Prüfbericht - Nr.: *Test Report No.:*	**16014821 001**	**Seite 1 von 36** *Page 1 of 36*

Auftraggeber: *Client:*	**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: *Test item:*	**Bluetooth Car Kit with Detachable Headset**		
Bezeichnung: *Identification:*	**BH6100D**	**FCC ID:** *FCC ID*	**WAD-BH6100D**
Wareneingangs-Nr.: *Receipt No.:*	**173040313**	**Eingangsdatum:** *Date of receipt:*	**26.Sep.2008**
Prüfort: *Testing location:*	**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: *Test specification:*	**ANSI C63.4: 2003** **FCC Part 15: 20, Sep. 2007 Subpart B section 15.109** **FCC Part 15: 20, Sep. 2007 Subpart C section 15.209 and 15.247**		
Prüfergebnis: *Test Result:*	**Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).** *The test item passed the test specification(s).*		
Prüflaboratorium: *Testing Laboratory:*	**TÜV Rheinland (Guangdong) Ltd.**		

geprüft/ *tested by*:			**kontrolliert**/ *reviewed by*:		
03. Feb. 2009	William Chen Project Engineer	William Chen	03. Feb. 2009	Ricky Liu Project Manager	Ricky Liu
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges/ Other Aspects:

Abkürzungen:				*Abbreviations:*			
	P(ass)	=	*entspricht Prüfgrundlage*		*P(ass)*	=	*passed*
	F(ail)	=	*entspricht nicht Prüfgrundlage*		*F(ail)*	=	*failed*
	N/A	=	*nicht anwendbar*		*N/A*	=	*not applicable*
	N/T	=	*nicht getestet*		*N/T*	=	*not tested*

Test Summary

FCC Rules		Test items	Result
Paragraph	**Released Date**		
Part 15 Per Section 15.207(a)	**20. Sep, 2007**	**Conducted Emission**	**Pass**
Part 15 Per Section 15.209(a)	**20. Sep, 2007**	**Radiated Spurious Emission**	**Pass**
Part 15 Per Section 15.203	**20. Sep, 2007**	**Antenna requirement**	**Pass**
Part 15 Per Section 15.247(b)(1)	**20. Sep, 2007**	**Maximum Peak Output power**	**Pass**
Part 15 Per Section 15.247(a)(1)	**20. Sep, 2007**	**20dB Bandwidth**	**Pass**
Part 15 Per Section 15.247(a)(1)	**20. Sep, 2007**	**Hopping Channel Carrier Frequency Separation**	**Pass**
Part 15 Per Section 15.247(a)(1)(iii)	**20. Sep, 2007**	**Number of Hopping Frequency Used**	**Pass**
Part 15 Per Section 15.247(a)(1)(iii)	**20. Sep, 2007**	**Time of Occupancy (Dwell Time)**	**Pass**
Part 15 Per Section 15.247(d)	**20. Sep, 2007**	**Out-Of-Band Emission measurement**	**Pass**

Contents

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-3	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	210	08.May.2009	2 year
Double-Ridged Waveguide Horn Antenna	HF906	Rohde & Schwarz	100385	18.Jul.2009	2 year
Double-Ridged Waveguide Horn Antenna	HF906	Rohde & Schwarz	100407	08.May.2009	2 year
Pre-amplifier	AFS42-00101800-25-S-42	MITEQ	1101599	31.Jul.2009	2 year
Band Reject Filter	BRM50702	Micro-Tronics	023	14.Mar.2010	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	16.Apr.2009	3 year
EMI Test Receiver	ESCS30	Rohde & Schwarz	100316	27.Mar.2009	1 year
Two-Line V-Network	ESH3-Z5	Rohde & Schwarz	100308	27.Mar.2009	1 year
Pulse Limiter	ESH3-Z2	Rohde & Schwarz	100701	27.Mar.2009	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.

2.5 Measurement Uncertainty

Uncertainty for conducted emissions measurements is ± 2.51dB.
Uncertainty for radiated emissions measurements is ± 4.51dB.

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

3 General Product Information

The appliance BH6100D is a Bluetooth car kit with detachable headset.

The headset can operate independently and can be linked to Bluetooth devices that support Bluetooth HFP or HSP device.

The car kit base is designed specially for the dedicated headset above mentioned. It provides hands free function via the speaker when the headset is plugged onto it. There is no any RF part in the car kit base, and the car kit base can't operate independently.

The headset is powered by an internal rechargeable Li-ion battery. It can be charged via the mini-USB port. It can also be charged while it is connected with the car kit base.

The car kit base is powered by 3 AAA size rechargeable Ni-MH batteries or external 5V DC via min USB port. The Ni-MH batteries can be recharged when car kit is connected to external 5V DC power via USB port.

3.1 Product Function and Intended Use

Refer to the Technical Documentation and user manual.

3.2 Ratings and System Details

Frequency range	:	2402.0MHz – 2480.0MHz (unlicensed ISM band)
Number of employed channels	:	79 channels
Total Number of channels	:	79 channels
Modulation Type	:	Frequency Hopping Spread Spectrum (Bluetooth V2.0 Class II product)
Type of antenna	:	Integral antenna
Power supply of car kit	:	3 AAA size rechargeable Ni-MH batteries or external 5Vdc via USB port
Power supply of Bluetooth headset	:	3.7V DC (the headset is powered by integral lithium rechargeable battery)
Ports of car kit	:	Mini USB charge port
Ports of Bluetooth headset	:	Mini USB charge port
Protection Class	:	III

Refer to the Technical Documentation for further information

3.3 Independent Operation Modes

Off
On:
1. Battery charging
2. Bluetooth RF connection with Bluetooth HFP/HSP device.

The basic operation modes for the Bluetooth headset:
Operating: RF Transmitting and receiving

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

The products have been tested together with the following device:

Device	Manufacture	Model	Serial no./ Version
Laptop notebook	IBM R40e	2684	99-CYY55
Bluetooth test Software	CSR	BlueTest	1.24

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 below 1 GHz

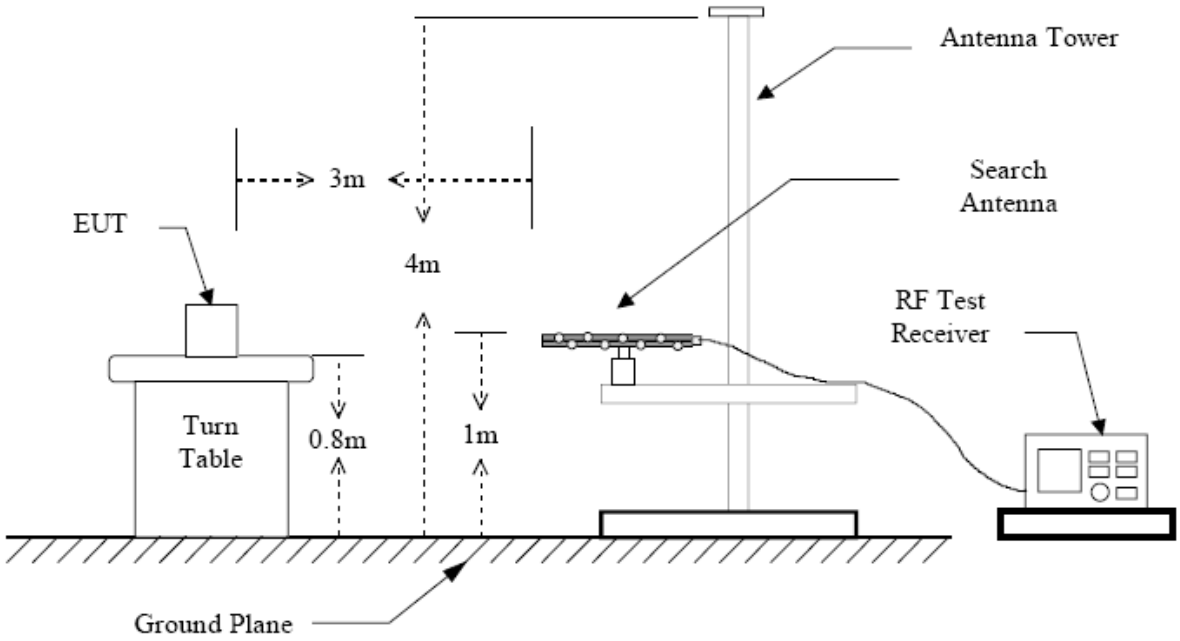


Diagram 2 of Configuration for Testing Radiated Emission above 1 GHz

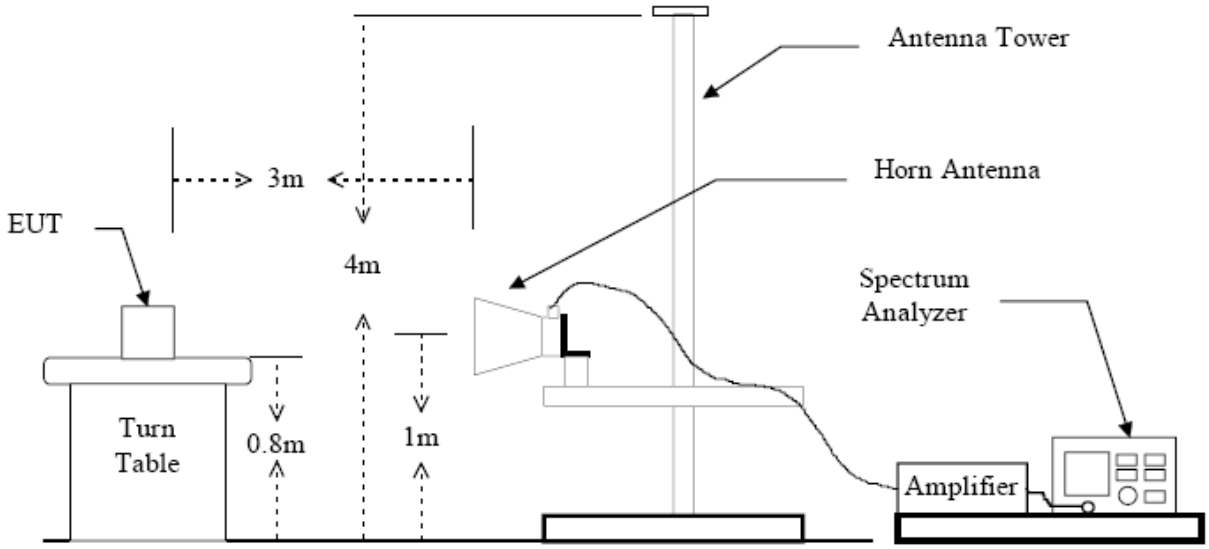


Diagram 3 of Measurement Equipment Configuration for Testing Conducted Emission

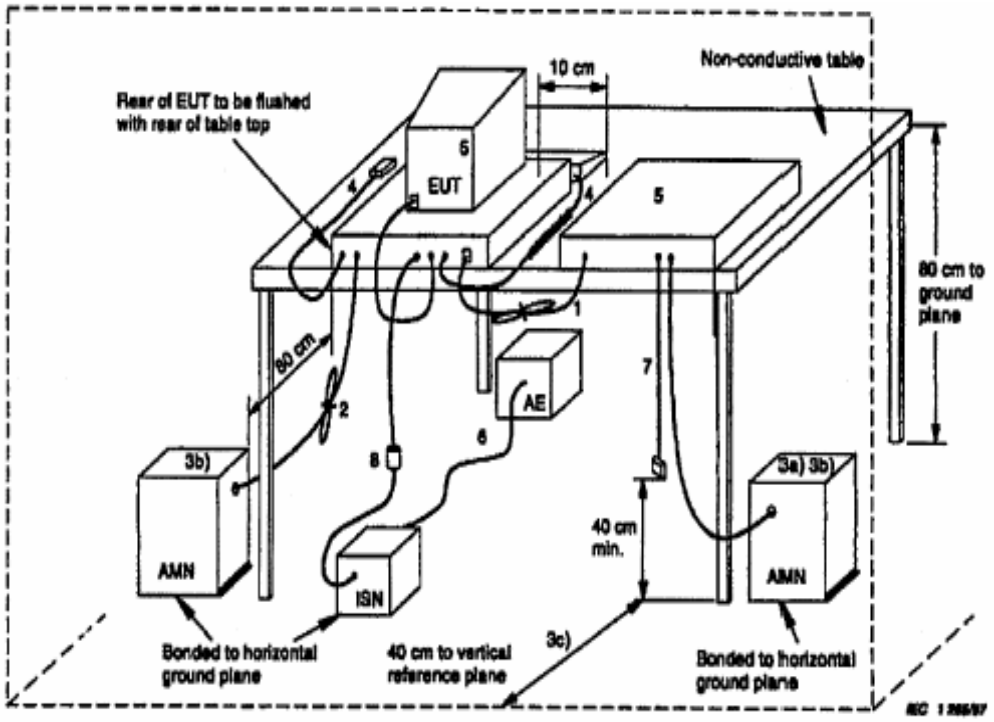
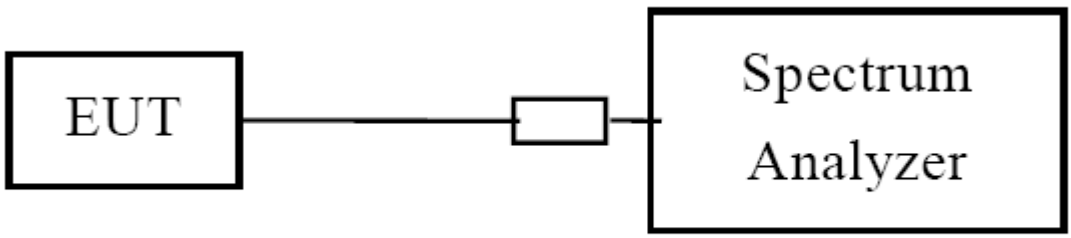


Diagram 4 of Configuration for Testing other test items



5 Test Results E M I S S I O N

5.1 Conducted Emission for FCC Part 15 Per Section 15.207(a)

RESULT: **Pass**

Date of testing	:	04.11.2008
Test specification	:	FCC Part 15 Per Section 15.207(a)
Limits	:	FCC Part 15 Per Section 15.207(a)
Test procedure	:	Procedure specified in ANSI C63.4 were followed
Deviations from Standard Test procedures	:	None
Kind of test site	:	Shielded room
Operation mode	:	Charging
Power supply	:	AC 120V; 60Hz to the AC/DC adaptor of the host charge computer.
Temperature	:	21°C
Humidity	:	50%

Test procedure:
1. Place the EUT as specified in ANSI C63.4 Clause 7.2.1

2. Plug the LISN to a correct power source (pay attention to: AC/DC, voltage, frequency).

4. Connect the EUT to LISN and choose N or L1 on the LISN.

5. Connect measurement receiver and LISN with a 50-ohm coaxial cable and a pulse limiter then begin exploratory measurement as specified in ANSI C63.4 Clause 7.2.3

6. Make final measurement as specified in ANSI C63.4 Clause 7.2.4

7. Switch to the other line on the LISN and repeat step 4 to 6.

Table 2: Disturbance Voltage on AC Mains

Frequency [MHz]	**Line** L/N	**QP** [dBµV]	**AV** [dBµV]	**Quasi Peak Limit** [dBµV]	**Average Limit** [dBµV]
0.170	L	48.3	42.2	65.0	55.0
0.205	L	42.9	35.0	63.4	53.4
0.665	L	34.0	27.0	56.0	46.0
1.635	L	33.5	26.9	56.0	46.0
3.025	L	33.7	27.1	56.0	46.0
7.105	L	35.2	30.4	60.0	50.0
0.170	N	52.2	46.8	65.0	55.0
0.205	N	50.4	47.0	63.4	53.4
0.280	N	47.7	44.4	60.8	60.8
0.665	N	34.6	28.4	56.0	46.0
3.030	N	34.3	26.2	56.0	46.0
7.315	N	35.1	30.8	60.0	50.0
*)					

*) Measurement is made from 150 kHz to 30 MHz. Disturbances other than those mentioned above are small or not detectable.

If the result of the measurement with the Quasi Peak detector is below the Average limit, the measurement with Average Detector may be omitted.

5.2 Radiated Spurious Emission

RESULT: **Pass**

Date of testing	:	17.10.2008
Test specification	:	FCC Part 15 Per Section 15.209(a)
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	:	RF transmitting
Power supply	:	DC 3.7V by battery
Temperature	:	22°C
Humidity	:	55%

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.

Table 3: Radiated Emission (Transmitting at channel low)

Frequency [MHz]	**QP** [dBµV/m]	**AV** [dBµV/m]	**Polarity** (H/V)	**Limit** [dBµV/m]
256.00	30.8	--	H	46
288.00	33.2	--	H	46
320.05	32.4	---	H	46
362.70	28.5	---	H	46
469.15	29.5	---	H	46
490.75	29.4	---	H	46
256.00	20.8	---	V	46
288.00	21.3	---	V	46
495.70	22.3	---	V	46
804.05	26.5	---	V	46
939.25	28.6	---	V	46
*				

Frequency [MHz]	**PK** [dBµV/m]	**AV** [dBµV/m]	**Polarity** (H/V)	**PK Limit** [dBµV/m]	**AV limit** [dBµV/m]
1601.50	44.9	40.8	H	74	54
4804.00	60.2	44.4	H	74	54
7206.00	48.8	35.4	H	74	54
9608.00	50.8	37.2	H	74	54
18545.00	30.2	18.1	H	74	54
20275.00	32.2	19.3	H	74	54
21305.00	32.2	20.5	H	74	54
1602.00	44.8	40.2	V	74	54
2376.000	40.6	39.5	V	74	54
4804.00	60.2	44.4	V	74	54
6408.00	52.3	40.0	V	74	54
7206.00	49.4	35.5	V	74	54
18103.00	31.8	18.7	V	74	54
18519.00	30.7	18.3	V	74	54
22815.00	33.4	21.1	V	74	54
24242.00	36.3	23.1	V	74	54
*					

Table 4: Radiated Emission (Transmitting at channel mid)

Frequency [MHz]	**QP** [dBµV/m]	**AV** [dBµV/m]	**Polarity** (H/V)	**Limit** [dBµV/m]
256.00	31.3	--	H	46
288.00	34.0	--	H	46
320.00	35.4	---	H	46
394.70	31.8	---	H	46
469.4	32.9	---	H	46
244.00	14.2	---	H	46
256.25	16.5	---	V	46
288.00	23.5	---	V	46
352.05	21.3	---	V	46
469.65	19.3	---	V	46
830.60	26.3	---	V	46
*				

Frequency [MHz]	**PK** [dBµV/m]	**AV** [dBµV/m]	**Polarity** (H/V)	**PK Limit** [dBµV/m]	**AV limit** [dBµV/m]
1626.50	434	39.0	H	74	54
4882.00	64.4	39.5	H	74	54
7323.00	48.1	34.9	H	74	54
18014.00	30.9	18.8	H	74	54
20317.00	30.9	18.9	H	74	54
23061.00	33.3	21.2	H	74	54
24337.00	35.3	22.8	H	74	54
1625.50	43.9	36.8	V	74	54
4882.00	64.1	41.5	V	74	54
6506.50	51.8	39.6	V	74	54
7206.00	48.4	35.0	V	74	54
18570.00	29.5	18.2	V	74	54
19345.00	29.7	17.8	V	74	54
21331.00	32.2	20.4	V	74	54
24194.00	35.3	23.2	V	74	54
*					

Table 5: Radiated Emission (Transmitting at channel high)

Frequency [MHz]	**QP** [dBµV/m]	**AV** [dBµV/m]	**Polarity** (H/V)	**Limit** [dBµV/m]
256.00	30.9	--	H	46
288.00	33.5	--	H	46
320.00	34.9	--	H	46
352.00	32.8		H	46
394.60	30.5		H	46
256.00	20.3		V	46
280.00	15.2		V	46
288.00	23.2		V	46
398.10	16.6	---	V	46
480.10	18.8		V	46
625.10	21.6	---	V	46
*				

Frequency [MHz]	**PK** [dBµV/m]	**AV** [dBµV/m]	**Polarity** (H/V)	**PK Limit** [dBµV/m]	**AV limit** [dBµV/m]
1652.00	40.9	34.4	H	74	54
4960.00	60.2	43.1	H	74	54
7440.00	49.9	36.6	H	74	54
18112.00	30.5	18.4	H	74	54
18527.00	31.7	18.2	H	74	54
21340.00	33.1	20.2	H	74	54
25899.00	37.2	24.3	H	74	54
1652.50	43.0	37.4	V	74	54
4960.00	64.2	47.3	V	74	54
6610.50	50.7	39.1	V	74	54
19449.00	30.6	18.3	V	74	54
20228.00	31.5	19.4	V	74	54
22713.00	33.1	21.0	V	74	54
25626.00	36.8	23.7	V	74	54
*					

*) 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 26 GHz. Disturbances other than those mentioned above are small or not detectable.

5.3 Antenna requirement

RESULT: **Pass**

Date of testing	:	---
Test specification	:	FCC Part 15 Per Section 15.203 FCC Part 15 Per Section 15.247(b)

For intentional device, according to 15.203, and intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to 15.247(b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by amount in dB than the directional gain of the antenna exceeds of 6dBi.

As the antenna is permanently mounted on RF Board, there is no consideration of replacement.

And the max gain of the antenna is 0dBi.

5.4 Maximum Peak Output Power

RESULT: **Pass**

Date of testing	:	01.11.2008
Test specification	:	FCC Part 15 Per Section 15.247(b)(1)
Limits	:	FCC Part 15 Per Section 15.247(b)(1) For frequency hopping systems operating in the band 2400-2483.5 MHz employing at least 75 hopping channels, the maximum peak conducted output power shall not exceed 1 W; for all other frequency hopping systems in the band, the maximum peak conducted output power shall not exceed 0.125 W.
Deviations from Standard Test procedures	:	None
Test procedure	:	Procedure specified in ANSI C63.4
Kind of test site	:	Shielded room
Operation mode	:	Continuously transmitting on the measured channel.
Power supply	:	DC 3.7V by battery
Temperature	:	22°C
Humidity	:	50%

Table 6: Peak Conducted Power

Channel	Frequency (MHz)	Power Reading(dBm)	Cable Loss (dB)	Output Power		Limit (mW) *
				(dBm)	(mW)	
Low	2402.0	4.70	0.80	5.50	3.55	1000
Mid	2441.0	3.62	0.80	4.42	2.77	1000
High	2480.0	2.59	0.80	3.39	2.18	1000
*Note 1: Refer to the test result of "Number of Hopping Channel Used" for the non-overlap channel number. *Note 2: The Peak Conducted Power has been measured on the Bluetooth headset.						

5.5 20dB Bandwidth

RESULT: **Pass**

Date of testing	:	01.11.2008
Test specification	:	FCC Part 15 Per Section 15.247(a)(1)
Limits	:	FCC Part 15 Per Section 15.247(b)(1) Frequency hopping systems operating in the band 2400-2483.5 MHz may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 0.125W.
Deviations from Standard Test procedures	:	None
Test procedure	:	Procedure specified in ANSI C63.4
Operation mode	:	Continuously transmitting on the measured channel.
Kind of test site	:	Shielded room
Power supply	:	DC 3.7V by battery
Temperature	:	22°C
Humidity	:	55%

Test procedure:

1. Connect the antenna port of the EUT to the spectrum analyzer by a low lost cable.
2. Set the EUT to proper test mode with relative test software and hardware.
3. Spectrum analyzer setting: Centered Frequency= measured channel, RBW=10kHz, VBW=30kHz.
4. Mark the peak power frequency point and the -20dB upper and lower frequency points.
5. Read the frequency delta value between the -20dB upper and lower frequency points.
6. Repeat step 2 to 5 until all the channels required are finished.

Table 7: 20dB Bandwidth

Channel	Frequency (GHz)	Test Result (kHz)
Low	2402.0	930
Mid	2441.0	935
High	2480.0	935

Please refer to Appendix 1 for measurement data.

Note: The 20dB Bandwidth measurement has been performed on the Bluetooth headset.

5.6 Hopping Channel Carrier Frequency Separation

RESULT: **Pass**

Date of testing	:	01.11.2008
Test specification	:	FCC Part 15 Per Section 15.247(a)(1)
Limits	:	FCC Part 15 Per Section 15.247(a)(1) Frequency hopping systems operating in the band 2400-2483.5 MHz may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 0.125W.
Deviations from Standard Test procedures	:	None
Test procedure	:	Procedure specified in ANSI C63.4
Kind of test site	:	Shielded room
Operation mode	:	Transmitting with hopping at the full channel set
Power supply	:	DC 3.7V by battery
Temperature	:	22°C
Humidity	:	55%

Test procedure:

1. Connect the antenna port of the EUT to the spectrum analyzer by a low lost cable.
2. Set the EUT to proper test mode with relative test software and hardware.
3. Spectrum analyzer setting: Centered Frequency = measured channel, RBW = 100 kHz, VBW = 100 kHz, Frequency Span = wide enough to cover the adjacent channel.
4. Mark the peak power frequency point of the measured channel and its adjacent channel(s)
5. Read the frequency delta value between the measured channel and its adjacent channel(s)
6. Repeat step 3 to 5 until all the channels measured are finished.

Table 8: Hopping Channel Carrier Frequency Separation

Channel	**Adjacent Hopping channel separation (kHz)**	**Limit**
Low	996	At least 25kHz or tow-thirds of the 20dB bandwidth of the hopping channel, whichever is greater. Note: refer to table 6 for the value of 20dB bandwidth
Mid	1020	
High	1038	

Please refer to Appendix 1 for measurement data.

Note: The Hopping Channel Carrier Frequency Separation measurement has been performed on the Bluetooth headset.

5.7 Number of Hopping Frequency Used

RESULT: **Pass**

Date of testing	:	17.12.2007
Test specification	:	FCC Part 15 Per Section 15.247(a)(1)(iii)
Limits	:	FCC Part 15 Per Section 15.247(a)(1)(iii) Frequency hopping system in the 2400-2483.5 MHz band shall use at least 15 non-overlapping channels
Deviations from Standard Test procedures	:	None
Test procedure	:	Procedure specified in ANSI C63.4
Kind of test site	:	Shielded room
Operation mode	:	Transmitting with hopping at the full channel set
Power supply	:	DC 3.7V by battery
Temperature	:	22°C
Humidity	:	55%

Test procedure:

1. Connect the antenna port of the EUT to the spectrum analyzer by a low lost cable.
2. Set the EUT to proper test mode with relative test software and hardware.
3. Spectrum analyzer setting: RBW = 300 kHz, VBW≥RBW, Frequency Span = wide enough to cover the channels to be plotted.
4. Set the spectrum analyzer to Max-hold mode and plot the result(s) with record of all hopping channel.

Table 9: Number of hopping frequency

Number of hopping frequency:	79
Limit:	At least 15 non-overlapping channels

Please refer to Appendix 1 for measurement data.

Note: The number of hopping frequency measurement has been performed on the Bluetooth headset.

5.8 Time of Occupancy (Dwell Time)

RESULT: **Pass**

Date of testing	:	19.12.2007
Test specification	:	FCC Part 15 Per Section 15.247(a)(1)(iii)
Limits	:	FCC Part 15 Per Section 15.247(a)(1)(iii) For frequency hopping system operating in the 2400-2483.5MHz band, the average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.
Deviations from Standard Test procedures	:	None
Test Procedure	:	Procedure specified in ANSI C63.4
Kind of test site	:	Shielded room
Operation mode	:	Transmitting with hopping at the full channel set
Power supply	:	DC 3.7V by battery
Temperature	:	22°C
Humidity	:	55%

Test procedure:

1. Connect the antenna port of the EUT to the spectrum analyzer by a low lost cable.
2. Set the EUT to proper test mode with relative test software and hardware.
3. Spectrum analyzer setting: Centered Frequency = measured channel, RBW = 1MHz, VBW≥RBW, Frequency Span = 0 Hz.
4. Set sweep time properly to capture the entire dwell time per hopping channel.
5. Set detector type to Peak and trace mode to Max Hold and make the measurement.
6. Repeat step 3-5 until all channels measured were complete.

Table 10: Dwell Time (DH5 mode)

channel	Frequency (GHz)	Dwell time of one signal Burst (ms)	Total Dwell Time (ms)	Limit (ms)
Low	2.402	2.960	(2.960 x **106.81**) = 316.158	400
Mid	2.441	2.960	(2.960 x **106.81**) = 316.158	400
High	2.480	2.960	(2.960 x **106.81**) = 316.158	400

Note 1:

Period = 0.4 (seconds) x 79 (channels) = 31.6 seconds

For Bluetooth system, there are 1600 timeslots in one second. The DH5 mode operates on a 5-slot transmission and 1-slot receiving basis. Thus there are 1600/ (5+1) = 266.7 transmission per second. In one period for each particular channel there are (266.7/79) x 31.6 = 106.81 times of transmission.

Dwell Time in one period(ms) = Dwell time of one-slot transmission(ms) multiplexes **106.81**

Note 2:
The Dwell Time measurement has been performed on the Bluetooth headset.

5.9 Out-of-Band Emission

RESULT: **Pass**

Date of testing	:	01.11.2008
Test specification	:	FCC Part 15 Per Section 15.247(d)
Limits	:	FCC Part 15 Per Section 15.247(d)
		In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition: FCC Part 15 - radiated emission which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a).
Deviations from Standard Test procedures	:	None
Test Procedure	:	Procedure specified in ANSI C63.4
Kind of test site	:	Shielded room
Operation mode	:	Transmitting at the highest and lowest channel (band edge)
Power supply	:	DC 3.7V by battery
Temperature	:	22°C
Humidity	:	55%

Test procedure:

1. Connect the antenna port of the EUT to the spectrum analyzer by a low lost cable.
2. Set the EUT to proper test mode with relative test software and hardware.
3. Spectrum analyzer setting: RBW = 100 kHz, VBW≥RBW.
4. Set proper frequency span respectively for out-of-band emission measurement of the band edge and the whole range (up to 10 times of the carrier frequency.)
5. Set the trace mode to Max Hold and mark the peak reading of any spurious emission recorded.

Table 11: Band Edges Emission

Emission	Attenuation (dB)	Limit (dB)
Lower Band Edge	All emission in this 100kHz bandwidth are attenuated more than 20dB from the carrier	△≥20
Upper Band Edge	All emission in this 100kHz bandwidth are attenuated more than 20dB from the carrier	△≥20

Please refer to Appendix 1 for measurement data.

Table 12: Out-Of-Band Emission measurement (conducted)

Emission (Carrier operating at Channel low, mid and high)	Attenuation	Limit (dB)
30MHz to 25GHz	All emission in this 100kHz bandwidth are attenuated more than 20dB from the carrier	△≥20

Please refer to Appendix 1 for measurement data.

Table 13: Band Edges Emission in the Restricted Bands 2310-2390MHz and 2483.5-2500MHz

Restricted band	Frequency [MHz]	dBc [dB]	PK [dBμV/m]	Polarity (H/V)	PK limit [dBμV/m]	AV limit [dBμV/m]
High band	2483.5	55.98	41.50	V	74	54
*						

NOTE:
1. The Peak carrier field strength of channel 0 and channel 78 is 96.28dBuV/m and 97.48dBuV/m.

2. The dBc value between the carrier maximum power and band edge emission power of the frequency listed in the table is calculated from the test record showed in Appendix 1.

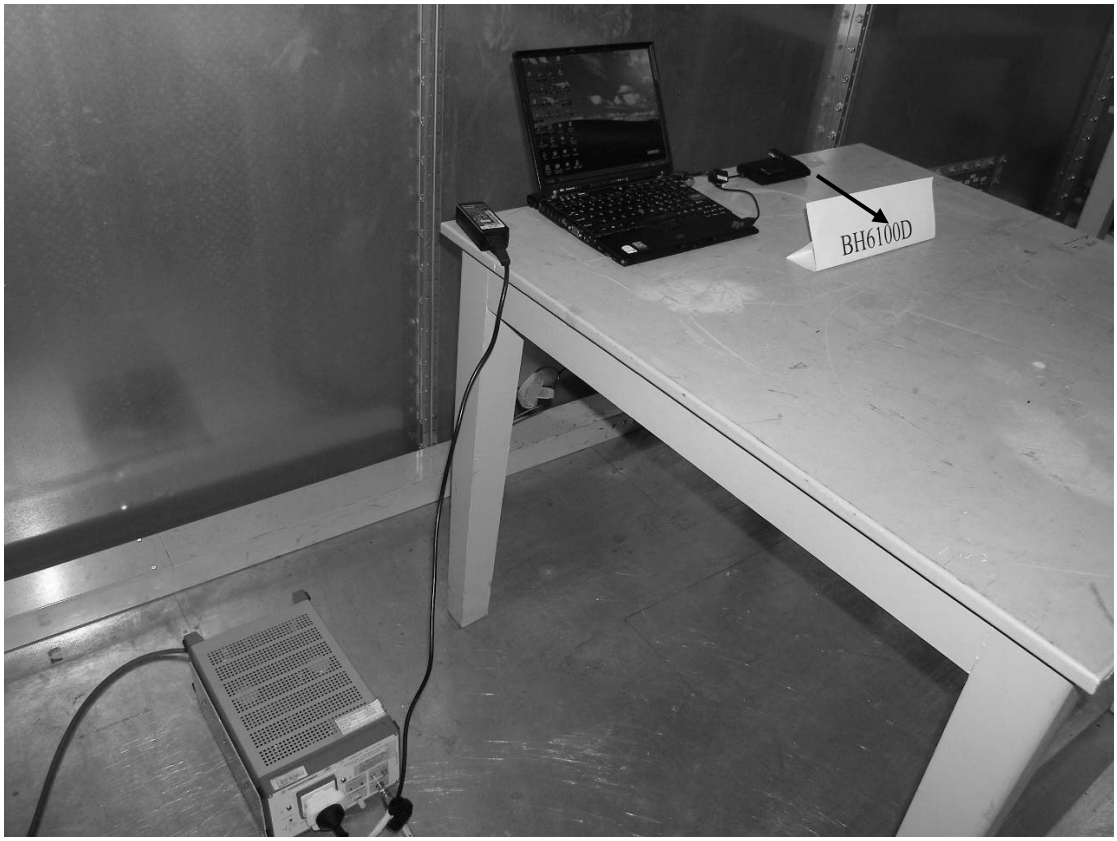
3. Peak value of the low band edge emission listed in the table is calculated by the below formula:
PK value of band edge emission = Peak carrier field strength – dBc value in item2

Please refer to Appendix 1 for measurement data.

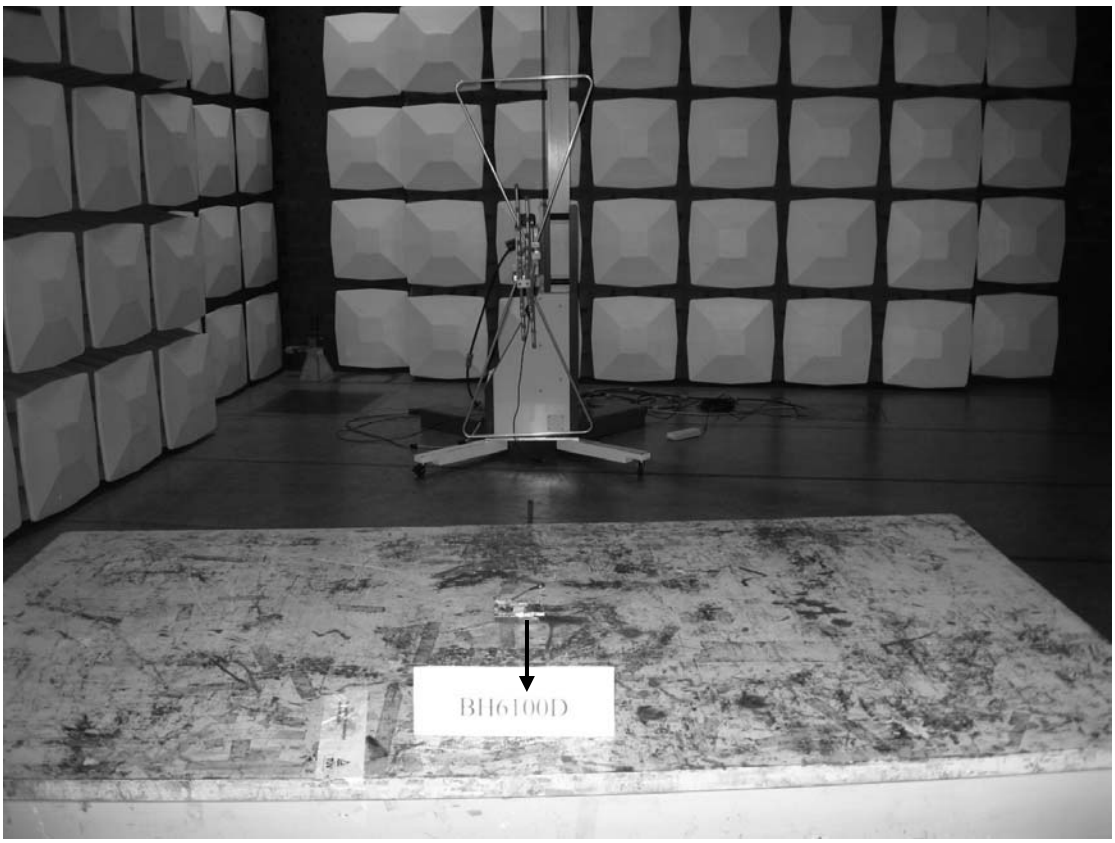
* Disturbances other than those mentioned above are small or not detectable. Please refer to the Appendix 1 for the noise floor of the band edge emission.

6 Photographs of the Test Set-Up

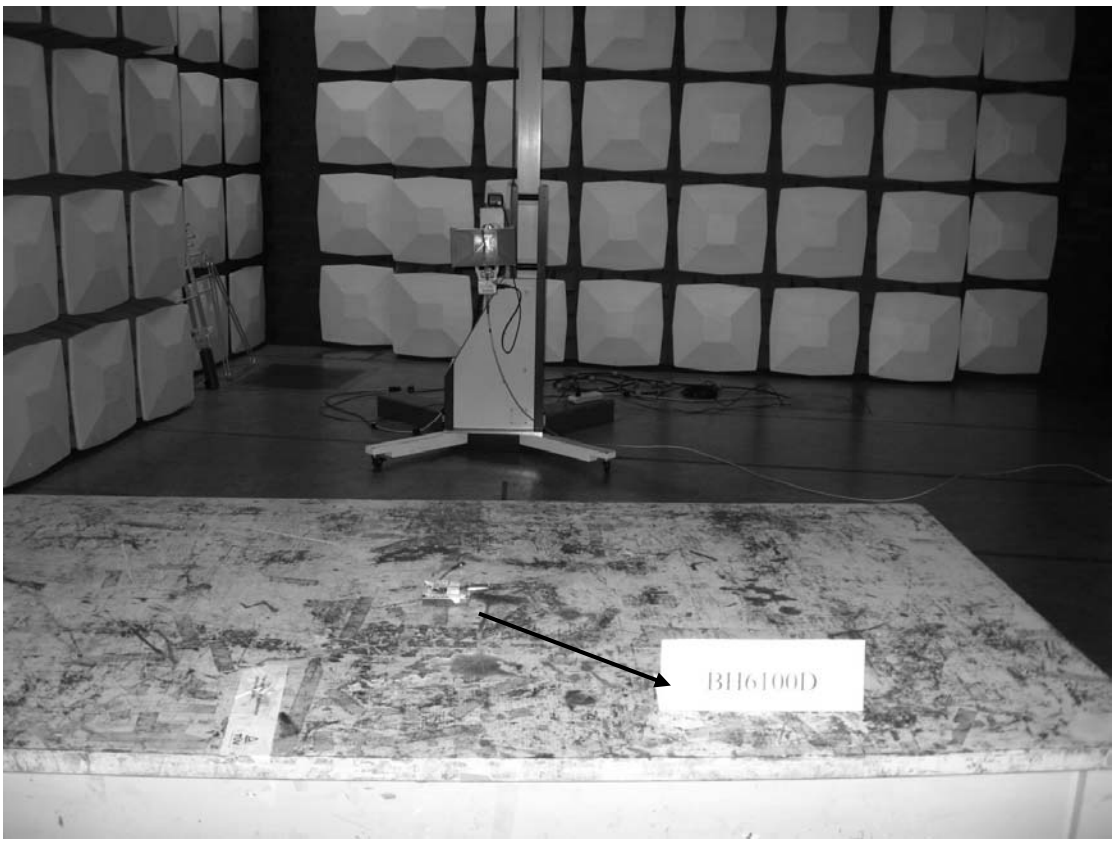
Photograph 1: Set-up for Conducted Emission Measurement

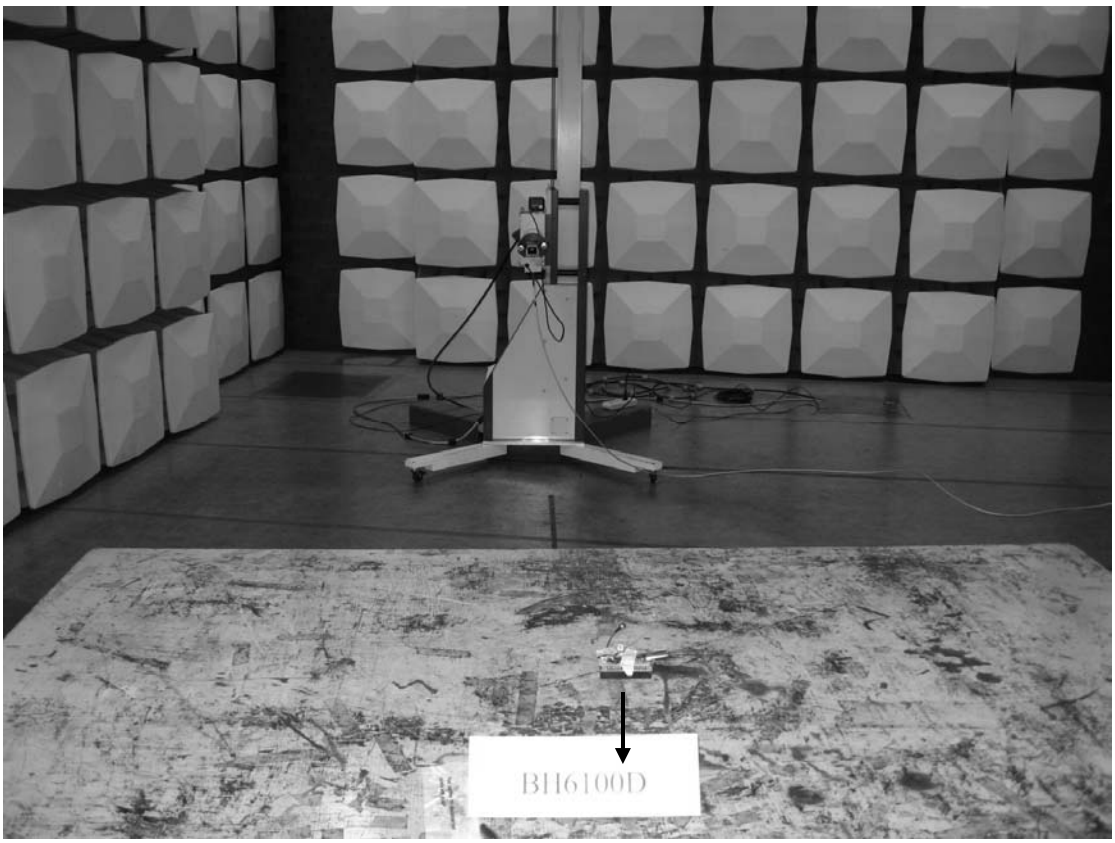


Photograph 2: Set-up for Radiation Measurement below 1GHz


BH6100D

Photograph 3: Set-up for Radiation Measurement above 1GHz

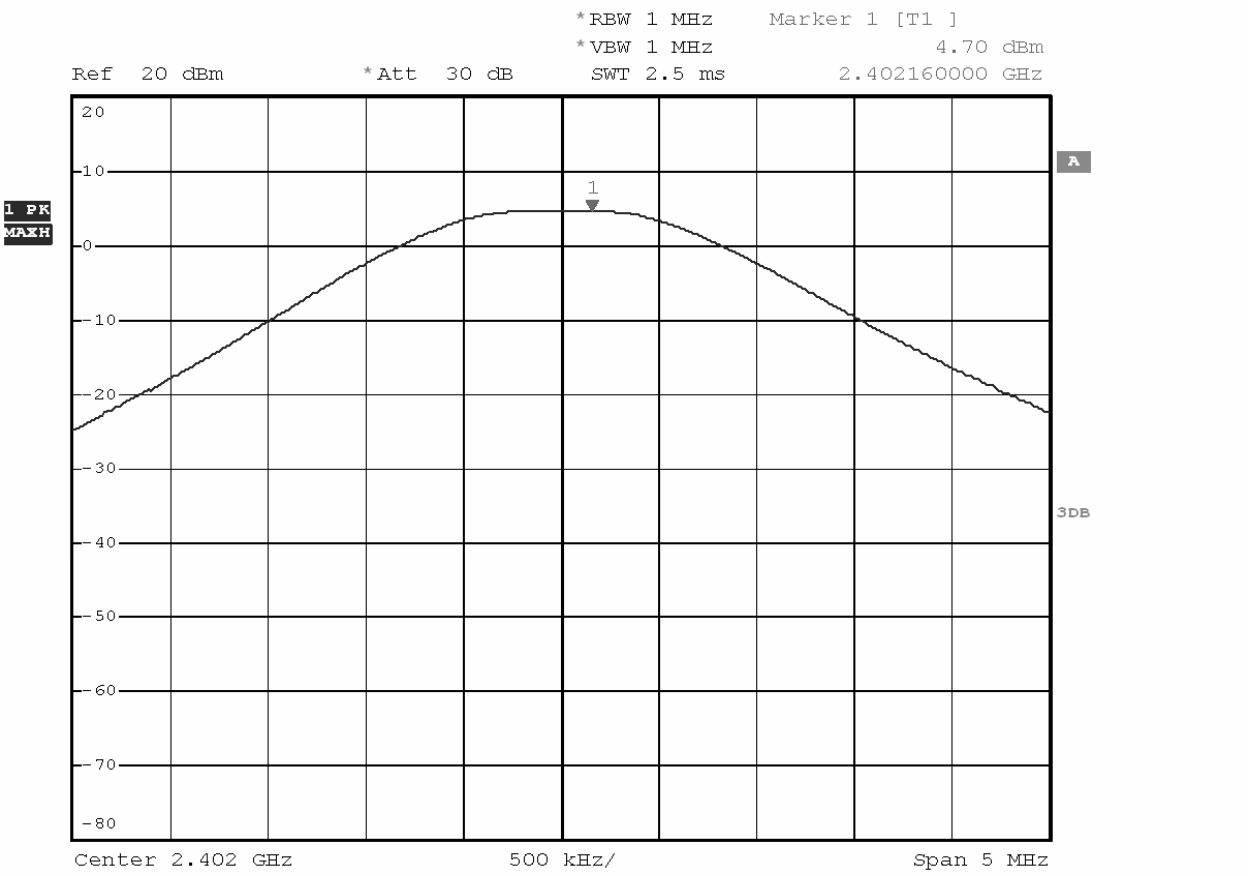



BH6100D

7 List of Tables

8 List of Photographs

Maximum Peak Output Power



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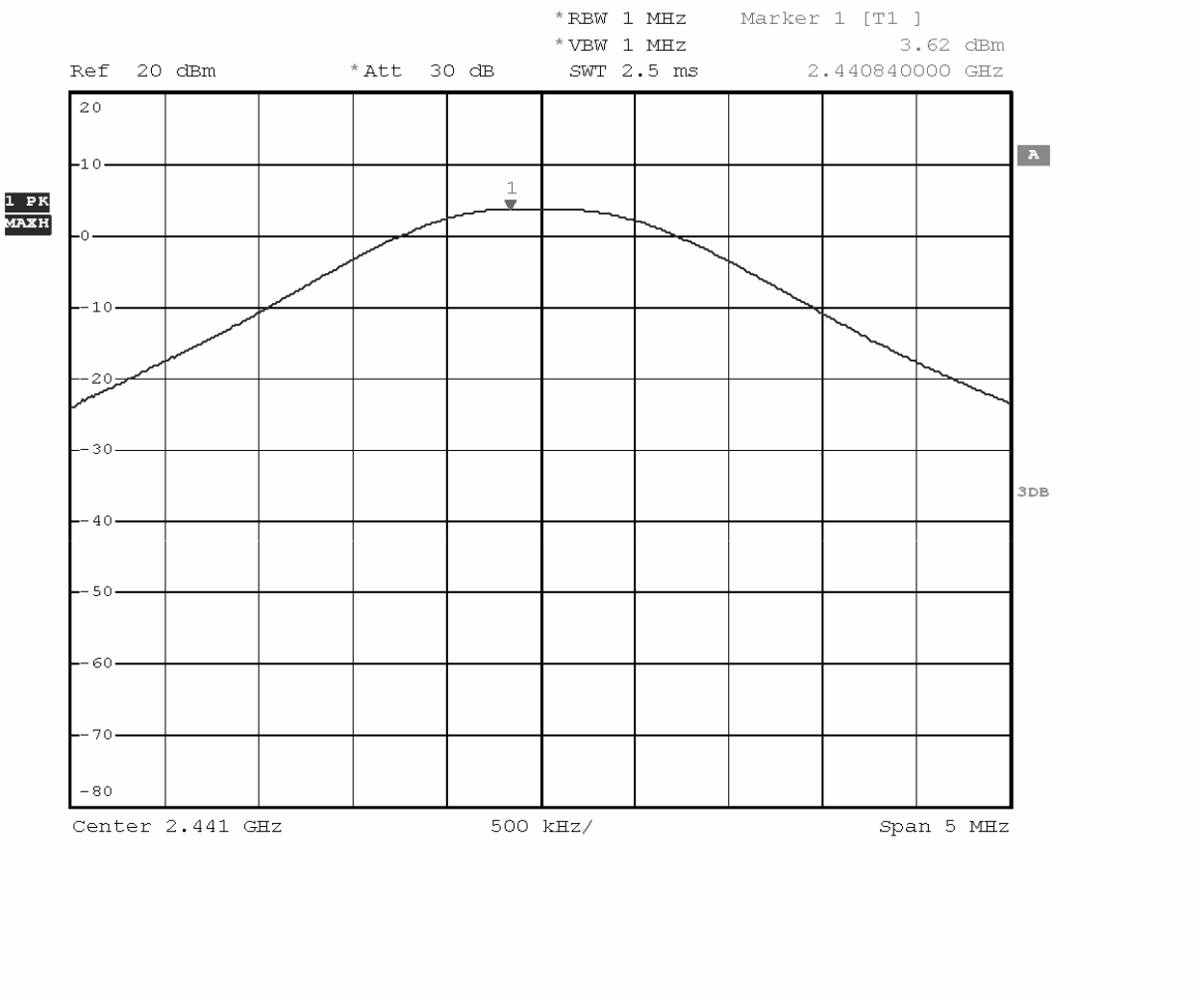

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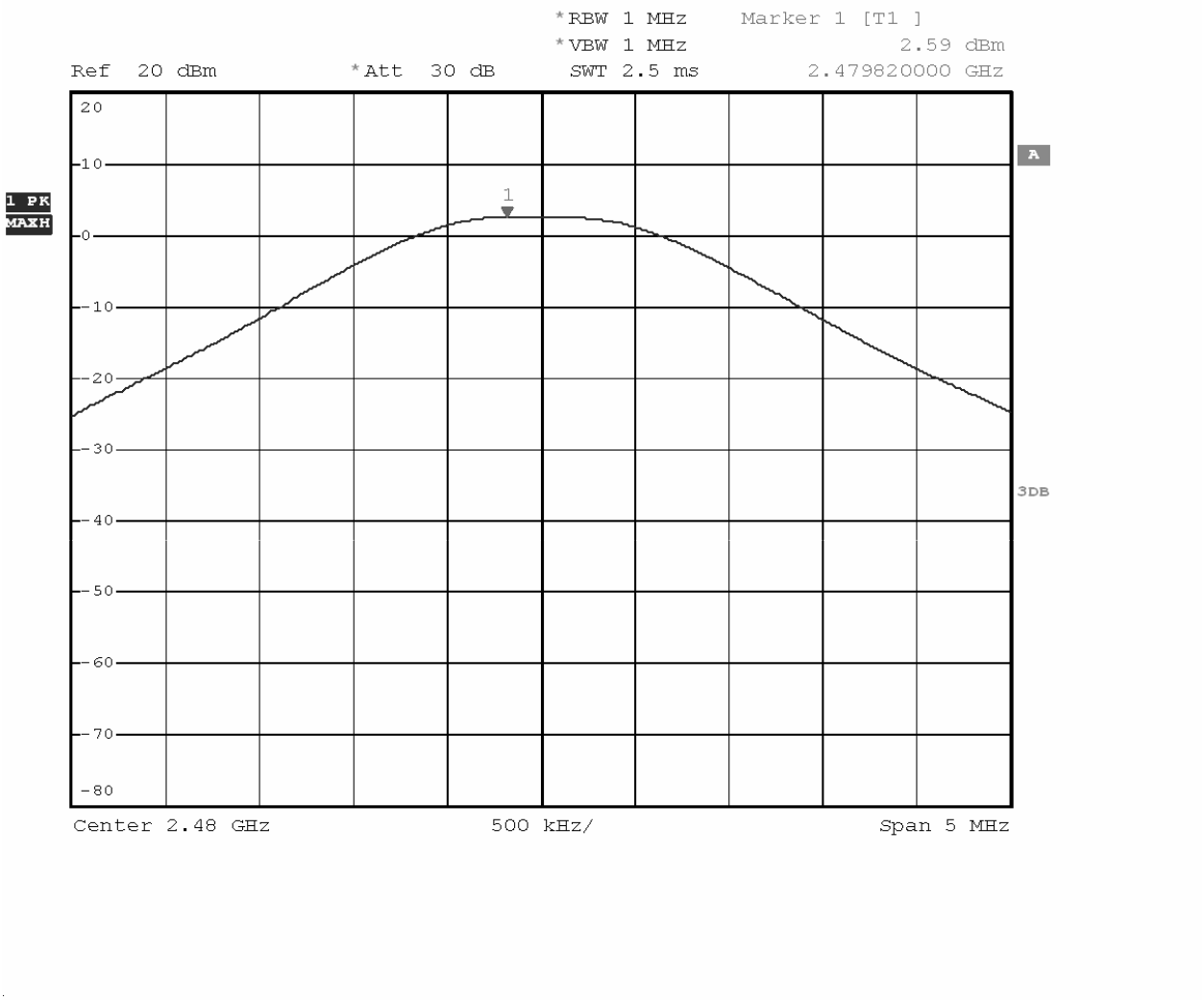

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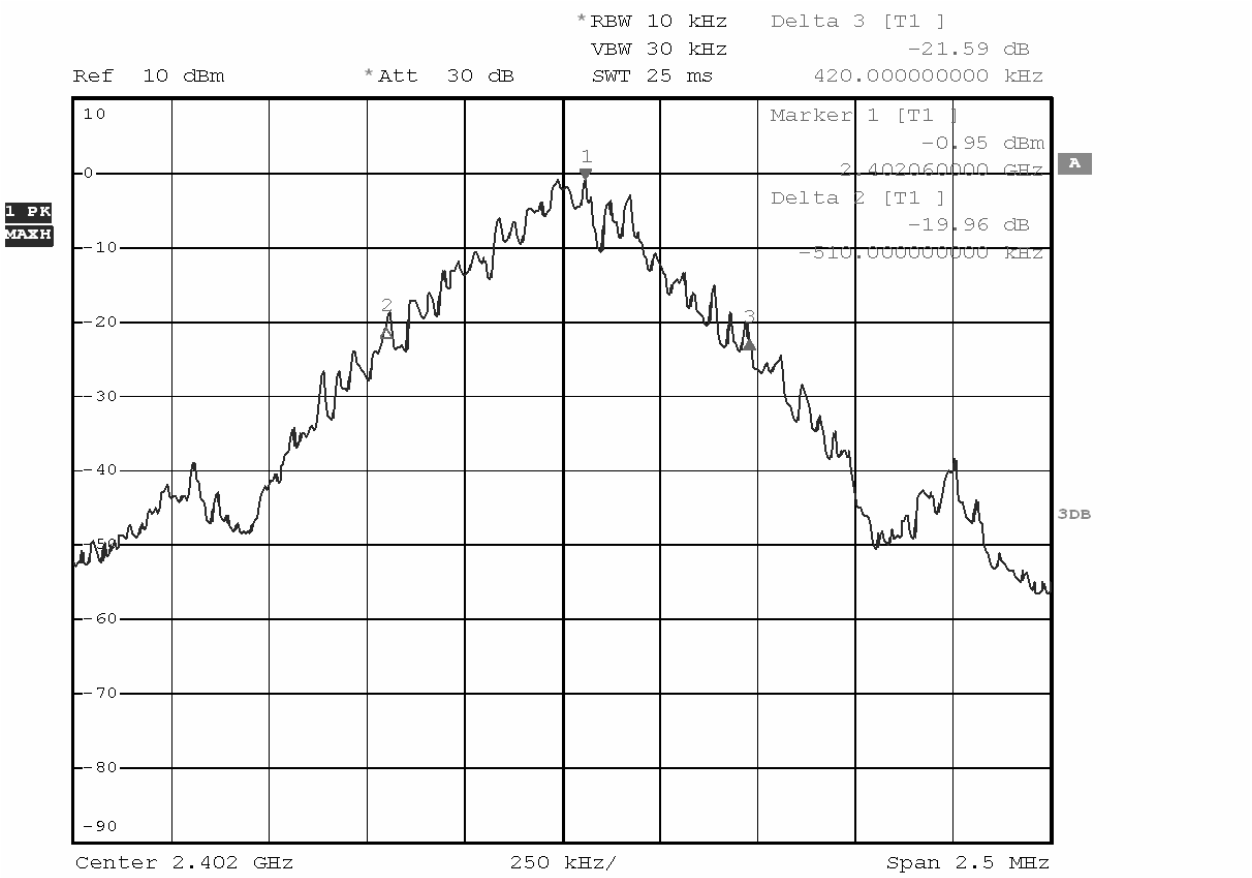
20dB Bandwidth



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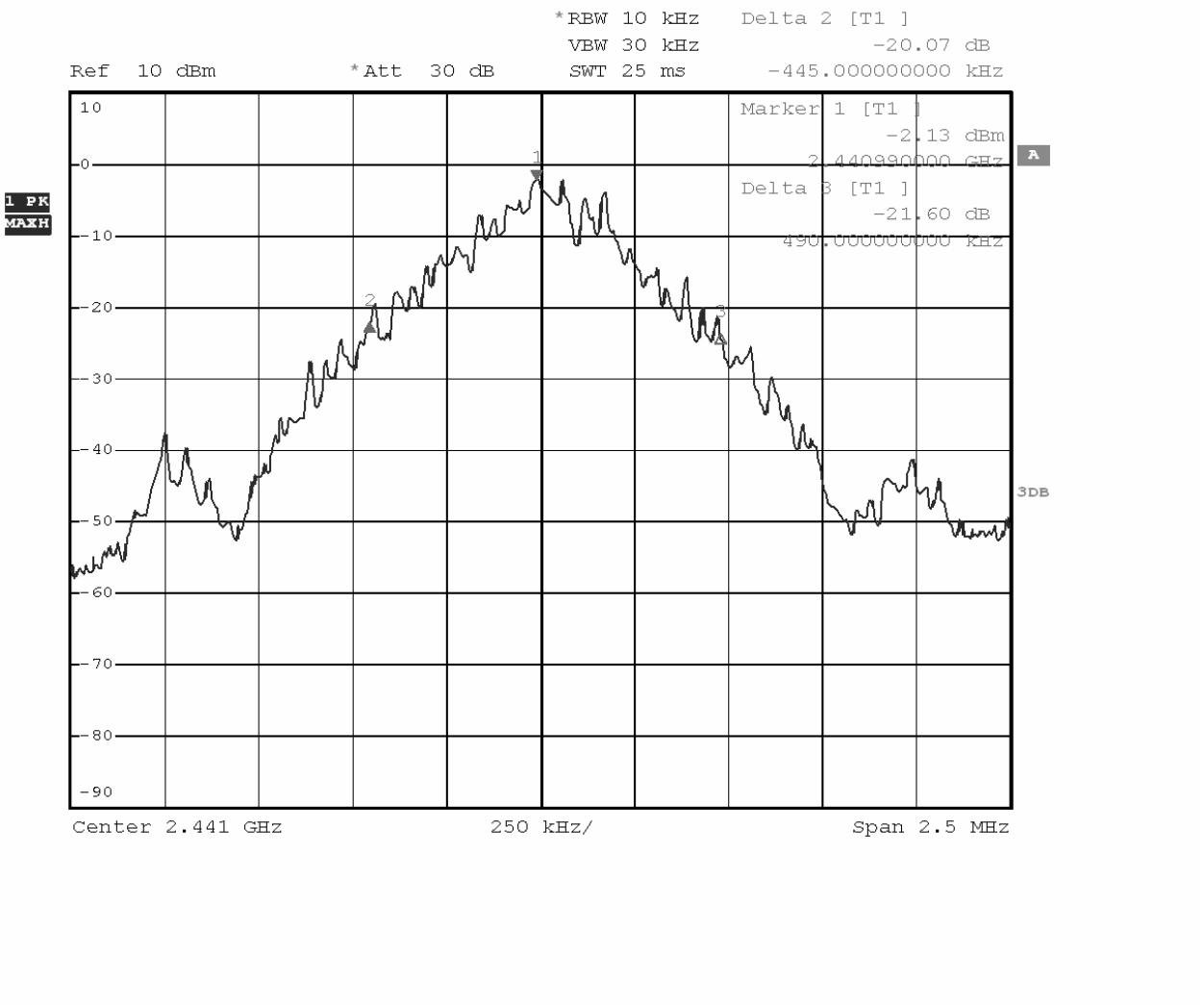

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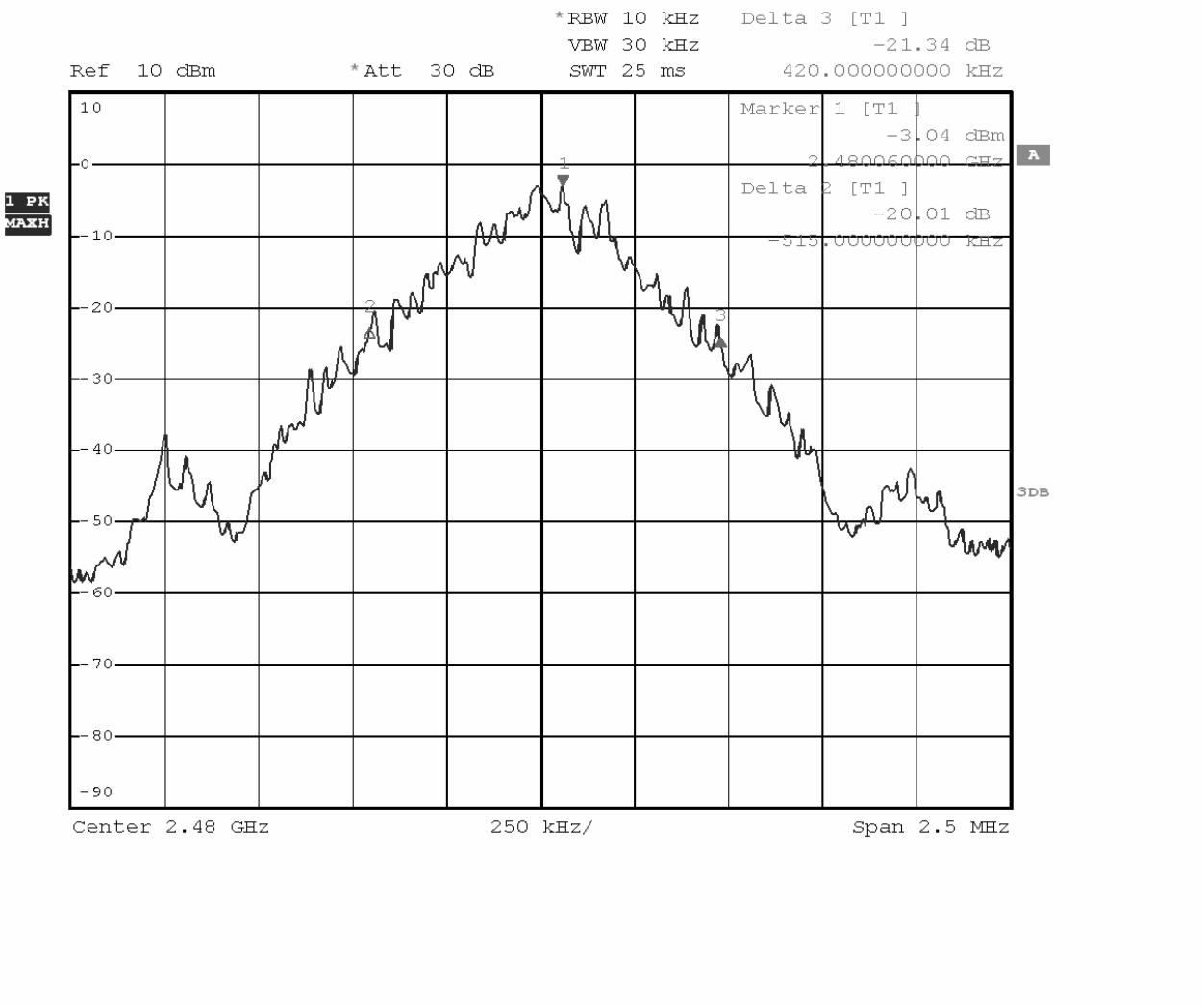

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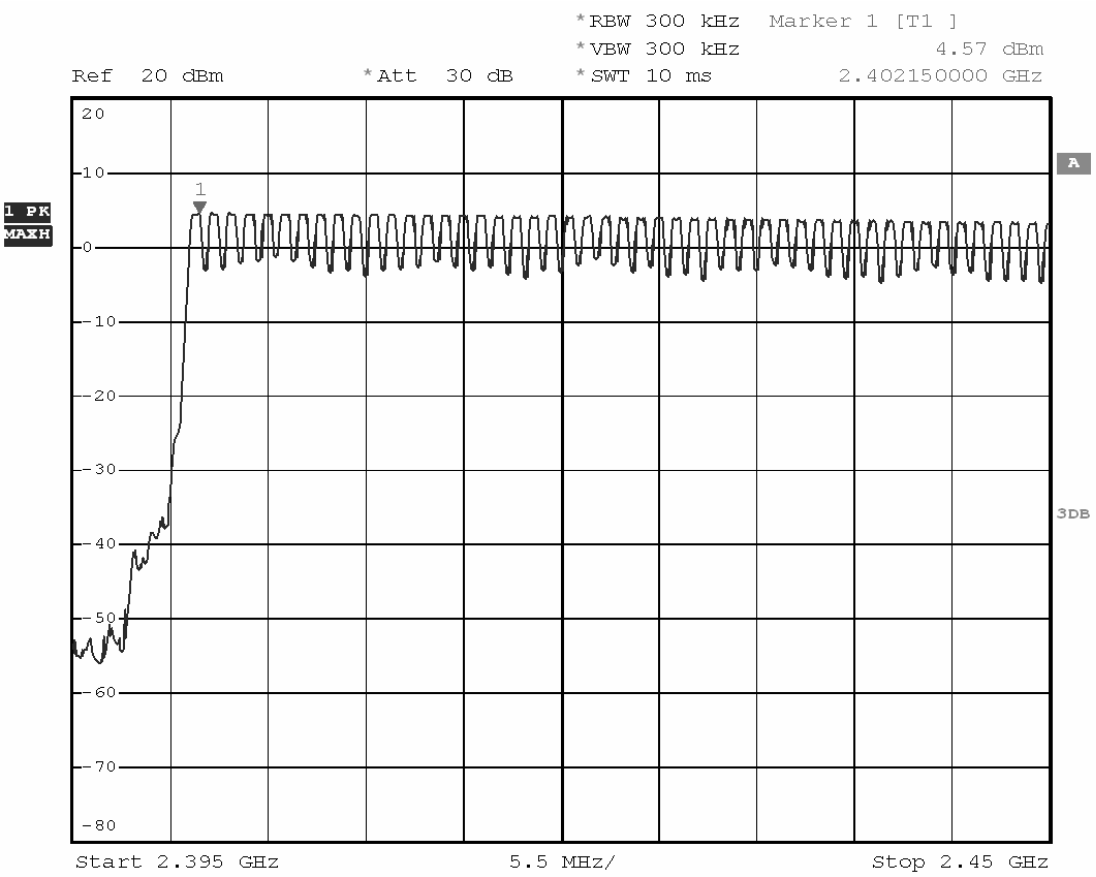
Number of Hopping Frequency Used



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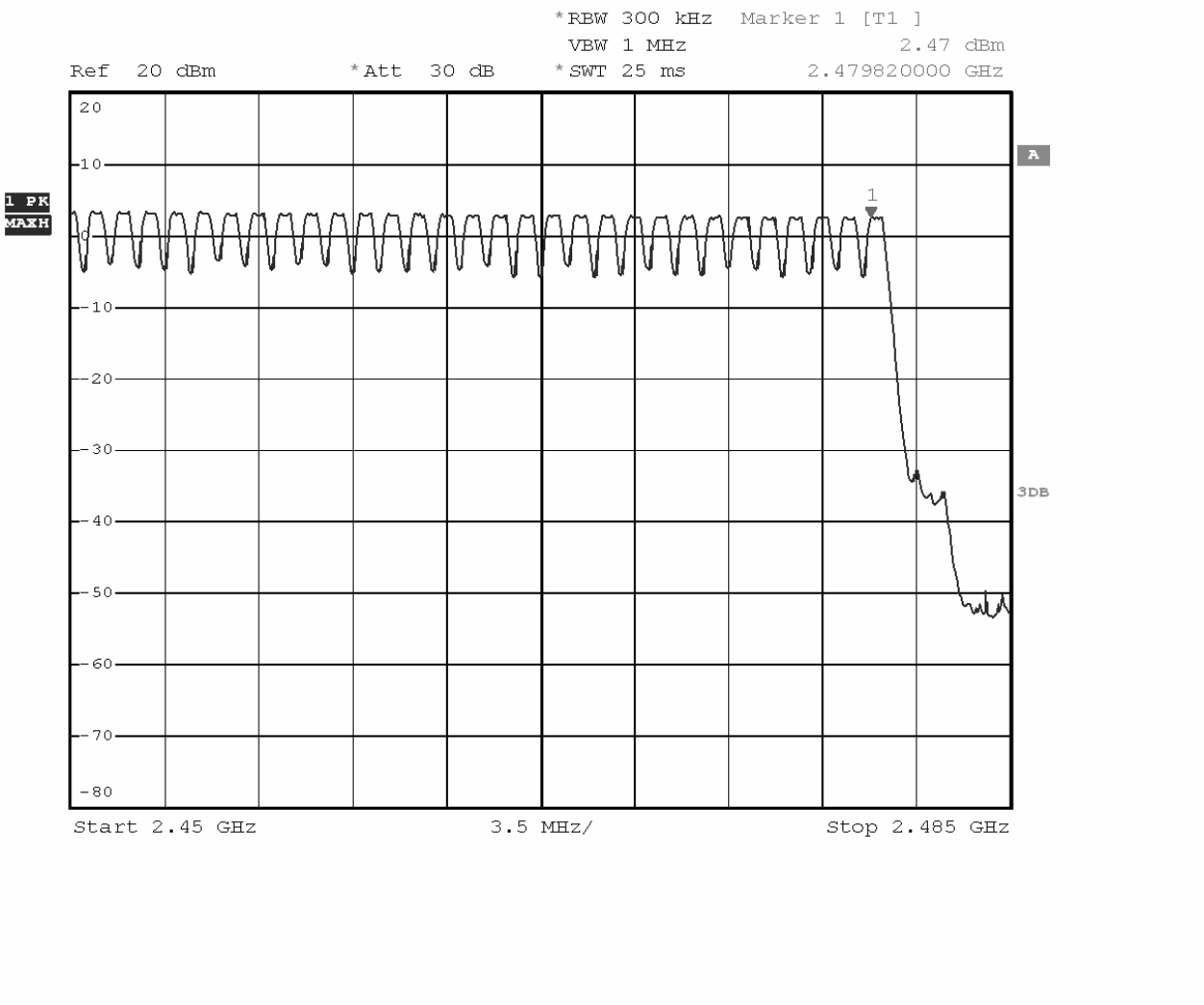

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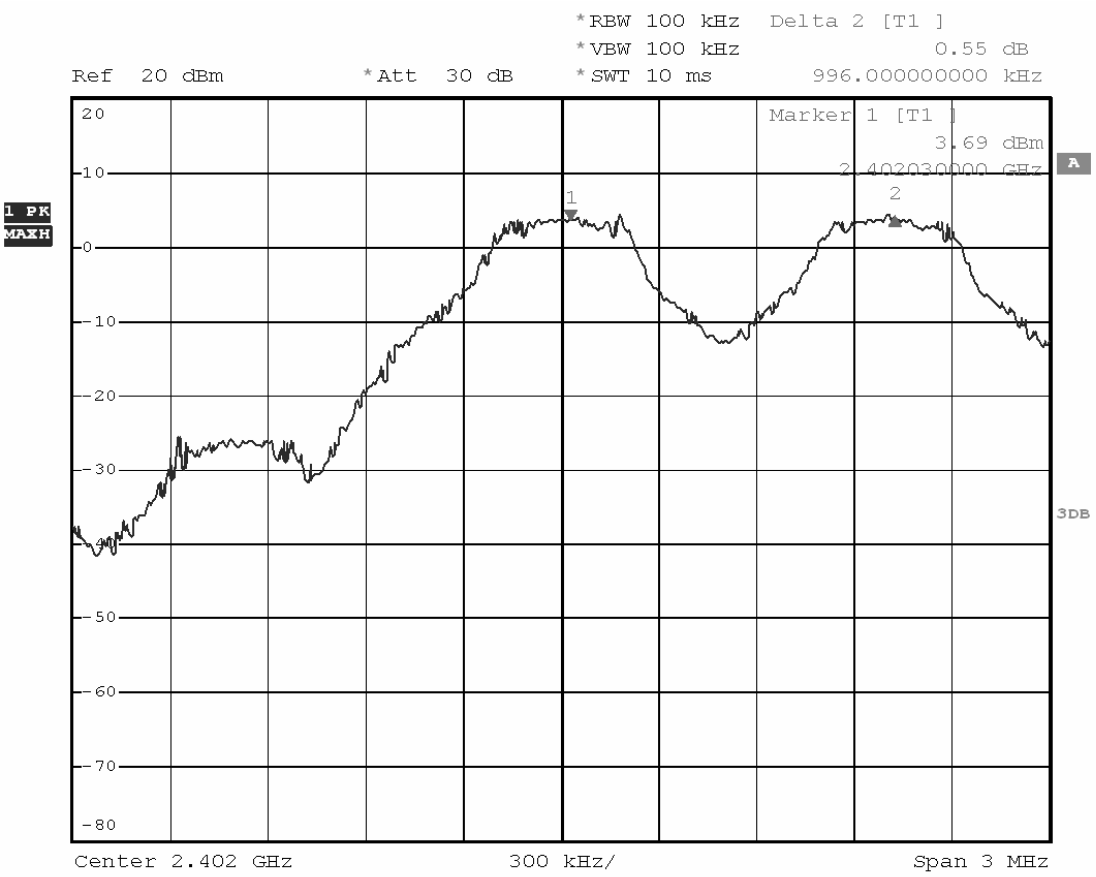
Hopping Channel Carrier Frequency Separation



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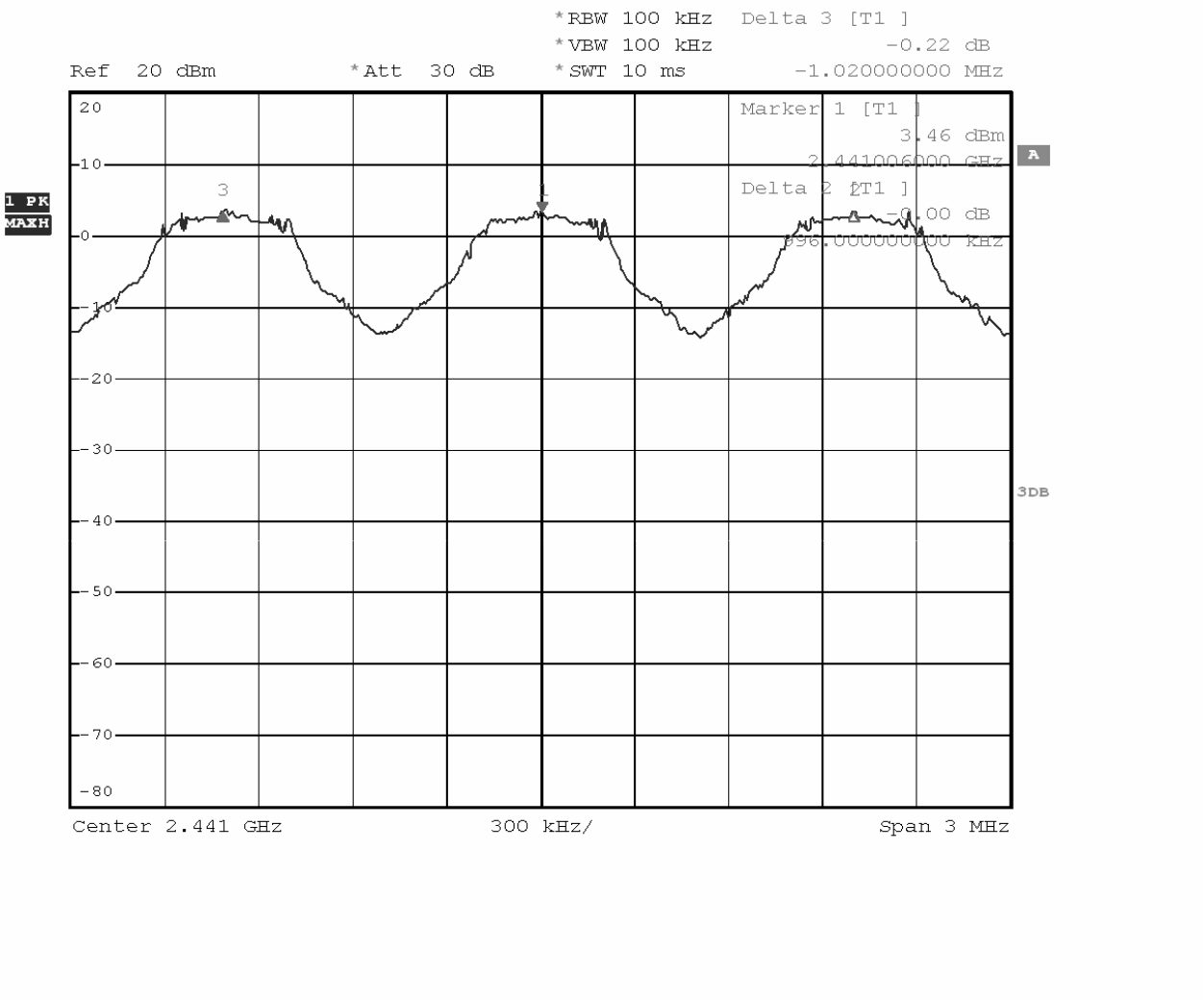

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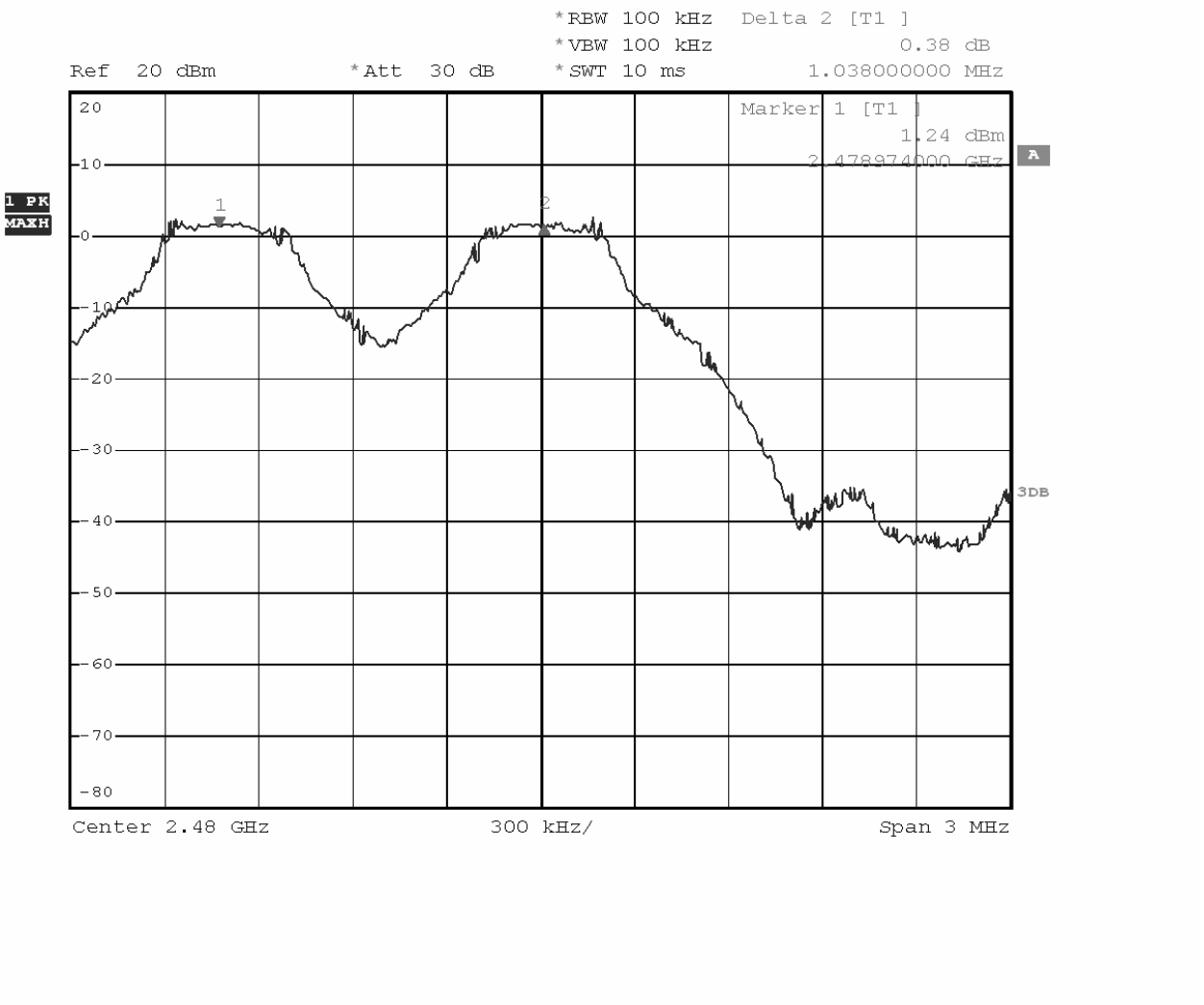

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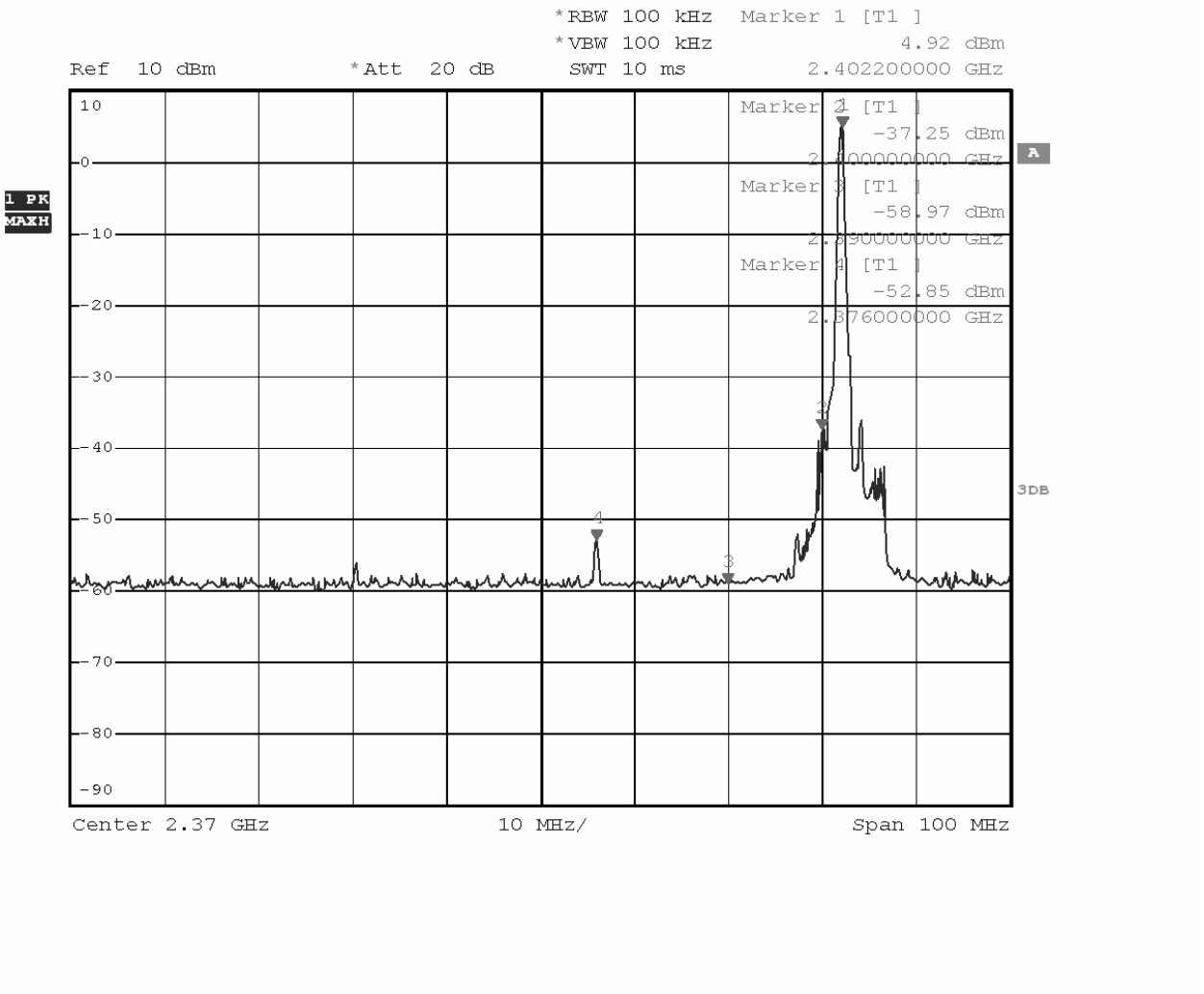
Out-of-Band Emission



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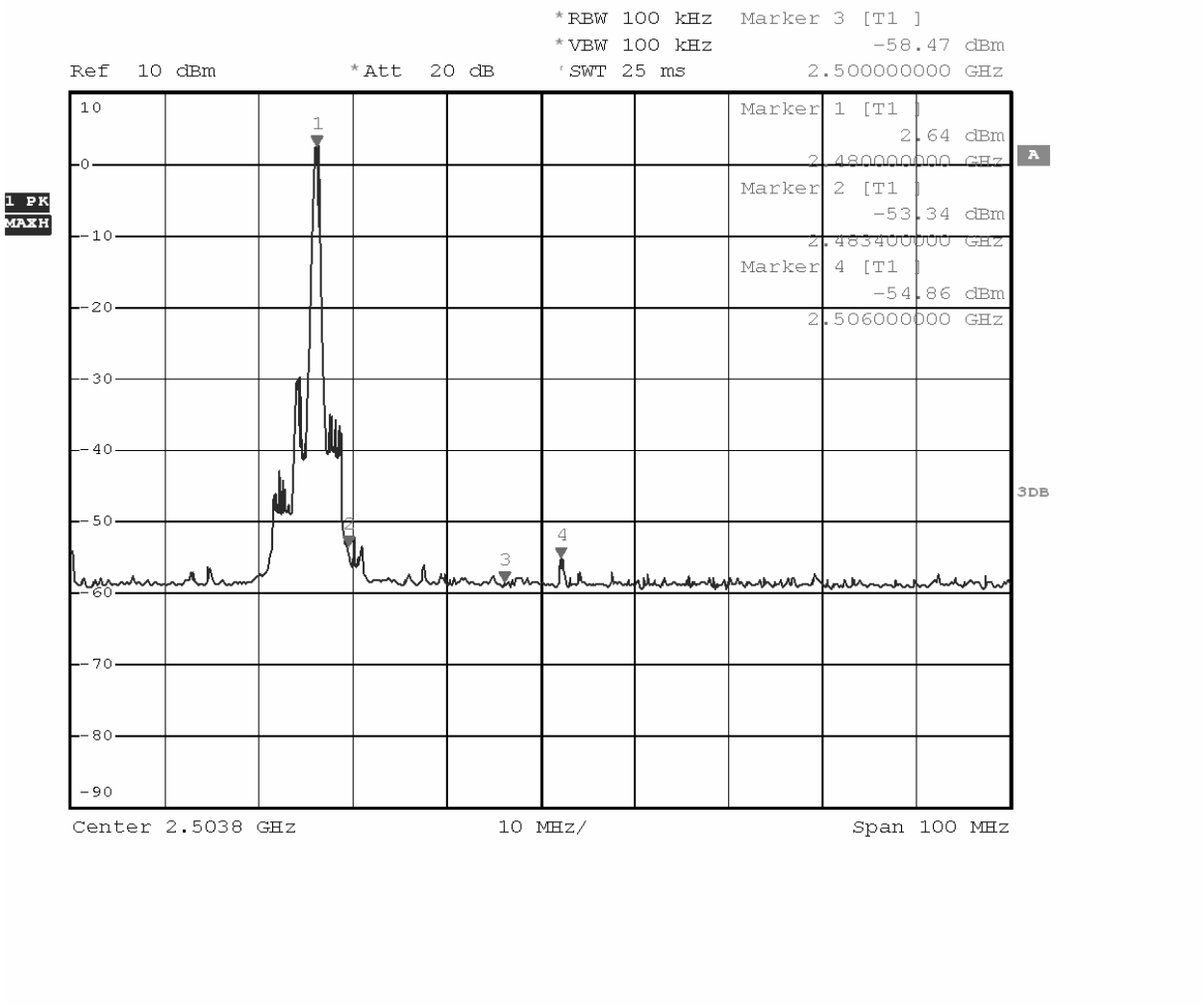
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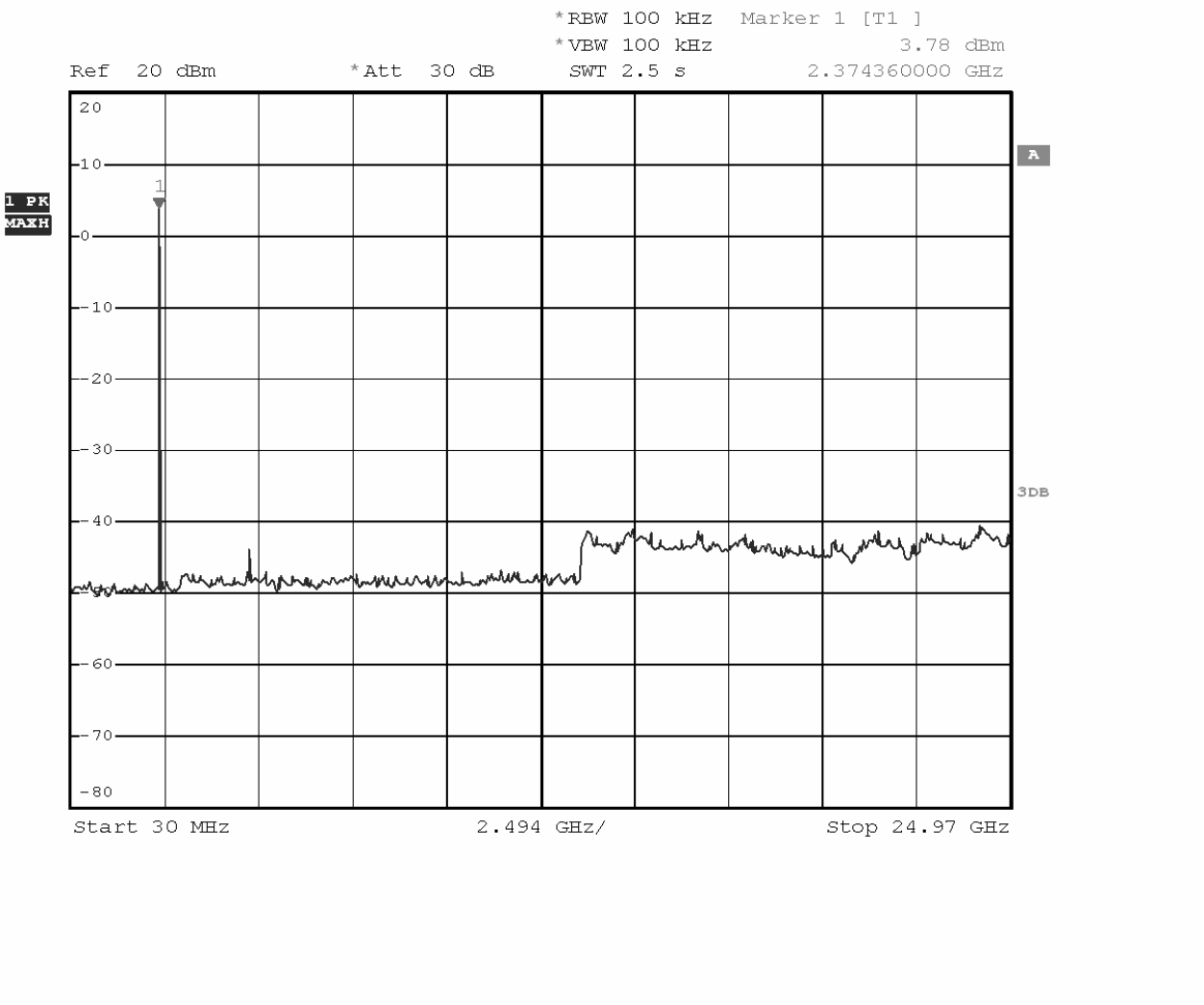
*VBW 100 kHz
Ref 10 dBm
*Att 20 dB
SWT 25 ms
Marker 3 [T1]
-58.47 dBm
2.500000000 GHz
Marker 1 [T1]
2.64 dBm
2.480000000 GHz
Marker 2 [T1]
-53.34 dBm
2.483400000 GHz
Marker 4 [T1]
-54.86 dBm
2.506000000 GHz
1 PK
MAXH
A
3DB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.5038 GHz
10 MHz/
Span 100 MHz
Date: 1.NOV.2008 02:35:33



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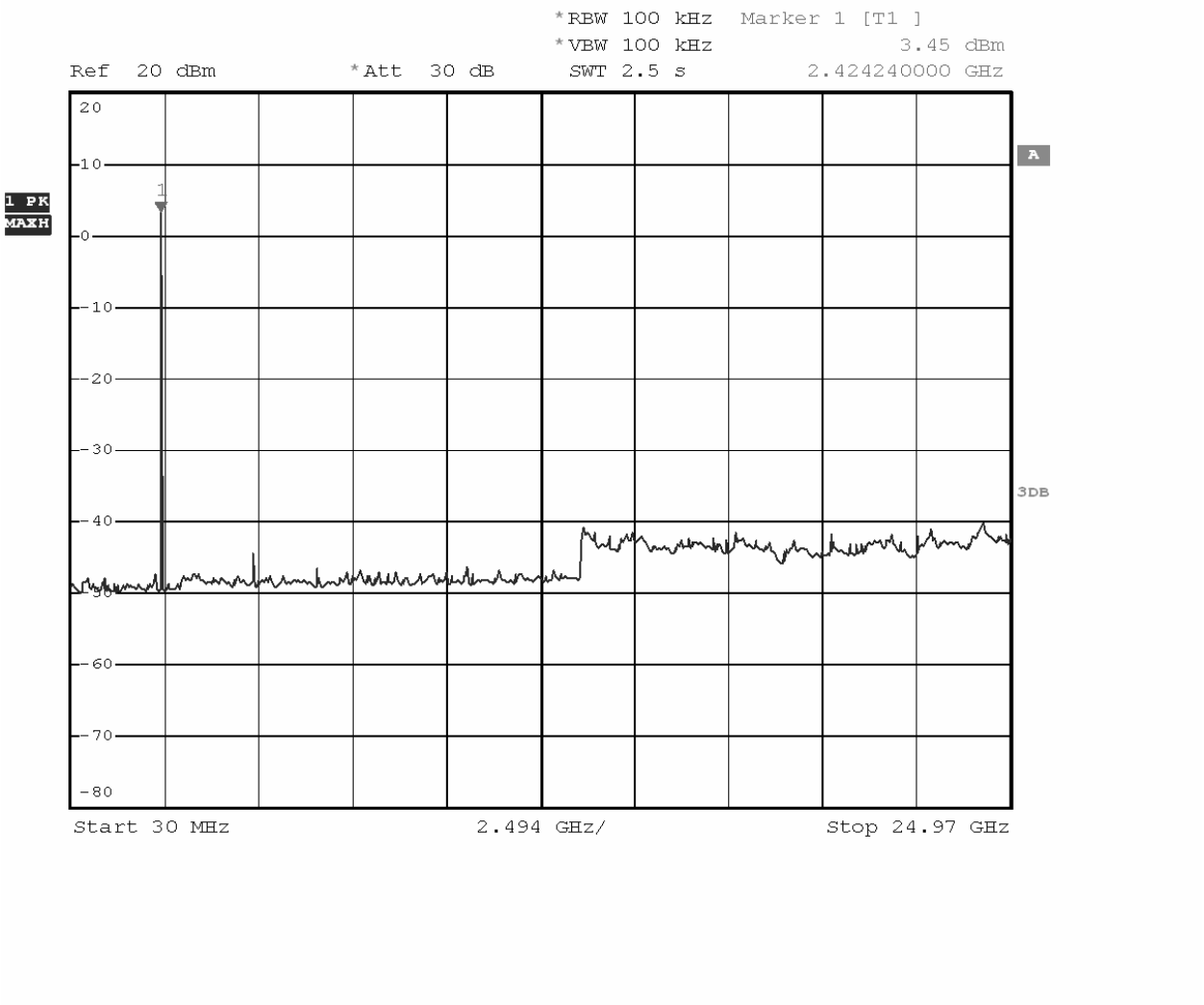

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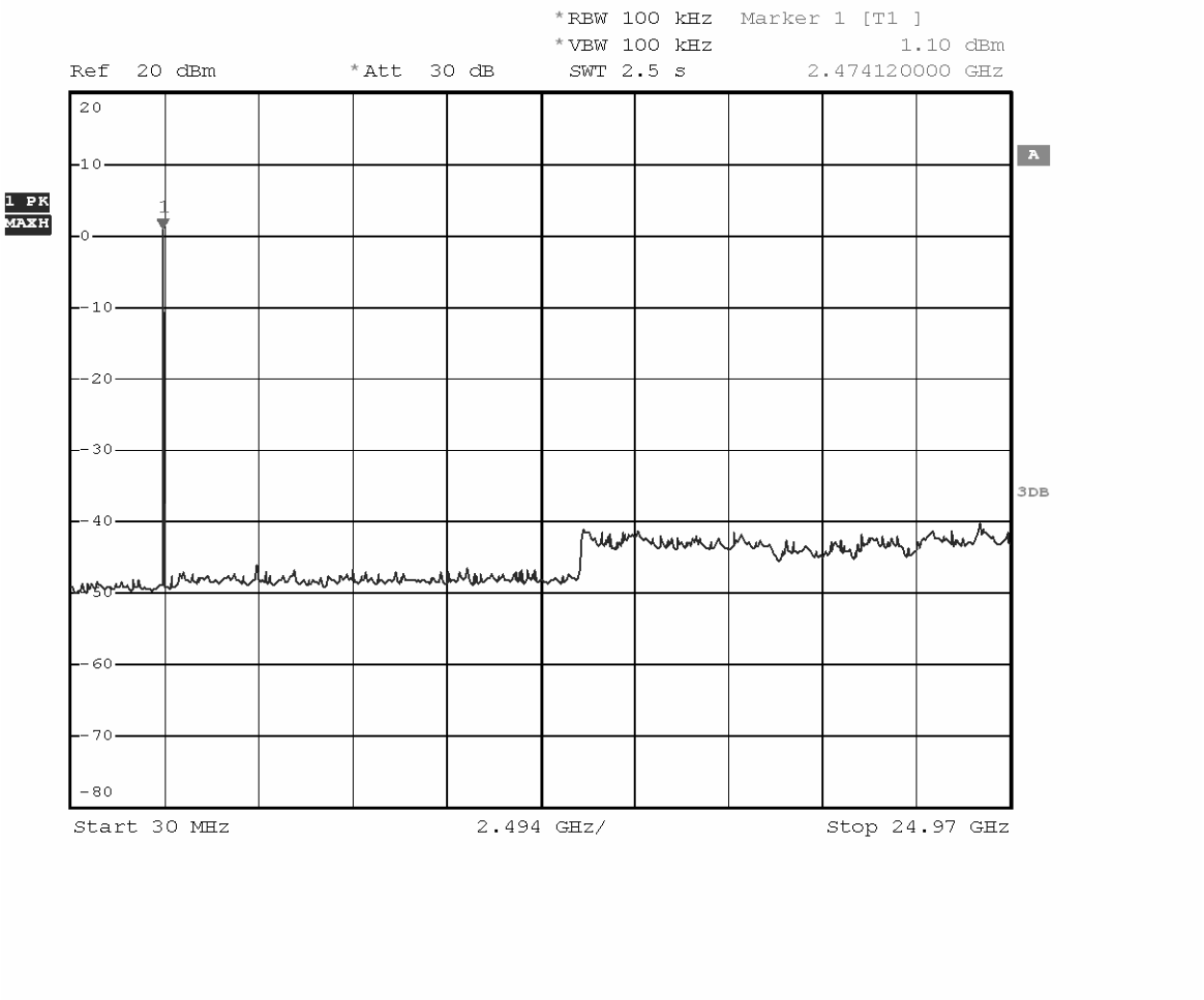

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