

# Test report

**322811-1TRFWL**

Date of issue: March 22, 2018

Applicant:

**Barrett Communications Pty Ltd**

Product:

**Barrett 4050 HF Transceiver**

Model:

**4050**

FCC ID:

**OW4-4050HF**

Specifications:

**FCC 47 CFR Part 90**

Private Land Mobile Radio Services

Test location

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Company name	Nemko Canada Inc.
Address	303 River Road
City	Ottawa
Province	Ontario
Postal code	K1V 1H2
Country	Canada
Telephone	+1 613 737 9680
Facsimile	+1 613 737 9691
Toll free	+1 800 563 6336
Website	www.nemko.com
Site number	FCC: CA2040; IC: 2040A-4 (3 m SAC)

Tested by	Kevin Rose, Wireless/EMC Specialist
Reviewed by	Andrey Adelberg, Senior Wireless/EMC Specialist
Date	March 22, 2018
Signature	

Limits of responsibility

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Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Copyright notification

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## Section 1. Report summary

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### 1.1 Applicant and manufacturer

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Company name	Barrett Communications Pty Ltd
Address	47 Discovery Drive, Bibra Lake
City	Perth
Province/State	Western Australia
Postal/Zip code	6163
Country	Australia

### 1.2 Test specifications

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FCC 47 CFR Part 90	Private Land Mobile Radio Services
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### 1.3 Test methods

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ANSI C63.26:2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
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### 1.4 Statement of compliance

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In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See "Summary of test results" for full details.

### 1.5 Exclusions

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None

### 1.6 Test report revision history

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Revision #	Details of changes made to test report
TRF	Original report issued



## Section 2. Summary of test results

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### 2.1 FCC Part 90 test results

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Part	Test description	Verdict
90.205(a)(b)	Power limits	Pass
2.1047	Modulation characteristics	Reported
90.210(a)	Emission limits, emission mask, bandwidth	Pass
90.210(a)	Emission limits, conducted method	Pass
90.210(a)	Emission limits, radiated method	Pass
90.213(a)	Frequency stability	Pass

Notes: None

## Section 3. Equipment under test (EUT) details

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### 3.1 Sample information

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Receipt date	February 8, 2017
Nemko sample ID number	1

### 3.2 EUT information

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Product name	Barrett 4050 HF Transceiver
Model	4050
Serial number	405010056

### 3.3 Technical information

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Operating band	1.6–30 MHz
Test frequencies	1.722, 16.1, and 27.86 MHz
Modulation type	J3E and H3E
Occupied bandwidth (99 %)	2.7 kHz (J3E), 3 kHz (H3E)
Power requirements	13.8 Vdc for 125 Watt system and 24 Vdc for 150 Watt system.
Emission designator	2K70J3E, 3K00H3E
Antenna information	Various types with standard PL-259 connector

### 3.4 Product description and theory of operation

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The Barrett 4050 Transceiver is a SDR based, 1000 channel HF SSB Transceiver with a frequency range of 1.6 to 30 MHz (250 kHz to 30 MHz in receive). The Barrett 4050 is designed using the latest technology including a high-resolution touch screen, IP connectivity, multi-language support, enhanced DSP noise reduction, secure digital voice, integrated GPS interface, ALE and advanced calling features.

### 3.5 EUT exercise details

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The EUT was programmed for the low, mid, and high channels J3E used 400 and 1800 Hz as input tone and H3E used 1500 Hz.

### 3.6 EUT setup diagram

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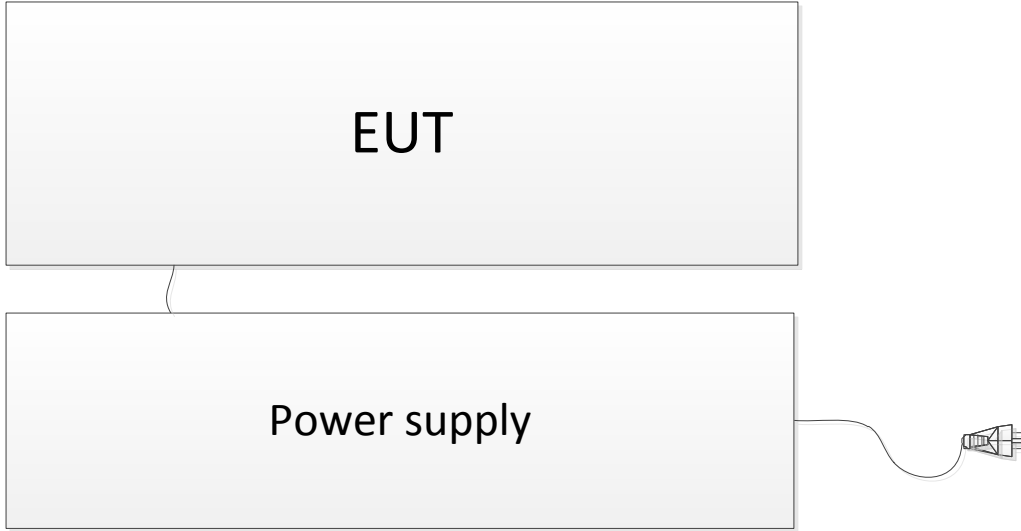


Figure 3.6-1: Setup diagram

### 3.7 EUT sub assemblies

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Table 3.7-1: EUT sub assemblies

Description	Brand name	Model/Part number	Serial number
Power supply 13.8 VDC	Barrett	2022	202207554
Power supply 24 VDC	Barrett	NA	0733

## Section 4. Engineering considerations

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### 4.1 Modifications incorporated in the EUT

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There were no modifications performed to the EUT during this assessment.

### 4.2 Technical judgment

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None

### 4.3 Deviations from laboratory tests procedures

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No deviations were made from laboratory procedures.



## Section 5. Test conditions

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### 5.1 Atmospheric conditions

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Temperature	15–30 °C
Relative humidity	20–75 %
Air pressure	860–1060 mbar

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

### 5.2 Power supply range

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The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages  $\pm 5\%$ , for which the equipment was designed.

## Section 6. Measurement uncertainty

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### 6.1 Uncertainty of measurement

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UKAS Lab 34 and TIA-603-B have been used as guidance for measurement uncertainty reasonable estimations with regards to previous experience and validation of data. Nemko Canada, Inc. follows these test methods in order to satisfy ISO/IEC 17025 requirements for estimation of uncertainty of measurement for wireless products.

Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of  $K = 2$  with 95% certainty.

Test name	Measurement uncertainty, dB
All antenna port measurements	0.55
Conducted spurious emissions	1.13
Radiated spurious emissions	3.78
AC power line conducted emissions	3.55

## Section 7. Test equipment

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### 7.1 Test equipment list

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*Table 7.1-1: Equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002047	1 year	Dec. 1/17
Flush mount turntable	Sunol	FM2022	FA002082	—	NCR
Controller	Sunol	SC104V	FA002060	—	NCR
Antenna mast	Sunol	TLT2	FA002061	—	NCR
Active loop antenna (0.01–30 MHz)	Com-Power	AL-130	FA002674	1 year	June 21/18
Bilog antenna (20–3000 MHz)	Sunol	JB3	FA002108	1 year	April 28/17
Spectrum analyzer	Rohde & Schwarz	FSP	FA001920	1 year	Aug. 20/17
Spectrum analyzer	Rohde & Schwarz	FSU	FA001877	1 year	July. 15/17
50 $\Omega$ coax cable	Huber + Suhner	None	FA002074	1 year	April 26/17
50 $\Omega$ coax cable	Huber + Suhner	None	FA002830	1 year	July 29/17
Frequency counter	HP	5352B	FA001915	2 year	Apr.05/18

Note: NCR - no calibration required, VOU - verify on use



## Section 8. Testing data

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### 8.1 FCC 90.205(a),(b) Power Limits

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#### 8.1.1 Definitions and limits

Applicants for licenses must request and use no more power than the actual power necessary for satisfactory operation. Except where otherwise specifically provided for, the maximum power that will be authorized to applicants whose license applications for new stations are filed after August 18, 1995 is as follows:

- (a) *Below 25 MHz.* For single sideband operations (J3E emission), the maximum transmitter peak envelope power is 1000 watts.
- (b) *25-50 MHz.* The maximum transmitter output power is 300 watts.

#### 8.1.2 Test summary

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Test date	March 8, 2017	Temperature	22 °C
Test engineer	Kevin Rose	Air pressure	1003 mbar
Verdict	Pass	Relative humidity	32 %

#### 8.1.3 Observations, settings and special notes

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Test receiver settings:

Detector mode	Peak
Resolution bandwidth	>OBW
Video bandwidth	>RBW
Trace mode	Max Hold
Measurement time	Auto



8.1.4 Test data

*Table 8.1-1: results 125 W system operation*

Modulation	Frequency, MHz	RF output power, dBm	Limit, dBm	Margin, dB
J3E	1.722	49.92	60	10.08
J3E	16.10	50.03	60	9.97
J3E	27.86	50.14	60	9.86

*Table 8.1-2: results 125 W system operation*

Modulation	Frequency, MHz	RF output power, dBm	Limit, dBm	Margin, dB
H3E	1.722	49.80	60	10.20
H3E	16.10	49.89	60	10.11
H3E	27.86	50.05	60	9.95

*Table 8.1-3: results 150 W system operation*

Modulation	Frequency, MHz	RF output power, dBm	Limit, dBm	Margin, dB
J3E	1.722	51.47	60	8.53
J3E	16.10	51.64	60	8.36
J3E	27.86	51.57	60	8.43

*Table 8.1-4: results 150 W system operation*

Modulation	Frequency, MHz	RF output power, dBm	Limit, dBm	Margin, dB
H3E	1.722	51.35	60	8.65
H3E	16.10	51.47	60	8.53
H3E	27.86	51.40	60	8.60

## 8.2 FCC 2.1047 Modulation characteristic

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### 8.2.1 Definitions and limits

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§2.1047 Measurements required: Modulation characteristics.

(a) Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.

(c) Single sideband and independent sideband radiotelephone transmitters which employ a device or circuit to limit peak envelope power. A curve showing the peak envelope power output versus the modulation input voltage shall be supplied. The modulating signals shall be the same in frequency as specified in paragraph (c) of §2.1049 for the occupied bandwidth tests.

### 8.2.2 Test summary

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Test date	March 8, 2017	Temperature	24 °C
Test engineer	Kevin Rose	Air pressure	1001 mbar
Verdict	Pass	Relative humidity	30 %

### 8.2.3 Observations, settings and special notes

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None

Detector mode	Peak
Resolution bandwidth	100 kHz
Video bandwidth	RBW × 3
Trace mode	Max Hold

8.2.4 Test data

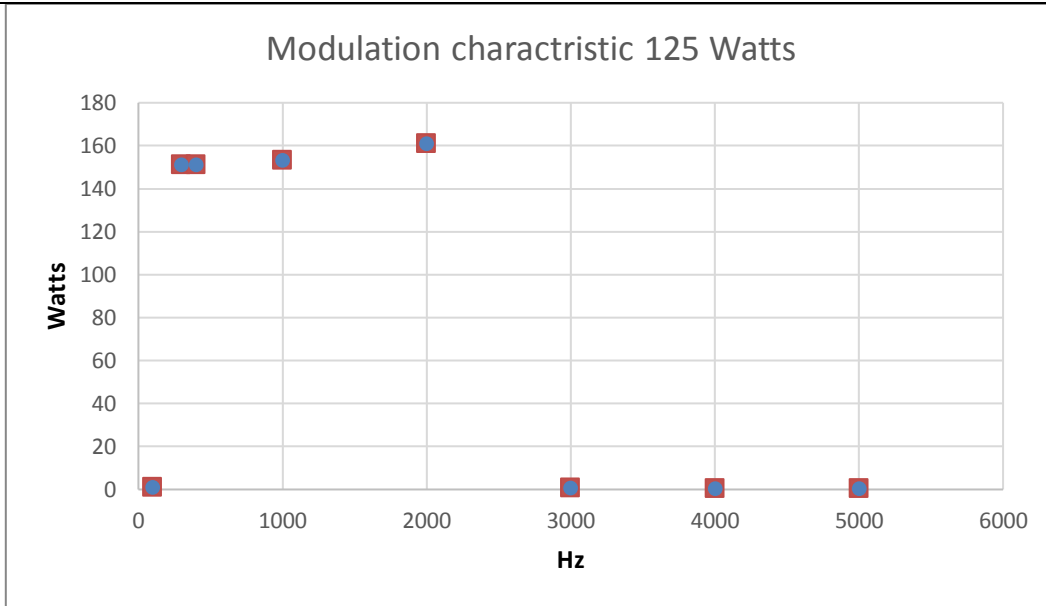


Figure 8.2-1: Modulation Characteristic 125 Watts

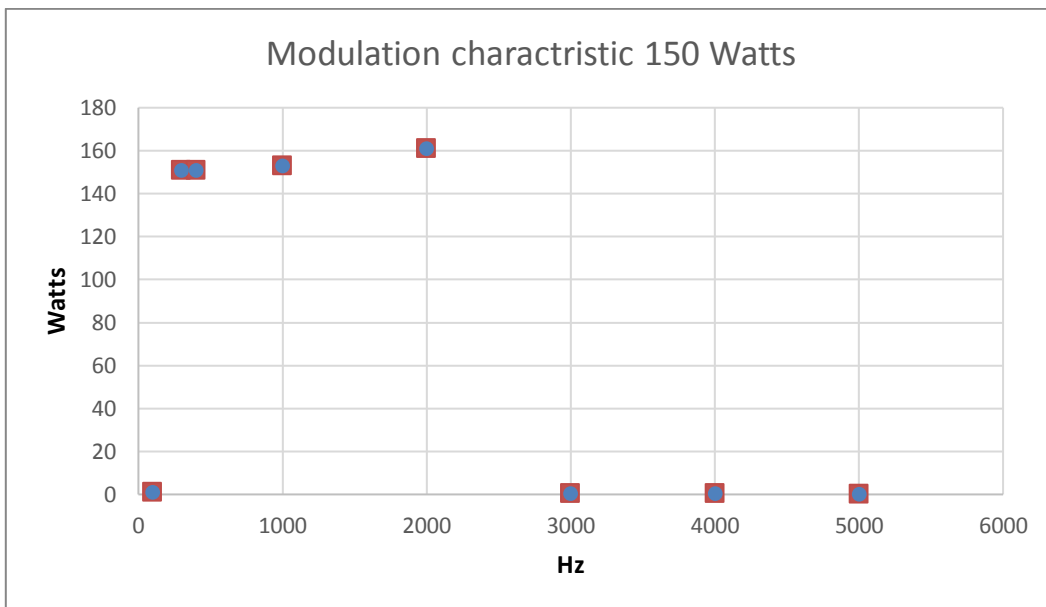


Figure 8.2-2: Modulation Characteristic 150 Watts



**Table 8.2-1: Modulation characteristics, frequency response results 125 Watts**

Input Frequency, Hz	Output power, Watts
100	1
300	117
400	109
1000	115
2000	111
2500	113
2800	25
3000	0.5
5000	0.1

**Table 8.2-2: Modulation characteristics, frequency response results 150 Watts**

Input Frequency, Hz	Output power, Watts
100	1
300	151
400	151
1000	153
2000	161
2500	151
2800	28
3000	0.5
5000	0.2

**Table 8.2-3: Modulation characteristics, modulation limiting results 125 Watts**

1.722 MHz		16.1 MHz		27.86 MHz	
Input Audio, V p-p	Output power, Watts	Input Audio, V p-p	Output power, Watts	Input Audio, V p-p	Output power, Watts
0.01	0.05	0.01	0.1	0.01	0.08
0.02	0.3	0.02	0.7	0.02	0.5
0.04	3	0.04	7	0.04	3
0.05	7	0.05	16	0.05	8
0.07	23	0.07	45	0.07	24
0.1	68	0.1	109	0.1	62
0.15	125	0.15	109	0.15	108
0.2	119	0.2	119	0.2	111
0.3	125	0.3	117	0.3	111

**Table 8.2-4: Modulation characteristics, modulation limiting results 150 Watts**

1.722 MHz		16.1 MHz		27.86 MHz	
Input Audio, V p-p	Output power, Watts	Input Audio, V p-p	Output power, Watts	Input Audio, V p-p	Output power, Watts
0.01	0.04	0.01	0.08	0.01	0.1
0.02	0.2	0.02	0.5	0.02	0.5
0.04	2	0.04	6	0.04	4
0.05	4	0.05	13	0.05	9
0.07	15	0.07	40	0.07	29
0.1	51	0.1	103	0.1	75
0.15	137	0.15	154	0.15	144
0.2	142	0.2	151	0.2	145
0.3	145	0.3	155	0.3	144



### 8.3 FCC 90.210(a) Emission limits, emission mask, bandwidth

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#### 8.3.1 Definitions and limits

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(a) Emission Mask A. For transmitters utilizing J3E emission, the carrier must be at least 40 dB below the peak envelope power and the power of emissions must be reduced below the output power (P in watts) of the transmitter as follows:

- 1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 150 percent of the authorized bandwidth: At least 25 dB.
- 2) On any frequency removed from the assigned frequency by more than 150 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
- 3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least  $43 + 10 \log P$  dB.

(a) Emission Mask B. For transmitters utilizing J3E emission, the carrier must be at least 40 dB below the peak envelope power and the power of emissions must be reduced below the output power (P in watts) of the transmitter as follows:

- 1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
- 2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 190 percent of the authorized bandwidth: At least 35 dB.
- 3) On any frequency removed from the assigned frequency by more than 190 percent of the authorized bandwidth: At least  $43 + 10 \log P$  dB.

(a) Emission Mask B. For transmitters utilizing H3E emission, the carrier must be at least 40 dB below the peak envelope power and the power of emissions must be reduced below the output power (P in watts) of the transmitter as follows:

- 1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
- 2) On any frequency removed from the assigned frequency by more than 150 percent, but not more than 200 percent of the authorized bandwidth: At least 35 dB.
- 3) On any frequency removed from the assigned frequency by more than 200 percent of the authorized bandwidth: At least  $43 + 10 \log P$  dB.

#### 8.3.2 Test summary

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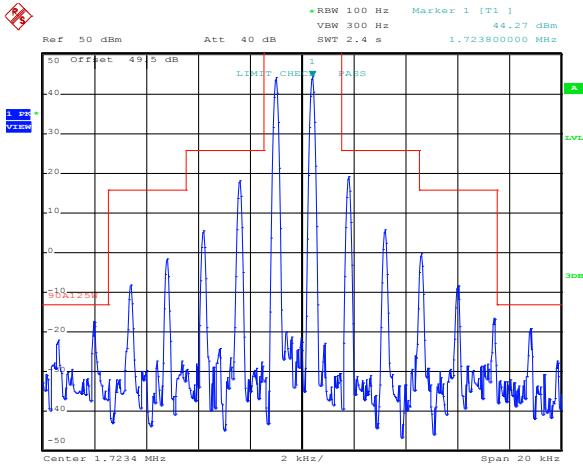
Test date	March 9, 2018	Temperature	23 °C
Test engineer	Kevin Rose	Air pressure	1005 mbar
Verdict	Pass	Relative humidity	33 %

#### 8.3.3 Observations, settings and special notes

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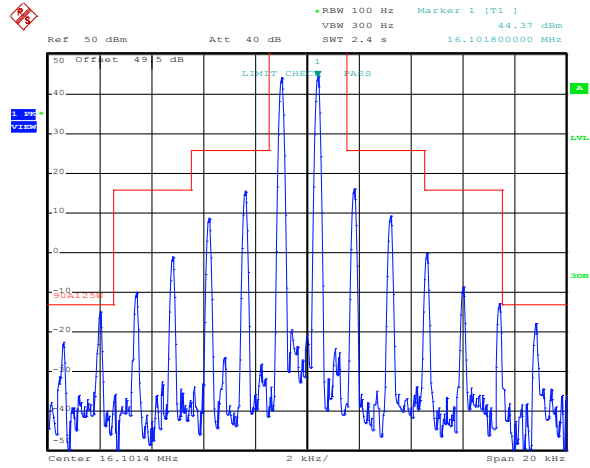
Detector mode	Peak
Resolution bandwidth	100 and 300 Hz
Video bandwidth	RBW × 3
Trace mode	Max Hold

8.3.4 Test data



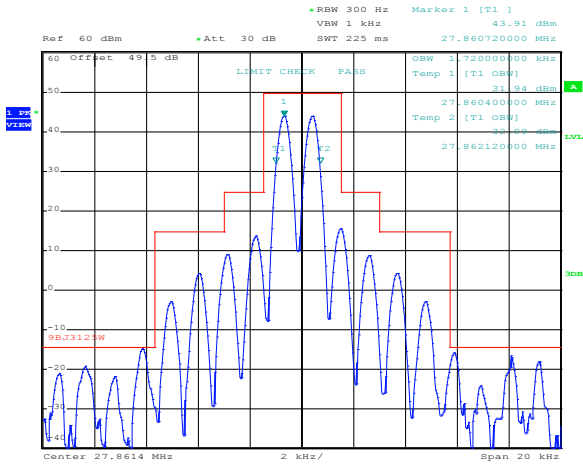
Date: 9.MAR.2018 09:45:00

Figure 8.3-1: Low channel Mask 125W 400 Hz and 1800 Hz



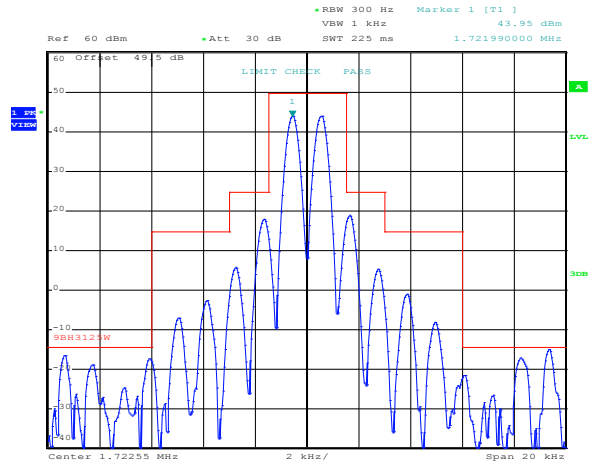
Date: 9.MAR.2018 09:44:09

Figure 8.3-2: Mid channel Mask 125W 400 Hz and 1800 Hz



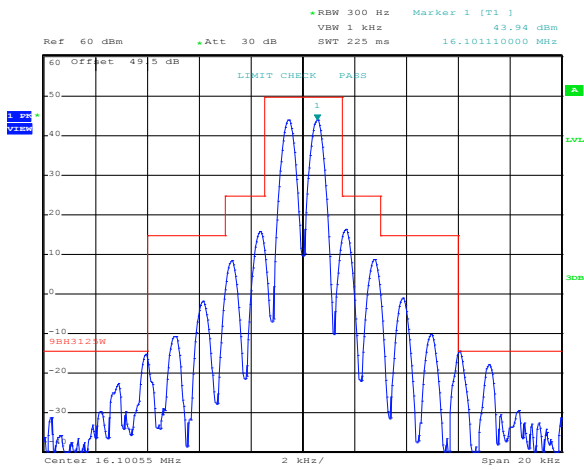
Date: 15.MAR.2018 12:51:37

Figure 8.3-3: High channel Mask 125W 700 Hz and 1800 Hz



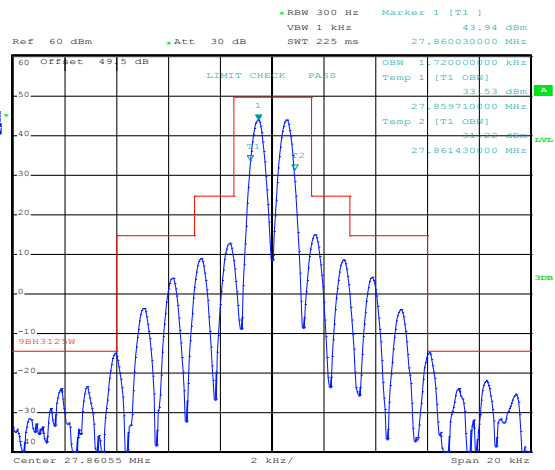
Date: 15.MAR.2018 13:02:00

Figure 8.3-4: Low channel Mask 125W 1100 Hz



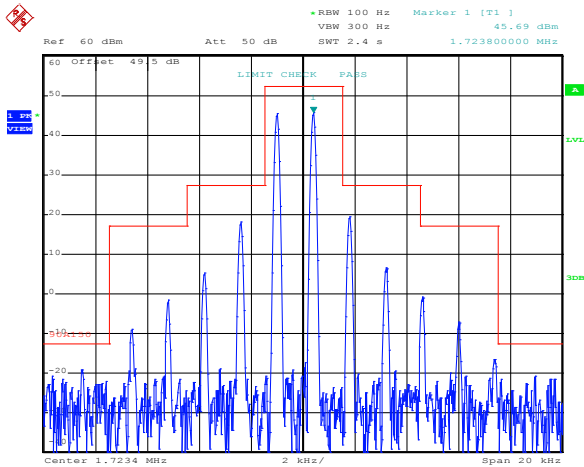
Date: 15.MAR.2018 13:00:40

Figure 8.3-5: Mid channel Mask 125W 1100 Hz



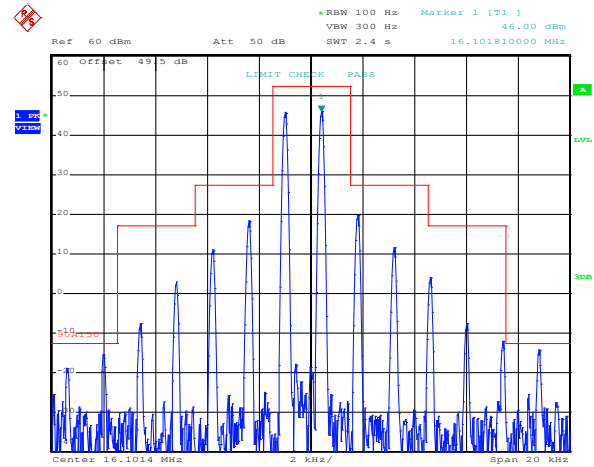
Date: 15.MAR.2018 12:57:36

Figure 8.3-6: High channel Mask 125W 1100 Hz



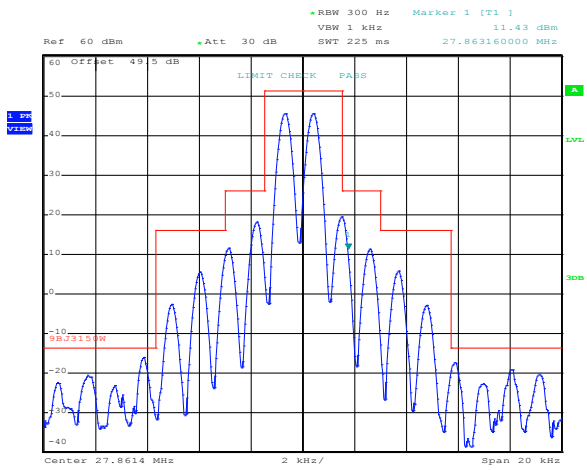
Date: 9.MAR.2018 10:26:04

Figure 8.3-7: Low channel Mask 150W 400 Hz and 1800 Hz



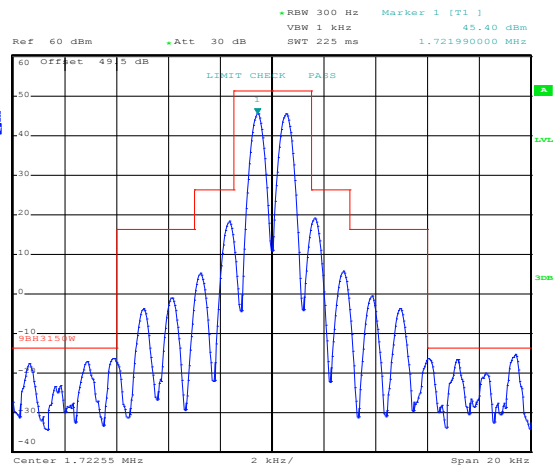
Date: 9.MAR.2018 10:24:32

Figure 8.3-8: Mid channel Mask 150W 400 Hz and 1800 Hz



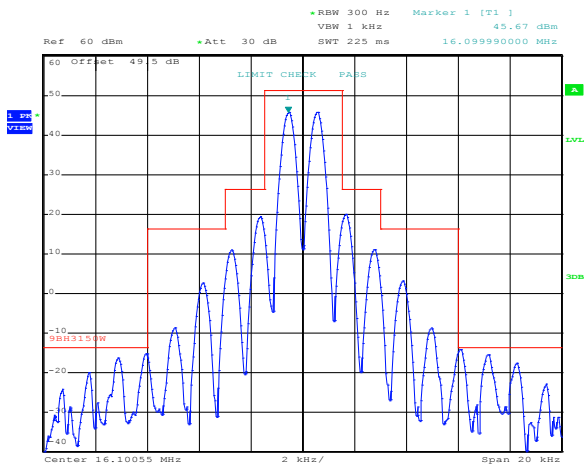
Date: 15.MAR.2018 12:45:55

Figure 8.3-9: High channel Mask 150W 700 Hz and 1800 Hz



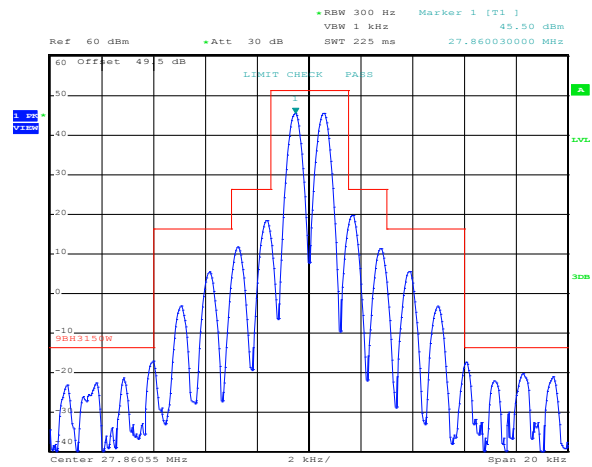
Date: 15.MAR.2018 13:03:52

Figure 8.3-10: Low channel Mask 150W 1100 Hz



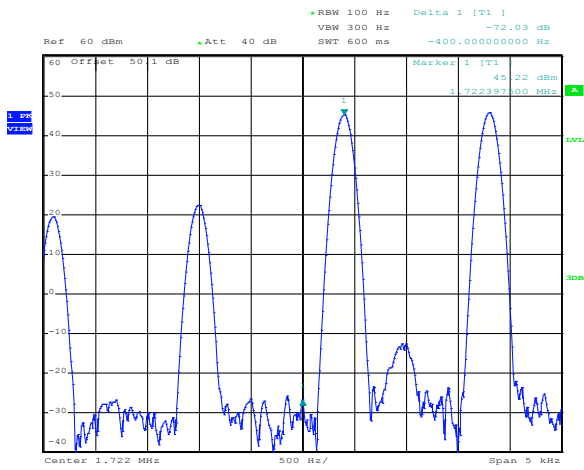
Date: 15.MAR.2018 13:05:28

Figure 8.3-11: Mid channel Mask 150W 1500 Hz



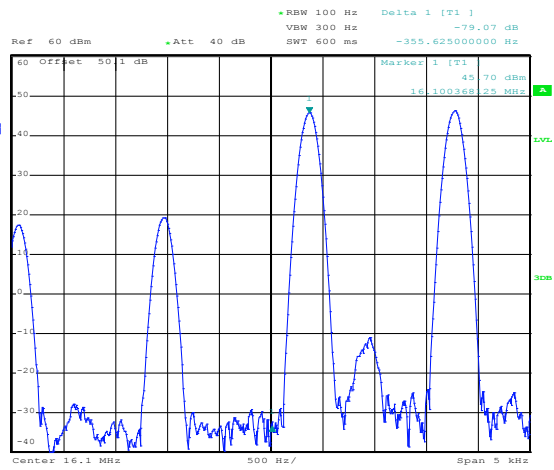
Date: 15.MAR.2018 13:06:25

Figure 8.3-12: High channel Mask 150W 1500 Hz



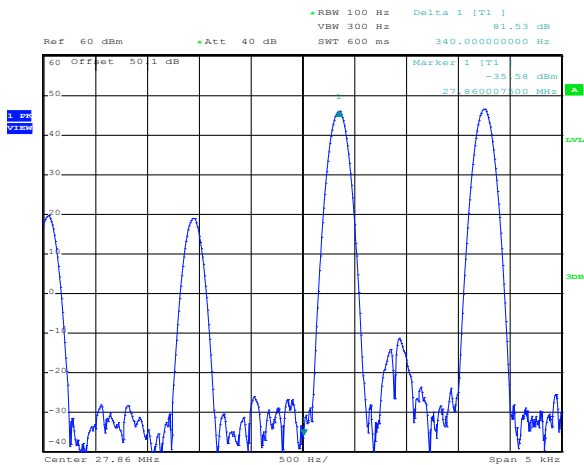
Date: 26.APR.2017 21:41:39

Figure 8.3-13: Low channel 150W 400 Hz and 1800 Hz 40 dB



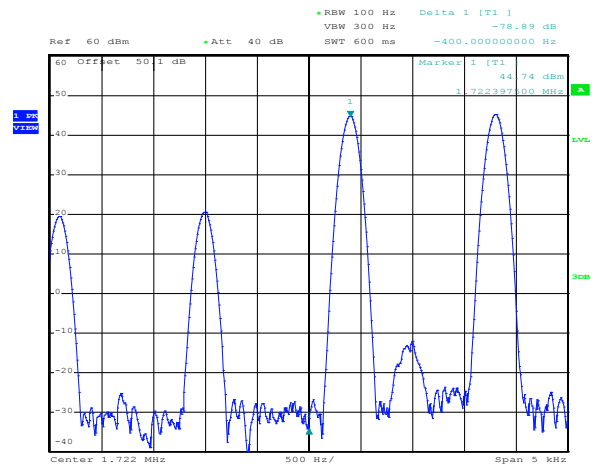
Date: 26.APR.2017 21:40:29

Figure 8.3-14: Mid channel 150W 400 Hz and 1800 Hz 40 dB



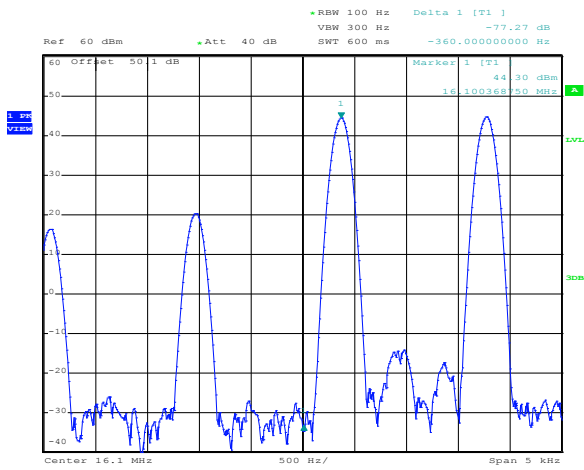
Date: 26.APR.2017 21:30:53

Figure 8.3-15: High channel 150W 400 Hz and 1800 Hz 40 dB



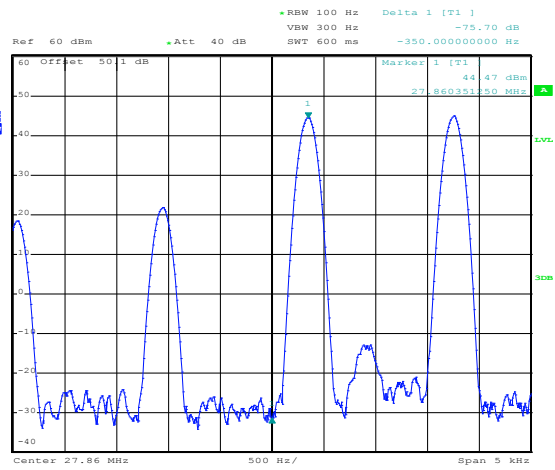
Date: 26.APR.2017 21:45:50

Figure 8.3-16: Low channel 125W 400 Hz and 1800 Hz 40 dB



Date: 26.APR.2017 21:46:56

Figure 8.3-17: Mid channel 125W 400 Hz and 1800 Hz 40 dB



Date: 26.APR.2017 21:48:20

Figure 8.3-18: High channel 125W 400 Hz and 1800 Hz 40 dB

## 8.4 FCC 90.210(a) Emission limits, conducted method

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### 8.4.1 Definitions and limits

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(a) Emission Mask A. For transmitters utilizing J3E emission, the carrier must be at least 40 dB below the peak envelope power and the power of emissions must be reduced below the output power (P in watts) of the transmitter as follows:

- 4) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 150 percent of the authorized bandwidth: At least 25 dB.
- 5) On any frequency removed from the assigned frequency by more than 150 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
- 6) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least  $43 + 10 \log P$  dB.

### 8.4.2 Test summary

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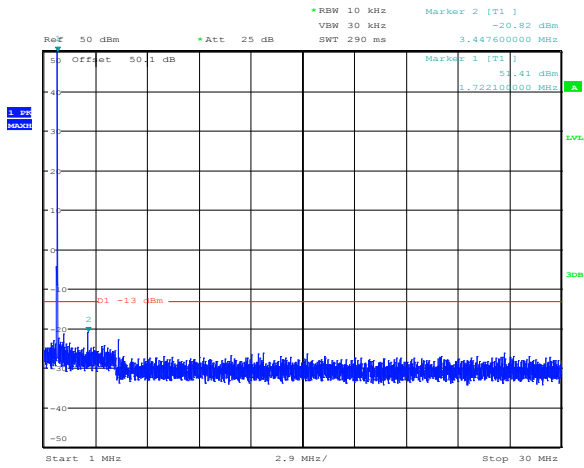
Test date	April 26, 2017	Temperature	24 °C
Test engineer	Kevin Rose	Air pressure	1001 mbar
Verdict	Pass	Relative humidity	30 %

### 8.4.3 Observations, settings and special notes

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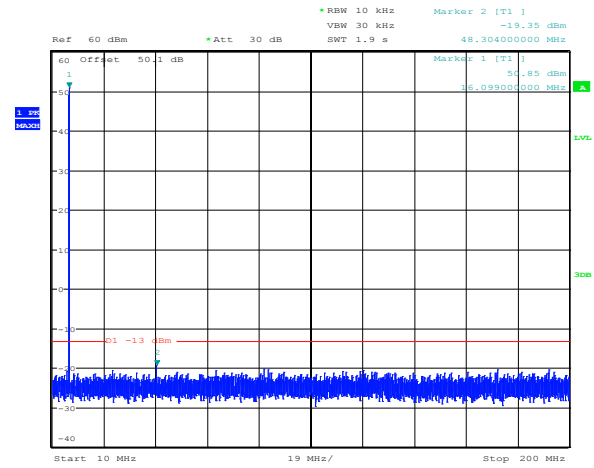
Detector mode	Peak
Resolution bandwidth	10 kHz
Video bandwidth	RBW × 3
Trace mode	Max Hold

8.4.4 Test data



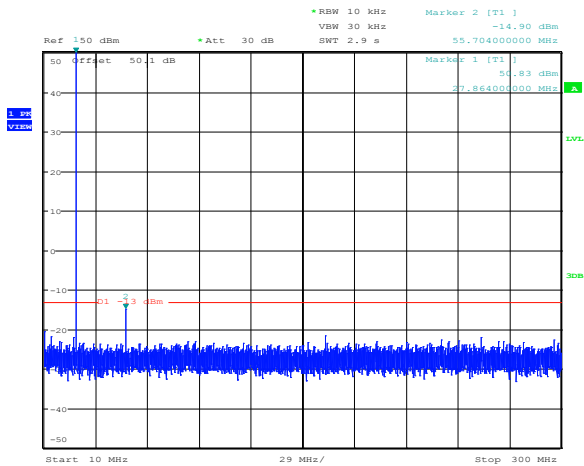
Date: 26.APR.2017 23:44:14

Figure 8.4-1: Low channel Mask 150W 400 Hz and 1800 Hz Conducted Spurious



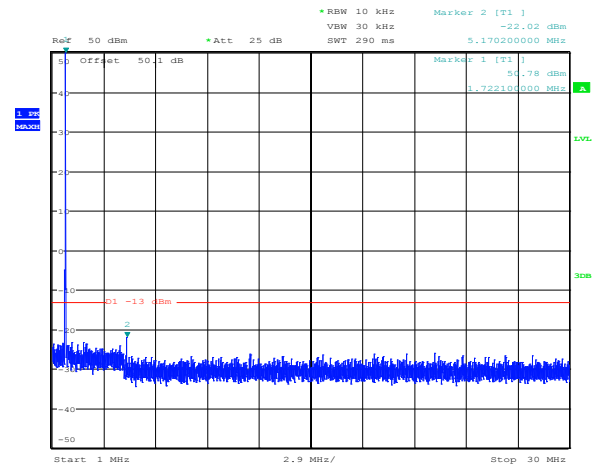
Date: 26.APR.2017 23:13:54

Figure 8.4-2: Mid channel Mask 150W 400 Hz and 1800 Hz Conducted Spurious



Date: 26.APR.2017 23:10:15

Figure 8.4-3: High channel Mask 150W 400 Hz and 1800 Hz Conducted Spurious



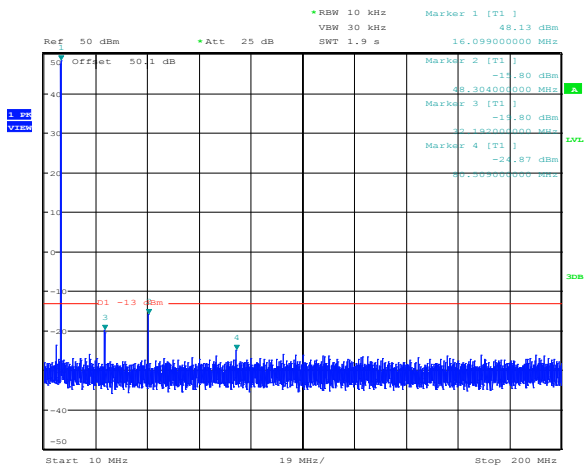
Date: 26.APR.2017 23:04:41

Figure 8.4-4: Low channel Mask 125W 400 Hz and 1800 Hz Conducted Spurious



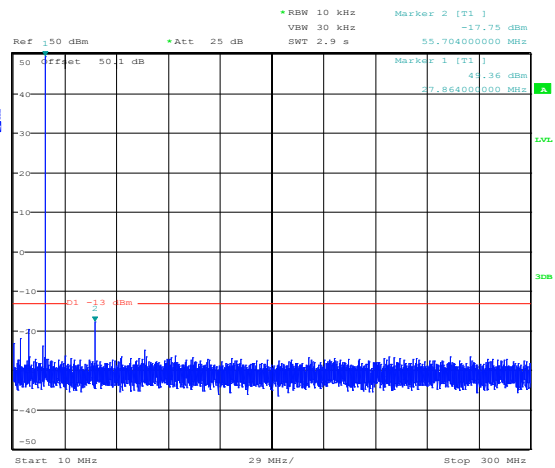
**Section 8**  
**Test name**  
**Specification**

Testing data  
 FCC 90.210(a) Emission limits, conducted method  
 FCC Part 90



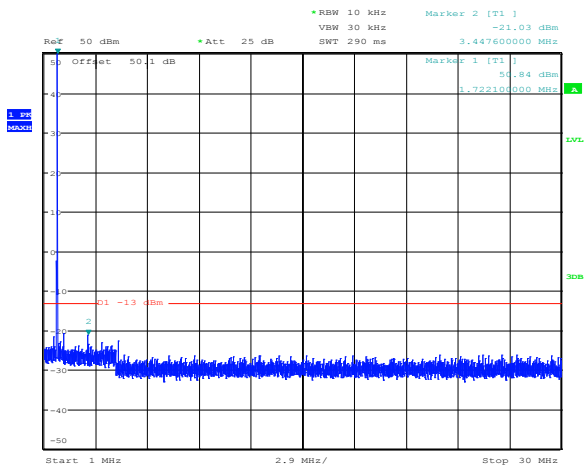
Date: 26.APR.2017 23:03:31

**Figure 8.4-5:** Mid channel Mask 125W 400 Hz and 1800 Hz Conducted Spurious



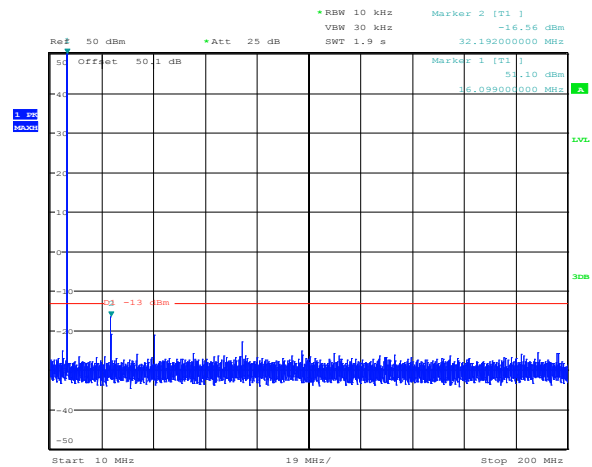
Date: 26.APR.2017 23:06:34

**Figure 8.4-6:** High channel Mask 125W 400 Hz and 1800 Hz Conducted Spurious



Date: 26.APR.2017 23:45:54

**Figure 8.4-7:** Low channel Mask 150W 1500 Hz Conducted Spurious

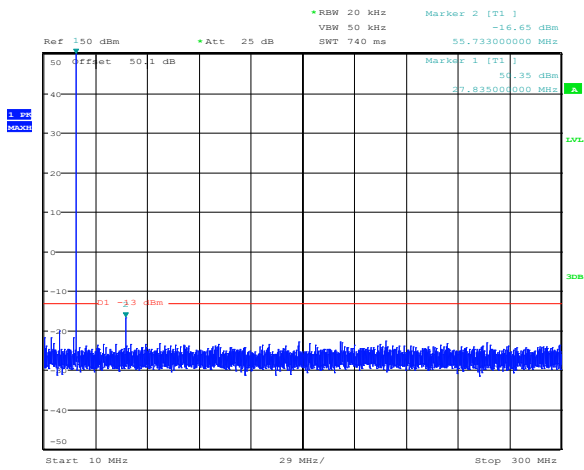


Date: 26.APR.2017 23:47:11

**Figure 8.4-8:** Mid channel Mask 150W 1500 Hz Conducted Spurious

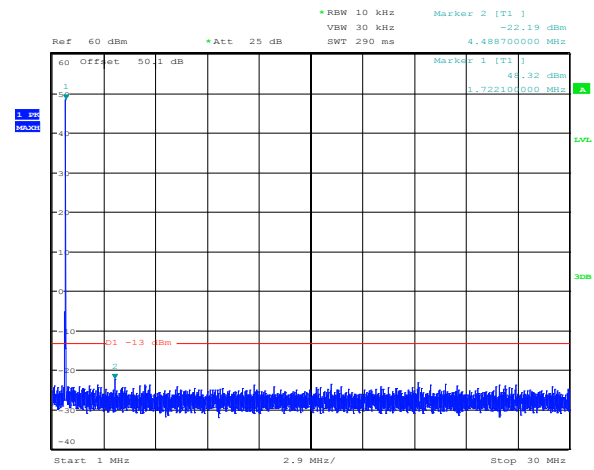
**Section 8**  
**Test name**  
**Specification**

Testing data  
 FCC 90.210(a) Emission limits, conducted method  
 FCC Part 90



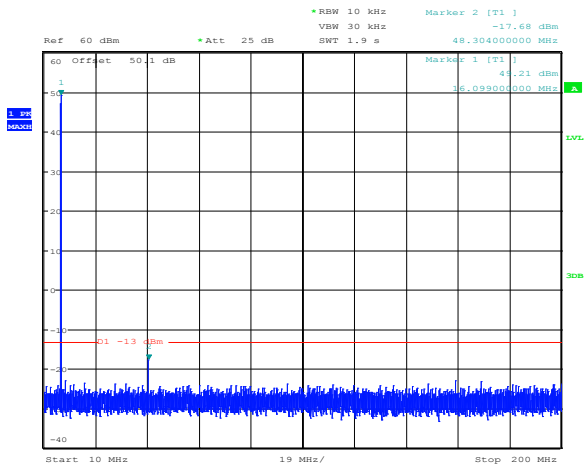
Date: 26.APR.2017 23:48:31

**Figure 8.4-9: High channel Mask 150W 1500 Hz Conducted Spurious**



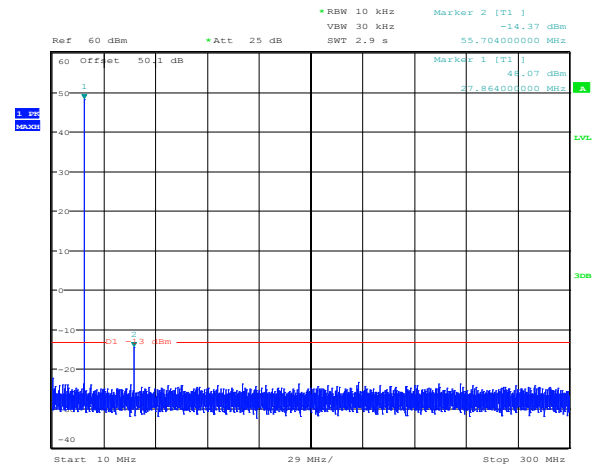
Date: 27.APR.2017 00:07:51

**Figure 8.4-10: Low channel Mask 125W 1500 Hz Conducted Spurious**



Date: 27.APR.2017 00:06:51

**Figure 8.4-11: Mid channel Mask 125W 1500 Hz Conducted Spurious**



Date: 27.APR.2017 00:06:00

**Figure 8.4-12: High channel Mask 125W 1500 Hz Conducted Spurious**

## 8.5 FCC 90.210(a) Emission limits, radiated method

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### 8.5.1 Definitions and limits

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(a) Emission Mask A. For transmitters utilizing J3E emission, the carrier must be at least 40 dB below the peak envelope power and the power of emissions must be reduced below the output power (P in watts) of the transmitter as follows:

- 7) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 150 percent of the authorized bandwidth: At least 25 dB.
- 8) On any frequency removed from the assigned frequency by more than 150 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
- 9) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least  $43 + 10 \log P$  dB.

### 8.5.2 Test summary

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Test date	April 26, 2017	Temperature	24 °C
Test engineer	Kevin Rose	Air pressure	1001 mbar
Verdict	Pass	Relative humidity	30 %

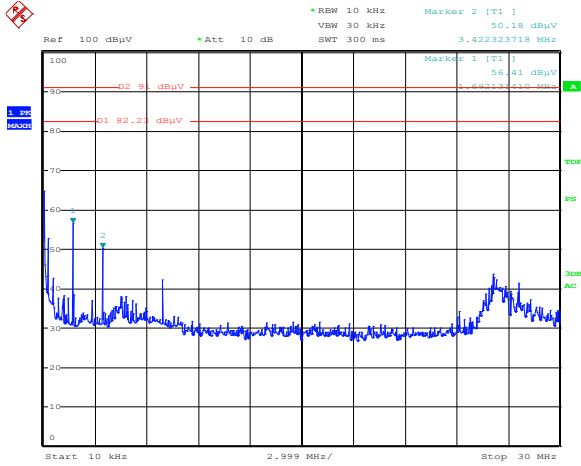
### 8.5.3 Observations, settings and special notes

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None

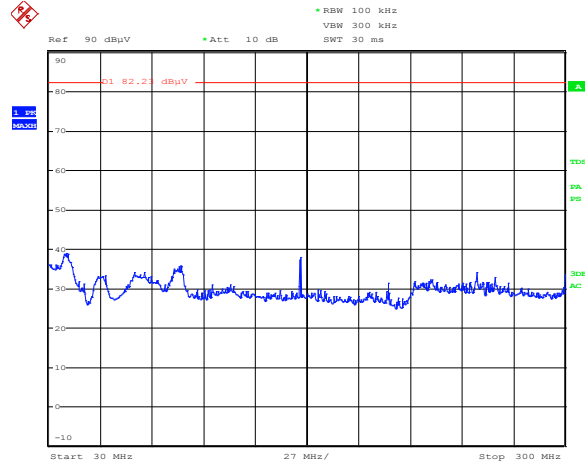
Detector mode	Peak
Resolution bandwidth	10 kHz
Video bandwidth	RBW × 3
Trace mode	Max Hold

8.5.4 Test data



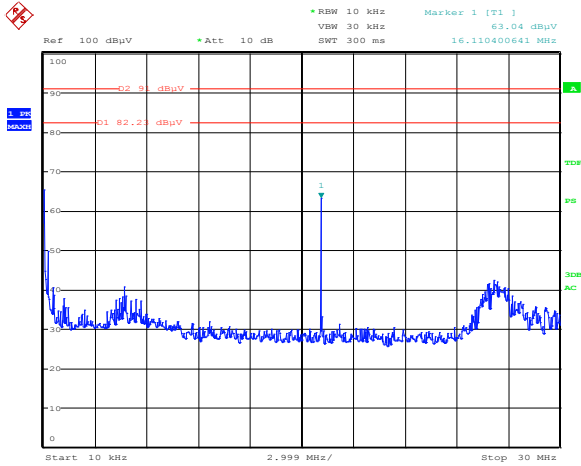
Date: 27.APR.2017 03:50:44

Figure 8.5-1: Low channel Radiated Spurious 125W



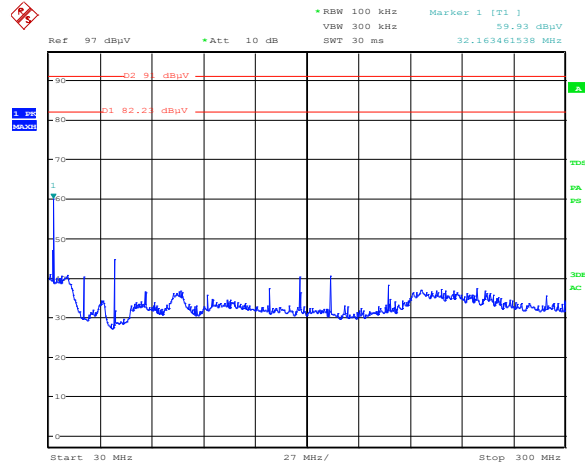
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Figure 8.5-2: Low channel Radiated Spurious 125W



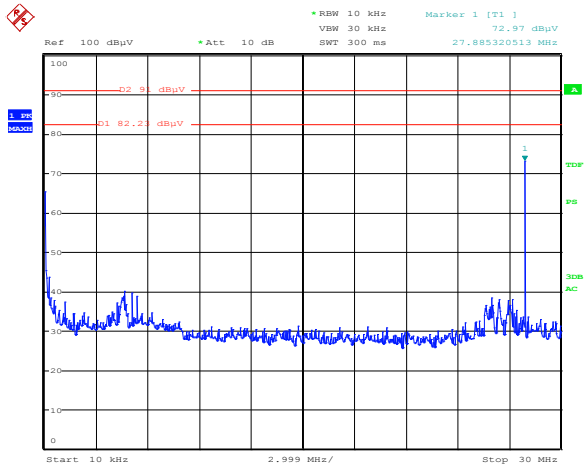
Date: 27.APR.2017 03:47:46

Figure 8.5-3: Mid channel Radiated Spurious 125W



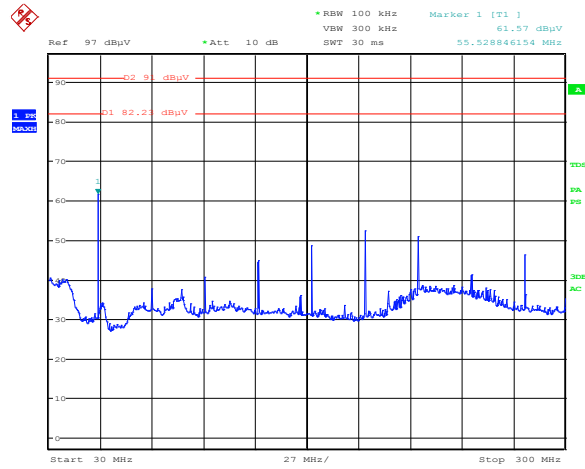
Date: 27.APR.2017 03:06:55

Figure 8.5-4: Mid channel Radiated Spurious 125W



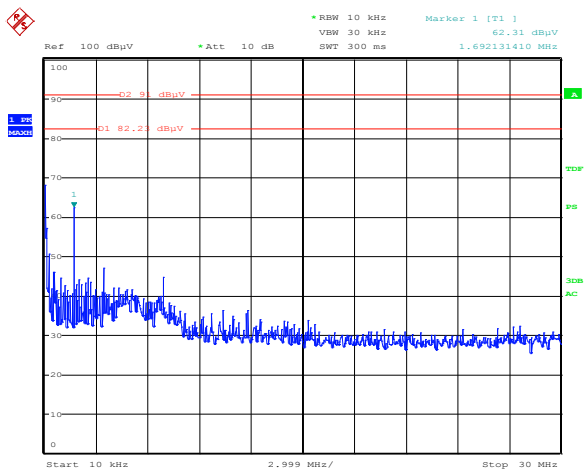
Date: 27.APR.2017 03:45:56

Figure 8.5-5: High channel Radiated Spurious 125W



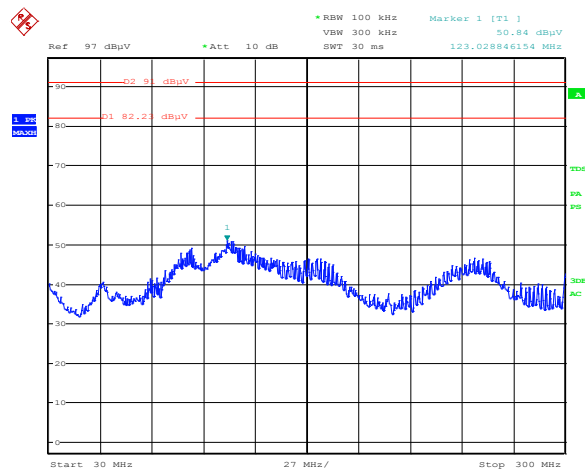
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Figure 8.5-6: High channel Radiated Spurious 125W



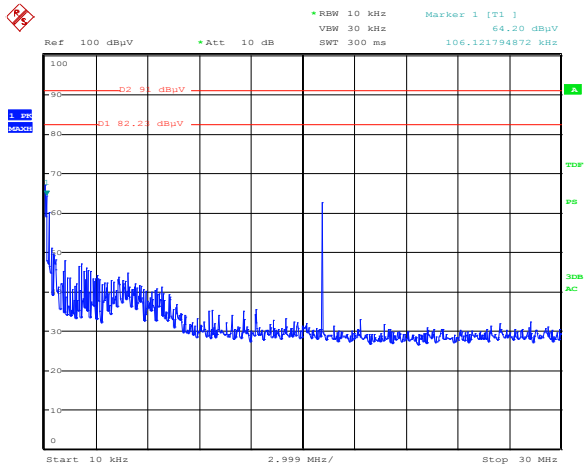
Date: 27.APR.2017 03:35:21

Figure 8.5-7: Low channel Radiated Spurious 150W



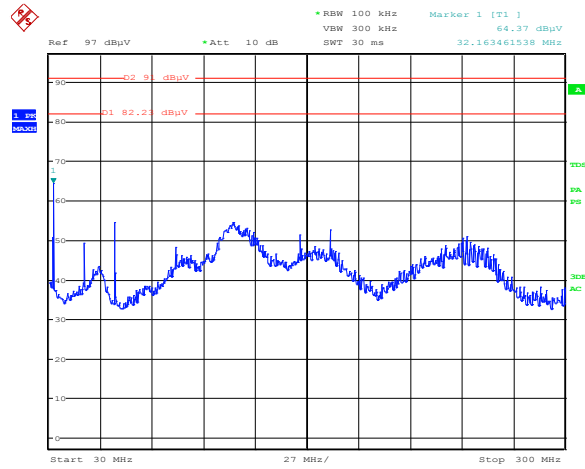
Date: 27.APR.2017 03:20:08

Figure 8.5-8: Low channel Radiated Spurious 150W



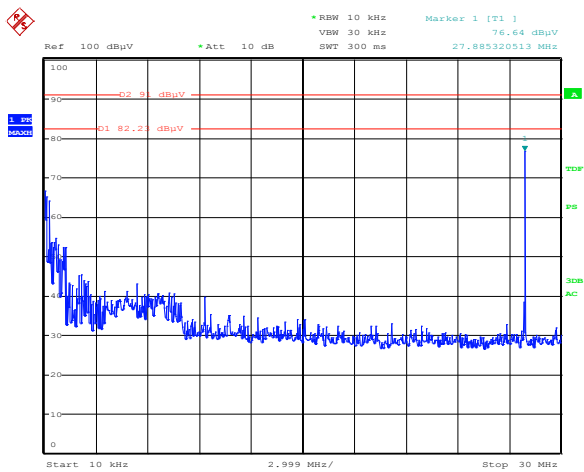
Date: 27.APR.2017 03:39:08

Figure 8.5-9: Mid channel Radiated Spurious 150W



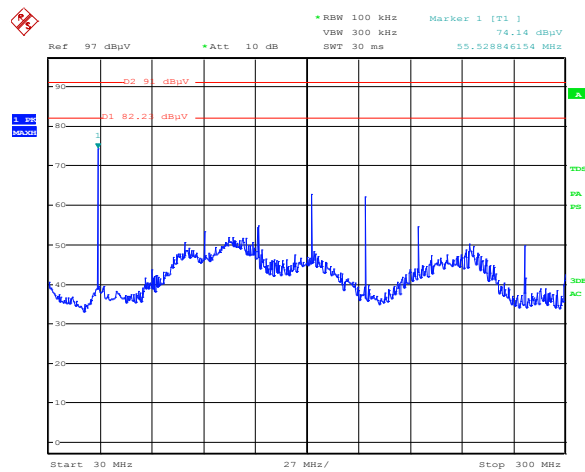
Date: 27.APR.2017 03:16:47

Figure 8.5-10: Mid channel Radiated Spurious 150W



Date: 27.APR.2017 03:41:08

Figure 8.5-11: High channel Radiated Spurious 150W



Date: 27.APR.2017 03:14:21

Figure 8.5-12: High channel Radiated Spurious 150W

## 8.6 FCC §90.213(a) Frequency stability

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### 8.6.1 Definitions and limits

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**FCC:**

(a) Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following table:

*Table 8.6-1: Minimum frequency stability*

Frequency range (MHz)	Fixed and base stations (±ppm)	Mobile stations (±ppm)	
		Over 2 watts output power	2 watts or less output power
Below 25	<sup>1, 2, 3</sup> 100	100	200
25–50	20	20	50

<sup>1</sup>Fixed and base stations with over 200 watts transmitter power must have a frequency stability of 50 ppm except for equipment used in the Public Safety Pool where the frequency stability is 100 ppm.

<sup>2</sup>For single sideband operations below 25 MHz, the carrier frequency must be maintained within 50 Hz of the authorized carrier frequency.

<sup>3</sup>Travelers information station transmitters operating from 530-1700 kHz and transmitters exceeding 200 watts peak envelope power used for disaster communications and long distance circuit operations pursuant to §§90.242 and 90.264 must maintain the carrier frequency to within 20 Hz of the authorized frequency.

### 8.6.1 Test summary

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Test date	February 17, 2017	Temperature	24 °C
Test engineer	Kevin Rose	Air pressure	1006 mbar
Verdict	Pass	Relative humidity	34 %

### 8.6.2 Observations, settings and special notes

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1500 Hz tone was used during testing



**Table 8.6-2: Frequency drift measurement FCC Part 90.213(a) results 125 watt**

Test conditions	Frequency, Hz	Drift, Hz	Limit ±50 Hz
+50 °C, Nominal	16101377	-3	±50 Hz
+40 °C, Nominal	16101377	-3	±50 Hz
+30 °C, Nominal	16101378	-2	±50 Hz
+20 °C, +15 %	16101380	0	±50 Hz
+20 °C, Nominal	16101380	0	Reference
+20 °C, -15 %	16101380	0	±50 Hz
+10 °C, Nominal	16101381	1	±50 Hz
0 °C, Nominal	16101383	3	±50 Hz
-10 °C, Nominal	16101381	1	±50 Hz
-20 °C, Nominal	16101384	4	±50 Hz
-30 °C, Nominal	16101384	3	±50 Hz

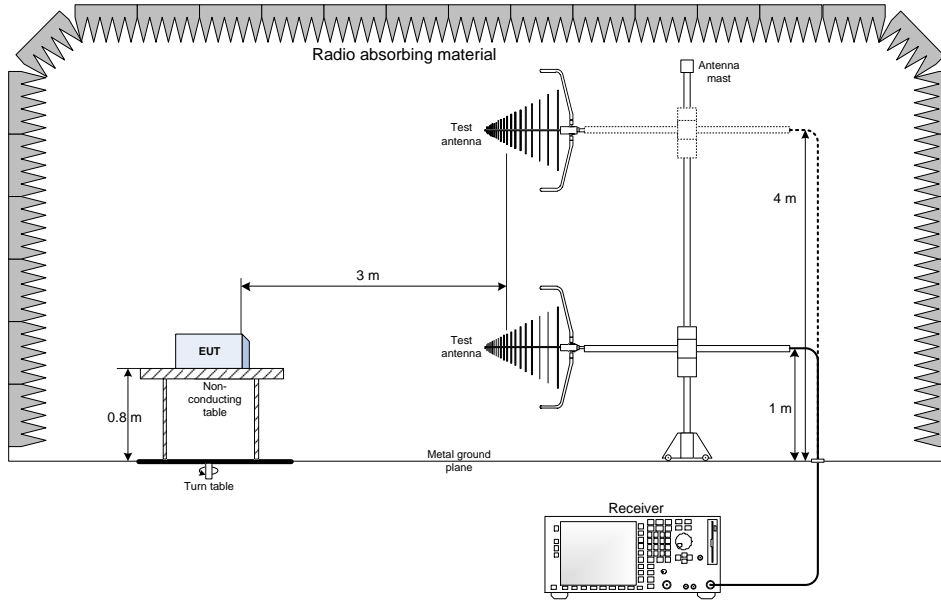
**Table 8.6-3: Frequency drift measurement FCC Part 90.213(a) results 150 watt**

Test conditions	Frequency, Hz	Drift, Hz	Limit ±20 Hz
+50 °C, Nominal	16101377	-4	±50 Hz
+40 °C, Nominal	16101377	-3	±50 Hz
+30 °C, Nominal	16101378	-1	±50 Hz
+20 °C, +15 %	16101380	0	±50 Hz
+20 °C, Nominal	16101380	0	Reference
+20 °C, -15 %	16101380	0	±50 Hz
+10 °C, Nominal	16101381	2	±50 Hz
0 °C, Nominal	16101383	1	±50 Hz
-10 °C, Nominal	16101381	0	±50 Hz
-20 °C, Nominal	16101384	3	±50 Hz
-30 °C, Nominal	16101383	2	±50 Hz

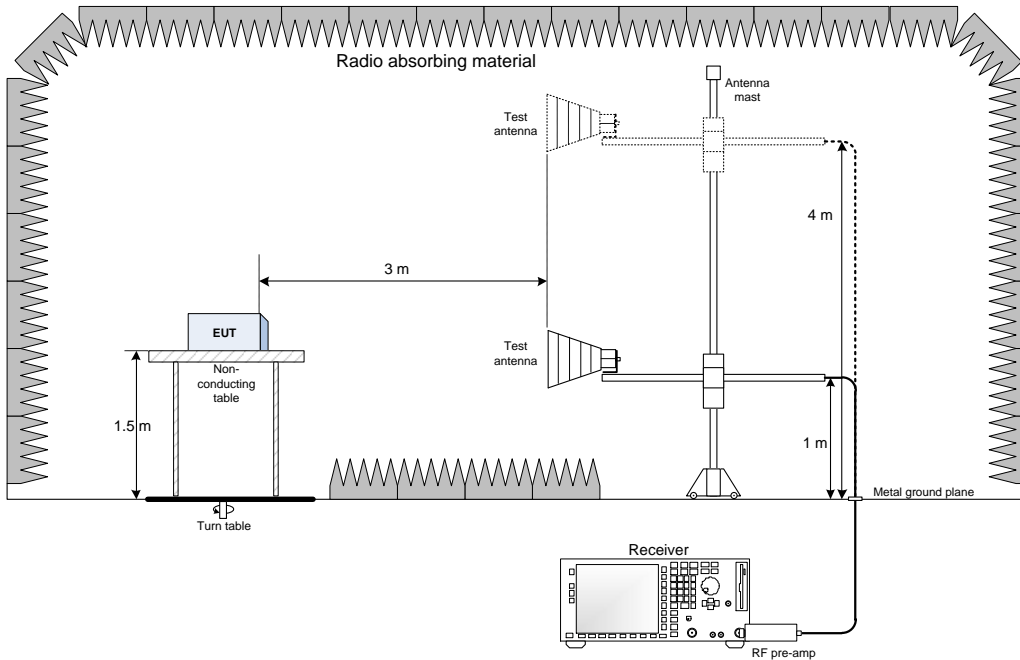


## Section 9. Block diagrams of test set-ups

### 9.1 Radiated emissions set-up for frequencies below 1 GHz

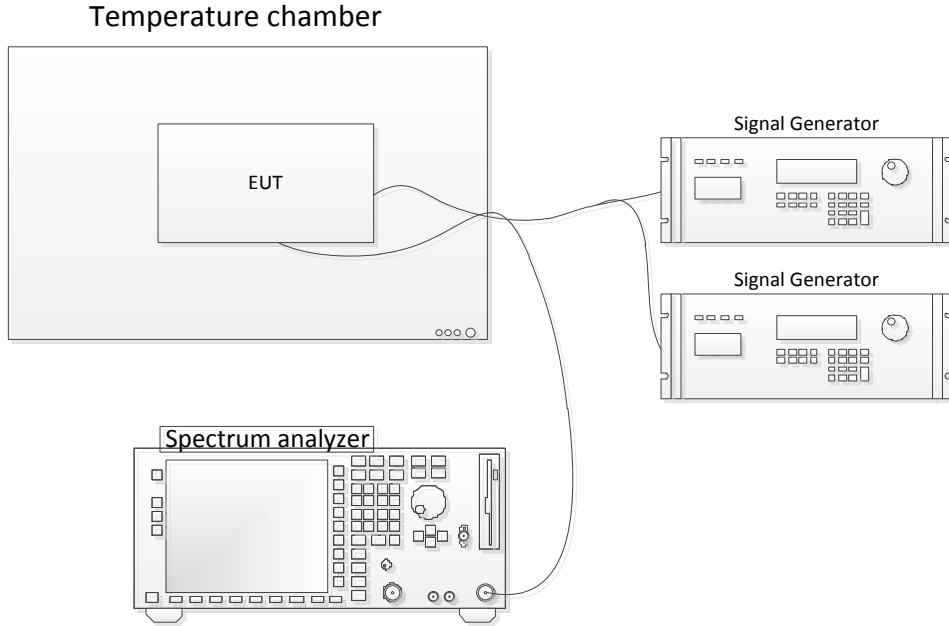


### 9.2 Radiated emissions set-up for frequencies above 1 GHz



### 9.3 Frequency stability

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### 9.4 Power limits, Modulation Characteristics, Emission limits, emission mask, bandwidth, Emission limits, conducted method

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