



Product Service

FCC - TEST REPORT

Report Number : **68.950.14.132.02** Date of Issue: August 18, 2014

Model 304-101, 304-JBL

Product Type : Bluetooth earphone

Applicant : Verto Medical Solutions. LLC

Address : 900 Spruce Street Suite 550 Saint Louis, MO 63102 United States

Production Facility : Charter Media(Dongguan) Co., Ltd.

Address : Dabandi Industrial Zone, Daning District, Humen Town
523930 Dongguan City, Guangdong Province PEOPLE'S
REPUBLIC OF CHINA

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including
Appendices : 48

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2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
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Nantou Checkpoint Road 2,
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Telephone: 86 755 8828 6998

Fax: 86 755 828 5299

Test Site 2

Company name: Audix Technology (shenzhen) Co., Ltd
Block Shenzhen, Science & Industry Park,
Nantou, Shenzhen,
Guangdong,
China

Telephone: 86 755 2663 9496

Fax: 86 755 2663 2877

3 Description of the Equipment Under Test

Product:	Bluetooth earphone
Model no.:	304-101, 304-JBL
FCC ID:	S9WLBT
Brand Name:	yurbuds
Options and accessories:	NIL
Rating:	DC3.7V (Supplied by Li-ion rechargeable battery) DC5.0V (Charged by USB Port)
RF Transmission Frequency:	2402-2480MHz
No. of Operated Channel:	79 for BT3.0, 40 for BT4.0
Modulation:	BT3.0: GFSK, $\pi/4$ -DQPSK, 8-DPSK BT4.0: GFSK
Antenna Type:	PIFA
Antenna Gain:	0dBi
Description of the EUT:	The Equipment Under Test (EUT) is a Bluetooth earphone operated at 2.4GHz

4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2013 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to Public Notice DA 00-705 -Frequency Hopper Spread Spectrum Test Procedure released by FCC on March 30, 2000 and C63.10 (2009).

5 Summary of Test Results

Technical Requirements for BT3.0				
FCC Part 15 Subpart C				
Test Condition		Pages	Test Site	Test Result
§15.207	Conducted emission AC power port	---	---	N/A
§15.247(b)(1)	Conducted peak output power	10	Site 2	Pass
§15.247(a)(1)	20dB bandwidth and 99% Occupied Bandwidth	15	Site 2	Pass
§15.247(a)(1)	Carrier frequency separation	19	Site 2	Pass
§15.247(a)(1)(iii)	Number of hopping frequencies	21	Site 2	Pass
§15.247(a)(1)(iii)	Dwell Time	23	Site 2	Pass
§15.247(d)	Spurious RF conducted emissions	28	Site 2	Pass
§15.247(d)	Band edge	38	Site 2	Pass
§15.247(d) &15.209 &15.205	Spurious radiated emissions for transmitter	44	Site 2	Pass
§15.203	Antenna requirement	See note 2		Pass

Technical Requirements for BT4.0				
FCC Part 15 Subpart C				
Test Condition		Pages	Test Site	Test Result
§15.207	Conducted emission AC power port	---	---	N/A
§15.247(b)(1)	Conducted peak output power	10	Site 2	Pass
§15.247(e)	Power spectral density	12	Site 2	Pass
§15.247(a)(2)	6dB bandwidth	13	Site 2	Pass
§15.247(d)	Spurious RF conducted emissions	28	Site 2	Pass
§15.247(d)	Band edge	38	Site 2	Pass
§15.247(d) &15.209 &15.205	Spurious radiated emissions for transmitter	44	Site 2	Pass
§15.203	Antenna requirement	See note 2		Pass

Note 1: N/A=Not Applicable.

Note 2: The EUT uses a permanently PIFA antenna, which gain is 0dBi. In accordance to §15.203, It is considered sufficiently to comply with the provisions of this section.

6 General Remarks

Remarks

This submittal(s) (test report) is intended for Class II permissive change of FCC ID: S9WLBT complies with Section 15.207, 15.209, 15.247 of the FCC Part 15 Subpart C Rules.

The differences between the models in this test report and the models in 68.950.14.142.01 only lies in the exterior sculpt and speaker size, so spurious radiated emission testing was performed on 304-101 and 304-JBL, the test data of other test items was from 68.950.14.142.01. The difference of 304-101, 304-JBL lies only in the outlook/color of the different models.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

□ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

Sample Received Date: June 26, 2014

Testing Start Date: June 27, 2014

Testing End Date: July 10, 2014

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch

Reviewed by:

Prepared by:

Tested by:



Ken Li
EMC Project Manager



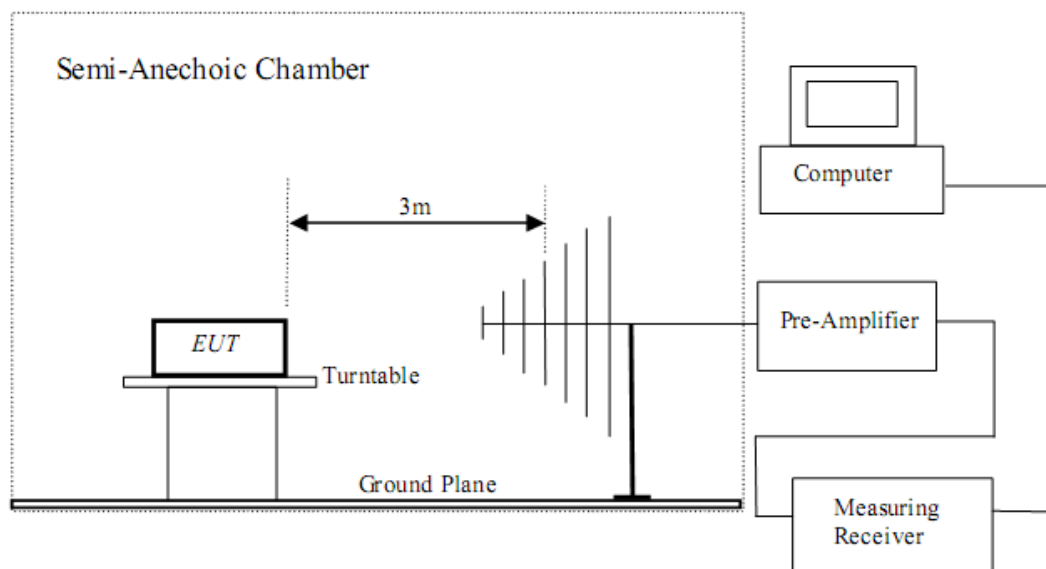
Felix Li
EMC Project Engineer



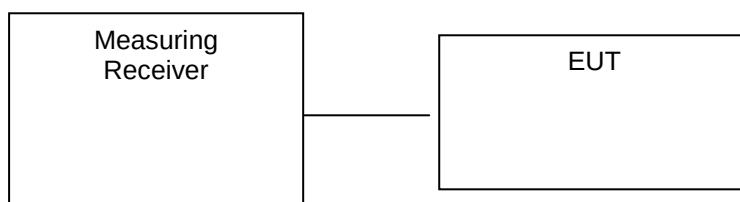
Leo Li
EMC Test Engineer

7 Test Setups

7.1 Radiated test setups



7.2 Conducted RF test setups



8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
NoteBook	Lenovo	X220	---

Test software: Bluetest 3.0, which used to control the EUT in continues transmitting mode

The system was configured to hopping mode, non-hopping mode, fixed frequency.

Hopping mode: typical working mode (normal hopping status).

Non-hopping mode: The system was configured to operate at a signal channel transmitting. The test software allows the configuration and operation at the worst-case duty and the highest transmit power.

9 Technical Requirement

9.1 Conducted peak output power

Test Method

1. 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 $\geq$ RBW,
Sweep = auto, Detector function = peak, Trace = max hold
2. Add a correction factor to the display.
3. 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

Limits

According to §15.247 (b) (1), conducted peak output power limit as below:

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤ 1	≤ 30

Conducted peak output power

BT3.0 Bluetooth Mode GFSK modulation Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2402MHz	5.01	Pass
Middle channel 2441MHz	7.79	Pass
High channel 2480MHz	7.48	Pass

BT3.0 Bluetooth Mode $\pi/4$ -DQPSK modulation Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2402MHz	3.45	Pass
Middle channel 2441MHz	6.48	Pass
High channel 2480MHz	6.23	Pass

BT3.0 Bluetooth Mode 8-DPSK modulation Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2402MHz	3.18	Pass
Middle channel 2441MHz	6.38	Pass
High channel 2480MHz	6.02	Pass

BT 4.0 Bluetooth Mode GFSK modulation Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2402MHz	7.93	Pass
Middle channel 2440MHz	8.54	Pass
High channel 2480MHz	9.36	Pass

9.2 Power spectral density

Test Method

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

1. Set analyzer center frequency to DTS channel center frequency.
RBW=3kHz,VBW≥3RBW,Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold
2. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
3. Repeat above procedures until other frequencies measured were completed

Limit

Limit [dBm]

≤8

BT 4.0 Bluetooth Mode GFSK modulation Test Result

Frequency MHz	Power spectral density	Limit dBm	Result
2402	-7.86	8	Pass
2440	-7.12	8	Pass
2480	-6.20	8	Pass

9.3 6 dB Bandwidth and 99% Occupied Bandwidth

Test Method

1. Use the following spectrum analyzer settings:
RBW=100K, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

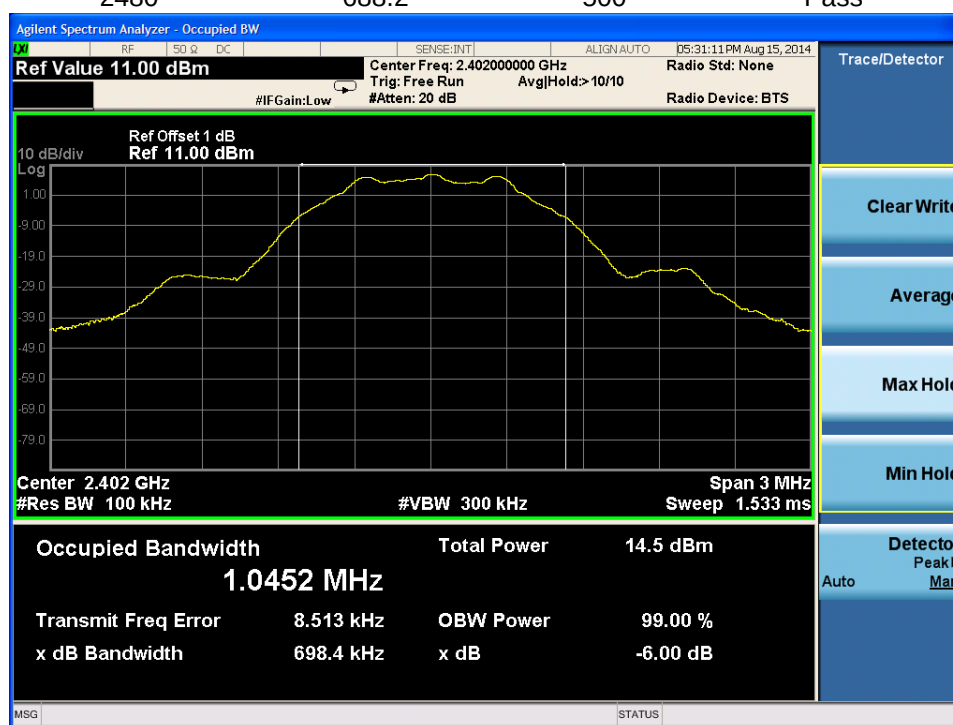
Limit

Limit [kHz]

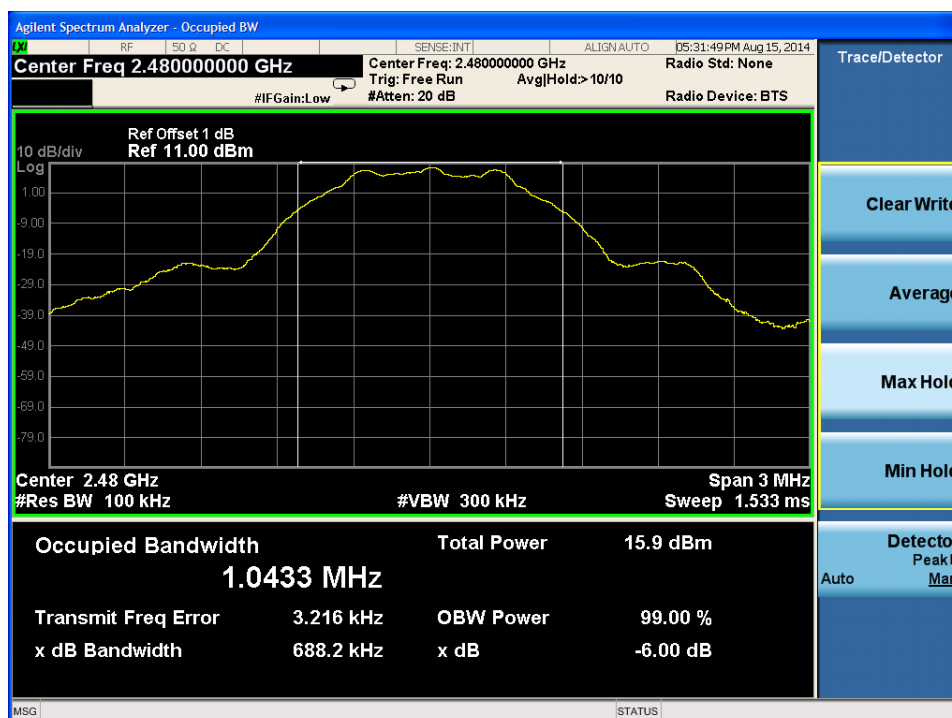
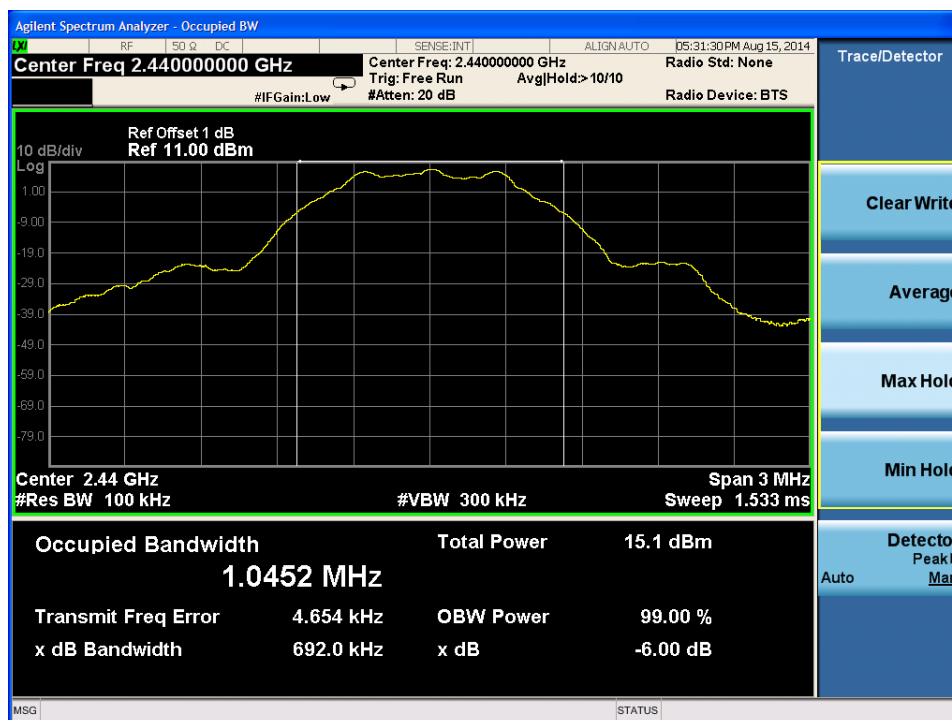
≥500

BT 4.0 Bluetooth Mode GFSK modulation Test Result

Frequency MHz	6 dB Bandwidth kHz	Limit kHz	Result
2402	698.4	500	Pass
2440	692.0	500	Pass
2480	688.2	500	Pass



6 dB Bandwidth



9.4 20 dB bandwidth and 99% Occupied Bandwidth

Test Method

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Limit

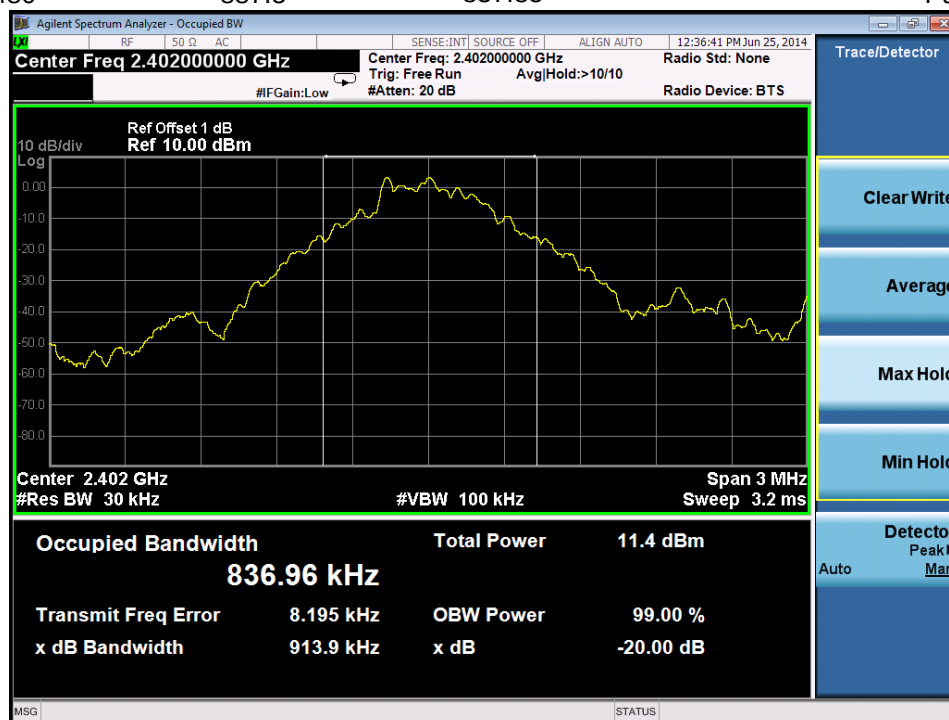
Limit [kHz]

N/A

20 dB bandwidth and 99% Occupied Bandwidth

BT3.0 Bluetooth Mode GFSK Modulation test result

Frequency MHz	20 dB Bandwidth kHz	99% Bandwidth kHz	Limit kHz	Result
2402	913.9	836.96	--	Pass
2441	884.4	835.98	--	Pass
2480	887.5	837.85	--	Pass

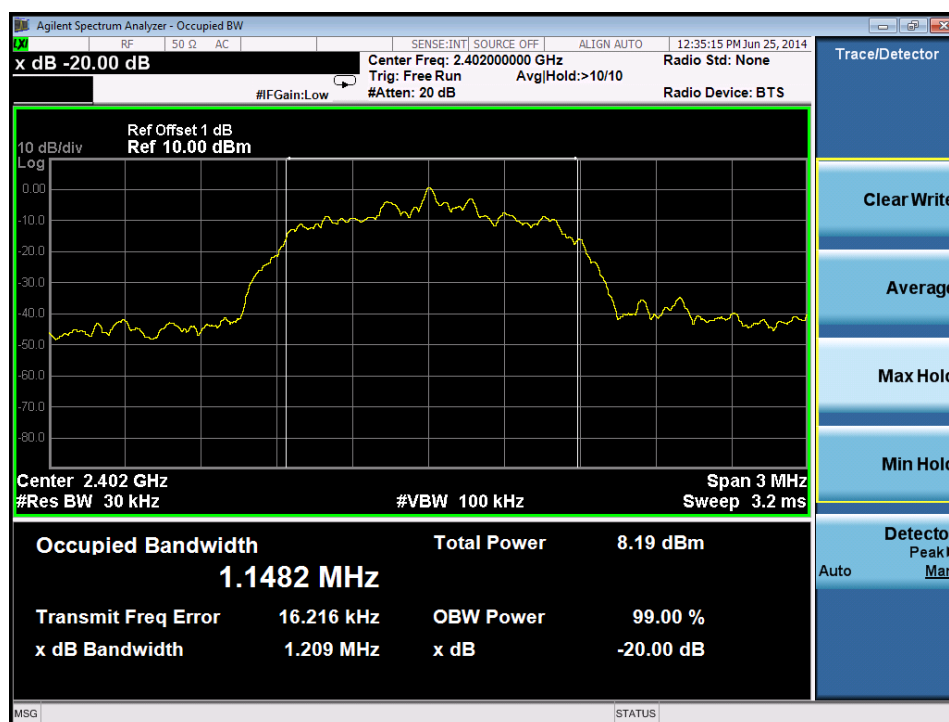


20 dB bandwidth and 99% Occupied Bandwidth

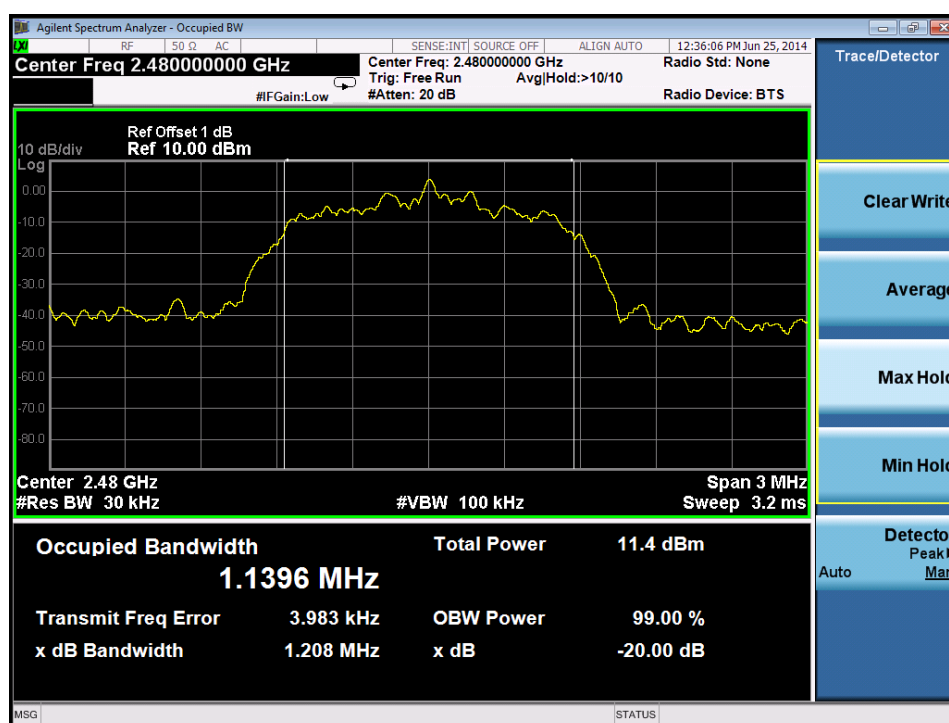
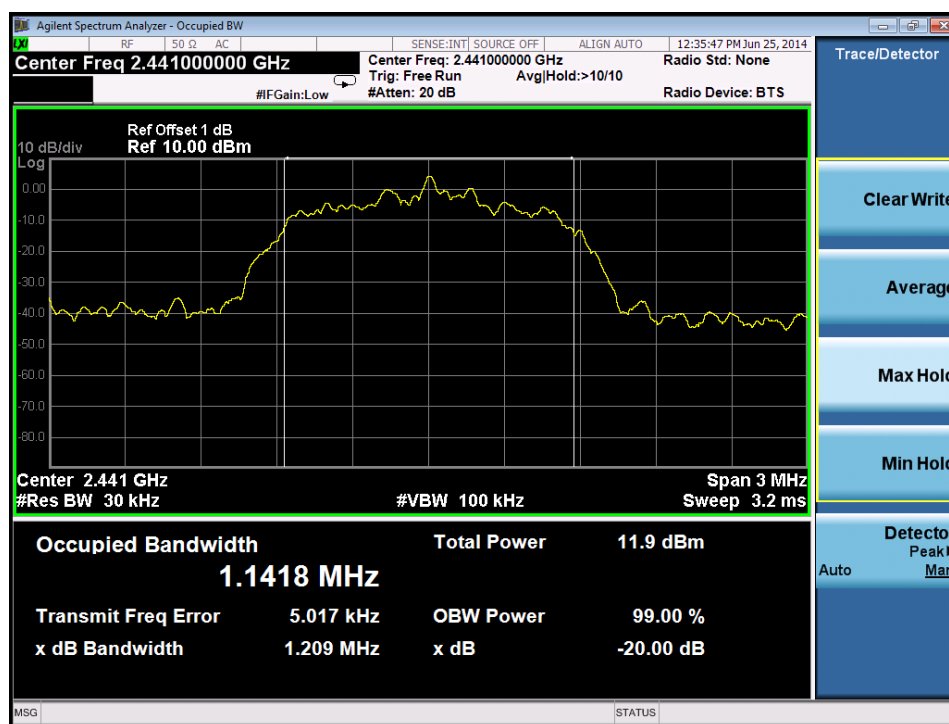


Bluetooth Mode 8-DPSK Modulation test result

Frequency MHz	20 dB Bandwidth kHz	99% Bandwidth kHz	Limit kHz	Result
2402	1209	1148.2	--	Pass
2441	1209	1141.8	--	Pass
2480	1208	1139.6	--	Pass



20 dB bandwidth and 99% Occupied Bandwidth



9.5 Carrier Frequency Separation

Test Method

1. Use the following spectrum analyzer settings:
Span = wide enough to capture the peaks of two adjacent channels, $RBW \geq 1\%$ of the span, $VBW \geq RBW$, Sweep = auto, Detector function = peak
2. By using the Max-Hold function record the separation of two adjacent channels.
3. Measure the frequency difference of these two adjacent channels by spectrum analyzer marker function.
4. Repeat above procedures until all frequencies measured were complete.

Limit

Limit
kHz

$\geq 25\text{kHz}$ or $2/3$ of the 20 dB bandwidth which is greater

GFSK Modulation Limit

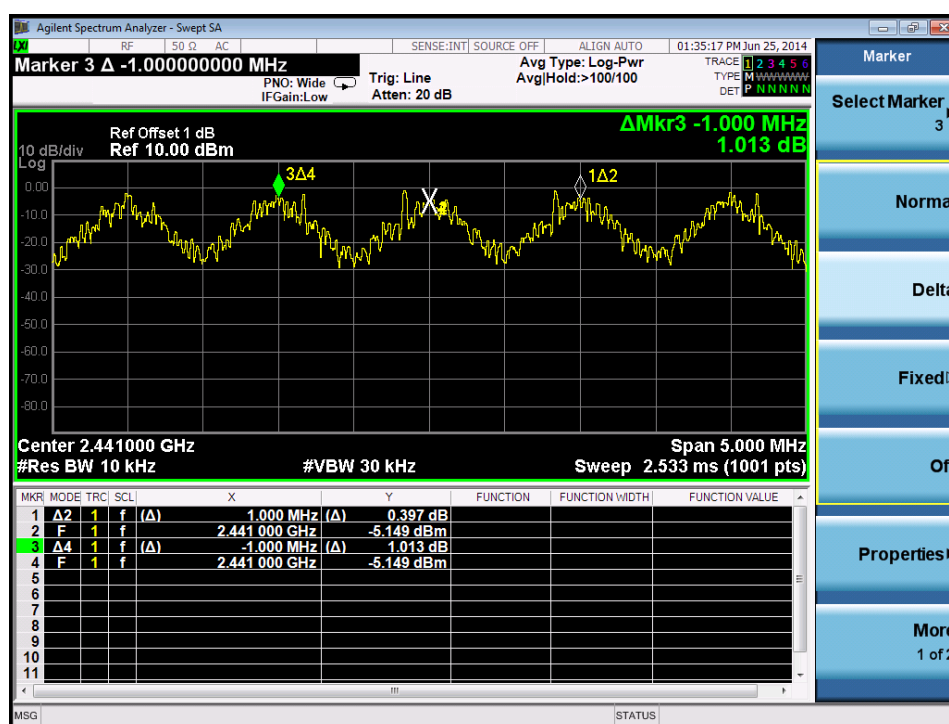
Frequency MHz	2/3 of 20 dB Bandwidth kHz
2402	609.27
2441	589.60
2480	591.67

Carrier Frequency Separation

Test result: The measurement was performed with the typical configuration (normal hopping status), here GFSK modulation mode was used to show compliance.

BT3.0 GFSK Modulation test result

Frequency MHz	Carrier Frequency Separation kHz	Result
2402	1000	Pass
2441	1000	Pass
2480	1000	Pass



9.6 Number of hopping frequencies

Test Method

1. Use the following spectrum analyzer settings:
Span = wide enough to capture the peaks of two adjacent channels, $RBW \geq 1\%$ of the span, $VBW \geq RBW$, Sweep = auto, Detector function = peak
2. Set the spectrum analyzer on Max-Hold Mode, and then keep the EUT in hopping mode.
3. Record all the signals from each channel until each one has been recorded.
4. Repeat above procedures until all frequencies measured were complete.

Limit

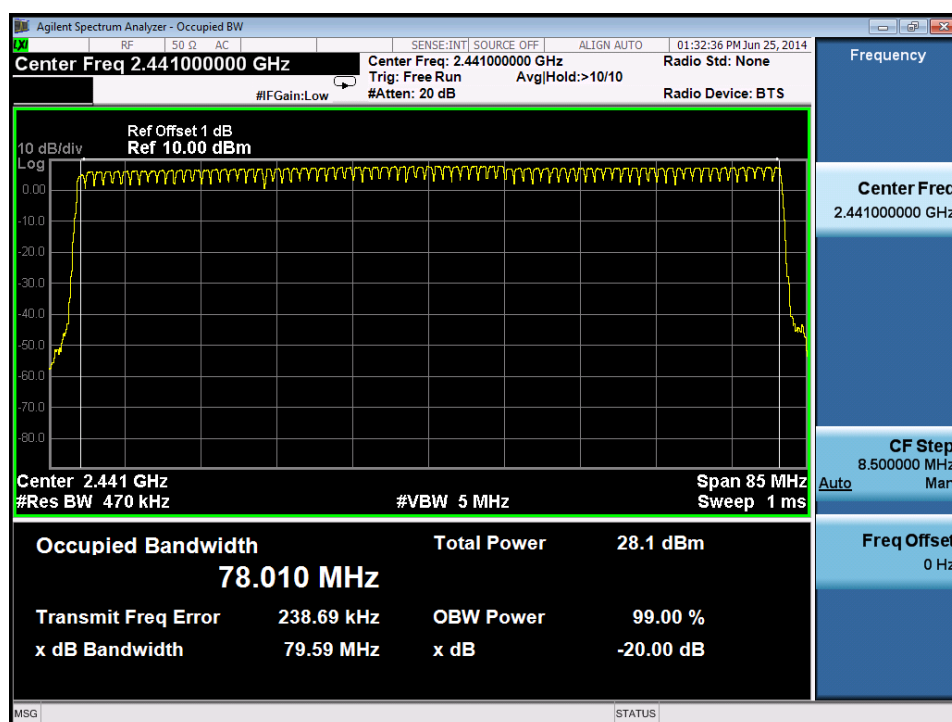
Limit
number

≥ 15

Number of hopping frequencies

Test result: The measurement was performed with the typical configuration (normal hopping status), and the total hopping channels is constant for the all modulation mode according with the Bluetooth Core Specification. Here BT3.0 GFSK modulation mode was used to show compliance.

Number of hopping frequencies	Result
79	Pass



9.7 Dwell Time

Test Method

1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable.
Equipment mode: Spectrum analyzer
2. RBW: 1MHz; VBW: 1MHz; SPAN: Zero Span
3. Adjust the center frequency of spectrum analyzer on any frequency be measured.
4. Measure the Dwell Time by spectrum analyzer Marker function.
5. Repeat above procedures until all frequencies measured were complete.

Limit

According to §15.247(a)(1)(iii), The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

Dwell Time

Dwell time

The maximum dwell time shall be 0,4 s.

The results (GFSK, 8-DPSK mode) were reported to show compliance.

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, which is directly measured, refers to the duration on one channel hop.

The maximum number of hopping channels in 31.6s for

DH1=1600 / 2 / 79 *31.6=320

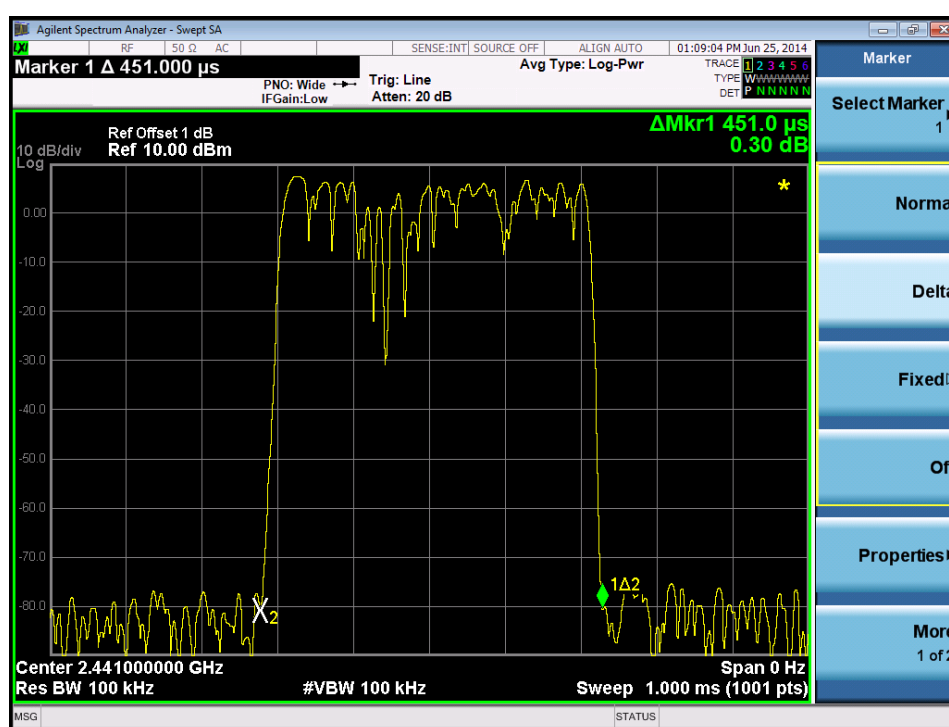
DH3=1600 / 4 / 79 *31.6=160

DH5=1600 / 6 / 79 *31.6=106.67

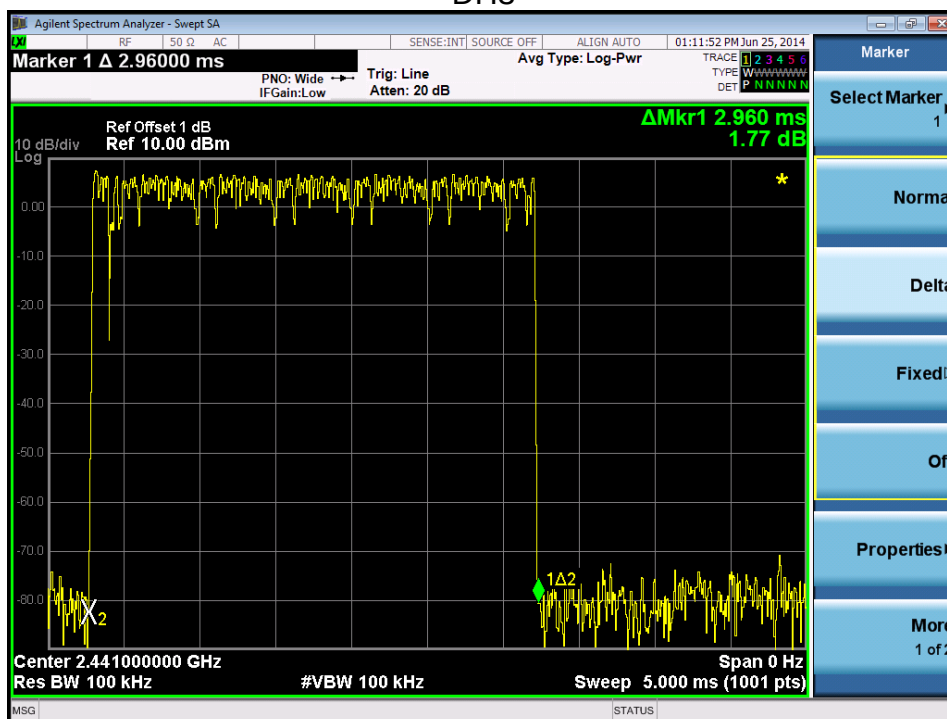
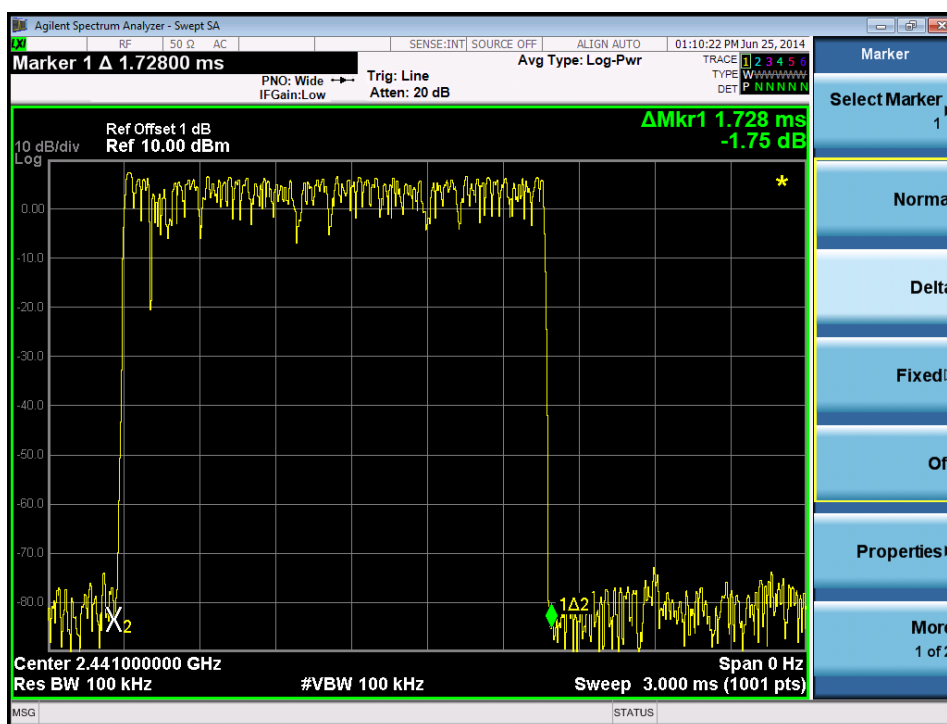
BT3.0 Test Result

Modulation	Mode	Reading (μs)	Total Hops	Test Result (ms)	Limit (ms)	Result
GFSK	DH1	451	320	144.32	< 400	Pass
GFSK	DH3	1728	160	276.48	< 400	Pass
GFSK	DH5	2960	106.67	315.74	< 400	Pass
8-DPSK	3DH1	463	320	148.16	< 400	Pass
8-DPSK	3DH3	1719	160	275.04	< 400	Pass
8-DPSK	3DH5	2975	106.67	317.34	< 400	Pass

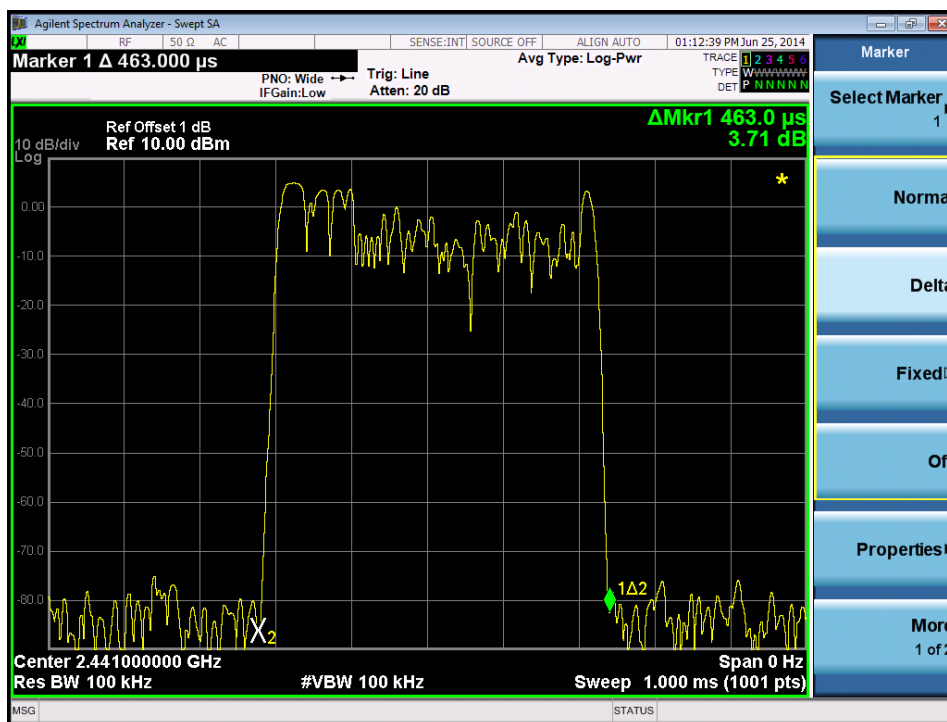
GFSK Modulation



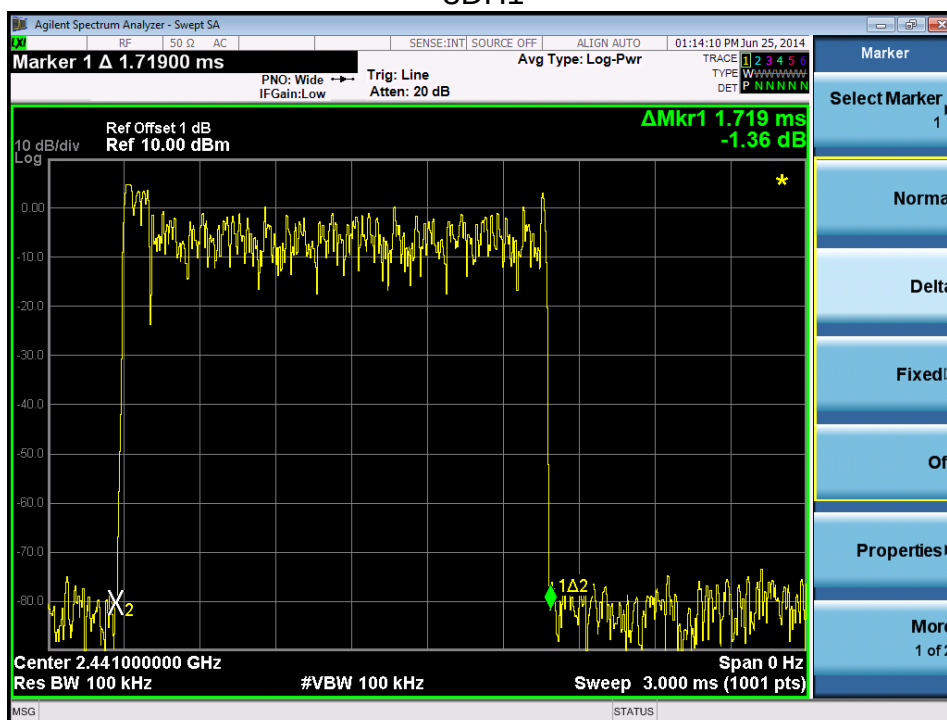
DH1



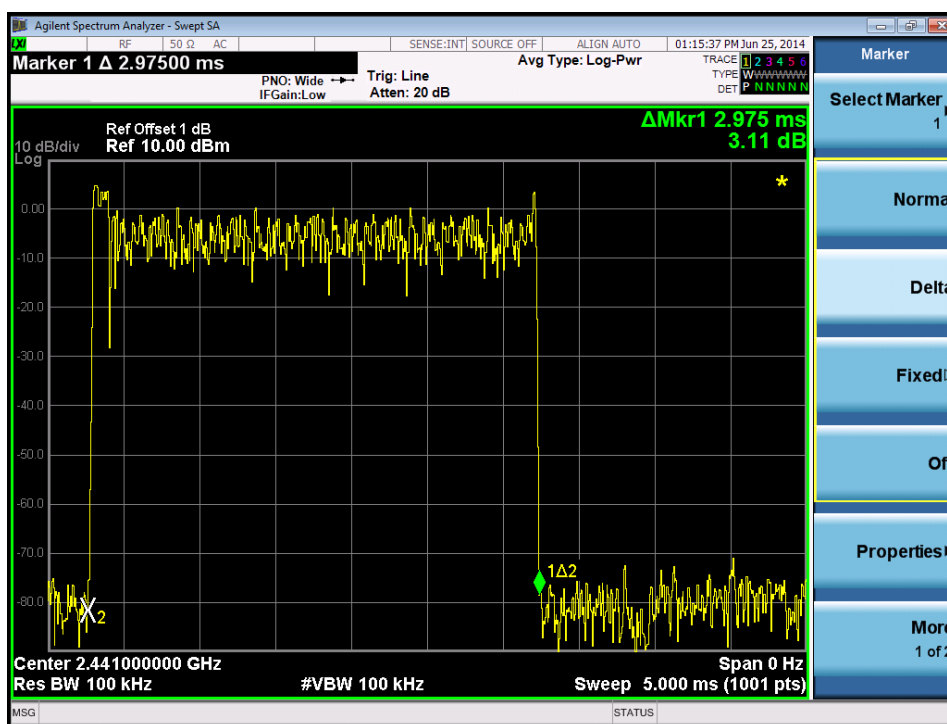
8-DPSK Modulation



3DH1



3DH3



3DH5

9.8 Spurious RF conducted emissions

Test Method

1. Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
RBW = 100 kHz, VBW ≥ RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.
3. The level displayed must comply with the limit specified in this Section. Submit these plots.
4. Repeat above procedures until all frequencies measured were complete.

Limit

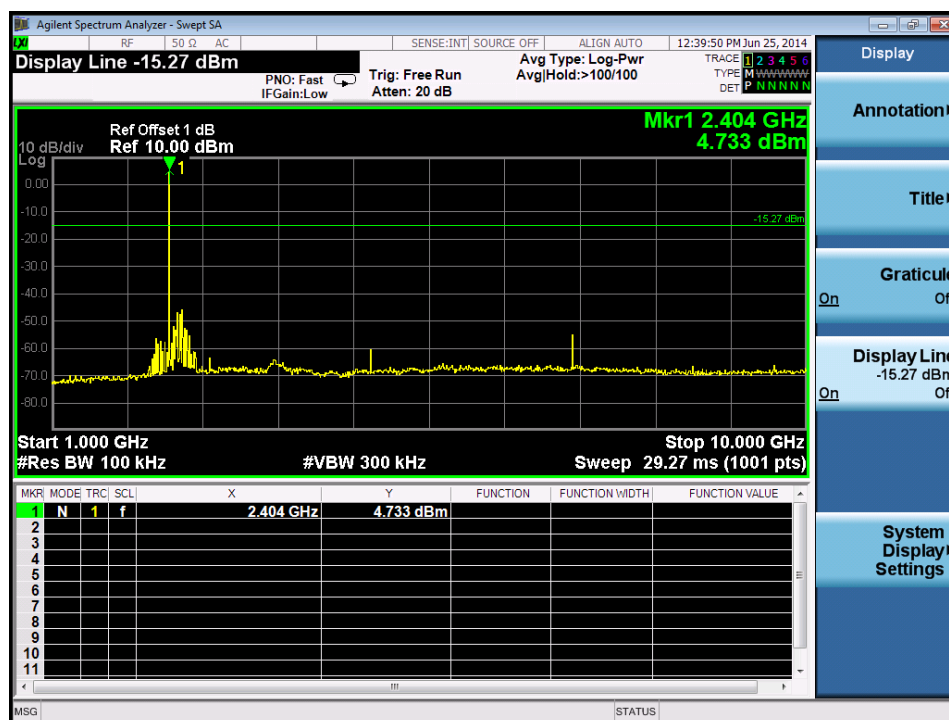
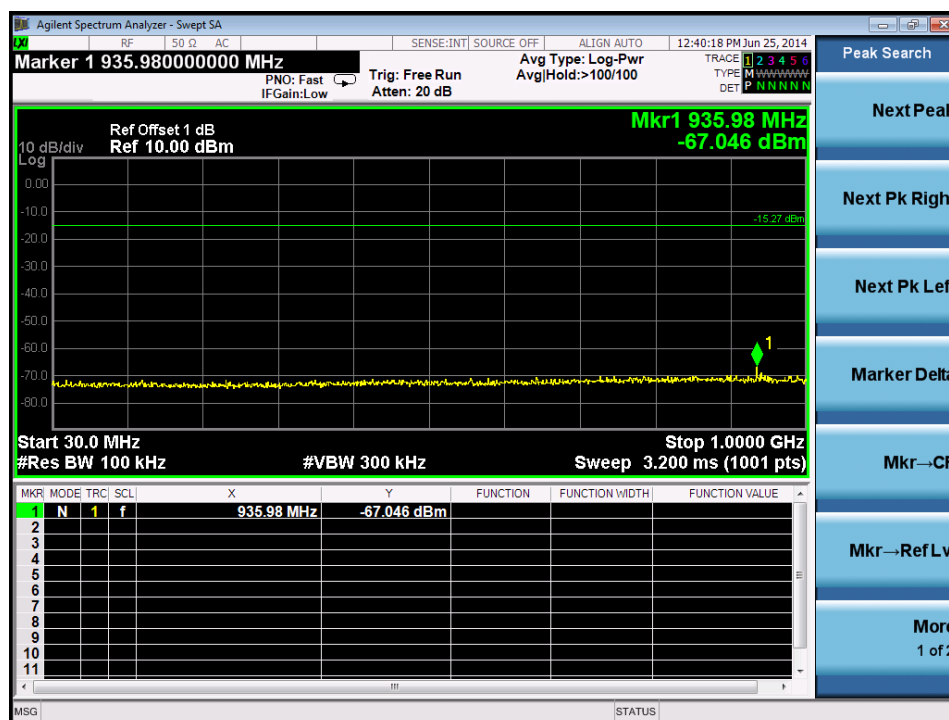
Frequency Range MHz	Limit (dBc)
30-25000	-20

Spurious RF conducted emissions

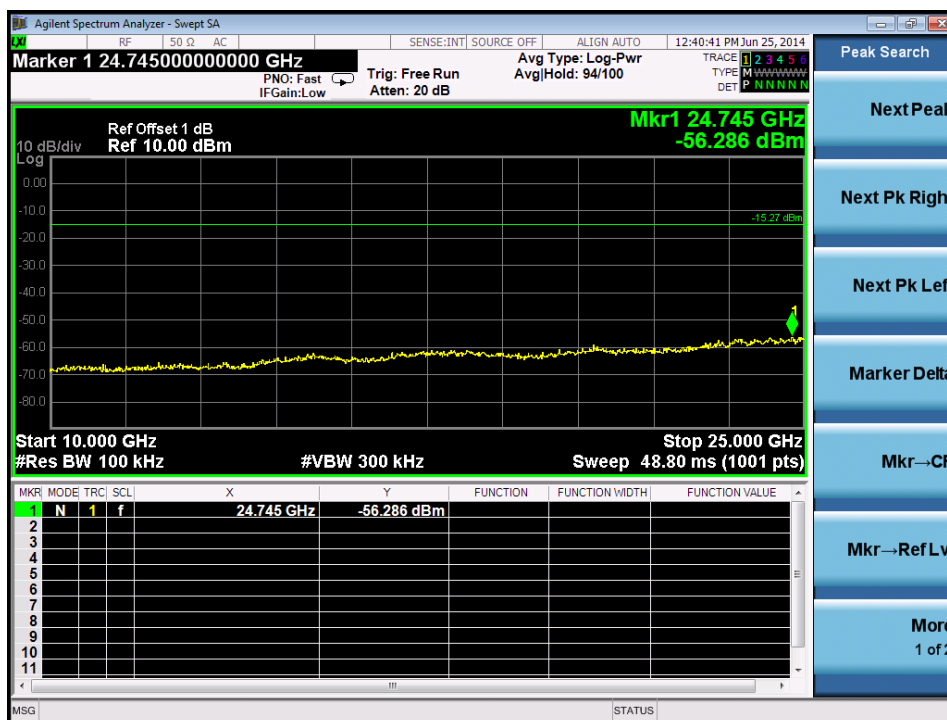
The worse case (which is subject to the maximum EIRP, BT3.0 and BT4.0 GFSK mode) test result is listed in the report.

BT3.0 GFSK Modulation:

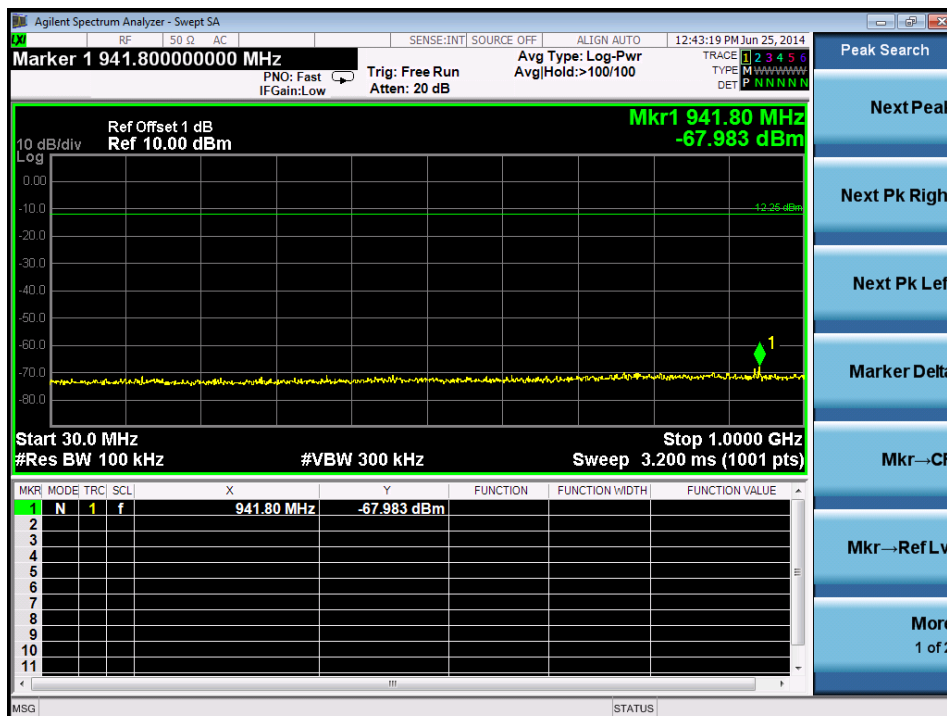
2402MHz



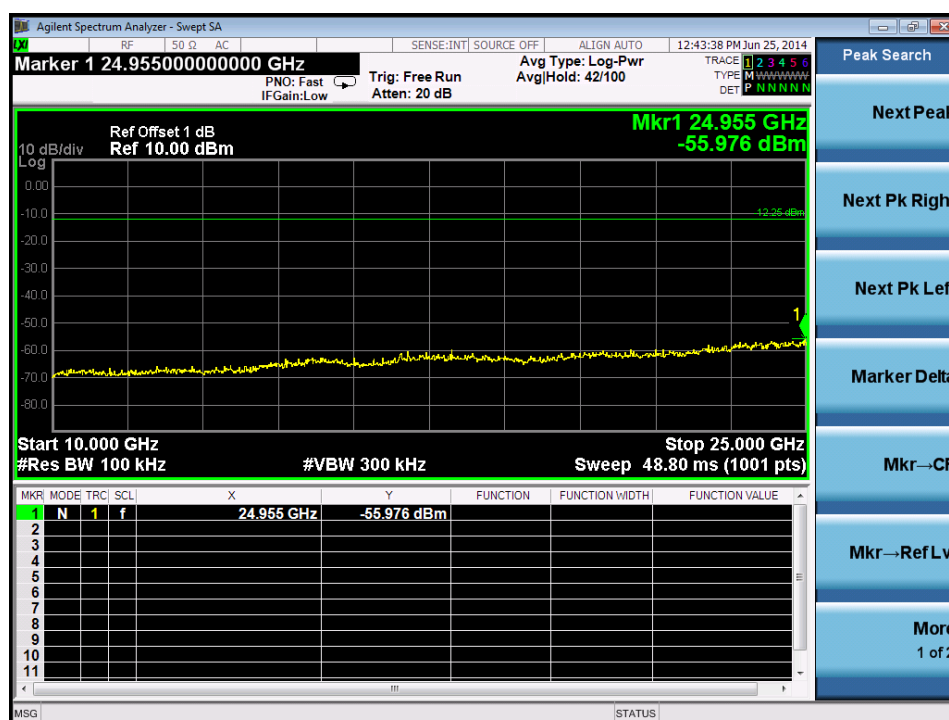
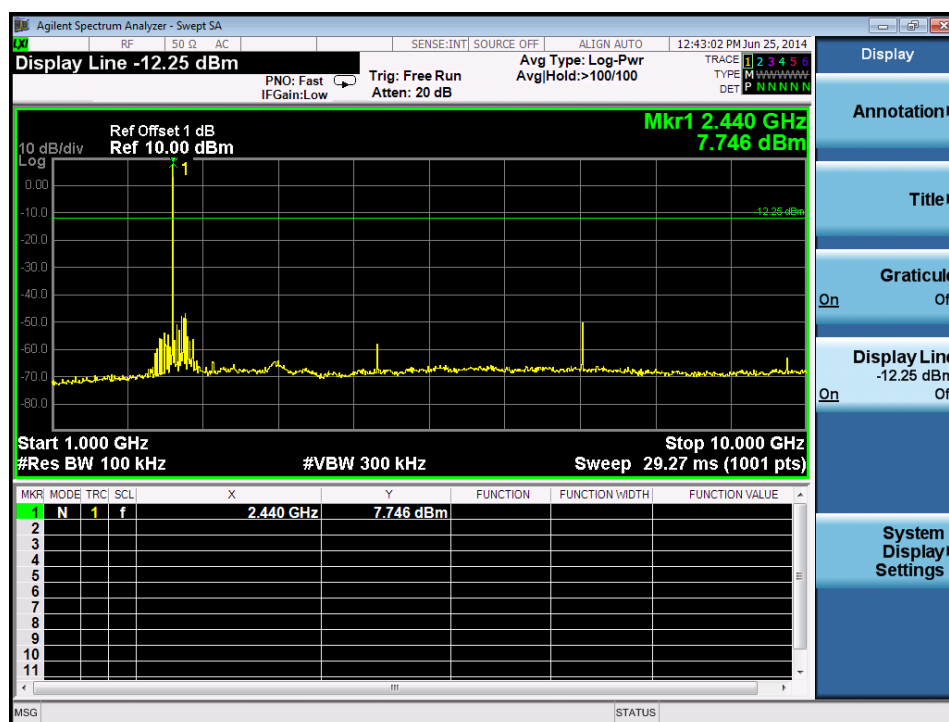
Spurious RF conducted emissions



2441MHz

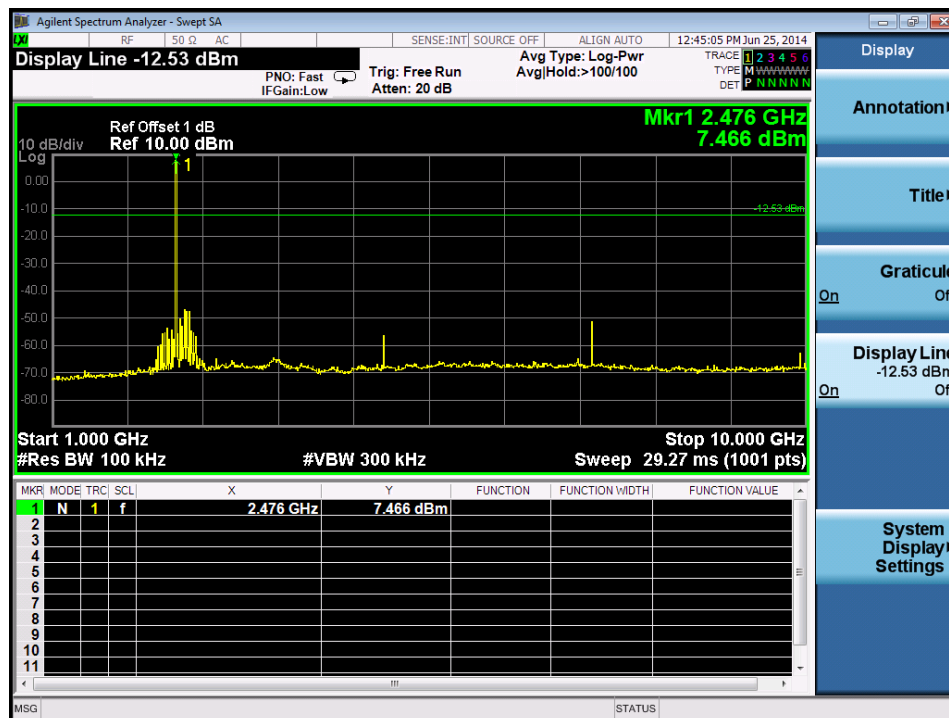
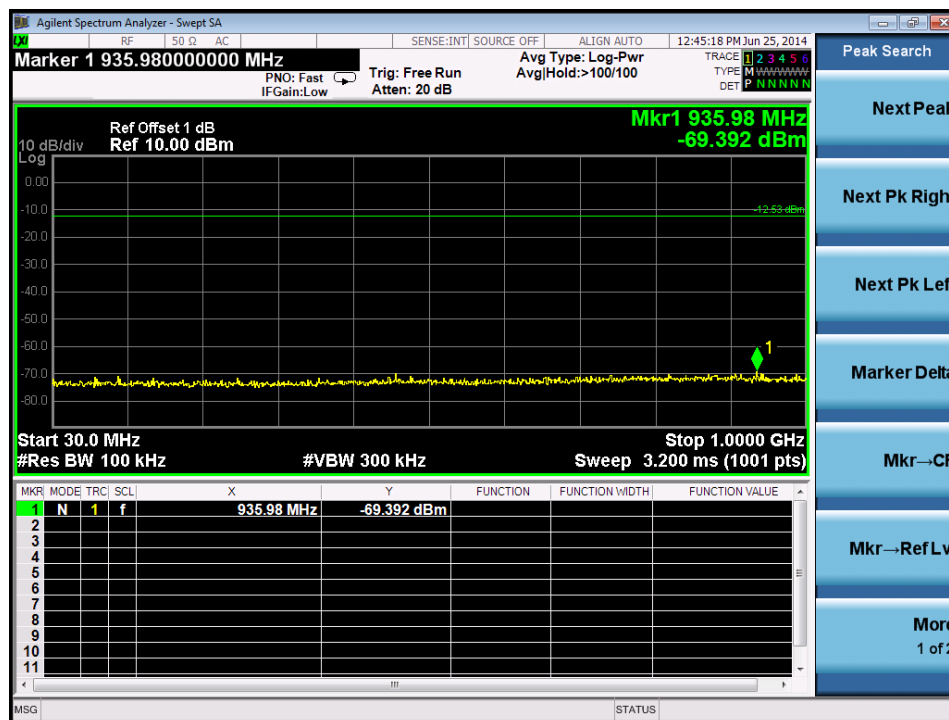


Spurious RF conducted emissions

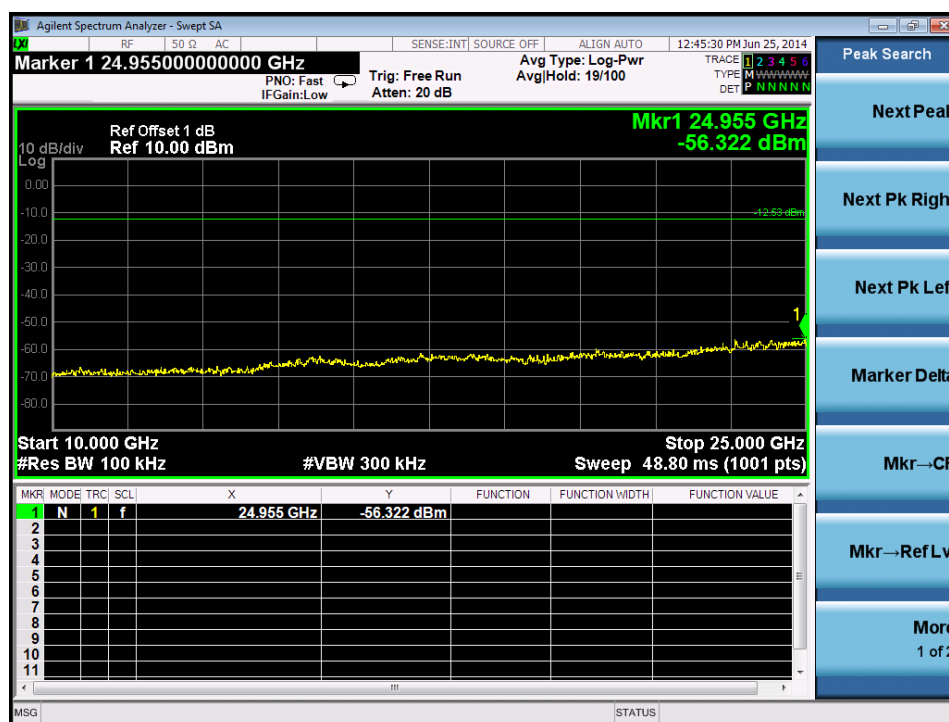


Spurious RF conducted emissions

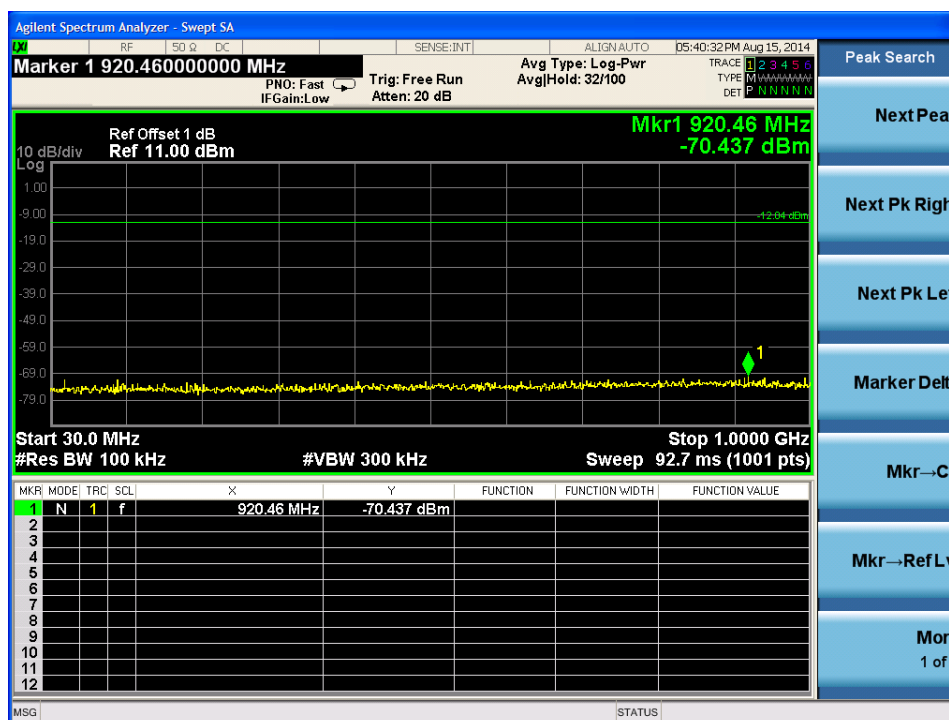
2480MHz



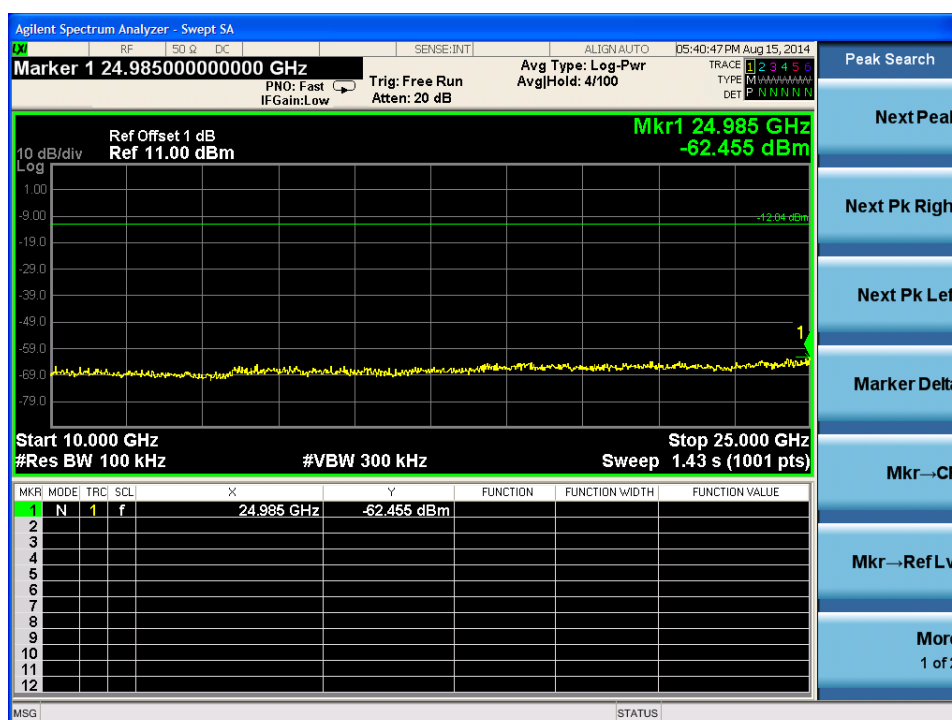
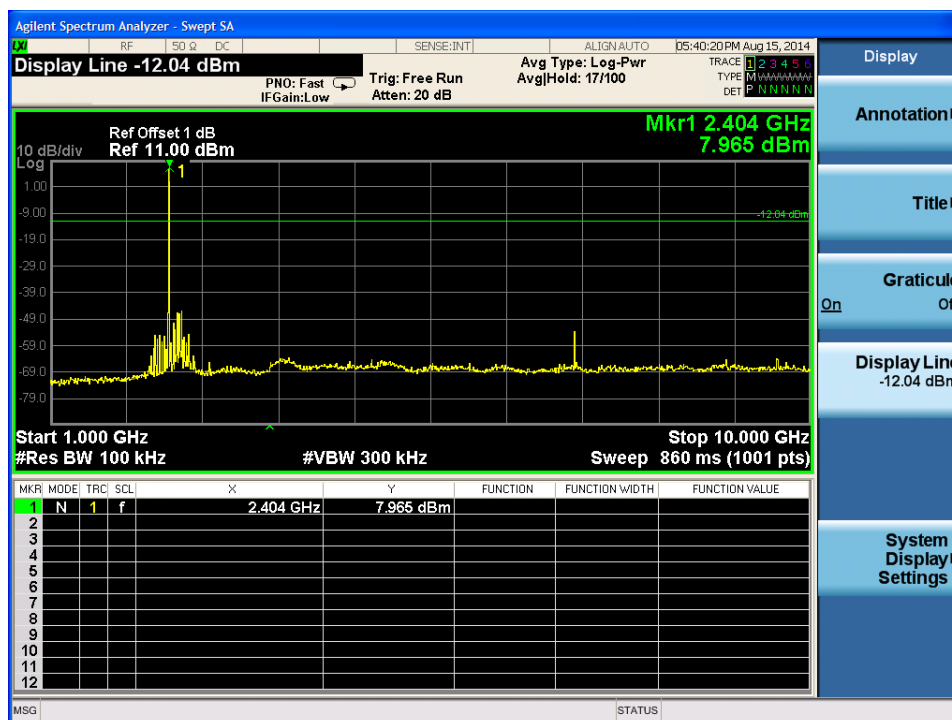
Spurious RF conducted emissions



BT4.0 GFSK mode 2402MHz

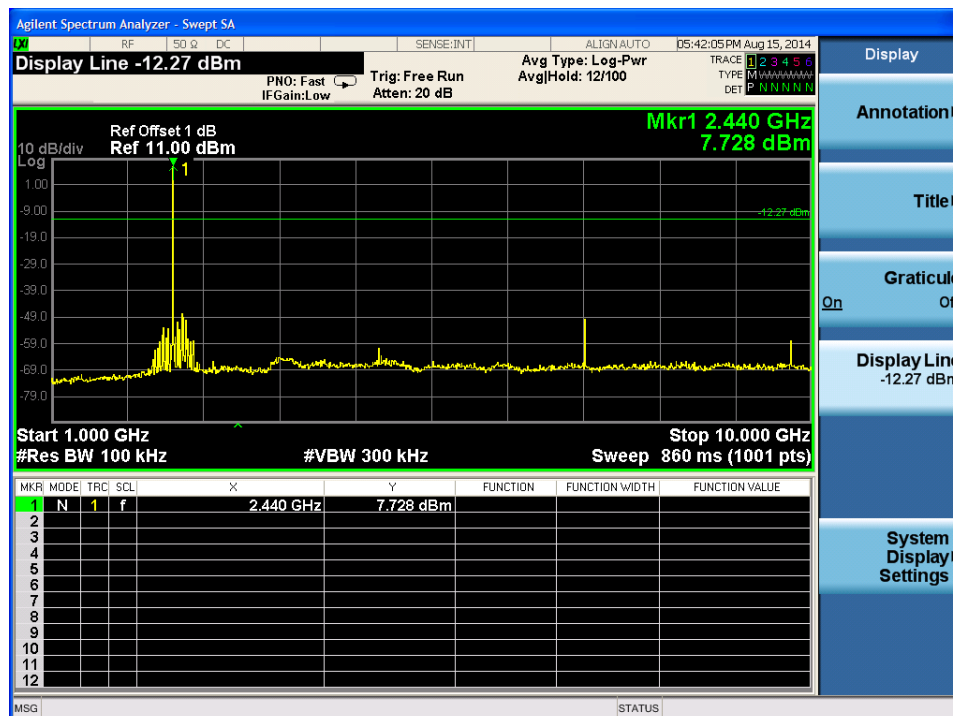
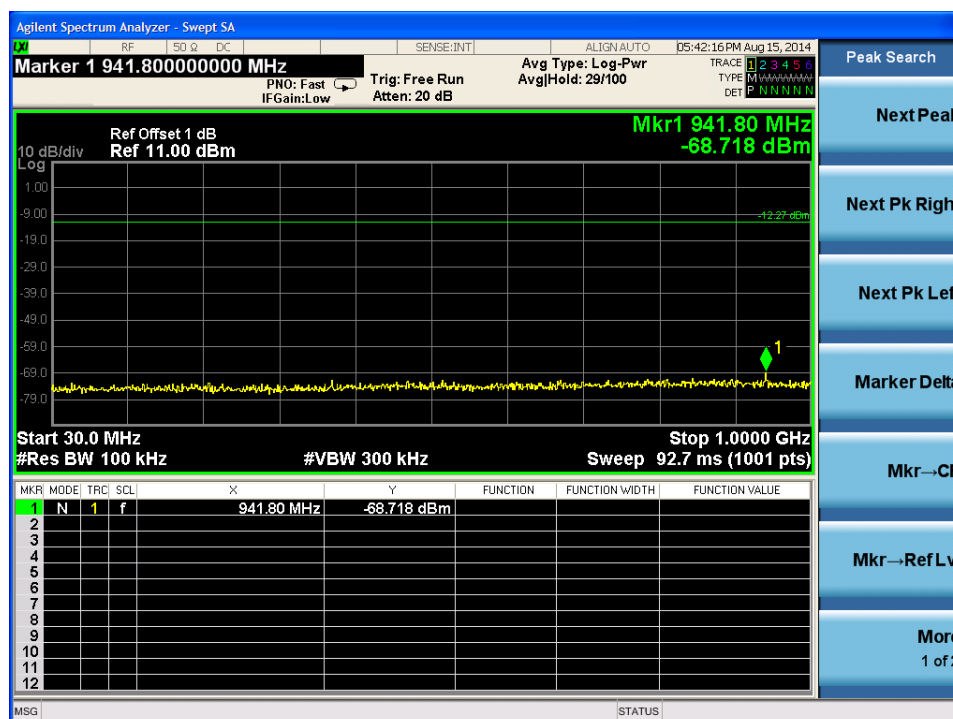


Spurious RF conducted emissions

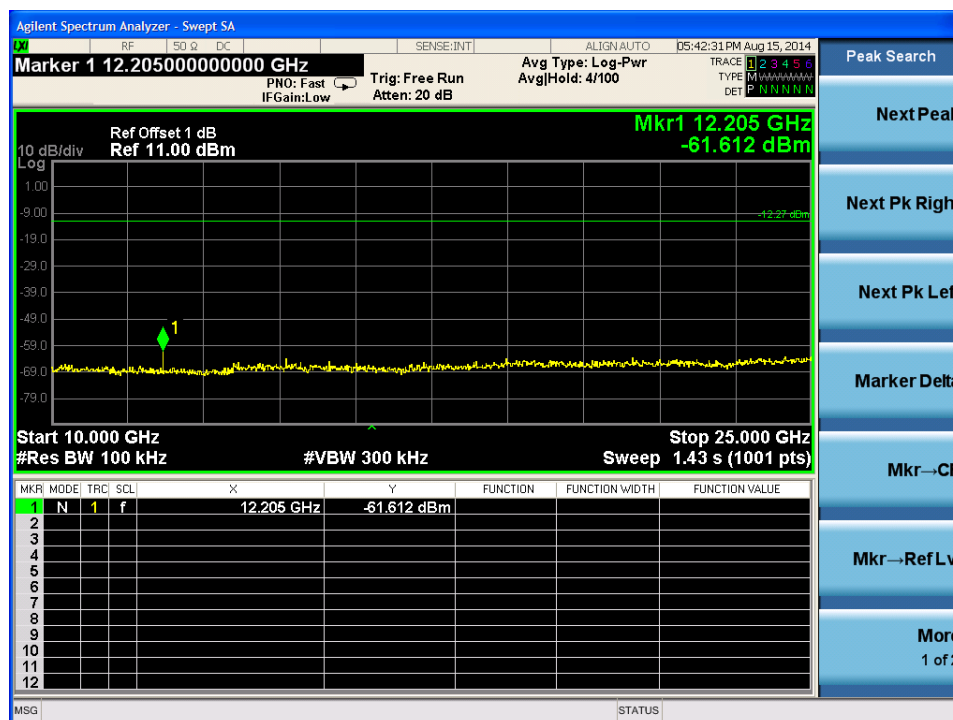


Spurious RF conducted emissions

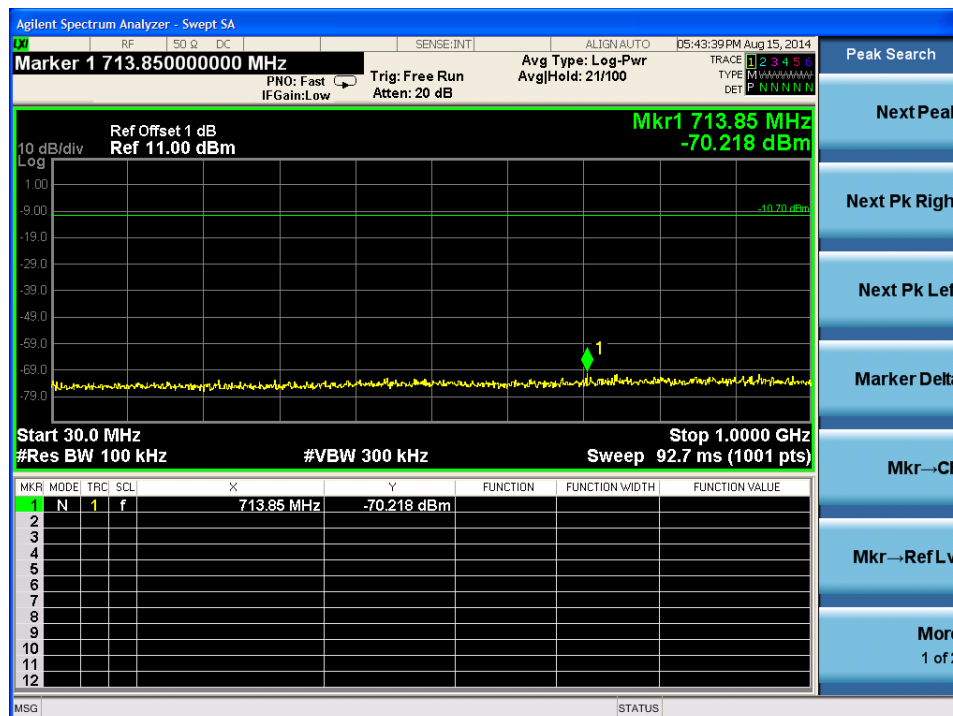
2440MHz



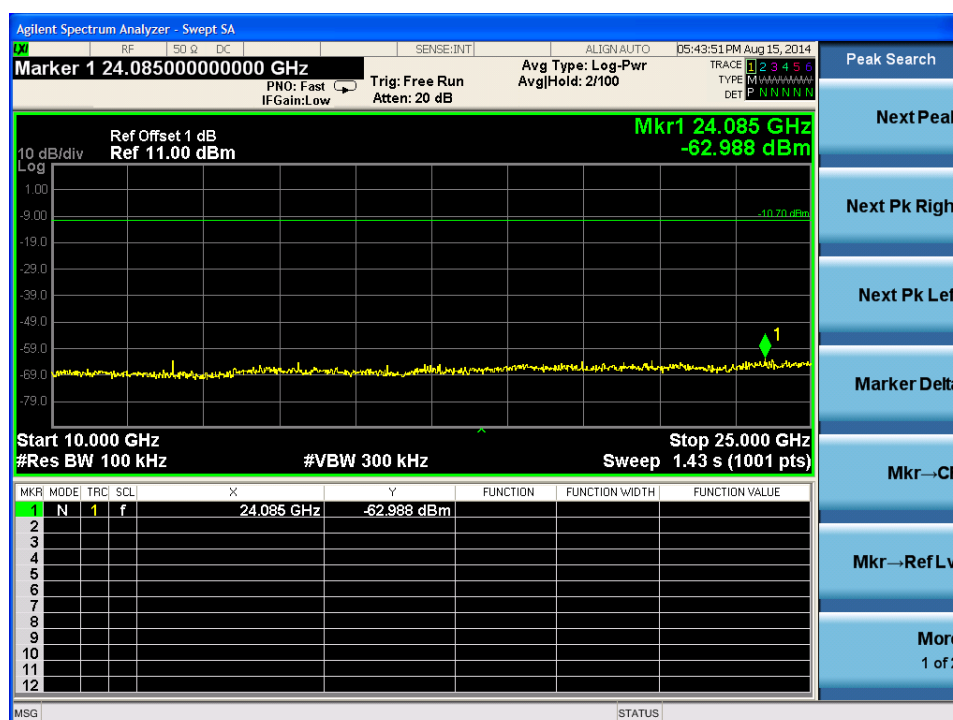
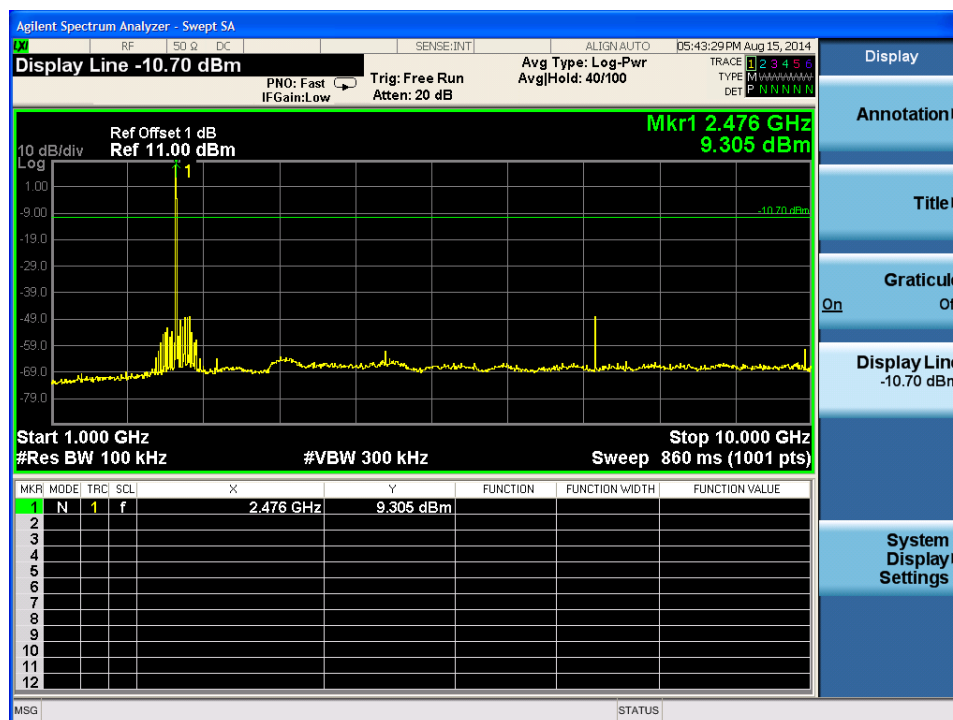
Spurious RF conducted emissions



2480MHz



Spurious RF conducted emissions



9.9 Band edge testing

Test Method

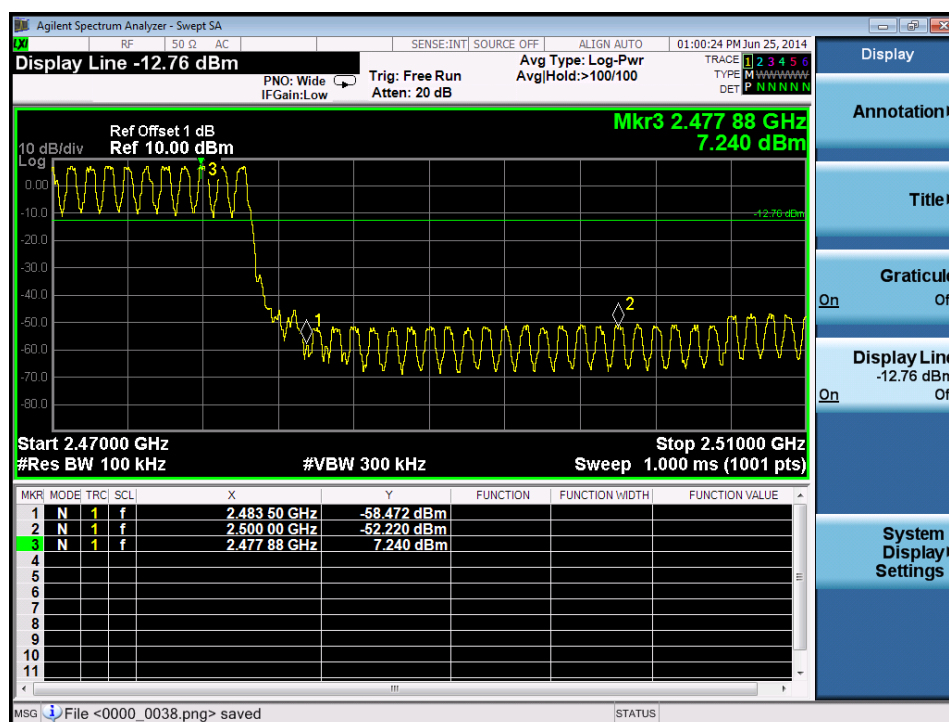
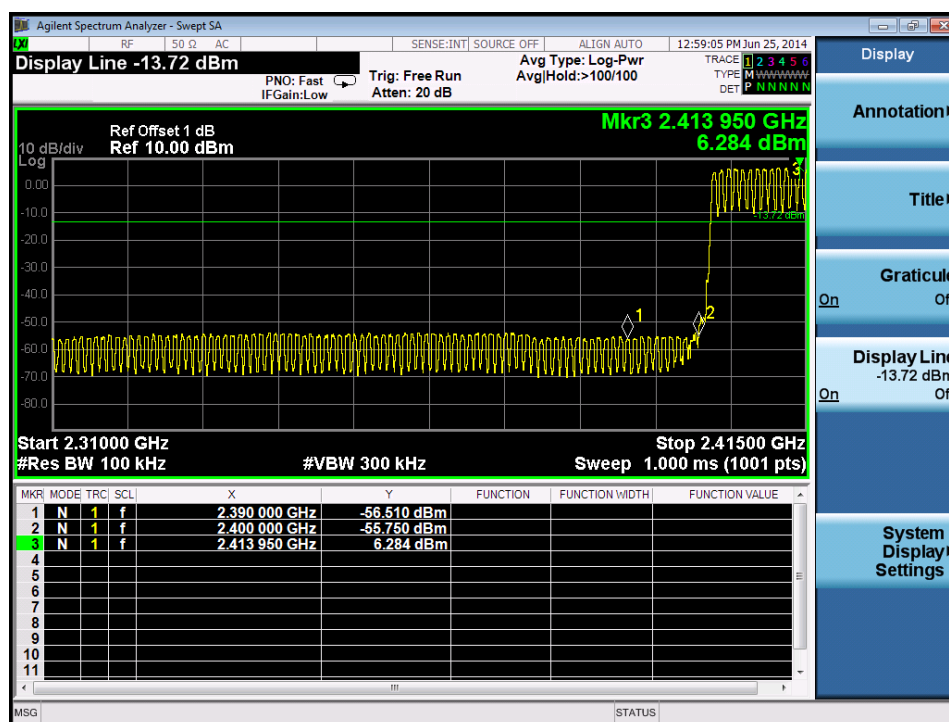
- 1 Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 kHz, VBW $\geq$ RBW, Sweep = auto, Detector function = peak, Trace = max hold
- 2 Allow the trace to stabilize, use the peak and delta measurement to record the result.
- 3 The level displayed must comply with the limit specified in this Section. .
- 4 Repeat the test at the hopping off and hopping on mode, submit all the plots.

Limit:

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. 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 in 15.209(a) (see Section 15.205(c))

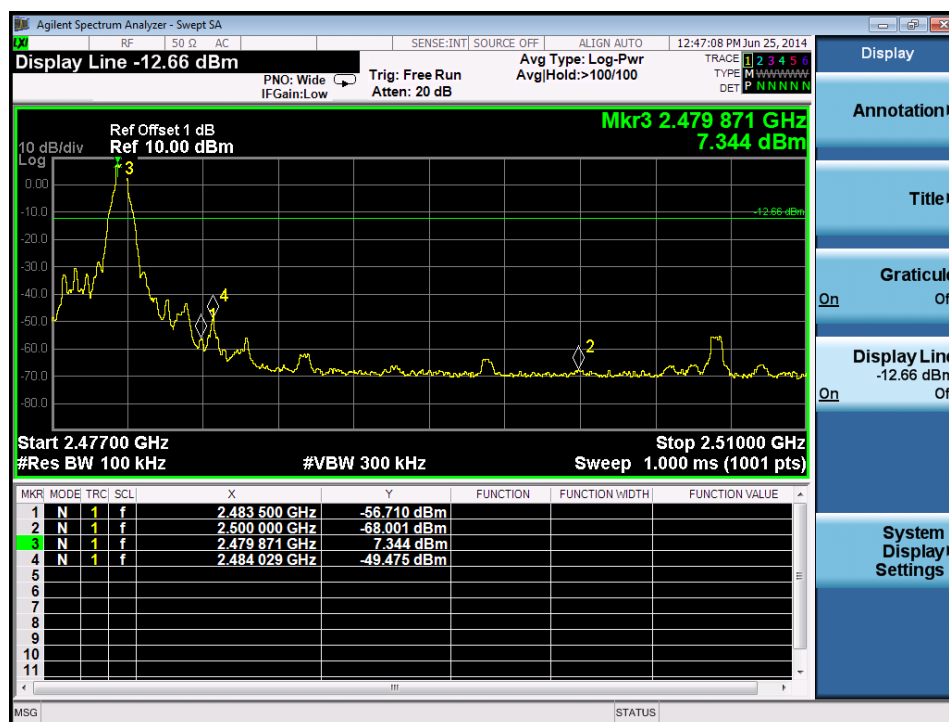
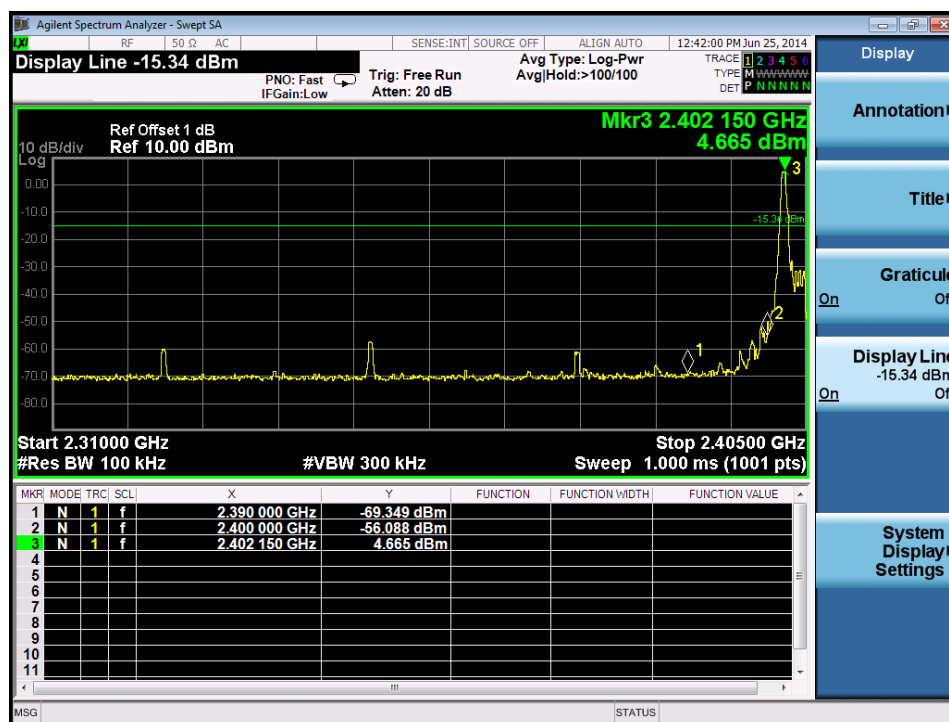
Band edge testing

BT3.0 GFSK Modulation Test Result:
Hopping on mode:



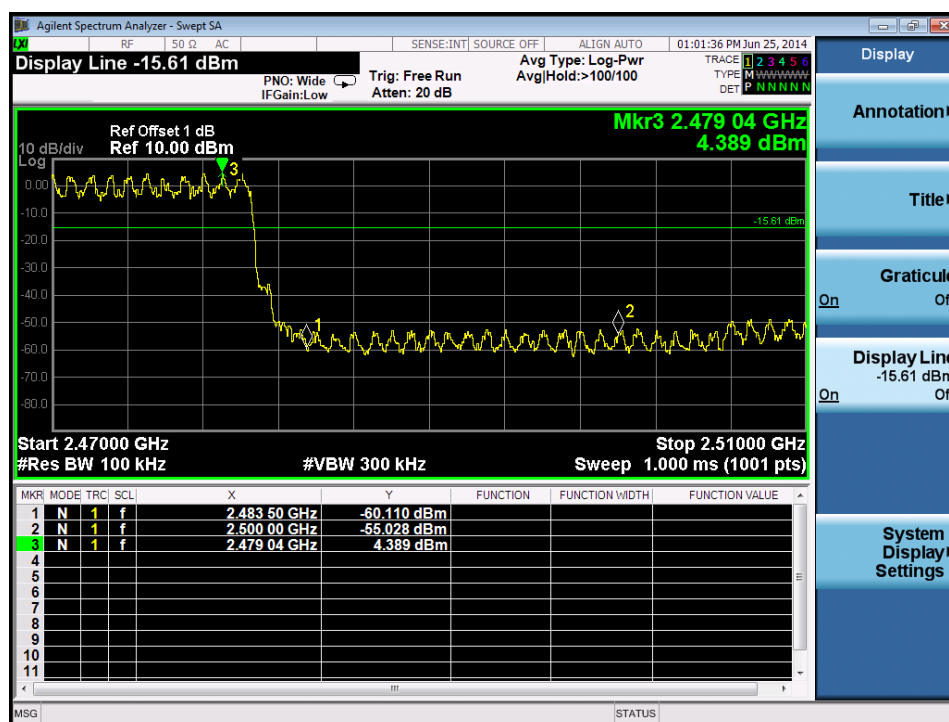
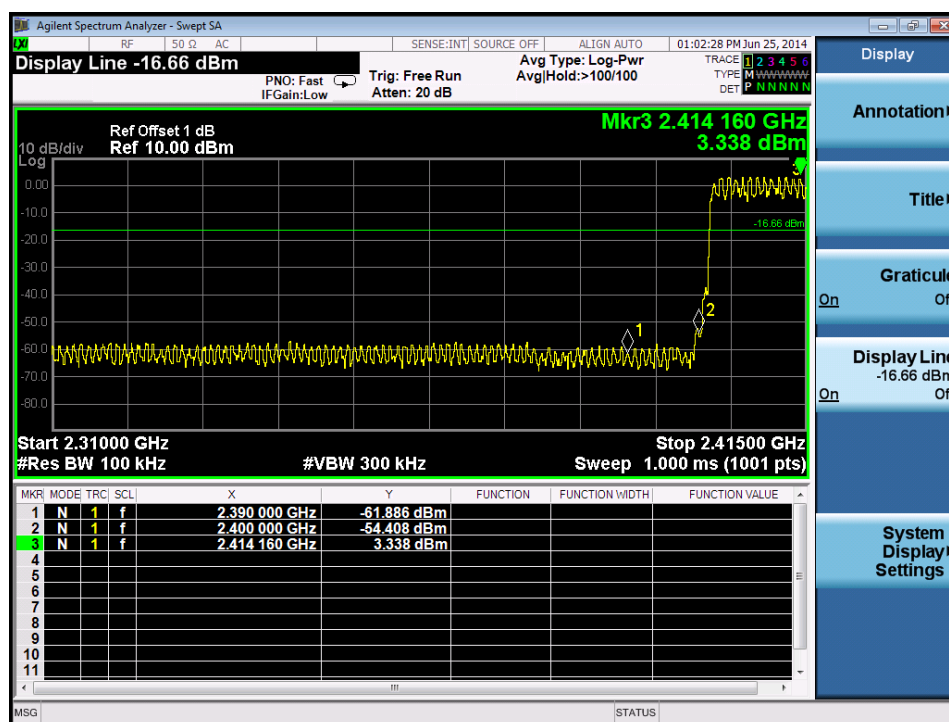
Band edge testing

Hopping off mode:



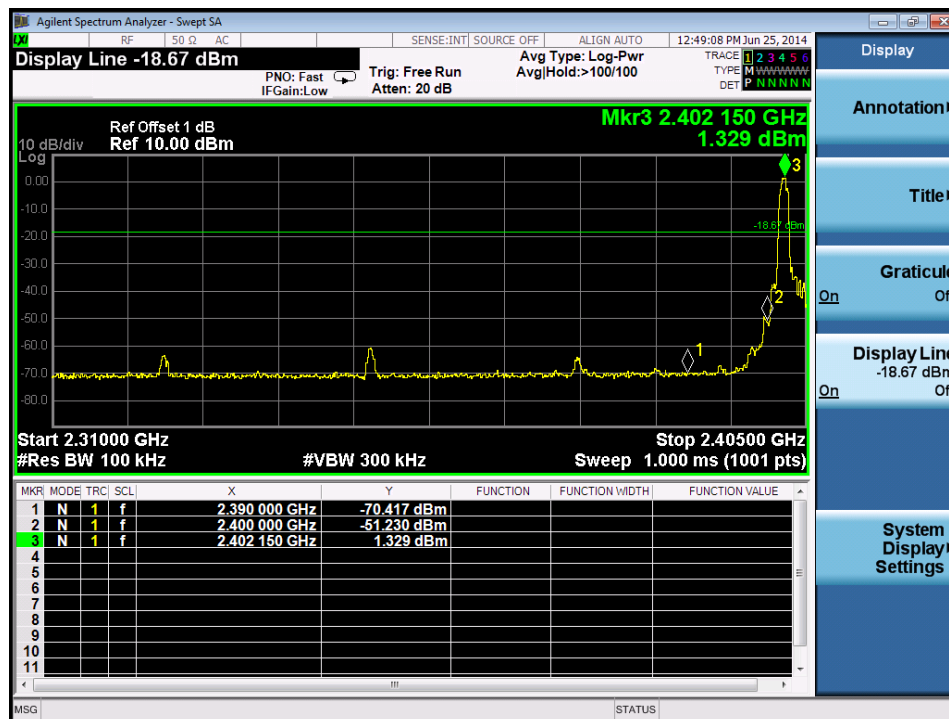
Band edge testing

BT3.0 8-DPSK Modulation Test Result:
Hopping on mode:



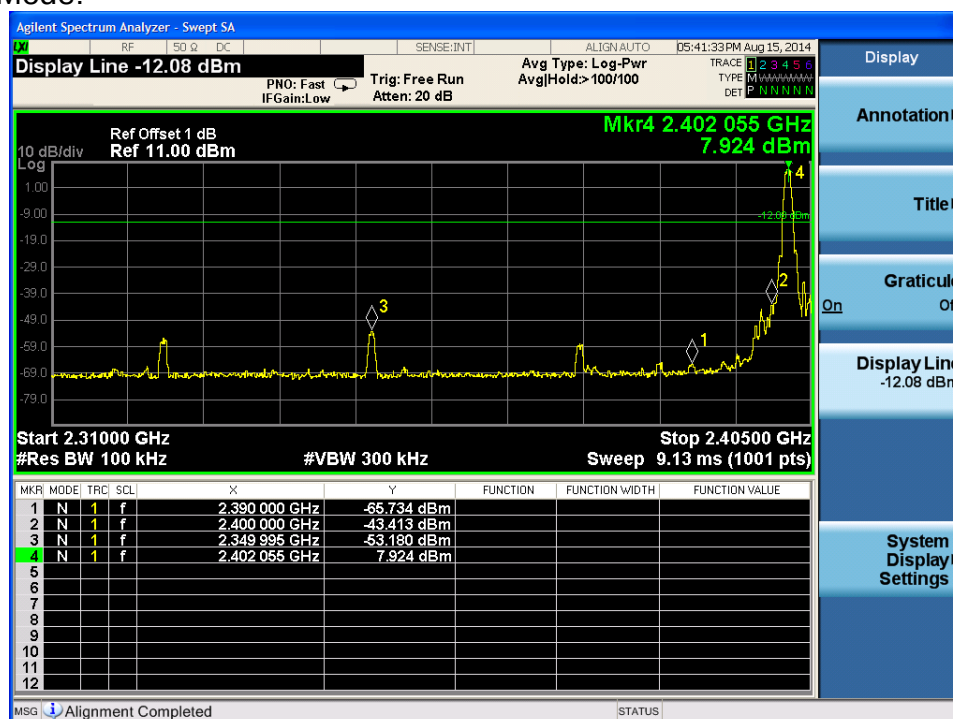
Band edge testing

Hopping off mode:



Band edge testing

BT4.0 GFSK Mode:



9.10 Spurious radiated emissions for transmitter

Test Method

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
3. Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured, RBW = 1 MHz for $f \geq 1\text{GHz}$, 100 kHz for $f < 1\text{GHz}$, VBW $\geq$ RBW, Sweep = auto, Detector function = peak, Trace = max hold
4. Follow the guidelines in ANSI C63.4-1992 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc.
The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the duty cycle per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{duty cycle}/100\text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Limit

According to part 15.247(d), the radio emission outside the operating frequency band 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. Radiated emissions which fall in the restricted bands, as defined in section 15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dBuV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

The only worse case (which is subject to the maximum EIRP, GFSK mode) test result is listed in the report.

Transmitting spurious emission test result as below:

BT3.0 Bluetooth Mode GFSK Modulation 2402MHz Test Result

Frequency	Antenna Factor	Cable Loss	Amp. Factor	Reading	Emission Level	Polarization	Limit	Detector	Result
MHz	dB/m	dB	dB	dBuV	dBuV/m		dBuV/m		
30-1000	--	--	--	--	--	Horizontal	--	QP	Pass
30-1000	--	--	--	--	--	Vertical	--	QP	Pass
*4804	32.85	8.56	35.70	41.53	47.24	Horizontal	74	PK	Pass
*4804	32.85	8.56	35.70	--	--	Horizontal	54	AV	Pass
*4804	32.85	8.56	35.7	44.85	50.56	Vertical	74	PK	Pass
*4804	32.85	8.56	35.70	--	--	Vertical	54	AV	Pass

BT3.0 Bluetooth Mode GFSK Modulation 2441MHz Test Result

Frequency	Antenna Factor	Cable Loss	Amp. Factor	Reading	Emission Level	Polarization	Limit	Detector	Result
MHz	dB/m	dB	dB	dBuV	dBuV/m		dBuV/m		
*4882	32.99	8.64	35.70	42.43	48.36	Horizontal	74	PK	Pass
*4882	32.99	8.64	35.70	--	--	Horizontal	54	AV	Pass
*4882	32.99	8.64	35.70	43.38	49.31	Vertical	74	PK	Pass
*4882	32.99	8.64	35.70	--	--	Vertical	74	AV	Pass

BT3.0 Bluetooth Mode GFSK Modulation 2480MHz Test Result

Frequency	Antenna Factor	Cable Loss	Amp. Factor	Reading	Emission Level	Polarization	Limit	Detector	Result
MHz	dB/m	dB	dB	dBuV	dBuV/m		dBuV/m		
*4960	33.13	8.72	35.70	45.56	51.71	Horizontal	74	PK	Pass
*4960	33.13	8.72	35.70	--	--	Horizontal	54	AV	Pass
*4960	33.13	8.72	35.70	46.22	52.37	Vertical	74	PK	Pass
*4960	33.13	8.72	35.70	--	--	Vertical	54	AV	Pass

BT4.0 Mode 2402MHz Test Result

Frequency	Antenna Factor	Cable Loss	Amp. Factor	Reading	Emission Level	Polarization	Limit	Detector	Result
MHz	dB/m	dB	dB	dBuV	dBuV/m		dBuV/m		
30-1000	--	--	--	--	--	Horizontal	--	QP	Pass
30-1000	--	--	--	--	--	Vertical	--	QP	Pass
*4804	32.85	8.56	35.70	43.33	49.04	Horizontal	74	PK	Pass
*4804	32.85	8.56	35.70	--	--	Horizontal	54	AV	Pass
*4804	32.85	8.56	35.70	46.83	52.54	Vertical	74	PK	Pass
*4804	32.85	8.56	35.70	--	--	Vertical	54	AV	Pass

BT4.0 Mode 2440MHz Test Result

Frequency	Antenna Factor	Cable Loss	Amp. Factor	Reading	Emission Level	Polarization	Limit	Detector	Result
MHz	dB/m	dB	dB	dBuV	dBuV/m		dBuV/m		
*4880	32.99	8.64	35.70	43.46	49.39	Horizontal	74	PK	Pass
*4880	32.99	8.64	35.70	--	--	Horizontal	54	AV	Pass
*4880	32.99	8.64	35.70	46.19	52.12	Vertical	74	PK	Pass
*4880	32.99	8.64	35.70	--	--	Vertical	74	AV	Pass

BT4.0 Mode 2480MHz Test Result

Frequency	Antenna Factor	Cable Loss	Amp. Factor	Reading	Emission Level	Polarization	Limit	Detector	Result
MHz	dB/m	dB	dB	dBuV	dBuV/m		dBuV/m		
*4960	33.13	8.72	35.70	44.62	50.77	Horizontal	74	PK	Pass
*4960	33.13	8.72	35.70	--	--	Horizontal	54	AV	Pass
*4960	33.13	8.72	35.70	46.88	53.03	Vertical	74	PK	Pass
*4960	33.13	8.72	35.70	--	--	Vertical	54	AV	Pass

Remark:

- (1) QP Emission Level= Antenna Factor +Cable Loss + Reading
PK Emission Level= Antenna Factor +Cable Loss - Amp. factor + Reading
AV Emission Level= PK Emission Level+20log(dutycycle)
- (2) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.
- (3) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

10 Test Equipment List

List of Test Instruments

	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE	
CE	Test Receiver	Rohde & Schwarz	ESHS10	838693/001	Nov.04, 14	☒
	L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	834066/011	Nov.04, 14	☒
	L.I.S.N.#3	Kyoritsu	KNW-242C	8-1920-1	May.07, 15	☐
	RF Cable	3D-2W	Fujikura	LISN Cable 1#	May.07, 15	☒
	Coaxial Switch	MP59B	Anritsu	M55367	May.07, 15	☒
	Passive Probe	ESH2-Z3	Rohde & Schwarz	299.7810.52	May.07, 15	☐
	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	100341	May.07, 15	☐
C	Spectrum	Agilent	E4446A	US44300459	May.08, 15	☒
RE < 1 GHz	Test Receiver <1GHz	Rohde & Schwarz	ESVS10	834468/011	May.07, 15	☒
	Amplifier < 1 GHz	HP	8447D	2648A04738	May.07, 15	☒
	HF Cable	Hubersuhne	Sucoflex104	Room 2	May.08, 15	☒
	Bilog Antenna	Schaffner	CBL6111C	2598	Oct.25, 14	☒
RE > 1 GHz	Spectrum > 1GHz	Agilent	E4446A	US44300459	May.08, 15	☒
	Horn Antenna	EMCO	3115	9607-4877	Jun. 24, 15	☒
	Amp > 1 Ghz	HP	8449B	3008A08495	May.08, 15	☒
	HF Cable	Hubersuhne	Sucoflex104	Room1	May.08, 15	☒

C - Conducted RF tests

- Conducted peak output power
- 6dB bandwidth
- 20dB bandwidth and 99% Occupied Bandwidth
- Carrier frequency separation
- Number of hopping frequencies
- Dwell Time
- Power spectral density*
- Spurious RF conducted emissions
- Band edge

11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

Items	Extended Uncertainty
Radiated spurious emission	4.32dB (30MHz-1GHz)
	2.27dB (1GHz -25GHz)
Conducted spurious emission	2.10dB(30MHz-25GHz)
Bandwidth test	1×10^{-9}
Conducted emission	2.4dB