FCC Test Report

Report No.: AGC00639150501FE03

FCC ID	:	ZL5B30
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	3G Feature phone
BRAND NAME	:	CAT
MODEL NAME	:	B30
CLIENT	:	Bullitt Group
DATE OF ISSUE	:	May 25, 2015
STANDARD(S) **TEST PROCEDURE(S)**	:	FCC Part 15 Rules DA 00-705
REPORT VERSION	:	V1.0

Attestation of ***G***lobal ***C***ompliance (Shenzhen) Co., Ltd

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	May 25, 2015	Valid	Original Report

TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY 5
2. GENERAL INFORMATION 6
2.1. PRODUCT DESCRIPTION 6
2.2. TABLE OF CARRIER FREQUENCYS 6
2.3. RECEIVER INPUT BANDWIDTH 7
2.4. EXAMPLE OF A HOPPING SEQUENCY IN DATA MODE 7
2.5. EQUALLY AVERAGE USE OF FREQUENCIES AND BEHAVIOUR 7
2.6. RELATED SUBMITTAL(S) / GRANT (S) 8
2.7. TEST METHODOLOGY 8
2.8. SPECIAL ACCESSORIES 8
2.9. EQUIPMENT MODIFICATIONS 8
3. MEASUREMENT UNCERTAINTY 9
4. DESCRIPTION OF TEST MODES 9
5. SYSTEM TEST CONFIGURATION 10
5.1. CONFIGURATION OF EUT SYSTEM 10
5.2. EQUIPMENT USED IN EUT SYSTEM 10
5.3. SUMMARY OF TEST RESULTS 10
6. TEST FACILITY 11
7. PEAK OUTPUT POWER 13
7.1. MEASUREMENT PROCEDURE 13
7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) 13
7.3. LIMITS AND MEASUREMENT RESULT 14
8. 20DB BANDWIDTH 18
8.1. MEASUREMENT PROCEDURE 18
8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) 18
8.3. LIMITS AND MEASUREMENT RESULTS 18
9. CONDUCTED SPURIOUS EMISSION 19
9.1. MEASUREMENT PROCEDURE 22
9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) 22
9.3. MEASUREMENT EQUIPMENT USED 22
9.4. LIMITS AND MEASUREMENT RESULT 22
10. RADIATED EMISSION 41
10.1. MEASUREMENT PROCEDURE 41
10.2. TEST SETUP 43

10.3. TEST RESULT 44
11. BAND EDGE EMISSION 51
11.1. MEASUREMENT PROCEDURE 51
11.2. TEST SET-UP 51
11.3. Radiated TEST RESULT 52
11.4 Conducted TEST RESULT 53
12. NUMBER OF HOPPING FREQUENCY 57
12.1. MEASUREMENT PROCEDURE 57
12.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION) 57
12.3. MEASUREMENT EQUIPMENT USED 57
12.4. LIMITS AND MEASUREMENT RESULT 57
13. TIME OF OCCUPANCY (DWELL TIME) 58
13.1. MEASUREMENT PROCEDURE 58
13.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION) 58
13.3. MEASUREMENT EQUIPMENT USED 58
13.4. LIMITS AND MEASUREMENT RESULT 58
14. FREQUENCY SEPARATION 60
14.1. MEASUREMENT PROCEDURE 60
14.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION) 60
14.3. MEASUREMENT EQUIPMENT USED 60
14.4. LIMITS AND MEASUREMENT RESULT 60
15. FCC LINE CONDUCTED EMISSION TEST 61
15.1. LIMITS OF LINE CONDUCTED EMISSION TEST 61
15.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST 61
15.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST 62
15.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST 62
15.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST 63
APPENDIX A: PHOTOGRAPHS OF TEST SETUP 65
APPENDIX B: PHOTOGRAPHS OF EUT 66

1. VERIFICATION OF CONFORMITY

Applicant	Bullitt Group
Address	Unit 4,The Aquarium Kings Street, Reading, Berkshire RG1 4AN
Manufacturer	Leadsky International Development Co., Ltd.
Address	4F, BLDG B, HUAFENG INDUSTRIAL PAPK, GUSHU,XIXIANG, BAO'AN DISTRICT, SHENZHEN, CHINA
Product Designation	3G Feature phone
Brand Name	CAT
Test Model	B30
Date of test	May 15,2015 to May 22,2015
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-BR/RF

We hereby certify that:
The above equipment was tested by Compliance Certification Services (Shenzhen) Inc. 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.

Prepared By	Matt Zhang	
	Matt Zhang	May 25, 2015
Checked By	Kidd Yang	
	Kidd Yang	May 25, 2015
Authorized By	Solger Zhang	
	Solger Zhang	May 25, 2015

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is “3G Feature 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	-0.75dBm(Max)
Bluetooth Version	V2.1+EDR
Modulation	GFSK, π /4-DQPSK, 8DPSK
Number of channels	79
Hardware Version	S721M_MB_V1.0
Software Version	B30_L02_2015_05_05_V0.3
Antenna Designation	Integrated Antenna
Antenna Gain	0.8dBi
Power Supply	DC3.7V by Battery

2.2. TABLE OF CARRIER FREQUENCYS

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 of multislot 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 send on the same frequency, it is send on the next frequency of the hopping sequence.

2.4. EXAMPLE OF A HOPPING SEQUENCY 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 24MSB's of the 48BD_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 ehavior zation with other units only offset are used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5us.The clock has a cycle of about one day(23h30).In most case it is implemented as 28 bit counter. For the deriving of the hopping sequence the entire. LAP(24 bits),4LSB's(4bits)(Input 1) and the 27MSB's of the clock(Input 2) are used. With this input values different mathematical procedures(permutations, additions, XOR-operations)are performed to generate te Sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions the Bluetooth system has the following ehavior:

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 transmission is longer(and it Cannot be shorter) than the minimum resolution of the clock(312.5us).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: ZL5B30** 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

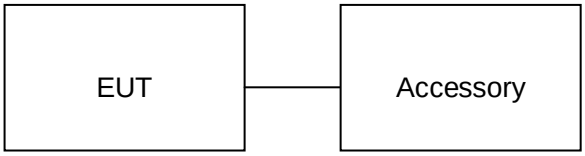
NO.	TEST MODE DESCRIPTION
1	Low channel GFSK
2	Middle channel GFSK
3	High channel GFSK
4	Low channel π /4-DQPSK
5	Middle channel π /4-DQPSK
6	High channel π /4-DQPSK
7	Low channel 8DPSK
8	Middle channel 8DPSK
9	High channel 8DPSK
10	Normal Hopping

Note:
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	3G Feature phone	B30	FCC ID:ZL5B30	EUT
2	Adapter	ASUC30a-050050	5V / 500mA	Accessory
3	Battery	BL-5C	DC3.7V / 1000mAh	Accessory
4	Earphone	B30	N/A	Accessory
5	USB Cable	B30	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	Compliance Certification Services (Shenzhen) Inc.
Location	No.10-1 Mingkeda Logistics park, No.18, Huanguan South Rd.,Guan Lan Town, Baoan District, Shenzhen, China
Description	Test Firm Registration Number: 441872

Description	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Power Probe	R&S	NRP-Z23	100323	07/25/2014	07/24/2015
RF attenuator	N/A	RFA20db	68	07/25/2014	07/24/2015
Spectrum Analyzer	Agilent	E4440A	US41421290	02/17/2015	02/16/2016
Amplifier	EM	EM30180	0607030	02/17/2015	02/16/2016
Horn Antenna	EM	EM-AH-10180	67	02/17/2015	02/16/2016
Horn Antenna	A.H. Systems Inc.	SAS-574	N/A	07/25/2014	07/24/2015
EMI Test Receiver	Rohde & Schwarz	ESCI	100694	07/25/2014	07/24/2015
WIDEBAND REQUENCY ANTENNA	SCHWARZBECK	VULB9168	26	08/16/2014	08/15/2015
LISN	R&S	ESH3-Z5	8389791009	07/25/2014	07/24/2015
Loop Antenna	A.H.	SAS-562B	SEL0097	05/09/2015	05/08/2016
Radiation Cable 1	Sat	RE1	R003	06/04/2014	06/03/2015
Radiation Cable 2	Sat	RE2	R002	06/04/2014	06/03/2015
Conduction Cable	Sat	CE1	C001	06/04/2014	06/03/2015

Radiated Emission Test Site 966(2)					
Name of Equipment	**Manufacturer**	**Model**	**S/N**	**Calibration Date**	**Calibration Due.**
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	Mar.01, 2015	Mar.01, 2016
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	Mar.09, 2015	Mar.08, 2016
Amplifier	MITEQ	AM-1604-3000	1123808	Mar.18, 2015	Mar.17, 2016
High Noise Amplifier	Agilent	8449B	3008A01838	Mar.18, 2015	Mar.17, 2016
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	July 10, 2014	July 09, 2015
Bilog Antenna	SCHAFFNER	CBL6143	5082	Mar.01, 2015	Mar.01, 2016
Horn Antenna	SCHWARZBECK	BBHA9120	D286	Mar.01, 2015	Mar.01, 2016
Loop Antenna	COM-POWER	AL-130	121044	Sep.27, 2014	Sep.26, 2015
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	Feb.28, 2015	Feb.27, 2016
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

Conducted Emission Test Site					
Name of Equipment	**Manufacturer**	**Model**	**S/N**	**Calibration Date**	**Calibration Due.**
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	Mar.09, 2015	Mar.08, 2016
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543-WX	Mar.09, 2015	Mar.08, 2016
LISN	EMCO	3825/2	8901-1459	Mar.09, 2015	Mar.08, 2016
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	Mar.04, 2015	Mar.03, 2016
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

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 ≥ RBW.
4. Record the maximum power from the Spectrum Analyzer.

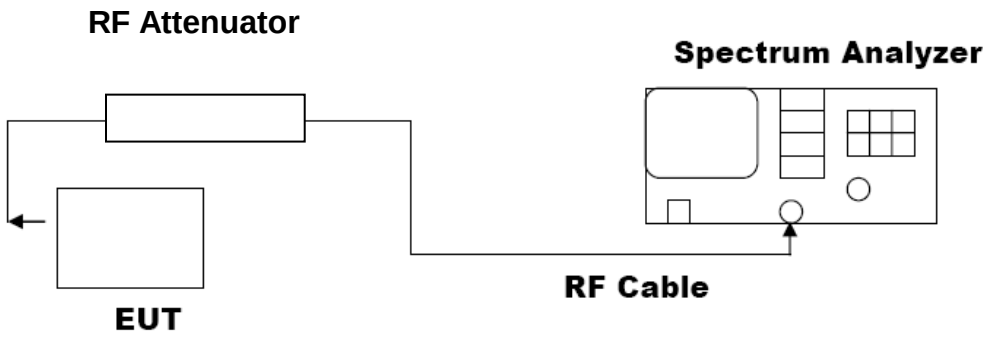
For average power test:

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).

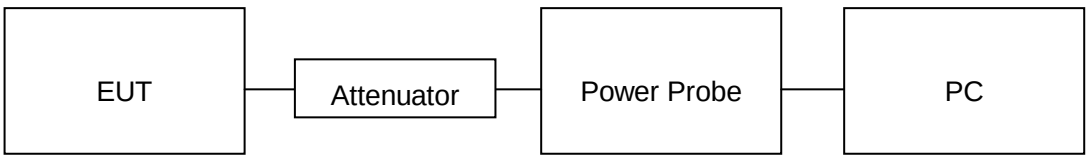
Note：The EUT was tested according to DA000705 for compliance to FCC 47CFR 15.247 requirements.

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

PEAK POWER TEST SETUP



AVERAGE POWER SETUP



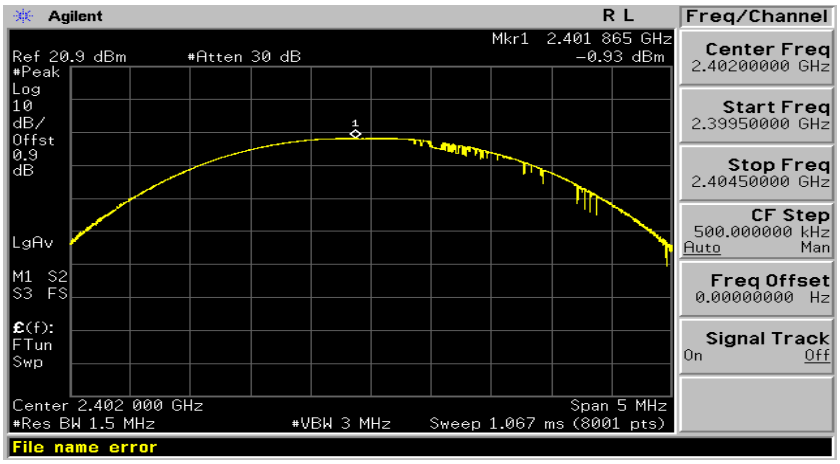
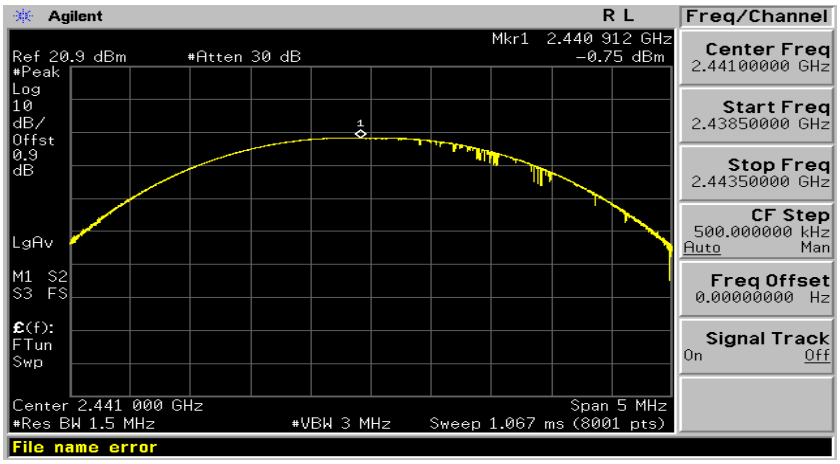
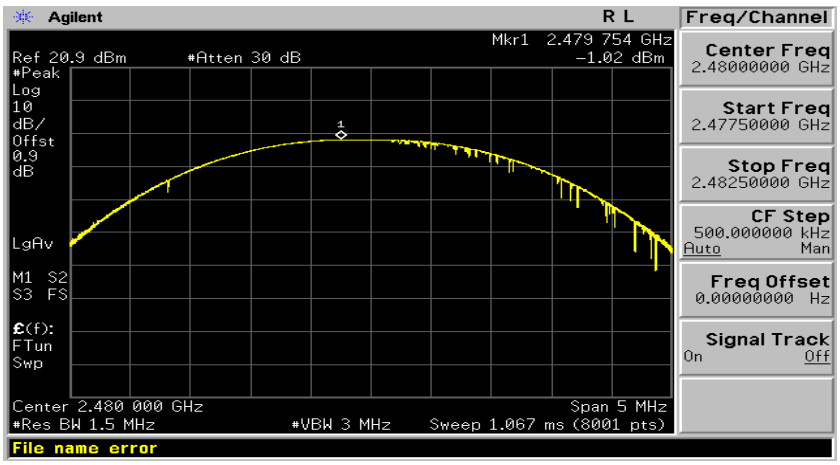
7.3. LIMITS AND MEASUREMENT RESULT

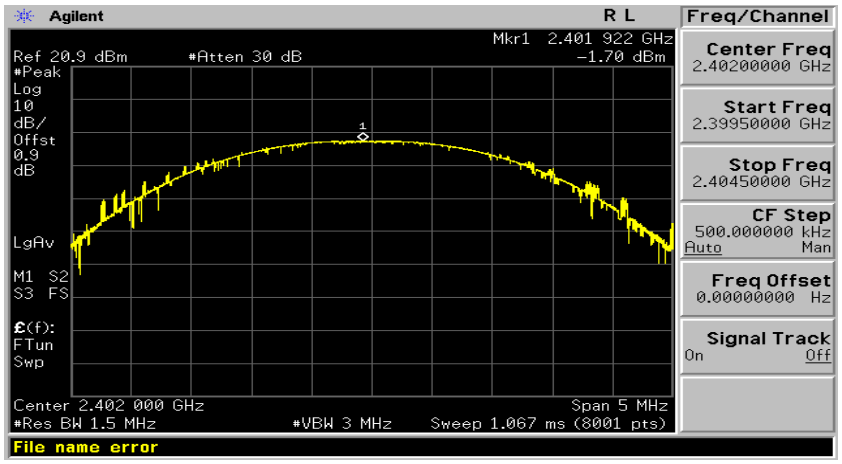
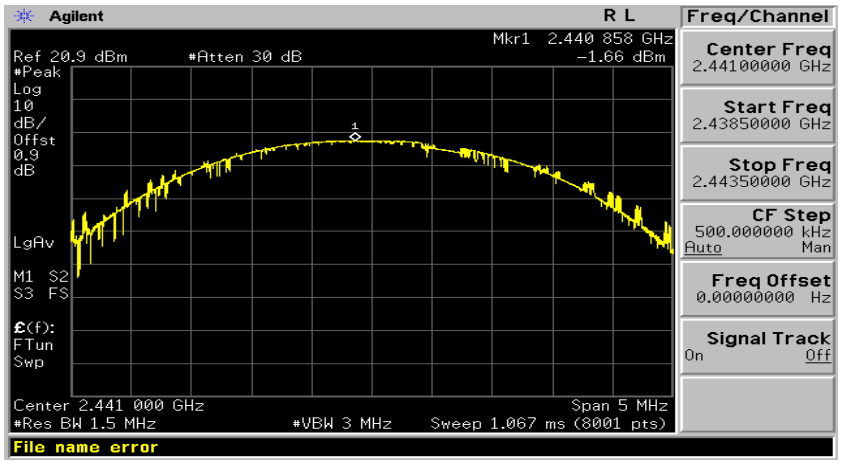
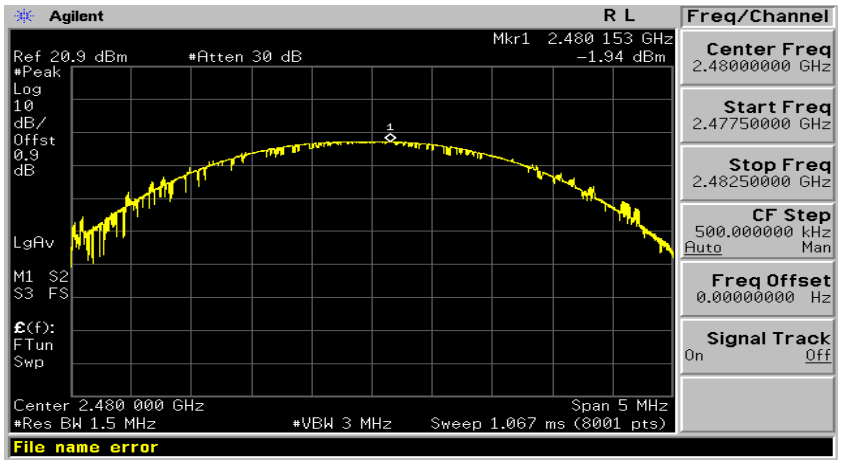
PEAK OUTPUT POWER MEASUREMENT RESULT FOR GFSK MOUDULATION				
Frequency (GHz)	**Average Power (dBm)**	**Peak Power (dBm)**	**Applicable Limits (dBm)**	**Pass or Fail**
2.402	-2.94	-0.93	21	Pass
2.441	-2.76	-0.75	21	Pass
2.480	-3.03	-1.02	21	Pass

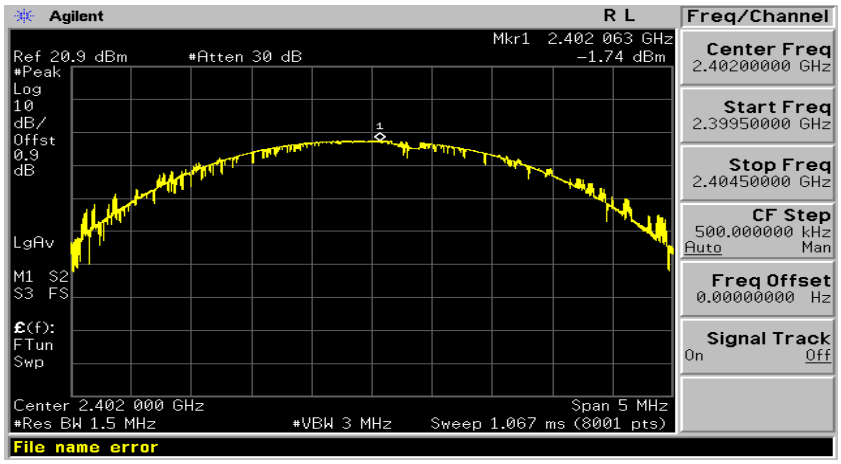
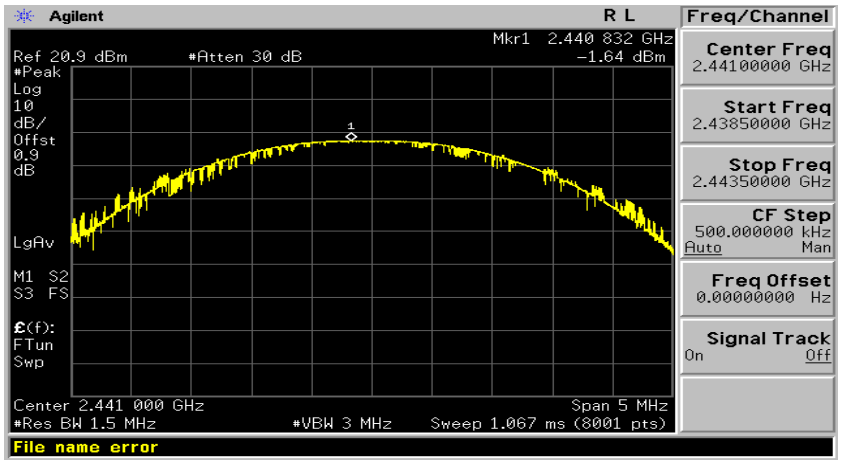
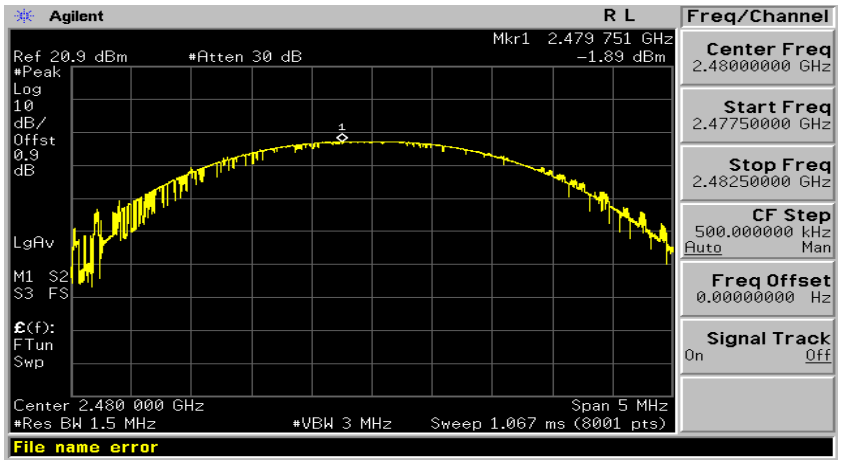
PEAK OUTPUT POWER MEASUREMENT RESULT FOR Ⅱ /4-DQPSK MODULATION				
Frequency (GHz)	**Average Power (dBm)**	**Peak Power (dBm)**	**Applicable Limits (dBm)**	**Pass or Fail**
2.402	-3.71	-1.7	21	Pass
2.441	-3.67	-1.66	21	Pass
2.480	-3.95	-1.94	21	Pass

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	-3.75	-1.74	21	Pass
2.441	-3.65	-1.64	21	Pass
2.480	-3.9	-1.89	21	Pass

Test Graph

Graphs	
GFSK/LCH	
GFSK/MCH	
GFSK/HCH	

π /4DQPSK/LCH	
π /4DQPSK/MCH	
π /4DQPSK/HCH	

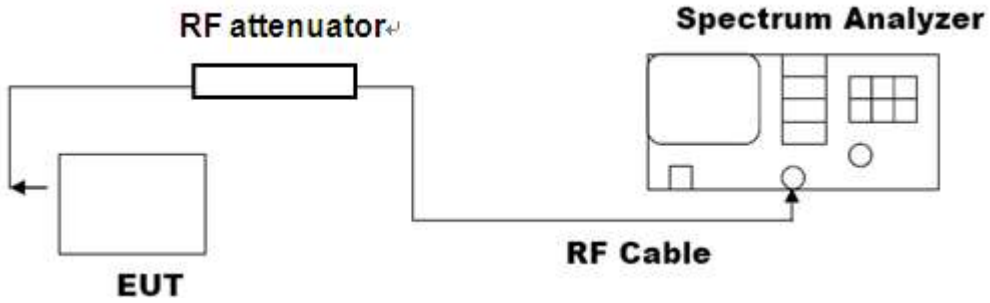
8DPSK/LCH	
8DPSK/MCH	
8DPSK/HCH	

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 hoping channel
   RBW ≥ 1% of the 20 dB bandwidth, VBW ≥ RBW; Sweep = auto; Detector function = peak
4. Set SPA Trace 1 Max hold, then View.

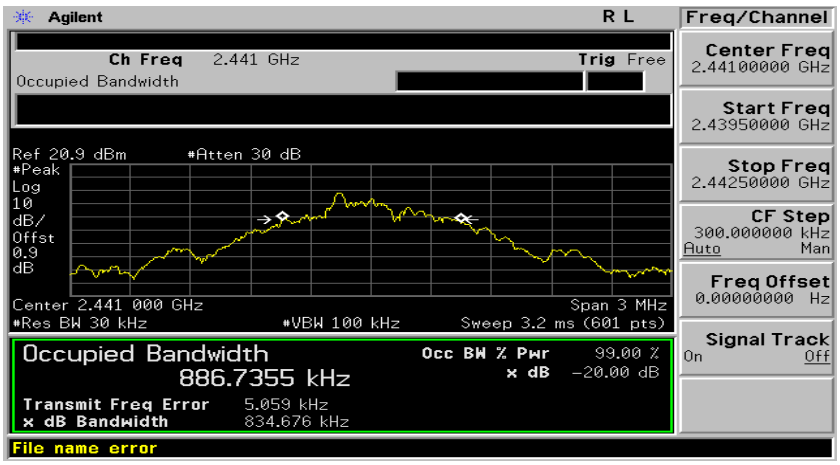
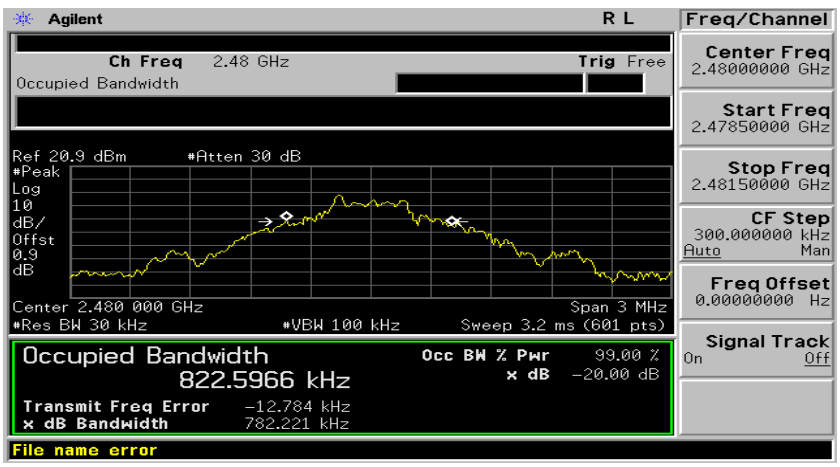
8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

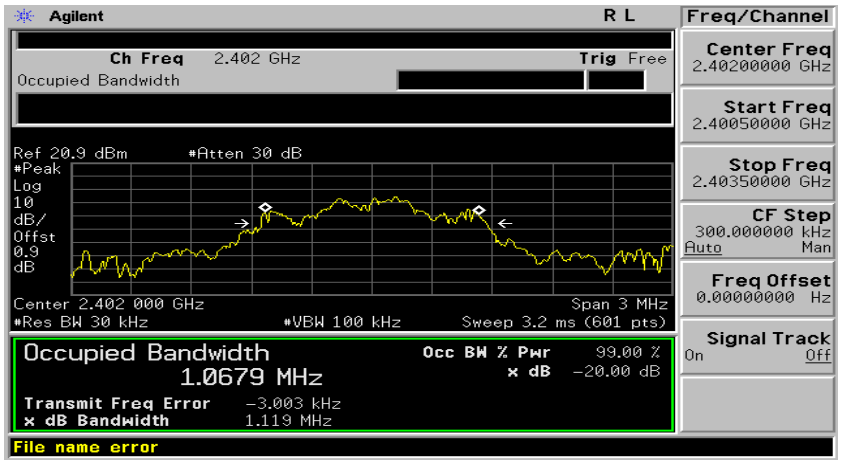
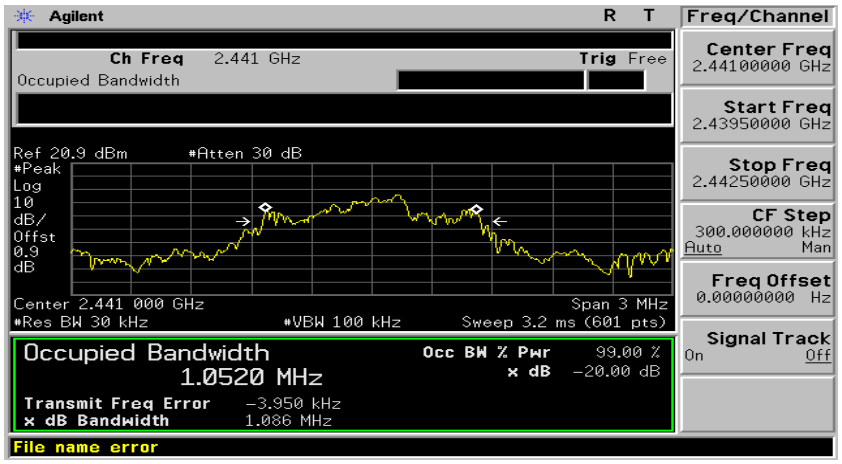
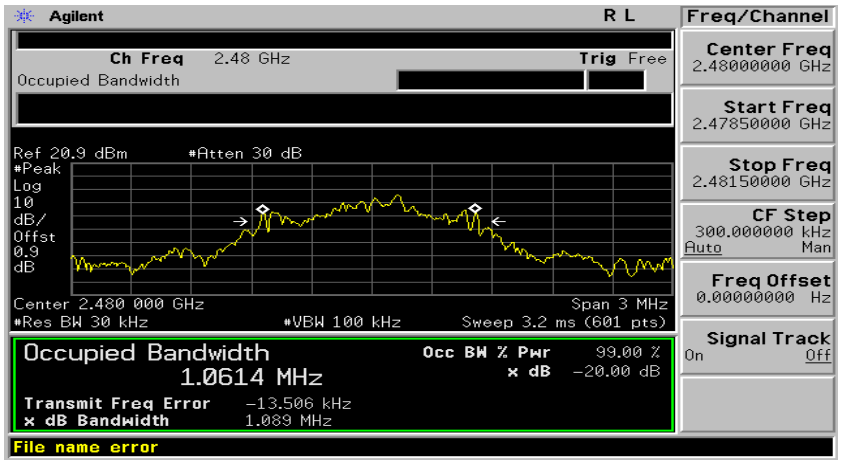


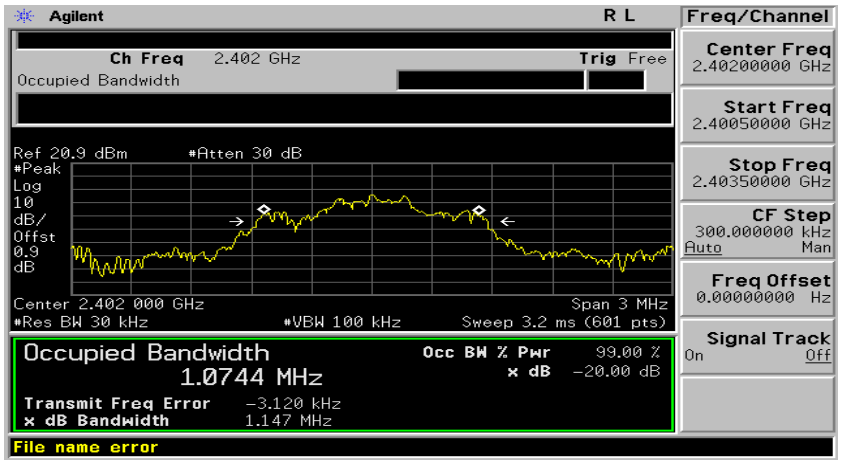
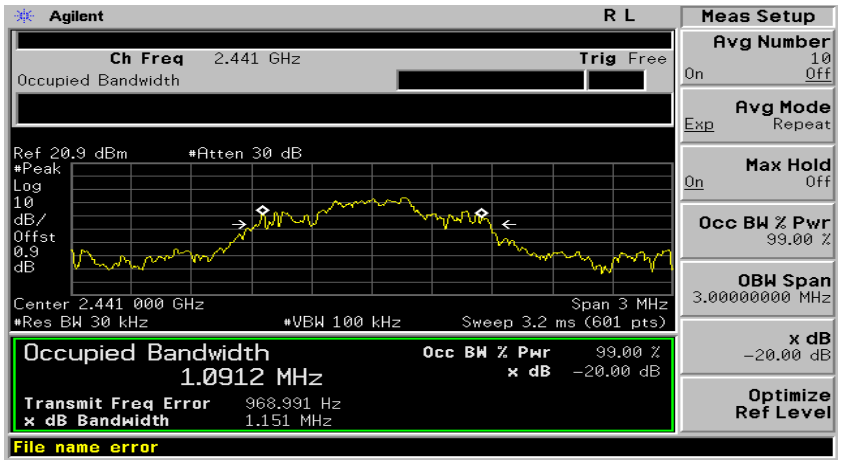
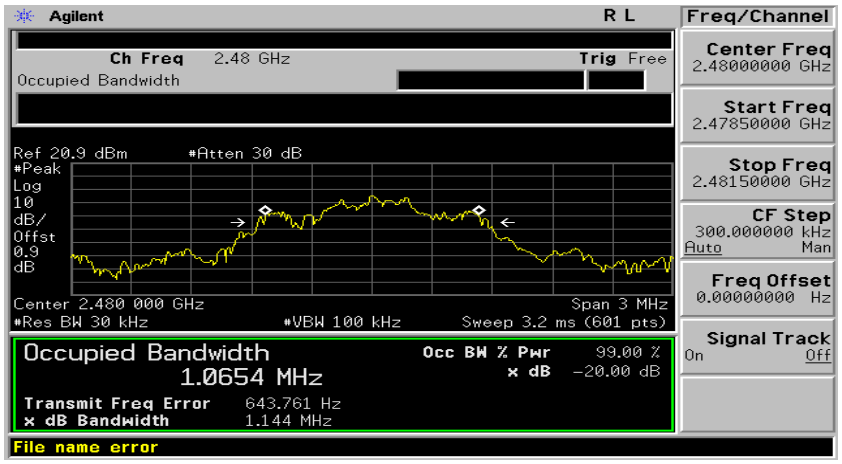
8.3. LIMITS AND MEASUREMENT RESULTS

Mode	Channel.	EBW [MHz]	OBW [MHz]	Verdict
GFSK	LCH	0.7843	0.8325	PASS
GFSK	MCH	0.8347	0.8867	PASS
GFSK	HCH	0.7822	0.8226	PASS
π/4DQPSK	LCH	1.1192	1.0679	PASS
π/4DQPSK	MCH	1.0863	1.0520	PASS
π/4DQPSK	HCH	1.0886	1.0614	PASS
8DPSK	LCH	1.1470	1.0744	PASS
8DPSK	MCH	1.1505	1.0912	PASS
8DPSK	HCH	1.1444	1.0654	PASS

Test Graph

Graphs	
GFSK/LCH	
GFSK/MCH	
GFSK/HCH	

π /4DQPSK/LCH	
π /4DQPSK/MCH	
π /4DQPSK/HCH	

8DPSK/LCH	
8DPSK/MCH	
8DPSK/HCH	

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 ≥ 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

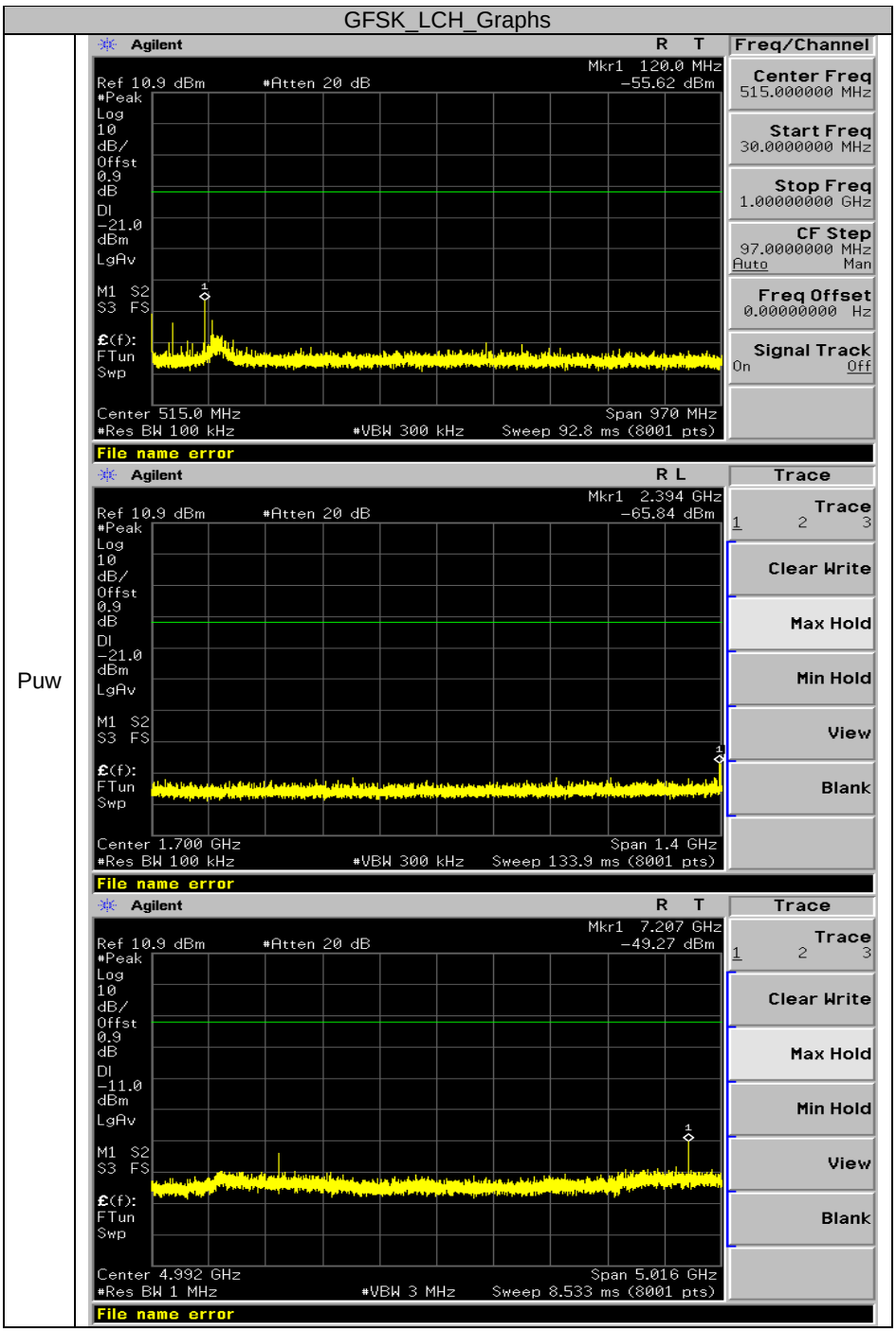
9.3. MEASUREMENT EQUIPMENT USED

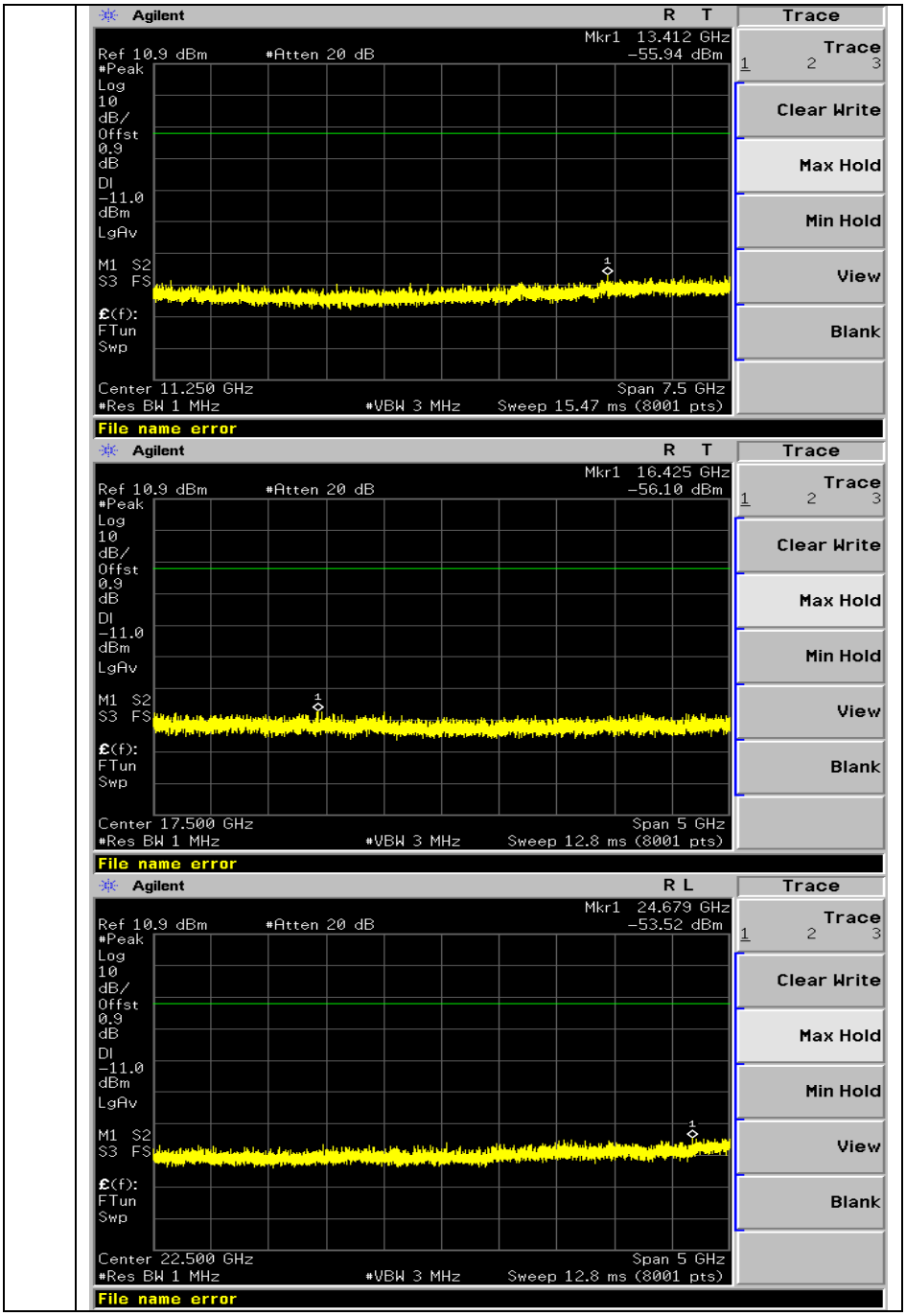
The same as described in section 6

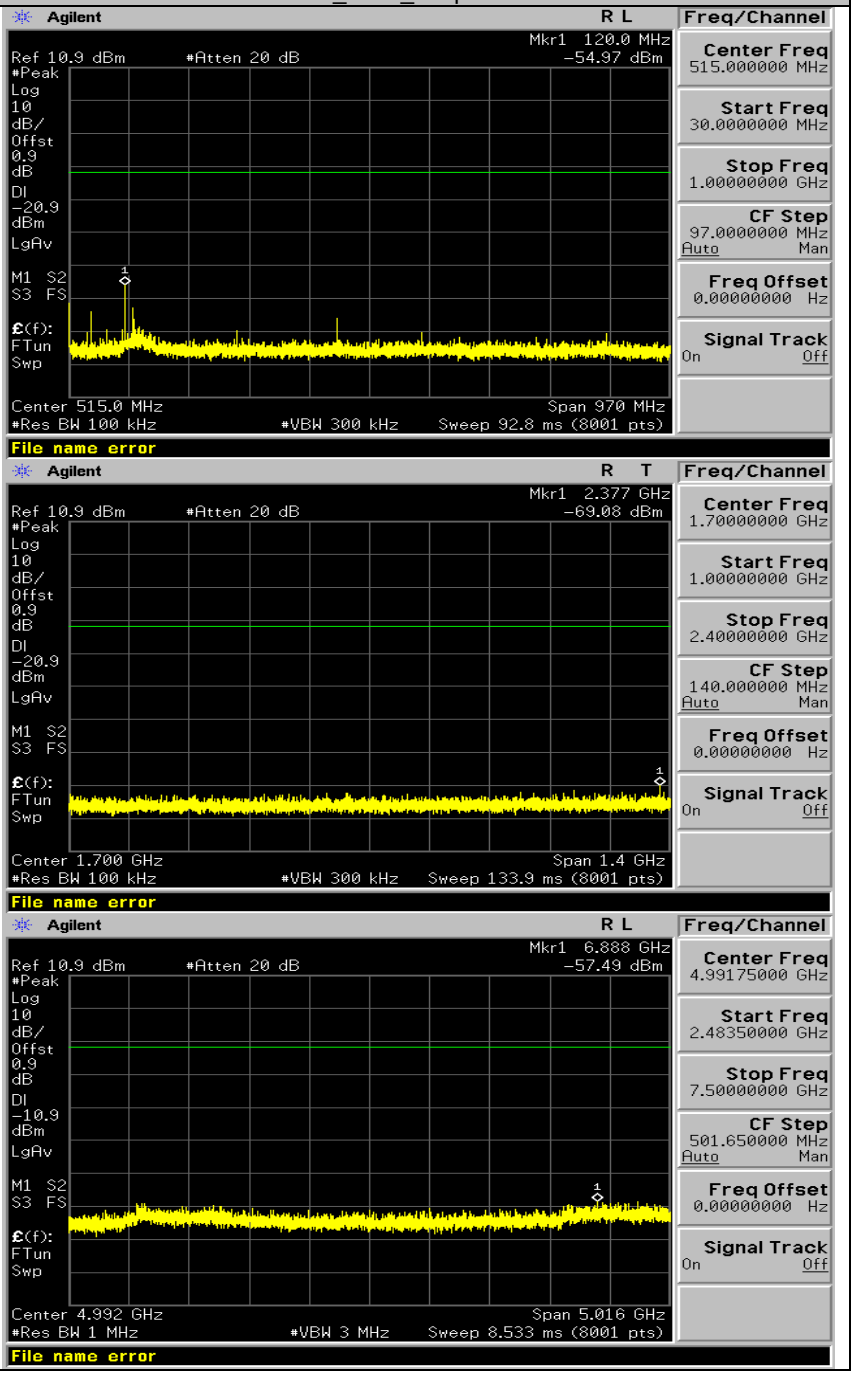
9.4. LIMITS AND MEASUREMENT RESULT

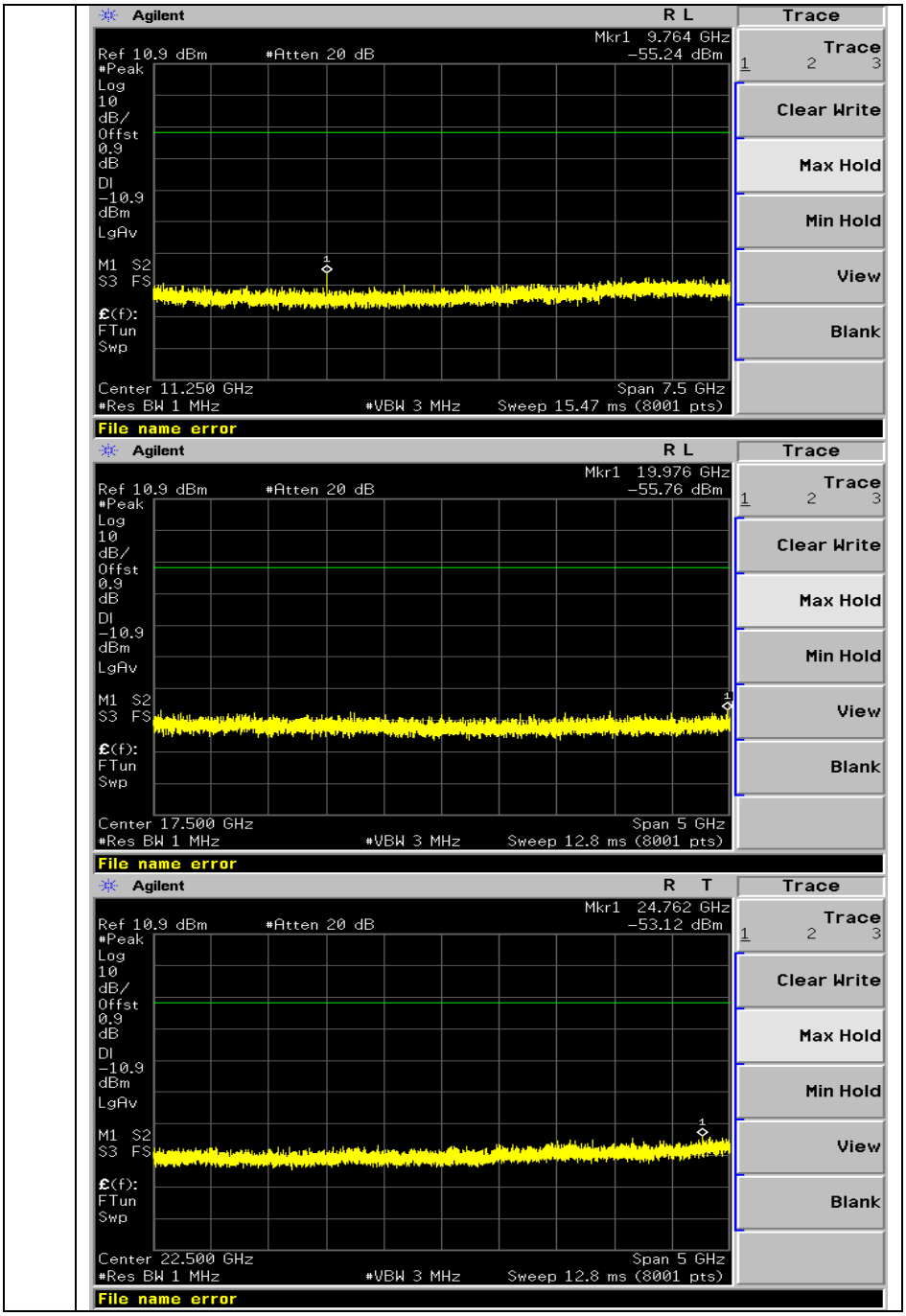
LIMITS AND MEASUREMENT RESULT		
Applicable Limits	**Measurement Result**	
	Test Data	**Criteria**
In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 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

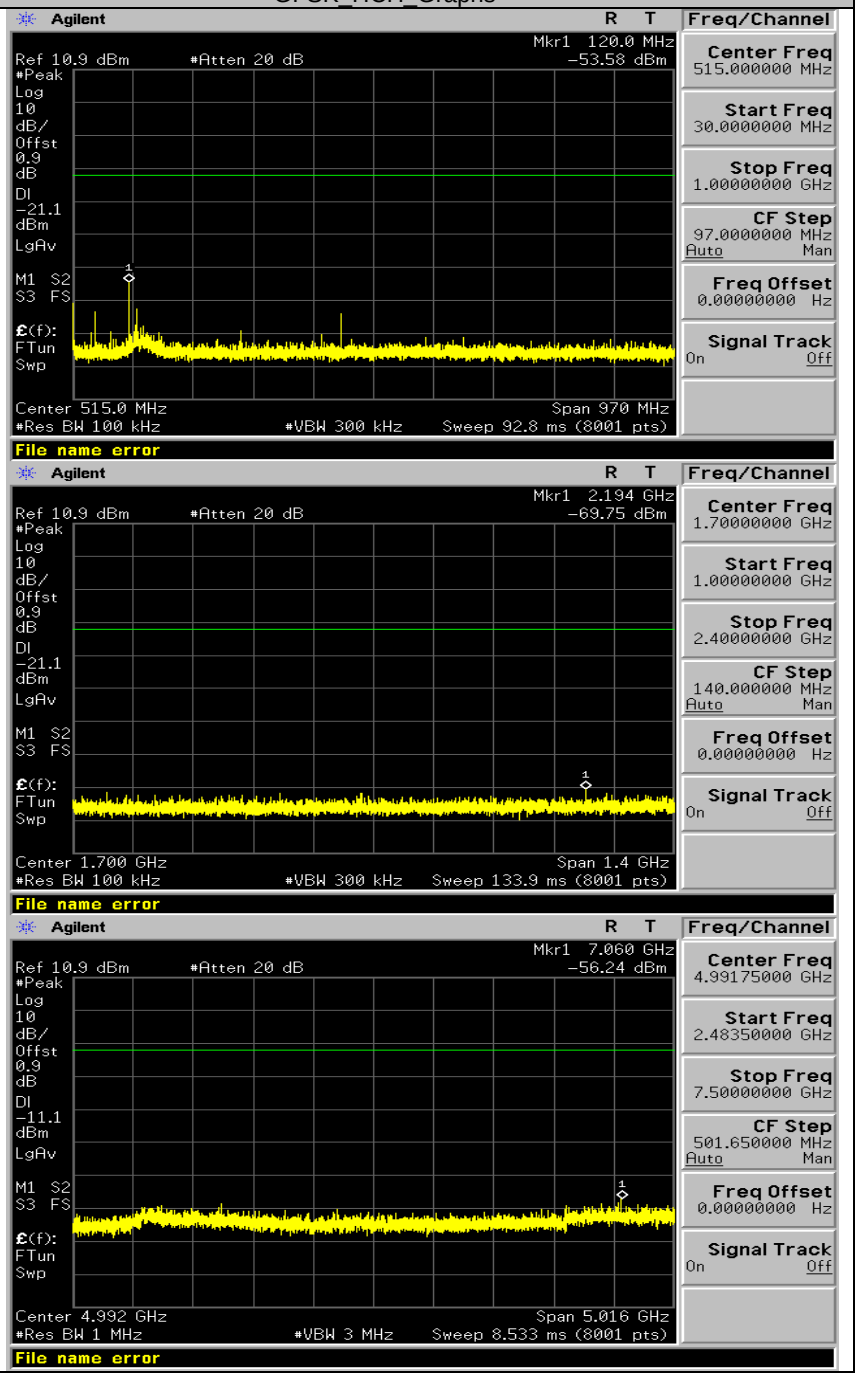
Test Graph

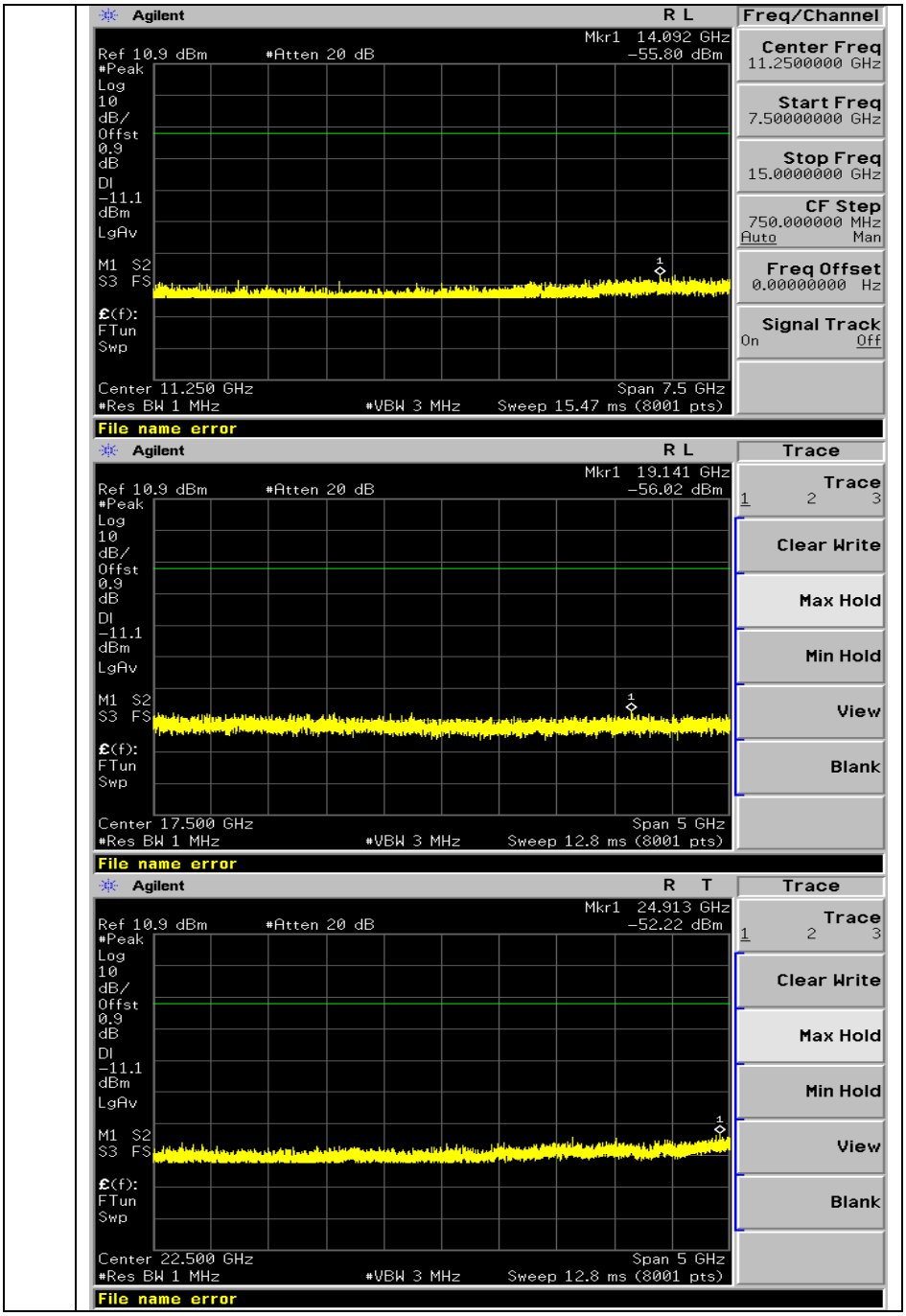
GFSK_LCH_Graphs	
Puw	

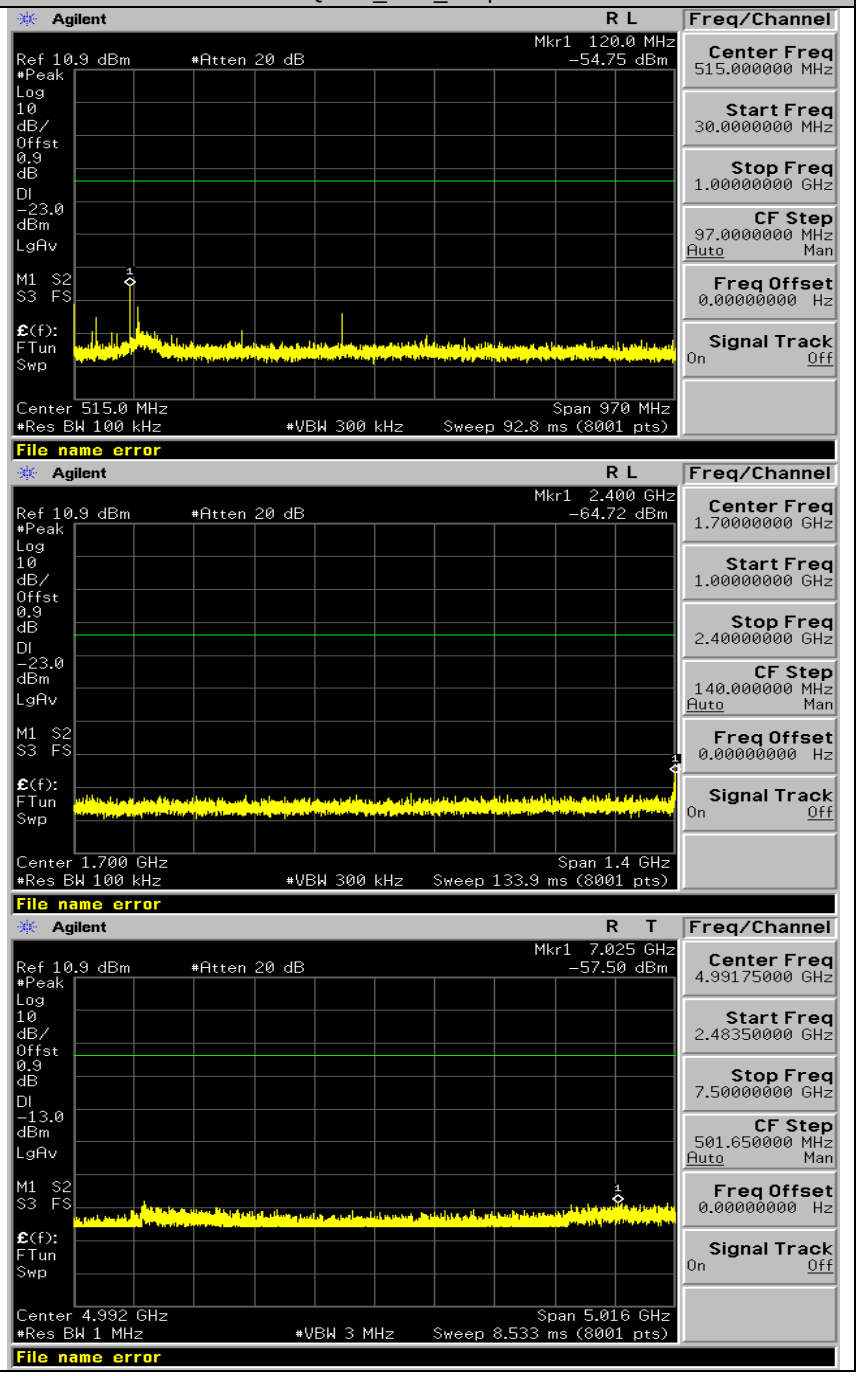

Agilent
R T
Trace
Mkr1 13.412 GHz
Ref 10.9 dBm
#Atten 20 dB
-55.94 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-11.0
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
Center 11.250 GHz
Span 7.5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 15.47 ms (8001 pts)
File name error
Agilent
R T
Trace
Mkr1 16.425 GHz
Ref 10.9 dBm
#Atten 20 dB
-56.10 dBm
Center 17.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
File name error
Agilent
R L
Trace
Mkr1 24.679 GHz
Ref 10.9 dBm
#Atten 20 dB
-53.52 dBm
Center 22.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
File name error

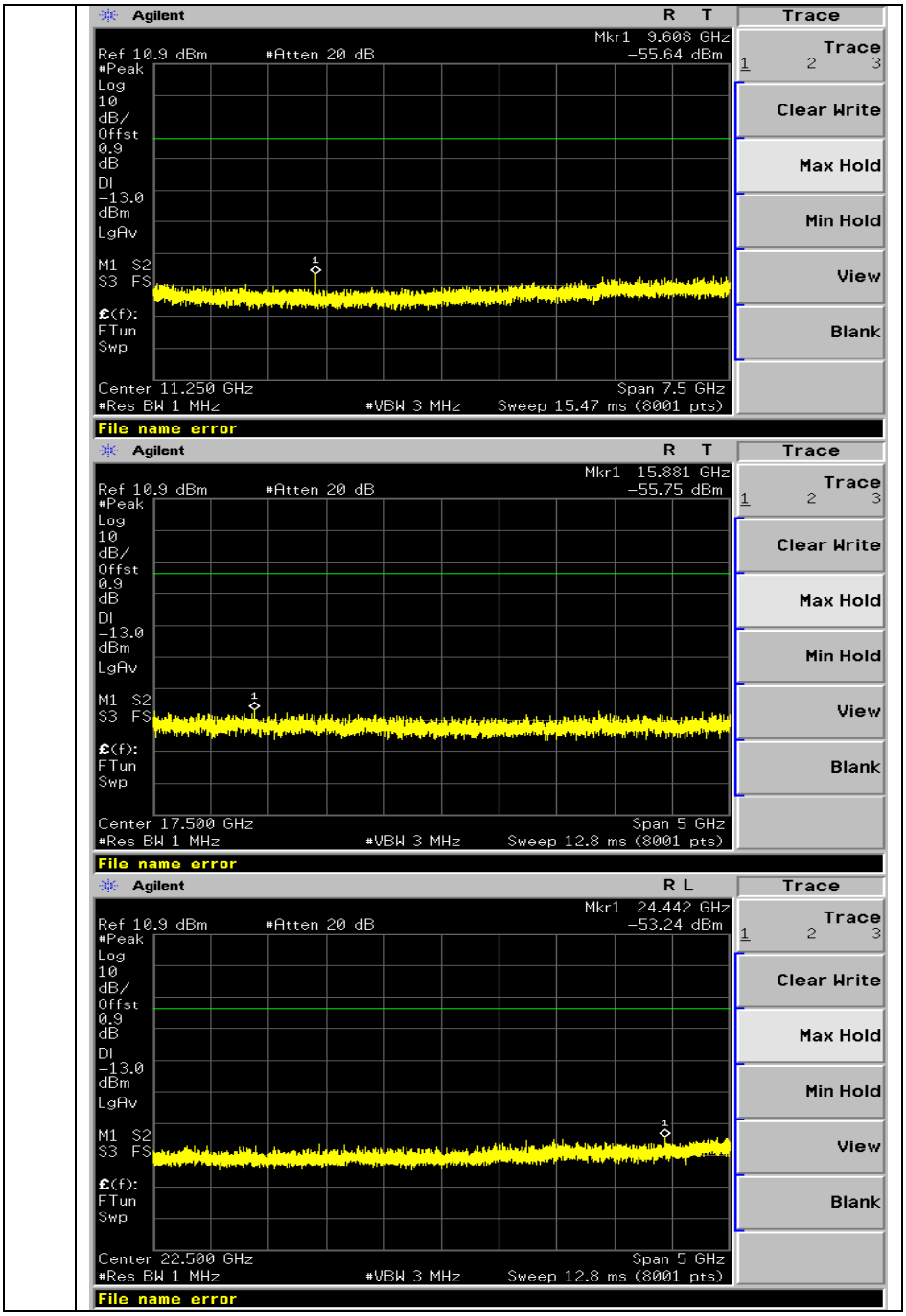
GFSK_MCH_Graphs	
Puw	

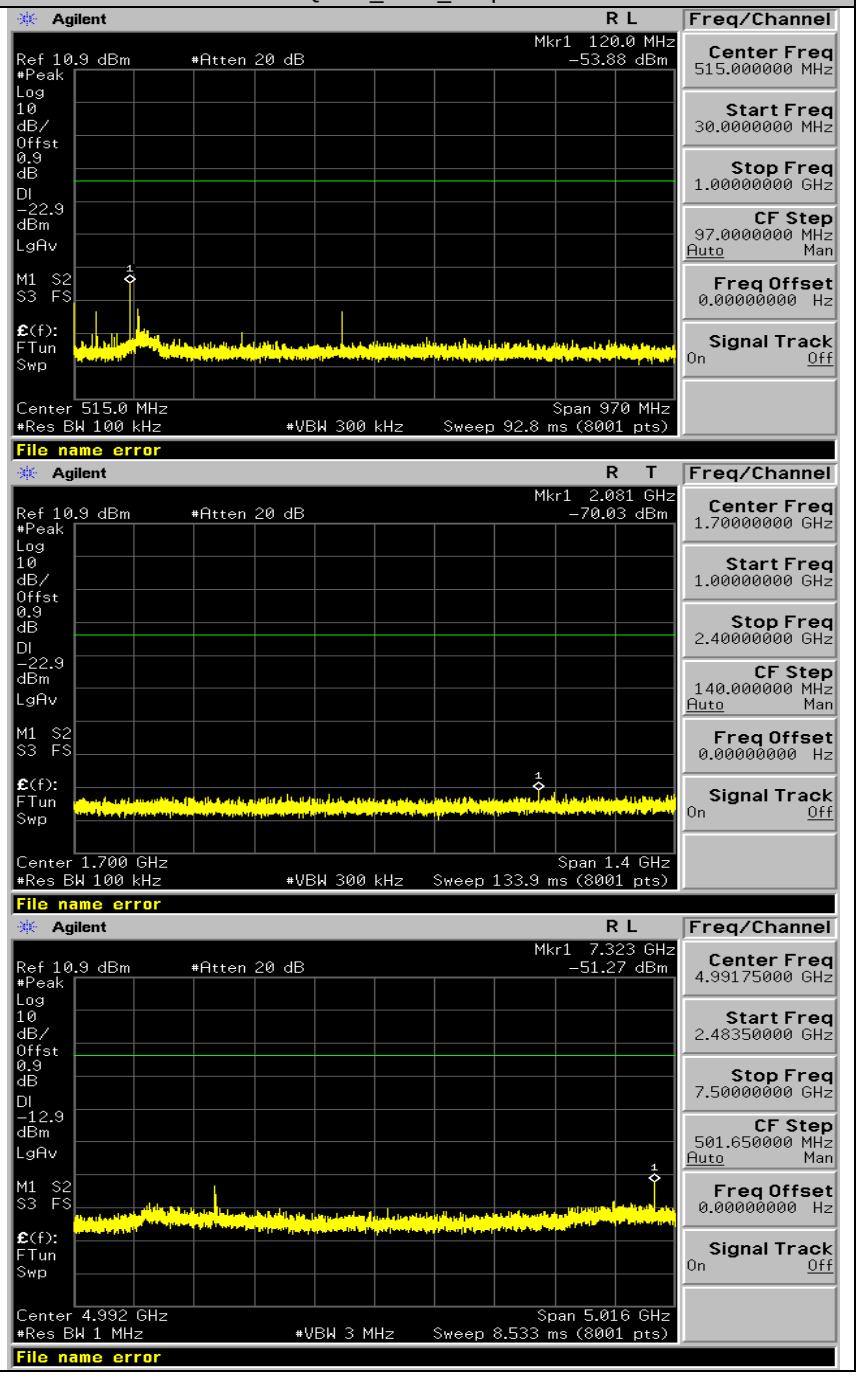

Agilent
R L
Trace
Mkr1 9.764 GHz
Ref 10.9 dBm
#Atten 20 dB
-55.24 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-10.9
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center 11.250 GHz
Span 7.5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 15.47 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
File name error
Agilent
R L
Trace
Mkr1 19.976 GHz
Ref 10.9 dBm
#Atten 20 dB
-55.76 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-10.9
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center 17.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
File name error
Agilent
R T
Trace
Mkr1 24.762 GHz
Ref 10.9 dBm
#Atten 20 dB
-53.12 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-10.9
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center 22.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
File name error

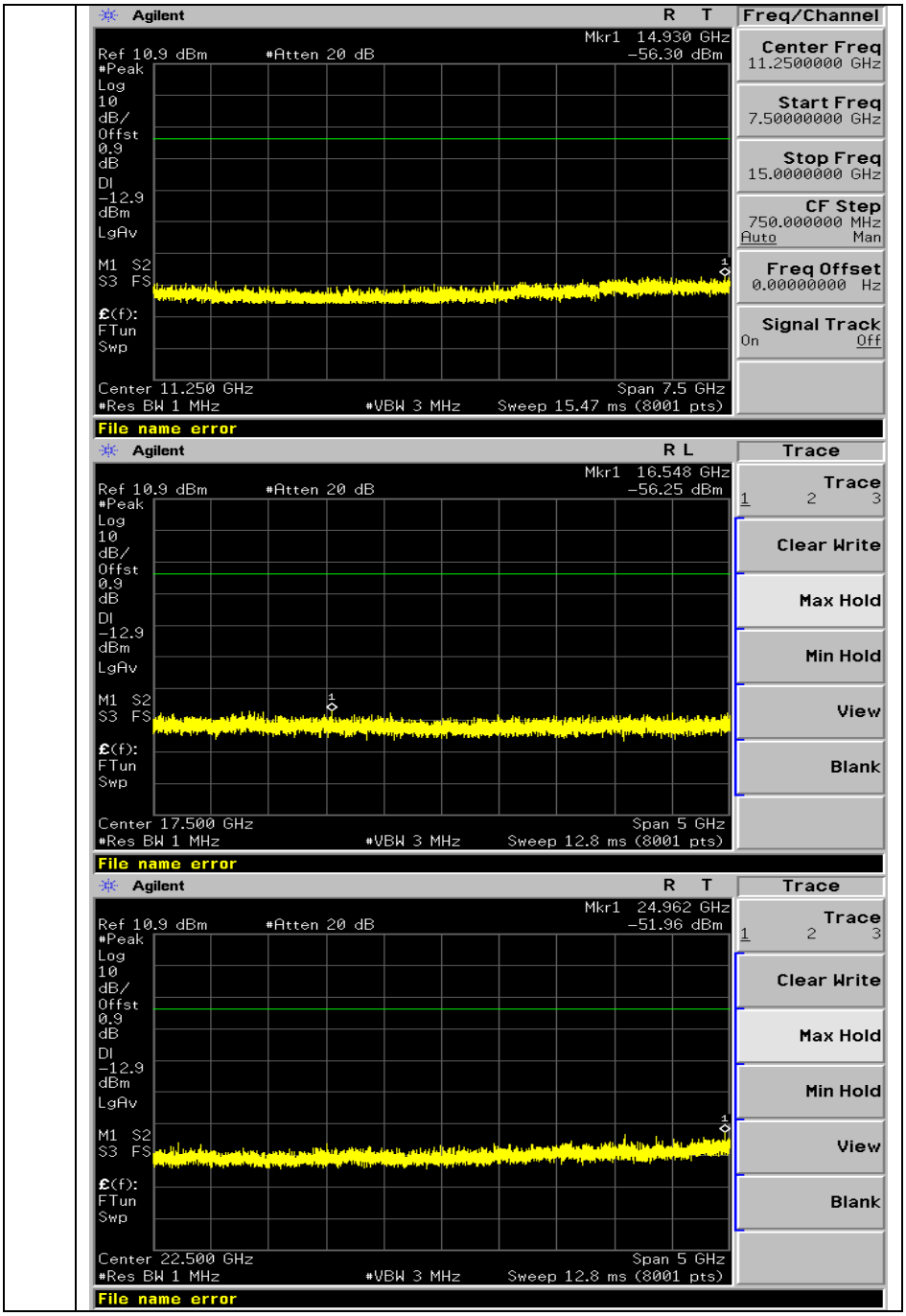
GFSK_HCH_Graphs	
Puw	

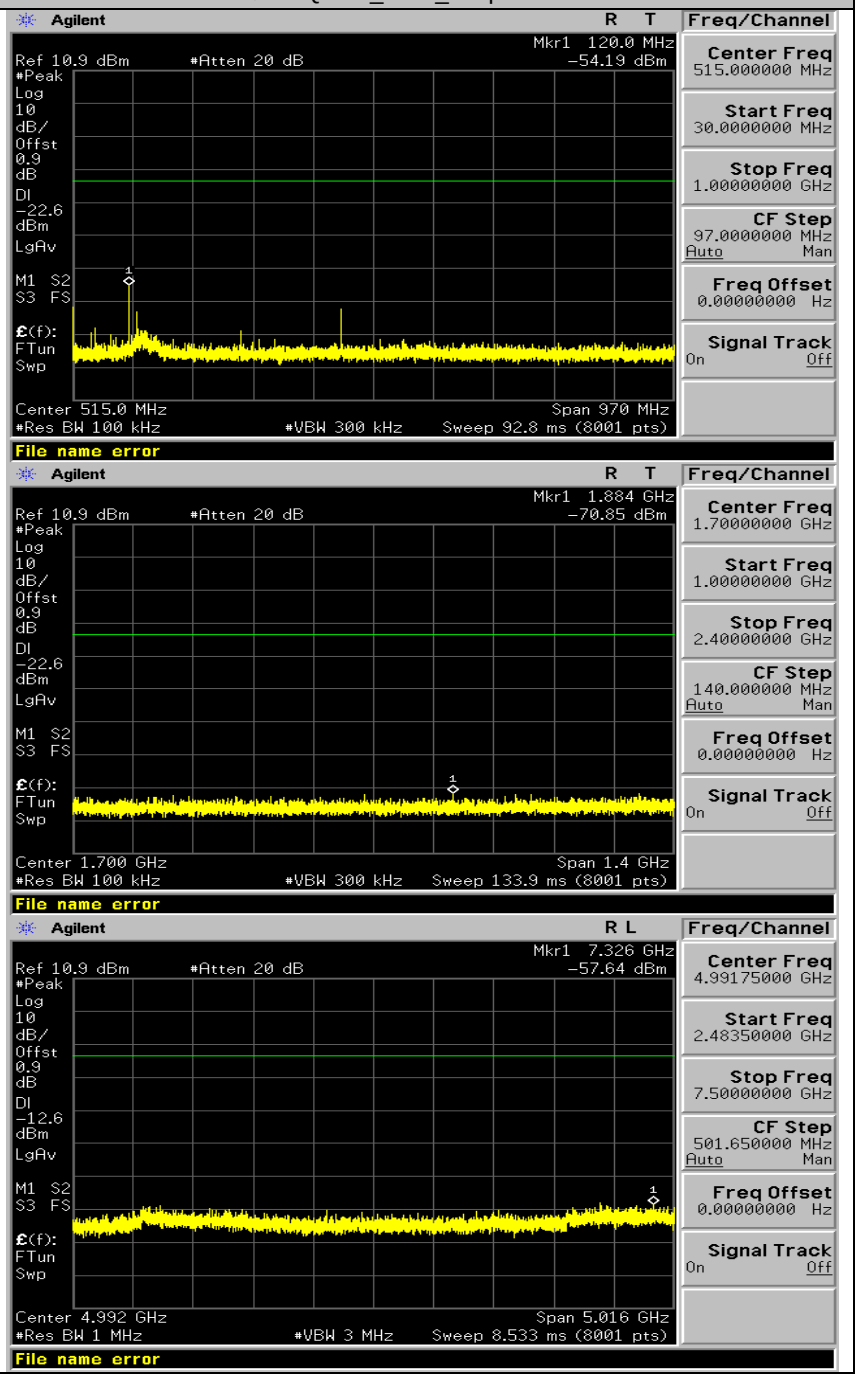

Agilent
R L
Freq/Channel
Mkr1 14.092 GHz
Ref 10.9 dBm
#Atten 20 dB
-55.80 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-11.1
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center Freq
11.2500000 GHz
Start Freq
7.50000000 GHz
Stop Freq
15.0000000 GHz
CF Step
750.000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 11.250 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 7.5 GHz
Sweep 15.47 ms (8001 pts)
File name error
Agilent
R L
Trace
Mkr1 19.141 GHz
Ref 10.9 dBm
#Atten 20 dB
-56.02 dBm
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
Center 17.500 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 5 GHz
Sweep 12.8 ms (8001 pts)
File name error
Agilent
R T
Trace
Mkr1 24.913 GHz
Ref 10.9 dBm
#Atten 20 dB
-52.22 dBm
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
Center 22.500 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 5 GHz
Sweep 12.8 ms (8001 pts)
File name error

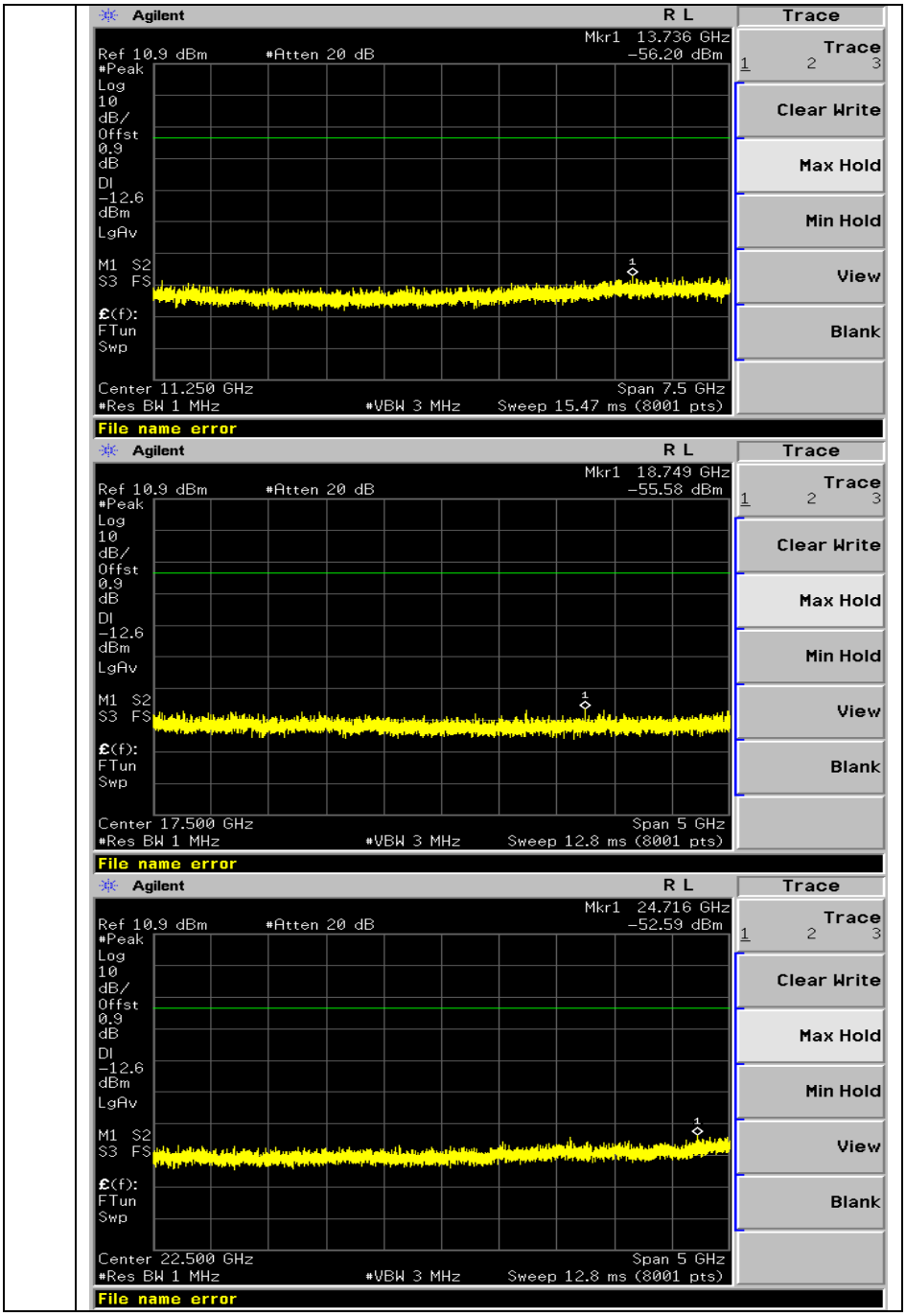
π/4DQPSK_LCH_Graphs	
Puw	

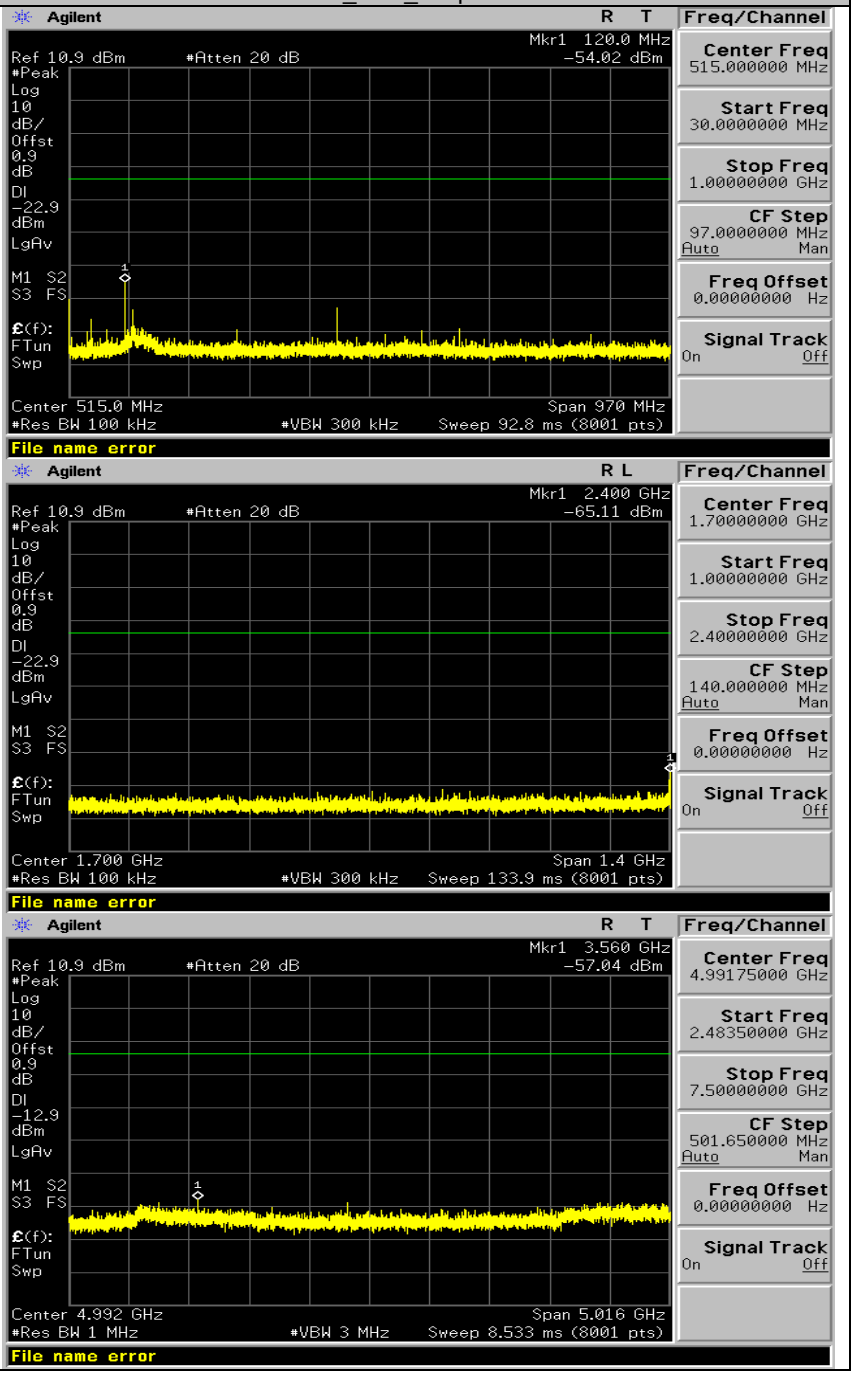

Agilent
R T
Trace
Mkr1 9.608 GHz
Ref 10.9 dBm
#Atten 20 dB
-55.64 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
Center 11.250 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 7.5 GHz
Sweep 15.47 ms (8001 pts)
File name error
Agilent
R T
Trace
Mkr1 15.881 GHz
Ref 10.9 dBm
#Atten 20 dB
-55.75 dBm
Center 17.500 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 5 GHz
Sweep 12.8 ms (8001 pts)
File name error
Agilent
R L
Trace
Mkr1 24.442 GHz
Ref 10.9 dBm
#Atten 20 dB
-53.24 dBm
Center 22.500 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 5 GHz
Sweep 12.8 ms (8001 pts)
File name error

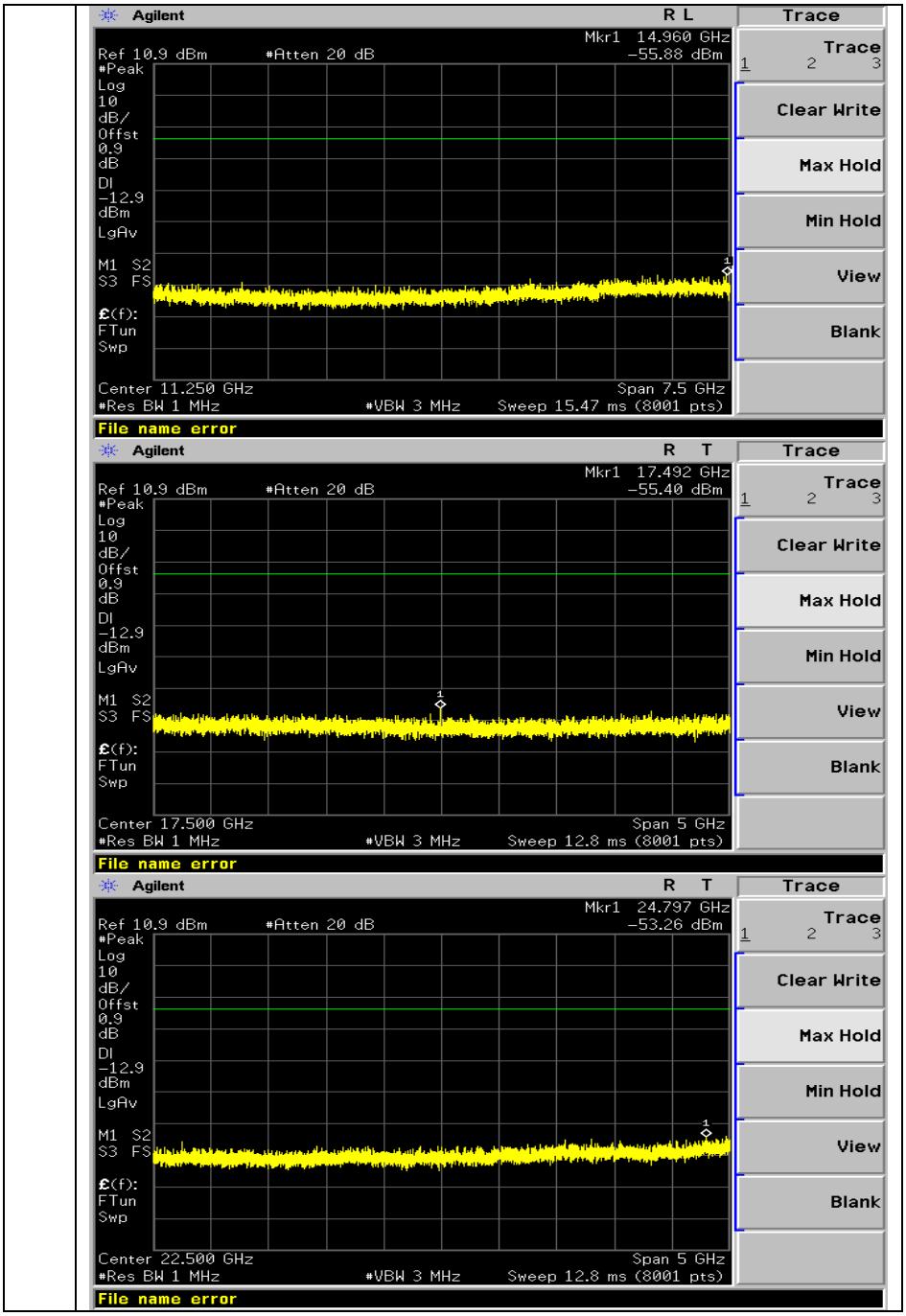
π/4DQPSK_MCH_Graphs	
Puw	

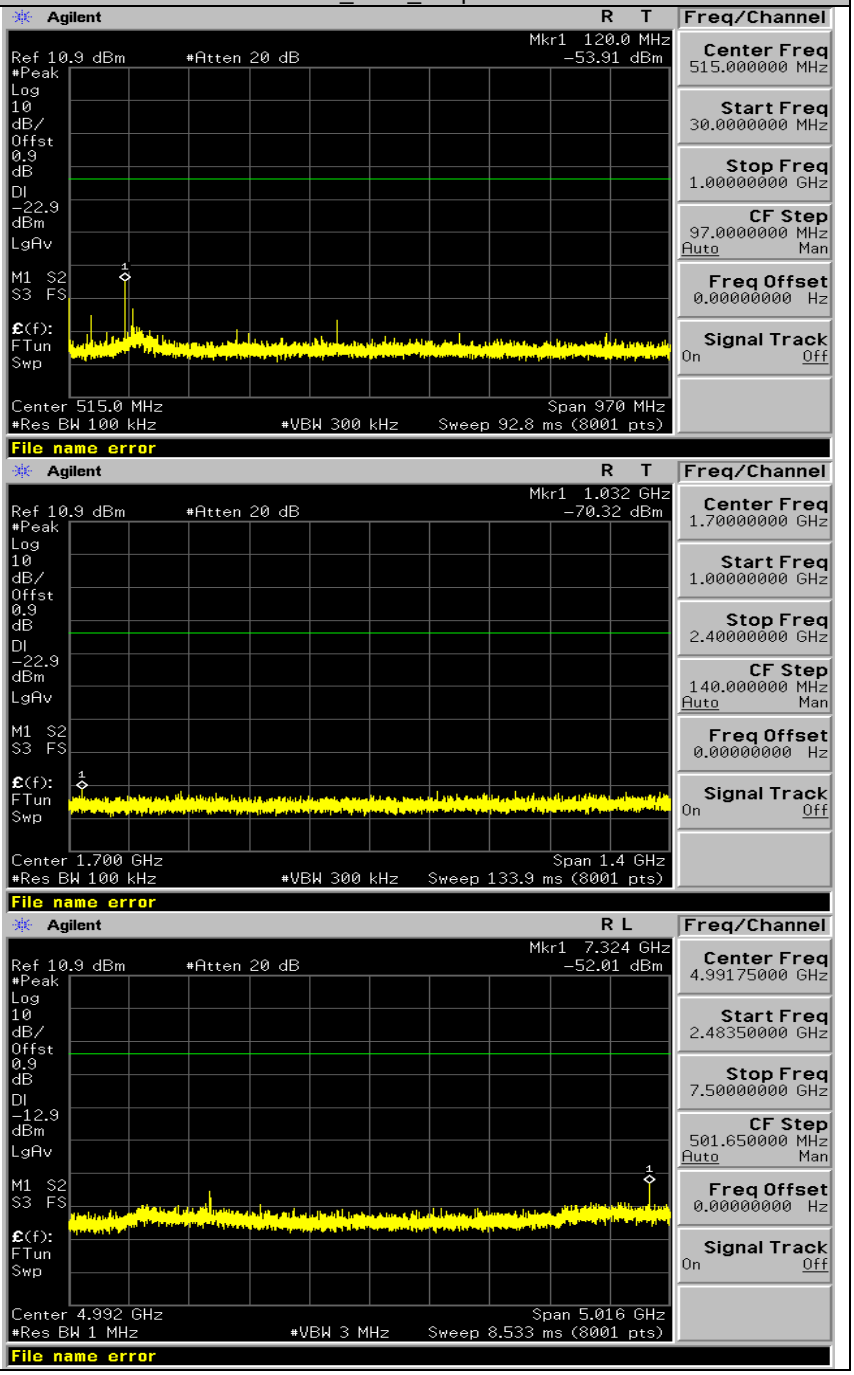

Agilent
R T
Freq/Channel
Mkr1 14.930 GHz
Ref 10.9 dBm
#Atten 20 dB
-56.30 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-12.9
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center 11.250 GHz
Span 7.5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 15.47 ms (8001 pts)
Center Freq
11.2500000 GHz
Start Freq
7.50000000 GHz
Stop Freq
15.0000000 GHz
CF Step
750.000000 MHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
File name error
Agilent
R L
Trace
Mkr1 16.548 GHz
Ref 10.9 dBm
#Atten 20 dB
-56.25 dBm
Center 17.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
File name error
Agilent
R T
Trace
Mkr1 24.962 GHz
Ref 10.9 dBm
#Atten 20 dB
-51.96 dBm
Center 22.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
File name error

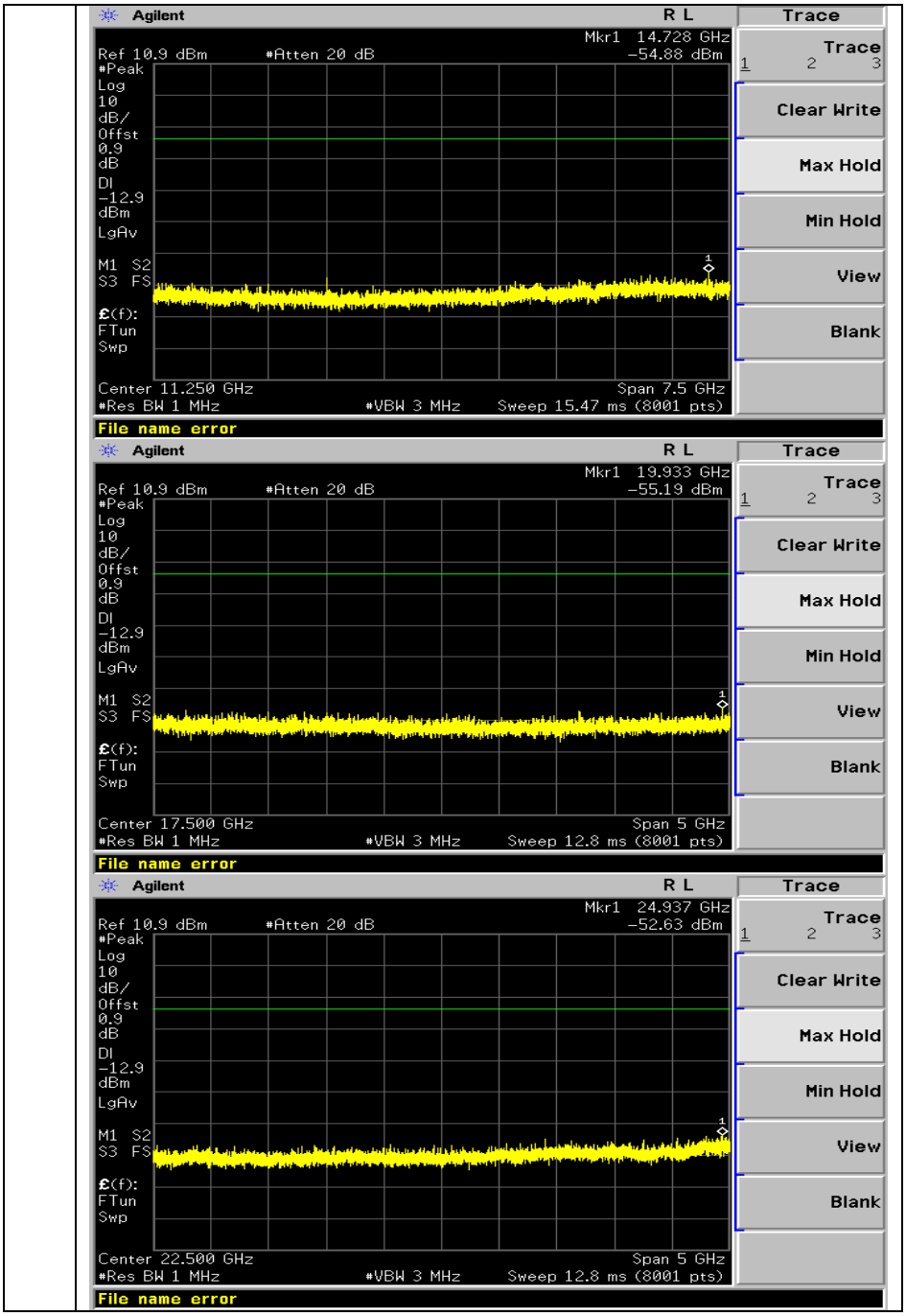
π/4DQPSK_HCH_Graphs	
Puw	

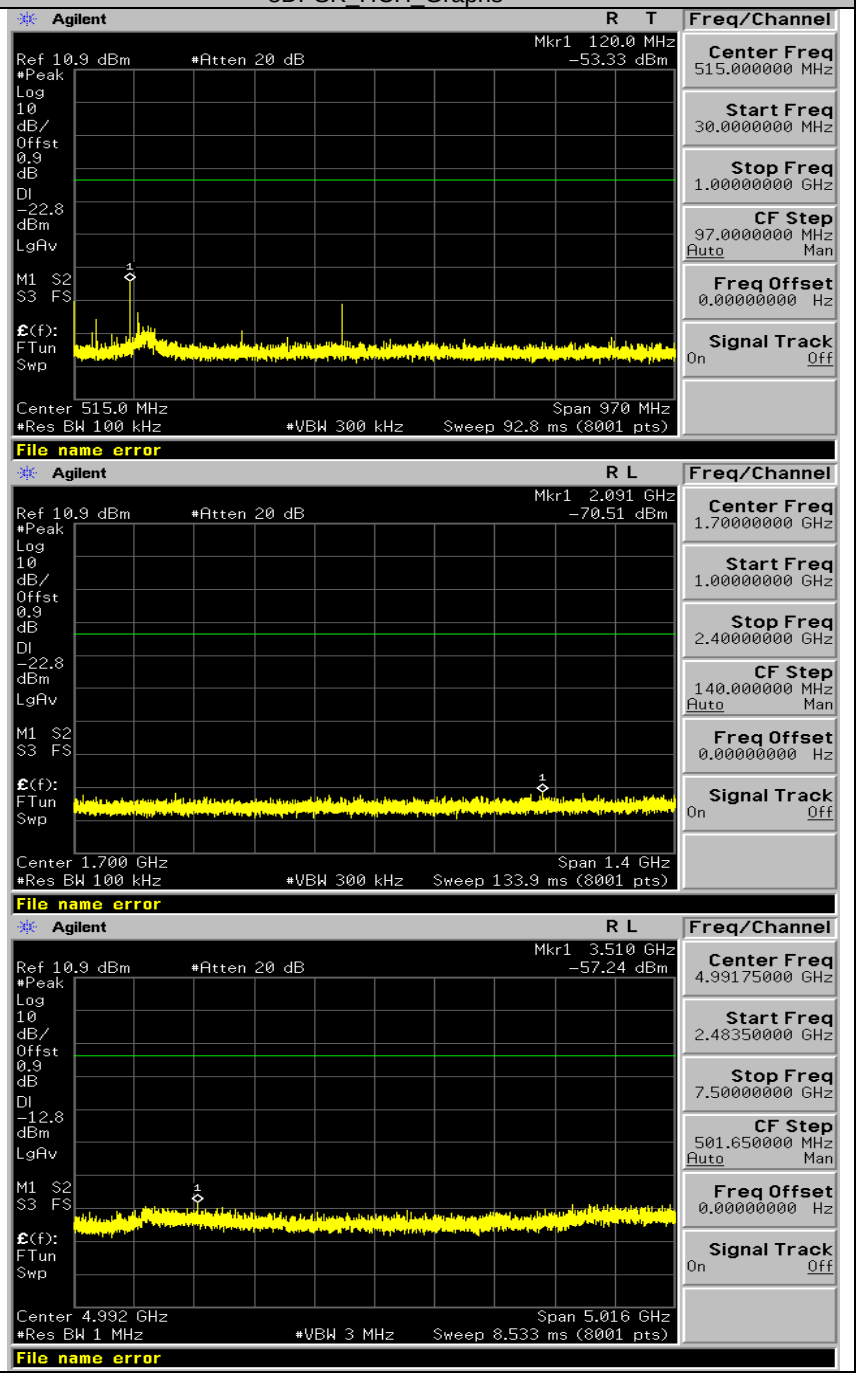

Agilent
R L
Trace
Mkr1 13.736 GHz
Ref 10.9 dBm
#Atten 20 dB
-56.20 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-12.6
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center 11.250 GHz
Span 7.5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 15.47 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
File name error
Agilent
R L
Trace
Mkr1 18.749 GHz
Ref 10.9 dBm
#Atten 20 dB
-55.58 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-12.6
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center 17.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
File name error
Agilent
R L
Trace
Mkr1 24.716 GHz
Ref 10.9 dBm
#Atten 20 dB
-52.59 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-12.6
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center 22.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
File name error

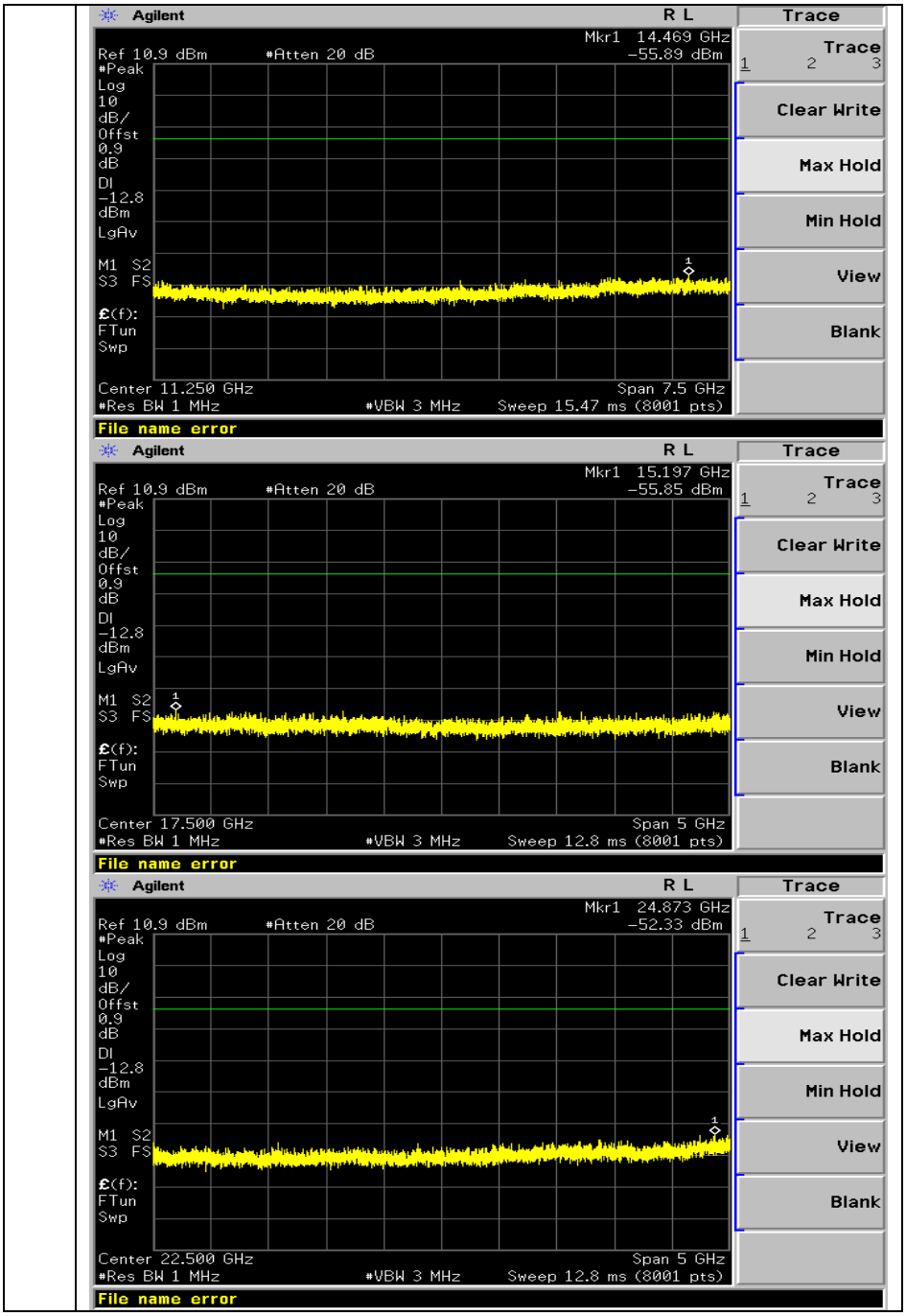
8DPSK_LCH_Graphs	
Puw	


Agilent
R L
Trace
Mkr1 14.960 GHz
Ref 10.9 dBm
#Atten 20 dB
-55.88 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-12.9
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
Center 11.250 GHz
Span 7.5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 15.47 ms (8001 pts)
File name error
Agilent
R T
Trace
Mkr1 17.492 GHz
Ref 10.9 dBm
#Atten 20 dB
-55.40 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-12.9
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
Center 17.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
File name error
Agilent
R T
Trace
Mkr1 24.797 GHz
Ref 10.9 dBm
#Atten 20 dB
-53.26 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-12.9
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
Center 22.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
File name error

8DPSK_MCH_Graphs	
Puw	


Agilent
R L
Trace
Mkr1 14.728 GHz
Ref 10.9 dBm
#Atten 20 dB
-54.88 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-12.9
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center 11.250 GHz
Span 7.5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 15.47 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
File name error
Agilent
R L
Trace
Mkr1 19.933 GHz
Ref 10.9 dBm
#Atten 20 dB
-55.19 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-12.9
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center 17.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
File name error
Agilent
R L
Trace
Mkr1 24.937 GHz
Ref 10.9 dBm
#Atten 20 dB
-52.63 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-12.9
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center 22.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
File name error

8DPSK_HCH_Graphs	
Puw	


Agilent
R L
Trace
Mkr1 14.469 GHz
Ref 10.9 dBm
#Atten 20 dB
-55.89 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-12.8
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center 11.250 GHz
Span 7.5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 15.47 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
File name error
Agilent
R L
Trace
Mkr1 15.197 GHz
Ref 10.9 dBm
#Atten 20 dB
-55.85 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-12.8
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center 17.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
File name error
Agilent
R L
Trace
Mkr1 24.873 GHz
Ref 10.9 dBm
#Atten 20 dB
-52.33 dBm
#Peak
Log
10
dB/
Offst
0.9
dB
Dl
-12.8
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Center 22.500 GHz
Span 5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.8 ms (8001 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
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.

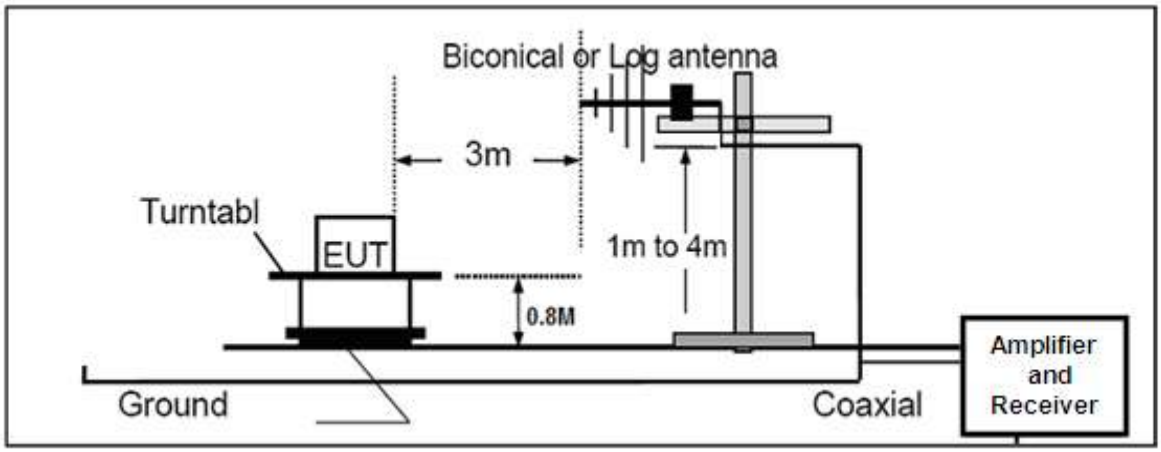
The following table is the setting of spectrum analyzer and receiver.

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

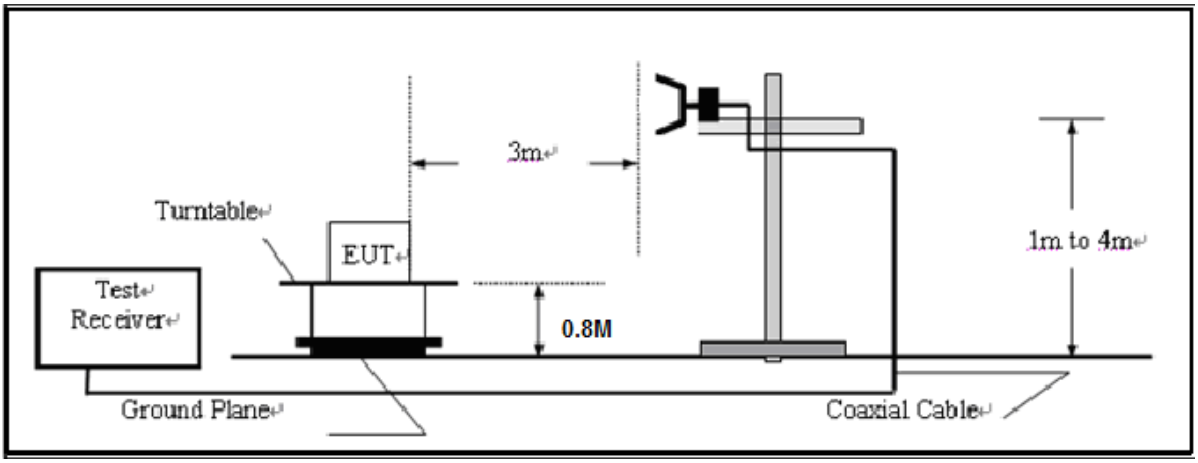
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

10.2. TEST SETUP

RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



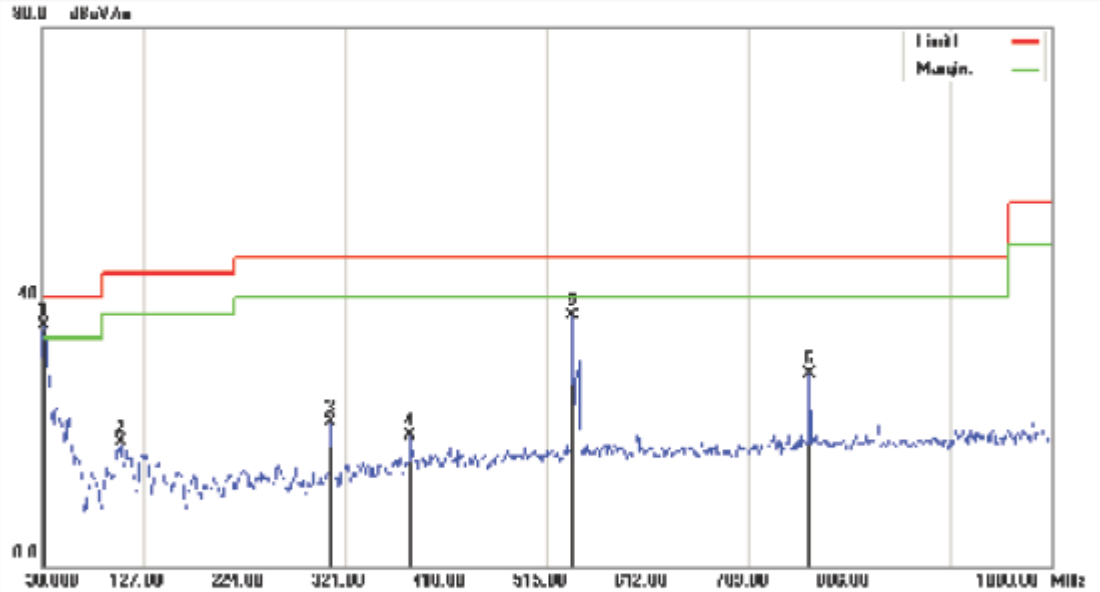
10.3. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

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

RADIATED EMISSION BELOW 1GHZ

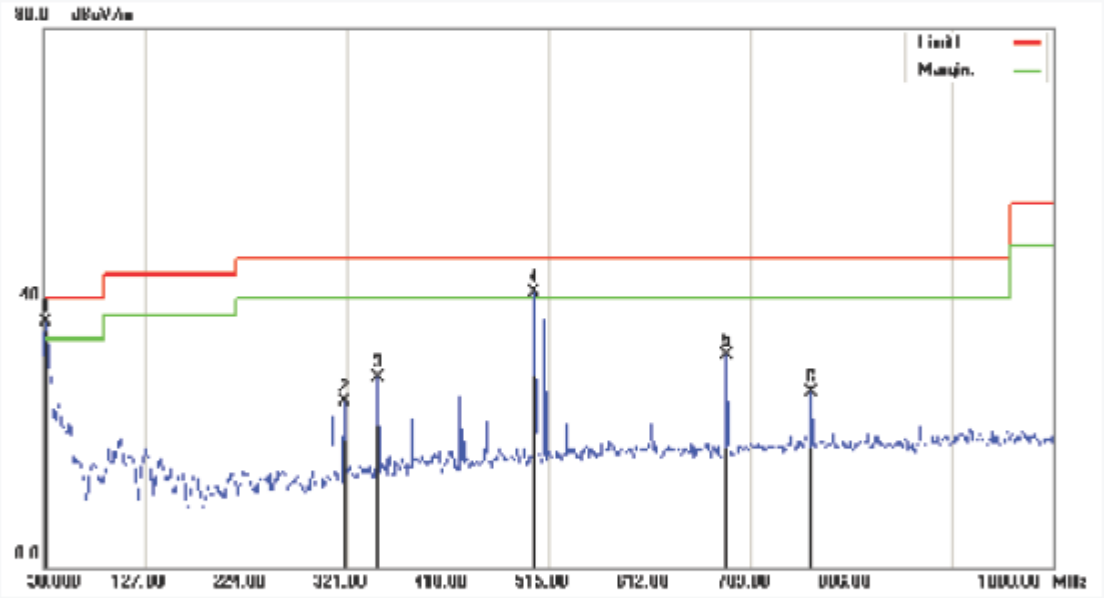
Job No.: 20150518	Probe : Horizontal
Standard: FCC Part15 Class B (30-1000MHz)	Tested Distance: 3m
Test item: Radiation Test	Power Source: AC 120V/60Hz
Temp.(C)/Hum.(%RH): 24 (C) / 52 %RH	Date: 2015-5-18 Time: 15:10:56
Company:	EUT:
Model: B30	Test By : Sunday
Test Mode: BT 1M 2402	



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	31.9400	48.67	-12.80	35.87	40.00	-4.13			peak
2	105.6600	41.11	-22.63	18.48	43.50	-25.02			peak
3	307.4200	40.69	-19.28	21.41	46.00	-24.59			peak
4	384.0500	35.94	-16.45	19.49	46.00	-26.51			peak
5	540.2200	50.66	-13.28	37.38	46.00	-8.62			peak
6	768.1700	39.76	-11.11	28.65	46.00	-17.35			peak

Job No.: 20150518	Probe : Vertical
Standard: FCC Part15 Class B (30-1000MHz)	Tested Distance: 3m
Test item: Radiation Test	Power Source: AC 120V/60Hz
Temp.(C)/Hum.(%RH): 24 (C) / 52 %RH	Date: 2015-5-18 Time: 15:09:36
Company:	EUT:
Model: B30	Test By : Sunday

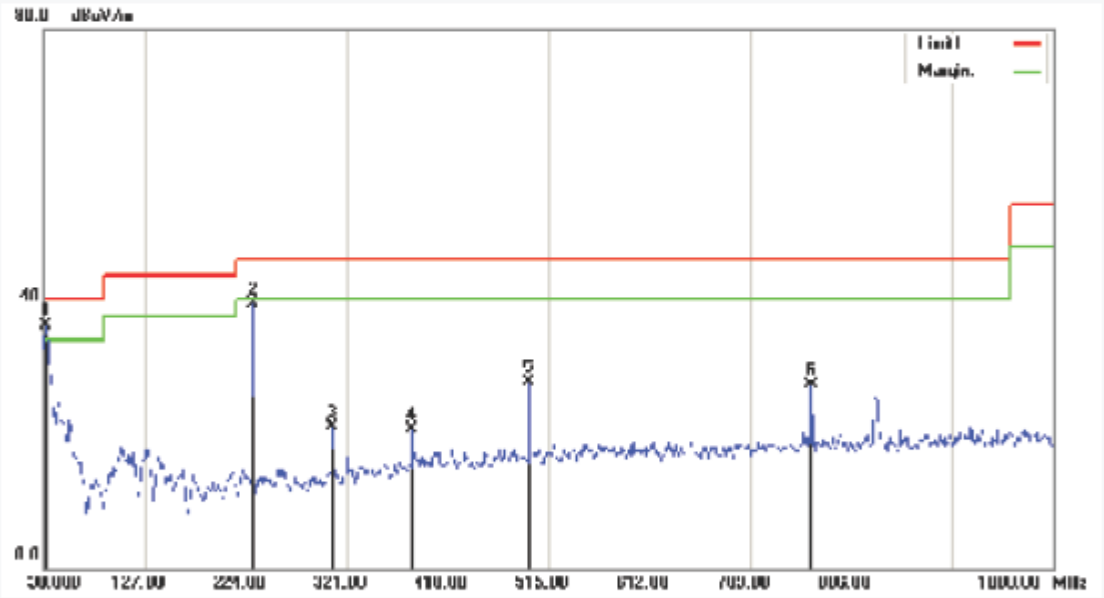
Test Mode: BT 1M 2402



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	31.9400	49.24	-12.80	36.44	40.00	-3.56			peak
2	319.0600	43.56	-18.95	24.61	46.00	-21.39			peak
3	351.0700	46.02	-17.63	28.39	46.00	-17.61			peak
4!	501.4200	55.15	-14.34	40.81	46.00	-5.19			peak
5	686.6900	43.84	-12.27	31.57	46.00	-14.43			peak
6	768.1700	37.19	-11.11	26.08	46.00	-19.92			peak

Job No.: 20150518	Probe : Horizontal
Standard: FCC Part15 Class B (30-1000MHz)	Tested Distance: 3m
Test item: Radiation Test	Power Source: AC 120V/60Hz
Temp.(C)/Hum.(%RH): 24 (C) / 52 %RH	Date: 2015-5-18 Time: 15:12:39
Company:	EUT:
Model: B30	Test By : Sunday

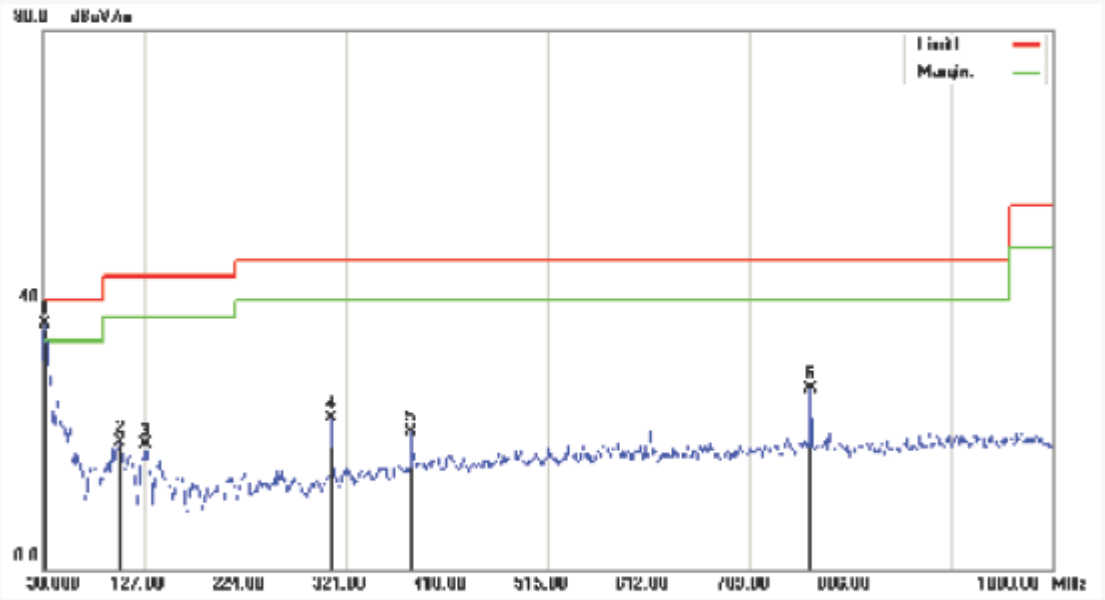
Test Mode: BT 1M 2441



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	31.9400	48.83	-12.80	36.03	40.00	-3.97			peak
2	230.7900	61.03	-21.82	39.21	46.00	-6.79			peak
3	307.4200	40.44	-19.28	21.16	46.00	-24.84			peak
4	384.0500	37.21	-16.45	20.76	46.00	-25.24			peak
5	496.5700	42.13	-14.36	27.77	46.00	-18.23			peak
6	768.1700	38.41	-11.11	27.30	46.00	-18.70			peak

Job No.: 20150518	Probe : Vertical
Standard: FCC Part15 Class B (30-1000MHz)	Tested Distance: 3m
Test item: Radiation Test	Power Source: AC 120V/60Hz
Temp.(C)/Hum.(%RH): 24 (C) / 52 %RH	Date: 2015-5-18 Time: 15:13:56
Company:	EUT:
Model: B30	Test By : Sunday

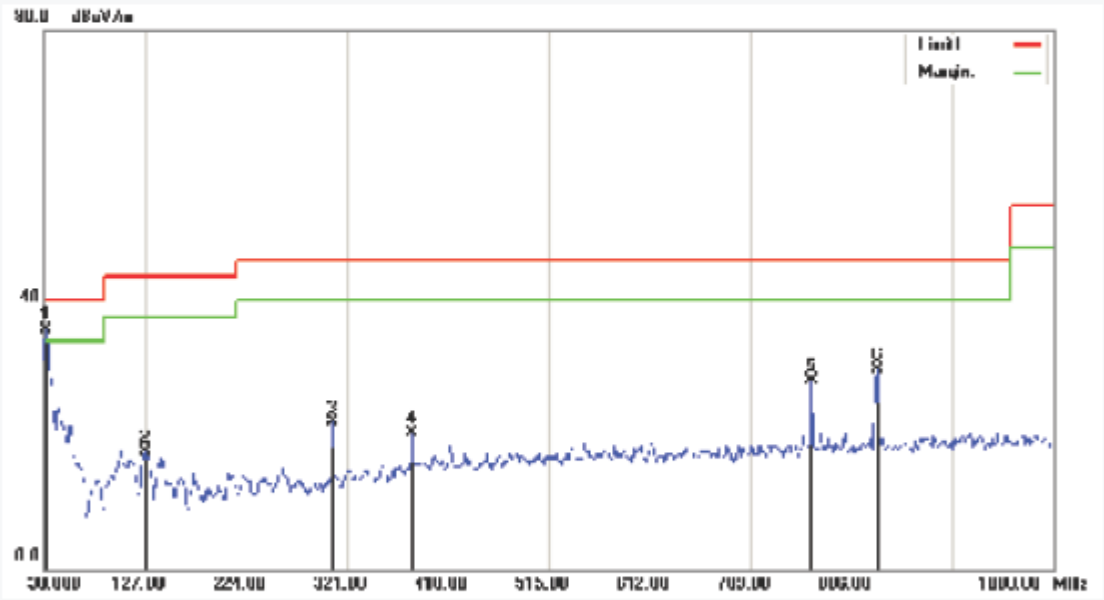
Test Mode: BT 1M 2441



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	31.9400	49.32	-12.80	36.52	40.00	-3.48			peak
2	104.6900	41.74	-22.81	18.93	43.50	-24.57			peak
3	128.9400	39.27	-20.79	18.48	43.50	-25.02			peak
4	307.4200	41.80	-19.28	22.52	46.00	-23.48			peak
5	384.0500	36.90	-16.45	20.45	46.00	-25.55			peak
6	768.1700	38.03	-11.11	26.92	46.00	-19.08			peak

Job No.:	20150518	Probe :	Horizontal
Standard:	FCC Part15 Class B (30-1000MHz)	Tested Distance:	3m
Test item:	Radiation Test	Power Source:	AC 120V/60Hz
Temp.(C)/Hum.(%RH):	24 (C) / 52 %RH	Date: 2015-5-18	Time: 15:17:37
Company:		EUT:	
Model:	B30	Test By :	Sunday

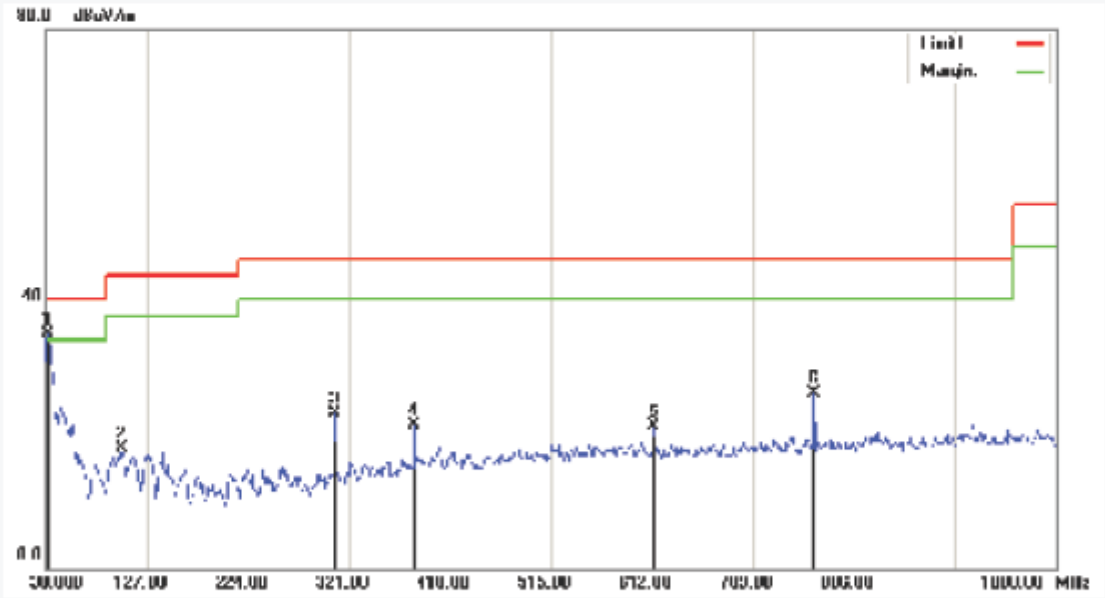
Test Mode: BT 1M 2480



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	31.9400	48.54	-12.80	35.74	40.00	-4.26			peak
2	127.9700	38.35	-20.83	17.52	43.50	-25.98			peak
3	307.4200	41.10	-19.28	21.82	46.00	-24.18			peak
4	384.0500	36.78	-16.45	20.33	46.00	-25.67			peak
5	768.1700	39.27	-11.11	28.16	46.00	-17.84			peak
6	831.2200	40.37	-10.60	29.77	46.00	-16.23			peak

Job No.:	20150518	Probe :	Vertical
Standard:	FCC Part15 Class B (30-1000MHz)	Tested Distance:	3m
Test item:	Radiation Test	Power Source:	AC 120V/60Hz
Temp.(C)/Hum.(%RH):	24 (C) / 52 %RH	Date: 2015-5-18	Time: 15:16:15
Company:		EUT:	
Model:	B30	Test By :	Sunday

Test Mode: BT 1M 2480



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	31.9400	47.75	-12.80	34.95	40.00	-5.05			peak
2	102.7500	41.09	-23.17	17.92	43.50	-25.58			peak
3	307.4200	42.48	-19.28	23.20	46.00	-22.80			peak
4	384.0500	37.67	-16.45	21.22	46.00	-24.78			peak
5	613.9400	33.88	-12.74	21.14	46.00	-24.86			peak
6	768.1700	37.29	-11.11	26.18	46.00	-19.82			peak

RESULT: PASS

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	66.57	-3.62	62.95	74	-11.05	Pk	Vertical
4804.272	46.48	-3.62	42.86	54	-11.14	AV	Vertical
7206.138	64.67	-0.9	63.77	74	-10.23	pk	Vertical
7206.156	43.29	-0.9	42.39	54	-11.61	AV	Vertical
4803.959	65.37	-3.64	61.73	74	-12.27	Pk	Horizontal
4803.964	45.84	-3.64	42.2	54	-11.8	AV	Horizontal
Mid Channel (2441 MHz)							
4882.128	65.48	-3.65	61.83	74	-12.17	Pk	Vertical
4882.094	47.67	-3.65	44.02	54	-9.98	AV	Vertical
7323.228	63.62	-0.82	62.8	74	-11.2	Pk	Vertical
7323.220	46.73	-0.82	45.91	54	-8.09	AV	Vertical
4882.096	62.44	-3.68	58.76	74	-15.24	Pk	Horizontal
4882.171	47.35	-3.68	43.67	54	-10.33	AV	Horizontal
High Channel (2480 MHz)							
4960.260	63.85	-3.59	60.26	74	-13.74	pk	Vertical
4960.325	45.46	-3.59	41.87	54	-12.13	AV	Vertical
4960.190	64.19	-3.59	60.6	74	-13.4	pk	Horizontal
4960.157	46.27	-3.59	42.68	54	-11.32	AV	Horizontal

Note:

1) 30MHz~25GHz:(Scan with GFSK, π/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

RESULT: PASS

11. BAND EDGE EMISSION

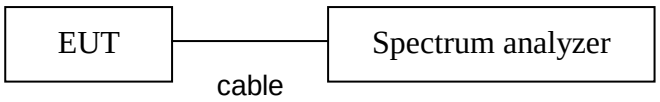
11.1. MEASUREMENT PROCEDURE

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	69.15	-12.99	56.16	74	-17.84	peak	Vertical
2399.9	54.62	-12.99	41.63	54	-12.37	AVG	Vertical
2399.9	71.27	-12.99	58.28	74	-15.72	peak	Horizontal
2399.9	54.38	-12.99	41.39	54	-12.61	AVG	Horizontal
2483.6	71.49	-12.78	58.71	74	-15.29	peak	Vertical
2483.6	54.53	-12.78	41.75	54	-12.25	AVG	Vertical
2483.6	71.67	-12.78	58.89	74	-15.11	peak	Horizontal
2483.6	54.28	-12.78	41.5	54	-12.5	AVG	Horizontal
π/4-DQPSK							
2399.9	71.48	-12.99	58.49	74	-15.51	peak	Vertical
2399.9	54.59	-12.99	41.6	54	-12.4	AVG	Vertical
2399.9	70.62	-12.99	57.63	74	-16.37	peak	Horizontal
2399.9	55.72	-12.99	42.73	54	-11.27	AVG	Horizontal
2483.6	71.38	-12.78	58.6	74	-15.4	peak	Vertical
2483.6	58.57	-12.78	45.79	54	-8.21	AVG	Vertical
2483.6	71.43	-12.78	58.65	74	-15.35	peak	Horizontal
2483.6	54.45	-12.78	41.67	54	-12.33	AVG	Horizontal
8DPSK							
2399.9	71.62	-12.99	58.63	74	-15.37	peak	Vertical
2399.9	55.77	-12.99	42.78	54	-11.22	AVG	Vertical
2399.9	70.38	-12.99	57.39	74	-16.61	peak	Horizontal
2399.9	56.27	-12.99	43.28	54	-10.72	AVG	Horizontal
2483.6	71.58	-12.78	58.8	74	-15.2	peak	Vertical
2483.6	55.49	-12.78	42.71	54	-11.29	AVG	Vertical
2483.6	71.39	-12.78	58.61	74	-15.39	peak	Horizontal
2483.6	54.69	-12.78	41.91	54	-12.09	AVG	Horizontal

RESULT: PASS

Note: Factor=Antenna Factor + Cable loss - Amplifier gain,

Emission Level = Meter Reading + Factor

Margin= Emission Level -Limit.

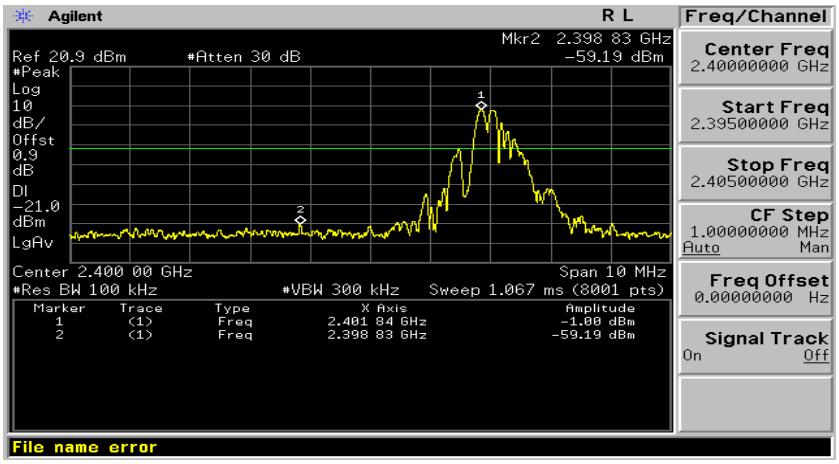
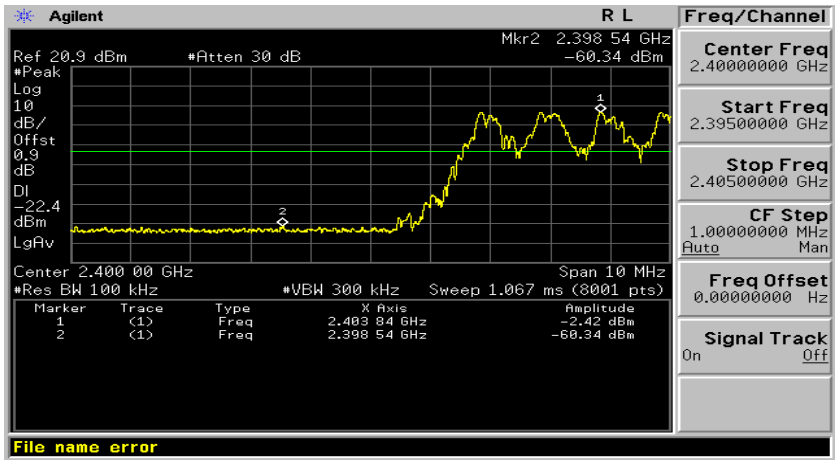
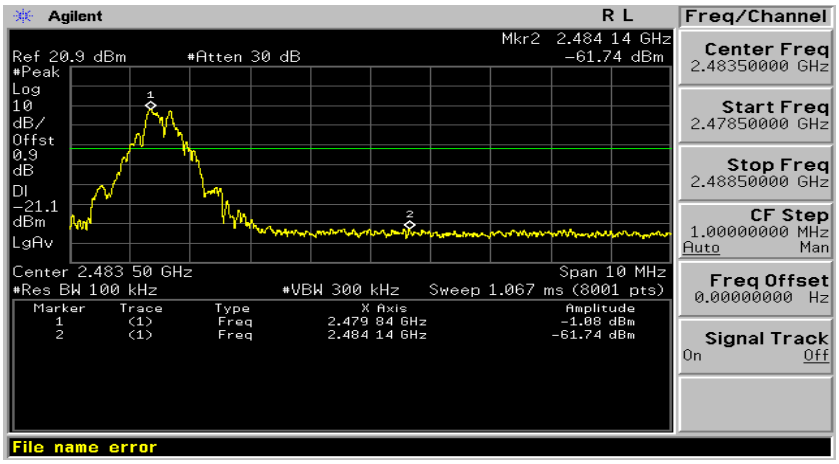
The “Factor” value can be calculated automatically by software of measurement system.

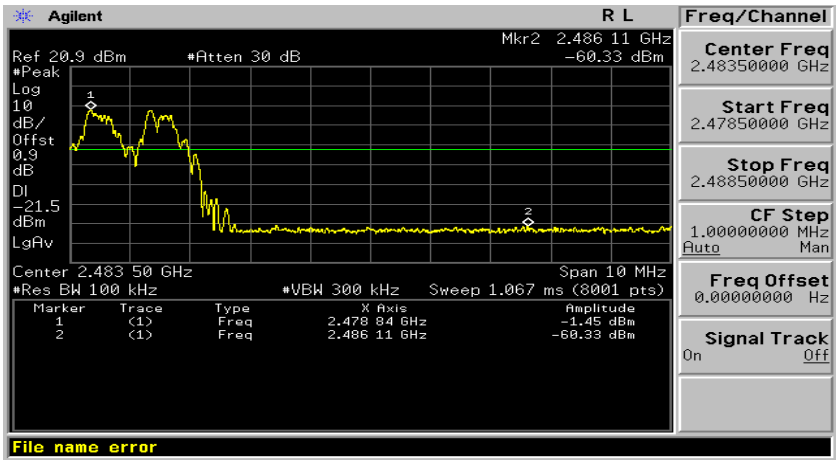
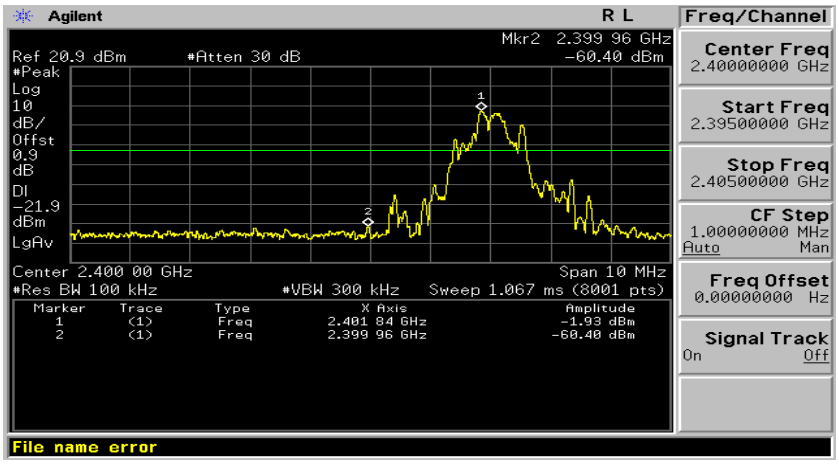
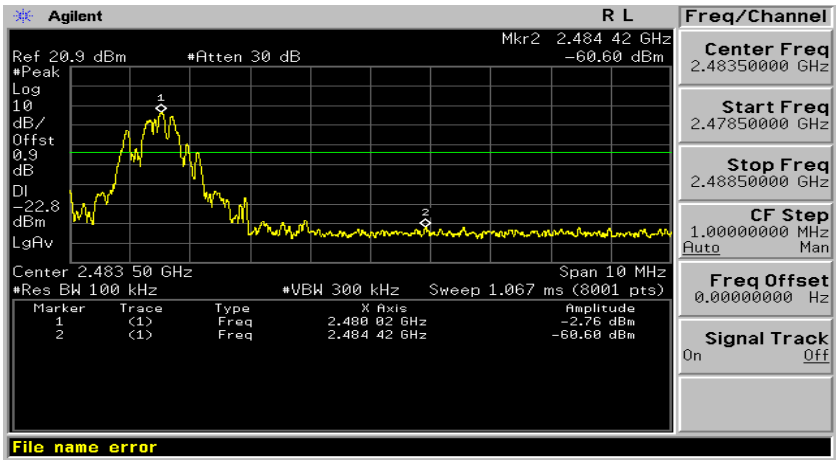
11.4 Conducted TEST RESULT

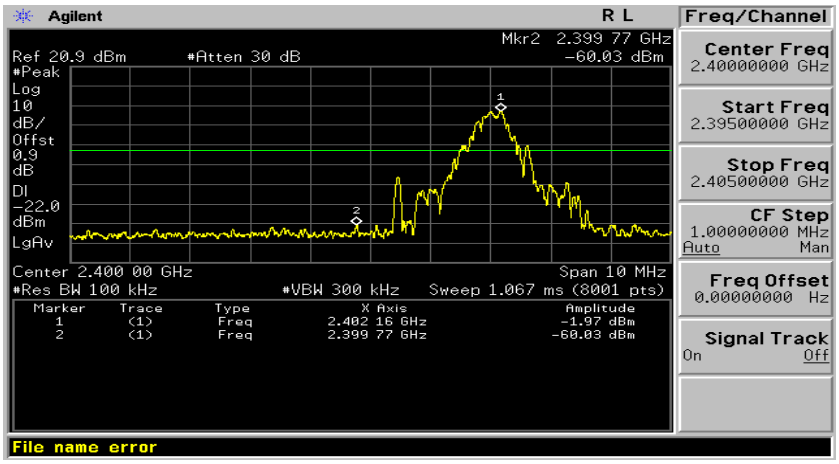
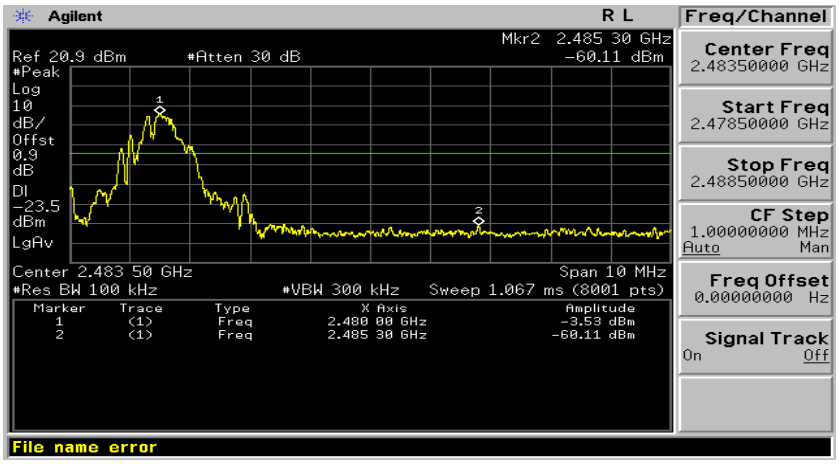
Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBm]	Verdict
GFSK	LCH	2402	Off	-59.194	PASS
			On	-60.34	PASS
GFSK	HCH	2480	Off	-61.741	PASS
			On	-60.33	PASS
π/4DQPSK	LCH	2402	Off	-60.405	PASS
π/4DQPSK	HCH	2480	Off	-60.598	PASS
8DPSK	LCH	2402	Off	-60.025	PASS
8DPSK	HCH	2480	Off	-60.11	PASS

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

Test Graph

Graphs	
GFSK/LCH/No Hop	
GFSK/LCH/Hop	
GFSK/HCH/No Hop	

GFSK/HCH/Hop	
π /4DQPSK/LCH/No Hop	
π /4DQPSK/HCH/No Hop	

8DPSK/LCH/No Hop	
8DPSK/HCH/No Hop	

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

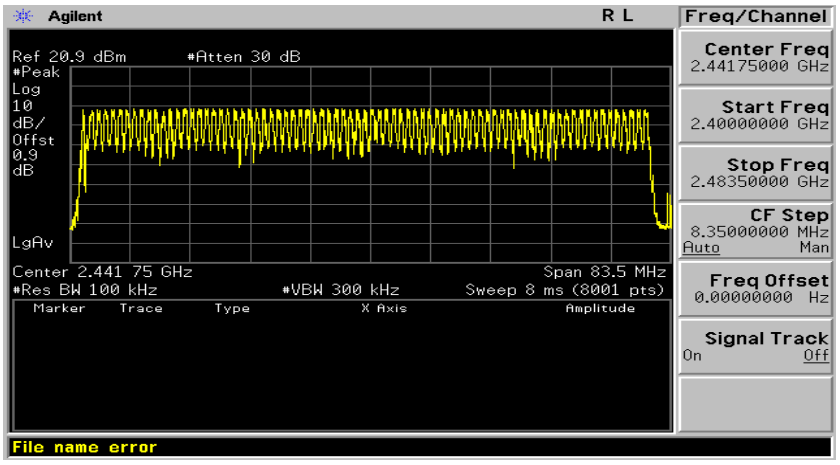
The same as described in section 6

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

Graphs	
GFSK/Hop	

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 hoping 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

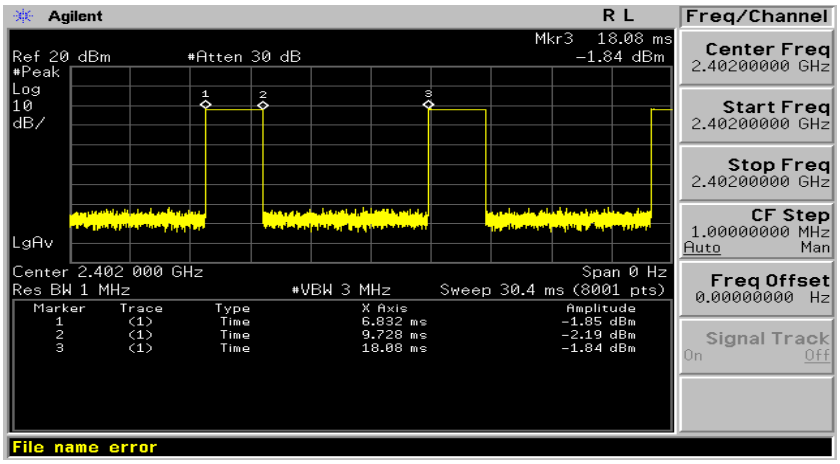
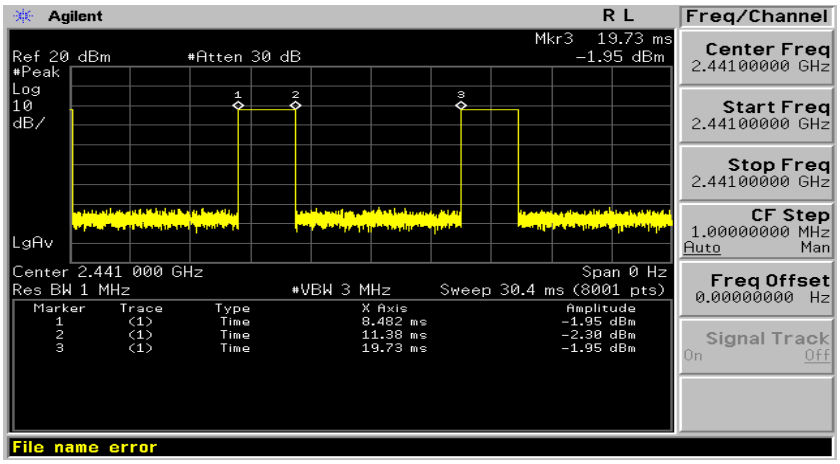
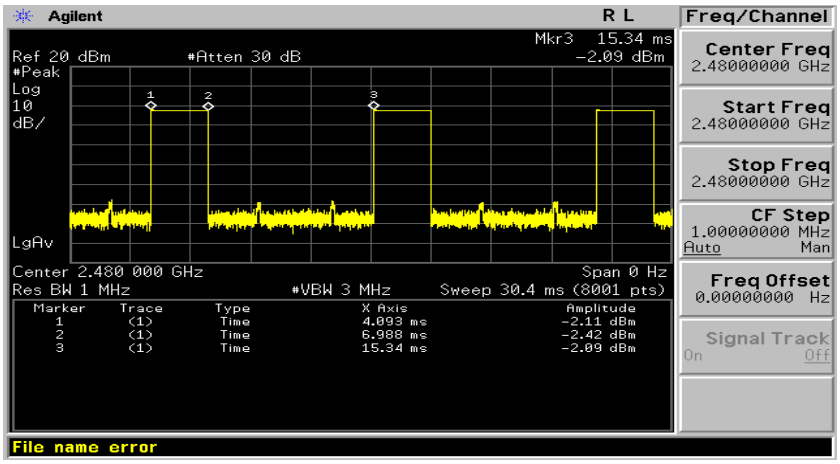
13.4. LIMITS AND MEASUREMENT RESULT

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

- The duration for dwell time calculation:0.4[s]*hopping number=0.4[s]*79[ch]=31.6[s*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 [ch*hop/s]
- The hops per second on one channel: 266.67 [ch*hops/s]/79 [ch]=3.38 [hop/s];
- The total hops for all channels within the dwell time calculation duration:3.38 [hop/s]*31.6[s*ch]=106.67 [hop*ch];
- The dwell time for all channels hopping: 106.67 [hop*ch]*Burst Width [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

Graphs	
GFSK/LCH	
GFSK/MCH	
GFSK/HCH	

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) ≥ 1% of the span Video (or Average) Bandwidth (VBW) ≥ 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

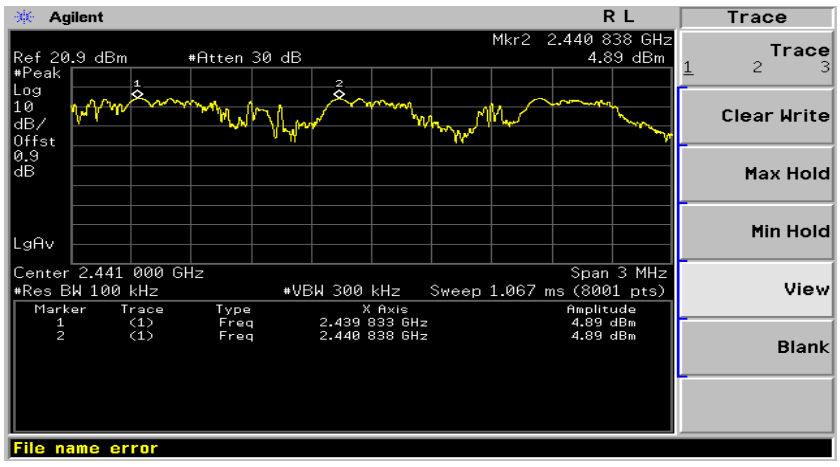
The same as described in section 6.3

14.4. LIMITS AND MEASUREMENT RESULT

Mode	Channel.	Carrier Frequency Separation [MHz]	Verdict
8DPSK	Hop	1.005	PASS

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

Test Graph

Graphs	
8DPSK/Hop	

15. FCC LINE CONDUCTED EMISSION TEST

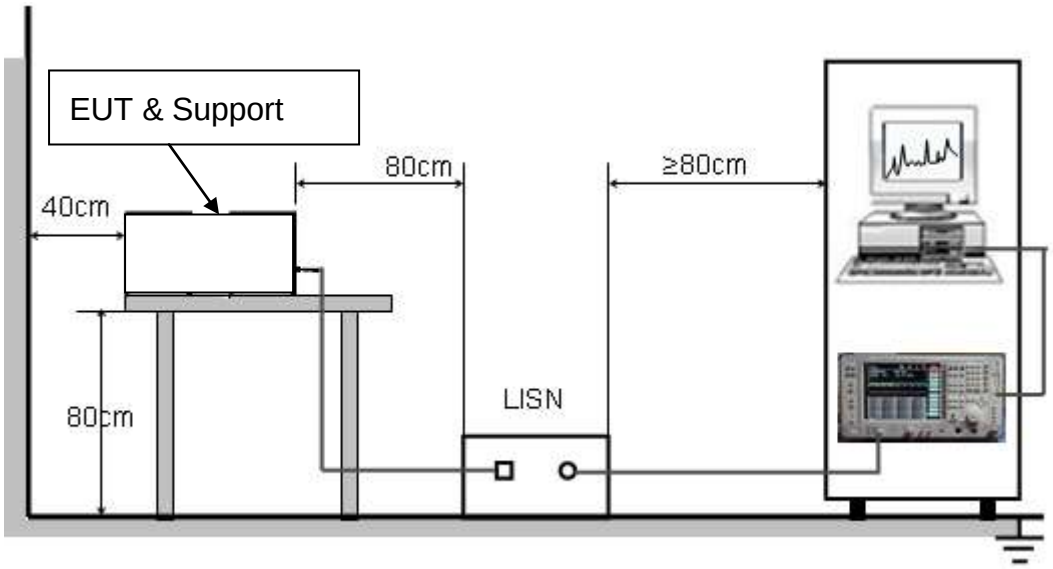
15.1. LIMITS OF LINE CONDUCTED EMISSION TEST

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/60Hzpower 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

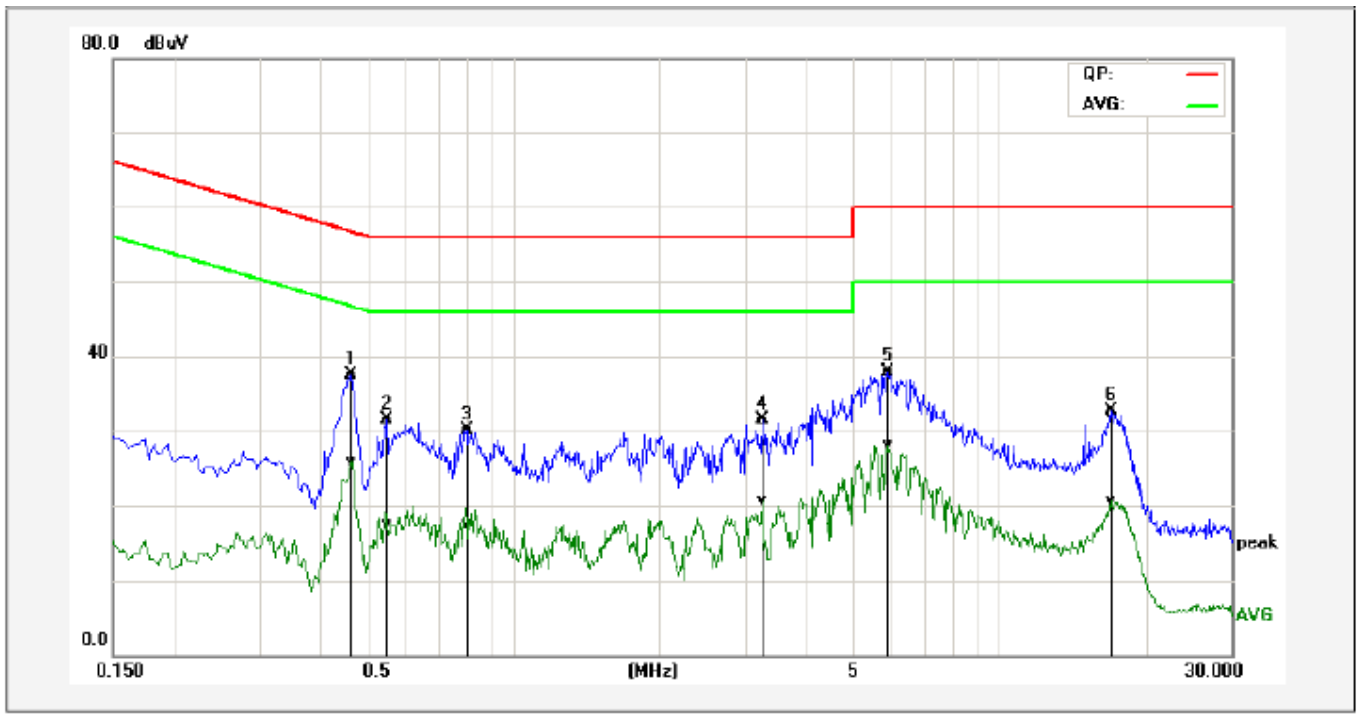
1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used 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

Job No.:	20150518-1	Date: 2015-5-18	
Company:		Time: 15:41:24	
Standard:	FCC Class B Conduction(QP)	Temp.(C)/Hum.(%):	26(C) / 60 %
Test item:	Conduction Test	EUT:	3G Feature phone
Line :	L1	Test Voltage	AC 120V/60Hz
Model:	B30	Test By :	

Description: Normal Operating(BT2.1+EDR)

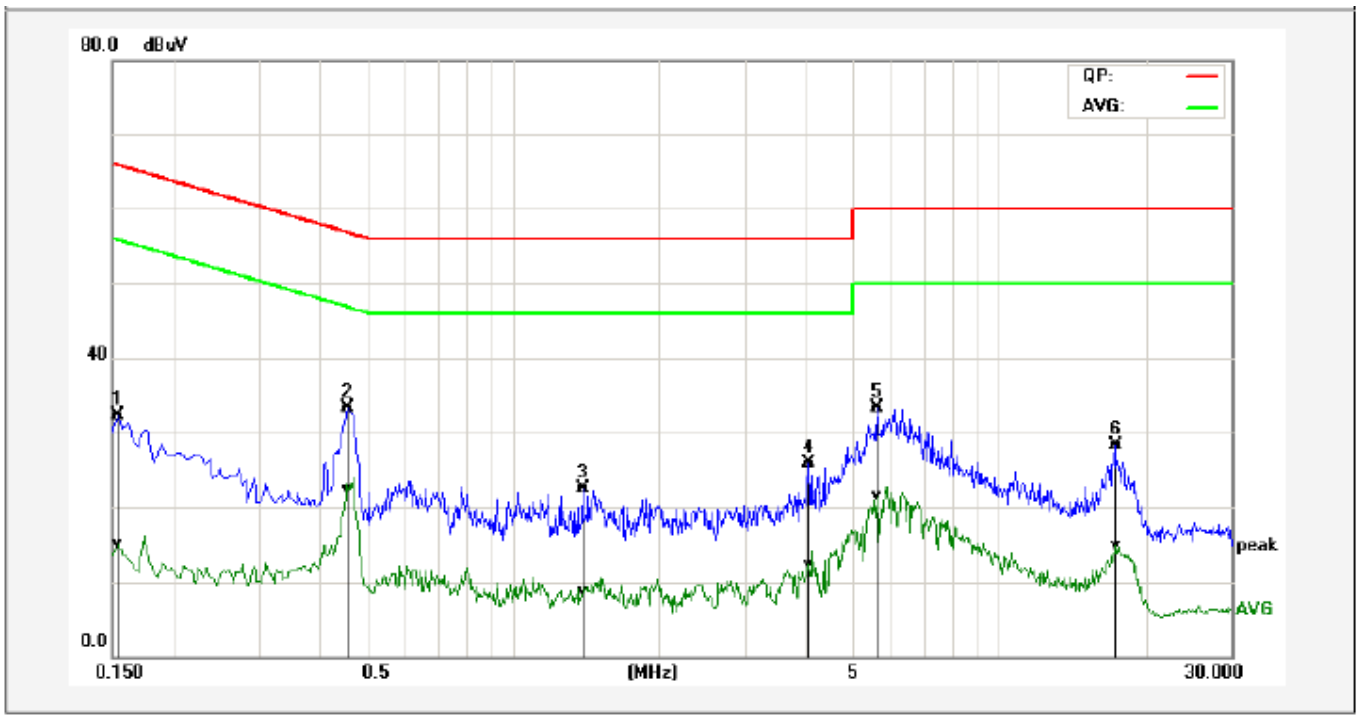


No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1*	0.4660	27.73	16.20	9.68	37.41	25.88	56.58	46.58	-19.17	-20.70	Pass
2P	0.5500	21.83	7.77	9.70	31.53	17.47	56.00	46.00	-24.47	-28.53	Pass
3P	0.8020	20.41	7.76	9.77	30.18	17.53	56.00	46.00	-25.82	-28.47	Pass
4P	3.2580	21.85	10.97	9.71	31.56	20.68	56.00	46.00	-24.44	-25.32	Pass
5P	5.8780	28.14	18.32	9.72	37.86	28.04	60.00	50.00	-22.14	-21.96	Pass
6P	16.9420	22.72	10.85	9.88	32.60	20.73	60.00	50.00	-27.40	-29.27	Pass

Line Conducted Emission Test Line 2-N

Job No.:	20150518-1	Date: 2015-5-18	
Company:		Time: 15:38:04	
Standard:	FCC Class B Conduction(QP)	Temp.(C)/Hum.(%):	26(C) / 60 %
Test item:	Conduction Test	EUT:	3G Feature phone
Line :	N	Test Voltage	AC 120V/60Hz
Model:	B30	Test By :	

Description: Normal Operating (BT2.1+EDR)



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.1539	22.55	5.36	9.78	32.33	15.14	65.78	55.79	-33.45	-40.65	Pass
2*	0.4580	23.59	12.61	9.69	33.28	22.30	56.73	46.73	-23.45	-24.43	Pass
3P	1.3940	12.73	-1.11	9.78	22.51	8.67	56.00	46.00	-33.49	-37.33	Pass
4P	4.0500	16.11	2.46	9.76	25.87	12.22	56.00	46.00	-30.13	-33.78	Pass
5P	5.6100	23.56	11.70	9.78	33.34	21.48	60.00	50.00	-26.66	-28.52	Pass
6P	17.3260	18.65	5.13	9.72	28.37	14.85	60.00	50.00	-31.63	-35.15	Pass

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

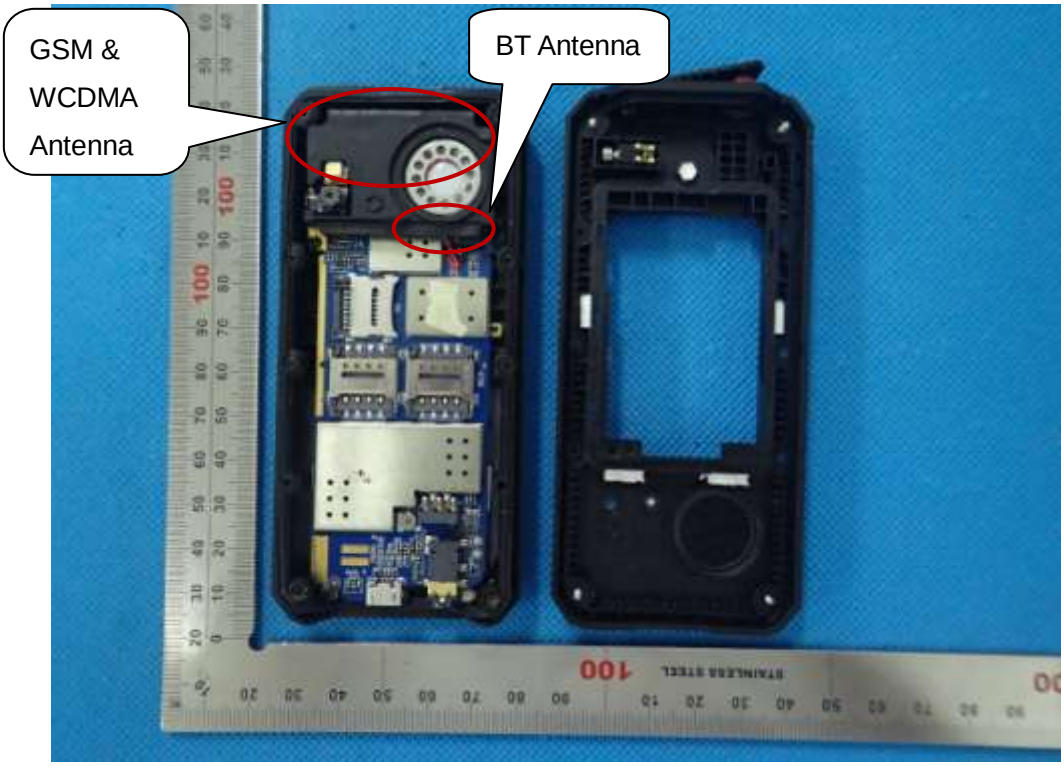
BACK VIEW OF EUT

LEFT VIEW OF EUT

RIGHT VIEW OF EUT

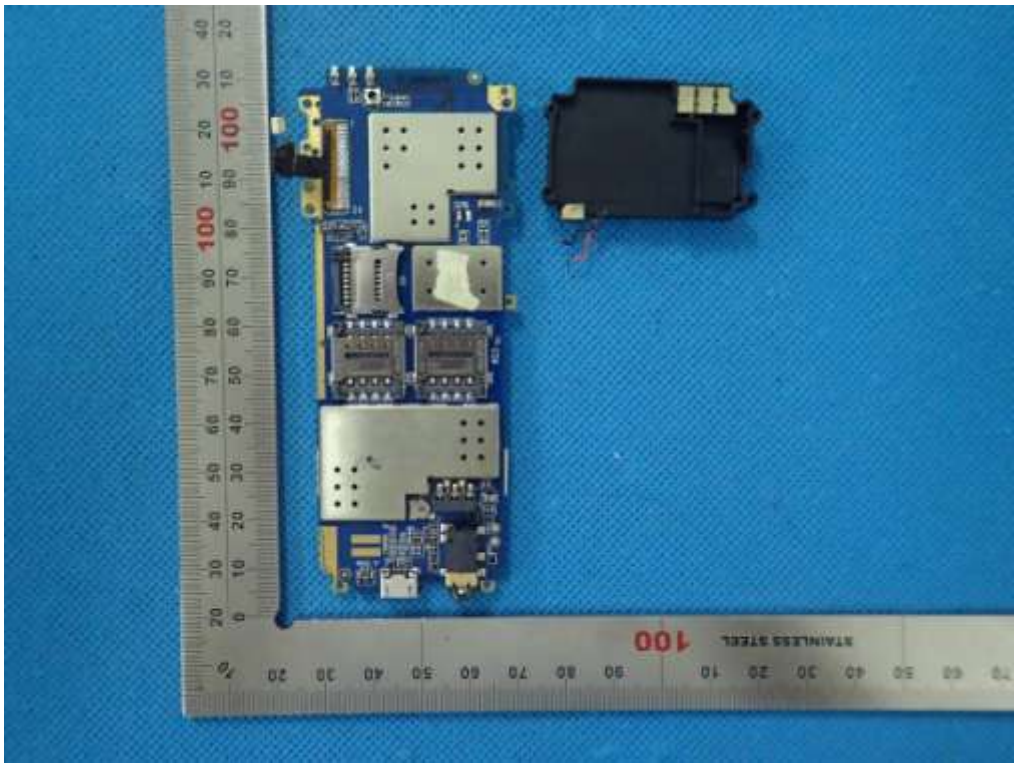
OPEN VIEW OF EUT-1

OPEN VIEW OF EUT-2

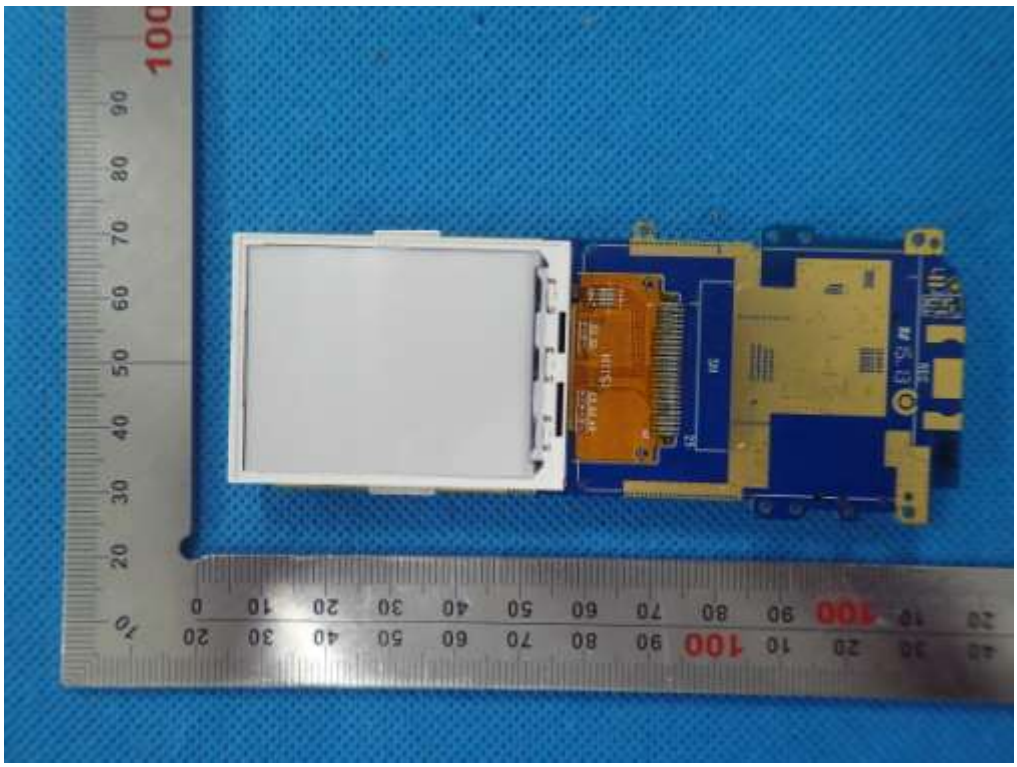


OPEN VIEW OF EUT-3

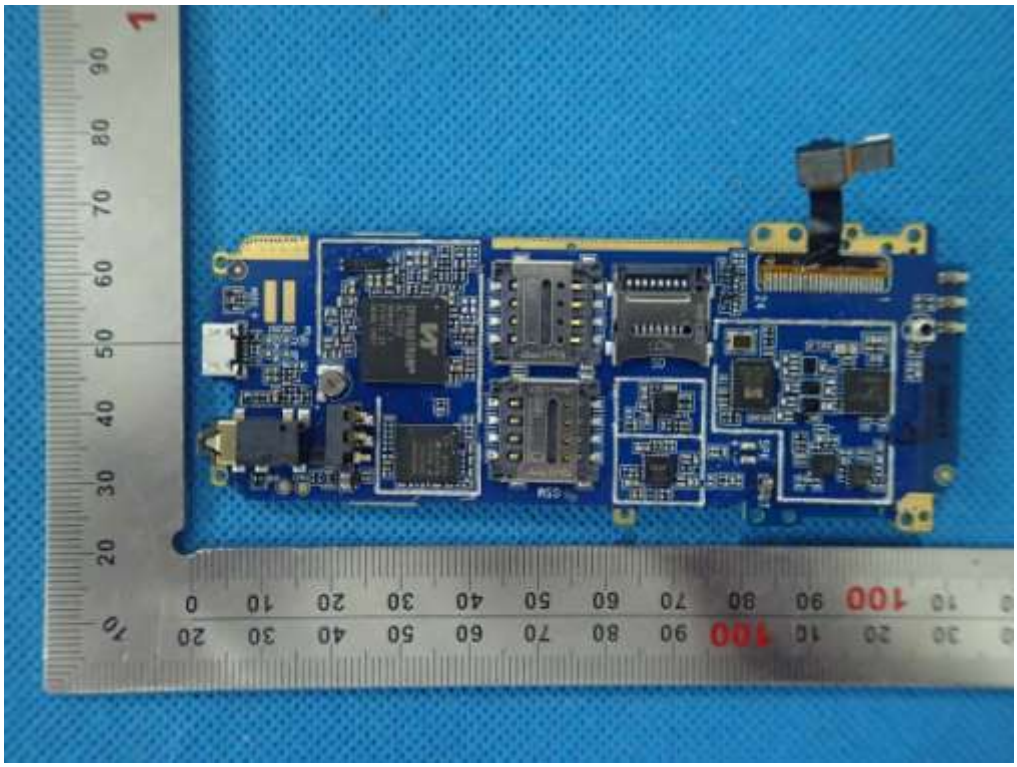
INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



----END OF REPORT----