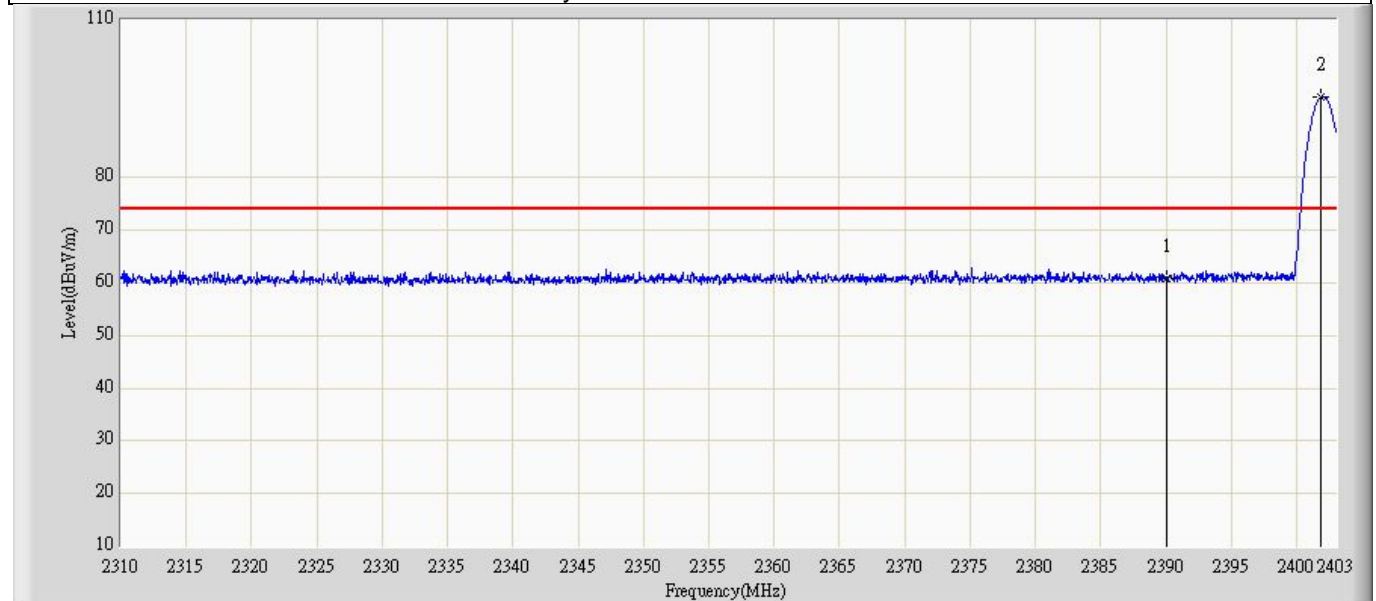
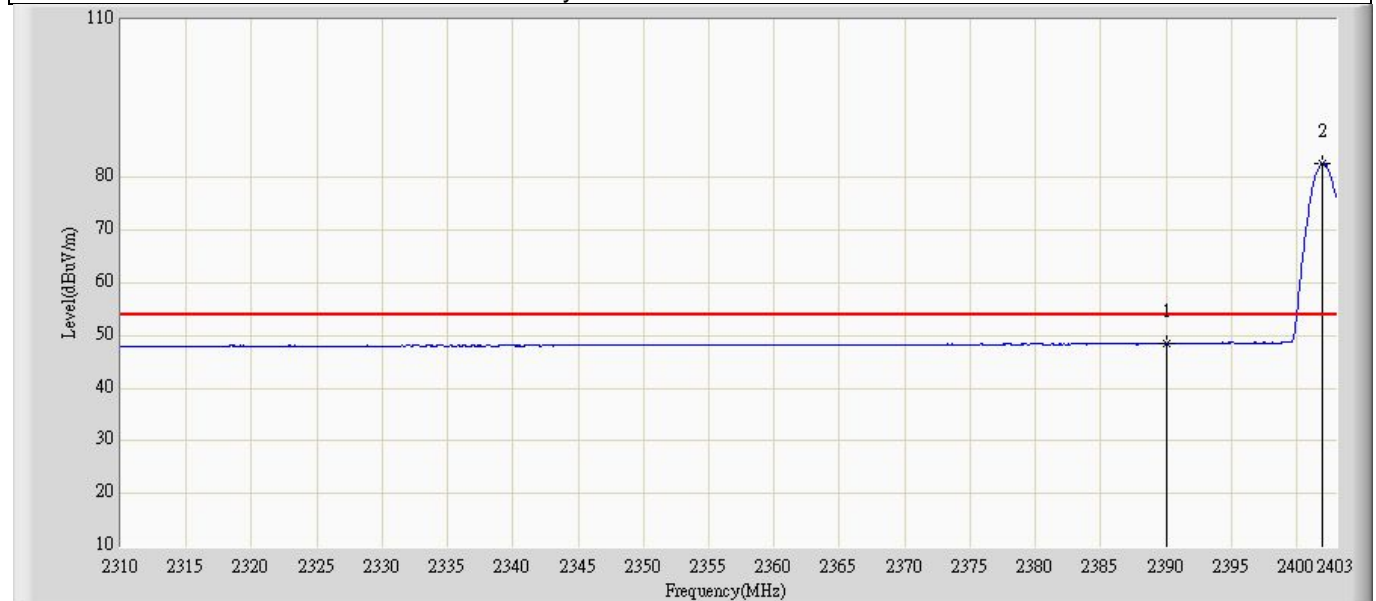


| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:13 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Horizontal |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode2: Transmit at channel 2402MHz By 2DH5 | |

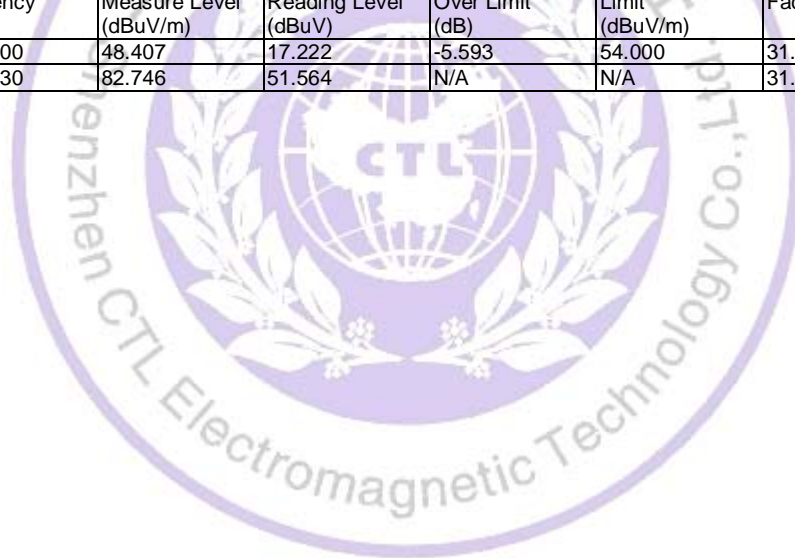


| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | | 2390.000 | 60.859 | 29.674 | -13.141 | 74.000 | 31.185 | PK |
| 2 | | * | 2401.791 | 95.266 | 64.084 | N/A | N/A | 31.181 | PK |

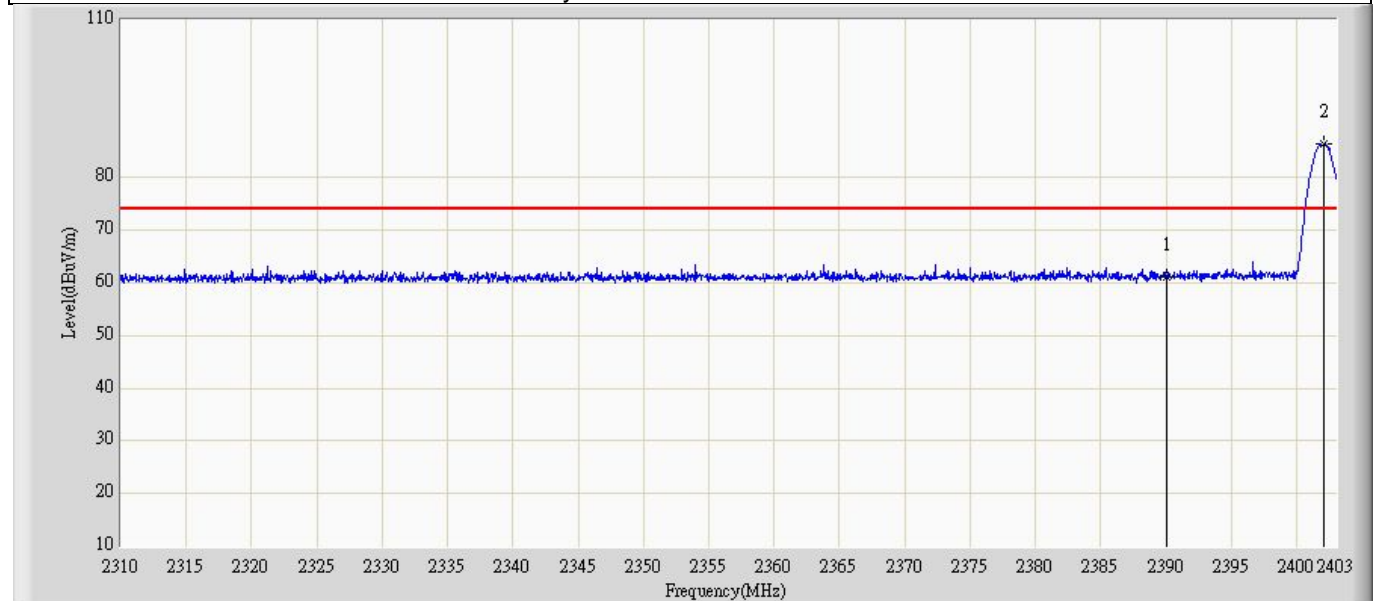
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:14 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Horizontal |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode2: Transmit at channel 2402MHz By 2DH5 | |



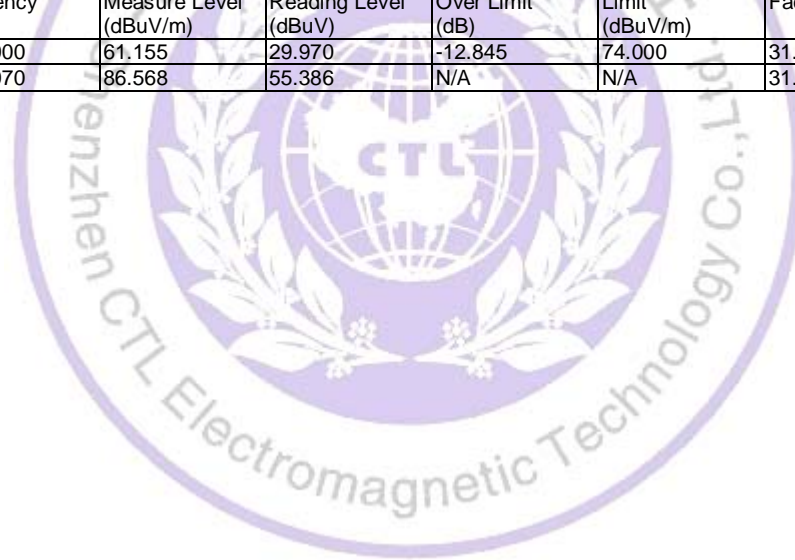
| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | | 2390.000 | 48.407 | 17.222 | -5.593 | 54.000 | 31.185 | AV |
| 2 | | * | 2401.930 | 82.746 | 51.564 | N/A | N/A | 31.181 | AV |



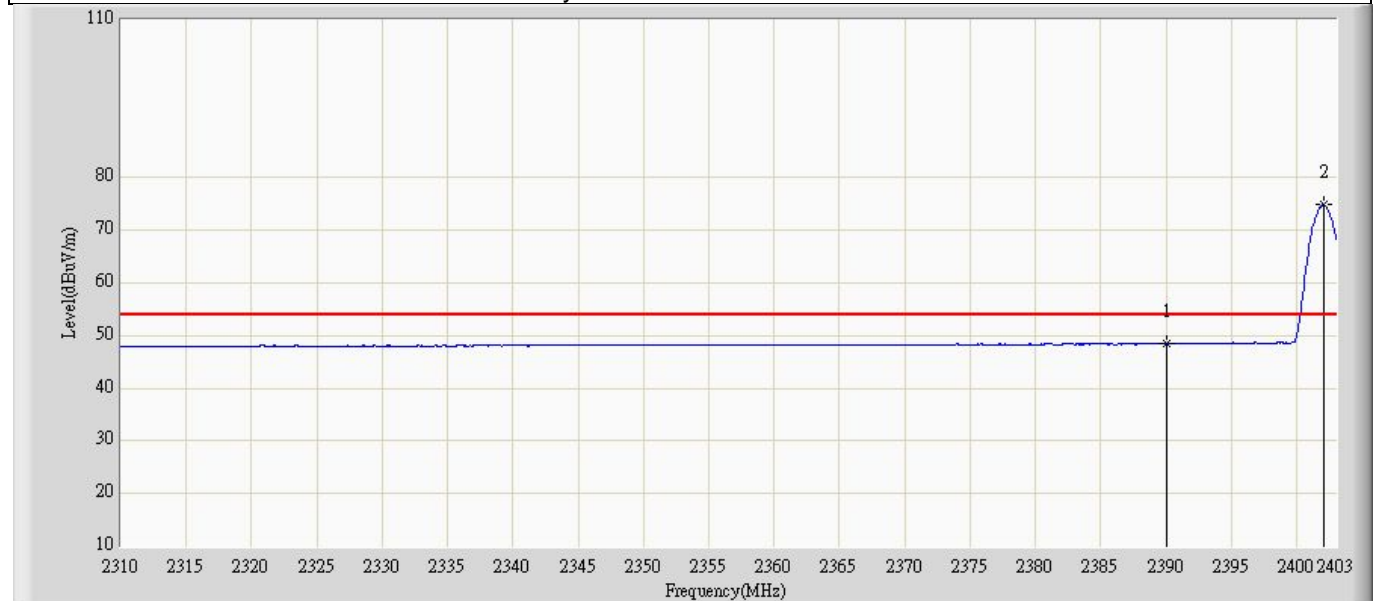
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:15 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Vertical |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode2: Transmit at channel 2402MHz By 2DH5 | |



| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | | 2390.000 | 61.155 | 29.970 | -12.845 | 74.000 | 31.185 | PK |
| 2 | | * | 2402.070 | 86.568 | 55.386 | N/A | N/A | 31.181 | PK |



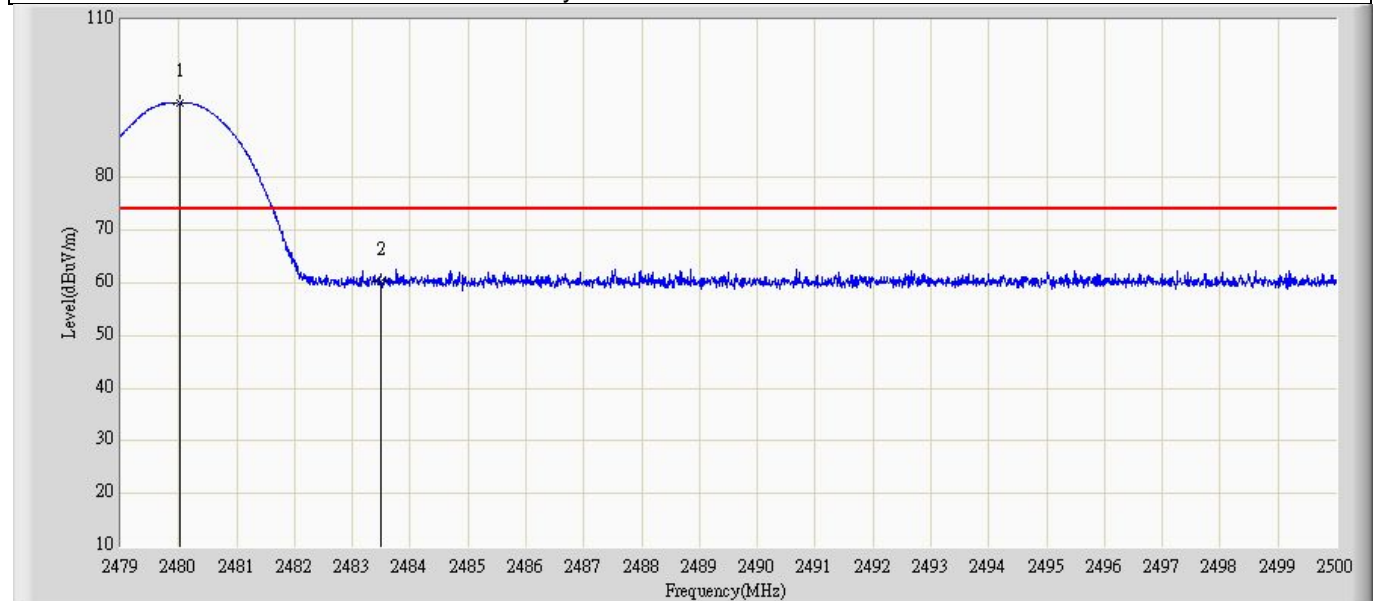
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:17 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Vertical |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode2: Transmit at channel 2402MHz By 2DH5 | |



| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | | 2390.000 | 48.445 | 17.260 | -5.555 | 54.000 | 31.185 | AV |
| 2 | | * | 2402.070 | 74.917 | 43.735 | N/A | N/A | 31.181 | AV |



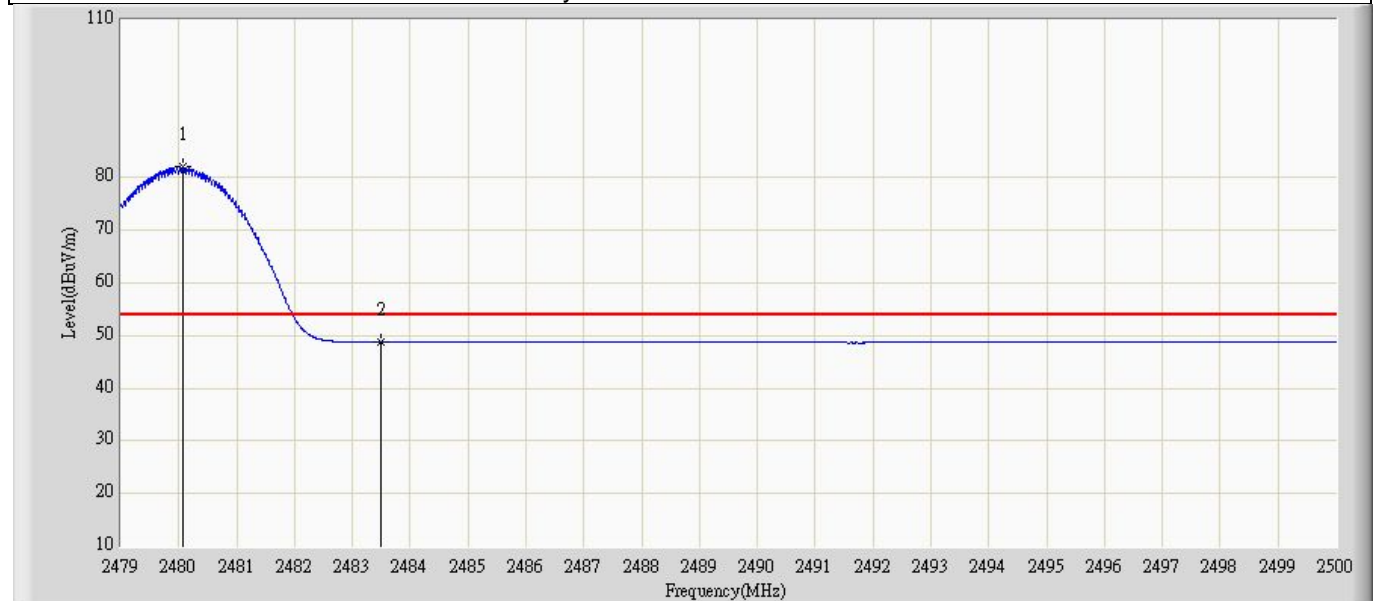
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:18 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Horizontal |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode2: Transmit at channel 2480MHz By 2DH5 | |



| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | * | 2480.029 | 94.193 | 62.986 | N/A | N/A | 31.206 | PK |
| 2 | | | 2483.500 | 60.221 | 29.012 | -13.779 | 74.000 | 31.209 | PK |



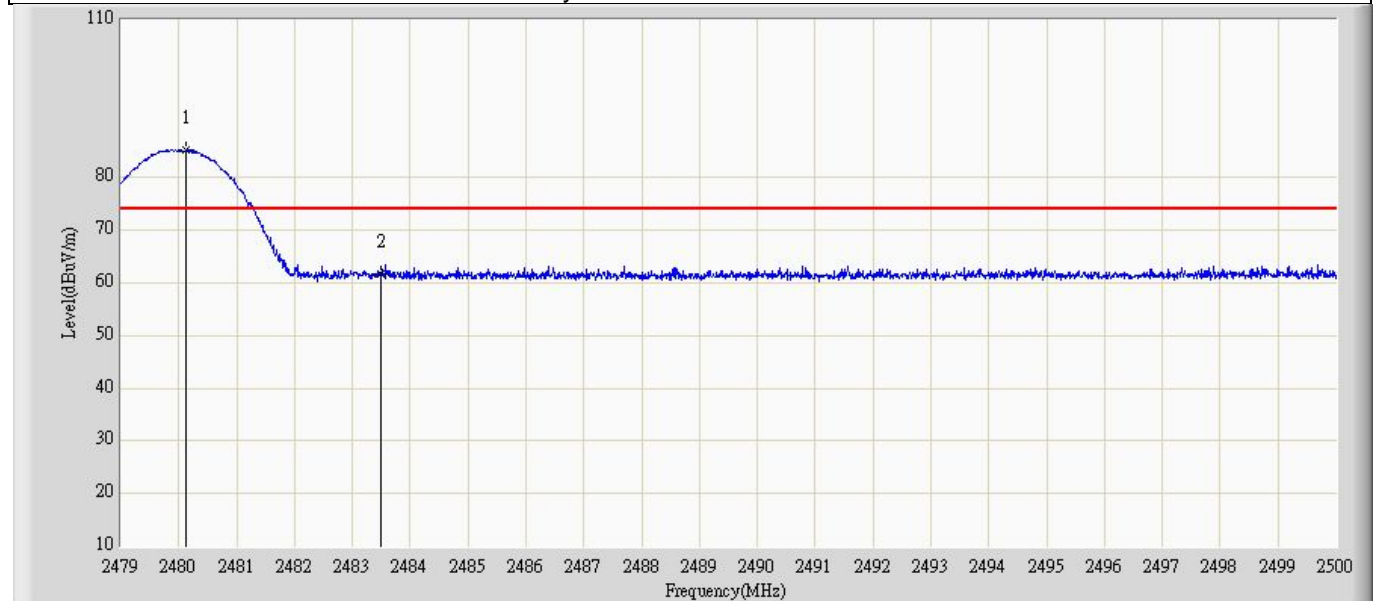
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:31 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Horizontal |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode2: Transmit at channel 2480MHz By 2DH5 | |



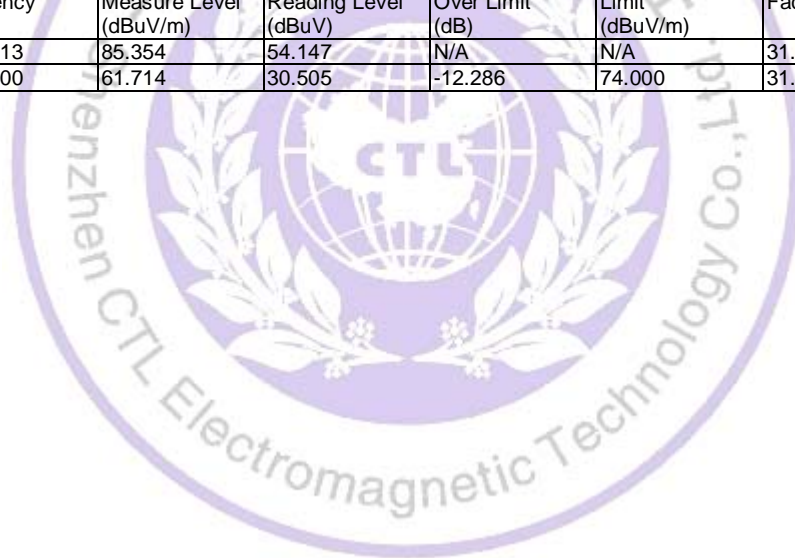
| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | * | 2480.071 | 81.990 | 50.783 | N/A | N/A | 31.206 | AV |
| 2 | | | 2483.500 | 48.762 | 17.553 | -5.238 | 54.000 | 31.209 | AV |



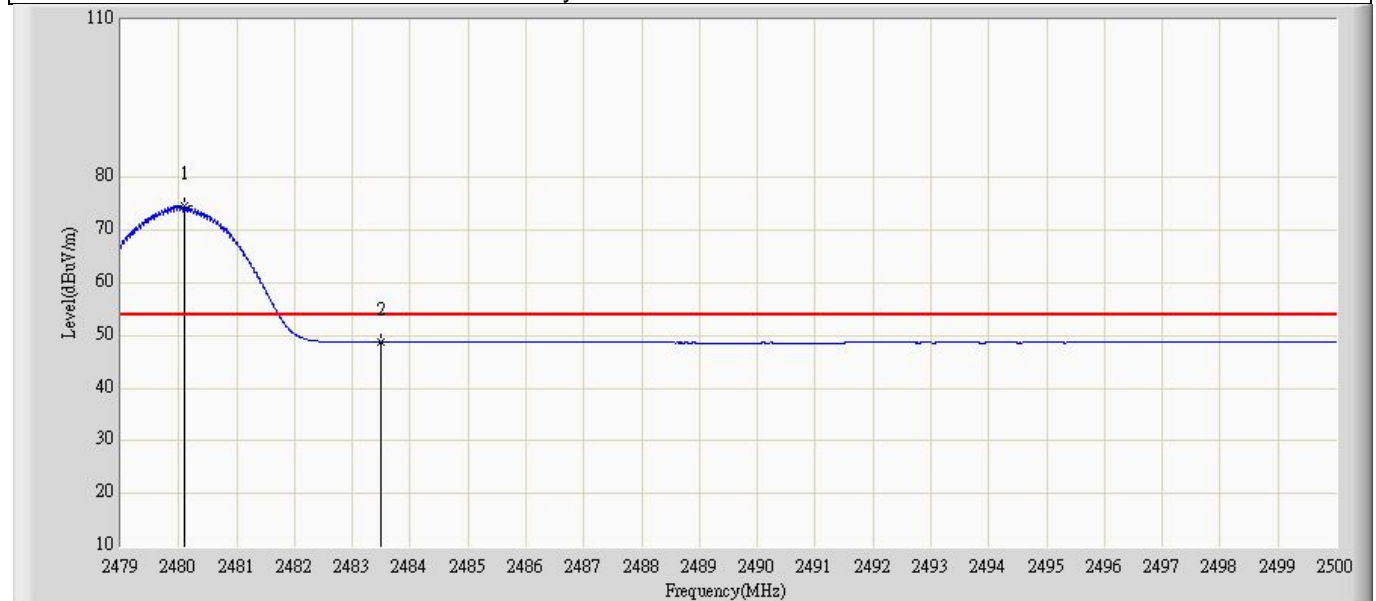
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:32 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Vertical |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode2: Transmit at channel 2480MHz By 2DH5 | |



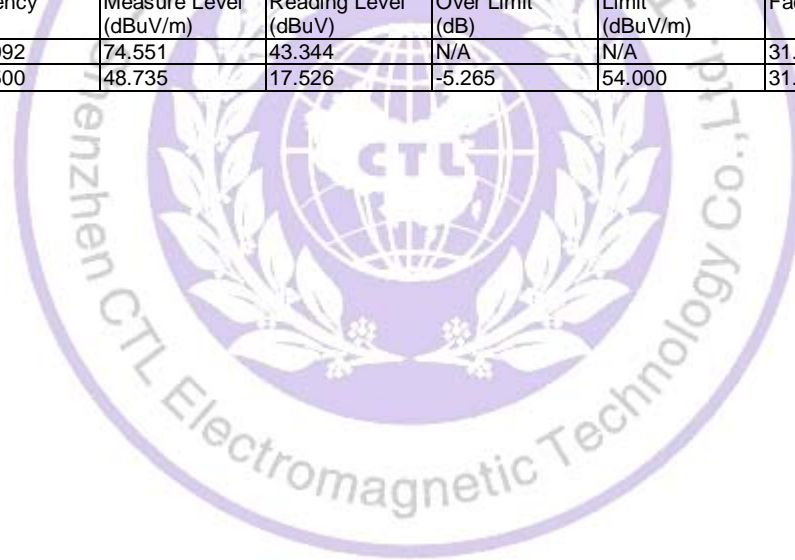
| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | * | 2480.113 | 85.354 | 54.147 | N/A | N/A | 31.206 | PK |
| 2 | | | 2483.500 | 61.714 | 30.505 | -12.286 | 74.000 | 31.209 | PK |



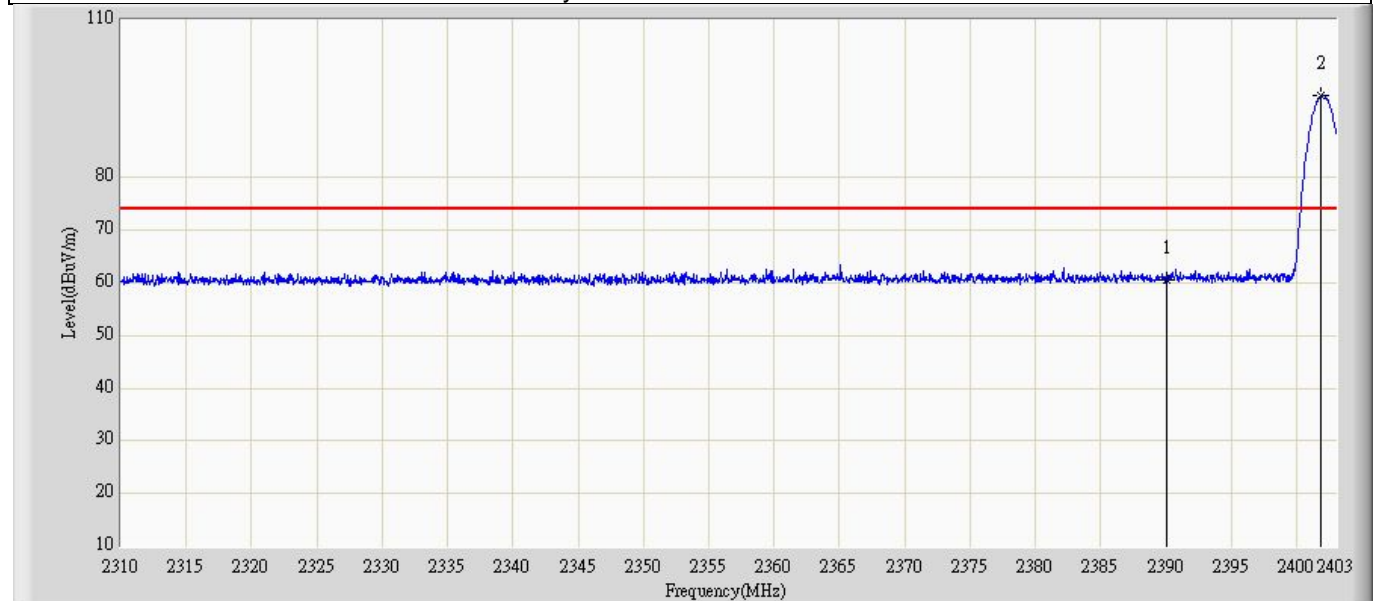
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:33 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Vertical |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode2: Transmit at channel 2480MHz By 2DH5 | |



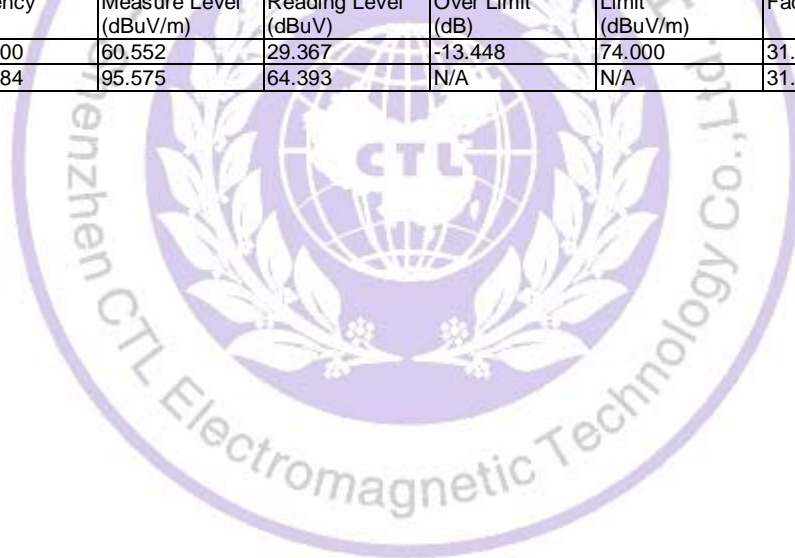
| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | * | 2480.092 | 74.551 | 43.344 | N/A | N/A | 31.206 | AV |
| 2 | | | 2483.500 | 48.735 | 17.526 | -5.265 | 54.000 | 31.209 | AV |



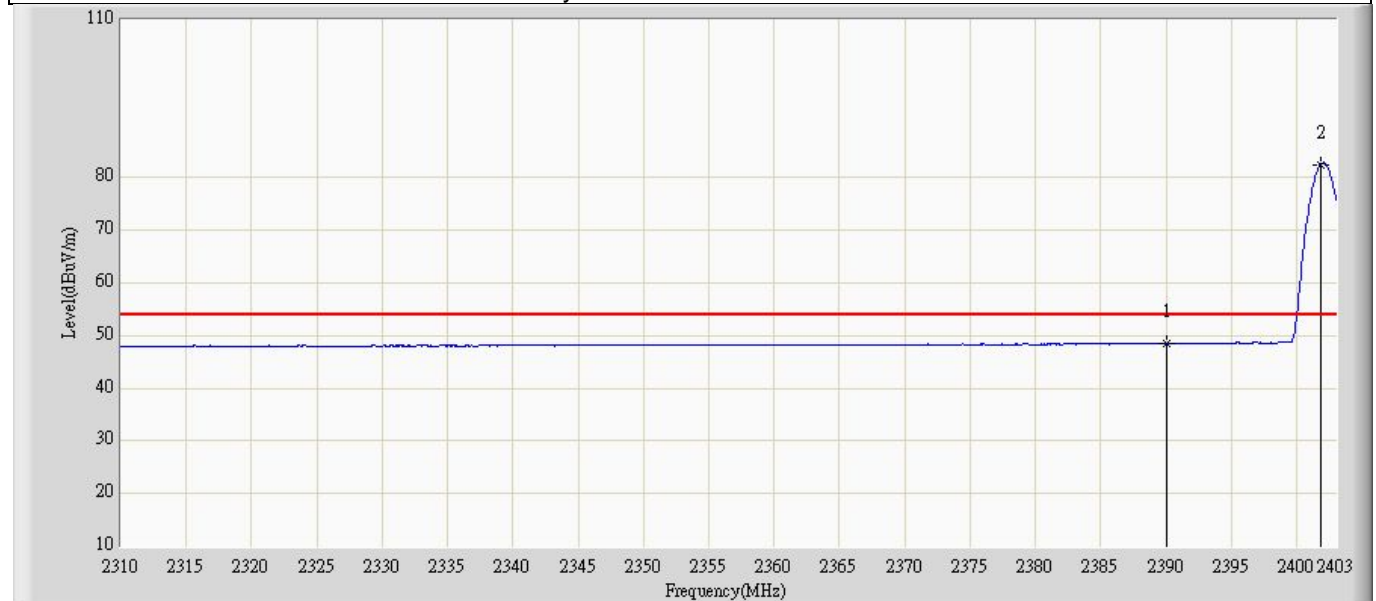
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:35 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Horizontal |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode3: Transmit at channel 2402MHz By 3DH5 | |



| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | | 2390.000 | 60.552 | 29.367 | -13.448 | 74.000 | 31.185 | PK |
| 2 | | * | 2401.884 | 95.575 | 64.393 | N/A | N/A | 31.181 | PK |



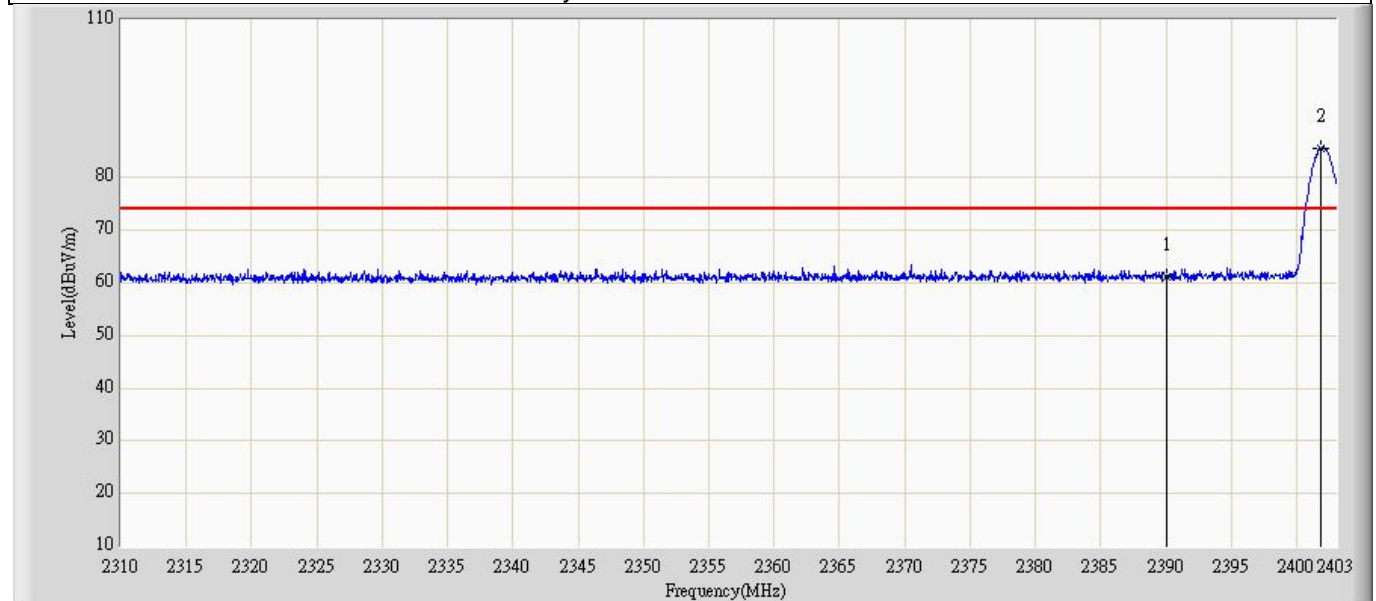
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:35 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Horizontal |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode3: Transmit at channel 2402MHz By 3DH5 | |



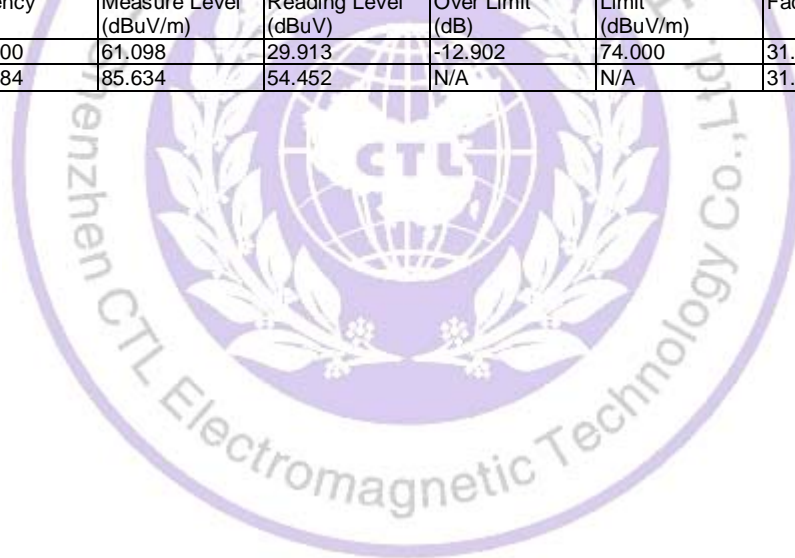
| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | | 2390.000 | 48.460 | 17.275 | -5.540 | 54.000 | 31.185 | AV |
| 2 | | * | 2401.837 | 82.551 | 51.369 | N/A | N/A | 31.181 | AV |



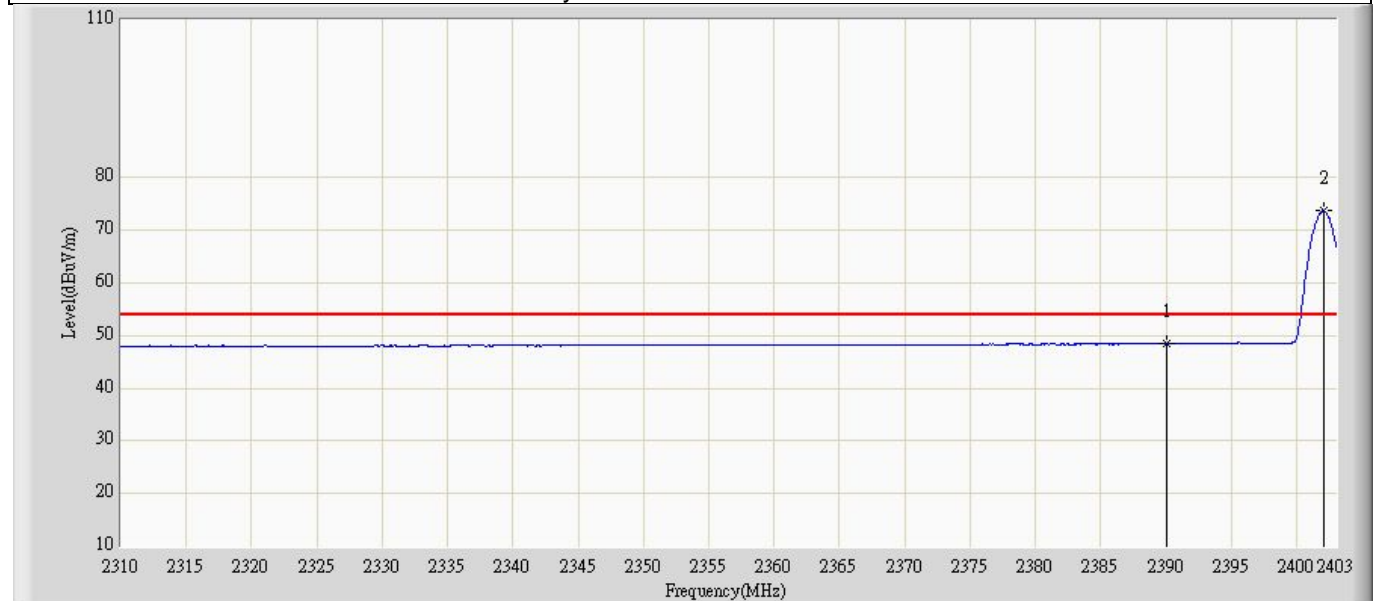
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:36 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Vertical |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode3: Transmit at channel 2402MHz By 3DH5 | |



| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | | 2390.000 | 61.098 | 29.913 | -12.902 | 74.000 | 31.185 | PK |
| 2 | | * | 2401.884 | 85.634 | 54.452 | N/A | N/A | 31.181 | PK |



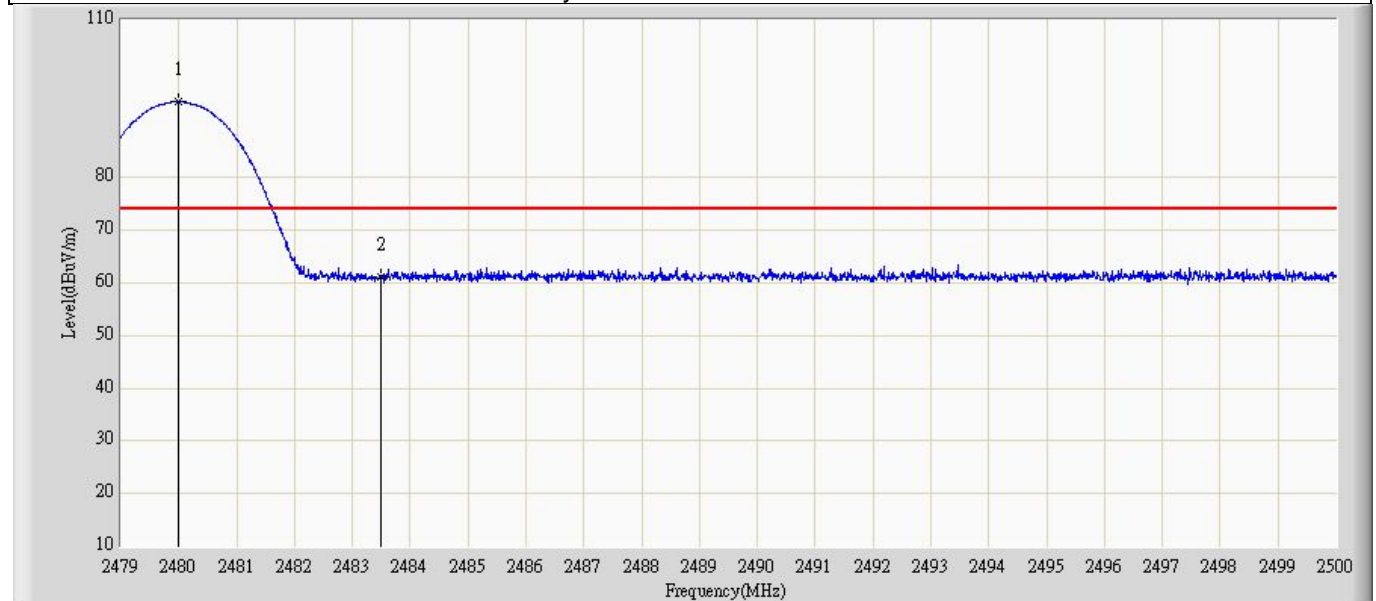
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:37 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Vertical |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode3: Transmit at channel 2402MHz By 3DH5 | |



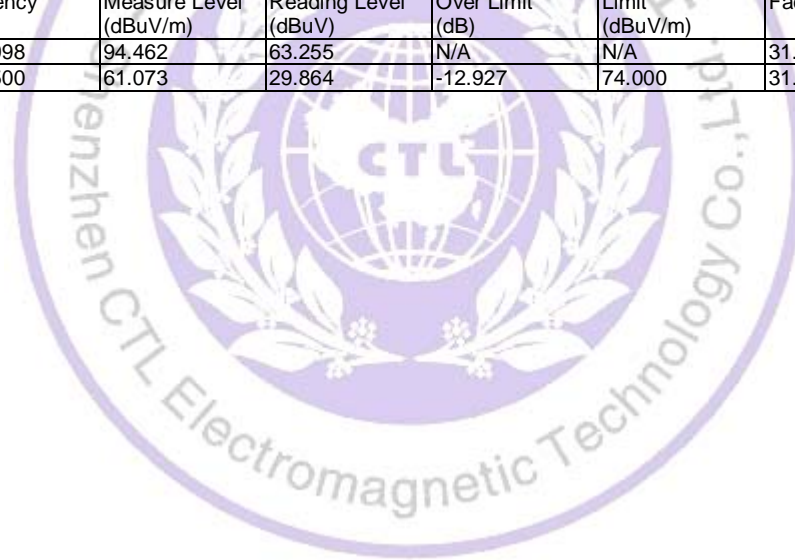
| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | | 2390.000 | 48.438 | 17.253 | -5.562 | 54.000 | 31.185 | AV |
| 2 | | * | 2402.070 | 73.701 | 42.519 | N/A | N/A | 31.181 | AV |



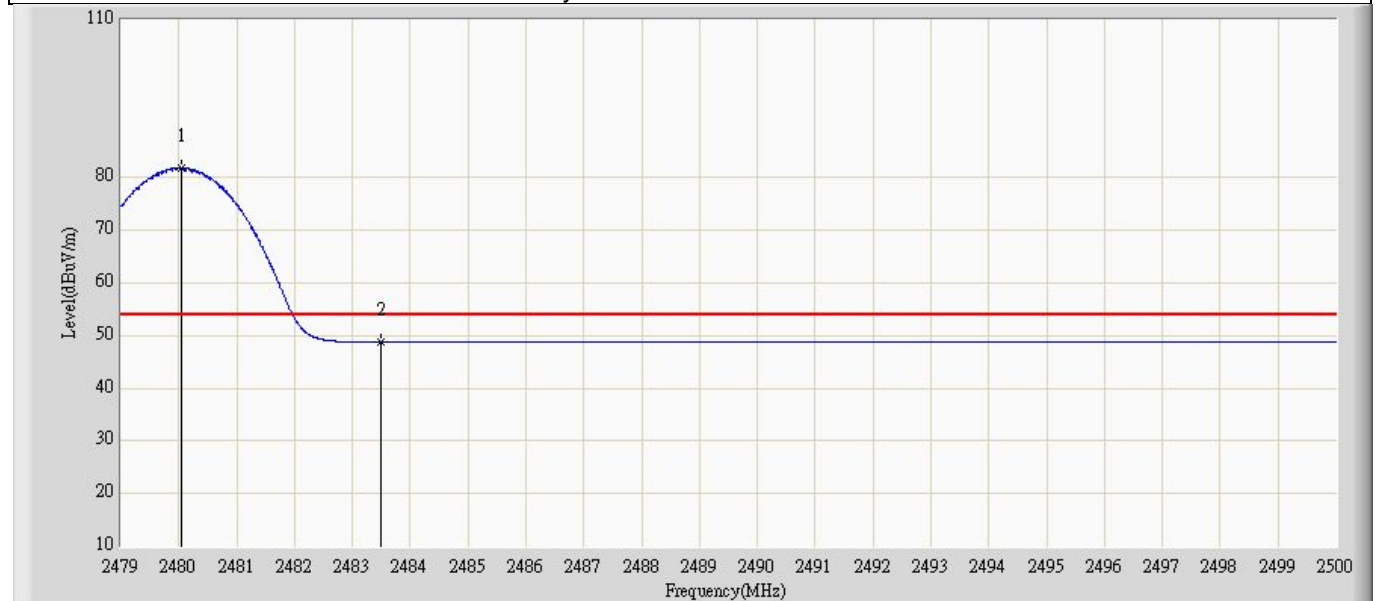
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:38 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Horizontal |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode3: Transmit at channel 2480MHz By 3DH5 | |



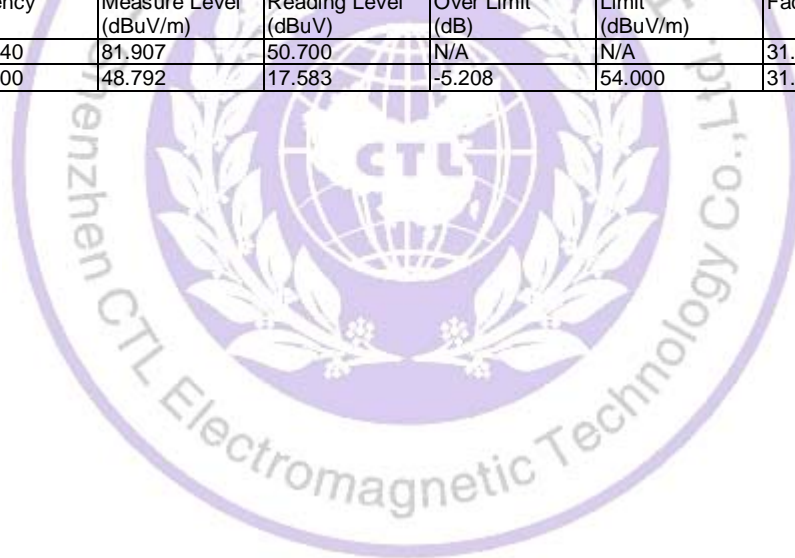
| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | * | 2479.998 | 94.462 | 63.255 | N/A | N/A | 31.206 | PK |
| 2 | | | 2483.500 | 61.073 | 29.864 | -12.927 | 74.000 | 31.209 | PK |



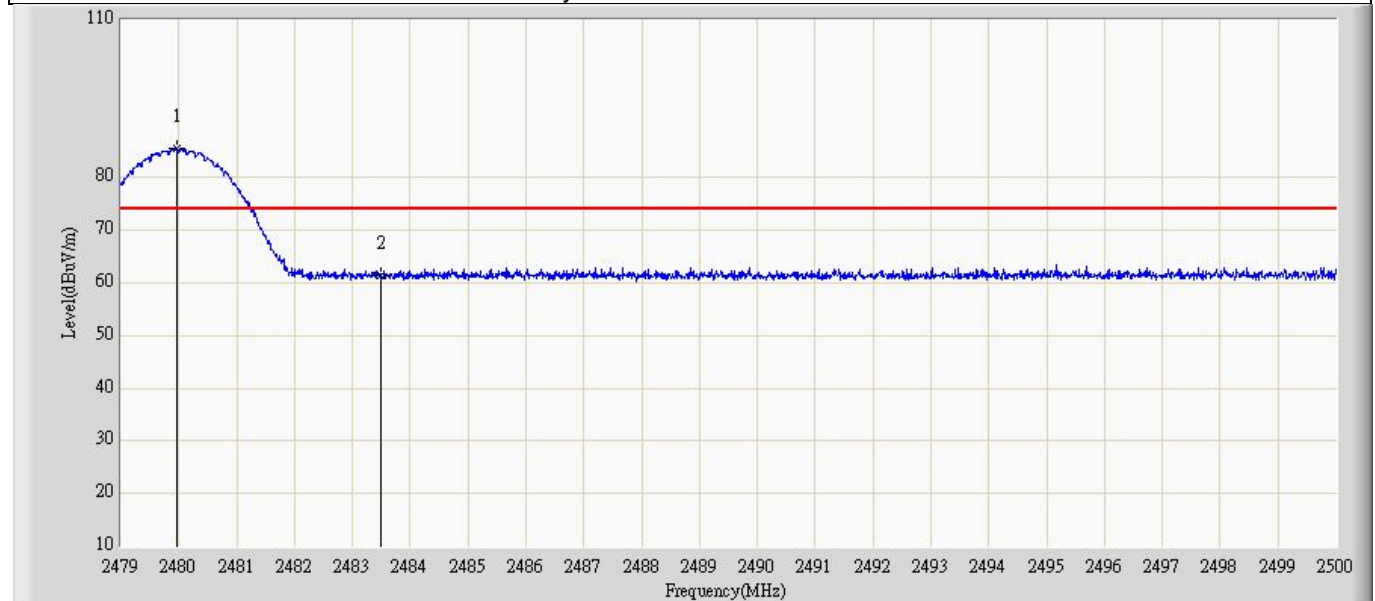
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:40 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Horizontal |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode3: Transmit at channel 2480MHz By 3DH5 | |



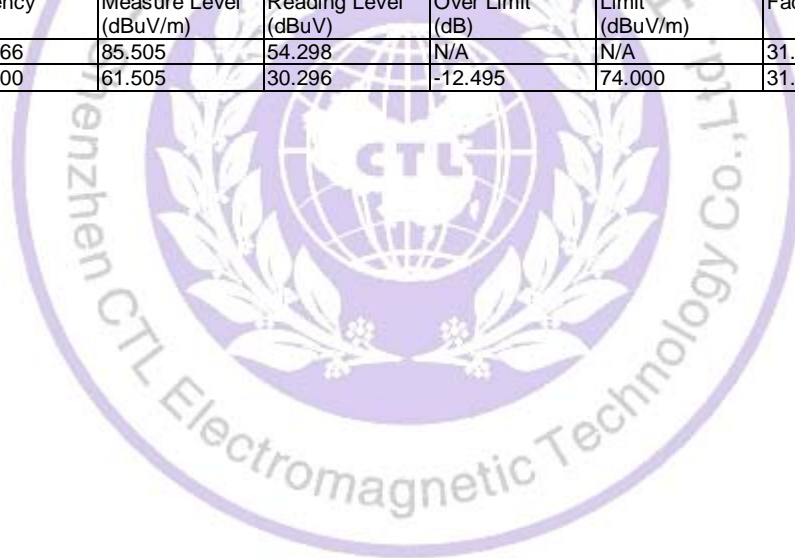
| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | * | 2480.040 | 81.907 | 50.700 | N/A | N/A | 31.206 | AV |
| 2 | | | 2483.500 | 48.792 | 17.583 | -5.208 | 54.000 | 31.209 | AV |



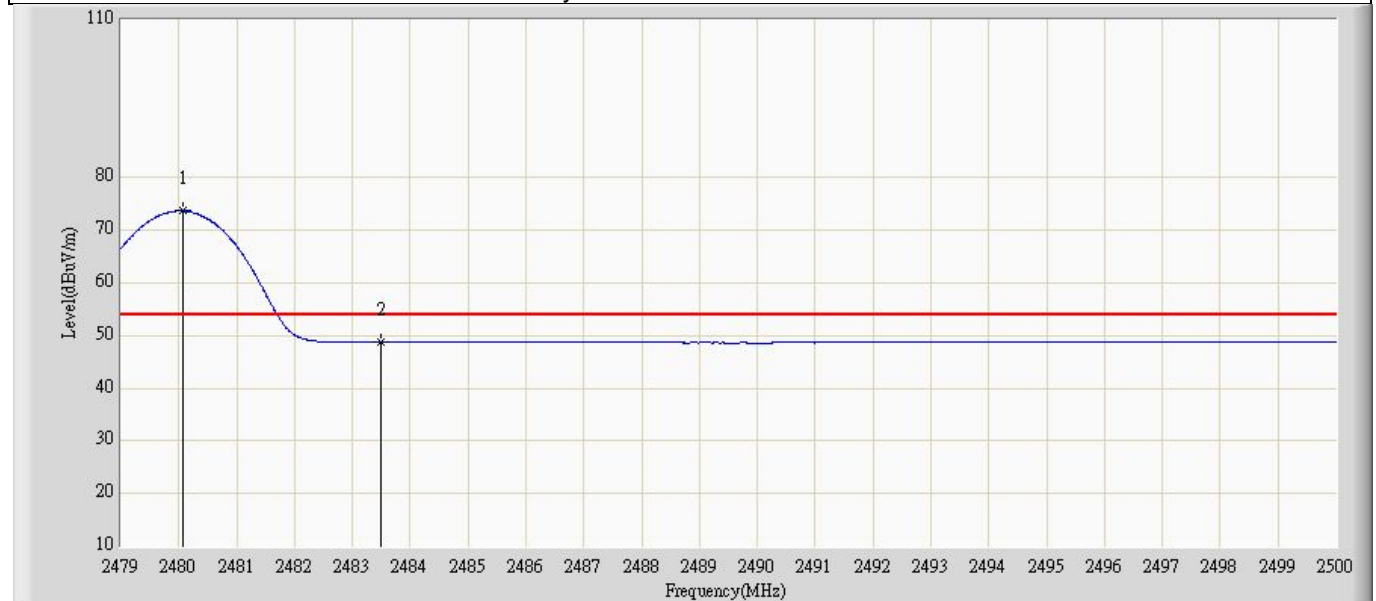
| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:41 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Vertical |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode3: Transmit at channel 2480MHz By 3DH5 | |



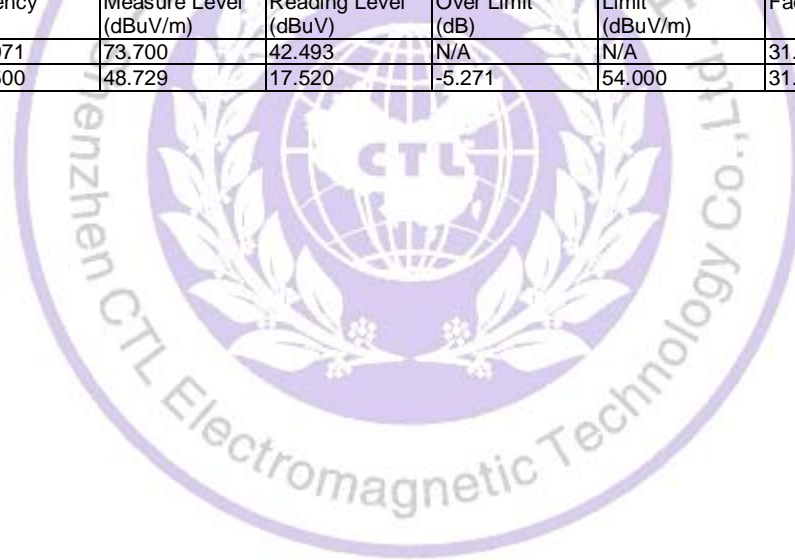
| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | * | 2479.966 | 85.505 | 54.298 | N/A | N/A | 31.206 | PK |
| 2 | | | 2483.500 | 61.505 | 30.296 | -12.495 | 74.000 | 31.209 | PK |



| | |
|--|--------------------------|
| Engineer: Jame | |
| Site: AC5 | Time: 2013/09/26 - 19:42 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: BBHA9120D_499(1-18GHz) | Polarity: Vertical |
| EUT: 3G WCDMA+GSM Smart Phone | Power: DC 3.7V |
| Note: Mode3: Transmit at channel 2480MHz By 3DH5 | |

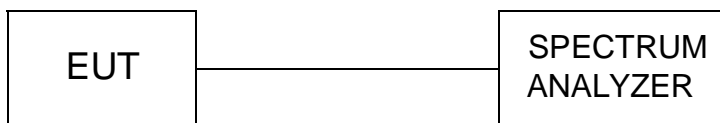


| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|--------|------|
| 1 | | * | 2480.071 | 73.700 | 42.493 | N/A | N/A | 31.206 | AV |
| 2 | | | 2483.500 | 48.729 | 17.520 | -5.271 | 54.000 | 31.209 | AV |



4.6. Frequency Separation

TEST CONFIGURATION



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.

LIMIT

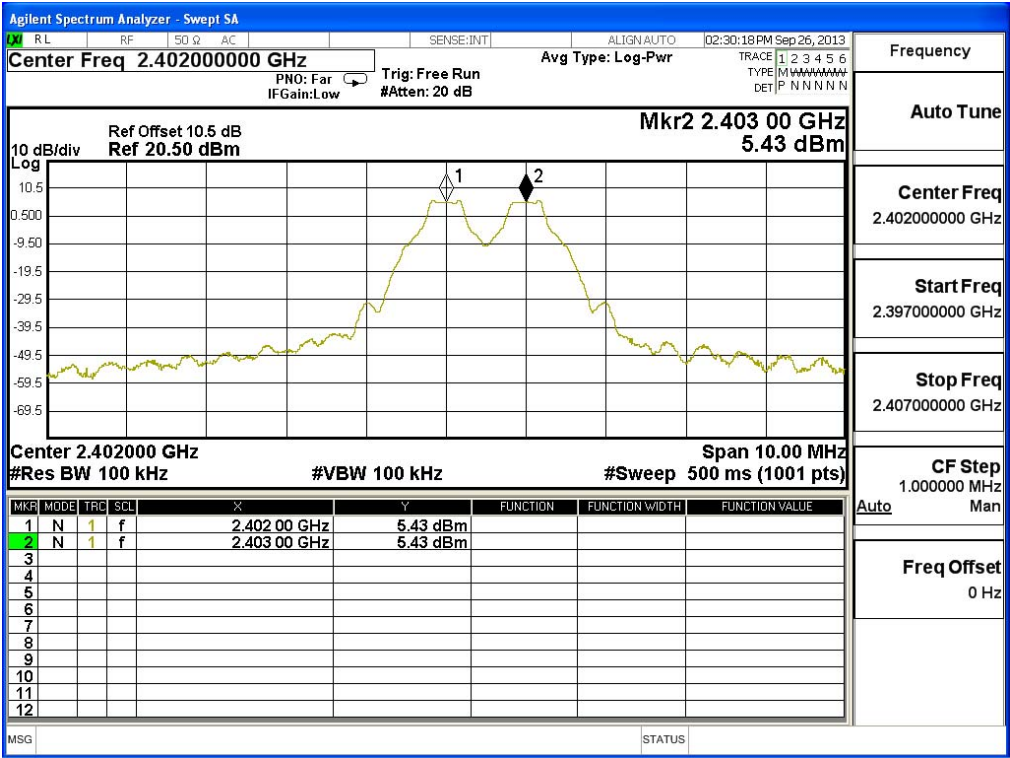
According to 15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25KHz or the $2/3 \times 20\text{dB}$ bandwidth of the hopping channel, whichever is greater.

TEST RESULTS

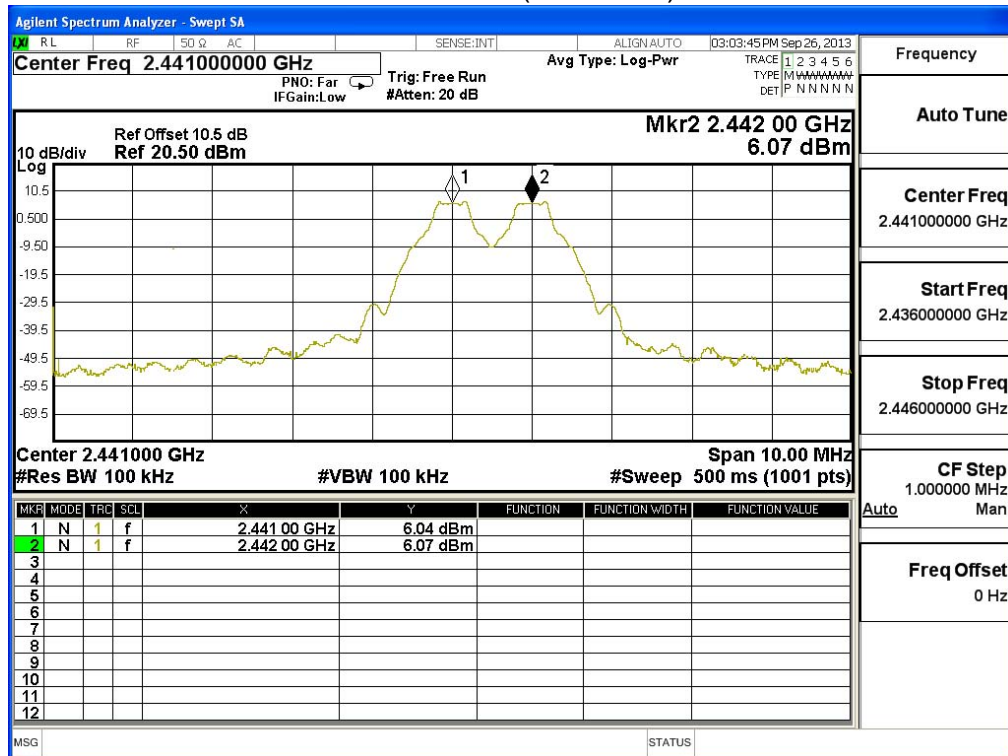
| | | |
|-----------|---|-------------------------------------|
| Product | : | 3G WCDMA+GSM Smart Phone |
| Test Item | : | Carrier Frequency Separation |
| Test Site | : | TR-8 |
| Test Mode | : | Mode 1: Transmitter-1Mbps(GFSK_DH5) |

| 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 |

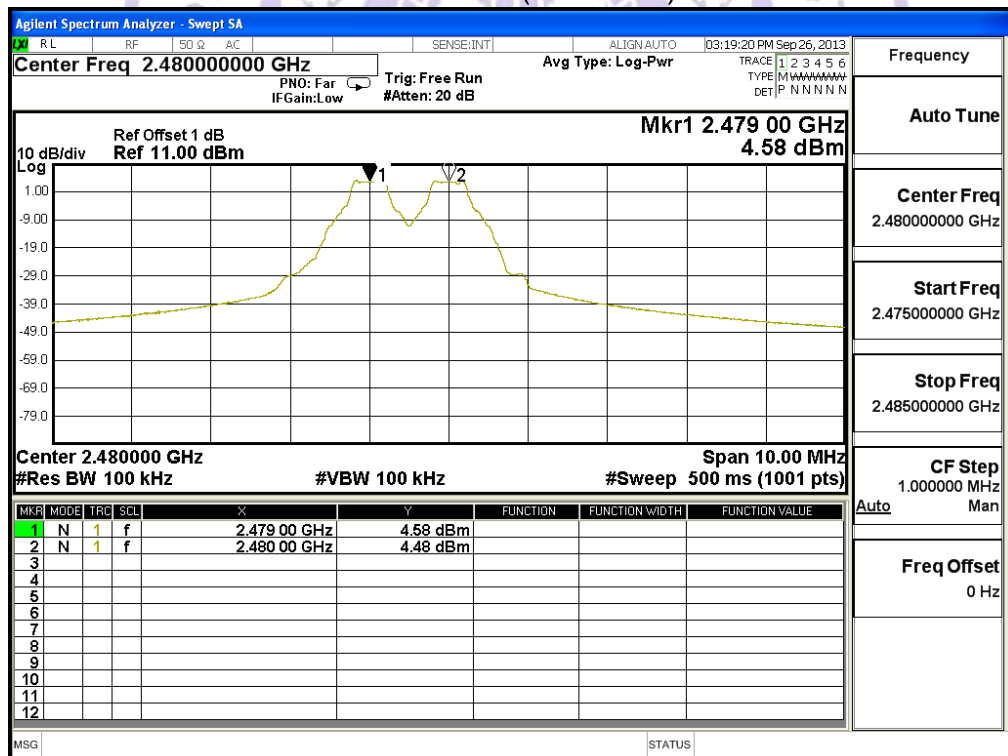
Channel 00 (2402MHz)



Channel 39 (2441MHz)



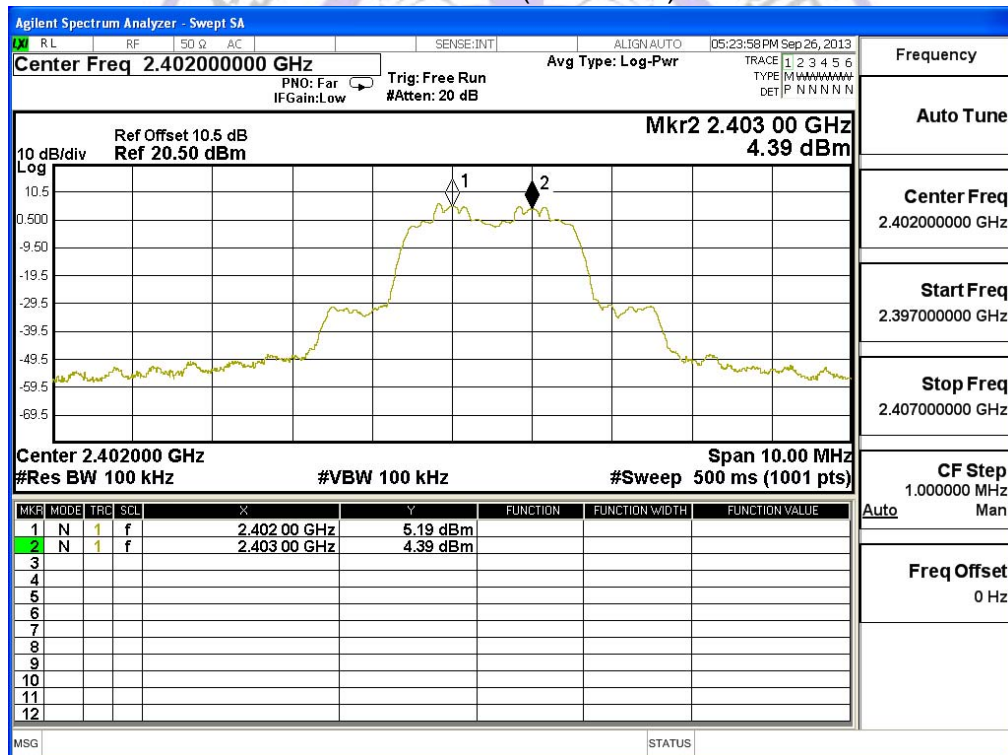
Channel 78 (2480MHz)



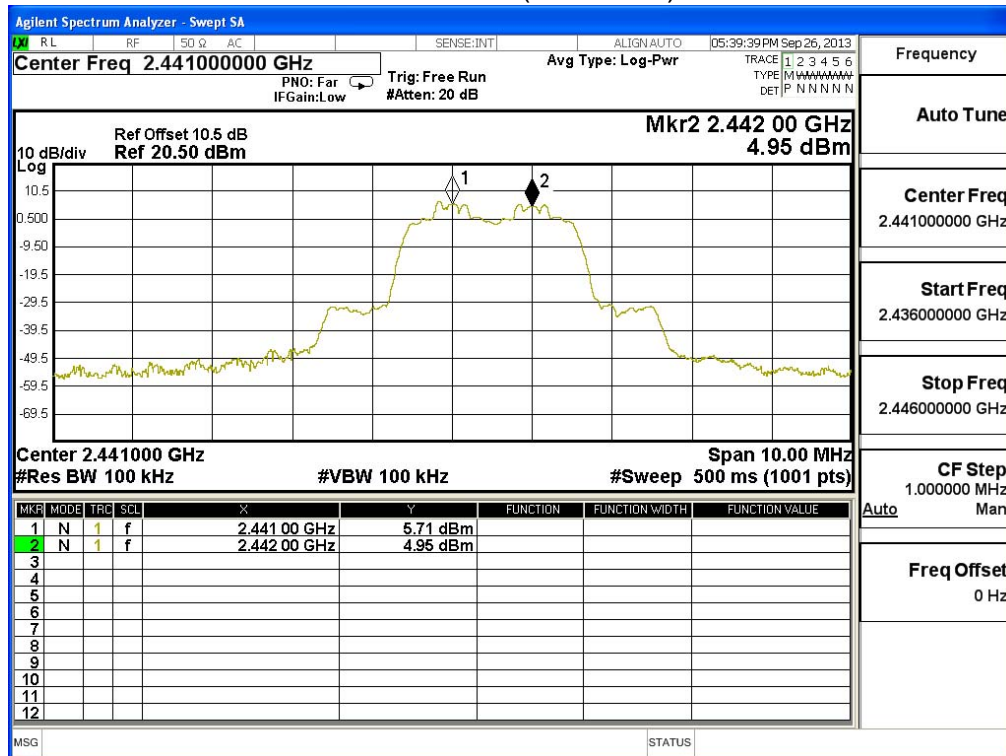
| | | |
|-----------|---|---|
| Product | : | 3G WCDMA+GSM Smart Phone |
| Test Item | : | Carrier Frequency Separation |
| Test Site | : | TR-8 |
| Test Mode | : | Mode 2: Transmitter-2Mbps(Pi/4 DQPSK_DH5) |

| 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 |

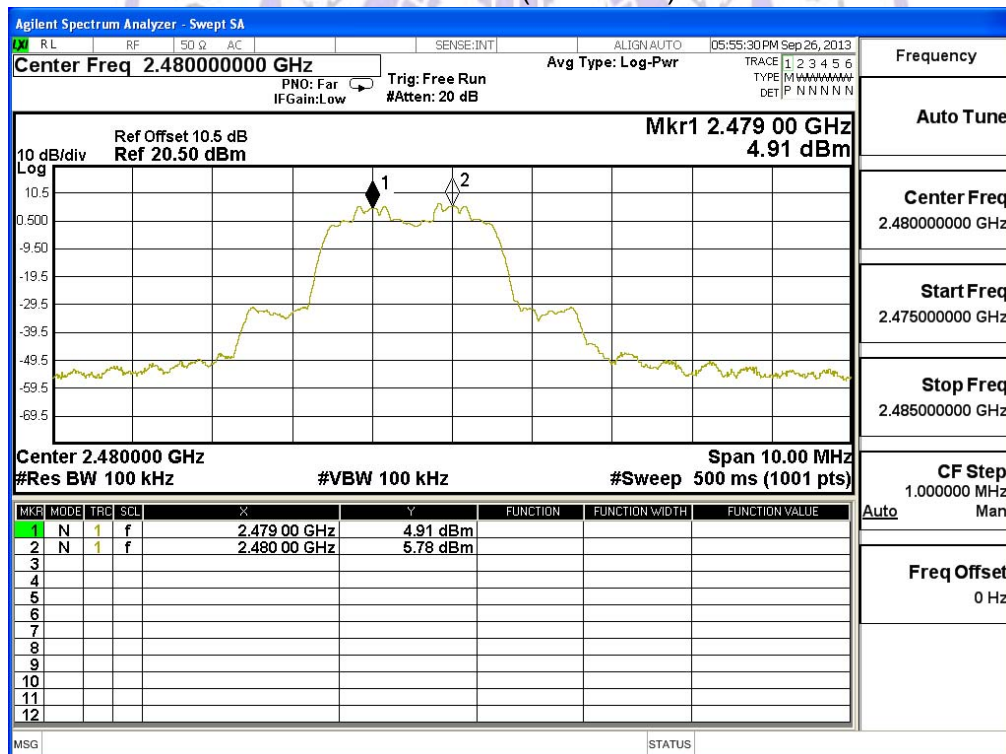
Channel 00 (2402MHz)



Channel 39 (2441MHz)

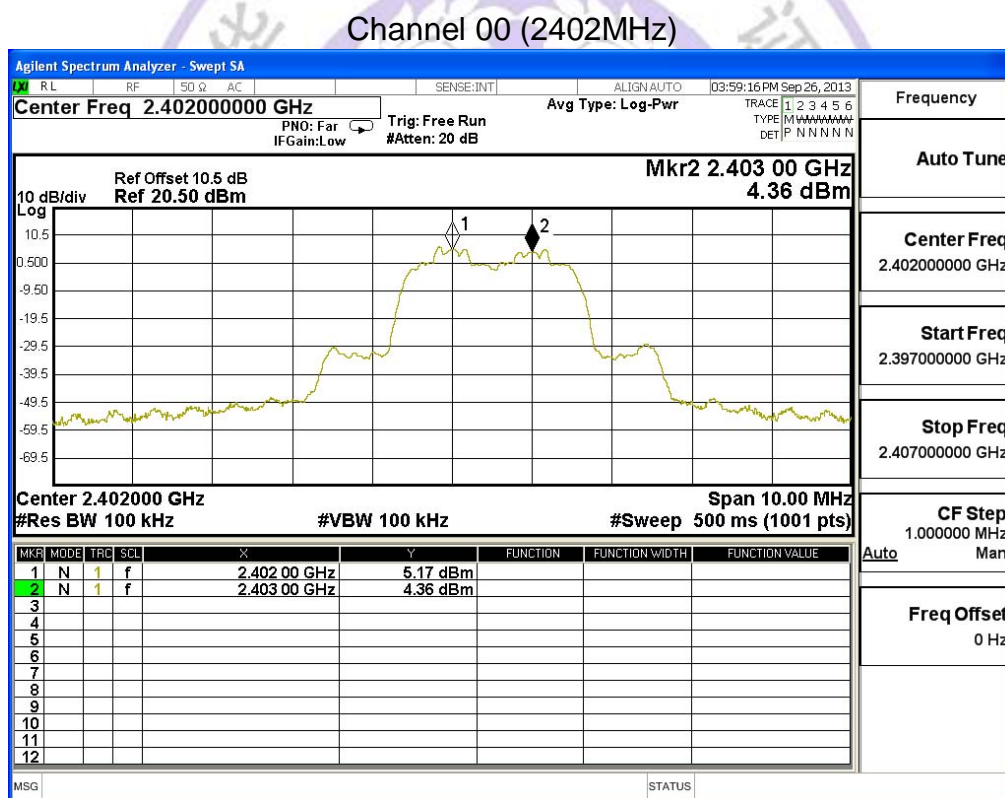


Channel 78 (2480MHz)

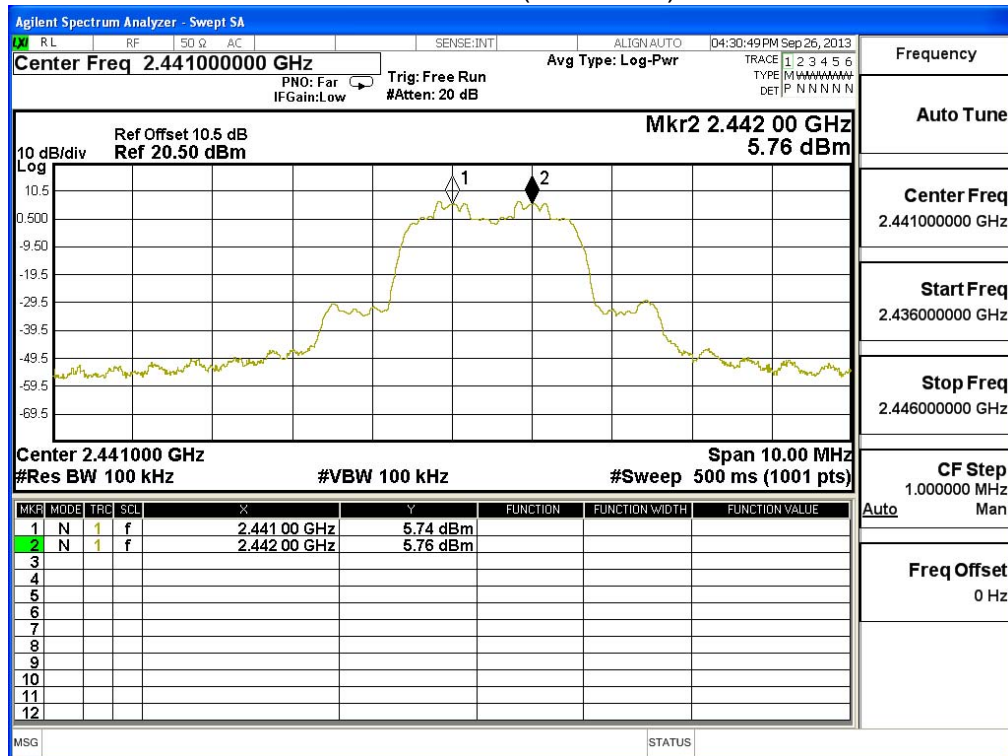


| | | |
|-----------|---|--------------------------------------|
| Product | : | 3G WCDMA+GSM Smart Phone |
| Test Item | : | Carrier Frequency Separation |
| Test Site | : | TR-8 |
| Test Mode | : | Mode 3: Transmitter-3Mbps(8DPSK_DH5) |

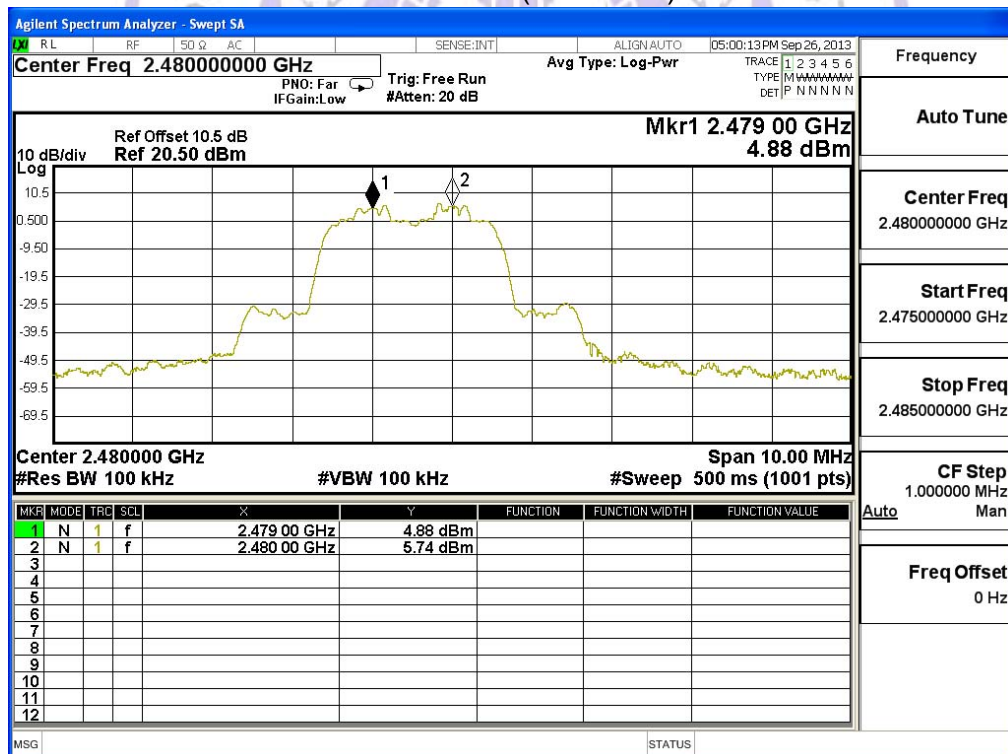
| Channel No. | Frequency (MHz) | Carrier Frequency Separation (kHz) | Limit (kHz) | Result |
|-------------|-----------------|------------------------------------|-------------------------------|--------|
| 00 | 2402 | 1000 | >25 kHz or 2/3 of 20 dB BW | Pass |
| 39 | 2441 | 1000 | >25 kHz or 2/3 of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



Channel 39 (2441MHz)

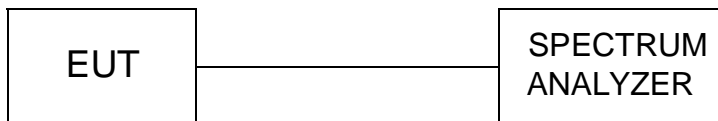


Channel 78 (2480MHz)



4.7. Number of hopping frequency

TEST CONFIGURATION



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.

LIMIT

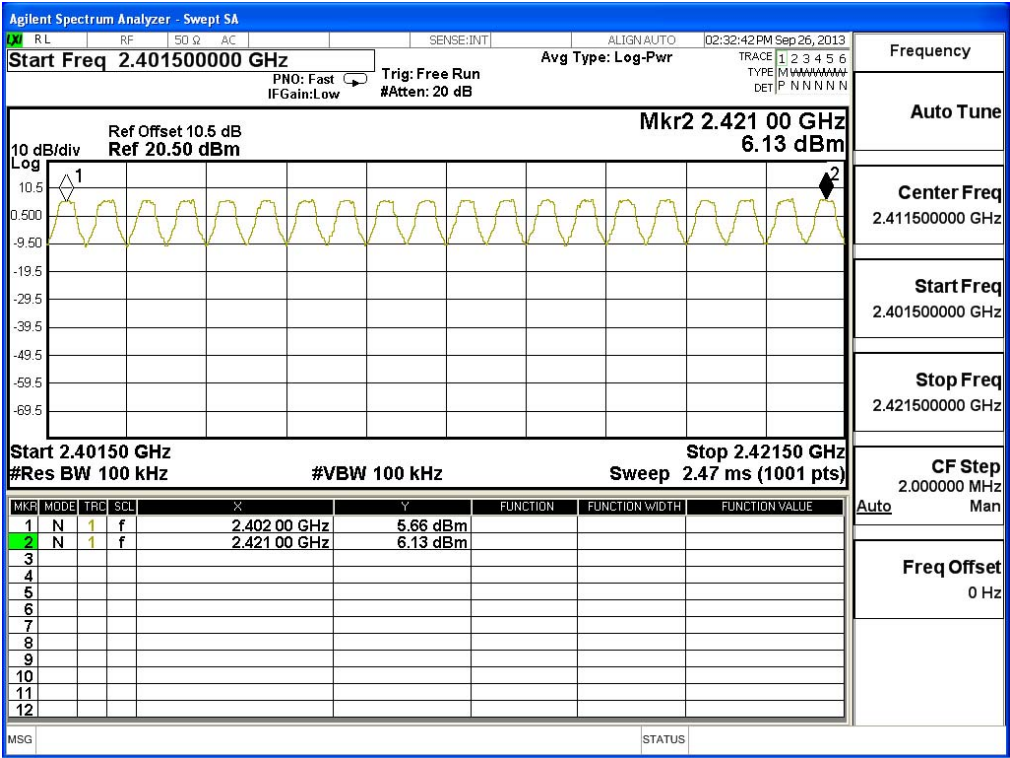
Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

TEST RESULTS

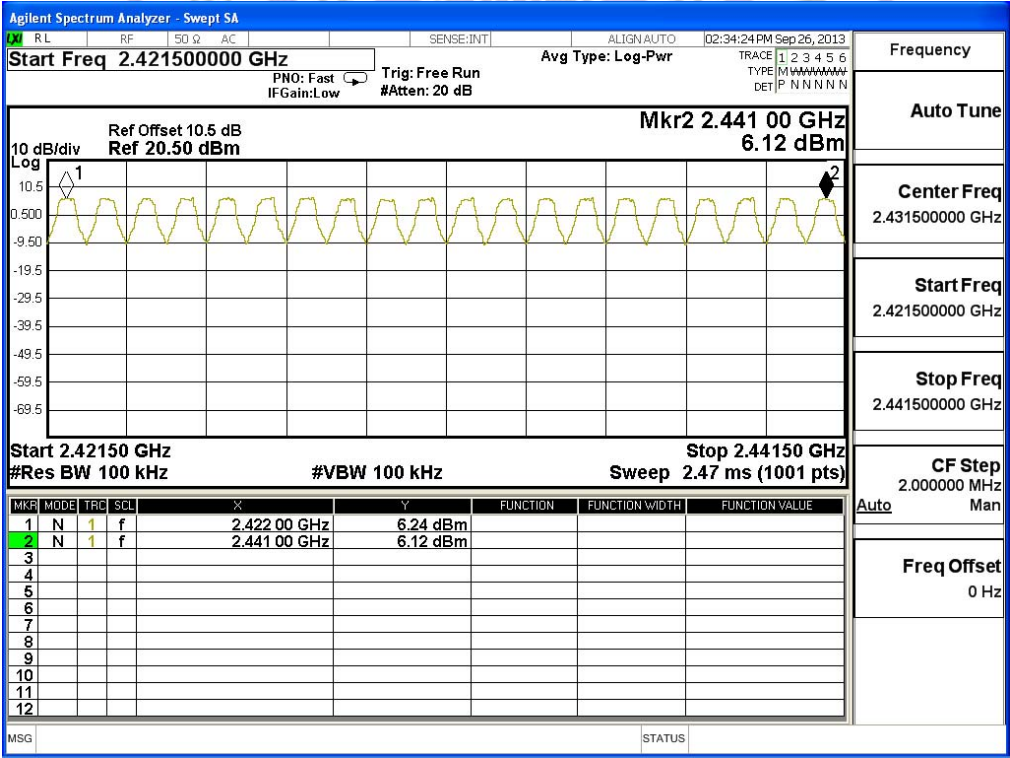
| | | |
|-----------|---|-------------------------------------|
| Product | : | 3G WCDMA+GSM Smart Phone |
| Test Item | : | Number of Hopping Frequencies |
| Test Site | : | TR-8 |
| Test Mode | : | Mode 1: Transmitter-1Mbps(GFSK_DH5) |

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

2402 - 2421 MHz



2422 - 2441 MHz

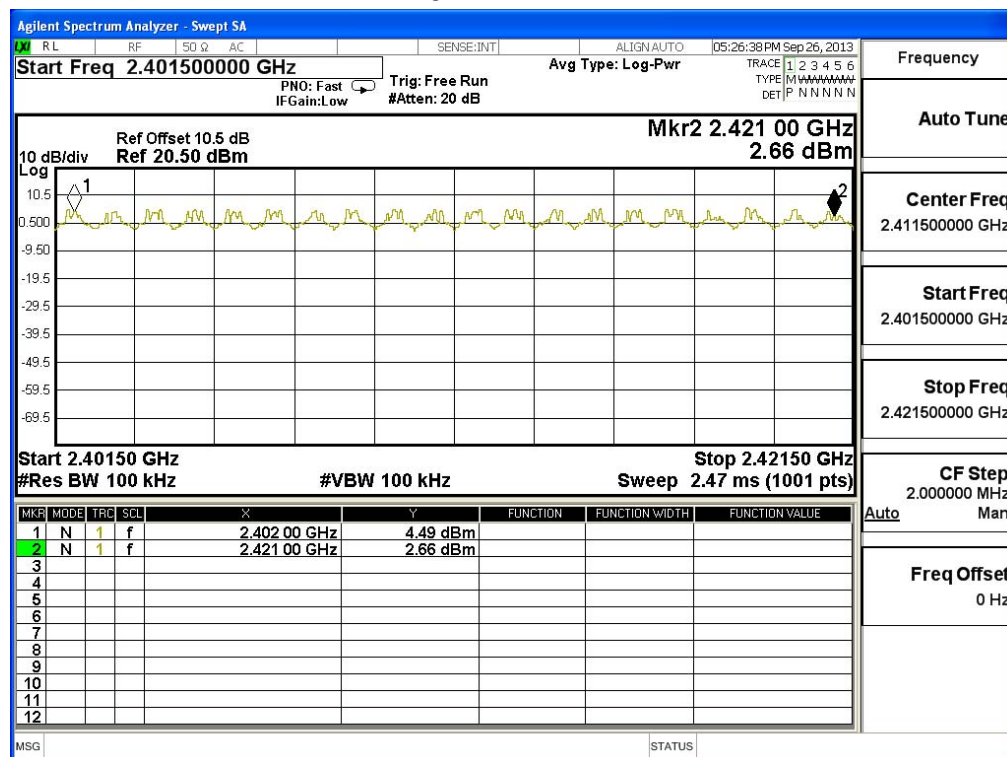


[illegible][illegible]

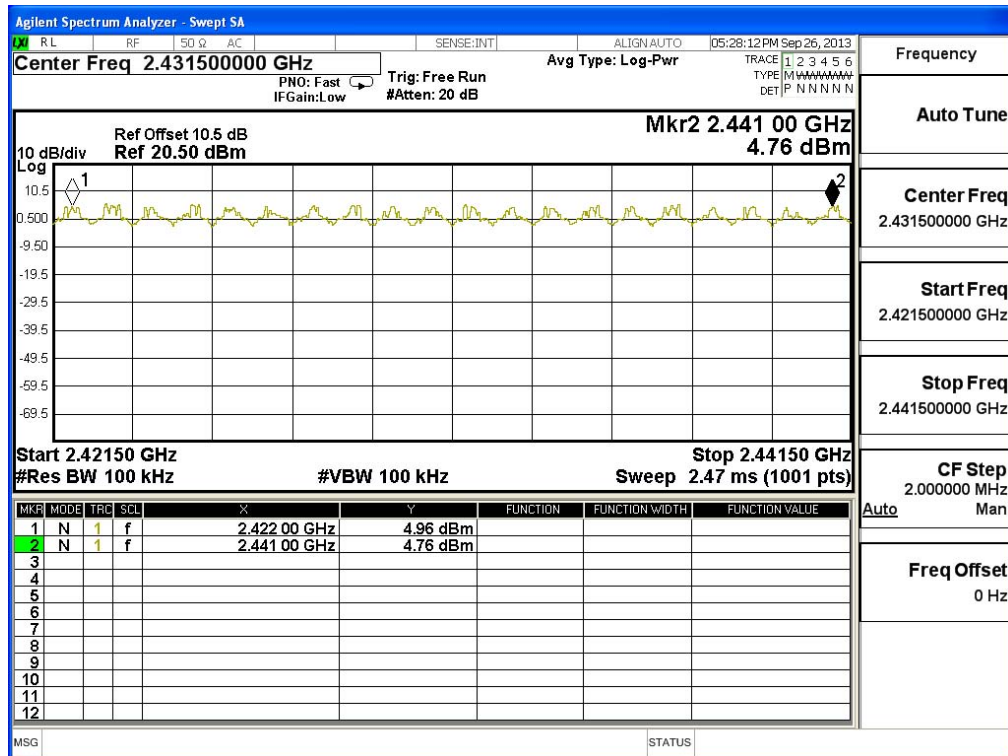
| | | |
|-----------|---|---|
| Product | : | 3G WCDMA+GSM Smart Phone |
| Test Item | : | Number of Hopping Frequencies |
| Test Site | : | TR-8 |
| Test Mode | : | Mode 2: Transmitter-2Mbps(Pi/4 DQPSK_DH5) |

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

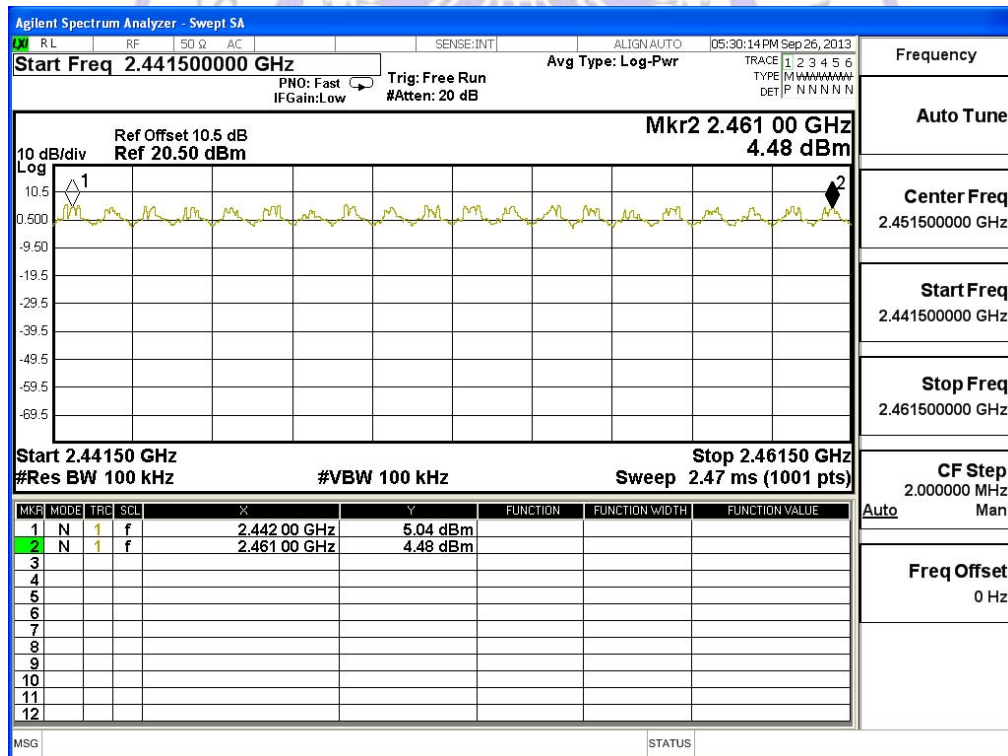
2402 - 2421 MHz



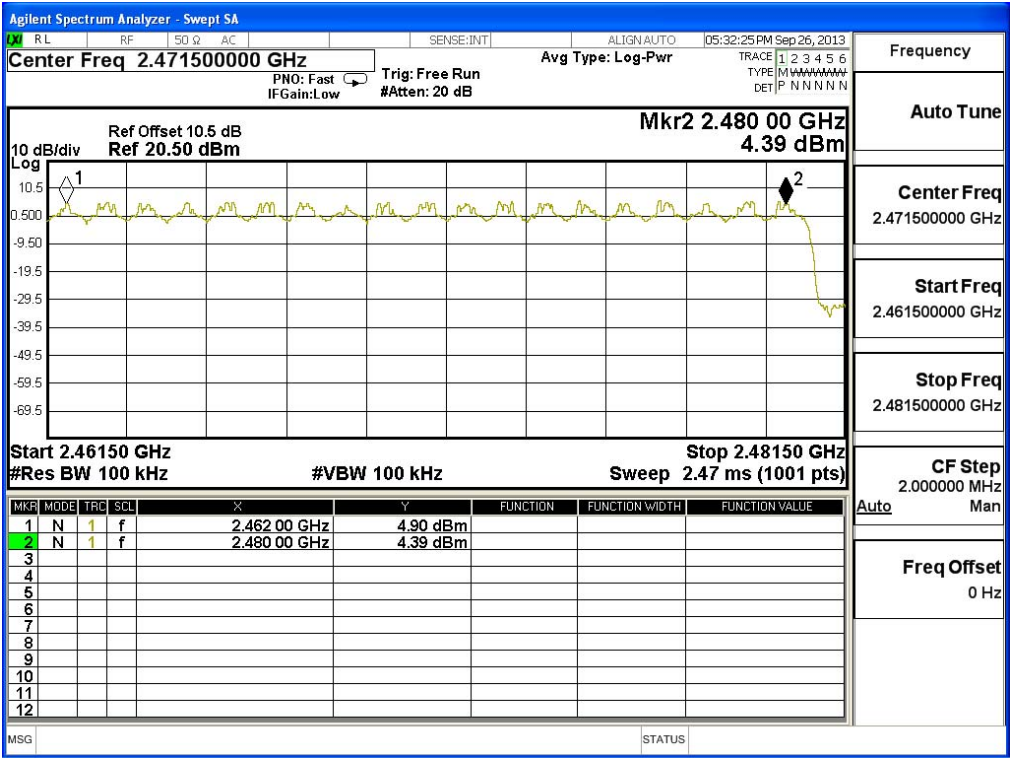
2422 - 2441 MHz



2442 - 2461 MHz



2462 - 2480 MHz



| | | |
|-----------|---|--------------------------------------|
| Product | : | 3G WCDMA+GSM Smart 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

