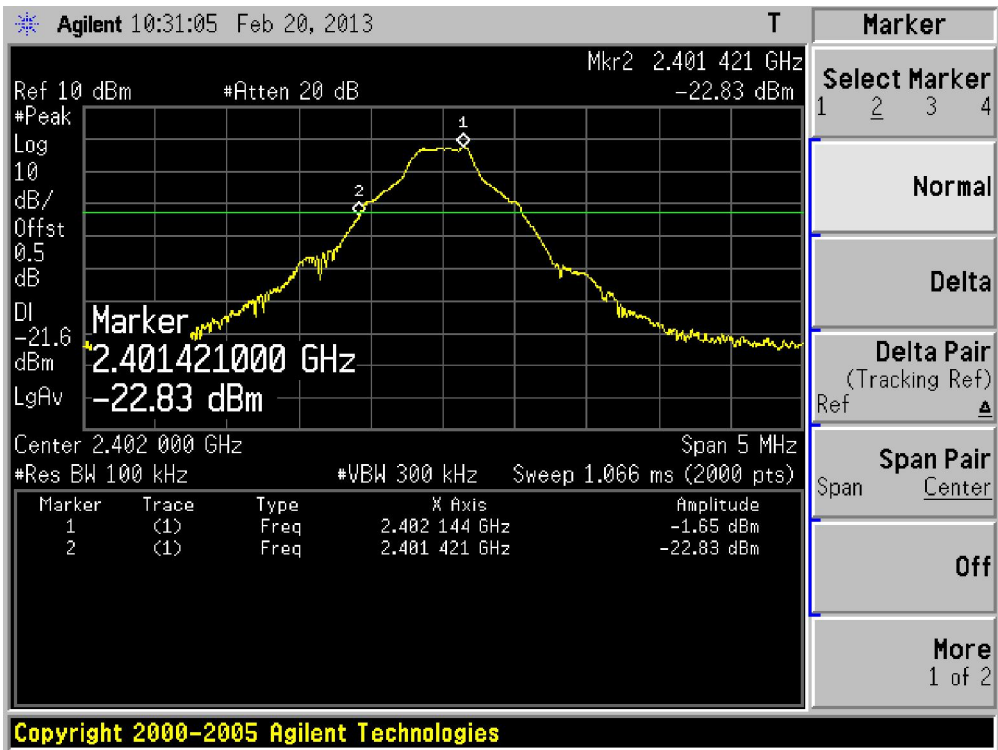


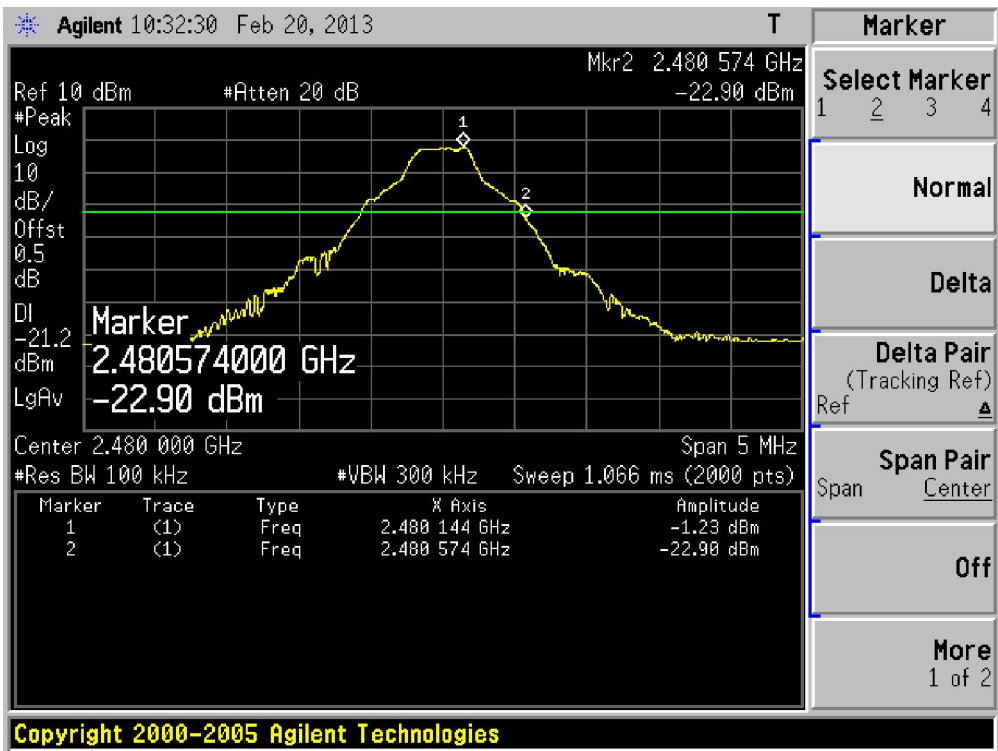
10.6. Test Result

Product	:	Speaker
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Mode	:	Mode 1: Transmitter-1Mbps(GFSK_DH5)

Channel 00 (2402MHz)

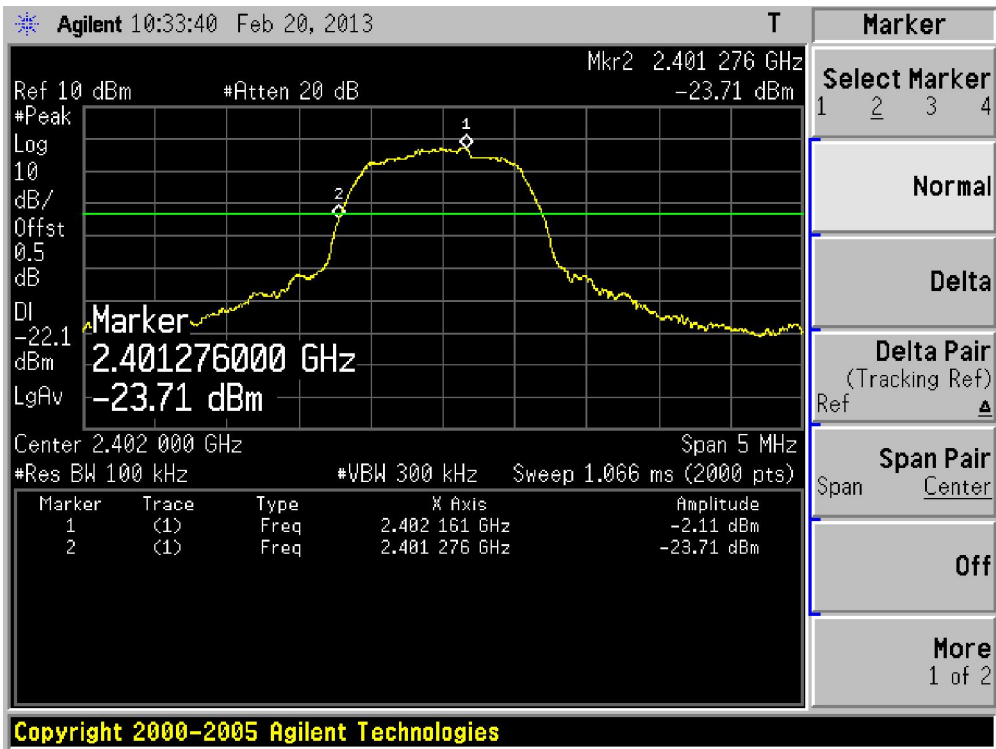


Channel 78 (2480MHz)

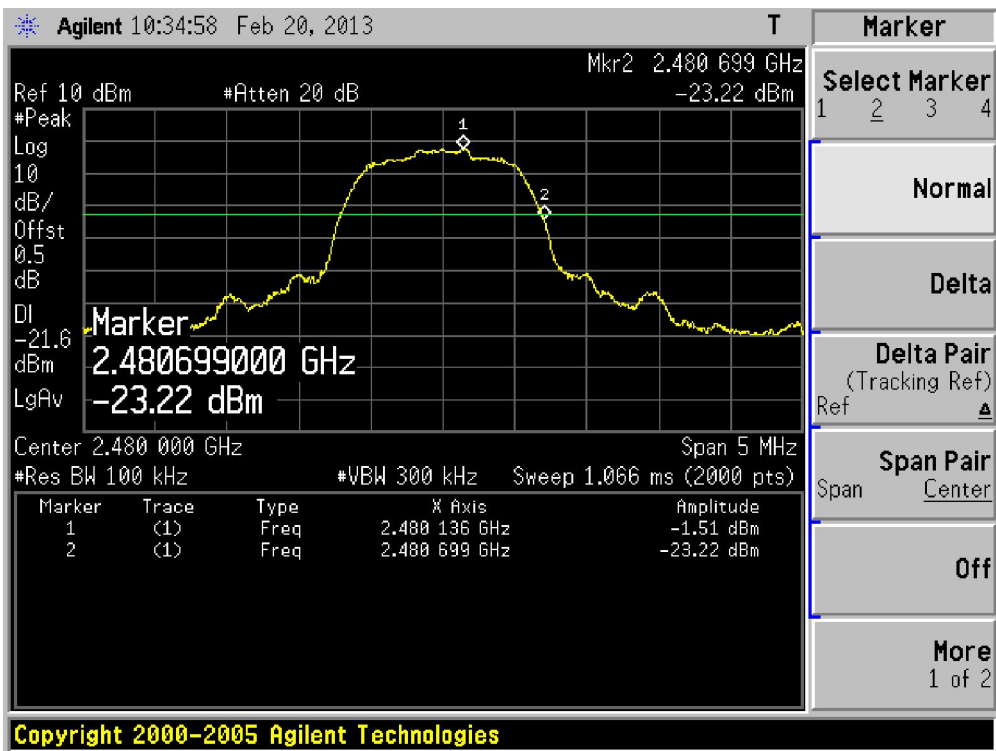


Product	:	Speaker
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Mode	:	Mode 2: Transmitter-2Mbps(Pi/4 DQPSK_DH5)

Channel 00 (2402MHz)

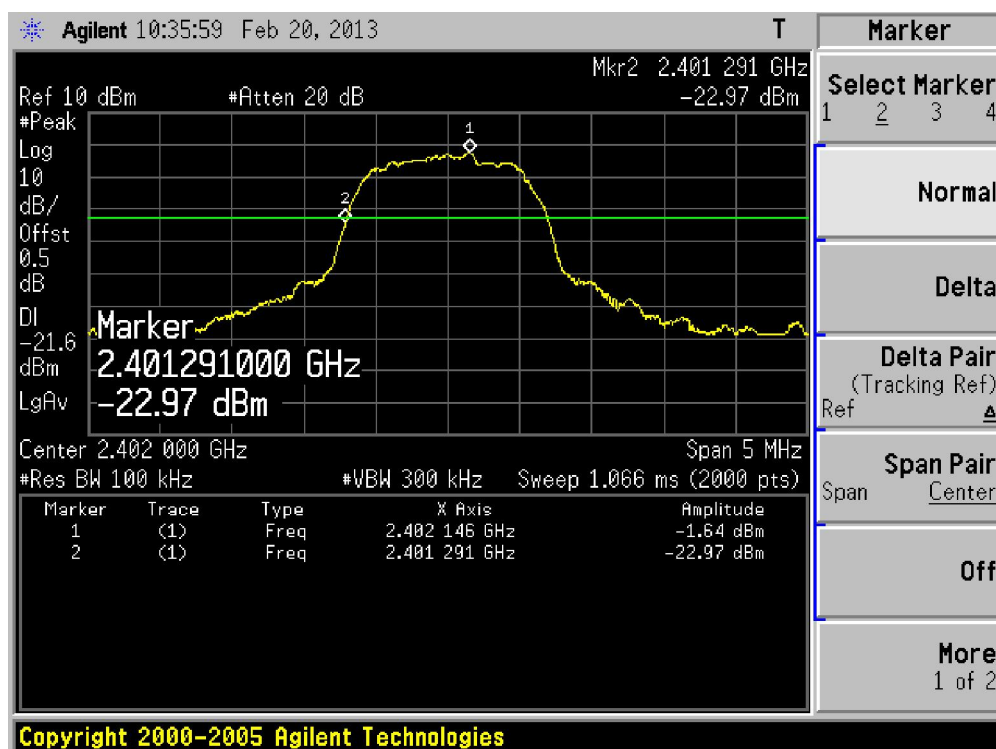


Channel 78 (2480MHz)

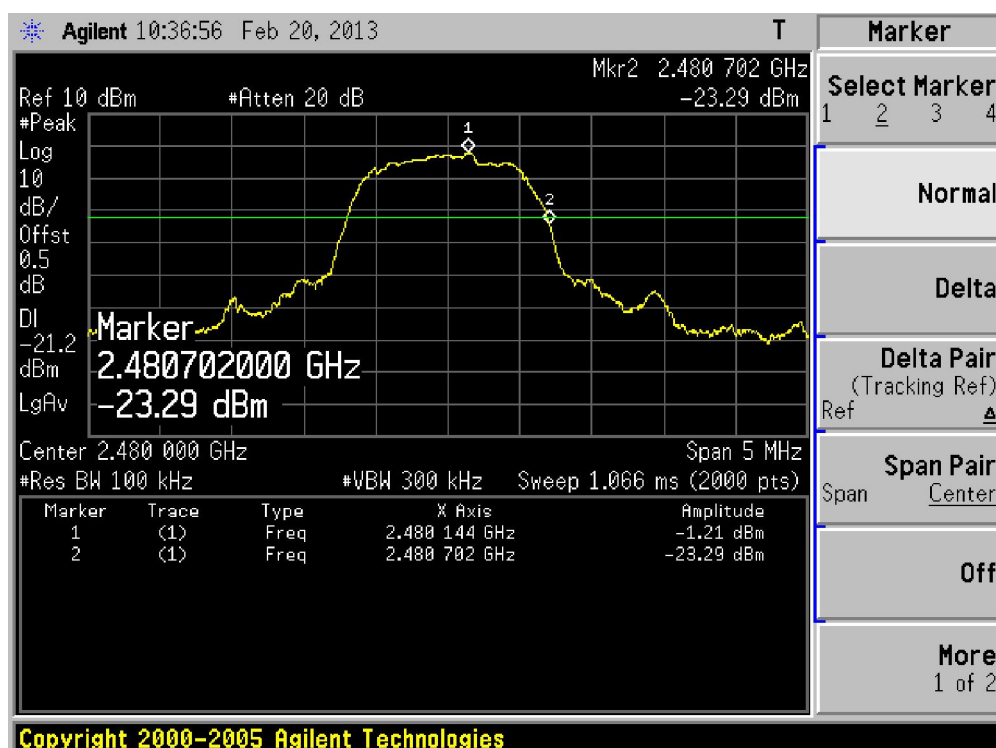


Product	:	Speaker
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Mode	:	Mode 3: Transmitter-3Mbps(8DPSK_DH5)

Channel 00 (2402MHz)

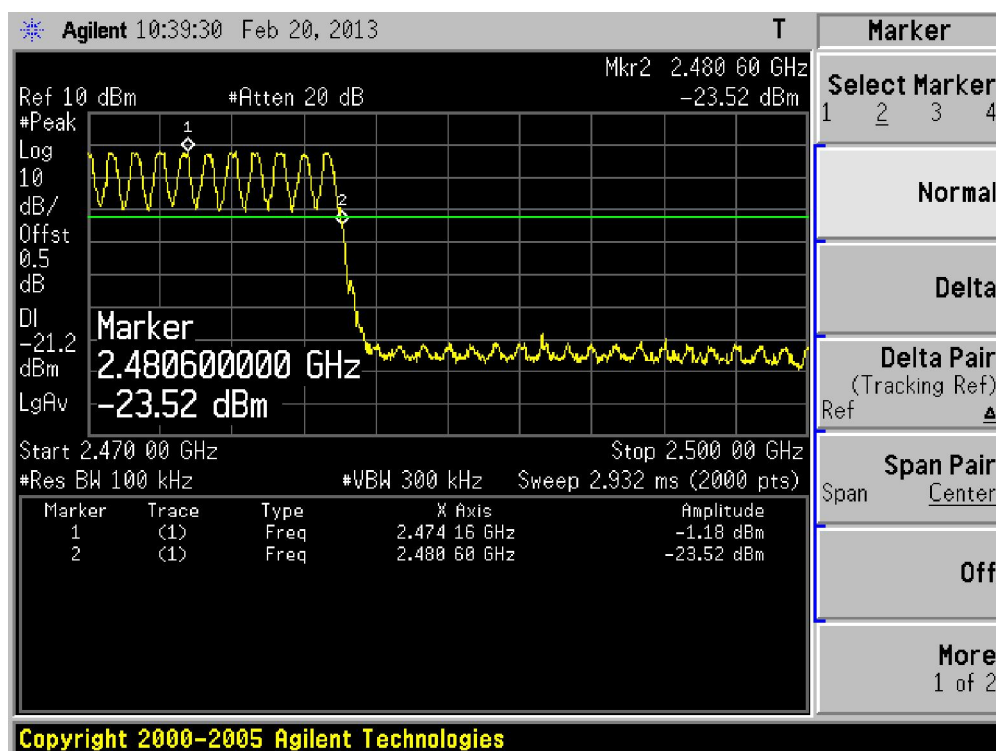
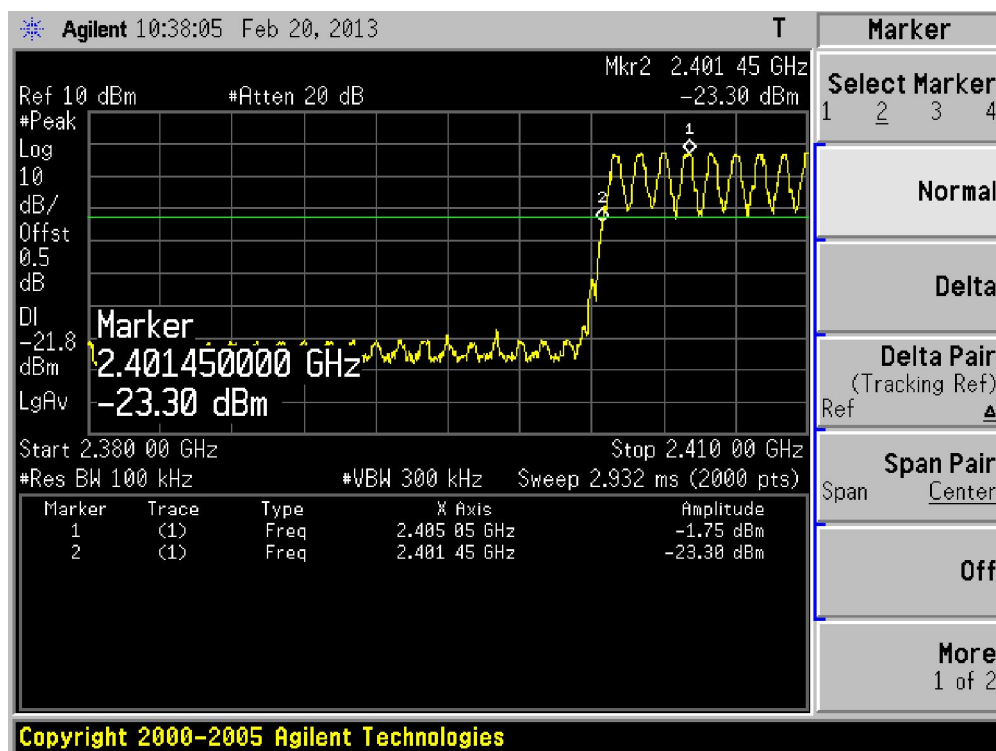


Channel 78 (2480MHz)



Product	:	Speaker
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Mode	:	Mode: Hopping Mode

Hopping Mode



11. Spurious RF Conducted Emissions

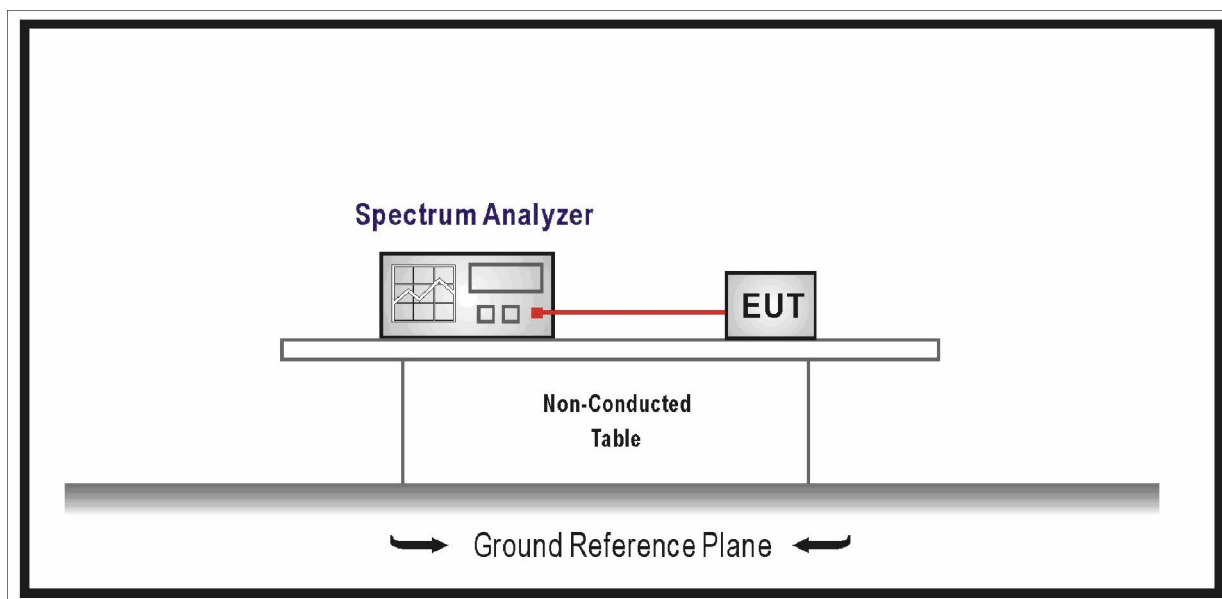
11.1. Test Equipment

Spurious RF Conducted Emissions / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2013.04.18
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2013.05.07

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

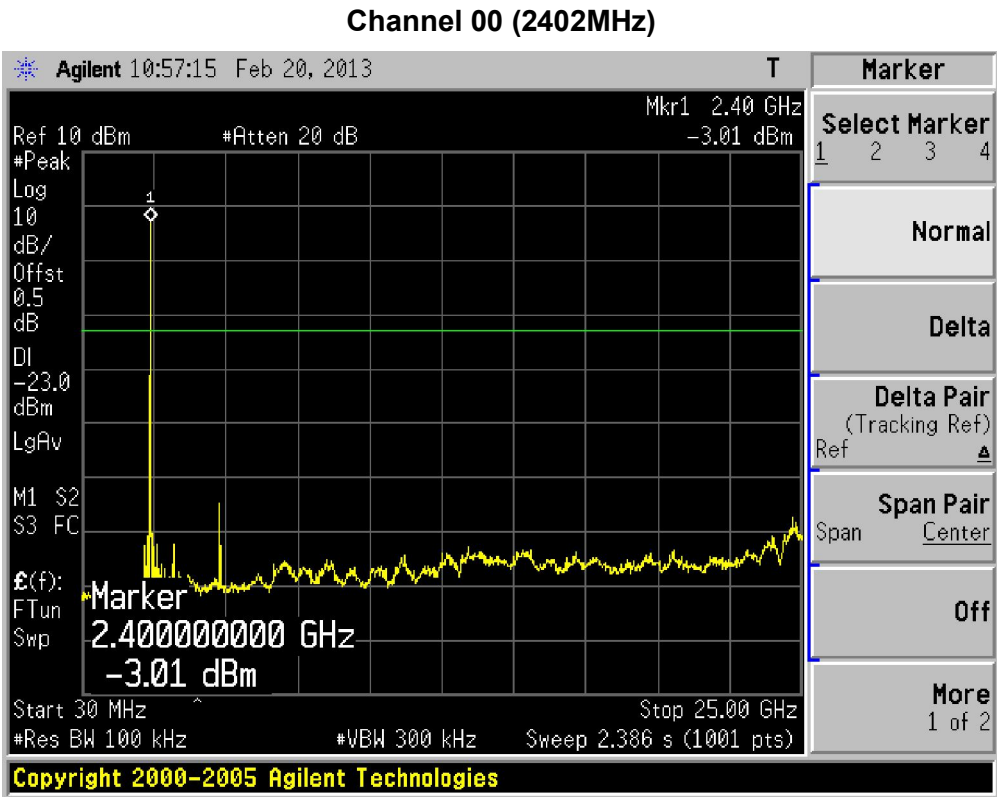
Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this section.

11.5. Uncertainty

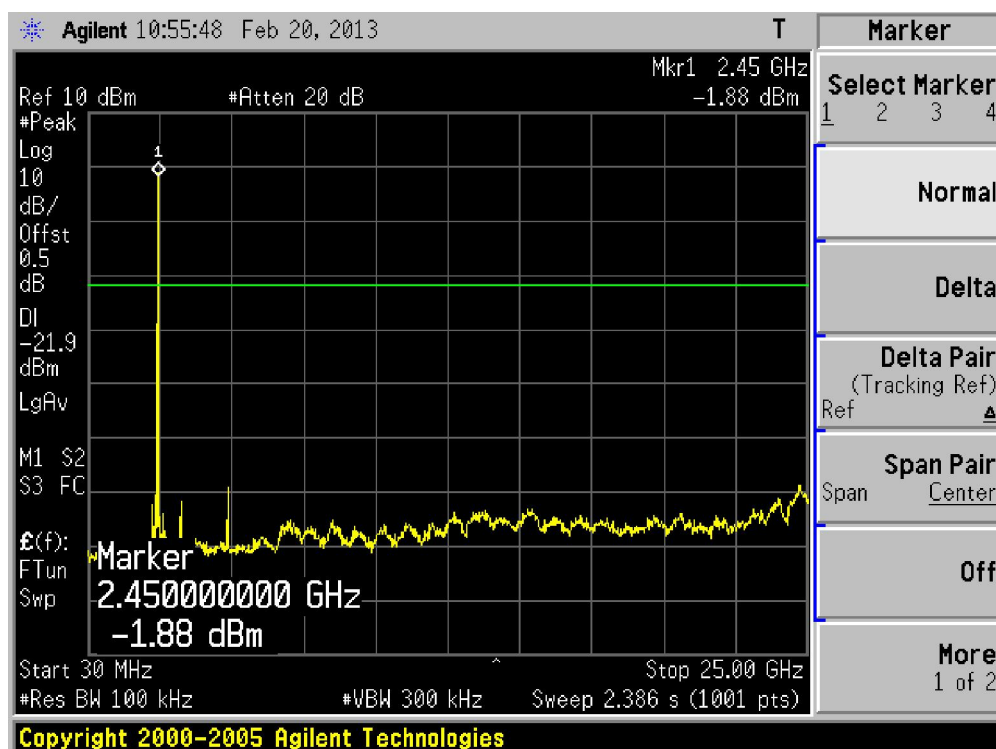
The measurement uncertainty is defined as ± 1.0 dB

11.6. Test Result

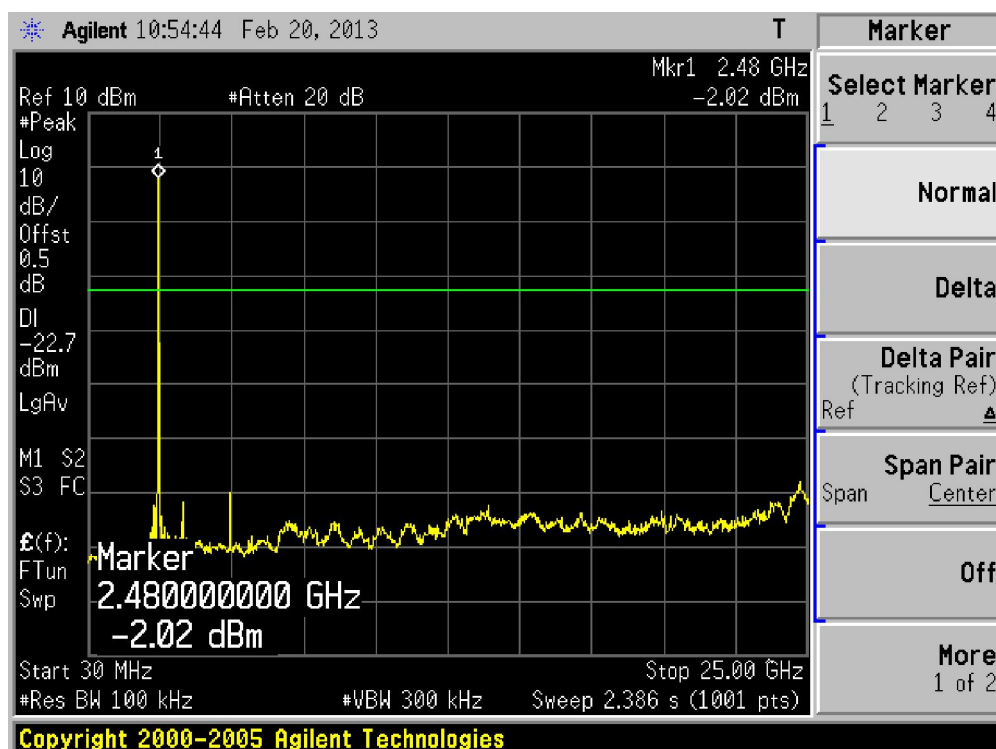
Product	:	Speaker
Test Item	:	Spurious RF Conducted Emissions
Test Mode	:	Mode 1: Transmitter-1Mbps(GFSK_DH5)



Channel 39 (2441MHz)

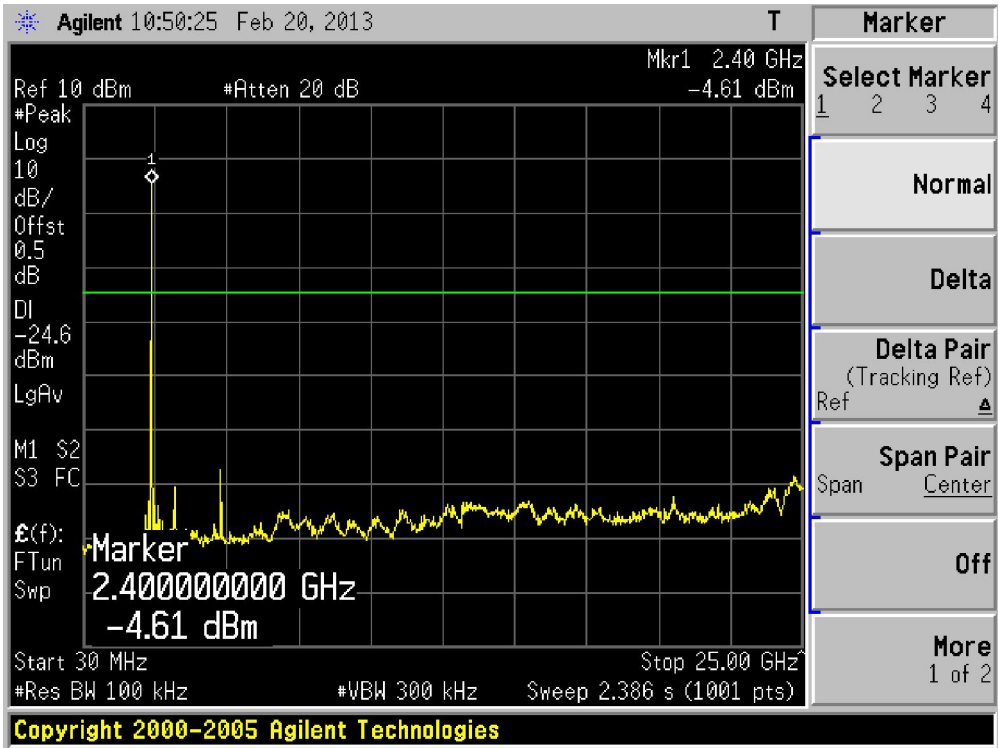


Channel 78 (2480MHz)

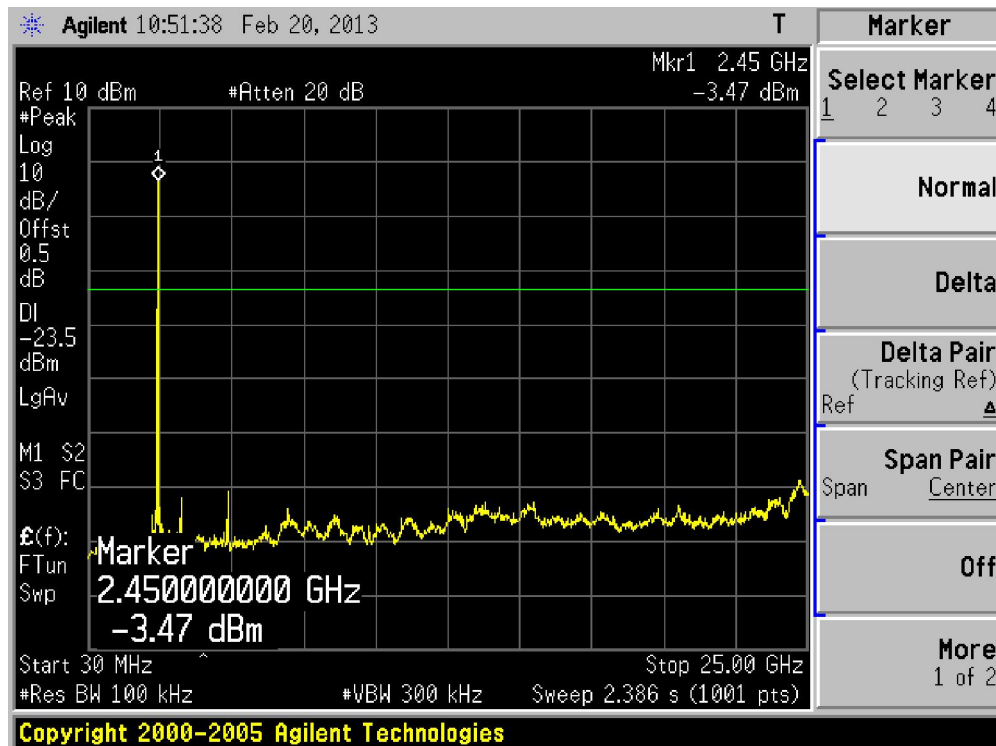


Product	:	Speaker
Test Item	:	Spurious RF Conducted Emissions
Test Mode	:	Mode 2: Transmitter-2Mbps(Pi/4 DQPSK_DH5)

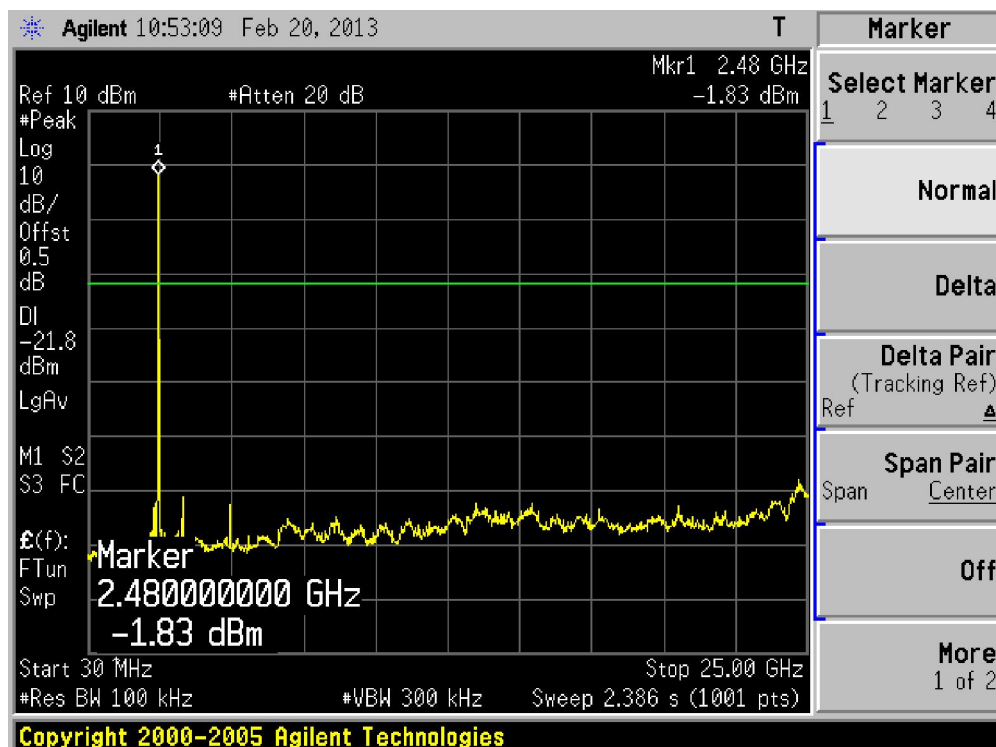
Channel 00 (2402MHz)



Channel 39 (2441MHz)

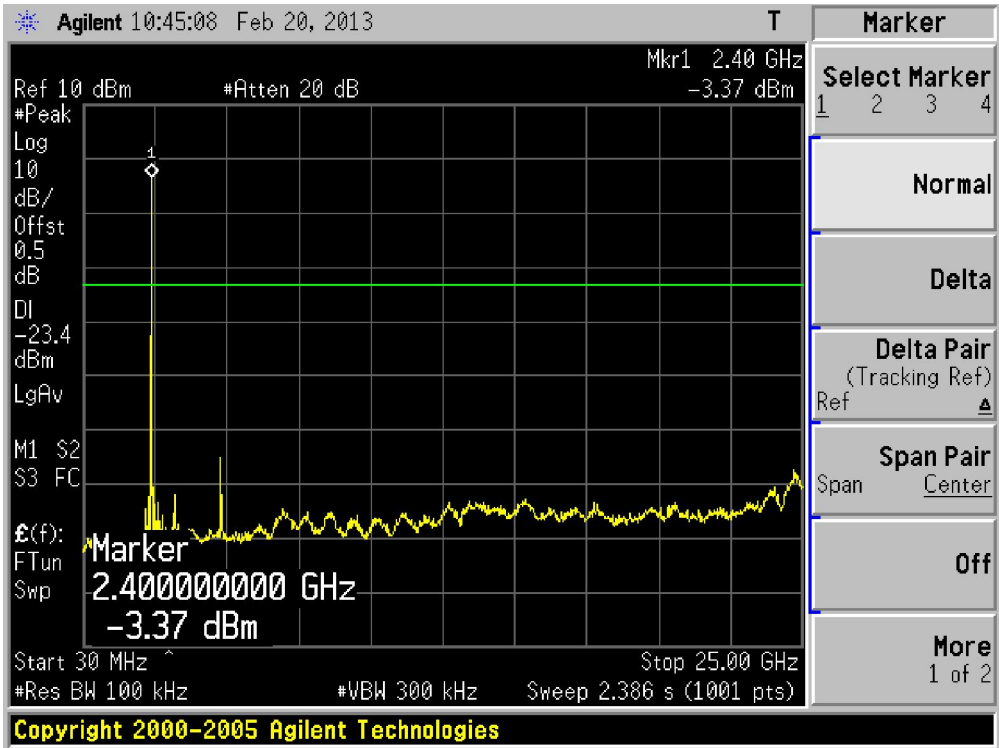


Channel 78 (2480MHz)

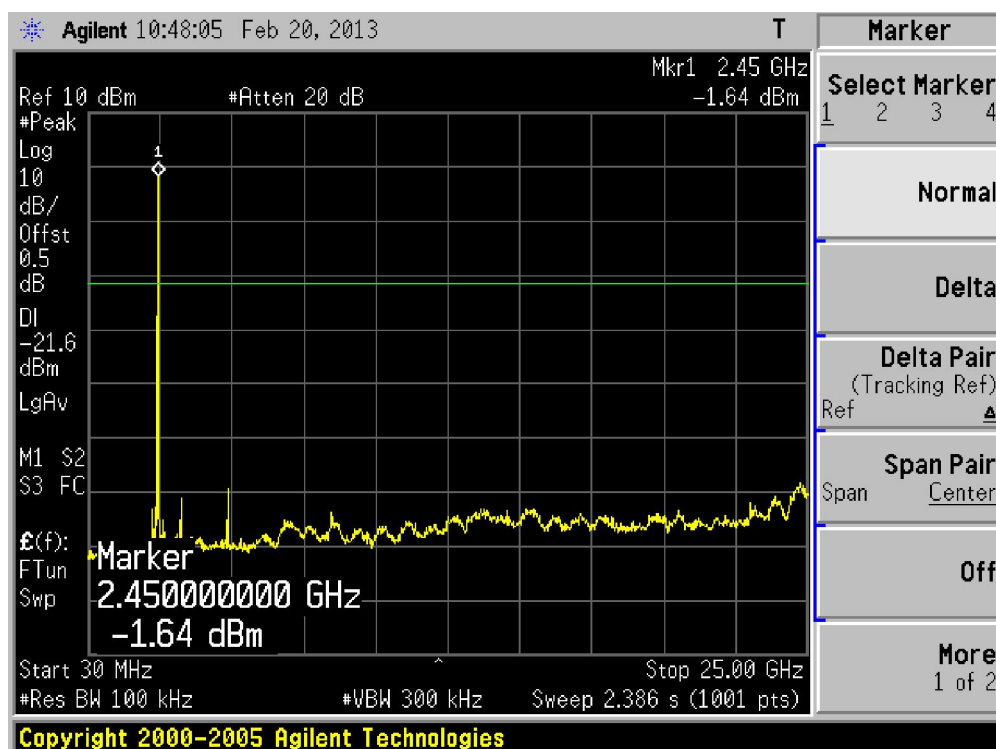


Product	:	Speaker
Test Item	:	Spurious RF Conducted Emissions
Test Mode	:	Mode 3: Transmitter-3Mbps(8DPSK_DH5)

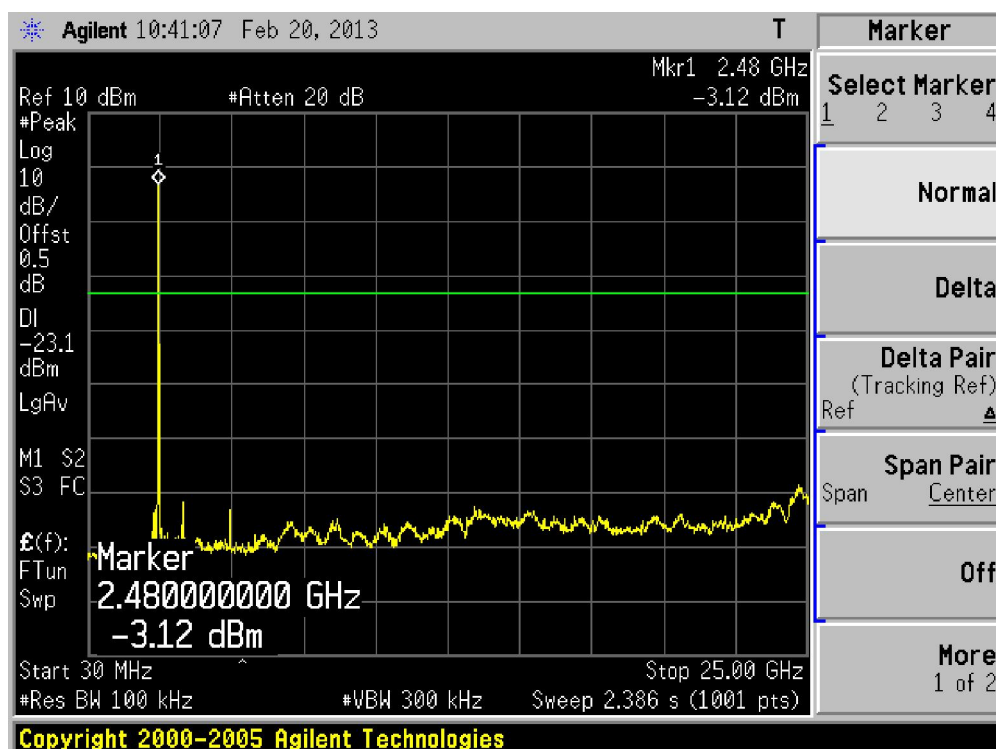
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



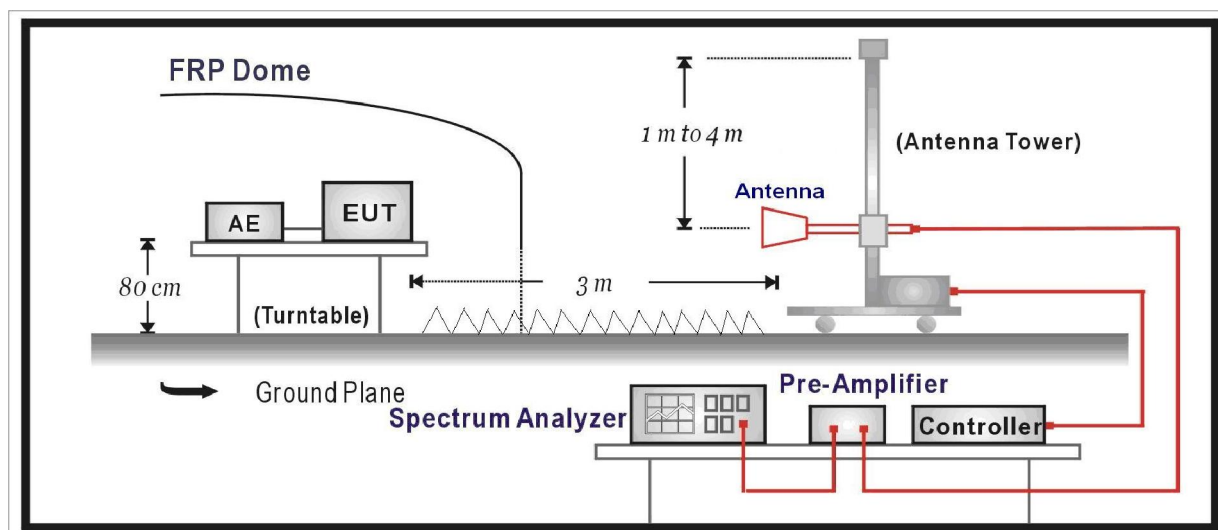
12. Radiated Emission Band Edge

12.1. Test Equipment

☒ Radiated Emission Band Edge / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2013.04.18
EMI Test Receiver	R&S	ESCI	100573	2013.04.18
Preamplifier	Miteq	NSP1800-25	1364185	2013.05.04
Preamplifier	Quietek	AP-040G	CHM-0906001	2013.05.04
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2013.10.15
DRG Horn	ETS-Lindgren	3117	00123988	2014.01.21
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2013.03.02
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 $\pm 3.8 \text{ dB}$

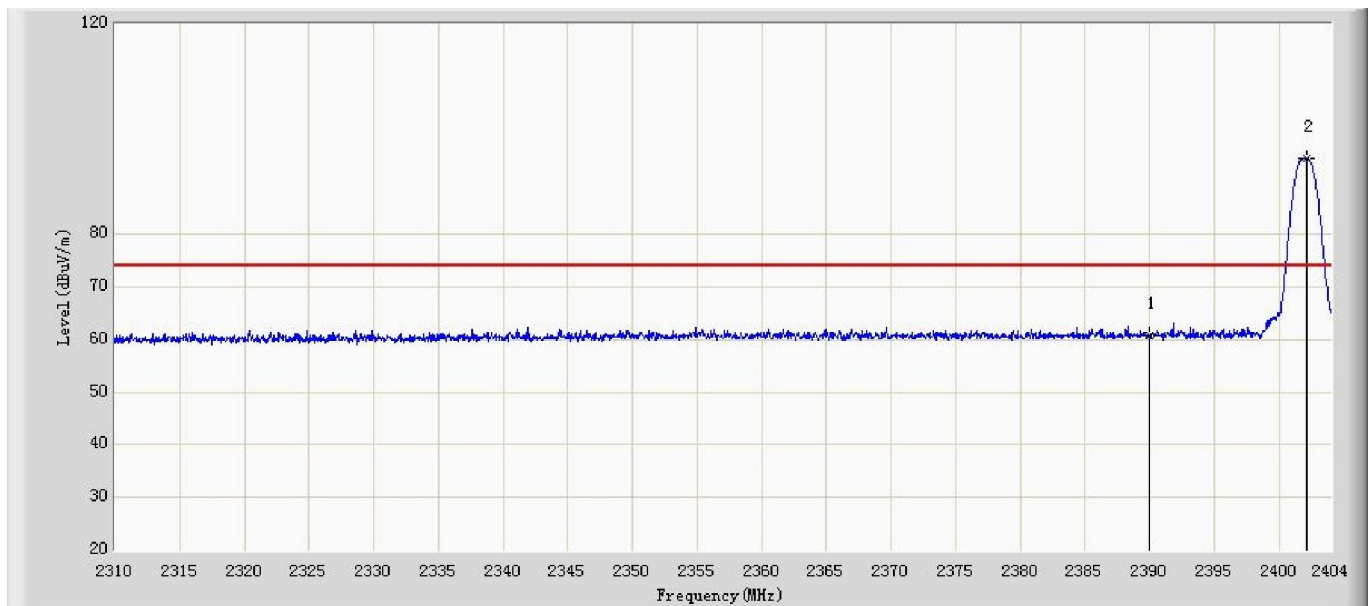
12.6. Test Result

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;

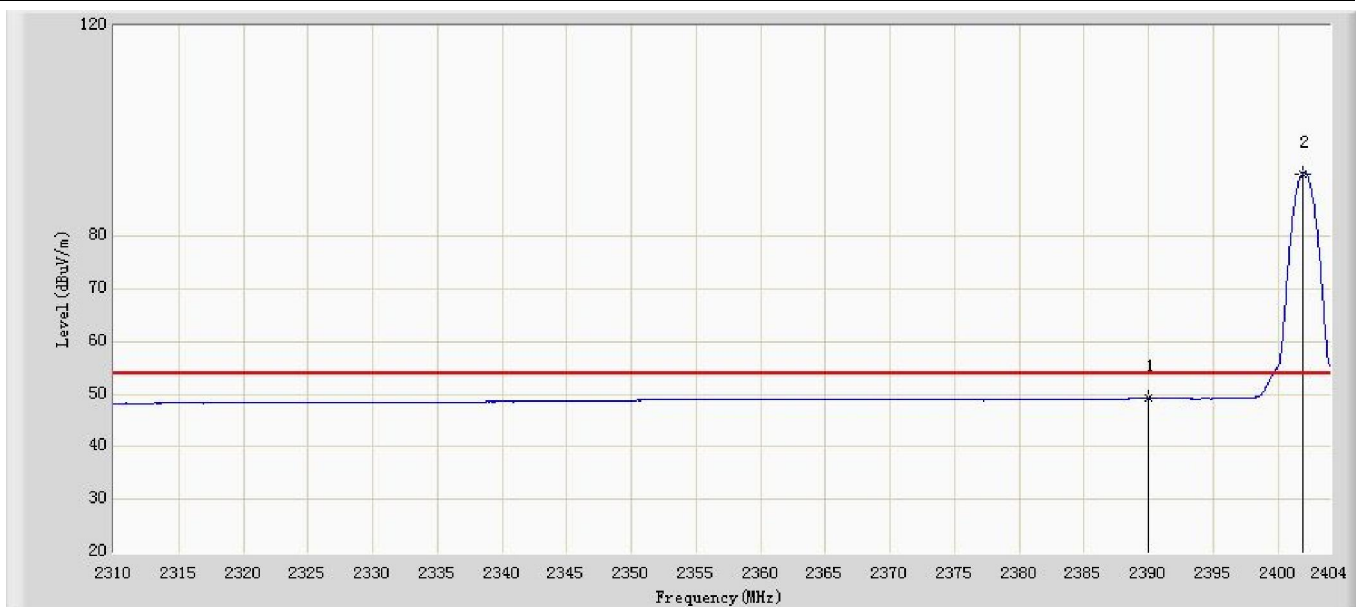
Average detector: RBW = 1MHz, VBW = 10Hz, sweep time = auto.

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 10:53
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode1: Transmit at 2402MHz by DH5	



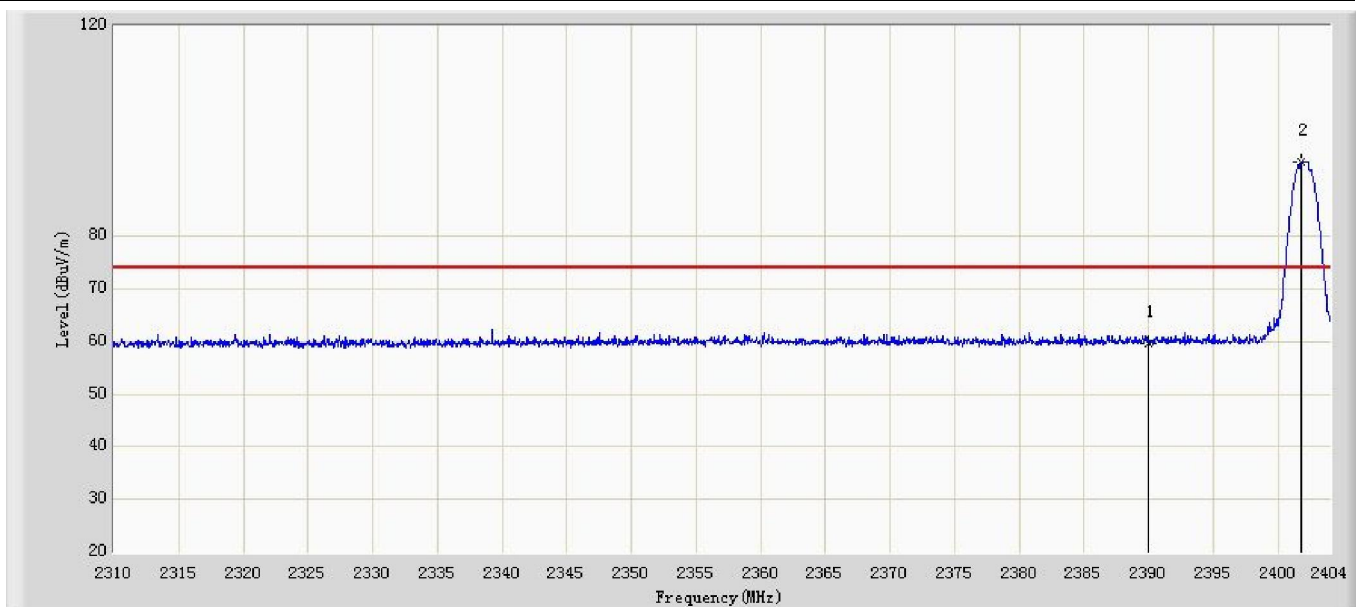
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	60.876	24.575	-13.124	74.000	36.302	PK
2	*	2402.073	94.306	57.906	N/A	N/A	36.401	PK

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:07
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode1: Transmit at 2402MHz by DH5	



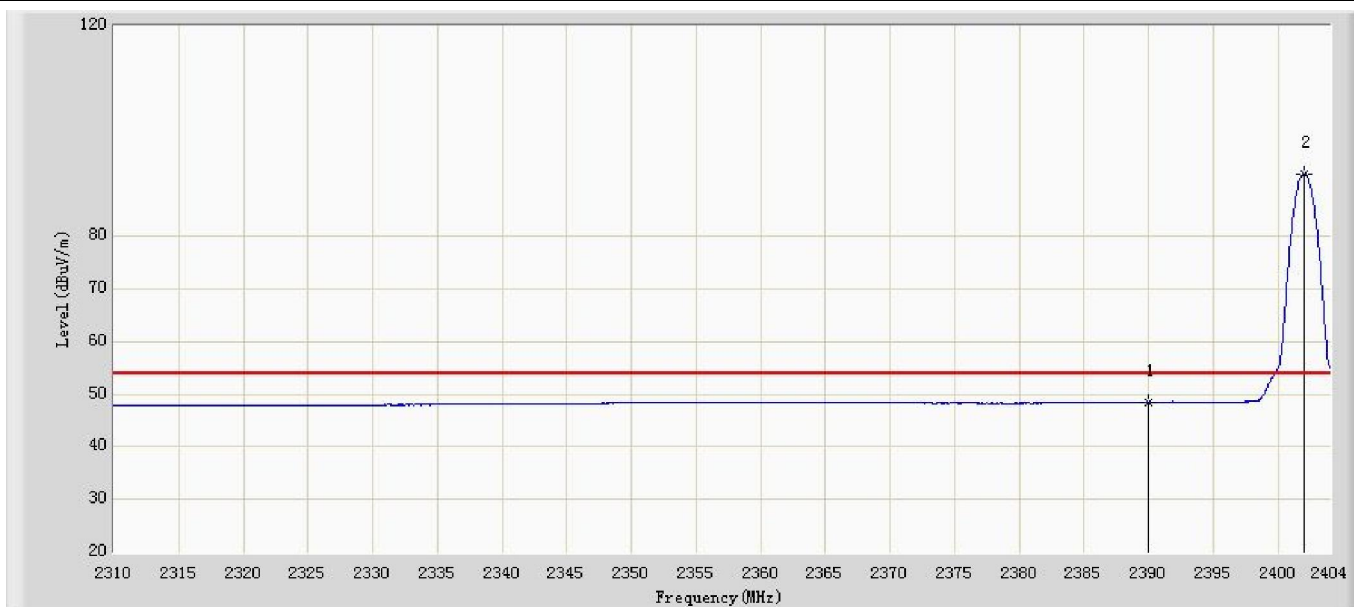
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	49.279	12.978	-4.721	54.000	36.302	AV
2	*	2401.885	91.936	55.537	N/A	N/A	36.399	AV

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:12
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode1: Transmit at 2402MHz by DH5	



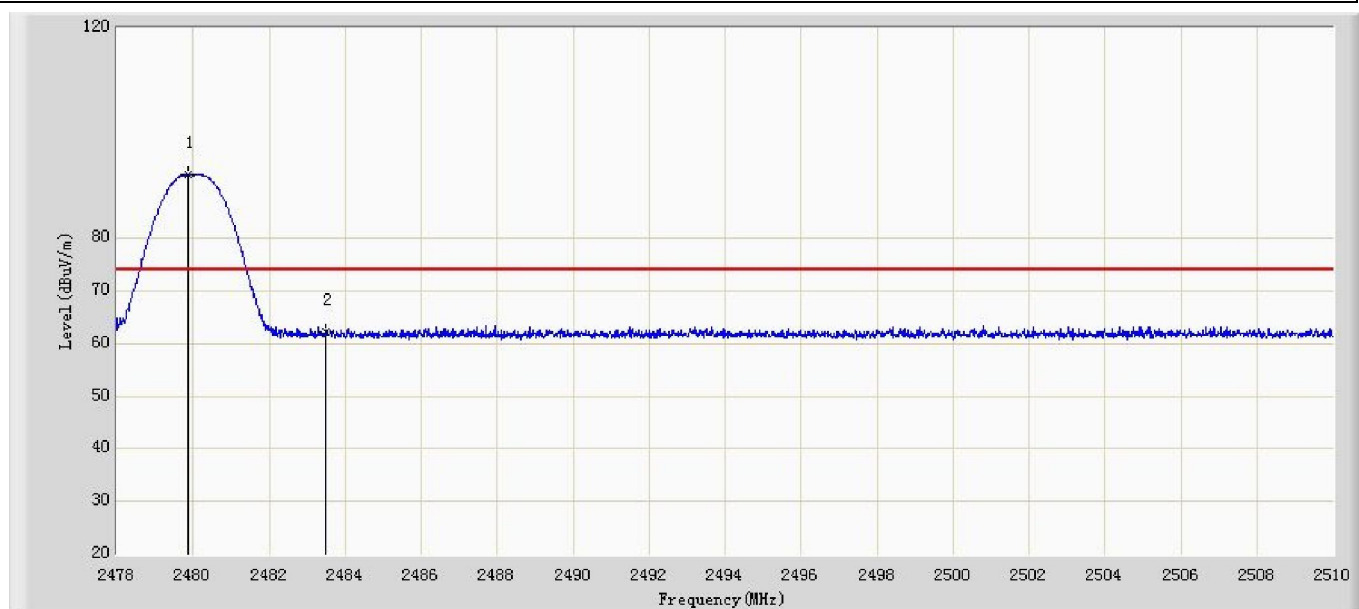
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	59.744	24.103	-14.256	74.000	35.642	PK
2	*	2401.791	94.080	58.389	N/A	N/A	35.691	PK

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:29
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode1: Transmit at 2402MHz by DH5	



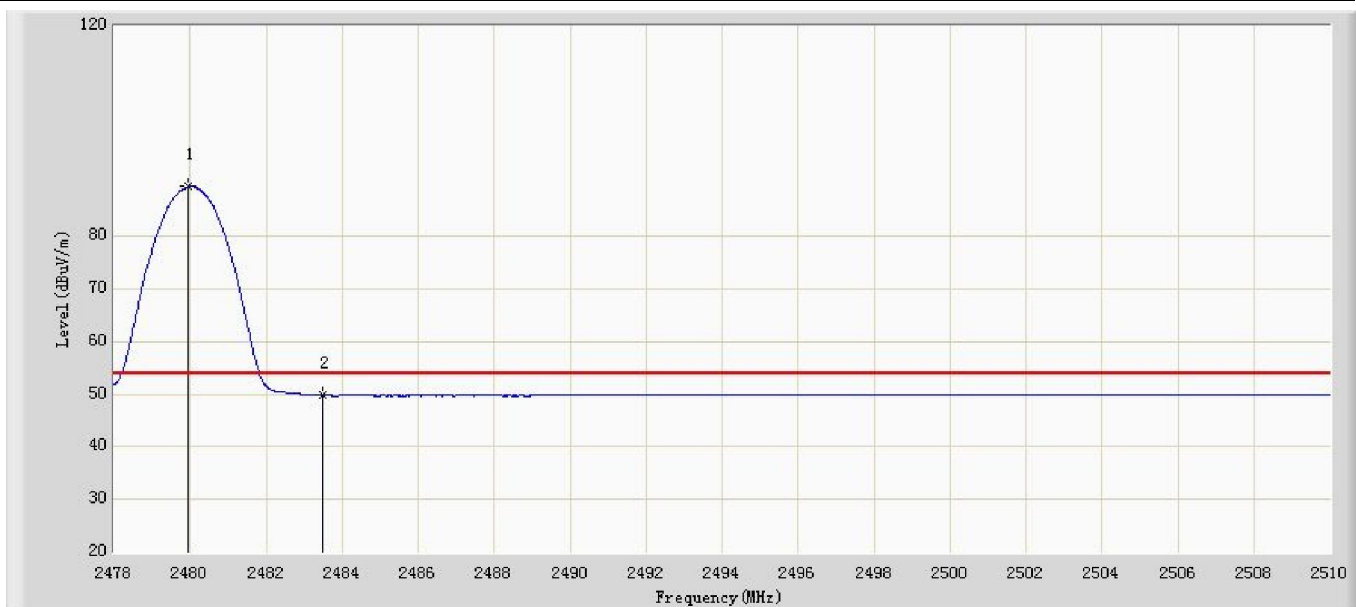
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	48.551	12.910	-5.449	54.000	35.642	AV
2	*	2401.979	91.920	56.228	N/A	N/A	35.692	AV

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode1: Transmit at 2480MHz by DH5	



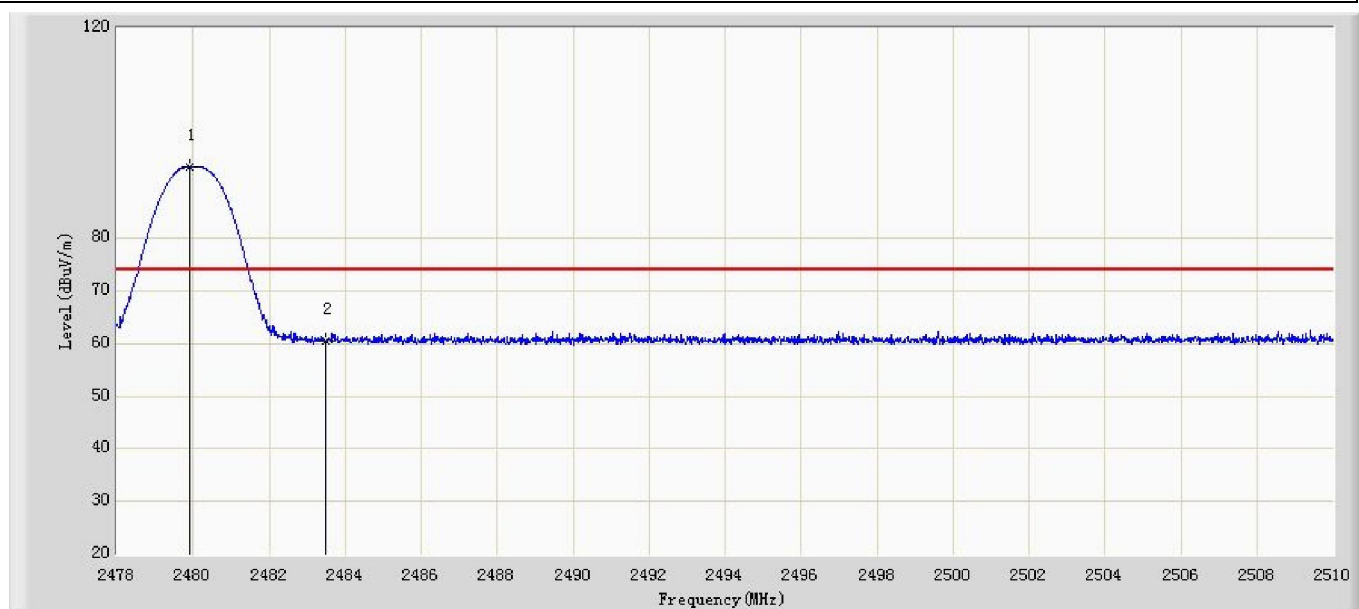
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.872	92.206	55.148	N/A	N/A	37.058	PK
2		2483.500	62.098	25.008	-11.902	74.000	37.089	PK

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:37
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode1: Transmit at 2480MHz by DH5	



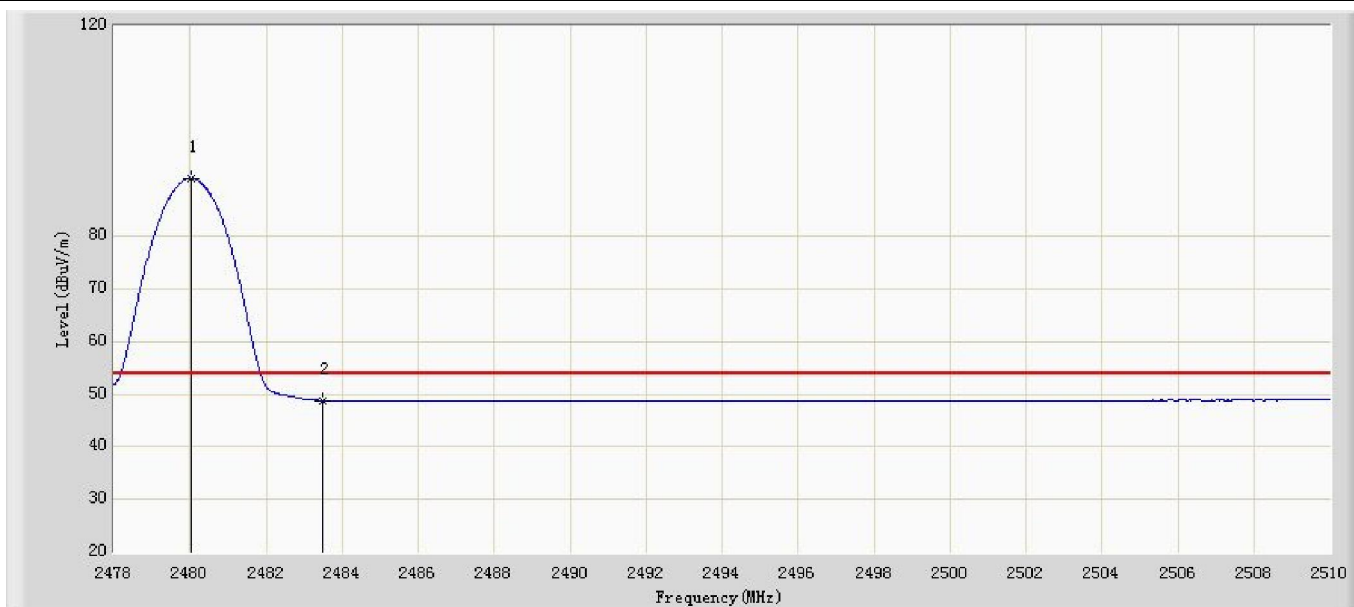
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.968	89.421	52.362	N/A	N/A	37.058	AV
2		2483.500	49.771	12.681	-4.229	54.000	37.089	AV

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:38
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode1: Transmit at 2480MHz by DH5	



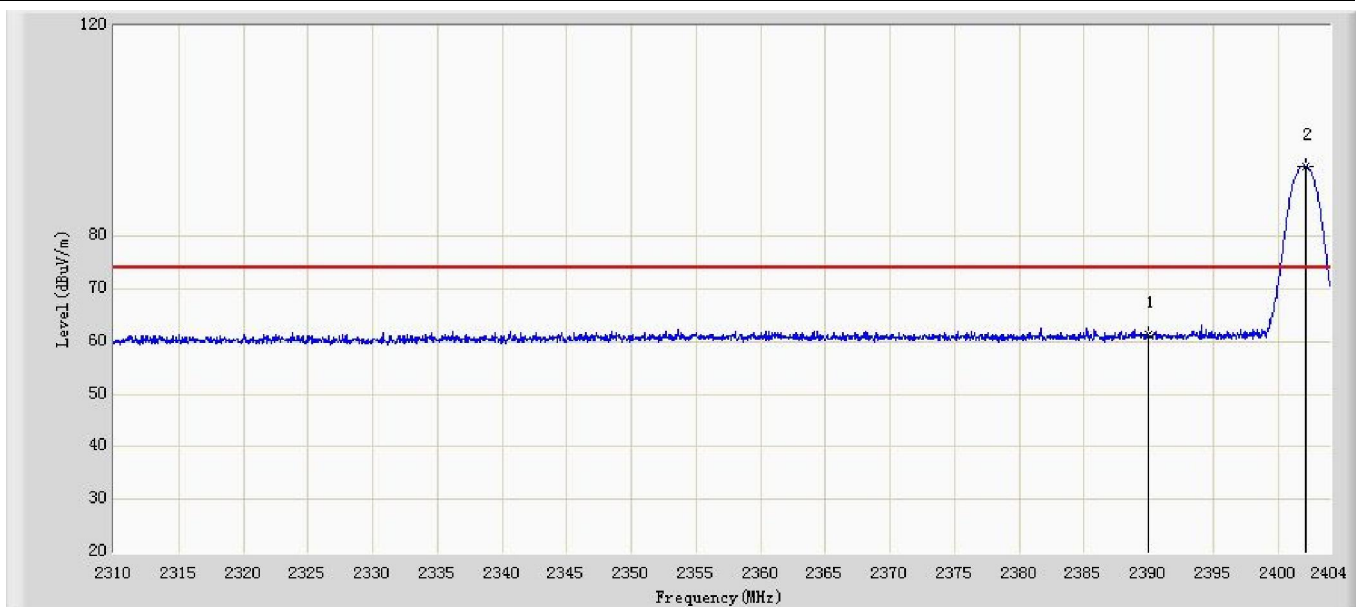
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.920	93.523	57.485	N/A	N/A	36.038	PK
2		2483.500	60.552	24.496	-13.448	74.000	36.055	PK

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:40
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode1: Transmit at 2480MHz by DH5	



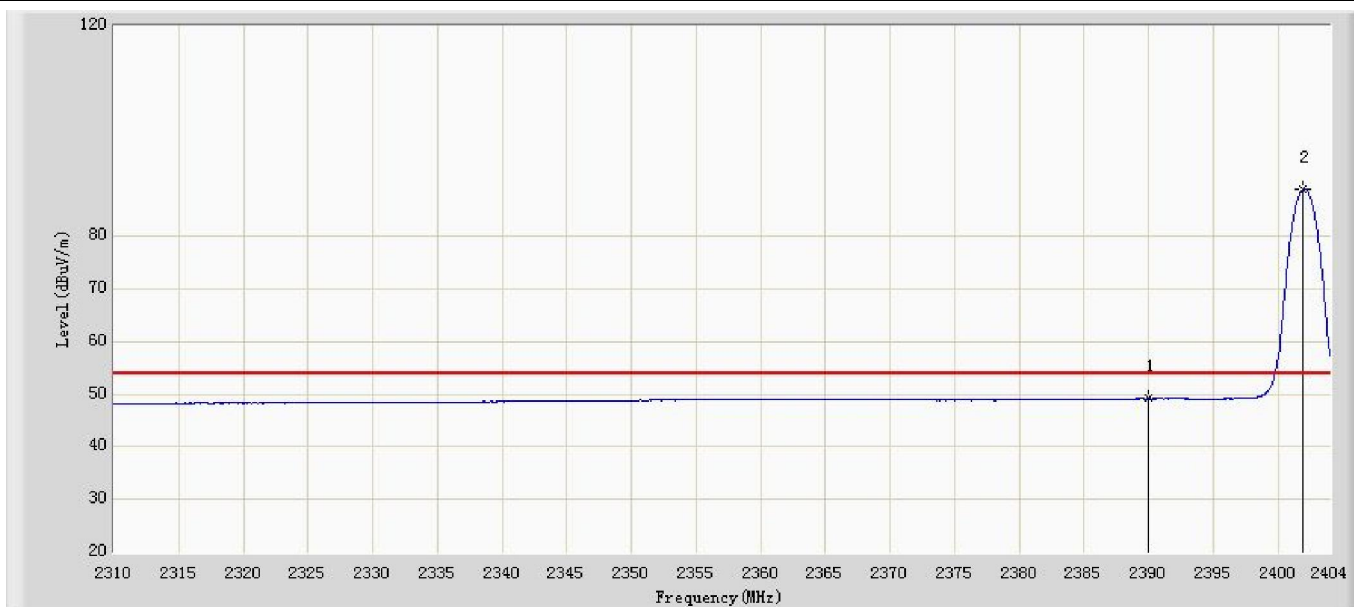
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.016	90.986	54.947	N/A	N/A	36.039	AV
2		2483.500	48.838	12.782	-5.162	54.000	36.055	AV

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:41
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode2: Transmit at 2402MHz by 2DH5	



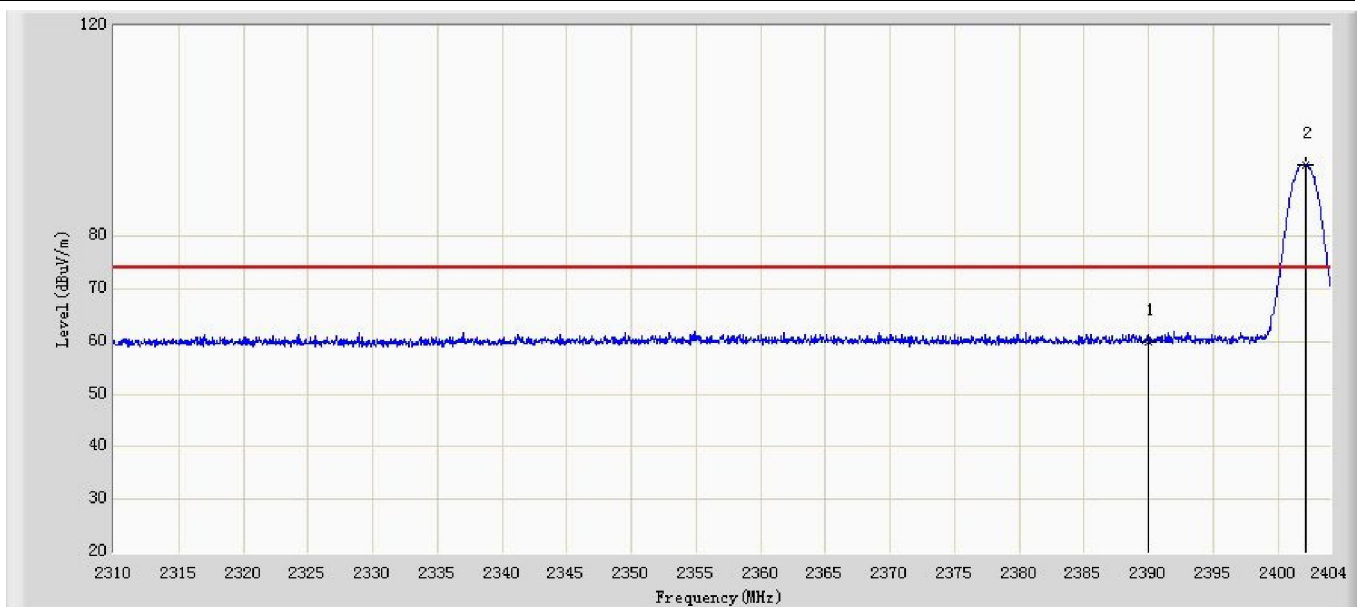
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	61.417	25.116	-12.583	74.000	36.302	PK
2	*	2402.073	93.303	56.903	N/A	N/A	36.401	PK

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:45
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode2: Transmit at 2402MHz by 2DH5	



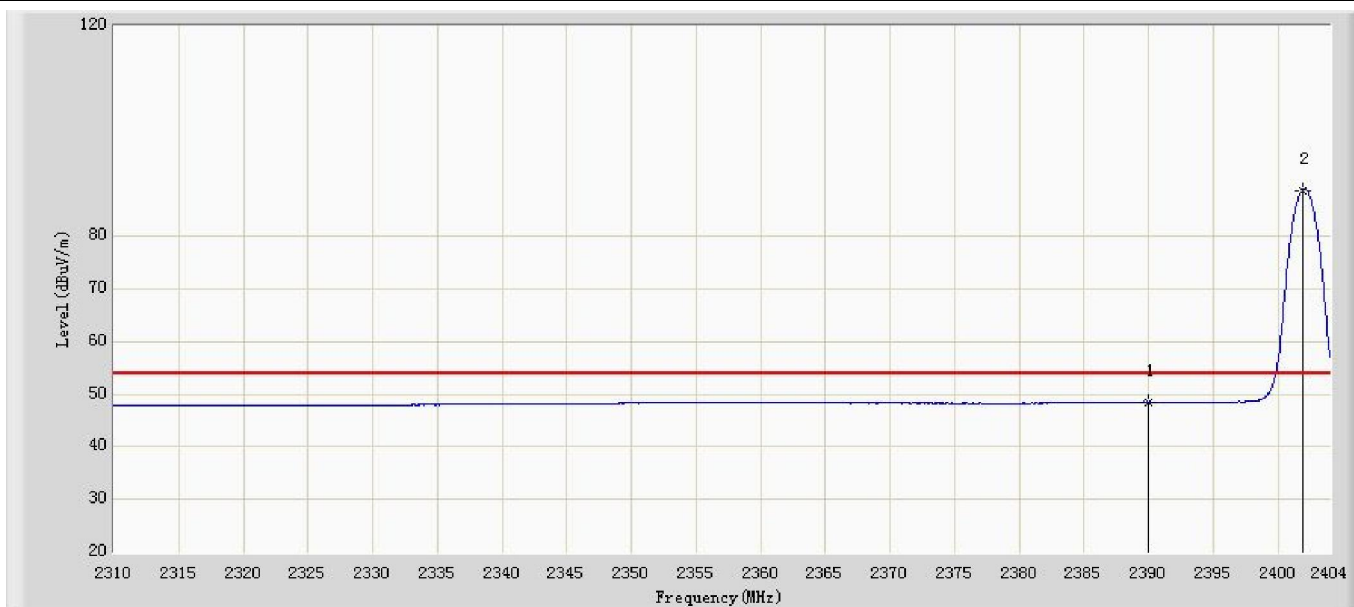
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	49.199	12.898	-4.801	54.000	36.302	AV
2	*	2401.885	88.911	52.512	N/A	N/A	36.399	AV

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:46
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode2: Transmit at 2402MHz by 2DH5	



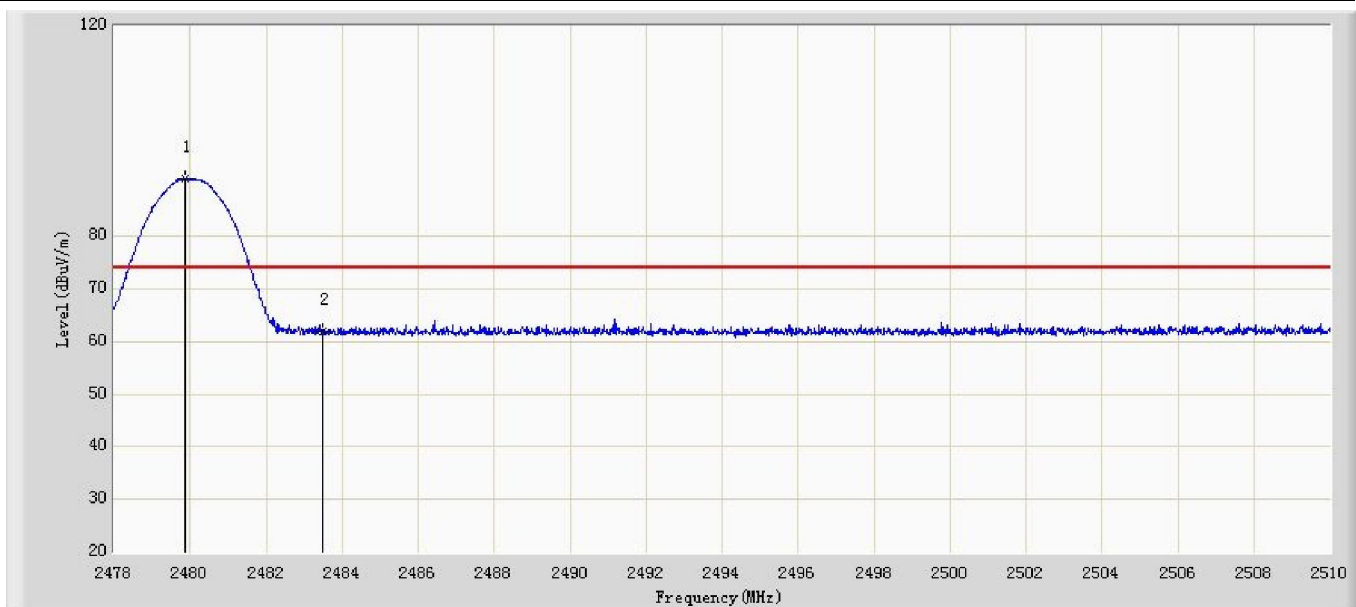
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	60.041	24.400	-13.959	74.000	35.642	PK
2	*	2402.073	93.577	57.885	N/A	N/A	35.692	PK

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:48
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode2: Transmit at 2402MHz by 2DH5	



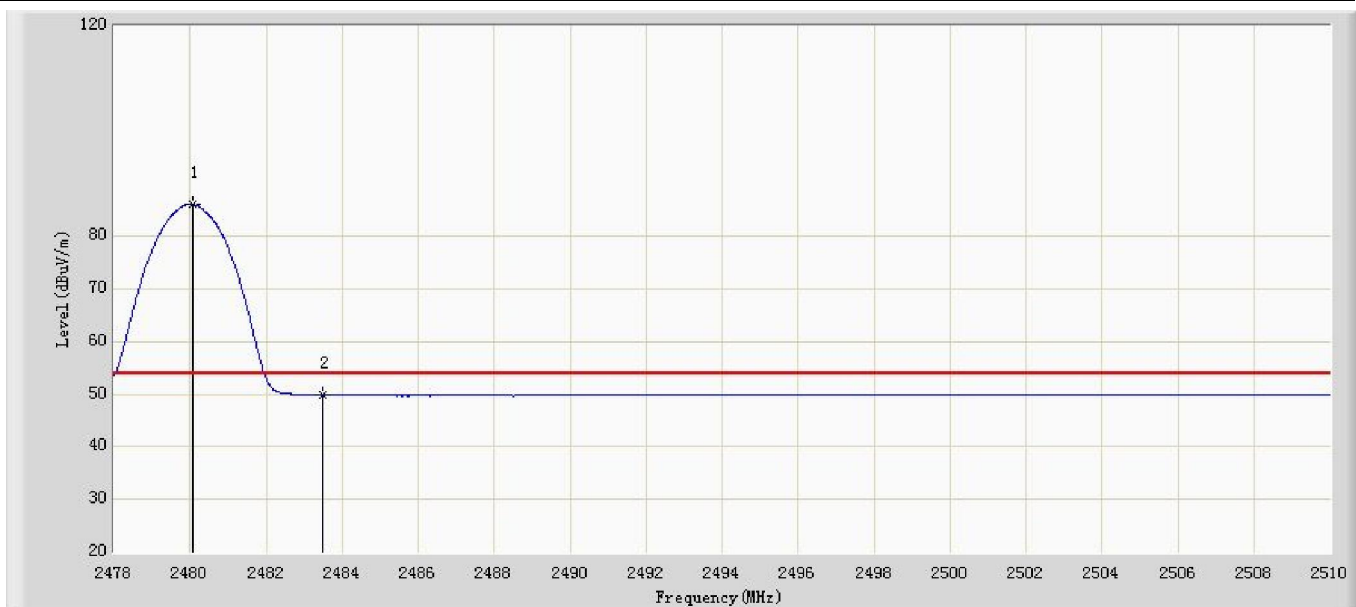
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	48.552	12.911	-5.448	54.000	35.642	AV
2	*	2401.885	88.804	53.113	N/A	N/A	35.692	AV

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode2: Transmit at 2480MHz by 2DH5	



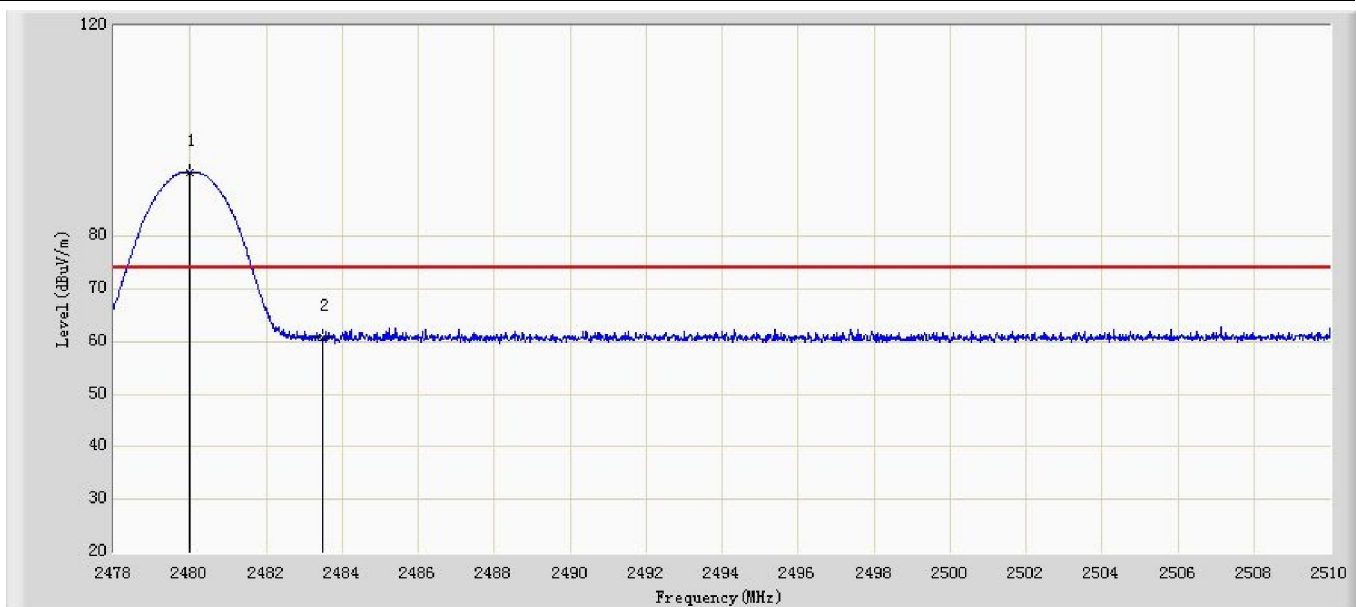
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.872	90.989	53.931	N/A	N/A	37.058	PK
2		2483.500	62.019	24.929	-11.981	74.000	37.089	PK

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:52
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode2: Transmit at 2480MHz by 2DH5	



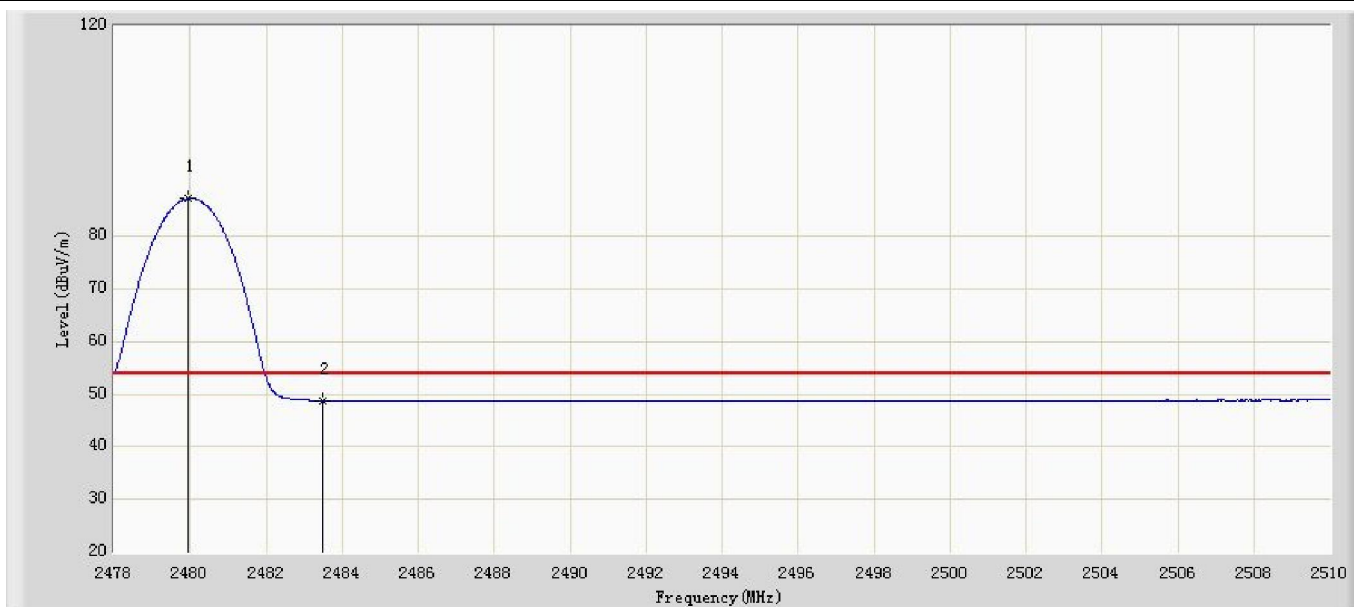
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.080	86.029	48.969	N/A	N/A	37.059	AV
2		2483.500	49.803	12.713	-4.197	54.000	37.089	AV

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:52
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode2: Transmit at 2480MHz by 2DH5	



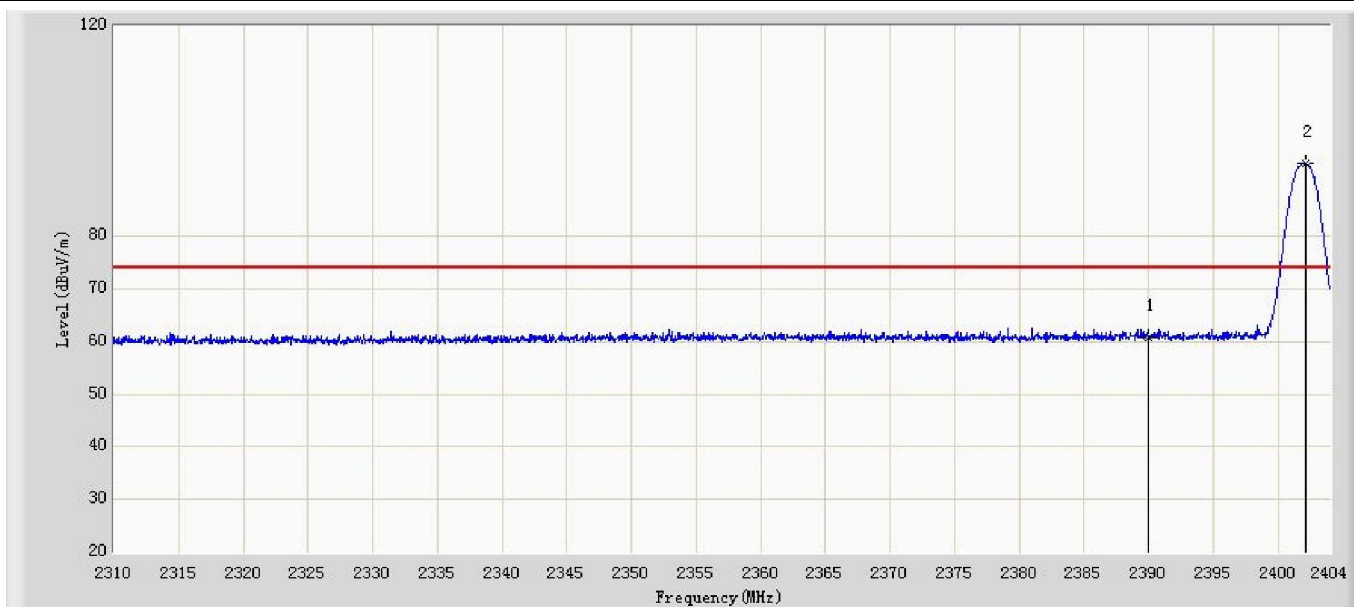
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.984	92.208	56.169	N/A	N/A	36.039	PK
2		2483.500	60.671	24.615	-13.329	74.000	36.055	PK

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:52
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode2: Transmit at 2480MHz by 2DH5	



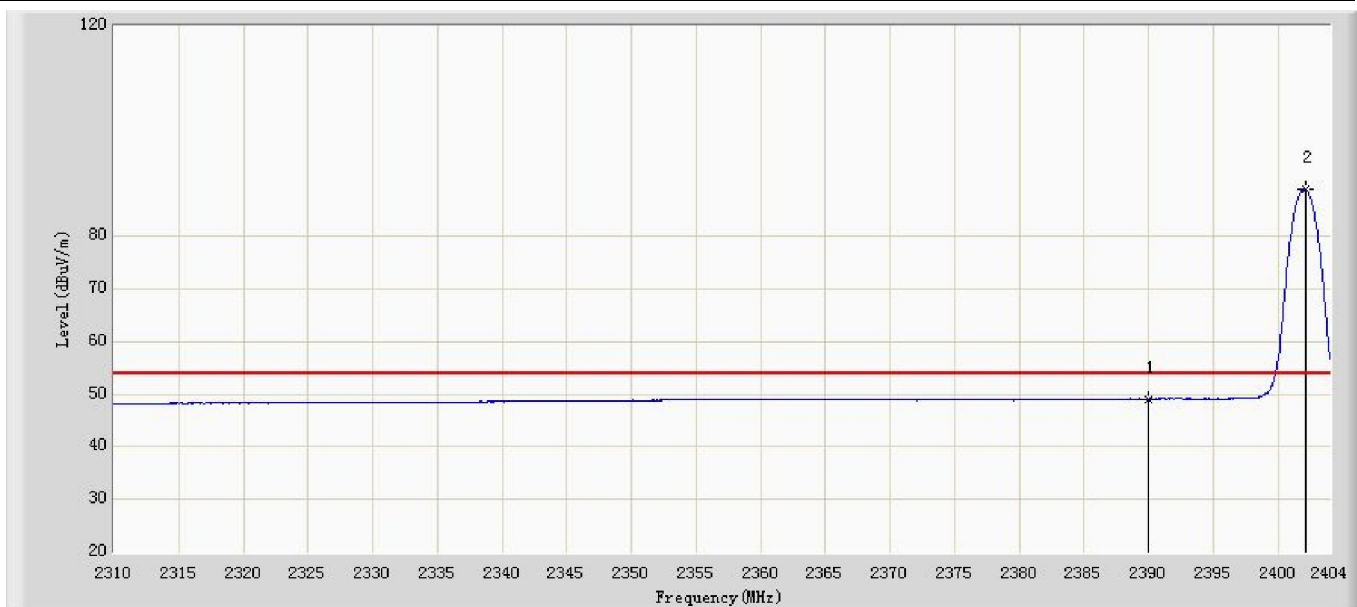
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.968	87.217	51.178	N/A	N/A	36.039	AV
2		2483.500	48.776	12.720	-5.224	54.000	36.055	AV

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 11:58
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode3: Transmit at 2402MHz by 3DH5	



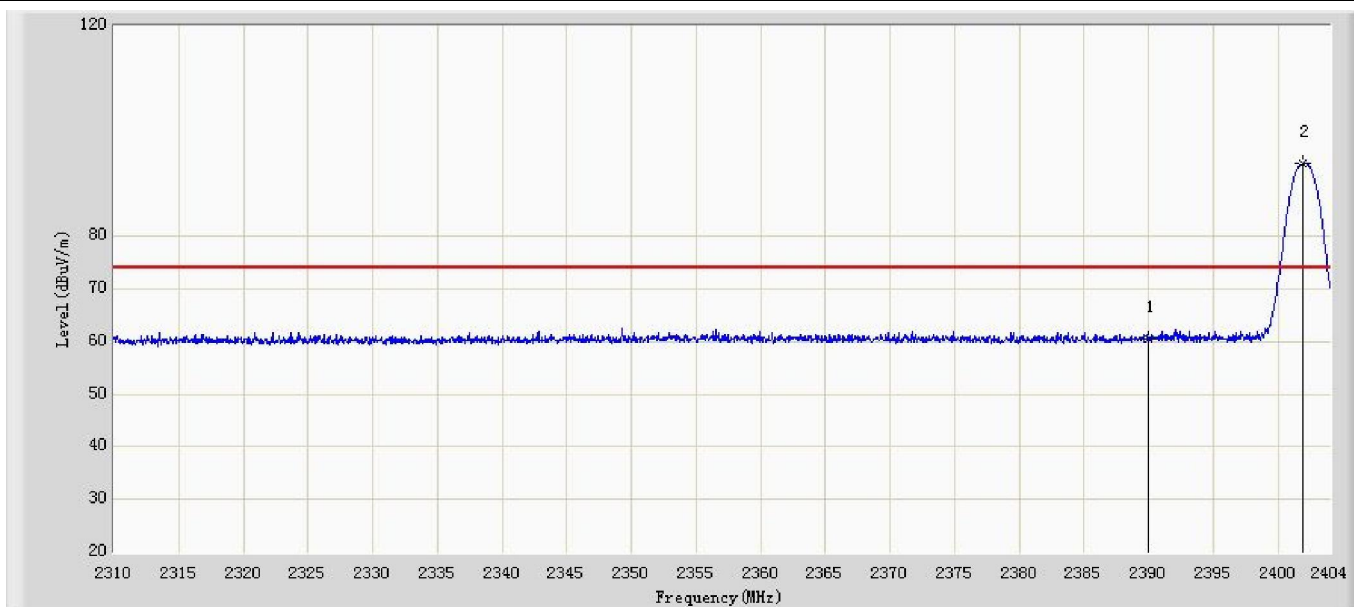
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	60.942	24.641	-13.058	74.000	36.302	PK
2	*	2402.073	93.765	57.365	N/A	N/A	36.401	PK

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 12:01
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode3: Transmit at 2402MHz by 3DH5	



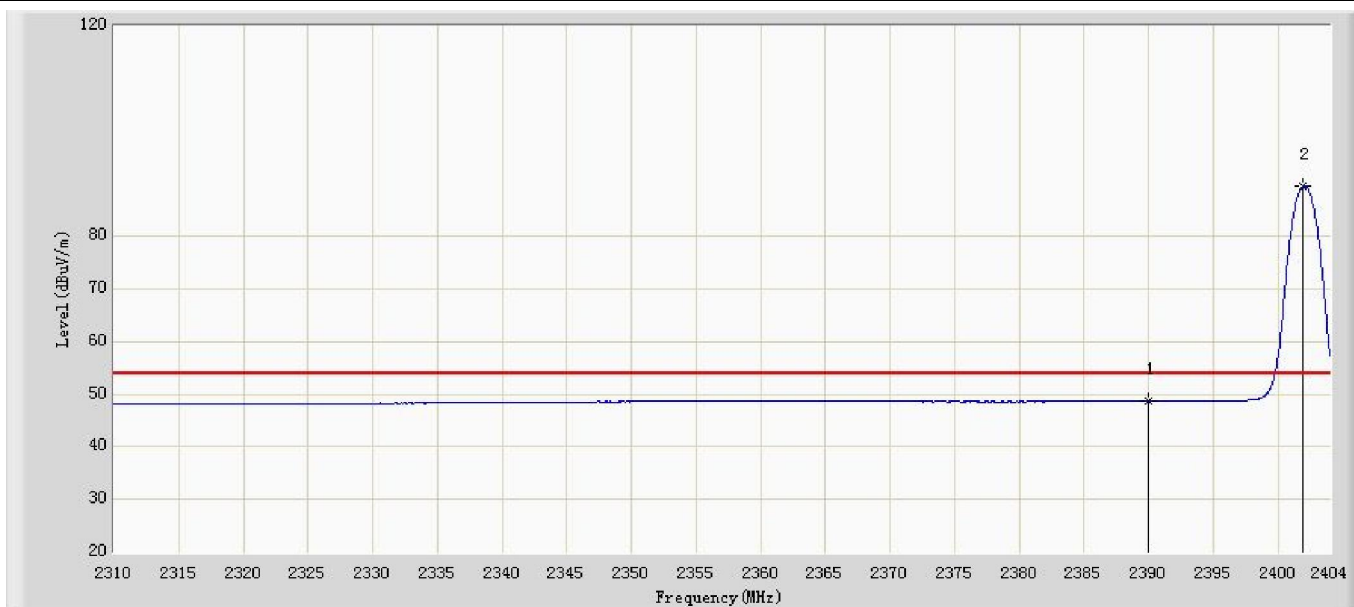
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	49.162	12.861	-4.838	54.000	36.302	AV
2	*	2402.073	88.986	52.586	N/A	N/A	36.401	AV

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 13:15
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode3: Transmit at 2402MHz by 3DH5	



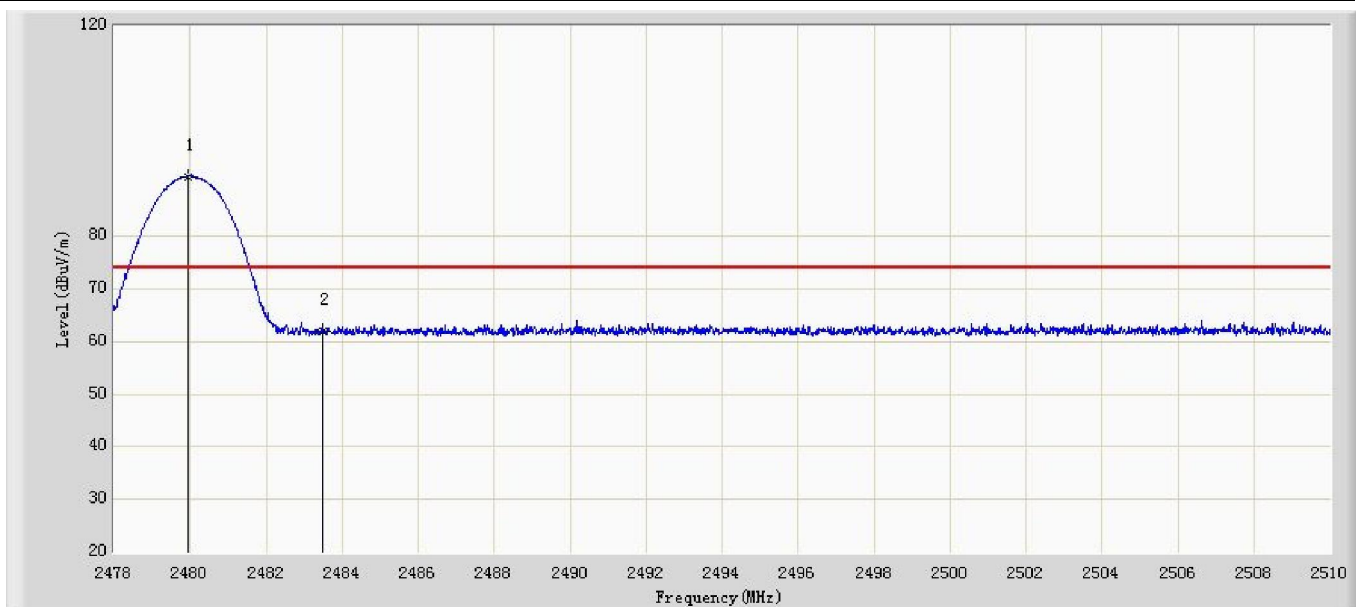
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	60.383	24.742	-13.617	74.000	35.642	PK
2	*	2401.932	93.802	58.110	N/A	N/A	35.692	PK

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 13:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode3: Transmit at 2402MHz by 3DH5	



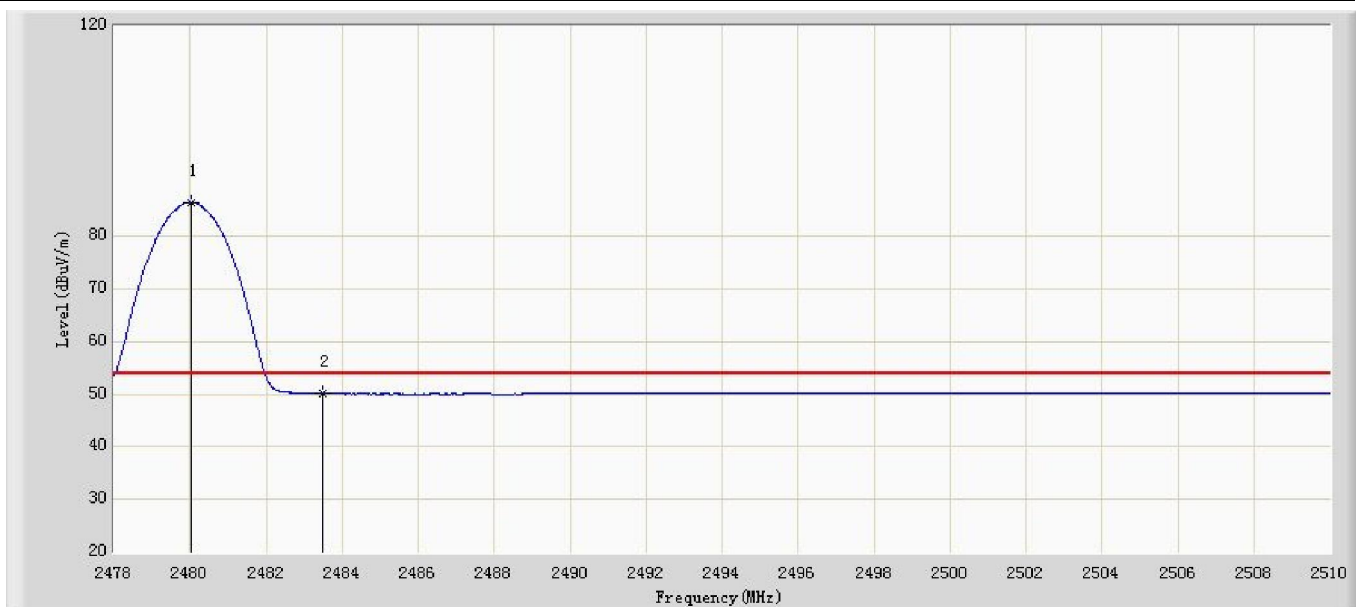
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	48.780	13.139	-5.220	54.000	35.642	AV
2	*	2401.932	89.452	53.760	N/A	N/A	35.692	AV

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 13:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode3: Transmit at 2480MHz by 3DH5	



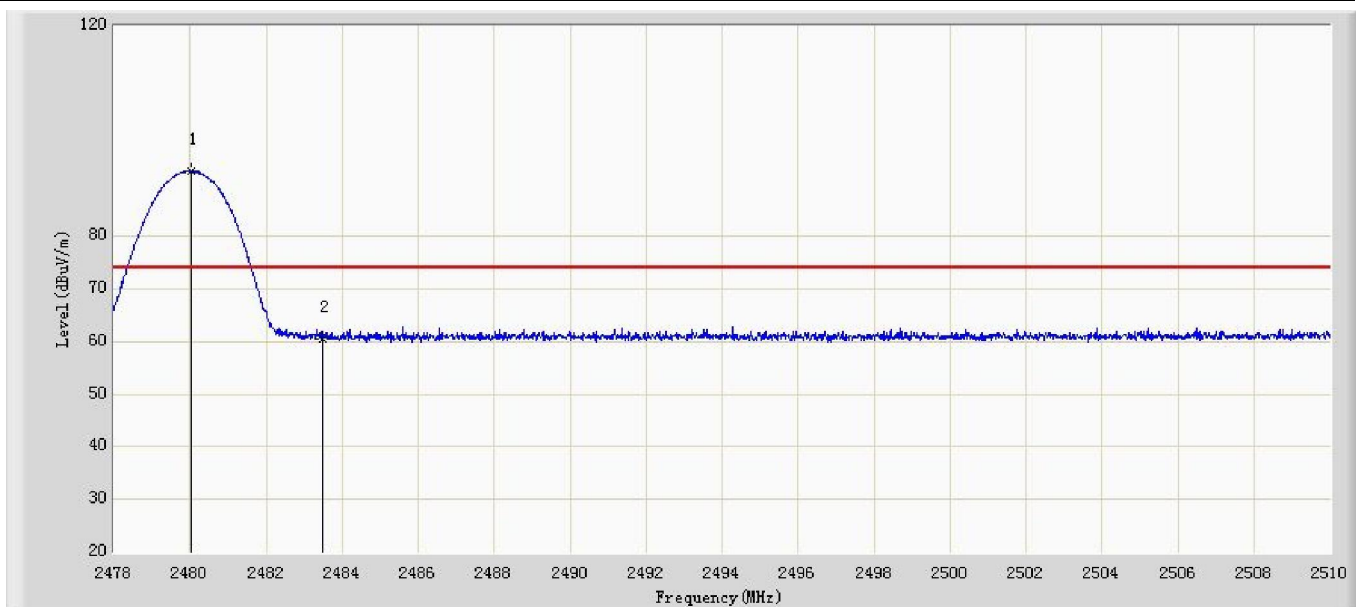
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.968	91.392	54.333	N/A	N/A	37.058	PK
2		2483.500	61.963	24.873	-12.037	74.000	37.089	PK

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 13:11
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode3: Transmit at 2480MHz by 3DH5	



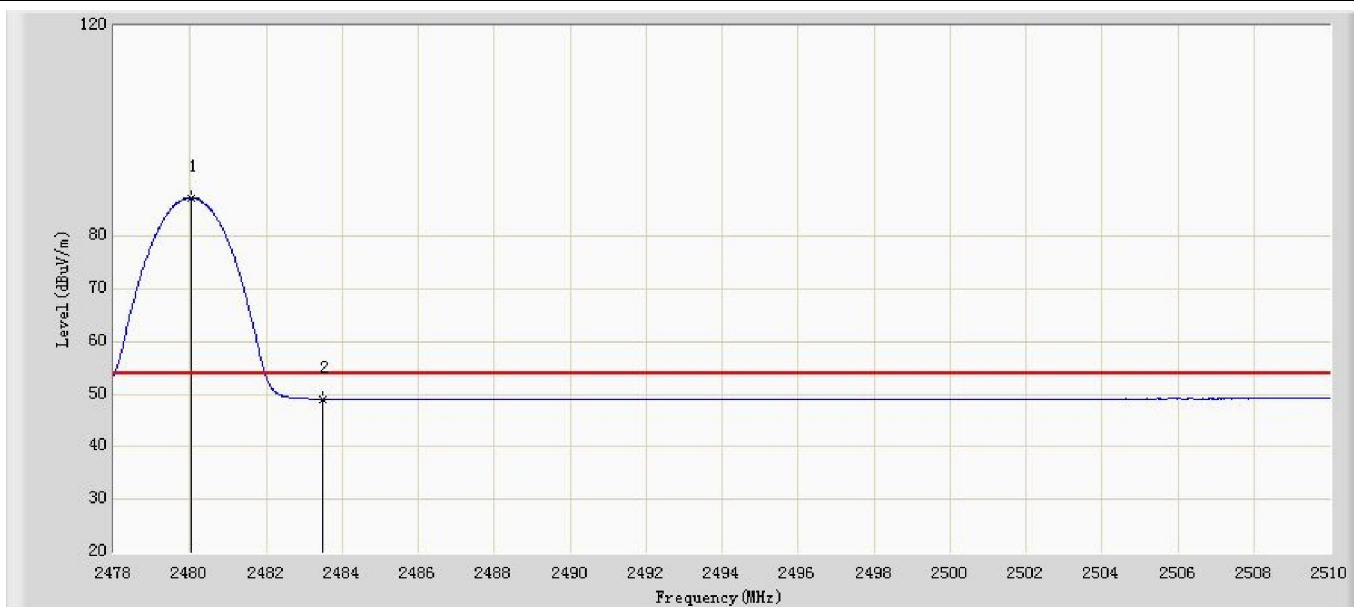
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.016	86.409	49.350	N/A	N/A	37.059	AV
2		2483.500	50.070	12.980	-3.930	54.000	37.089	AV

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 13:12
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode3: Transmit at 2480MHz by 3DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.016	92.381	56.342	N/A	N/A	36.039	PK
2		2483.500	60.643	24.587	-13.357	74.000	36.055	PK

Engineer: Milo	
Site: AC5	Time: 2013/02/07 - 13:15
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode3: Transmit at 2480MHz by 3DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.016	87.273	51.234	N/A	N/A	36.039	AV
2		2483.500	49.083	13.027	-4.917	54.000	36.055	AV

13. Receiver Spurious Emission for Industry Canada RSS-Gen Requirement

13.1. Test Equipment

Radiated Emission / AC-2

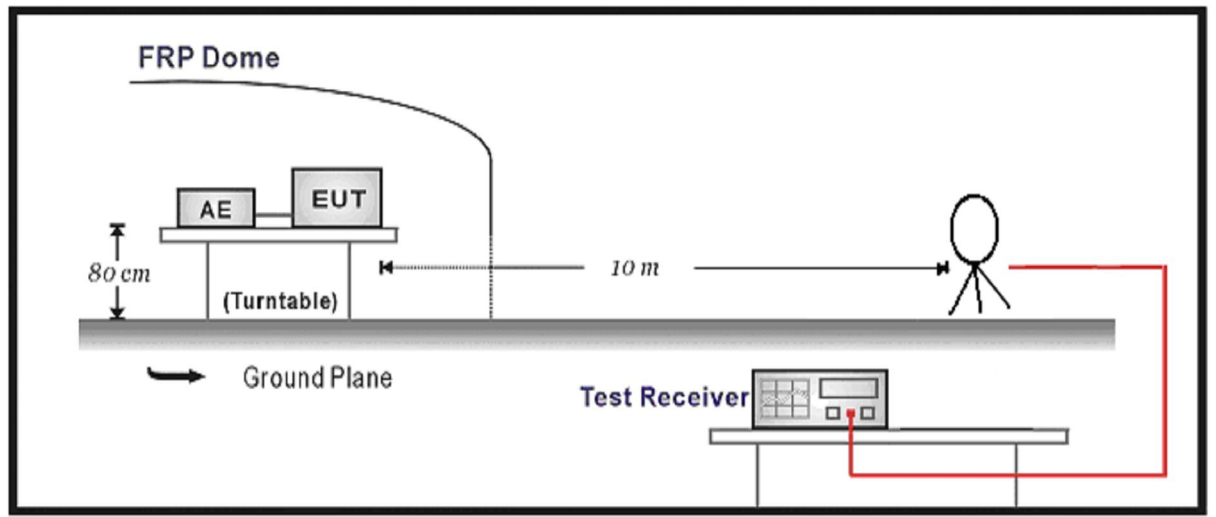
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2013.04.18
Loop Antenna	R&S	HFH2-Z2	833799/003	2013.11.17
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2013.10.15
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2013.03.02
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2014.01.09

Radiated Emission / AC-5

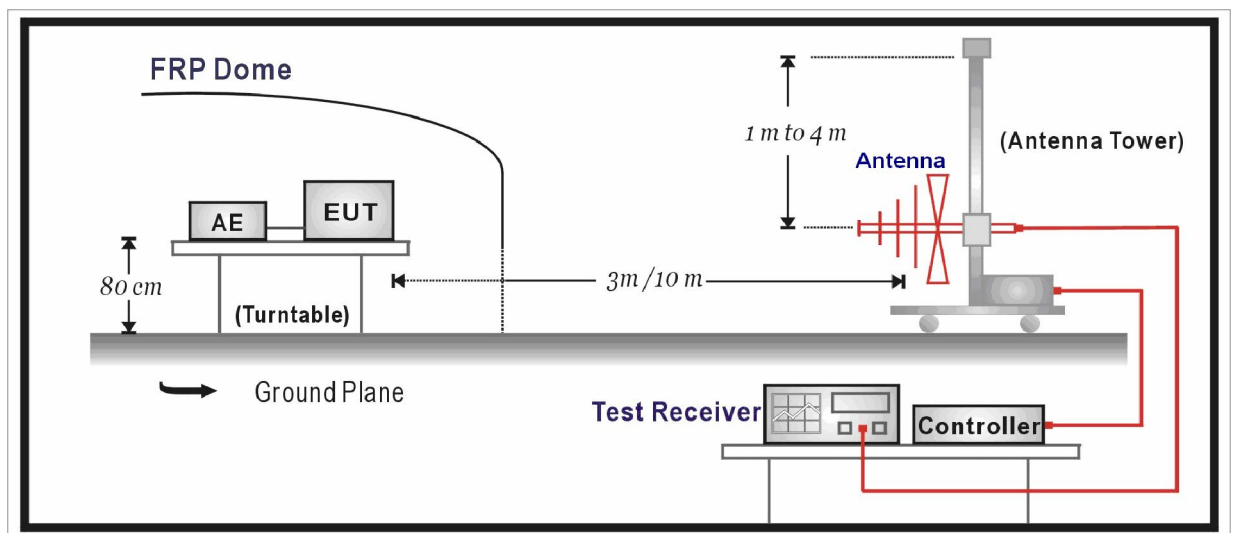
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2013.04.18
Preamplifier	Miteq	NSP1800-25	1364185	2013.05.04
Preamplifier	Quietek	AP-040G	CHM-0906001	2013.05.04
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2013.10.15
DRG Horn	ETS-Lindgren	3117	00123988	2014.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2013.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2013.03.02
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2013.03.02
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2013.03.02
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2014.01.11

13.2. Test Setup

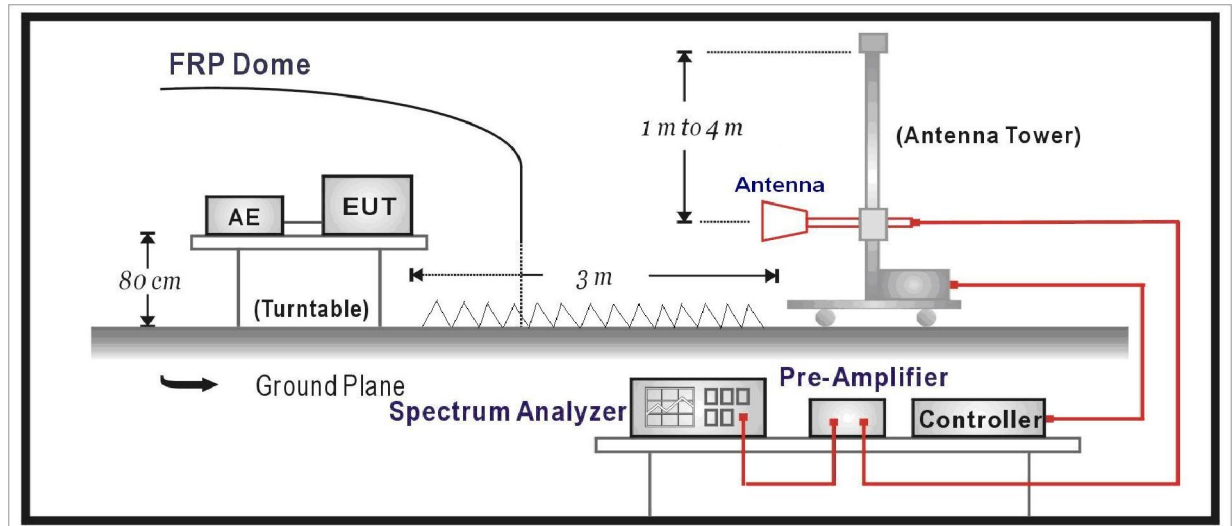
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



13.3. Limit

FCC Part 15 Subpart B Paragraph 15.109		
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)

13.4. 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 9kHz 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.

13.5. Uncertainty

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

13.6. 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: Receive-1Mbps (GFSK_DH5)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
00	H	405.4	5.6	23.9	29.5	46	-16.5	QP
	V	405.5	8.2	23.9	32.2	46	-13.8	QP
	H	621.0	8.7	27.2	35.9	46	-10.1	QP
	V	639.0	8.4	27.4	35.7	46	-10.3	QP
	H	2513.0	50.8	-10.0	40.8	54(Note3)	-13.2	PK
	V	3575.5	49.3	-9.4	39.9	54(Note3)	-14.1	PK
	H	4502.0	49.5	-8.0	41.5	54(Note3)	-12.5	PK
	V	5445.5	49.3	-7.0	42.3	54(Note3)	-11.7	PK
39	H	405.4	7.7	23.9	31.6	46	-14.4	QP
	V	405.5	7.0	23.9	31.0	46	-15.0	QP
	H	589.9	7.8	26.7	34.5	46	-11.5	QP
	V	663.7	7.7	27.4	35.1	46	-10.9	QP
	H	3091.0	51.0	-9.8	41.1	54(Note3)	-12.9	PK
	V	3125.0	50.1	-10.0	40.1	54(Note3)	-13.9	PK
	H	4782.5	48.7	-7.6	41.1	54(Note3)	-12.9	PK
	V	4544.5	49.0	-8.2	40.8	54(Note3)	-13.2	PK
78	H	384.1	9.9	23.0	32.9	46	-13.1	QP
	V	393.4	9.0	23.3	32.3	46	-13.7	QP
	H	683.1	6.7	27.5	34.2	46	-11.8	QP
	V	663.7	8.4	27.4	35.8	46	-10.2	QP
	H	3269.5	51.3	-9.5	41.9	54(Note3)	-12.1	PK
	V	3439.5	50.4	-9.5	40.8	54(Note3)	-13.2	PK
	H	6040.5	48.4	-5.6	42.8	54(Note3)	-11.2	PK
	V	6695.0	47.6	-4.3	43.3	54(Note3)	-10.7	PK

Note: 1. Measure Level = Reading Level + Factor.

2. The test trace is same as the ambient noise (the test frequency range: 9kHz~30MHz,

18GHz~25GHz), therefore no data appear in the report.

3. 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: Receive-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
00	H	405.5	8.3	23.9	32.2	46	-13.8	QP
	V	430.1	8.2	24.2	32.4	46	-13.6	QP
	H	621.0	6.5	27.2	33.8	46	-12.2	QP
	V	683.1	7.8	27.5	35.3	46	-10.7	QP
	H	3286.5	50.5	-9.5	41.0	54(Note3)	-13.0	PK
	V	3414.0	50.0	-9.5	40.5	54(Note3)	-13.5	PK
	H	5224.5	48.6	-7.3	41.3	54(Note3)	-12.7	PK
	V	5700.5	48.6	-6.7	41.9	54(Note3)	-12.1	PK
39	H	467.0	8.1	24.8	32.9	46	-13.1	QP
	V	331.9	5.5	21.4	27.0	46	-19.0	QP
	H	621.0	9.0	27.2	36.3	46	-9.7	QP
	V	577.6	7.0	26.7	33.6	46	-12.4	QP
	H	3142.0	50.1	-9.7	40.5	54(Note3)	-13.5	PK
	V	3380.0	50.7	-9.6	41.1	54(Note3)	-12.9	PK
	H	5581.5	48.3	-6.8	41.5	54(Note3)	-12.5	PK
	V	4969.5	48.1	-7.5	40.6	54(Note3)	-13.4	PK
78	H	405.5	8.4	23.9	32.3	46	-13.7	QP
	V	496.8	6.3	25.3	31.5	46	-14.5	QP
	H	620.9	7.5	27.2	34.7	46	-11.3	QP
	V	683.1	7.3	27.5	34.7	46	-11.3	QP
	H	3142.0	49.8	-9.7	40.1	54(Note3)	-13.9	PK
	V	3278.0	49.9	-9.6	40.2	54(Note3)	-13.8	PK
	H	4570.0	49.1	-7.9	41.2	54(Note3)	-12.8	PK
	V	4782.5	49.5	-7.8	41.7	54(Note3)	-12.3	PK

Note: 1. Measure Level = Reading Level + Factor.

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

3. 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: Receive-3Mbps (8DPSK_DH5)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
00	H	467.0	8.9	24.8	33.6	46	-12.4	QP
	V	430.1	8.7	24.2	32.9	46	-13.1	QP
	H	762.8	6.6	28.4	35.0	46	-11.0	QP
	V	663.7	8.0	27.4	35.5	46	-10.5	QP
	H	3108.0	49.9	-9.8	40.1	54(Note3)	-13.9	PK
	V	2793.5	50.6	-10.4	40.2	54(Note3)	-13.8	PK
	H	4587.0	49.2	-7.9	41.4	54(Note3)	-12.6	PK
	V	4876.0	49.5	-7.6	41.9	54(Note3)	-12.1	PK
39	H	454.7	6.5	24.3	30.8	46	-15.2	QP
	V	467.0	6.6	24.8	31.4	46	-14.6	QP
	H	662.4	7.3	27.4	34.7	46	-11.3	QP
	V	663.7	7.7	27.4	35.2	46	-10.8	QP
	H	3023.0	49.8	-10.0	39.8	54(Note3)	-14.2	PK
	V	3184.5	49.7	-9.8	39.9	54(Note3)	-14.1	PK
	H	4544.5	49.6	-7.9	41.6	54(Note3)	-12.4	PK
	V	4638.0	49.9	-8.1	41.9	54(Note3)	-12.1	PK
78	H	503.8	5.6	25.4	31.0	46	-15.0	QP
	V	393.4	6.2	23.3	29.6	46	-16.4	QP
	H	683.1	7.8	27.5	35.2	46	-10.8	QP
	V	491.6	6.8	25.3	32.2	46	-13.8	QP
	H	3184.5	49.9	-9.6	40.3	54(Note3)	-13.7	PK
	V	4119.5	49.6	-8.7	40.9	54(Note3)	-13.1	PK
	H	4502.0	48.8	-8.0	40.8	54(Note3)	-13.2	PK
	V	5896.0	48.1	-6.1	42.0	54(Note3)	-12.0	PK

Note: 1. Measure Level = Reading Level + Factor.

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

3. 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 End