



FCC Part15.247 Test Report

Product Name : WCDMA Digital Mobile Phone
Model No. : HUAWEI Y320-U151
FCC ID : QISY320-U151

Applicant : HUAWEI TECHNOLOGIES CO., LTD
Address : Administration Building, Headquarters of Huawei
Technologies Co., Ltd., Bantian, Longgang District,
Shenzhen, 518129, P.R.C

Date of Receipt : 24/06/2013
Test Date : 24/06/2013~28/07/2013
Issued Date : 02/08/2013
Report No. : 136S045R-RF-US-P06V01
Report Version : V 1.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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Test Report Certification

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Applicant : HUAWEI TECHNOLOGIES CO., LTD.

Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

Manufacturer : HUAWEI TECHNOLOGIES CO., LTD.

Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

Model No. : HUAWEI Y320-U151

FCC ID : QISY320-U151

EUT Voltage : DC: 3.7V

Trade Name : HUAWEI

Applicable Standard : FCC CFR Title 47 Part 15 Subpart C: 2012
ANSI C63.4: 2009; ANSI C63.10: 2009

Test Result : Complied

Performed Location : Suzhou EMC Laboratory
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FCC Registration Number: 800392

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Laboratory Information

We, **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	:	BSMI, NCC, TAF
Germany	:	TUV Rheinland
Norway	:	Nemko, DNV
USA	:	FCC
Japan	:	VCCI
China	:	CNAS

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site :<http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site :
<http://www.quietek.com/>

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1. General Information

1.1. EUT Description

Product Name	WCDMA Digital Mobile Phone
Model No.	HUAWEI Y320-U151
Hardware Version	HWDSL5-V1.0
Software Version	Y320-U151V100R001C195B500
Device Category	Portable
RF Exposure Environment	Uncontrolled
Antenna Type	Internal
GPS	
Class of SRD	Class 3
2G	
Support Band	GSM850/PCS1900
GPRS Class	Class 12
Uplink	GSM 850: 824~849MHz PCS 1900: 1850~1910MHz
Downlink	GSM 850: 869~894MHz PCS 1900: 1930~1990MHz
Release Version	R99
Type of modulation	GMSK for GPRS; 8PSK for EDGE
Antenna Gain	GSM 850: 0.30dBi PCS1900: -0.30dBi
3G	
Support Band	WCDMA Band II/WCDMA Band V
Uplink	WCDMA Band II: 1850~1910MHz WCDMA Band V: 824~849MHz
Downlink	WCDMA Band II: 1930~1990MHz WCDMA Band V: 869~894MHz
Release Version	Rel-7
Type of modulation	QPSK, 16QAM for Downlink QPSK for Uplink
Antenna Gain	WCDMA Band II: -0.30dBi WCDMA Band V: 0.25dBi
Wi-Fi	
Wi-Fi Frequency	802.11b/g/n(20MHz): 2412 ~ 2462 MHz

	802.11n(40MHz): 2422 ~ 2452 MHz
Type of modulation	802.11b: DSSS; 802.11g/n: OFDM
Data Rate	802.11b: 1/2/5.5/11 Mbps
	802.11g: 6/9/12/18/24/36/48/54 Mbps
	802.11n: up to 135 Mbps
Peak Antenna Gain	-2dBi
Bluetooth	
Bluetooth Frequency	2402~2480MHz
Bluetooth Version	V3.0 + HS
Type of modulation	FHSS
Data Rate	1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)
Antenna Gain	-2dBi
Components	
Battery #1	Brand Name: HUAWEI M/N: HB5N1 Rated Voltage and Capacitance: 3.7V/1350mAh S/N: BAAD413A158B8432
Battery #2	Brand Name: HUAWEI M/N: HB5N1 Rated Voltage and Capacitance: 3.7V/1350mAh S/N: GAGD310Z15805992
Adapter #1	Brand Name: HUAWEI M/N: HW-050055U1W Input: 100-240V~50/60Hz 0.2A Output: 5Vdc, 550mA S/N: BYAD31910787
Adapter #2	Brand Name: HUAWEI M/N: HW-050055U1W Input: 100-240V~50/60Hz 0.2A Output: 5Vdc, 550mA S/N: HKAD50698141

Bluetooth Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2403 MHz	02	2404 MHz	03	2405 MHz
04	2406 MHz	05	2407 MHz	06	2408 MHz	07	2409 MHz
08	2410 MHz	09	2411 MHz	10	2412 MHz	11	2413 MHz
12	2414 MHz	13	2415 MHz	14	2416 MHz	15	2417 MHz
16	2418 MHz	17	2419 MHz	18	2420 MHz	19	2421 MHz
20	2422 MHz	21	2423 MHz	22	2424 MHz	23	2425 MHz
24	2426 MHz	25	2427 MHz	26	2428 MHz	27	2429 MHz
28	2430 MHz	29	2431 MHz	30	2432 MHz	31	2433 MHz
32	2434 MHz	33	2435 MHz	34	2436 MHz	35	2437 MHz
36	2438 MHz	37	2439 MHz	38	2440 MHz	39	2441 MHz
40	2442 MHz	41	2443 MHz	42	2444 MHz	43	2445 MHz
44	2446 MHz	45	2447 MHz	46	2448 MHz	47	2449 MHz
48	2450 MHz	49	2451 MHz	50	2452 MHz	51	2453 MHz
52	2454 MHz	53	2455 MHz	54	2456 MHz	55	2457 MHz
56	2458 MHz	57	2459 MHz	58	2460 MHz	59	2461 MHz
60	2462 MHz	61	2463 MHz	62	2464 MHz	63	2465 MHz
64	2466 MHz	65	2467 MHz	66	2468 MHz	67	2469 MHz
68	2470 MHz	69	2471 MHz	70	2472 MHz	71	2473 MHz
72	2474 MHz	73	2475 MHz	74	2476 MHz	75	2477 MHz
76	2478 MHz	77	2479 MHz	78	2480 MHz	N/A	N/A

1.2. Mode of Operation

Quietek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Transmitter-1Mbps(GFSK_DH5)
Mode 2: Transmitter-2Mbps(Pi/4 DQPSK_DH5)
Mode 3: Transmitter-3Mbps(8DPSK_DH5)

Note:

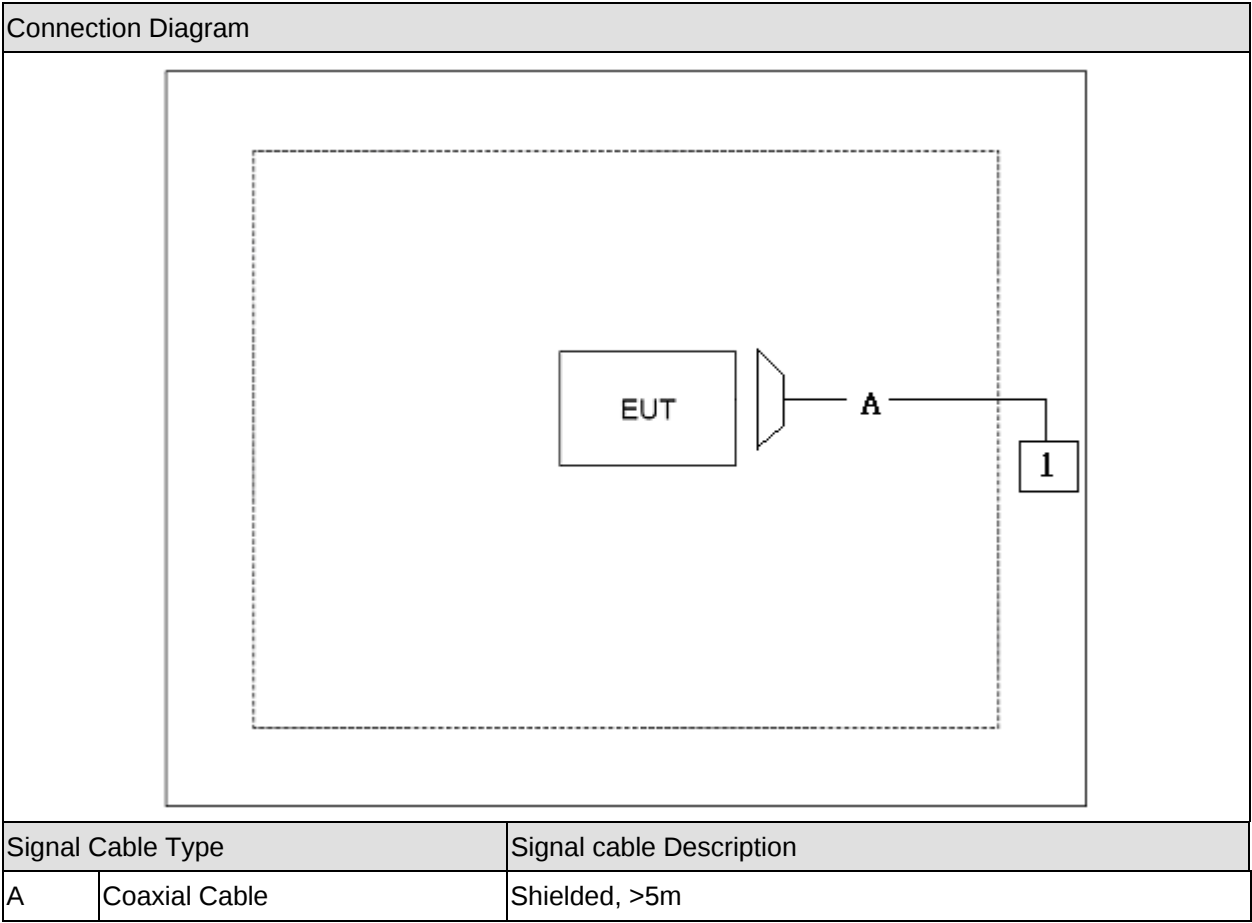
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. For portable device, radiated spurious emission was verified over X, Y, Z Axis, and shown the worst case on this report.
3. This device is a composite device in accordance with Part 15 Subpart B regulations. The report number is 136S045R-IT-US-P01V01.

1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Bluetooth Tester	Anritsu	MT8852B	SUA0500090	Non-Shielded, 1.8m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of equipment.
3	EUT communicate with Bluetooth Tester, then select test mode and channel to test

2. Technical Test

2.1. Summary of Test Result

- ☒ No deviations from the test standards
- ☐ Deviations from the test standards as below description:

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.207	Yes	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.209	Yes	No
20dB Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.247(a)(1)	Yes	No
Carrier Frequency Separation	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.247(a)(1)	Yes	No
Number of Hopping Frequencies	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.247(a)(1)(iii)	Yes	No
Time of Occupancy (Dwell Time)	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.247(a)(1)(iii)	Yes	No
Peak Output Power	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.247(b)(1)	Yes	No
Band-edge Compliance of RF Conducted Emissions	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.215(c), 15.247(d)	Yes	No
Spurious RF Conducted Emissions	FCC CFR Title 47 Part 15 Subpart C: 2012 15.247(d)	Yes	No
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart C: 2012 15.247(d)	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

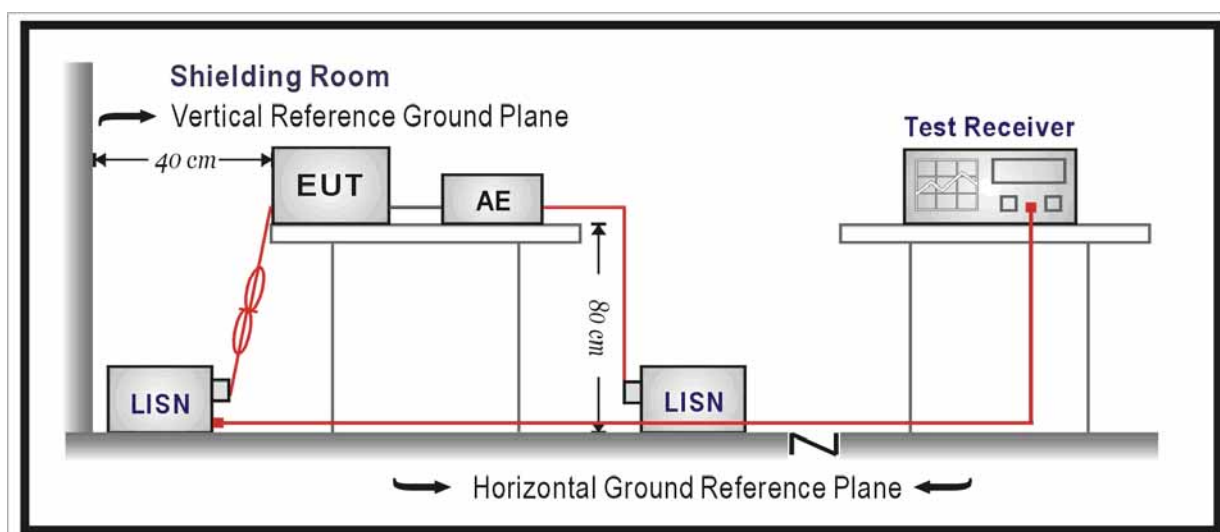
3.1. Test Equipment

Conducted Emission / TR-1

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100726	2014.03.30
Two-Line V-Network	R&S	ENV216	100043	2014.03.30
Two-Line V-Network	R&S	ENV216	100044	2013.09.17
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2014.03.01
50ohm Termination	SHX	TF2	07081401	2013.09.17
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2014.01.10

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

According to FCC ANSI C63.4: 2009 & ANSI C63.10: 2009.

The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

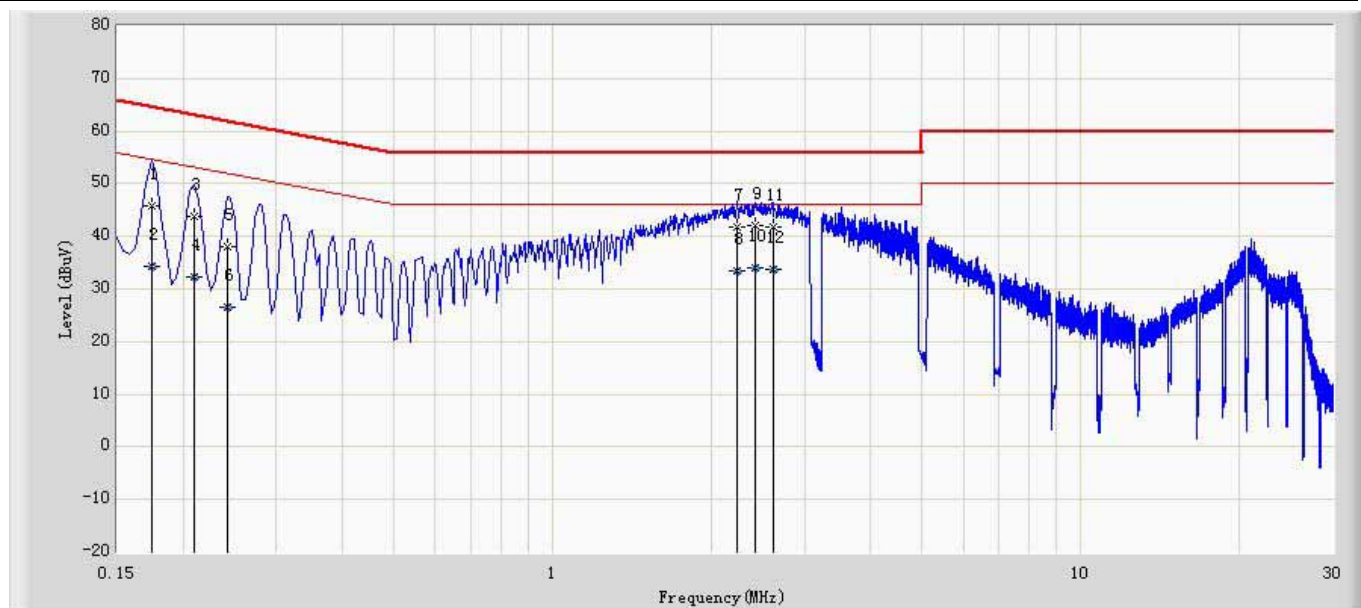
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

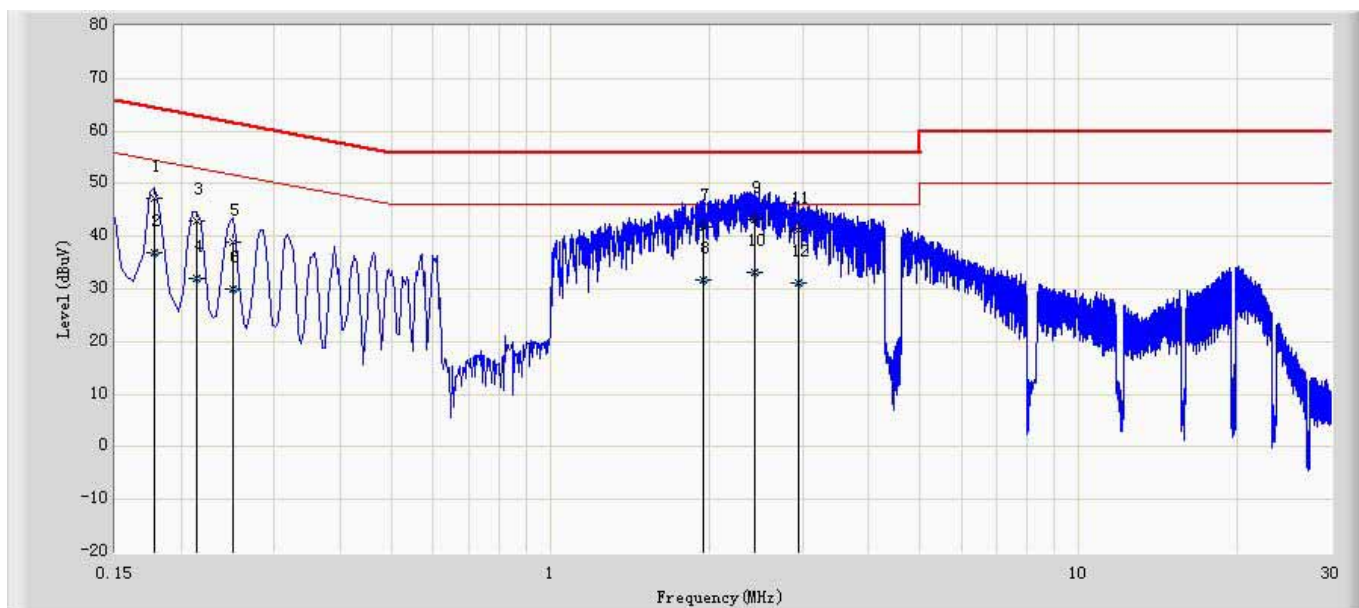
3.6. Test Result

Engineer: Jack	
Site: TR1	Time: 2013/07/23 - 13:03
Limit: FCC_Part15.207_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Line
EUT: WCDMA Digital Mobile Phone	Power: AC 230V/50Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.174	45.860	36.035	-18.907	64.767	9.825	QP
2		0.174	34.411	24.587	-20.356	54.767	9.825	AV
3		0.210	43.736	33.927	-19.469	63.205	9.810	QP
4		0.210	32.318	22.508	-20.888	53.205	9.810	AV
5		0.242	38.146	28.327	-23.881	62.027	9.819	QP
6		0.242	26.631	16.812	-25.396	52.027	9.819	AV
7		2.234	41.823	32.025	-14.177	56.000	9.797	QP
8		2.234	33.428	23.631	-12.572	46.000	9.797	AV
9		2.414	42.190	32.381	-13.810	56.000	9.808	QP
10	*	2.414	33.984	24.176	-12.016	46.000	9.808	AV
11		2.622	41.698	31.871	-14.302	56.000	9.827	QP
12		2.622	33.745	23.918	-12.255	46.000	9.827	AV

Engineer: Jack	
Site: TR1	Time: 2013/07/23 - 13:10
Limit: FCC_Part15.207_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Neutral
EUT: WCDMA Digital Mobile Phone	Power: AC 230V/50Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.178	47.339	37.418	-17.240	64.578	9.921	QP
2		0.178	36.795	26.874	-17.784	54.578	9.921	AV
3		0.214	42.821	32.960	-20.228	63.049	9.860	QP
4		0.214	32.058	22.198	-20.990	53.049	9.860	AV
5		0.250	39.040	29.154	-22.717	61.757	9.887	QP
6		0.250	30.126	20.240	-21.631	51.757	9.887	AV
7		1.950	41.721	31.752	-14.279	56.000	9.969	QP
8		1.950	31.852	21.883	-14.148	46.000	9.969	AV
9		2.442	43.181	33.200	-12.819	56.000	9.981	QP
10	*	2.442	33.281	23.300	-12.719	46.000	9.981	AV
11		2.958	41.300	31.300	-14.700	56.000	10.000	QP
12		2.958	31.100	21.100	-14.900	46.000	10.000	AV

4. Radiated Emission

4.1. Test Equipment

Radiated Emission / AC-2

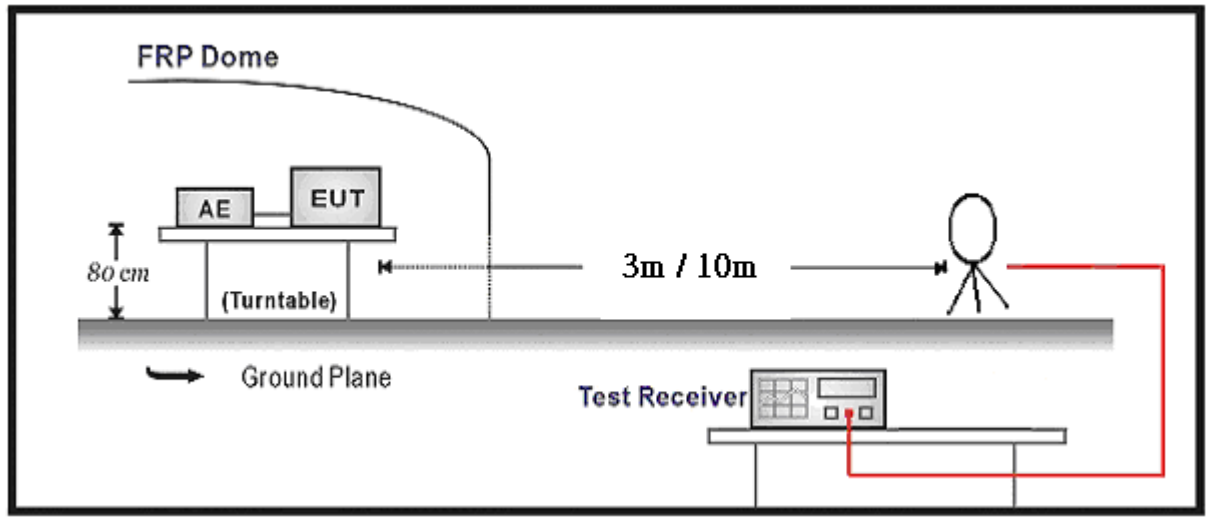
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2014.04.30
Loop Antenna	R&S	HFH2-Z2	833799/003	2013.11.17
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2013.10.15
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2014.03.01
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2014.01.09

Radiated Emission / AC-5

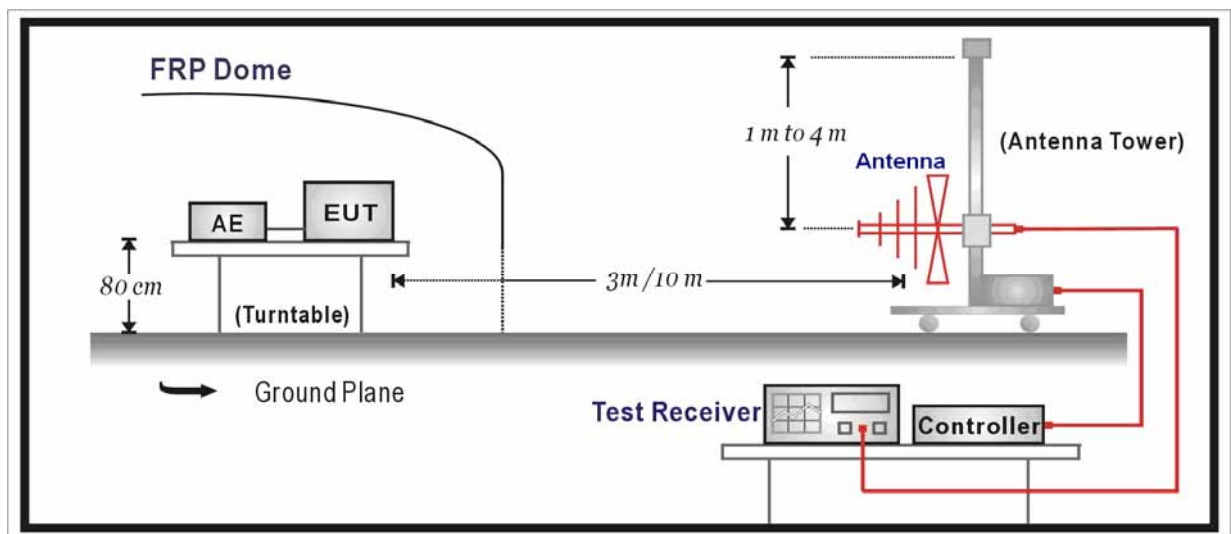
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2014.03.30
Preamplifier	Miteq	NSP1800-25	1364185	2014.05.03
Preamplifier	Quietek	AP-040G	CHM-0906001	2014.05.03
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2013.10.15
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2013.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2013.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2014.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2014.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2014.03.01
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2014.01.11

4.2. Test Setup

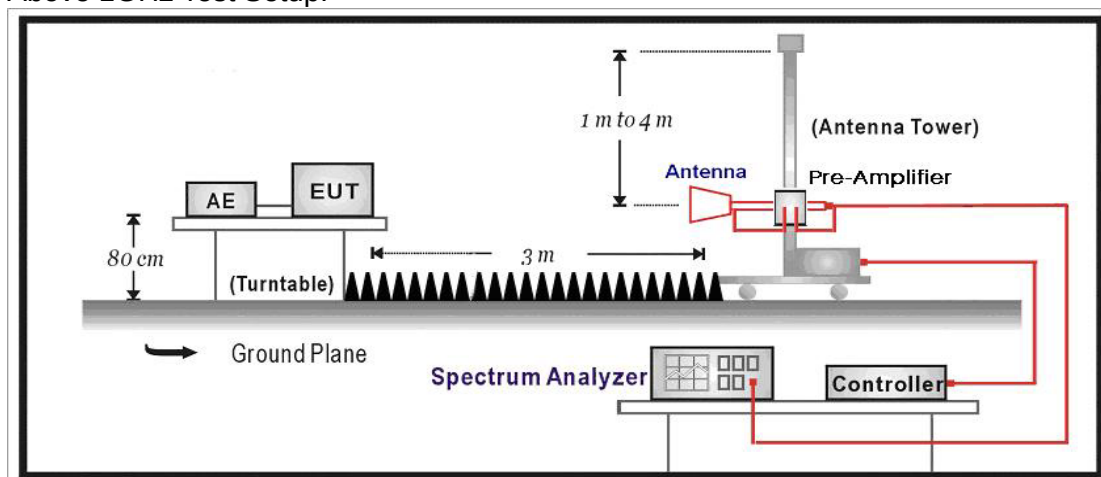
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Distance (m)	Level (dBuV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.

Note 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.

Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m)

4.4. Test Procedure

According to ANSI C63.10: 2009.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4: 2009 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

The frequency range from 30MHz to 10th harmonic is checked.

Note: When doing emission measurement above 1GHz, the horn antenna will be bended down a little (as horn antenna has the narrow beamwidth) in order to keeping the antenna in the “cone of radiation” of EUT. The 3dB beamwidth is 60~10 degrees for H-plane and 90~10 degrees for E-plane.

4.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB
below 1G is defined as ± 3.8 dB

4.6. Test Result

All of the test result shown indicates the worst case, and spectrum analyzer parameters setting as shown below:

Peak detector: RBW = 1MHz, VBW = 3MHz, sweep time = 200ms;

Average detector: RBW = 1MHz, VBW = 10Hz, sweep time = auto.

Measure Level = Reading Level + Cable Loss + Antenna Factor – Preamplifier Gain

Mode 1: Transmitter-1Mbps(GFSK_DH5)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
0	H	4804.0	42.1	2.6	44.7	54(Note2)	-9.3	PK
	V	4824.0	42.3	2.6	44.9	54(Note2)	-9.1	PK
	H	7206.0	40.7	8.9	49.6	54(Note2)	-4.4	PK
	V	7206.0	42.0	8.9	50.9	54(Note2)	-3.1	PK
39	H	4882.0	41.5	2.8	44.3	54(Note2)	-9.7	PK
	V	4882.0	41.4	2.8	44.2	54(Note2)	-9.8	PK
	H	7323.0	41.3	8.9	50.2	54(Note2)	-3.8	PK
	V	7323.0	41.4	8.9	50.3	54(Note2)	-3.7	PK
78	H	4960.0	41.3	3.2	44.5	54(Note2)	-9.5	PK
	V	4944.0	44.4	3.1	47.5	54(Note2)	-6.5	PK
	H	7440.0	41.3	8.8	50.1	54(Note2)	-3.9	PK
	V	7440.0	41.8	8.8	50.6	54(Note2)	-3.4	PK

Note 1: The test trace is same as the ambient noise (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), therefore no data appear in the report.

2: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Mode 2: Transmitter-2Mbps(Pi/4 DQPSK _DH5)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
0	H	4804.0	41.2	2.6	43.8	54(Note2)	-10.2	PK
	V	4804.0	41.6	2.6	44.2	54(Note2)	-9.8	PK
	H	7206.0	40.6	8.9	49.5	54(Note2)	-4.5	PK
	V	7206.0	40.8	8.9	49.7	54(Note2)	-4.3	PK
39	H	4882.0	41.6	2.8	44.4	54(Note2)	-9.6	PK
	V	4882.0	41.5	2.8	44.3	54(Note2)	-9.7	PK
	H	7323.0	40.9	8.9	49.8	54(Note2)	-4.2	PK
	V	7323.0	41.2	8.9	50.1	54(Note2)	-3.9	PK
78	H	4960.0	41.1	3.2	44.3	54(Note2)	-9.7	PK
	V	4960.0	40.5	3.2	43.7	54(Note2)	-10.3	PK
	H	7440.0	41.1	8.8	49.9	54(Note2)	-4.1	PK
	V	7440.0	41.0	8.8	49.8	54(Note2)	-4.2	PK

Note 1: The test trace is same as the ambient noise (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), therefore no data appear in the report.

2: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Mode 3: Transmitter-3Mbps(8DPSK_DH5)

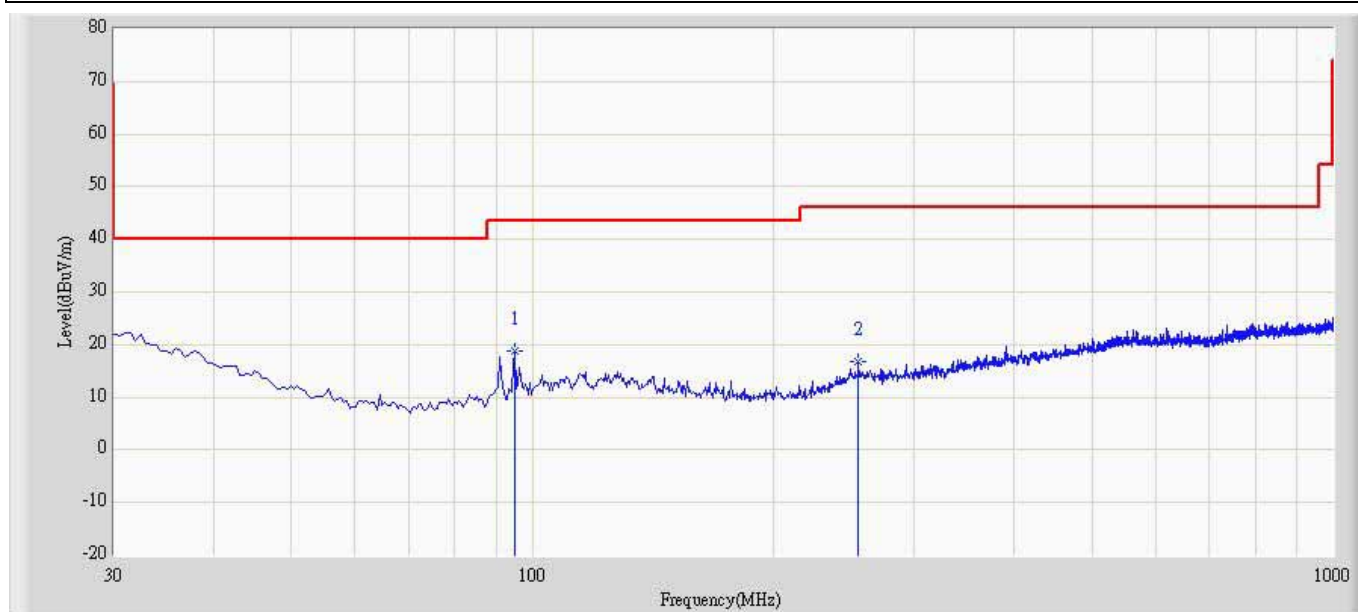
CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
0	H	4804.0	42.2	2.6	44.8	54(Note2)	-9.2	PK
	V	4804.0	41.2	2.6	43.8	54(Note2)	-10.2	PK
	H	7206.0	40.2	8.9	49.1	54(Note2)	-4.9	PK
	V	7206.0	40.1	8.9	49.0	54(Note2)	-5.0	PK
39	H	4882.0	41.1	2.8	43.9	54(Note2)	-10.1	PK
	V	4882.0	41.2	2.8	44.0	54(Note2)	-10.0	PK
	H	7323.0	40.6	8.9	49.5	54(Note2)	-4.5	PK
	V	7323.0	41.6	8.9	50.5	54(Note2)	-3.5	PK
78	H	4944.0	43.9	3.1	47.0	54(Note2)	-7.0	PK
	V	4960.0	41.4	3.2	44.6	54(Note2)	-9.4	PK
	H	7440.0	41.2	8.8	50.0	54(Note2)	-4.0	PK
	V	7440.0	41.4	8.8	50.2	54(Note2)	-3.8	PK

Note 1: The test trace is same as the ambient noise (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), therefore no data appear in the report.

2: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

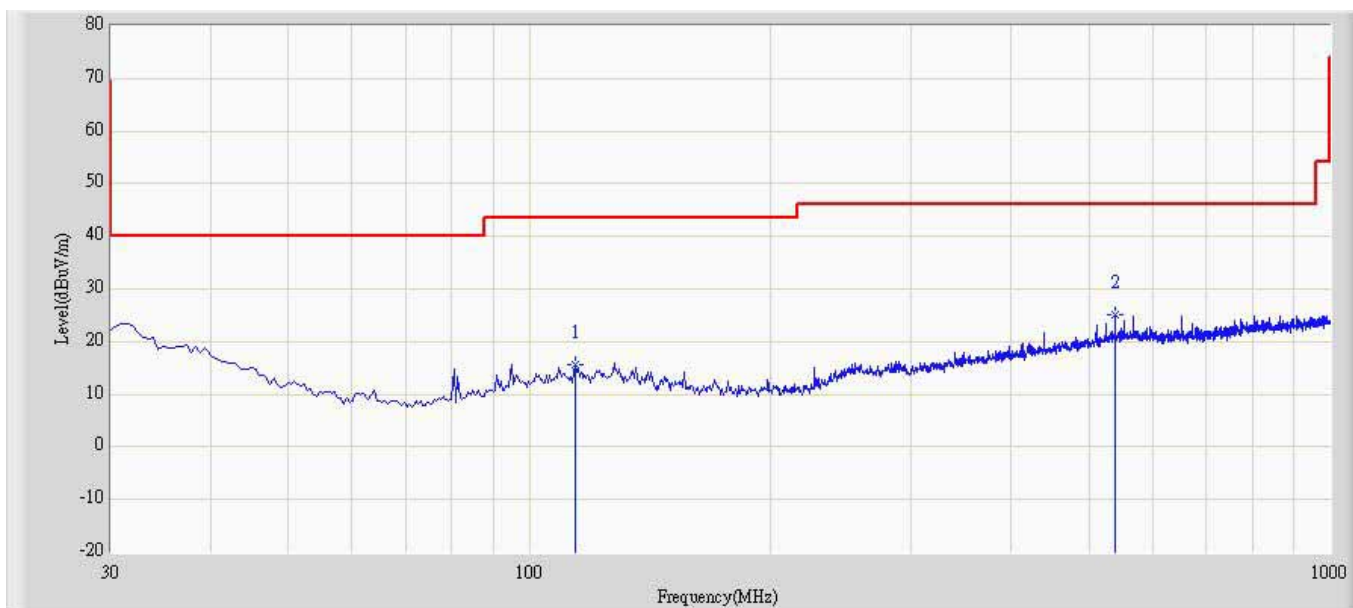
The worst case of Radiated Emission below 1GHz:

Engineer: Milo	
Site: AC2	Time: 2013/07/10 - 14:56
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: CBL6112D_(30-2000MHz)	Polarity: Horizontal
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7VV
Note: Mode1: Transmit channel 2480MHz by DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	94.990	18.717	8.038	-24.783	43.500	10.679	QP
2		255.525	16.892	2.401	-29.108	46.000	14.491	QP

Engineer: Milo	
Site: AC2	Time: 2013/07/10 - 15:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: CBL6112D_(30-2000MHz)	Polarity: Vertical
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7VV
Note: Mode1: Transmit channel 2480MHz by DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		113.905	15.665	2.990	-27.835	43.500	12.675	QP
2	*	539.250	25.255	4.343	-20.745	46.000	20.912	QP

5. 20dB Bandwidth

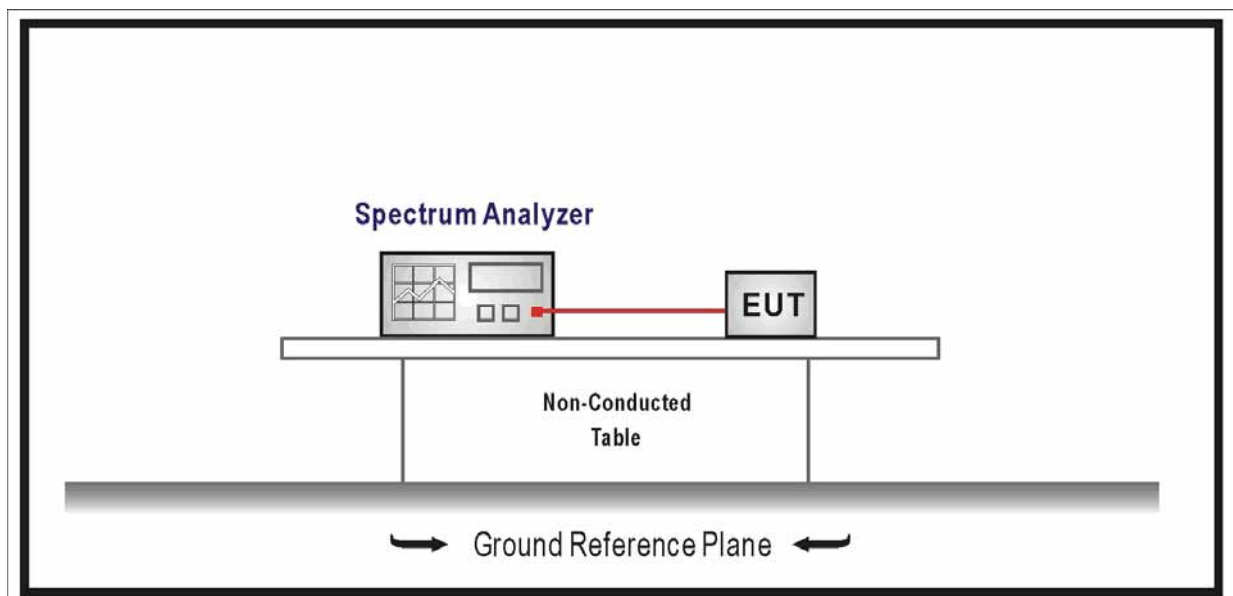
5.1 Test Equipment

20dB Bandwidth / TR8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2014.01.21
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2014.05.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2 Test Setup



5.3 Limit

- For frequency hopping systems operating in 2400-2483.5 MHz band, no limitation.
- For frequency hopping systems operating in 902-928 MHz band, the maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.
- For frequency hopping systems operating in 5725-5850 MHz band, the maximum 20 dB bandwidth of the hopping channel is 1 MHz.

5.4 Test Procedure

According to ANSI C63.10: 2009.

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel

RBW $\geq$ 1% of the 20dB bandwidth

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize.

Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

5.5 Uncertainty

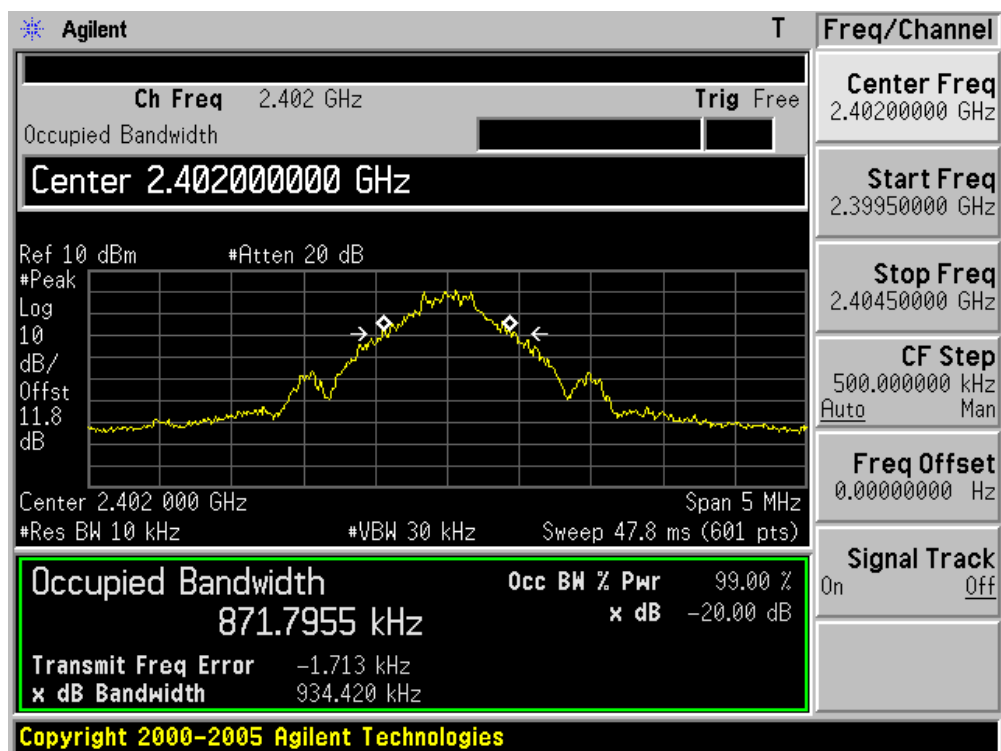
The measurement uncertainty is defined as ± 1 kHz

5.6 Test Result

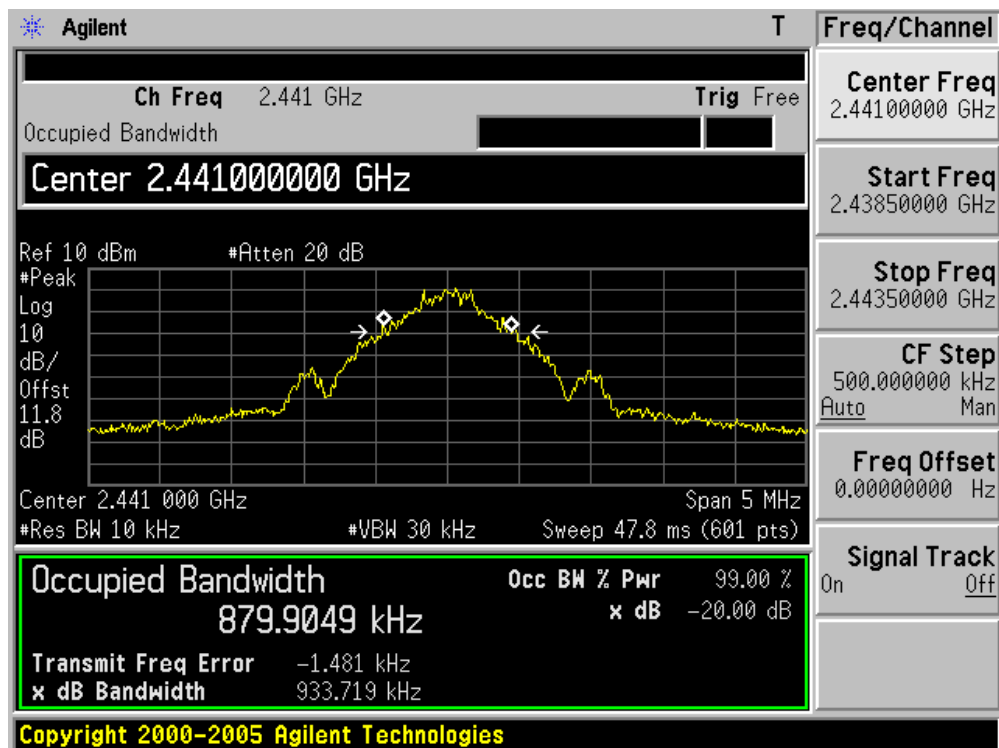
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmitter-1Mbps (GFSK_DH5)

Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
00	2402	934.4	871.8
39	2441	933.7	879.9
78	2480	933.5	874.6

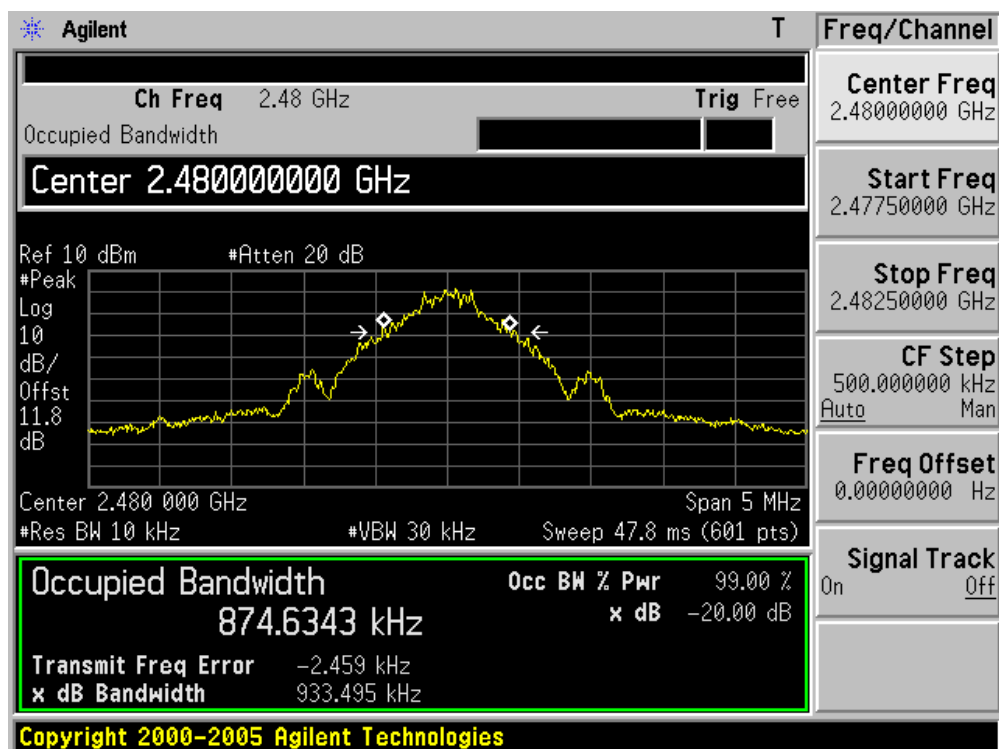
Channel 00 (2402MHz)



Channel 39 (2441MHz)



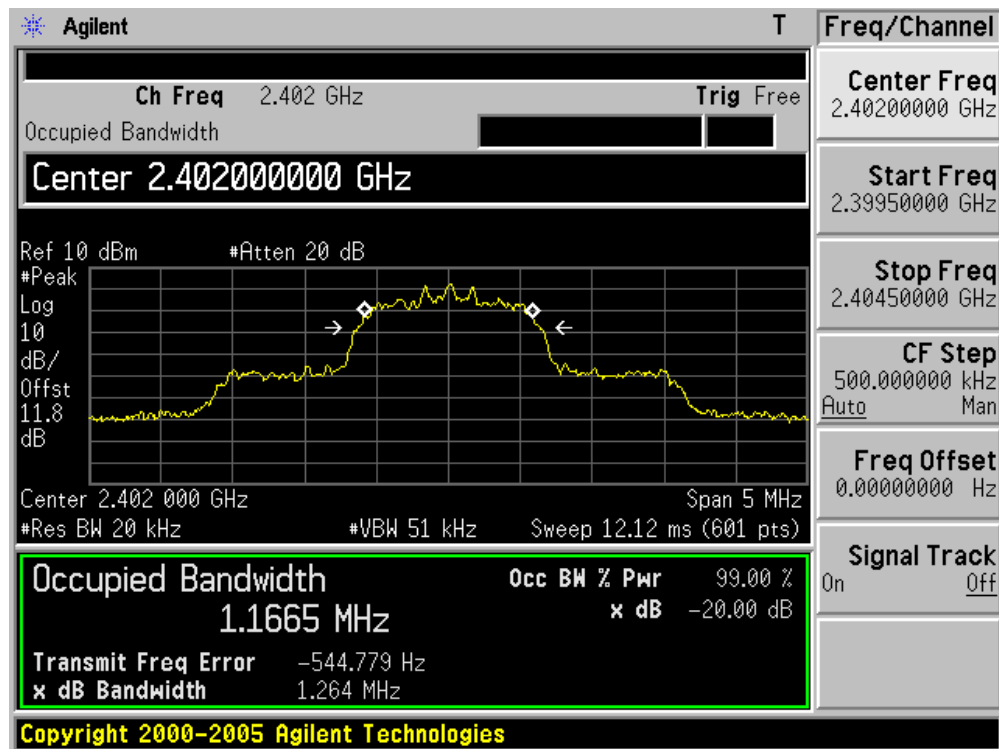
Channel 78 (2480MHz)



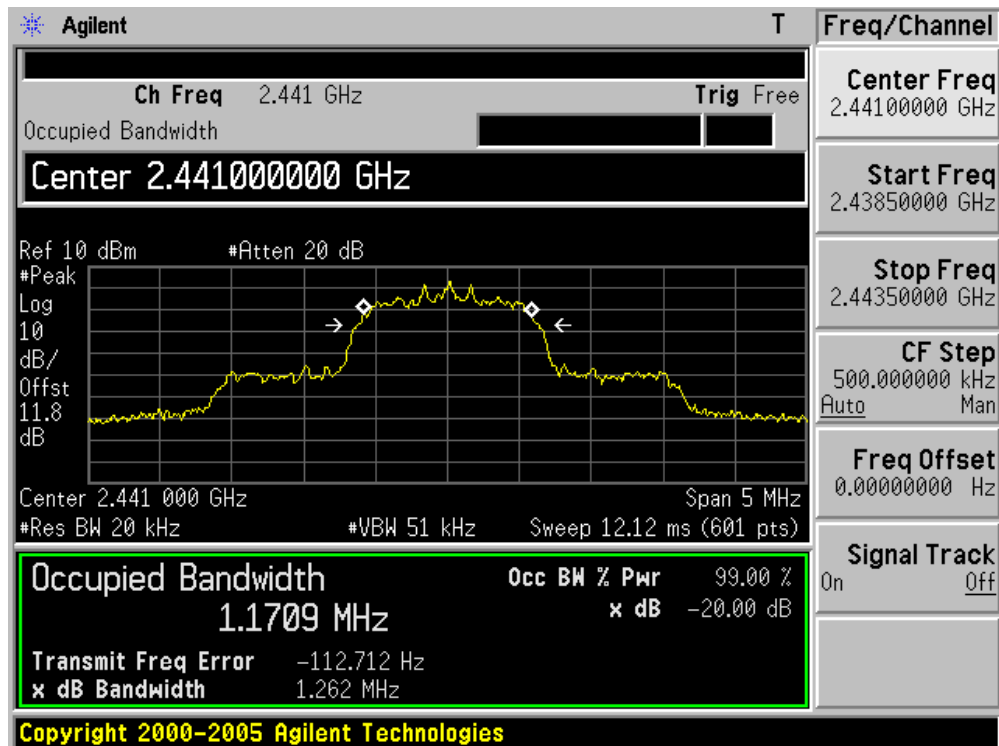
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmitter-2Mbps (Pi/4 DQPSK_DH5)

Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
00	2402	1264.0	1166.5
39	2441	1262.0	1170.9
78	2480	1261.0	1169.8

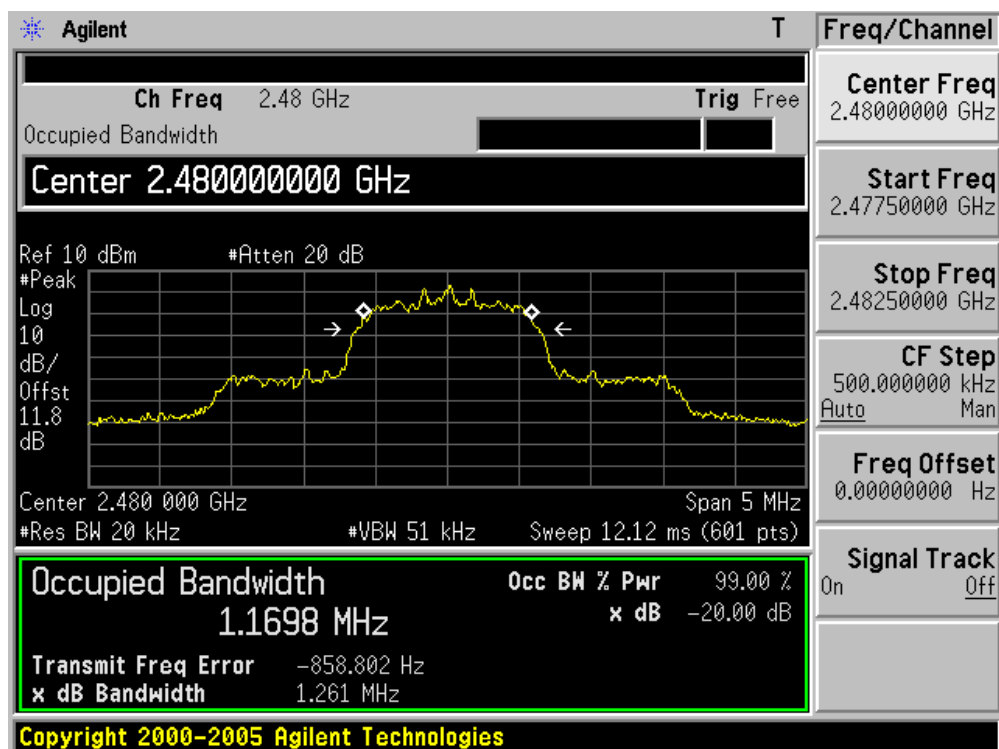
Channel 00 (2402MHz)



Channel 39 (2441MHz)



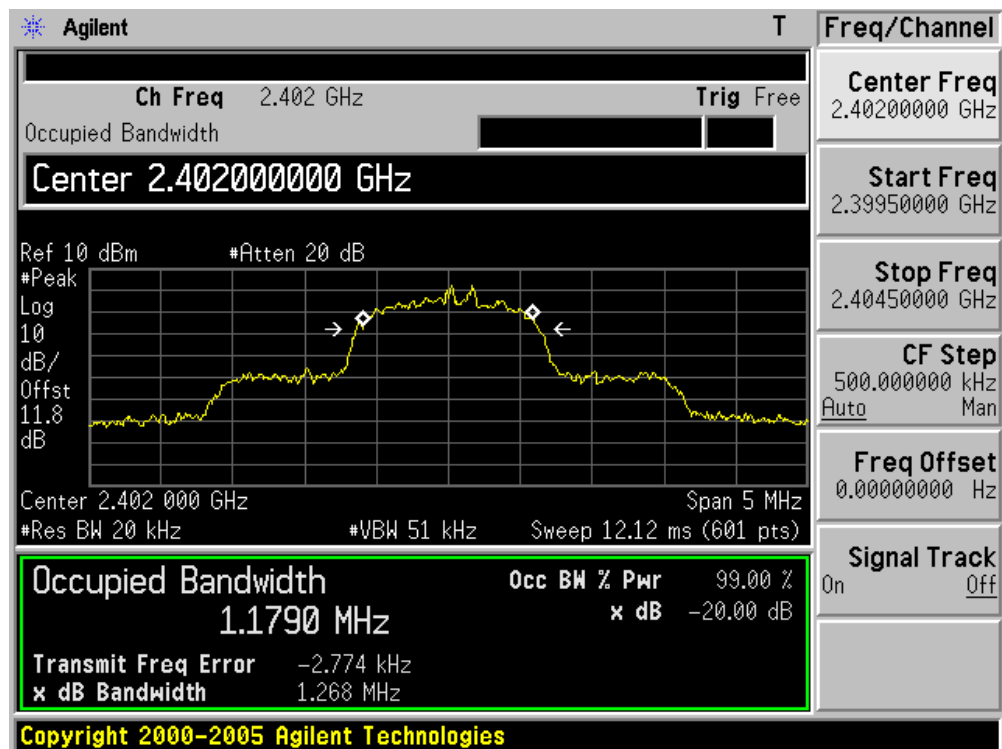
Channel 78 (2480MHz)



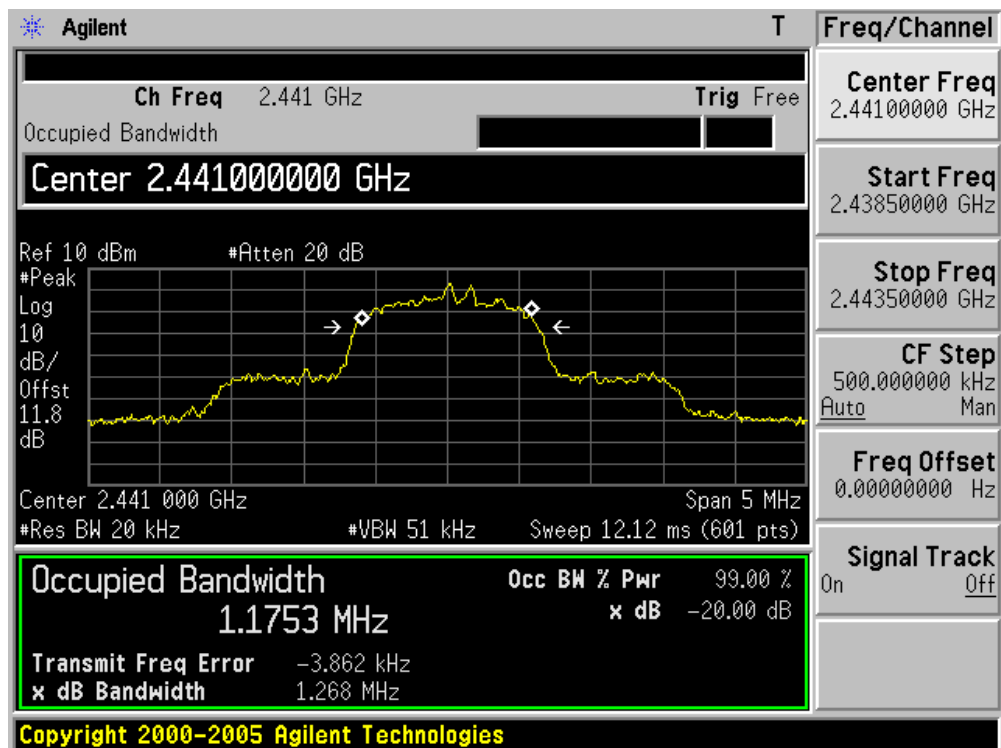
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmitter-3Mbps (8DPSK_DH5)

Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
00	2402	1268.0	1179.0
39	2441	1268.0	1175.3
78	2480	1268.0	1175.5

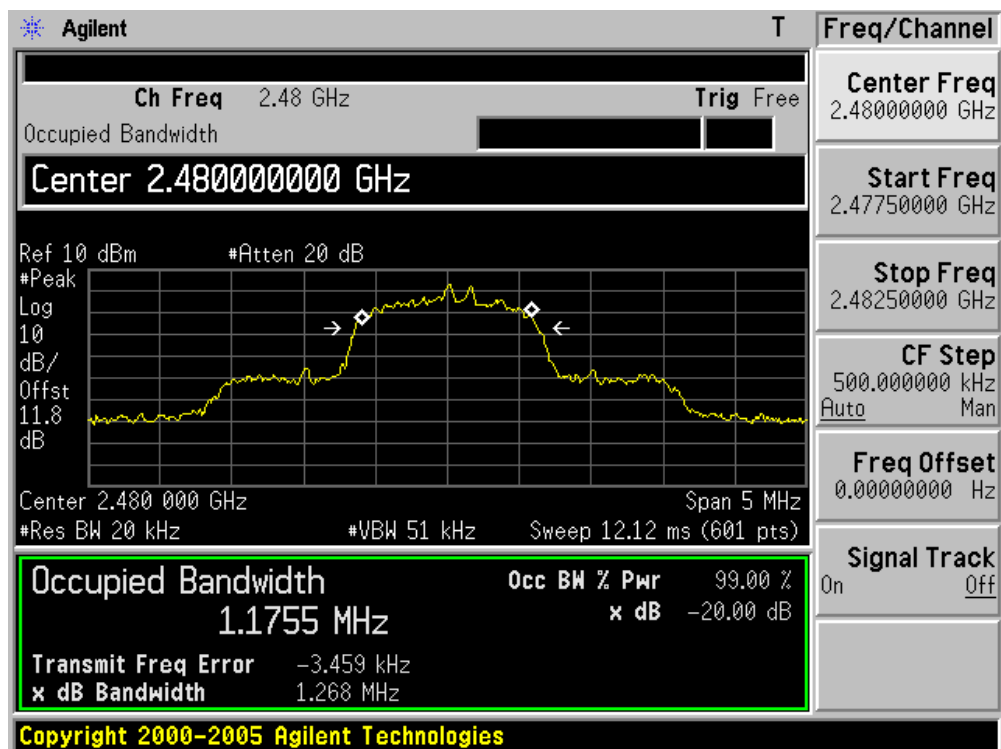
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



6. Carrier Frequency Separation

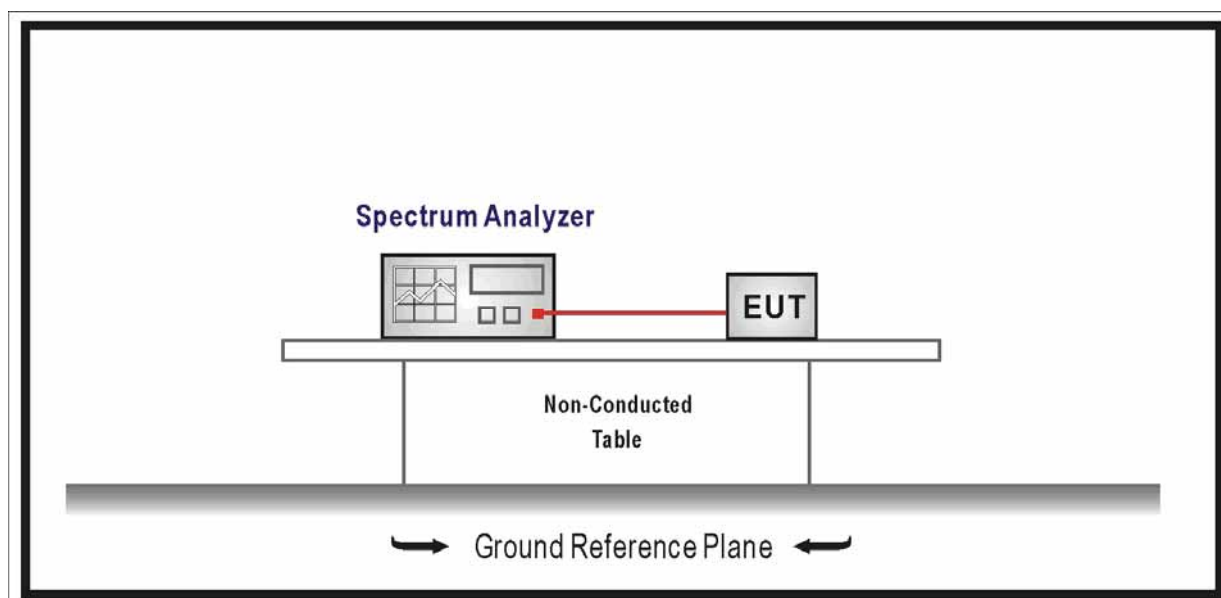
6.1. Test Equipment

Carrier Frequency Separation / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2014.01.21
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2014.05.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

6.2. Test Setup



6.3. Limit

- Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band 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 125mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping

channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

- For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.
- Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

6.4. Test Procedure

According to ANSI C63.10: 2009.

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) Bandwidth (RBW) $\geq$ 1% of the span

Video (or Average) Bandwidth VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

6.5. Uncertainty

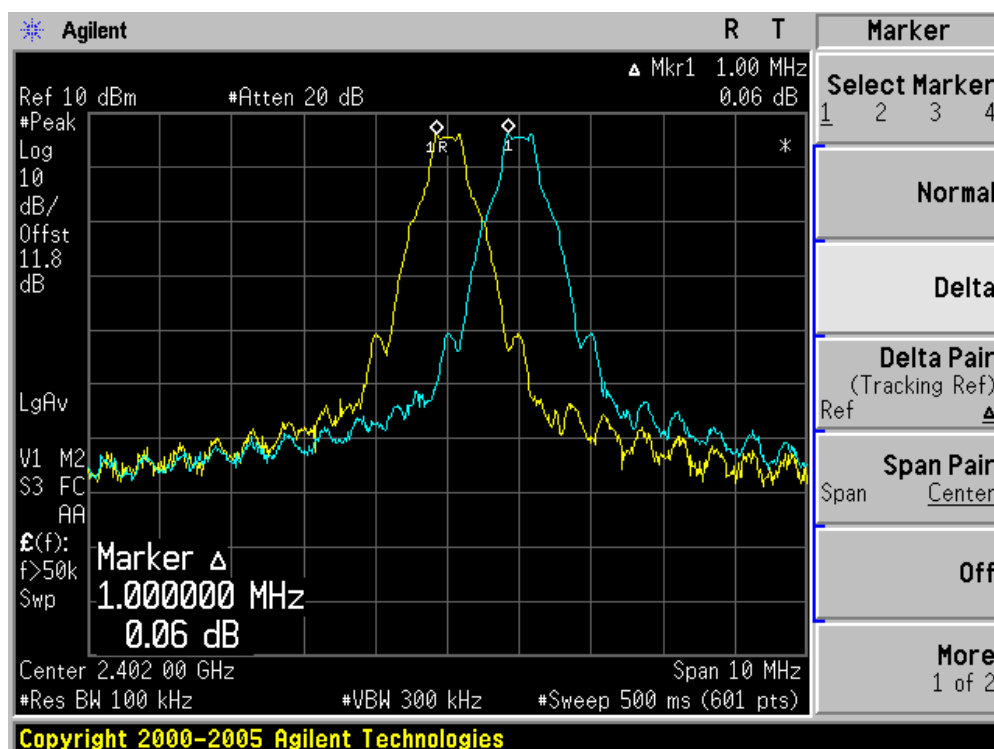
The measurement uncertainty is defined as ± 1 kHz

6.6. Test Result

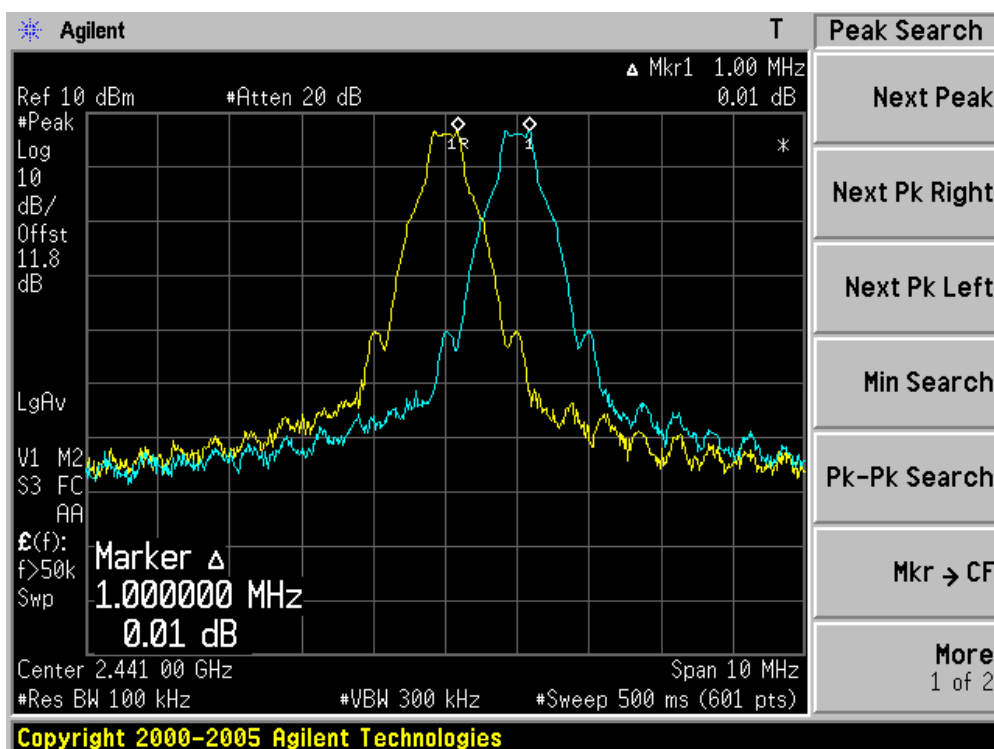
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Carrier Frequency Separation
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmitter-1Mbps (GFSK_DH5)

Channel No.	Frequency (MHz)	Carrier Frequency Separation (kHz)	Limit (kHz)	Result
00	2402	1000	>25 kHz or 2/3 of 20 dB BW	Pass
39	2441	1000	>25 kHz or 2/3 of 20 dB BW	Pass
78	2480	1000	>25 kHz or 2/3 of 20 dB BW	Pass

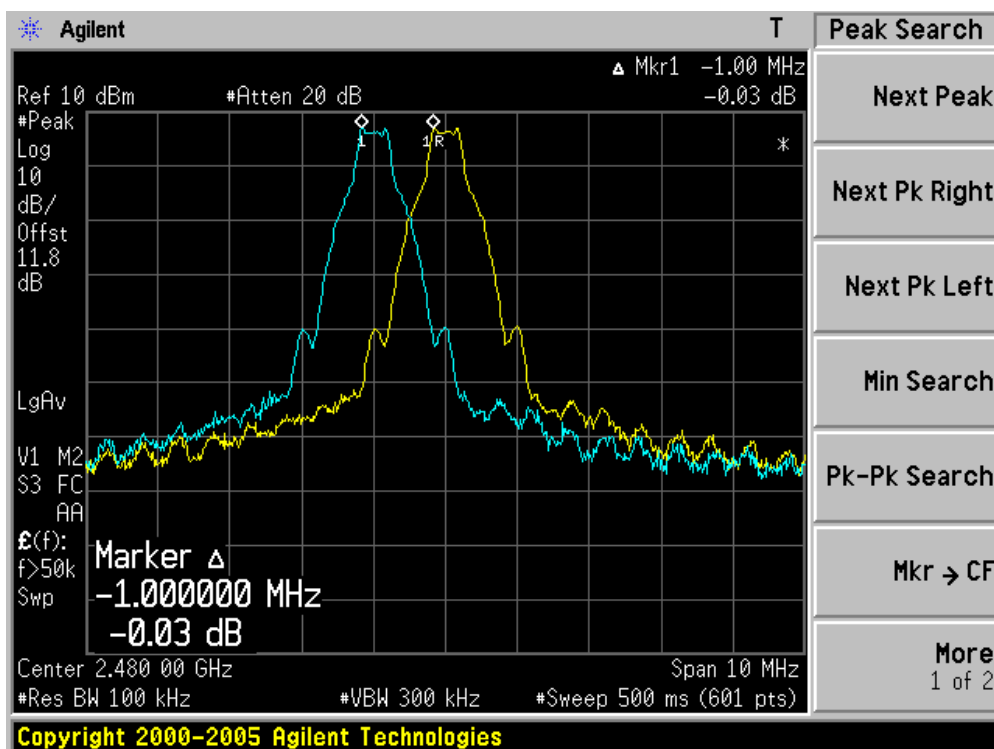
Channel 00 (2402MHz)



Channel 39 (2441MHz)



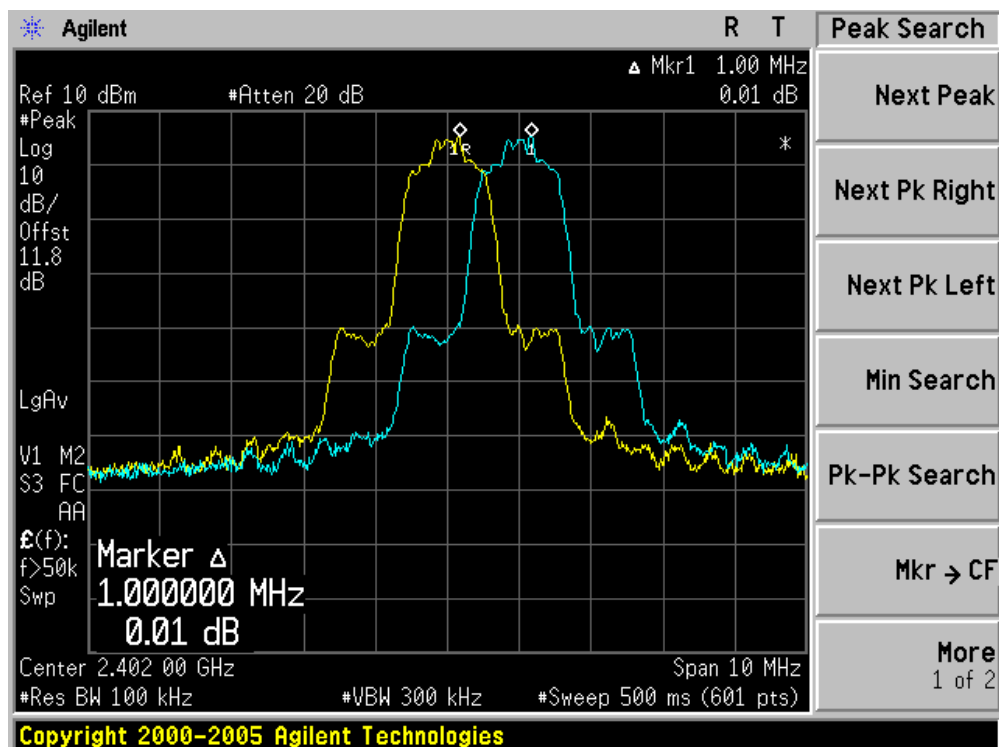
Channel 78 (2480MHz)



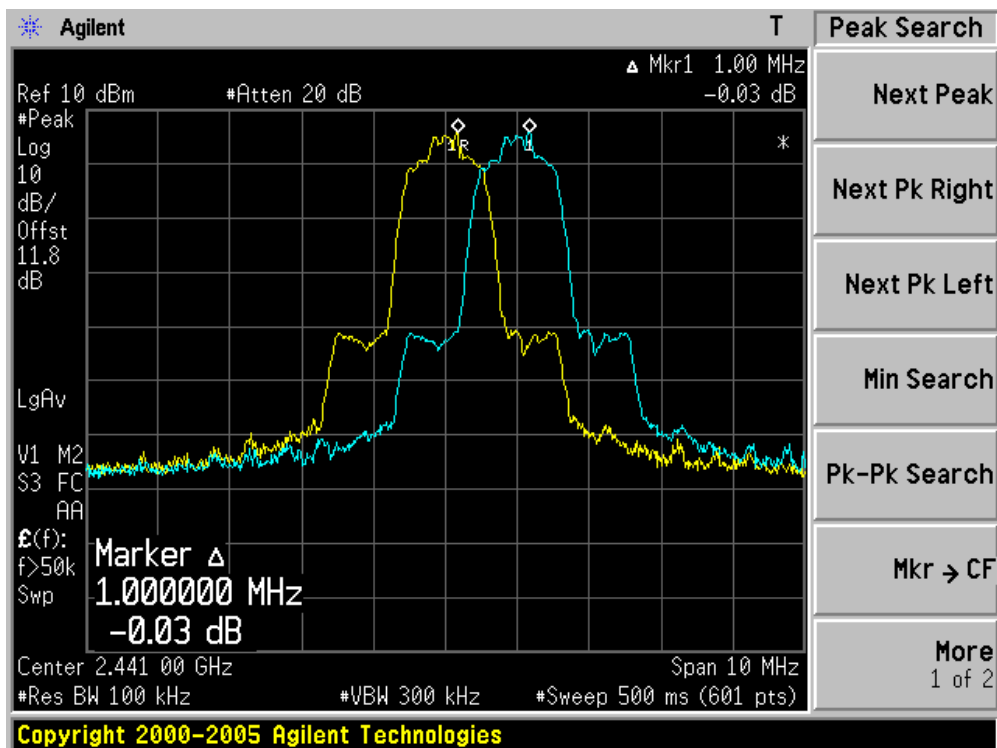
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Carrier Frequency Separation
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmitter-2Mbps (Pi/4 DQPSK_DH5)

Channel No.	Frequency (MHz)	Carrier Frequency Separation (kHz)	Limit (kHz)	Result
00	2402	1000	>25 kHz or 2/3 of 20 dB BW	Pass
39	2441	1000	>25 kHz or 2/3 of 20 dB BW	Pass
78	2480	1000	>25 kHz or 2/3 of 20 dB BW	Pass

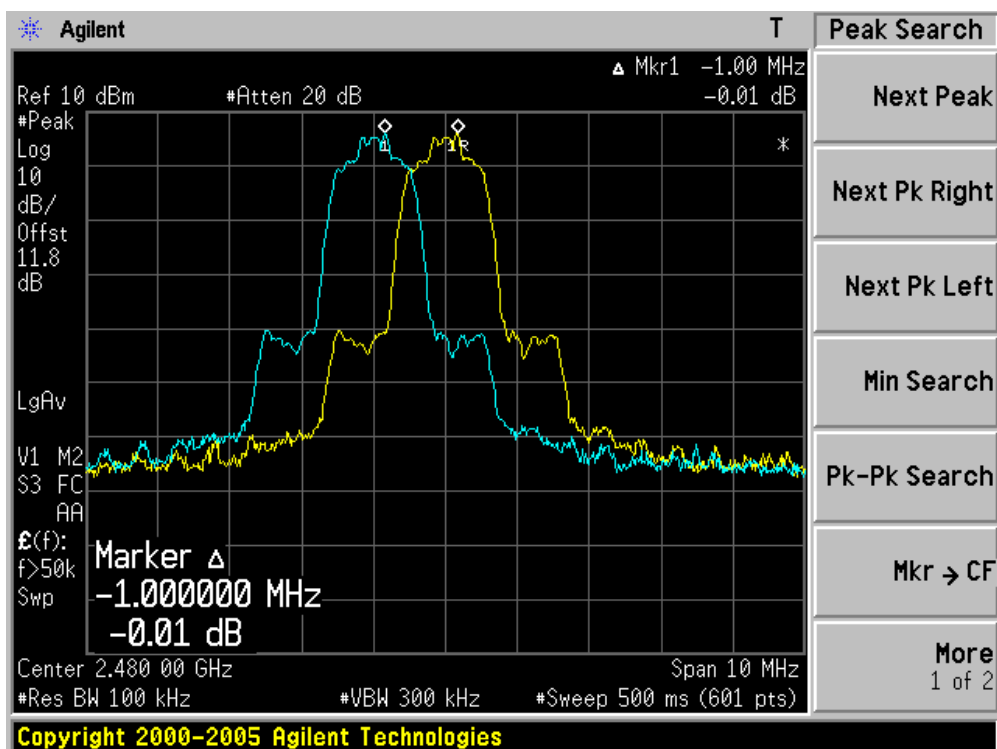
Channel 00 (2402MHz)



Channel 39 (2441MHz)



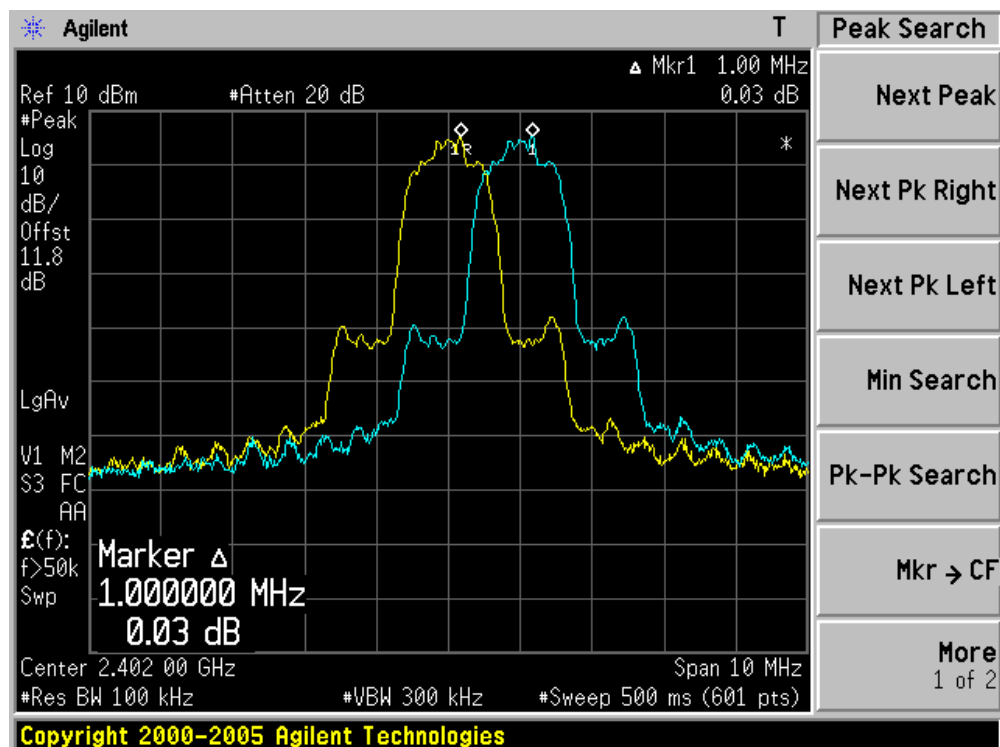
Channel 78 (2480MHz)



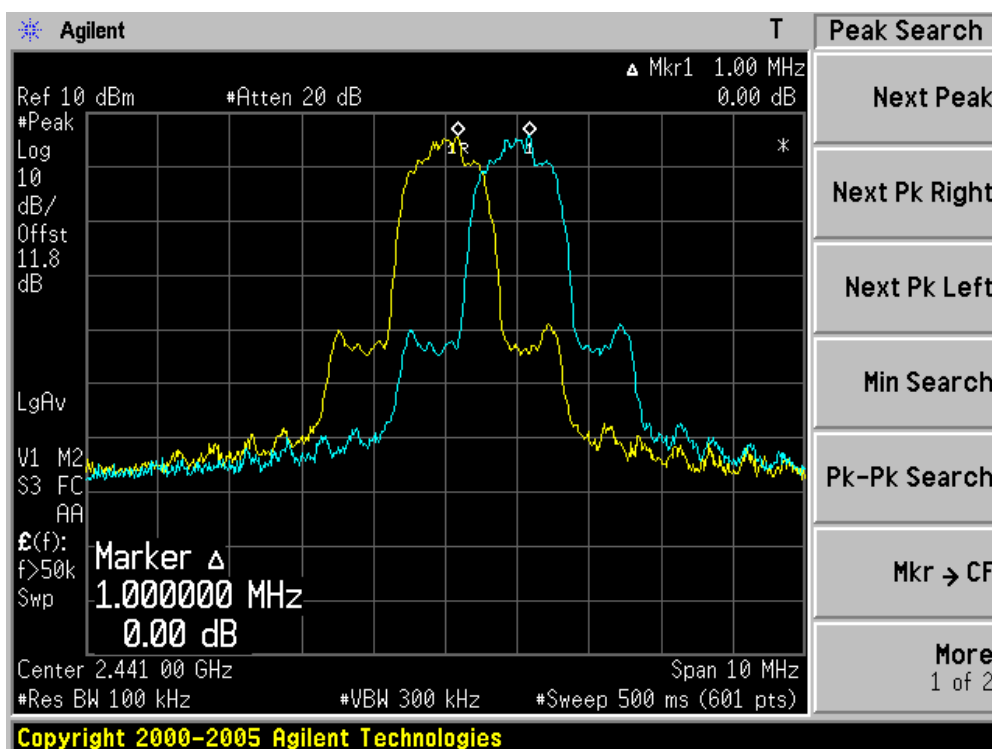
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Carrier Frequency Separation
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmitter-3Mbps (8DPSK_DH5)

Channel No.	Frequency (MHz)	Carrier Frequency Separation (kHz)	Limit (kHz)	Result
00	2402	1000	>25 kHz or 2/3 of 20 dB BW	Pass
39	2441	1000	>25 kHz or 2/3 of 20 dB BW	Pass
78	2480	1000	>25 kHz or 2/3 of 20 dB BW	Pass

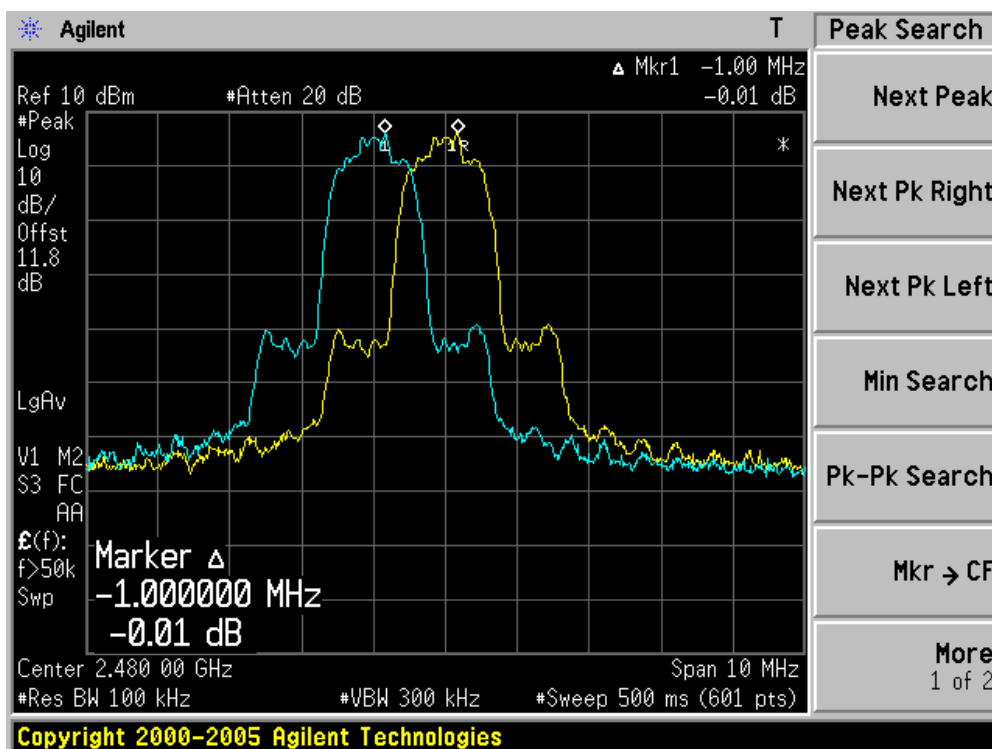
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



7. Number of Hopping Frequencies

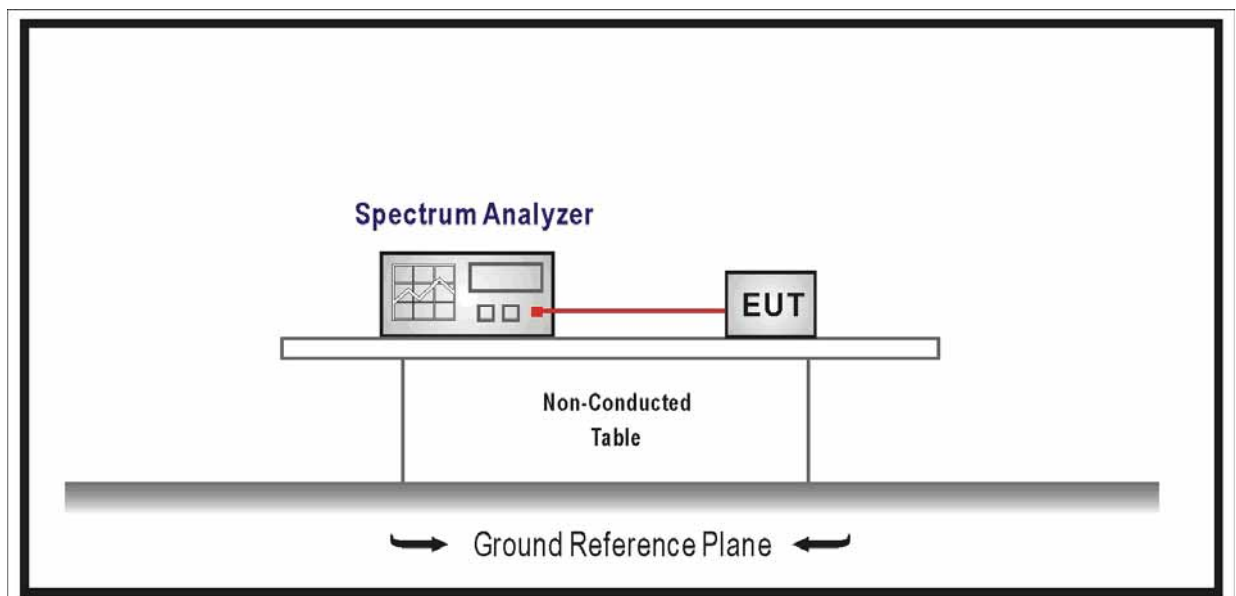
7.1. Test Equipment

Number of Hopping Frequencies / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2014.01.21
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2014.05.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

7.2. Test Setup



7.3. Limit

- For frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 hopping frequencies.
- For frequency hopping systems operating in 902-928 MHz band shall use at least 50 hopping frequencies.
- For frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies.

7.4. Test Procedure

According to ANSI C63.10: 2009.

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = the frequency band of operation

RBW $\geq$ 1% of the span

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. It may prove necessary to bread the span up to sections, in order to clearly show all of the hopping frequencies.

7.5. Uncertainty

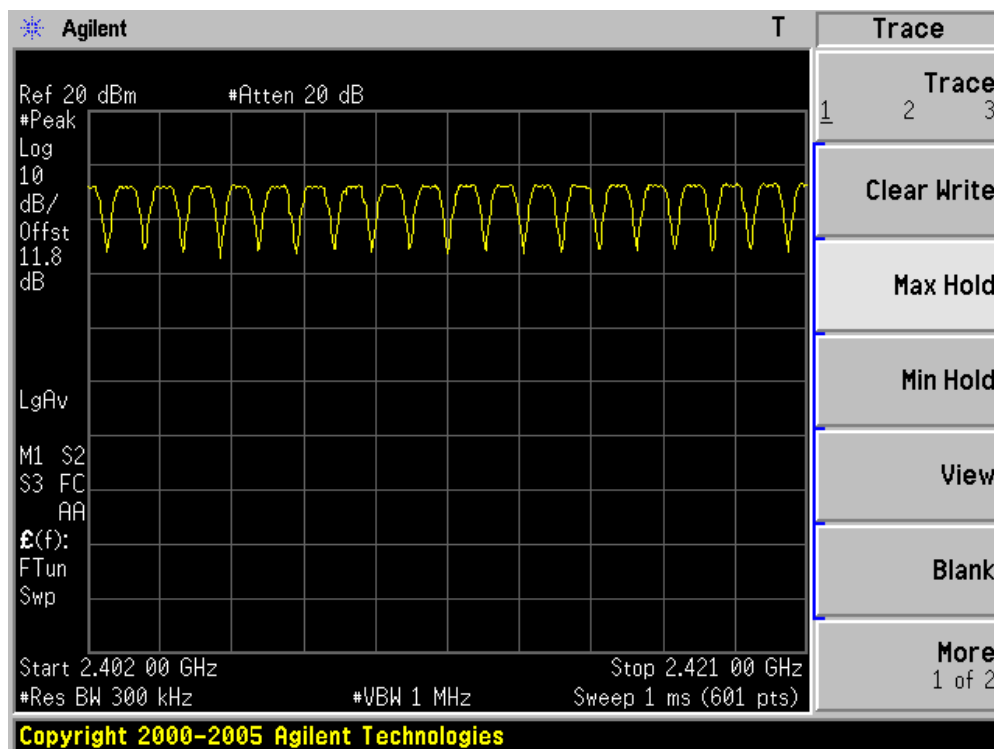
The measurement uncertainty is defined as ± 1 kHz

7.6. Test Result

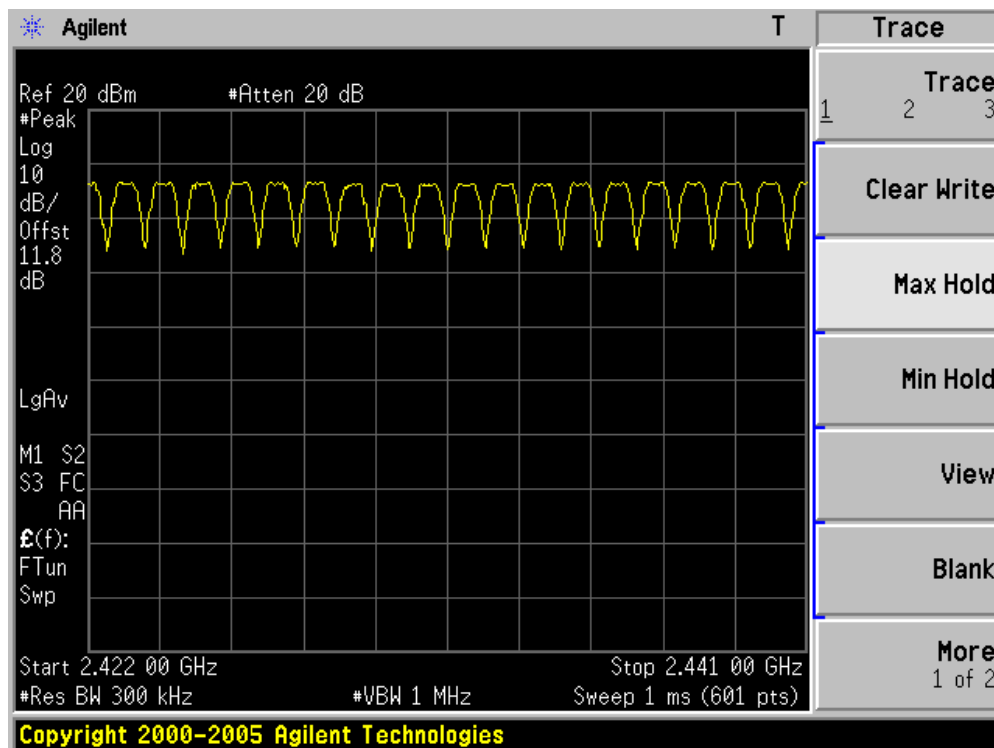
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Number of Hopping Frequencies
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmitter-1Mbps (GFSK_DH5)

Frequency Band (MHz)	Number of Hopping Frequencies	Limit	Result
2400 - 2483.5	79	>15	Pass

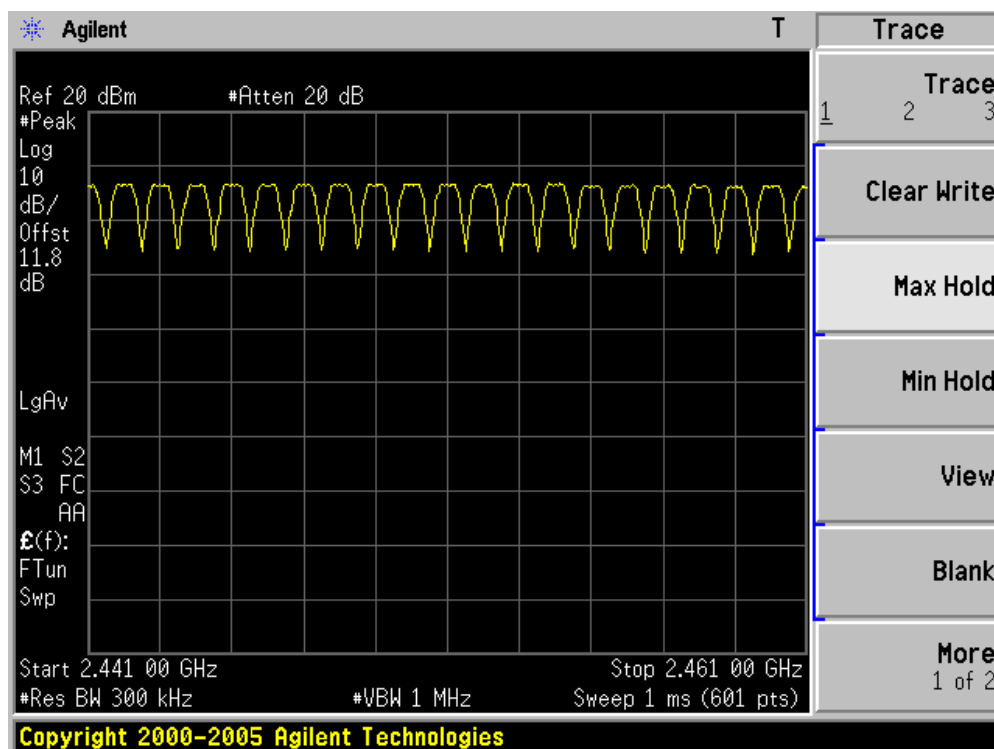
2402 - 2421 MHz



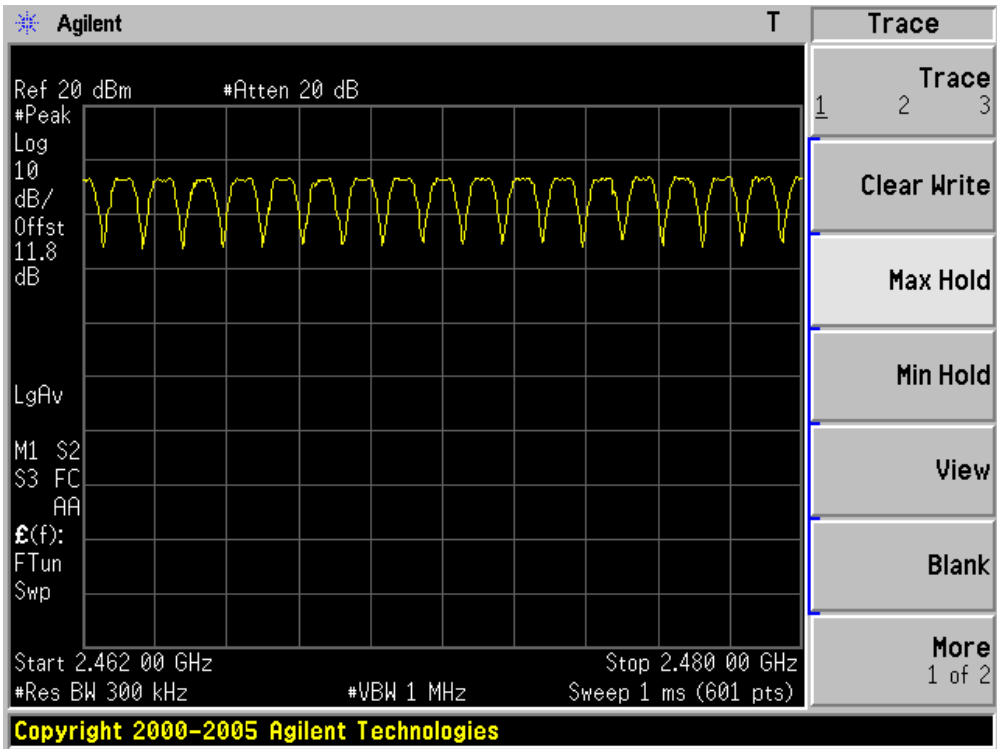
2422 - 2441 MHz



2442 - 2461 MHz



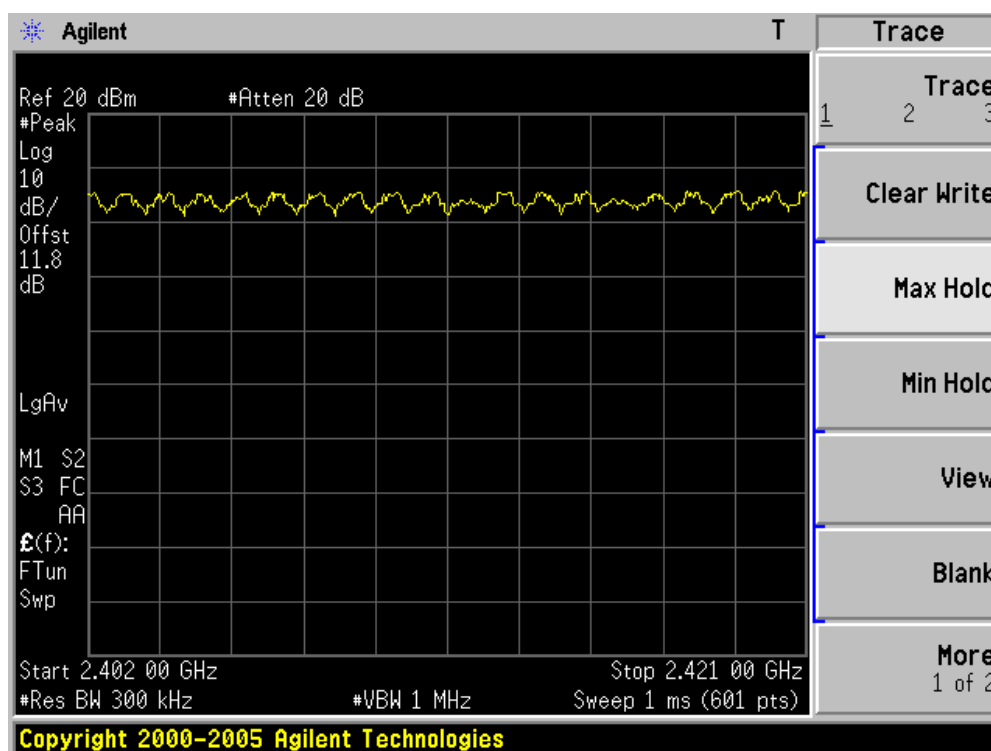
2462 - 2480 MHz



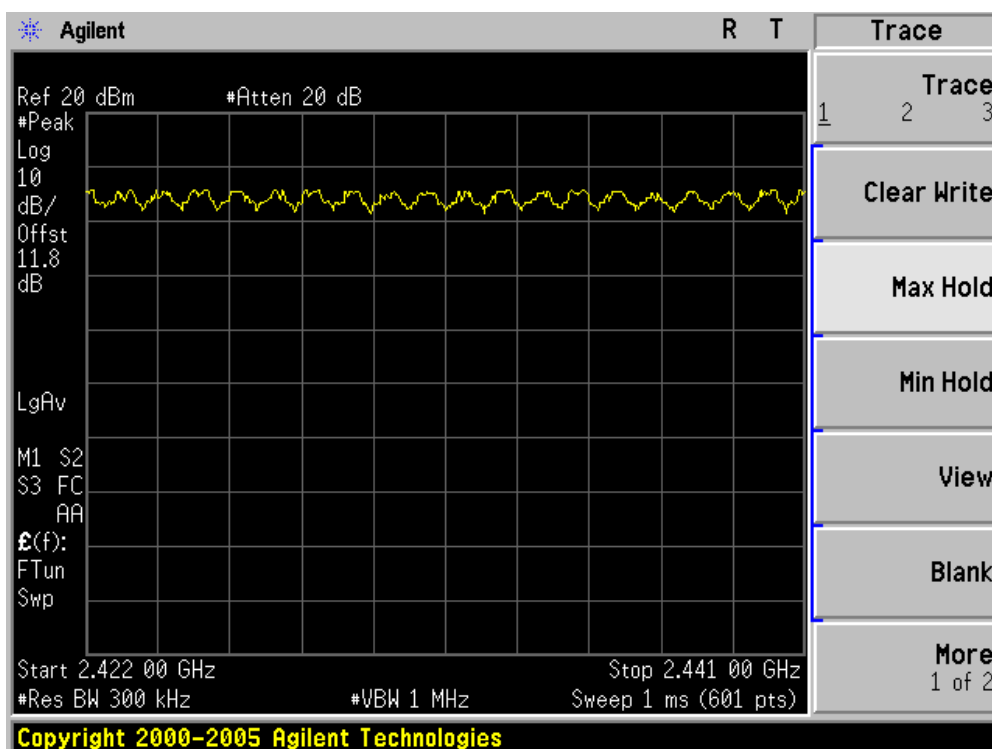
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Number of Hopping Frequencies
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmitter-2Mbps (Pi/4 DQPSK_DH5)

Frequency Band (MHz)	Number of Hopping Frequencies	Limit	Result
2400 - 2483.5	79	>15	Pass

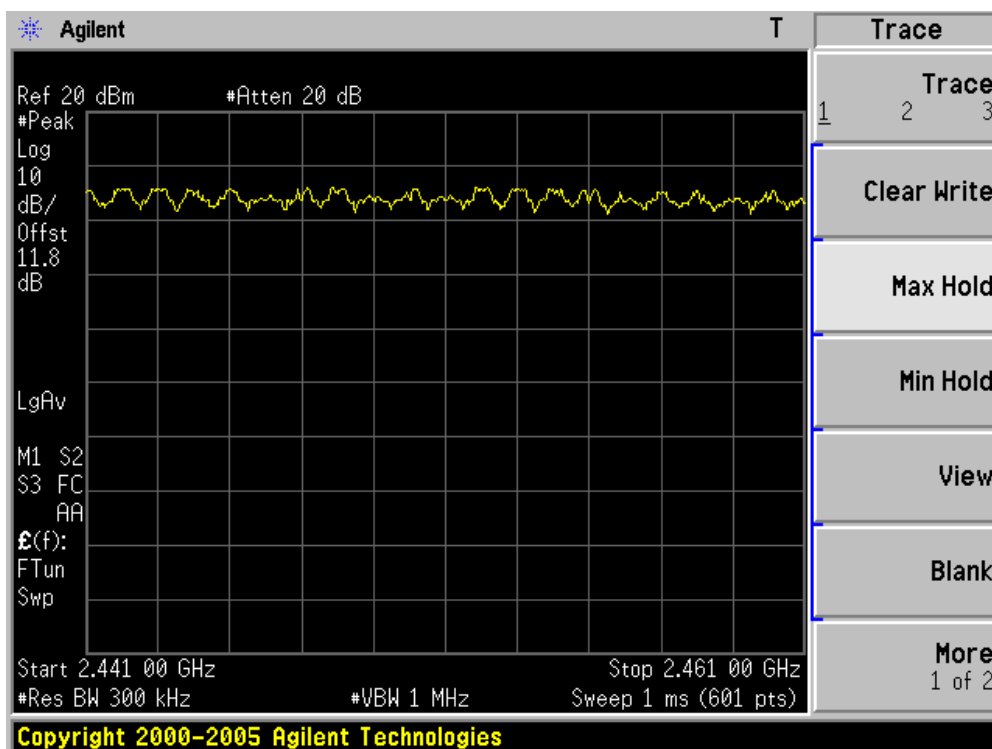
2402 - 2421 MHz



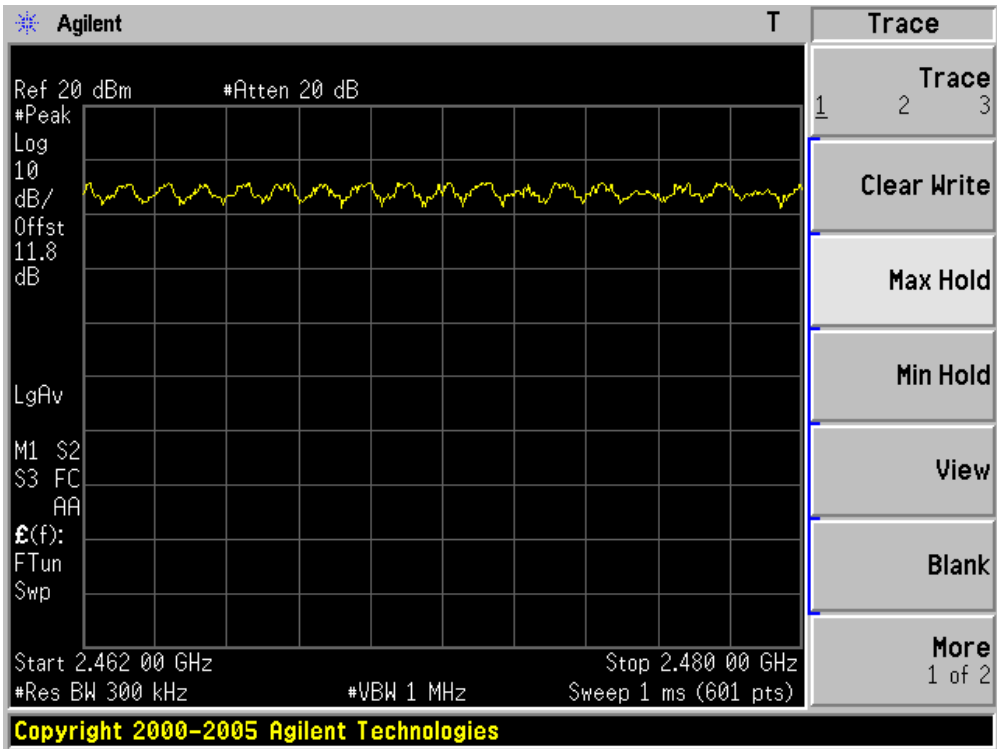
2422 - 2441 MHz



2442 - 2461 MHz



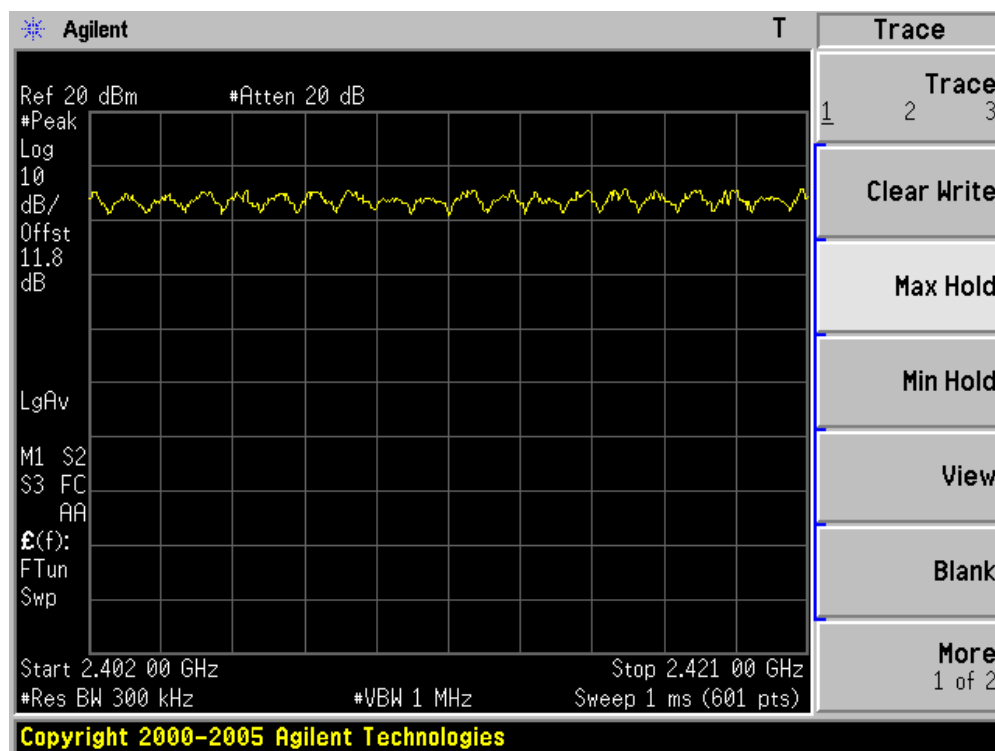
2462 - 2480 MHz



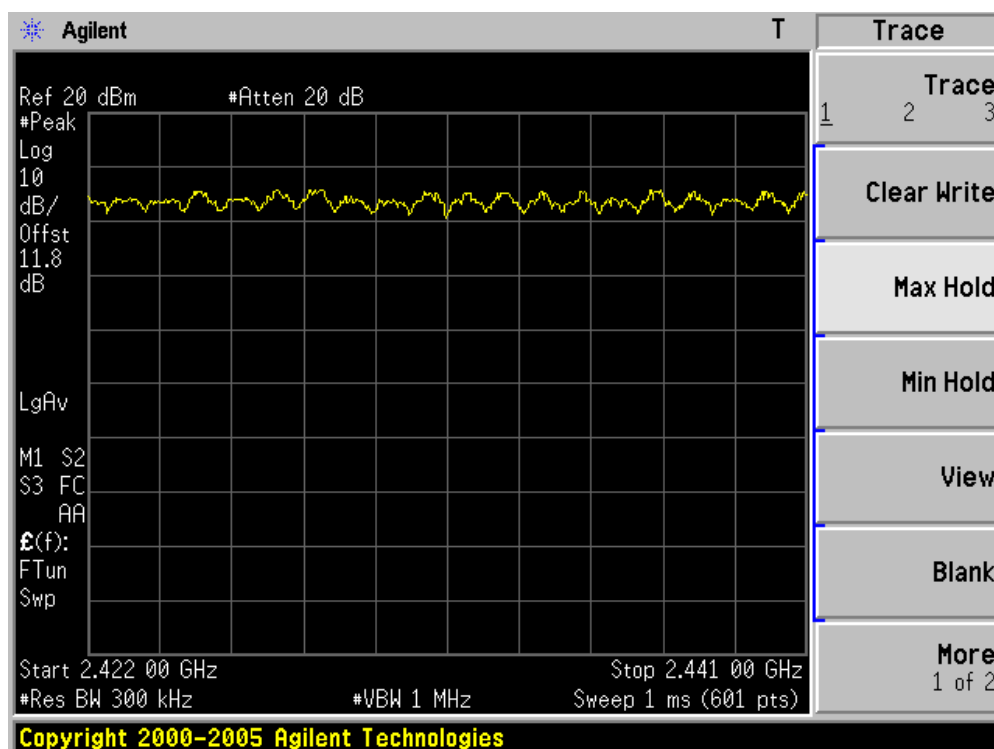
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Number of Hopping Frequencies
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmitter-3Mbps (8DPSK_DH5)

Frequency Band (MHz)	Number of Hopping Frequencies	Limit	Result
2400 - 2483.5	79	>15	Pass

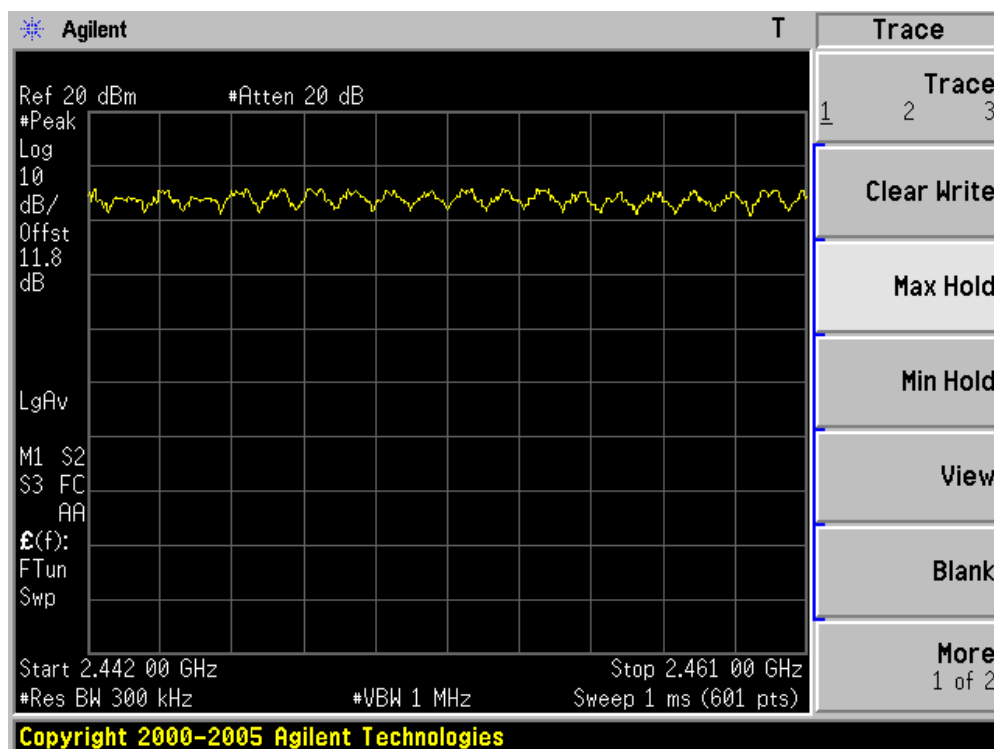
2402 - 2421 MHz



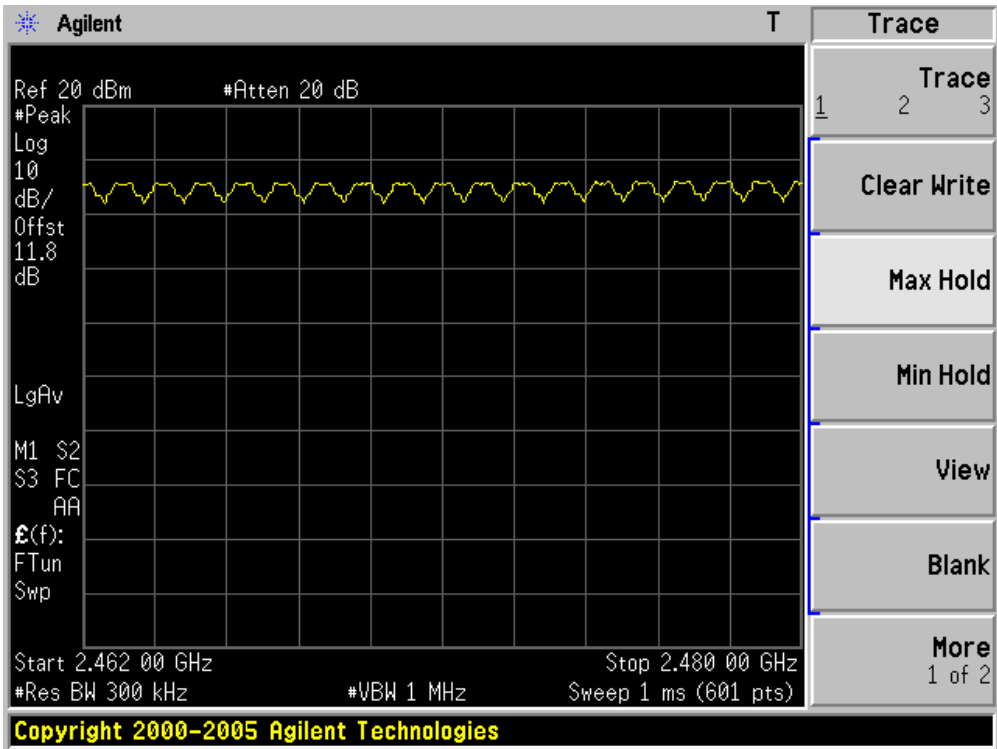
2422 - 2441 MHz



2442 - 2461 MHz



2462 - 2480 MHz



8. Time of Occupancy (Dwell Time)

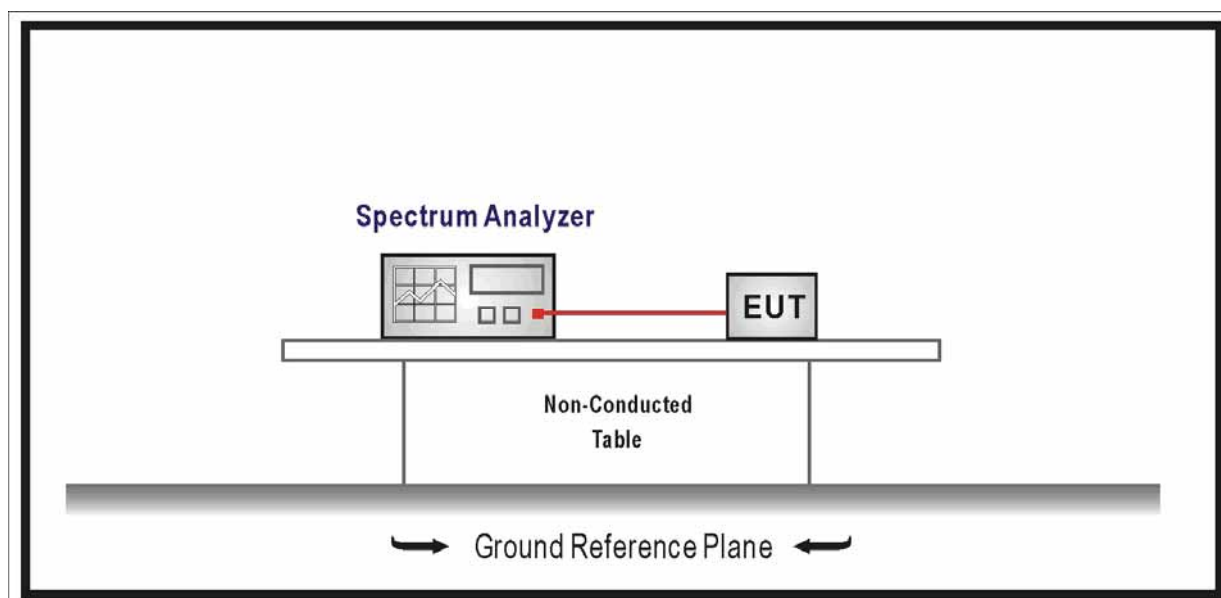
8.1. Test Equipment

Time of Occupancy (Dwell Time) / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2014.01.21
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2014.05.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

8.2. Test Setup



8.3. Limit

- For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.
- Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75

hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

- Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

8.4. Test Procedure

According to ANSI C63.10: 2009.

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = zero span, centered on a hopping channel

RBW = 1MHz

VBW $\geq$ RBW

Sweep = as necessary to capture the entire dwell time per hopping channel

Detector function = peak

Trace = max hold

If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

8.5. Uncertainty

The measurement uncertainty is defined as ± 0.1 us

8.6. Test Result

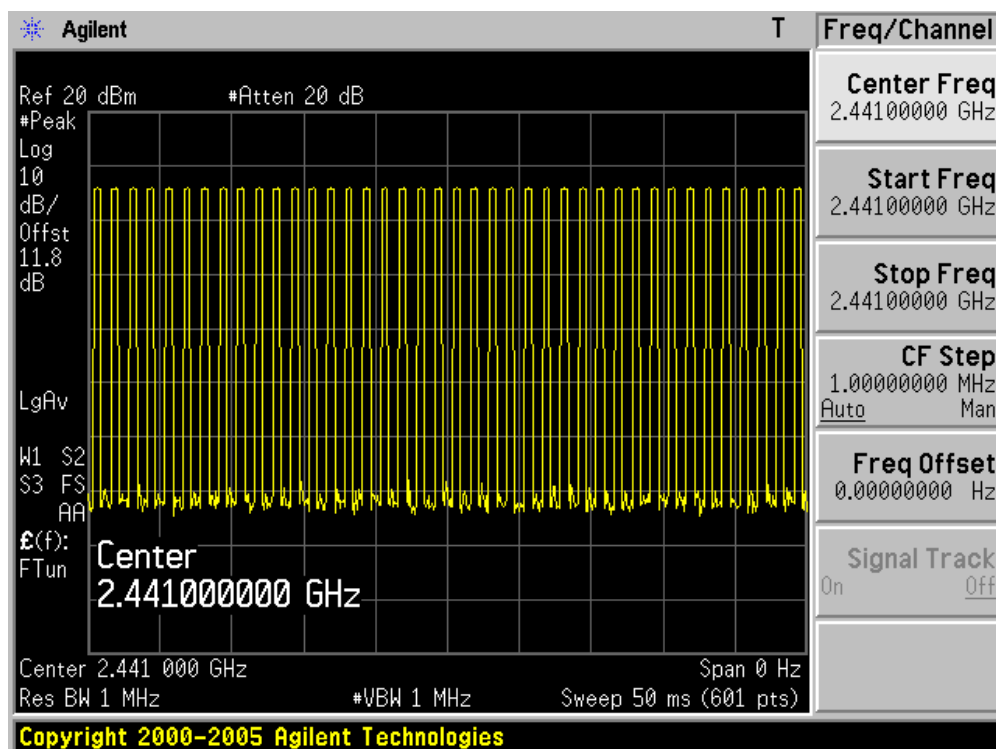
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Time of Occupancy (Dwell Time)
Test Site	:	TR-8
Test Mode	:	Transmitter-3Mbps (8DPSK_DH1)

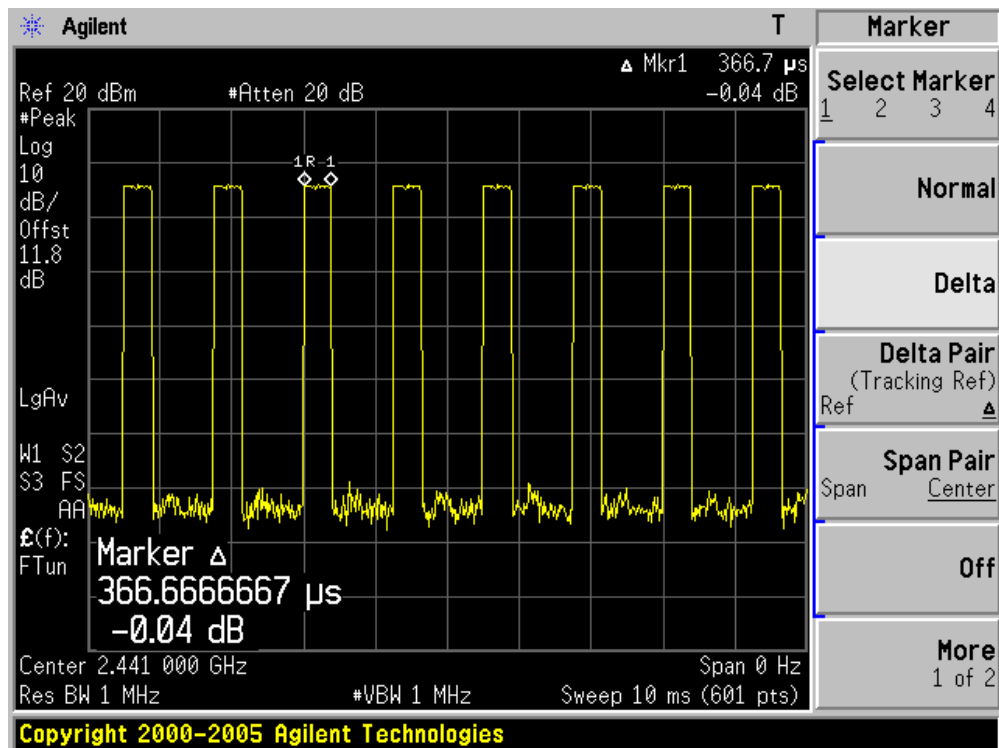
Channel No.	Frequency (MHz)	Time of Occupancy (ms)	Limit (ms)	Result
39	2441	117.44	< 400	Pass

Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $40/50\text{msec} = 800\text{ hops/sec}$.

- 2441MHz, The Maximum Occupancy Time Within 31.6sec: $[(0.367\text{ms} \times 800)/79] \times 31.6 = 117.44\text{msec}$

Channel 39 (2441MHz)-(3DH1)





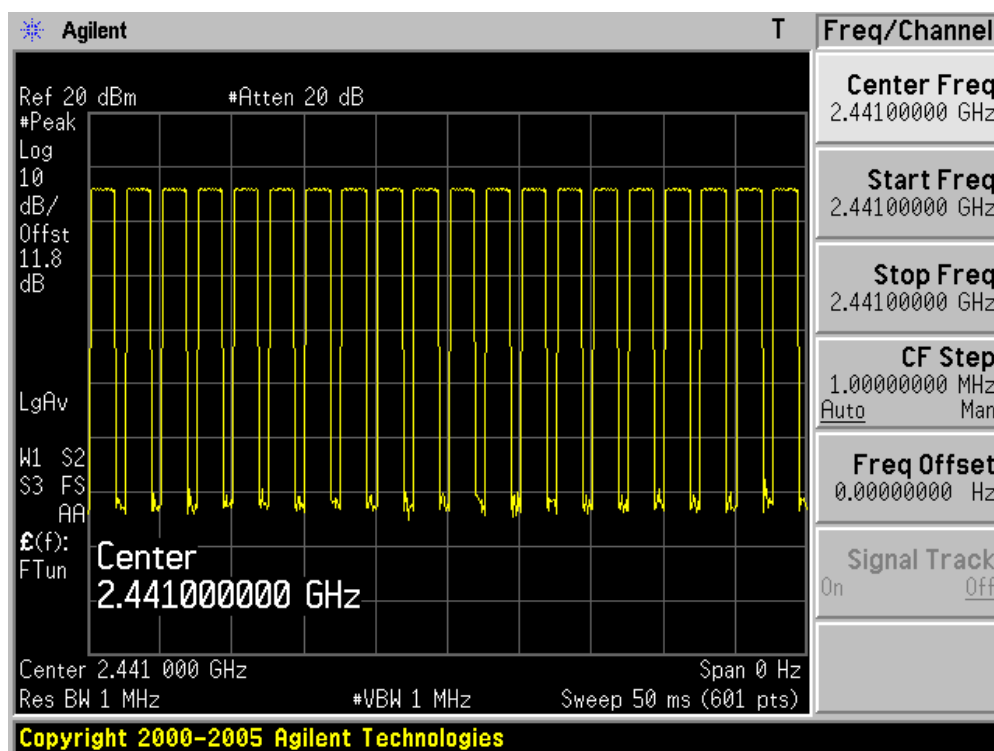
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Time of Occupancy (Dwell Time)
Test Site	:	TR-8
Test Mode	:	Transmitter-3Mbps (8DPSK_DH3)

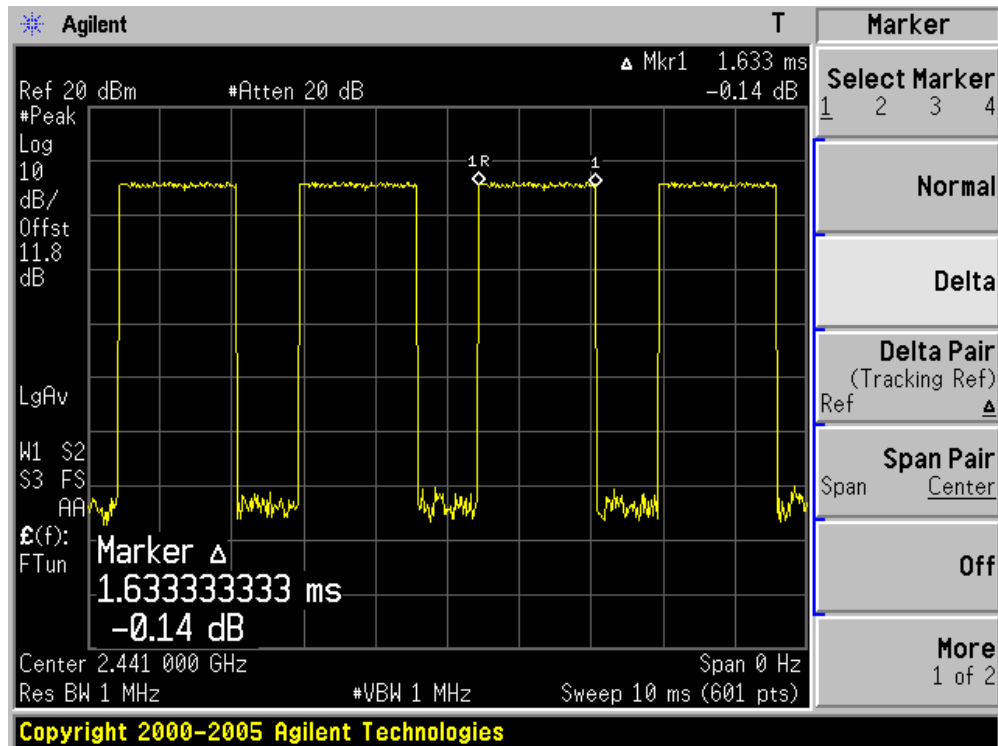
Channel No.	Frequency (MHz)	Time of Occupancy (ms)	Limit (ms)	Result
39	2441	260.80	< 400	Pass

Test Time Period: $0.4 \times 79 = 31.6$ sec, Hopping Times Within 1sec: $20/50$ msec= 400 hops/sec.

- 2441MHz, The Maximum Occupancy Time Within 31.6sec: $[(1.63\text{ms} \times 400)/79] \times 31.6 = 260.80$ msec

Channel 39 (2441MHz) - (3DH3)





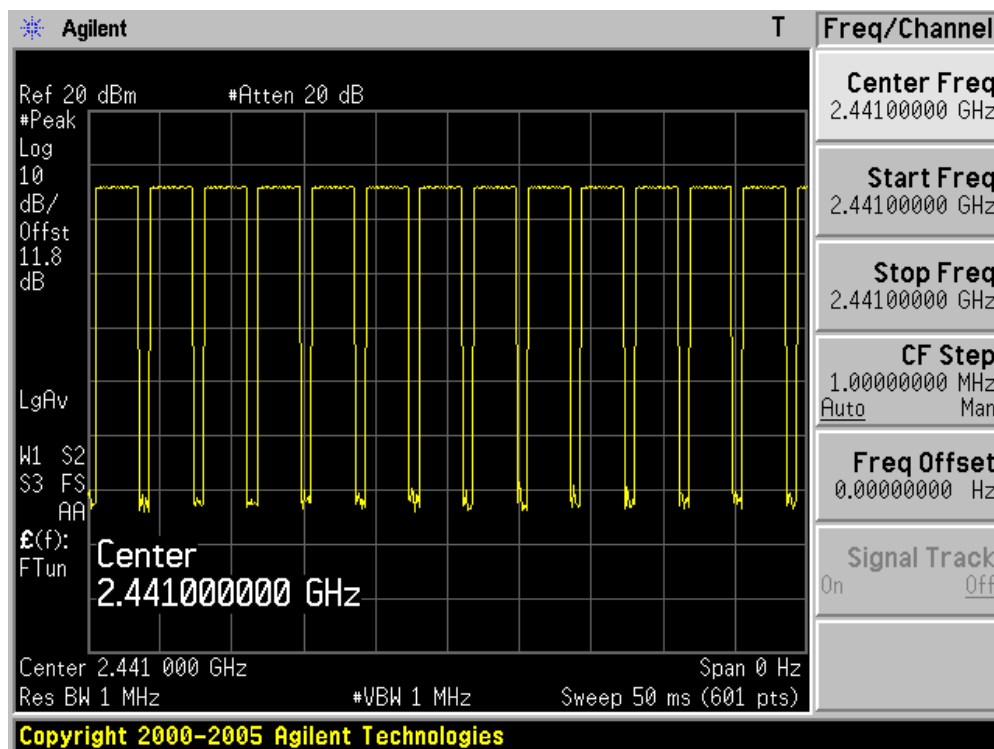
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Time of Occupancy (Dwell Time)
Test Site	:	TR-8
Test Mode	:	Transmitter-3Mbps (8DPSK_DH5)

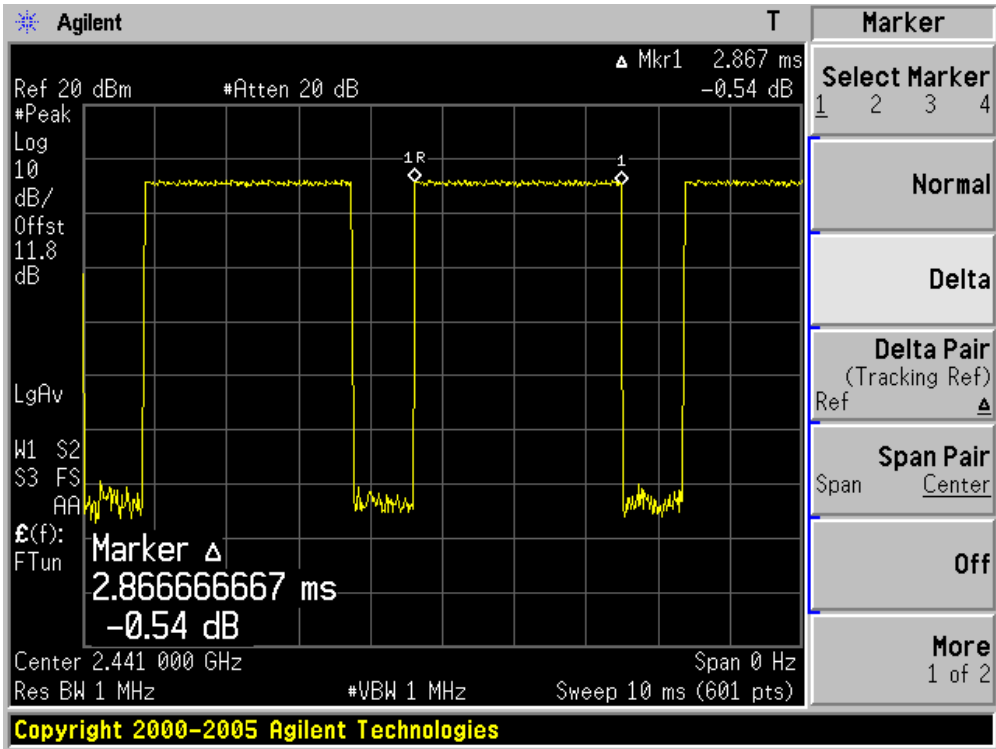
Channel No.	Frequency (MHz)	Time of Occupancy (ms)	Limit (ms)	Result
39	2441	321.44	< 400	Pass

Test Time Period: $0.4 \times 79 = 31.6$ sec, Hopping Times Within 1sec: $14/50$ msec=280 hops/sec.

- 2441MHz, The Maximum Occupancy Time Within 31.6sec: $[(2.87 \text{ ms} \times 280)/79] \times 31.6 = 321.44$ msec

Channel 39 (2441MHz) - (3DH5)





9. Peak Output Power

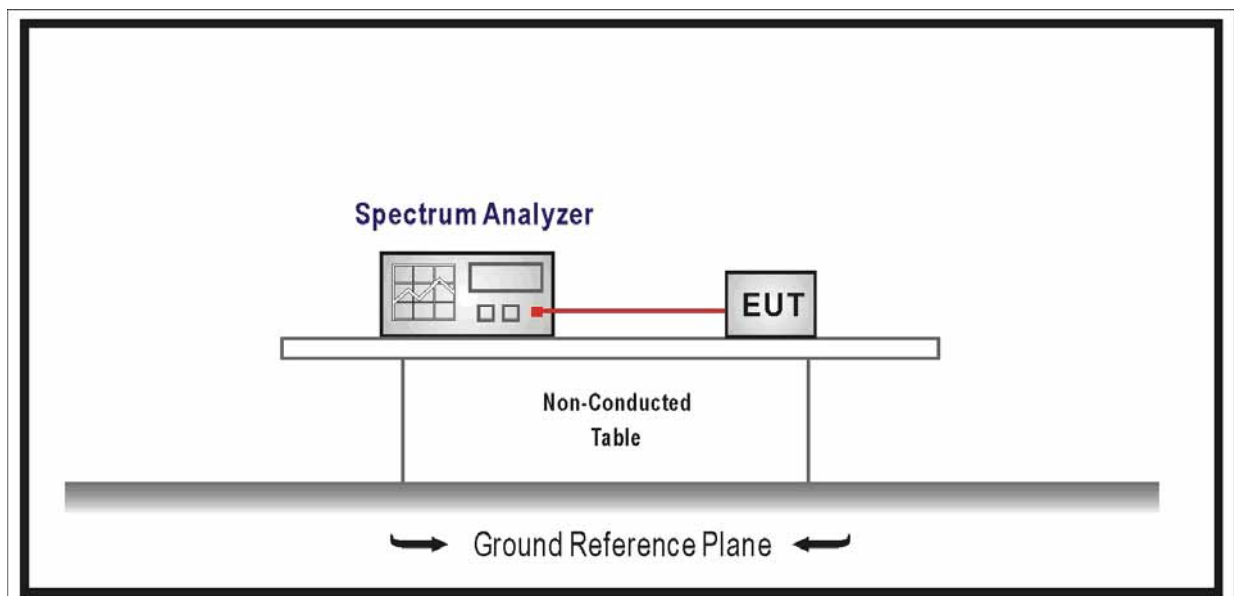
9.1. Test Equipment

Peak Output Power / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2014.01.21
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2014.05.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

9.2. Test Setup



9.3. Limit

- For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
- For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels.

Note: the conducted output power limit specified above is based on the use the antennas with

directional gains that do not exceed 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values above, as appropriate, by the amount in dB that the directional gain of antenna exceeds 6 dBi.

9.4. Test Procedure

According to ANSI C63.10: 2009.

Use the following spectrum analyzer settings:

Span = approximately 5 times the 20dB bandwidth, centered on a hopping channel

RBW > the 20 dB bandwidth of the emission being measured.

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power (don't forget added the external attenuation and cable loss).

9.5. Uncertainty

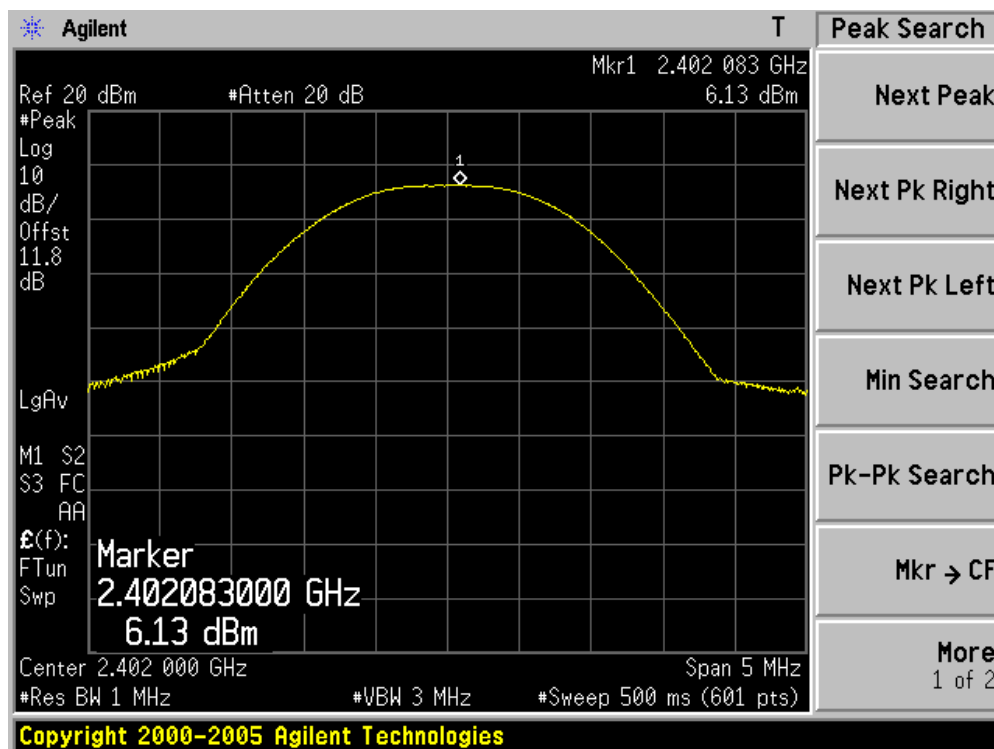
The measurement uncertainty is defined as ± 1.0 dB

9.6. Test Result

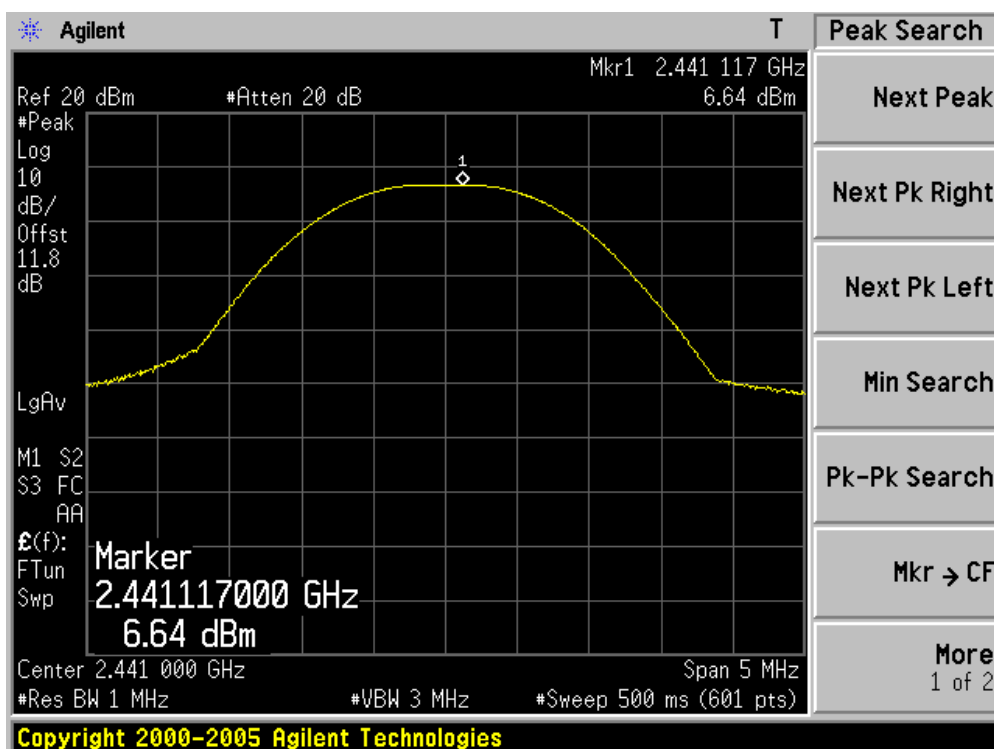
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Power Output
Test Mode	:	Mode 1: Transmitter-1Mbps (GFSK_DH5)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)	Result
0	2402	6.13	30.00	Pass
39	2441	6.64	30.00	Pass
78	2480	6.84	30.00	Pass

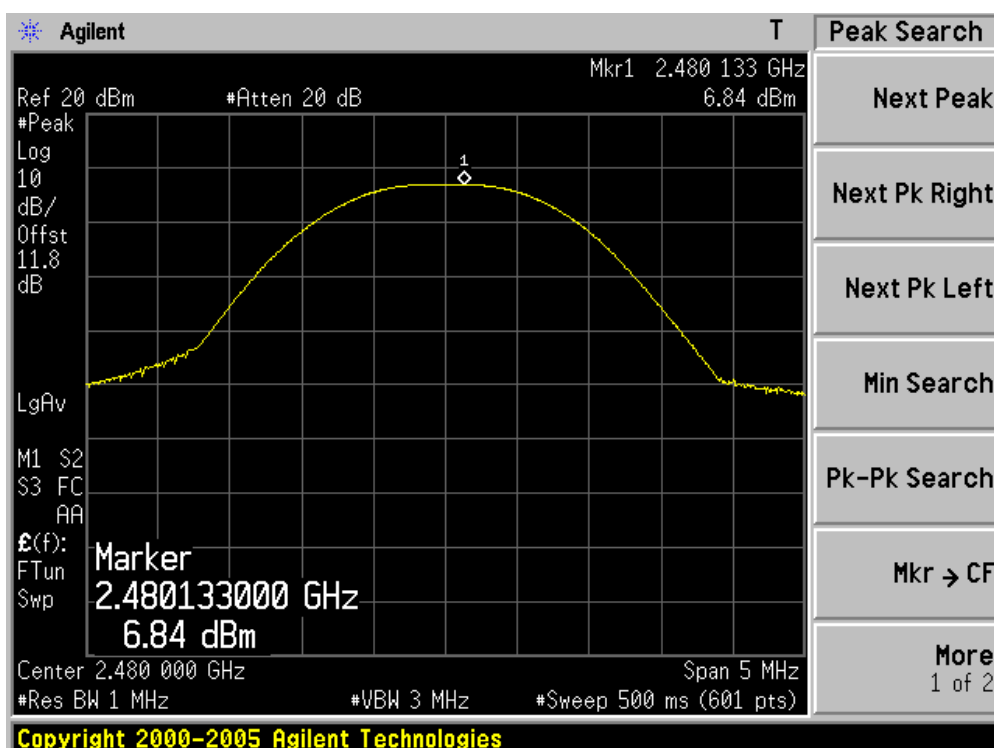
Channel 00 (2402MHz)



Channel 39 (2441MHz)



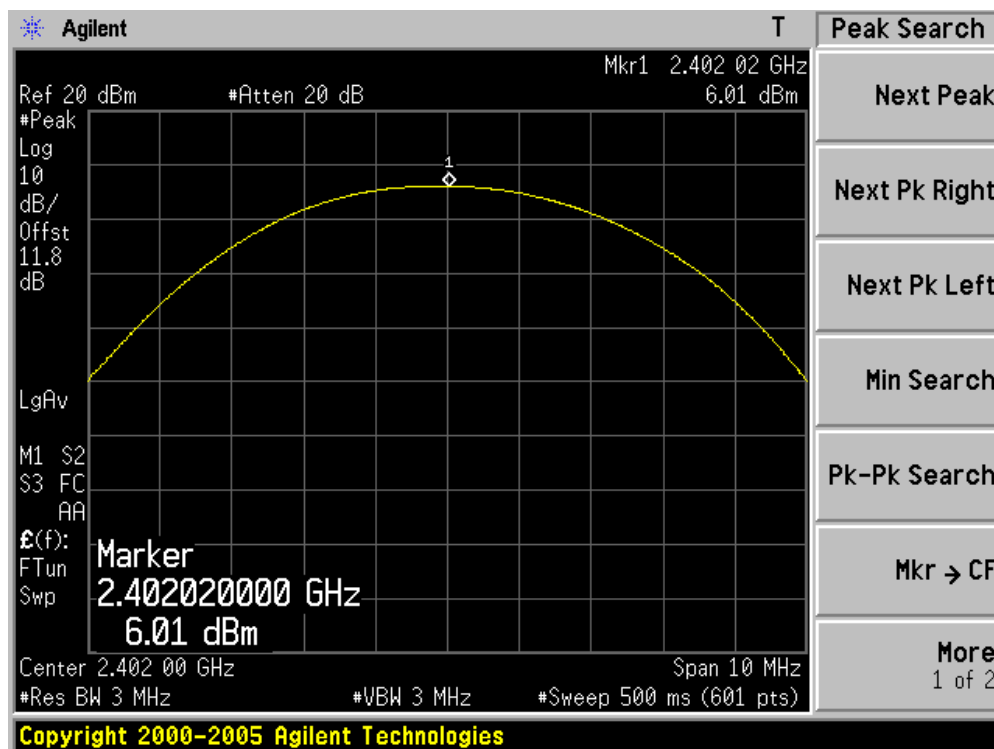
Channel 78 (2480MHz)



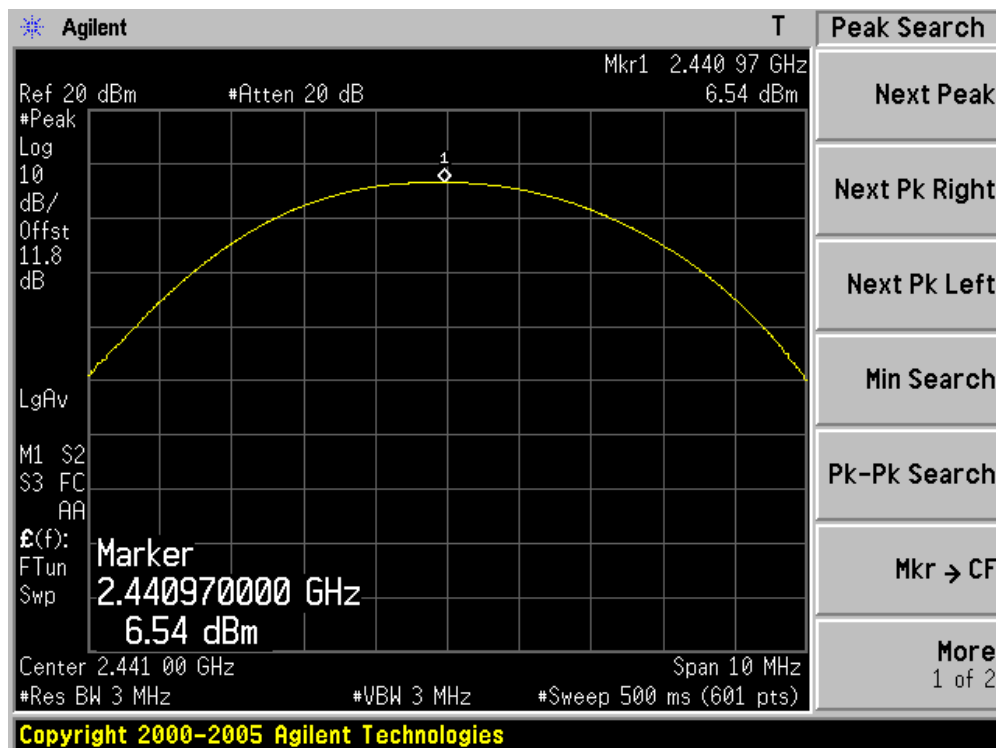
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Power Output
Test Mode	:	Mode 2: Transmitter-2Mbps (Pi/4 DQPSK_DH5)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)	Result
0	2402	6.01	30.00	Pass
39	2441	6.54	30.00	Pass
78	2480	6.71	30.00	Pass

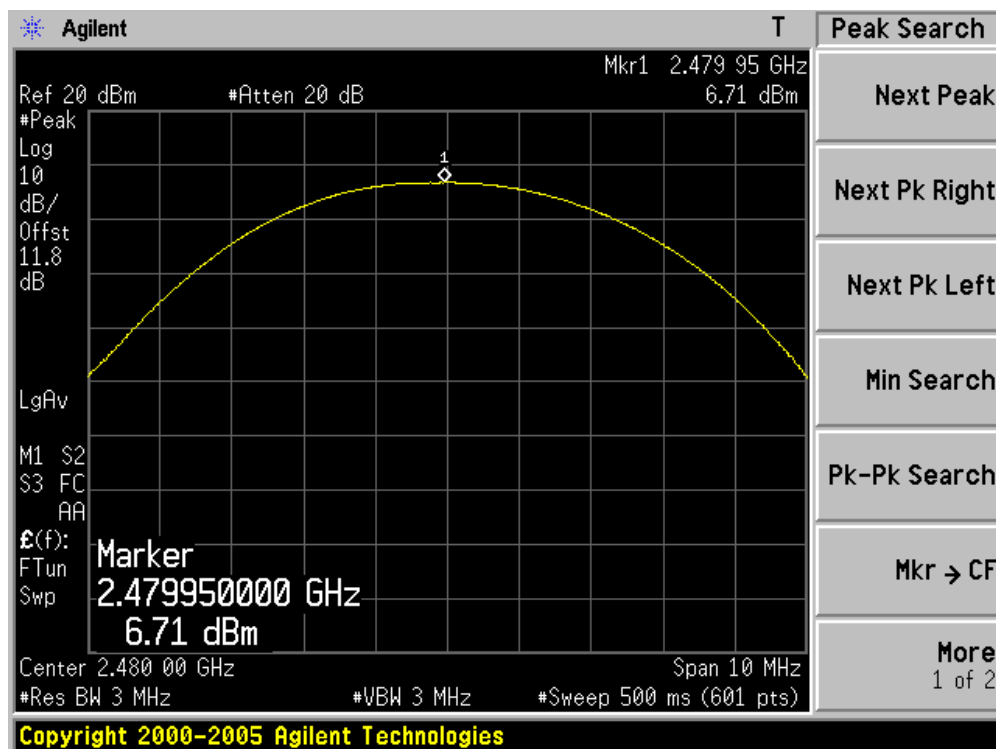
Channel 00 (2402MHz)



Channel 39 (2441MHz)



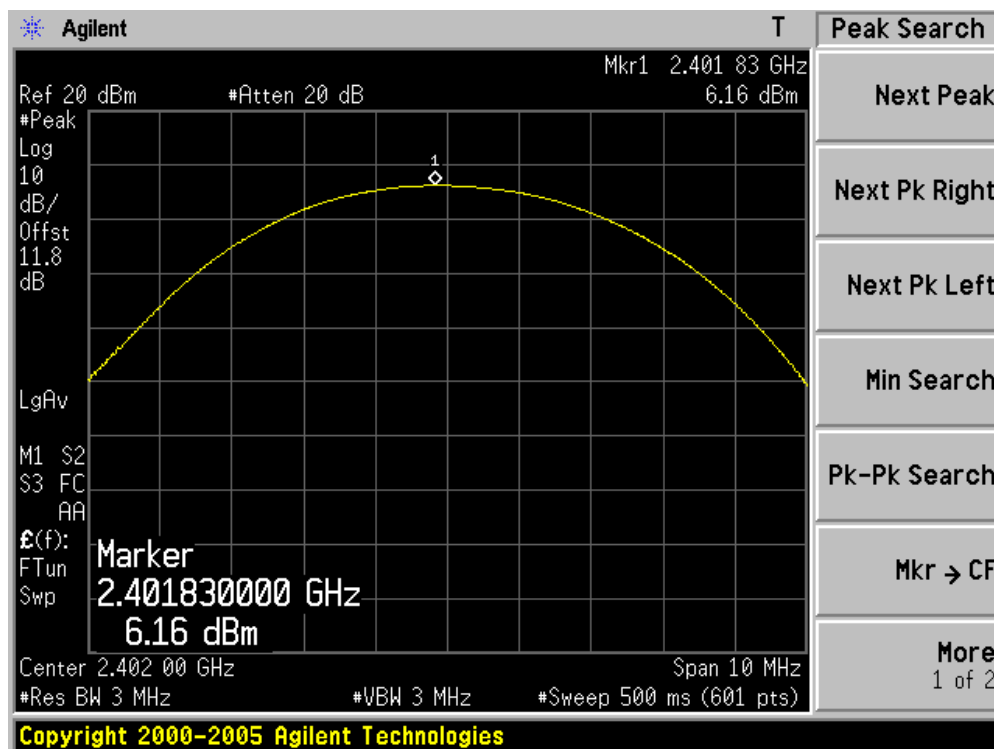
Channel 78 (2480MHz)



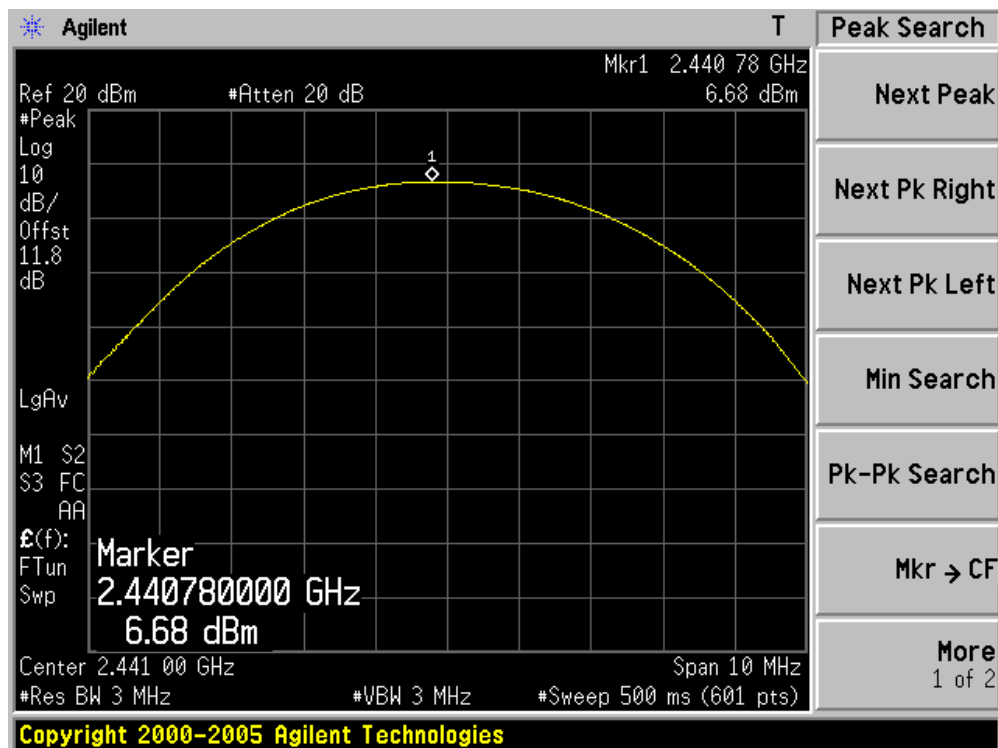
Product	:	WCDMA Digital Mobile Phone
Test Item	:	Power Output
Test Mode	:	Mode 3: Transmitter-3Mbps (8DPSK_DH5)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)	Result
0	2402	6.16	30.00	Pass
39	2441	6.68	30.00	Pass
78	2480	6.85	30.00	Pass

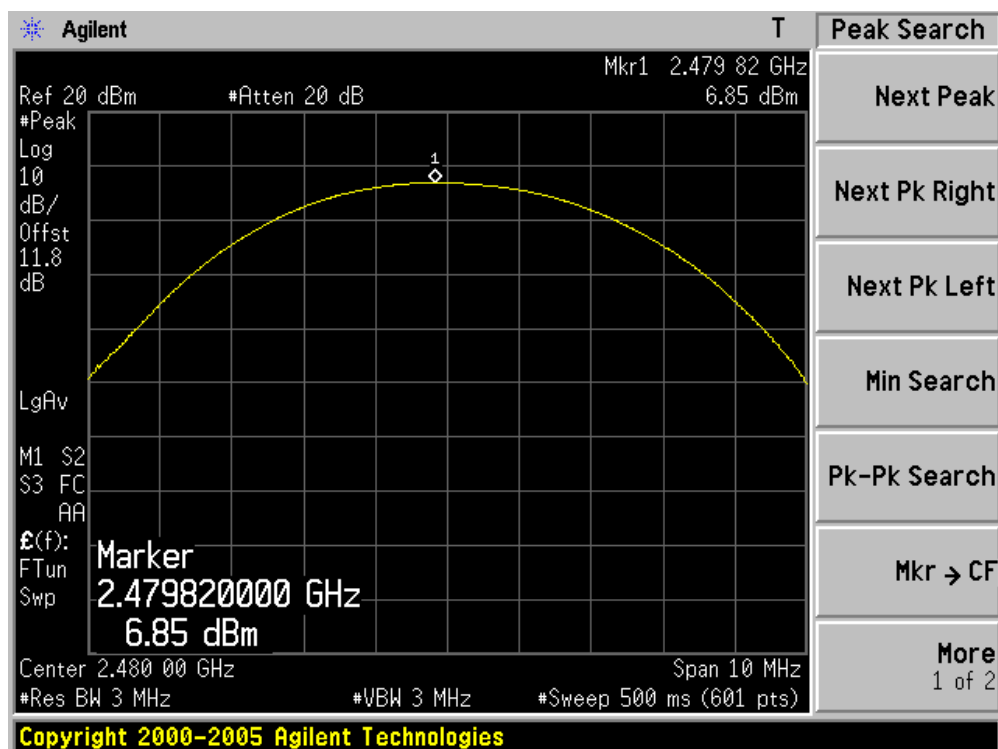
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



10. Band-edge Compliance of RF Conducted Emissions

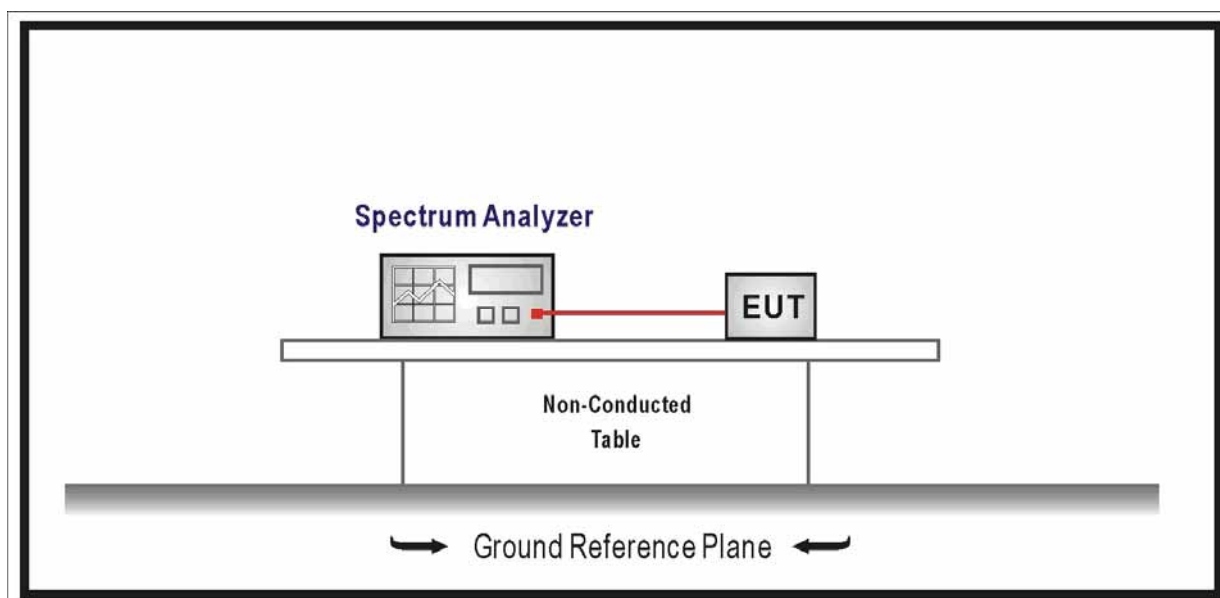
10.1. Test Equipment

Band-edge Compliance of RF Conducted Emissions / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2014.01.21
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2014.05.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

10.2. Test Setup



10.3. Limit

- Intentional radiators operating under the alternative provisions to the general emission limits as contained in 15.217 through 15.257 and in Subpart E of FCC part 15, must be designed to ensure that 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.
- In any 100 kHz 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 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, provided the transmitter demonstrates compliance with the peak conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) of FCC part 15 is not required.

10.4. Test Procedure

According to ANSI C63.10: 2009.

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation.

RBW $\geq$ 1% of the span

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge.

Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.

Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit.

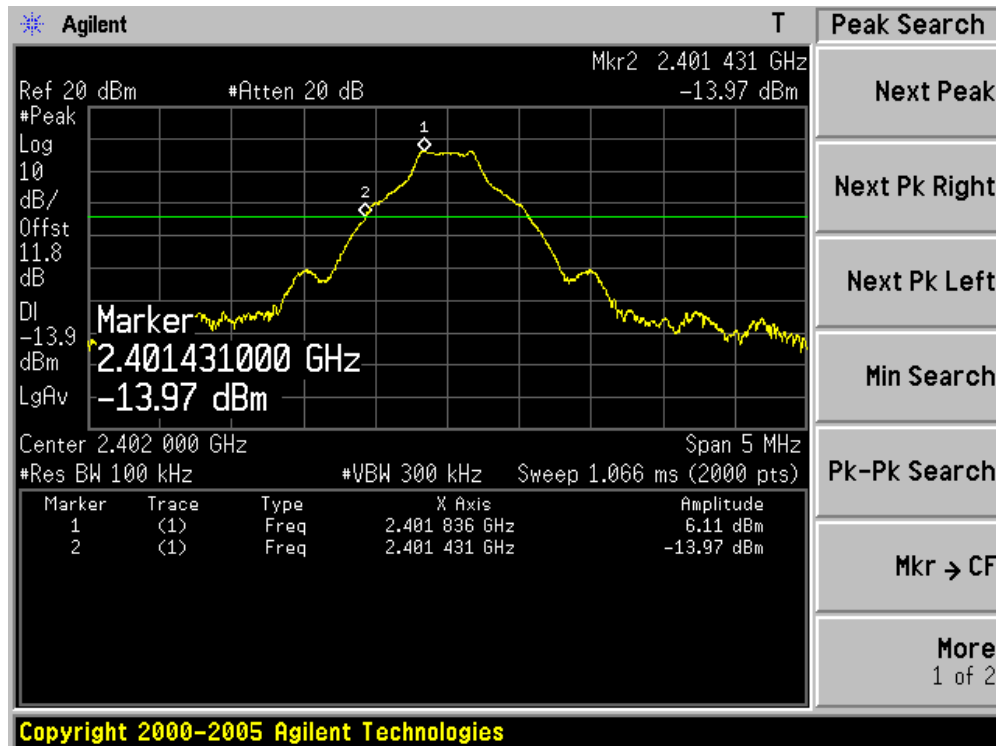
10.5. Uncertainty

The measurement uncertainty is defined as ± 1.0 dB

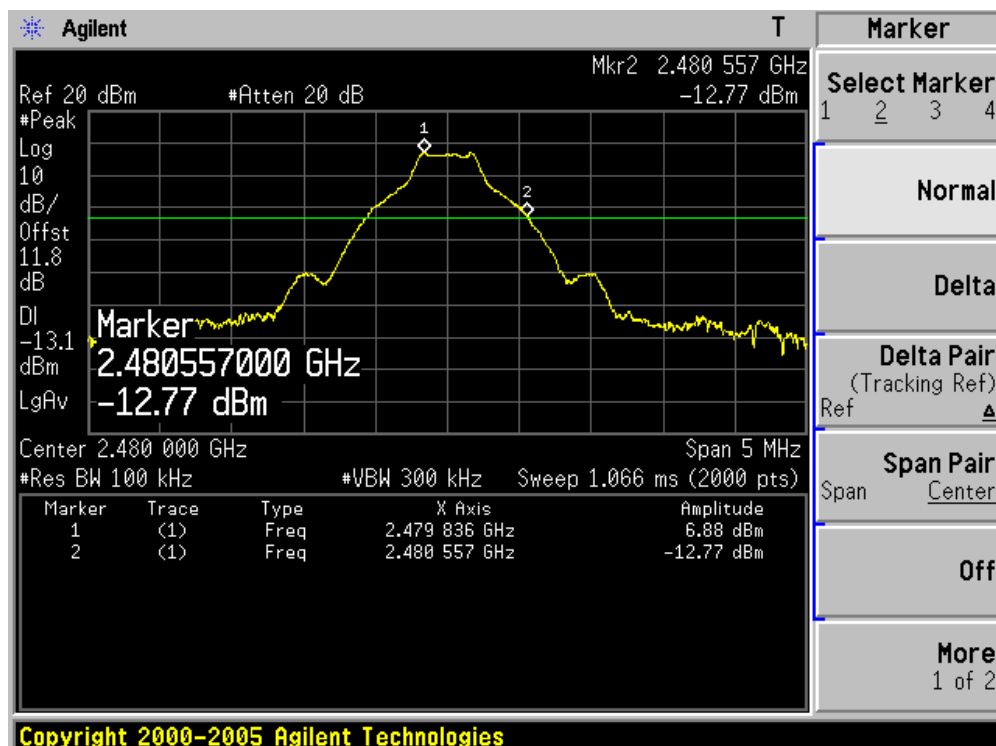
10.6. Test Result

Product	:	WCDMA Digital Mobile Phone
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Mode	:	Mode 1: Transmitter-1Mbps (GFSK_DH5)

Channel 00 (2402MHz)

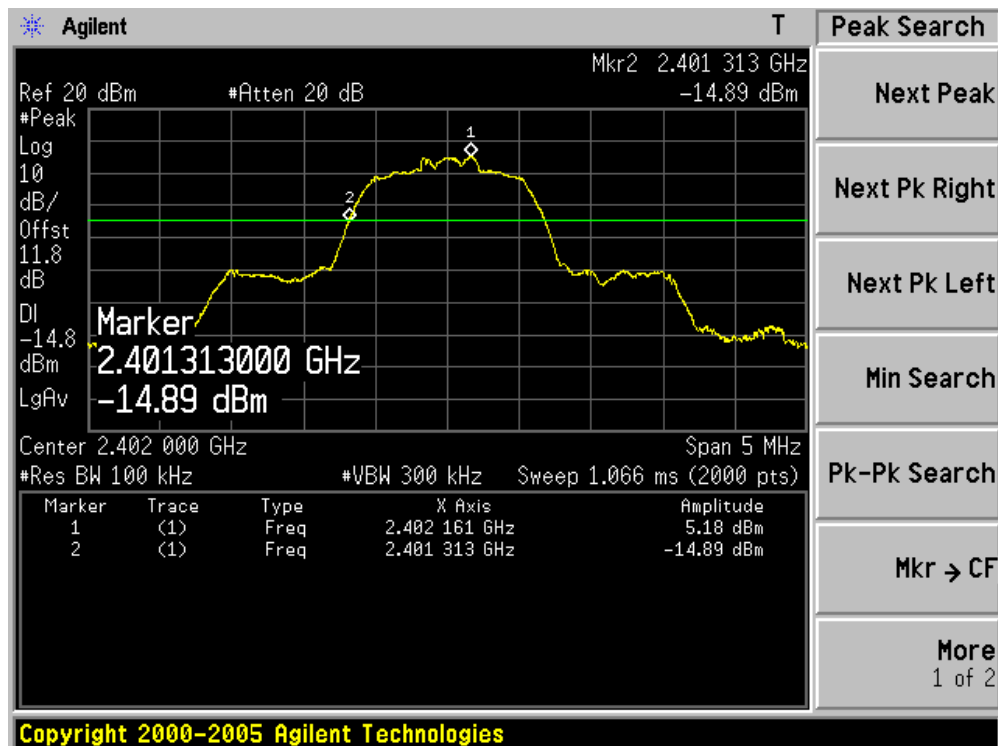


Channel 78 (2480MHz)

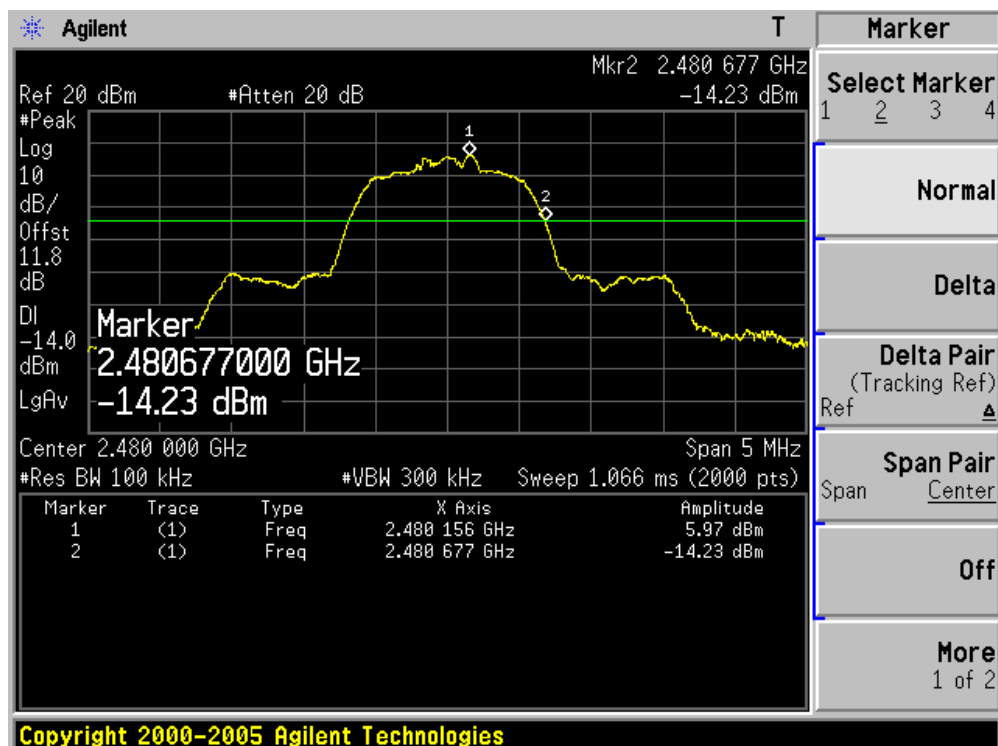


Product	:	WCDMA Digital Mobile Phone
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Mode	:	Mode 2: Transmitter-2Mbps (Pi/4 DQPSK_DH5)

Channel 00 (2402MHz)

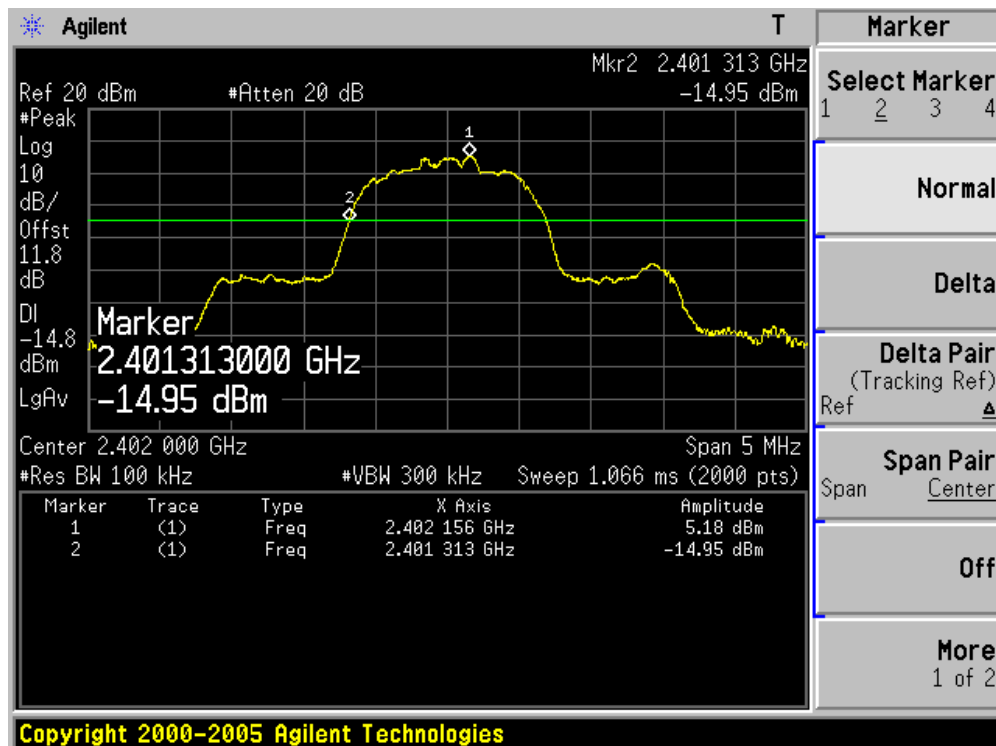


Channel 78 (2480MHz)

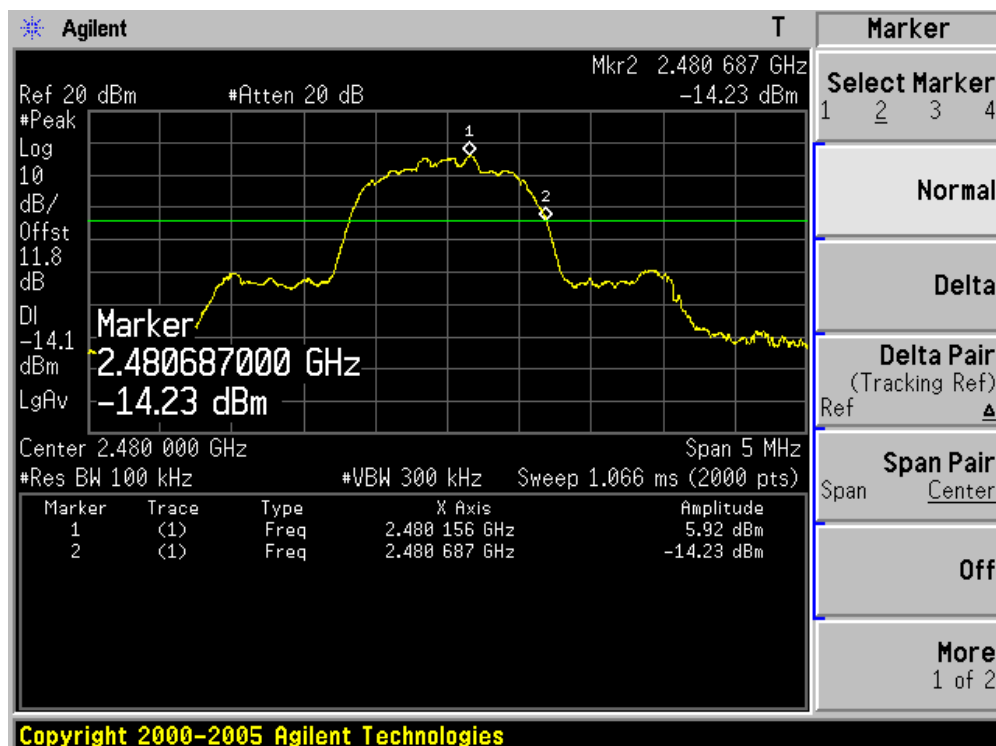


Product	:	WCDMA Digital Mobile Phone
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Mode	:	Mode 3: Transmitter-3Mbps (8DPSK_DH5)

Channel 00 (2402MHz)

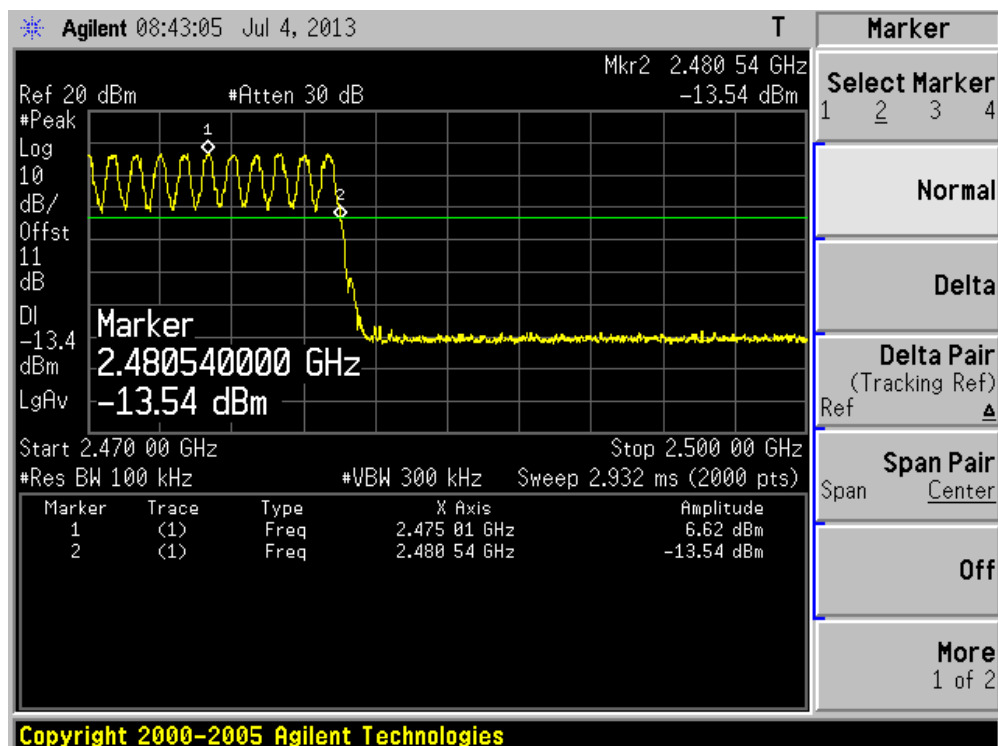
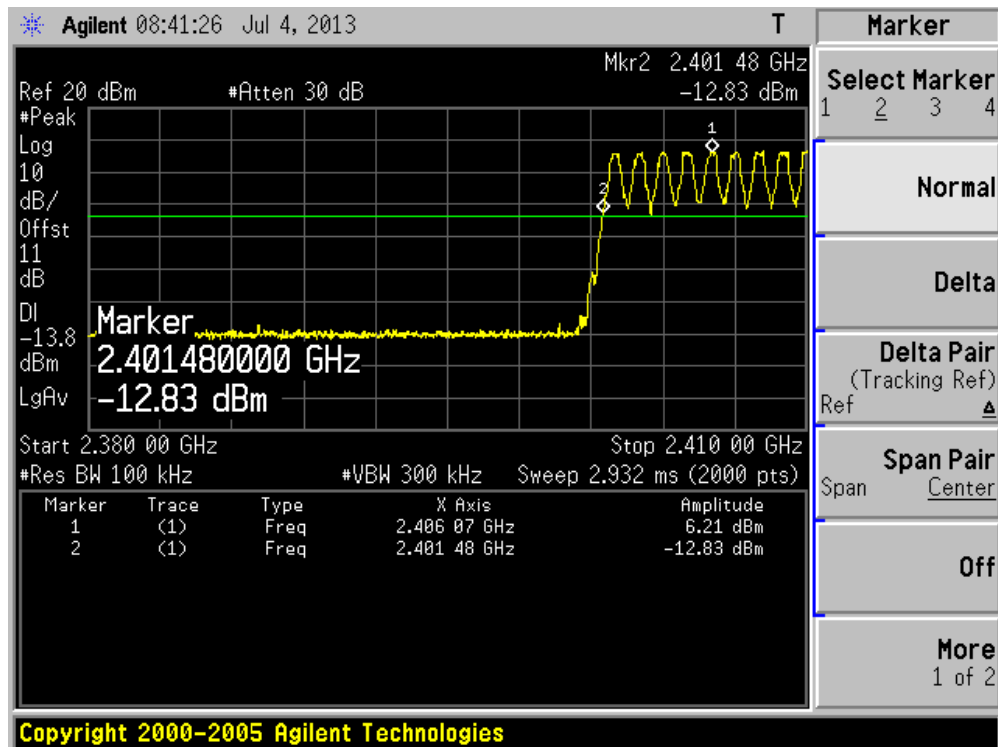


Channel 78 (2480MHz)



Product	:	WCDMA Digital Mobile Phone
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Mode	:	Mode 1: Hopping Mode

Hopping Mode



11. Spurious RF Conducted Emissions

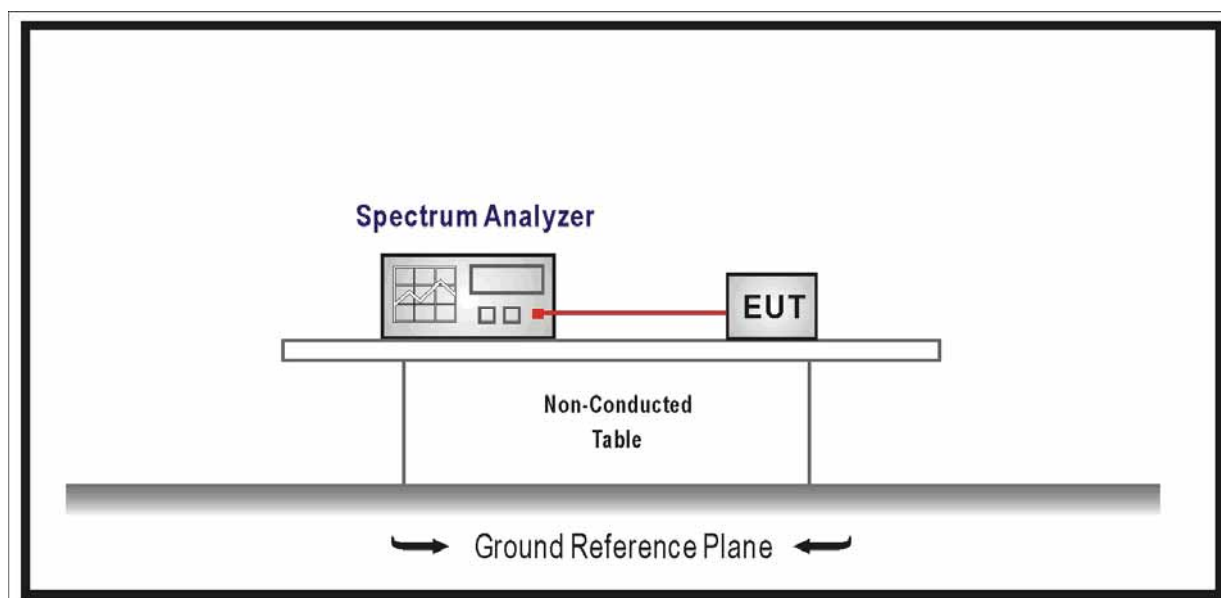
11.1. Test Equipment

Spurious RF Conducted Emissions / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2014.01.21
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2014.05.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

11.2. Test Setup



11.3. Limit

In any 100 kHz 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 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, provided the transmitter demonstrates compliance with the peak conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in

Section 15.209(a) of FCC part 15 is not required.

11.4. Test Procedure

According to ANSI C63.10: 2009.

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

RBW = 100 kHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this section.

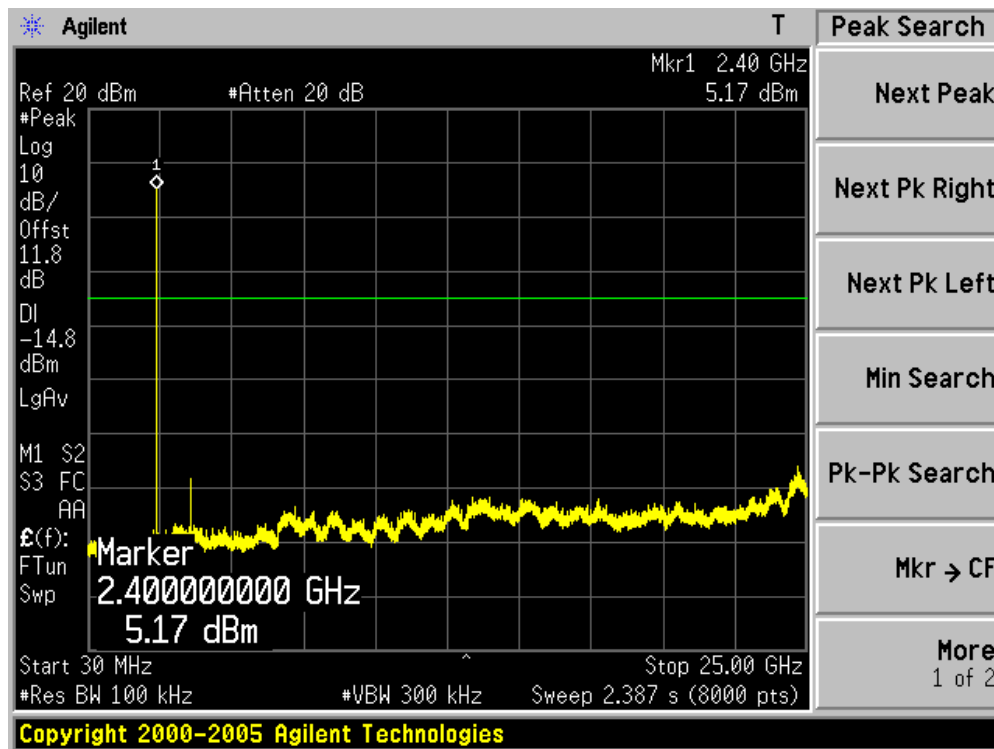
11.5. Uncertainty

The measurement uncertainty is defined as ± 1.0 dB

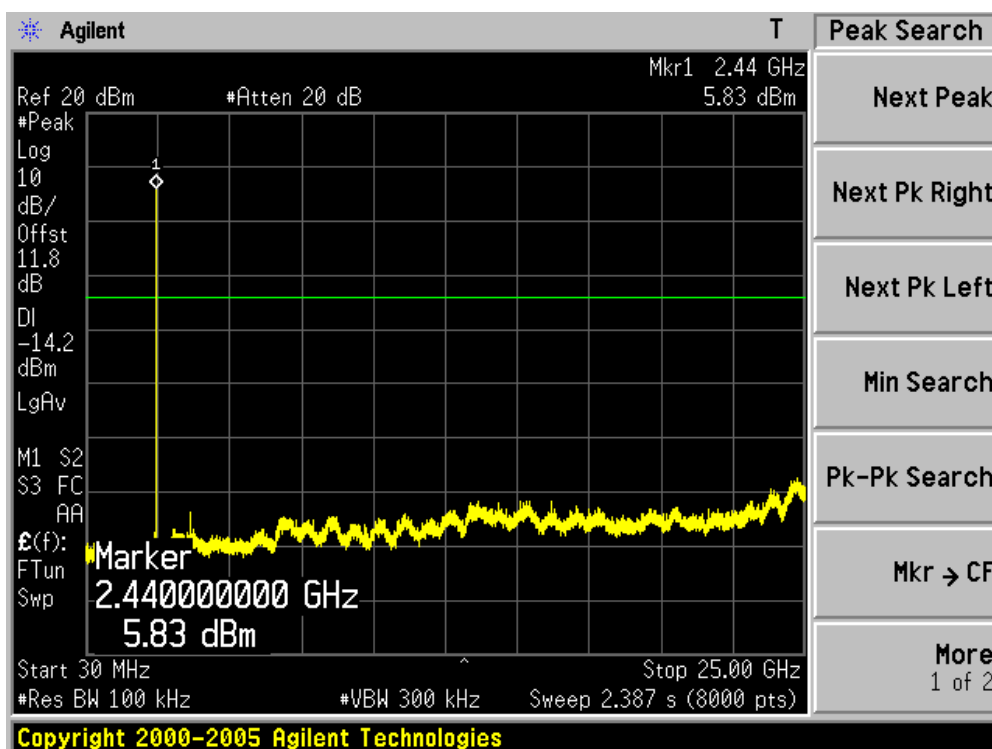
11.6. Test Result

Product	:	WCDMA Digital Mobile Phone
Test Item	:	Spurious RF Conducted Emissions
Test Mode	:	Mode 1: Transmitter-1Mbps (GFSK_DH5)

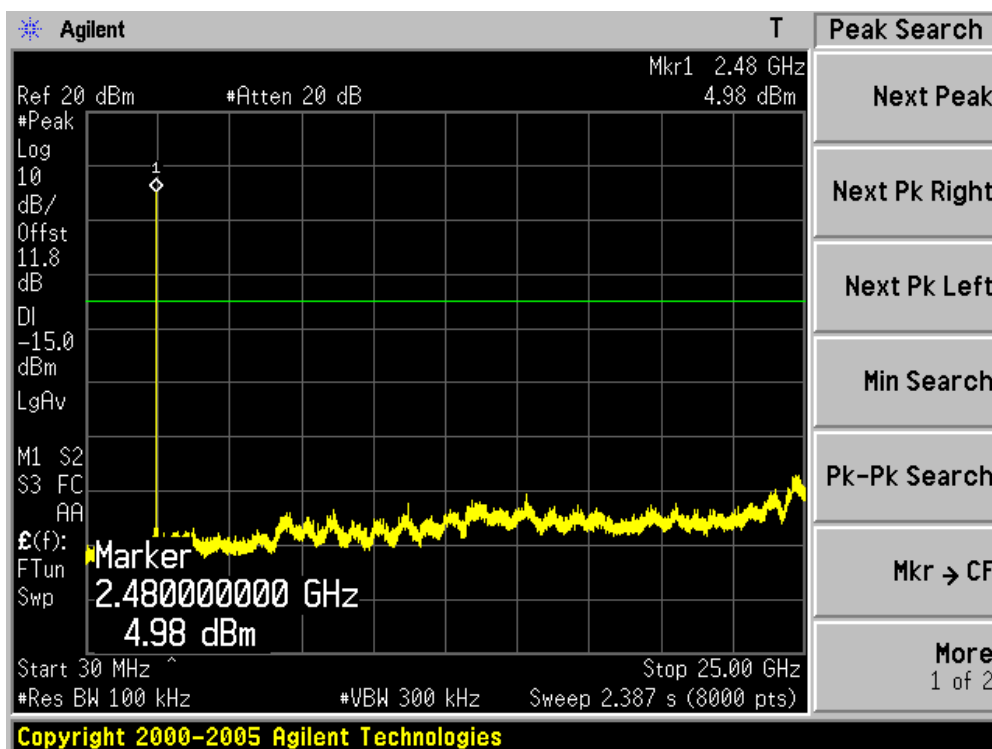
Channel 00 (2402MHz)



Channel 39 (2441MHz)

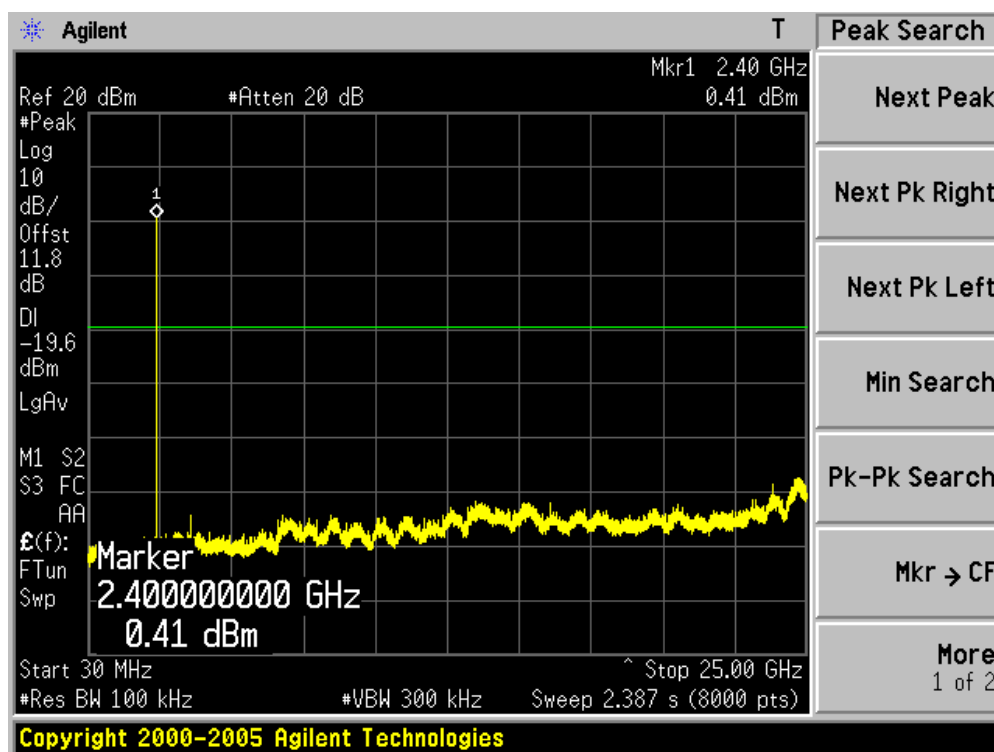


Channel 78 (2480MHz)

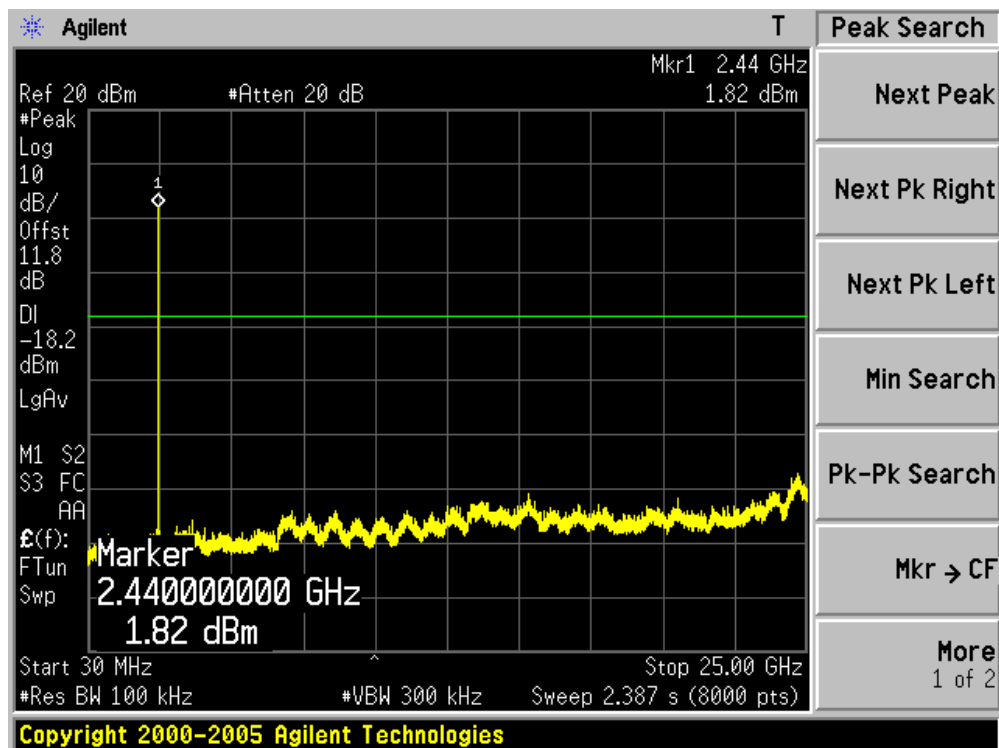


Product	:	WCDMA Digital Mobile Phone
Test Item	:	Spurious RF Conducted Emissions
Test Mode	:	Mode 2: Transmitter-2Mbps (Pi/4 DQPSK_DH5)

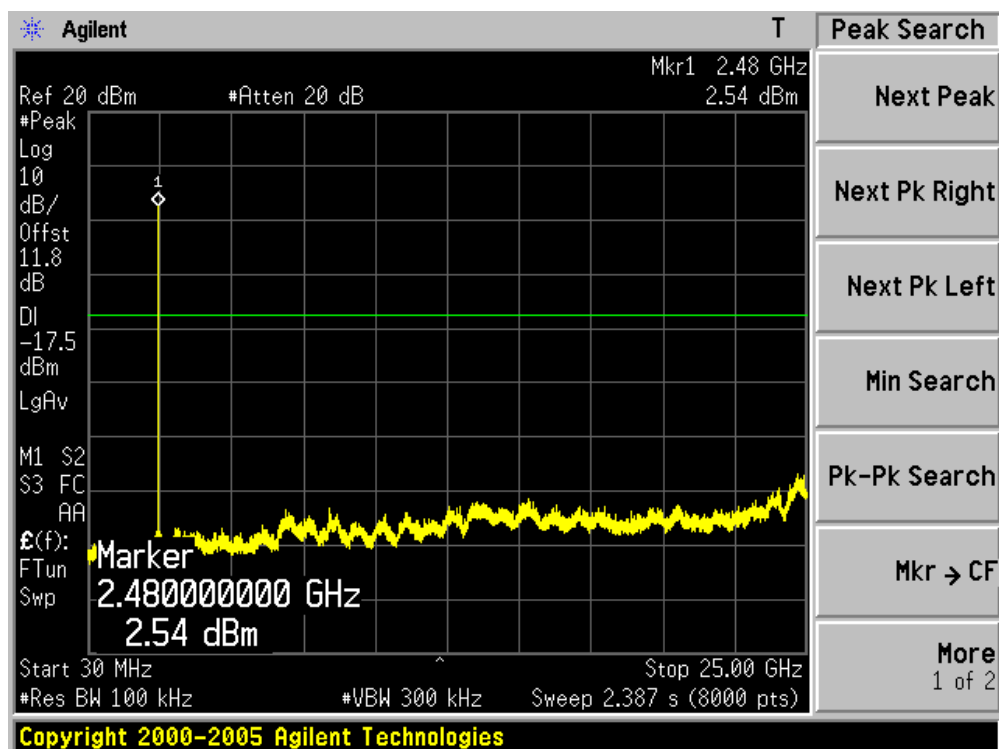
Channel 00 (2402MHz)



Channel 39 (2441MHz)

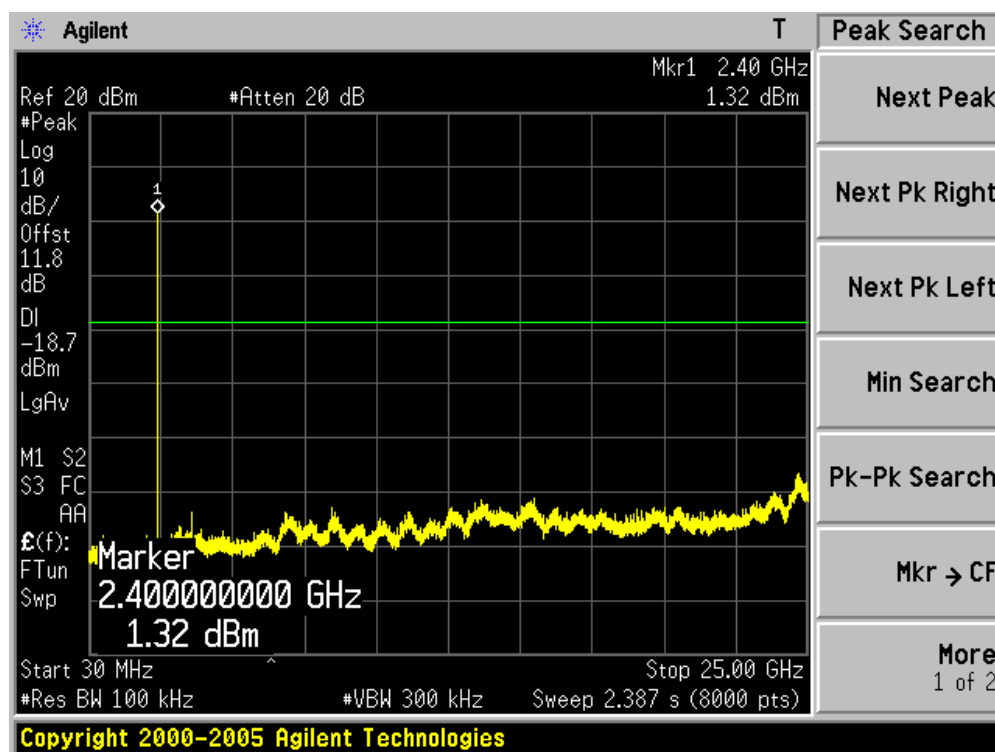


Channel 78 (2480MHz)

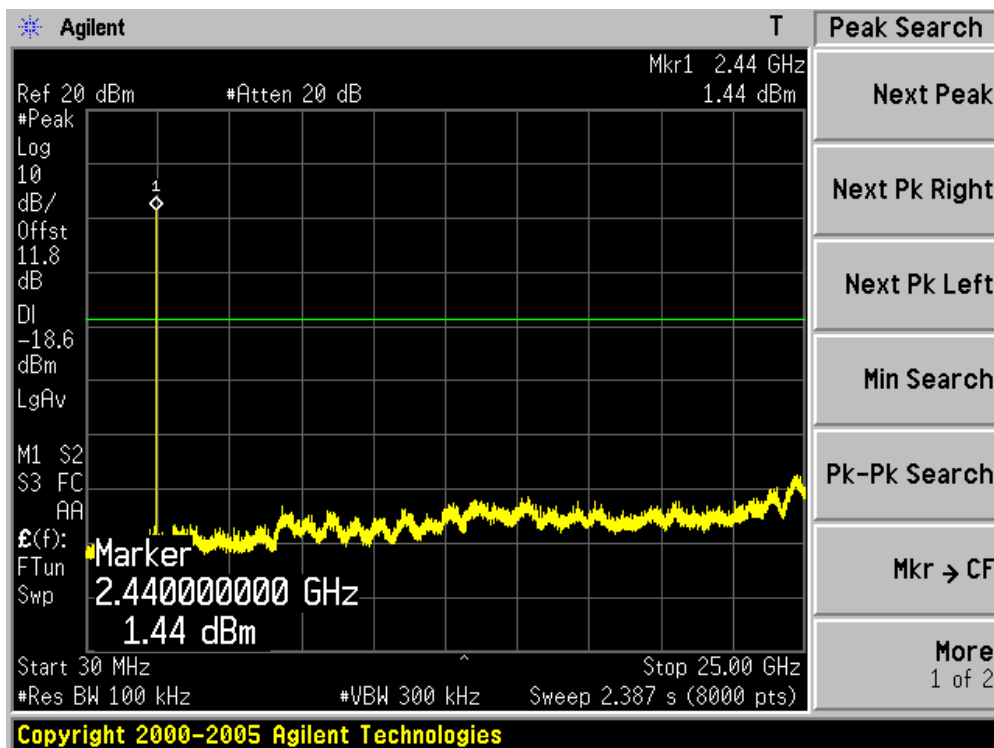


Product	:	WCDMA Digital Mobile Phone
Test Item	:	Spurious RF Conducted Emissions
Test Mode	:	Mode 3: Transmitter-3Mbps (8DPSK_DH5)

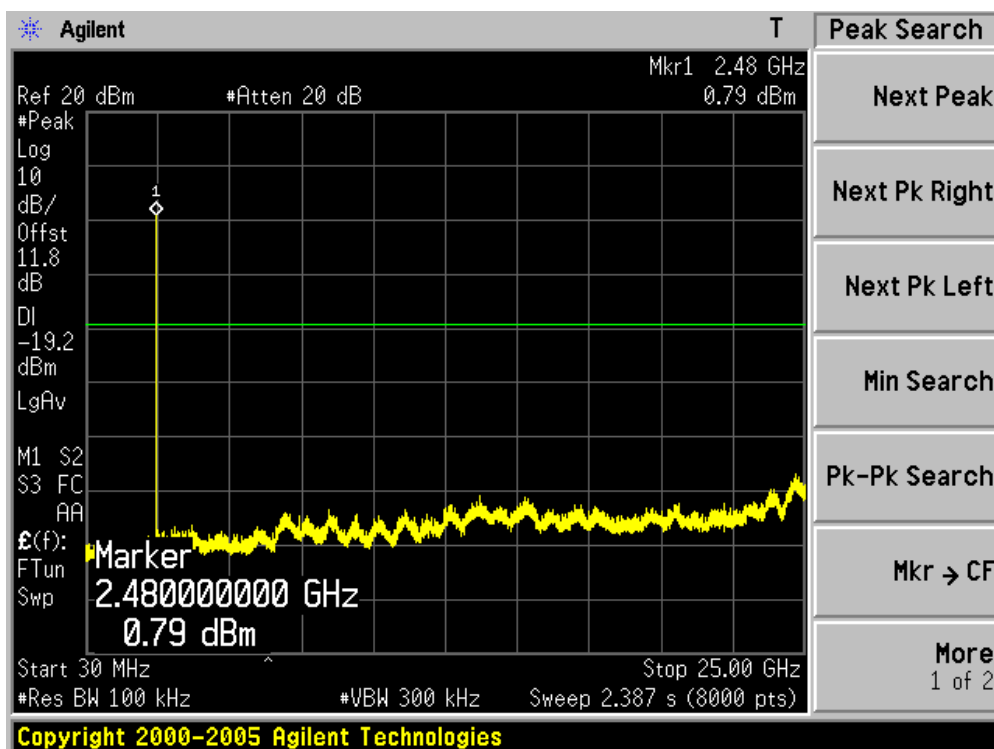
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



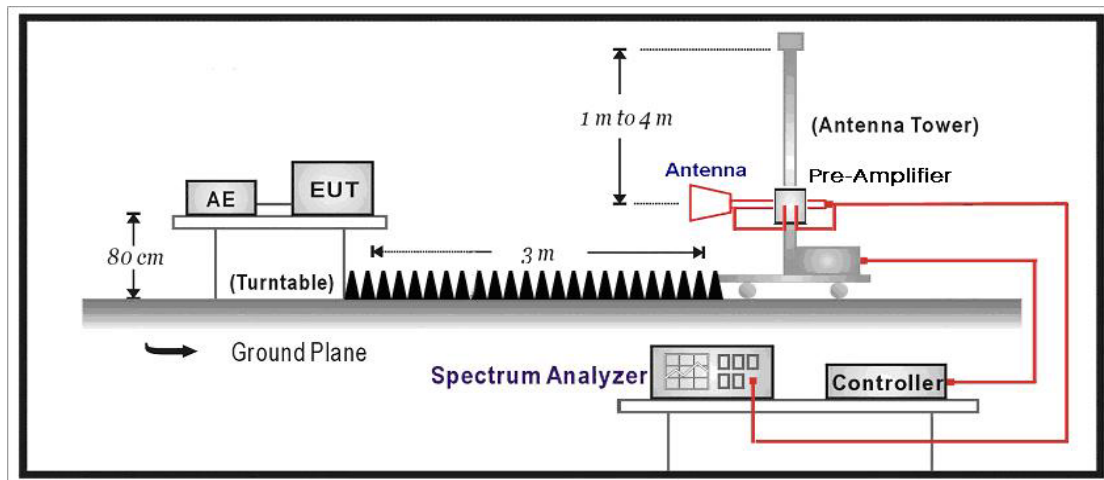
12. Radiated Emission Band Edge

12.1. Test Equipment

☒ Radiated Emission Band Edge / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2014.03.30
EMI Test Receiver	R&S	ESCI	100573	2014.03.30
Preamplifier	Miteq	NSP1800-25	1364185	2014.05.03
Preamplifier	Quietek	AP-040G	CHM-0906001	2014.05.03
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2013.10.15
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2013.11.24
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2014.03.01
Temperature/Humidity Meter	zhicheng	ZC1-2	AC5-TH	2014.01.11

12.2. Test Setup



12.3. Limit

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a) of FCC part 15.

12.4. Test Procedure

According to ANSI C63.10: 2009.

This test is required for any spurious emission or modulation product that falls in a Restricted Band, as defined in Section 15.205 of FCC part 15. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Follow the guidelines in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b) of FCC part 15.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209 of FCC Part 15. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit of FCC part 15.

If the emission on which a radiated measurement must be made is located at the edge of the authorized band of operation, then the alternative “marker-delta” method may be employed.

12.5. Uncertainty

The measurement uncertainty above 1G is defined as $\pm 3.9 \text{ dB}$
below 1G is defined as $\pm 3.8 \text{ dB}$

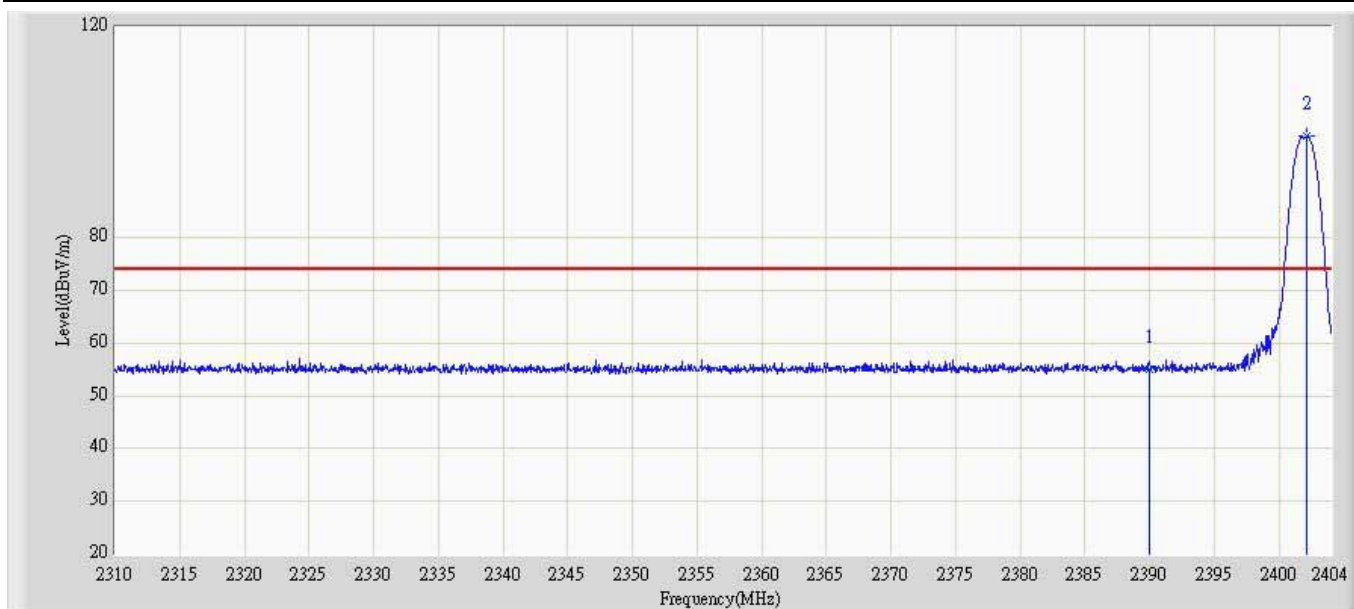
12.6. Test Result

All of the test result shown indicates the worst case, and spectrum analyzer parameters setting as shown below:

Peak detector: RBW = 1MHz, VBW = 3MHz, sweep time = 200ms;

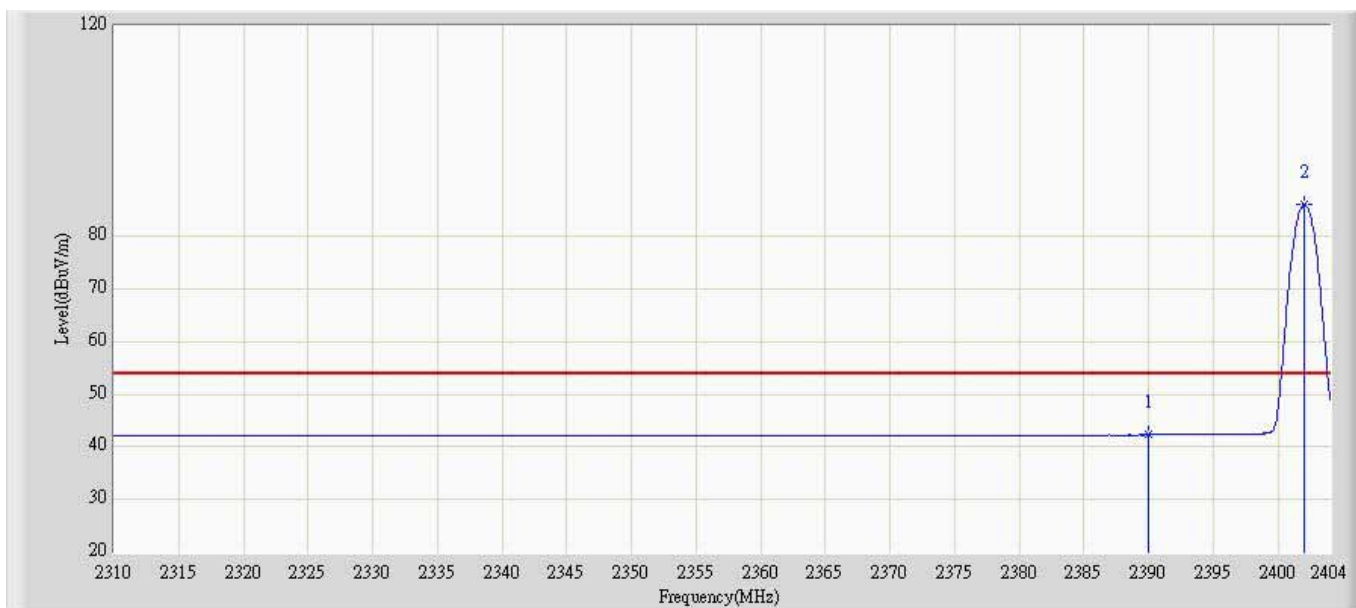
Average detector: RBW = 1MHz, VBW = 10Hz, sweep time = auto.

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 17:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Horizontal
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode1: Transmit channel 2402MHz by DH5	



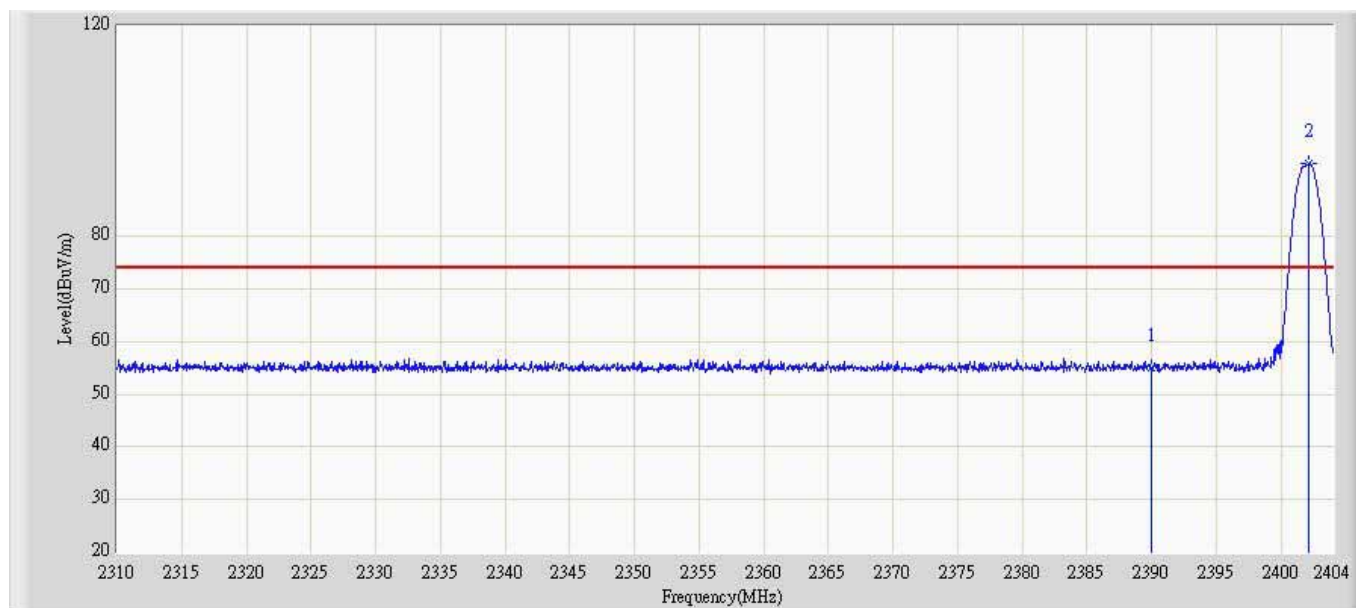
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	55.159	24.071	-18.841	74.000	31.088	PK
2	*	2402.167	99.223	68.064	N/A	N/A	31.158	PK

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 17:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Horizontal
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode1: Transmit channel 2402MHz by DH5	



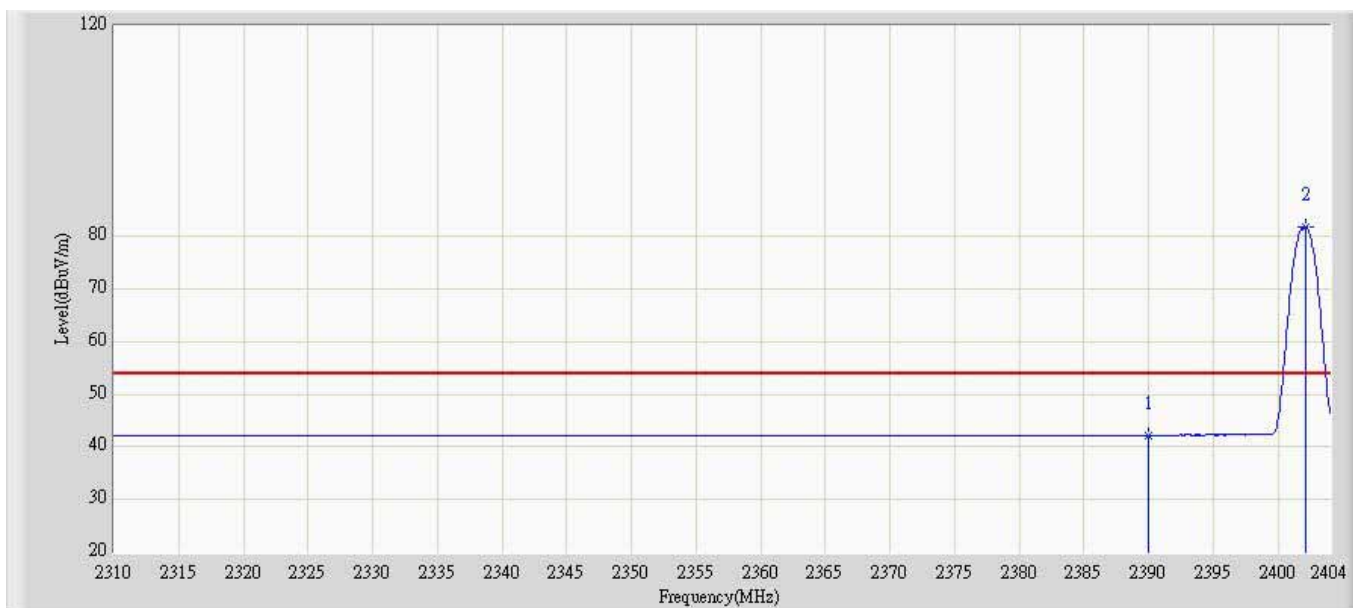
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	42.333	11.245	-11.667	54.000	31.088	AV
2	*	2401.979	86.018	54.861	N/A	N/A	31.158	AV

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 17:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Vertical
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode1: Transmit channel 2402MHz by DH5	



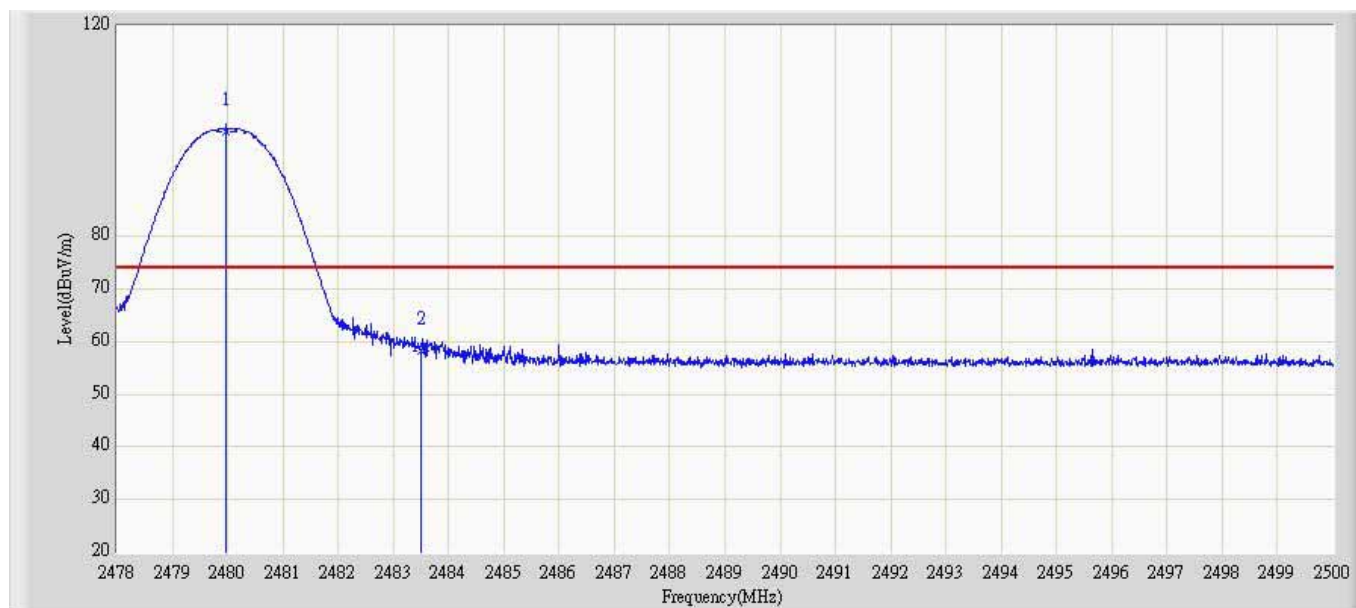
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	54.947	23.859	-19.053	74.000	31.088	PK
2	*	2402.167	93.817	62.658	N/A	N/A	31.158	PK

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 17:26
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Vertical
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode1: Transmit channel 2402MHz by DH5	



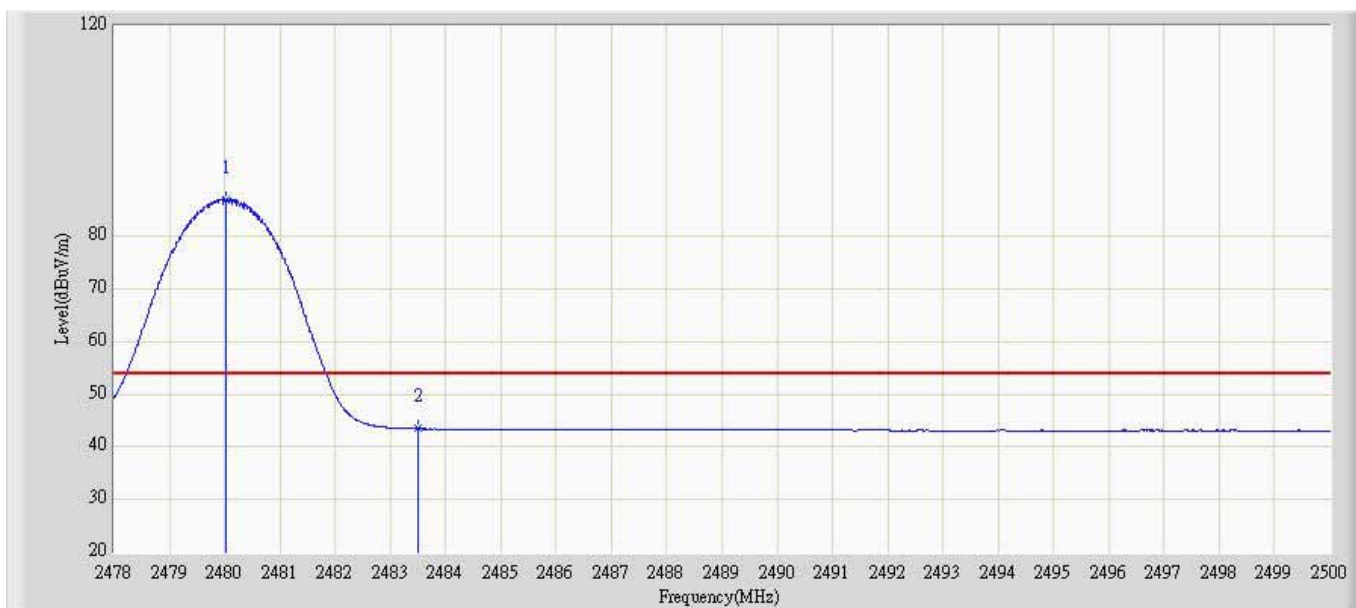
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	42.180	11.092	-11.820	54.000	31.088	AV
2	*	2402.167	81.780	50.621	N/A	N/A	31.158	AV

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 17:27
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Horizontal
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode1: Transmit channel 2480MHz by DH5	



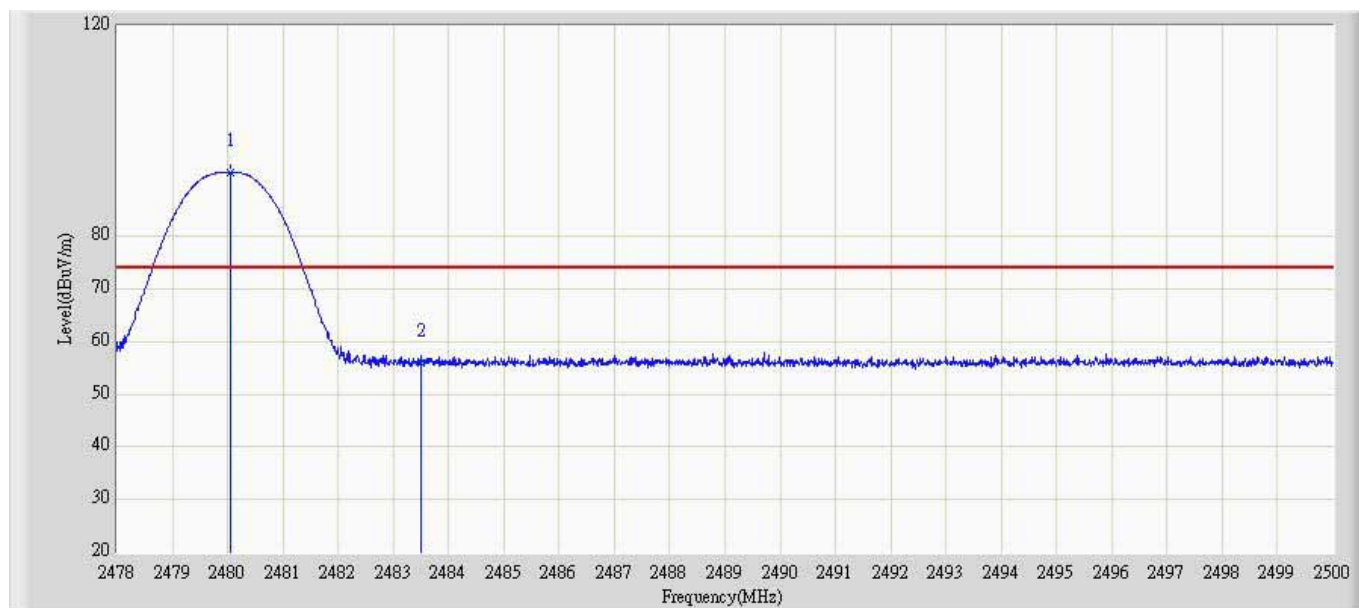
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.980	99.974	68.364	N/A	N/A	31.610	PK
2		2483.500	58.303	26.689	-15.697	74.000	31.613	PK

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 17:30
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Horizontal
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode1: Transmit channel 2480MHz by DH5	



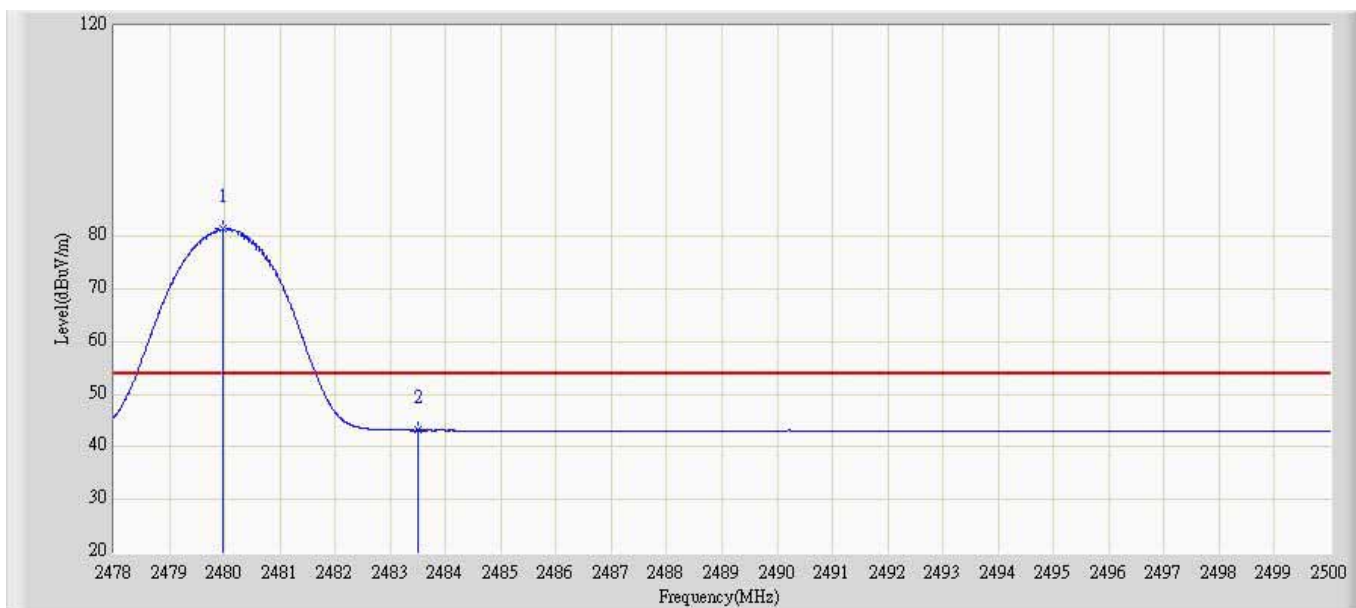
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.013	87.038	55.428	N/A	N/A	31.610	AV
2		2483.500	43.428	11.814	-10.572	54.000	31.613	AV

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 17:31
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Vertical
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode1: Transmit channel 2480MHz by DH5	



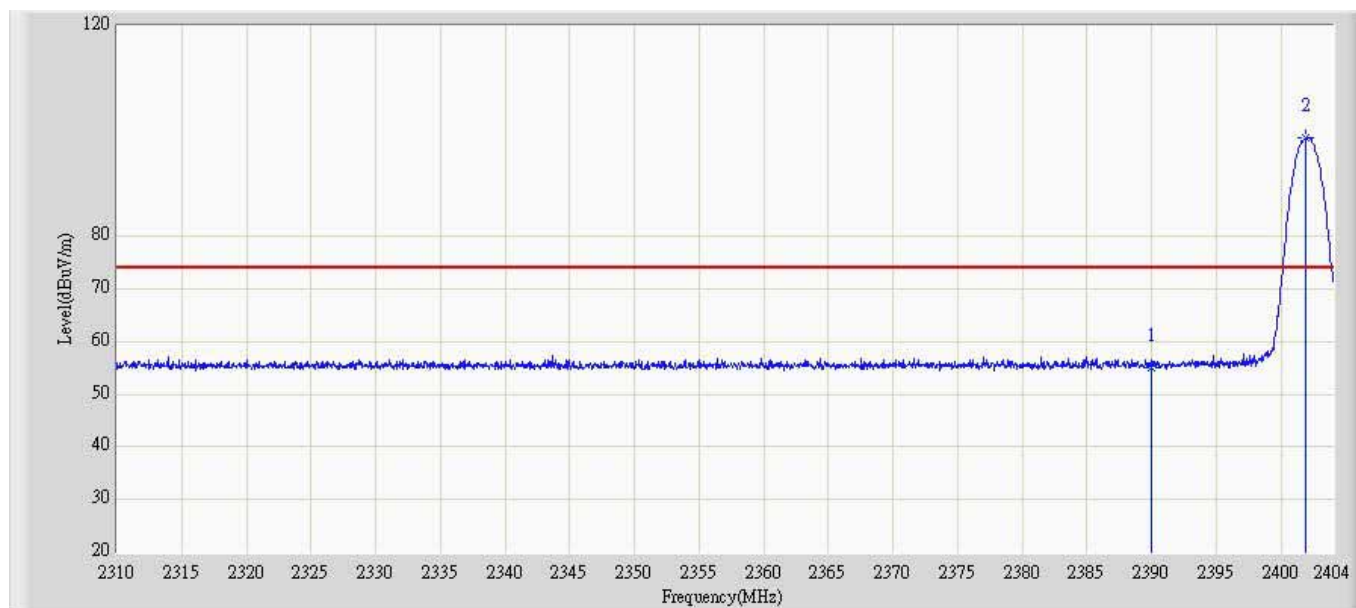
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.046	92.097	60.487	N/A	N/A	31.610	PK
2		2483.500	55.785	24.171	-18.215	74.000	31.613	PK

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 17:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Vertical
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode1: Transmit channel 2480MHz by DH5	



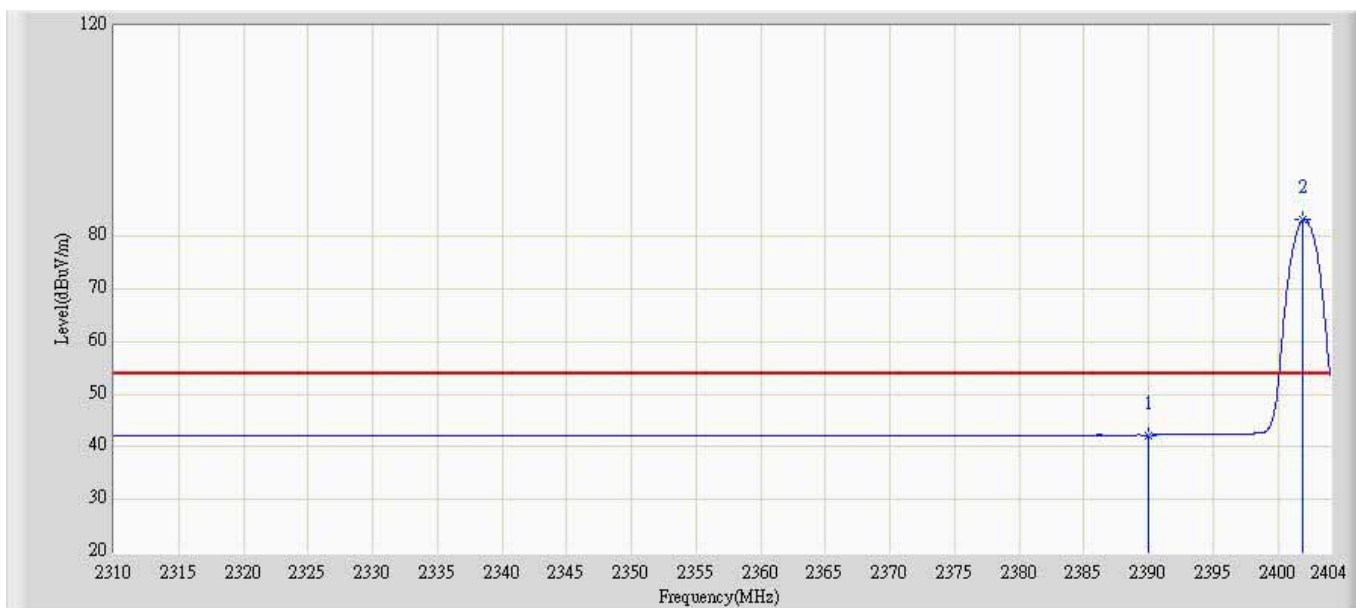
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.980	81.363	49.753	N/A	N/A	31.610	AV
2		2483.500	43.136	11.522	-10.864	54.000	31.613	AV

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 17:35
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Horizontal
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode2: Transmit channel 2402MHz by 2DH5	



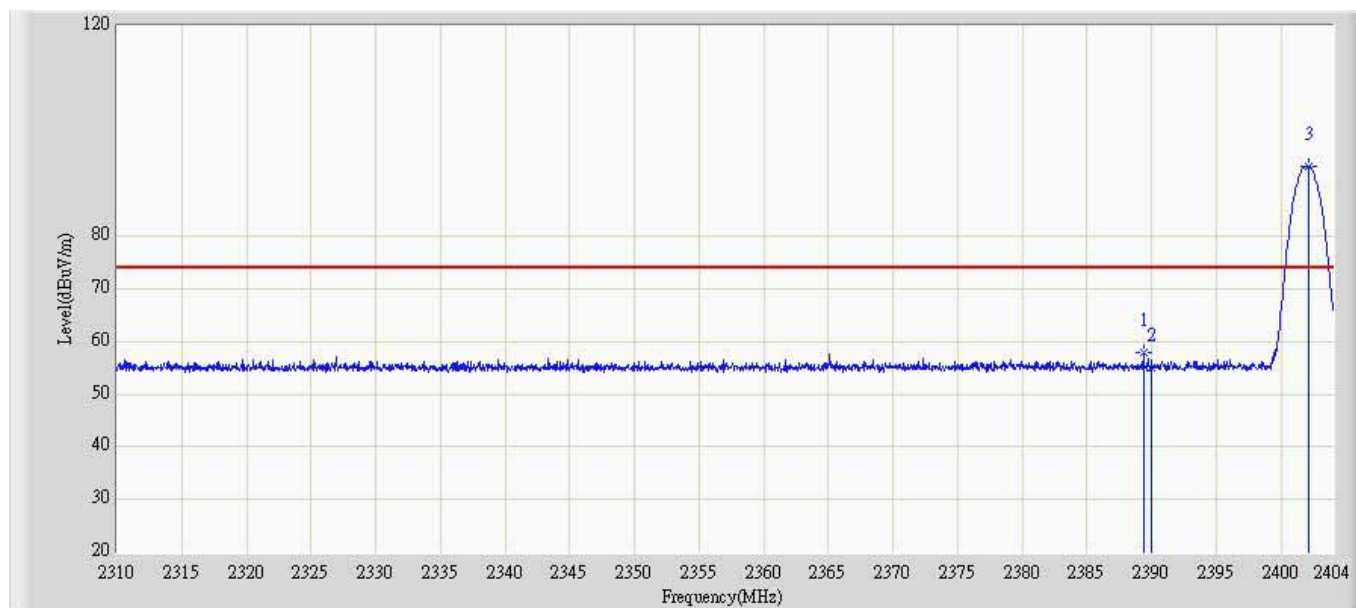
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	55.133	24.045	-18.867	74.000	31.088	PK
2	*	2401.885	98.766	67.609	N/A	N/A	31.157	PK

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 17:41
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Horizontal
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode2: Transmit channel 2402MHz by 2DH5	



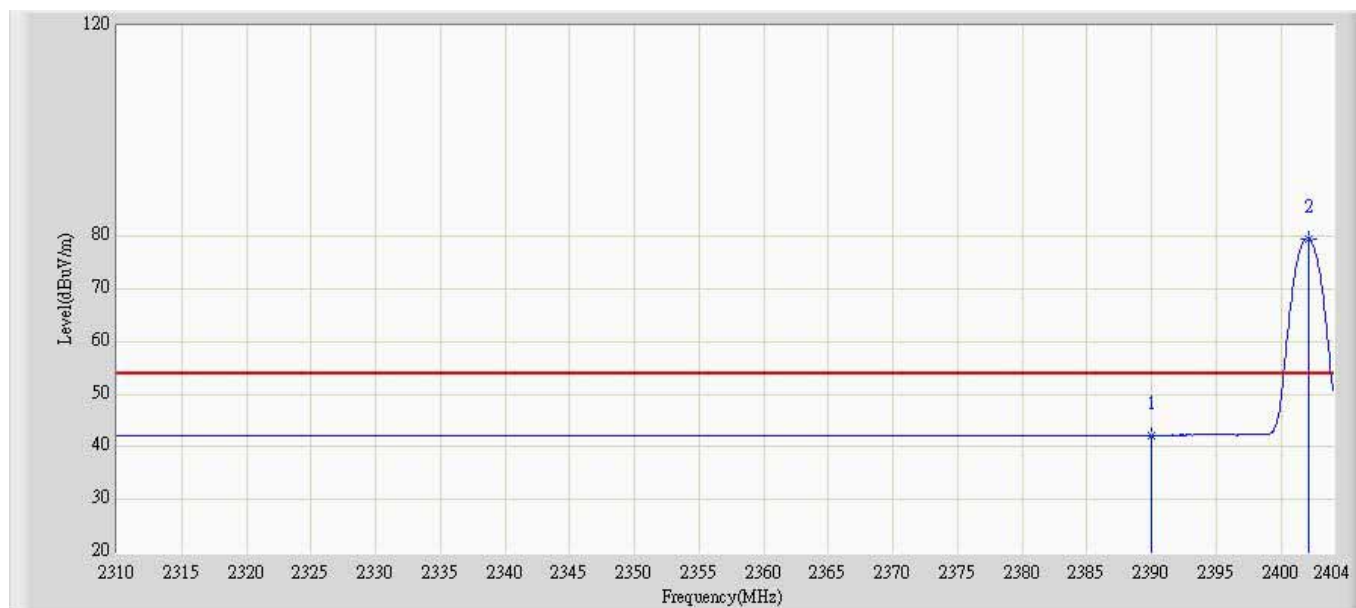
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	42.259	11.171	-11.741	54.000	31.088	AV
2	*	2401.932	83.222	52.065	N/A	N/A	31.157	AV

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 17:42
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Vertical
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode2: Transmit channel 2402MHz by 2DH5	



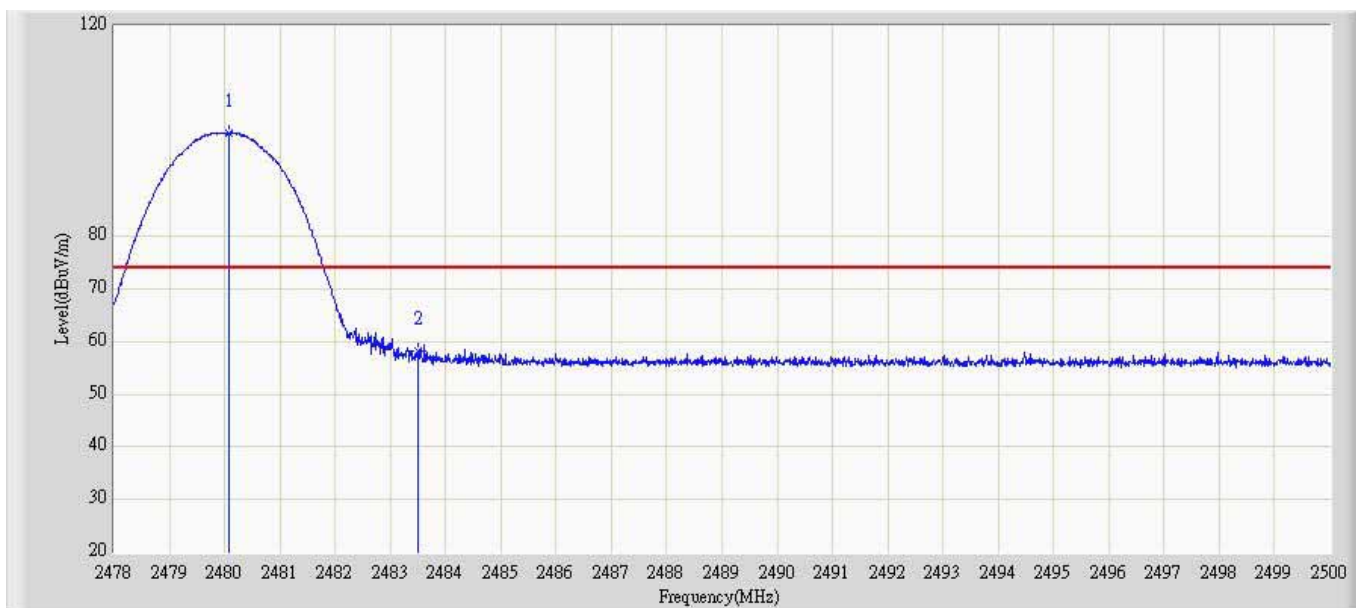
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2389.336	57.994	26.908	-16.006	74.000	31.086	PK
2		2390.000	54.928	23.840	-19.072	74.000	31.088	PK
3	*	2402.167	93.272	62.113	N/A	N/A	31.158	PK

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 17:44
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Vertical
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode2: Transmit channel 2402MHz by 2DH5	



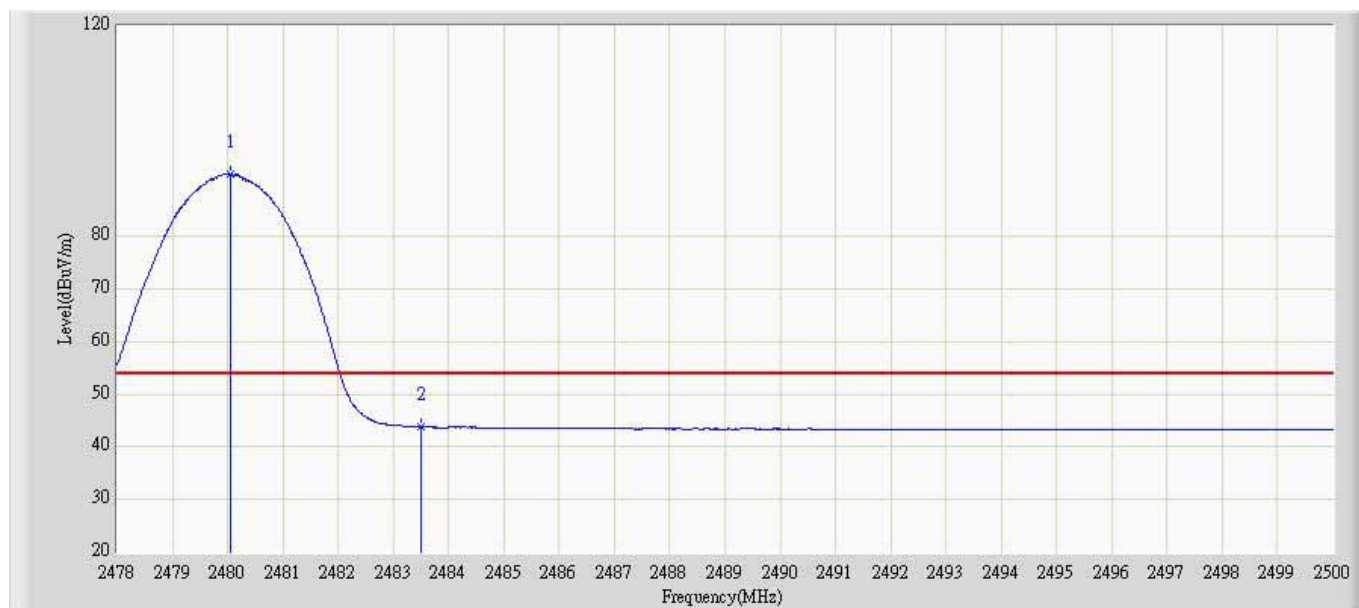
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	42.215	11.127	-11.785	54.000	31.088	AV
2	*	2402.167	79.549	48.390	N/A	N/A	31.158	AV

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 17:45
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Horizontal
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode2: Transmit channel 2480MHz by 2DH5	



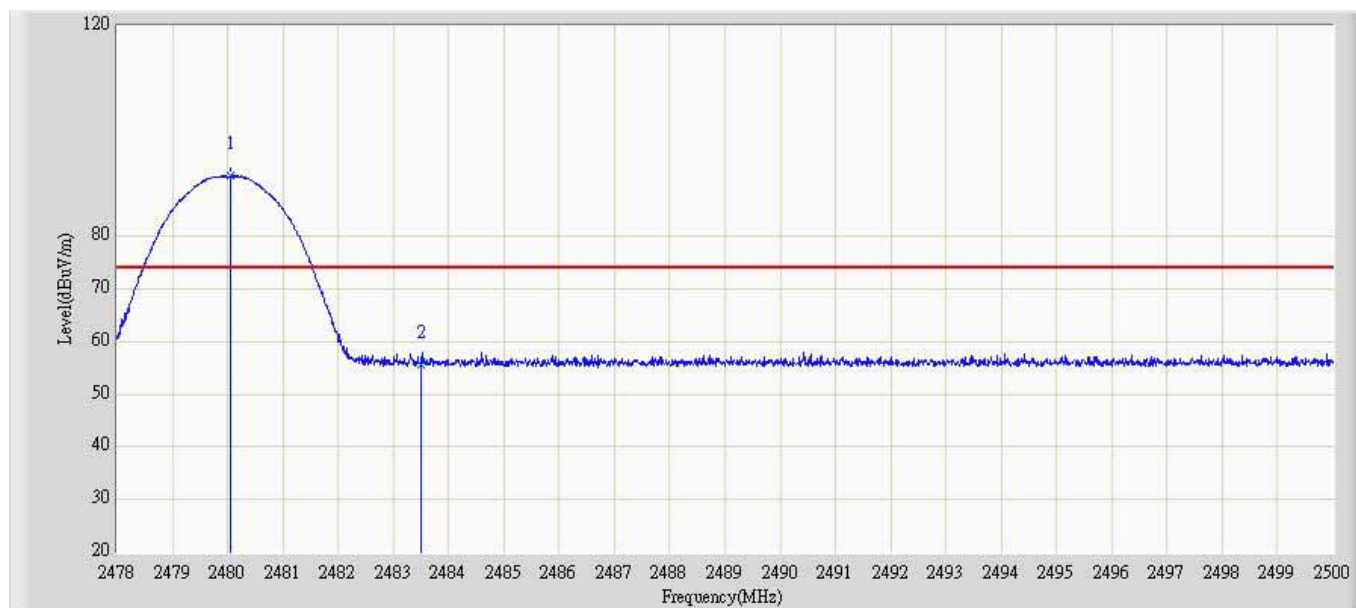
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.079	99.735	68.125	N/A	N/A	31.610	PK
2		2483.500	58.095	26.482	-15.905	74.000	31.613	PK

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 19:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Horizontal
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode2: Transmit channel 2480MHz by 2DH5	



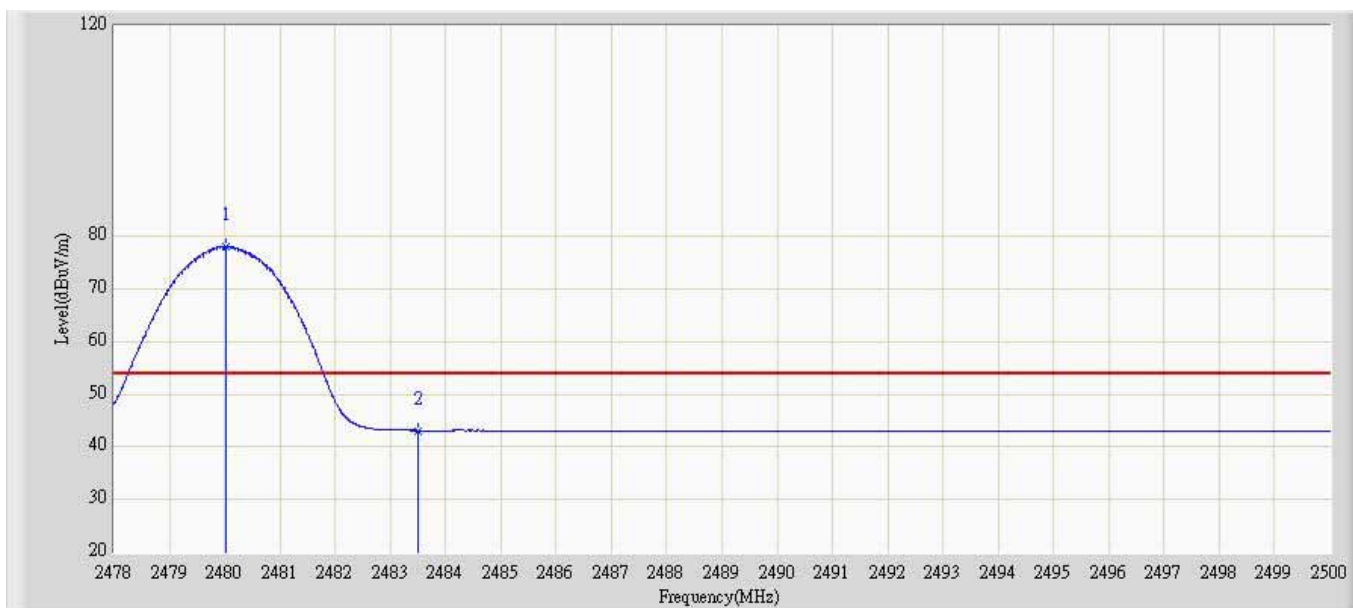
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.046	91.802	60.192	N/A	N/A	31.610	AV
2		2483.500	43.883	12.269	-10.117	54.000	31.613	AV

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 19:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Vertical
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode2: Transmit channel 2480MHz by 2DH5	



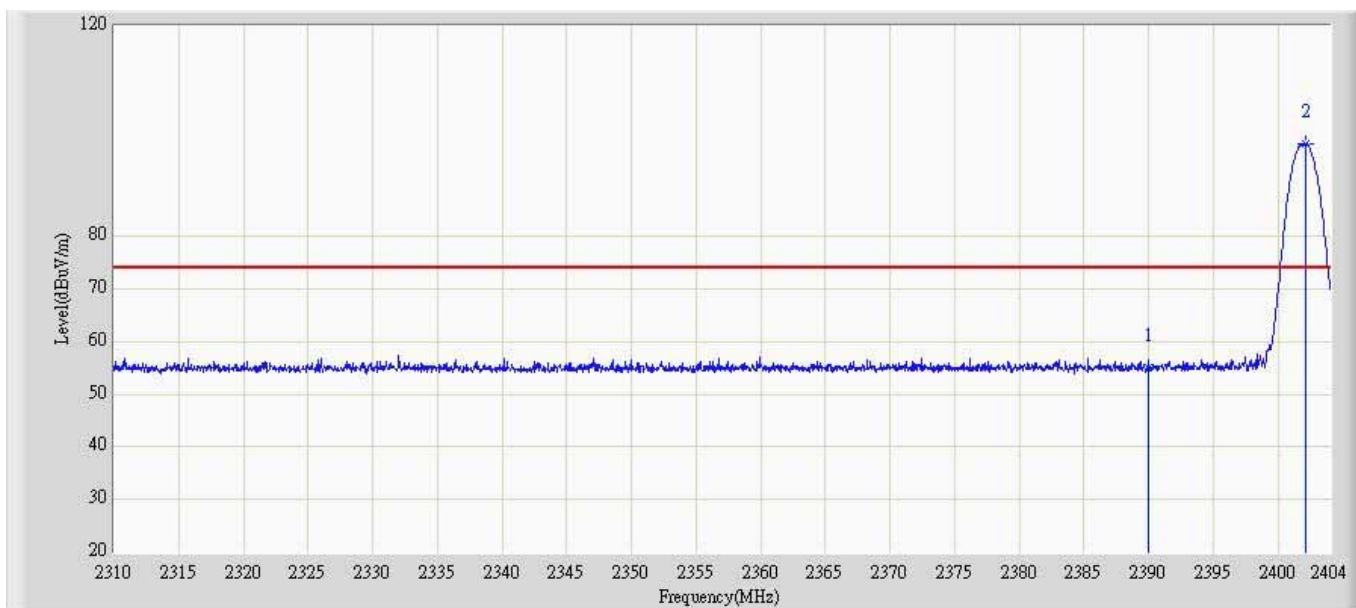
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.046	91.441	59.831	N/A	N/A	31.610	PK
2		2483.500	55.738	24.125	-18.262	74.000	31.613	PK

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 19:20
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Vertical
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode2: Transmit channel 2480MHz by 2DH5	



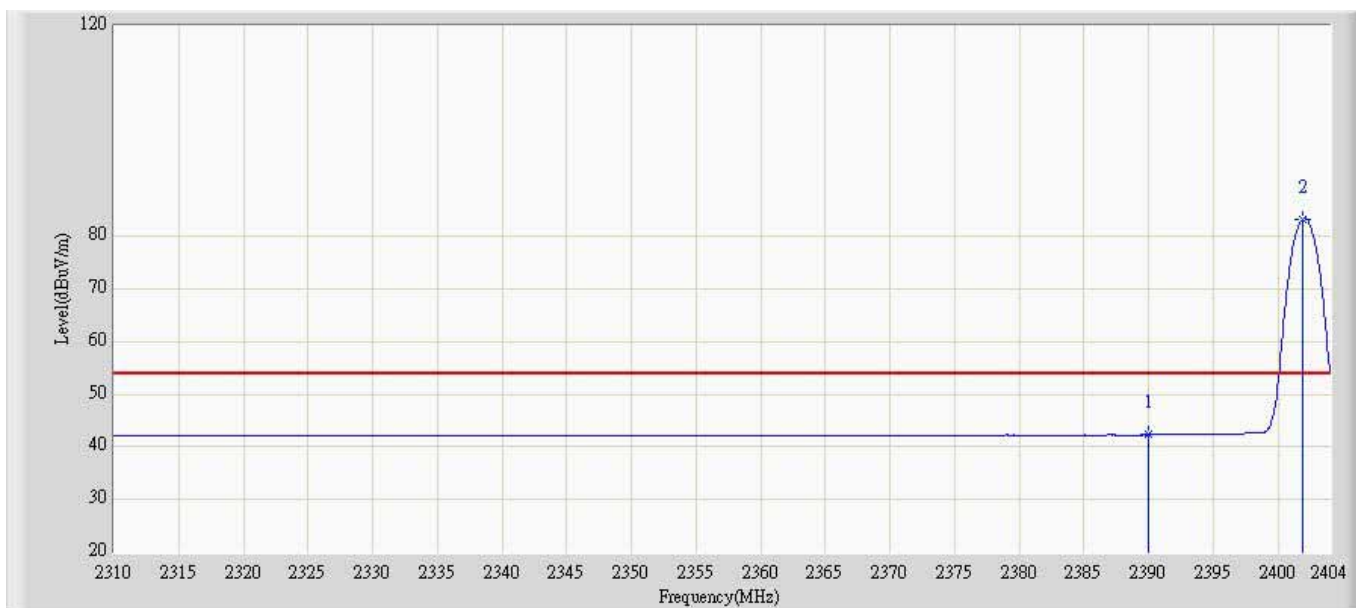
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.013	78.087	46.477	N/A	N/A	31.610	AV
2		2483.500	43.119	11.506	-10.881	54.000	31.613	AV

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 19:21
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Horizontal
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode3: Transmit channel 2402MHz by 3DH5	



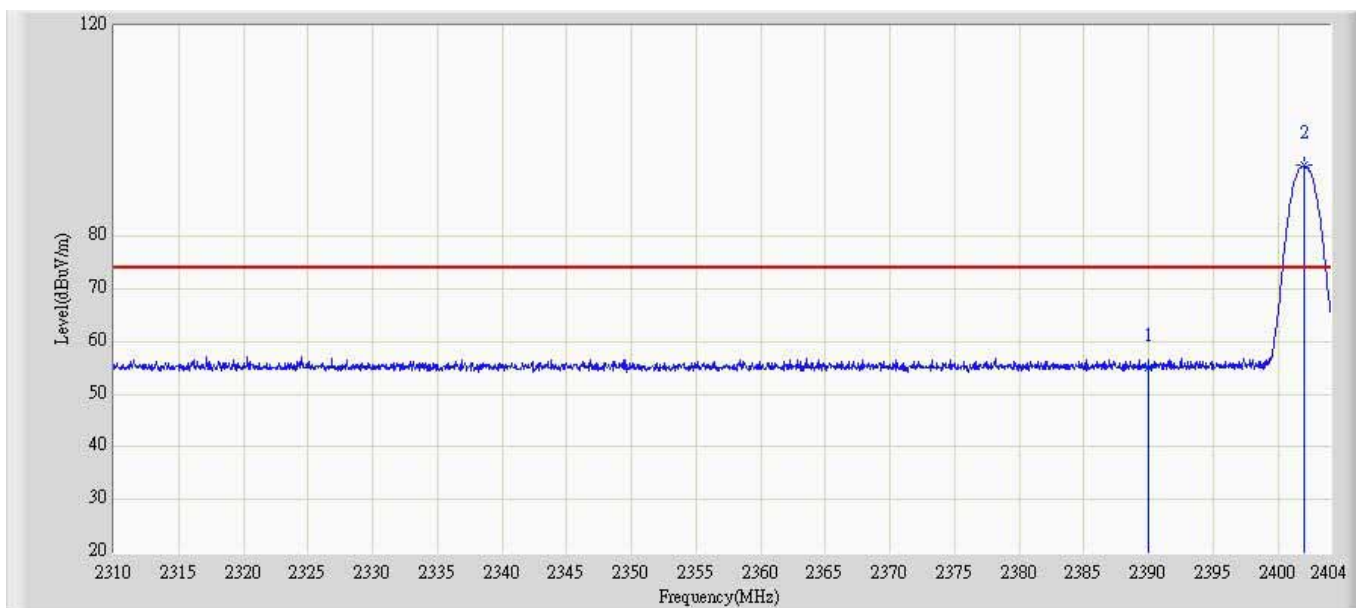
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	55.028	23.940	-18.972	74.000	31.088	PK
2	*	2402.167	97.489	66.330	N/A	N/A	31.158	PK

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 19:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Horizontal
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode3: Transmit channel 2402MHz by 3DH5	



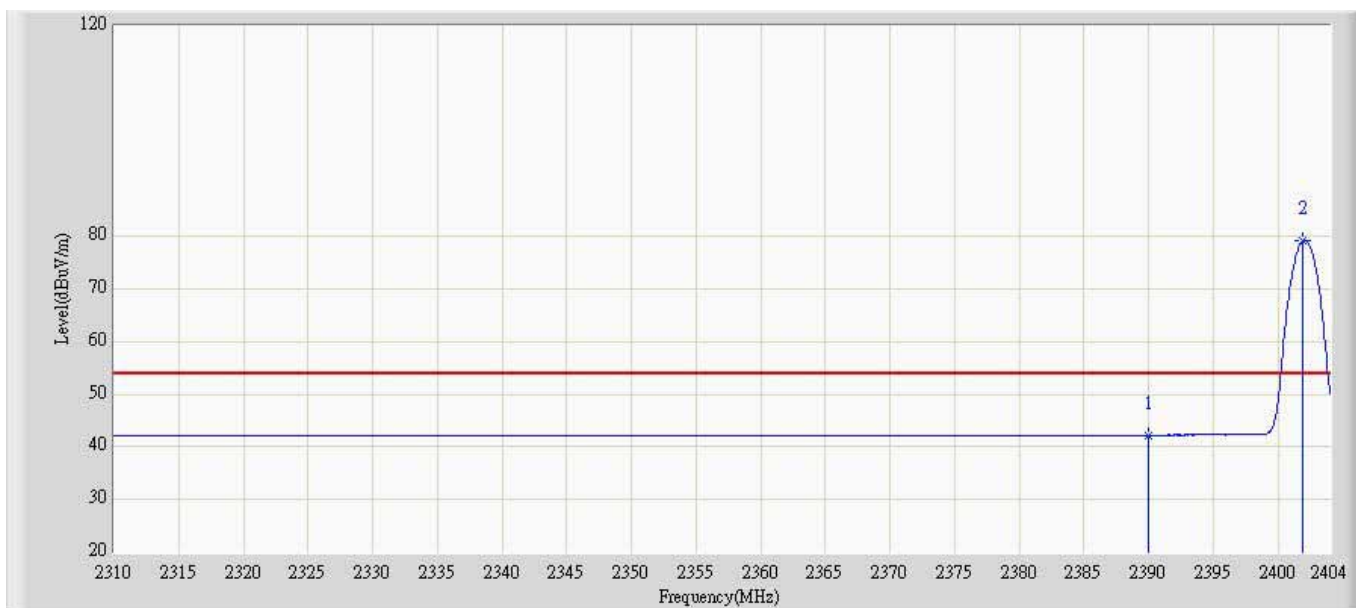
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	42.288	11.200	-11.712	54.000	31.088	AV
2	*	2401.885	83.227	52.070	N/A	N/A	31.157	AV

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 19:26
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Vertical
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode3: Transmit channel 2402MHz by 3DH5	



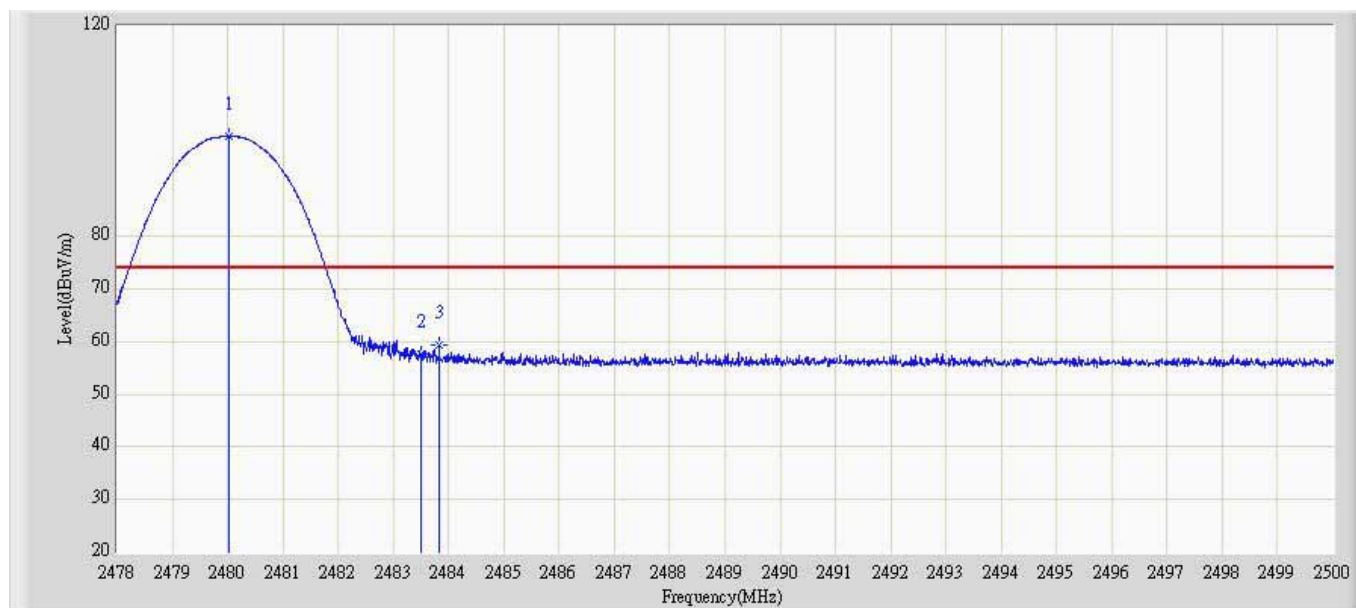
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	55.071	23.983	-18.929	74.000	31.088	PK
2	*	2401.979	93.447	62.290	N/A	N/A	31.158	PK

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 19:29
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Vertical
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode3: Transmit channel 2402MHz by 3DH5	



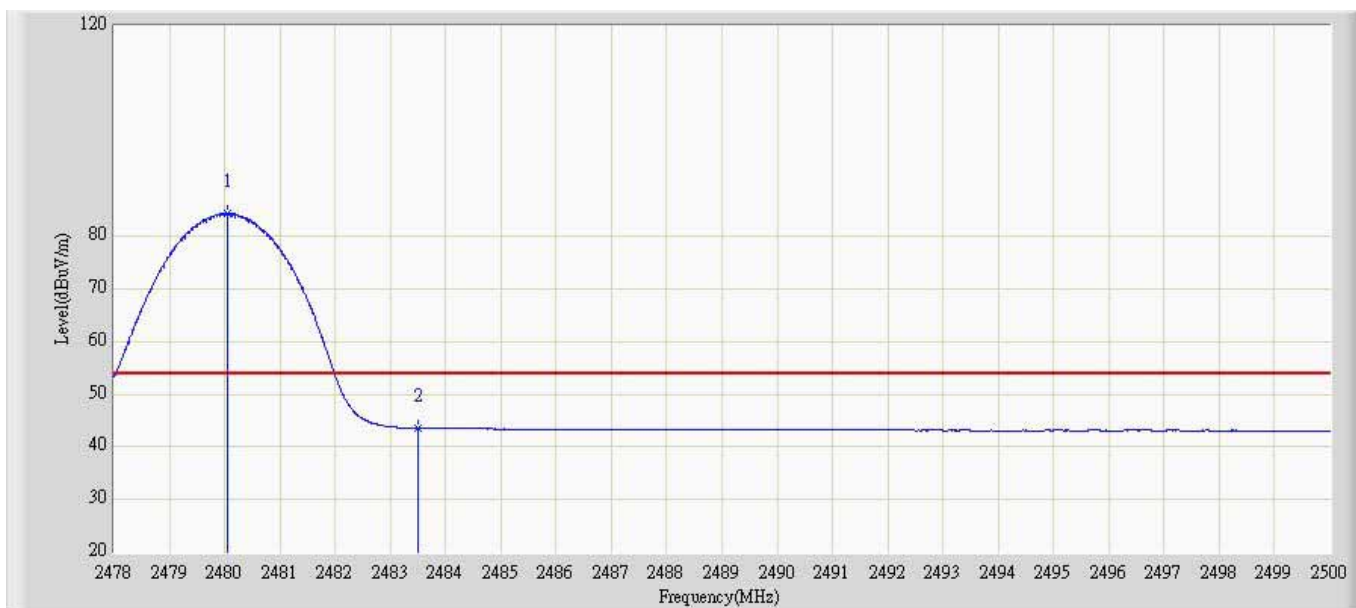
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	42.205	11.117	-11.795	54.000	31.088	AV
2	*	2401.932	79.226	48.069	N/A	N/A	31.157	AV

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 19:30
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Horizontal
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode3: Transmit channel 2480MHz by 3DH5	



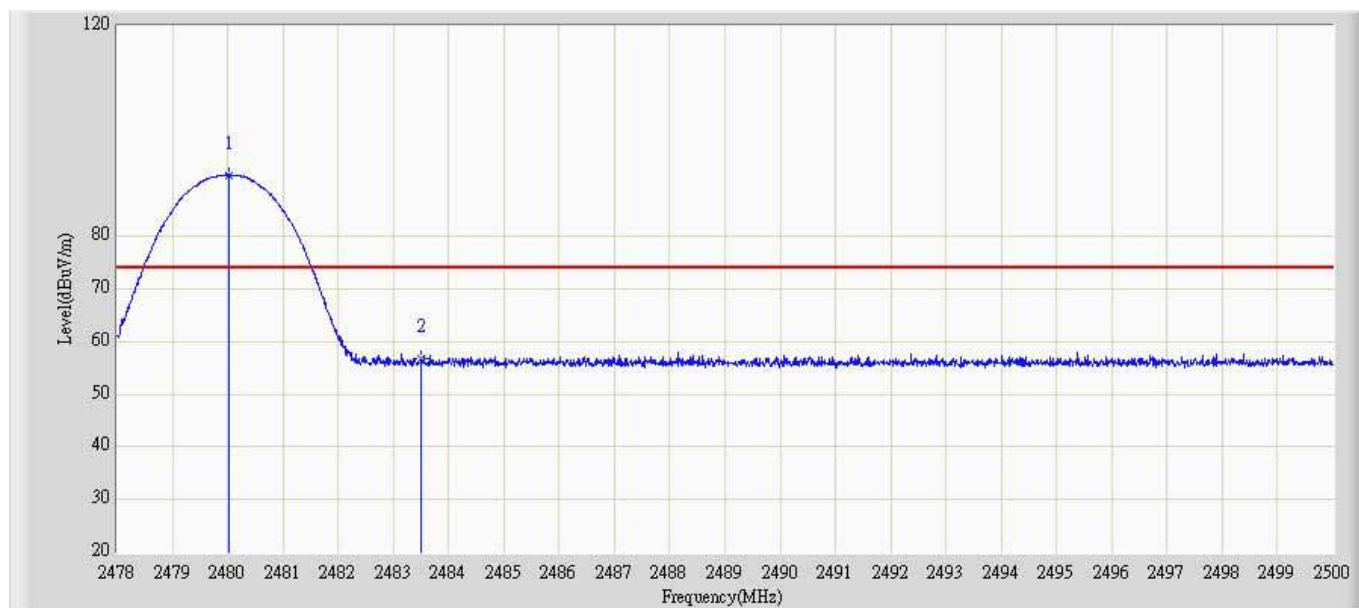
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.013	99.054	67.444	N/A	N/A	31.610	PK
2		2483.500	57.523	25.910	-16.477	74.000	31.613	PK
3		2483.830	59.435	27.821	-14.565	74.000	31.613	PK

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 19:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Horizontal
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode3: Transmit channel 2480MHz by 3DH5	



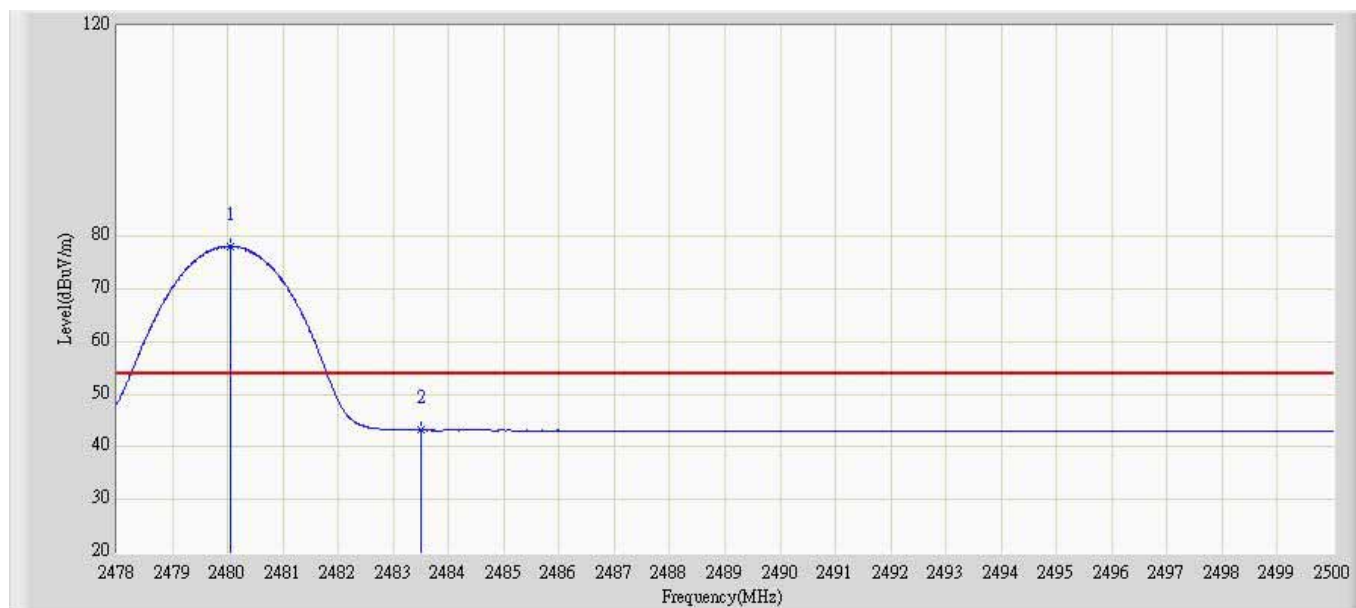
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.057	84.239	52.629	N/A	N/A	31.610	AV
2		2483.500	43.544	11.931	-10.456	54.000	31.613	AV

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 19:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Vertical
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode3: Transmit channel 2480MHz by 3DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.013	91.672	60.062	N/A	N/A	31.610	PK
2		2483.500	56.753	25.140	-17.247	74.000	31.613	PK

Engineer: Milo	
Site: AC5	Time: 2013/07/10 - 19:36
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-737(1-18GHz)	Polarity: Vertical
EUT: WCDMA Digital Mobile Phone	Power: DC 3.7V
Note: Mode3: Transmit channel 2480MHz by 3DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.046	78.053	46.443	N/A	N/A	31.610	AV
2		2483.500	43.163	11.549	-10.837	54.000	31.613	AV

The End