

EMC TEST REPORT

Report No. : EME-040080

Model No. : GH9764

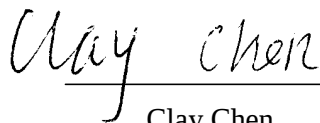
Issued Date : Mar. 10, 2004

Applicant : Cidmate International Technology Inc.
5F-1, No. 168, Lian-Cheng Rd., Chung-Ho City,
Taipei Hsien,

Test By : Intertek Testing Services Taiwan Ltd.
No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,
Shiang-Shan District, Hsinchu City, Taiwan

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Project Engineer



Clay Chen

Reviewed By



Elton Chen

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Summary of Tests**2.4G DSST Multi Handset with CID+DAM****Model: GH9764****FCC ID: PIZGH9764**

Test	Reference	Results
Minimum 6dB Bandwidth test	15.247(a)(2)	Complies
Maximum Output Power test	15.247(b)	Complies
Radiated Spurious Emission test	15.205, 15.209	Complies
Power Spectrum Density test	15.247(d)	Complies
Power Line Conducted Emission test	15.207	Complies

1. General information

1.1 Identification of the EUT

Applicant	: Cidmate International Technology Inc.
Product	: 2.4G DSST Multi Handset with CID+DAM
Model No.	: GH9764
FCC ID.	: PIZGH9764
Frequency Range	: 2407.5MHz to 2472MHz
Channel Number	: 44 channels
Frequency of Each Channel (Base)	: 2407.5+1.5k MHz, k=0~43
Frequency of Each Channel (Handset)	: 2407.5+1.5k MHz, k=0~43
Type of Modulation	: DSSS
Rated Power	: 120Vac, 60Hz
Power Cord	: N/A
Sample Received	: Feb. 5, 2004
Test Date(s)	: Feb. 12, 2004 to Feb. 19, 2004

1.2 Additional information about the EUT

The EUT is a Cordless Phone, it consists one handset and one base.

For different brand serves as marketing strategy as listed below:

<u>Model Number</u>	<u>Trade Name</u>
GH9764	XACT
GH9764	BELLSOUTH
GH9764	UNISONIC

For more detail features, please refer to User's manual as file name "Installation guide.pdf"

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain	: 0.2dBi
Antenna Type	: Monopole antenna
Connector Type	: N/A

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section § 15.205 、 §15.207 、 §15.209 、 §15.247 and ANSI C63.4/2001.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

2.2 Operation mode

During the conduction emission test, the EUT was operated in the status of charging mode.

And During the other test items, the EUT was operated in transmitting continuously mode.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.	Intertek ID No.	Last Cal. Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	EC303	6/16/2003
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI	EC317	6/24/2003
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	EC353	7/19/2003
Spectrum Analyzer	Rohde & Schwarz	20Hz~40GHz	FSEK 30	EC365	10/20/2003
Horn Antenna	EMCO	1GHz~18GHz	3115	EC332	10/15/2003
Horn Antenna	SCHWARZBECK	15GHz~40GHz	BBHA 9170	EC351	6/21/2003
Bilog Antenna	SCHWARZBECK	25MHz~1.7GHz	VULB 9160	EC350	6/21/2003
Turn Table	HDGmbH	N/A	DS 420S	EP317-3	N/A
Antenna Tower	HDGmbH	N/A	MA 240	EP317-2	N/A
Microwave Amplifier	Agilent	2GHz~26.5GHz	8348A	EC360	1/14/2004
Crystal Detector	Agilent	10MHz~18GHz	8472B	-	N/A
Signal Generator	Rohde & Schwarz	20MHz~27GHz	SMR27	EC354	8/16/2003
Two Channel Digital Storage Oscilloscope	Tektronix	N/A	TDS1012	-	8/16/2003
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5	EC344	1/20/2004

Note: The above equipments are within the valid calibration period.

3. Minimum 6dB Bandwidth test

3.1 Operating environment

Temperature: 18 °C
 Relative Humidity: 62 %
 Atmospheric Pressure 1023 hPa

3.2 Test setup & procedure

The minimum 6dB bandwidth per FCC §15.247(a)(2) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 100kHz, the video bandwidth set at 300kHz, and the SPAN>>RBW. The test was performed at 3 channels (lowest, middle and highest channel). The minimum 6-dB modulation bandwidth is in the following Table.

3.3 Measured data of Minimum 6dB Bandwidth test results

Test Mode: Base

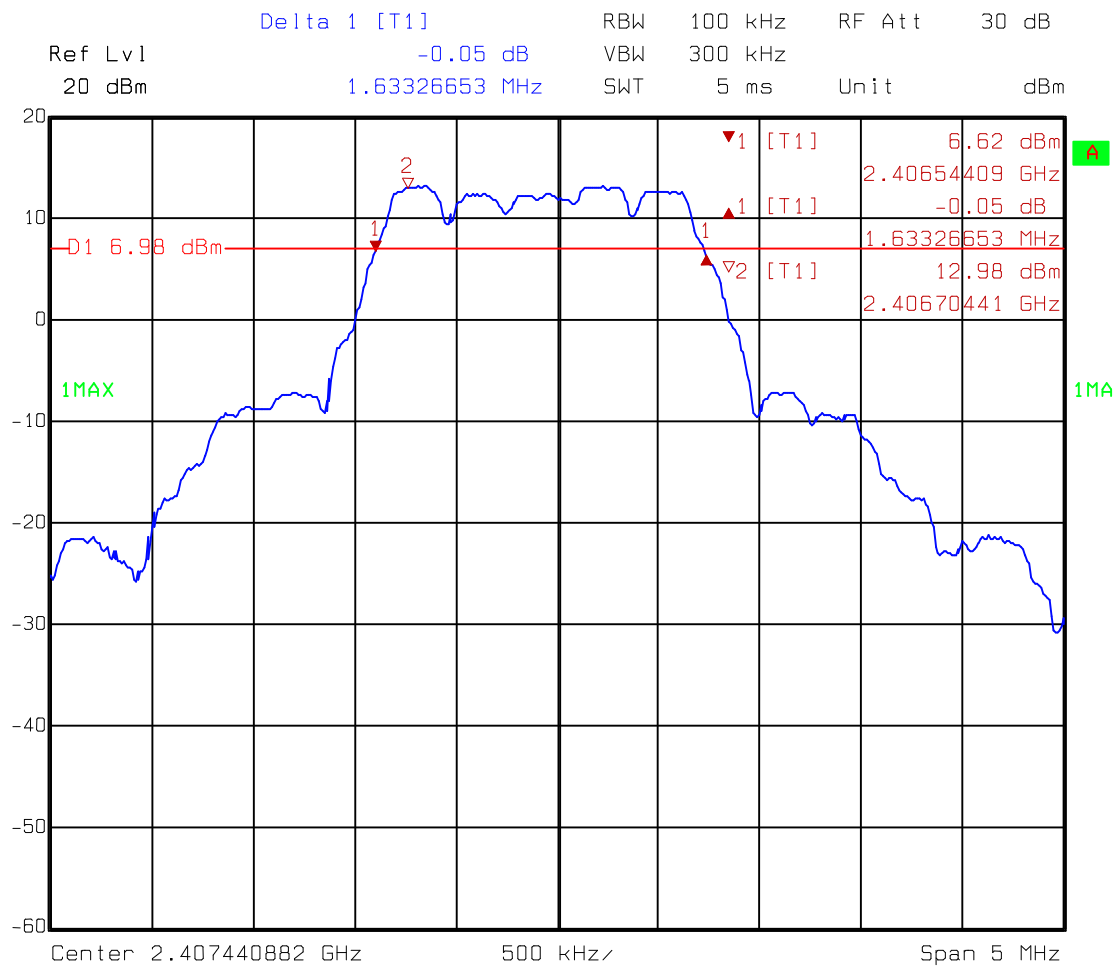
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
Low	2406.654	1.633	> 500kHz
Middle	2439.510	1.663	> 500kHz
High	2470.918.	1.774	> 500kHz

Test Mode: Handset

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
Low	2406.559	1.583	> 500kHz
Middle	2439.440	1.713	> 500kHz
High	2470.848	1.834	> 500kHz

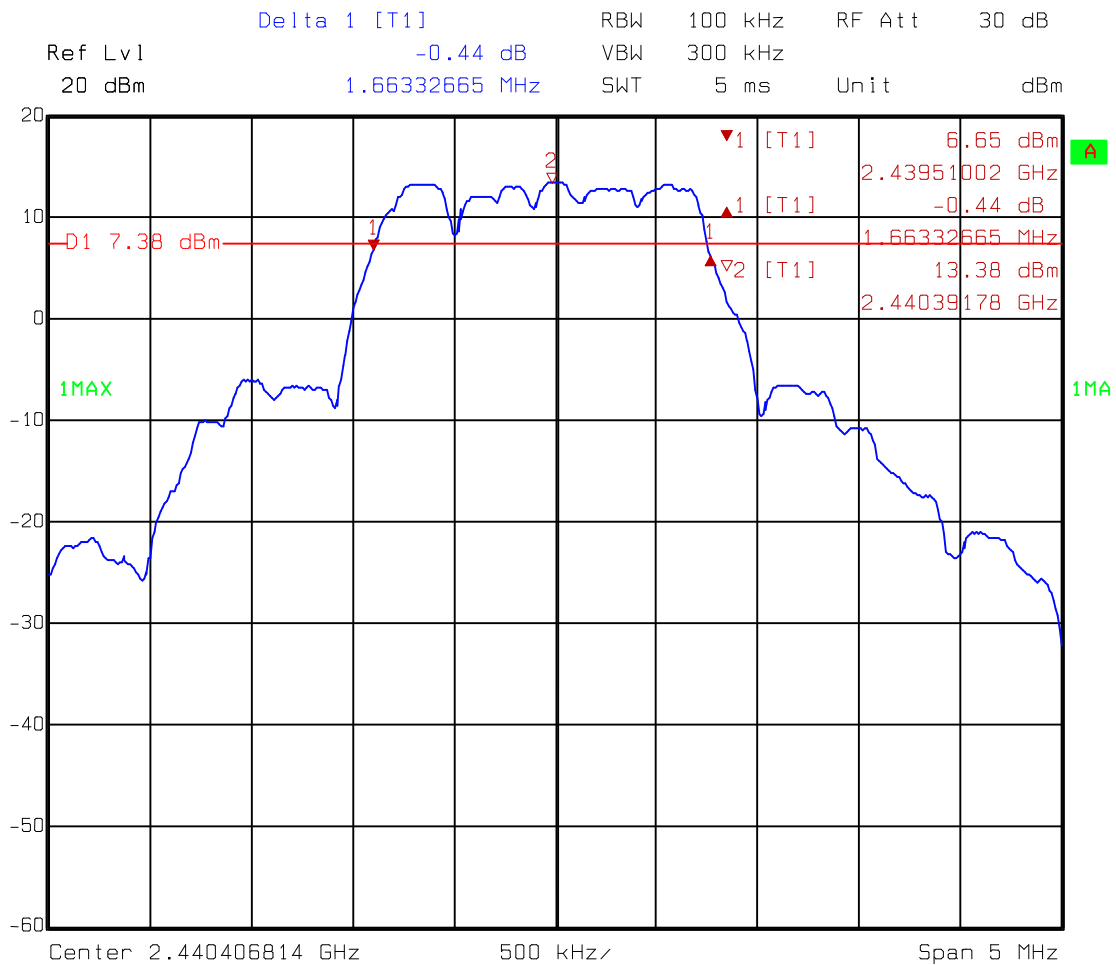
Please see the plot below.

Test mode: Base

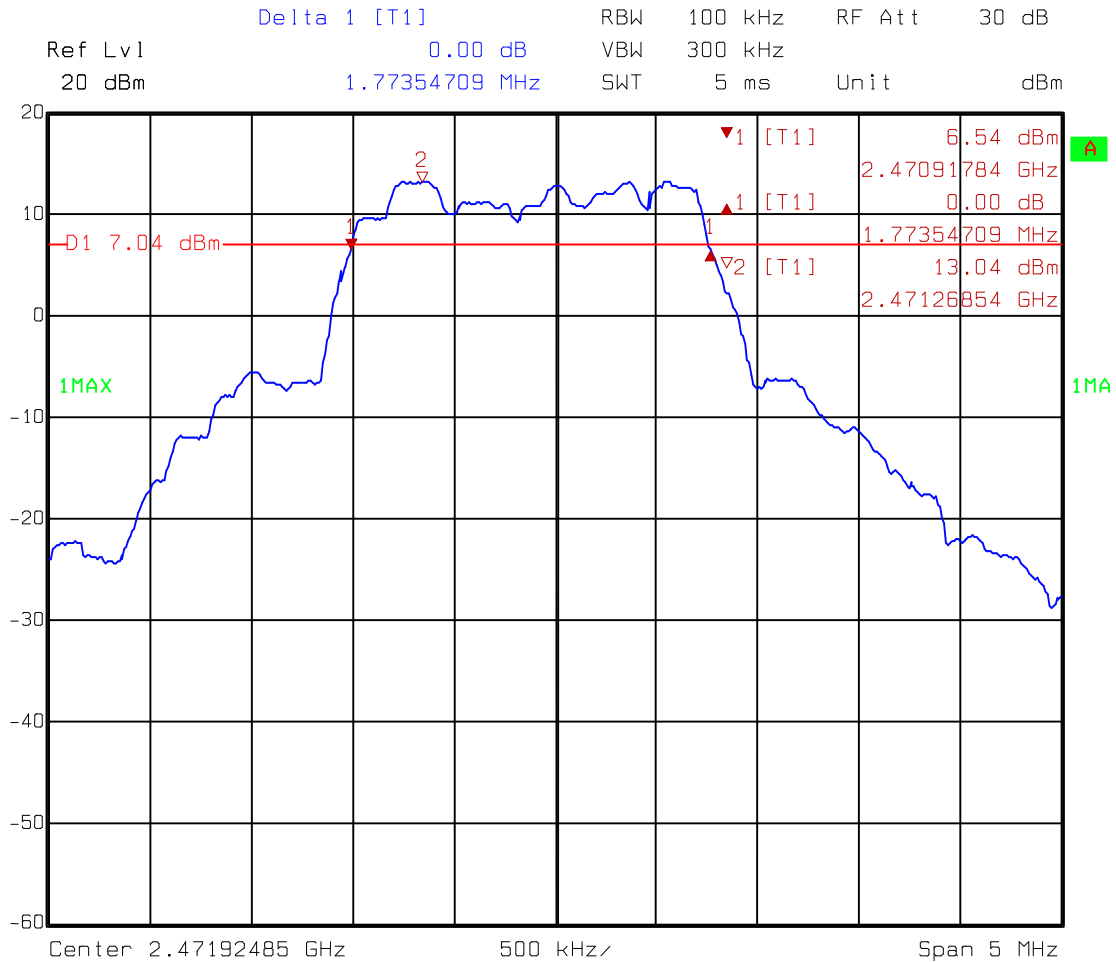


Comment A: 6dB bandwidth at low channel (EC365) Base

Date: 18.FEB.2004 14:58:28



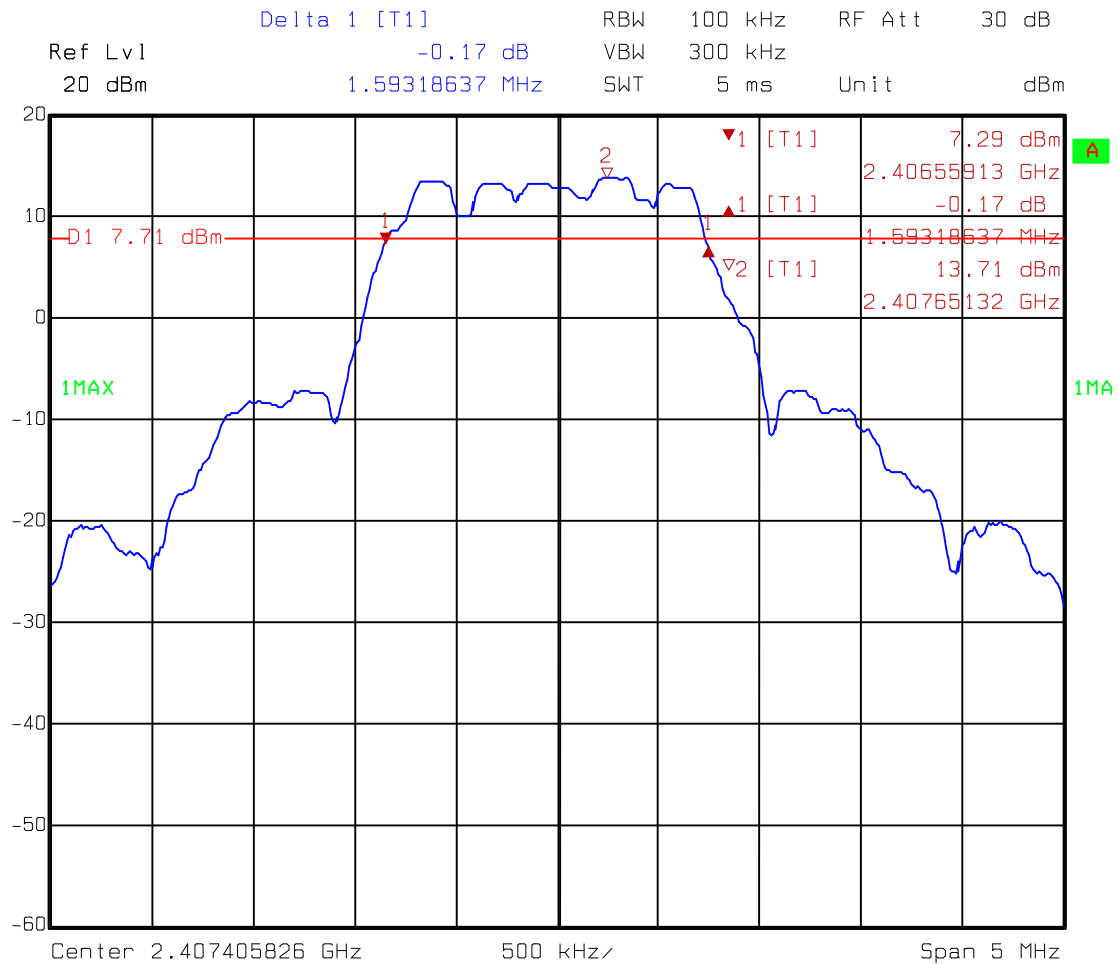
Comment A: 6dB bandwidth at middle channel (EC365) Base
 Date: 18.FEB.2004 14:53:56



Comment A: 6dB bandwidth at high channel (EC365) Base

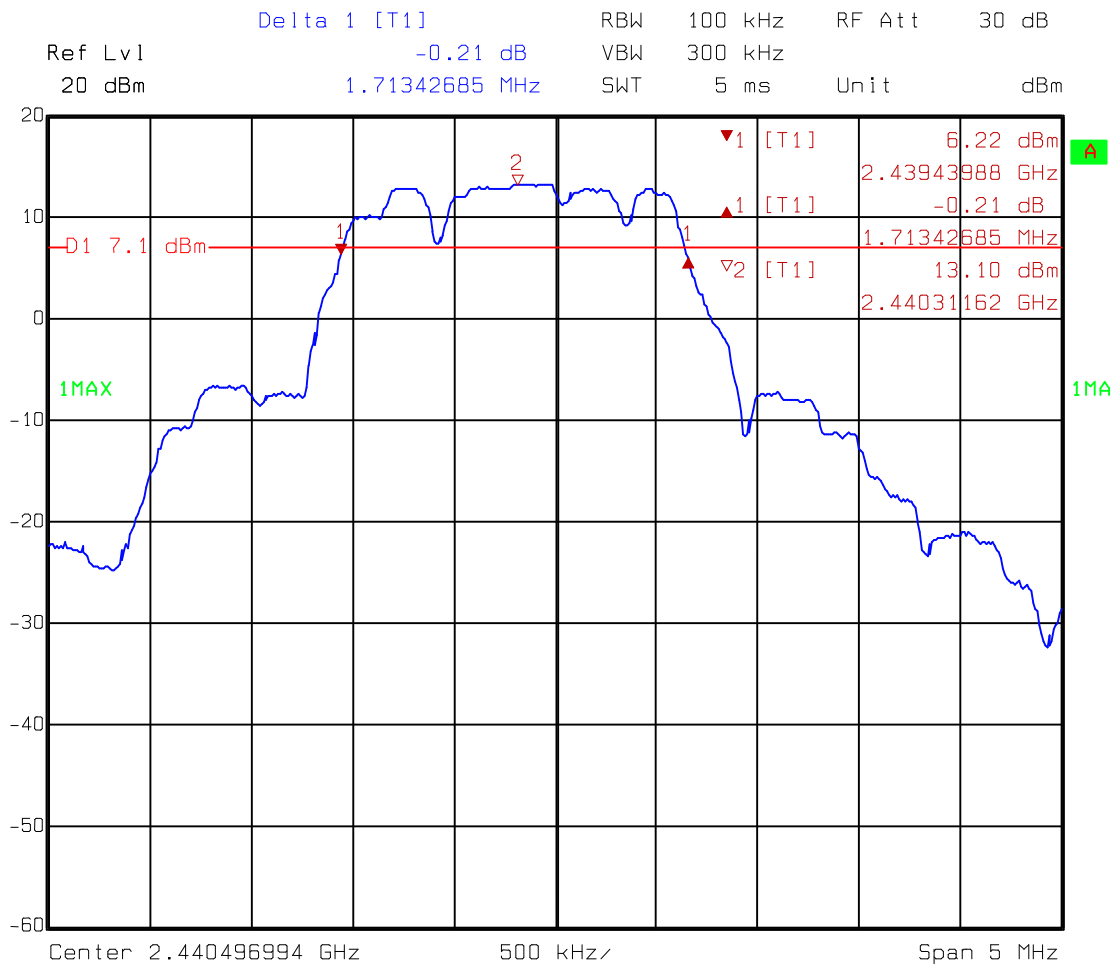
Date: 18.FEB.2004 14:55:48

Test mode: Handset

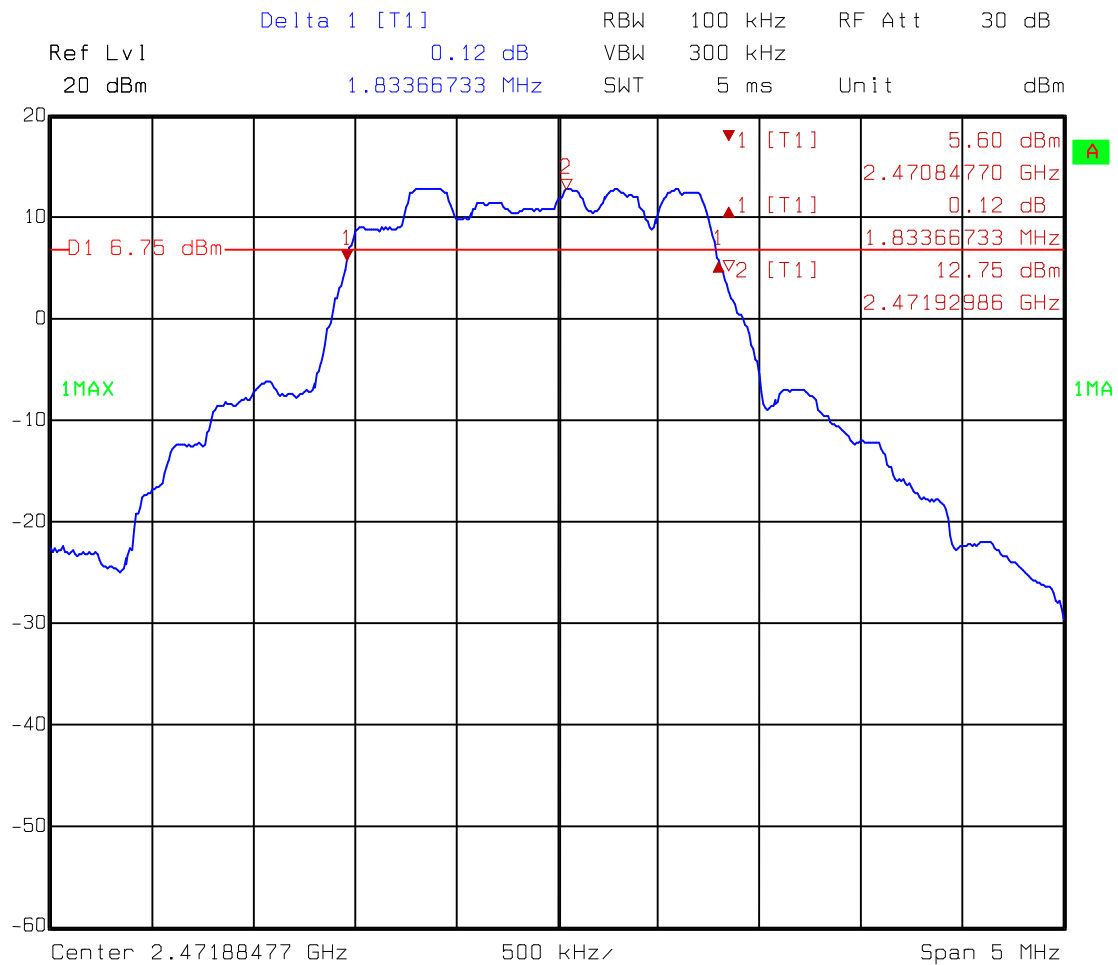


Comment A: 6dB bandwidth at low channel (EC365) Handset

Date: 19.FEB.2004 11:43:26



Comment A: 6dB bandwidth at middle channel (EC365) Handset
 Date: 18.FEB.2004 15:28:44



Comment A: 6dB bandwidth at high channel (EC365) Handset
 Date: 18.FEB.2004 15:24:36

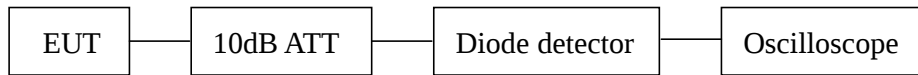
4. Maximum Output Power test

4.1 Operating environment

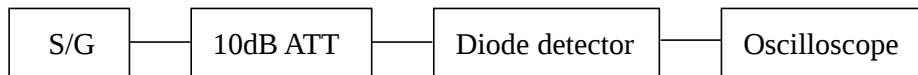
Temperature: 22 °C
 Relative Humidity: 60 %
 Atmospheric Pressure 1023 hPa

4.2 Test setup & procedure

A:



B:



1. The output of the transmitter via a 10 dB attenuator and coupled to a diode detector.
2. The output of the diode detector connected to the vertical channel of an oscilloscope. The observed trace of the oscilloscope shall be recorded as “A”.
3. The transmitter replaced by a signal generator. The output frequency of the signal made equal to the center of the frequency range occupied by the transmitter and unmodulated.
4. The output of the signal generator raised to reach the peak of trace “A” named X.
5. The signal generator output level X (dBm) is the transmitter peak output power.

4.3 Measured data of Maximum Output Power test results

Test Mode: Handset

Channel	Frequency (MHz)	Test Voltage (Vac/Vdc)	Reading (dBm)	Output Power		Limit (W)
				(dBm)	(mW)	
Lowest	2407.5	3.6Vdc	19.76	19.76	94.623	30
Middle	2440.5	3.6Vdc	19.78	19.78	95.060	30
Highest	2472.0	3.6Vdc	19.73	19.73	93.972	30

Test Mode: Base

Channel	Frequency (MHz)	Test Voltage (Vac/Vdc)	Reading (dBm)	Output Power		Limit (W)
				(dBm)	(mW)	
Lowest	2407.5	120Vac	19.10	19.10	81.283	30
Middle	2440.5	120Vac	19.20	19.20	83.176	30
Highest	2472.0	120Vac	18.38	18.38	68.865	30

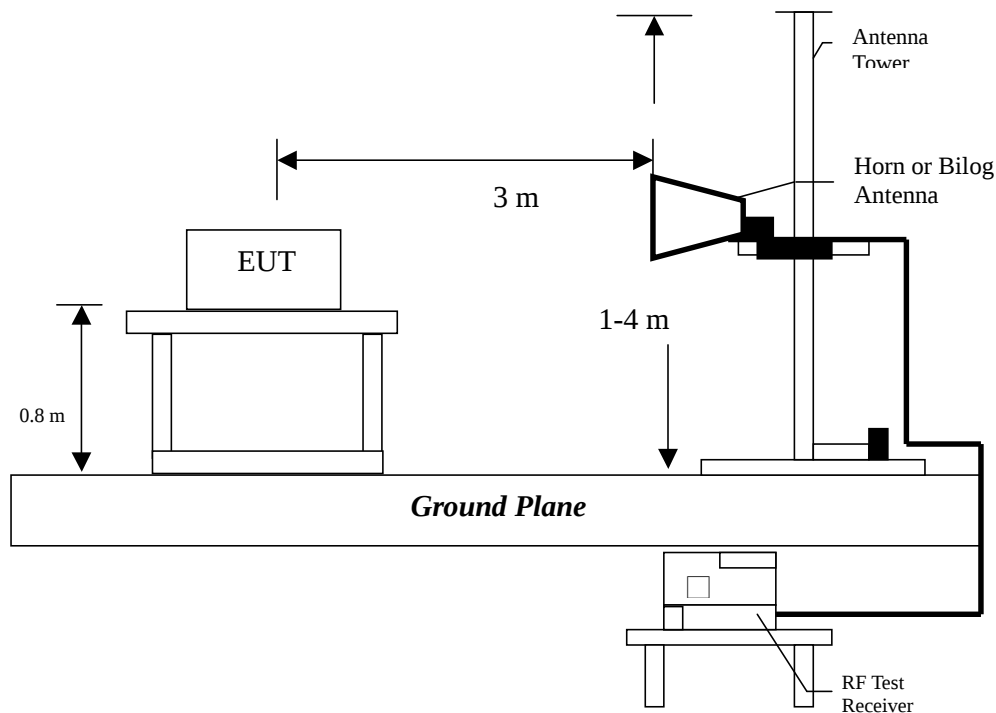
5. Radiated Emission test

5.1 Operating environment

Temperature:	18	°C	(10-40°C)
Relative Humidity:	62	%	(10-90%)
Atmospheric Pressure	1023	hPa	(860-1060hPa)

5.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



Radiated emissions were investigated cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1MHz RBW/VBW) recorded also on the report.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three-meter reading using inverse scaling with distance.

**Setup 1****Setup 2****Setup 3**

The EUT configuration please refer to the “Spurious set-up photo.pdf”.

5.3 Emission limits

The spurious Emission shall test through the 10th harmonic. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

Frequency (MHz)	Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Uncertainty was calculated in accordance with NAMAS NIS 81.

Expanded uncertainty (k=2) of radiated emission measurement is ± 4.98 dB.

Expanded uncertainty (k=2) of conducted emission measurement is ± 2.02 dB.

5.4 Radiated spurious emission test data

5.4.1 Measurement results: frequencies equal to or less than 1 GHz

EUT : GH9764
Test Unit : Base
Worst Case Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
45.03000	QP	V	13.05	18.87	31.92	40.00	-8.08	100	0
54.60000	QP	V	13.07	15.95	29.02	40.00	-10.98	100	360
81.90000	QP	V	9.50	14.36	23.86	40.00	-16.14	110	235
109.20000	QP	V	10.92	18.11	29.03	43.50	-14.47	121	30
237.55000	QP	V	11.82	15.73	27.55	46.00	-18.45	100	0
253.92000	QP	V	12.85	15.57	28.42	46.00	-17.58	100	176
81.89000	QP	H	9.50	17.26	26.76	40.00	-13.24	228	90
109.21000	QP	H	10.92	25.65	36.57	43.50	-6.93	288	100
182.93000	QP	H	13.55	19.28	32.83	43.50	-10.67	148	110
237.56000	QP	H	11.82	18.52	30.34	46.00	-15.66	100	144
253.94000	QP	H	12.85	18.21	31.06	46.00	-14.94	100	236
371.33000	QP	H	15.81	5.85	21.66	46.00	-24.34	100	226

Remark:

1. Corrected Level = Reading Level + Correction Factor
2. Correction Factor = Antenna Factor + Cable Loss

EUT : GH9764
Test Unit (Worst Case Condition) : Handset (Set 3)
Worst Case Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
359.96000	QP	V	15.56	3.84	19.40	46.00	-26.60	170	286
383.95000	QP	V	16.40	6.41	22.81	46.00	-23.19	149	0
527.95000	QP	V	19.15	0.77	19.92	46.00	-26.08	159	278
635.30000	QP	V	21.32	-2.23	19.09	46.00	-26.91	100	0
767.92000	QP	V	23.40	4.53	27.93	46.00	-18.07	115	273
815.93000	QP	V	23.89	6.94	30.83	46.00	-15.17	121	283
383.95000	QP	H	16.40	8.64	25.04	46.00	-20.96	100	360
480.10000	QP	H	18.61	6.03	24.64	46.00	-21.36	201	0
527.94000	QP	H	19.15	6.89	26.04	46.00	-19.96	172	360
767.93000	QP	H	23.40	10.32	33.72	46.00	-12.28	100	180
815.92000	QP	H	23.89	10.62	34.51	46.00	-11.49	100	180
863.93000	QP	H	24.39	7.62	32.01	46.00	-13.99	100	0

Remark:

1. Corrected Level = Reading Level + Correction Factor
2. Correction Factor = Antenna Factor + Cable Loss

5.4.2 Measurement results: frequency above 1GHz

EUT : GH9764
Phase : Vertical
Test Unit : Base
Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4012.2	PK	V	31.88	35.742	44.778	48.64	74	-25.36	148	163
4012.2	AV	V	31.88	35.742	28.618	32.48	54	-21.52	148	163
4814.7	PK	V	32.265	35.742	55.343	58.82	74	-15.18	153	144
4814.7	AV	V	32.265	35.742	33.633	37.11	54	-16.89	153	144
5616.18	PK	V	33.035	38.966	45.829	51.76	74	-22.24	172	119
5616.18	AV	V	33.035	38.966	26.349	32.28	54	-21.72	172	119
9627.76	PK	V	35.753	43.384	60.5985	68.23	74	-5.77	111	104
9627.76	AV	V	35.753	43.384	35.3085	42.94	54	-11.06	111	104

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:

1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

EUT : GH9764
 Phase : Horizontal
 Test Unit : Base
 Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
2380.4	PK	H	33.74	30.542	62.918	59.72	74	-14.28	200	180
2380.4	AV	H	33.74	30.542	50.978	47.78	54	-6.22	200	180
2386.38	PK	H	33.74	30.542	63.538	60.34	74	-13.66	200	180
2386.38	AV	H	33.74	30.542	51.398	48.2	54	-5.8	200	180
4012.26	PK	H	31.88	35.742	50.358	54.22	74	-19.78	138	188
4012.26	AV	H	31.88	35.742	31.928	35.79	54	-18.21	138	188
4814.74	PK	H	32.265	35.742	51.163	54.64	74	-19.36	126	142
4814.74	AV	H	32.265	35.742	33.633	37.11	54	-16.89	126	142
5616.34	PK	H	33.035	38.966	47.929	53.86	74	-20.14	127	122
5616.34	AV	H	33.035	38.966	28.279	34.21	54	-19.79	127	122
9627.53	PK	H	35.753	43.384	50.5185	58.15	74	-15.85	165	360
9627.53	AV	H	35.753	43.384	31.0185	38.65	54	-15.35	165	360

Remark:

1. Corrected Level = Reading Level + Correction Factor — Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:

1GHz-3GHz: 20dBuV
 3GHz-14GHz: 27dBuV
 14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV
 3GHz-14GHz: 16dBuV
 14GHz-26.5GHz: 28dBuV

EUT : GH9764

Test Unit : Base

Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4067.3	PK	V	31.88	35.742	43.278	47.14	74	-26.86	141	136
4067.3	AV	V	31.88	35.742	27.348	31.21	54	-22.79	141	136
4880.8	PK	V	32.265	35.742	47.423	50.9	74	-23.1	110	220
4880.8	AV	V	32.265	35.742	29.453	32.93	54	-21.07	110	220
7322.24	PK	V	34.17	39.966	50.624	56.42	74	-17.58	162	224
7322.24	AV	V	34.17	39.966	31.224	37.02	54	-16.98	162	224
9759.52	PK	V	35.753	43.384	50.0985	57.73	74	-16.27	148	192
9759.52	AV	V	35.753	43.384	30.7485	38.38	54	-15.62	148	192
4067.72	PK	H	31.88	35.742	49.638	53.5	74	-20.5	156	194
4067.72	AV	H	31.88	35.742	30.788	34.65	54	-19.35	156	194
4880.68	PK	H	32.265	35.742	51.313	54.79	74	-19.21	141	200
4880.68	AV	H	32.265	35.742	31.803	35.28	54	-18.72	141	200
7322.22	PK	H	34.17	39.966	52.474	58.27	74	-15.73	120	203
7322.22	AV	H	34.17	39.966	32.034	37.83	54	-16.17	120	203
9759.6	PK	H	35.753	43.384	56.8385	64.47	74	-9.53	100	205
9759.6	AV	H	35.753	43.384	33.7485	41.38	54	-12.62	100	205

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:

1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

EUT : GH9764

Test Unit : Base

Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4119.74	PK	V	31.88	35.742	46.938	50.8	74	-23.2	144	159
4119.74	AV	V	31.88	35.742	29.588	33.45	54	-20.55	144	159
4943.72	PK	V	32.265	35.742	56.723	60.2	74	-13.8	153	137
4943.72	AV	V	32.265	35.742	34.083	37.56	54	-16.44	153	137
7416.64	PK	V	34.17	39.966	56.884	62.68	74	-11.32	132	163
7416.64	AV	V	34.17	39.966	33.834	39.63	54	-14.37	132	163
9889.14	PK	V	35.753	43.384	56.7085	64.34	74	-9.66	108	96
9889.14	AV	V	35.753	43.384	33.3485	40.98	54	-13.02	108	96
4119.8	PK	H	31.88	35.742	53.458	57.32	74	-16.68	135	156
4119.8	AV	H	31.88	35.742	33.018	36.88	54	-17.12	135	156
4943.64	PK	H	32.265	35.742	54.803	58.28	74	-15.72	128	251
4943.64	AV	H	32.265	35.742	33.103	36.58	54	-17.42	128	251
7416.68	PK	H	34.17	39.966	54.854	60.65	74	-13.35	135	159
7416.68	AV	H	34.17	39.966	32.904	38.7	54	-15.3	135	159
9885.38	PK	H	35.753	43.384	54.7385	62.37	74	-11.63	104	155
9885.38	AV	H	35.753	43.384	32.2885	39.92	54	-14.08	104	155

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:

1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

EUT : GH9764
 Phase : Vertical
 Test Unit (Worst Case Condition) : Handset (set 2)
 Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4012.36	PK	V	31.88	35.742	44.458	48.32	74	-25.68	129	210
4012.36	AV	V	31.88	35.742	28.348	32.21	54	-21.79	129	210
4814.76	PK	V	32.265	35.742	62.163	65.64	74	-8.36	194	190
4814.76	AV	V	32.265	35.742	37.703	41.18	54	-12.82	194	190
7222.98	PK	V	34.17	39.966	55.934	61.73	74	-12.27	181	203
7222.98	AV	V	34.17	39.966	33.254	39.05	54	-14.95	181	203
9631	PK	V	35.753	43.384	61.4985	69.13	74	-4.87	160	216
9631	AV	V	35.753	43.384	61.4985	69.13	54	15.13	160	216

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:

1GHz-3GHz: 20dBuV
 3GHz-14GHz: 27dBuV
 14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV
 3GHz-14GHz: 16dBuV
 14GHz-26.5GHz: 28dBuV

EUT : GH9764
 Phase : Horizontal
 Test Unit (Worst Case Condition) : Handset (set 2)
 Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4012.3	PK	H	31.88	35.742	44.658	48.52	74	-25.48	134	208
4012.3	AV	H	31.88	35.742	28.518	32.38	54	-21.62	134	208
4814.76	PK	H	32.265	35.742	62.563	66.04	74	-7.96	194	190
4814.76	AV	H	32.265	35.742	37.813	41.29	54	-12.71	194	190
7223.1	PK	H	34.17	39.966	49.354	55.15	74	-18.85	100	150
7223.1	AV	H	34.17	39.966	30.324	36.12	54	-17.88	100	150
9631.04	PK	H	35.753	43.384	55.5485	63.18	74	-10.82	182	334
9631.04	AV	H	35.753	43.384	33.1685	40.80	54	-13.2	182	334

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:

1GHz-3GHz: 20dBuV
 3GHz-14GHz: 27dBuV
 14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV
 3GHz-14GHz: 16dBuV
 14GHz-26.5GHz: 28dBuV

EUT : GH9764
 Phase : Vertical
 Test Unit (Worst Case Condition) : Handset (set 2)
 Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4067.26	PK	V	31.88	35.742	48.238	52.10	74	-21.9	167	277
4067.26	AV	V	31.88	35.742	30.418	34.28	54	-19.72	167	277
4880.72	PK	V	32.265	35.742	62.423	65.90	74	-8.1	172	195
4880.72	AV	V	32.265	35.742	37.603	41.08	54	-12.92	172	195
7322.02	PK	V	34.17	39.966	60.314	66.11	74	-7.89	184	247
7322.02	AV	V	34.17	39.966	35.424	41.22	54	-12.78	184	247
9759.7	PK	V	35.753	43.384	53.2585	60.89	74	-13.11	120	348
9759.7	AV	V	35.753	43.384	31.9585	39.59	54	-14.41	120	348

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:

1GHz-3GHz: 20dBuV
 3GHz-14GHz: 27dBuV
 14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV
 3GHz-14GHz: 16dBuV
 14GHz-26.5GHz: 28dBuV

EUT : GH9764
 Phase : Horizontal
 Test Unit (Worst Case Condition) : Handset (set 2)
 Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4067.28	PK	H	31.88	35.742	48.238	52.10	74	-21.9	147	246
4067.28	AV	H	31.88	35.742	30.208	34.07	54	-19.93	147	246
4880.66	PK	H	32.265	35.742	63.453	66.93	74	-7.07	165	0
4880.66	AV	H	32.265	35.742	38.223	41.70	54	-12.3	165	0
7322	PK	H	34.17	39.966	58.524	64.32	74	-9.68	171	311
7322	AV	H	34.17	39.966	34.924	40.72	54	-13.28	171	311
9758.8	PK	H	35.753	43.384	53.1785	60.81	74	-13.19	156	227
9758.8	AV	H	35.753	43.384	31.8185	39.45	54	-14.6	156	227

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:

1GHz-3GHz: 20dBuV
 3GHz-14GHz: 27dBuV
 14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV
 3GHz-14GHz: 16dBuV
 14GHz-26.5GHz: 28dBuV

EUT : GH9764
 Phase : Vertical
 Test Unit (Worst Case Condition) : Handset (set 2)
 Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4119.8	PK	V	31.88	35.742	49.898	53.76	74	-20.2	189	243
4119.8	AV	V	31.88	35.742	31.018	34.88	54	-19.1	189	243
4943.72	PK	V	32.265	35.742	58.473	61.95	74	-12.1	200	165
4943.72	AV	V	32.265	35.742	35.303	38.78	54	-15.2	200	165
7416.62	PK	V	34.17	39.966	59.074	64.87	74	-9.13	187	325
7416.62	AV	V	34.17	39.966	34.554	40.35	54	-13.7	187	325
9889.2	PK	V	35.753	43.384	50.1485	57.78	74	-16.2	125	343
9889.2	AV	V	35.753	43.384	30.4685	38.10	54	-15.9	125	343

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:

1GHz-3GHz: 20dBuV
 3GHz-14GHz: 27dBuV
 14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV
 3GHz-14GHz: 16dBuV
 14GHz-26.5GHz: 28dBuV

EUT : GH9764
 Phase : Horizontal
 Test Unit (Worst Case Condition) : Handset (set 2)
 Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4119.76	PK	H	31.88	35.742	51.368	55.23	74	-18.8	179	244
4119.76	AV	H	31.88	35.742	31.978	35.84	54	-18.2	179	244
4943.72	PK	H	32.265	35.742	58.703	62.18	74	-11.8	200	165
4943.72	AV	H	32.265	35.742	35.593	39.07	54	-14.9	200	165
7416.62	PK	H	34.17	39.966	59.744	65.54	74	-8.46	146	291
7416.62	AV	H	34.17	39.966	35.314	41.11	54	-12.9	146	291
9889.14	PK	H	35.753	43.384	46.2985	53.93	74	-20.1	162	164
9889.14	AV	H	35.753	43.384	28.6485	36.28	54	-17.7	162	164

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:

1GHz-3GHz: 20dBuV
 3GHz-14GHz: 27dBuV
 14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV
 3GHz-14GHz: 16dBuV
 14GHz-26.5GHz: 28dBuV

6. Power Spectrum Density test

6.1 Operating environment

Temperature: 18 °C
 Relative Humidity: 62 %
 Atmospheric Pressure 1023 hPa

6.2 Test setup & procedure

The power spectrum density per FCC §15.247(d) was measured from the antenna port of the EUT using a 50ohm spectrum analyzer with the resolution bandwidth set at 3kHz, the video bandwidth set at 10kHz, a span of 1.5 MHz, and the sweep time set at 500 seconds. Power Density was read directly and cable loss (2.13dB) correction was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel). The Power Spectral Density measured result is in the following table.

6.3 Measured data of Power Spectrum Density test results

Test mode: Base

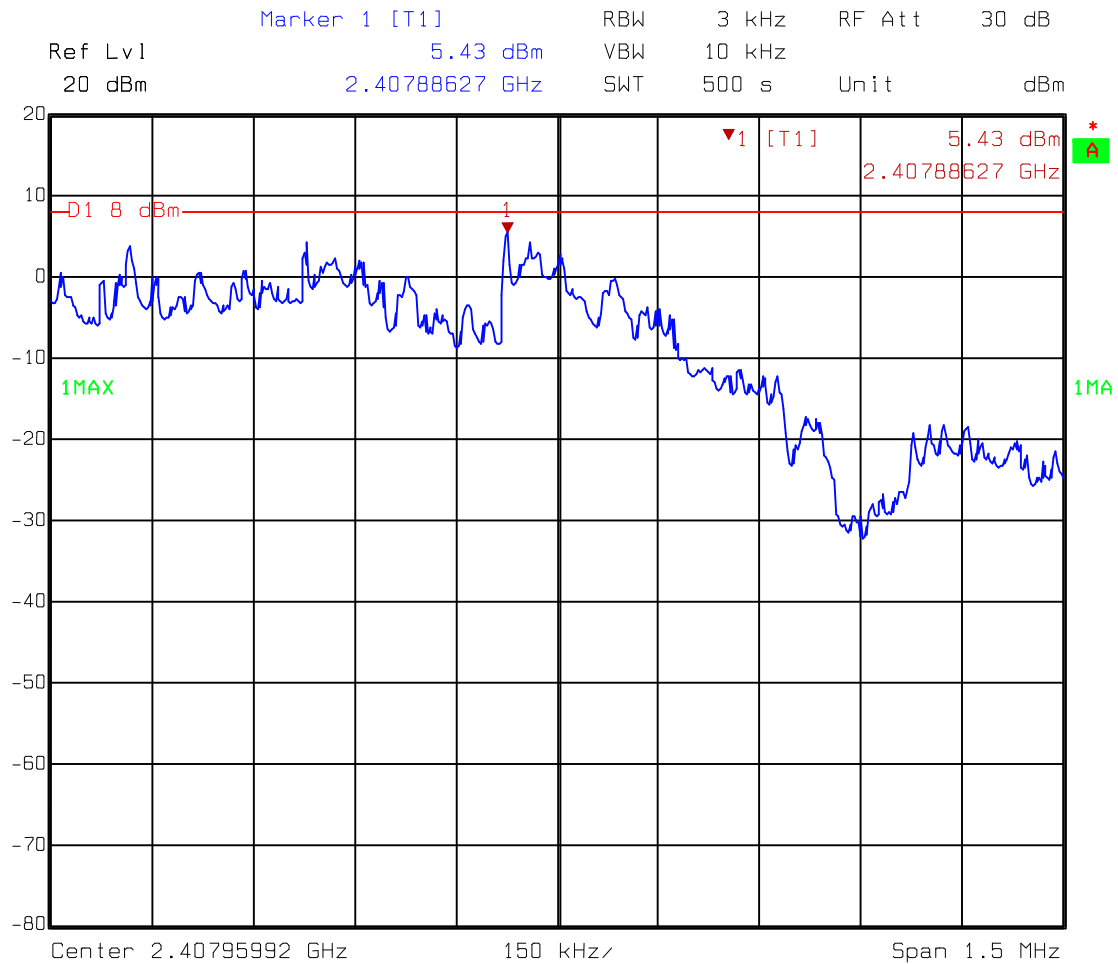
Channel	Frequency (MHz)	Measured level (dBm)	Limit (dBm)
Low	2407.88	7.56	8
Middle	2440.90	6.34	8
High	2471.21	5.65	8

Test mode: Handset

Channel	Frequency (MHz)	Measured level (dBm)	Limit (dBm)
Low	2406.71	5.69	8
Middle	2440.93	6.16	8
High	2472.46	5.25	8

Please see the plot below.

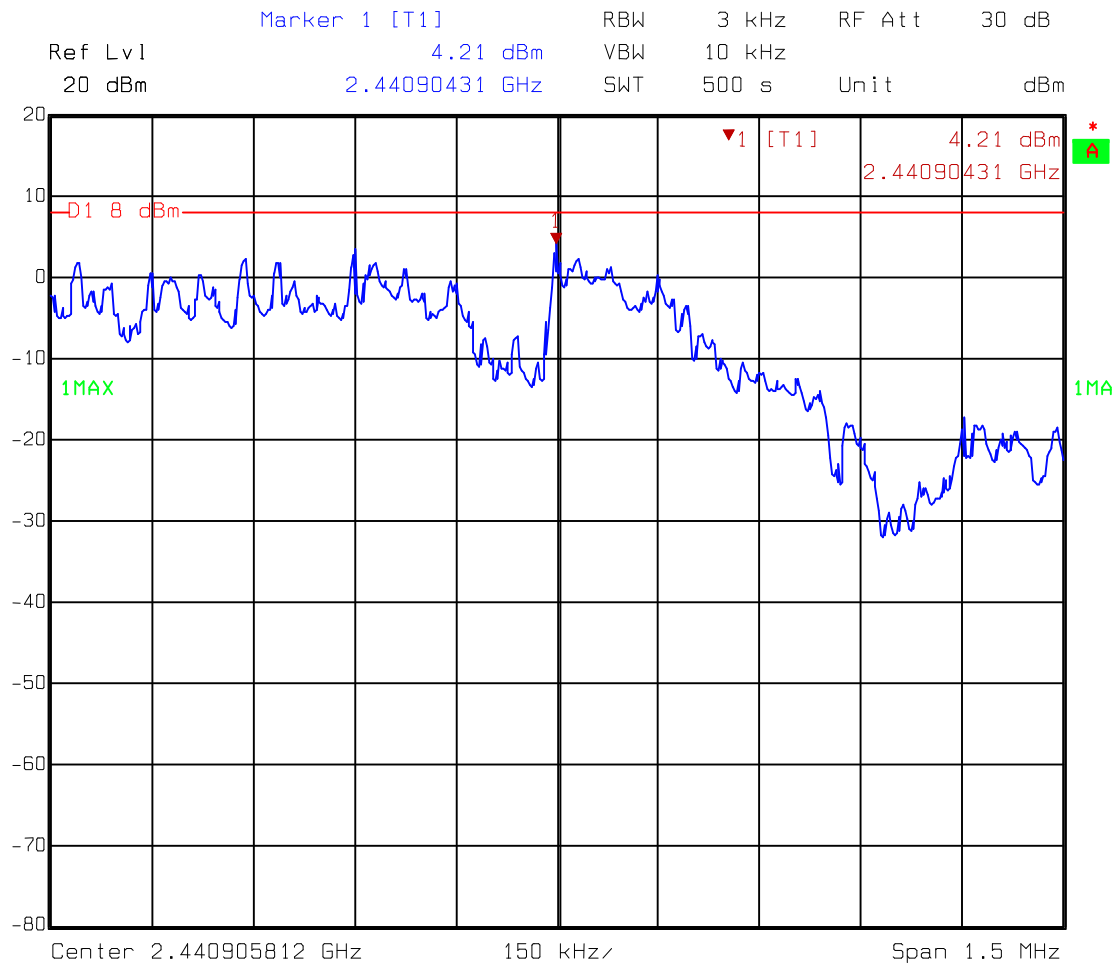
Base



Comment A: Power spectrum density at low channel

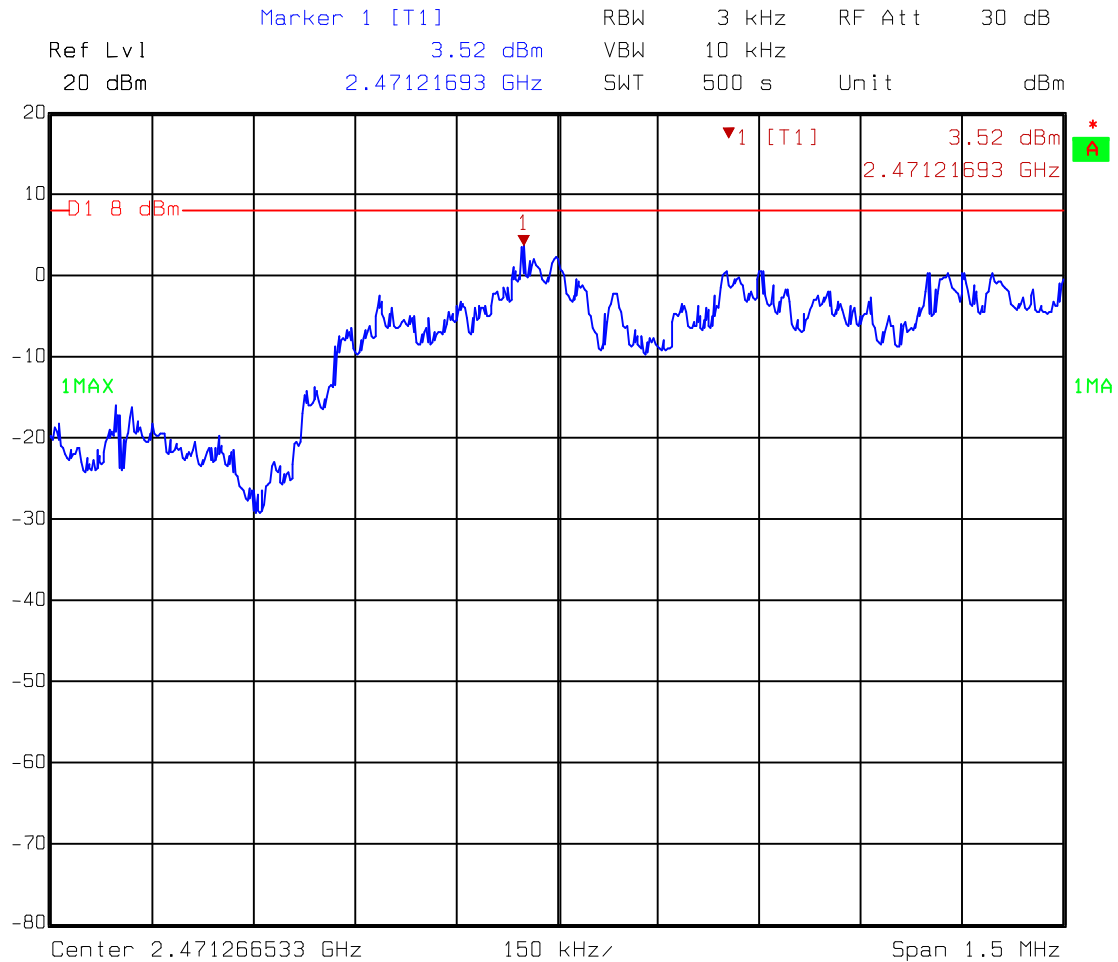
CL=2.13dB Base

Date: 18.FEB.2004 15:01:38



Comment A: Power spectrum density at middle channel
 CL=2.13dB Base

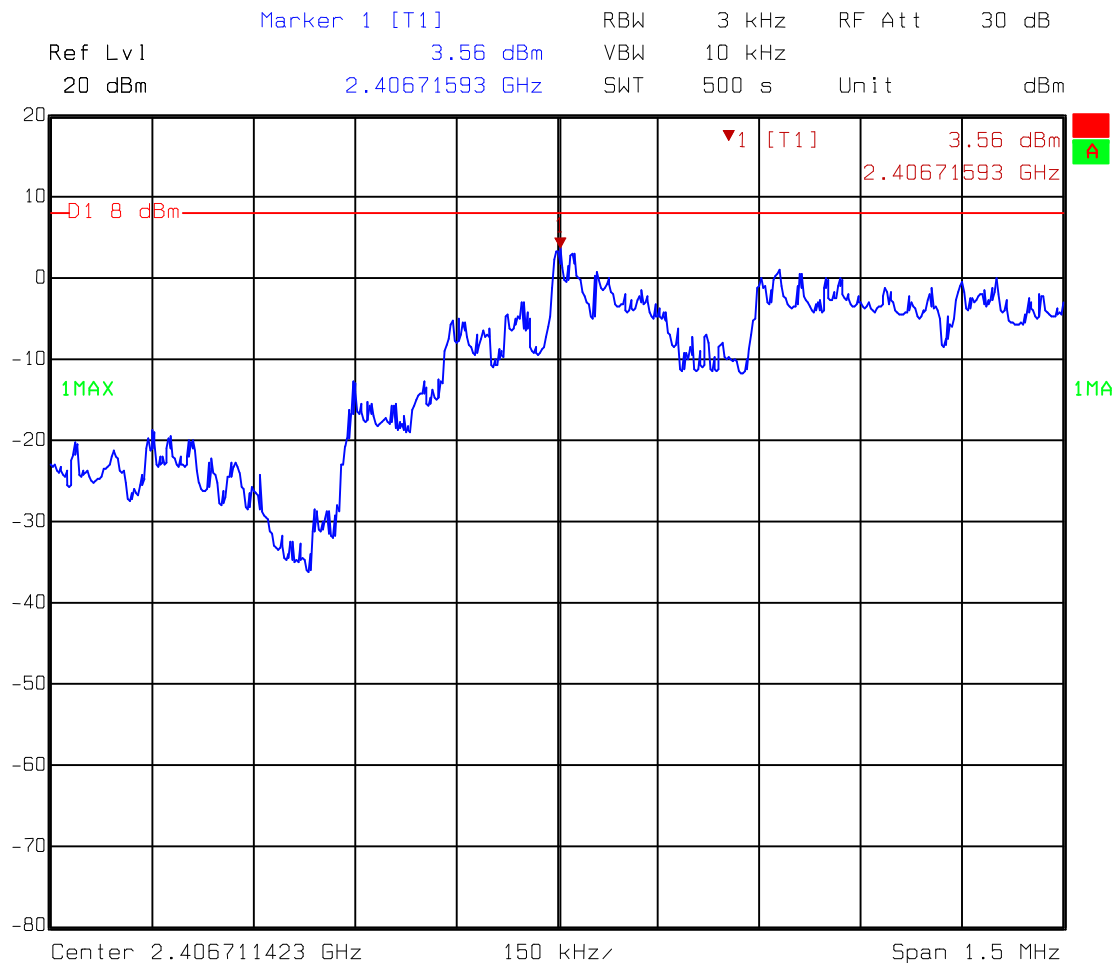
Date: 18.FEB.2004 15:05:25



Comment A: Power spectrum density at high channel
 CL=2.13dB Base

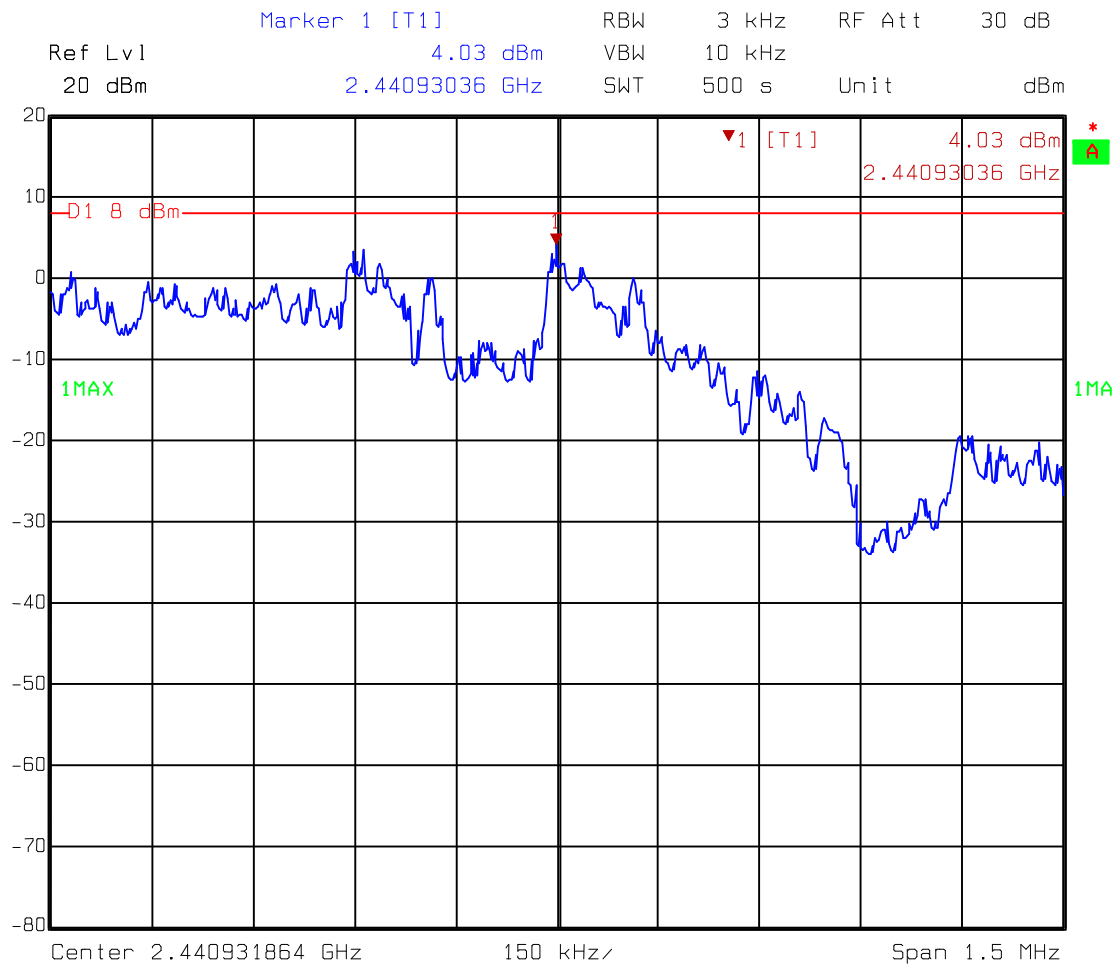
Date: 18.FEB.2004 15:07:21

Test mode: Handset



Comment A: Power spectrum density at low channel
 CL=2.13dB Handset

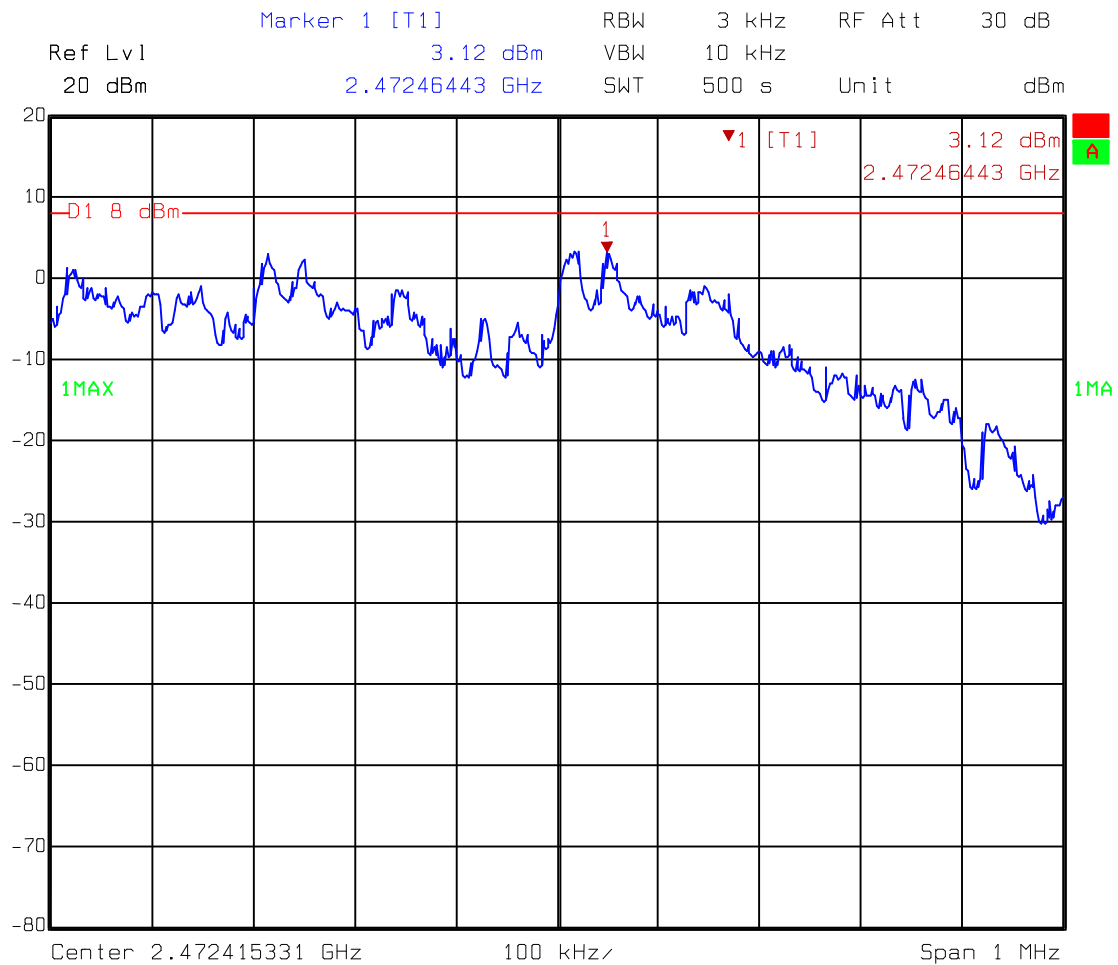
Date: 18.FEB.2004 15:32:29



Comment A: Power spectrum density at middle channel

CL=2.13dB Handset

Date: 18.FEB.2004 15:30:45



Comment A: Power spectrum density at high channel

CL=2.13dB Handset

Date: 18.FEB.2004 15:35:04

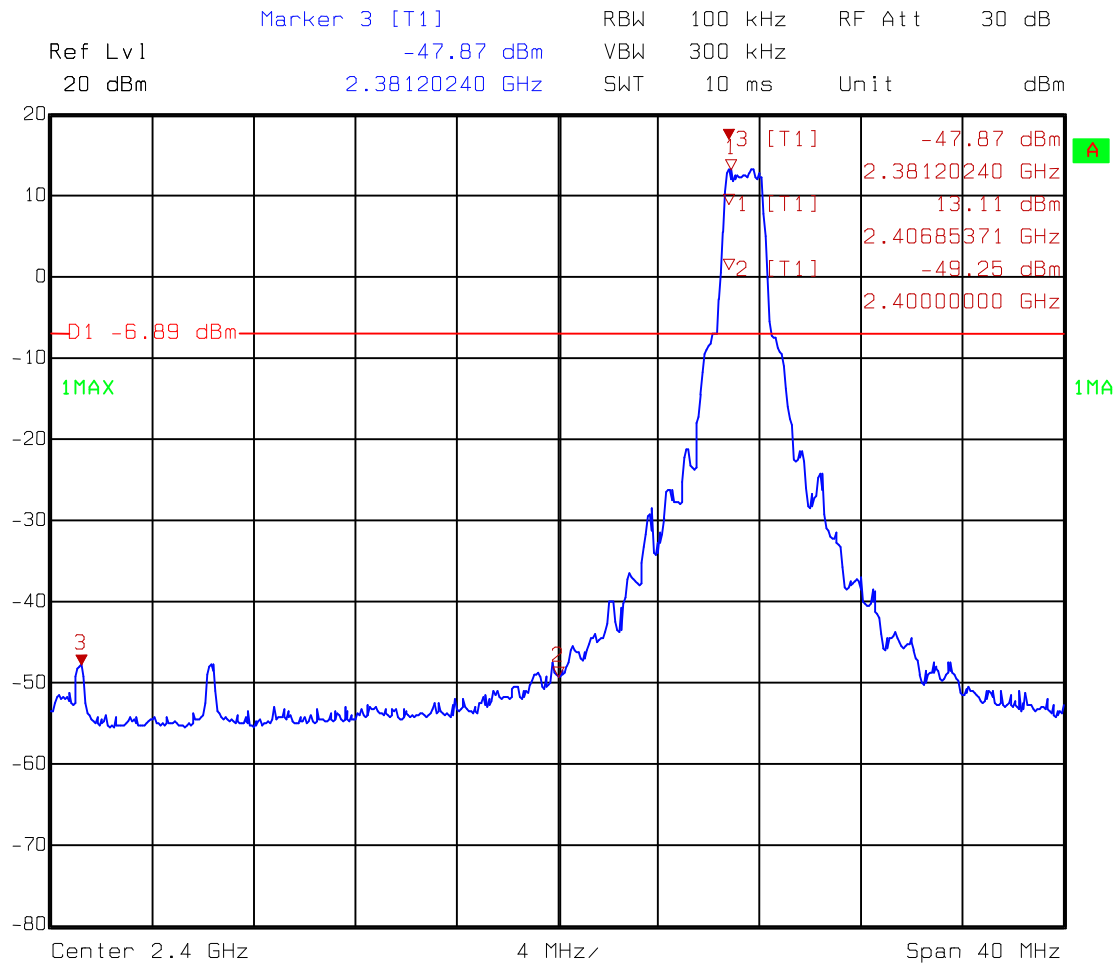
7. Emission on the band edge §FCC 15.247(C)

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Please see the plot below.

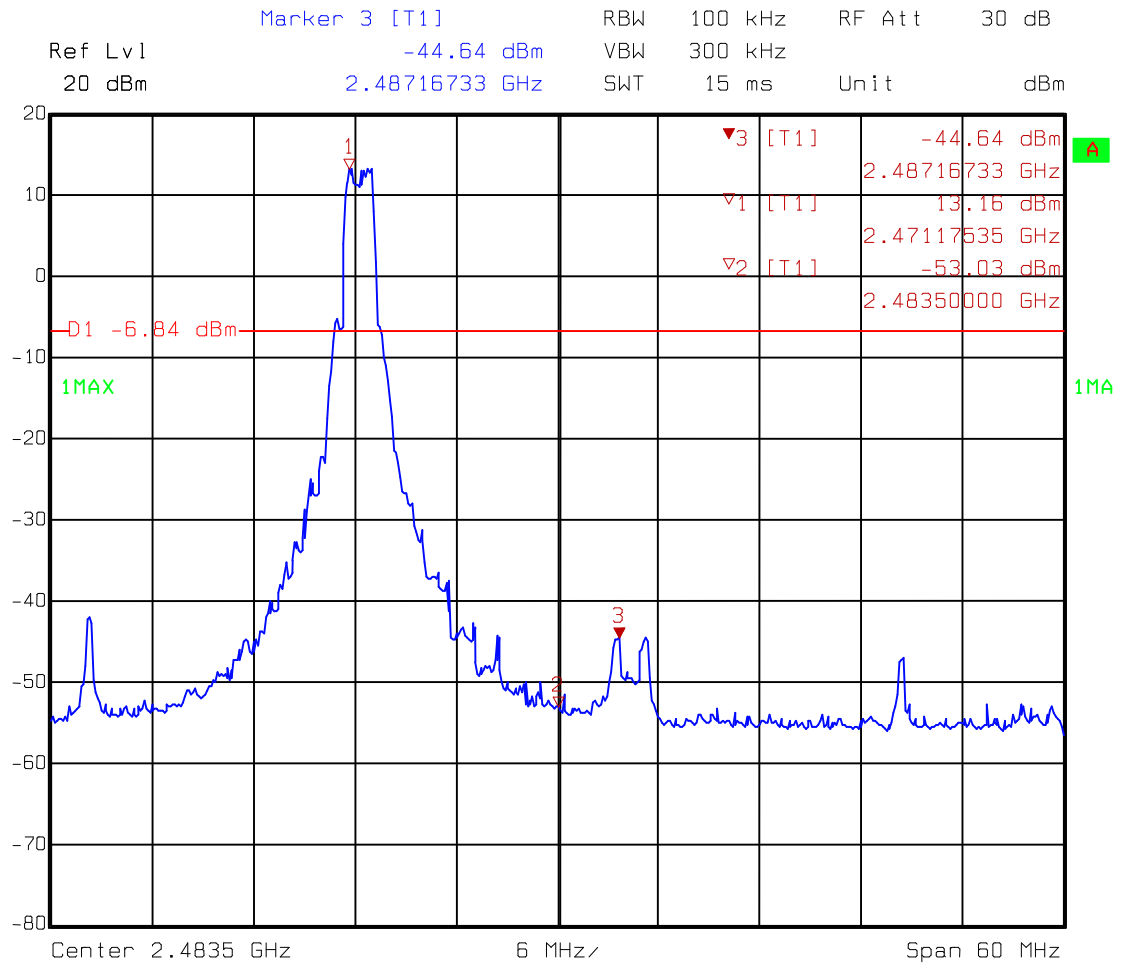
7.1 Band-edge (Conducted method)

Test mode: Base



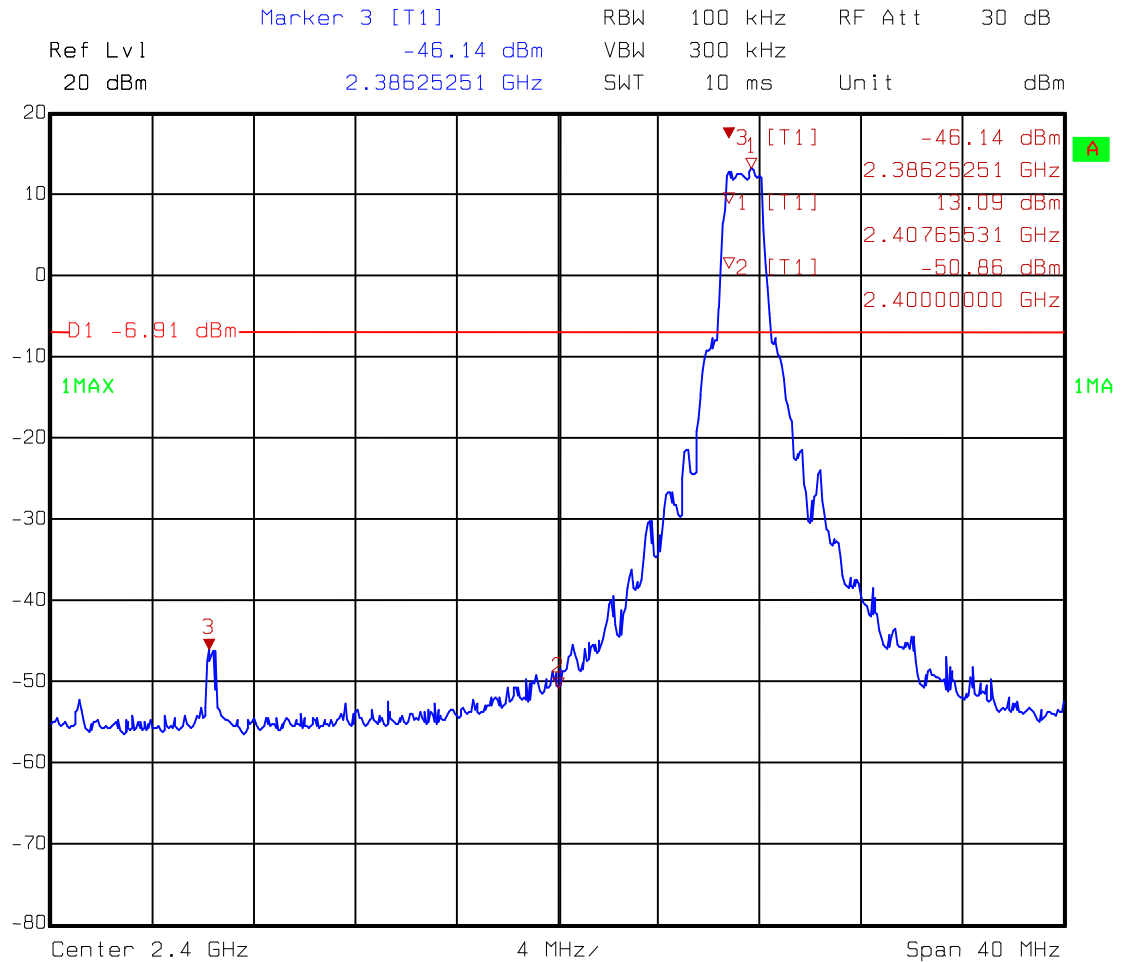
Comment A: Band-edge at low channel Base

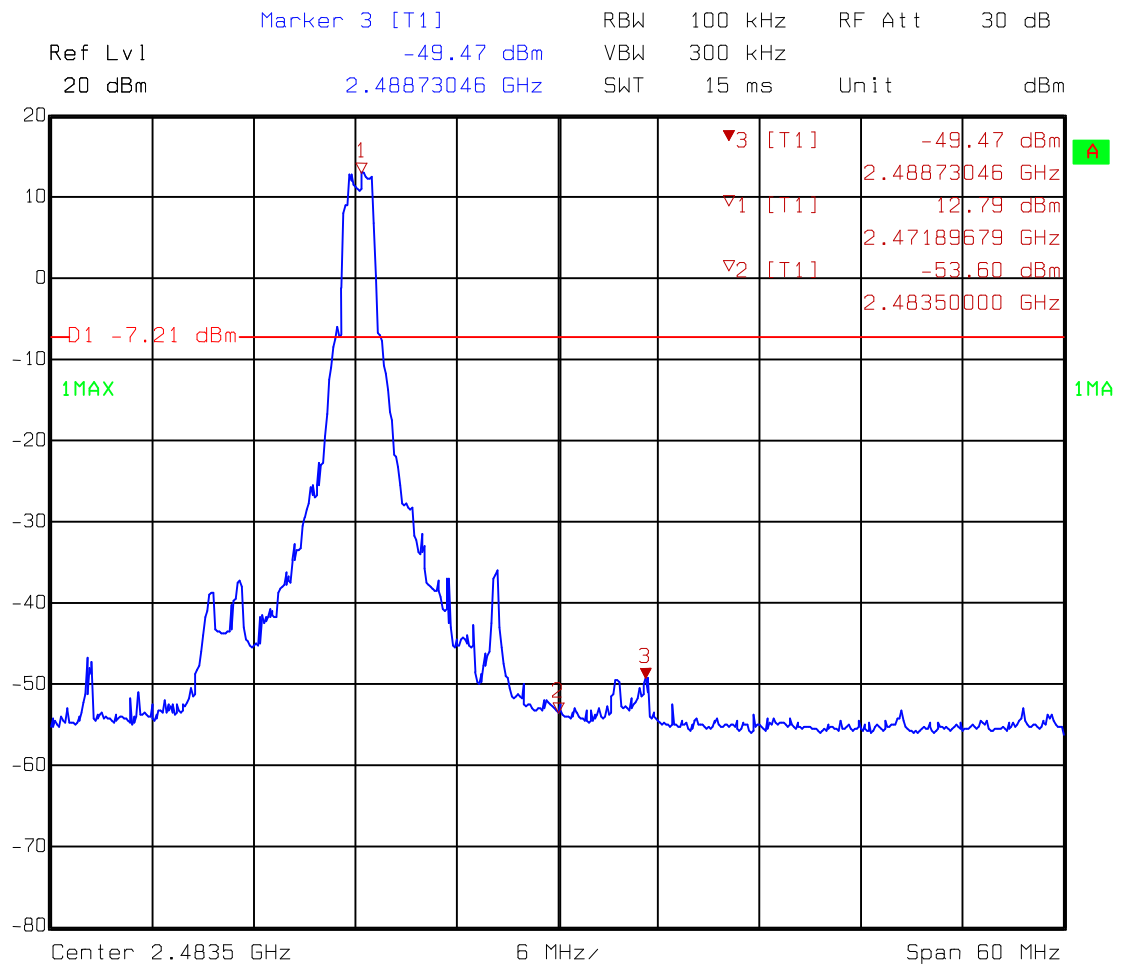
Date: 18.FEB.2004 15:13:16



Comment A: Band-edge at high channel Base
 Date: 18.FEB.2004 15:09:41

Test mode: Handset

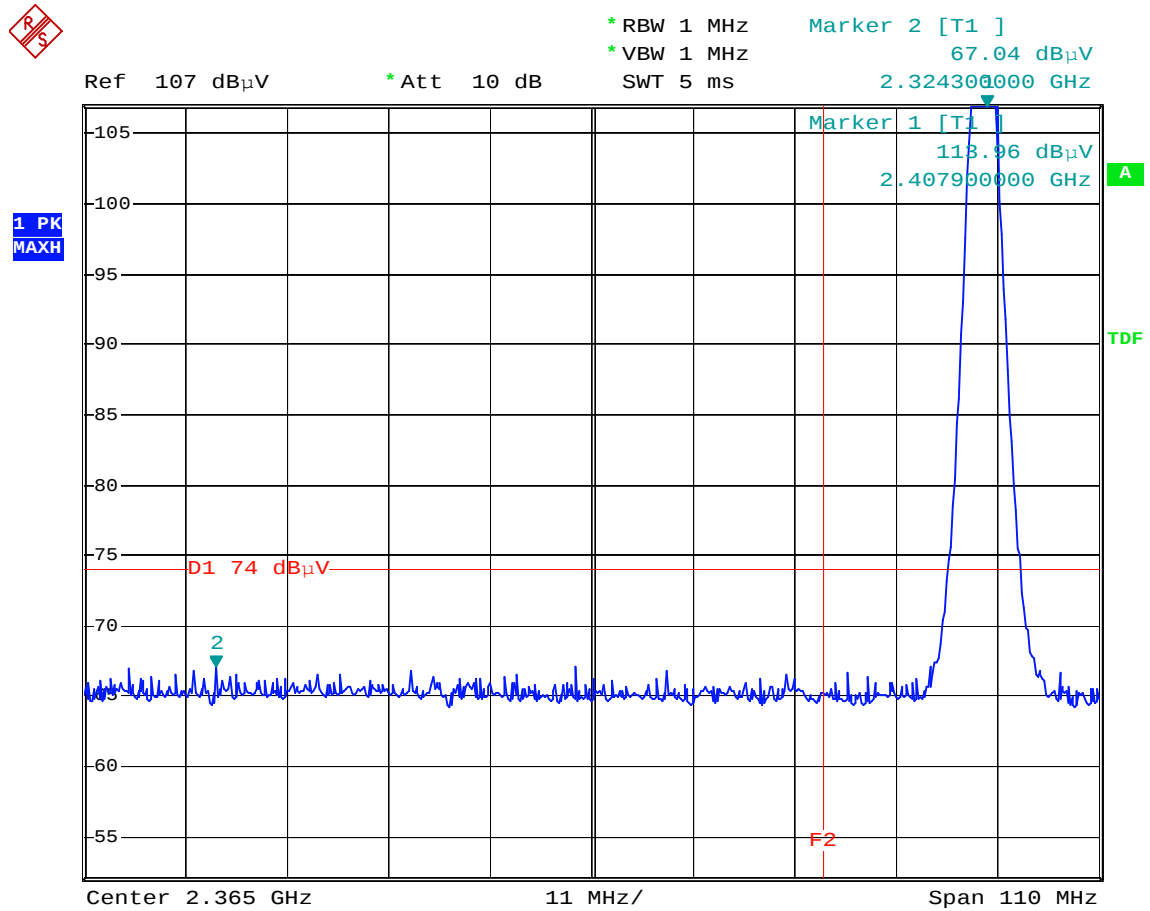




Comment A: Band-edge at high channel Handset
 Date: 18.FEB.2004 15:36:47

7.2 Band-edge (Radiated method)

Test mode: Base



Comment: Band-edge test at low channel
 Comment: Peak detector F2=2390MHz Base
 Date: 17.FEB.2004 10:19:37



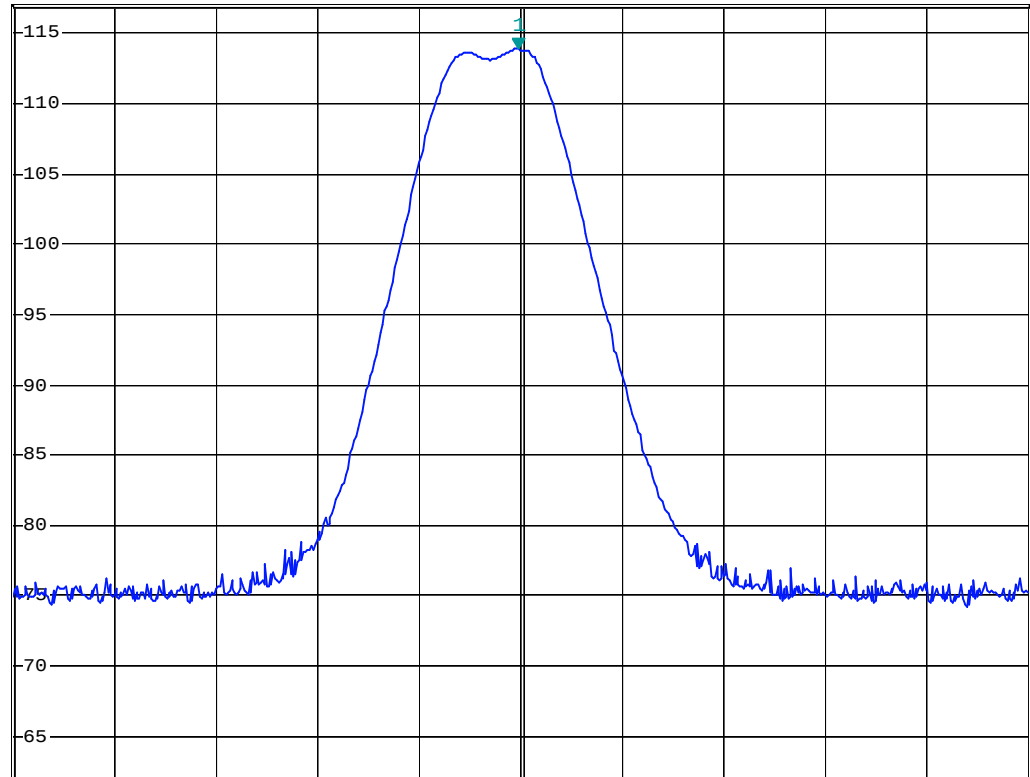
* RBW 1 MHz
* VBW 1 MHz
SWT 2.5 ms

Marker 1 [T1]
113.83 dB μ V
2.407860000 GHz

Ref 117 dB μ V

* Att 20 dB

1 PK
MAXH



A

TDF

Center 2.4079 GHz

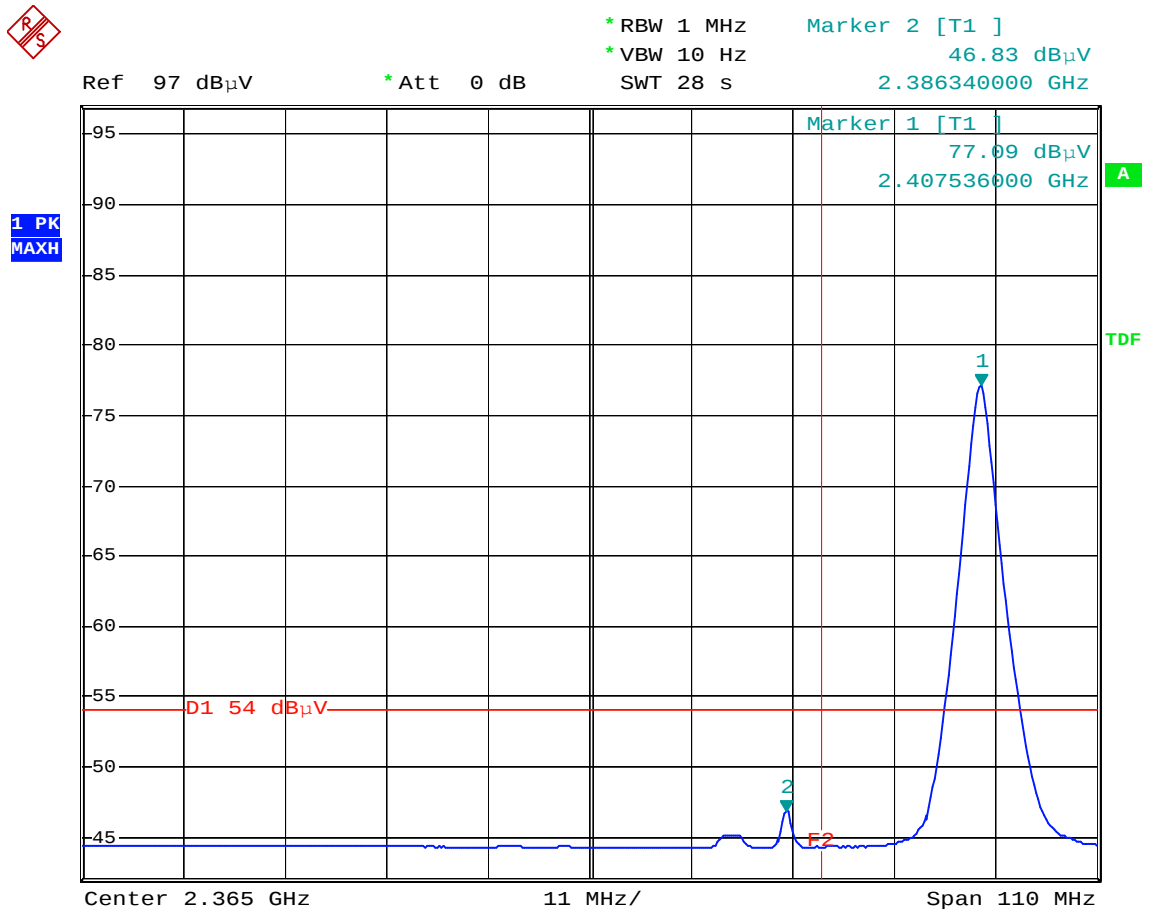
2 MHz/

Span 20 MHz

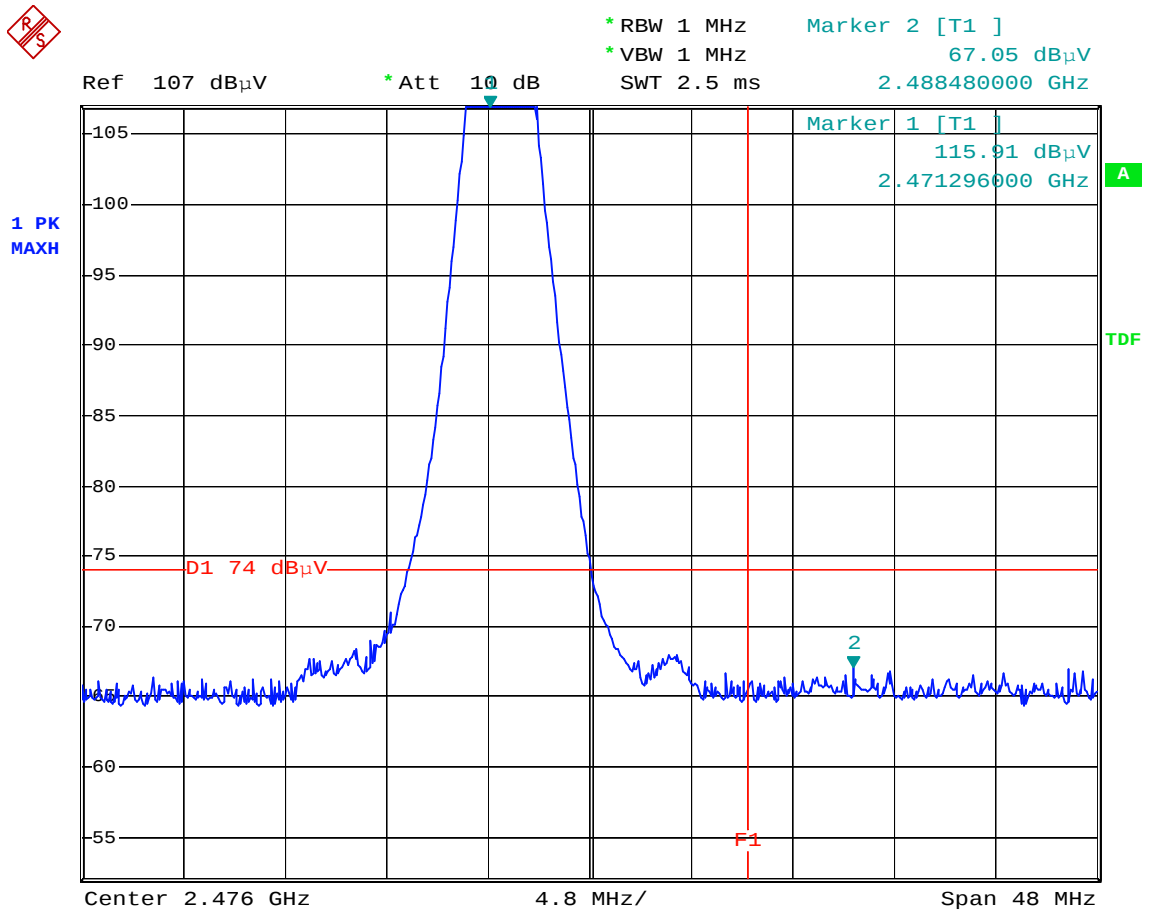
Comment: Band-edge test at low channel

Comment: Peak detector F2=2390MHz Base

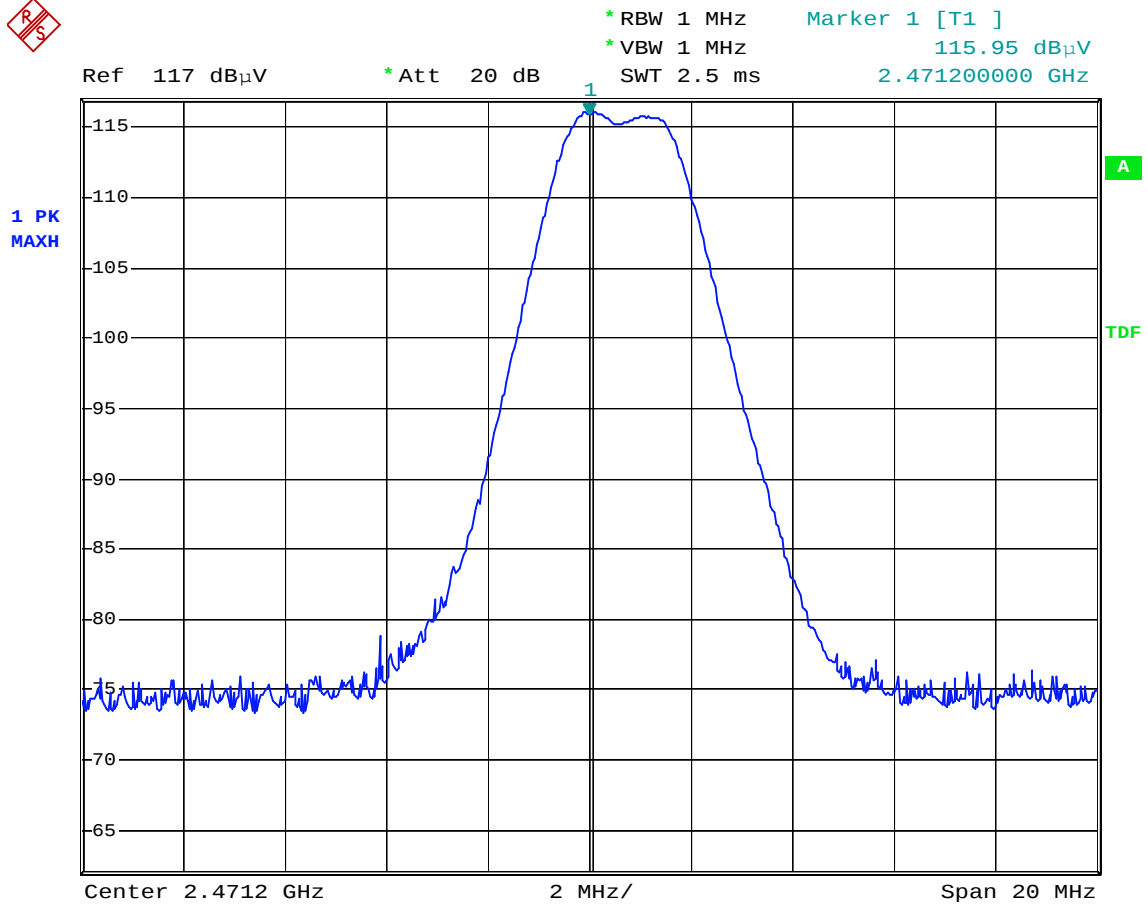
Date: 17.FEB.2004 10:22:22



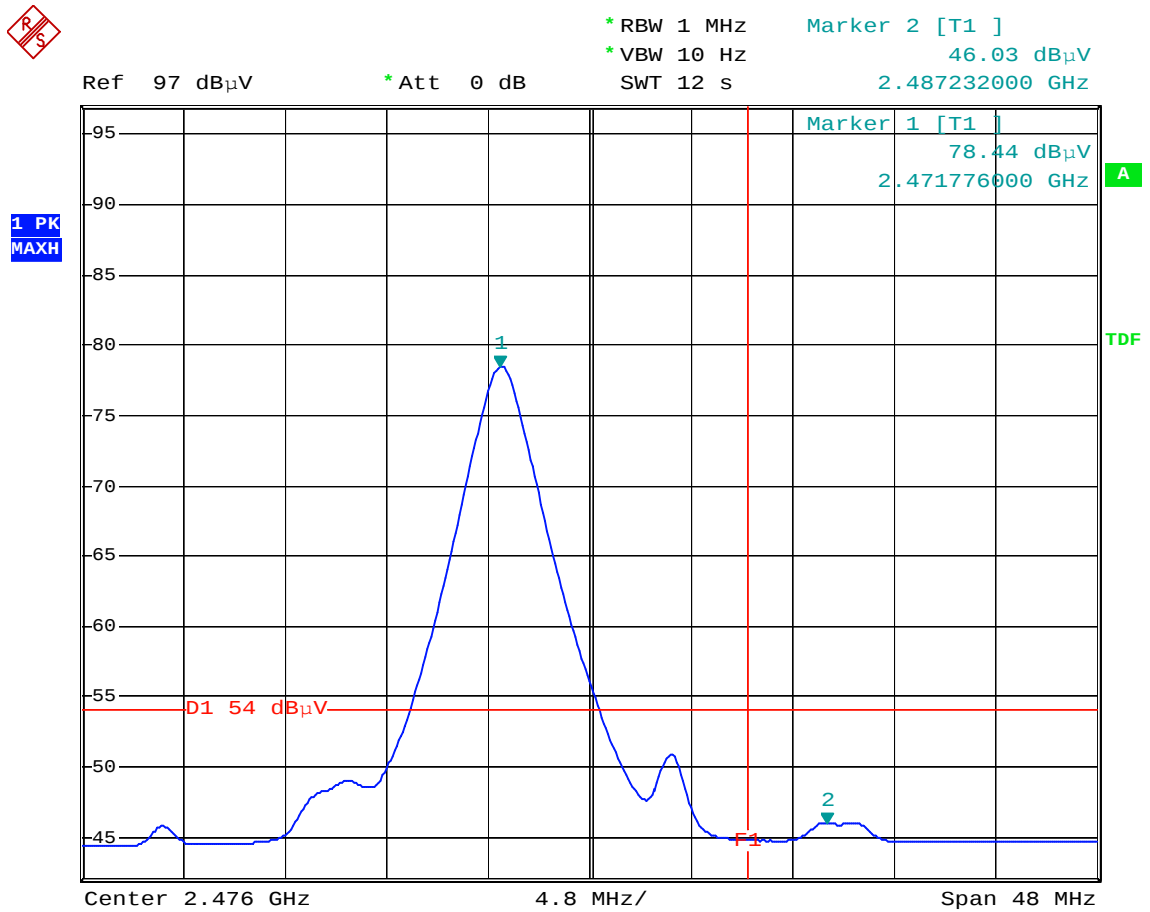
Comment: Band-edge test at low channel
 Comment: Average detector F2=2390MHz Base
 Date: 17.FEB.2004 10:23:31



Comment: Band-edge test at high channel
 Comment: Peak detector F1=2483.5MHz Base
 Date: 17.FEB.2004 10:14:23

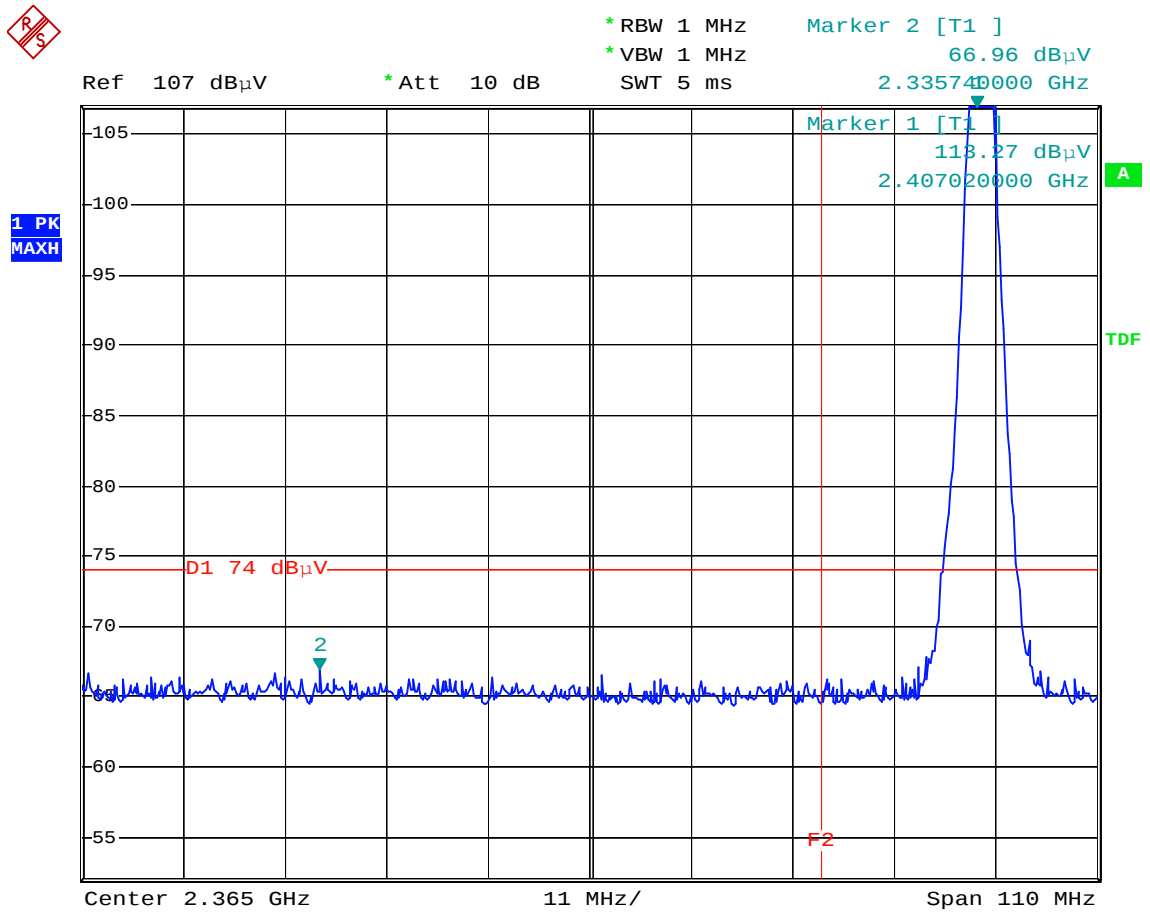


Comment: Band-edge test at high channel
 Comment: Peak detector F1=2483.5MHz Base
 Date: 17.FEB.2004 10:15:44



Comment: Band-edge test at high channel
 Comment: Average detector F1=2483.5MHz Base
 Date: 17.FEB.2004 10:17:05

Test mode: Handset



Comment: Band-edge test at low channel
 Comment: Peak detector F2=2390MHz Handset
 Date: 17.FEB.2004 11:37:34



* RBW 1 MHz

Marker 1 [T1]

* VBW 1 MHz

112.96 dB μ V

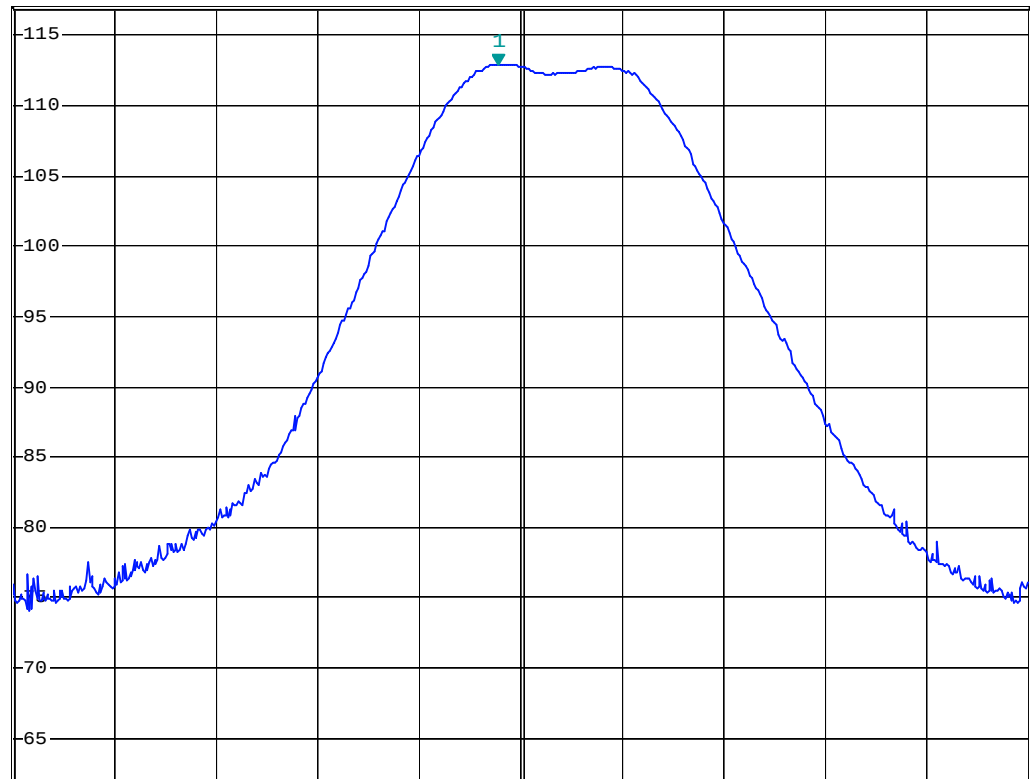
SWT 2.5 ms

2.406800000 GHz

Ref 117 dB μ V

* Att 20 dB

1 PK
MAXH



Center 2.40702 GHz

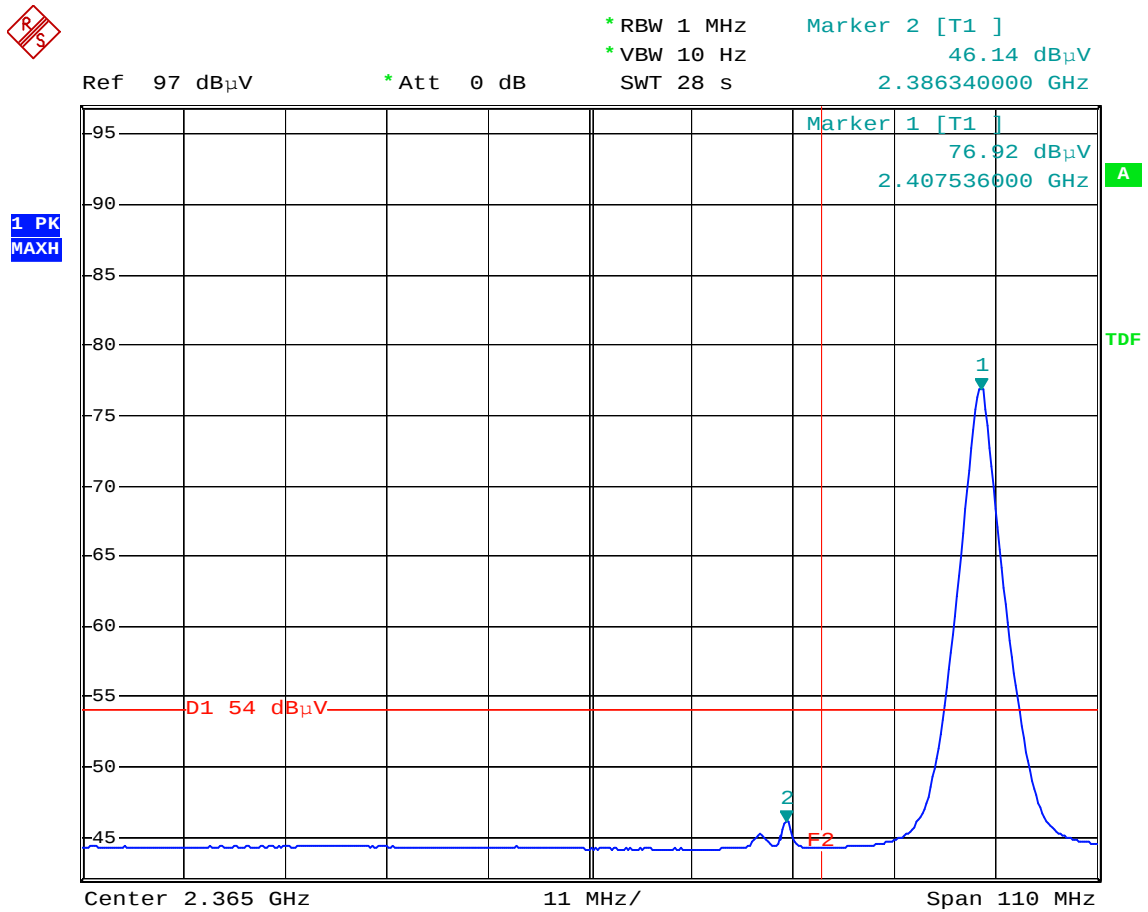
1 MHz/

Span 10 MHz

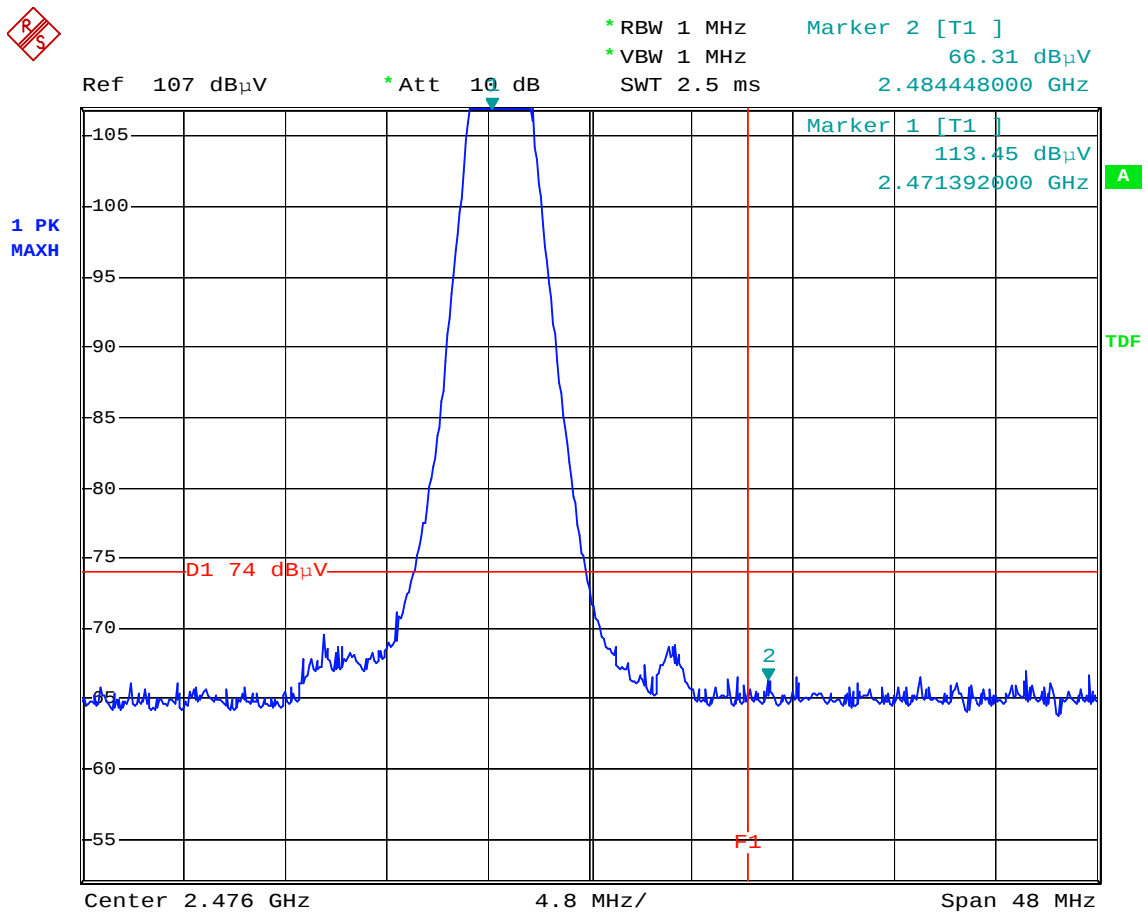
Comment: Band-edge test at low channel

Comment: Peak detector F2=2390MHz Handset

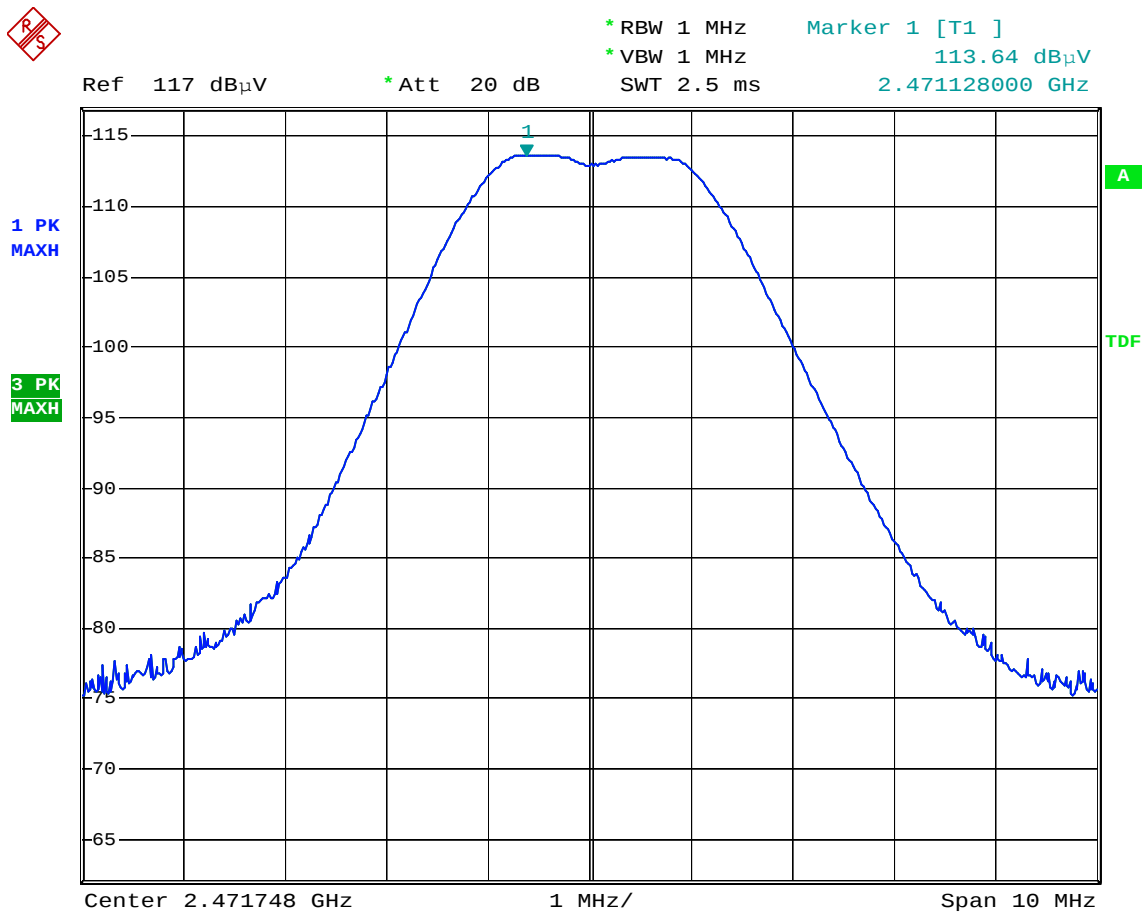
Date: 17.FEB.2004 11:39:26



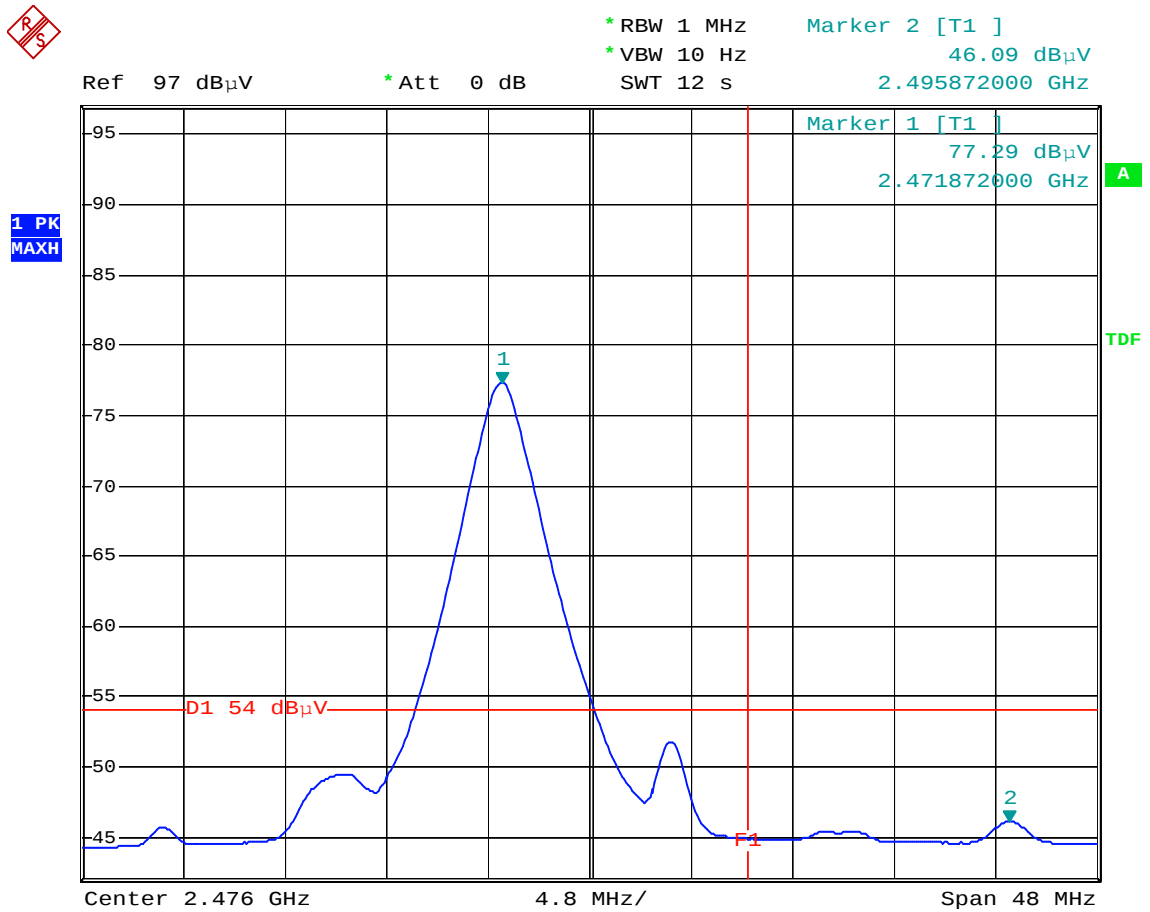
Comment: Band-edge test at low channel
 Comment: Average detector F2=2390MHz Handset
 Date: 17.FEB.2004 11:40:33



Comment: Band-edge test at high channel
 Comment: Peak detector F1=2483.5MHz Handset
 Date: 17.FEB.2004 12:47:49



Comment: Band-edge test at high channel
 Comment: Peak detector F1=2483.5MHz Handset
 Date: 17.FEB.2004 12:46:43



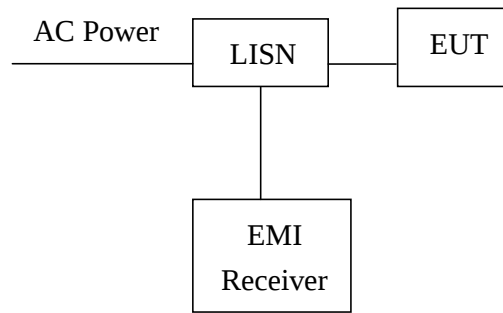
Comment: Band-edge test at high channel
 Comment: Average detector F1=2483.5MHz Handset
 Date: 17.FEB.2004 12:49:01

8. Power Line Conducted Emission test §FCC 15.207

8.1 Operating environment

Temperature:	15	°C	(10-40°C)
Relative Humidity:	73	%	(10-90%)
Atmospheric Pressure	1023	hPa	(860-1061hPa)

8.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/1992 on conducted measurement. The AC power conducted emissions was investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz. (15.207 paragraph)

The EUT configuration please refer to the “Conducted set-up photo.pdf”.

Please see the plot below.

Emission Limit

Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

*Decreases with the logarithm of the frequency.

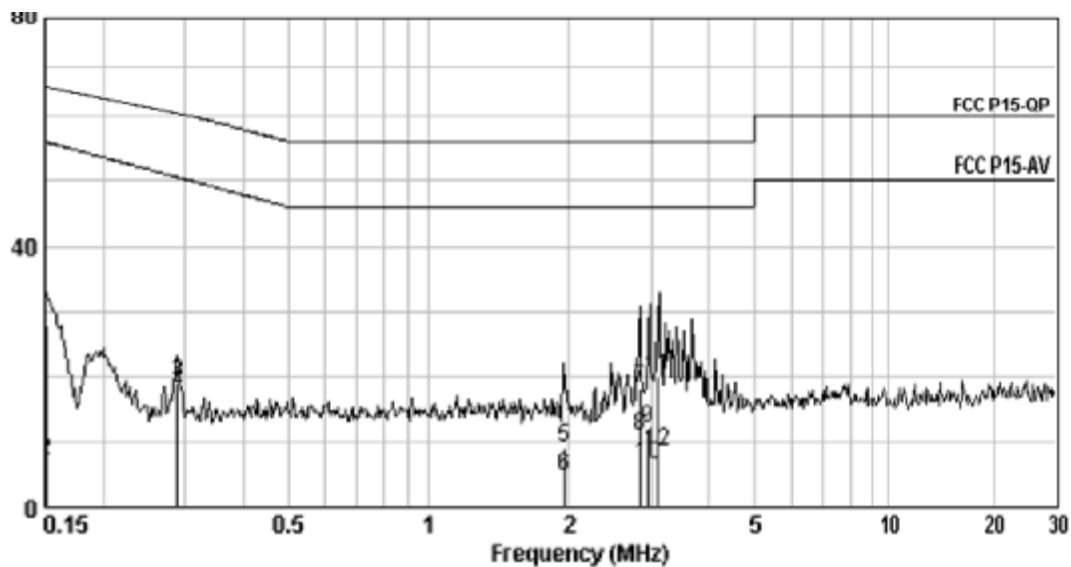
8.3 Power Line Conducted Emission test data

(1) Line

EUT : GH9764

Worst case Condition : Charging mode

Freq. (MHz)	Correction Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
0.1512	0.1	27.98	65.93	-37.95	QP
0.1512	0.1	6.94	55.93	-48.99	AVERAGE
0.28927	0.1	18.92	60.55	-41.63	QP
0.28927	0.1	17.71	50.55	-32.84	AVERAGE
1.952	0.1	9.23	56	-46.77	QP
1.952	0.1	4.63	46	-41.37	AVERAGE
2.838	0.14	18.26	56	-37.74	QP
2.838	0.14	10.83	46	-35.17	AVERAGE
2.953	0.15	11.99	56	-44.01	QP
2.953	0.15	6.47	46	-39.53	AVERAGE



(2) Neutral

EUT : GH9764

Worst Case Condition : Charging mode

Freq. (MHz)	Correction Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
0.15	0.1	28.66	66	-37.34	QP
0.15	0.1	7	56	-49	AVERAGE
0.28602	0.1	19.93	60.64	-40.71	QP
0.28602	0.1	19.08	50.64	-31.56	AVERAGE
1.574	0.1	8.52	56	-47.48	QP
1.574	0.1	4.36	46	-41.64	AVERAGE
3.098	0.16	16.25	56	-39.75	QP
3.098	0.16	6.82	46	-39.18	AVERAGE
3.409	0.17	22.84	56	-33.16	QP
3.409	0.17	14.01	46	-31.99	AVERAGE

Remark:

1. The reading value included cable loss and LISN factor.
2. Uncertainty was calculated in accordance with NAMAS NIS 81.
Expanded uncertainty (k=2) of conducted emission measurement is ± 2.6 dB.

