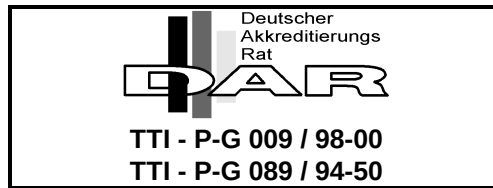


FCC ID: E9MHT40



EMISSION -- TESTREPORT

Testreport file no. : T17590-1-01 KJ Date : March 08, 2000
of issue

Model : Handheld microphone transmitter

Type : HT 40

Applicant : AKG Acoustics GmbH

Manufacturer : WAGOL Industrial Co. LTD

Licence holder : AKG Acoustics U.S.

Address : 1449 Donelson Pike, Nashville TN 37217

United States of America

Test result accrdg.
to the regulation(s)
at page 3

:

POSITIV

This testreport with appendix consists of 46 pages.
The testresult only responds to the tested sample. It is not allowed to copy
this report even partly without the allowance of the testlaboratory.

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TEST REGULATIONS

The tests were performed according to following regulations :

- o - EN 50081-1 / 2.1991
- o - EN 50081-2 / 7.1993

- o - EN 55011 / 3.1991

- o - Group 1
- o - class A

- o - Group 2
- o - class B

- o - EN 55014 / 4.1993

- o - Household appliances and similar
- o - tools
- o - Semiconductor devices

- o - EN 55014 / A2:1990
- o - EN 55104 / 5.1995

Category:

- o - EN 55015 / A1:1990
- o - EN 55015 / 12.1993

- o - EN 55022 / 5.1995

- o - class A

- o - class B

- o - prEN 55103-1/ 3.1995
- o - prEN 50121-3-2 / 3.1995
- o - EN 60601-1-2 / 4.1994

- o - VCCI

- o - class 1

- o - class 2

- - 47 CFR Part 74 Subpart H (74.861)

ADDRESS OF THE TEST LABORATORY

- - MIKES BABT PRODUCT SERVICE GmbH
Ohmstrasse 2-4
D - 94342 Strasskirchen

o - _____

ENVIRONMENTAL CONDITIONS

Temperature: 15-35 ° C

Humidity 45-60 %

Atmospheric pressure 860-1060 mbar

POWER SUPPLY SYSTEM UTILIZED

Power supply system : Internal batteries DC 3V

STATEMENT OF 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 that can account for a nominal measurement error of $\pm 4\text{dB}$. 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.

SHORT DESCRIPTION OF THE EQUIPMENT UNDER TEST (EUT)

The handheld transmitter HT 40 is used for e.g. in concerts, theaters and tv or radio studios to transmit audio signals to a receiver who gets back the audio signal from the high frequency signal via a demodulation circuit. The transmitter is processing the input signal which is given by a connectable wired microphone, modulating it on a carrier (frequency modulation) and amplifying it. This signal will be feeded through filters to the antenna and then radiated. The microphones exist in 3 different version: US54 / US58 / EU62. Additional to the base version HT 40, this transmitter will transmit additional the battery status of the integral battery. For detailed difference please see technical data.

Number of received/tested samples: **3 / 1**

DEFINITIONS FOR SYMBOLS USED IN THIS TEST REPORT

- - Black box indicates that the listed condition, standard or equipment is applicable for this Report.
- o - Blank box indicates that the listed condition, standard or equipment was not applicable for this Report.

**M E A S U R E M E N T P R O T O C O L F O R F C C , V C C I
A N D A U S T E L**

Test Methodology

Conducted and radiated emission testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22 (1993), European Standard EN 55022 and Australian Standard AS 3548 (which are based on CISPR 22).

The Japanese standard, "Voluntary Control Council for Interference (VCCI) by Data Processing Equipment and Electronic Office Machines, Technical Requirements" is technically equivalent to CISPR 22 (1993). For official compliance, a conformance report must be sent to and accepted by the VCCI.

In compliance with FCC Docket 92-152, "Harmonization of Rules for Digital Devices Incorporate International Standards", testing for FCC compliance may be done following the ANSI C63.4-1992 procedures and using the FCC limits or the CISPR 22 Limits.

Measurement Error

The test system for conducted emissions is defined as the LISN, tuned receiver and coaxial cable. The test system for spurious emissions is defined as the antenna, the pre-amplifier, the tuned receiver and the coaxial cable. These test systems have an expected error of ± 3 dB. The equipment comprising the test systems are calibrated on an annual basis.

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 into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

General Standard Information

The test methods used comply with CISPR Publication 22 (1993), EN 55022 (1987) and AS 3548 (1992) - "Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment" and with ANSI C63.4-1992 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

For detailed description of each measurement please refer to section testresults.

DISCOVERY OF WORST CASE MEASUREMENT CONDITION:

The model HT 40 consists of 3 different versions US54, US58 and EU62.

For the exact frequency range of this models please refer to the frequency plan in the technical documentation set.

All the 3 versions are technically identical except the following items:

- 3 different programmed frequency ranges
- PCB. The boards are similar with differences only in the output filter. On the PCB, the values of some resistors, coils and capacitors are different. For more detailed information, please see technical documentation set. Due to the different output filter, the PCB's have different names.

To find out the worst case channel for the complete measurement the following tests have been performed:

- Measurement of the radiated fieldstrength of the operating frequency on all 3 versions. This measurement have been performed in order to find out the maximum transmitted fieldstrength of the transmmmitter.
- Measurement of the radiated spurious emissions of all 3 versions. This measurement have been performed in order to find out the maximum spurious emissions of the transmmmitter.
- Measurement of the modulation limiting data of all 3 versions, on the center channel of the frequency range. This measurement has been performed in order to find out, whether the modulation limiting data have different results in the different frequency ranges.
- Checking the occupied bandwidth with the maximum input level for the microphone (Audio frequency: 20 kHz; Audio input level: 30 mV) on each version of the microphones on the center channel of the assigned frequency band.

SUMMARIZING:

=> maximum fieldstrength: EU62
=> maximum spurious emission: EU62
=> modulation limiting data: no essential differences on the 3 versions
=> occupied bandwidth: no essential differences on the 3 versions

Based on this testresults, the measurements have been performed completely on the version: EU62. This testresults are documented in the following sections of the testreport.

T E S T R E S U L T**CONDUCTED EMISSIONS - 10/150 kHz - 30 MHz**

■ - Test not applicable

Testlocation :

- o - Shielded room no. 1
- o - Shielded room no. 2
- o - Shielded room no. 3
- o - Shielded room no. 4
- o - Shielded room no. 5
- o - Shielded room no. 6
- o - Shielded room no. 7
- o - Anechoic chamber
- o - Full compact chamber

For TEST EQUIPMENT USED please refer to ATTACHMENT D: _____

Description of Measurement

The final level, expressed in dB μ V, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC Limit or to the CISPR limit, which is equivalent to the Australian AS 3548 limit.

To convert between dB μ V and μ V, the following conversions apply:

$$\text{dB}\mu\text{V} = 20(\log \mu\text{V})$$

$$\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$$

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasipeak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω /50 μ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasipeak and average detection and recorded on the data sheets.

Testresult

The requirements are

0 - MET

0 - NOT MET

Min. limit margin _____ dB at _____ MHz

Max. limit exceeding _____ dB at _____ MHz

Remarks: EUT is not having a mains connection. Operated by a internal
battery.

SPURIOUS EMISSION

Spurious emissions from the EUT are measured in the frequency range of 30 to 10 times the highest used frequency 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 quasipeak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection, remeasurement of results which may be critical will be repeated in average mode. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters 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 the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees.

SPURIOUS EMISSION (MAGNETIC FIELD) 10 kHz - 30 MHz

■ - Test not applicable

- o - in a shielded room
- o - at a non - reflecting open-site
- and
- o - in a testdistance of 3 meters.
- o - in a testdistance of 30 meters.

For TEST EQUIPMENT USED please refer to ATTACHMENT D: _____

Description of Measurement

The final level, expressed in dBµV/m, is arrived at by taking the reading from the EMI receiver (Level dBµV) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	Limit (dBµV/m)	=	Delta (dB)
1.705	5	+	20	=	25	30	=	5

Testresult

The requirements are

0 - MET**0 - NOT MET**

Min. limit margin

dB

at

MHz

Max. limit exceeding

dB

at

MHz

Remarks: Not applicable.**SPURIOUS EMISSIONS (electric field) 30 MHz - 1000 MHz****0 - Test not applicable**

- - Open-site 1
- o - Open-site 2
- - 3 meters
- o - 10 meters
- o - 30 meters

For TEST EQUIPMENT USED please refer to ATTACHMENT D: SER2**Description of Measurement**

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) 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 24 - 25. The CISPR 22 limit is equivalent to the Australian AS 3548 limit.

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	Limit (dBµV/m)	=	Delta (dB)
719	75	+	32.6	=	107.6	110	=	-2.4

Testresult

The requirements are

■ - MET**0 - NOT MET**

Min. limit margin

> 48 dBat 30-1000 MHz

Max. limit exceeding

 dBat MHzRemarks: The emissions have to be att. $43+10\log(P \text{ in W})$ below the carrier. $P_{\text{max.}} = 6.5 \text{ mW} \rightarrow 21 \text{ dB att. Max. field strength in}$ OATS: 84.5 dB μ V/m. For plot see page B1-B2.**SPURIOUS EMISSION 1 GHz - 18 GHz**

0 - Test not applicable

Testlocation :

- o - Open-site 1
- o - Open-site 2
- - Anechoic chamber
- o - Full compact chamber

- o - 1 meters
- - 3 meters
- o - 10 meters

For TEST EQUIPMENT USED please refer to ATTACHMENT D: SER3**Description of Measurement**

The final level, expressed in dB μ V/m, is arrived by taking the reading from the Spectrumalyzer in dB μ V and adding the correction factors of the test setup incl. cables.

Example of the correction value at 1.8236 GHz

Level reading at 1.5 GHz	correction EMC0 3115	correction Amplifier AWT 8035 + cable	correction factor (summarized)	corrected level
56 dBµV	+25.7	-41.7	-16	40 dBµV

Testresult

The requirements are

■ - MET

○ - NOT MET

Min. limit margin

> 28 dB at 1-8 GHz

Max. limit exceeding

 dB at GHz

Remarks: The limits are met.

Testresult in detail:

Frequency GHz	L: Peak dBµV	L: AV dBµV	Correct.	L: Peak dBµV/m	L: AV dBµV/m	Limit dBµV/m
1.204	--	58.8	-15.6	--	42.9	84.5
1.601	--	47.4	-14.8	--	32.6	84.5
2.004	--	48.9	-11.8	--	37.1	84.5
2.407	--	57.2	-10.7	--	46.5	84.5
2.810	--	52.2	-10.1	--	42.1	84.5
3.212	--	59.5	-9.3	--	50.2	84.5
3.615	--	48.2	-7.6	--	40.6	84.5
4.012	--	54.1	2.1	--	56.2	84.5
4.413	--	48.8	0.9	--	49.7	84.5
4.818	--	44.0	-0.3	--	43.7	84.5
5.218	--	48.5	-0.5	--	48.0	84.5
5.619	--	41.5	3.0	--	44.5	84.5

**CONDUCTED POWER OF THE FUNDAMENTAL WAVE MEASURED
ON THE ANTENNA TERMINALS**

■ - Test not applicable

Testlocation :

- o - Shielded room no. 1
- o - Shielded room no. 2
- o - Shielded room no. 3
- o - Shielded room no. 4
- o - Shielded room no. 5
- o - Shielded room no. 6
- o - Shielded room no. 7
- o - Anechoic chamber
- o - Full compact chamber
- o - Climatic test chamber VLK

For TEST EQUIPMENT USED please refer to ATTACHMENT D: _____

Description of Measurement

The conducted power of the fundamental wave measured on the antenna terminals 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.

Testresult

The requirements are

0 - MET

0 - NOT MET

Frequency range of equipment								
Temperature/°C	DC supply voltage/V	Power/dBm	Power/dBm	Power/dBm	Power/dBm	Power/dBm	Power/dBm	Power/dBm
-30								
-20								
-10								
0								
+10								
+20								
+30								
+40								
+50								

Remarks: _____

MODULATION LIMITING DATA

0 - Test not applicable

Testlocation :

- o - Shielded room no. 1
- o - Shielded room no. 2
- o - Shielded room no. 3
- - Shielded room no. 4
- o - Shielded room no. 5
- o - Shielded room no. 6
- o - Shielded room no. 7
- o - Anechoic chamber
- o - Full compact chamber
- - Climatic test chamber VLK

For TEST EQUIPMENT USED please refer to ATTACHMENT D: MLD

Description of Measurement

The modulation limiting data were measured on 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 dB μ V to the maximum audio input level specified by the manufacturer. The frequency deviation at this levels have been recorded.

PFD: Positive frequency deviation

NFD: Negative frequency deviation

For the occupied bandwidth plot 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.

Testresult

The requirements are

■ - MET

○ - NOT MET

EUT: HT 40 Version: EU62 working on 802.525 MHz

Input audio level/dBμV	f _{mod} = 30 Hz		f _{mod} = 10 kHz		f _{mod} = 20 kHz	
	PFD/kHz	NFD/kHz	PFD/kHz	NFD/kHz	PFD/kHz	NFD/kHz
20	0.2	0.2	0.7	0.7	0.7	0.7
30	0.2	0.2	1.0	1.0	1.2	1.2
40	0.7	0.6	1.6	1.6	2.3	2.3
50	0.8	0.7	2.5	2.5	4.2	4.2
60	1.1	1.1	4.3	4.2	7.4	7.4
70	1.9	1.9	7.6	7.5	13.2	13.0
80	3.2	3.2	13.4	13.0	23.0	22.9
90	5.7	5.7	23.7	22.9	36.9	35.9
100	10.2	10.0	40.8	38.3	37.6	36.5
110	18.6	18.6	46.2	41.3	37.6	36.7
118	28.9	29.0	45.8	41.3	37.5	36.7

Remarks: The limit of ± 75 kHz is kept.

(PFD=Positive frequency deviation; NFD=Negative Frequency deviation)

Judging the requirements of the emission mask with the data from the modulation limiting data:

EU62 working on 802.525 MHz:Max. measured frequency deviation: ± 46.2 kHz50% of the maximum deviation: ± 23.1 kHzAudio input level (ail) to get ± 22.5 kHz: L = 89.6 dBμV

L + 16 dBμV = 105.6 dBμV => Level for testing the occupied bandwidth

Occupied bandwidth:

version of EUT	EU62		CH		CH	
audio test level	L = 114.3 dBμV/1kHz		L = 114.3 dBμV/15kHz		L = 114.3 dBμV/20kHz	
shape of emission mask	± 50 -100% [dB]	± 100 -250% [dB]	± 50 -100% [dB]	± 100 -250% [dB]	± 50 -100% [dB]	± 100 -250% [dB]
min. limit margin/dB	> 5	> 10	> 5	> 10	> 5	> 10

Remarks: The limit is kept. For plot see pages B3-B5 and B9-11.

FREQUENCY ERROR

o - Test not applicable

Testlocation :

- o - Shielded room no. 1
- o - Shielded room no. 2
- o - Shielded room no. 3
- - Shielded room no. 4
- o - Shielded room no. 5
- o - Shielded room no. 6
- o - Shielded room no. 7
- o - Anechoic chamber
- o - Full compact chamber
- - Climatic test chamber VLK

For TEST EQUIPMENT USED please refer to ATTACHMENT D: FE

Description of Measurement

The frequency error was measured on 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.

Testresult:

The requirements are

■ - MET

0 - NOT MET

Frequency range of equipment		CHF						
Temperature/°C	DC supply voltage/V	Frequency error/kHz	Frequency error/kHz	Frequency error/kHz	Frequency error/kHz	Frequency error/kHz	Frequency error/kHz	Frequency error/kHz
-30	1.9	13.1						
	3.5	13.0						
-20	1.9	13.8						
	3.5	13.9						
-10	1.9	13.1						
	3.5	13.1						
0	1.9	10.4						
	3.5	10.5						
+10	1.9	6.3						
	3.5	6.4						
+20	1.9	1.2						
	3.5	1.2						
+30	1.9	-3.2						
	3.5	-3.1						
+40	1.9	-7.8						
	3.5	-7.7						
+50	1.9	-12.4						
	3.5	-12.4						

Remarks: The most strict limit for this frequency range is: 40.1 kHz

(0.005% of 802.525 MHz)

KEEPING THE REQUIREMENTS OF THE EMISSION MASK

0 - Test not applicable

Testlocation :

- o - Shielded room no. 1
- o - Shielded room no. 2
- o - Shielded room no. 3
- - Shielded room no. 4
- o - Shielded room no. 5
- o - Shielded room no. 6
- o - Shielded room no. 7
- o - Anechoic chamber
- o - Full compact chamber
- o - Climatic test chamber VLK

For TEST EQUIPMENT USED please refer to ATTACHMENT D: EM

Description of Measurement

The requirements of the emission mask were measured with different input signals on 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 spectrum analyzer. The spectrum analyzer was set up as following:

- video and resolution bandwidth: 10 kHz
- attenuation: automatic, low noise
- center frequency: nominal transmit frequency
- frequency span: 500 kHz

The reference level was set to the maximum value of the unmodulated carrier. The internal batteries have been removed also and a variable DC power supply was used instead. The measurements have been made with a modulation frequency and voltage accdg. to the specification of the manufacturer. The audio frequency was provided by a communication test receiver. 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.

Testresult

The requirements are

■ - MET

○ - NOT MET

The **requirements** are as following:

Attenuation on any frequencies removed from the transmit frequency

between 50 and 100 % of the authorized bandwidth: at least 25 dB

between 100 and 250 % of the authorized bandwidth: at least 35 dB

more than 250 % of the authorized bandwidth: see spurious emissions

The following table is showing the minimal margin to the required attenuations:

Frequency range of equipment		EU62		CH		CH	
input modulation	DC supply voltage /V	±50-100% [dB]	±100-250% [dB]	±50-100% [dB]	±100-250% [dB]	±50-100% [dB]	±100-250% [dB]
1 kHz	1.9	> 5	> 10				
105.6 dBµV	3.5	> 5	> 10				
10 kHz	1.9	> 5	> 10				
105.6 dBµV	3.5	> 5	> 10				
20 kHz	1.9	> 5	> 10				
105.6 dBµV	3.5	> 5	> 10				
1 kHz	1.9	> 5	> 10				
30 mV	3.5	> 5	> 10				
10 kHz	1.9	> 5	> 10				
30 mV	3.5	> 5	> 10				
20 kHz	1.9	> 5	> 10				
30 mV	3.5	> 5	> 10				

Remarks: The limit is kept. The attenuation is related to the unmodulated carrier. For plot see page B3-B14.

EQUIPMENT UNDER TEST

Operation - mode of the EUT.:

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

- ☐ - Standby
- ☐ - Testprogram (H - Pattern)
- ☐ - Testprogram (color bar)
- ☐ - Testprogram (customer specific)
- ☒ - Transmit (unmodulated)(for radiated measurements and frequency error)
- ☒ - Transmit (modulated: 20 kHz, 30 mV)(for bandwidth under extreme
conditions measurements)
- ☐ - _____

Configuration of the equipment under test: see appendix
Following periphery devices and interface cables were connected during the measurement:

- ☐ - _____ Type : _____
- ☐ - _____ Type : _____
- ☐ - _____ Type : _____
- ☐ - _____ Type : _____
- ☐ - _____ Type : _____
- ☐ - _____ Type : _____
- ☐ - unshielded power cable
- ☐ - unshielded cables
- ☐ - shielded cables MPS.No.: _____
- ☒ - customer specific cables (wireless microphone)
- ☒ - no cables
- ☐ - _____

SUMMARY

GENERAL REMARKS:

The product HT 40, version EU62 has been tested on the following frequency:
802.525 MHz

This version was defined as the worst condition model of all 3 versions:
US54
US58
EU62

FINAL JUDGEMENT:

The requirements according to the technical regulations and tested operation modes are

- - met.
- o - **not** met.

The equipment under test

- - **Fulfills** the general approval requirements cited on page 3.
- o - **Does not** fulfill the general approval requirements cited on page 3.

Date of receipt of test sample : accdg. to storage record

Testing Start Date : January 27, 2000

Testing End Date : March 3, 2000

- MIKES BABT PRODUCT SERVICE GmbH -

Test-engineer


Günter Mikes
Dipl.-Ing.(FH)


Josef Knab

CONSTRUCTIONAL DATAFORM FOR TESTING OF RADIO EQUIPMENT

Licence holder:	AKG Acoustics U.S.		
Address:	1449 Donelsen Pike, Nashville TN 37217, USA		
Manufacturer:	WAGOL Industrial Co. LTD		
Address:	No. 85 Chang Hsing First Street, Tai Tzu Village Jen-TeHsian, Tainan Hsien, Taiwan		
Type:	HT 40		
Model:			
Serial-No.:		Protection class:	

Application for getting

☒ national approval in the following countries: GB,D,NL,B

☐ EC-type examination

Additional informations to the above named model:**Antenna:**

transmitter: Type: integral
Length/size: 9.5 cm

Receiver: Type:
Length/size:

Power supply of the transmitter:

Type: 2 AA cells

nominal voltage:	3 V
lowest voltage:	1.9 V
highest voltage:	3.5 V

Power supply of the receiver:

Type: nominal voltage: V

Ancillary equipment:

Description:	Type:	Serial-no.:
Description:	Type:	Serial-no.:
Description:	Type:	Serial-no.:

Extreme temperature range in which the approval test should be performed:

☐ Category I: General (-20°C to +55°C) ☐ Category II: Portable (-10°C to +55°C)

☐ Category III: Equipment for normal indoor use (0°C to +55°C)

Connectable cables:

Name of the cable	Digital	Length/m	shielded
	☐ yes ☐ no		☐ yes ☐ no
	☐ yes ☐ no		☐ yes ☐ no
	☐ yes ☐ no		☐ yes ☐ no
	☐ yes ☐ no		☐ yes ☐ no
	☐ yes ☐ no		☐ yes ☐ no

O If applicable, if necessary complete overleaf

Page A1 of A3

Type designation: HT 40			
Name and type designation of individual units comprising the radio equipment:			
Type of equipment:			
☐ Radiotelephone equipment	☐ Remote-control equipment	☐ Radiomaritime equipment	☐ LPD
☐ One-way radiotelephone equipment	☐ Inductive loop system	☐ Inland waterways equipment	☐ RLAN
☐ Personal paging system	☐ Radio-relay system	☐ Radionavigation equipm.	☒ wireless microphone
☐ Satellite earth station	☐ CB radiotelephone equipment	☐ Antenna	☐
☐ Data transmission equipment	☐ Movement detector	☐ Aeronautical equipment	☐
Technical characteristics:			
	Transmitter-receiver	Transmitter	Receiver
Frequency range		710.4 – 806.0 MHz	
Maximum no. of channels			
Channel spacing		200k	
Class of emission (type of modulation)		200KF3E	
Maximum RF output power			
Maximum effective radiated power (ERP)		6 mW (3mW +- 3 dB)	
Output power variable		No	
Channel switching frequency range		1 channel	
Method of frequency generation	☐ Synthesizer ☒ Crystal ☐ Other		
Frequency generation TX	Crystal/multiplier		
Frequency generation RX			
IF	1st IF	2nd IF	3rd IF
Integral selective calling	no		
Audio-frequency interface level at external data socket	40 kOhm on audio socket, max deviation at 300 mV (low) or 30 mV (high) frequency response: 30 Hz to 20 kHz		
Modes of operation	☐ Duplex mode ☐ Semi-duplex mode ☒ Simplex mode		
Power source	☐ Mains ☐ Vehicle-regulated ☒ Integral		
Antenna socket	☐ BNC ☐ TNC ☐ N ☐ M ☐ UHF ☐ Adapter ☒ None ☐ ☐		
Type approval specifications: ETS 300 422			

Applicant: AKG Acoustics U.S.

Model-name: HT 40

Declarations:

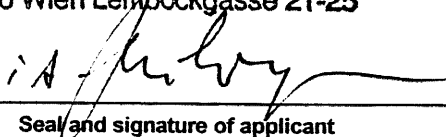
- We declare that the above information are correct and the named model was supplied with the maximum configuration to the accredited test laboratory.

AKG Acoustics GmbH
A-1230 Wien Lemböckgasse 21-25

Strasskirchen

place of issue

,date

27. 1. 2000
Seal and signature of applicant

O If applicable, if necessary complete overleaf

Page A3 of A3

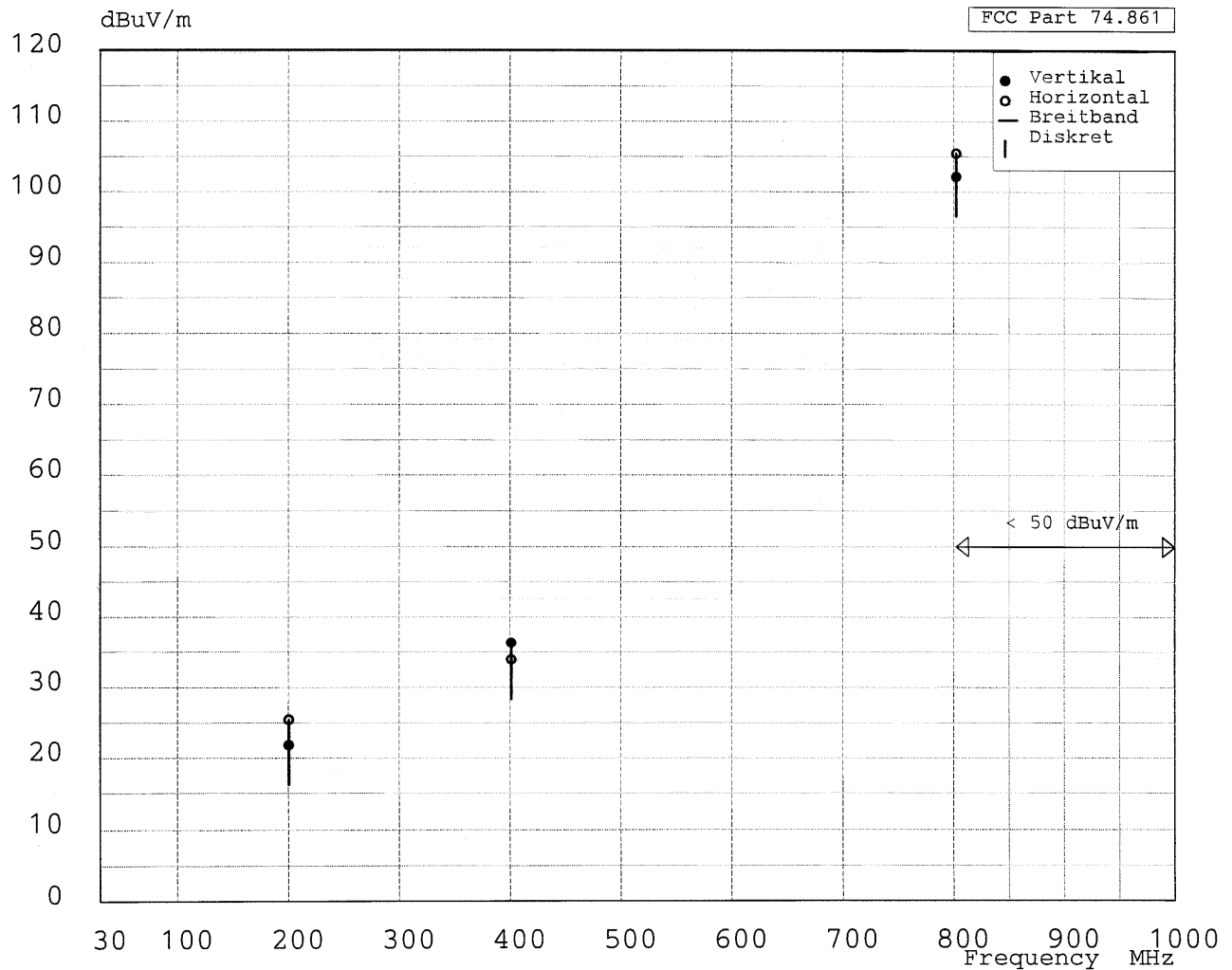
FCC ID: E9MHT40

Radiation-Test

accdg. 74.861

Typ: HT 40
Manufacturer: WAGOL
Client: AKG
Regulation: FCC Part 74.861
Order No.: T17590-1-01KJ
Operation Mode: Permanent transmit
Remarks: The limits are met!

Testdistance: 3 m
Testreceiver: ESVP
Antenna: BBA/UHALP
Testengineer: KJ
Date: 03-02-2000



FCC ID: E9MHT40

Radiation-Test

accdg. 74.861

Typ: HT 40
 Manufacturer: WAGOL
 Client: AKG
 Regulation: FCC Part 74.861
 Order No.: T17590-1-01KJ
 Operation Mode: Permanent transmit
 Remarks: The limits are met!

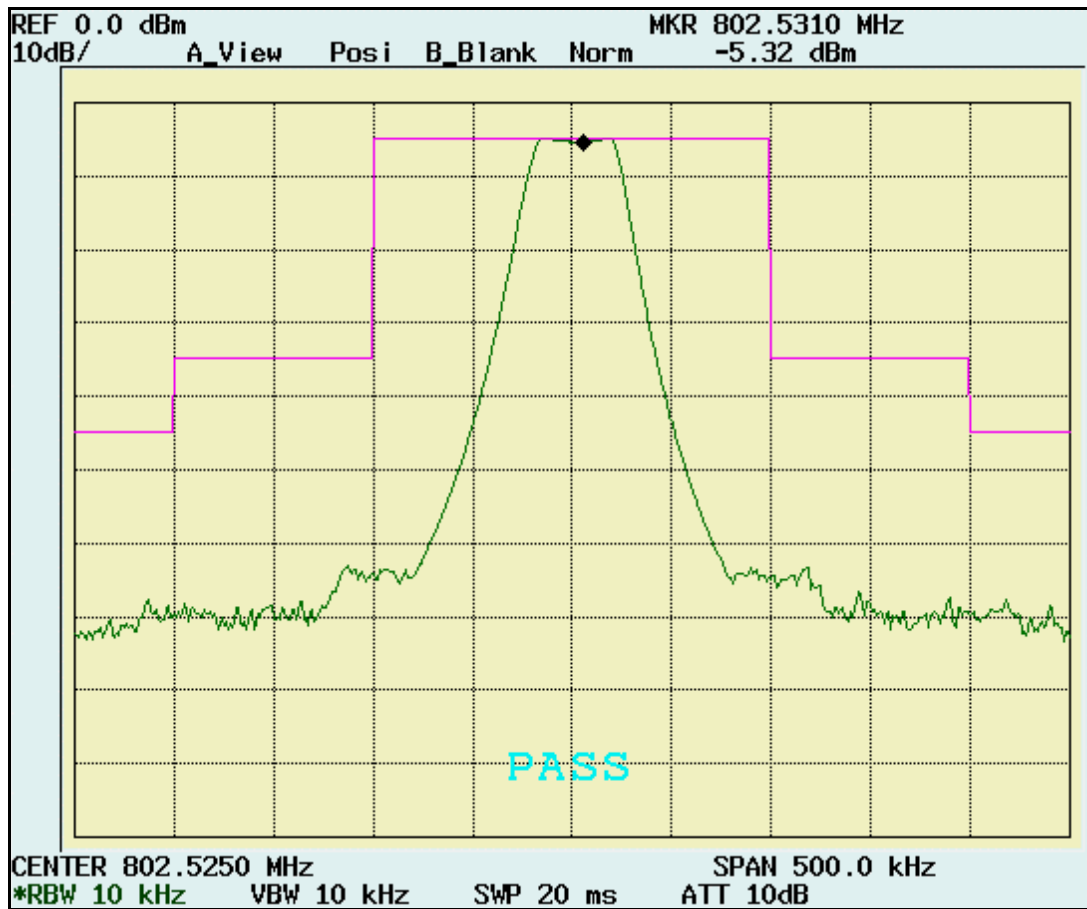
Testdistance: 3 m
 Testreceiver: ESVP
 Antenna: BBA/UHALP
 Testengineer: KJ
 Date: 03-02-2000

Result	Frequency [MHz]	Reading [dBuV/m]	Korr [dB]	Final [dBuV/m]	Limit [dBuV/m]	DLimit [dB]	Polarisation	Noise
	200.64	4.90	20.54	25.44	120.00	94.56	Horizontal	Diskret
	200.64	1.30	20.54	21.84	120.00	98.16	Vertikal	Diskret
	401.27	14.00	22.33	36.33	120.00	83.67	Vertikal	Diskret
	401.27	11.60	22.33	33.93	120.00	86.07	Horizontal	Diskret
	802.53	72.60	32.87	105.47	120.00	14.53	Horizontal	Diskret
	802.53	69.30	32.87	102.17	120.00	17.83	Vertikal	Diskret

Calculation for the maximum power with the measured fieldstrength in 3 meter distance

$$P = (E \cdot D)^2 / 49.2$$

$$P = (0.188 \text{ V/m} \cdot 3 \text{ m})^2 / 49.2 = 6.5 \text{ mW}$$



Bandwidth Plot according FCC Part 74.861

Type: HT 40
Frequency: 802.525 MHz
Client: AKG

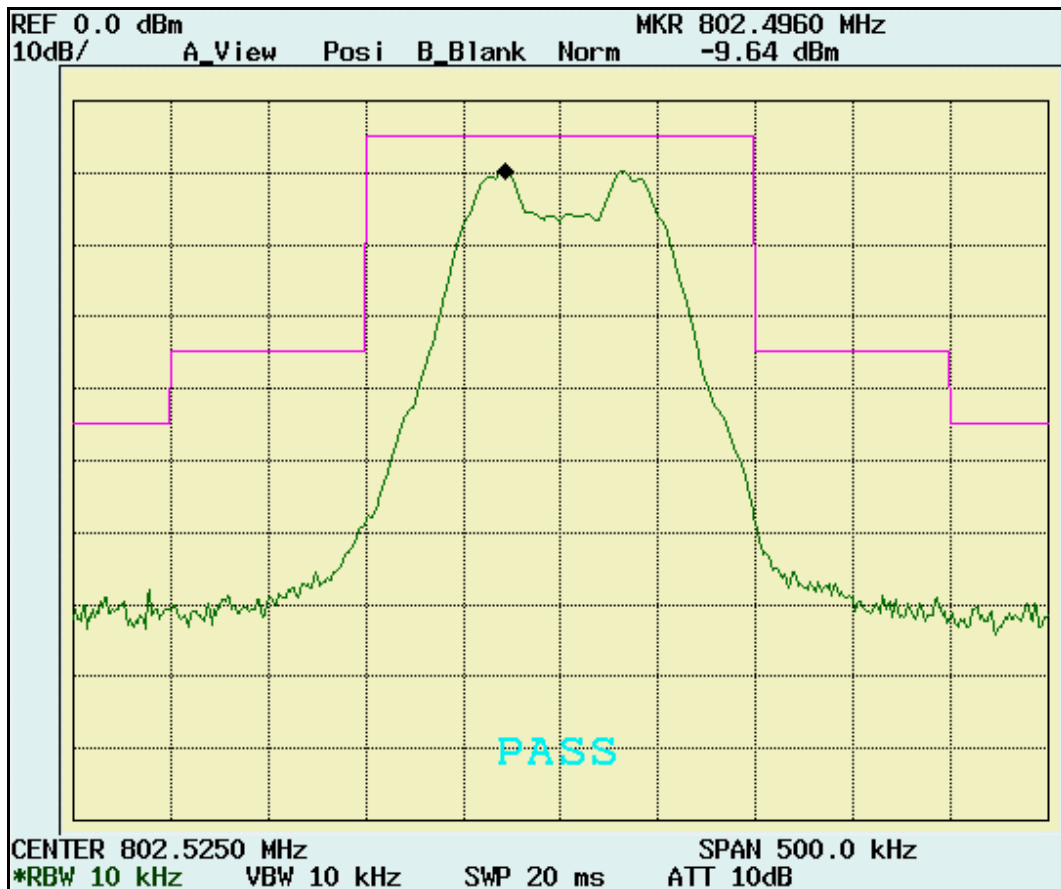
Input Signal: 1 kHz / 105.6 dBμV
Temperature: 20 °C
Supply Voltage: 3.5 Volt

Resolution Bandwidth: 10 kHz
Video Bandwidth: 10 kHz

Marker Value (Carrier unmodulated)

Resolution Bandwidth: 1 kHz
Video Bandwidth: 1 kHz

Power Level: -5.02 dBm



Bandwidth Plot according FCC Part 74.861

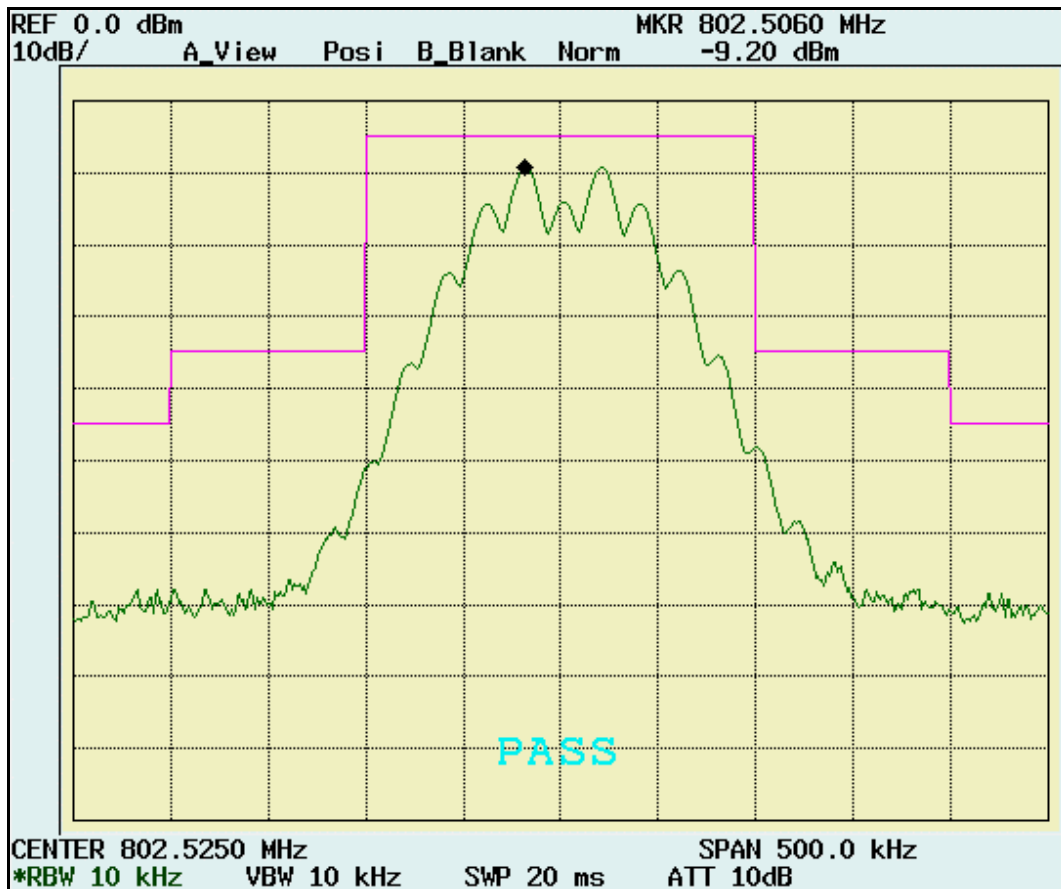
Type: HT 40
Frequency: 802.525 MHz
Client: AKG
Input Signal: 10 kHz / 105.6 dBμV
Temperature: 20 °C
Supply Voltage: 3.5 Volt

Resolution Bandwidth: 10 kHz
Video Bandwidth: 10 kHz

Marker Value (Carrier unmodulated)

Resolution Bandwidth: 1 kHz
Video Bandwidth: 1 kHz

Power Level: -5.02 dBm



Bandwidth Plot according FCC Part 74.861

Type: HT 40
Frequency: 802.525 MHz
Client: AKG

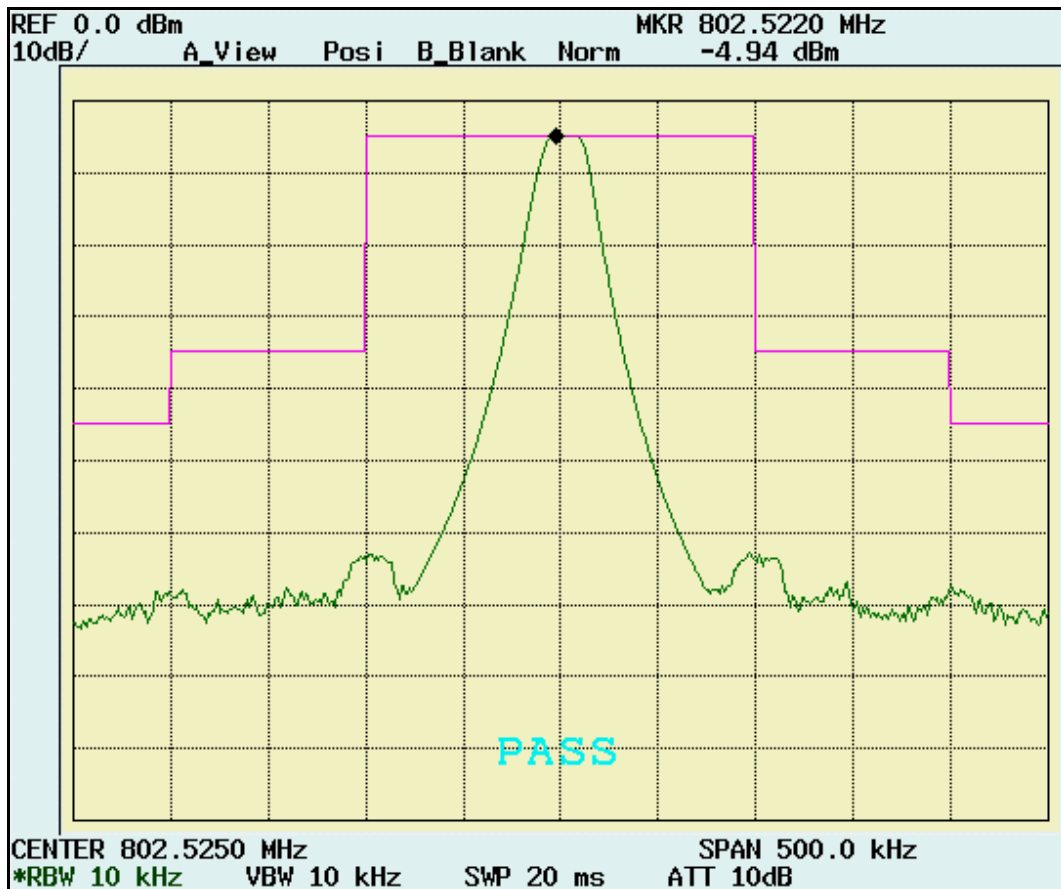
Input Signal: 20 kHz / 105.6 dBμV
Temperature: 20 °C
Supply Voltage: 3.5 Volt

Resolution Bandwidth: 10 kHz
Video Bandwidth: 10 kHz

Marker Value (Carrier unmodulated)

Resolution Bandwidth: 1 kHz
Video Bandwidth: 1 kHz

Power Level: -5.02 dBm



Bandwidth Plot according FCC Part 74.861

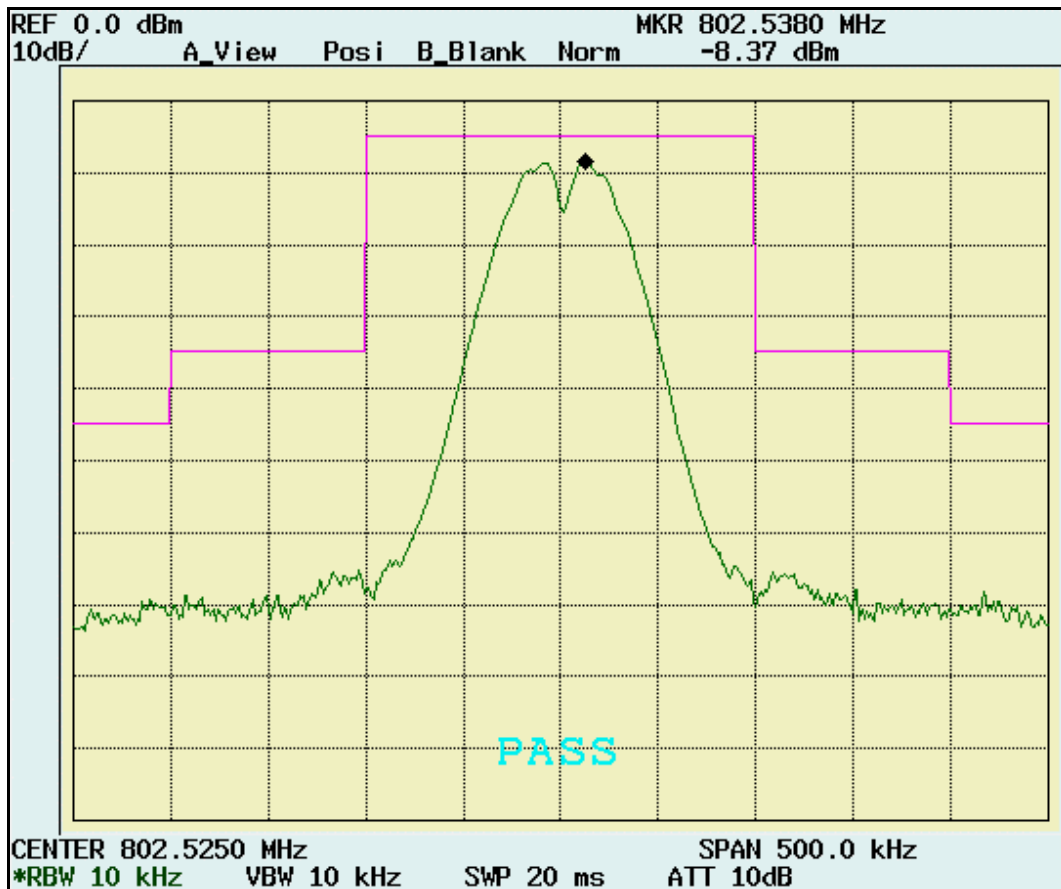
Type: HT 40
Frequency: 802.525 MHz
Client: AKG
Input Signal: 1 kHz / 30 mV
Temperature: 20 °C
Supply Voltage: 3.5 Volt

Resolution Bandwidth: 10 kHz
Video Bandwidth: 10 kHz

Marker Value (Carrier unmodulated)

Resolution Bandwidth: 1 kHz
Video Bandwidth: 1 kHz

Power Level: -5.02 dBm



Bandwidth Plot according FCC Part 74.861

Type: HT 40
Frequency: 802.525 MHz
Client: AKG

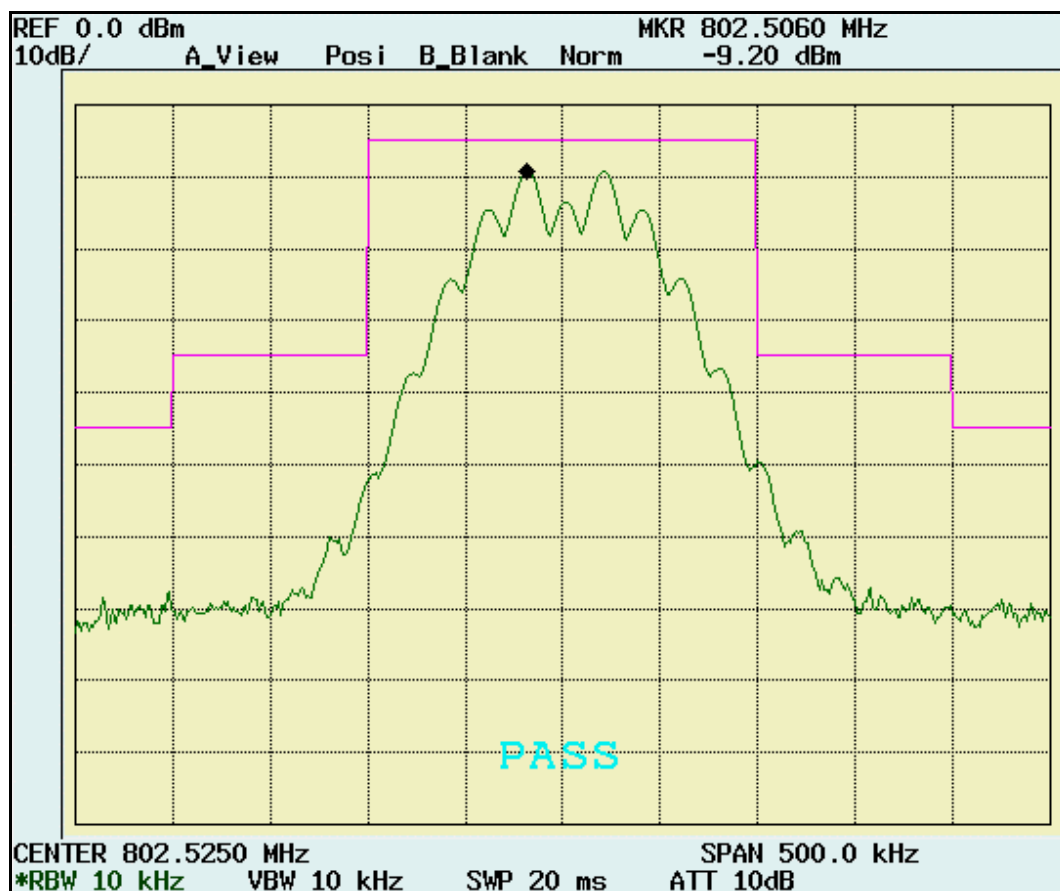
Input Signal: 10 kHz / 30 mV
Temperature: 20 °C
Supply Voltage: 3.5 Volt

Resolution Bandwidth: 10 kHz
Video Bandwidth: 10 kHz

Marker Value (Carrier unmodulated)

Resolution Bandwidth: 1 kHz
Video Bandwidth: 1 kHz

Power Level: -5.02 dBm



Bandwidth Plot according FCC Part 74.861

Type: HT 40
Frequency: 802.525 MHz
Client: AKG

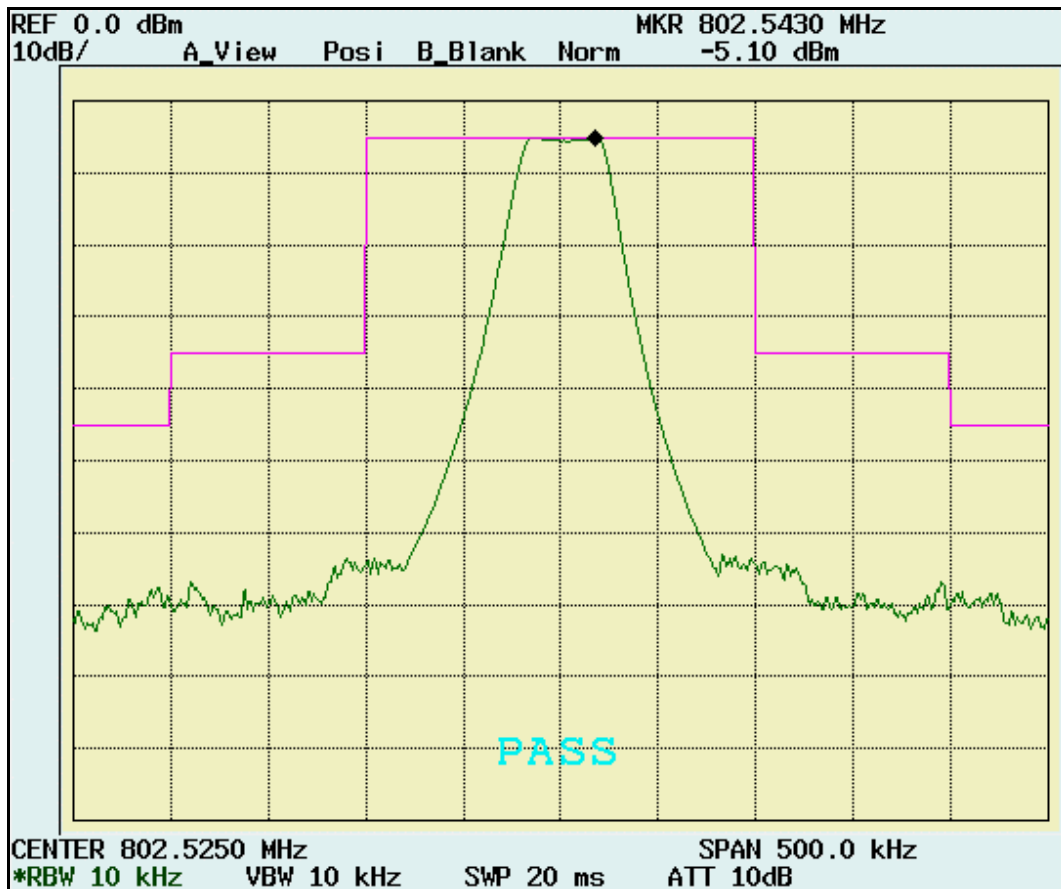
Input Signal: 20 kHz / 30 mV
Temperature: 20 °C
Supply Voltage: 3.5 Volt

Resolution Bandwidth: 10 kHz
Video Bandwidth: 10 kHz

Marker Value (Carrier unmodulated)

Resolution Bandwidth: 1 kHz
Video Bandwidth: 1 kHz

Power Level: -5.02 dBm



Bandwidth Plot according FCC Part 74.861

Type: HT 40
Frequency: 802.525 MHz
Client: AKG

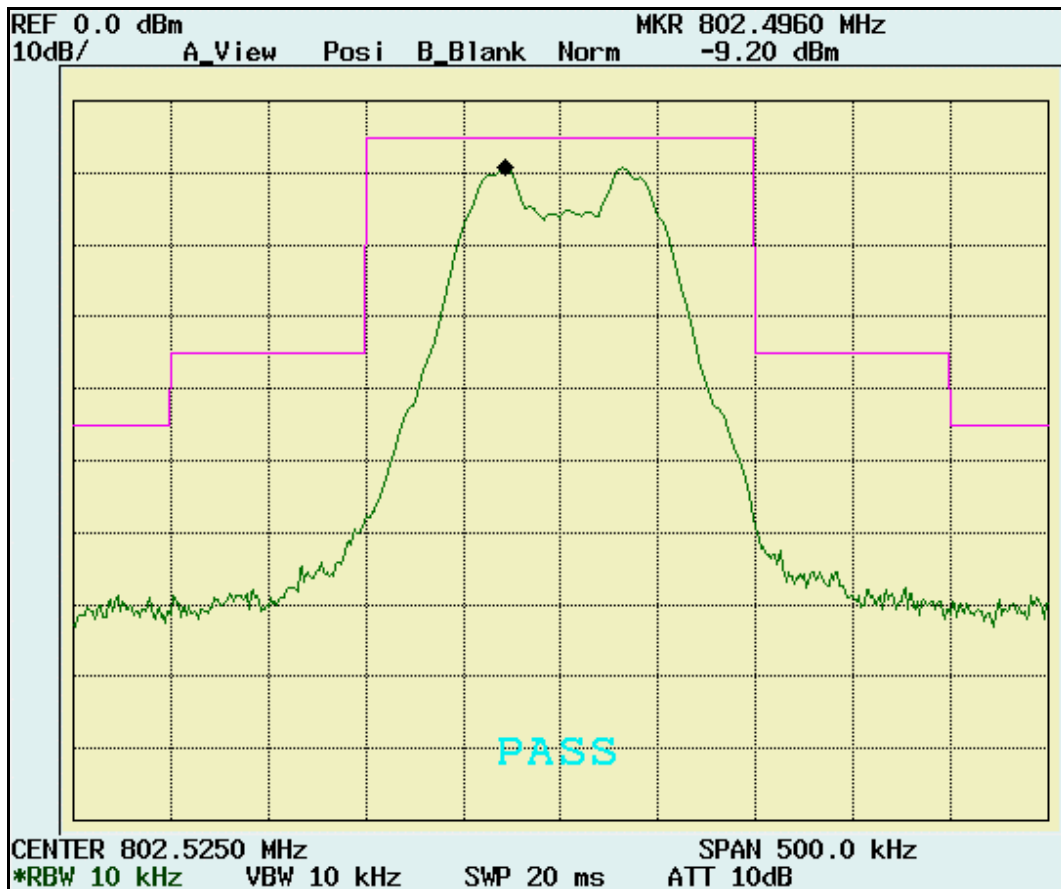
Input Signal: 1 kHz / 105.6 dBμV
Temperature: 20 °C
Supply Voltage: 1.9 Volt

Resolution Bandwidth: 10 kHz
Video Bandwidth: 10 kHz

Marker Value (Carrier unmodulated)

Resolution Bandwidth: 1 kHz
Video Bandwidth: 1 kHz

Power Level: -5.15dBm



Bandwidth Plot according FCC Part 74.861

Type: HT 40
Frequency: 802.525 MHz
Client: AKG

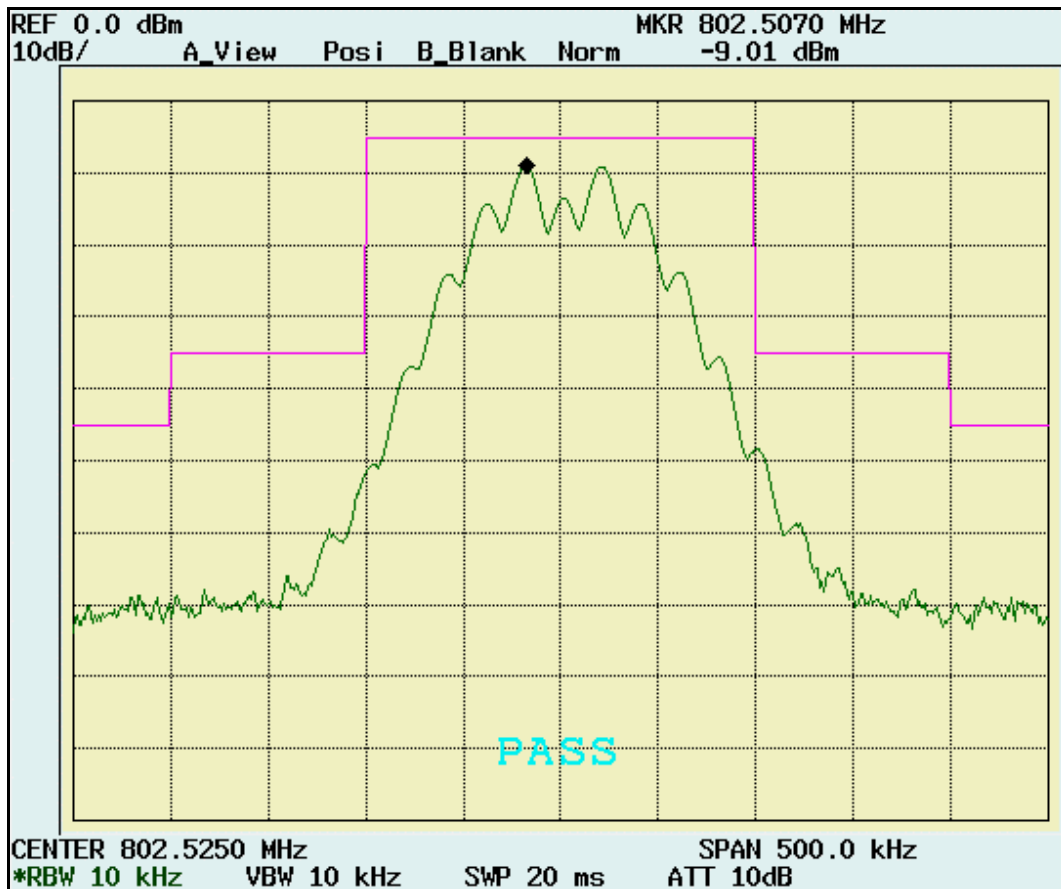
Input Signal: 10 kHz / 105.6 dBμV
Temperature: 20 °C
Supply Voltage: 1.9 Volt

Resolution Bandwidth: 10 kHz
Video Bandwidth: 10 kHz

Marker Value (Carrier unmodulated)

Resolution Bandwidth: 1 kHz
Video Bandwidth: 1 kHz

Power Level: -5.15 dBm



Bandwidth Plot according FCC Part 74.861

Type: HT 40
Frequency: 802.525 MHz
Client: AKG

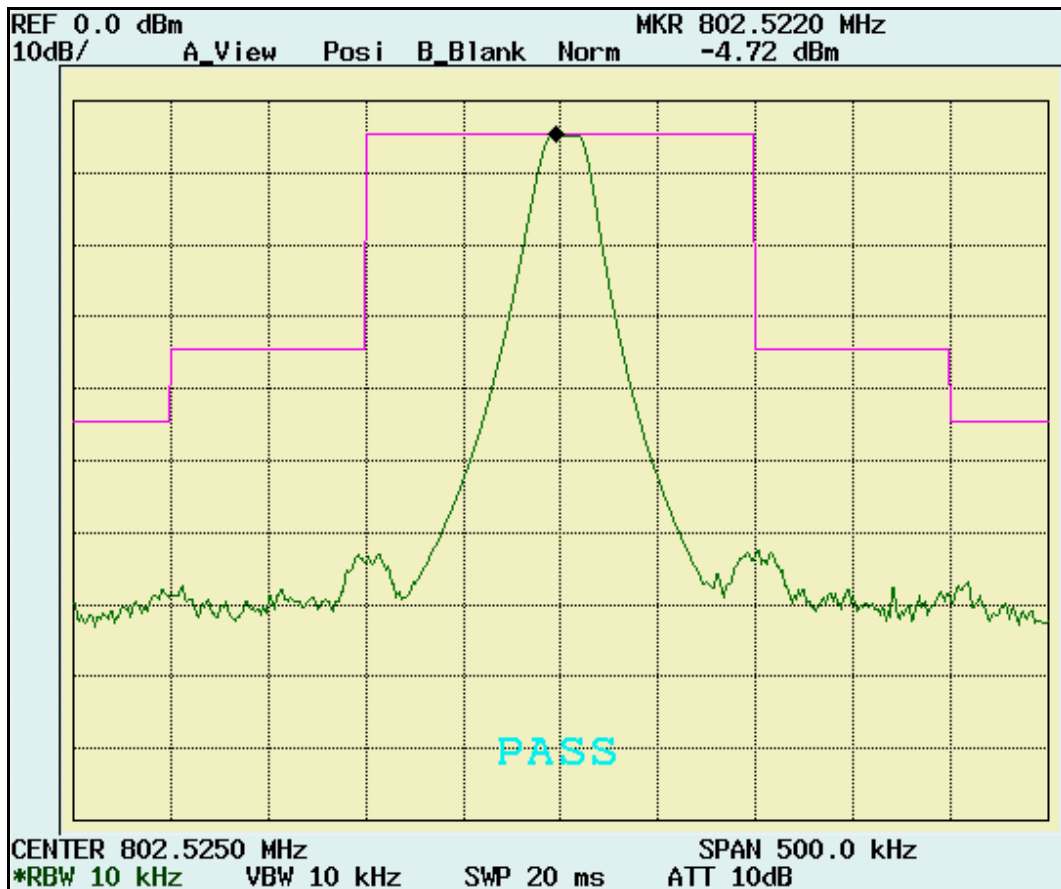
Input Signal: 120 kHz / 105.6 dB μ V
Temperature: 20 °C
Supply Voltage: 1.9 Volt

Resolution Bandwidth: 10 kHz
Video Bandwidth: 10 kHz

Marker Value (Carrier unmodulated)

Resolution Bandwidth: 1 kHz
Video Bandwidth: 1 kHz

Power Level: -5.15 dBm



Bandwidth Plot according FCC Part 74.861

Type: HT 40
Frequency: 802.525 MHz
Client: AKG

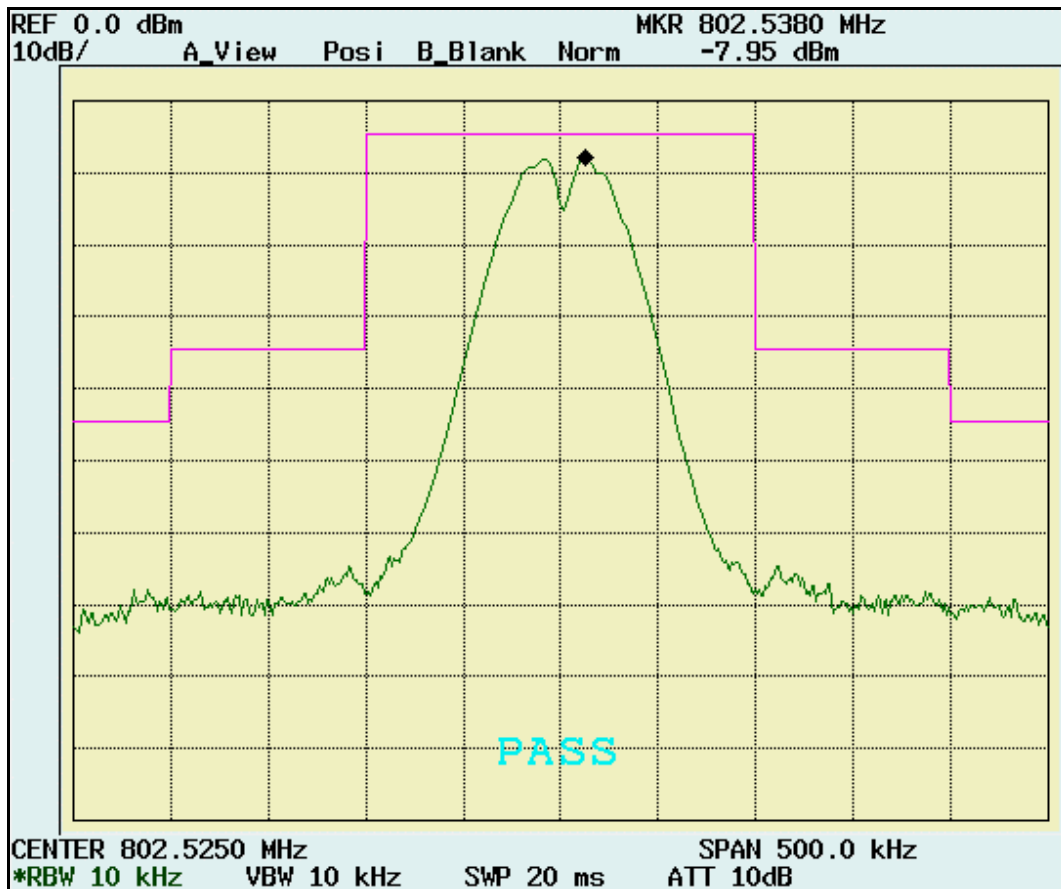
Input Signal: 1 kHz / 30 mV
Temperature: 20 °C
Supply Voltage: 1.9 Volt

Resolution Bandwidth: 10 kHz
Video Bandwidth: 10 kHz

Marker Value (Carrier unmodulated)

Resolution Bandwidth: 1 kHz
Video Bandwidth: 1 kHz

Power Level: -5.15 dBm



Bandwidth Plot according FCC Part 74.861

Type: HT 40
Frequency: 802.525 MHz
Client: AKG

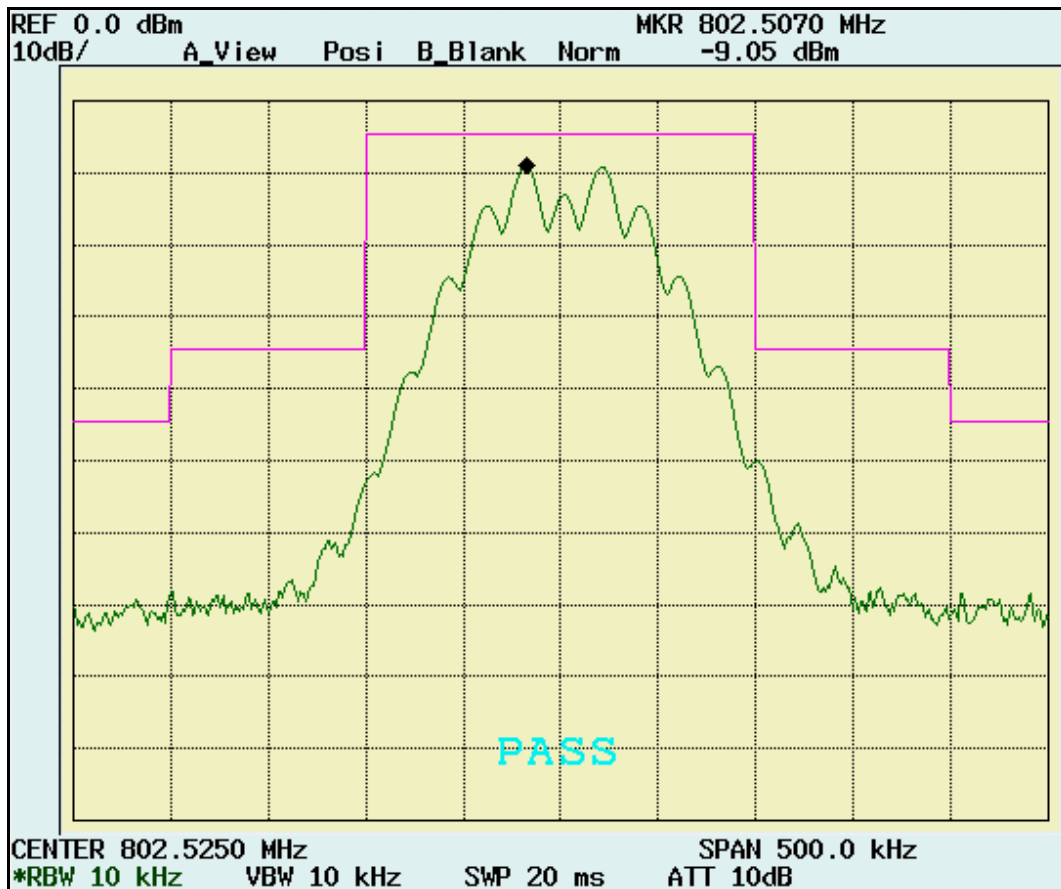
Input Signal: 10 kHz / 30 mV
Temperature: 20 °C
Supply Voltage: 1.9 Volt

Resolution Bandwidth: 10 kHz
Video Bandwidth: 10 kHz

Marker Value (Carrier unmodulated)

Resolution Bandwidth: 1 kHz
Video Bandwidth: 1 kHz

Power Level: -5.15 dBm



Bandwidth Plot according FCC Part 74.861

Type: HT 40
Frequency: 802.525 MHz
Client: AKG

Input Signal: 20 kHz / 30 mV
Temperature: 20 °C
Supply Voltage: 1.9 Volt

Resolution Bandwidth: 10 kHz
Video Bandwidth: 10 kHz

Marker Value (Carrier unmodulated)

Resolution Bandwidth: 1 kHz
Video Bandwidth: 1 kHz

Power Level: -5.15 dBm

Attachment: D

List of Test Equipment

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

Test Report No: T 17590-1-01 KJ

Beginning of Testing: 27-Januar-2000

Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.
EM	433 MHz-Antenna	Rod Antenna	MIKES PRODUCT SERVICE	04-07/62-97-002
	CMS-54	Com. Receiver	Rohde & Schwarz	04-07/63-94-052
	R 3162	Spectrum Analyzer	Advantest	04-07/74-00-001
FE	433 MHz-Antenna	Rod Antenna	MIKES PRODUCT SERVICE	04-07/62-97-002
	CMS-54	Com. Receiver	Rohde & Schwarz	04-07/63-94-052
	R 3162	Spectrum Analyzer	Advantest	04-07/74-00-001
MLD	433 MHz-Antenna	Rod Antenna	MIKES PRODUCT SERVICE	04-07/62-97-002
	CMS-54	Com. Receiver	Rohde & Schwarz	04-07/63-94-052
	R 3162	Spectrum Analyzer	Advantest	04-07/74-00-001
SER2	BBA-9106	Antenna	Schwarzbeck G.	04-07/62-92-048
	UHALP-9108A	Antenna	Schwarzbeck G.	04-07/62-97-009
	ESVP	Test Receiver	Rohde & Schwarz	04-07/63-89-008
SER3	Sucoflex 104, SMA	RF-cable 2 m	Huber+Suhner	04-07/60-97-485
	Sucoflex 104, N	RF-cable 3 m	Huber+Suhner	04-07/60-97-492
	Model 3115	Hornantenna	EMCO Elektronik GmbH	04-07/62-96-458
	AMT-12435	Microwave-Amplifier	TransTech Hochfrequenztechn	04-07/66-89-219
	AWT-4534	Microwave-Amplifier	TransTech Hochfrequenztechn	04-07/66-90-217
	FSEM 30	Spectrum Analyser	Rohde & Schwarz	04-07/74-97-001