FCC TEST REPORT

FOR

Speedata Group LTD

Handheld terminal

Model No.: KT40

Additional Model No.: KT40-S, KT40-N43, KT40-N63

Prepared for	:	Speedata Group LTD
Address	:	Room 2-308, building No.25, No.9 Anningzhuang Road West, Haidian district, Beijing, China
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
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Web	:	www.LCS-cert.com
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Date of receipt of test sample	:	May 06, 2017
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	May 06, 2017~May 26, 2017
Date of Report	:	May 26, 2017

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FCC TEST REPORT

FCC CFR 47 PART 15 C(15.247)

Report Reference No. ..... :	**LCS170506005AE**
Date of Issue ..... :	May 26, 2017
Testing Laboratory Name ..... :	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address ..... :	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure..... :	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name..... :	**Speedata Group LTD**
Address ..... :	Room 2-308, building No.25, No.9 Anningzhuang Road West, Haidian district, Beijing, China
Test Specification	
Standard..... :	FCC CFR 47 PART 15 C(15.247)
Test Report Form No. ..... :	LCSEMC-1.0
TRF Originator ..... :	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF ..... :	Dated 2011-03

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Test Item Description. ..... :	**Handheld terminal**
Trade Mark..... :	SPEEDATA®
Model/ Type reference..... :	KT40
Ratings ..... :	DC 3.8V, 4300mAh Charging parameter: Input: 110~220V AC, 50/60Hz, 0.25A; Output: DC 5V, 1.2A
Result ..... :	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Calvin Weng		Gavin Liang
Calvin Weng/ Administrators	Glin Lu/ Technique principal	Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : **LCS170506005AE**	May 26, 2017 Date of issue

EUT.....	: Handheld terminal
Type / Model.....	: KT40
Applicant.....	**: Speedata Group LTD**
Address.....	: Room 2-308, building No.25, No.9 Anningzhuang Road West, Haidian district, Beijing, China
Telephone.....	:
Fax.....	:
Manufacturer.....	**: Beijing Speedata Technology Co.,Ltd**
Address.....	: Room 2-308, building No.25, No.9 Anningzhuang Road West, Haidian district, Beijing, China
Telephone.....	:
Fax.....	:
Factory.....	: **Beijing Speedata Technology Co.,Ltd**
Address.....	: Room 2-308, building No.25, No.9 Anningzhuang Road West, Haidian district, Beijing, China
Telephone.....	:
Fax.....	:

Test Result	**Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
00	May 26, 2017	Initial Issue	Gavin Liang

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1. GENERAL INFORMATION

1.1 Description of Device (EUT)

Name of EUT	Handheld terminal
Model Number	KT40, KT40-S, KT40-N43, KT40-N63
Modulation Type	GMSK for GSM/GPRS, 8-PSK for EDGE,QPSK for UMTS, QPSK, 16QAM for LTE
Antenna Gain	2.0dBi (max.) For GSM 850; 2.0dBi (max.) For GSM 900 1.8dBi (max.) For DCS 1800; 1.8dBi (max.) For PCS 1900 1.8dBi (max.) For WCDMA Band II 2.0dBi (max.) For WCDMA Band V 1.8dBi (max.) For LTE FDD Band 7 2.0dBi (max.) For BT and WLAN 3.0dBi (max.) For NFC
Hardware version	rev.B1
Software version	2017_05_22
GSM/EDGE/GPRS Operation Frequency Band	GSM850/PCS1900/GPRS850/GPRS1900/EDGE850/EDGE1900
UMTS Operation Frequency Band	UMTS FDD Band II/V
LTE Operation Frequency Band	LTE FDD band 7
GSM/EDGE/GPRS	Supported GSM/GPRS/EDGE
GSM Release Version	R99
GSM/EDGE/GPRS Power Class	GSM850:Power Class 4/ PCS1900:Power Class 1
GPRS/EDGE Multislot Class	GPRS/EDGE: Multi-slot Class 12
GPRS operation mode	Class B
WCDMA Release Version	R99
HSDPA Release Version	Release 8
HSUPA Release Version	Release 6
DC-HSUPA Release Version	Not Support
LTE Release Version	R8
LTE/UMTS Power Class	Class 3
WLAN FCC Modulation Type	IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)
WLAN FCC Operation frequency	IEEE 802.11b:2412-2462MHz IEEE 802.11g:2412-2462MHz IEEE 802.11n HT20:2412-2462MHz IEEE 802.11n HT40:2422-2452MHz
Antenna Type	PIFA Antenna
BT Modulation Type	GFSK,8-DPSK,π/4-DQPSK(BT V4.1)
Extreme temp. Tolerance	-30°C to +50°C
GPS function	Support and only RX
NFC Function	Support
Extreme vol. Limits	3.40VDC to 4.2VDC (nominal: 3.80VDC)

1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
SHEN ZHEN KEYU SUPPLY TECHNOLOGY Co.,Ltd	Power Adapter	KA25-0501200US	---	FCC VoC

1.3. External I/O Cable

I/O Port Description	Quantity	Cable
USB	1	1m, unshielded cable
Earphone	1	N/A

1.4. Description of Test Facility

CNAS Registration Number is L4595.
FCC Registration Number is 899208.
Industry Canada Registration Number is 9642A-1.
ESMD Registration Number is ARCB0108.
UL Registration Number is 100571-492.
TUV SUD Registration Number is SCN1081.
TUV RH Registration Number is UA 50296516-001

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.5. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	±3.10dB	(1)
		30MHz~200MHz	±2.96dB	(1)
		200MHz~1000MHz	±3.10dB	(1)
		1GHz~26.5GHz	±3.80dB	(1)
		26.5GHz~40GHz	±3.90dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±1.63dB	(1)
Power disturbance	:	30MHz~300MHz	±1.60dB	(1)

(1) The uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.7 Description of Test Modes

Bluetooth operates in the unlicensed ISM Band at 2.4GHz. With basic data rate feature, the data rates can be up to 1 Mb/s by modulating the RF carrier using GFSK techniques. The EUT works in the X-axis, Y-axis, Z-axis. The following operating modes were applied for the related test items. All test modes were tested, only the result of the worst case was recorded in the report.

Mode of Operations	Frequency Range (MHz)	Data Rate (Mbps)
BT V 3.0	2402	1/2/3
	2441	1/2/3
	2480	1/2/3
For Conducted Emission		
Test Mode	TX Mode	
For Radiated Emission		
Test Mode	TX Mode	

Worst-case mode and channel used for 150 KHz-30 MHz power line conducted emissions was the mode and channel with the highest output power that was determined to be TX (1Mbps).

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be TX(1Mbps-Low Channel).

AC conducted emission pre-test at both at AC 120V/60Hz and AC 240V/50Hz modes, recorded worst case;

AC conducted emission pre-test at both at power adapter and power from PC modes, recorded worst case;

Bluetooth V3.0 (DSS) frequency & channel list:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2402	41	2442
2	2403	42	2443
--	--	--	--
38	2439	78	2479
39	2440	79	2480
40	2441		

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR PART 15C 15.207, 15.209, 15.247 and DA 00-705.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209, 15.247 under the FCC Rules Part 15 Subpart C.

2.3 General Test Procedures

2.3.1 Conducted Emissions

The EUT is directly placed on the ground. According to the requirements in Section 6.2.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turntable, which is directly placed on the ground. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10-2013.

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3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a continuous transmits condition.

3.2 EUT Exercise Software

The sample will be controlled by dialing *#*#3646633#*#* to enter RF test mode to control sample change channel, modulation and so on;

3.3 Special Accessories

No.	Equipment	Manufacturer	Model No.	Serial No.	Length	shielded/ unshielded	Notes
1	PC	Lenovo	Ideapad	A131101550	/	/	DOC
2	Power adapter	Lenovo	CPA-A090	36200414	1.00m	unshielded	DOC

3.4 Block Diagram/Schematics

Please refer to the related document.

3.5 Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6 Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 15 Subpart C		
FCC Rules	Description of Test	Result
§15.247(b)(1)	Maximum Conducted Output Power	Compliant
§15.247(c)	Frequency Separation And 20 dB Bandwidth	Compliant
§15.247(a)(1)(ii)	Number Of Hopping Frequency	Compliant
§15.247(a)(1)(iii)	Time Of Occupancy (Dwell Time)	Compliant
§15.209, §15.205	Conducted Spurious Emissions and Band Edges Test	Compliant
§15.209, §15.247(d)	Radiated and Conducted Spurious Emissions	Compliant
§15.205	Emissions at Restricted Band	Compliant
§15.207(a)	Conducted Emissions	Compliant
§15.203	Antenna Requirements	Compliant
§15.247(i)§2.1093	RF Exposure	Compliant

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5. SUMMARY OF TEST EQUIPMENT

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	Power Sensor	R&S	NRV-Z81	100458	2016-06-18	2017-06-17
2	Power Sensor	R&S	NRV-Z32	10057	2016-06-18	2017-06-17
3	Power Meter	R&S	NRVS	100444	2016-06-18	2017-06-17
4	DC Filter	MPE	23872C	N/A	2016-06-18	2017-06-17
5	RF Cable	Harbour Industries	1452	N/A	2016-06-18	2017-06-17
6	SMA Connector	Harbour Industries	9625	N/A	2016-06-18	2017-06-17
7	Spectrum Analyzer	Agilent	N9020A	MY50510140	2016-10-27	2017-10-26
8	Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	2016-06-16	2017-06-15
9	RF Cable	Hubersuhne	Sucoflex104	FP2RX2	2016-06-18	2017-06-17
10	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2016-06-18	2017-06-17
11	Amplifier	SCHAFFNER	COA9231A	18667	2017-04-18	2018-04-17
12	Amplifier	Agilent	8449B	3008A02120	2017-04-18	2018-04-17
13	Amplifier	MITEQ	AMF-6F-260400	9121372	2017-04-18	2018-04-17
14	Loop Antenna	R&S	HFH2-Z2	860004/001	2017-04-18	2018-04-17
15	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2017-04-18	2018-04-17
16	Horn Antenna	EMCO	3115	6741	2017-04-18	2018-04-17
17	Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	2017-04-18	2018-04-17
18	RF Cable-R03m	Jye Bao	RG142	CB021	2016-06-18	2017-06-17
19	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2016-06-18	2017-06-17
20	EMI Test Receiver	R&S	ESCI	101142	2016-06-18	2017-06-17
21	Artificial Mains	R&S	ENV216	101288	2016-06-18	2017-06-17
22	EMI Test Software	AUDIX	E3	N/A	2016-06-18	2017-06-17

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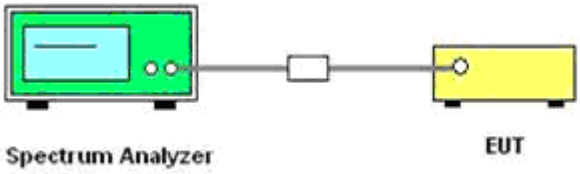
6. ANTENNA PORT MEASUREMENT

6.1 Peak Power

6.1.1 Block Diagram of Test Setup



6.1.2 Limit

According to §15.247(b)(1), For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping system in the 2400–2483.5 MHz band: 0.125 watts.

6.1.3 Test Procedure

Use the following spectrum analyzer settings:

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

RBW > the 20 dB bandwidth of the emission being measured

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power

6.1.4 Test Results

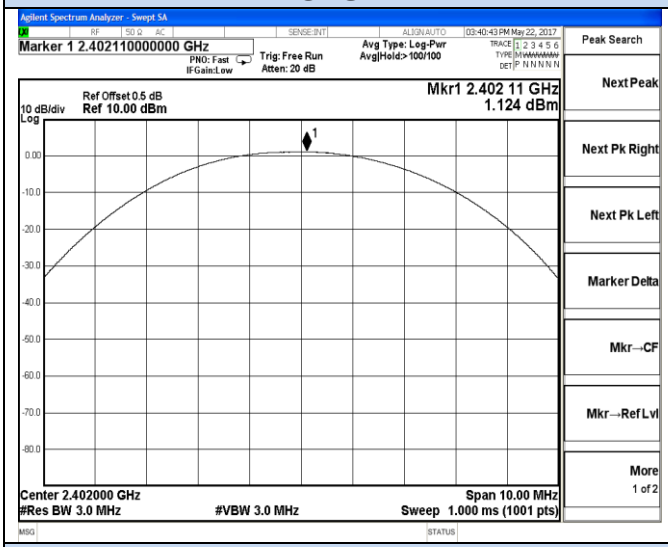
Test Mode	Channel	Frequency (MHz)	Measured Maximum Power (dBm)	Limits (dBm)	Verdict
GFSK	0	2402	1.124	30.00	PASS
	39	2441	4.705		
	78	2480	0.725		
π/4DQPSK	0	2402	0.305	21.00	PASS
	39	2441	3.700		
	78	2480	-0.151		
8DPSK	0	2402	0.226	21.00	PASS
	39	2441	3.674		
	78	2480	-0.284		

Remark:

1. *Test results including cable loss;*
2. *Measured output power at difference Packet Type for each mode and recorded worst case for each mode.*
3. *Worst case data at DH1 for GFSK, 2DH1 for π/4DQPSK, 3DH1 for 8DPSK modulation type;*
4. *Please refer to following test plots;*

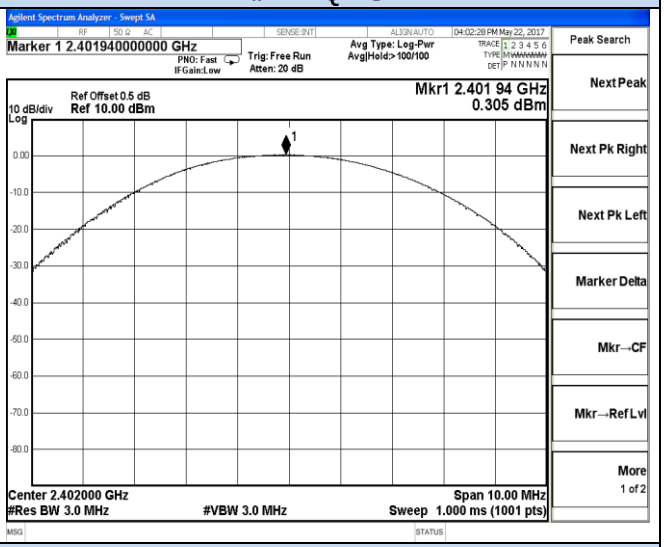
Peak Output Power

GFSK

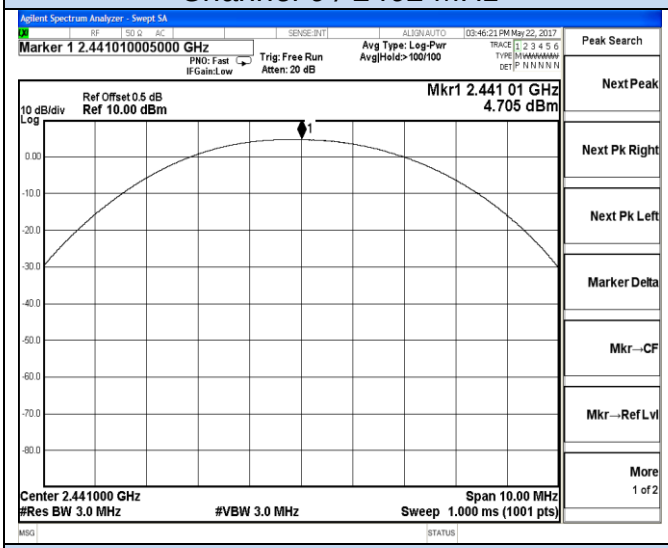


Channel 0 / 2402 MHz

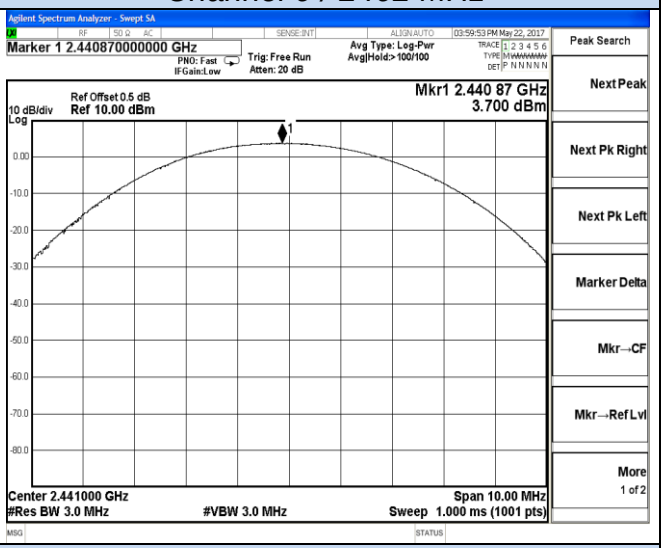
π/4-DQPSK



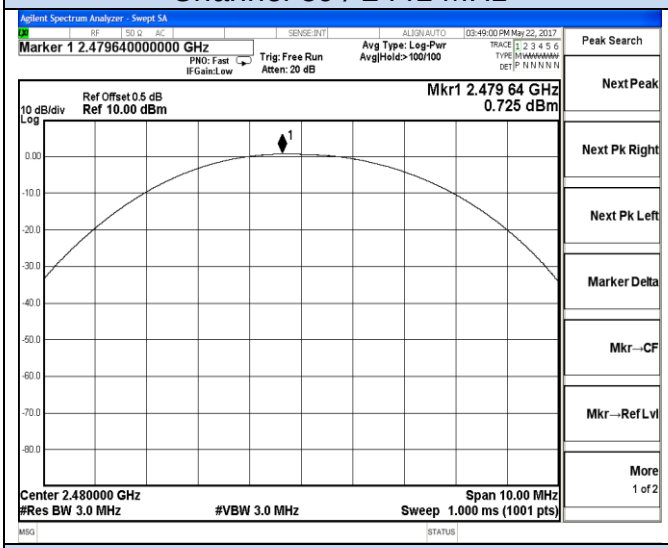
Channel 0 / 2402 MHz



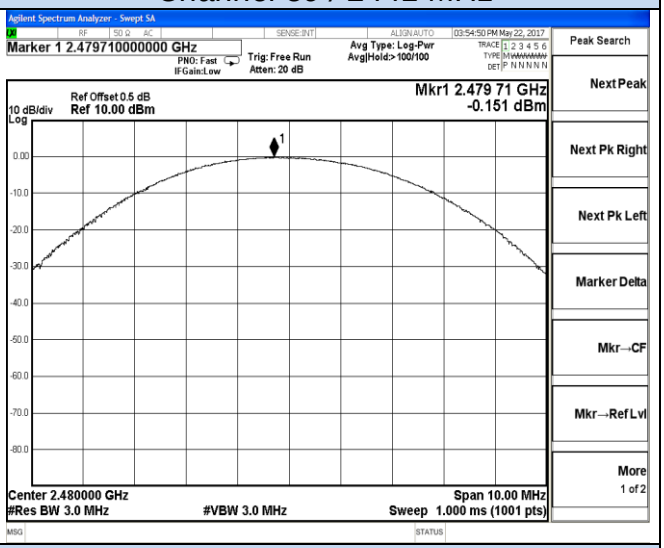
Channel 39 / 2441 MHz



Channel 39 / 2441 MHz



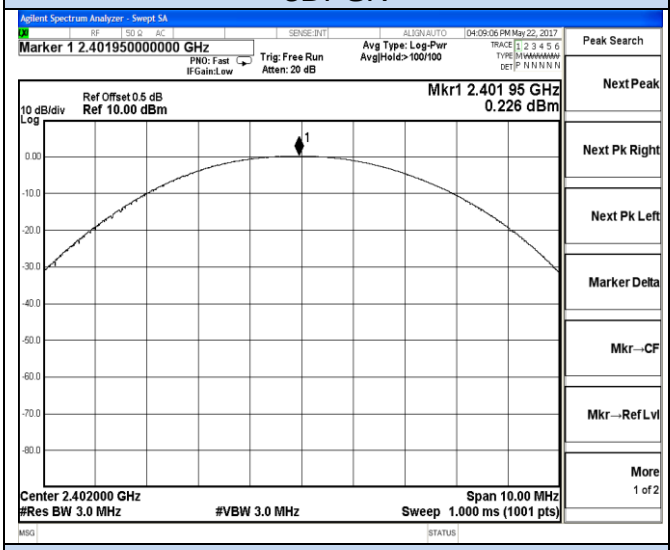
Channel 78 / 2480 MHz



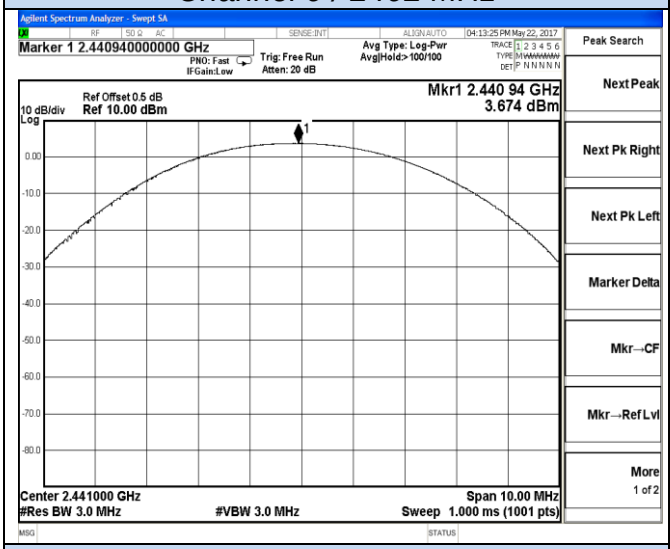
Channel 78 / 2480 MHz

Peak Output Power

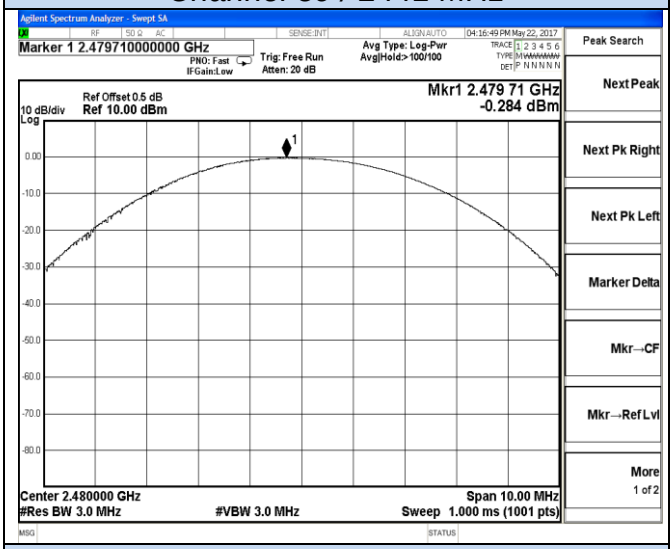
8DPSK



Channel 0 / 2402 MHz



Channel 39 / 2441 MHz



Channel 78 / 2480 MHz

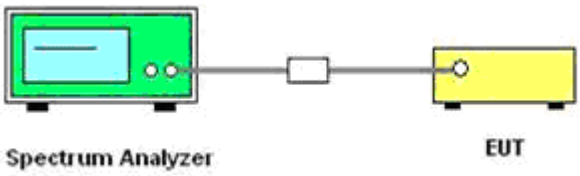
6.2 Frequency Separation and 20 dB Bandwidth

6.2.1 Limit

§15.247(a) (1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

According to §15.247(c) or A8.1(a), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

6.2.2 Block Diagram of Test Setup



6.2.3 Test Procedure

Frequency separation test 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 loss RF cable from the antenna port to the Spectrum Analyzer.

3). Set center frequency of Spectrum Analyzer = middle of hopping channel.

4). Set the Spectrum Analyzer as RBW = 100 KHz, VBW = 300 KHz, Span = wide enough to capture the peaks of two adjacent channels, Sweep = auto.

5). Max hold, mark 2 peaks of hopping channel and record the 2 peaks frequency.

20dB bandwidth test procedure：

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

2). RBW = 30 KHz, VBW = 100 KHz.

3). Detector function = peak.

4). Trace = max hold.

6.2.4 Test Results

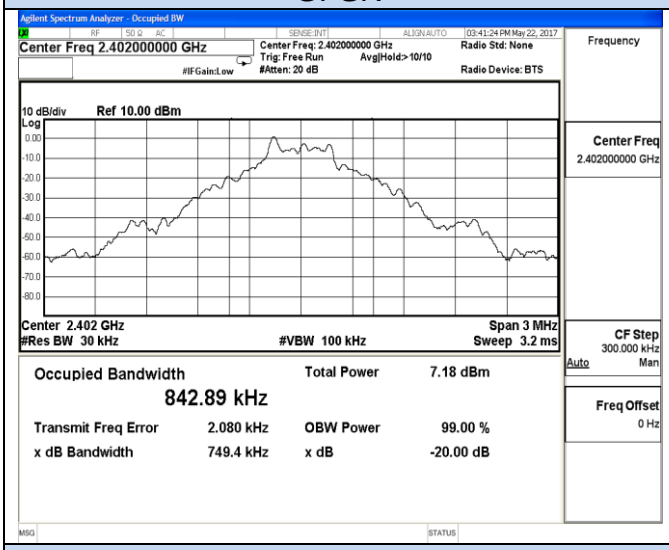
6.2.4.1 20dB Bandwidth

Test Mode	Channel	Frequency (MHz)	Measured Bandwidth (KHz)		Limits (KHz)	Verdict
			99%	20dB		
GFSK	0	2402	842.89	749.40	No Limits	PASS
	39	2441	837.93	827.70		
	78	2480	838.97	828.80		
π/4DQPSK	0	2402	1064.50	1115.00	No Limits	PASS
	39	2441	1065.30	1117.00		
	78	2480	1064.90	1117.00		
8DPSK	0	2402	1073.30	1134.00	No Limits	PASS
	39	2441	1072.10	1133.00		
	78	2480	1074.40	1133.00		

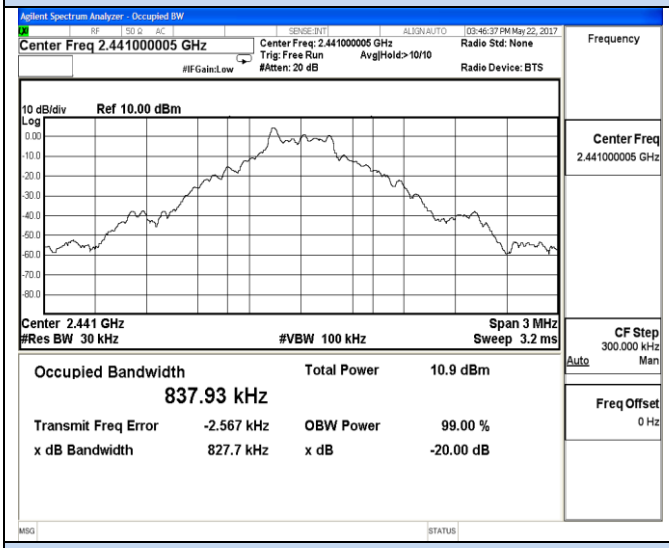
Remark:
1. *Measured bandwidth at difference Packet Type for each mode and recorded worst case for each mode.*
2. *Worst case data at DH5 for GFSK, 2DH5 for π/4DQPSK, 3DH5 for 8DPSK modulation type;*
3. *Please refer following test plots;*

20dB Bandwidth and 99% Bandwidth

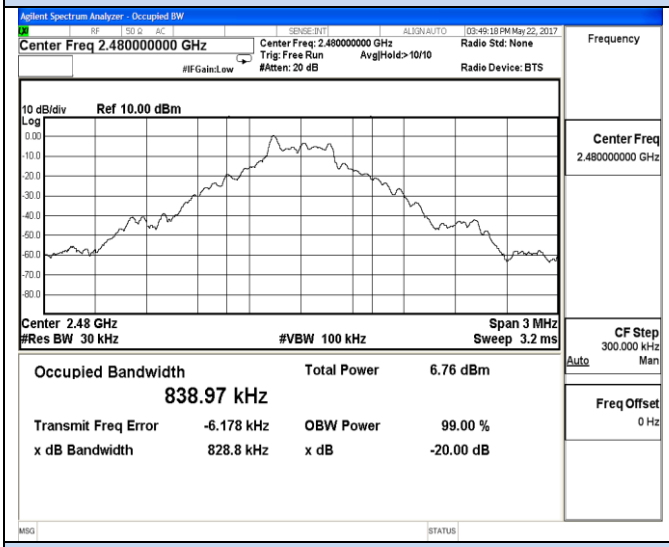
GFSK



Channel 0 / 2402 MHz

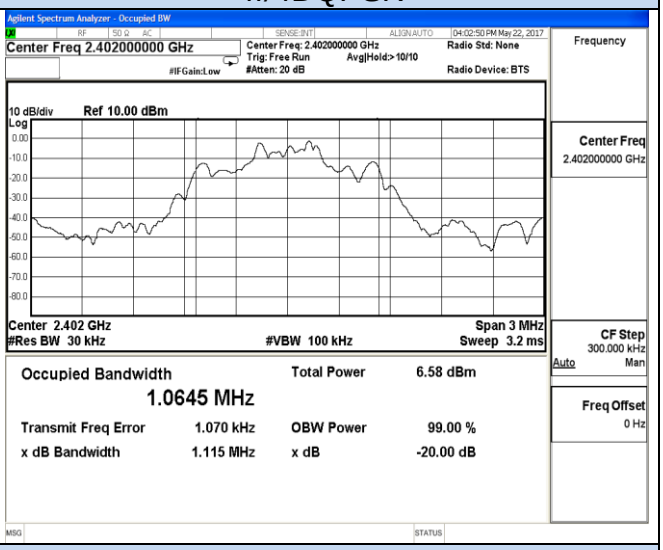


Channel 39 / 2441 MHz

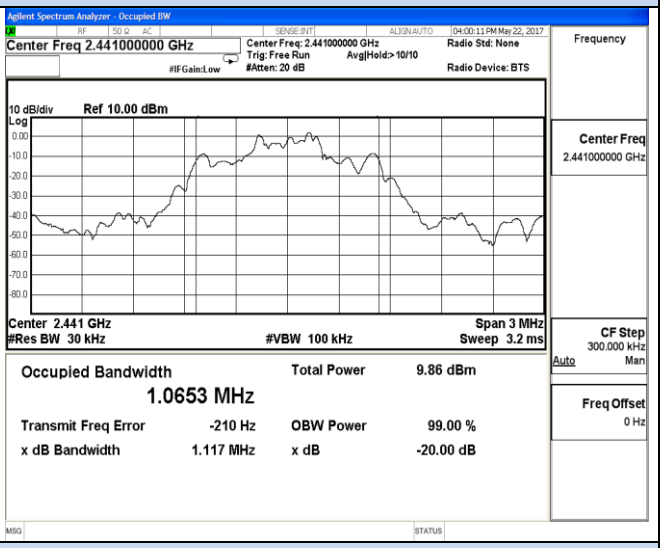


Channel 78 / 2480 MHz

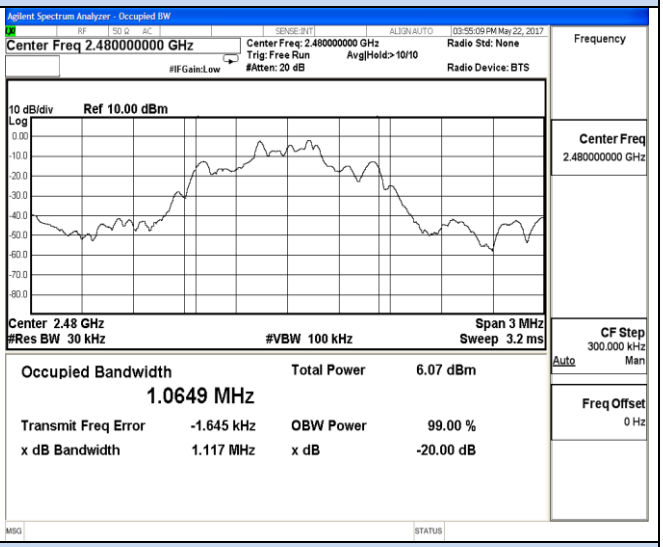
π/4DQPSK



Channel 0 / 2402 MHz



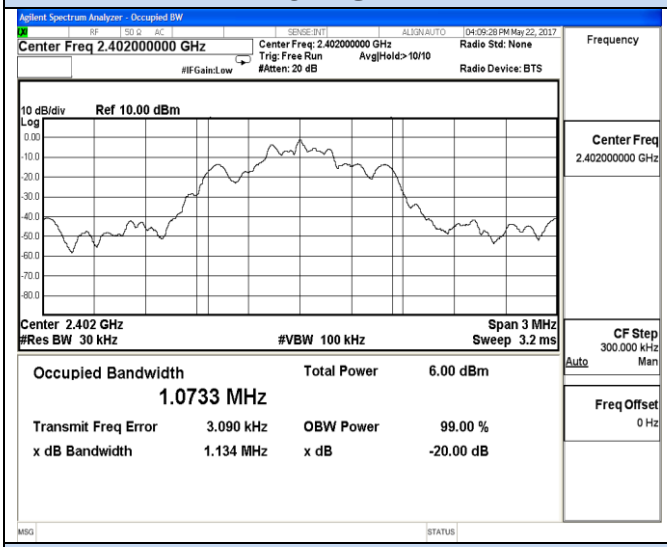
Channel 39 / 2441 MHz



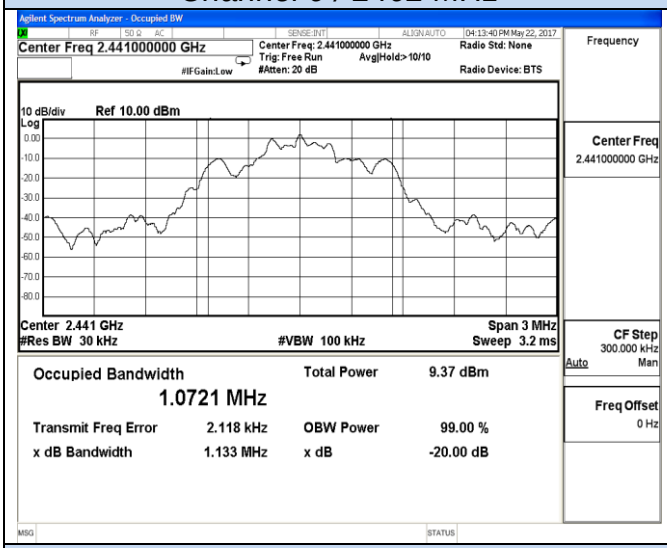
Channel 78 / 2480 MHz

20dB Bandwidth and 99% Bandwidth

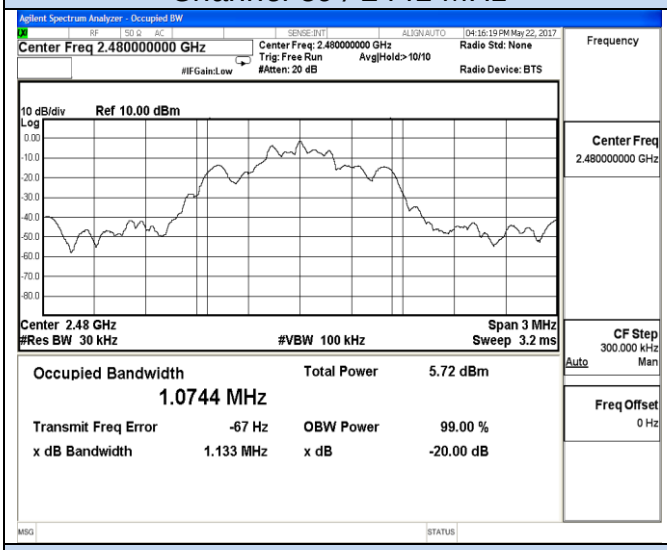
8DPSK



Channel 0 / 2402 MHz



Channel 39 / 2441 MHz



Channel 78 / 2480 MHz

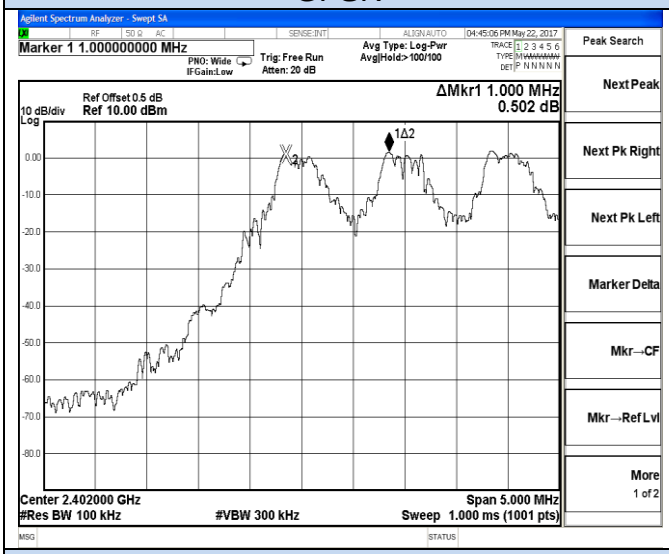
6.2.4.2 Frequency Separation

The Measurement Result With 1Mbps For GFSK Modulation				
Channel	20dB Bandwidth (KHz)	Channel Separation (MHz)	Limit (KHz)	Result
Low	749.40	1.000	≥749.40	Pass
Middle	827.70	1.000	≥827.70	Pass
High	828.80	1.000	≥828.80	Pass
The Measurement Result With 2Mbps For π/4-DQPSK Modulation				
Channel	20dB Bandwidth (KHz)	Channel Separation (MHz)	Limit (KHz)	Result
Low	1115.00	0.985	≥743.33	Pass
Middle	1117.00	1.000	≥744.67	Pass
High	1117.00	1.000	≥744.67	Pass
The Measurement Result With 3Mbps For 8-DPSK Modulation				
Channel	20dB Bandwidth (KHz)	Channel Separation (MHz)	Limit (KHz)	Result
Low	1134.00	1.000	≥756.00	Pass
Middle	1133.00	1.000	≥755.33	Pass
High	1133.00	1.000	≥755.33	Pass

Remark:
1. *Please refer to following plots;*
2. *Measured at difference Packet Type for each mode and recorded worst case for each mode.*
3. *Worst case data at DH5 for GFSK, 2DH5 for π/4-DQPSK, 3DH5 for 8DPSK modulation type;*

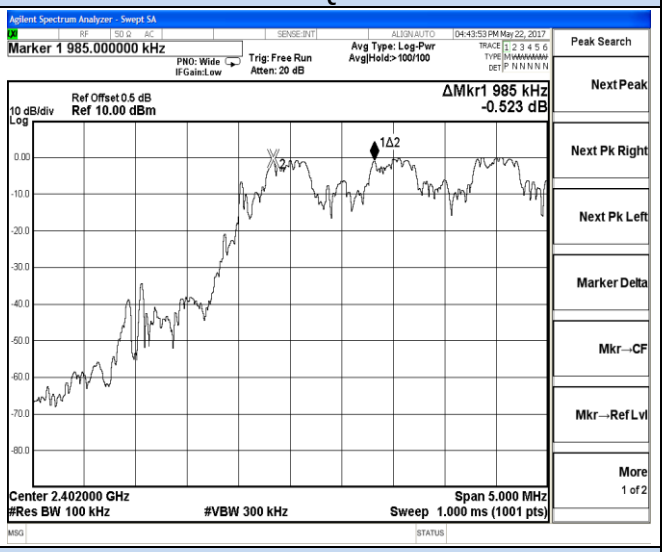
Frequency Separation

GFSK

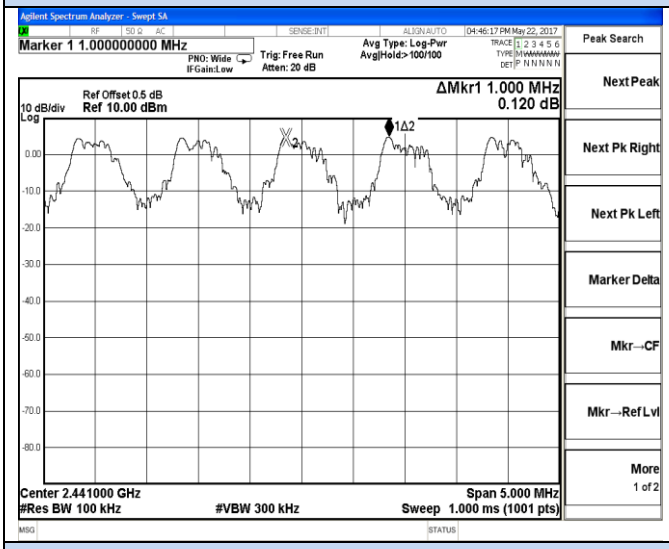


Channel 0 / 2402 MHz

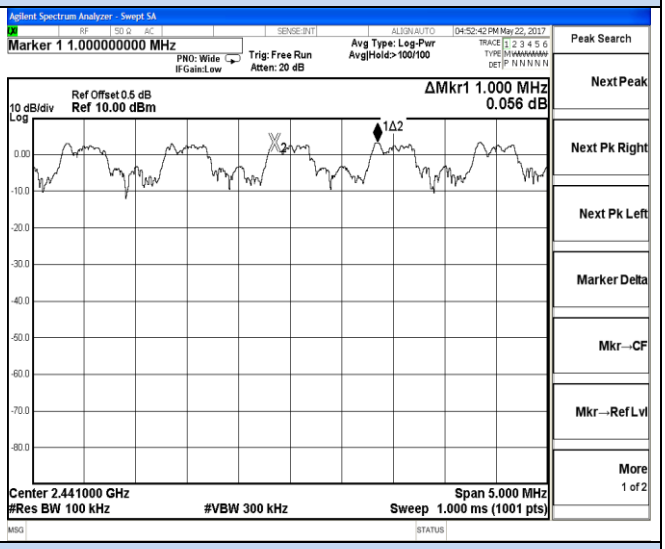
π/4DQPSK



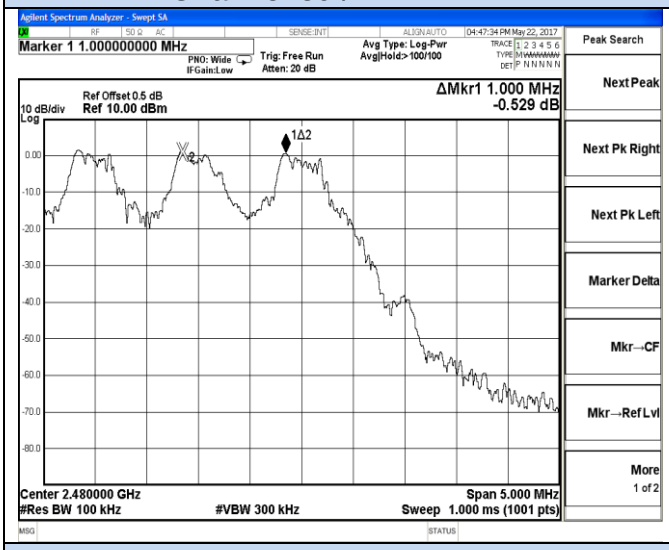
Channel 0 / 2402 MHz



Channel 39 / 2441 MHz



Channel 39 / 2441 MHz



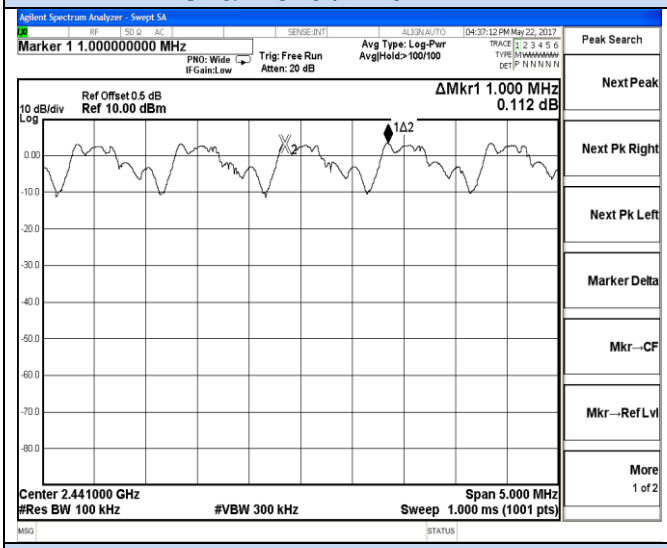
Channel 78 / 2480 MHz

Channel 78 / 2480 MHz

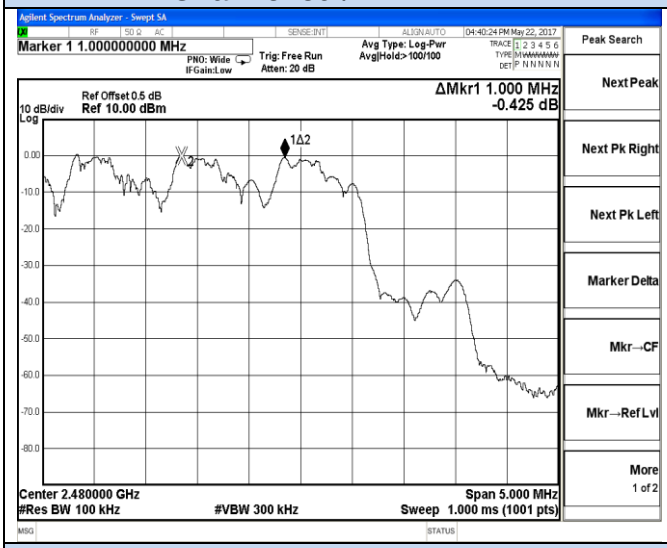
Frequency Separation

8DPSK

Channel 0 / 2402 MHz



Channel 39 / 2441 MHz



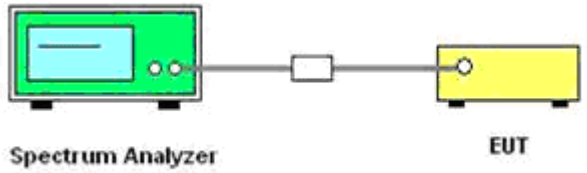
Channel 78 / 2480 MHz

6.3 Number of Hopping Frequency

6.3.1 Limit

According to §15.247(a)(1)(ii) or A8.1 (d), Frequency hopping systems operating in the band 2400-2483.5 MHz shall use at least 15 hopping channels.

6.3.2 Block Diagram of Test Setup



6.3.3 Test 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 loss RF cable from the antenna port to the Spectrum Analyzer.

3). Set Spectrum Analyzer Start=2400MHz, Stop = 2483.5MHz, Sweep = auto.

4). Set the Spectrum Analyzer as RBW = 1 MHz, VBW=1MHz.

5). Max hold, view and count how many channel in the band.

6.3.4 Test Results

Test Mode	Measurement Result (No. of Channels)	Limit (No. of Channels)	Result
GFSK	79	≥15	PASS
π/4DQPSK	79	≥15	PASS
8DPSK	79	≥15	PASS

Remark:
1. *Test results including cable loss;*
2. *Measured at difference Packet Type for each mode and recorded worst case for each mode.*
3. *Worst case data at DH5 for GFSK, 2DH5 for π/4DQPSK, 3DH5 for 8DPSK modulation type;*
4. *Record test plots only for GFSK;*
5. *Please refer following test plots;*

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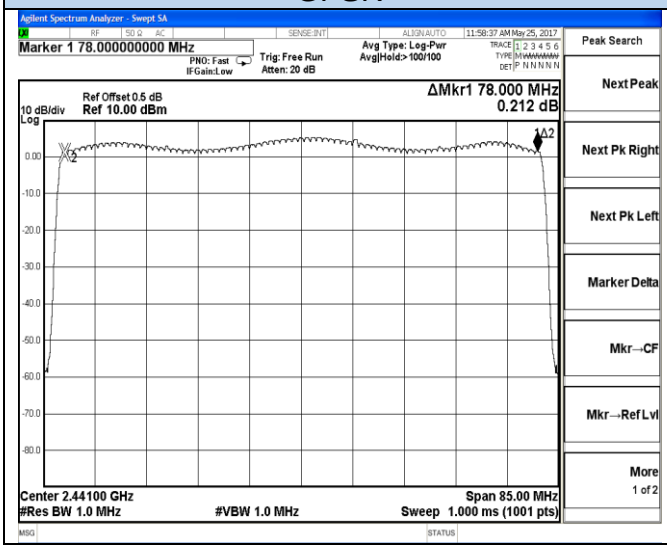
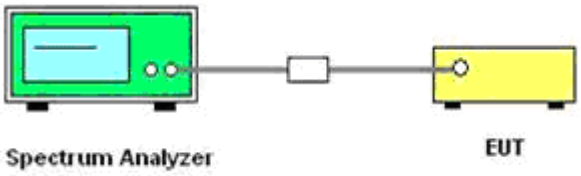
Number of Hopping Frequency	
GFSK	
	

6.4 Time of Occupancy (Dwell Time)

6.4.1 Limit

According to §15.247(a)(1)(iii) or A8.1 (d), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a period 0.4 s multiplied by the number of hopping channels employed.

6.4.2 Block Diagram of Test Setup



6.4.3 Test 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 loss RF cable from the antenna port to the Spectrum Analyzer.
3). Set center frequency of Spectrum Analyzer = operating frequency.
4). Set the Spectrum Analyzer as RBW, VBW=1MHz, Span = 0Hz, Sweep = auto.
5). Repeat above procedures until all frequency measured was complete.

6.4.4 Test Results

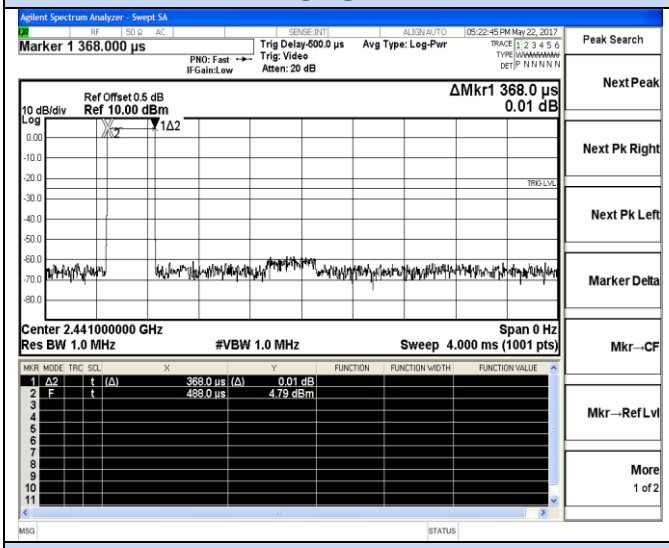
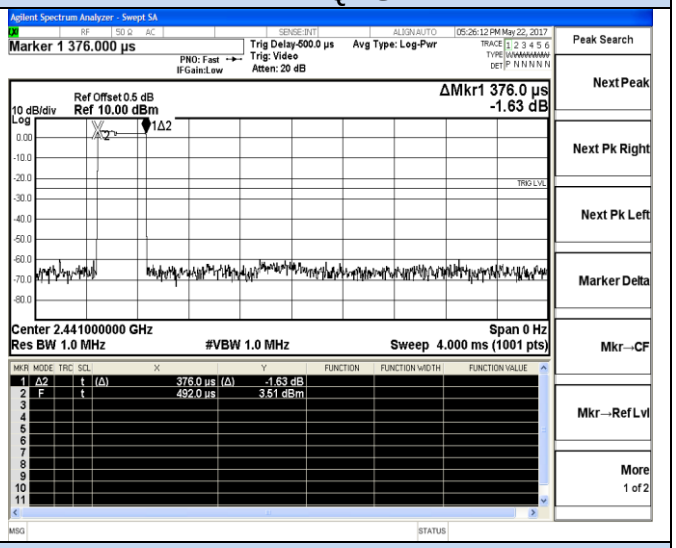
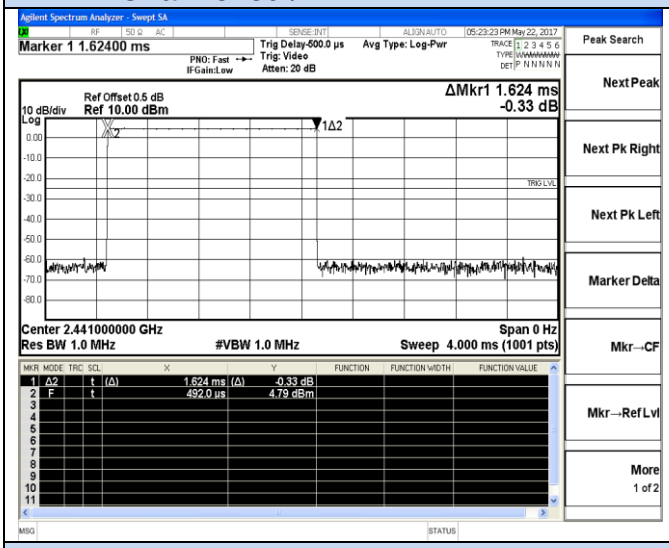
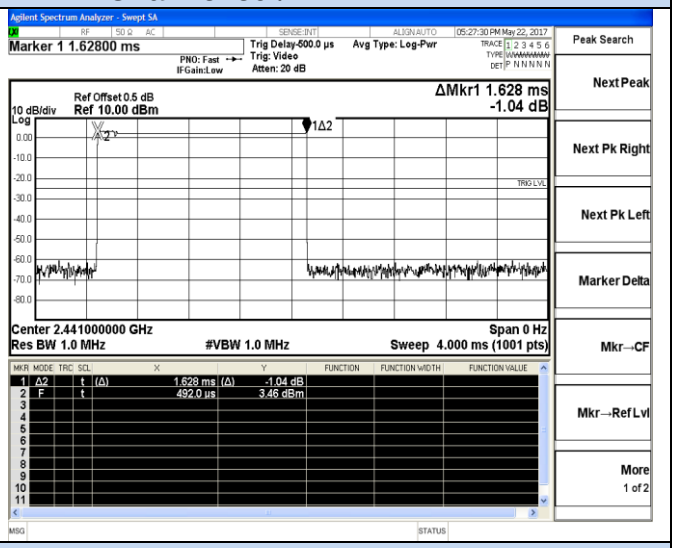
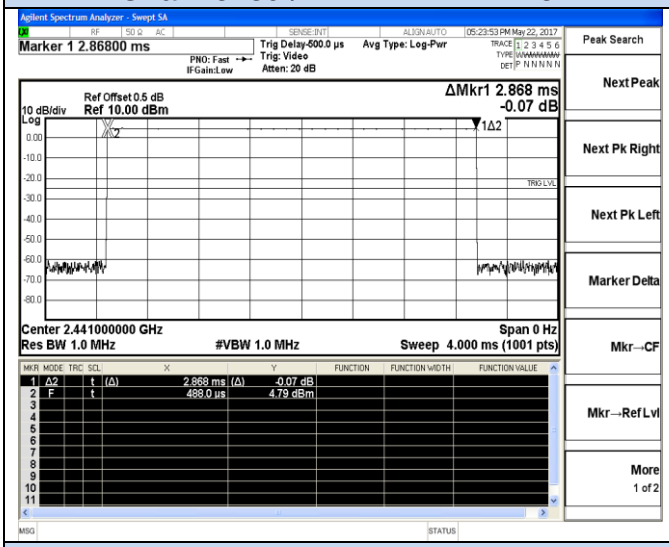
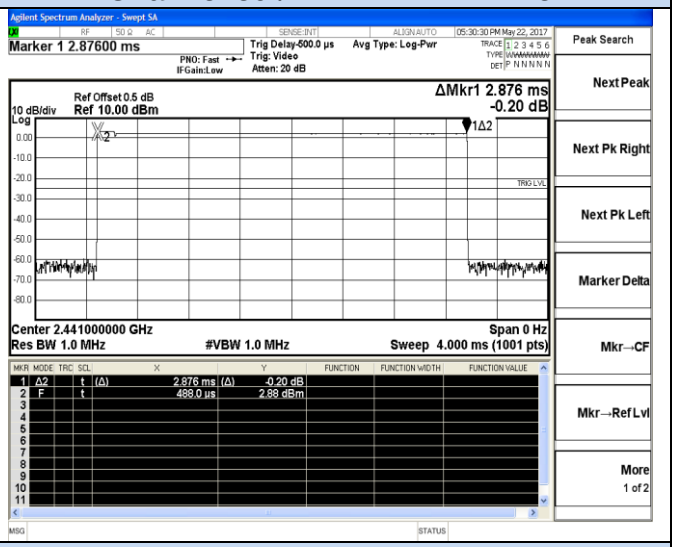
The Dwell Time=Burst Width*Total Hops. The detailed calculations are showed as follows:
The duration for dwell time calculation: 0.4[s]*hopping number=0.4[s]*79[ch] =31.6[s*ch];
The burst width [ms/hop/ch], which is directly measured, refers to the duration on one channel hop.
The hops per second for 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	Frequency (MHz)	Burst Type	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Verdict
GFSK	2441	DH1	0.368	0.118	0.4	PASS
		DH3	1.624	0.260	0.4	PASS
		DH5	2.868	0.306	0.4	PASS
π/4-DQPSK	2441	2DH1	0.376	0.120	0.4	PASS
		2DH3	1.628	0.260	0.4	PASS
		2DH5	2.876	0.307	0.4	PASS
8DPSK	2441	3DH1	0.372	0.119	0.4	PASS
		3DH3	1.628	0.260	0.4	PASS
		3DH5	2.876	0.307	0.4	PASS

Remark:
1. *Test results including cable loss;*
2. *Please refer to following plots;*
3. *Measured at difference Packet Type for each mode and recorded worst case for each mode.*
4. *Dwell Time Calculate formula:*
   DH1: Dwell time=Pulse time (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second
   DH3: Dwell time=Pulse time (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second

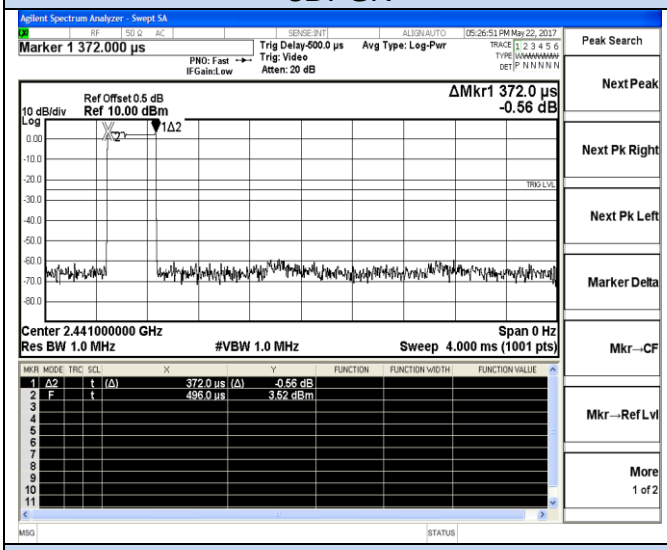
DH5: Dwell time=Pulse Time (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second

5. *Measured at low, middle and high channel, recorded worst at middle channel;*

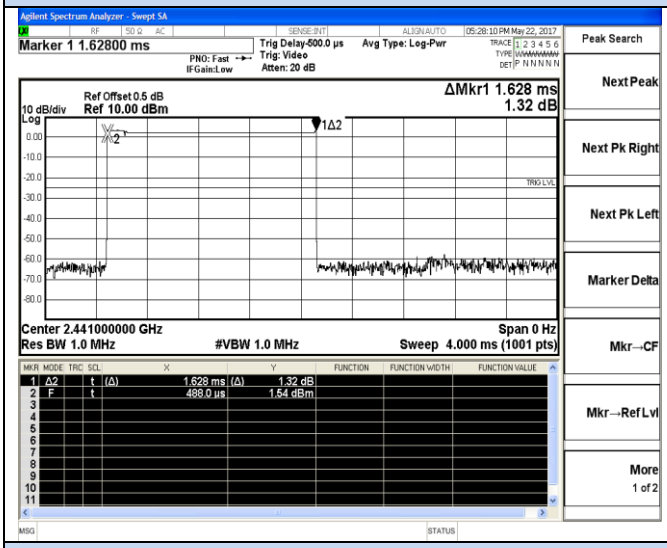
Dwell time	
GFSK	π/4-DQPSK
	
Channel 39 / 2441 MHz – DH1	Channel 39 / 2441 MHz - 2DH1
	
Channel 39 / 2441 MHz – DH3	Channel 39 / 2441 MHz - 2DH3
	
Channel 39 / 2441 MHz – DH5	Channel 39 / 2441 MHz - 2DH5

Dwell time

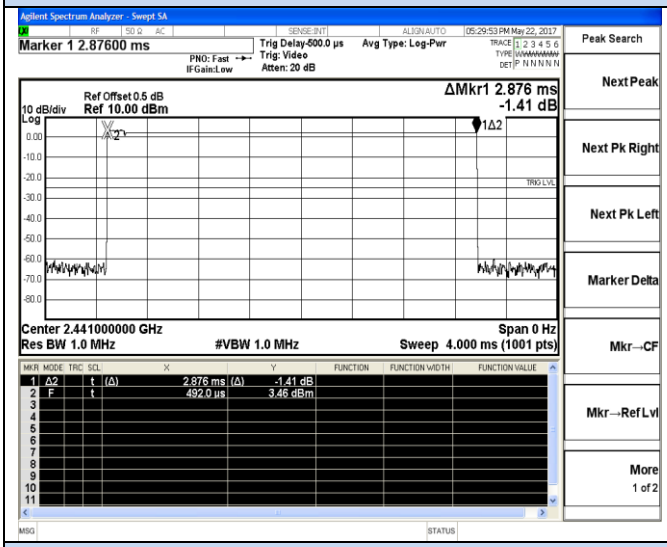
8DPSK



Channel 39 / 2441 MHz – 3DH1



Channel 39 / 2441 MHz – 3DH3



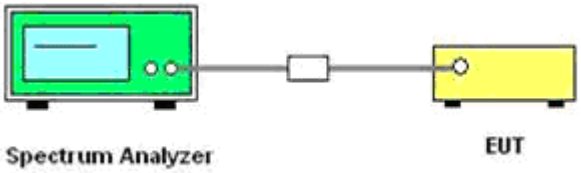
Channel 39 / 2441 MHz – 3DH5

6.5 Conducted Spurious Emissions and Band Edges Test

6.5.1 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

6.5.2 Block Diagram of Test Setup



6.5.3 Test Procedure

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 KHz. The video bandwidth is set to 300 KHz.
Measurements are made over the 9 KHz to 26.5GHz range with the transmitter set to the lowest, middle, and highest channels

6.5.4 Test Results of Conducted Spurious Emissions

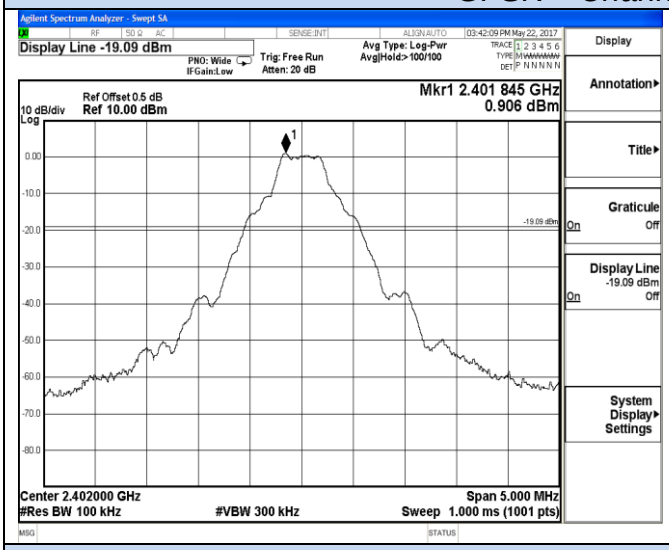
No non-compliance noted. Only record the worst test result (TX-GFSK) in this report. The test data refer to the following page.

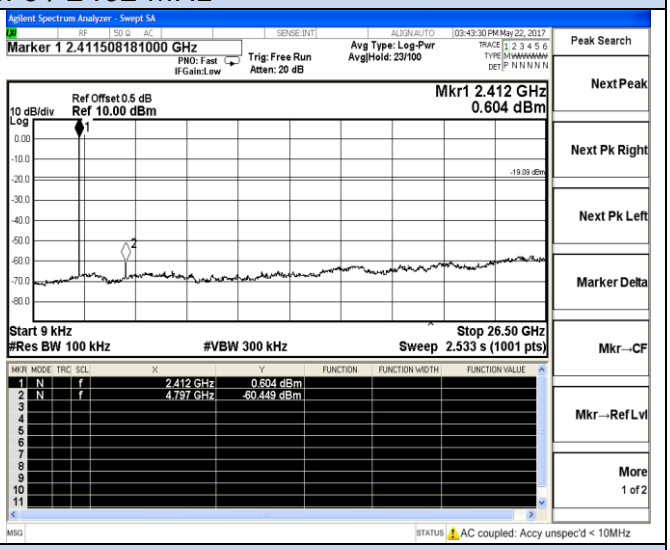
Test Mode	Channel	Frequency (MHz)	Spurious RF Conducted Emission (dBc)	Limits (dBc)	Verdict
GFSK	0	2402	<-20	-20	PASS
	39	2441	<-20		
	78	2480	<-20		
π/4-DQPSK	0	2402	<-20	-20	PASS
	39	2441	<-20		
	78	2480	<-20		
8DPSK	0	2402	<-20	-20	PASS
	39	2441	<-20		
	78	2480	<-20		

Remark:
1. *Test results including cable loss;*
2. *Please refer to following plots;*
3. *Measured at difference Packet Type for each mode and recorded worst case for each mode.*
4. *Worst case data at DH5 for GFSK, 2DH5 for π/4-DQPSK, 3DH5 for 8DPSK modulation type;*

RF Conducted Spurious Emissions

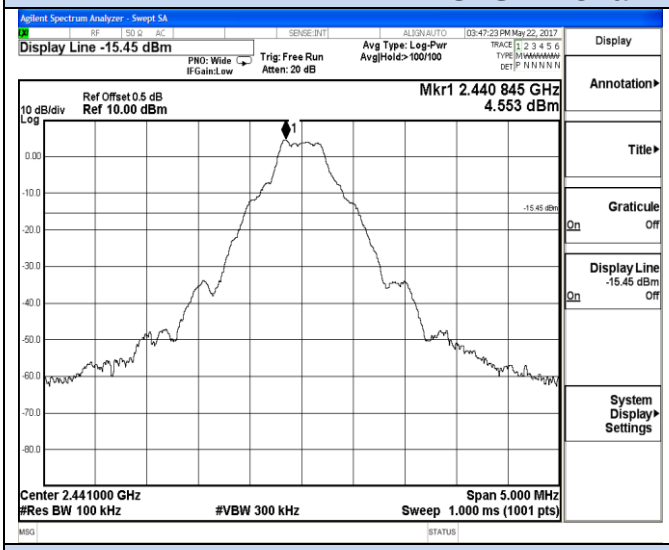
GFSK – Channel 0 / 2402 MHz

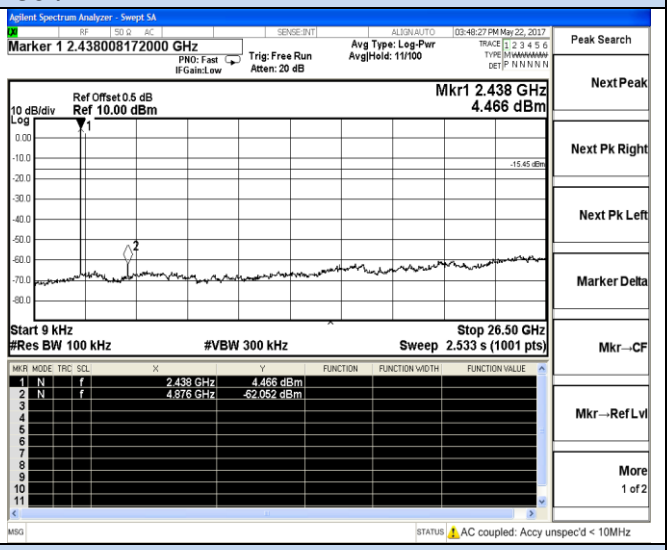




2399.5 MHz – 2404.5 MHz | 9 KHz – 26.5 GHz

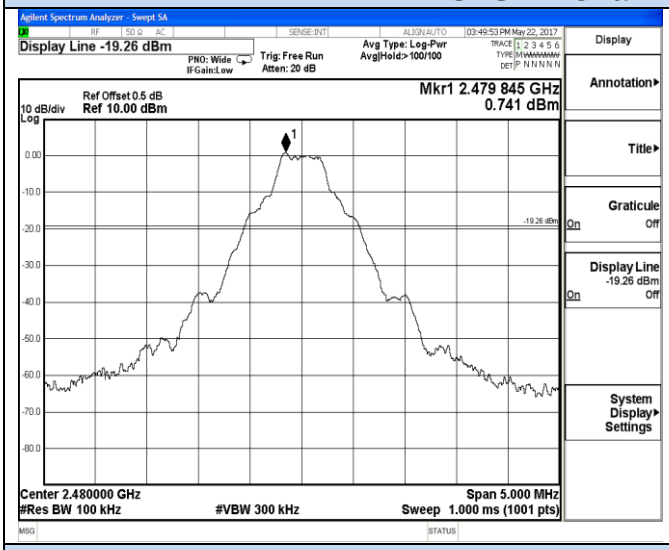
GFSK – Channel 39 / 2441 MHz

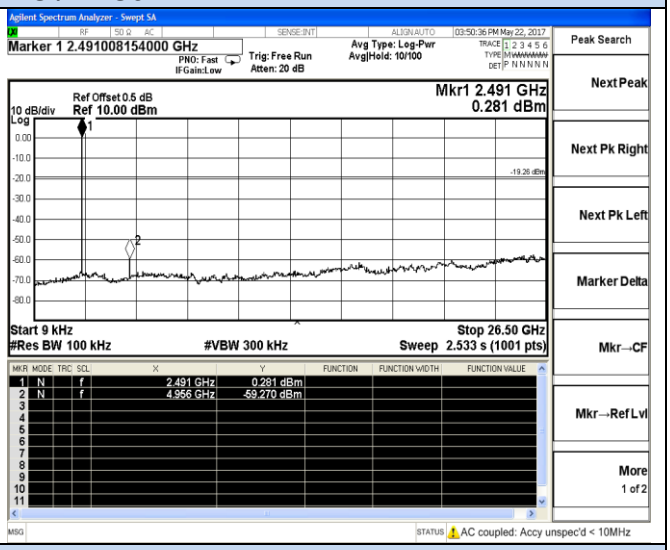




2438.5 MHz – 2443.5 MHz | 9 KHz – 26.5 GHz

GFSK – Channel 78 / 2480 MHz

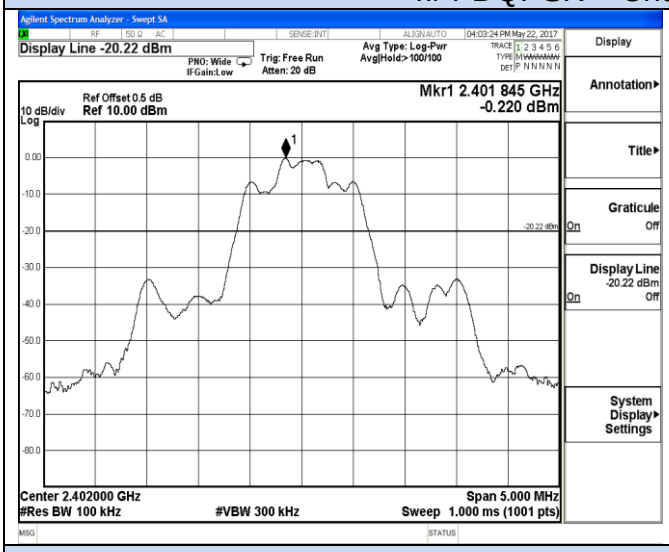




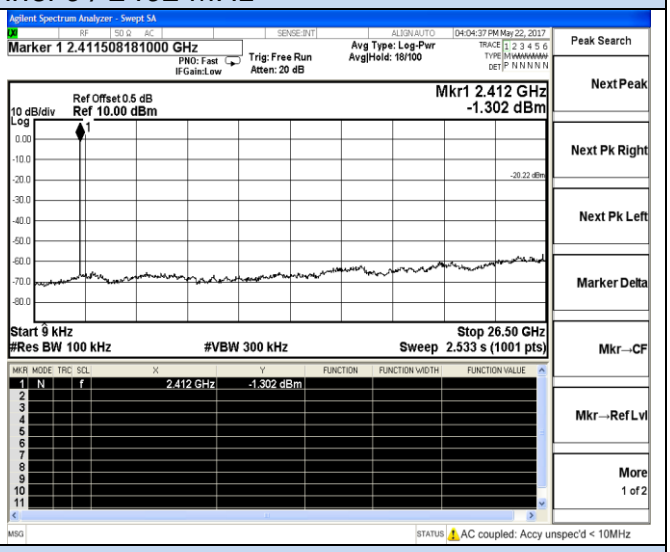
2477.5 MHz – 2482.5 MHz | 9 KHz – 26.5 GHz

RF Conducted Spurious Emissions

π/4-DQPSK – Channel 0 / 2402 MHz

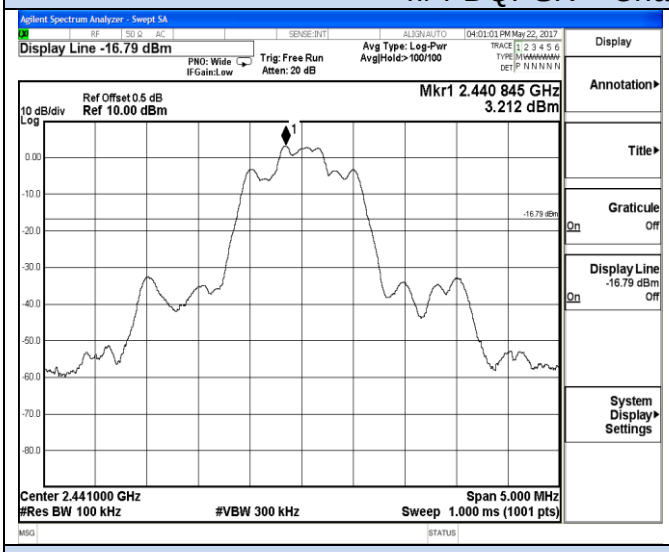


2399.5 MHz – 2404.5 MHz

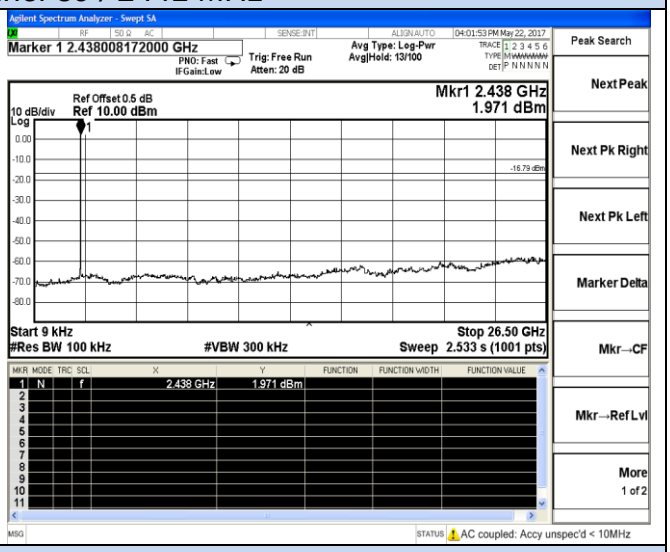


9 KHz – 26.5 GHz

π/4-DQPSK – Channel 39 / 2441 MHz

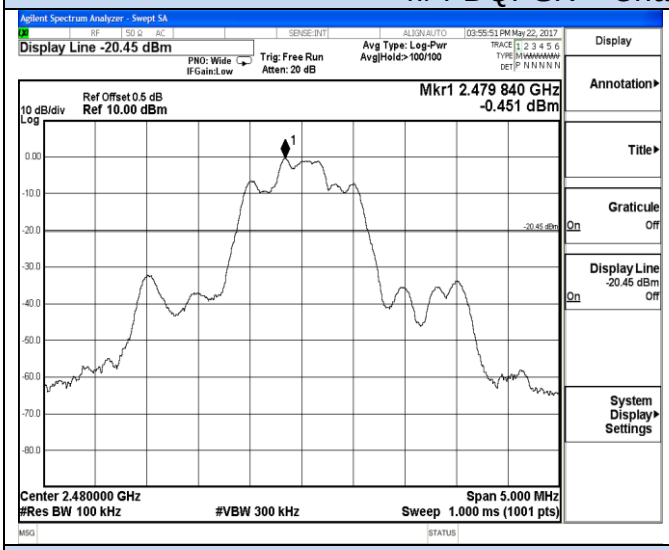


2438.5 MHz – 2443.5 MHz

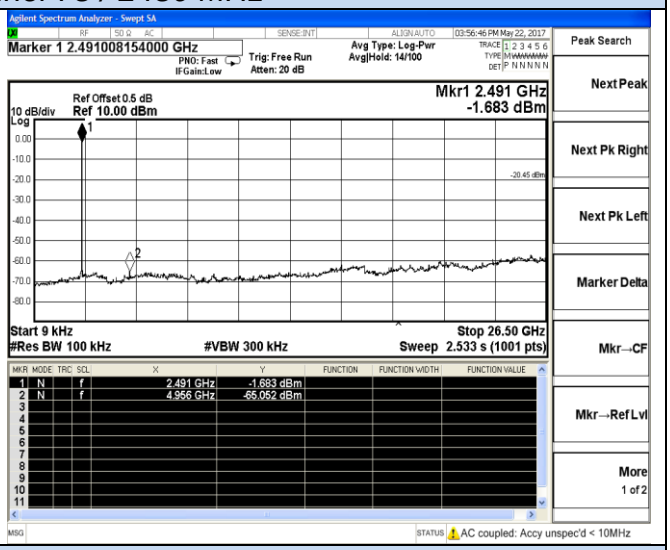


9 KHz – 26.5 GHz

π/4-DQPSK – Channel 78 / 2480 MHz



2477.5 MHz – 2482.5 MHz



9 KHz – 26.5 GHz