
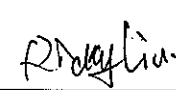


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Auftraggeber: <i>Client:</i>		Zhongshan K-mate General Elec. Co., Ltd. Fuwan Industrial Zone, Fuwan South Road, Sunwen East Road, East District, Zhongshan, Guangdong, P.R. China			
Gegenstand der Prüfung: Bluetooth FM Transmitter <i>Test item:</i>					
Bezeichnung: <i>Identification:</i>		BTC008	FCC ID: <i>FCC ID</i>	WAD-BTC008	
Wareneingangs-Nr.: <i>Receipt No.:</i>		173045017	Eingangsdatum: <i>Date of receipt:</i>	May 20, 2009	
Prüfört: <i>Testing location:</i>		TÜV Rheinland (Guangdong) Ltd. EMC Laboratory Guangzhou Auto Market, Yuan Gang Section of Guangshan Road, Guangzhou 510650, P. R. China		Listed test laboratory according to FCC rules section 2.948 for measuring devices under Parts 15	
Prüfgrundlage: <i>Test specification:</i>		ANSI C63.4: 2003 FCC Part 15: July 10, 2008 Subpart C section 15.239			
Prüfergebnis: <i>Test Result:</i>		Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test item passed the test specification(s).</i>			
Prüflaboratorium: <i>Testing Laboratory:</i>		TÜV Rheinland (Guangdong) Ltd.			
geprüft/ tested by:		kontrolliert/ reviewed by:			
Ken Kuang Project Engineer <i>July 15, 2009</i> Datum <i>Date</i>		 <i>15.07.2009</i> Datum <i>Date</i>		Ricky Liu Project Manager  Datum <i>Date</i>	
Name/Stellung <i>Name/Position</i>		Unterschrift <i>Signature</i>		Unterschrift <i>Signature</i>	
Sonstiges/ Other Aspects:					
Abkürzungen:		Abbreviations:			
P(ass) = entspricht Prüfgrundlage		P(ass) = passed			
F(all) = entspricht nicht Prüfgrundlage		F(all) = failed			
N/A = nicht anwendbar		N/A = not applicable			
N/T = nicht getestet		N/T = not tested			
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>					

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Test Summary

FCC Rules		Test items	Result
Paragraph	Released Date		
Part 15 Per Section 15.239(c)	July 10, 2008	Radiated Spurious Emission	Pass
Part 15 Per Section 15.239(b)	July 10, 2008	Inband Radiated Emission	Pass
Part 15 Per Section 15.239(a)	July 10, 2008	26dB Bandwidth	Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix 1: Test result

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Guangdong) Ltd. EMC Laboratory

Guangzhou Auto Market, Yuan Gang Section of Guangshan Road
Guangzhou 510650

P. R. China

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Type	Manufacturer	S/N	Calibrated until	Calibrated Interval
EMI Test Receiver	ESCI	Rohde & Schwarz	100216	26.Nov.2009	1 year
Spectrum Analyzer	FSP30	Rohde & Schwarz	100286	27.Aug.2009	1 year
Trilog-Broadband Antenna	VULB9168	SCHWARZBECK MESS-ELEKTRONIK	209	07.Nov.2009	2 year
Double-Ridged Waveguide Horn Antenna	HF906	Rohde & Schwarz	100385	18.Jul.2009	2 year
Standard Gain Horn Antenna	3160-09	EMCO	21642	N/A	N/A
Standard Gain Horn Antenna	3160-09	EMCO	21645	N/A	N/A
Pre-amplifier	AFS33- 18002650- 30-8P-44	MITEQ	1108282	31.Jul.2009	2 year
3m Anechoic Chamber	N/A	Albatross Project GmbH	N/A	10.Feb.2010	1 year
Audio Analyzer	VA-2230A	Kenwood	1008729 0	07.Oct.2008	1 Year

2.3 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications.

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2.5 Measurement Uncertainty

Uncertainty for conducted emissions measurements is $\pm 2.68\text{dB}$.

Uncertainty for radiated emissions measurements is $\pm 4.94\text{dB}$ (30M-1GHz) and $\pm 4.88\text{dB}$ (> 1GHz)

The reported expanded uncertainty is based on a standard uncertainty multiply by a coverage factor $k=2$, providing a level of confidence of approximately 95%.

2.6 Location of original data

The original copies of test data taken during actual testing were attached at Appendix 1 of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Guangdong) file for certification follow-up purposes.

2.7 Status of facility used for testing

TÜV Rheinland (Guangdong) Ltd. EMC Laboratory; Guangzhou Auto Market, Yuan Gang Section of Guangshan Road, Guangzhou 510650, P. R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements, the register no. 833845

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3 General Product Information

Brief description of the test sample:

The EUT is a Bluetooth FM transmitter powered by the DC 12V of vehicle battery. It can be linked to Bluetooth devices that support HFP or A2DP and transmit call or music to car FM radio. It can also transmit audio from line-in port.

No vehicle wiring are used as antenna.

For details, refer to technical documentation and the user manual.

3.1 Product Function and Intended Use

Refer to the Technical Documentation and user manual.

3.2 Ratings and System Details

Frequency range	:	1) Bluetooth: 2402.0MHz – 2480.0MHz 2) FM: 88.1MHz – 107.9MHz
Total Number of channels	:	1) Bluetooth: 79 channels 2) FM: 199 channels
Channel Spacing	:	1) Bluetooth: 1MHz 2) FM: 100 kHz
Modulation Type	:	1) Bluetooth: FHSS 2) FM: FM
Type of antenna	:	1) Bluetooth: Integral antenna 2) FM: Integral antenna
Power supply of Bluetooth headset	:	12V DC by vehicle battery
Ports	:	audio lin-in port, audio line-out port, 12V DC input port, USB DC 5V output port
Protection Class	:	III

Refer to the Technical Documentation for further information

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3.3 Independent Operation Modes

1. Bluetooth: RF Transmitting and receiving
2. FM: RF Transmitting

For further information refer to User Manual

3.4 Submitted Documents

Block Diagram
Schematics
Operation Description
Components List
FCC label and location
User Manual
Internal Photos
External Photos
Application form

4 Test Set-up and Operation Mode

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Refer to test set-up in chapter 5.

4.3 Special Accessories and Auxiliary Equipment

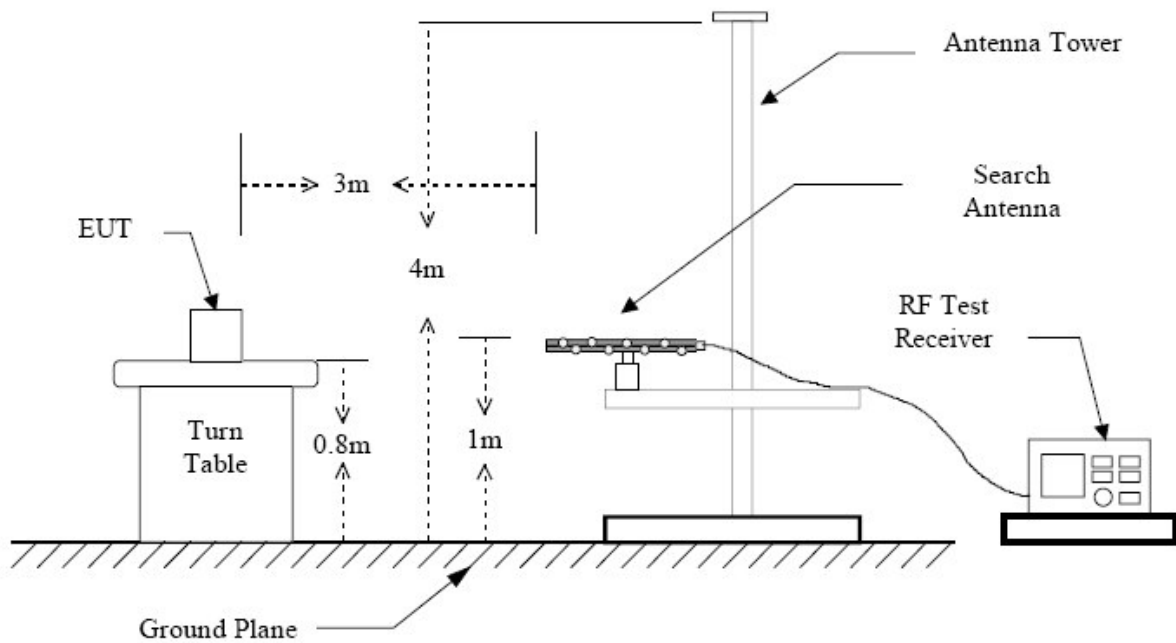
None.

4.4 Countermeasures to achieve EMC Compliance

The test sample, which has been tested, contained the noise suppression parts as described in the technical document. No additional measures were employed to achieve compliance.

4.5 Test set-up

Diagram 1 of Configuration for Testing Radiated Emission



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5 Test Results EMISSION

5.1 Radiated Spurious Emission

RESULT:

Pass

Date of testing	:	Jun. 26, 2009
Test specification	:	FCC Part 15 Per Section 15.239(c)
Limits	:	FCC Part 15 Per Section 15.209(a)
Test procedure	:	Procedure specified in ANSI C63.4
Deviations from Standard Test procedures	:	None
Kind of test site	:	3m Semi-anechoic chamber
Operation mode	:	FM RF transmitting at fix channel (High, Low, Mid)
Power supply	:	DC 12V
Temperature	:	22°C
Humidity	:	50%

Test procedure:

1. The EUT was placed on the top of a rotatable table 0.8 meters above the ground with 3-orthogonal direction and be kept close enough to the receiving antenna. The table was rotated 360 degrees to determine the suspected emission frequency and the position of the worst radiation case with both horizontal and vertical antenna polarization.
2. The EUT was then set 3 meters away from the receiving antenna, which was mounted on a variable-height antenna tower.
3. For each suspected emission frequency recorded in step 1, the EUT was arranged to its worst case that the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to read the maximum emission.

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Table 2: Radiated Spurious Emission (Transmitting at channel low)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dB μ V/m]			(H/V)	[dB μ V/m]		
128.00	18.5	N/A	N/A	H	43.5	N/A	N/A
138.60	18.9	N/A	N/A	H	43.5	N/A	N/A
160.00	25.4	N/A	N/A	H	43.5	N/A	N/A
127.95	12.9	N/A	N/A	V	43.5	N/A	N/A
144.10	12.6	N/A	N/A	V	43.5	N/A	N/A
192.00	13.6	N/A	N/A	V	43.5	N/A	N/A
*)---							

Table 3: Radiated Spurious Emission (Transmitting at channel mid)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dB μ V/m]			(H/V)	[dB μ V/m]		
120.00	11.2	N/A	N/A	H	43.5	N/A	N/A
224.00	22.4	N/A	N/A	H	46.0	N/A	N/A
320.00	24.2	N/A	N/A	H	46.0	N/A	N/A
116.70	9.9	N/A	N/A	V	43.5	N/A	N/A
139.55	12.1	N/A	N/A	V	43.5	N/A	N/A
192.00	12.1	N/A	N/A	V	43.5	N/A	N/A
*)---							

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Table 4: Radiated Spurious Emission (Transmitting at channel high)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dB μ V/m]			(H/V)	[dB μ V/m]		
133.80	11.2	N/A	N/A	H	43.5	N/A	N/A
224.00	20.6	N/A	N/A	H	46.0	N/A	N/A
320.00	13.5	N/A	N/A	H	46.0	N/A	N/A
131.75	11.2	N/A	N/A	V	43.5	N/A	N/A
148.50	12.2	N/A	N/A	V	43.5	N/A	N/A
203.50	9.0	N/A	N/A	V	43.5	N/A	N/A
*)---							

*) Note:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz at frequency below 1GHz.

The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz at frequency above 1GHz.

Measurement is made from 30 MHz to 1080 MHz. Disturbances other than those mentioned above are small or not detectable.

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5.2 Inband Radiated Emission

RESULT:**Pass**

Date of testing	:	Jun. 26, 2009
Test specification	:	FCC Part 15 Per Section 15.239(b)
Limits	:	FCC Part 15 Per Section 15.239(b)
Test procedure	:	Procedure specified in ANSI C63.4
Deviations from Standard Test procedures	:	None
Kind of test site	:	3m Semi-anechoic chamber
Operation mode	:	FM RF transmitting at fix channel (High, Low, Mid)
Power supply	:	DC 12V
Temperature	:	22°C
Humidity	:	50%

Test procedure:

1. The EUT was placed on the top of a rotatable table 0.8 meters above the ground with 3-orthogonal direction and be kept close enough to the receiving antenna. The table was rotated 360 degrees to determine the suspected emission frequency and the position of the worst radiation case with both horizontal and vertical antenna polarization.
2. The EUT was then set 3 meters away from the receiving antenna, which was mounted on a variable-height antenna tower.
3. For each suspected emission frequency recorded in step 1, the EUT was arranged to its worst case that the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to read the maximum emission.

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Table 5: Radiated Inband Emission (Transmitting at channel low)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dB μ V/m]			(H/V)	[dB μ V/m]		
88.100	N/A	18.1	18.3	H	N/A	48	68
88.100	N/A	18.0	18.2	V	N/A	48	68
*)---							

Table 6: Radiated Inband Emission (Transmitting at channel mid)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dB μ V/m]			(H/V)	[dB μ V/m]		
98.100	N/A	26.7	26.8	H	N/A	48	68
98.100	N/A	22.9	23.1	V	N/A	48	68
*)---							

Table 7: Radiated Inband Emission (Transmitting at channel high)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dB μ V/m]			(H/V)	[dB μ V/m]		
107.900	N/A	34.4	34.5	H	N/A	48	68
107.900	N/A	28.1	28.2	V	N/A	48	68
*)---							

*) Note:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz at frequency below 1GHz.

Measurement is made from carrier frequency-100 kHz to carrier frequency+100 kHz and maximum reading among the range is listed.

5.3 26dB Bandwidth

RESULT:
Pass

Date of testing	:	Jul. 14, 2009
Test specification	:	FCC Part 15 Per Section 15.239(a)
Limits	:	FCC Part 15 Per Section 15.239(a)
Deviations from Standard Test procedures	:	None
Test procedure	:	Procedure specified in ANSI C63.4
Operation mode	:	FM continuously transmitting on the measured channel with maximum volume specified by the applicant.
Kind of test site	:	Shielded room
Power supply	:	DC 12V
Temperature	:	22°C
Humidity	:	50%

Test procedure:

1. Set the EUT to proper test channel.
2. Spectrum analyzer setting: Centered Frequency= measured channel, RBW=10kHz, VBW=30kHz.
3. Mark the peak power frequency point and the -26dB upper and lower frequency points.
4. Read the frequency delta value between the -26dB upper and lower frequency points.
5. Repeat step 1 to 4 until all the channels required are finished.

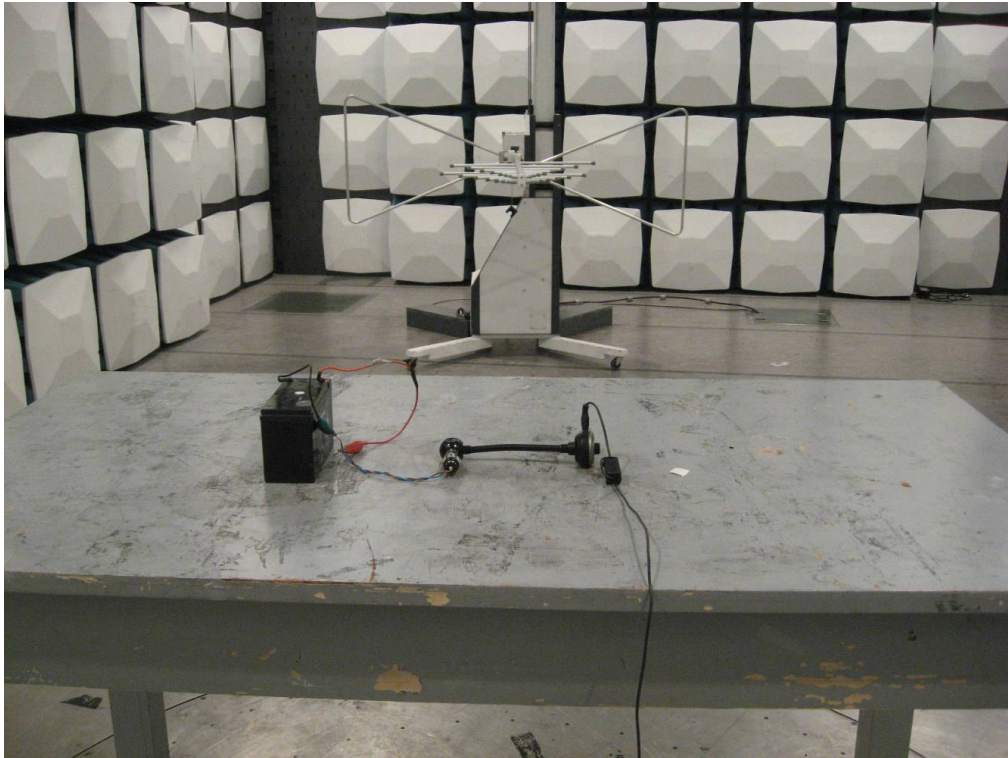
Table 8: 26dB Bandwidth

Channel	Lowest Frequency (MHz)	Highest Frequency (MHz)	Test Result (kHz)
Lowest 88.100MHz	88.040	88.162	122
Middle 98.100MHz	98.041	98.162	121
Highest 107.900MHz	107.841	108.962	121

Please refer to Appendix 1 for measurement data.

6 Photographs of the Test Set-Up

Photograph 1: Set-up for Radiation Measurement



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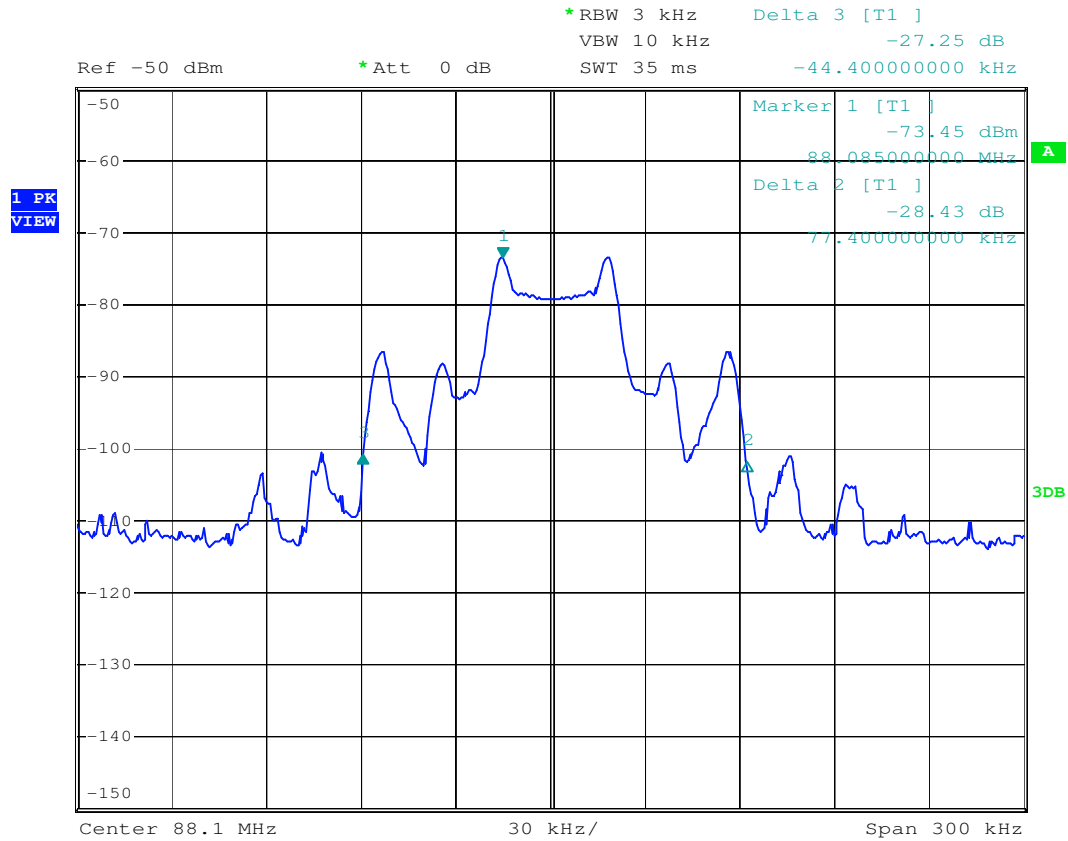
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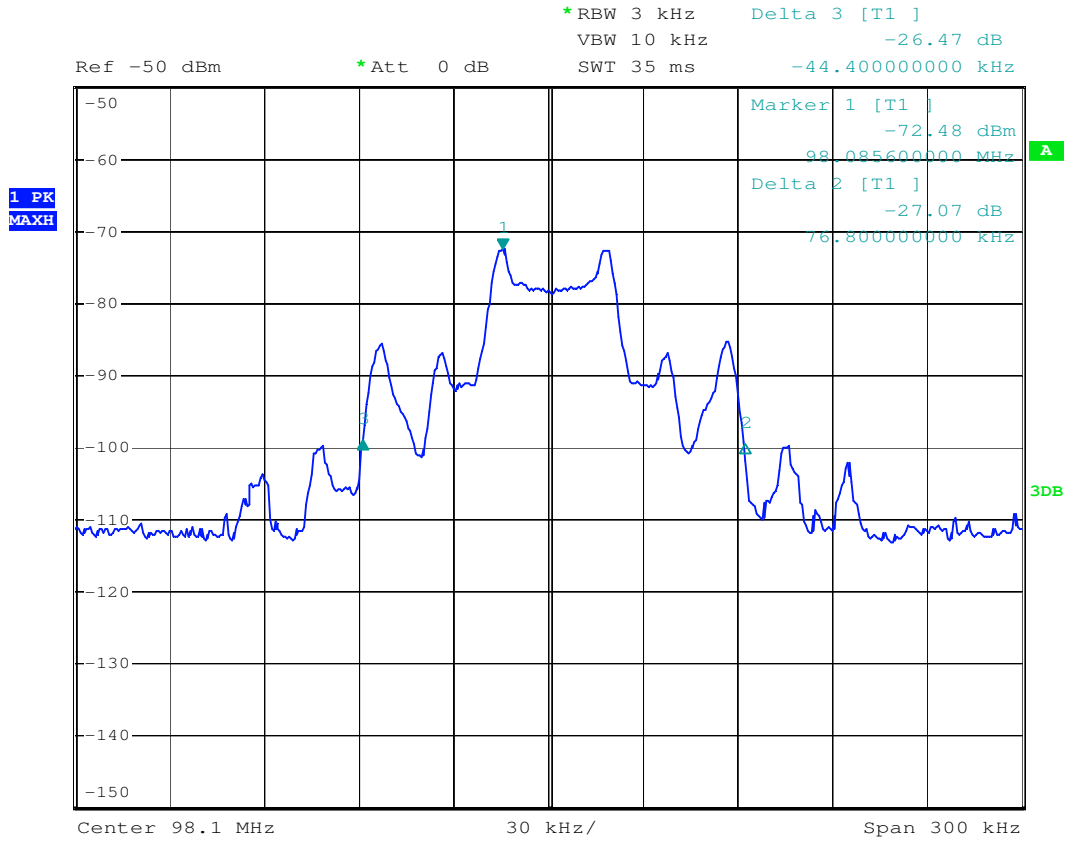
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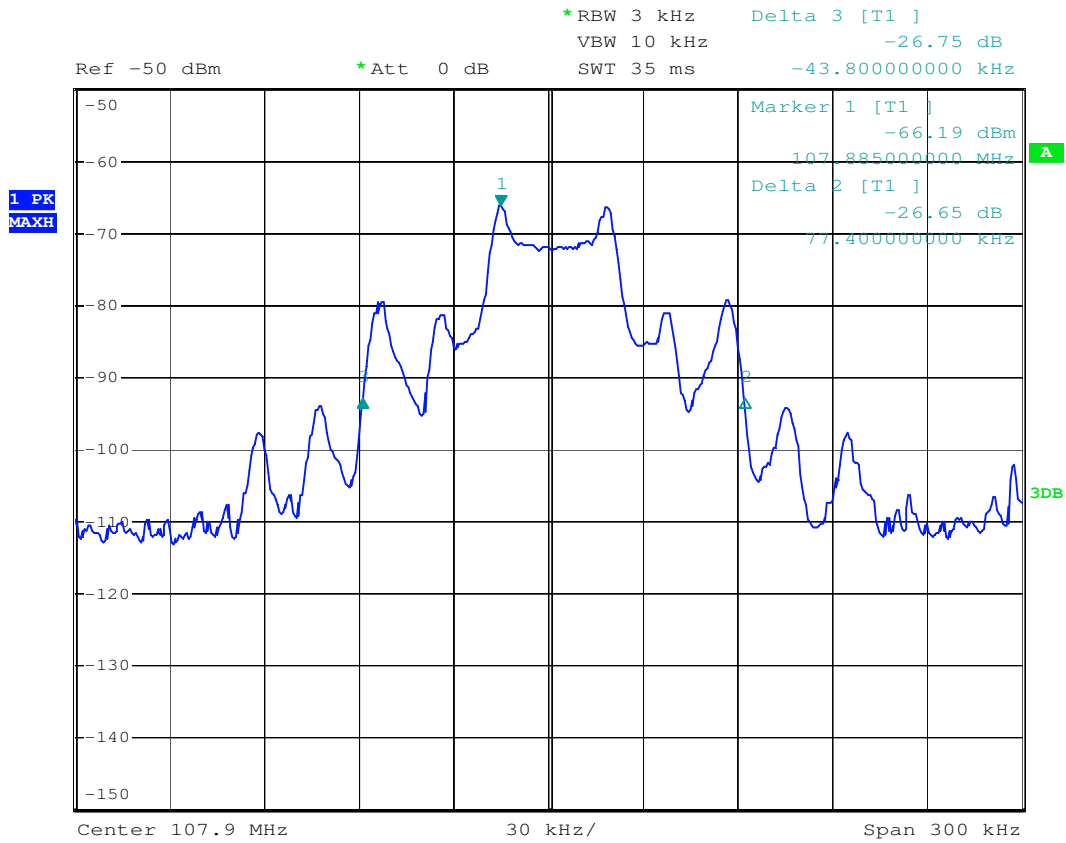
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