Report on the Radio Testing

For

Tektroniks

on

CC1312PSIP Sub-1-GHz Wireless System-inPackage

Report no. TRA-064959-47-06B

2025-10-30

RF915 14

0026

Report Number: TRA-064959-47-06B
Issue: B

REPORT ON THE RADIO TESTING OF A
Tektroniks
CC1312PSIP Sub-1-GHz Wireless System-inPackage
WITH RESPECT TO SPECIFICATION
FCC 47CFR 15.247
TO SATISFY PERMISSIVE CHANGE REQUIREMENTS OF
KDB 178919 D01 Permissive Change Policy v06

TEST DATE: 2025-06-13 to 2025-06-16

Tested by: D Winstanley

Written by: Digitally signed by Steve Garwell DN: cn=Steve Garwell, o=Element, email=steve.garwell@element.com, c=GB Date: 2025.10.30 15:54:41 Z — S Garwell, Radio Test Engineer

Approved by: Digitally signed by John Charters Date: 2025.10.30 16:25:21 Z — J Charters, Lab Manager

Date: 2025-10-30

Disclaimers:

[1] THIS DOCUMENT MAY BE REPRODUCED ONLY IN ITS ENTIRETY AND WITHOUT CHANGE
[2] THE RESULTS CONTAINED IN THIS DOCUMENT RELATE ONLY TO THE ITEM(S) TESTED

ilac-MRA UKAS TESTING 0026

1 Revision Record

Issue Number	*Issue Date*	*Revision History*
A	2025-06-25	Original
B	2025-10-30	General amendments throughout document

2 Summary

TEST REPORT NUMBER:	TRA-064959-47-06B
WORKS ORDER NUMBER:	TRA-064959-13
PURPOSE OF TEST:	Testing of radio frequency equipment per the relev authorisation requirements of chapter 47 of CFR (code of federal regulations) Part 2, subpart J
TEST SPECIFICATION:	47CFR15.247
EQUIPMENT UNDER TEST (EUT):	CC1312PSIP Sub-1-GHz Wireless System-inPackage
FCC IDENTIFIER:	XAX-TEKCC1312PSIP
EUT SERIAL NUMBER:	EMC 025/026
MANUFACTURER/AGENT:	Tektroniks
ADDRESS:	Unit 21, Manvers Business Park, High Hazles Rd, Cotgrave, Nottingham, NG12 3GZ United Kingdom
CLIENT CONTACT:	Steve Smith ☎ 0115 989 0090 ✉ steve.smith@tek-troniks.com
ORDER NUMBER:	15013
TEST DATE:	2025-06-13 to 2025-06-16
TESTED BY:	D Winstanley Element

2.1 Test Summary

Test Method and Description		*Requirement Clause FCC 47 CFR*	*Applicable to this equipment*	*Result / Note*
Radiated spurious emissions (restricted bands of operation and cabinet radiation)		15.205	☒	*Pass*
AC power line conducted emissions		15.207	☒	*Pass*
6 dB bandwidth		15.247 (a) (2)	☒	*Pass*
Conducted output power	Peak	15.247 (b) (3)	☒	*Pass*
	Maximum		☐	
Undesirable / unwanted emissions		15.247 (d)	☒	*Pass*
Power spectral density		15.247 (e)	☒	*Pass*
Pulsed operation correction		15.35 (c)	☒	*Pass*

General notes:

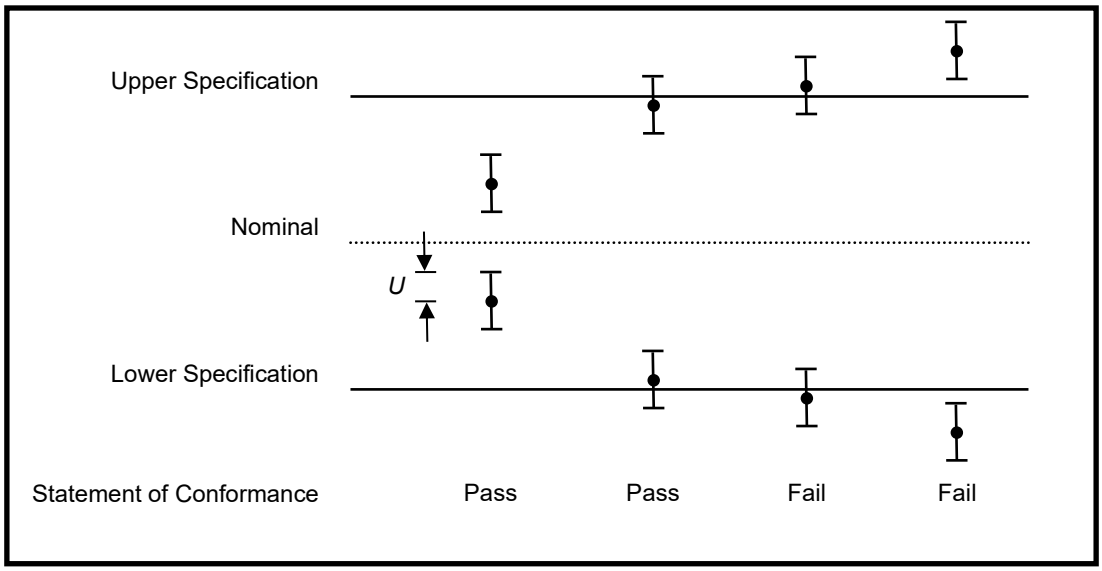
The results contained in this report relate only to the items tested, in the condition at time of test, and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

The apparatus was set up and exercised using the configurations, modes of operation and arrangements defined in this report only. Any modifications made are identified in Section 8 of this report.

Particular operating modes, apparatus monitoring methods and performance criteria required by the standards tested to have been performed except where identified in Section 5.2 of this test report (Deviations from Test Standards).

The decision rule for compliance is not inherent within this specification and compliance is based on the customer requesting a simple acceptance rule based on understanding and acceptance of Elements Measurement Uncertainty values.

Graphical Representation of a Pass / Fail Binary Statement - Simple Acceptance



● = Measured value
U = 95 % expanded measurement uncertainty

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4 Introduction

This report TRA-064959-47-06B presents the results of the Radio testing on a Tektroniks, CC1312PSIP Sub-1-GHz Wireless System-inPackage to specification FCC Title 47 CFR 15 Radio Frequency Devices.

The testing was carried out for Tektroniks by Element, at the address detailed below.

☒ Element Skelmersdale
Unit 1
Pendle Place
Skelmersdale
West Lancashire
WN8 9PN
UK

☐ Element Surrey Hills
Unit 15 B
Henley Business Park
Pirbright Road
Normandy
Guildford
GU3 2DX
UK

This report details the configuration of the equipment, the test methods used and any relevant modifications where appropriate.

All test and measurement equipment under the control of the laboratory and requiring calibration is subject to an established programme and procedures to control and maintain measurement standards. The quality management system meets the principles of ISO 9001, and has quality control procedures for monitoring the validity of tests undertaken. Records and sufficient detail are retained to establish an audit trail of calibration records relating to its test results for a defined period. Under control of the established calibration programme, key quantities or values of the test & measurement instrumentation are within specification and comply with the relevant traceable internationally recognised and appropriate standard specifications, which are ISO/IEC 17025:2017 accredited calibrated as such where these properties have a significant effect on results. Participation in inter-laboratory comparisons and proficiency testing ensures satisfactory correlation of results conform to Elements own procedures, as well as statistical techniques for analysis of test data providing the appropriate confidence in measurements.

Throughout this report EUT denotes equipment under test.

FCC Site Listing:

The test laboratory is accredited for the above sites under the US-UK MRA,

Designation number:

Element Skelmersdale UK2020

The test site requirements of ANSI C63.4-2014 are met up to 1GHz.

The test site SVSWR requirements of CISPR 16-1-4:2010 are met over the frequency range 1 GHz to 18 GHz.

5 Test Specifications

5.1 Normative References

- FCC 47 CFR Ch. I – Part 15 – Radio Frequency Devices.
- ANSI C63.10-2020 – American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.
- ANSI C63.4-2014 – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
- KDB 178919 D01 Permissive Change Policy v06

5.2 Deviations from Test Standards

There were no deviations from the test standard.

6 Glossary of Terms

§	denotes a section reference from the standard, not this document
AC	Alternating Current
ANSI	American National Standards Institute
BW	bandwidth
C	Celsius
CFR	Code of Federal Regulations
CW	Continuous Wave
dB	decibel
dBm	dB relative to 1 milliwatt
DC	Direct Current
DSSS	Direct Sequence Spread Spectrum
EIRP	Equivalent Isotropically Radiated Power
ERP	Effective Radiated Power
EUT	Equipment under Test
FCC	Federal Communications Commission
FHSS	Frequency Hopping Spread Spectrum
Hz	hertz
IC	Industry Canada
ITU	International Telecommunication Union
LBT	Listen before Talk
m	metre
max	maximum
MIMO	Multiple Input and Multiple Output
min	minimum
MRA	Mutual Recognition Agreement
N/A	Not Applicable
PCB	Printed Circuit Board
PDF	Portable Document Format
Pt-mpt	Point-to-multipoint
Pt-pt	Point-to-point
RF	Radio Frequency
RH	Relative Humidity
RMS	Root Mean Square
Rx	receiver
s	second
SVSWR	Site Voltage Standing Wave Ratio
Tx	transmitter
UKAS	United Kingdom Accreditation Service
V	volt
W	watt
Ω	ohm

7 Equipment under Test

7.1 EUT Identification

- Name: CC1312PSIP Sub-1-GHz Wireless System-inPackage
- Serial Number: EMC 025/026
- Model Number: Bespoke hardware with minimal components for antenna testing
- Software Revision: Bespoke
- Build Level / Revision Number: 7

7.2 System Equipment

Equipment listed below forms part of the overall test setup and is required for equipment functionality and/or monitoring during testing. The compliance levels achieved in this report relate only to the EUT and not items given in the following list.

Not Applicable – No support/monitoring equipment required.

7.3 EUT Mode of Operation

The EUT was transmitting a modulated carrier on the frequencies as indicated.

7.4 EUT Radio Parameters

7.4.1 General

Frequencies of operation:	915 MHz to 921.4 MHz
Modulation type:	2-GFSK
Occupied channel bandwidth:	1.6 MHz
Declared output power:	≤ 15 dBm
Nominal Supply Voltage:	3 Vdc
Duty cycle:	19.5 % (Normal Use); 100% for test

7.4.2 Antennas

Internal Antenna

Type:	Abracon PRO-OB-471 pcb antenna
Frequency range:	902 MHz – 928 MHz
Impedance:	50Ω
Gain:	2.4 dBi Peak
Mounting:	Surface Mount
Dimensions:	34.00 x 11.53 x 4.93 mm

External Antenna

Type:	Pulse electroncs - WHIP W5012
Frequency range:	868 MHz – 928 MHz
Impedance:	50Ω
Gain:	2 dBi Peak
Mounting:	SMA-RP Male
Dimensions:	10 x 179 mm

7.5 EUT Description

The EUT is a CC1312PSIP Sub-1-GHz Wireless System-inPackage.

8 Modifications

No modifications were performed during this assessment.

9 EUT Test Setup

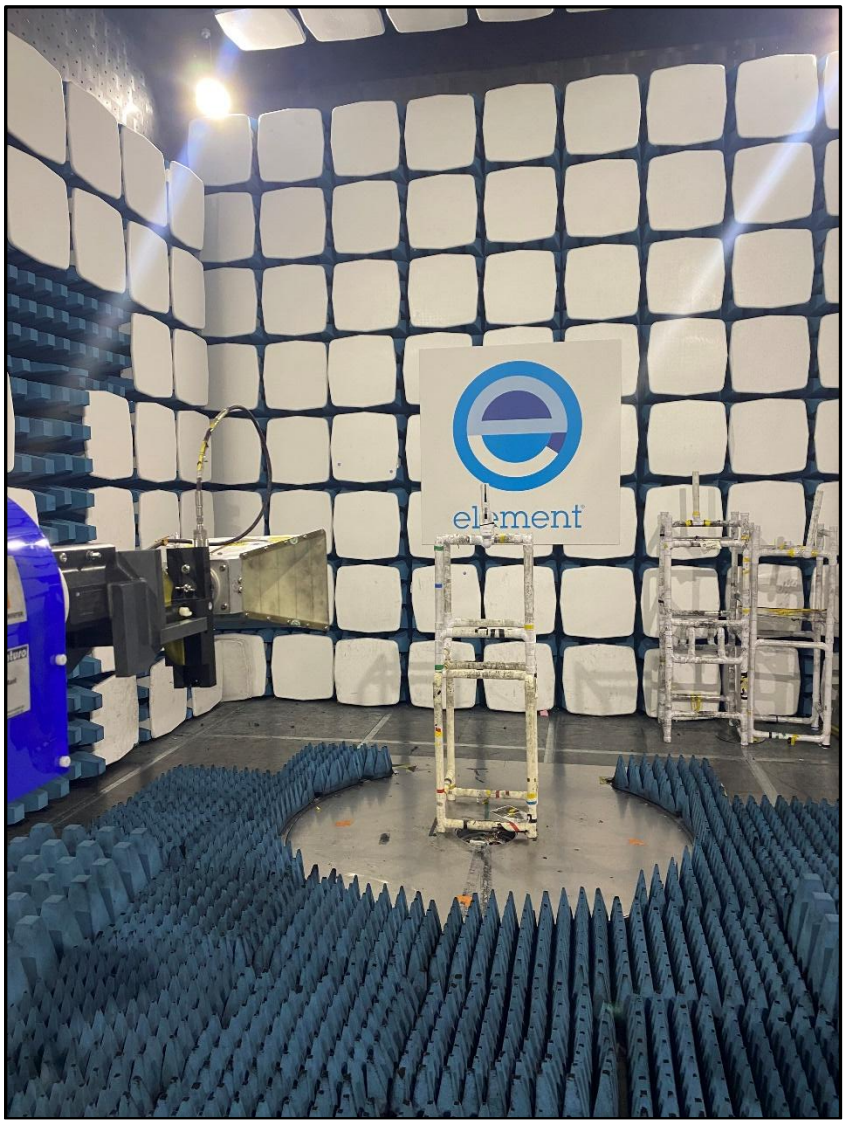
9.1 Block Diagram

The following diagram shows basic EUT interconnections with cable type and cable lengths identified:

9.2 General Set-up Photographs

The following photographs illustrate basic EUT set-up:

30 MHz to 1 GHz



Above 1 GHz

9.3 Measurement software

Where applicable, the following software was used to perform measurements contained within this report.

Element Emissions R5
Element Transmitter Bench Test
ETS Lindgren EMPower V1.0.4.2

10 General Technical Parameters

10.1 Normal Conditions

The EUT was tested under the normal environmental conditions of the test laboratory, except where otherwise stated. The normal power source applied was 3 Vdc from a Lithium Ion Battery.

10.2 Varying Test Conditions

There are no specific frequency stability requirements for the type of device. The results contained in this report demonstrate that the occupied bandwidth is contained within the authorised band and the manufacturer has declared sufficient frequency stability.

Variation of supply voltage is required to ensure stability of the declared output power. During carrier power testing the following variations were made:

	Category	***Nominal***	***Variation***
☐	Mains	110 Vac +/-2 %	85 % and 115 %
☒	Battery	New battery	N/A

11 Radiated emissions

11.1 Definitions

Spurious emissions
Emissions on a frequency or frequencies, which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

Restricted bands
A frequency band in which intentional radiators are permitted to radiate only spurious emissions but not fundamental signals.

11.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	EMC Chamber 1 (SK01) & Radio Chamber (SK03)
Test Standard and Clause:	ANSI C63.10-2020, Clause 6.5 and 6.6
EUT Frequencies Measured:	915.0 MHz, 921.4 MHz
Deviations from Standard:	None
Measurement BW:	30 MHz to 1 GHz: 120 kHz; Above 1 GHz: 1 MHz
Measurement Detector:	Up to 1 GHz: quasi-peak; Above 1 GHz: RMS average and Peak

Environmental Conditions (Normal Environment)

Temperature: 22 °C	+15 ºC to +35 ºC (as declared)
Humidity: 48 % RH	20 % RH to 75 % RH (as declared)

11.3 Test Limit

Unwanted emissions that fall within the restricted frequency bands shall comply with the limits specified:

General Field Strength Limits for License-Exempt Transmitters at Frequencies above 30 MHz

Frequency (MHz)	*Field Strength (µV/m at 3 m)*	*Field Strength (dBµV/m at 3 m)*
30 to 88	100	40.0
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

On frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function. On frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit.

11.4 Test Method

With the EUT setup as per section 9 of this report and connected as per Figure i, the emissions from the EUT were measured on a spectrum analyzer / EMI receiver.

Radiated electromagnetic emissions from the EUT are checked first by preview scans. Preview scans for all spectrum and modulation characteristics are checked, using a peak detector and where applicable worst-case determined for function, operation, orientation, etc. for both vertical and horizontal polarisations. Pre-scan plots are shown with a peak detector and 100 kHz RBW.

If the EUT connects to auxiliary equipment and is table or floor standing, the configurations prescribed in ANSI C63.10 are followed. Alternatively, a layout closest to normal use (as declared by the provider) is employed, (see EUT setup photographs for more detail).

Emissions between 30 MHz and 1 GHz are measured using calibrated broadband antennas. Emissions above 1 GHz are characterized using standard gain horn antennas. Pre-amplifiers and filters are used where required. Care is taken to ensure that test receiver resolution bandwidth, video bandwidth and detector type(s) meet the regulatory requirements.

For both horizontal and vertical polarizations, the EUT is then rotated through 360 degrees in azimuth until the highest emission is detected. At the previously determined azimuth the test antenna is raised and lowered from 1 to 4 m in height until a maximum emission level is detected, this maximum value is recorded.

Power values measured on the test receiver / analyzer are converted to field strength, FS, in dBµV/m at the regulatory distance, using:

$$FS = PR + CL + AF – PA + DC – CF$$

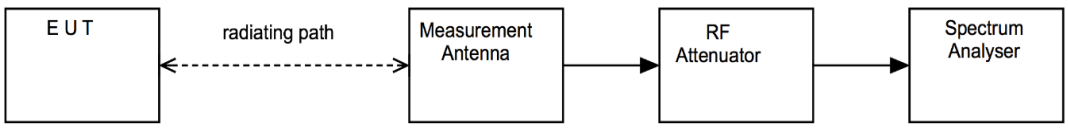
$$Factor = CL + AF – PA$$

Where,

PR is the power recorded on the receiver / spectrum analyzer in dBµV;
CL is the cable loss in dB;
AF is the test antenna factor in dB/m;
PA is the pre-amplifier gain in dB (where used);
DC is the duty correction factor in dB (where used, e.g. harmonics of pulsed fundamental);
CF is the distance factor in dB (where measurement distance different to limit distance);

This field strength value is then compared with the regulatory limit.

Figure i Test Setup

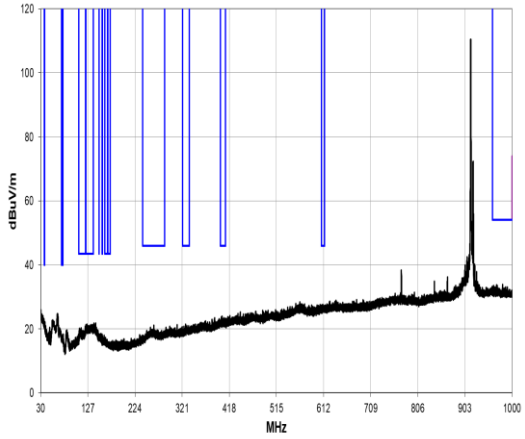


11.5 Test Equipment

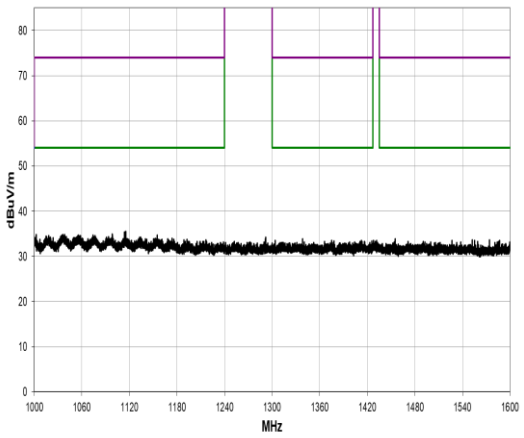
Equipment Type	*Manufacturer*	*Equipment Description*	*Element No*	*Due For Calibration*
Emissions R5	Element	Radiated Test Software	REF9000	Cal Not Required
ATS	Rainford EMC	Radio Chamber - PP	REF940	2026-01-29
ATS	Rainford EMC	Chamber 1	U387	2026-01-24
ESR7	R&S	EMI Receiver	U456	2026-03-26
FSU46	R&S	Spectrum Analyser	REF910	2026-02-27
CBL611/B	Chase	Bilog	U573	2026-11-04
LNA6901	AMETEK	Pre Amp	U711	2026-04-24
3115	EMCO	Horn Antenna	L138	2026-06-11
3115	EMCO	1-18GHz Horn	L139	2026-08-21
8449B	Agilent	Pre Amp	U457	2026-02-04
8449B	Agilent	Pre Amp	L572	2025-11-13
VHF-1500+	MiniCircuits	High Pass Filter	U519	2026-02-17
AFH-05000 Rev A	Atlantic Microwave	HI Pass Fillter 5-16 GHz	U663	2026-02-17

11.6 Test Results – Internal Antenna

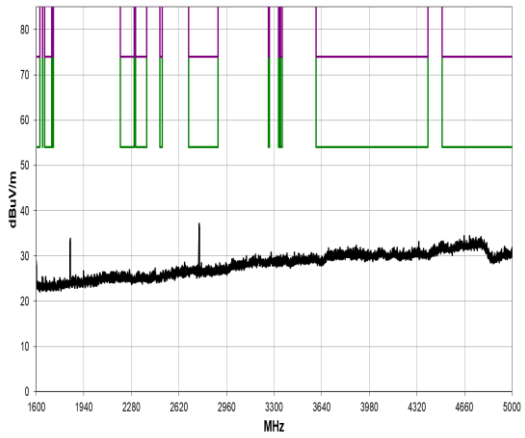
Frequency: 915.0 MHz; Modulation: 2-GFSK; Power Setting: Default



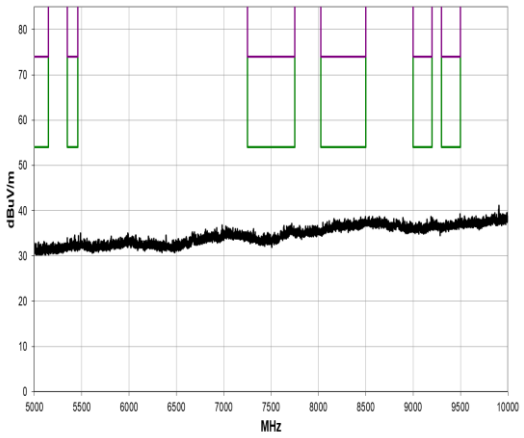
30 MHz to 1 GHz



1 GHz to 1.6 GHz



1.6 GHz to 5 GHz

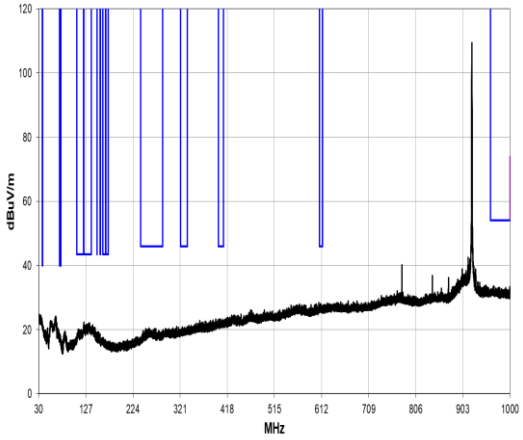


5 GHz to 10 GHz

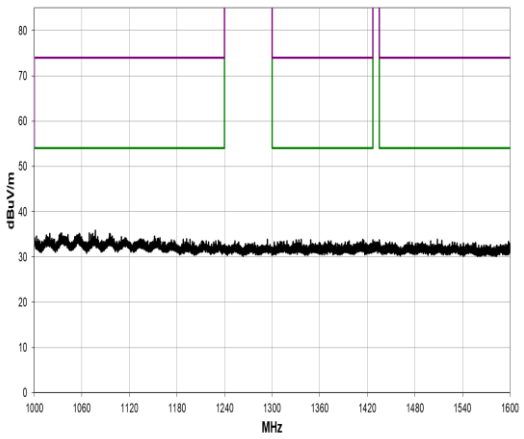
Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)
2764.400	52.9	-2.8	1.72	291.9	1.0	0.0	Horz	PK	-9.5	40.6	74.0	-33.4

Note: Peak measurements below average limit only peak measurement shown.

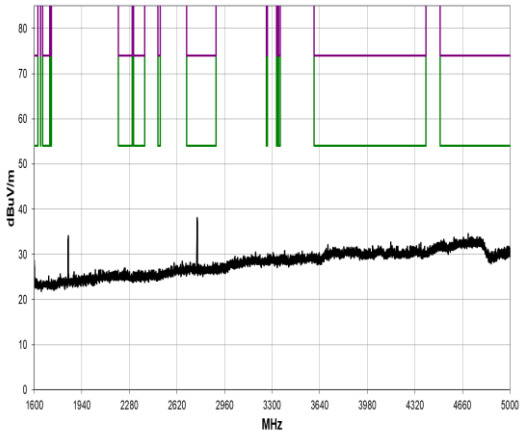
Frequency: 921.4 MHz; Modulation: 2-GFSK; Power Setting: Default



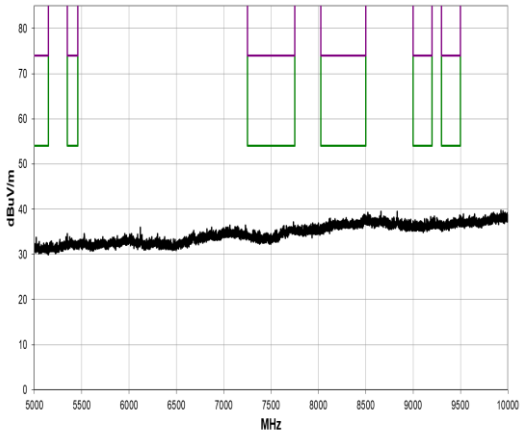
30 MHz to 1 GHz



1 GHz to 1.6 GHz



1.6 GHz to 5 GHz



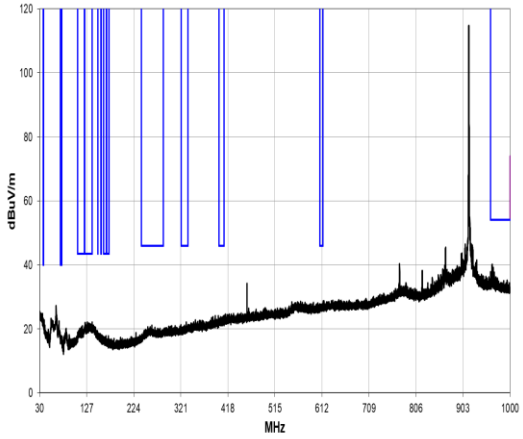
5 GHz to 10 GHz

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)
2763.475	53.1	-2.8	1.64	305.0	1.0	0.0	Horz	PK	-9.5	40.8	74.0	-33.2

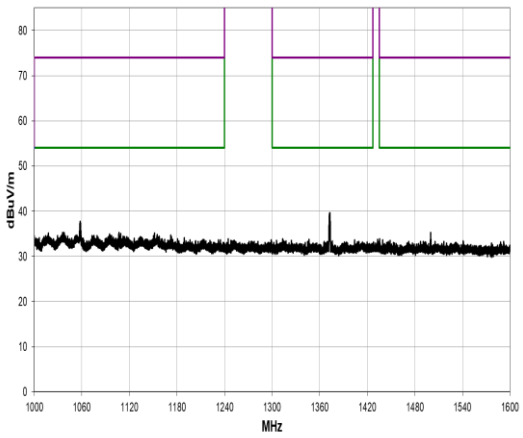
Note: Peak measurements below average limit only peak measurement shown.

11.7 Test Results – External Antenna

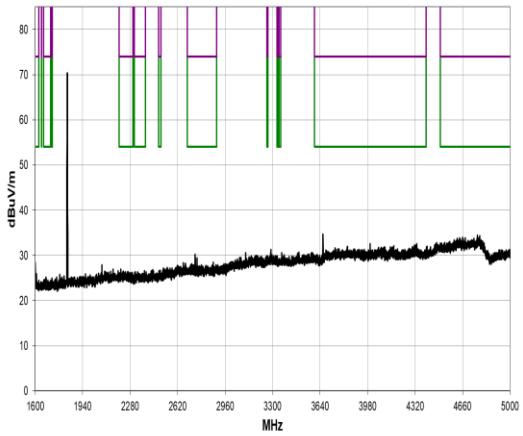
Frequency: 915.0 MHz; Modulation: 2-GFSK; Power Setting: Default



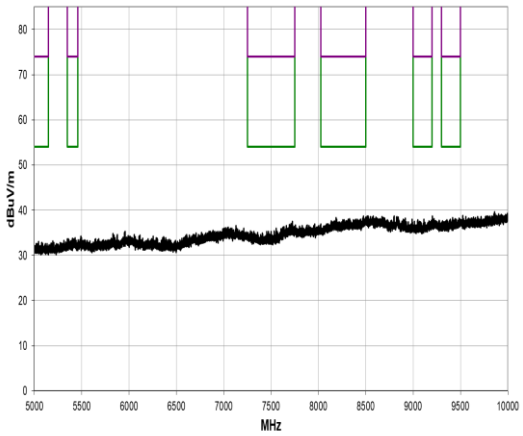
30 MHz to 1 GHz



1 GHz to 1.6 GHz



1.6 GHz to 5 GHz

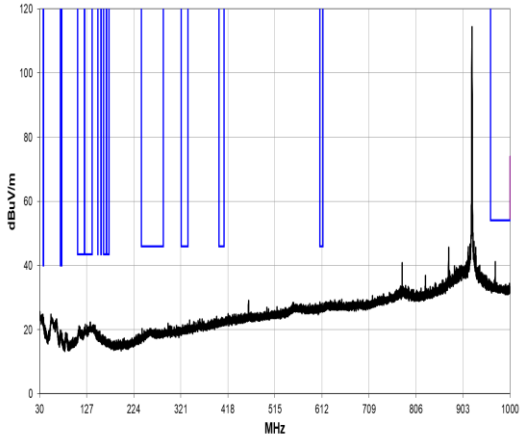


5 GHz to 10 GHz

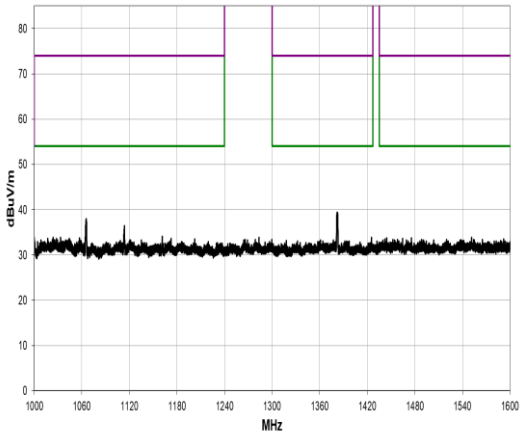
Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)
962.810	31.9	5.8	1.06	211.8	3.0	0.0	Vert	QP	0.0	37.7	54.0	-16.3
1057.875	51.8	-7.9	1.5	56.0	3.0	0.0	Horz	PK	0.0	43.9	74.0	-30.1
1372.033	52.8	-8.2	1.87	91.9	3.0	0.0	Horz	PK	0.0	44.6	74.0	-29.4
1499.817	49.8	-8.1	4.0	60.1	3.0	0.0	Vert	PK	0.0	41.7	74.0	-32.3

Note: Peak measurements below average limit only peak measurement shown.

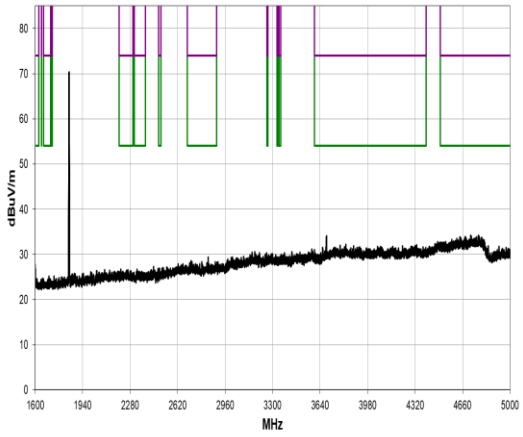
Frequency: 921.4 MHz; Modulation: 2-GFSK; Power Setting: Default



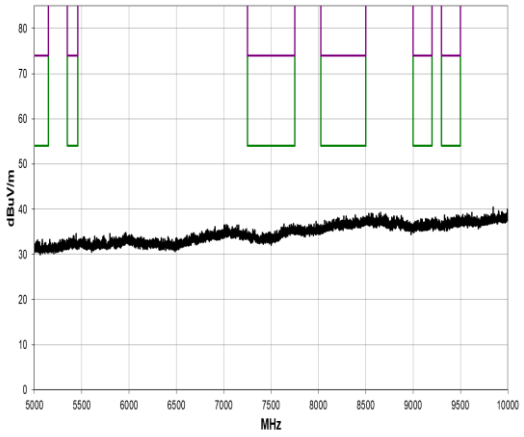
30 MHz to 1 GHz



1 GHz to 1.6 GHz



1.6 GHz to 5 GHz



5 GHz to 10 GHz

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)
969.563	32.3	5.6	1.5	221.9	3.0	0.0	Horz	QP	0.0	37.9	54.0	-16.1
1065.450	43.7	-8.4	1.3	252.2	3.0	0.0	Horz	AV	0.0	35.3	54.0	-18.7
1113.817	51.6	-8.2	1.21	238.0	3.0	0.0	Horz	PK	0.0	43.4	74.0	-30.6
1381.767	50.5	-7.0	1.45	323.1	3.0	0.0	Vert	PK	0.0	43.5	74.0	-30.5
3686.283	52.7	1.1	1.76	218.0	1.0	0.0	Horz	PK	-9.5	44.3	74.0	-29.7

Note: Peak measurements below average limit only peak measurement shown.

12 AC power-line conducted emissions

12.1 Definition

Line-to-ground radio-noise voltage that is conducted from all of the EUT current-carrying power input terminals that are directly (or indirectly via separate transformers or power supplies) connected to a public power network.

12.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	Transient Laboratory
Test Standard and Clause:	ANSI C63.10-2020, Clause 6.2
EUT Frequencies Measured:	915.0 MHz
EUT Modulation:	2-GFSK
Deviations From Standard:	None
Measurement BW:	9 kHz
Measurement Detectors:	Quasi-Peak and Average, RMS

Environmental Conditions (Normal Environment)

Temperature: 20 °C	+15 ºC to +35 ºC (as declared)
Humidity: 50 % RH	20 % RH to 75 % RH (as declared)

12.3 Test Limit

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz, shall not exceed the limits in Table 3.

Table 3 – AC Power Line Conducted Emission Limits

Frequency (MHz)	***Conducted limit (dBµV)***	
	Quasi-Peak	***Average****
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

*The level decreases linearly with the logarithm of the frequency.
**A linear average detector is required.

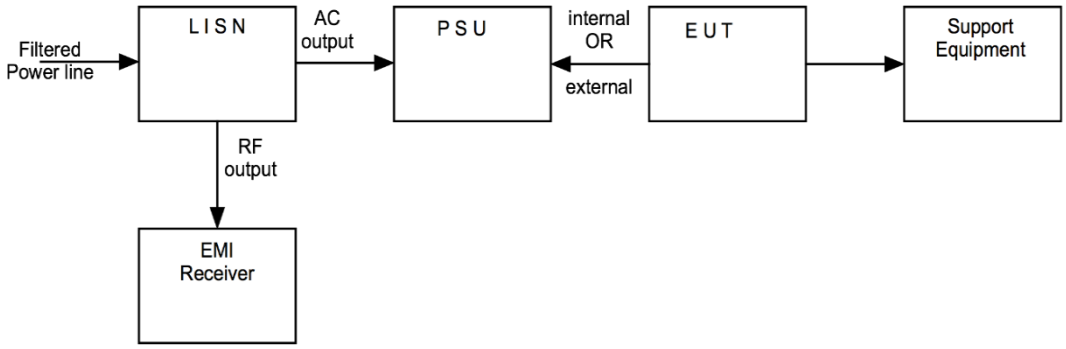
12.4 Test Method

With the EUT setup in a screened room, as per section 9 of this report and connected as per Figure ii, the power line emissions were measured on a spectrum analyzer / EMI receiver.

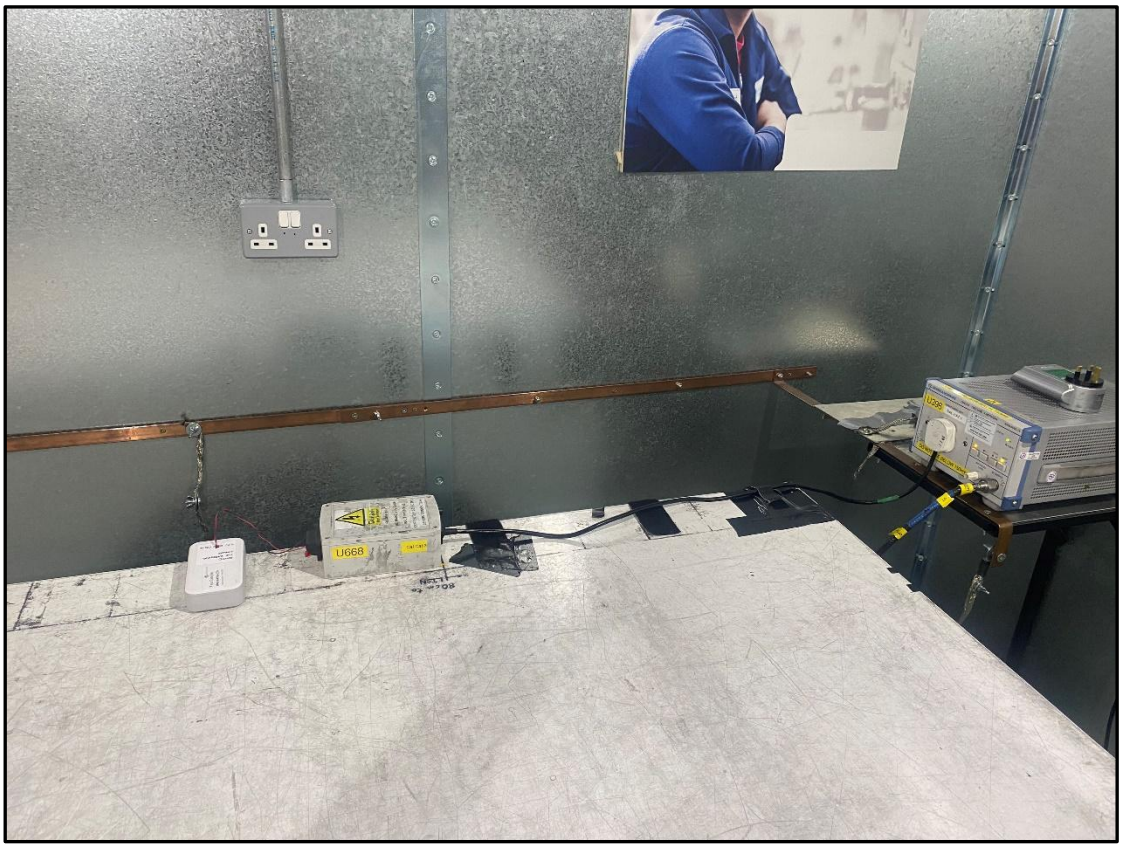
AC power line conducted emissions from the EUT are checked first by preview scans with peak and average detectors covering both live and neutral lines. A spectrum analyzer is used to determine if any periodic emissions are present.

Formal measurements using the correct detector(s) and bandwidth are made on frequencies identified from the preview scans. Final measurements were performed with EUT set at its maximum duty in transmit and receive modes.

Figure ii Test Setup



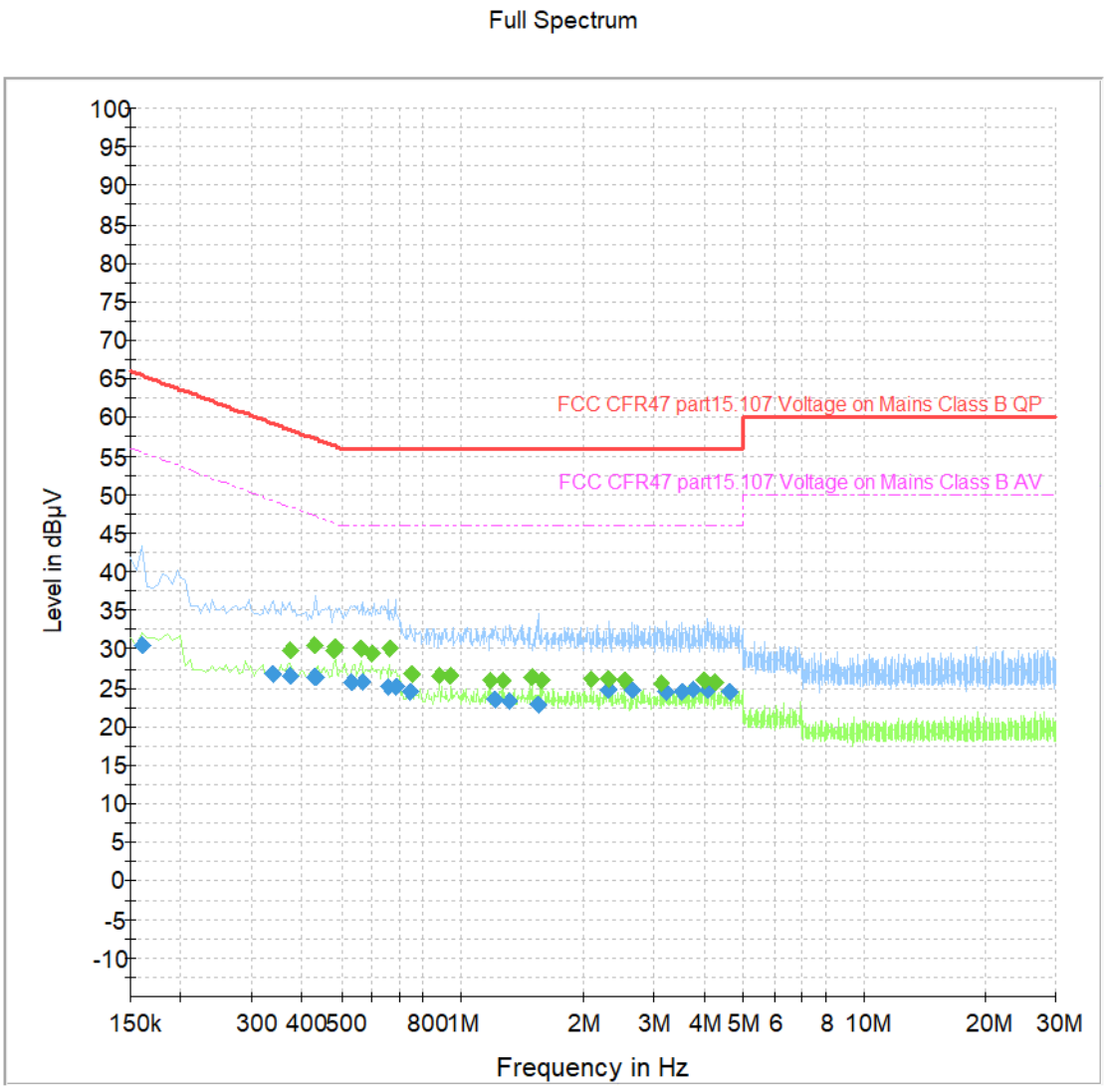
12.5 Test Set-up Photograph



12.6 Test Equipment

Equipment Type	Manufacturer	Equipment Description	Element No	Due For Calibration
Spectrum Analyser	R&S	FSU50	U544	2025-12-16
Lisn	R&S	ENV216	U396	2025-12-05
Pulse Limiter	R&S	ESH3-Z2	U559	2026-02-27

12.7 Test Results



Final Results QPK								
Frequency (MHz)	**QuasiPeak (dBµV)**	**Limit (dBµV)**	**Margin (dB)**	**Meas. Time (ms)**	**Bandwidth (kHz)**	**Line**	**Filter**	**Corr. (dB)**
0.159950	30.54	65.47	34.92	2000.0	9.000	N	OFF	19.5
0.339050	26.69	59.23	32.53	2000.0	9.000	N	OFF	19.5
0.373875	26.50	58.41	31.92	2000.0	9.000	L1	OFF	19.6
0.428600	26.27	57.28	31.01	2000.0	9.000	L1	OFF	19.6
0.433575	26.27	57.18	30.91	2000.0	9.000	L1	OFF	19.6
0.528100	25.71	56.00	30.29	2000.0	9.000	N	OFF	19.6
0.562925	25.72	56.00	30.28	2000.0	9.000	L1	OFF	19.6
0.657450	25.03	56.00	30.97	2000.0	9.000	N	OFF	19.6
0.682325	25.20	56.00	30.80	2000.0	9.000	N	OFF	19.6
0.747000	24.60	56.00	31.40	2000.0	9.000	L1	OFF	19.6
1.204700	23.41	56.00	32.59	2000.0	9.000	N	OFF	19.6
1.314150	23.32	56.00	32.68	2000.0	9.000	L1	OFF	19.6
1.543000	22.75	56.00	33.25	2000.0	9.000	N	OFF	19.6
2.314125	24.77	56.00	31.23	2000.0	9.000	L1	OFF	19.6
2.642475	24.69	56.00	31.31	2000.0	9.000	L1	OFF	19.6
3.224550	24.53	56.00	31.47	2000.0	9.000	N	OFF	19.6
3.523050	24.60	56.00	31.40	2000.0	9.000	N	OFF	19.6
3.741950	24.61	56.00	31.39	2000.0	9.000	N	OFF	19.7
4.065325	24.61	56.00	31.39	2000.0	9.000	L1	OFF	19.7
4.622525	24.40	56.00	31.60	2000.0	9.000	L1	OFF	19.7

Final Results Average								
Frequency (MHz)	**Average (dBµV)**	**Limit (dBµV)**	**Margin (dB)**	**Meas. Time (ms)**	**Bandwidth (kHz)**	**Line**	**Filter**	**Corr. (dB)**
0.373875	29.86	48.41	18.55	2000.0	9.000	N	OFF	19.5
0.428600	30.44	47.28	16.84	2000.0	9.000	N	OFF	19.6
0.478350	29.87	46.37	16.50	2000.0	9.000	L1	OFF	19.6
0.483325	30.24	46.28	16.04	2000.0	9.000	L1	OFF	19.6
0.557950	30.04	46.00	15.96	2000.0	9.000	N	OFF	19.6
0.597750	29.52	46.00	16.48	2000.0	9.000	L1	OFF	19.6
0.662425	30.09	46.00	15.91	2000.0	9.000	L1	OFF	19.6
0.751975	26.73	46.00	19.27	2000.0	9.000	L1	OFF	19.6
0.876350	26.53	46.00	19.47	2000.0	9.000	L1	OFF	19.6
0.936050	26.49	46.00	19.51	2000.0	9.000	L1	OFF	19.6
1.179825	25.95	46.00	20.05	2000.0	9.000	L1	OFF	19.6
1.259425	25.92	46.00	20.08	2000.0	9.000	L1	OFF	19.6
1.488275	26.38	46.00	19.62	2000.0	9.000	N	OFF	19.6
1.572850	26.04	46.00	19.96	2000.0	9.000	N	OFF	19.6
2.095225	26.15	46.00	19.85	2000.0	9.000	N	OFF	19.6
2.314125	26.07	46.00	19.93	2000.0	9.000	L1	OFF	19.6
2.538000	25.89	46.00	20.11	2000.0	9.000	L1	OFF	19.6
3.135000	25.47	46.00	20.53	2000.0	9.000	N	OFF	19.6
4.000650	25.97	46.00	20.03	2000.0	9.000	L1	OFF	19.7
4.264325	25.76	46.00	20.24	2000.0	9.000	N	OFF	19.7

13 Occupied Bandwidth

13.1 Definition

The emission bandwidth (x dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated x dB below the maximum in-band spectral density of the modulated signal.

The 99% emission bandwidth is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained.

13.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	Radio Laboratory
Test Standard and Clause:	6 dB Bandwidth: ANSI C63.10-2020, Clause 11.8
EUT Frequencies Measured:	915.0 MHz, 921.4 MHz
EUT Test Modulations:	2-GFSK
Deviations From Standard:	None
Measurement BW: 6 dB requirement: 100 kHz)	100 kHz
Spectrum Analyzer Video BW: (requirement at least 3x RBW)	300 kHz
Measurement Span: (requirement 2 to 5 times OBW)	2 MHz
Measurement Detector:	Peak

Environmental Conditions (Normal Environment)

Temperature: 22 °C	+15 ºC to +35 ºC (as declared)
Humidity: 55 % RH	20 % RH to 75 % RH (as declared)

13.3 Test Limit

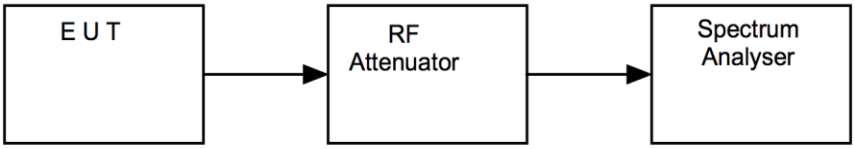
The minimum -6 dB bandwidth shall be at least 500 kHz.

13.4 Test Method

With the EUT setup as per section 9 of this report and connected as per Figure iii, the bandwidth of the EUT was measured on a spectrum analyser.

The measurements were performed with EUT set at its maximum duty. All modulation schemes, data rates and power settings were used to observe the worst-case configuration in each bandwidth.

Figure iii Test Setup

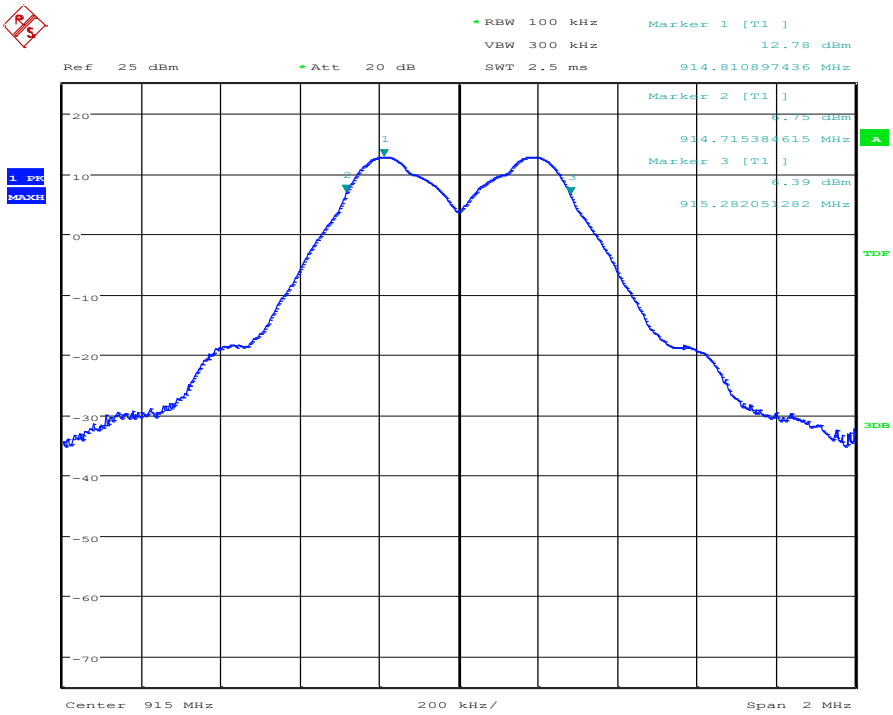


13.5 Test Equipment

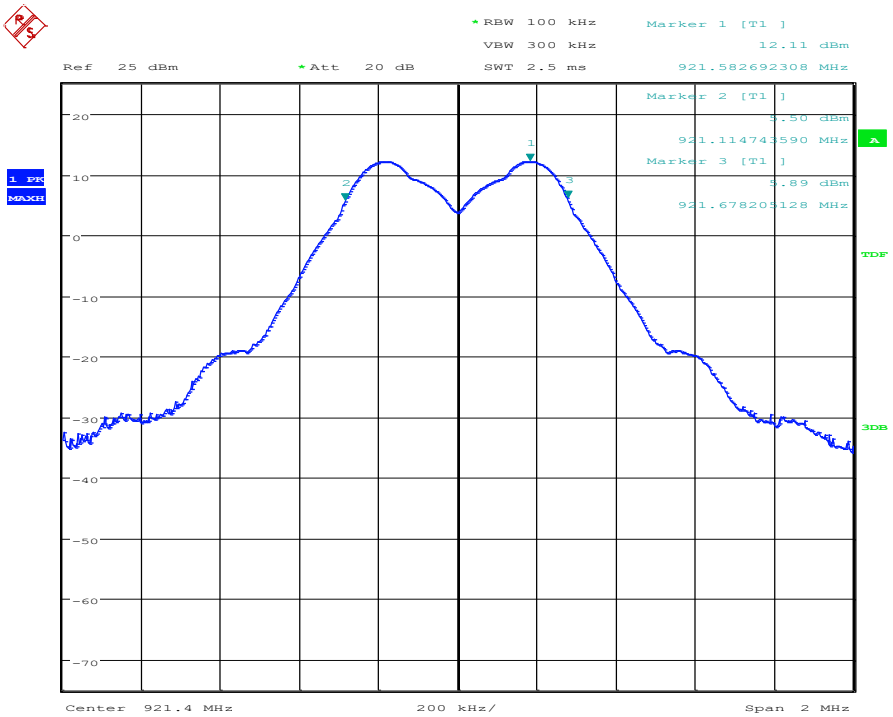
Equipment Type	*Manufacturer*	*Equipment Description*	*Element No*	*Due For Calibration*
FSU26	R&S	Spectrum Analyser	REF909	2025-09-24
40 GHz BW-K20 2W44	Mini Circuits	20dB Attenuator	U790	2025-07-17

13.6 Test Results

Bandwidth Type: 6 dB; Modulation: 2-GFSK;				
Frequency (MHz)	***F_L (MHz)***	***F_H (MHz)***	***Bandwidth (kHz)***	***Result***
915.0	914.7153846	915.2820513	566.666667	Pass
921.4	921.1147436	921.6782051	563.461538	Pass



915.0 MHz



921.4 MHz

14 Maximum peak conducted output power

14.1 Definition

The maximum peak conducted output power is defined as the maximum power level measured with a peak detector using a filter with width and shape of which is sufficient to accept the signal bandwidth.

14.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	Radio Laboratory
Test Standard and Clause:	ANSI C63.10-2020, Clause 11.9.1
EUT Frequencies Measured:	915.0 MHz, 921.4 MHz
Deviations From Standard:	None
Measurement BW:	N/A Power meter used
Spectrum Analyzer Video BW: (requirement at least 3x RBW)	N/A Power meter used
Measurement Detector:	Peak
Voltage Extreme Environment Test Range:	Battery Power = new battery.

Environmental Conditions (Normal Environment)

Temperature: 22 °C	+15 ºC to +35 ºC (as declared)
Humidity: 55 % RH	20 % RH to 75 % RH (as declared)

14.3 Test Limit

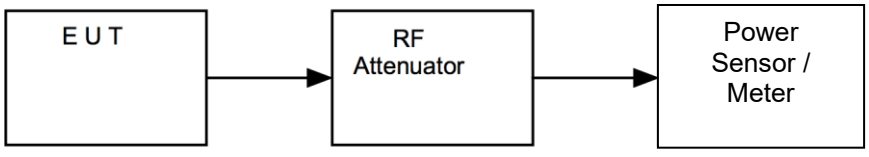
For systems employing digital modulation techniques operating in the bands 902 to 928 MHz, 2400 to 2483.5 MHz and 5725 to 5850 MHz, the maximum peak conducted output power shall not exceed 1 W.

14.4 Test Method

With the EUT setup as per section 9 of this report and connected as per Figure iv, the resolution bandwidth of the spectrum analyser was increased above the EUT occupied bandwidth and the peak emission data noted.

The measurements were performed with EUT set at its maximum duty. All modulation schemes, data rates and power settings were used to observe the worst-case configuration in each bandwidth.

Figure iv Test Setup



14.5 Test Equipment

Equipment Type	*Manufacturer*	*Equipment Description*	*Element No*	*Due For Calibration*
N1922A	Agilent	Power Sensor	REF835	2026-09-05
N1911A	Agilent	Power Meter	REF836	2026-09-04
40 GHz BW-K20 2W44	Mini Circuits	20dB Attenuator	U790	2025-07-17

14.6 Test Results

Modulation: 2-GFSK; Power setting: Default			
Frequency (MHz)	*Maximum peak conducted output power*		*Result*
	(dBm)	*(mW)*	
915.0	14.0	25.12	Pass
921.4	14.1	25.70	Pass

15 Out-of-band and conducted spurious emissions

15.1 Definition

Out-of-band emission.
Emission on a frequency or frequencies immediately outside the necessary bandwidth that results from the modulation process but excluding spurious emissions.

Spurious emission.
Emission on a frequency or frequencies that are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products, and frequency conversion products, but exclude out-of-band emissions.

15.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	Radio Laboratory
Test Standard and Clause:	ANSI C63.10-2020, Clause 11.11
EUT Frequencies Measured:	915.0 MHz / 921.4 MHz
Deviations From Standard:	None
Measurement BW:	100 kHz
Spectrum Analyzer Video BW: (requirement at least 3x RBW)	300 kHz
Measurement Detector:	Peak
Measurement Range:	9 kHz to 10 GHz

Environmental Conditions (Normal Environment)

Temperature: 22 °C	+15 ºC to +35 ºC (as declared)
Humidity: 55 % RH	20 % RH to 75 % RH (as declared)

15.3 Test Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in FCC 47CFR15.209(a).

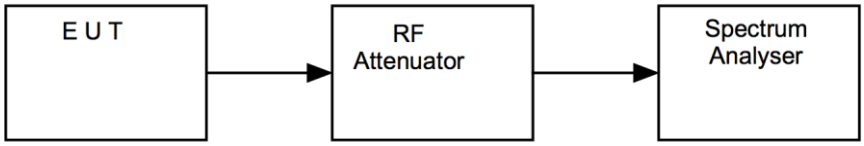
15.4 Test Method

With the EUT setup as per section 9 of this report and connected as per Figure v, the emissions from the EUT were measured on a spectrum analyser.

The measurements were performed with EUT set at 100% maximum duty.

The reference level in a 100 kHz RBW was taken from the highest level seen on the 6 dB bandwidth plots.

Figure v Test Setup

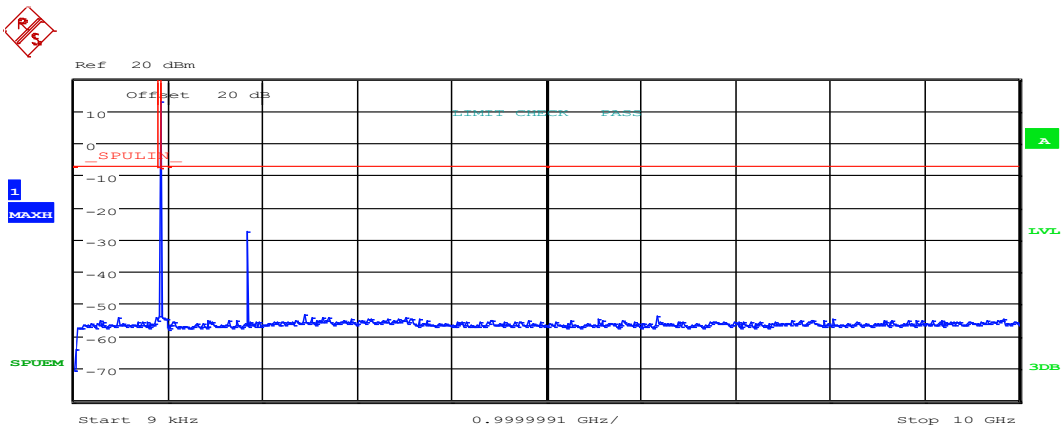


15.5 Test Equipment

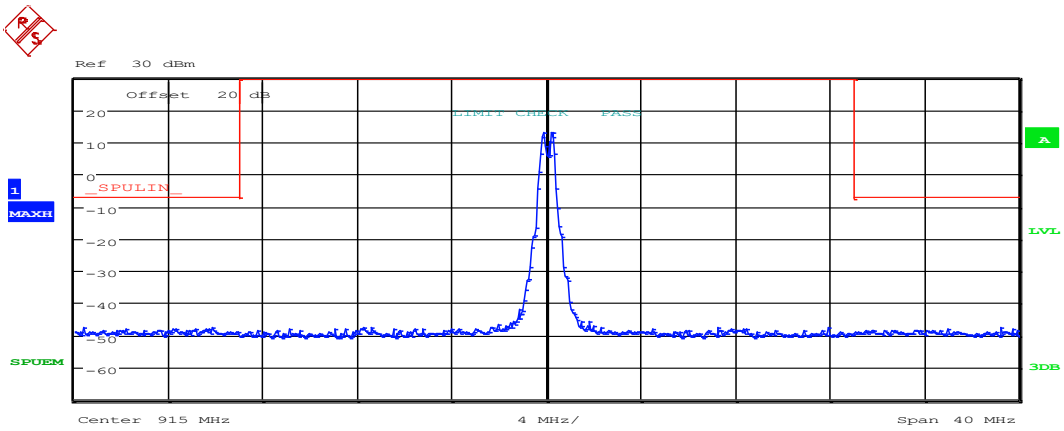
Equipment Type	*Manufacturer*	*Equipment Description*	*Element No*	*Due For Calibration*
FSU26	R&S	Spectrum Analyser	REF909	2025-09-24
40 GHz BW-K20 2W44	Mini Circuits	20dB Attenuator	U790	2025-07-17

15.6 Test Results

Channel	Emission Frequency (MHz)	Analyzer Level (dBm)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
Low	915.0	12.78	12.78	N/A	N/A	Pass
No Significant Emissions within 20 dB of the limit						

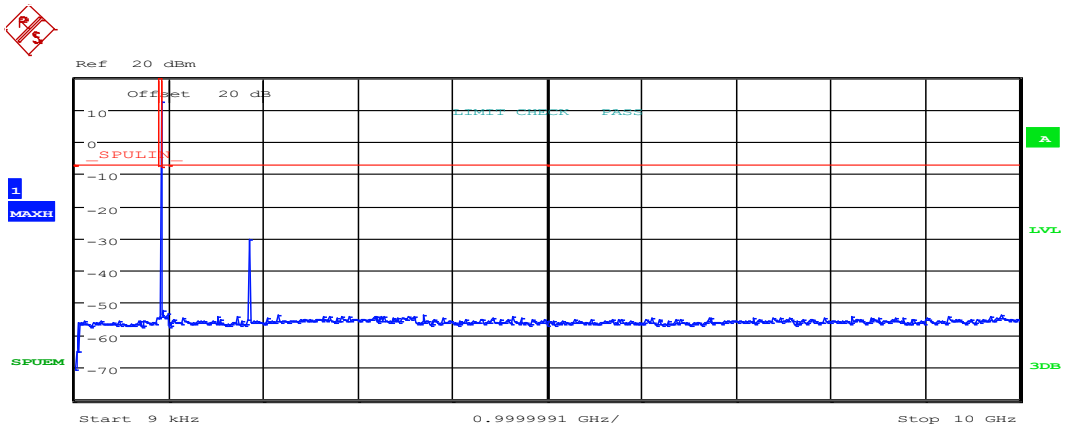


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
9.000 k	150.000 k	1.00 k	66.168269 k	-70.95	-63.75
150.000 k	30.000 M	10.00 k	154.975000 k	-64.33	-57.13
30.000 M	902.000 M	100.00 k	457.628800 M	-54.20	-47.00
902.000 M	928.000 M	100.00 k	914.792000 M	12.71	-17.29
928.000 M	1.000 G	100.00 k	931.168000 M	-54.33	-47.13
1.000 G	5.000 G	100.00 k	1.829600 G	-27.79	-20.59
5.000 G	10.000 G	100.00 k	6.165667 G	-54.05	-46.85

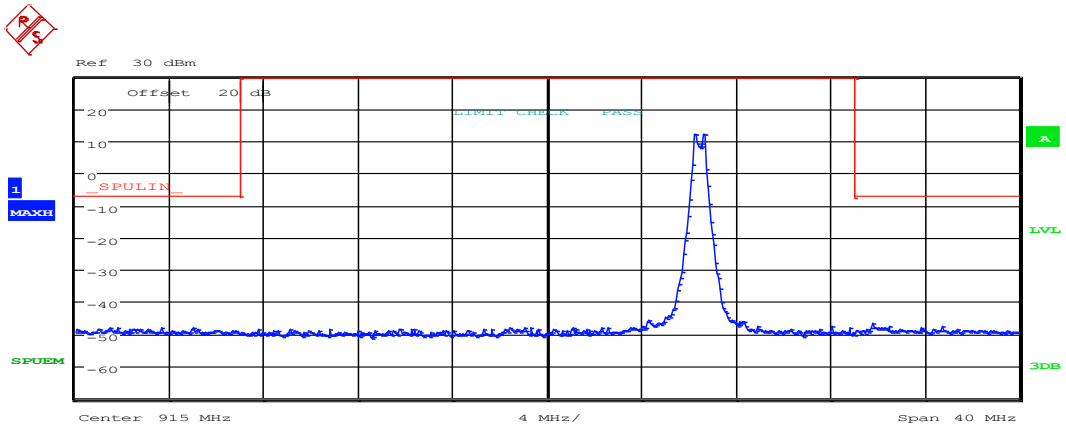


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
895.000 M	902.000 M	100.00 k	900.823200 M	-47.73	-40.53
902.000 M	928.000 M	100.00 k	914.792000 M	12.67	-17.33
928.000 M	935.000 M	100.00 k	934.253333 M	-47.73	-40.53

Channel	Emission Frequency (MHz)	Analyzer Level (dBm)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
High	915.0	12.78	12.78	N/A	N/A	Pass
No Significant Emissions within 20 dB of the limit						



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
9.000 k	150.000 k	1.00 k	58.485577 k	-70.67	-63.47
150.000 k	30.000 M	10.00 k	199.750000 k	-65.08	-57.88
30.000 M	902.000 M	100.00 k	873.547886 M	-54.95	-47.75
902.000 M	928.000 M	100.00 k	921.240000 M	12.03	-17.97
928.000 M	1.000 G	100.00 k	928.960000 M	-52.33	-45.13
1.000 G	5.000 G	100.00 k	1.842400 G	-30.51	-23.31
5.000 G	10.000 G	100.00 k	9.800833 G	-53.74	-46.54



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
895.000 M	902.000 M	100.00 k	896.482800 M	-48.00	-40.80
902.000 M	928.000 M	100.00 k	921.604000 M	12.06	-17.94
928.000 M	935.000 M	100.00 k	928.807333 M	-46.90	-39.70

16 Power spectral density

16.1 Definition

The power per unit bandwidth.

16.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	Radio Labatory
Test Standard and Clause:	ANSI C63.10-2020, Clause 11.10
EUT Frequencies Measured:	915.0 MHz, 921.4 MHz
Deviations From Standard:	None
Measurement BW:	3 kHz
Spectrum Analyzer Video BW: (requirement at least 3x RBW)	10 kHz
Measurement Span: (requirement 1.5 times Channel BW)	850 kHz
Measurement Detector:	Peak

Environmental Conditions (Normal Environment)

Temperature: 22 °C	+15 ºC to +35 ºC (as declared)
Humidity: 55 % RH	20 % RH to 75 % RH (as declared)

16.3 Test Limit

For equipment operating in the bands 902 - 928 MHz and 2400 - 2483.5 MHz the transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

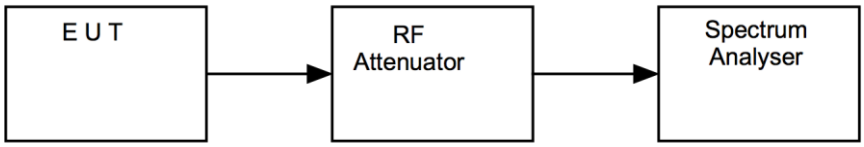
For equipment operating in the band 5725 - 5850 MHz the output power spectral density shall not exceed 30 dBm in any 500 kHz band

16.4 Test Method

With the EUT setup as per section 9 of this report and connected as per the test set-up diagram below, the peak emission of the EUT was measured on a spectrum analyser, with path losses taken into account.

The measurements were performed with EUT set at its maximum duty. All modulation schemes, data rates and power settings were used to observe the worst case configuration in each bandwidth.

Test Set-up Diagram

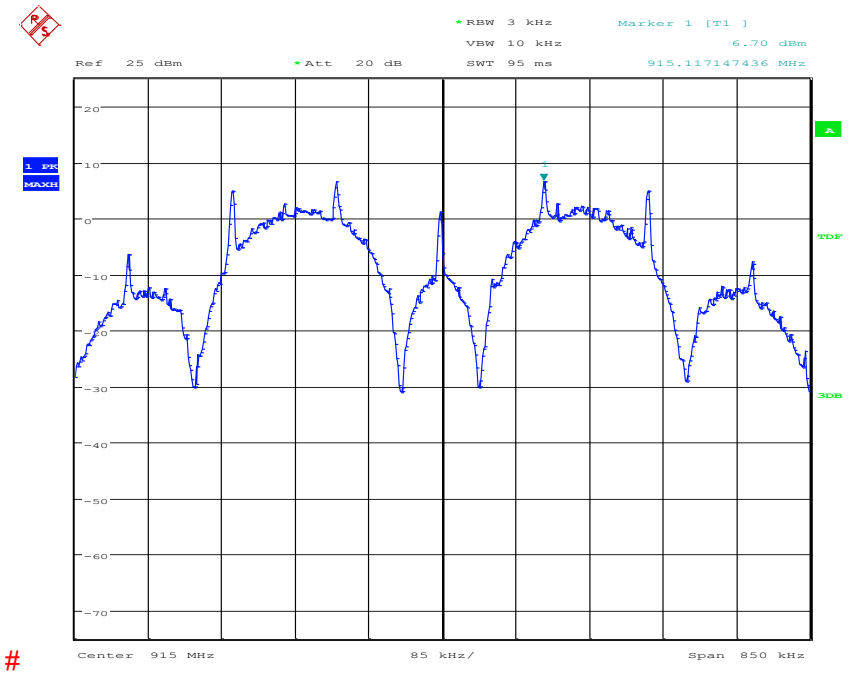


16.5 Test Equipment

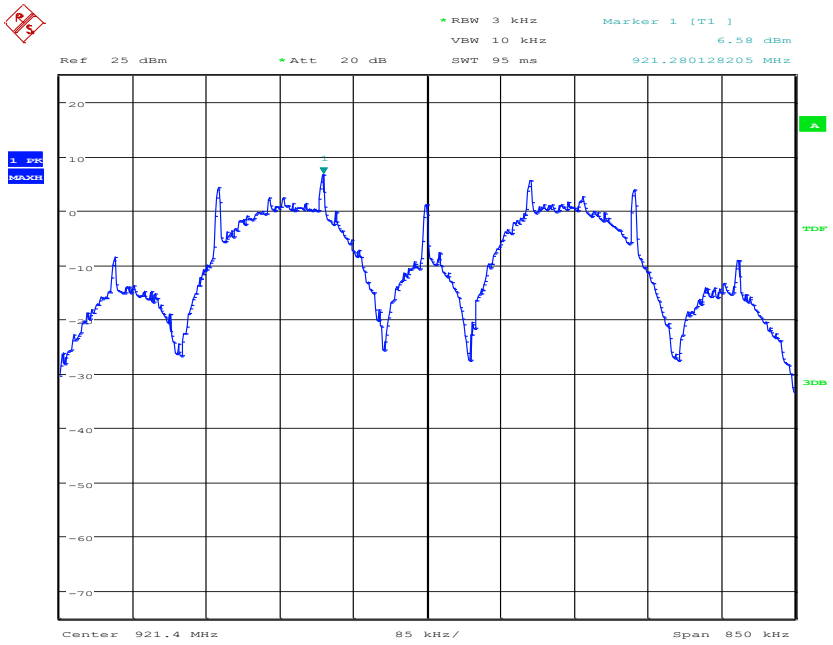
Equipment Type	*Manufacturer*	*Equipment Description*	*Element No*	*Due For Calibration*
FSU26	R&S	Spectrum Analyser	REF909	2025-09-24
40 GHz BW-K20 2W44	Mini Circuits	20dB Attenuator	U790	2025-07-17

16.6 Test Results

Modulation: 2-GFSK				
Frequency (MHz)	***Analyser level (dBm)***	***Cable Loss (dB)***	***PSD (dBm)***	***Result***
915	-13.30	20.00	6.70	Pass
921.4	-13.42	20.00	6.58	Pass



915.0 MHz



921.4 MHz

17 Duty Cycle

17.1 Definition

The ratio of the sum of all pulse durations to the total period, during a specified period of operation.

17.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	EMC Chamber 1 (SK01)
Test Standard and Clause:	ANSI C63.10-2020, Clause 7.5
EUT Frequency Measured:	915.0 MHz
EUT Channel loading:	Maximum in normal use
Deviations From Standard:	None
Temperature Extreme Environment Test Range:	N/A
Voltage Extreme Environment Test Range:	N/A

Environmental Conditions (Normal Environment)

Temperature: 19 °C	+15 ºC to +35 ºC (as declared)
Humidity: 49 % RH	20 % RH to 75 % RH (as declared)

17.3 Test Limit

N/A.

17.4 Test Method

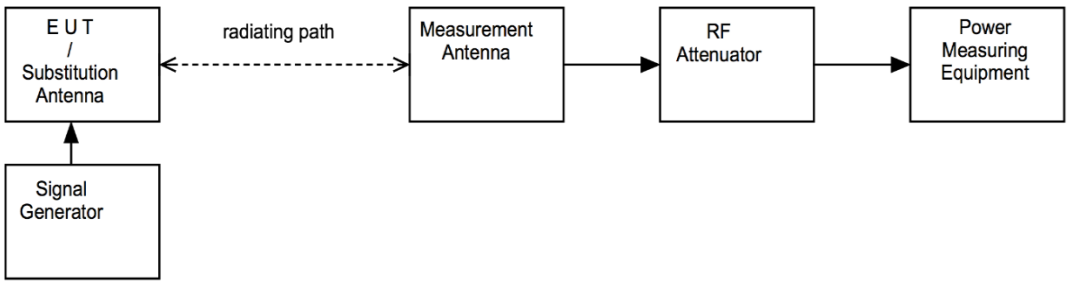
With the EUT setup as per section 9 of this report and connected as per Figure vii, the duty of the EUT was calculated from the sum of total on and off times over the observation period.

The measurements were performed with EUT set at its maximum duty. All modulation schemes, bandwidths, data rates and power settings were used to observe the worst-case configuration.

[1] Single antenna output devices at a distance of 3 m.

The duty cycle is used to determine the time average power used for the RF exposure assessment.

Figure vii Test Setup

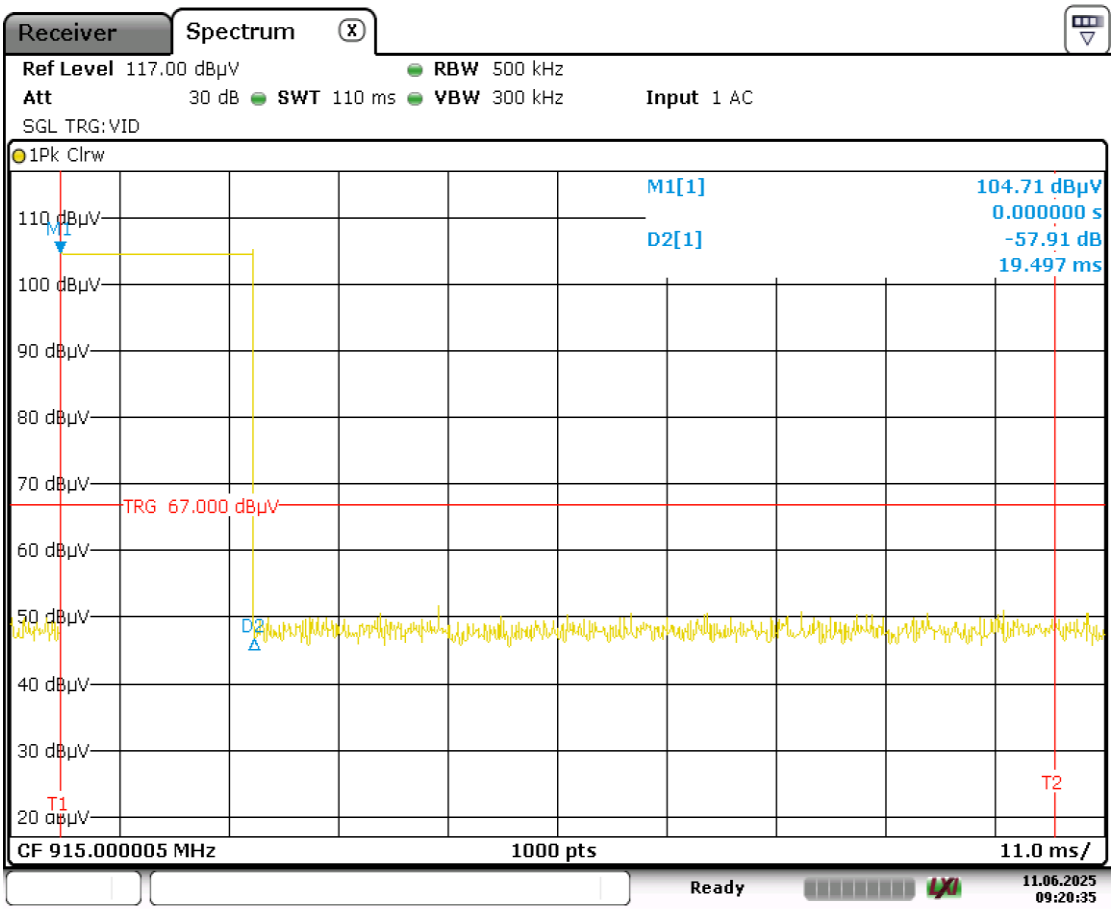


17.5 Test Equipment

Equipment Type	*Manufacturer*	*Equipment Description*	*Element No*	*Due For Calibration*
ESR7	R&S	EMI Receiver	U456	2026-03-26
CBL611/B	Chase	Bilog	U573	2026-11-04
LNA6901	AMETEK	Pre Amp	U711	2026-04-24

17.6 Test Results

Test Environment		*Single Channel TxOn time (ms)*	*Total TxOn time (ms)*	*Observation period (ms)*	*Duty (%)*
$V_{nominal}$	$T_{nominal}$	19.497	19.497	100	19.5



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18 Measurement Uncertainty Schedule

Radio Testing – General Uncertainty Schedule

All statements of uncertainty are expanded standard uncertainty using a coverage factor of 1.96 to give a 95 % confidence where no required test level exists.

Test/Measurement	***Budget Number***	***MU***
Conducted RF Power, Power Spectral Density, Adjacent Channel Power and Spurious emissions		
Absolute RF power (via antenna connecter) Sampling Power Meter to 8 GHz	MU4001	**0.9 dB**
Carrier Power and PSD - Spectrum Analysers	MU4004	**1.7 dB**
Adjacent Channel Power	MU4002	**1.9 dB**
Transmitter conducted spurious emissions (Including emissions due to intermodulation)	MU4041	**0.9 dB**
Conducted power and spurious emissions 40 GHz to 50 GHz	MU4042	**2.4 dB**
Conducted power and spurious emissions 50 GHz to 75 GHz	MU4043	**2.5 dB**
Conducted power and spurious emissions 75 GHz to 110 GHz	MU4044	**2.4 dB**
Input and output intermodulation	MU4053	**1.6 dB**
Radiated RF Power and Spurious emissions ERP and EIRP		
Effective Radiated Power Reverb Chamber	MU4020	**3.7 dB**
Effective Radiated Power	MU4021	**4.7 dB**
TRP Emissions 30 MHz to 1 GHz using CBL6111 or CBL6112 Bilog Antenna	MU4046	**5.3 dB**
TRP Emissions 1 GHz to 18 GHz using HL050 Log Periodic Antenna	MU4047	**5.1 dB**
TRP Emissions 18 GHz to 26.5 GHz using Standard Gain Horn	MU4048	**2.7 dB**
TRP Emissions 26.5 GHz to 40 GHz using Standard Gain Horn	MU4049	**2.7 dB**
In-band (3450-3980 MHz) TRP using CATR_ASH_B2	MU4051	**4.1 dB**
Cellular Effective radiated RF power in a SAC between 30 MHz to 180 MHz	MU4052	**6.3 dB**
Cellular Effective radiated RF power in a SAC between 180 MHz to 1 GHz	MU4052	**3.5 dB**
Cellular Effective radiated RF power in a SAC between 1 GHz and 18 GHz	MU4052	**2.8 dB**
Cellular Effective radiated RF power in a SAC between 18 GHz to 26 GHz	MU4052	**2.8 dB**
Cellular Effective radiated RF power in a FAR between 30 MHz to 180 MHz	MU4052	**5.4 dB**
Cellular Effective radiated RF power in a FAR between 180 MHz to 1 GHz	MU4052	**2.9 dB**
Cellular Effective radiated RF power in a FAR between 1 GHz and 18 GHz	MU4052	**2.6 dB**
Cellular Effective radiated RF power in a FAR between 18 GHz to 26 GHz	MU4052	**2.7 dB**
Spurious Emissions Electric and Magnetic Field		
Radiated Spurious Emissions 30 MHz to 1 GHz (Including emissions due to intermodulation)	MU4037	**4.7 dB**
Radiated Spurious Emissions 1-18 GHz (Including emissions due to intermodulation)	MU4032	**4.5 dB**
E Field Emissions 18 GHz to 26 GHz	MU4024	**3.2 dB**
E Field Emissions 26 GHz to 40 GHz	MU4025	**3.3 dB**
E Field Emissions 40 GHz to 50 GHz	MU4026	**3.5 dB**

Test/Measurement	*Budget Number*	*MU*
E Field Emissions 50 GHz to 75 GHz	MU4027	**3.6 dB**
E Field Emissions 75 GHz to 110 GHz	MU4028	**3.6 dB**
Radiated Magnetic Field Emissions	MU4031	**2.3 dB**
Frequency Measurements		
Frequency Deviation	MU4022	**3.7 kHz**
Frequency error using CMTA test set	MU4023	**113.441 Hz**
Frequency error using GPS locked frequency source	MU4045	**0.0413 ppm**
Bandwidth/Spectral Mask Measurements		
Channel Bandwidth	MU4005	**3.87%**
Transmitter Mask Amplitude	MU4039	**1.3 dB**
Transmitter Mask Frequency	MU4040	**2.59%**
Time Domain Measurements		
Transmission Time	MU4038	**4.40%**
Dynamic Frequency Selection (DFS) Parameters)		
DFS Analyser - Measurement Time	MU4006	**678.984 µs**
DFS Generator - Frequency Error	MU4007	**91.650 Hz**
DFS Threshold Conducted	MU4008	**1.3 dB**
DFS Threshold Radiated	MU4009	**3.2 dB**
Receiver Parameters		
EN 300 328 Receiver Blocking	MU4010	**1.1 dB**
EN 301 893 Receiver Blocking	MU4011	**1.1 dB**
EN 303 340 Adjacent Channel Selectivity	MU4012	**1.1 dB**
EN 303 340 Overloading	MU4013	**1.1 dB**
EN 303 340 Receiver Blocking	MU4014	**1.1 dB**
EN 303 340 Receiver Sensitivity	MU4015	**0.9 dB**
EN 303 372-1 Image Rejection	MU4016	**1.4 dB**
EN 303 372-1 Receiver Blocking	MU4017	**1.1 dB**
EN 303 372-2 Adjacent Channel Selectivity	MU4018	**1.1 dB**
EN 303 372-2 Dynamic Range	MU4019	**0.9 dB**
Receiver Blocking Talk Mode Conducted	MU4033	**1.2 dB**
Receiver Blocking Talk Mode- radiated	MU4034	**3.4 dB**
Rx Blocking, listen mode, blocking level	MU4035	**3.2 dB**
Rx Blocking, listen mode, radiated Threshold Measurement	MU4036	**3.4 dB**
Adjacent Sub Band Selectivity	MU4003	**4.2 dB**

Test/Measurement	*Budget Number*	*MU*
Rohde & Schwarz TS8997		
Carrier frequency	MU4050	**5.2 ppm**
RF Output Power	MU4050	**1.0 dB**
Peak Power	MU4050	**0.8 dB**
Power Spectral Density	MU4050	**1.0 dB**
Occupied Channel Bandwidth	MU4050	**2.08 %**
Transmitter unwanted emissions in-band	MU4050	**0.9 dB**
Transmitter unwanted emissions in the spurious domain 30 MHz to 1 GHz	MU4050	**0.6 dB**
Transmitter unwanted emissions in the spurious domain 1 GHz to 12.75 GHz	MU4050	**1.8 dB**
Receiver Spurious emission 30 MHz to 1 GHz	MU4050	**0.6 dB**
Receiver Spurious emission 1 GHz to 12.75 GHz	MU4050	**1.8 dB**
Duty Cycle	MU4050	**0.02 %**
Tx Sequence	MU4050	**0.02 %**
Tx Gap	MU4050	**0.02 %**
Medium Utilisation	MU4050	**0.1 %**
Accumulated Transmit Time	MU4050	**0.01 %**
Minimum Frequency Occupation Time	MU4050	**0.01 %**
Hopping Frequency Separation	MU4050	**0.6 %**
Adjacent Channel Selectivity / Receiver blocking (for bit streams)	MU4050	**3.0 dB**
Generated signal level: Channel Access Mechanism / DFS / Contention Based Protocol	MU4050	**1.8 dB**

19 RF Exposure

OVERVIEW

Section 1.3 of KDB 44798 D04 v01 states that, “Under the new rules, all radio services and operations are subject to Routine Evaluation [§§ 1.1307(b)(1), 2.1033(f), etc.], unless shown to qualify under the exemptions provided in the rules and OET Lab policies for equipment authorization.”

The glossary of KDB 447498 D04 v01 specifies that an exempt RF device is defined “solely from the obligation to perform a routine environmental evaluation to demonstrate compliance with the RF exposure limits in § 1.1310; it is not exemption from the equipment authorization procedures described in 47 CFR Part 2, not exemption from general obligations of compliance with the RF exposure limits in § 1.1310 of this chapter, and not exemption from determination of whether there is no significant effect on the quality of the human environment under § 1.1306.” Compliance with the exemption criteria defined in 1.1307(b) confirm compliance with the limits in § 1.1310.

COMPLIANCE WITH FCC 1.1310

Per 1.1307(b)(3), (i) For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

$$P_{th}(\text{mW}) = \begin{cases} \text{ERP}_{20\text{ cm}}(\text{d}/20\text{ cm})^{\text{x}} & \text{d} \leq 20\text{ cm} \\ \text{ERP}_{20\text{ cm}} & 20\text{ cm} < \text{d} \leq 40\text{ cm} \end{cases}$$

Where

$$\text{x} = -\log_{10}\left(\frac{60}{\text{ERP}_{20\text{ cm}}\sqrt{\text{f}}}\right) \text{ and f is in GHz;}$$

And

$$\text{ERP}_{20\text{ cm}}(\text{mW}) = \begin{cases} 2040\text{f} & 0.3\text{ GHz} \leq \text{f} < 1.5\text{ GHz} \\ 3060 & 1.5\text{ GHz} \leq \text{f} \leq 6\text{ GHz} \end{cases}$$

(C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least λ/2π, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of λ/4 or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

TABLE 1 TO §1.1307(b)(3)(i)(C)—SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

(ii) For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those is paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).

(B) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{\text{Evaluated}_k}{\text{Exposure Limit}_k} \leq 1$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for P_{th}, including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

$P_{th,i}$ = the exemption threshold power (P_{th}) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i.

ERP_j = the ERP of fixed, mobile, or portable RF source j.

$ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least $\lambda/2\pi$ according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

$Evaluated_k$ = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

$Exposure\ Limit_k$ = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k, as applicable from §1.1310

The relationship between EIRP and ERP is:

$$\text{ERP (dBm)} = \text{EIRP (dBm)} - 2.14\ \text{dB}$$

Where EIRP is the sum of the conducted power (dBm) and the antenna gain (dBi).

ASSESSMENT

The exemption from RF exposure evaluation is summarized in the following table:

Radio	Transmit Frequency (MHz)	Conducted Output Power (dBm)	Power Tolerance (dB)	Duty Cycle (%)	Antenna Assembly Gain (dBi)	Minimum Separation Distance (cm)	Calculated Radiated Exposure Power (mW) ERP	Calculated Conducted Exposure Power (mW)	Limit (mW)	Compliant
DSSS	921.4	15.0	N/A	19.5	2.4	0.5	6.5	6.2	8.1	yes
DSSS	915.0	15.0	N/A	19.5	2.4	0.5	6.5	6.2	8.1	yes

The information in the table above was obtained from:
The rated value was used in these calculations.