

Report on the Radio Testing
For
AGD Systems Ltd
on
343
Report no. TRA-039734-47-01B
26 March 2019

Report Number: TRA-039734-47-01B
Issue: B

REPORT ON THE RADIO TESTING OF A
AGD Systems Ltd
343
WITH RESPECT TO SPECIFICATION
FCC 47CFR 15.245

TEST DATE: 11th - 20th February 2019

Written by:

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Date: 26 March 2019



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

1 Revision Record

<i>Issue Number</i>	<i>Issue Date</i>	<i>Revision History</i>
A	13 th March 2019	Original
B	26 March 2019	Typographical corrections

2 Summary

TEST REPORT NUMBER:	TRA-039734-47-01B
WORKS ORDER NUMBER:	TRA-039734-04
PURPOSE OF TEST:	USA: Testing of radio frequency equipment per the relevant authorization procedure of chapter 47 of CFR (code of federal regulations) Part 2, subpart J.
TEST SPECIFICATION(S):	47CFR15.245
EQUIPMENT UNDER TEST (EUT):	343
FCC IDENTIFIER:	WH3343501
EUT SERIAL NUMBER:	111913-0001
MANUFACTURER/AGENT:	AGD Systems Ltd
ADDRESS:	White Lion House Gloucester Road Staverton Cheltenham Gloucestershire GL51 0TF United Kingdom
CLIENT CONTACT:	Richard Ellis   richard.ellis@agd-systems.com
TEST DATE:	11th - 20th February 2019
TESTED BY:	D Winstanley Element

2.1 Test Summary

<i>Test Method and Description</i>	<i>Requirement Clause 47CFR15</i>	<i>Applicable to this equipment</i>	<i>Result / Note</i>
Radiated spurious emissions	15.245(b)	<input checked="" type="checkbox"/>	Pass
AC power line conducted emissions	15.207	<input checked="" type="checkbox"/>	Pass
Occupied bandwidth	15.215(c)	<input checked="" type="checkbox"/>	Pass
Field strength of fundamental	15.245(b)	<input checked="" type="checkbox"/>	Pass
Calculation of duty correction	15.35(c)	<input type="checkbox"/>	N/A

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).

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4 Introduction

This report TRA-039734-47-01B presents the results of the Radio testing on a AGD Systems Ltd, 343 to specification 47CFR15 Radio Frequency Devices.

The testing was carried out for AGD Systems Ltd by Element, at the addresses detailed below.

<input checked="" type="checkbox"/>	Element Hull Unit E South Orbital Trading Park Hedon Road Hull HU9 1NJ UK	<input checked="" type="checkbox"/>	Element Skelmersdale Unit 1 Pendle Place Skelmersdale West Lancashire WN8 9PN UK
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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 UKAS 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:

Element is accredited for the above sites under the US-EU MRA, Designation number UK0009.

IC Registration Number(s):

Element North West 3930B

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

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 C63.10-2013 – 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.

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: 343
- Serial Number: 111913-0001
- Model Number: 343-501-000
- Software Revision: MI-198Pver 1
- Build Level / Revision Number: 1

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

7.3.1 Transmission

The mode of operation for transmit tests was as follows:-

On Power up the unit transmits a FMCW centered on 24.125 GHz

7.4 EUT Radio Parameters

7.4.1 General

Frequency of operation:	24.125 GHz
Modulation type(s):	FMCW
Occupied channel bandwidth(s):	45 MHz
Channel spacing:	Wideband
Declared output power(s):	Maximum EIRP 27 dBm
Nominal Supply Voltage:	12 Vdc- 30 Vdc
Duty cycle:	100%

7.5 EUT Description

The EUT is a speed monitoring radar.

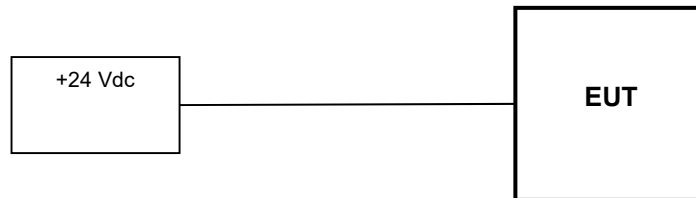
8 Modifications

No modifications were performed during this assessment.

9 EUT Test Setup

9.1 Block Diagram

The following diagram shows basic EUT interconnections:



9.2 General Set-up Photograph

The following photograph shows basic EUT set-up:



10 General Technical Parameters

10.1 Normal Conditions

The E U T was tested under the normal environmental conditions of the test laboratory, except where otherwise stated. The normal power source applied was 24 V dc from a bench top power supply. The nominal voltage range is 12 Vdc – 30 Vdc.

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 (refer to section 7.4).

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
<input checked="" type="checkbox"/>	Power Supply	12 Vdc - 30 Vdc	85 % and 115 %

11 Radiated emissions

11.1 Definitions

Out-of-band emissions

Emissions on a frequency or frequencies immediately outside the necessary bandwidth which result from the modulation process, but exclude spurious emissions.

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 / Element Hull
Test Chamber:	Radio Chamber
Test Standard and Clause:	ANSI C63.10-2013, Clause 6.5 and 6.6
EUT Frequencies Measured:	24.125 GHz
EUT Channel Bandwidths:	45 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 °C to +35 °C (as declared)
Humidity: 48 % RH	20 % RH to 75 % RH (as declared)
Supply: 12 Vdc	

11.3 Test Limit

The average field strength of emissions measured at 3m shall not exceed:

- (a) 2500 mV/m for fundamental emission; and
- (b) 25 mV/m for harmonic emissions for devices operating in the 24.075-24.175 GHz band

Harmonic emissions falling into restricted bands n and which are below 17.7 GHz shall meet the general field strength limits.

Harmonic emissions falling into restricted bands which are at and above 17.7 GHz shall not exceed the following strength limits measured at a distance of 3 m:

- (a) 25 mV/m for the second and third harmonic emissions of devices operating in the band 24.075-24.175 GHz; and
- (b) 7.5 mV/m for all other devices.

Emissions radiated outside of these specified operating frequency bands, except for harmonic emissions, shall be attenuated by at least 50 dB below the level of the fundamental emissions or to the general field strength limits specified, whichever is less stringent.

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

<i>Frequency (MHz)</i>	<i>Field Strength (μV/m at 3 m)</i>
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

n.b. peak limit is 20 dB above average.

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 dB μ V/m at the regulatory distance, using:

$$FS = PR + CL + AF - PA + DC - CF$$

Where,

PR is the power recorded on the receiver / spectrum analyzer in dB μ V;

CL is the cable loss in dB;

AF is the test antenna factor in dB/m;

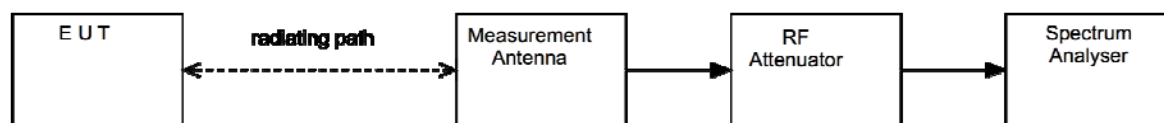
PA is the pre-amplifier gain in dB (where used);

DC is the duty correction factor in dB (where used, e.g. harmonics of pulsed fundamental);

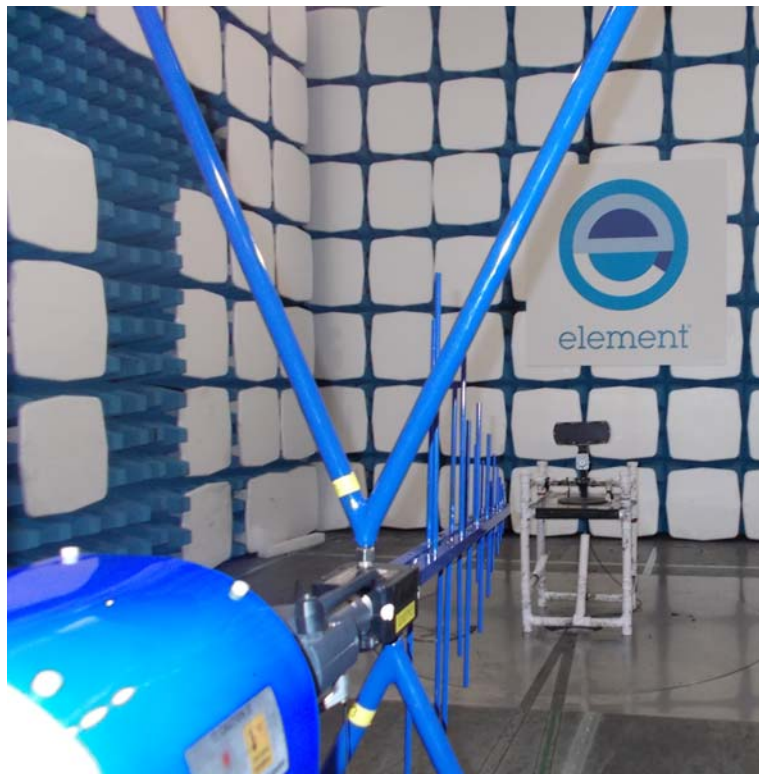
CF is the distance factor in dB (where measurement distance different to limit distance);

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

Figure i Test Setup



Test Set-up Photograph

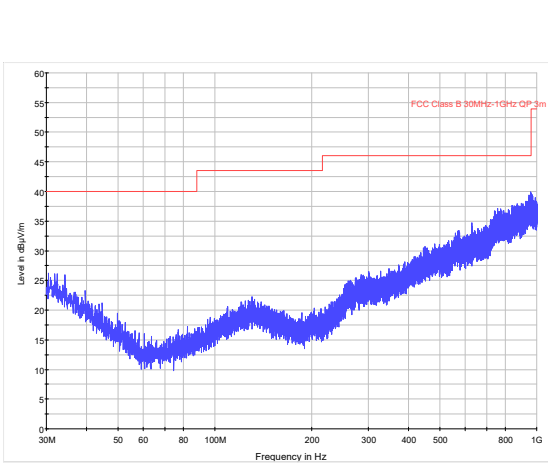


11.5 Test Equipment

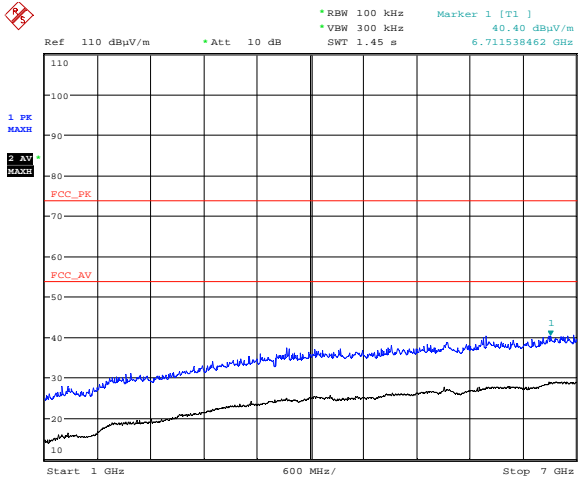
Equipment Type	Manufacturer	Equipment Description	Element No	Due For Calibration
8449B	Agilent	Pre-Amp (1 – 26.5GHz)	REF913	2020-02-06
310	Sonoma	Pre-Amp (9kHz – 1GHz)	REF927	2019-05-22
3115	EMCO	Horn Antenna	RFG129	2020-02-12
QSH20S20S	Q-Par	Horn Antenna	RFG629	2019-09-26
CBL6111B	Chase	Bilog Antenna	REF2233	2020-08-17
ATS	Rainford	Ferrite Lined Chamber	REF886	2020-07-29
ESU40	R&S	Receiver	RFG701	2019-12-18
ESW26	R&S	EMI Test Receiver	REF2235	2019-07-23
11970Q	Agilent	Harmonic Mixer (33-50)	U365	2019-05-05
11970V	Agilent	Harmonic Mixer (50-75)	U366	2019-05-04
11970W	Agilent	Harmonic Mixer (75-110)	U367	2019-05-17
25240-20	Flann	Standard Gain Horn (50-75)	U368	2019-05-05
27240-20	Flann	Standard Gain Horn (75-110)	U369	2019-05-04
23240-20	Flann	Standard Gain Horn (33-50)	L264A	2019-05-17
N9030A	Agilent	Spectrum Analyser	REF2167	2019-07-25

11.6 Test Results

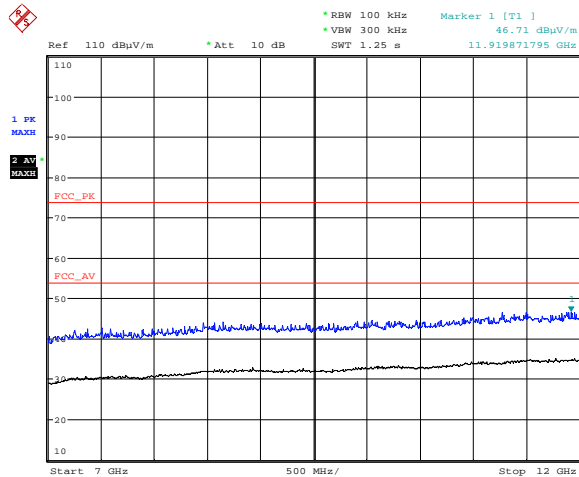
Detector	Freq. (MHz)	Meas'd Emission (dBμV)	Cable Loss (dB)	Antenna Factor (dB/m)	Pre-amp Gain (dB)	Duty Cycle Corr'n (dB)	Distance Extrap'n Factor (dB)	Field Strength (dBμV/m)	Field Strength (μV/m)	Limit (μV/m)
Radiated Spurious Emission investigations have been performed up to 100 GHz, No Significant Emissions Within 20 dB of Limit or above the measurement system noise floor found										



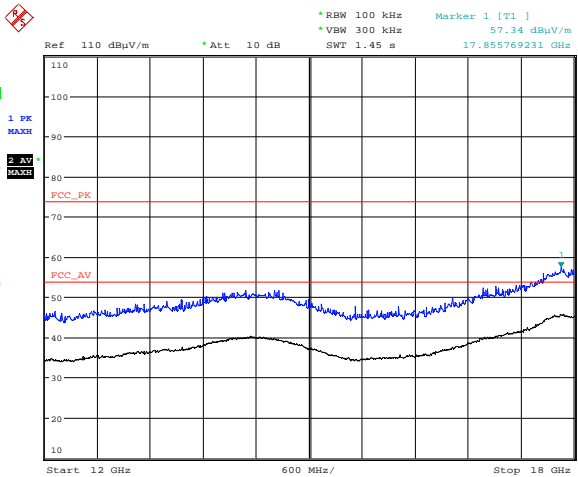
30 MHz - 1GHz



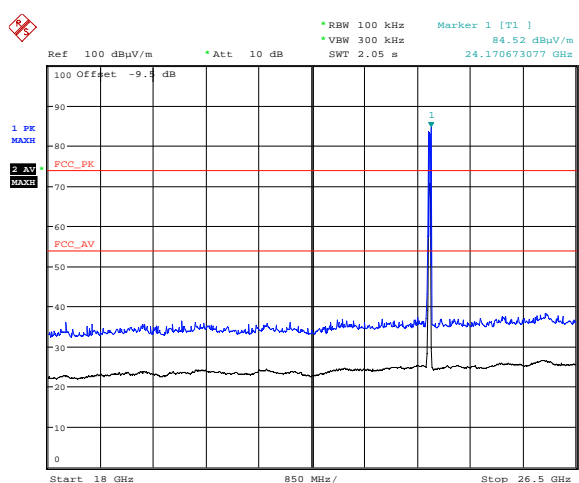
1 GHz – 7 GHz



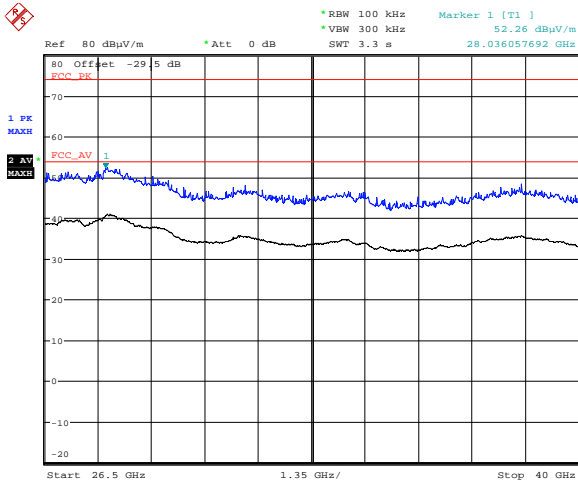
7 GHz – 12 GHz



12 GHz – 18 GHz



18 GHz – 26.5 GHz



26.5GHz – 40 GHz

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:	Screen Room 2
Test Standard and Clause:	ANSI C63.10-2013, Clause 6.2
EUT Frequency Measured:	24.125 GHz
Deviations From Standard:	None
Measurement Detectors:	Quasi-Peak and Average

Environmental Conditions (Normal Environment)

Temperature: 21 °C	+15 °C to +35 °C (as declared)
Humidity: 27 % 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 (dB μ V)	
	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.

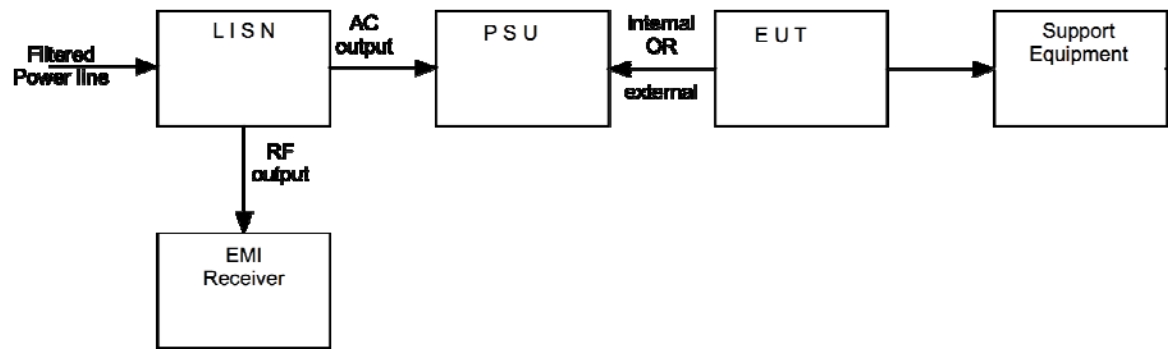
12.4 Test Method

With the EUT setup in a screened room, 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



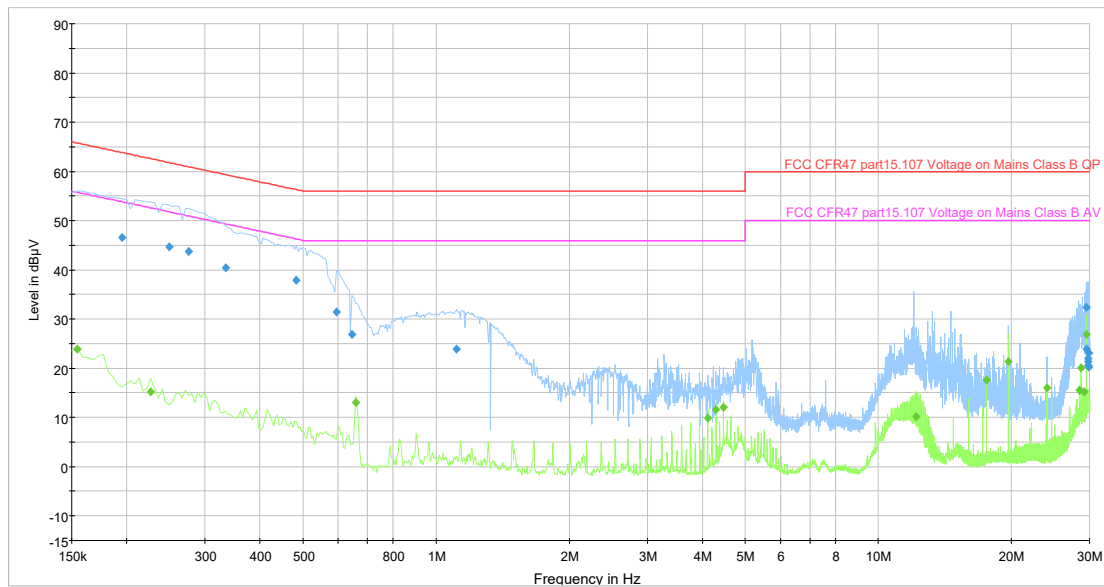
12.5 Test Set-up Photograph

12.6 Test Equipment

Equipment Description	Manufacturer	Equipment Type	Element No	Due For Calibration
Receiver	R&S	ESHS10	U003	2019-09-21
Lisn	R&S	ESH3-Z5.831.5	U195	2019-09-12
Pulse Limiter	R&S	ESH3-Z2	U443	2019-10-03

12.7 Test Results

AC power-line conducted emissions, Transmit mode						
Results measured using the average detector						
Reference Number	Frequency (MHz)	Conductor	Result (dBuV)	Specification Limit (dBuV)	Margin (dB)	Result Summary
1	19.689000	L1	21.3	50.0	28.7	PASS
2	28.671000	L1	20.2	50.0	29.8	PASS
3	29.530500	L1	26.9	50.0	23.1	PASS
Results measured using the quasi-peak detector						
Reference Number	Frequency (MHz)	Conductor	Result (dBuV)	Specification Limit (dBuV)	Margin (dB)	Result Summary
1	0.195000	N	46.5	63.8	17.3	PASS
2	0.249000	N	44.7	61.8	17.1	PASS
3	0.276000	N	43.7	60.9	17.2	PASS
4	0.334500	N	40.5	59.3	18.8	PASS
5	0.483000	L1	38.0	56.3	18.3	PASS



13 Occupied Bandwidth

13.1 Definitions

Occupied bandwidth

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to 0.5 % of the emitted power. This is also known as the 99 % *emission bandwidth*. For transmitters in which there are multiple carriers, contiguous or non-contiguous in frequency, the occupied bandwidth is to be the sum of the occupied bandwidths of the individual carriers.

20 dB / 40 dB bandwidth

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.

13.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	Radio Chamber
Test Standard and Clause:	ANSI C63.10-2013, Clause 6.9
Deviations From Standard:	None
Measurement BW:	1 MHz
Spectrum Analyzer Video BW:	3 MHz
Measurement Span:	150 MHz
Measurement Detector:	Peak

Environmental Conditions (Normal Environment)

Temperature: 23 °C	+15 °C to +35 °C (as declared)
Humidity: 38 % RH	20 % RH to 75 % RH (as declared)
Supply: 24 Vdc	As declared

13.3 Test Limit

ISED:

The frequency stability shall be sufficient to ensure that the 40 dB bandwidth stays within the operating frequency band when tested at the temperature and supply voltage variations specified the frequency stability measurement in RSS-Gen.

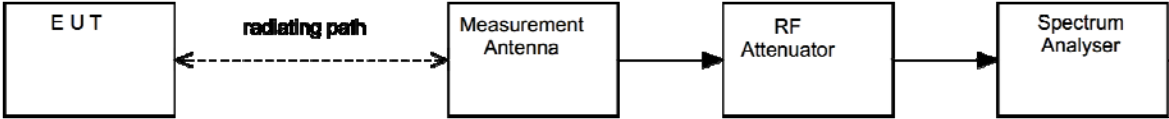
FCC:

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

13.4 Test Method

With the EUT connected as per Figure iii, the bandwidth of the EUT was measured on a spectrum analyser.

Figure iii Test Setup

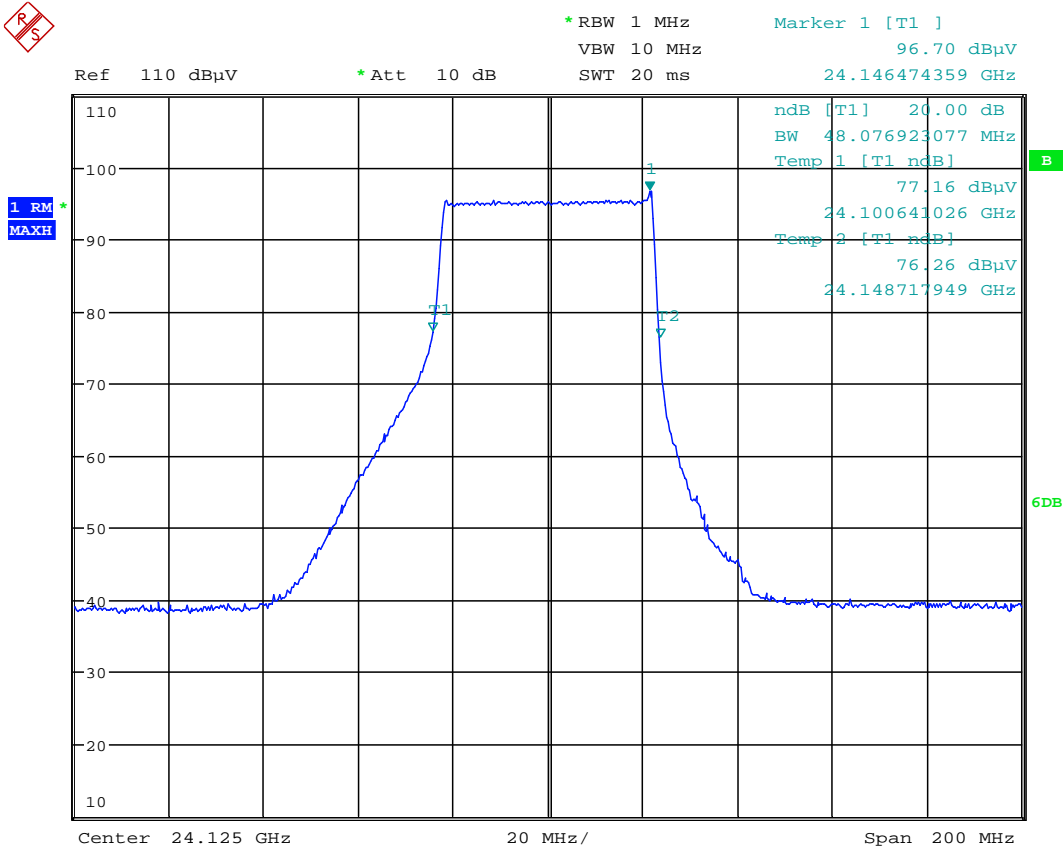


13.5 Test Equipment

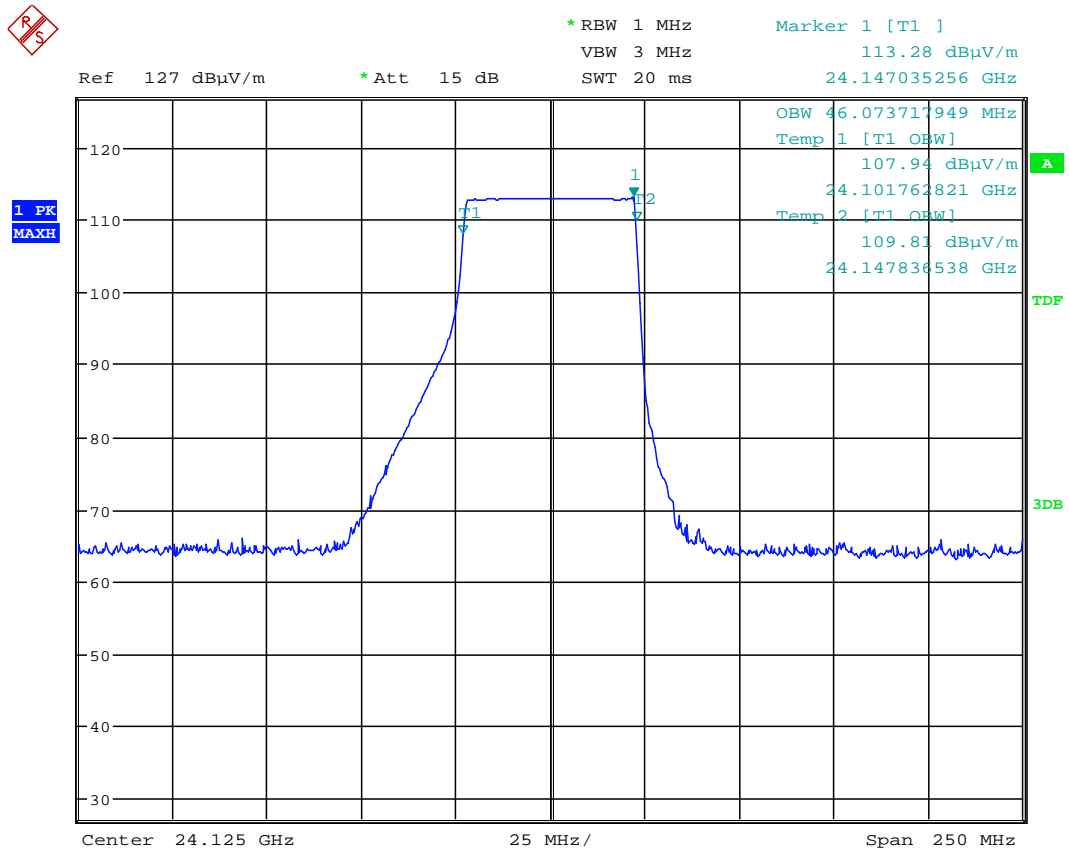
Equipment Type	Manufacturer	Equipment Description	Element No	Due For Calibration
FSU46	R&S	Spectrum Analyser	U281	2019-11-20
3115	EMCO	Horn Antenna	L300	2020-03-01

13.6 Test Results

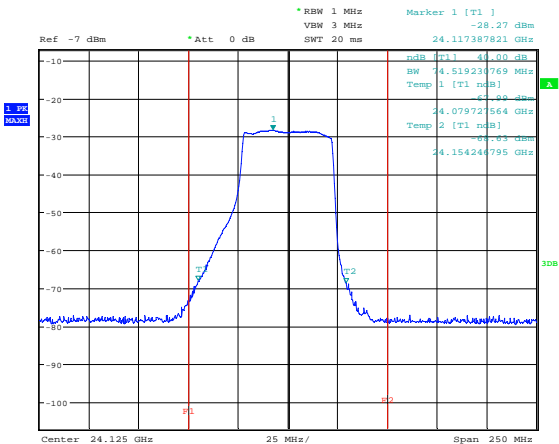
20 dB Bandwidth				
Channel Frequency (MHz)	FL (MHz)	FH (MHz)	20 dB Bandwidth (MHz)	Result
24125	24100.641026	24148.717949	48.077	PASS



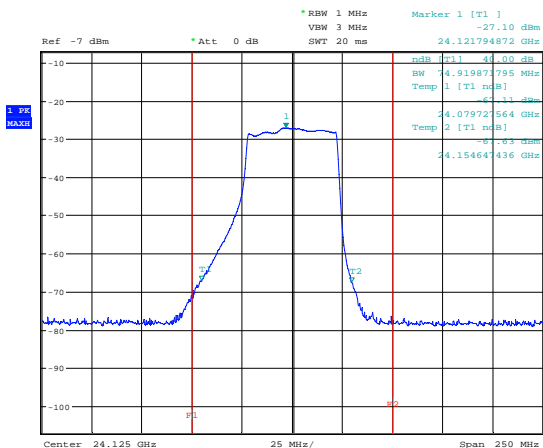
99 % bandwidth				
Channel Frequency (MHz)	F_L (MHz)	F_H (MHz)	99 % Bandwidth (MHz)	Result
24125	24101.762821	24147.836538	46.074	PASS



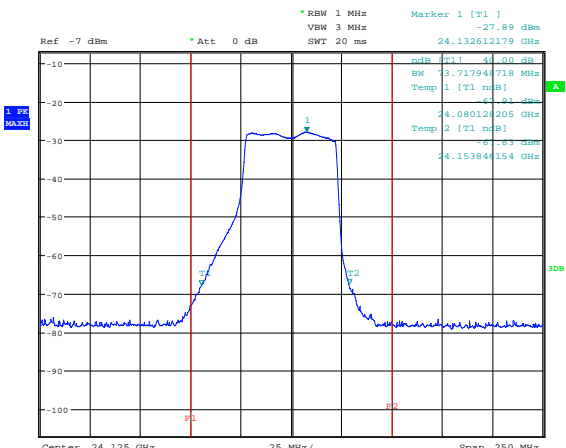
40 dB Bandwidth					
Temp	Voltage	F_L (MHz)	F_H (MHz)	40 dB Bandwidth (MHz)	Result
20°C	Nominal	24079.727564	24154.246795	74.519	PASS
-20°C	Nominal	24079.727564	24154.647436	74.919	PASS
+50°C	Nominal	24080.128205	24153.846154	73.718	PASS
20°C	85%	24080.128205	24154.246795	74.118	PASS
20°C	115%	24080.128205	24154.246795	74.118	PASS



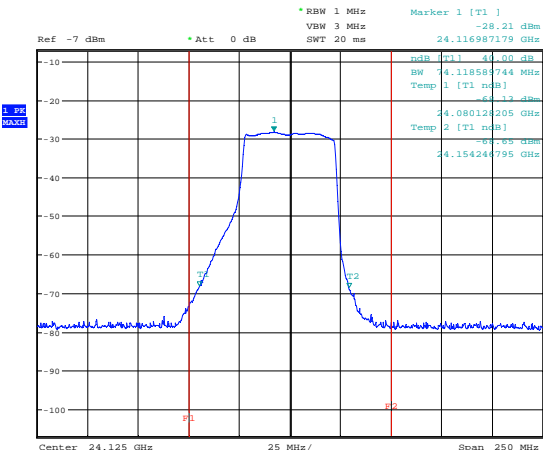
Tnominal Vnominal



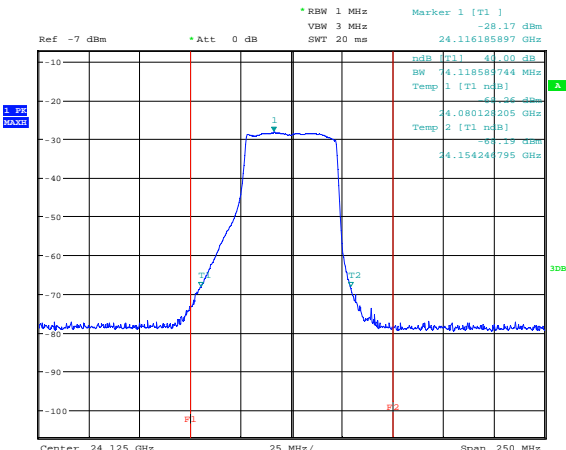
Tminimum Vnominal



Tmaximum Vnominal



Tnominal Vmaximum



Tnominal Vminimum

14 Transmitter output power (fundamental radiated emission)

14.1 Definition

The RF power dissipated in the standard output termination when operating under the rated duty cycle selected by the applicant for approval.

14.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	Radio Chamber
Test Standard and Clause:	ANSI C63.10-2013, Clause 6.5 / 6.6
EUT Frequency Measured:	24.125 GHz
EUT Channel Bandwidths:	45 MHz
Deviations From Standard:	None
Measurement BW:	N/A, Wideband Power Meter
Spectrum Analyzer Video BW: (requirement at least 3x RBW)	N/A
Measurement Detector:	Average RMS and Peak

Environmental Conditions (Normal Environment)

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

14.3 Test Limit

The average field strength of emissions measured at 3m shall not exceed:

Field Strength Limits

<i>Fundamental frequency (GHz)</i>	<i>Field strength (mV/m at 3 m)</i>	<i>Detector</i>
24.075 to 24.175	2500	Average, RMS

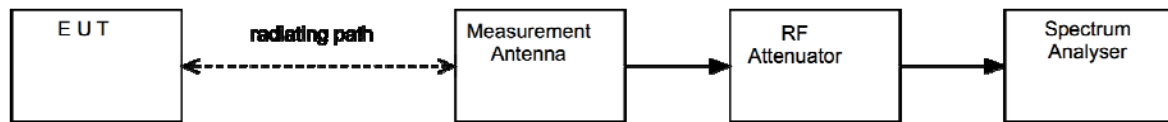
n.b. peak limit is 20 dB above average.

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	2020-08-28
N1911A	Agilent	Power Meter	REF836	2020-08-28
20240-20	Flann	Horn 18-26GHz (&U330)	L300	2020-04-24
8449B	Agilent	Pre Amp	L572	2019-10-12

14.6 Test Results

Detector	Meas'd Emission (dBμV)	Cable Loss (dB)	Antenna Factor (dB/m)	Pre-amp Gain (dB)	Field Strength (dBμV/m)	Distance Extrap'n Factor (dB)	Field Strength (mV/m)	Result
Peak	103.0	8.9	37.5	35.5	113.90	0.00	495.45	Pass
Average	102.4	8.9	37.5	35.5	113.30	0.00	462.38	Pass

15 Measurement Uncertainty

Calculated Measurement Uncertainties

All statements of uncertainty are expanded standard uncertainty using a coverage factor of 1.96 to give a 95 % confidence:

[1] Carrier power

Uncertainty in test result (Power Meter) = **1.08 dB**

Uncertainty in test result (Spectrum Analyser) = **2.48 dB**

[2] Spurious emissions

Uncertainty in test result (30 MHz to 1 GHz) = **4.6 dB**

Uncertainty in test result (1 GHz to 18 GHz) = **4.7 dB**

[3] AC power line conducted emissions

Uncertainty in test result = **3.4 dB**

[4] Occupied bandwidth

Uncertainty in test result = **15.5 %**

[5] Maximum frequency error

Uncertainty in test result (Power Meter) = **0.113 ppm**

Uncertainty in test result (Spectrum Analyser) = **0.265 ppm**

[6] Duty cycle

Uncertainty in test result = **7.98 %**

16 RF Exposure

KDB 447498 MPE Calculation

Prediction of MPE limit at a given distance

Equation from IEEE C95.1

$$S = \frac{EIRP}{4 \pi R^2} \text{ re - arranged} \quad R = \sqrt{\frac{EIRP}{S 4 \pi}}$$

where:

S = power density

R = distance to the centre of radiation of the antenna

EIRP = EUT Maximum power

Note:

The EIRP was calculated by addition of the maximum conducted carrier power plus the antenna gain.

OR

The following formula may be used to convert field strength (FS) in volts/metre to transmitter output power (TP) in watts:

$$TP = (FS \times D)^2 / (30 \times G)$$

where D is the distance in metres between the two antennas and G is the antenna numerical gain referenced to isotropic gain.

Result

Prediction Frequency (MHz)	Field Strength (dBuV/m)	Maximum EIRP (mW)	Minimum Distance (cm)	Power density at distance (mW/cm ²)	Power density limit (S) (mW/cm ²)
24125	113.90	73.6	2.5	0.94	1