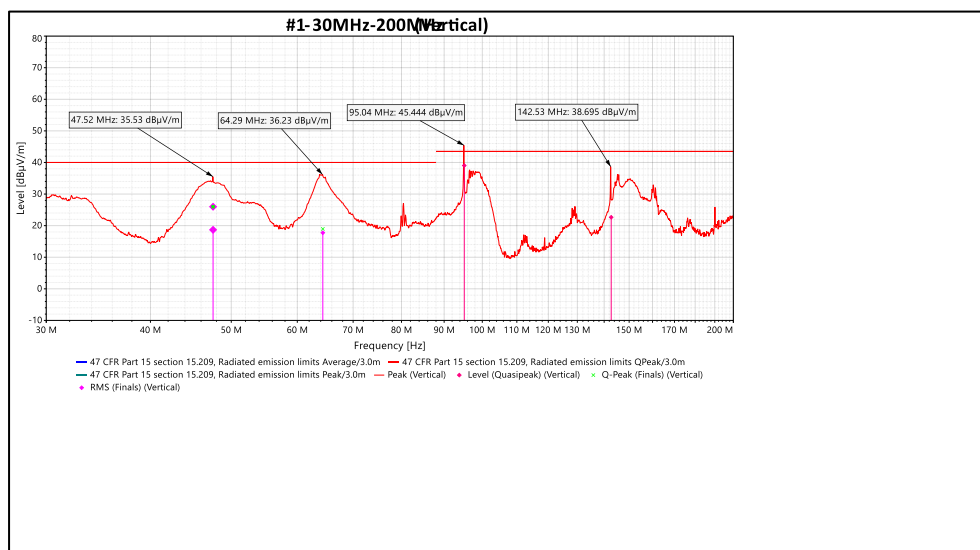
Test results for frequency range 9kHz – 30MHz

No emissions found in frequency range 9 kHz to 30 MHz, and measured levels are below 20dB from the limit line, hence not reported.

Table 6: Test results for frequency range 30MHz – 1GHz

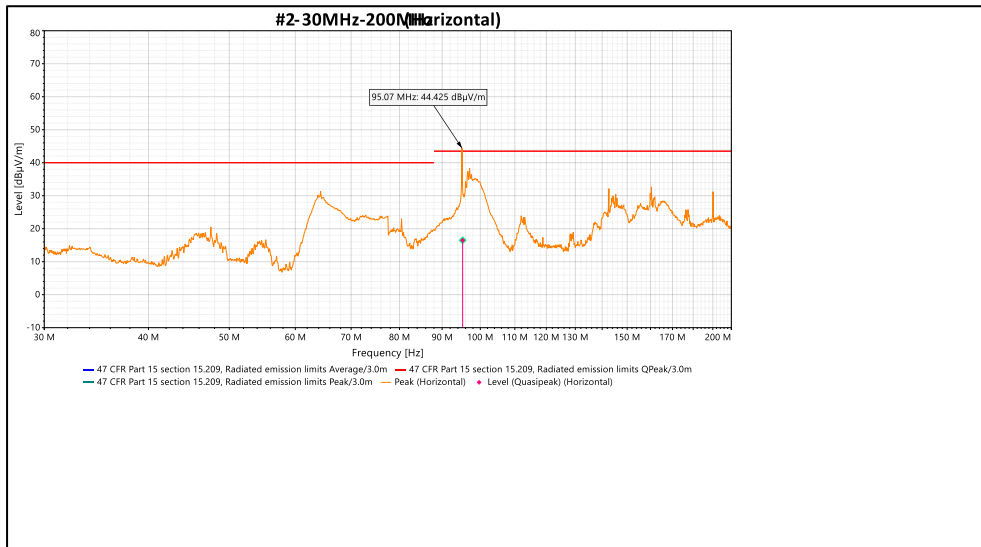
Antenna Polarization	Measured Frequency (MHz)	Measured emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Vertical	47.56	30.09	40.00	-9.91
	64.39	26.01	40.00	-13.99
	95.14	39.03	43.50	-4.47
	142.75	22.65	43.50	-20.85
	400.01	40.11	46.00	-5.89
	425.00	44.10	46.00	-1.90
	450.00	45.71	46.00	-0.29
	475.01	41.40	46.00	-4.60
	500.01	43.75	46.00	-2.25
Horizontal	524.99	40.57	46.00	-5.43
	95.24	16.49	43.50	-27.01
	425.00	38.17	46.00	-7.83
	450.00	40.28	46.00	-5.72
	500.00	38.93	46.00	-7.07
	600.03	33.51	46.00	-12.49

Test Plots:



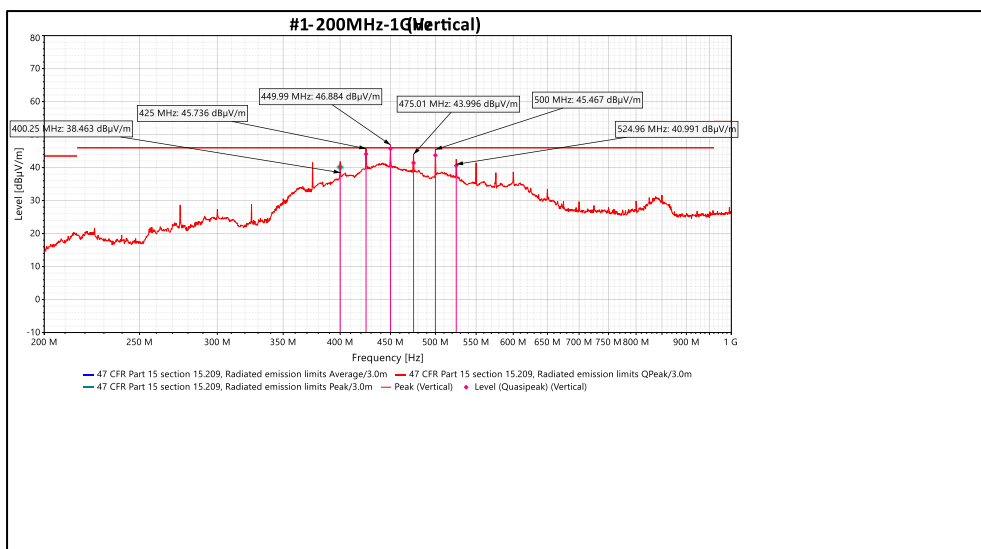
Channel Frequency 30MHz – 200MHz

Polarization Vertical



Channel Frequency 30MHz – 200MHz

Polarization Horizontal



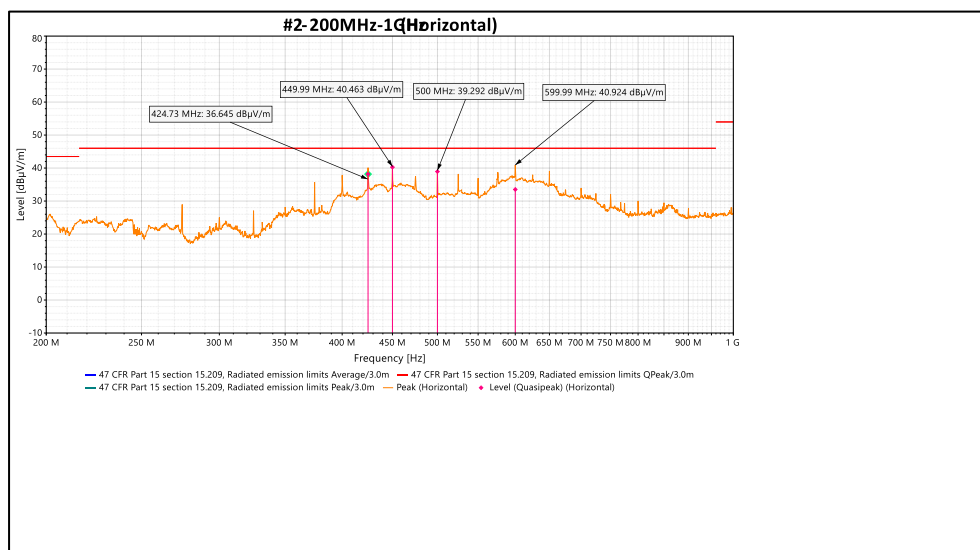
Channel Frequency 200MHz – 1GHz

Polarization Vertical

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 29 von 38
Page 29 of 38



Channel Frequency 200MHz – 1GHz

Polarization Horizontal

Prüfbericht - Nr.:

Test Report No.:

IN25S64J 001

Seite 30 von 38

Page 30 of 38

Table 7: Test results for the frequencies above 1GHz:

Antenna Polarization	Measured Frequency (MHz)	Measured Spurious Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Vertical	2390(PK)	37.29	74.00*	-36.71
	2390(AV)	24.87	54.00*	-29.13
	2425(PK)	81.5	-	-
	2425(AV)	79.82	-	-
	2483.5(PK)	36.72	74.00*	-37.28
	2483.5(AV)	23.76	54.00*	-30.24
	4850(PK)	58.84	74.00	-15.16
	4850(AV)	52.74	54.00	-1.26
	7275(PK)	55.92	74.00	-18.08
	7275(AV)	46.26	54.00	-7.74
Horizontal	2390(PK)	37.47	74.00*	-36.53
	2390(AV)	24.88	54.00*	-29.12
	2425(PK)	83.02	-	-
	2425(AV)	81.15	-	-
	2483.5(PK)	36.45	74.00*	-37.55
	2483.5(AV)	23.76	54.00*	-30.24
	4850(PK)	56.11	74.00	-17.89
	4850(AV)	49.67	54.00	-4.33
	7275(PK)	54.92	74.00	-19.08
	7275(AV)	44.74	54.00	-9.26

_ → Fundamental Frequency

*→ Restricted Band edges

Pk: Peak Detector;

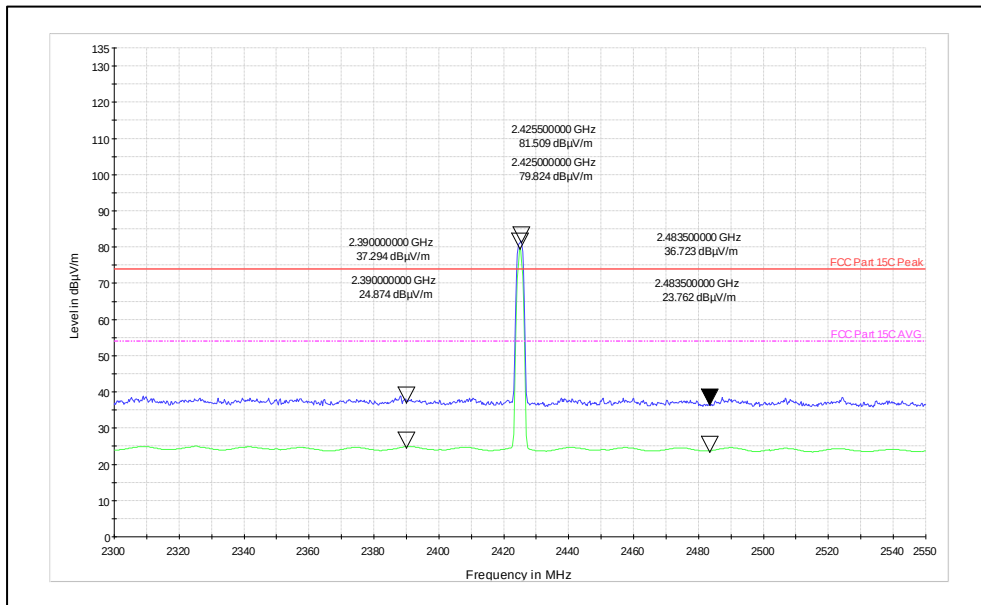
Av: Average Detector

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

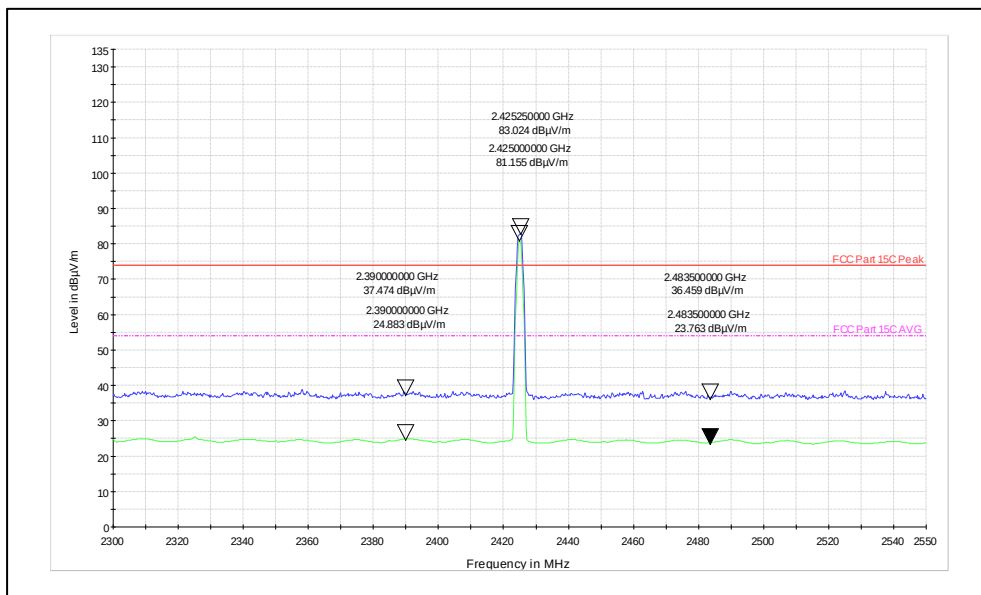
Seite 31 von 38
Page 31 of 38

Test Plots:



Channel Frequency: 2425MHz

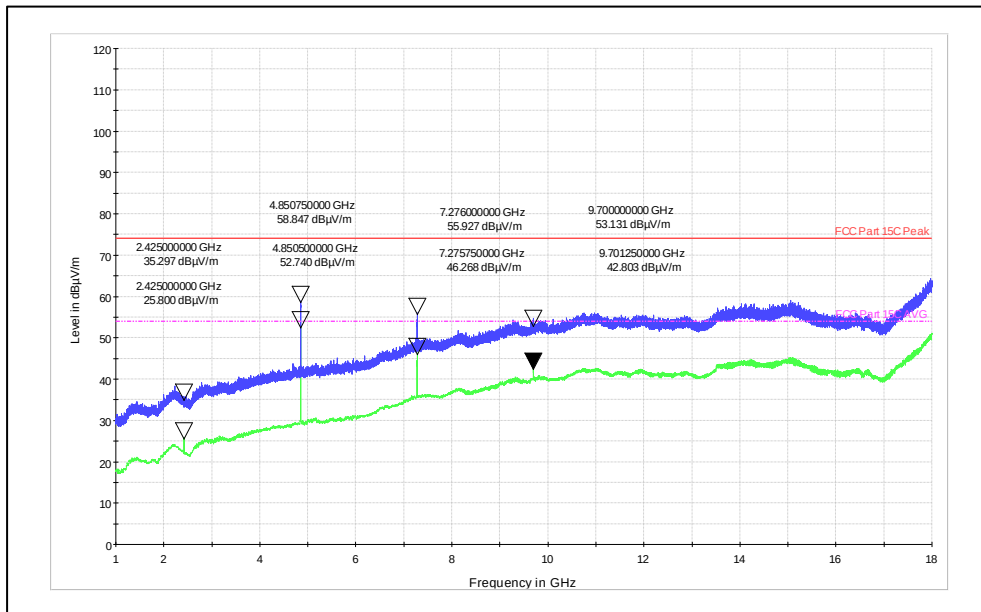
Polarization: Vertical



Channel Frequency: 2425MHz

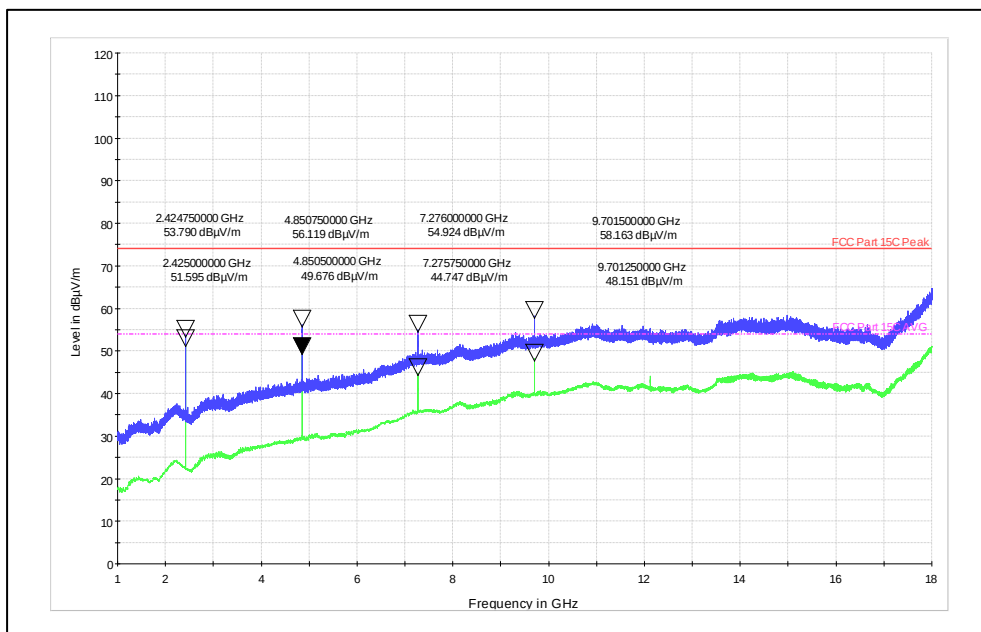
Polarization: Horizontal

Spurious Radiated emission Test Plots:



Polarization: Vertical

Frequency range: 1GHz to 18GHz



Polarization: Horizontal

Frequency range: 1GHz to 18GHz

Prüfbericht - Nr.:
Test Report No.:

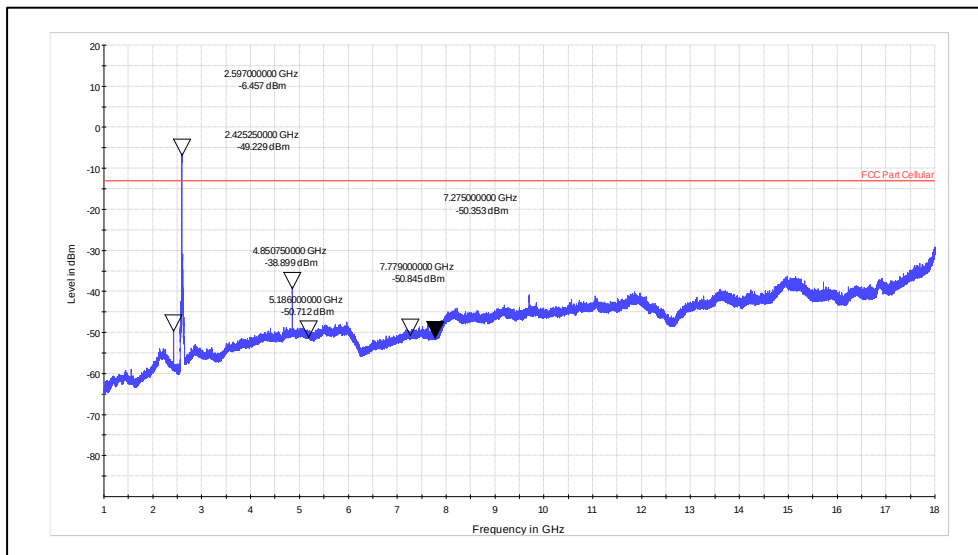
IN25S64J 001

Seite 33 von 38
Page 33 of 38

Simultaneous Operation: Proprietary protocol + LTE

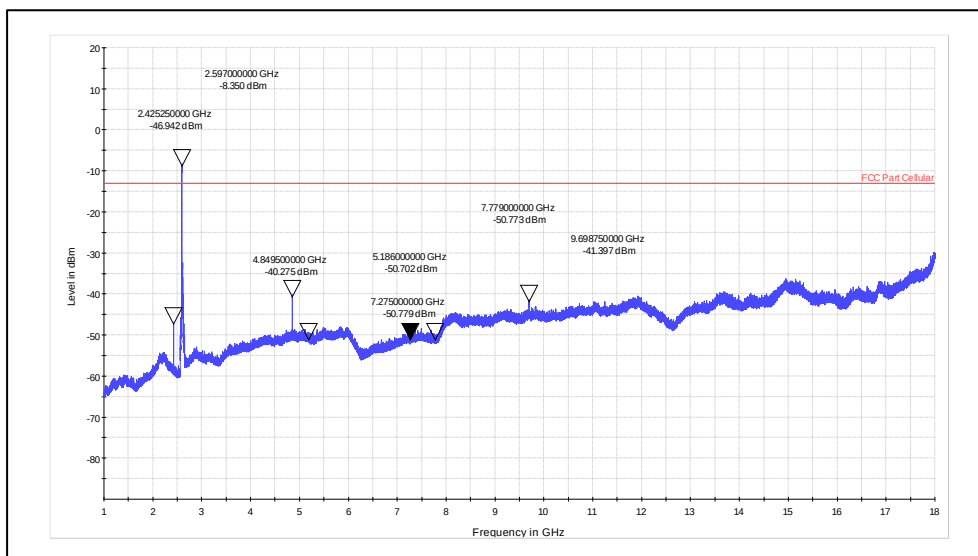
Channel Frequency (MHz)	Antenna Polarization	Measured Frequency (MHz)	Measured Spurious Emission (dBm)	Limit (dBm)	Margin (dB)
2593.00	Vertical	5186.00	-50.71	-13.00	-37.71
		7779.00	-50.84	-13.00	-37.84
2425.00		4850.00	-38.89	-13.00	-25.89
		7275.00	-50.35	-13.00	-37.35
2593.00	Horizontal	5186.00	-50.70	-13.00	-37.70
		7779.00	-50.77	-13.00	-37.77
2425.00		4850.00	-40.27	-13.00	-27.27
		7275.00	-50.77	-13.00	-37.77

Test Plots:



Channel Frequency: 2593MHz & 2425MHz

Polarization: Vertical



Channel Frequency: 2593MHz & 2425MHz

Polarization: Horizontal

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 34 von 38
Page 34 of 38

7.6 AC Power lines Conducted Emission

Result

Pass

Test Specification : FCC Part 15 Section 15.207/RSS Gen Issue 5 Section 8.8
Test Method : ANSI C 63.10-2013
Testing Location : Screened room
Measurement Bandwidth : 9kHz
Frequency Range : 150kHz – 30MHz
Supply Voltage : 110VAC,60Hz
Test Method : Refer TEST METHODOLOGY

Table 8: Limits for Conducted power line emission

Frequency of emission (MHz)	QP Limit (dBμV)	AV Limit (dBμV)
0.15 – 0.5	66 – 56*	56 – 46*
0.5 – 5	56	46
5 – 30	60	50

* Decreases with the logarithm of the frequency

Prüfbericht - Nr.:

Test Report No.:

IN25S64J 001

Seite 35 von 38

Page 35 of 38

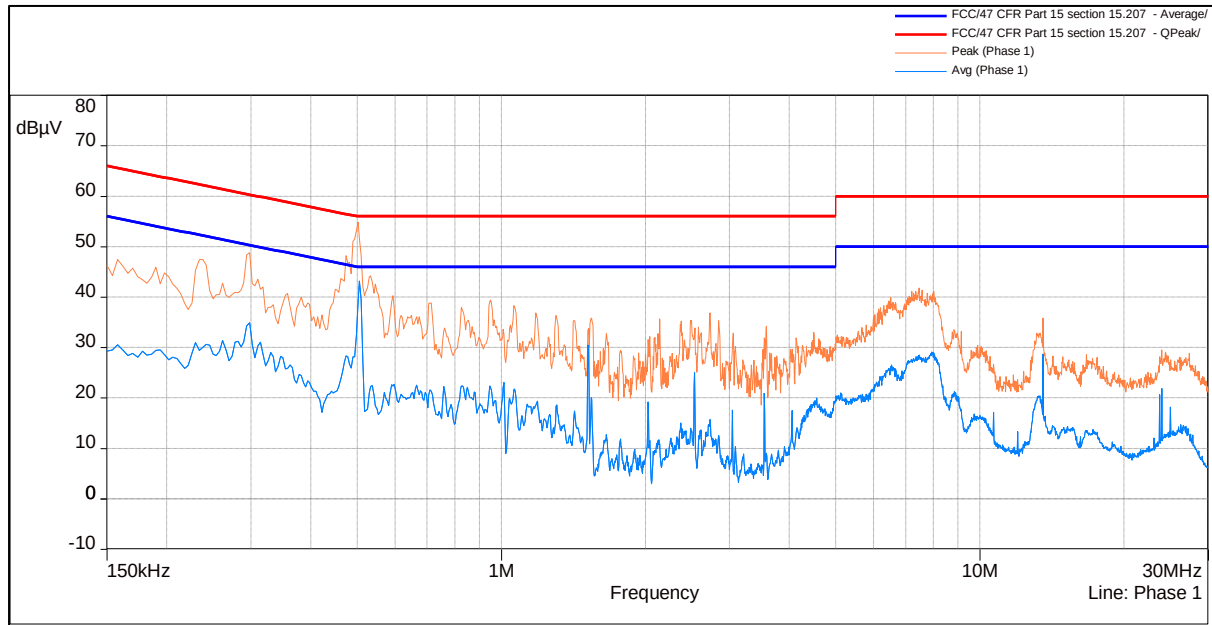
Test Conditions:

Temperature (Norm) = +24 °C Voltage = 110VAC through mains

Relative humidity: 64%

Test results:

110VAC-60Hz-Line



Quasi Peak:

Frequency (MHz)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Comments
0.50425	44.93	56	-11.07	Pass
0.29665	45.4	60.3	-14.9	Pass
0.94415	36.19	56	-19.81	Pass
0.2345	40.73	62.31	-21.58	Pass
1.52025	33.54	56	-22.46	Pass
7.91375	35.9	60	-24.1	Pass
1.2966	31.83	56	-24.17	Pass
13.5616	33.98	60	-26.02	Pass
2.5349	29.44	56	-26.56	Pass

Prüfbericht - Nr.:
Test Report No.:

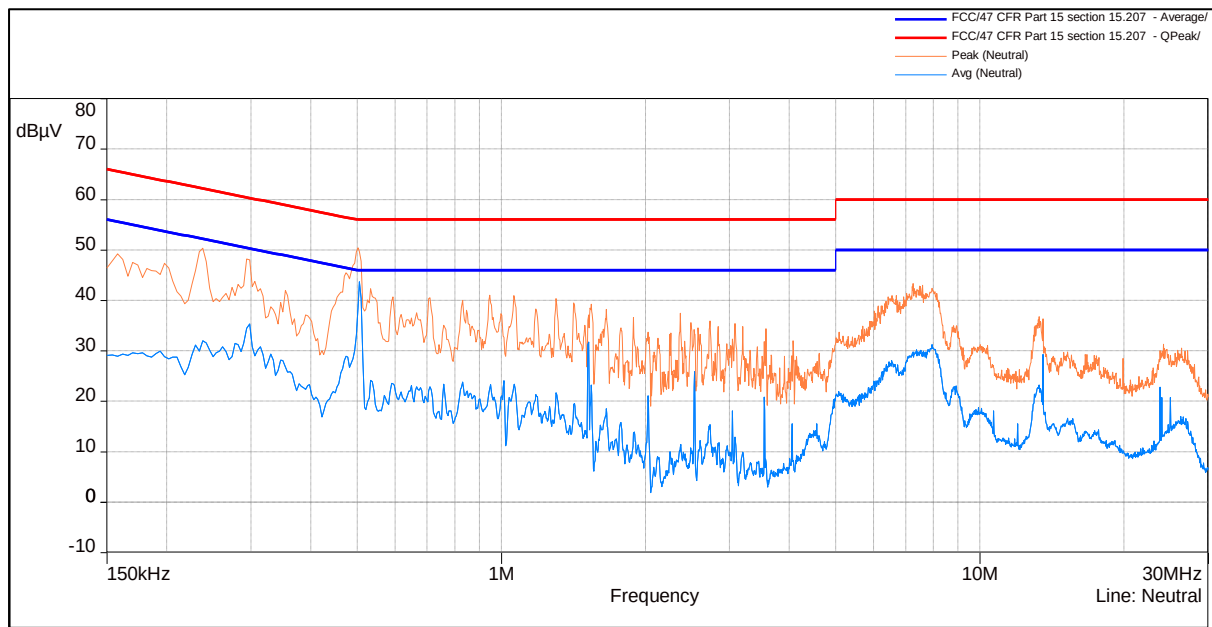
IN25S64J 001

Seite 36 von 38
Page 36 of 38

Average:

Frequency (MHz)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Comments
0.50425	41.63	46	-4.37	Pass
1.52025	32.17	46	-13.83	Pass
0.29665	34.77	50.3	-15.53	Pass
2.5349	25.6	46	-20.4	Pass
13.5616	27.57	50	-22.43	Pass
7.91375	27.36	50	-22.64	Pass
0.94415	21.87	46	-24.13	Pass
0.2345	27.61	52.31	-24.7	Pass
1.2966	17.39	46	-28.61	Pass

110VAC-60Hz-Neutral:



Quasipeak:

Frequency (MHz)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Comments
0.50285	44.4	56	-11.6	Pass
0.29845	43.56	60.3	-16.74	Pass
0.2371	42.89	62.17	-19.28	Pass
1.06335	36.61	56	-19.39	Pass
1.53685	35.4	56	-20.6	Pass
7.95285	37.33	60	-22.67	Pass
13.55885	34.15	60	-25.85	Pass
2.53355	28.57	56	-27.43	Pass

Prüfbericht - Nr.:

Test Report No.:

IN25S64J 001

Seite 37 von 38

Page 37 of 38

Average:

Frequency (MHz)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Comments
0.50285	39.16	46	-6.84	Pass
0.29845	33.45	50.3	-16.84	Pass
2.53355	25.86	46	-20.14	Pass
7.95285	28.93	50	-21.07	Pass
0.2371	30.51	52.17	-21.66	Pass
13.55885	28.29	50	-21.71	Pass
1.06335	22.37	46	-23.63	Pass
1.53685	21.66	46	-24.34	Pass

Prüfbericht - Nr.:
Test Report No.:

IN25S64J 001

Seite 38 von 38
Page 38 of 38

8 LIST OF TABLES

Table 1: List of test and measurement instruments	7
Table 2: Instrument application Software versions	7
Table 3: Ratings and System Details as declared by Client*	8
Table 4: Measurement Uncertainty	9
Table 5: Transmitter limits for Radiated emission	26
Table 6: Test results for frequency range 30MHz – 1GHz	27
Table 7: Test results for the frequencies above 1GHz:	30
Table 8: Limits for Conducted power line emission	34

9 List of Figures

Figure 1: Frequency Range 9 kHz- 30 MHz	13
Figure 2: Frequency Range 30 MHz – 200 MHz	13
Figure 3: Frequency Range 200 MHz - 1GHz	14
Figure 4: Frequency Range above 1 GHz	14

*****End of test report*****