



FCC ID: V3TGB40FLEXX

EMI -- TEST REPORT

Test Report No. : T33123-00-02KJ	12. January 2009
	Date of issue

Type / Model Name : GB 40 flexx

Product Description : Wireless Transmitter / Guitar Bug

Applicant : AKG Acoustics GmbH

Address : Lemböckgasse 21-25
1230 Wien, Austria

Manufacturer : VTECH

Address : Dongguan Vtech Electronics Manufacturer Industries
Vtech Science Park, Cia Ling Bei Management Zone
Liaobu, Dingguan, Guangdon, China Postal Code 523411

Licence holder : AKG Acoustics GmbH

Address : Lemböckgasse 21-25
1230 Wien, Austria

Test Result according to the standards listed in clause 1 test standards:	POSITIVE
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The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

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1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 74

Experimental radio, auxiliary, special broadcast and other program distributional services (October 01, 2007)

Part 74, Subpart H, Section 74.861

Technical requirements for low power auxiliary stations

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2 SUMMARY

GENERAL REMARKS:

All tests have been performed with full batteries and maximum RF output power.

FINAL ASSESSMENT:

The equipment under test **fulfills** the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 16. December 2008

Testing concluded on : 22. December 2008

Checked by:

Tested by:

Thomas Weise
Dipl.-Ing.(FH)
Laboratory Manager

Josef Knab

3.2 Power supply system utilised

Power supply voltage : 1.5 V / DC

3.3 Short description of the Equipment under Test (EuT)

The EuT is a miniature transmitter for electric guitars and basses but is also suited for keyboards. The GB 40 flexx operates at three selectable, quartz stabilized carrier frequencies (CH1 660.700 MHz, CH2 661.100 MHz, CH3 662.300 MHz).

Number of tested samples: 1
Serial number: V08101300086

EuT operation mode:

The equipment under test was operated during the measurement under the following conditions:

- TX mode _____
- _____
- _____

EuT configuration:
(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurements:

- _____ Model : _____
- _____ Model : _____
- _____ Model : _____
- _____ Model : _____
- _____ Model : _____
- _____ Model : _____

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

mikes-testingpartners gmbh
Ohmstrasse 2-4
94342 STRASSKIRCHEN
GERMANY

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 /11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.4 Measurement Protocol for FCC, VCCI and AUSTEL

4.4.1 GENERAL INFORMATION

4.4.1.1 Test Methodology

Conducted and radiated disturbance testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22, European Standard EN 55022 as shown under section 1 of this report.

In compliance with 47 CFR Part 15 Subpart A Section 15.38 testing for FCC compliance may be done following the ANSI C63.4-2003 procedures and using the CISPR 22 Limits.

4.4.1.2 Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left unterminated. Where appropriate, cables are manually manipulated with respect to each other thus obtaining maximum disturbances from the unit.

4.4.2 DETAILS OF TEST PROCEDURES

4.4.2.1 General Standard Information

The test methods used comply with CISPR Publication 22, EN 55022 - " Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with ANSI C63.4-2003 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

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5 TEST CONDITIONS AND RESULTS

5.1 Conducted emissions

For test instruments and accessories used see section 6 Part A 4.

5.1.1 Description of the test location

Test location: None

5.1.2 Test result

Remarks: Not applicable.

The EuT is battery powered.



5.2 Effective radiated power (conducted)

For test instruments and accessories used see section 6 Part CPC 2.

5.2.1 Description of the test location

Test location: AREA4

5.2.2 Photo documentation of the test set-up

Please see attachment
“Test setup photos”

Please see attachment
“Test setup photos”

5.2.3 Description of Measurement

Transmitter power is the power at the transmitter output terminals and delivered to the antenna, antenna transmission line, or any other impedance-matched, radio frequency load.

No unusual transmitting antennas or antenna elevations shall be used as defined in §74.861(f) and the requirements in § 74.801 shall be.

5.2.4 Test result

EuT: GB 40 flexx (CH1 working at 660.700 MHz):

Frequency [MHz]	Level [dBm]	Limit [dBm]	DLimit [dB]
660.7034	7.3	24.0	-16.7

EuT: GB 40 flexx (CH2 working at 661.100 MHz):

Frequency [MHz]	Level [dBm]	Limit [dBm]	DLimit [dB]
661.1020	7.2	24.0	-16.8

EuT: GB 40 flexx (CH3 working at 662.300 MHz):

Frequency [MHz]	Level [dBm]	Limit [dBm]	DLimit [dB]
662.3030	6.6	24.0	-17.4

Peak Power Limit according to FCC Subpart 74.861(e)(1)(ii):

Transmitting frequencies of the EuT [MHz]	Limit [mW]	Limit [dBm]
54 – 72	50	17
76 – 88		
174 – 216		
470 – 608	250	24
614 - 806		

The requirements are **FULFILLED**.

Remarks: No unusual transmitting antennas or antenna elevations have not been used as defined
in §74.861(f) and the requirements in § 74.831 are also.

5.3 Radiated emissions (electric field) 30 MHz – 40 GHz

For test instruments and accessories used see section 6 Part SER 2, SER 3.

5.3.1 Description of the test location

Test location / distance: OATS1 / 3 meters

Test location / distance: Anechoic Chamber A2 / 3 meters

5.3.2 Photo documentation of the test set-up

Please see attachment
“Test setup photos”

Please see attachment
“Test setup photos”

Please see attachment
“Test setup photos”

Please see attachment
“Test setup photos”

5.3.3 Description of Measurement

Radiated spurious emissions from the EuT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003. The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample

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the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization's and the EuT are rotated 360 degrees.

The final level, expressed in dB μ V/m, is arrived by taking the reading from the EMI receiver (Level dB μ V) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

The radiated emissions from the EuT are measured in the frequency range of 1 GHz to maximum frequency as specified in section 15.33, using a tuned receiver (Spectrum Analyser) and appropriate linearly polarized antennas. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003.

The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3 horizontally from the EuT.

Measurement are made in both the horizontal and vertical planes of polarization in a fully anechoic room using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwidth set to 1 MHz. All tests are performed at a test-distance of 3 meters. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration procedure the highest emission relative the limit and therefore shall be used for final testing. During the tests the EUT is rotated all around to find the maximum levels of emissions. The cables and equipment were placed and moved within the range of position likely to find their maximum emissions. When the EuT is larger than the beamwidth of the measuring antenna, the measurement antenna will be moved over the surfaces for the four sides or the test distance will be reduced to demonstrate that emissions were at maximum at the limit distance.

The resolution bandwidth during the measurement is as follows:

30 MHz – 1000 MHz:	ResBW: 120 kHz
1000 MHz – 40000 MHz	ResBW: 1 MHz

5.3.4 Test result

EuT: GB 40 flexx (CH1 working at 660.700 MHz):

Frequency [MHz]	Reading Vert. [dBm]	Reading Hor. [dBm]	Correct. Vert. [dB]	Correct. Hor. [dB]	Level Vert. [dBm]	Level Hor. [dBm]	Limit [dBm]	DLimit [dB]
25 - 1000	-	-	-	-	< -50.0	< -50.0	-13.0	-
1318	-29.8	-31.3	-11.6	-10.8	-41.4	-42.1	-13.0	-28.4
1654	-36.1	-42.8	-12.6	-12.4	-48.7	-55.2	-13.0	-35.7
1984	-34.4	-42.0	-11.5	-12.2	-45.9	-54.2	-13.0	-32.9
2314	-42.1	-49.5	-10.2	-10.4	-52.3	-59.9	-13.0	-39.3
2644	-40.2	-46.6	-8.9	-8.6	-49.1	-55.2	-13.0	-36.1
2974	-46.7	-53.1	-6.9	-7.7	-53.6	-60.8	-13.0	-40.6
3304	-39.3	-44.7	-4.9	-5.0	-44.2	-49.7	-13.0	-31.2
3634	-54.9	-54.8	-5.0	-4.9	-59.9	-59.7	-13.0	-46.7
3802	-50.1	-53.7	-4.4	-4.8	-54.5	-58.5	-13.0	-41.5
3970	-33.0	-40.0	-5.2	-6.0	-38.2	-46.0	-13.0	-25.2
4128	-55.7	-60.9	3.9	3.6	-51.8	-57.3	-13.0	-38.8
4296	-44.7	-54.8	2.5	3.0	-42.2	-51.8	-13.0	-29.2
4456	-56.5	-63.2	3.5	3.6	-53.0	-59.6	-13.0	-40.0
4624	-40.7	-47.5	4.2	4.2	-36.4	-43.3	-13.0	-23.4
4952	-46.3	-56.4	4.2	4.1	-42.1	-52.3	-13.0	-29.1
5288	-54.9	-55.6	4.5	4.7	-50.4	-50.9	-13.0	-37.4
5616	-52.8	-56.3	5.0	5.0	-47.8	-51.3	-13.0	-34.8
5944	-55.0	-61.1	5.1	5.0	-49.9	-56.1	-13.0	-36.9
6280	-53.4	-50.6	5.9	5.8	-47.5	-44.8	-13.0	-31.8
6608	-58.4	-59.0	6.1	6.5	-52.3	-52.5	-13.0	-39.3
6944	-51.9	-51.5	7.0	6.9	-44.9	-44.6	-13.0	-31.6
7272	-51.4	-52.7	7.9	7.8	-43.5	-44.9	-13.0	-30.5
7600	-53.3	-55.4	8.4	8.4	-44.9	-47.0	-13.0	-31.9
7936	-58.3	-61.1	9.1	9.0	-49.2	-52.1	-13.0	-36.2

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EuT: GB 40 flexx (CH2 working at 661.100 MHz):

Frequency [MHz]	Reading Vert. [dBm]	Reading Hor. [dBm]	Correct. Vert. [dB]	Correct. Hor. [dB]	Level Vert. [dBm]	Level Hor. [dBm]	Limit [dBm]	DLimit [dB]
25 - 1000	-	-	-	-	< -50.0	< -50.0	-13.0	-
1318	-29.6	-31.8	-11.6	-10.8	-41.2	-42.6	-13.0	-28.2
1654	-36.3	-43.9	-12.6	-12.4	-48.9	-56.3	-13.0	-35.9
1984	-34.3	-43.5	-11.5	-12.2	-45.8	-55.6	-13.0	-32.8
2314	-42.2	-50.5	-10.2	-10.4	-52.4	-60.8	-13.0	-39.4
2644	-39.2	-46.4	-8.9	-8.6	-48.1	-55.0	-13.0	-35.1
2974	-47.8	-55.2	-6.9	-7.7	-54.7	-62.9	-13.0	-41.7
3310	-39.7	-46.1	-4.9	-5.0	-44.6	-51.1	-13.0	-31.6
3808	-51.1	-55.9	-4.4	-4.9	-55.5	-60.8	-13.0	-42.5
3970	-35.5	-41.1	-5.2	-6.0	-40.7	-47.1	-13.0	-27.7
4128	-57.0	-63.0	3.9	3.6	-53.0	-59.4	-13.0	-40.0
4296	-45.6	-56.9	2.5	3.0	-43.2	-53.9	-13.0	-30.2
4456	-57.9	-63.0	3.5	3.6	-54.4	-59.4	-13.0	-41.4
4620	-41.5	-48.5	4.2	4.2	-37.3	-44.2	-13.0	-24.3
4960	-47.2	-57.6	4.2	4.0	-43.0	-53.6	-13.0	-30.0
5288	-55.1	-55.8	4.5	4.7	-50.6	-51.1	-13.0	-37.6
5616	-54.1	-57.9	5.0	5.0	-49.1	-52.9	-13.0	-36.1
5952	-53.5	-58.8	5.2	5.1	-48.3	-53.7	-13.0	-35.3
6280	-50.4	-50.5	5.9	5.8	-44.5	-44.7	-13.0	-31.5
6616	-52.5	-58.1	6.2	6.5	-46.3	-51.6	-13.0	-33.3
6944	-49.7	-53.1	7.0	6.9	-42.7	-46.2	-13.0	-29.7
7280	-49.4	-51.2	7.9	7.8	-41.5	-43.4	-13.0	-28.5
7608	-52.9	-55.3	8.4	8.4	-44.5	-46.9	-13.0	-31.5
7936	-56.2	-59.0	9.1	9.0	-47.1	-50.0	-13.0	-34.1

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EuT: GB 40 flexx (CH3 working at 662.300 MHz):

Frequency [MHz]	Reading Vert. [dBm]	Reading Hor. [dBm]	Correct. Vert. [dB]	Correct. Hor. [dB]	Level Vert. [dBm]	Level Hor. [dBm]	Limit [dBm]	DLimit [dB]
25 - 1000	-	-	-	-	< -50.0	< -50.0	-13.0	-
1324	-28.8	-31.4	-11.7	-10.9	-40.5	-42.3	-13.0	-27.5
1654	-37.4	-44.5	-12.6	-12.4	-50.0	-56.9	-13.0	-37.0
1984	-33.7	-42.5	-11.5	-12.2	-45.2	-54.6	-13.0	-32.2
2320	-42.1	-50.5	-10.2	-10.4	-52.3	-60.9	-13.0	-39.3
2650	-37.8	-45.5	-8.8	-8.6	-46.6	-54.1	-13.0	-33.6
2980	-48.6	-54.7	-6.8	-7.6	-55.4	-62.3	-13.0	-42.4
3316	-39.8	-46.3	-5.0	-5.0	-44.8	-51.3	-13.0	-31.8
3814	-49.0	-53.4	-4.5	-4.9	-53.5	-58.3	-13.0	-40.5
3976	-32.2	-40.4	-5.2	-6.0	-37.4	-46.4	-13.0	-24.4
4136	-54.1	-62.2	4.0	3.5	-50.2	-58.7	-13.0	-37.2
4304	-45.5	-55.8	2.5	3.0	-43.0	-52.8	-13.0	-30.0
4472	-56.5	-63.1	3.4	3.7	-53.1	-59.4	-13.0	-40.1
4628	-41.2	-49.1	4.2	4.2	-36.9	-44.9	-13.0	-23.9
4968	-48.5	-56.3	4.1	4.0	-44.4	-52.3	-13.0	-31.4
5296	-55.7	-55.8	4.5	4.7	-51.2	-51.1	-13.0	-38.1
5632	-53.4	-56.5	5.0	4.9	-48.4	-51.6	-13.0	-35.4
5960	-50.7	-56.7	5.3	5.1	-45.4	-51.6	-13.0	-32.4
6296	-48.4	-50.6	5.9	5.8	-42.5	-44.8	-13.0	-29.5
6624	-48.6	-53.3	6.2	6.6	-42.4	-46.7	-13.0	-29.4
6960	-52.1	-54.2	7.0	6.9	-45.1	-47.3	-13.0	-32.1
7288	-47.9	-49.9	7.9	7.8	-40.0	-42.1	-13.0	-27.0
7624	-53.4	-55.4	8.5	8.4	-44.9	-47.0	-13.0	-31.9
7952	-52.7	-57.6	9.0	9.0	-43.7	-48.6	-13.0	-30.7

Peak-Limit according to FCC Subpart 74.861(e)(6)(iii)

The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least $43+10\log_{10}$ (mean output power in watts) dB.

The requirements are **FULFILLED**.

Remarks: During the test, the Eut was set into transmitting mode without modulation.

The measurement was performed up to the 10th harmonic (8000 MHz).

The measurement has been performed in Peak mode. For critical results, the measurements would be repeated in average mode.

5.4 Modulation Limiting Data

For test instruments and accessories used see section 6 Part MLD.

5.4.1 Description of the test location

Test location: AREA4

5.4.2 Photo documentation of the test set-up

Please see attachment
“Test setup photos”

Please see attachment
“Test setup photos”

5.4.3 Description of Measurement

The modulation limiting data were measured at the antenna terminals for EuT's with external connector. Other EuT's are tested via an adequate coupling device with antenna jack. The antenna jack was connected to the input of a communication test receiver. The internal batteries of the EuT have been removed also and an external DC power supply was used instead. The data have been taken by feeding the connectors used for connecting the microphone with different audio frequencies. These frequencies are generated in the communication test receiver. The level was varied in 10 dB steps from 20 dBµV to the maximum audio input level specified by the manufacturer. The frequency deviation at these levels has been recorded.

PFD: Positive frequency deviation
 NFD: Negative frequency deviation

5.4.4 Test result

EuT: GB 40 flexx (CH1 working at 660.700 MHz):

Input audio level [dBµV]	F _{mod} =50 Hz		F _{mod} =1 kHz		F _{mod} =20 kHz	
	PFD [kHz]	NFD [kHz]	PFD [kHz]	NFD [kHz]	PFD [kHz]	NFD [kHz]
20	0.7	0.7	0.8	0.8	1.2	1.2
30	0.7	0.7	0.8	0.9	2.0	2.0
40	0.8	0.8	1.1	1.1	3.6	3.6
50	1.2	1.2	1.7	1.7	6.5	6.5
60	1.9	1.9	2.8	2.8	11.0	11.2
70	3.3	3.3	4.8	4.9	19.8	19.5
80	5.7	5.7	8.5	8.4	34.4	32.7
90	10.3	10.2	14.8	14.9	48.0	45.3
100	18.1	17.9	26.0	25.8	48.0	45.4
110	31.6	31.7	42.3	42.1	47.4	45.1
115	35.6	38.8	46.6	45.4	47.3	45.1
120	37.1	40.1	47.0	45.7	47.3	45.1

EuT: GB 40 flexx (CH2 working at 661.100 MHz):

Input audio level [dBµV]	F _{mod} =50 Hz		F _{mod} =1 kHz		F _{mod} =20 kHz	
	PFD [kHz]	NFD [kHz]	PFD [kHz]	NFD [kHz]	PFD [kHz]	NFD [kHz]
20	0.7	0.7	0.9	0.8	1.2	1.2
30	0.7	0.7	0.9	0.9	2.0	2.0
40	0.9	0.8	1.1	1.2	3.7	3.7
50	1.1	1.2	1.7	1.7	6.5	6.5
60	1.9	1.9	2.8	2.8	11.1	11.3
70	3.3	3.3	4.9	4.9	19.9	19.9
80	5.7	5.7	8.5	8.5	34.2	33.5
90	10.1	10.1	14.8	15.1	46.6	46.8
100	17.8	17.8	25.9	26.1	46.8	47.0
110	30.7	31.7	40.6	43.1	46.4	46.7
115	34.4	38.9	44.8	46.8	46.2	46.7
120	36.1	40.3	45.1	47.2	46.3	46.6

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EuT: GB 40 flexx (CH3 working at 662.300 MHz):

Input audio level [dB μ V]	F _{mod} =50 Hz		F _{mod} =1 kHz		F _{mod} =20 kHz	
	PFD [kHz]	NFD [kHz]	PFD [kHz]	NFD [kHz]	PFD [kHz]	NFD [kHz]
20	0.8	0.8	0.9	0.9	1.3	1.3
30	0.9	0.8	0.9	0.9	2.1	2.1
40	0.9	0.8	1.2	1.2	3.9	3.9
50	1.1	1.2	1.8	1.8	6.8	6.8
60	1.9	1.9	2.9	2.9	11.6	11.9
70	3.3	3.4	5.2	5.2	20.8	20.9
80	5.8	5.8	9.0	9.0	35.6	35.4
90	10.3	10.3	15.6	16.0	48.1	49.7
100	17.9	18.3	27.1	27.8	48.2	49.8
110	30.9	34.1	41.9	46.6	47.7	49.5
115	34.4	42.4	46.3	50.6	47.6	49.5
120	36.2	44.0	46.6	51.0	47.7	49.5

Limit according to FCC Subpart 74.861(e)(3):

Any form of modulation may be used. A maximum deviation of +/- 75 kHz is permitted when frequency modulation is employed.

The requirements are **FULFILLED**.

Remarks:

5.5 Occupied Bandwidth

For test instruments and accessories used see section 6 Part MB.

5.5.1 Description of the test location

Test location: AREA4

5.5.2 Photo documentation of the test set-up

Please see attachment
“Test setup photos”

Please see attachment
“Test setup photos”

5.5.3 Description of Measurement

For the occupied bandwidth protocol the value of 50 % of the maximum frequency deviation was calculated. The level on the audio input was increased until this 50 % frequency deviation was achieved. To this level 16 dB have been added and a plot was made as described in the next chapter under section occupied bandwidth

5.5.4 Test result

EuT: GB 40 flexx (CH1 working at 660.700 MHz):

Max. measured frequency deviation (e.g. 2.-5 kHz): ± 47.0 kHz

50% of the maximum deviation: ± 23.5 kHz

Audio input level (ail) to get \pm kHz: L= 98.2 dB μ V

L + 16 dB μ V = 114.2 dB μ V \Rightarrow Level for testing the occupied bandwidth

Version of EuT	CH1			
Audio test level	L= 114.2 dB μ V 2.5 kHz		L= 89.5 dB μ V 15.0 kHz	
Shape of emission mask	± 50 -100% [dB]	± 100 -250% [dB]	± 50 -100% [dB]	± 100 -250% [dB]
Min.limit margin [dB]	> 15	> 30	> 10	> 30

EuT: GB 40 flexx (CH2 working at 661.100 MHz):

Max. measured frequency deviation (e.g. 2.-5 kHz): ± 47.2 kHz

50% of the maximum deviation: ± 23.6 kHz

Audio input level (ail) to get \pm kHz: L= 98.2 dB μ V

L + 16 dB μ V = 114.2 dB μ V \Rightarrow Level for testing the occupied bandwidth

Version of EuT	CH2			
Audio test level	L= 114.2 dB μ V 2.5 kHz		L= 89.2 dB μ V 15.0 kHz	
Shape of emission mask	± 50 -100% [dB]	± 100 -250% [dB]	± 50 -100% [dB]	± 100 -250% [dB]
Min.limit margin [dB]	> 25	> 30	> 15	> 30

EuT: GB 40 flexx (CH3 working at 662.300 MHz):

Max. measured frequency deviation (e.g. 2.-5 kHz): ± 51.0 kHz

50% of the maximum deviation: ± 25.5 kHz

Audio input level (ail) to get \pm kHz: L= 98.5 dB μ V

L + 16 dB μ V = 114.5 dB μ V \Rightarrow Level for testing the occupied bandwidth

Version of EuT	CH3			
Audio test level	L= 114.5 dB μ V 2.5 kHz		L= 89.4 dB μ V 15.0 kHz	
Shape of emission mask	± 50 -100% [dB]	± 100 -250% [dB]	± 50 -100% [dB]	± 100 -250% [dB]
Min.limit margin [dB]	> 25	> 30	> 15	> 30

FCC ID: V3TGB40FLEXX

Limit according to FCC Subpart 15.247(e)(6)(i)(ii)(iii):

Attenuated below the mean output power of the transmitter	$\pm 50-100\%$ [dB]	$\pm 100-250\%$ [dB]	$> 250\%$
Limit	25	35	$43+10\log_{10}$ (mean output power in watt)

The requirements are **FULFILLED**.

Remarks: For detailed results, please see the protocol at following page(s).



5.5.5 Test protocol

Occupied Bandwidth
FCC Part 15 Subpart 74.861(e)(6)

CH1 working at 660.700 MHz
AIL: 114.2 dB μ V F_{mod}: 2.5 kHz



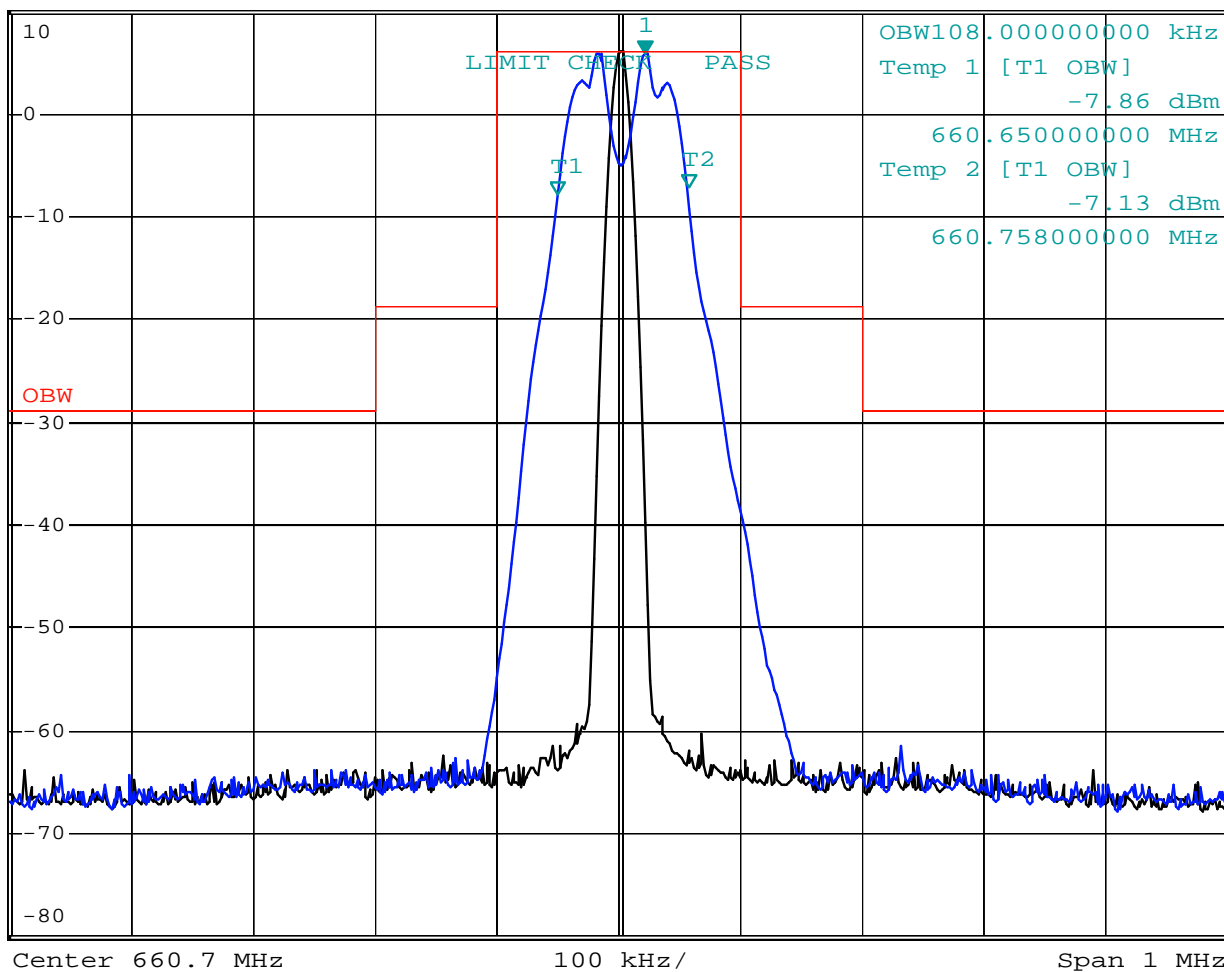
*RBW 10 kHz Marker 1 [T1]
*VBW 10 kHz 5.97 dBm
*SWT 5 s 660.722000000 MHz

Ref 10 dBm

*Att 20 dB

1 PK
VIEW

2 PK
VIEW



B

3DB

Occupied Bandwidth
FCC Part 15 Subpart 74.861(e)(6)

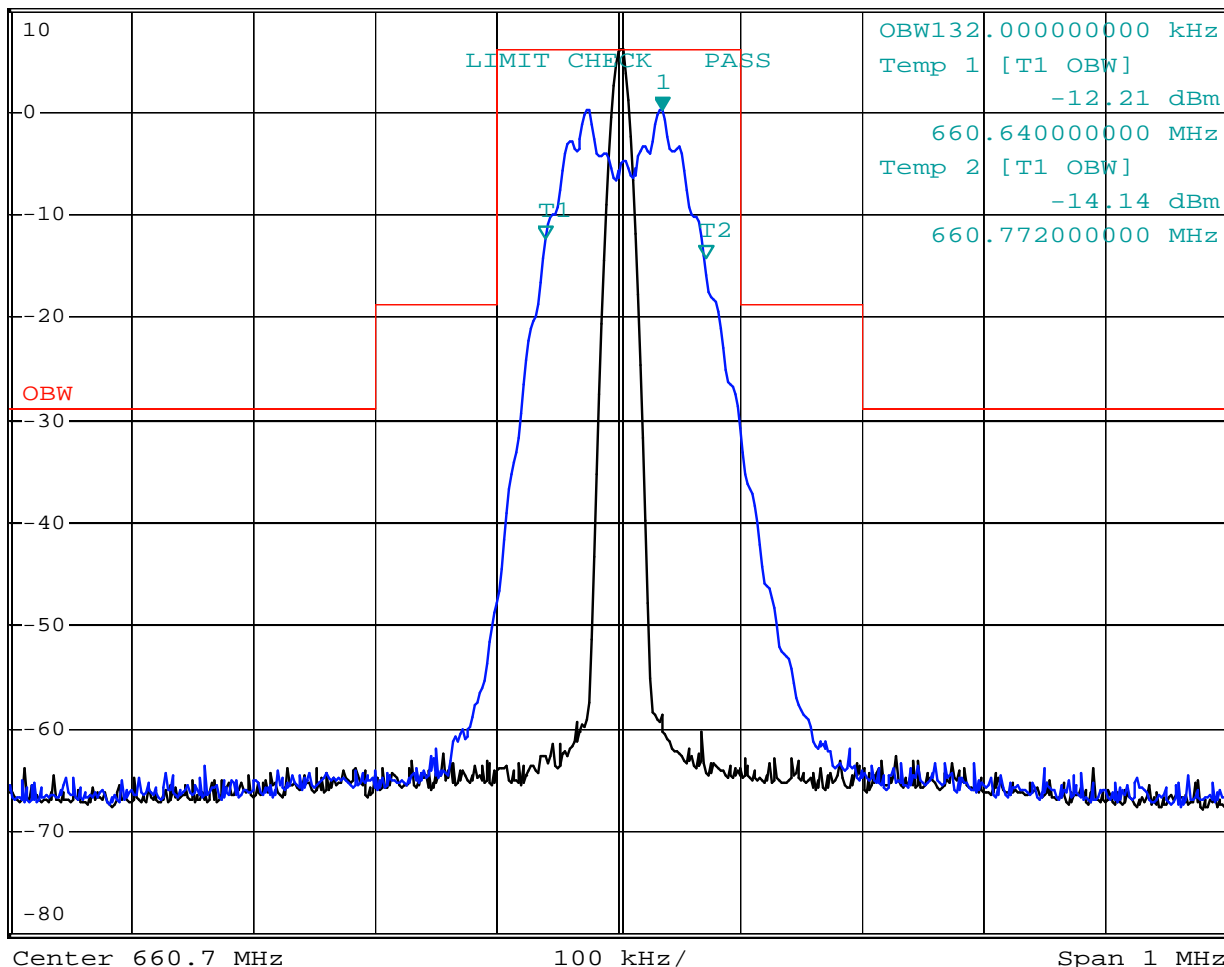
CH1 working at 660.700 MHz
AIL: 89.5 dBμV F_{mod}: 15 kHz



Ref 10 dBm * Att 20 dB * RBW 10 kHz Marker 1 [T1] 0.27 dBm
 * VBW 10 kHz 660.73600000 MHz
 * SWT 5 s

1 PK
VIEW

2 PK
VIEW



FCC ID: V3TGB40FLEXX

Occupied Bandwidth
FCC Part 15 Subpart 74.861(e)(6)

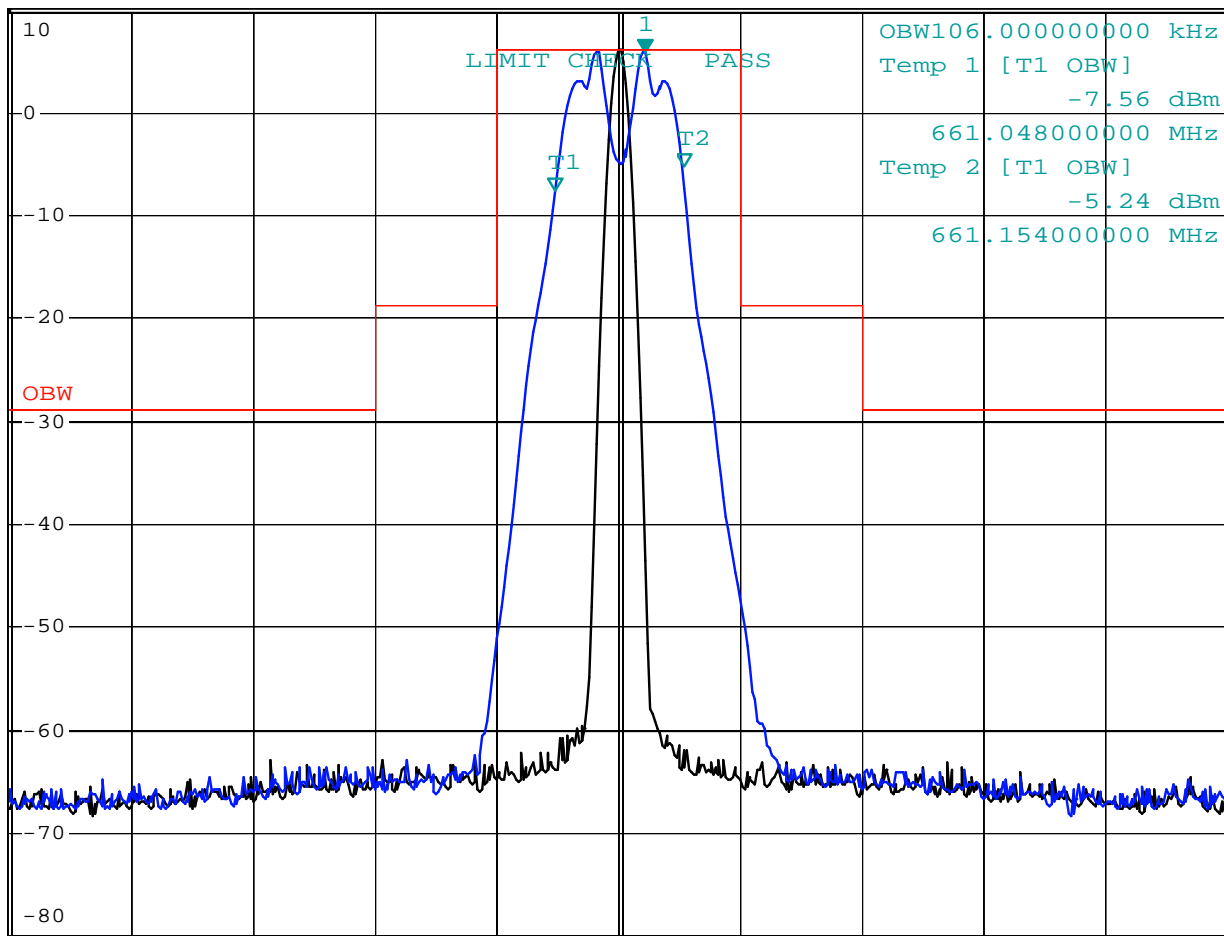
CH2 working at 661.100 MHz
AIL: 114.2 dB μ V F_{mod}: 2.5 kHz



Ref 10 dBm * Att 20 dB * RBW 10 kHz Marker 1 [T1] 5.89 dBm
 * VBW 10 kHz 661.12200000 MHz
 * SWT 5 s

1 PK
VIEW

2 PK
VIEW



Center 661.1 MHz 100 kHz/ Span 1 MHz

FCC ID: V3TGB40FLEXX

Occupied Bandwidth
FCC Part 15 Subpart 74.861(e)(6)

CH2 working at 661.100 MHz
AIL: 89.2 dBµV F_{mod}: 15 kHz



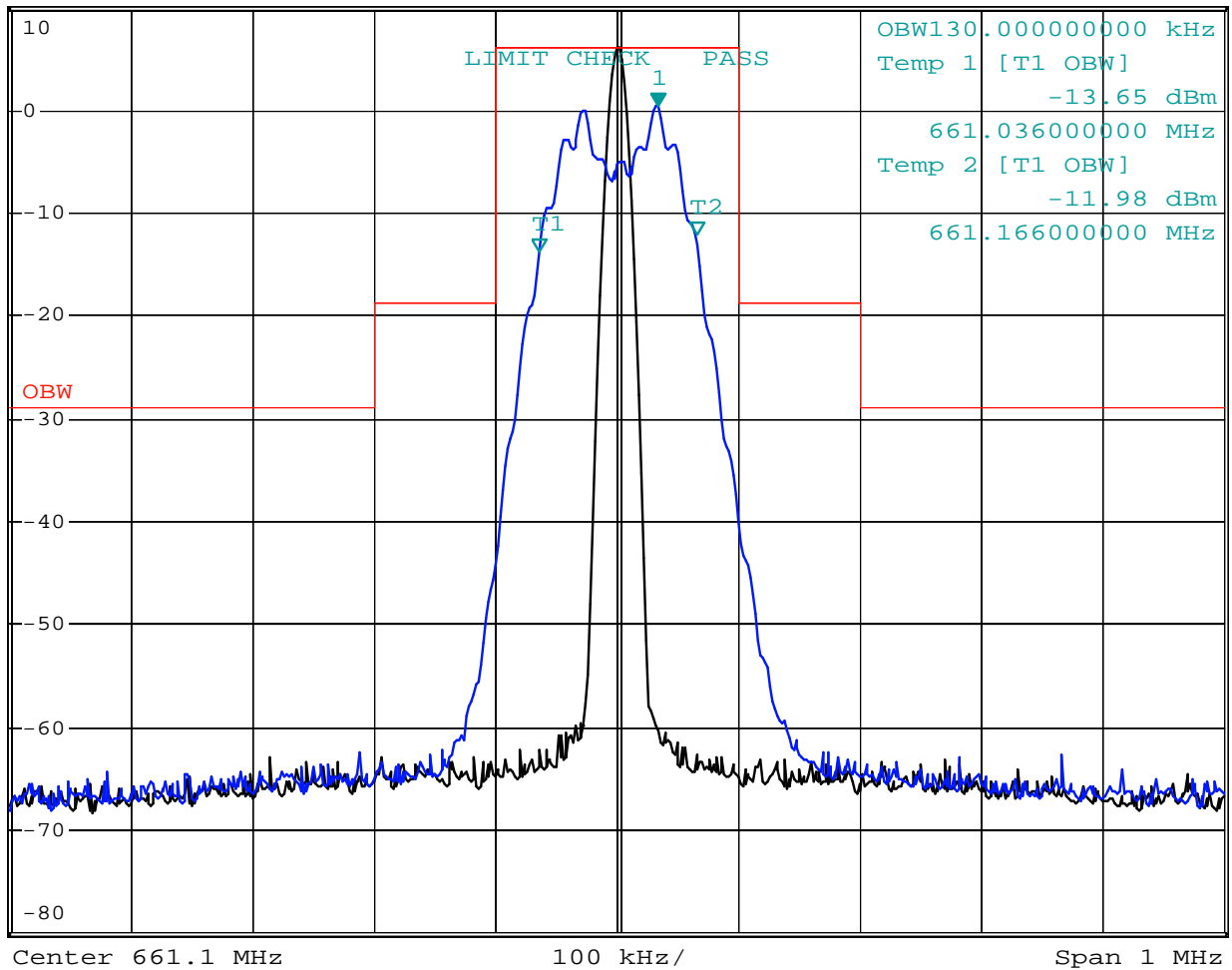
*RBW 10 kHz Marker 1 [T1] 0.44 dBm
*VBW 10 kHz
*SWT 5 s 661.134000000 MHz

Ref 10 dBm

*Att 20 dB

1 PK
VIEW

2 PK
VIEW



FCC ID: V3TGB40FLEXX

Occupied Bandwidth
FCC Part 15 Subpart 74.861(e)(6)

CH3 working at 662.300 MHz
AIL: 114.5 dBµV F_{mod}: 2.5 kHz



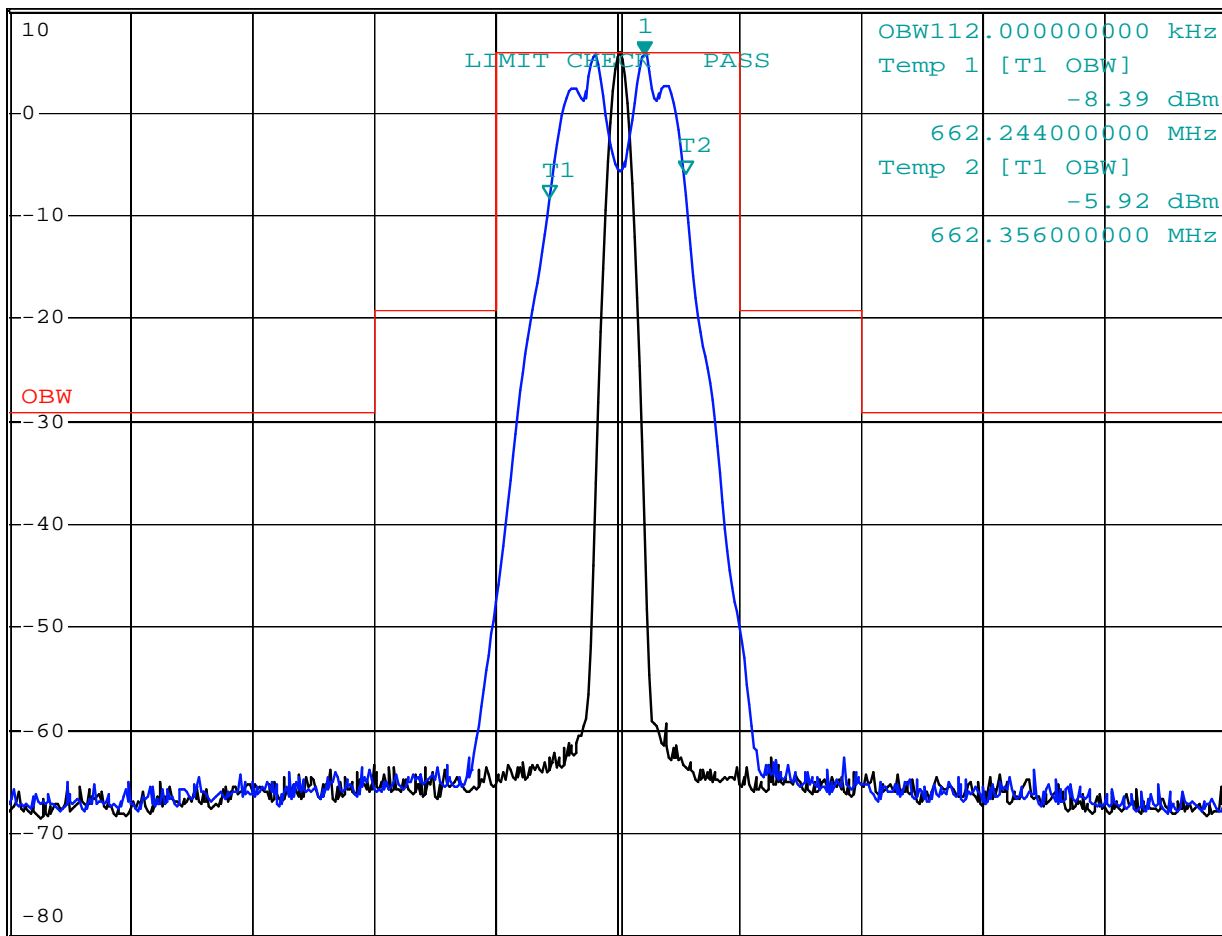
*RBW 10 kHz Marker 1 [T1]
*VBW 10 kHz 5.55 dBm
*SWT 5 s 662.322000000 MHz

Ref 10 dBm

*Att 20 dB

1 PK
VIEW

2 PK
VIEW



Center 662.3 MHz

100 kHz/

Span 1 MHz

FCC ID: V3TGB40FLEXX

Occupied Bandwidth
FCC Part 15 Subpart 74.861(e)(6)

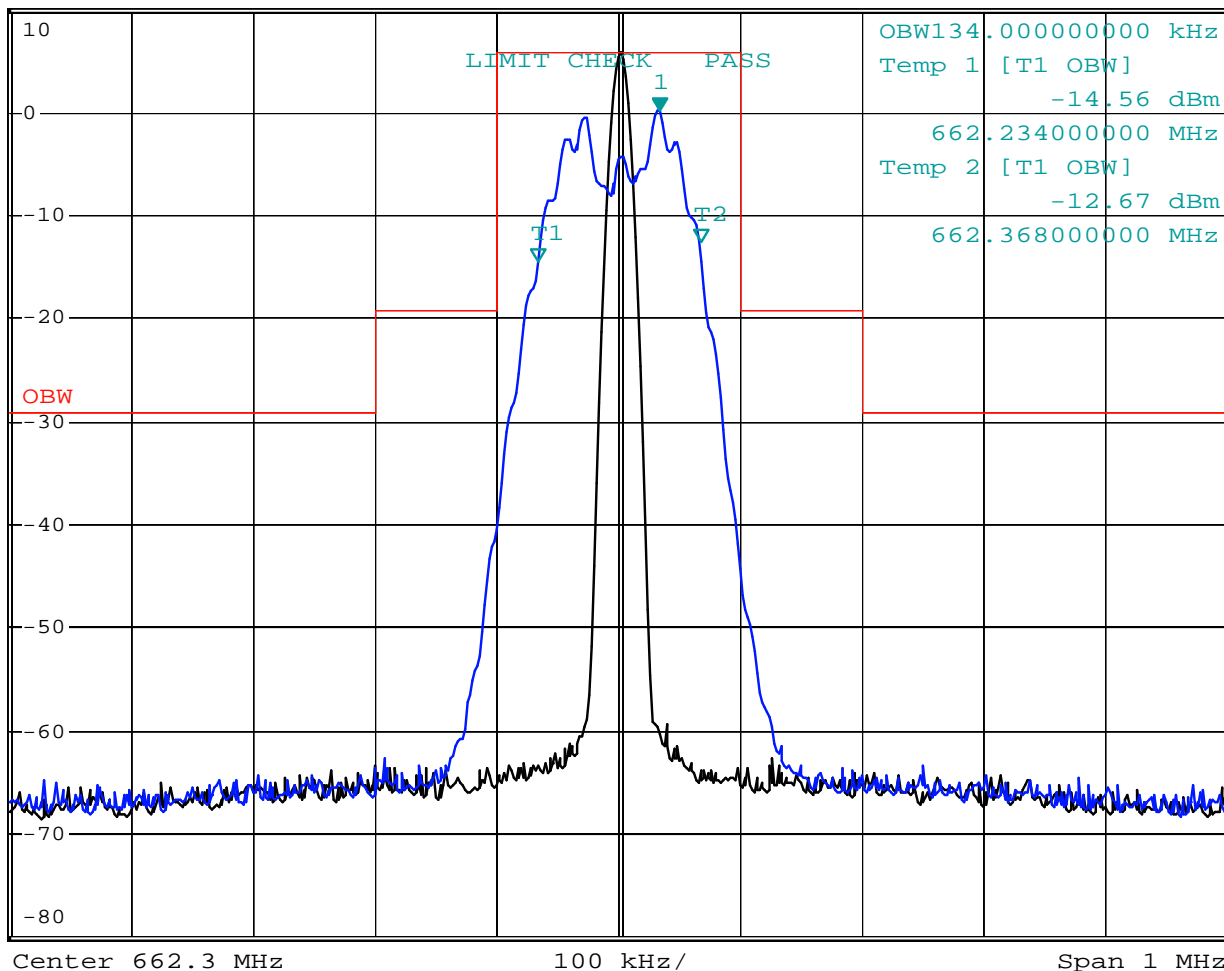
CH3 working at 662.300 MHz
AIL: 89.4 dBμV F_{mod}: 15 kHz



Ref 10 dBm * Att 20 dB * RBW 10 kHz Marker 1 [T1] 0.10 dBm
 * VBW 10 kHz 662.334000000 MHz
 * SWT 5 s

1 PK
VIEW

2 PK
VIEW



3DB

5.6 Frequency error

For test instruments and accessories used see section 6 Part FE.

5.6.1 Description of the test location

Test location: AREA4

5.6.2 Photo documentation of the test set-up

Please see attachment
“Test setup photos”

Please see attachment
“Test setup photos”

5.6.3 Description of Measurement

The frequency error was measured at the antenna terminals for EuT`s with external connector. Other EuT`s are tested via an adequate coupling device with antenna jack in a climatic test chamber. The antenna jack was connected to the input of a communication test receiver. The internal batteries have been removed also and a variable DC power supply was used instead. The measurements have been made with the EuT unmodulated. During the test the supply voltage and the temperature were varied and applied simultaneously. The lower supply voltage was given by the manufacturer. In case the equipment was switching off before, the switch off voltage was used instead. The frequency error is defined as the deviation of the transmitting frequency from the nominal frequency.

5.6.4 Test result

Version of Equipment with the fitting transmitting frequency		CH1 660.700 MHz	CH2 661.100 MHz	CH3 662.300 MHz
Temperature [°C]	DC supply voltage [V]	Frequency error [kHz]	Frequency error [kHz]	Frequency error [kHz]
-30	1.50	-0.25	-1.54	-0.68
	1.00	-0.18	-1.37	-0.48
-20	1.50	2.70	1.83	3.03
	1.00	2.85	2.06	3.25
-10	1.50	6.33	4.34	4.57
	1.00	6.53	4.61	4.96
0	1.50	10.39	4.30	4.84
	1.00	10.72	4.57	5.17
+10	1.50	7.04	4.25	4.07
	1.00	7.22	4.61	4.57
+20	1.50	3.53	2.09	3.15
	1.00	4.18	2.82	3.93
+30	1.50	1.18	-0.05	1.00
	1.00	1.67	0.46	1.49
+40	1.50	-0.31	-1.60	-0.78
	1.00	0.23	-1.06	-0.24
+50	1.50	-1.54	-2.62	-2.06
	1.00	-1.10	-1.98	-1.33
Maximum deviation from nominal frequency: [kHz]		+10.72 / -1.54	+4.61 / -2.62	+5.17 / -2.06

FCC ID: V3TGB40FLEXX

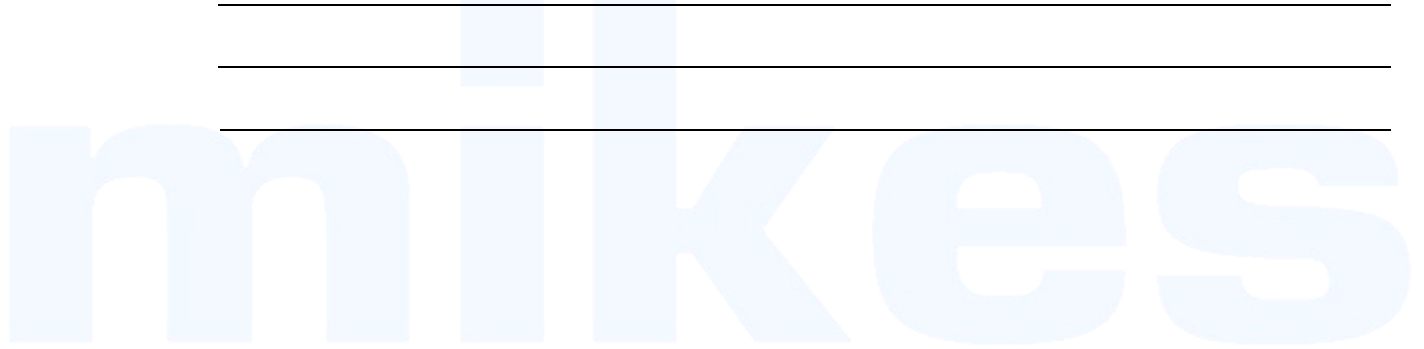
Limit according to FCC Subpart 74.861(e)(4):

The frequency tolerance of the transmitter shall be not greater than 0.005 percent of the nominal transmit frequency as declared by the manufacturer.

Versions of Eut`s with the fitting nominal frequency [MHz]	0.005% of nominal frequency [kHz]	Limit [kHz]
CH1 working at 660.700	33.0	±16.5
CH2 working at 661.100	33.0	±16.5
CH3 working at 662.300	33.1	±16.5

The requirements are **FULFILLED**.

Remarks:



6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used, in addition to the test accessories, are calibrated and verified regularly.

The calibration intervals and the calibration history will be given out on request.

Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
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CPC 2	CMS-54	Com. Receiver	Rohde & Schwarz München	02-02/05-05-011	08/18/2009	08/18/2008		
	MHIT29S	Multimeter digital TRMS	GOSEN-METRAWATT GmbH	02-02/32-07-004	12/05/2009	12/05/2008		
	6543A	Power Supply	HP Hewelett-Packard	02-02/50-05-157				

FE	CMS-54	Com. Receiver	Rohde & Schwarz München	02-02/05-05-011	08/18/2009	08/18/2008		
	MHIT29S	Multimeter digital TRMS	GOSEN-METRAWATT GmbH	02-02/32-07-004	12/05/2009	12/05/2008		
	WK-340/40	Climatic Chamber	Weiss Umwelttechnik GmbH	02-02/45-05-001	09/01/2010	09/01/2005	12/17/2008	06/17/2008
	6543A	Power Supply	HP Hewelett-Packard	02-02/50-05-157				

MB	FSP 7	Spectrum Analyzer	Rohde & Schwarz München	01-02/11-05-002	08/26/2009	08/26/2008		
	CMS-54	Com. Receiver	Rohde & Schwarz München	02-02/05-05-011	08/18/2009	08/18/2008		
	UPL	Audio Analyzer	Rohde & Schwarz München	02-02/19-05-002	04/03/2009	04/03/2007	04/23/2009	04/23/2008
	DR285/N	2-Way Power Divider	PARZICH GMBH	02-02/50-05-169				

MLD	FSP 7	Spectrum Analyzer	Rohde & Schwarz München	01-02/11-05-002	08/26/2009	08/26/2008		
	CMS-54	Com. Receiver	Rohde & Schwarz München	02-02/05-05-011	08/18/2009	08/18/2008		
	UPL	Audio Analyzer	Rohde & Schwarz München	02-02/19-05-002	04/03/2009	04/03/2007	04/23/2009	04/23/2008
	DR285/N	2-Way Power Divider	PARZICH GMBH	02-02/50-05-169				

FCC ID: V3TGB40FLEXX

Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
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SER 2	ESVS 30	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-006	07/30/2009	07/30/2008		
	VULB 9168	Trilog Broad Band Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-005	05/06/2011	05/06/2008	02/28/2009	08/29/2008
	S10162-B	RF Cable 33 m	Huber + Suhner	02-02/50-05-031				
	KK-EF393-21N-16	RF Cable 20 m	Huber + Suhner	02-02/50-05-033				
	NW-2000-NB	RF Cable	Huber + Suhner	02-02/50-05-113				

SER 3	FSP 30	Spectrum Analyzer	Rohde & Schwarz München	02-02/11-05-001	04/08/2009	04/08/2008		
	AFS4-01000400-10-10P-4	RF Amplifier 1-4 GHz	PARZICH GMBH	02-02/17-05-003				
	AMF-4F-04001200-15-10P	RF Amplifier 4-12 GHz	PARZICH GMBH	02-02/17-05-004				
	AFS5-12001800-18-10P-6	RF Amplifier 12-18 GHz	PARZICH GMBH	02-02/17-06-002				
	3117	Horn Antenna 1-18 GHz	EMCO Elektronik GmbH	02-02/24-05-009	01/16/2009	01/16/2008		
	Sucoflex N-1600-SMA	RF Cable	novotronik Signalverarbeitung und	02-02/50-05-073				
	Sucoflex N-2000-SMA	RF Cable	novotronik Signalverarbeitung und	02-02/50-05-075				