
FCC Test Report

Report No.: AGC00069150807FE03

FCC ID : 2AE56K1
APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : Smart Phone
BRAND NAME : KENXINDA
MODEL NAME : K1
CLIENT : KENXINDA TECHNOLOGY CO., LIMITED
DATE OF ISSUE : Sept.01, 2015
STANDARD(S) : FCC Part 15 Rules
TEST PROCEDURE(S) : DA 00-705
REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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Report Revise Record

| Report Version | Revise Time | Issued Date | Valid Version | Notes |
|----------------|-------------|---------------|---------------|-----------------|
| V1.0 | / | Sept.01, 2015 | Valid | Original Report |

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1. VERIFICATION OF CONFORMITY

| | |
|---------------------------------|---|
| Applicant | KENXINDA TECHNOLOGY CO., LIMITED |
| Address | UNIT B 13/F PRAT COMMERCIAL BUILDING 17-19 PRAT AVENUE TSIMSHATSUI KL HONGKONG |
| Manufacturer | SHENZHEN KENXINDA TECHNOLOGY CO., LTD. (BAO'AN BRANCH) |
| Address | 1-6 Floor, No.105 Work Shop & 1-5 Floor, No.104 Work Shop, Xinweihuaning Road, Dalang Community, Dalang Street, Bao'an District, Shenzhen, P.R.C |
| Product Designation | Smart Phone |
| Brand Name | KENXINDA |
| Test Model | K1 |
| Date of test | Aug.27, 2015 to Aug.29, 2015 |
| Deviation | None |
| Condition of Test Sample | Normal |
| Report Template | AGCRT-US-BR/RF |

We hereby certify that:

The above equipment was tested by Dongguan Precise Testing Service Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.247.

Tested By

Matt Zhang

Matt Zhang(Zhang Liang)

Sept.01, 2015

Reviewed By

Bart Xie

Bart Xie(Xie Xiaobin)

Sept.01, 2015

Approved By

Solger Zhang

Solger Zhang(Zhang Hongyi)
Authorized Officer

Sept.01, 2015

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is “Smart Phone” designed as a “Communication Device”. It is designed by way of utilizing the FHSS technology to achieve the system operation.

A major technical description of EUT is described as following

| | |
|----------------------------|--|
| Operation Frequency | 2.402 GHz to 2.480GHz |
| RF Output Power | 4.89dBm(Max) |
| Bluetooth Version | V 4.0 |
| Modulation | GFSK, $\pi/4$ -DQPSK, 8DPSK |
| Number of channels | 79 |
| Hardware Version | M180_V6.0 |
| Software Version | kk.mt6572.phone.name.model.nand_180_4_0.p1 |
| Antenna Designation | Integrated Antenna |
| Antenna Gain | 0.8dBi |
| Power Supply | DC3.7V by Battery |

2.2. TABLE OF CARRIER FREQUENCIES

| Frequency Band | Channel Number | Frequency |
|----------------|----------------|-----------|
| 2400~2483.5MHZ | 0 | 2402MHZ |
| | 1 | 2403MHZ |
| | : | : |
| | 38 | 2440 MHZ |
| | 39 | 2441 MHZ |
| | 40 | 2442 MHZ |
| | : | : |
| | 77 | 2479 MHZ |
| | 78 | 2480 MHZ |

2.3. RECEIVER INPUT BANDWIDTH

The input bandwidth of the receiver is 1.3MHz. In every connection one Bluetooth device is the master and the other one is slave. The master determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally the type of connection (e.g. single or multislotted packet) is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings.

Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be sent on the same frequency, it is sent on the next frequency of the hopping sequence.

2.4. EXAMPLE OF A HOPPING SEQUENCE IN DATA MODE

Example of a 79 hopping sequence in data mode:

40,21,44,23,42,53,46,55,48,33,52,35,50,65,54,67
56,37,60,39,58,69,62,71,64,25,68,27,66,57,70,59
72,29,76,31,74,61,78,63,01,41,05,43,03,73,07,75
09,45,13,47,11,77,15,00,64,49,66,53,68,02,70,06
01, 51, 03, 55, 05, 04

2.5. EQUALLY AVERAGE USE OF FREQUENCIES AND BEHAVIOUR

The generation of the hopping sequence in connection mode depends essentially on two input values:

1. LAP/UAP of the master of the connection.
2. Internal master clock

The LAP (lower address part) are the 24 LSB's of the 48 BD_ADDRESS. The BD_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP (upper address part) are the 24 MSB's of the 48 BD_ADDRESS.

The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For synchronization with other units only offsets are used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5 µs. The clock has a cycle of about one day (23h30). In most cases it is implemented as a 28-bit counter. For the deriving of the hopping sequence the entire LAP (24 bits), 4 LSB's (4 bits) (Input 1) and the 27 MSB's of the clock (Input 2) are used. With these input values different mathematical procedures (permutations, additions, XOR-operations) are performed to generate the sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions the Bluetooth system has the following behavior:

The first connection between the two devices is established, a hopping sequence was generated. For transmitting the wanted data the complete hopping sequence was not used. The connection ended.

The second connection will be established. A new hopping sequence is generated. Due to the fact the Bluetooth clock has a different value, because the period between the two transmissions is longer (and it cannot be shorter) than the minimum resolution of the clock (312.5 µs). The hopping sequence will always differ from the first one.

2.6. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AE56K1** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

2.7. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in FCC DA 00-705. Radiated testing was performed at an antenna to EUT distance 3 meters.

2.8. SPECIAL ACCESSORIES

Refer to section 5.2.

2.9. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

3. MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 2.75dB

Radiated measurement: +/- 3.2dB

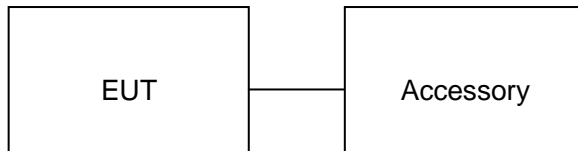
4. DESCRIPTION OF TEST MODES

| NO. | TEST MODE DESCRIPTION |
|---|-------------------------------|
| 1 | Low channel GFSK |
| 2 | Middle channel GFSK |
| 3 | High channel GFSK |
| 4 | Low channel $\pi/4$ -DQPSK |
| 5 | Middle channel $\pi/4$ -DQPSK |
| 6 | High channel $\pi/4$ -DQPSK |
| 7 | Low channel 8DPSK |
| 8 | Middle channel 8DPSK |
| 9 | High channel 8DPSK |
| 10 | Normal Hopping |
| <p>Note:</p> <ol style="list-style-type: none">1. All the test modes can be supply by Built-in Li-ion battery, only the result of the worst case was recorded in the report, if no other cases.2. For Radiated Emission, 3axis were chosen for testing for each applicable mode. | |

5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configuration:



5.2. EQUIPMENT USED IN EUT SYSTEM

| Item | Equipment | Model No. | ID or Specification | Note |
|------|-------------|-----------|---------------------|-----------|
| 1 | Smart Phone | K1 | FCC ID: 2AE56K1 | EUT |
| 2 | Adapter | K1 | DC5V /1000mA | Accessory |
| 3 | Battery | K1 | DC3.7V/ 1300 mAh | Accessory |
| 4 | Earphone | K1 | N/A | Accessory |
| 5 | USB Cable | K1 | N/A | Accessory |

5.3. SUMMARY OF TEST RESULTS

| FCC RULES | DESCRIPTION OF TEST | RESULT |
|-----------|-----------------------------|-----------|
| §15.247 | Peak Output Power | Compliant |
| §15.247 | 20 dB Bandwidth | Compliant |
| §15.247 | Spurious Emission | Compliant |
| §15.209 | Radiated Emission | Compliant |
| §15.247 | Band Edges | Compliant |
| §15.207 | Conduction Emission | Compliant |
| §15.247 | Number of Hopping Frequency | Compliant |
| §15.247 | Time of Occupancy | Compliant |
| §15.247 | Frequency Separation | Compliant |

6. TEST FACILITY

| | |
|-----------------------------|--|
| Site | Dongguan Precise Testing Service Co., Ltd. |
| Location | Building D,Baoding Technology Park,Guangming Road2,Dongcheng District, Dongguan, Guangdong, China, |
| FCC Registration No. | 371540 |
| Description | The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2009. |

ALL TEST EQUIPMENT LIST

FOR RADIATED EMISSION TEST (BELOW 1GHZ)

| Radiated Emission Test Site | | | | | |
|-------------------------------------|-----------------|--------------|---------------|------------------|-----------------|
| Name of Equipment | Manufacturer | Model Number | Serial Number | Last Calibration | Due Calibration |
| EMI Test Receiver | Rohde & Schwarz | ESCI | 101417 | July 4, 2015 | July 3, 2016 |
| Trilog Broadband Antenna (25M-1GHz) | SCHWARZBECK | VULB9160 | 9160-3355 | July 4, 2015 | July 3, 2016 |
| Signal Amplifier | SCHWARZBECK | BBV 9475 | 9745-0013 | July 4, 2015 | July 3, 2016 |
| RF Cable | SCHWARZBECK | AK9515E | 96221 | July 4, 2015 | July 3, 2016 |
| 3m Anechoic Chamber | CHENGYU | 966 | PTS-001 | June 6, 2015 | June 5, 2016 |
| MULTI-DEVICE Positioning Controller | Max-Full | MF-7802 | MF780208339 | N/A | N/A |
| Active loop antenna (9K-30MHz) | Schwarzbeck | FMZB1519 | 1519-038 | June 6, 2015 | June 5, 2016 |
| Spectrum analyzer | Agilent | E4407B | MY46185649 | June 6, 2015 | June 5, 2016 |
| Power Probe | R&S | NRP-Z23 | 100323 | July 25,2015 | July 24,2016 |
| RF attenuator | N/A | RFA20db | 68 | N/A | N/A |

FOR RADIATED EMISSION TEST (1GHZ ABOVE)

| Radiated Emission Test Site | | | | | |
|-------------------------------------|-----------------|--------------|---------------|------------------|-----------------|
| Name of Equipment | Manufacturer | Model Number | Serial Number | Last Calibration | Due Calibration |
| EMI Test Receiver | Rohde & Schwarz | ESCI | 101417 | July 4, 2015 | July 3, 2016 |
| Horn Antenna (1G-18GHz) | SCHWARZBECK | BBHA9120D | 9120D-1246 | July 11, 2015 | July 10, 2016 |
| Spectrum Analyzer | Agilent | E4411B | MY4511453 | July 4, 2015 | July 3, 2016 |
| Signal Amplifier | SCHWARZBECK | BBV 9718 | 9718-269 | July 7, 2015 | July 6, 2016 |
| RF Cable | SCHWARZBECK | AK9515H | 96220 | July 8, 2015 | July 7, 2016 |
| 3m Anechoic Chamber | CHENGYU | 966 | PTS-001 | June 6, 2015 | June 5, 2016 |
| MULTI-DEVICE Positioning Controller | Max-Full | MF-7802 | MF780208339 | N/A | N/A |
| Horn Ant (18G-40GHz) | Schwarzbeck | BBHA 9170 | 9170-181 | June 6, 2015 | June 5, 2016 |
| Power Probe | R&S | NRP-Z23 | 100323 | July 25,2015 | July 24,2016 |
| RF attenuator | N/A | RFA20db | 68 | N/A | N/A |

| Conducted Emission Test Site | | | | | |
|--------------------------------|-----------------|--------------|---------------|------------------|-----------------|
| Name of Equipment | Manufacturer | Model Number | Serial Number | Last Calibration | Due Calibration |
| EMI Test Receiver | Rohde & Schwarz | ESCI | 101417 | July 4, 2015 | July 3, 2016 |
| Artificial Mains Network | Narda | L2-16B | 000WX31025 | July 8, 2015 | July 7, 2016 |
| Artificial Mains Network (AUX) | Narda | L2-16B | 000WX31026 | July 8, 2015 | July 7, 2016 |
| RF Cable | SCHWARZBECK | AK9515E | 96222 | July 4, 2015 | July 3, 2016 |
| Shielded Room | CHENGYU | 843 | PTS-002 | June 6,2015 | June 5,2016 |

7. PEAK OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

For peak power test:

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, middle and the bottom operation frequency individually.
3. RBW > the 20 dB bandwidth of the emission being measured, VBW \geq RBW.
4. Record the maximum power from the Spectrum Analyzer.

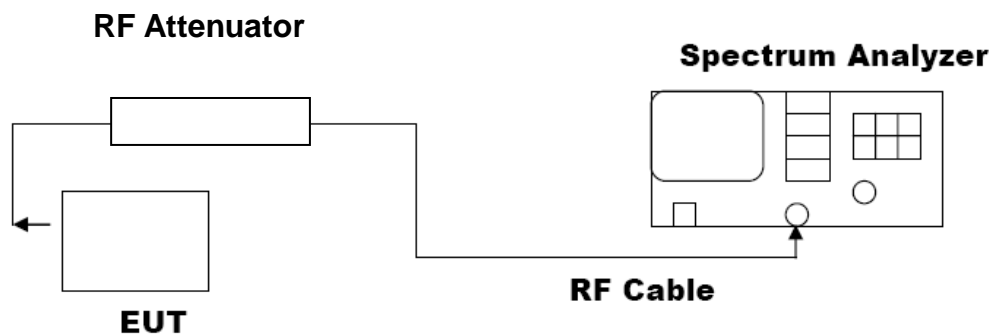
For average power test:

1. Connect EUT RF output port to power probe through an RF attenuator.
2. Connect the power probe to the PC.
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Record the maximum power from the software.
5. The maximum peak power shall be less 125mW (21dBm).

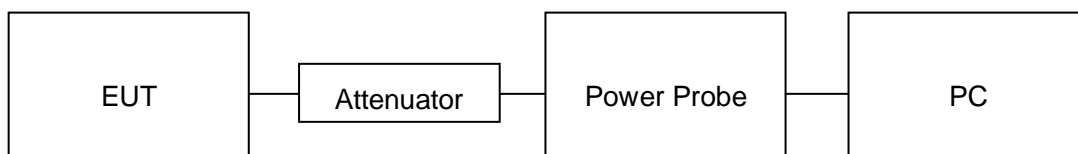
Note : The EUT was tested according to DA000705 for compliance to FCC 47CFR 15.247 requirements.

7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

PEAK POWER TEST SETUP



AVERAGE POWER SETUP



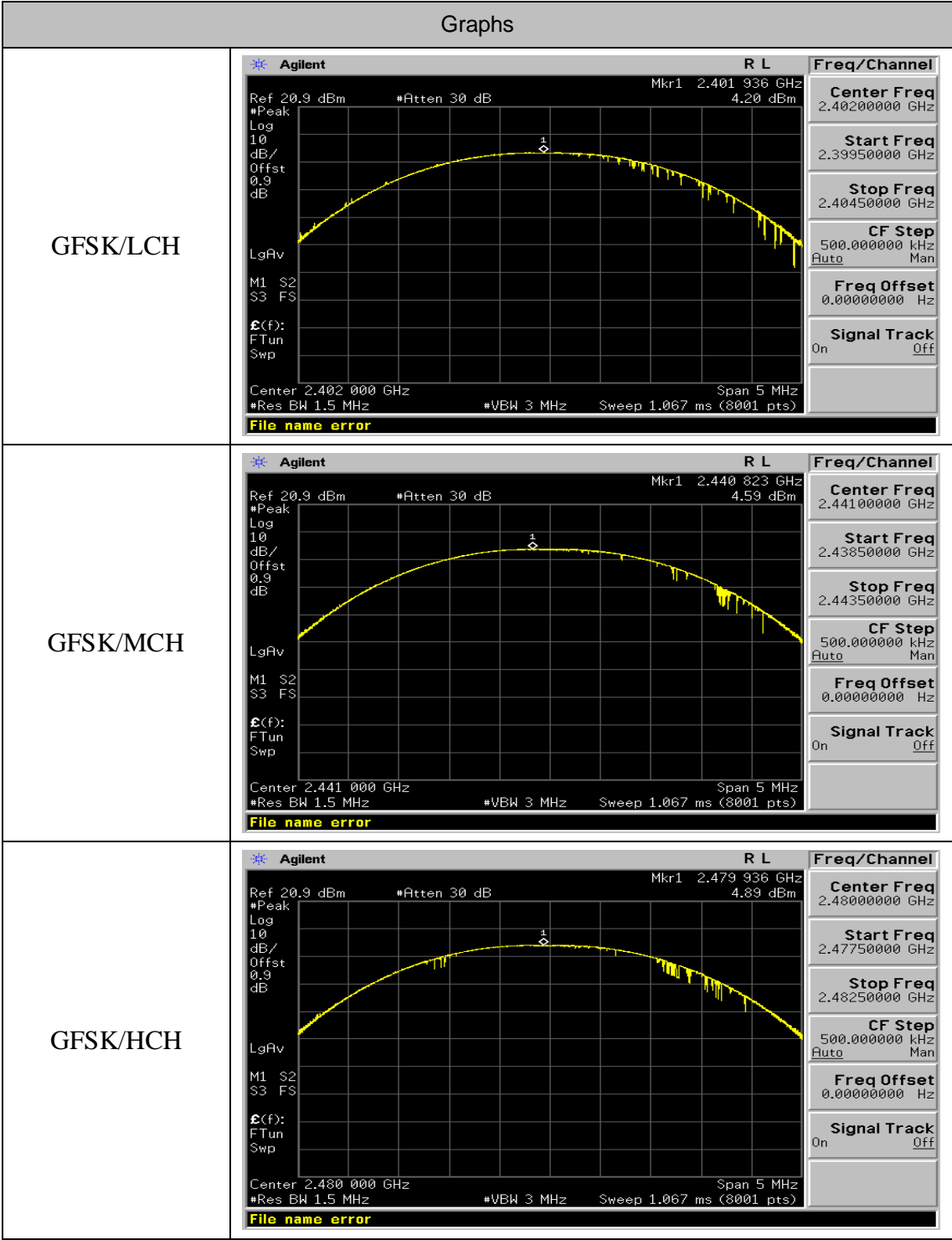
7.3. LIMITS AND MEASUREMENT RESULT

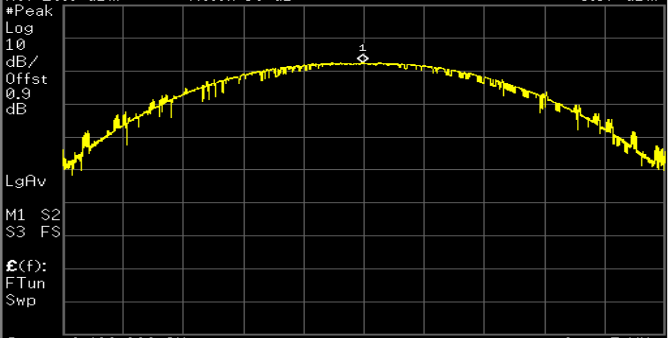
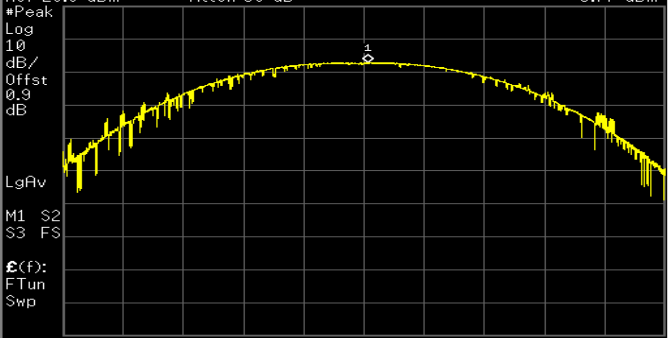
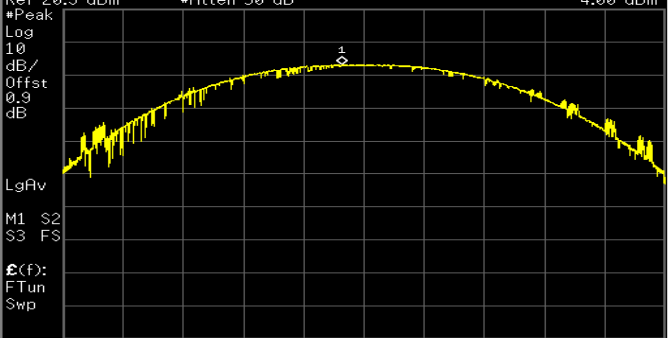
| PEAK OUTPUT POWER MEASUREMENT RESULT FOR GFSK MODULATION | | | | |
|---|------------------------|---------------------|----------------------------|--------------|
| Frequency (GHz) | Average Power (dBm) | Peak Power (dBm) | Applicable Limits (dBm) | Pass or Fail |
| 2.402 | 2.19 | 4.2 | 21 | Pass |
| 2.441 | 2.58 | 4.59 | 21 | Pass |
| 2.480 | 2.88 | 4.89 | 21 | Pass |

| PEAK OUTPUT POWER MEASUREMENT RESULT FOR II /4-DQPSK MODULATION | | | | |
|--|------------------------|---------------------|----------------------------|--------------|
| Frequency (GHz) | Average Power (dBm) | Peak Power (dBm) | Applicable Limits (dBm) | Pass or Fail |
| 2.402 | 1.36 | 3.37 | 21 | Pass |
| 2.441 | 1.76 | 3.77 | 21 | Pass |
| 2.480 | 1.99 | 4 | 21 | Pass |

| PEAK OUTPUT POWER MEASUREMENT RESULT FOR 8-DPSK MODULATION | | | | |
|---|------------------------|---------------------|----------------------------|--------------|
| Frequency (GHz) | Average Power (dBm) | Peak Power (dBm) | Applicable Limits (dBm) | Pass or Fail |
| 2.402 | 2.49 | 4.5 | 21 | Pass |
| 2.441 | 1.78 | 3.79 | 21 | Pass |
| 2.480 | 2.06 | 4.07 | 21 | Pass |

Test Graph



| | |
|-------------------|---|
| π /4DQPSK/LCH | <div><div><div>Agilent</div><div>R L</div><div>Ref 20.9 dBm #Atten 30 dB Mkr1 2.401 988 GHz 3.37 dBm</div><div><div>#Peak</div><div>Log</div><div>10</div><div>dB/</div><div>Offst</div><div>0.9</div><div>dB</div></div><div></div><div>M1 S2 S3 FS</div><div>$\mathcal{E}(f)$: FTun Swp</div><div>Center 2.402 000 GHz Span 5 MHz #Res BW 1.5 MHz #VBW 3 MHz Sweep 1.067 ms (8001 pts)</div><div>File name error</div></div><div><div>Freq/Channel</div><div>Center Freq 2.40200000 GHz</div><div>Start Freq 2.39950000 GHz</div><div>Stop Freq 2.40450000 GHz</div><div>CF Step 500.000000 kHz Auto Man</div><div>Freq Offset 0.00000000 Hz</div><div>Signal Track On Off</div></div></div> |
| π /4DQPSK/MCH | <div><div><div>Agilent</div><div>R L</div><div>Ref 20.9 dBm #Atten 30 dB Mkr1 2.441 033 GHz 3.77 dBm</div><div><div>#Peak</div><div>Log</div><div>10</div><div>dB/</div><div>Offst</div><div>0.9</div><div>dB</div></div><div></div><div>M1 S2 S3 FS</div><div>$\mathcal{E}(f)$: FTun Swp</div><div>Center 2.441 000 GHz Span 5 MHz #Res BW 1.5 MHz #VBW 3 MHz Sweep 1.067 ms (8001 pts)</div><div>File name error</div></div><div><div>Freq/Channel</div><div>Center Freq 2.44100000 GHz</div><div>Start Freq 2.43850000 GHz</div><div>Stop Freq 2.44350000 GHz</div><div>CF Step 500.000000 kHz Auto Man</div><div>Freq Offset 0.00000000 Hz</div><div>Signal Track On Off</div></div></div> |
| π /4DQPSK/HCH | <div><div><div>Agilent</div><div>R L</div><div>Ref 20.9 dBm #Atten 30 dB Mkr1 2.479 821 GHz 4.00 dBm</div><div><div>#Peak</div><div>Log</div><div>10</div><div>dB/</div><div>Offst</div><div>0.9</div><div>dB</div></div><div></div><div>M1 S2 S3 FS</div><div>$\mathcal{E}(f)$: FTun Swp</div><div>Center 2.480 000 GHz Span 5 MHz #Res BW 1.5 MHz #VBW 3 MHz Sweep 1.067 ms (8001 pts)</div><div>File name error</div></div><div><div>Freq/Channel</div><div>Center Freq 2.48000000 GHz</div><div>Start Freq 2.47750000 GHz</div><div>Stop Freq 2.48250000 GHz</div><div>CF Step 500.000000 kHz Auto Man</div><div>Freq Offset 0.00000000 Hz</div><div>Signal Track On Off</div></div></div> |

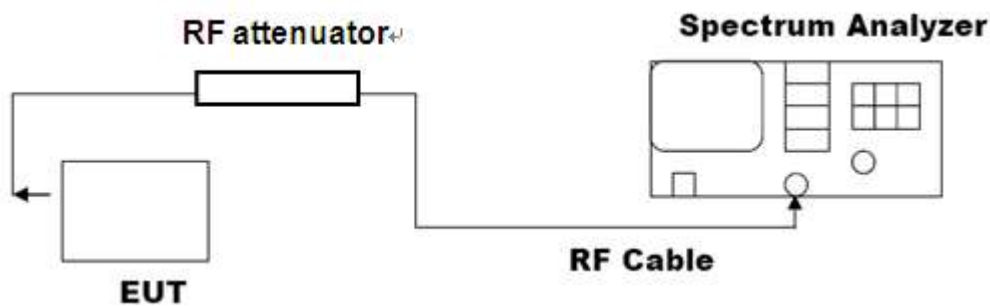
| | |
|-----------|---|
| 8DPSK/LCH | <div><div><div>Agilent</div><div>R L</div><div>Mkr1 2.402 128 GHz</div><div>4.50 dBm</div></div><div><div>Ref 20.9 dBm</div><div>*Atten 30 dB</div></div><div><div>*Peak</div><div>Log</div><div>10</div><div>dB/</div><div>Offst</div><div>0.9</div><div>dB</div></div><div><div>LgAv</div><div>M1 S2</div><div>S3 FS</div><div>Ⓔ(f):</div><div>FTun</div><div>Swp</div></div><div><div>Center 2.402 000 GHz</div><div>*Res BW 1.5 MHz</div><div>#VBW 3 MHz</div><div>Sweep 1.067 ms (8001 pts)</div><div>Span 5 MHz</div></div><div><div>File name error</div></div></div> <div><div>Freq/Channel</div><div>Center Freq</div><div>2.40200000 GHz</div><div>Start Freq</div><div>2.39950000 GHz</div><div>Stop Freq</div><div>2.40450000 GHz</div><div>CF Step</div><div>500.000000 kHz</div><div>Auto Man</div><div>Freq Offset</div><div>0.00000000 Hz</div><div>Signal Track</div><div>On Off</div></div> |
| 8DPSK/MCH | <div><div><div>Agilent</div><div>R L</div><div>Mkr1 2.441 125 GHz</div><div>3.79 dBm</div></div><div><div>Ref 20.9 dBm</div><div>*Atten 30 dB</div></div><div><div>*Peak</div><div>Log</div><div>10</div><div>dB/</div><div>Offst</div><div>0.9</div><div>dB</div></div><div><div>LgAv</div><div>M1 S2</div><div>S3 FS</div><div>Ⓔ(f):</div><div>FTun</div><div>Swp</div></div><div><div>Center 2.441 000 GHz</div><div>*Res BW 1.5 MHz</div><div>#VBW 3 MHz</div><div>Sweep 1.067 ms (8001 pts)</div><div>Span 5 MHz</div></div><div><div>File name error</div></div></div> <div><div>Freq/Channel</div><div>Center Freq</div><div>2.44100000 GHz</div><div>Start Freq</div><div>2.43850000 GHz</div><div>Stop Freq</div><div>2.44350000 GHz</div><div>CF Step</div><div>500.000000 kHz</div><div>Auto Man</div><div>Freq Offset</div><div>0.00000000 Hz</div><div>Signal Track</div><div>On Off</div></div> |
| 8DPSK/HCH | <div><div><div>Agilent</div><div>R L</div><div>Mkr1 2.479 815 GHz</div><div>4.07 dBm</div></div><div><div>Ref 20.9 dBm</div><div>*Atten 30 dB</div></div><div><div>*Peak</div><div>Log</div><div>10</div><div>dB/</div><div>Offst</div><div>0.9</div><div>dB</div></div><div><div>LgAv</div><div>M1 S2</div><div>S3 FS</div><div>Ⓔ(f):</div><div>FTun</div><div>Swp</div></div><div><div>Center 2.480 000 GHz</div><div>*Res BW 1.5 MHz</div><div>#VBW 3 MHz</div><div>Sweep 1.067 ms (8001 pts)</div><div>Span 5 MHz</div></div><div><div>File name error</div></div></div> <div><div>Freq/Channel</div><div>Center Freq</div><div>2.48000000 GHz</div><div>Start Freq</div><div>2.47750000 GHz</div><div>Stop Freq</div><div>2.48250000 GHz</div><div>CF Step</div><div>500.000000 kHz</div><div>Auto Man</div><div>Freq Offset</div><div>0.00000000 Hz</div><div>Signal Track</div><div>On Off</div></div> |

8. 20DB BANDWIDTH

8.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
RBW \geq 1% of the 20 dB bandwidth, VBW \geq RBW; Sweep = auto; Detector function = peak
4. Set SPA Trace 1 Max hold, then View.

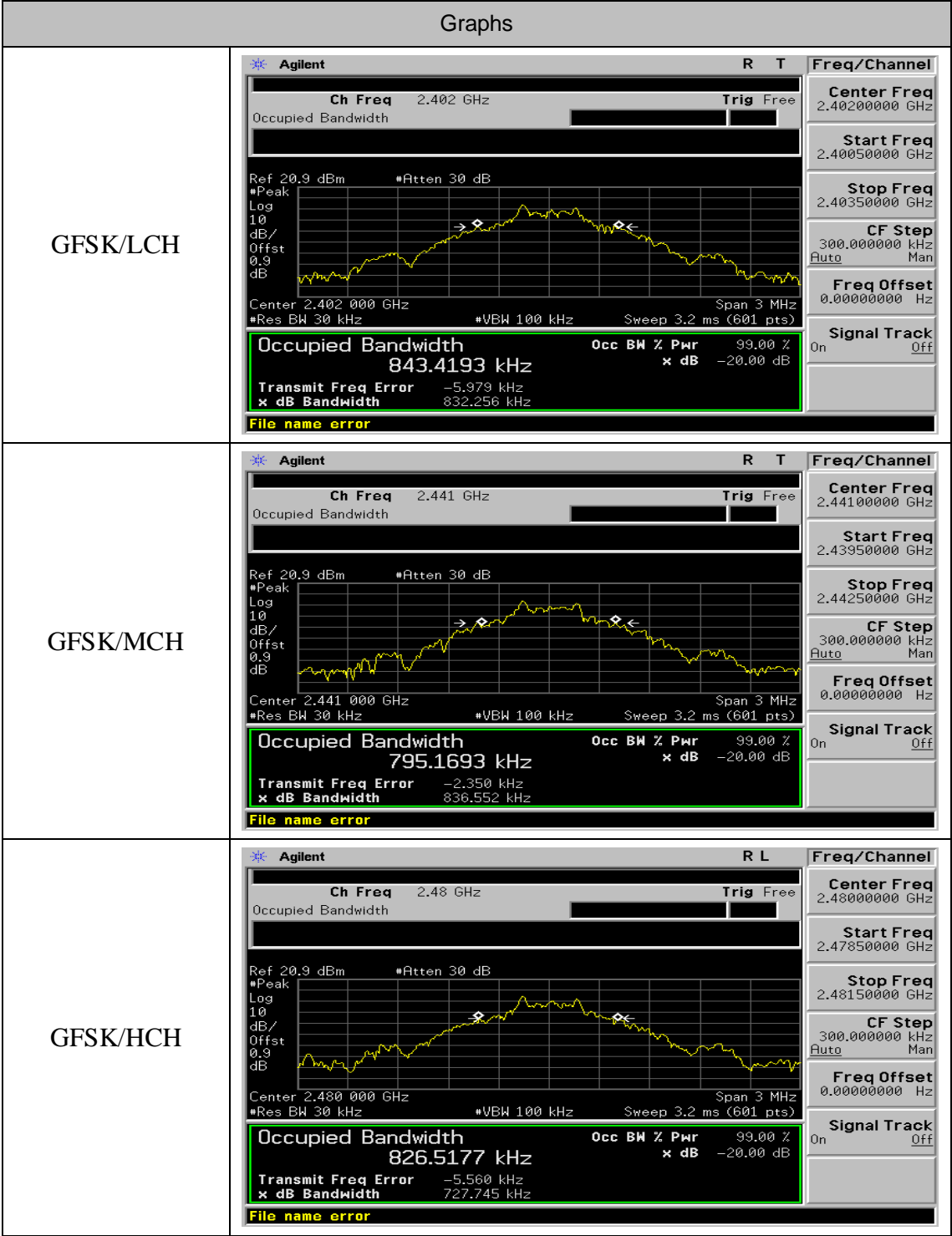
8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

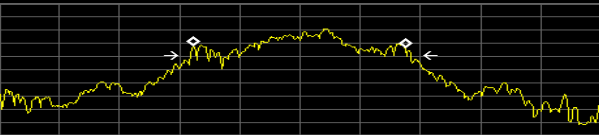
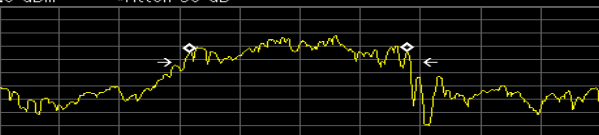
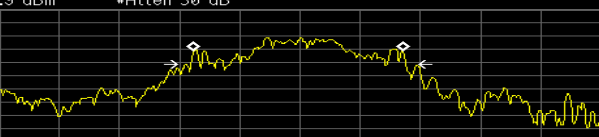


8.3. LIMITS AND MEASUREMENT RESULTS

| Mode | Channel. | EBW [MHz] | OBW [MHz] | Verdict |
|---------------|----------|-----------|-----------|---------|
| GFSK | LCH | 0.8323 | 0.8434 | PASS |
| GFSK | MCH | 0.8366 | 0.7952 | PASS |
| GFSK | HCH | 0.7277 | 0.8265 | PASS |
| $\pi/4$ DQPSK | LCH | 1.0981 | 1.0537 | PASS |
| $\pi/4$ DQPSK | MCH | 1.1228 | 1.0848 | PASS |
| $\pi/4$ DQPSK | HCH | 1.0705 | 1.0401 | PASS |
| 8DPSK | LCH | 1.1217 | 1.0579 | PASS |
| 8DPSK | MCH | 1.0587 | 1.0007 | PASS |
| 8DPSK | HCH | 1.1289 | 1.0489 | PASS |

Test Graph



| | |
|-------------------|--|
| π /4DQPSK/LCH | <div><div><div>Agilent</div><div>R T</div><div>Ch Freq 2.402 GHz</div><div>Trig Free</div><div>Occupied Bandwidth</div></div><div><div>Ref 20.9 dBm</div><div>*Atten 30 dB</div><div>*Peak Log 10 dB/Offst 0.9 dB</div><div></div><div>Center 2.402 000 GHz</div><div>*Res BW 30 kHz</div><div>*VBW 100 kHz</div><div>Sweep 3.2 ms (601 pts)</div></div><div><div>Occupied Bandwidth</div><div>1.0537 MHz</div><div>Occ BW % Pwr 99.00 %</div><div>x dB -20.00 dB</div><div>Transmit Freq Error -4.224 kHz</div><div>x dB Bandwidth 1.098 MHz</div></div><div>File name error</div></div> <div><div>Freq/Channel</div><div>Center Freq 2.40200000 GHz</div><div>Start Freq 2.40050000 GHz</div><div>Stop Freq 2.40350000 GHz</div><div>CF Step 300.000000 kHz</div><div>Auto Man</div><div>Freq Offset 0.00000000 Hz</div><div>Signal Track On Off</div></div> |
| π /4DQPSK/MCH | <div><div><div>Agilent</div><div>R L</div><div>Ch Freq 2.441 GHz</div><div>Trig Free</div><div>Occupied Bandwidth</div></div><div><div>Ref 20.9 dBm</div><div>*Atten 30 dB</div><div>*Peak Log 10 dB/Offst 0.9 dB</div><div></div><div>Center 2.441 000 GHz</div><div>*Res BW 30 kHz</div><div>*VBW 100 kHz</div><div>Sweep 3.2 ms (601 pts)</div></div><div><div>Occupied Bandwidth</div><div>1.0848 MHz</div><div>Occ BW % Pwr 99.00 %</div><div>x dB -20.00 dB</div><div>Transmit Freq Error -12.164 kHz</div><div>x dB Bandwidth 1.123 MHz</div></div><div>File name error</div></div> <div><div>Freq/Channel</div><div>Center Freq 2.44100000 GHz</div><div>Start Freq 2.43950000 GHz</div><div>Stop Freq 2.44250000 GHz</div><div>CF Step 300.000000 kHz</div><div>Auto Man</div><div>Freq Offset 0.00000000 Hz</div><div>Signal Track On Off</div></div> |
| π /4DQPSK/HCH | <div><div><div>Agilent</div><div>R L</div><div>Ch Freq 2.48 GHz</div><div>Trig Free</div><div>Occupied Bandwidth</div></div><div><div>Ref 20.9 dBm</div><div>*Atten 30 dB</div><div>*Peak Log 10 dB/Offst 0.9 dB</div><div></div><div>Center 2.480 000 GHz</div><div>*Res BW 30 kHz</div><div>*VBW 100 kHz</div><div>Sweep 3.2 ms (601 pts)</div></div><div><div>Occupied Bandwidth</div><div>1.0401 MHz</div><div>Occ BW % Pwr 99.00 %</div><div>x dB -20.00 dB</div><div>Transmit Freq Error -9.911 kHz</div><div>x dB Bandwidth 1.070 MHz</div></div><div>File name error</div></div> <div><div>Freq/Channel</div><div>Center Freq 2.48000000 GHz</div><div>Start Freq 2.47850000 GHz</div><div>Stop Freq 2.48150000 GHz</div><div>CF Step 300.000000 kHz</div><div>Auto Man</div><div>Freq Offset 0.00000000 Hz</div><div>Signal Track On Off</div></div> |

| | |
|-----------|---|
| 8DPSK/LCH | <div><div><div>Agilent</div><div>R L</div><div>Ch Freq 2.402 GHz</div><div>Trig Free</div><div>Occupied Bandwidth</div><div>Ref 20.9 dBm</div><div>*Atten 30 dB</div><div>*Peak</div><div>Log</div><div>10</div><div>dB/</div><div>Offst</div><div>0.9</div><div>dB</div><div>Center 2.402 000 GHz</div><div>*Res BW 30 kHz</div><div>*VBW 100 kHz</div><div>Sweep 3.2 ms (601 pts)</div><div>Span 3 MHz</div><div>Occupied Bandwidth 1.0579 MHz</div><div>Occ BW % Pwr 99.00 %</div><div>x dB -20.00 dB</div><div>Transmit Freq Error -358.085 Hz</div><div>x dB Bandwidth 1.122 MHz</div><div>File name error</div></div><div><div>Freq/Channel</div><div>Center Freq 2.40200000 GHz</div><div>Start Freq 2.40050000 GHz</div><div>Stop Freq 2.40350000 GHz</div><div>CF Step 300.000000 kHz</div><div>Auto Man</div><div>Freq Offset 0.00000000 Hz</div><div>Signal Track On Off</div></div></div> |
| 8DPSK/MCH | <div><div><div>Agilent</div><div>R L</div><div>Ch Freq 2.441 GHz</div><div>Trig Free</div><div>Occupied Bandwidth</div><div>Ref 20.9 dBm</div><div>*Atten 30 dB</div><div>*Peak</div><div>Log</div><div>10</div><div>dB/</div><div>Offst</div><div>0.9</div><div>dB</div><div>Center 2.441 000 GHz</div><div>*Res BW 30 kHz</div><div>*VBW 100 kHz</div><div>Sweep 3.2 ms (601 pts)</div><div>Span 3 MHz</div><div>Occupied Bandwidth 1.0007 MHz</div><div>Occ BW % Pwr 99.00 %</div><div>x dB -20.00 dB</div><div>Transmit Freq Error -50.381 kHz</div><div>x dB Bandwidth 1.059 MHz</div><div>File name error</div></div><div><div>Freq/Channel</div><div>Center Freq 2.44100000 GHz</div><div>Start Freq 2.43950000 GHz</div><div>Stop Freq 2.44250000 GHz</div><div>CF Step 300.000000 kHz</div><div>Auto Man</div><div>Freq Offset 0.00000000 Hz</div><div>Signal Track On Off</div></div></div> |
| 8DPSK/HCH | <div><div><div>Agilent</div><div>R L</div><div>Ch Freq 2.48 GHz</div><div>Trig Free</div><div>Occupied Bandwidth</div><div>Ref 20.9 dBm</div><div>*Atten 30 dB</div><div>*Peak</div><div>Log</div><div>10</div><div>dB/</div><div>Offst</div><div>0.9</div><div>dB</div><div>Center 2.480 000 GHz</div><div>*Res BW 30 kHz</div><div>*VBW 100 kHz</div><div>Sweep 3.2 ms (601 pts)</div><div>Span 3 MHz</div><div>Occupied Bandwidth 1.0489 MHz</div><div>Occ BW % Pwr 99.00 %</div><div>x dB -20.00 dB</div><div>Transmit Freq Error -2.097 kHz</div><div>x dB Bandwidth 1.129 MHz</div><div>File name error</div></div><div><div>Freq/Channel</div><div>Center Freq 2.48000000 GHz</div><div>Start Freq 2.47850000 GHz</div><div>Stop Freq 2.48150000 GHz</div><div>CF Step 300.000000 kHz</div><div>Auto Man</div><div>Freq Offset 0.00000000 Hz</div><div>Signal Track On Off</div></div></div> |

9. CONDUCTED SPURIOUS EMISSION

9.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the Middle and the bottom operation frequency individually.
3. Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.
RBW = 100 kHz; VBW \geq RBW; Sweep = auto; Detector function = peak.
4. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to DA000705 for compliance to FCC 47CFR 15.247 requirements. Owing to satisfy the requirements of the number of measurement points, we set the RBW=1MHz, VBW > RBW, scan up through 10th harmonic, and consider the tested results as the worst case, if the tested results conform to the requirement, we can deem that the real tested results(set the RBW=100KHz, VBW > RBW) are conform to the requirement.

9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2

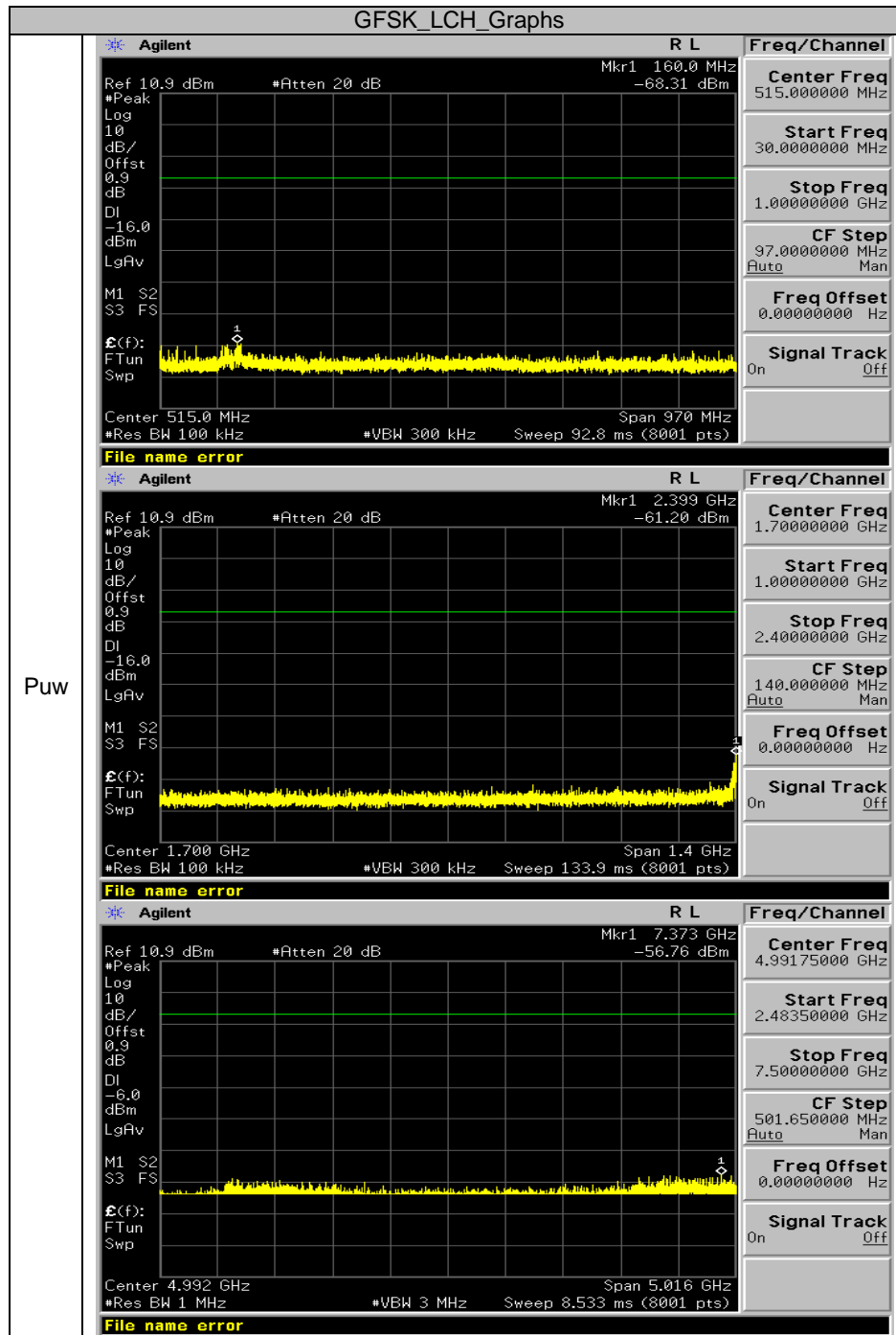
9.3. MEASUREMENT EQUIPMENT USED

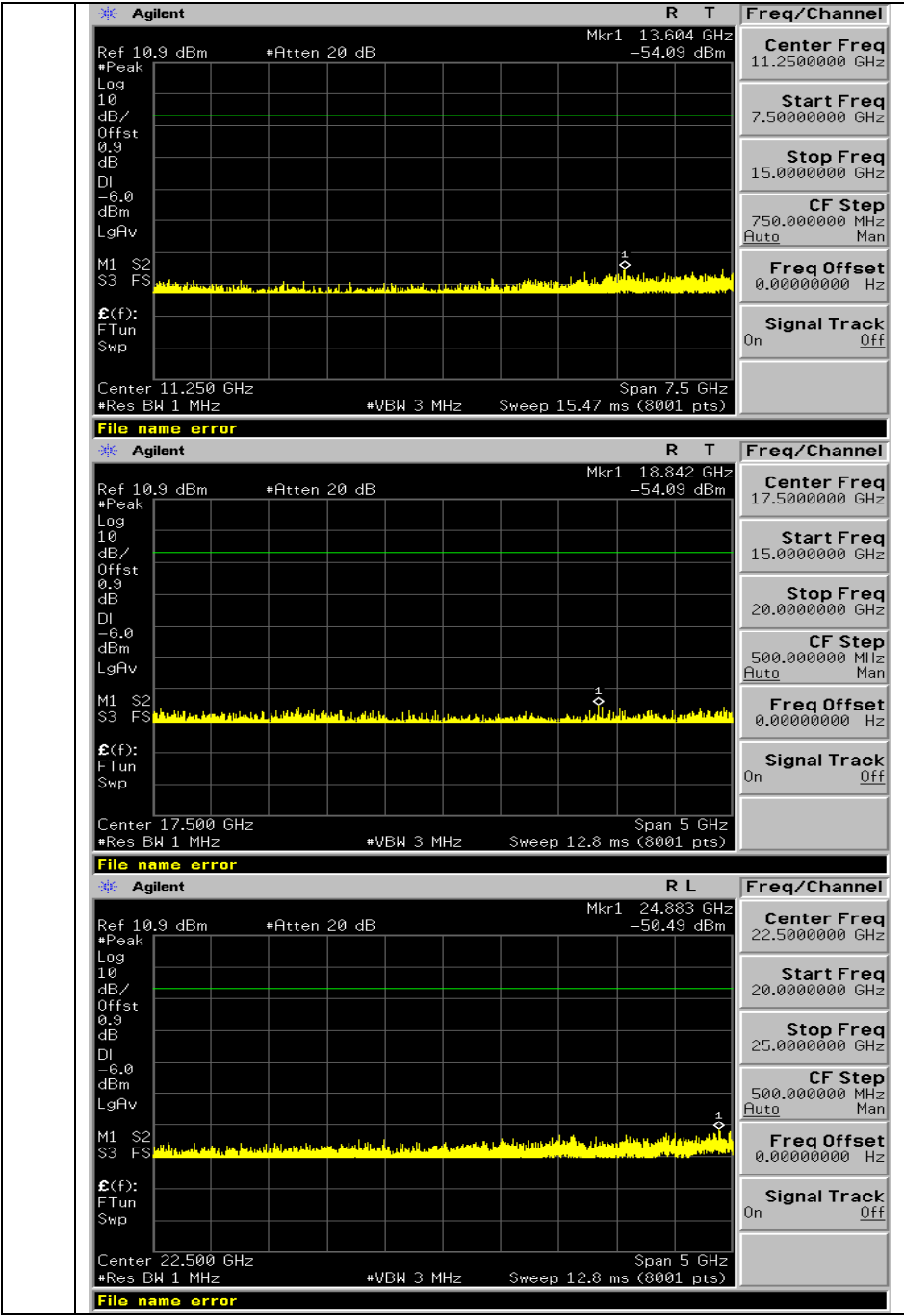
The same as described in section 6

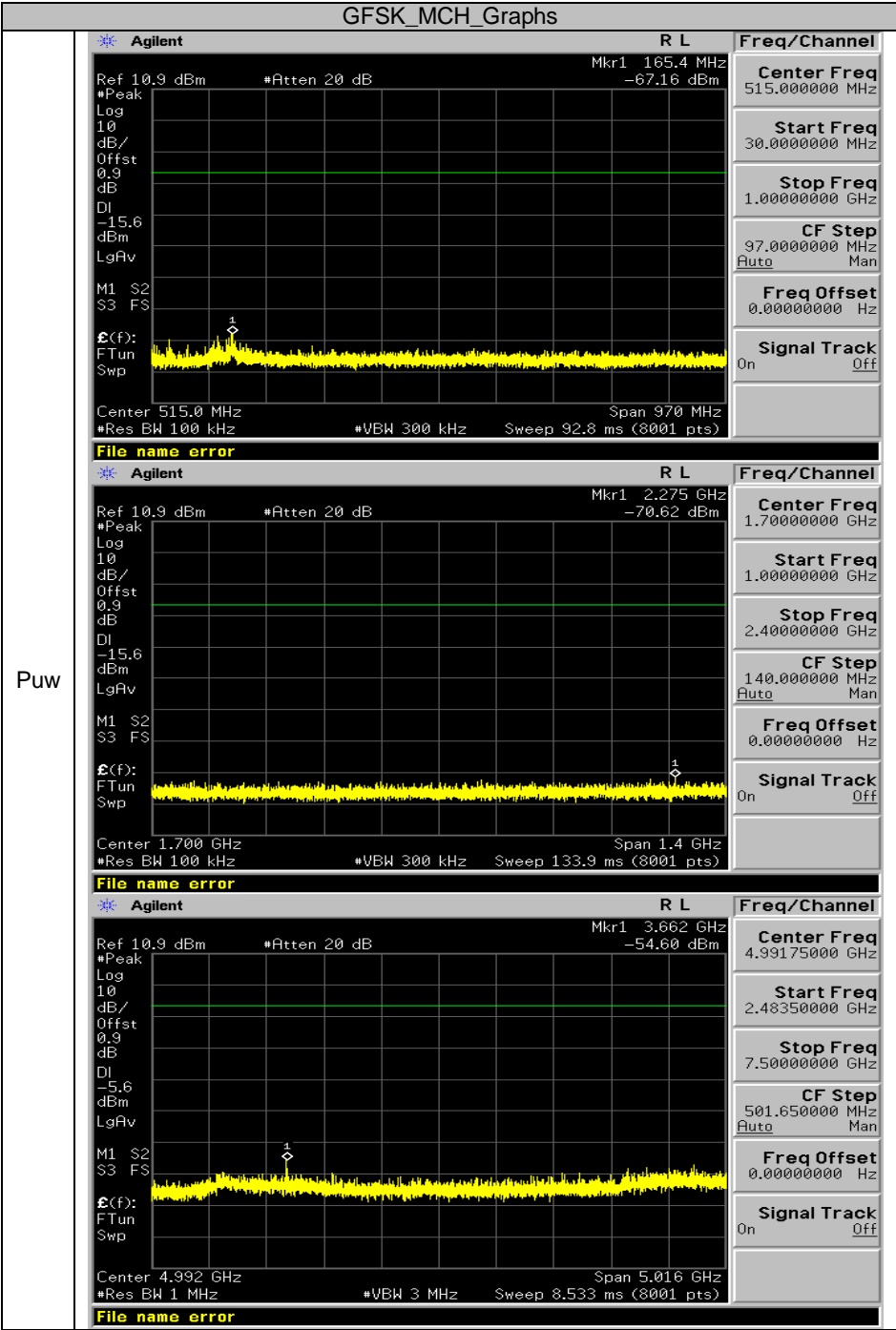
9.4. LIMITS AND MEASUREMENT RESULT

| LIMITS AND MEASUREMENT RESULT | | |
|---|--|----------|
| Applicable Limits | Measurement Result | |
| | Test Data | Criteria |
| In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power. In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in§15.209(a)) | At least -20dBc than the limit Specified on the BOTTOM Channel | PASS |
| | At least -20dBc than the limit Specified on the TOP Channel | PASS |

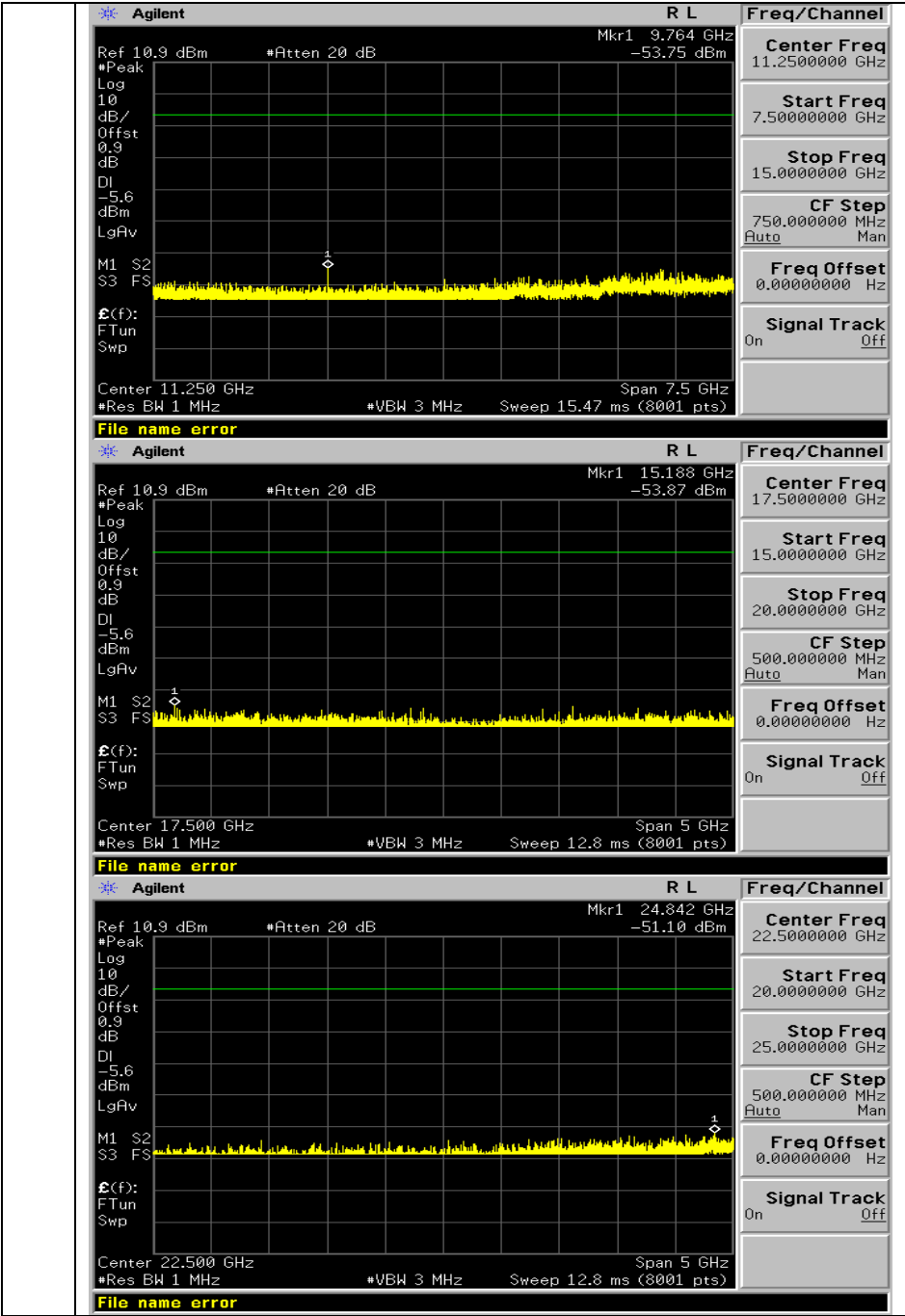
Test Graph

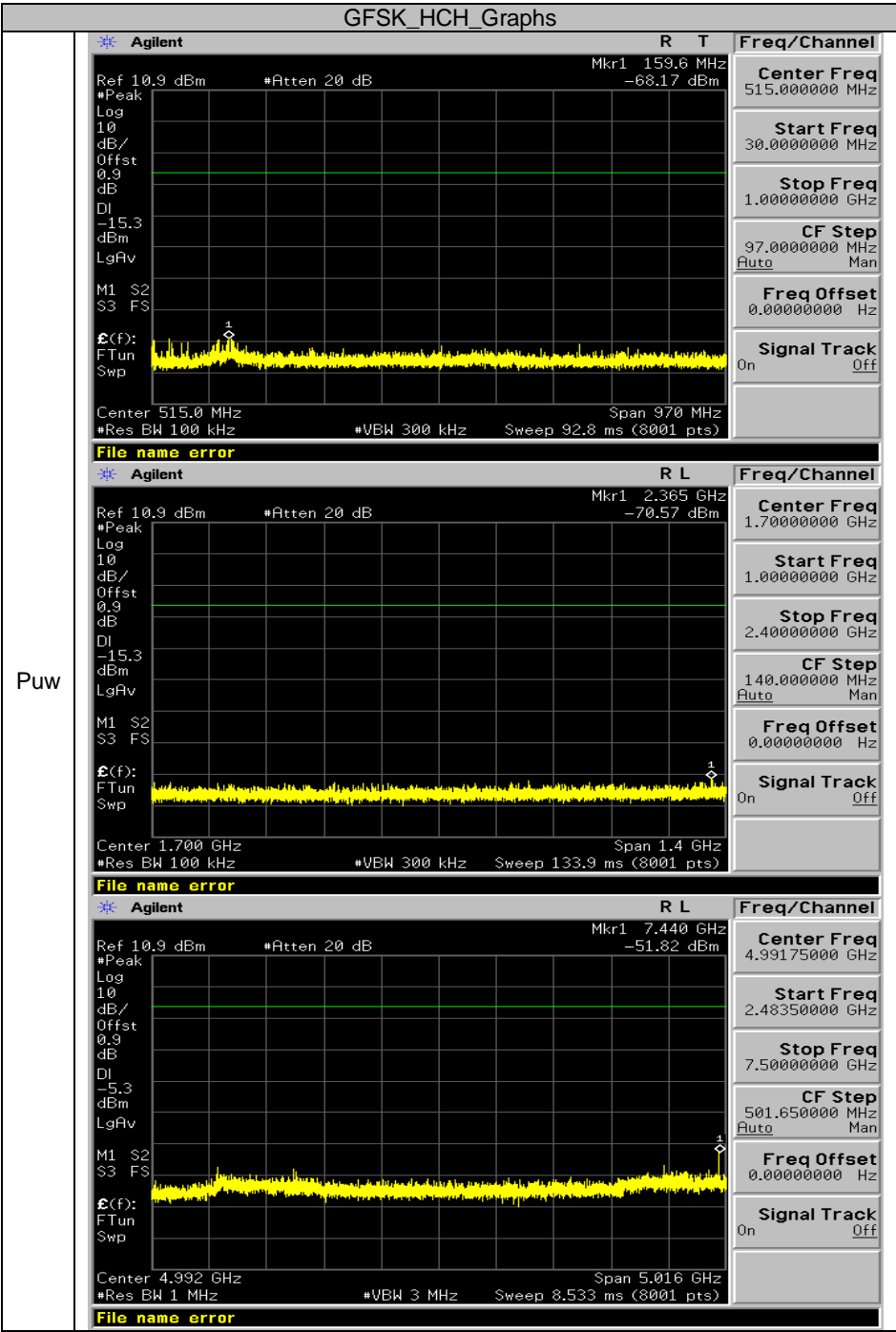




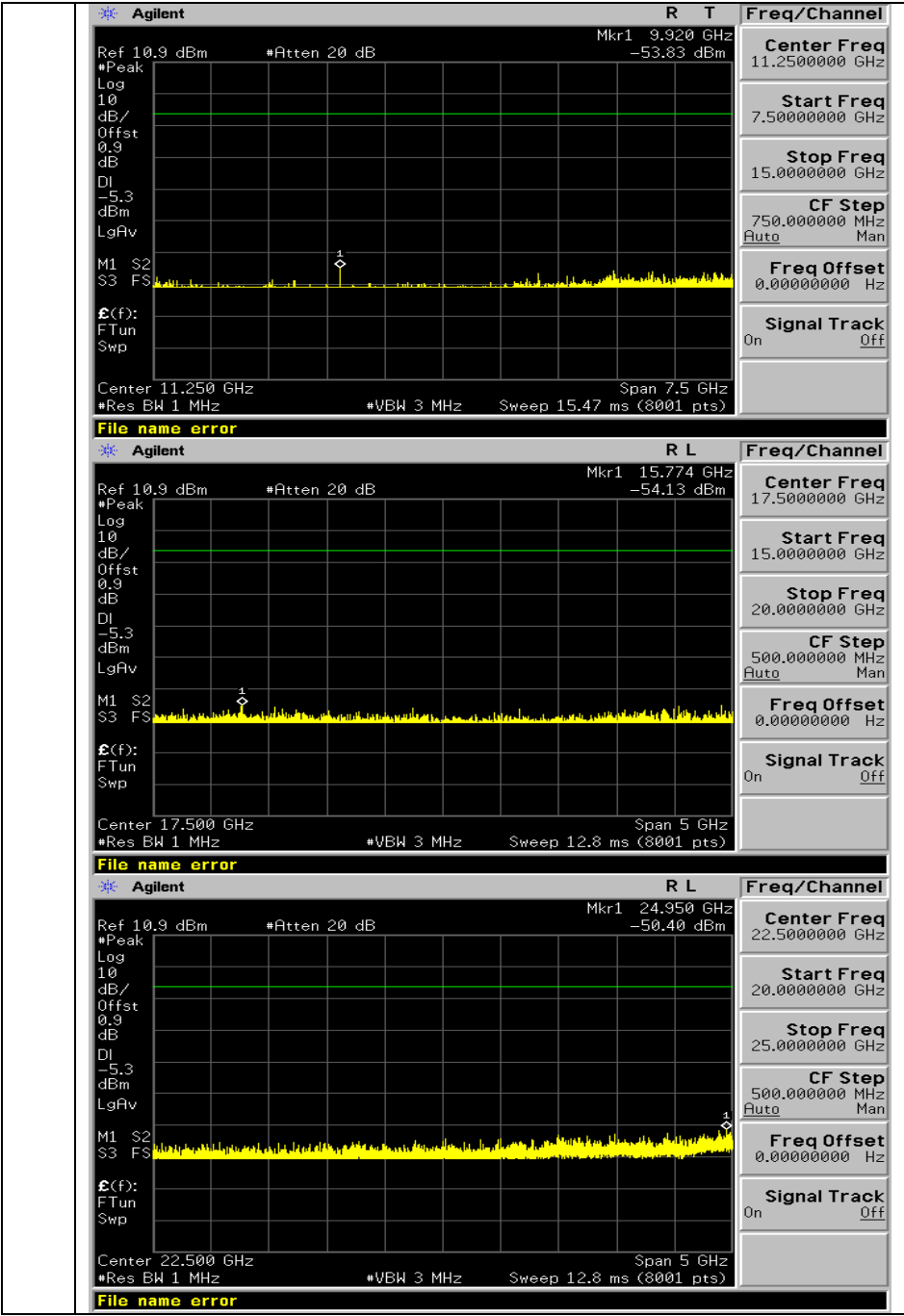


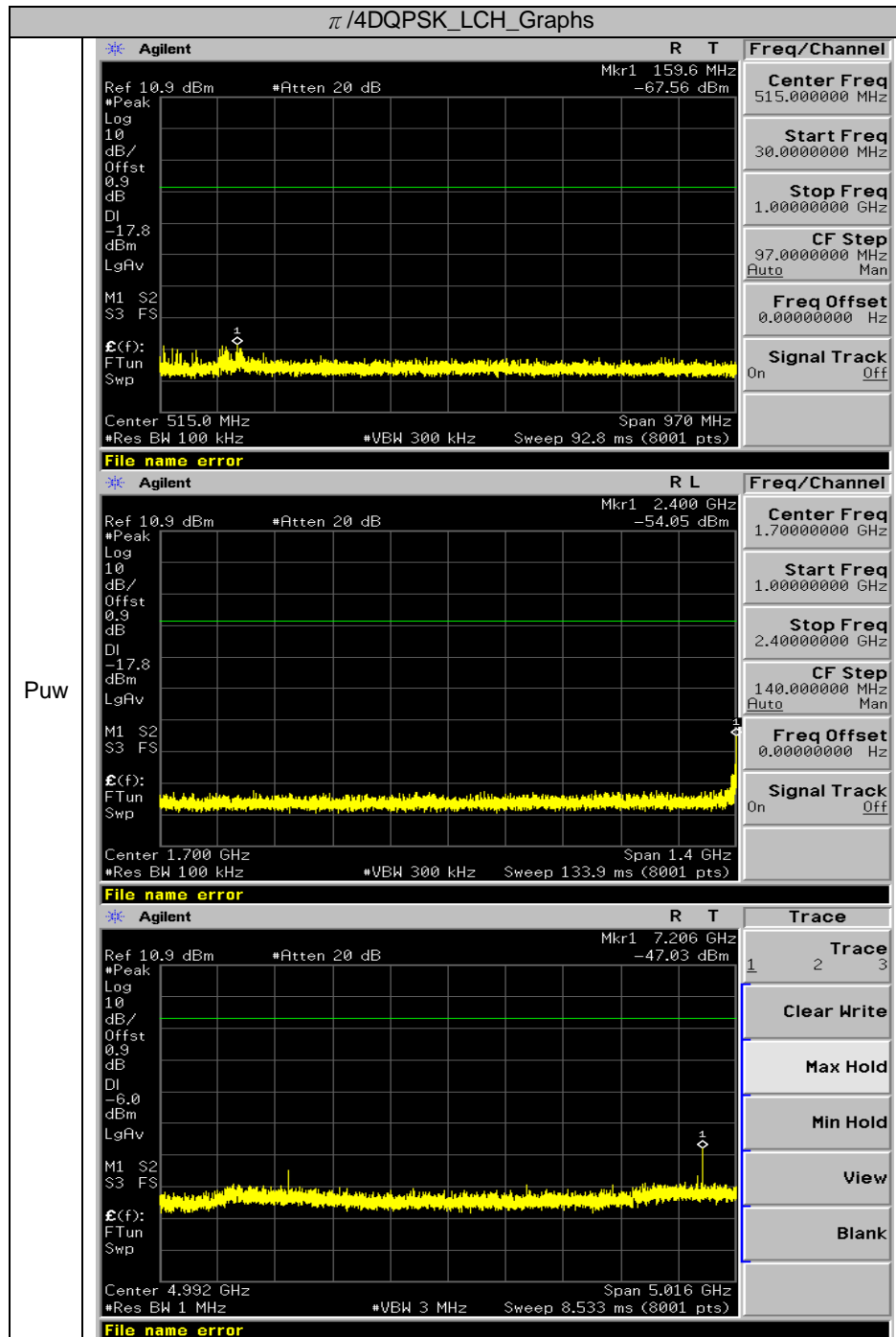
Puw

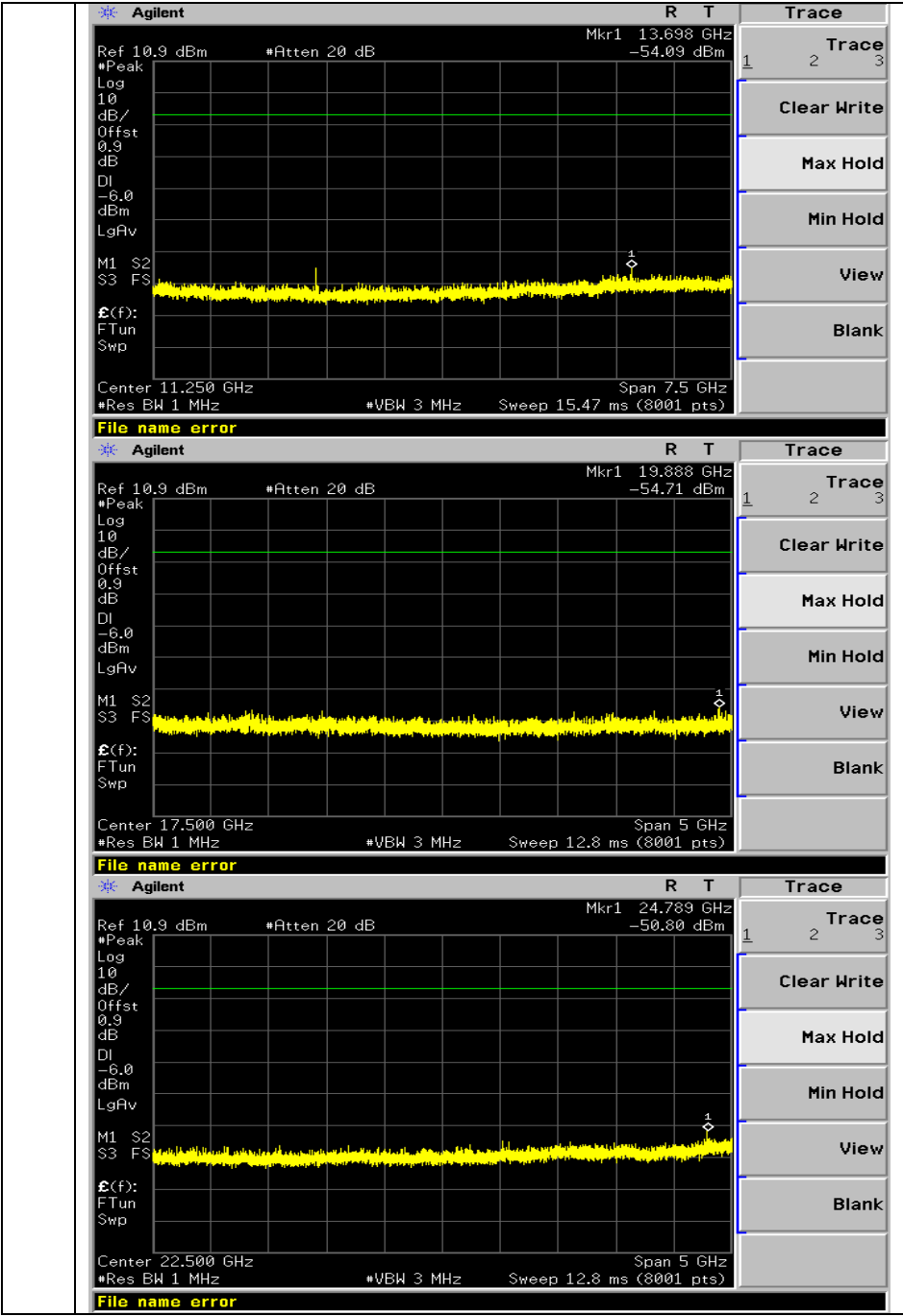


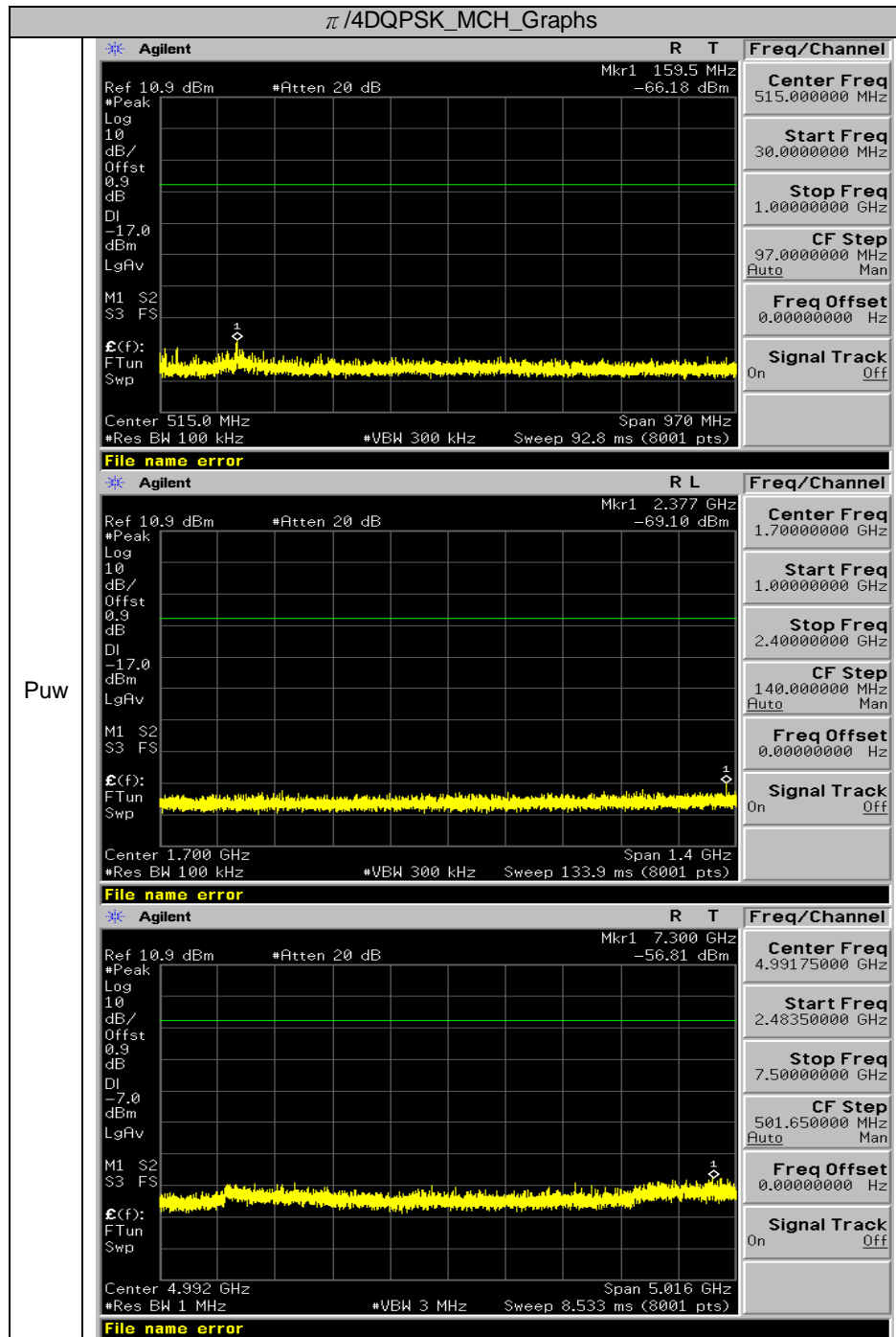


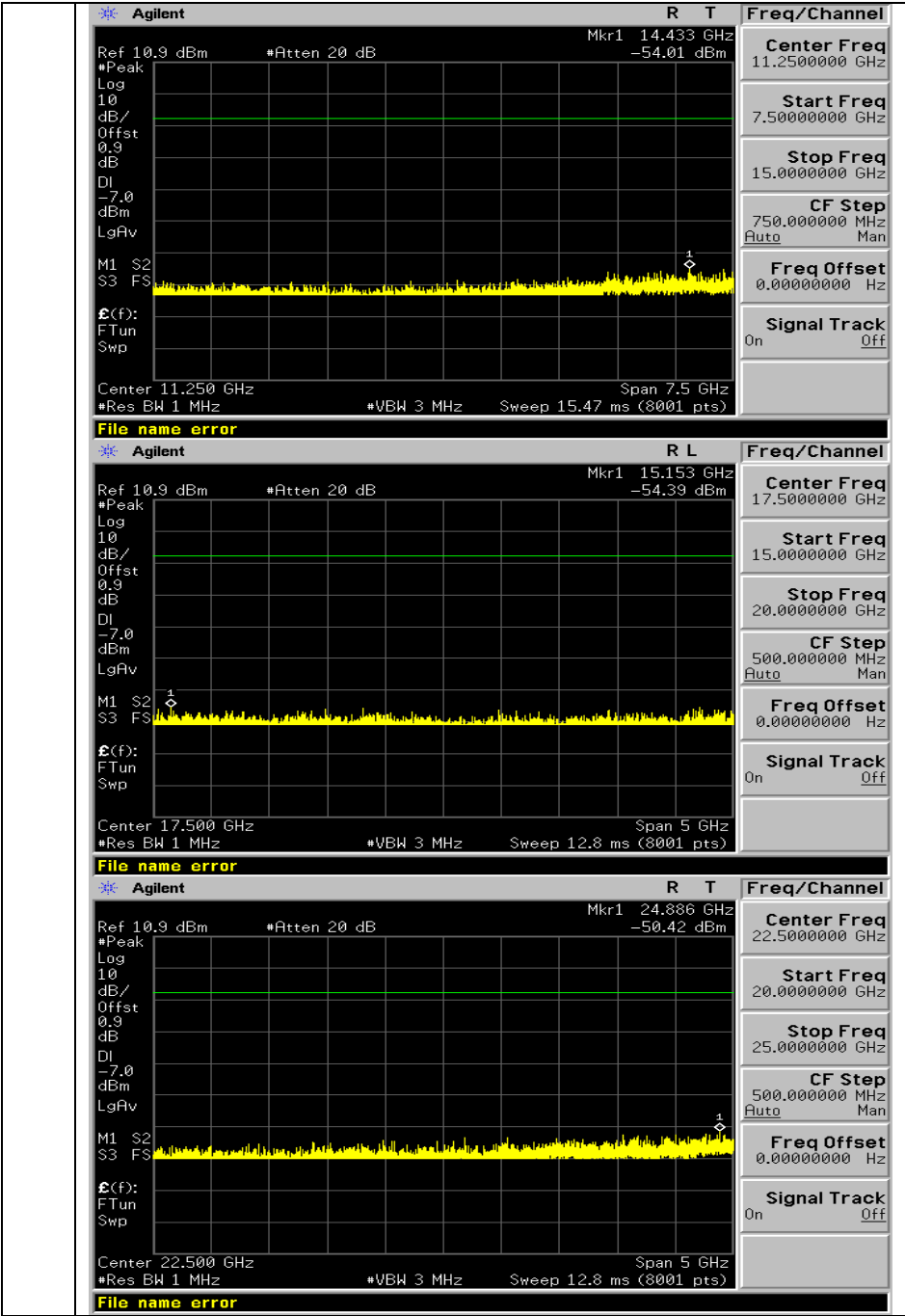
Puw

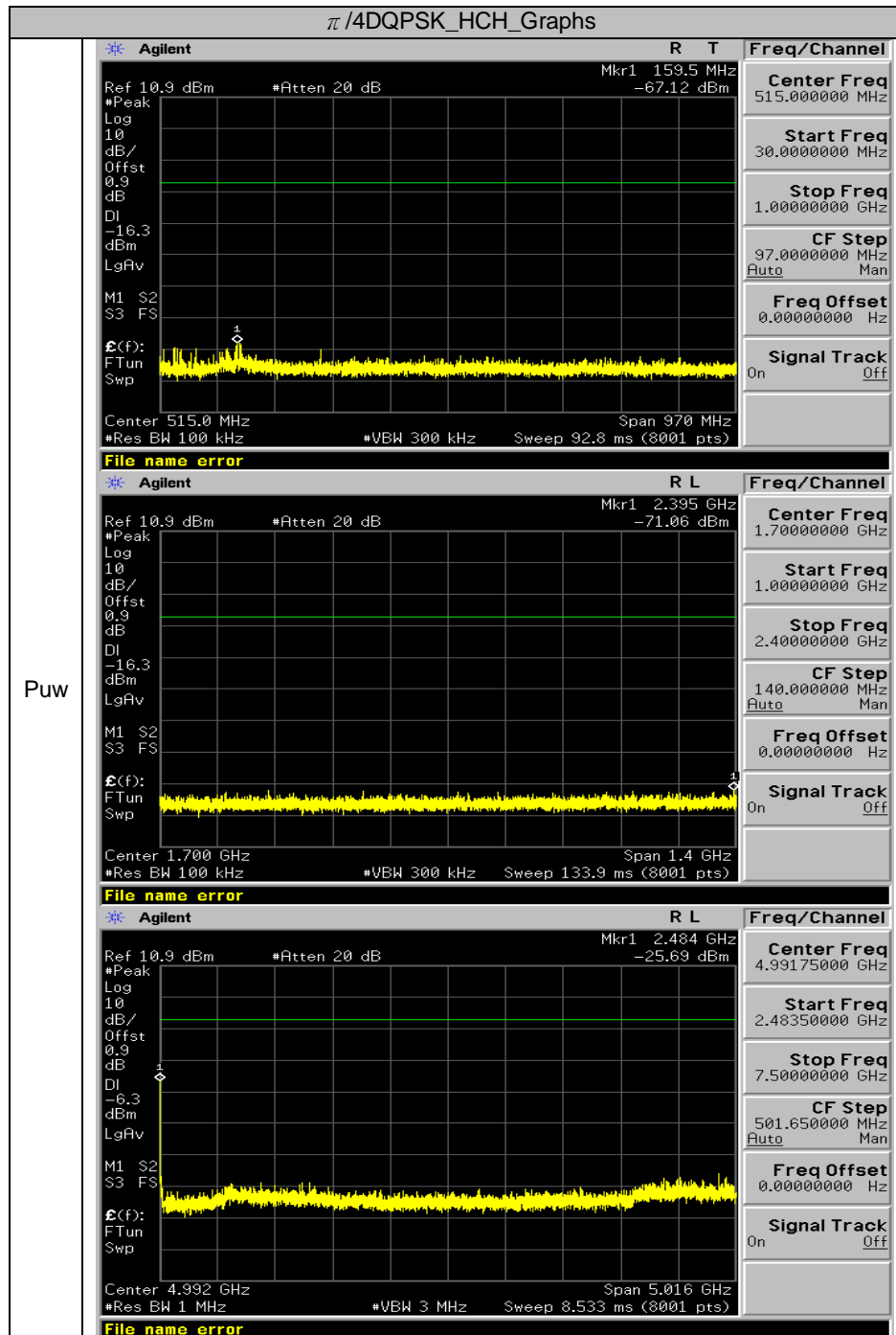


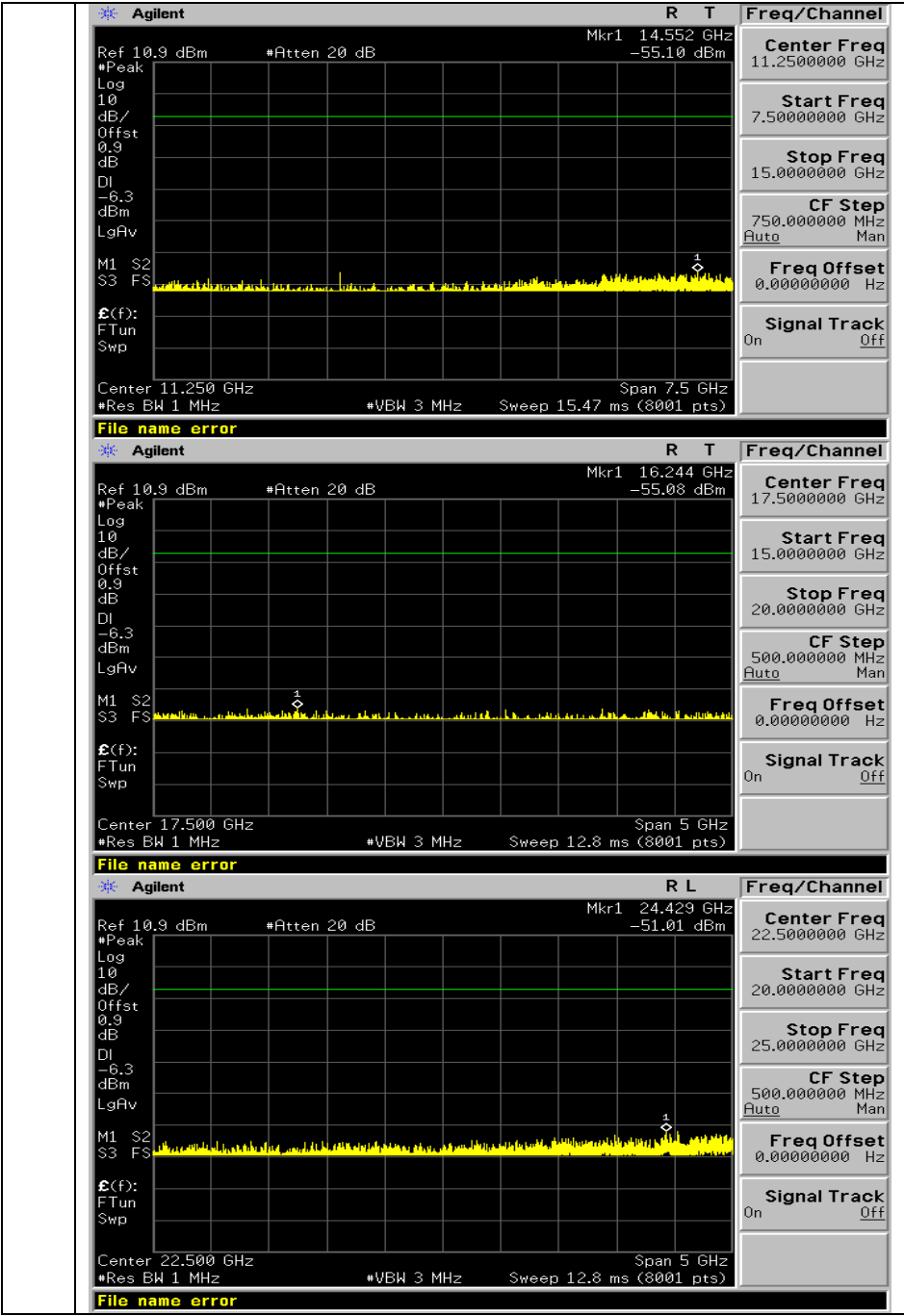


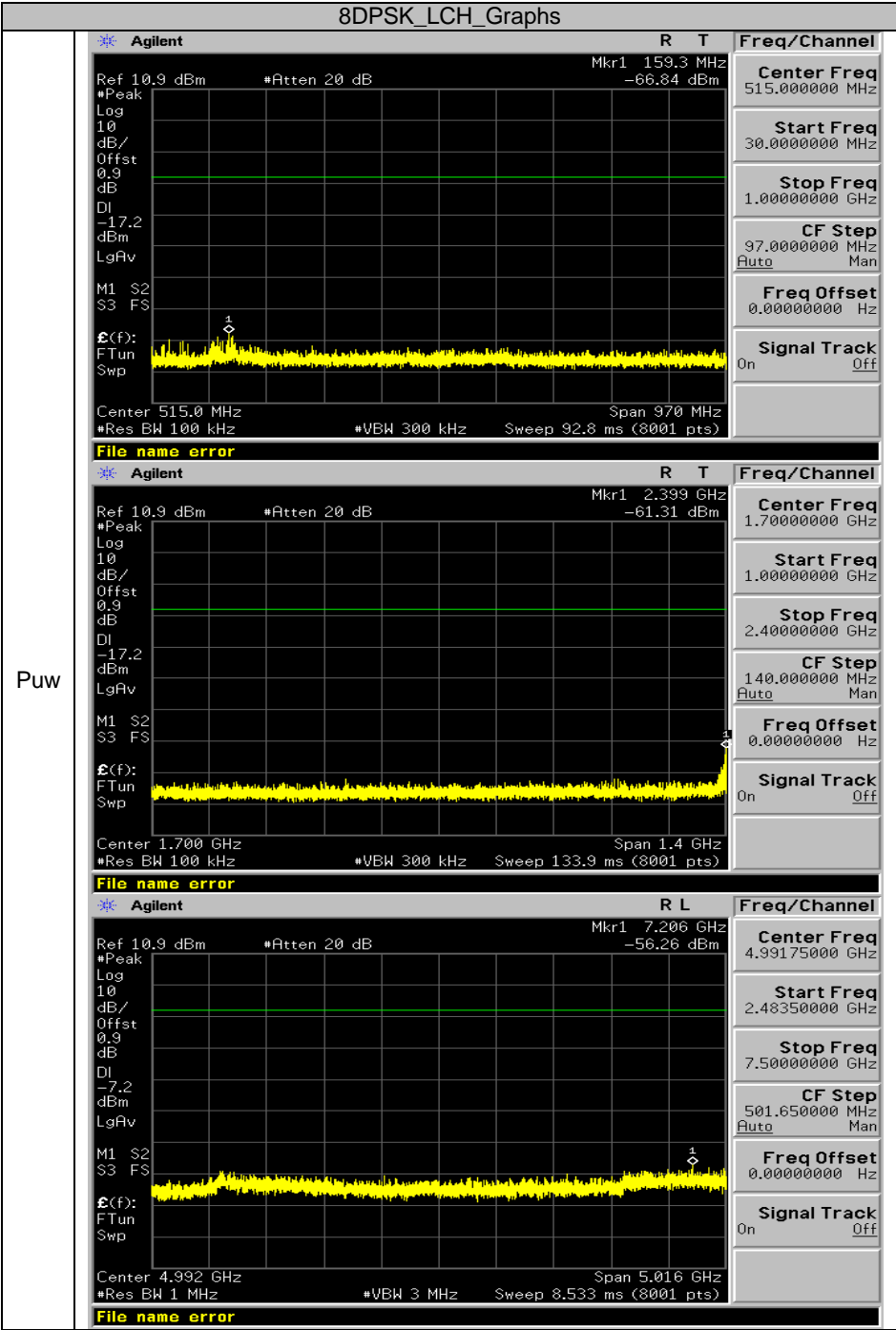




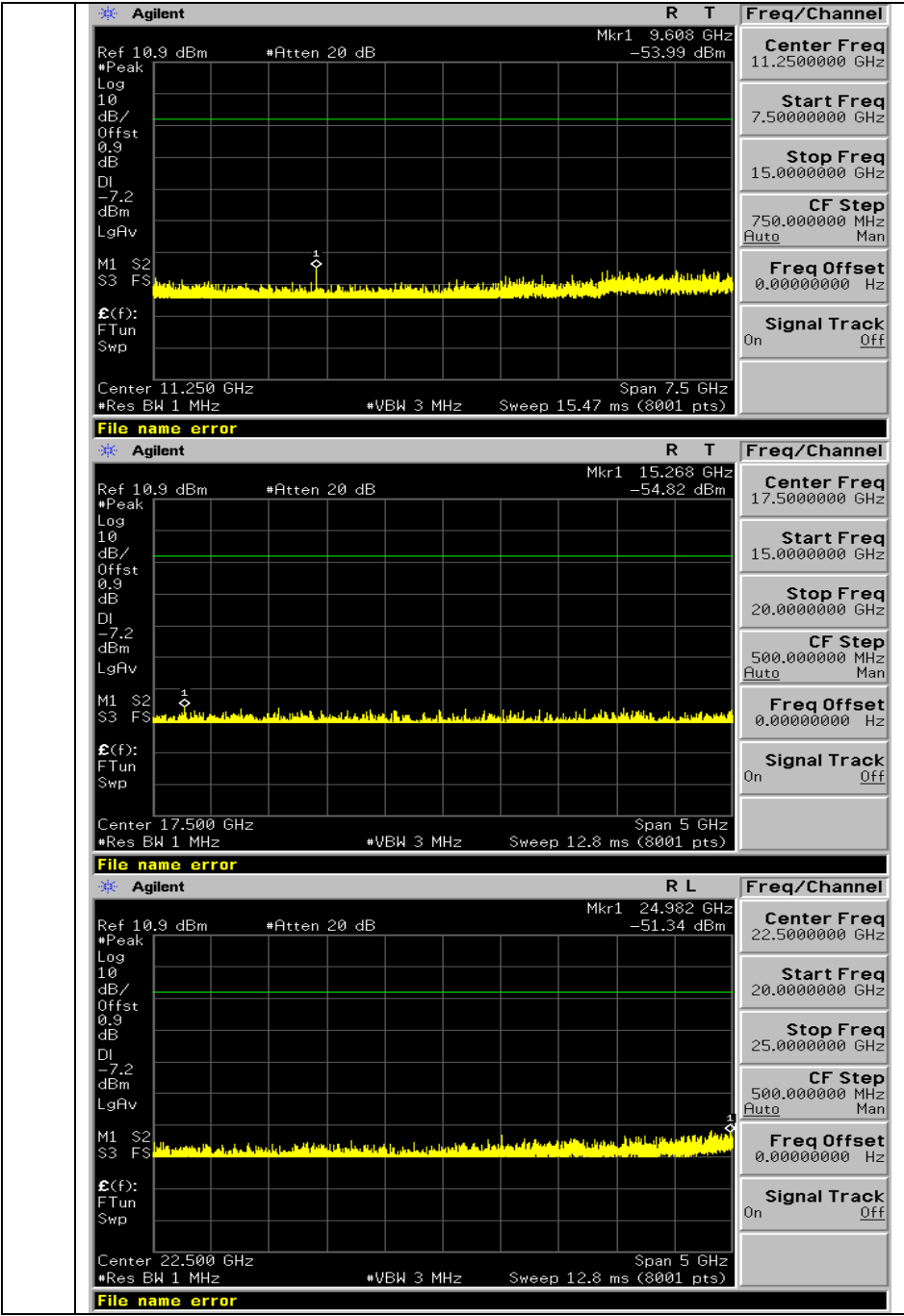








Puw



File name error

Agilent

R L

Freq/Channel

Ref 10.9 dBm

*Atten 20 dB

Mkr1 24.982 GHz

-51.34 dBm

#Peak

Log

10

dB/

Offst

0.9

dB

DI

-7.2

dBm

LgAv

M1 S2

S3 FS

Ⓐ(f):

FTun

Swp

Center 22.500 GHz

*Res BW 1 MHz

*VBW 3 MHz

Sweep 12.8 ms (8001 pts)

Span 5 GHz

Center Freq

22.500000 GHz

Start Freq

20.000000 GHz

Stop Freq

25.000000 GHz

CF Step

500.000000 MHz

Auto

Man

Freq Offset

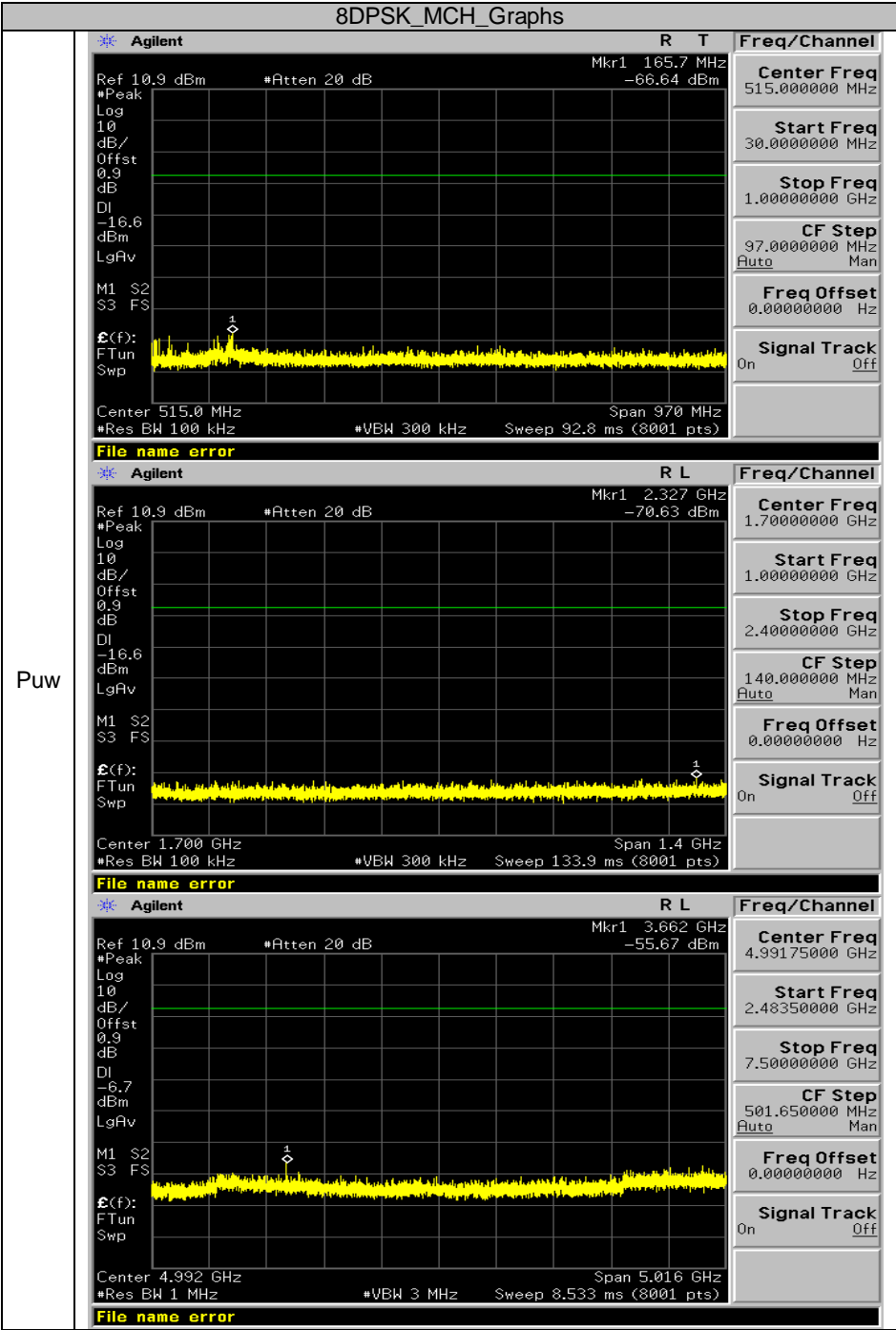
0.0000000 Hz

Signal Track

On

Off

File name error



Agilent

R L

Ref 10.9 dBm *Atten 20 dB Mkr1 3.662 GHz -55.67 dBm

#Peak

Log

10

dB/

Offst

0.9

dB

DI

-6.7

dBm

LgAv

M1 S2
S3 FS

$\mathcal{E}(f)$:

FTun

Swp

Center 4.992 GHz

*Res BW 1 MHz

*VBW 3 MHz

Sweep 8.533 ms (8001 pts)

Span 5.016 GHz

File name error

Freq/Channel

Center Freq
4.99175000 GHz

Start Freq
2.48350000 GHz

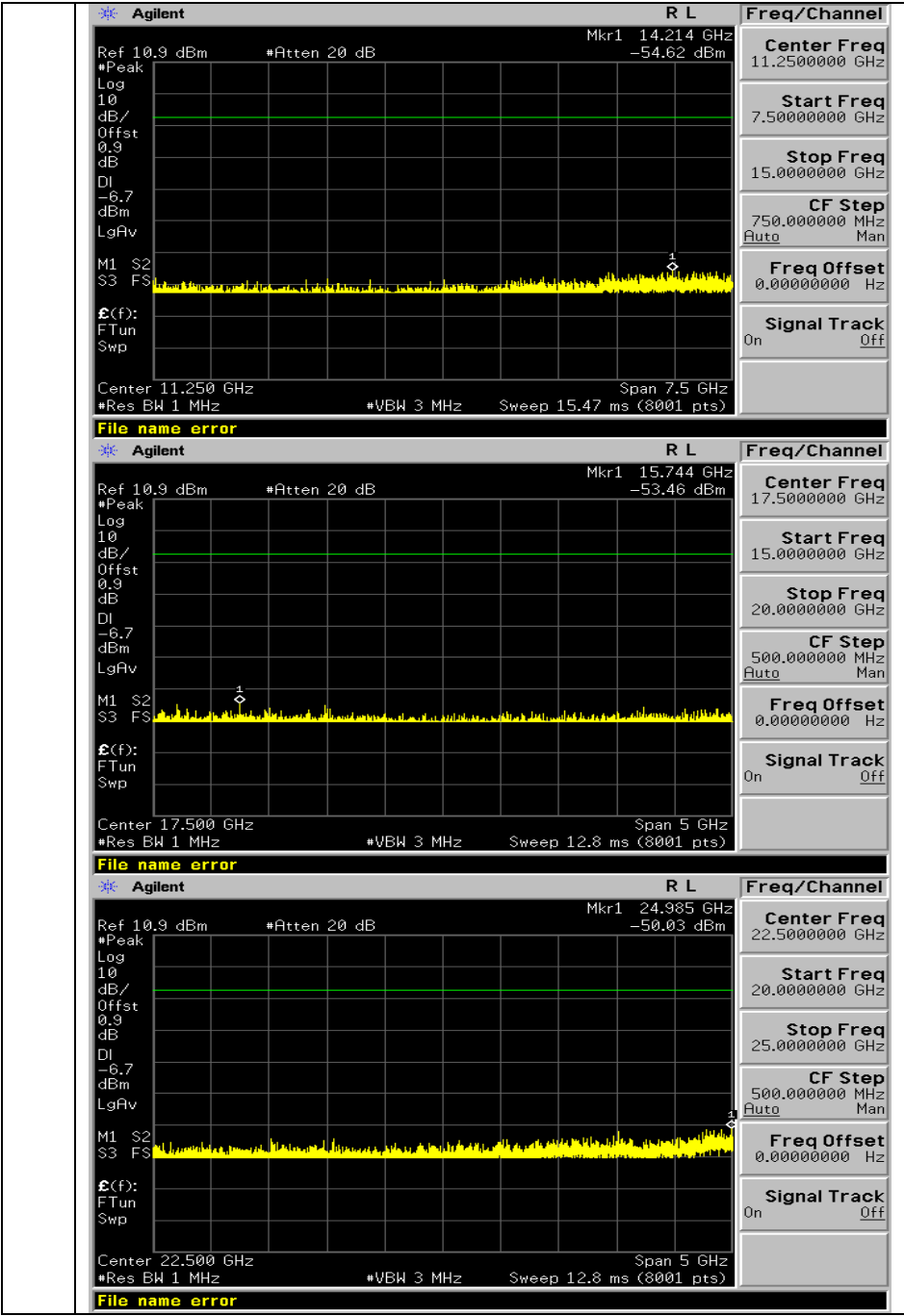
Stop Freq
7.50000000 GHz

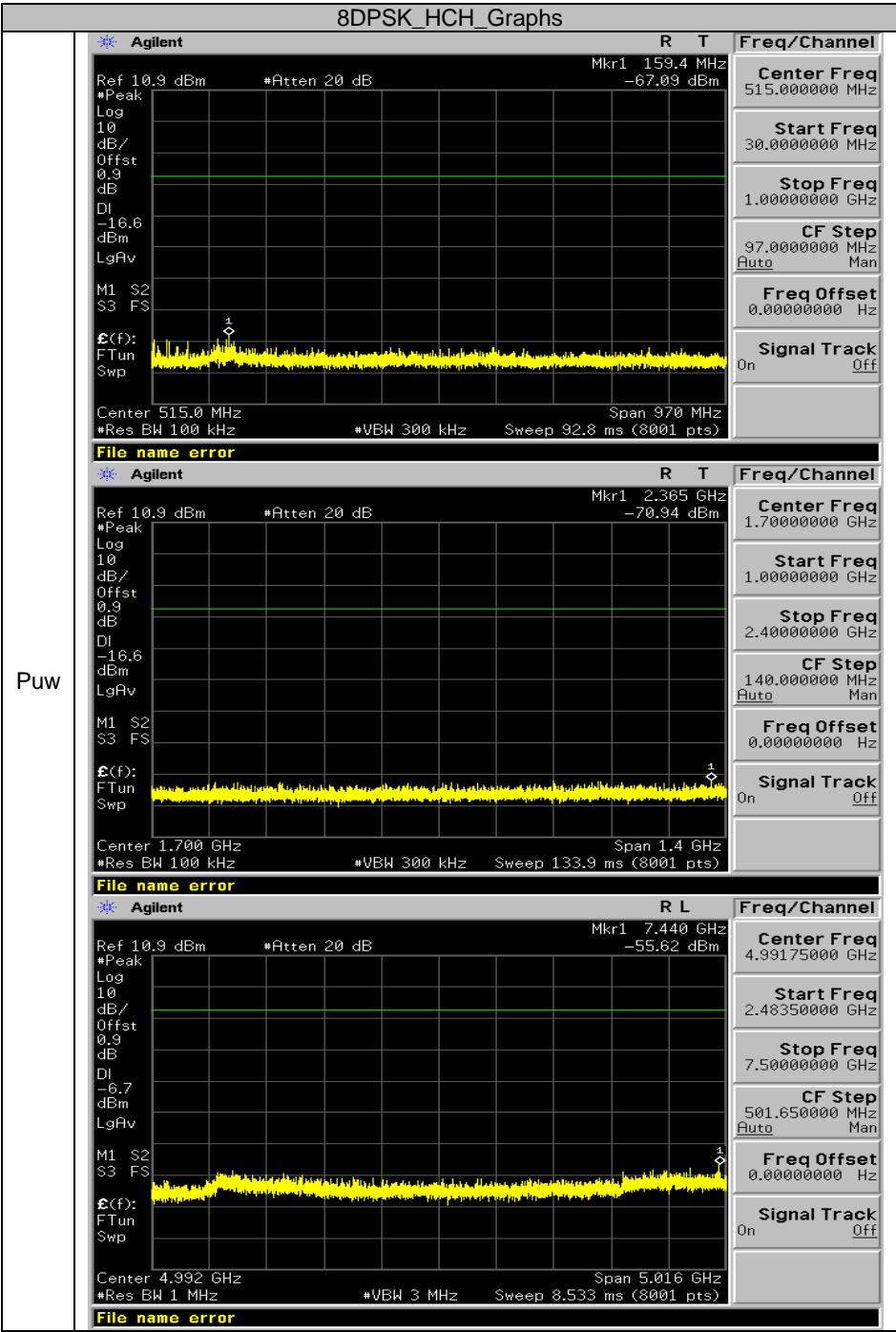
CF Step
501.650000 MHz
Auto Man

Freq Offset
0.00000000 Hz

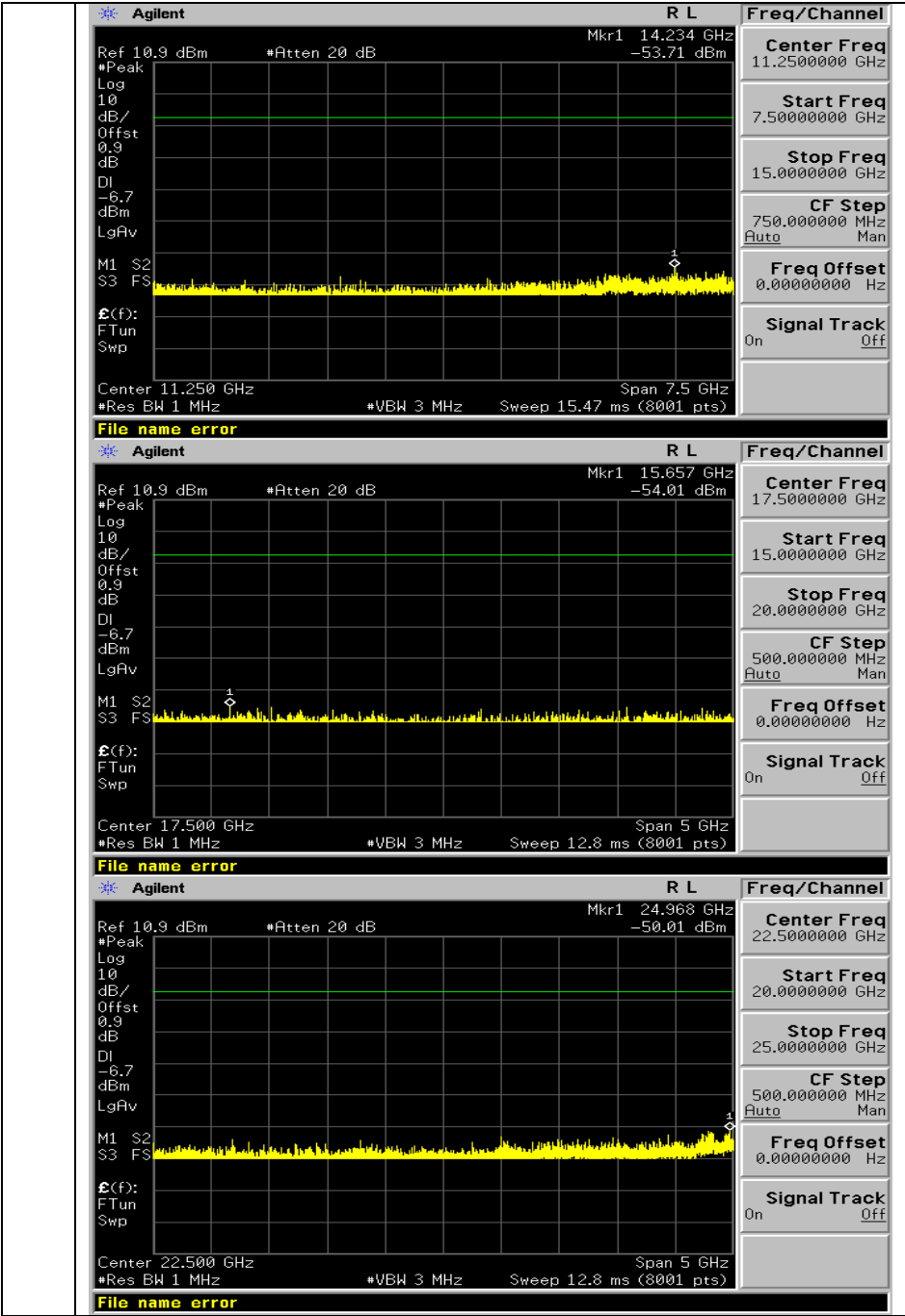
Signal Track
On Off

Puw





Puw



File name error

Agilent

R L

Freq/Channel

Ref 10.9 dBm

*Atten 20 dB

Mkr1 24.968 GHz

-50.01 dBm

#Peak

Log

10

dB/

Offst

0.9

dB

DI

-6.7

dBm

LgAv

M1 S2

S3 FS

$\mathcal{E}(f)$:

FTun

Swp

Center 22.500 GHz

*Res BW 1 MHz

*VBW 3 MHz

Sweep 12.8 ms (8001 pts)

Span 5 GHz

Center Freq

22.500000 GHz

Start Freq

20.000000 GHz

Stop Freq

25.000000 GHz

CF Step

500.000000 MHz

Auto

Man

Freq Offset

0.0000000 Hz

Signal Track

On

Off

File name error

10. RADIATED EMISSION

10.1. MEASUREMENT PROCEDURE

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

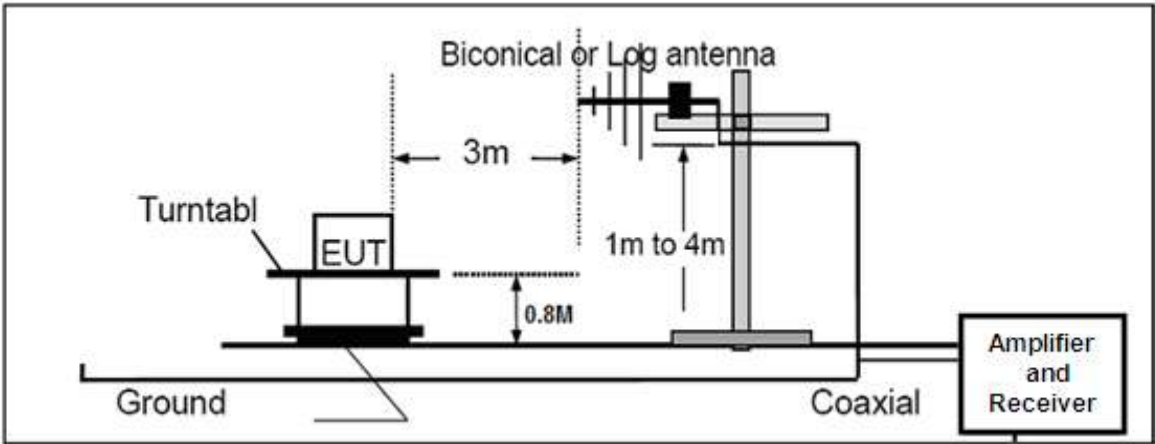
The following table is the setting of spectrum analyzer and receiver.

| Spectrum Parameter | Setting |
|-----------------------|---|
| Start ~Stop Frequency | 9KHz~150KHz/RB 200Hz for QP |
| Start ~Stop Frequency | 150KHz~30MHz/RB 9KHz for QP |
| Start ~Stop Frequency | 30MHz~1000MHz/RB 120KHz for QP |
| Start ~Stop Frequency | 1GHz~26.5GHz 1MHz/1MHz for Peak, 1MHz/10Hz for Average |

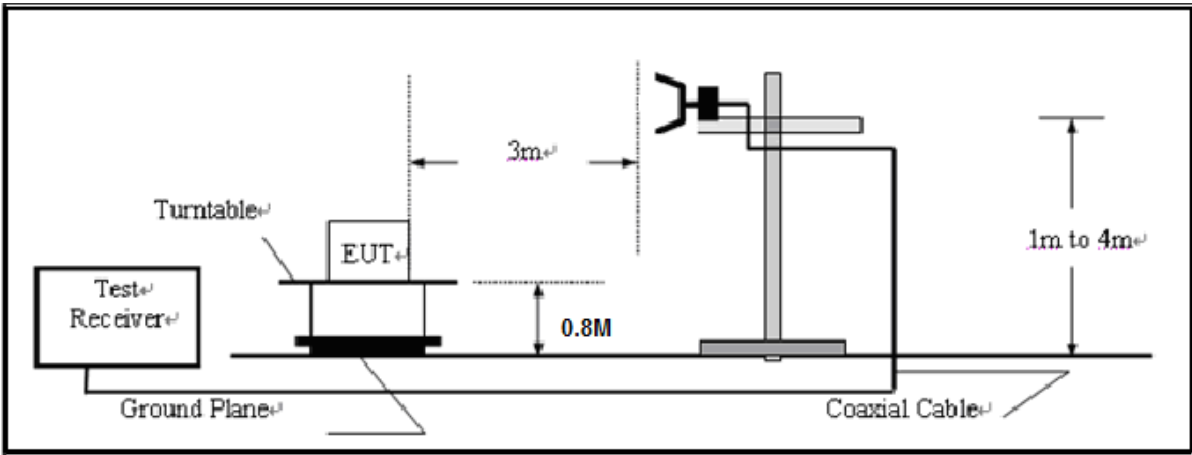
| Receiver Parameter | Setting |
|-----------------------|--------------------------------|
| Start ~Stop Frequency | 9KHz~150KHz/RB 200Hz for QP |
| Start ~Stop Frequency | 150KHz~30MHz/RB 9KHz for QP |
| Start ~Stop Frequency | 30MHz~1000MHz/RB 120KHz for QP |

10.2. TEST SETUP

RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz

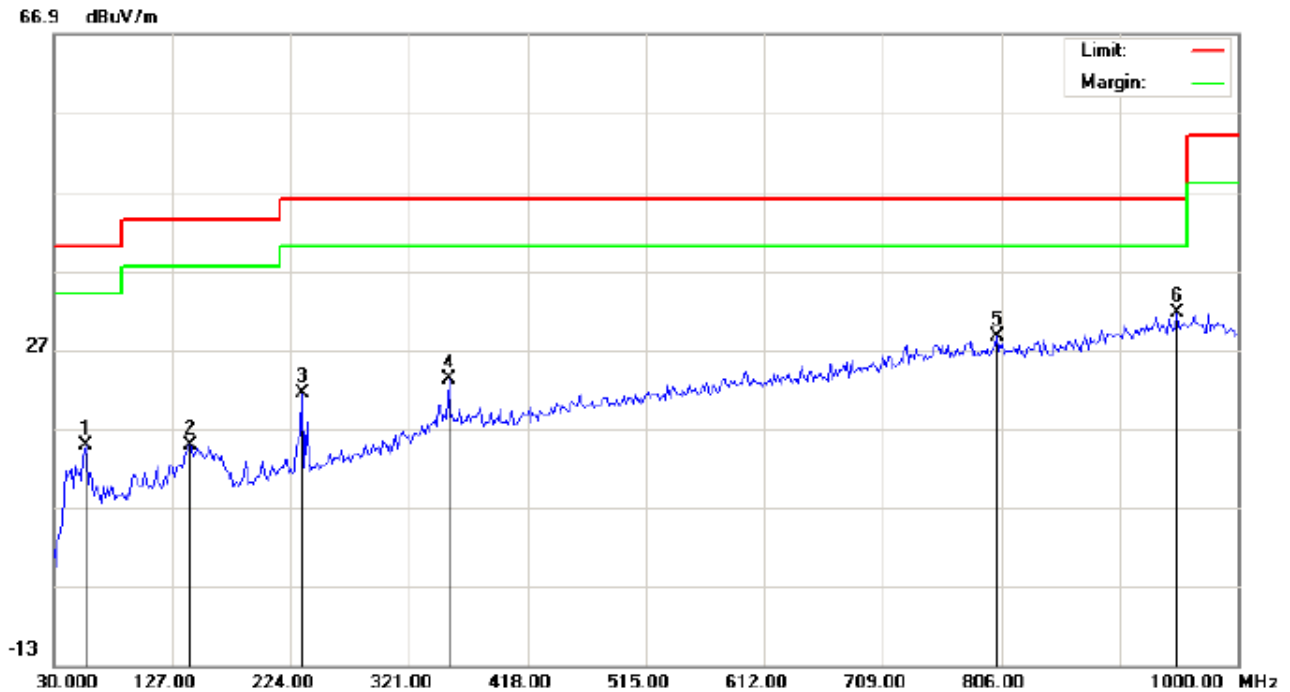


10.3. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

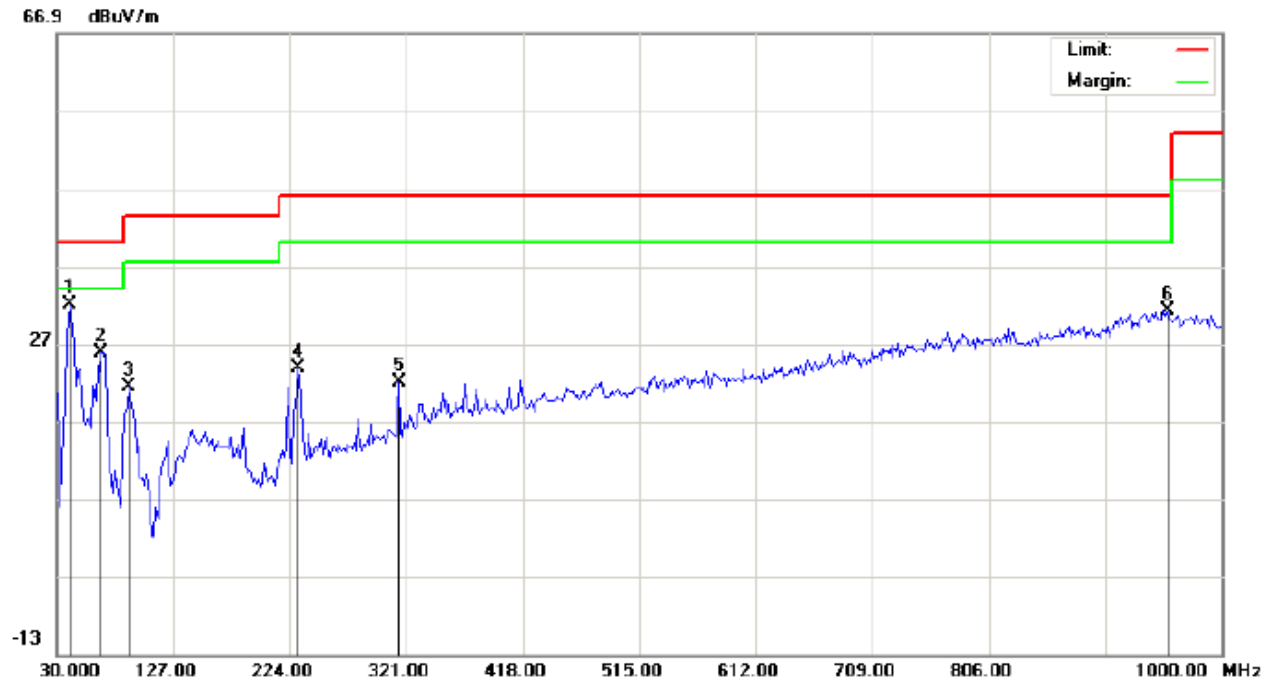
No emission found between lowest internal used/generated frequencies to 30MHz.

RADIATED EMISSION BELOW 1GHZ



| | | |
|---------------------------------|---------------------------------|-------------------|
| Site: site #1 | Polarization: Horizontal | Temperature: 22.7 |
| Limit: FCC Class B 3M Radiation | Power: AC 120V/60Hz | Humidity: 55.6 % |
| EUT: Smart Phone | Distance: 3m | |
| M/N: K1 | | |
| Mode: Low channel TX | | |
| Note: | | |

| No. | Mk | Freq. | Reading | Factor | Measurement | Limit | Over | Detector | Antenna Height | Table Degree | Comment |
|-----|----|----------|---------|--------|-------------|--------|--------|----------|----------------|--------------|---------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | cm | degree | |
| 1 | | 55.8667 | 3.62 | 11.19 | 14.81 | 40.00 | -25.19 | peak | | | |
| 2 | | 141.5500 | -0.48 | 15.21 | 14.73 | 43.50 | -28.77 | peak | | | |
| 3 | | 233.7000 | 8.12 | 13.28 | 21.40 | 46.00 | -24.60 | peak | | | |
| 4 | | 353.3333 | 4.40 | 18.76 | 23.16 | 46.00 | -22.84 | peak | | | |
| 5 | | 802.7667 | 1.32 | 27.32 | 28.64 | 46.00 | -17.36 | peak | | | |
| 6 | * | 949.8833 | 1.59 | 30.00 | 31.59 | 46.00 | -14.41 | peak | | | |



Site: site #1

Limit: FCC Class B 3M Radiation

EUT: Smart Phone

M/N: K1

Mode: Low channel TX

Note:

Polarization: **Vertical**

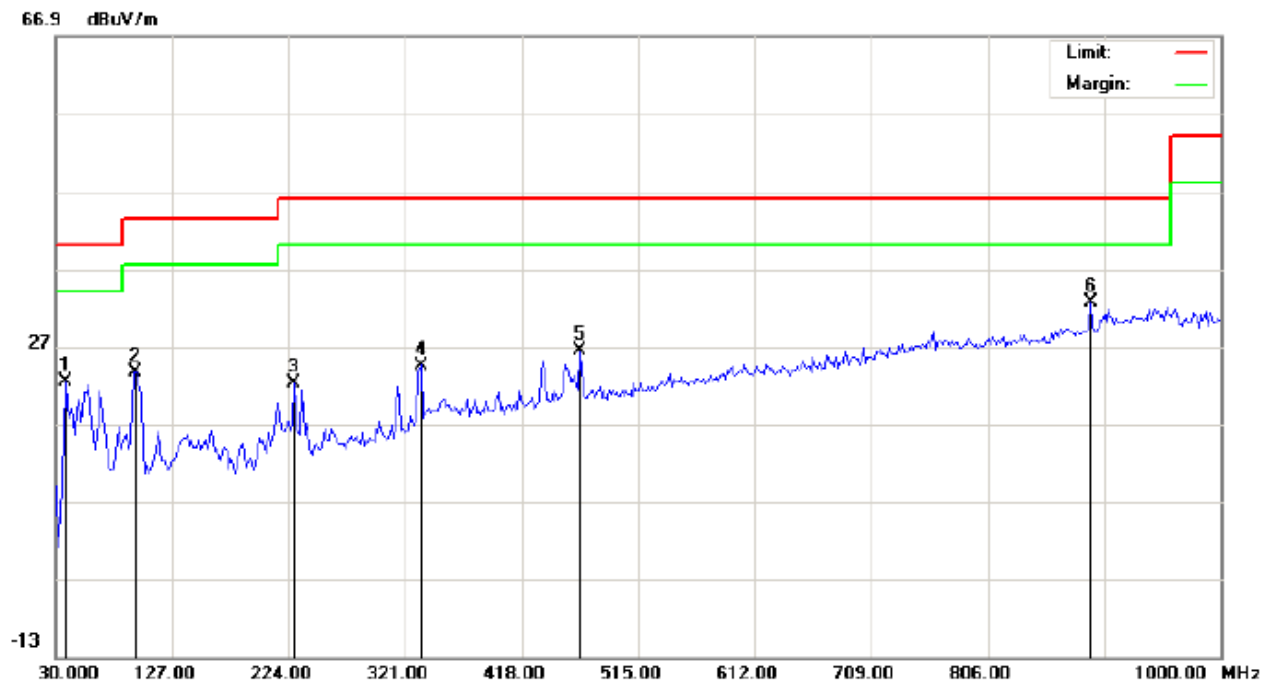
Power: AC 120V/60Hz

Distance: 3m

Temperature: 22.7

Humidity: 55.6 %

| No. | Mk | Freq. | Reading | Factor | Measurement | Limit | Over | Detector | Antenna Height | Table Degree | Comment |
|-----|----|----------|---------|--------|-------------|--------|--------|----------|----------------|--------------|---------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | cm | degree | |
| 1 | * | 41.3167 | 23.13 | 8.81 | 31.94 | 40.00 | -8.06 | peak | | | |
| 2 | | 67.1833 | 20.42 | 5.36 | 25.78 | 40.00 | -14.22 | peak | | | |
| 3 | | 89.8167 | 16.19 | 5.31 | 21.50 | 43.50 | -22.00 | peak | | | |
| 4 | | 230.4667 | 11.81 | 11.99 | 23.80 | 46.00 | -22.20 | peak | | | |
| 5 | | 314.5333 | 5.54 | 16.38 | 21.92 | 46.00 | -24.08 | peak | | | |
| 6 | | 954.7333 | 1.28 | 29.95 | 31.23 | 46.00 | -14.77 | peak | | | |



Site: site #1

Polarization: *Horizontal*

Temperature: 22.7

Limit: FCC Class B 3M Radiation

Power: AC 120V/60Hz

Humidity: 55.6 %

EUT: Smart Phone

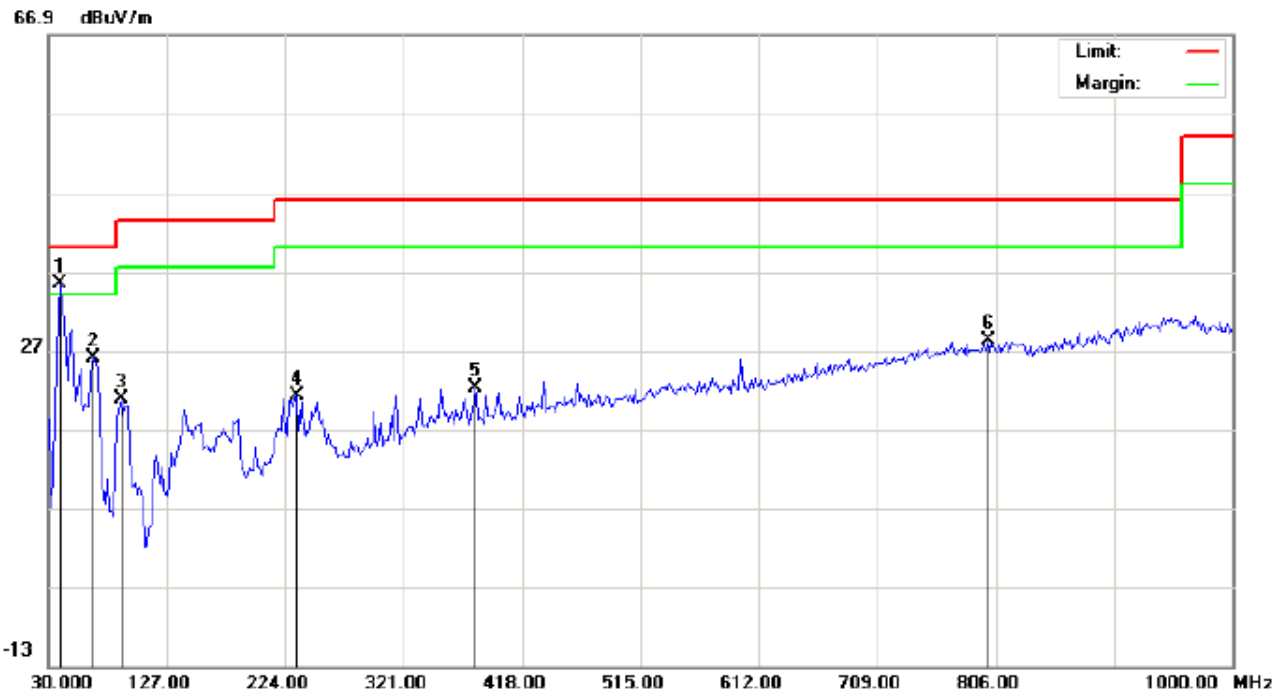
Distance: 3m

M/N: K1

Mode: Middle channel TX

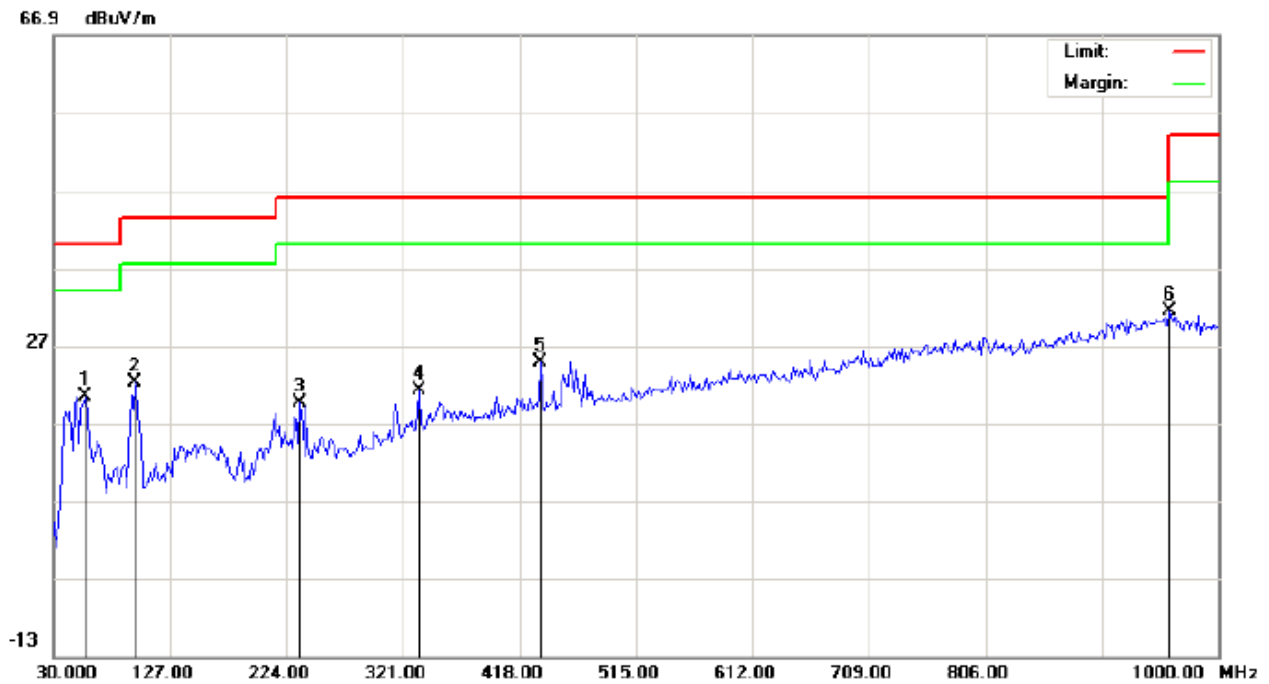
Note:

| No. | Mk | Freq. | Reading | Factor | Measurement | Limit | Over | Detector | Antenna Height | Table Degree | Comment |
|-----|----|----------|---------|--------|-------------|--------|--------|----------|----------------|--------------|---------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | cm | degree | |
| 1 | | 38.0833 | 12.88 | 9.43 | 22.31 | 40.00 | -17.69 | peak | | | |
| 2 | | 96.2833 | 13.61 | 10.07 | 23.68 | 43.50 | -19.82 | peak | | | |
| 3 | | 228.8500 | 9.15 | 13.10 | 22.25 | 46.00 | -23.75 | peak | | | |
| 4 | | 333.9333 | 6.83 | 17.67 | 24.50 | 46.00 | -21.50 | peak | | | |
| 5 | | 466.5000 | 5.68 | 20.77 | 26.45 | 46.00 | -19.55 | peak | | | |
| 6 | * | 891.6833 | 4.16 | 28.39 | 32.55 | 46.00 | -13.45 | peak | | | |



Site: site #1 Polarization: **Vertical** Temperature: 22.7
Limit: FCC Class B 3M Radiation Power: AC 120V/60Hz Humidity: 55.6 %
EUT: Smart Phone Distance: 3m
M/N: K1
Mode: Middle channel TX
Note:

| No. | Mk | Freq. | Reading | Factor | Measurement | Limit | Over | Detector | Antenna Height | Table Degree | Comment |
|-----|----|----------|---------|--------|-------------|--------|--------|----------|----------------|--------------|---------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | cm | degree | |
| 1 | * | 39.7000 | 26.92 | 8.51 | 35.43 | 40.00 | -4.57 | peak | | | |
| 2 | | 67.1833 | 20.62 | 5.36 | 25.98 | 40.00 | -14.02 | peak | | | |
| 3 | | 89.8167 | 15.49 | 5.31 | 20.80 | 43.50 | -22.70 | peak | | | |
| 4 | | 233.7000 | 8.91 | 12.30 | 21.21 | 46.00 | -24.79 | peak | | | |
| 5 | | 379.2000 | 3.23 | 18.93 | 22.16 | 46.00 | -23.84 | peak | | | |
| 6 | | 799.5333 | 0.82 | 27.31 | 28.13 | 46.00 | -17.87 | peak | | | |



Site: site #1

Limit: FCC Class B 3M Radiation

EUT: Smart Phone

M/N: K1

Mode: High channel TX

Note:

Polarization: *Horizontal*

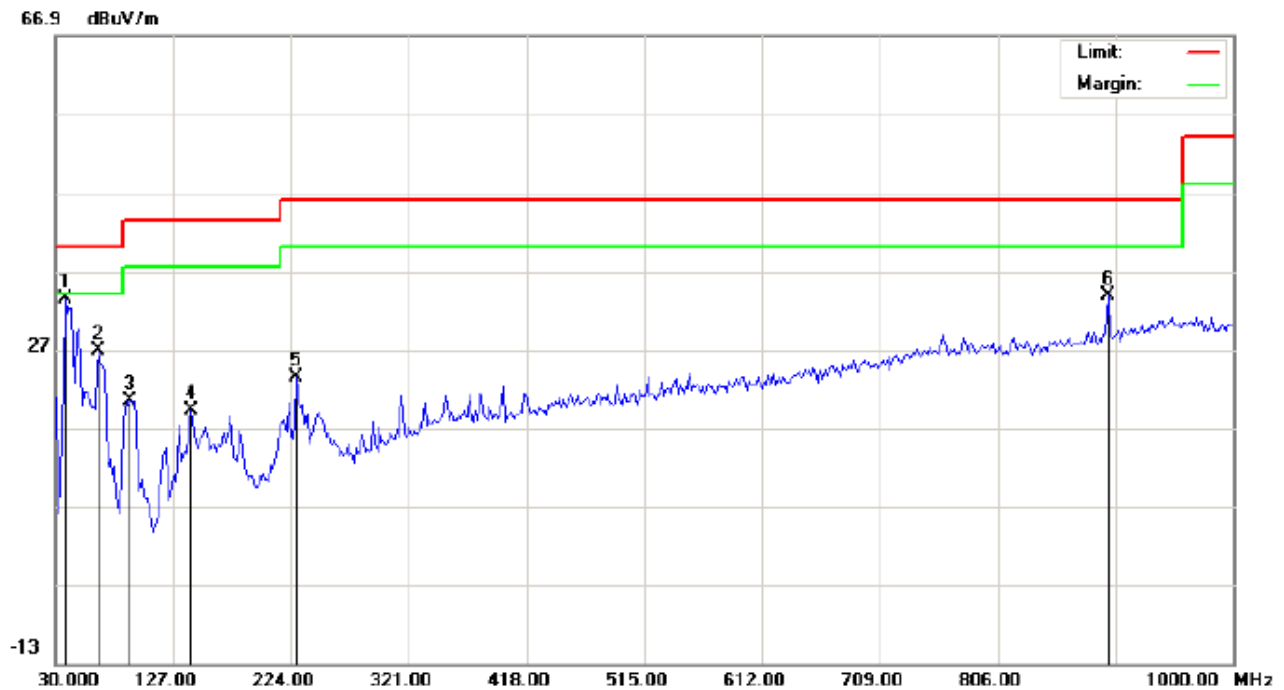
Power: AC 120V/60Hz

Distance: 3m

Temperature: 22.7

Humidity: 55.6 %

| No. | Mk | Freq. | Reading | Factor | Measurement | Limit | Over | Detector | Antenna Height | Table Degree | Comment |
|-----|----|----------|---------|--------|-------------|--------|--------|----------|----------------|--------------|---------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | cm | degree | |
| 1 | | 55.8667 | 9.12 | 11.19 | 20.31 | 40.00 | -19.69 | peak | | | |
| 2 | | 97.9000 | 11.93 | 10.25 | 22.18 | 43.50 | -21.32 | peak | | | |
| 3 | | 235.3167 | 6.34 | 13.34 | 19.68 | 46.00 | -26.32 | peak | | | |
| 4 | | 333.9333 | 3.53 | 17.67 | 21.20 | 46.00 | -24.80 | peak | | | |
| 5 | | 435.7833 | 4.69 | 20.16 | 24.85 | 46.00 | -21.15 | peak | | | |
| 6 | * | 959.5833 | 1.43 | 29.91 | 31.34 | 46.00 | -14.66 | peak | | | |



Site: site #1 Polarization: **Vertical** Temperature: 22.7
Limit: FCC Class B 3M Radiation Power: AC 120V/60Hz Humidity: 55.6 %
EUT: Smart Phone Distance: 3m
M/N: K1
Mode: High channel TX
Note:

| No. | Mk | Freq. | Reading | Factor | Measurement | Limit | Over | Detector | Antenna Height | Table Degree | Comment |
|-----|----|----------|---------|--------|-------------|--------|--------|----------|----------------|--------------|---------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | cm | degree | |
| 1 | * | 38.0833 | 27.06 | 6.39 | 33.45 | 40.00 | -6.55 | peak | | | |
| 2 | | 65.5667 | 20.79 | 5.98 | 26.77 | 40.00 | -13.23 | peak | | | |
| 3 | | 91.4333 | 16.33 | 4.16 | 20.49 | 43.50 | -23.01 | peak | | | |
| 4 | | 141.5500 | 4.06 | 15.21 | 19.27 | 43.50 | -24.23 | peak | | | |
| 5 | | 228.8500 | 11.59 | 11.83 | 23.42 | 46.00 | -22.58 | peak | | | |
| 6 | | 896.5333 | 5.23 | 28.52 | 33.75 | 46.00 | -12.25 | peak | | | |

RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

3. Scan with GFSK, $\pi/4$ -DQPSK, 8DPSK, record the worst case is GFSK Mode.

RADIATED EMISSION TEST- (ABOVE 1GHZ)

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector | Comment |
|-------------------------|---------------|--------|----------------|----------|--------|----------|------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | Type | |
| Low Channel (2402 MHz) | | | | | | | |
| 4804.264 | 66.68 | -3.62 | 63.06 | 74 | -10.94 | Pk | Vertical |
| 4804.272 | 46.18 | -3.62 | 42.56 | 54 | -11.44 | AV | Vertical |
| 7206.138 | 64.61 | -0.9 | 63.71 | 74 | -10.29 | pk | Vertical |
| 7206.156 | 43.29 | -0.9 | 42.39 | 54 | -11.61 | AV | Vertical |
| 4803.959 | 65.42 | -3.64 | 61.78 | 74 | -12.22 | Pk | Horizontal |
| 4803.964 | 45.73 | -3.64 | 42.09 | 54 | -11.91 | AV | Horizontal |
| Mid Channel (2441 MHz) | | | | | | | |
| 4882.128 | 65.86 | -3.65 | 62.21 | 74 | -11.79 | Pk | Vertical |
| 4882.094 | 47.46 | -3.65 | 43.81 | 54 | -10.19 | AV | Vertical |
| 7323.228 | 63.29 | -0.82 | 62.47 | 74 | -11.53 | Pk | Vertical |
| 7323.220 | 46.33 | -0.82 | 45.51 | 54 | -8.49 | AV | Vertical |
| 4882.096 | 62.81 | -3.68 | 59.13 | 74 | -14.87 | Pk | Horizontal |
| 4882.171 | 47.69 | -3.68 | 44.01 | 54 | -9.99 | AV | Horizontal |
| High Channel (2480 MHz) | | | | | | | |
| 4960.260 | 63.51 | -3.59 | 59.92 | 74 | -14.08 | pk | Vertical |
| 4960.325 | 45.29 | -3.59 | 41.7 | 54 | -12.3 | AV | Vertical |
| 4960.190 | 64.78 | -3.59 | 61.19 | 74 | -12.81 | pk | Horizontal |
| 4960.157 | 46.63 | -3.59 | 43.04 | 54 | -10.96 | AV | Horizontal |

Note:

- 1) 30MHz~25GHz:(Scan with GFSK, $\pi/4$ -DQPSK,8DPSK, the worst casw is GFSK Mode)
- 2) Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Meter Reading + Factor
Margin = Emission Leve - Limit
- 3) Scan with GFSK, $\pi/4$ -DQPSK,8DPSK, record the worst cas is GFSK Mode.

RESULT: PASS

11. BAND EDGE EMISSION

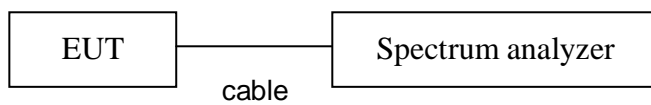
11.1. MEASUREMENT PROCEDURE

1. The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100kHz. The video bandwidth is set to 300kHz.
2. Transmitter set to the normal hopping mode at 2.4 and 2.4835 GHz.

11.2. TEST SET-UP

Radiated same as 10.2

Conducted set up



11.3. Radiated TEST RESULT

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector | Comment |
|-----------|---------------|--------|----------------|----------|--------|----------|------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | Type | |
| GFSK | | | | | | | |
| 2399.9 | 69.61 | -12.99 | 56.62 | 74 | -17.38 | peak | Vertical |
| 2399.9 | 54.82 | -12.99 | 41.83 | 54 | -12.17 | AVG | Vertical |
| 2399.9 | 71.42 | -12.99 | 58.43 | 74 | -15.57 | peak | Horizontal |
| 2399.9 | 54.75 | -12.99 | 41.76 | 54 | -12.24 | AVG | Horizontal |
| 2483.6 | 71.29 | -12.78 | 58.51 | 74 | -15.49 | peak | Vertical |
| 2483.6 | 54.46 | -12.78 | 41.68 | 54 | -12.32 | AVG | Vertical |
| 2483.6 | 71.59 | -12.78 | 58.81 | 74 | -15.19 | peak | Horizontal |
| 2483.6 | 54.61 | -12.78 | 41.83 | 54 | -12.17 | AVG | Horizontal |
| π/4-DQPSK | | | | | | | |
| 2399.9 | 71.88 | -12.99 | 58.89 | 74 | -15.11 | peak | Vertical |
| 2399.9 | 54.75 | -12.99 | 41.76 | 54 | -12.24 | AVG | Vertical |
| 2399.9 | 70.29 | -12.99 | 57.3 | 74 | -16.7 | peak | Horizontal |
| 2399.9 | 55.59 | -12.99 | 42.6 | 54 | -11.4 | AVG | Horizontal |
| 2483.6 | 71.27 | -12.78 | 58.49 | 74 | -15.51 | peak | Vertical |
| 2483.6 | 58.23 | -12.78 | 45.45 | 54 | -8.55 | AVG | Vertical |
| 2483.6 | 71.73 | -12.78 | 58.95 | 74 | -15.05 | peak | Horizontal |
| 2483.6 | 54.81 | -12.78 | 42.03 | 54 | -11.97 | AVG | Horizontal |
| 8DPSK | | | | | | | |
| 2399.9 | 71.12 | -12.99 | 58.13 | 74 | -15.87 | peak | Vertical |
| 2399.9 | 55.82 | -12.99 | 42.83 | 54 | -11.17 | AVG | Vertical |
| 2399.9 | 70.75 | -12.99 | 57.76 | 74 | -16.24 | peak | Horizontal |
| 2399.9 | 56.64 | -12.99 | 43.65 | 54 | -10.35 | AVG | Horizontal |
| 2483.6 | 71.33 | -12.78 | 58.55 | 74 | -15.45 | peak | Vertical |
| 2483.6 | 55.81 | -12.78 | 43.03 | 54 | -10.97 | AVG | Vertical |
| 2483.6 | 71.75 | -12.78 | 58.97 | 74 | -15.03 | peak | Horizontal |
| 2483.6 | 54.61 | -12.78 | 41.83 | 54 | -12.17 | AVG | Horizontal |

RESULT: PASS

Note: The other modes radiation emission have enough 20dB margin.

Factor=Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

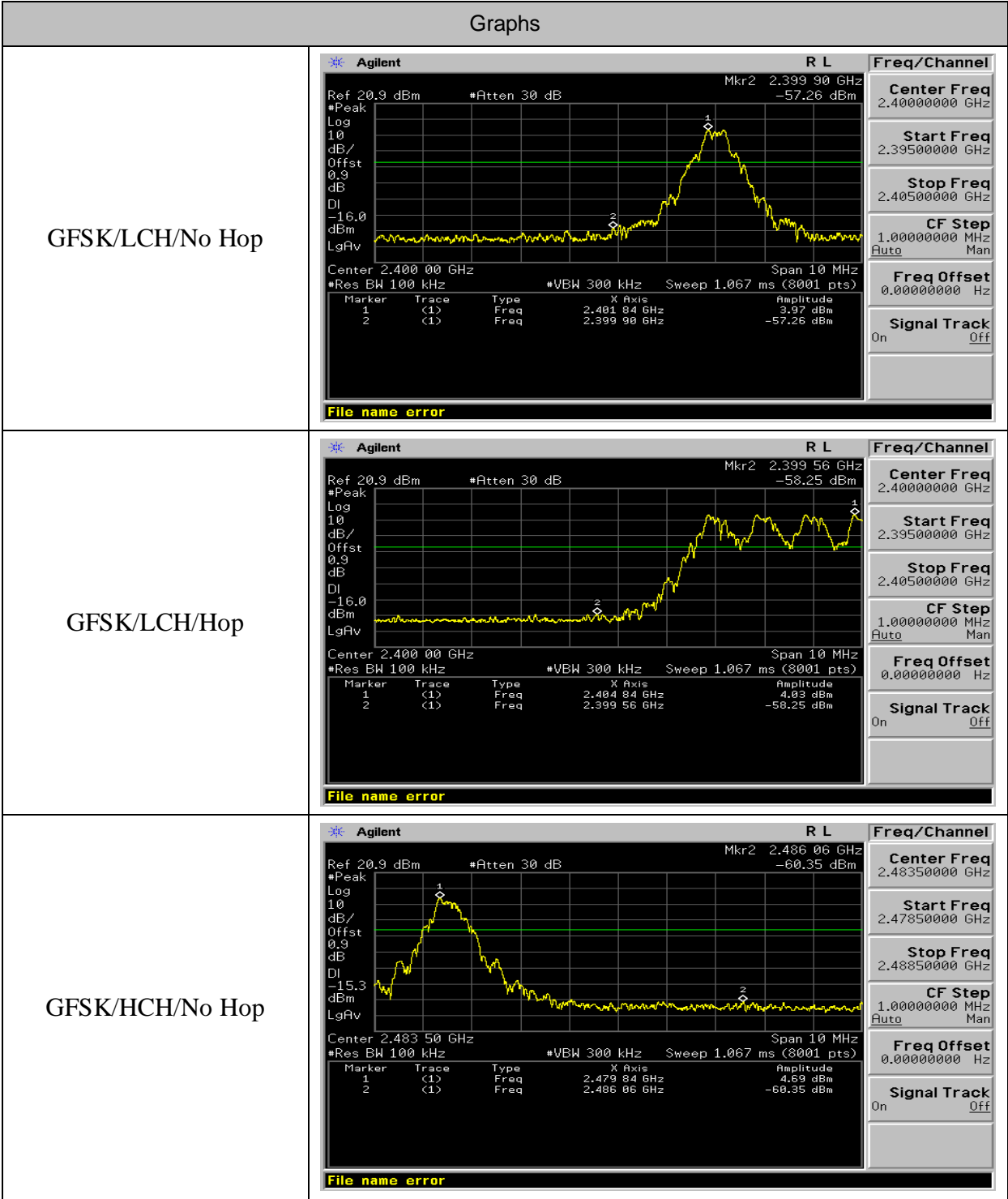
The "Factor" value can be calculated automatically by software of measurement system.

11.4 Conducted TEST RESULT

| Mode | Channel | Carrier Frequency [MHz] | Frequency Hopping | Max Spurious Level [dBm] | Verdict |
|---------------|---------|-------------------------|-------------------|--------------------------|---------|
| GFSK | LCH | 2402 | Off | -57.262 | PASS |
| | | | On | -58.254 | PASS |
| GFSK | HCH | 2480 | Off | -60.351 | PASS |
| | | | On | -49.97 | PASS |
| $\pi/4$ DQPSK | LCH | 2402 | Off | -55.767 | PASS |
| $\pi/4$ DQPSK | HCH | 2480 | Off | -55.867 | PASS |
| 8DPSK | LCH | 2402 | Off | -57.661 | PASS |
| 8DPSK | HCH | 2480 | Off | -57.712 | PASS |

Note: All modes were tested, only the worst case record in the report.

Test Graph



GFSK/HCH/Hop $\pi/4$ DQPSK/LCH/No Hop $\pi/4$ DQPSK/HCH/No Hop

8DPSK/LCH/No Hop

Agilent Spectrum Analyzer display for 8DPSK/LCH/No Hop. The plot shows a signal centered at 2.40000 GHz. The peak is at -3.18 dBm. The span is 10 MHz, resolution bandwidth is 100 kHz, and video bandwidth is 300 kHz. A table at the bottom shows two markers: Marker 1 at 2.40214 GHz and Marker 2 at 2.40000 GHz.

| Marker | Trace | Type | Freq | Amplitude |
|--------|-------|------|-------------|------------|
| 1 | (1) | Freq | 2.40214 GHz | -3.18 dBm |
| 2 | (1) | Freq | 2.40000 GHz | -57.66 dBm |

8DPSK/HCH/No Hop

Agilent Spectrum Analyzer display for 8DPSK/HCH/No Hop. The plot shows a signal centered at 2.48350 GHz. The peak is at -3.58 dBm. The span is 10 MHz, resolution bandwidth is 100 kHz, and video bandwidth is 300 kHz. A table at the bottom shows two markers: Marker 1 at 2.48004 GHz and Marker 2 at 2.48431 GHz.

| Marker | Trace | Type | Freq | Amplitude |
|--------|-------|------|-------------|------------|
| 1 | (1) | Freq | 2.48004 GHz | -3.58 dBm |
| 2 | (1) | Freq | 2.48431 GHz | -57.71 dBm |

12. NUMBER OF HOPPING FREQUENCY

12.1. MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer Start = 2.4GHz Stop = 2.4835GHz
4. Set the Spectrum Analyzer as RBW>=1%span, VBW>=RBW.

12.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

12.3. MEASUREMENT EQUIPMENT USED

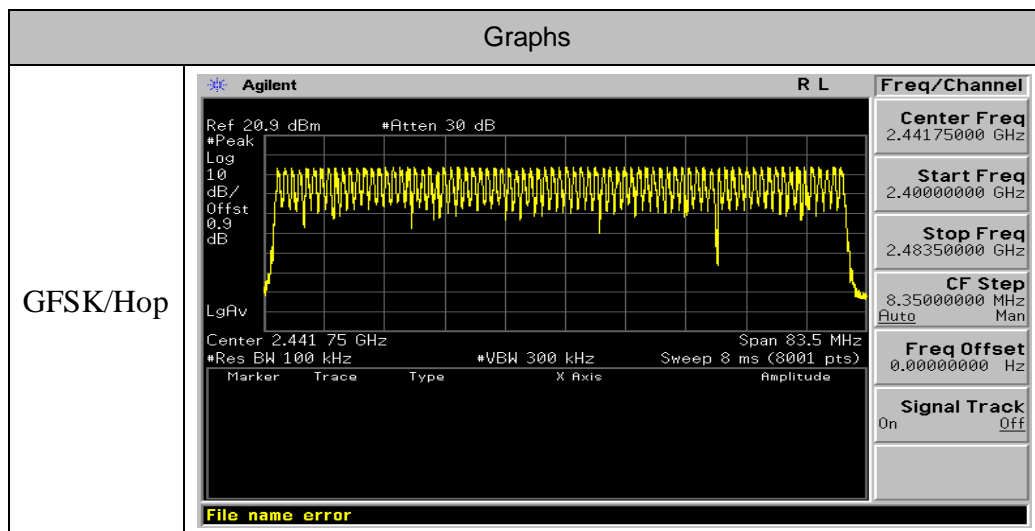
The same as described in section 6

12.4. LIMITS AND MEASUREMENT RESULT

| Mode | Channel. | Number of Hopping Channel | Verdict |
|------|----------|---------------------------|---------|
| GFSK | Hop | 79 | PASS |

Note: All modes were tested, only the worst case record in the report.

Test Graph



13. TIME OF OCCUPANCY (DWELL TIME)

13.1. MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.
3. Set Span = zero span, centered on a hopping channel
4. Set the spectrum analyzer as RBW=1MHz, VBW>=RBW, Span = 0 Hz

13.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

13.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

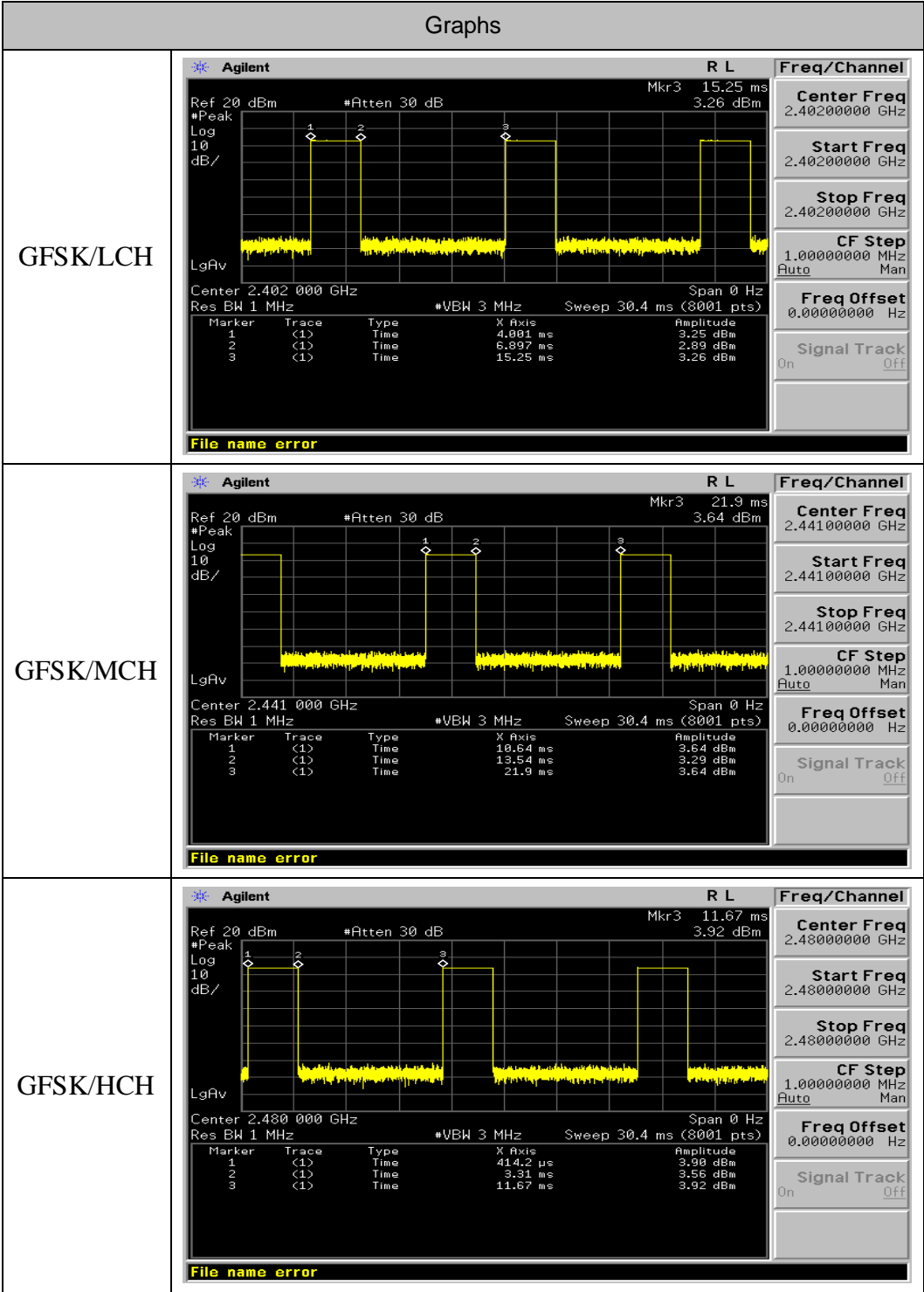
13.4. LIMITS AND MEASUREMENT RESULT

The Dwell Time=Burst Width*Total Hops. The detailed calculations are showed as follows:

- The duration for dwell time calculation: $0.4[s] * \text{hopping number} = 0.4[s] * 79[\text{ch}] = 31.6[s * \text{ch}]$;
- The burst width [ms/hop/ch], which is directly measured, refers to the duration on one channel hop.
- The hops per second for all channels: The selected EUT Conf uses a slot type of 5-Tx&1-Rx and a hopping rate of 1600 [ch*hop/s] for all channels. So the final hopping rate for all channels is $1600/6 = 266.67 [\text{ch} * \text{hop/s}]$
- The hops per second on one channel: $266.67 [\text{ch} * \text{hops/s}] / 79 [\text{ch}] = 3.38 [\text{hop/s}]$;
- The total hops for all channels within the dwell time calculation duration: $3.38 [\text{hop/s}] * 31.6[s * \text{ch}] = 106.67 [\text{hop} * \text{ch}]$;
- The dwell time for all channels hopping: $106.67 [\text{hop} * \text{ch}] * \text{Burst Width} [\text{ms/hop/ch}]$.

| Mode | Channel. | Burst Width [ms/hop/ch] | Total Hops[hop*ch] | Dwell Time[ms] | Verdict | Limit (ms) |
|------|----------|-------------------------|--------------------|----------------|---------|------------|
| GFSK | LCH | 2.896 | 106.67 | 309.872 | PASS | 400 |
| GFSK | MCH | 2.896 | 106.67 | 309.872 | PASS | 400 |
| GFSK | HCH | 2.896 | 106.67 | 309.872 | PASS | 400 |

Test Graph



14. FREQUENCY SEPARATION

14.1. MEASUREMENT PROCEDURE

- 1. Place the EUT on the table and set it in transmitting mode
- 2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer
- 3. Set 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

14.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 6.2

14.3. MEASUREMENT EQUIPMENT USED

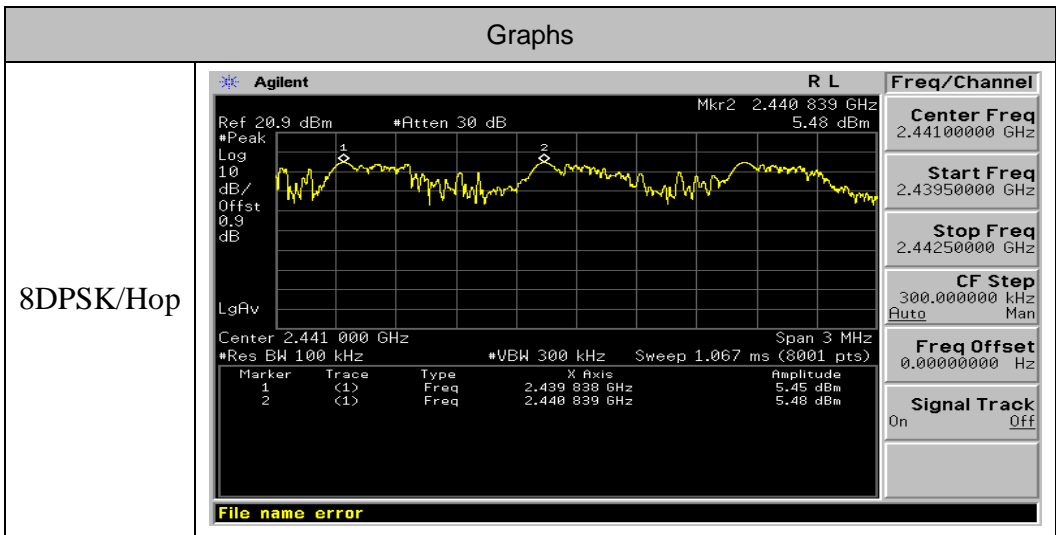
The same as described in section 6.3

14.4. LIMITS AND MEASUREMENT RESULT

| Mode | Channel. | Carrier Frequency Separation [MHz] | Verdict |
|-------|----------|------------------------------------|---------|
| 8DPSK | Hop | 1.001 | PASS |

Note: All modes were tested, only the worst case record in the report.

Test Graph



15. FCC LINE CONDUCTED EMISSION TEST

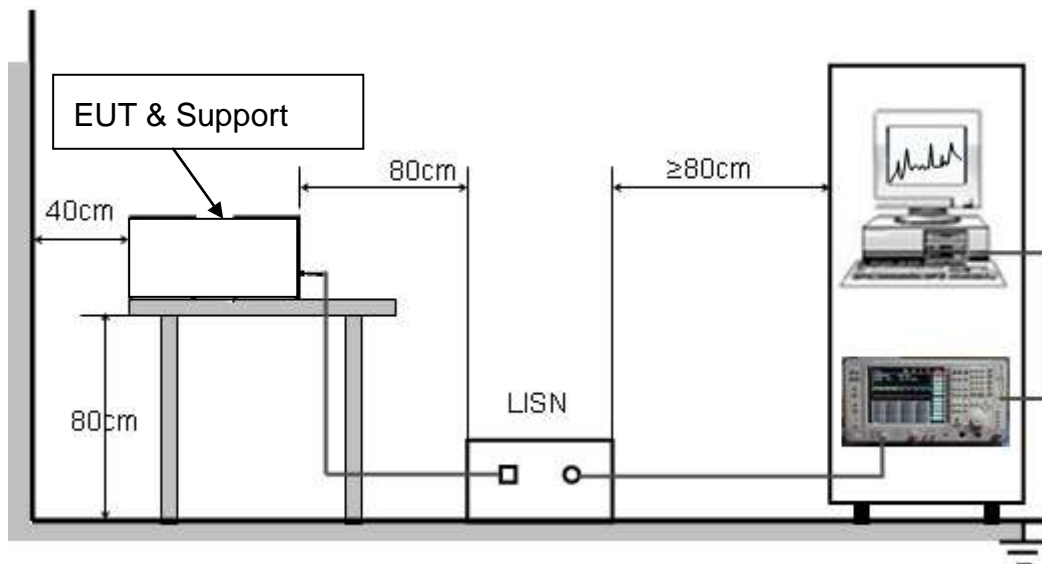
15.1. LIMITS OF LINE CONDUCTED EMISSION TEST

| Frequency | Maximum RF Line Voltage | |
|---------------|-------------------------|----------------|
| | Q.P.(dBuV) | Average(dBuV) |
| 150kHz~500kHz | 66-56 | 56-46 |
| 500kHz~5MHz | 56 | 46 |
| 5MHz~30MHz | 60 | 50 |

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

15.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



15.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.4.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received DC charging voltage by adapter which received 120V/60Hz power by a LISN..
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

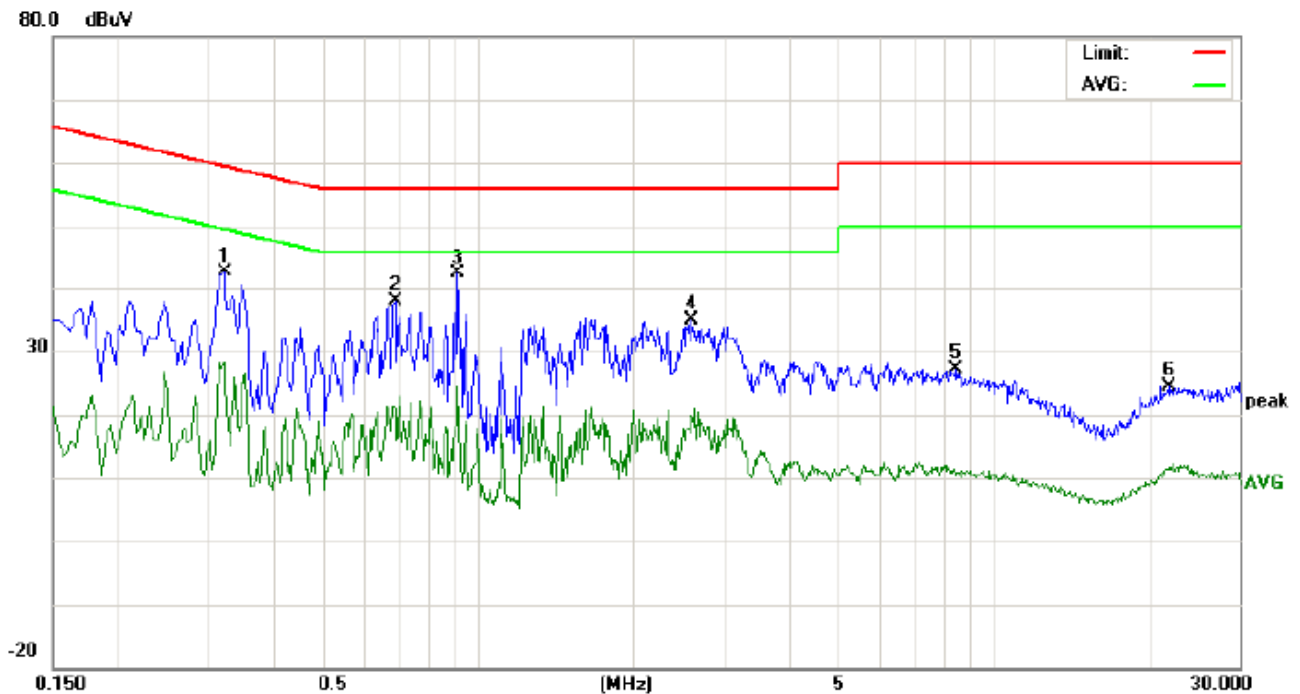
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

15.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

15.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

Line Conducted Emission Test Line 1-L

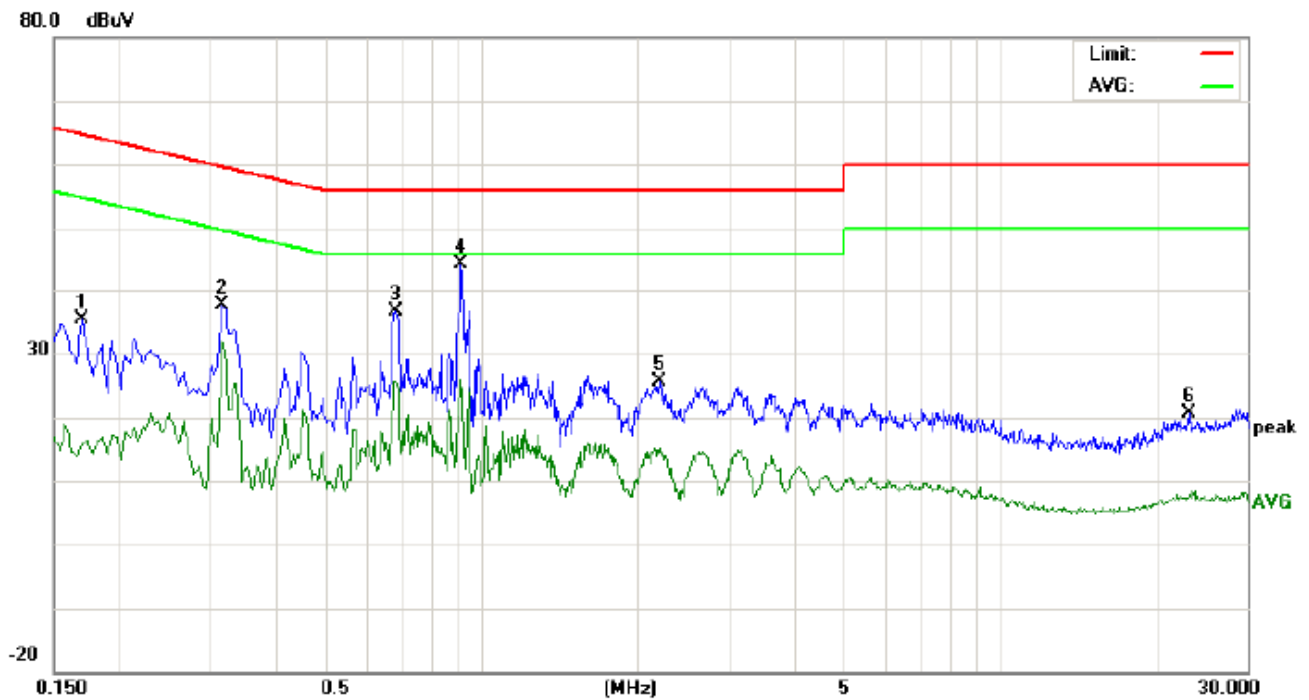


Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: Smart Phone
M/N: K1
Mode: Normal Operation(BT3.0)
Note:

Phase: **L1**
Power: AC 120V/60Hz
Temperature: 23.2
Humidity: 56.5 %

| No. | Freq. (MHz) | Reading_Level (dBuV) | | | Correct Factor | Measurement (dBuV) | | | Limit (dBuV) | | Margin (dB) | | P/F | Comment |
|-----|-------------|----------------------|----|-------|----------------|--------------------|----|-------|--------------|-------|-------------|--------|-----|---------|
| | | Peak | QP | AVG | | Peak | QP | AVG | QP | AVG | QP | AVG | | |
| 1 | 0.3220 | 32.24 | | 18.06 | 10.30 | 42.54 | | 28.36 | 59.65 | 49.65 | -17.11 | -21.29 | P | |
| 2 | 0.6900 | 27.59 | | 10.58 | 10.35 | 37.94 | | 20.93 | 56.00 | 46.00 | -18.06 | -25.07 | P | |
| 3 | 0.9180 | 31.92 | | 14.04 | 10.40 | 42.32 | | 24.44 | 56.00 | 46.00 | -13.68 | -21.56 | P | |
| 4 | 2.6060 | 24.37 | | 9.44 | 10.46 | 34.83 | | 19.90 | 56.00 | 46.00 | -21.17 | -26.10 | P | |
| 5 | 8.4940 | 16.89 | | 0.15 | 10.34 | 27.23 | | 10.49 | 60.00 | 50.00 | -32.77 | -39.51 | P | |
| 6 | 21.9100 | 14.30 | | 1.15 | 10.12 | 24.42 | | 11.27 | 60.00 | 50.00 | -35.58 | -38.73 | P | |

Line Conducted Emission Test Line 2-N



Site: Conduction Phase: **N** Temperature: 23.2
Limit: FCC Class B Conduction(QP) Power: AC 120V/60Hz Humidity: 56.5 %
EUT: Smart Phone
M/N: K1
Mode: Normal Operation(BT3.0)
Note:

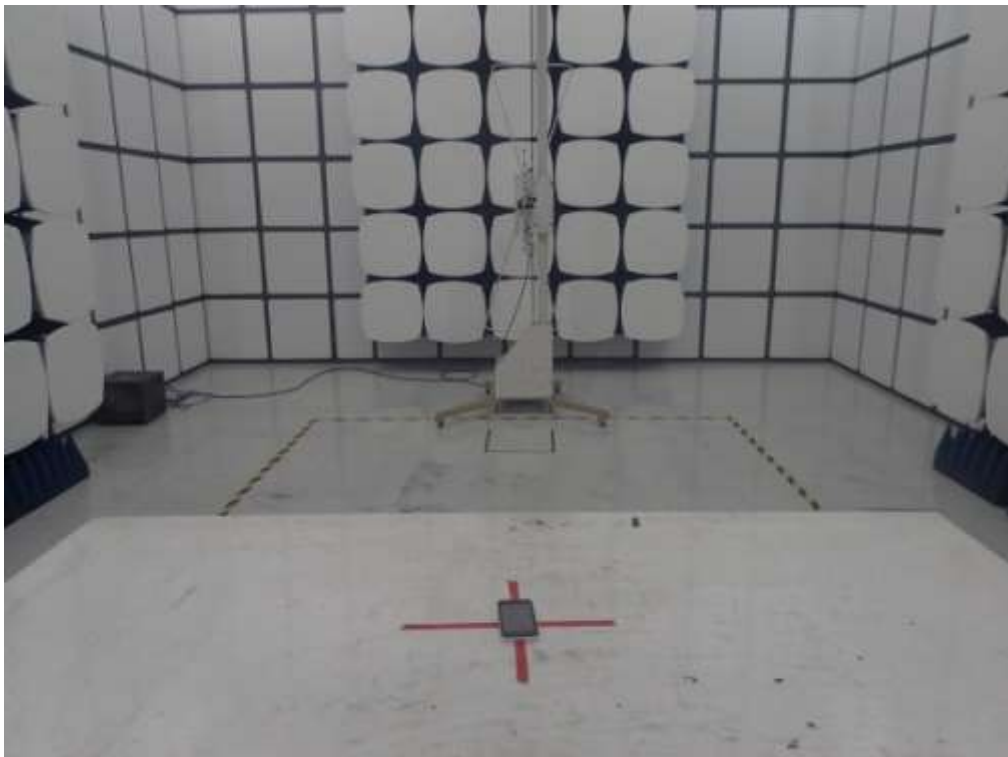
| No. | Freq. (MHz) | Reading_Level (dBuV) | | | Correct Factor dB | Measurement (dBuV) | | | Limit (dBuV) | | Margin (dB) | | P/F | Comment |
|-----|----------------|-------------------------|----|-------|-------------------------|-----------------------|----|-------|-----------------|-------|----------------|--------|-----|---------|
| | | Peak | QP | AVG | | Peak | QP | AVG | QP | AVG | QP | AVG | | |
| 1 | 0.1700 | 25.19 | | 5.82 | 10.18 | 35.37 | | 16.00 | 64.96 | 54.96 | -29.59 | -38.96 | P | |
| 2 | 0.3180 | 27.38 | | 21.69 | 10.30 | 37.68 | | 31.99 | 59.76 | 49.76 | -22.08 | -17.77 | P | |
| 3 | 0.6860 | 26.23 | | 15.23 | 10.34 | 36.57 | | 25.57 | 56.00 | 46.00 | -19.43 | -20.43 | P | |
| 4 | 0.9140 | 34.00 | | 15.53 | 10.40 | 44.40 | | 25.93 | 56.00 | 46.00 | -11.60 | -20.07 | P | |
| 5 | 2.2060 | 15.34 | | 4.87 | 10.31 | 25.65 | | 15.18 | 56.00 | 46.00 | -30.35 | -30.82 | P | |
| 6 | 23.1940 | 10.56 | | -2.60 | 10.11 | 20.67 | | 7.51 | 60.00 | 50.00 | -39.33 | -42.49 | P | |

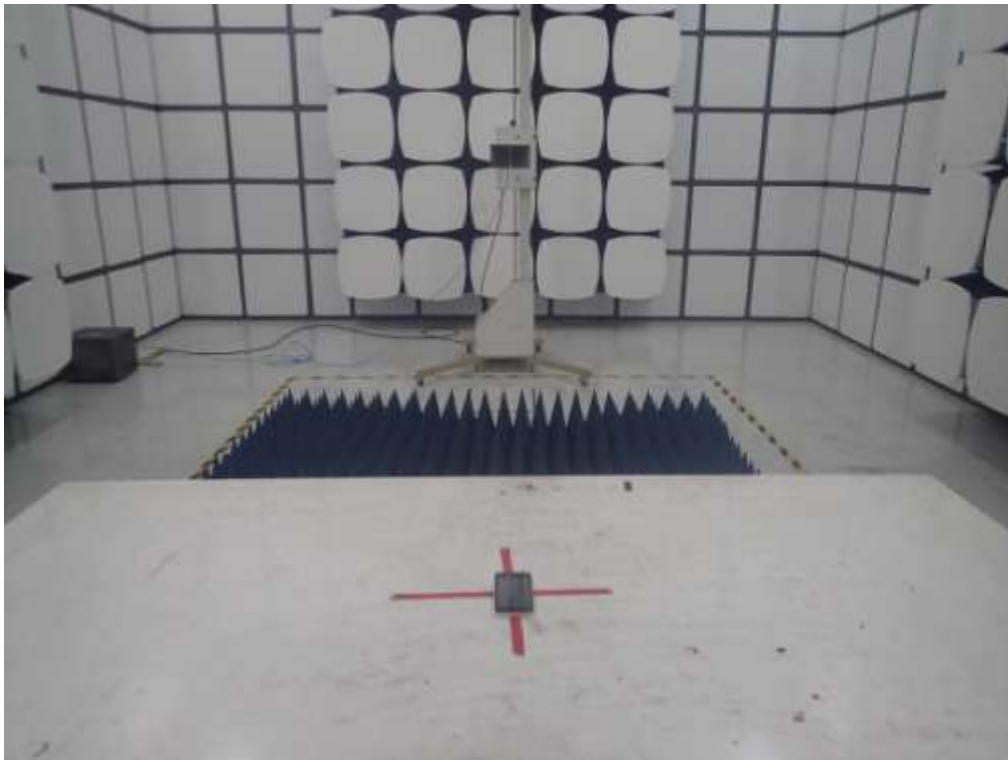
APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP



FCC RADIATED EMISSION TEST SETUP





APPENDIX B: PHOTOGRAPHS OF EUT

TOTAL VIEW OF EUT



TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



LEFT VIEW OF EUT



RIGHT VIEW OF EUT



OPEN VIEW OF EUT-1



OPEN VIEW OF EUT-2

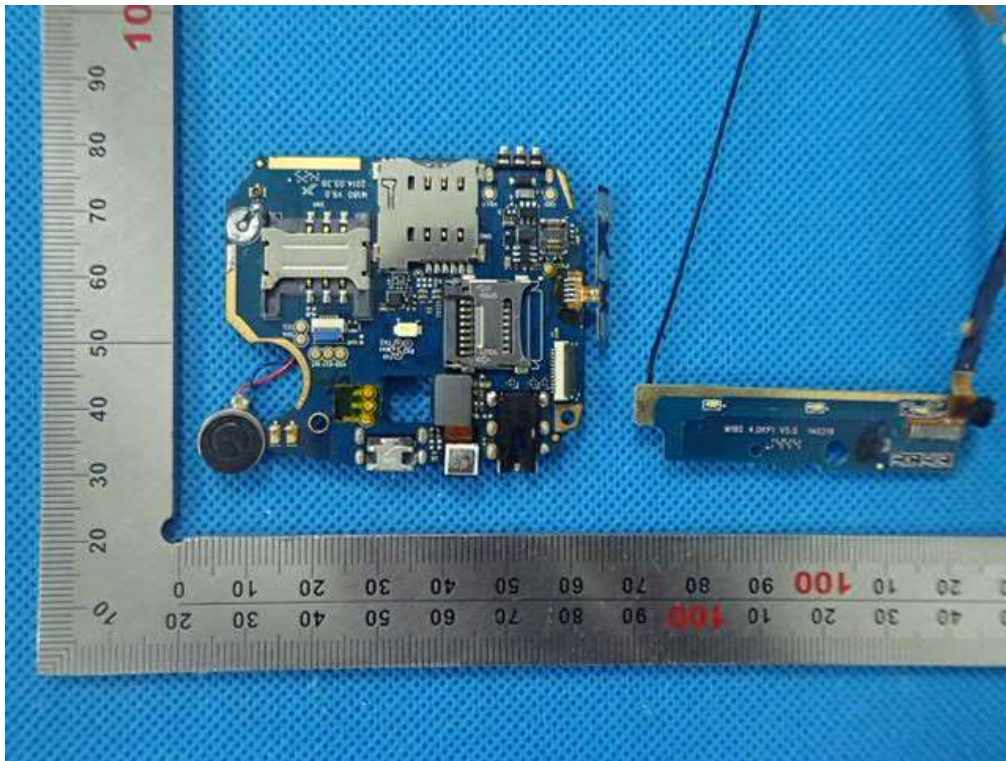
BT&WIFI
Antenna



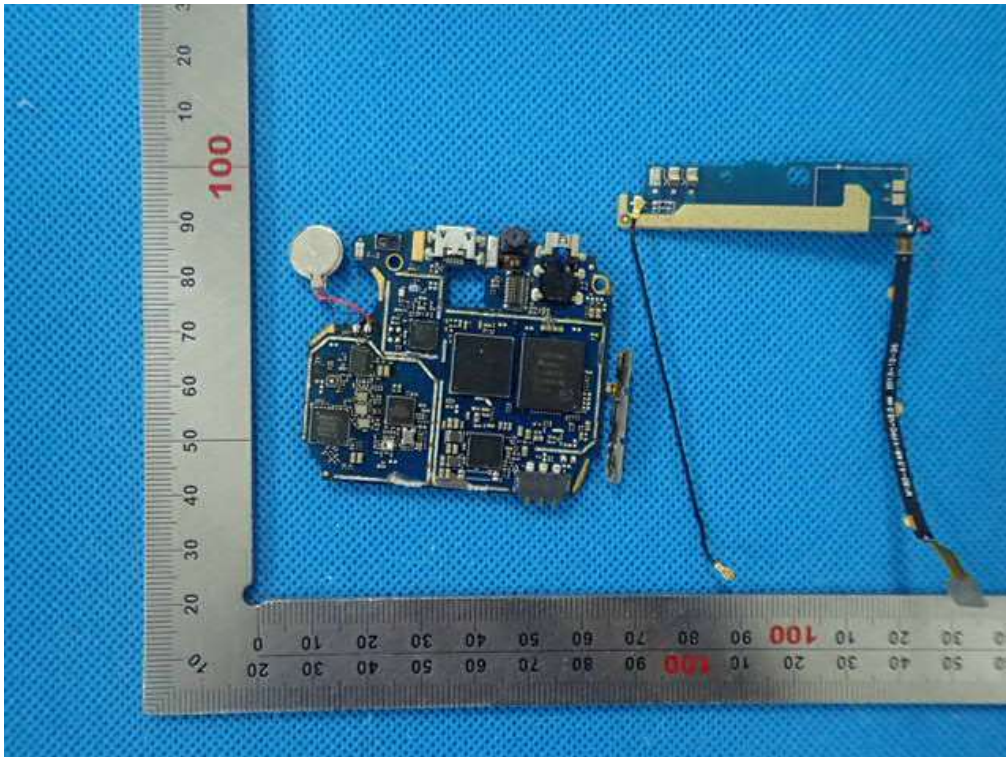
OPEN VIEW OF EUT-3



INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



----END OF REPORT----