

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 1 of 52

Applicant : Leica Geosystems AG
Address of Applicant : Heinrich-Wild-Strasse, CH-9435 Heerbrugg

Product Name : Rugged Windows Field Controller
Model No. : CS30 LTE
Sample No. : E20090001-01#01
E20090001-01#02
FCC ID : RFD-CS30
ISED Number : 3177A-CS30

Standards : FCC CFR47 Part 15, Subpart C
RSS-Gen (Issue 5, March 2019)
RSS-247 (Issue 2, February 2017)

Date of Receipt : 2020-09-03
Date of Test : 2020-09-22 ~ 2020-11-26
Date of Issue : 2020-11-27

Remark:

This report details the results of the testing carried out on one sample, the results contained in this report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

Prepared by:

Jennifer Zhou
(Jennifer Zhou)

Reviewed by:

Oliver Xiang
(Oliver Xiang)

Approved by:

Guoyou Chi
(Authorized signatory: Guoyou Chi)

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 2 of 52

Contents

1	GENERAL INFORMATION	3
1.1	TESTING LABORATORY	3
1.2	DETAILS OF APPLICATION	3
1.3	DETAILS OF EUT	3
1.4	TEST METHODOLOGY	4
2	TEST CONDITION	5
2.1	ENVIRONMENTAL CONDITIONS	5
2.2	EQUIPMENT LIST	5
2.3	MEASUREMENT UNCERTAINTY	5
3	TEST SET-UP AND OPERATION MODES	6
3.1	DETAILS OF TEST MODE	6
3.2	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	6
3.3	SUPPORT SOFTWARE	6
3.4	TEST SETUP DIAGRAM	7
4	TEST RESULTS	9
4.1	TRANSMITTER REQUIREMENT & TEST SUITES	9
4.1.1	<i>Antenna Requirement</i>	<i>9</i>
4.1.2	<i>Maximum Conducted Output Power and E.I.R.P.</i>	<i>10</i>
4.1.3	<i>20dB Bandwidth and 99% Bandwidth</i>	<i>16</i>
4.1.4	<i>Conducted Spurious Emission & Authorized-band band-edge</i>	<i>20</i>
4.1.5	<i>Spurious Emission</i>	<i>37</i>
4.1.6	<i>Band Edge (Restricted-band band-edge)</i>	<i>38</i>
4.1.7	<i>Hopping Frequency Separation</i>	<i>39</i>
4.1.8	<i>Number of Hopping Frequency</i>	<i>41</i>
4.1.9	<i>Time of Occupancy</i>	<i>43</i>
4.2	MAINS EMISSIONS	47
4.2.1	<i>Conducted Emission on AC Mains</i>	<i>47</i>
5	APPENDIXES	50
5.1	PHOTOGRAPHS OF THE SAMPLE	50
5.2	SET-UP FOR CONDUCTED EMISSIONS	51
5.3	SET-UP FOR CONDUCTED RF TEST AT ANTENNA PORT	51
5.4	SET-UP FOR SPURIOUS EMISSIONS BELOW 1GHZ	52
5.5	SET-UP FOR SPURIOUS EMISSIONS ABOVE 1GHZ	52

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 3 of 52

1 General Information

1.1 Testing Laboratory

Company Name	ICAS Testing Technology Service (Shanghai) Co., Ltd.
Address	No.1298 Pingan Rd, Minhang District, Shanghai, China
Telephone	0086 21-51682999
Fax	0086 21-54711112
Homepage	www.icasiso.com

1.2 Details of Application

Company Name	Leica Geosystems AG
Address	Heinrich-Wild-Strasse, CH-9435 Heerbrugg
Contact Person	Tero Huhtala
Telephone	+41 71 727 3422
Email	tero.huhtala@leica-geosystems.com

1.3 Details of EUT

Product Name	Rugged Windows Field Controller
Brand Name	Leica
Model No.	CS30 LTE
FCC ID	RFD-CS30
ISED Number	3177A-CS30
Mode of Operation	Bluetooth BR/EDR
Frequency Range	2400MHz ~ 2483.5MHz
Number of Channels	79 (at intervals of 1 MHz)
Modulation Type	GFSK, $\pi/4$ -DQPSK, 8-DPSK
Antenna Type	Internal Antenna
Antenna Gain	1.97 dBi
Extreme Temperature Range	-20°C ~ +60°C
Test Voltage	DC 11.1V
Hardware version	PCB V0.4
Software version	R.ED.00.02.03
Test SW Version	BL410_R
RF power setting in TEST SW	DRTU

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 4 of 52

1.4 Test Methodology

47 CFR Part 15, Subpart C (10-1-16 Edition)	Miscellaneous Wireless Communications Services
FCC PUBLIC NOTICE DA 00-705 (Mar.30, 2000)	Filling and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
RSS-Gen (Issue 5, March 2019)	General Requirements for Compliance of Radio Apparatus
RSS-247 (Issue 2, February 2017)	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Note(s):

All test items were verified and recorded according to the standards and without any addition/deviation/exclusion during the test.

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 5 of 52

2 Test Condition

2.1 Environmental conditions

Temperature (°C)	18-25
Humidity (%RH)	40-65
Barometric Pressure (mbar)	960-1060

2.2 Equipment List

Name of Equipment	Manufacturer	Model	Serial No.	Cal. Due Date
Spectrum Analyzer	Keysight	N9020B	MY59260184	2021-08-18
Spectrum Analyzer	Rohde & Schwarz	FSV40N	101450	2021-06-08
EMI Test Receiver	Rohde & Schwarz	ESPI3	100173	2021-06-08
EMI Test Receiver	Rohde & Schwarz	ESR 7	101911	2021-06-08
V-network	SCHWARZBECK	NSLK 8127	8127-902	2021-02-20
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	100687	2021-08-18
Broadband Antenna	SCHWARZBECK	VULB9163	9163-1037	2021-06-08
Horn Antenna-18G	SCHWARZBECK	BBHA9120D	9120D-1775	2021-06-08
Loop Antenna	SCHWARZBECK	FMZB 1513	N/A	2021-03-19
Horn Antenna-40G	YINGLIAN	LB-180400-KF	N/A	2021-07-26
EMC chamber 9*6*6 (L*W*H)	CHANGNING	966	N/A	2021-06-08
Shielded Enclosure 8*5*4 (L*W*H)	CHANGNING	854	N/A	2021-06-08
Test Software	BL	BL410_E	N/A	N/A

2.3 Measurement Uncertainty

Parameter	Frequency	Uncertainty
Antenna Port Conducted Emission	< 1GHz	± 1.5 dB
	> 1GHz	± 1.5 dB
Radiated Emission	30 MHz – 1 GHz	± 3 dB
	> 1GHz	± 3 dB

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 6 of 52

3 Test Set-up and Operation Modes

3.1 Details of Test Mode

Using test software was control EUT work in continuous transmitter and receiver mode. Select test channel as below:

Channel	Frequency
The lowest channel(CH0)	2402MHz
The middle channel(CH39)	2441MHz
The Highest channel(CH78)	2480MHz

The basic operation modes are:

- A. On
 - 1. BR/EDR mode
 - a. Transmitting
 - i. Low Channel
 - ii. Middle Channel
 - iii. High Channel
 - iv. Hopping mode
 - b. Receiving
 - 2. Normal working with Bluetooth on
- B. Standby
- C. Off

3.2 Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	TP00083A	N/A

3.3 Support Software

Description	Manufacturer	Software Name
Software	Intel	DRTU

TEST REPORT

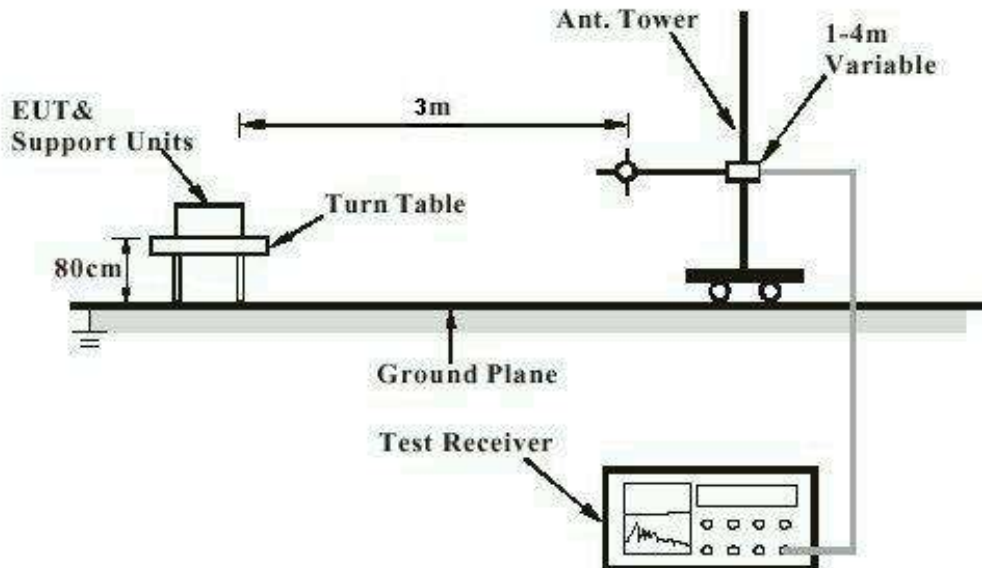
Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 7 of 52

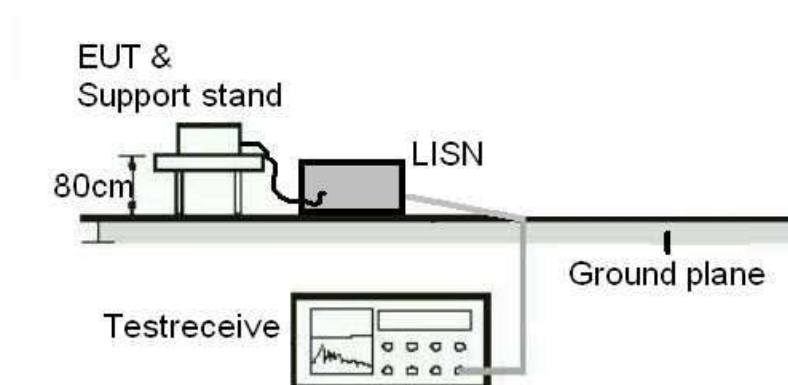
3.4 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

Diagram of Measurement Equipment Configuration for Conduction Measurement



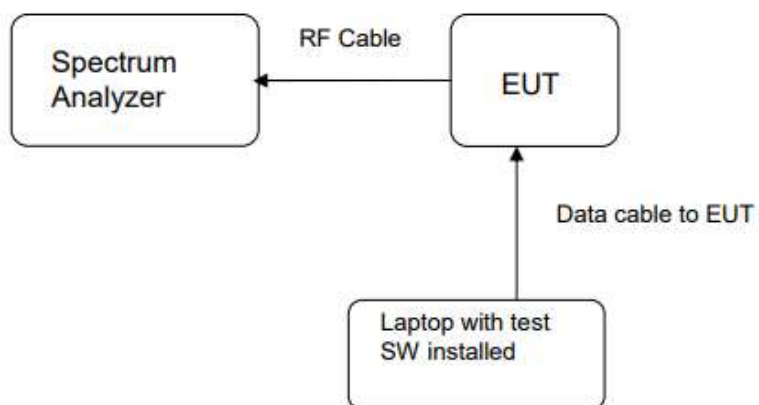
TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 8 of 52

Diagram of Measurement Equipment Configuration for Transmitter Measurement



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 9 of 52

4 Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Antenna Requirement

RESULT:

PASS

Test standard : FCC Part 15.247(b)(4), Part 15.203
RSS-247 5.4(6)

Requirement : The use of approved antennas only with directional
gains that do not exceed 6dBi

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 1.97dBi. The antenna is an internal antenna with no possibility of replacement with a non-approved antenna by the end-user.

Therefore, the EUT is considered to comply with this provision.

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 10 of 52

4.1.2 Maximum Conducted Output Power and E.I.R.P

RESULT:

PASS

Test standard : FCC Part 15.247(b)(1)
RSS-247 5.4(2)
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 23°C
Relative humidity : 52%

Table 1: Maximum Conducted Output Power

Test Mode	Test Channel (MHz)	Measured Peak Power		Limit (W)
		(dBm)	(mW)	
GFSK	2402	2.77	1.89	< 1
	2441	3.50	2.24	
	2480	3.27	2.12	
$\pi/4$ -DQPSK	2402	0.50	1.12	< 0.125
	2441	1.29	1.35	
	2480	1.25	1.33	
8-DPSK	2402	-0.53	0.89	< 0.125
	2441	0.21	1.05	
	2480	0.24	1.06	

Table 2: E.I.R.P

Test Mode	Test Channel (MHz)	E.I.R.P		Limit (W)
		(dBm)	(mW)	
GFSK	2402	4.74	2.98	< 4
	2441	5.47	3.52	
	2480	5.24	3.34	
$\pi/4$ -DQPSK	2402	2.47	1.77	
	2441	3.26	2.12	
	2480	3.22	2.10	
8-DPSK	2402	1.44	1.39	
	2441	2.18	1.65	
	2480	2.21	1.66	

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 11 of 52

Figure 1: Maximum Conducted Output Power, 2402MHz, GFSK



Figure 2: Maximum Conducted Output Power, 2441MHz, GFSK



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 12 of 52

Figure 3: Maximum Conducted Output Power, 2480MHz, GFSK



Figure 4: Maximum Conducted Output Power, 2402MHz, $\pi/4$ -DQPSK



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 13 of 52

Figure 5: Maximum Conducted Output Power, 2441MHz, $\pi/4$ -DQPSK



Figure 6: Maximum Conducted Output Power, 2480MHz, $\pi/4$ -DQPSK



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 14 of 52

Figure 7: Maximum Conducted Output Power, 2402MHz, 8-DPSK



Figure 8: Maximum Conducted Output Power, 2441MHz, 8-DPSK



TEST REPORT

Report No.:

SHE20090001-02HE

Date:

2020-11-27

Page 15 of 52

Figure 9: Maximum Conducted Output Power, 2480MHz, 8-DPSK



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 16 of 52

4.1.3 20dB Bandwidth and 99% Bandwidth

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)
RSS-247 5.1(1)
RSS-Gen 6.7
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 23°C
Relative humidity : 52%

Table 3: 20dB Bandwidth and 99% Bandwidth

Test Mode	Test Channel (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
GFSK	2402	0.993	0.893
	2441	0.998	0.888
	2480	0.991	0.885
8-DPSK	2402	1.447	1.346
	2441	1.447	1.346
	2480	1.481	1.347

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 17 of 52

Figure 10: 20dB Bandwidth and 99% Bandwidth, 2402MHz, GFSK



Figure 11: 20dB Bandwidth and 99% Bandwidth, 2441MHz, GFSK



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 18 of 52

Figure 12: 20dB Bandwidth and 99% Bandwidth, 2480MHz, GFSK



Figure 13: 20dB Bandwidth and 99% Bandwidth, 2402MHz, 8-DPSK



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 19 of 52

Figure 14: 20dB Bandwidth and 99% Bandwidth, 2441MHz, 8-DPSK



Figure 15: 20dB Bandwidth and 99% Bandwidth, 2480MHz, 8-DPSK



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 20 of 52

4.1.4 Conducted Spurious Emission & Authorized-band band-edge

RESULT:

PASS

Test standard : FCC Part 15.247(d)
RSS-247 5.5
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High for spurious, Low/High for Band
Edge
Operation Mode : A.1.a
Ambient temperature : 23°C
Relative humidity : 52%

For details refer to following test plot.

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 21 of 52

Figure 16: Conducted Spurious Emission & Authorized-band band-edge, 2402MHz, GFSK Carrier Level



Band Edge



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 22 of 52

Conducted spurious emissions 30MHz-25GHz



TEST REPORT

Report No.: SHE20090001-02HE

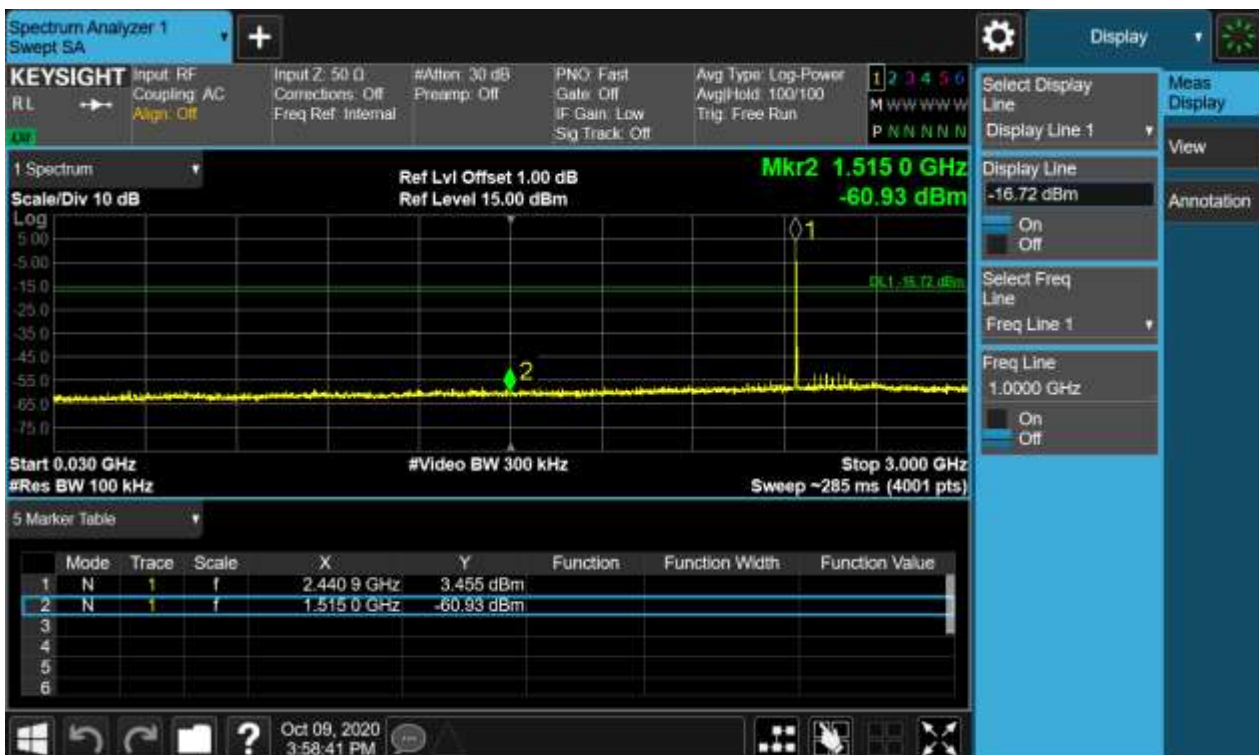
Date: 2020-11-27

Page 23 of 52

Figure 17: Conducted Spurious Emission & Authorized-band band-edge, 2441MHz, GFSK Carrier Level



Conducted spurious emissions 30MHz-25GHz



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 24 of 52



Figure 18: Conducted Spurious Emission & Authorized-band band-edge, 2480MHz, GFSK Carrier Level



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 25 of 52

Band Edge



Conducted spurious emissions 30MHz-25GHz



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 26 of 52



Figure 19: Conducted Spurious Emission & Authorized-band band-edge, 2402MHz, 8-DPSK Carrier Level



TEST REPORT

Report No.: SHE20090001-02HE

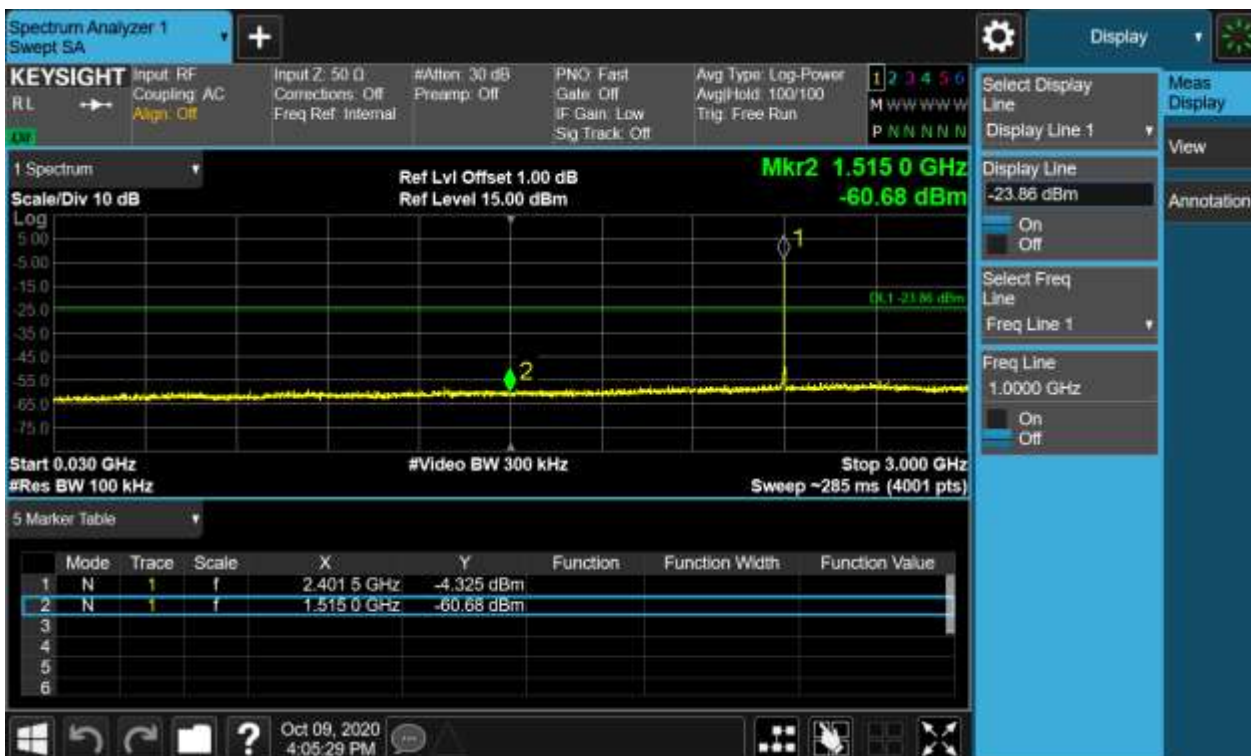
Date: 2020-11-27

Page 27 of 52

Band Edge



Conducted spurious emissions 30MHz-25GHz



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 28 of 52



Figure 20: Conducted Spurious Emission & Authorized-band band-edge, 2441MHz, 8-DPSK Carrier Level



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 29 of 52

Conducted spurious emissions 30MHz-25GHz



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 30 of 52

Figure 21: Conducted Spurious Emission & Authorized-band band-edge, 2480MHz, 8-DPSK Carrier Level



Band Edge



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 31 of 52

Conducted spurious emissions 30MHz-25GHz



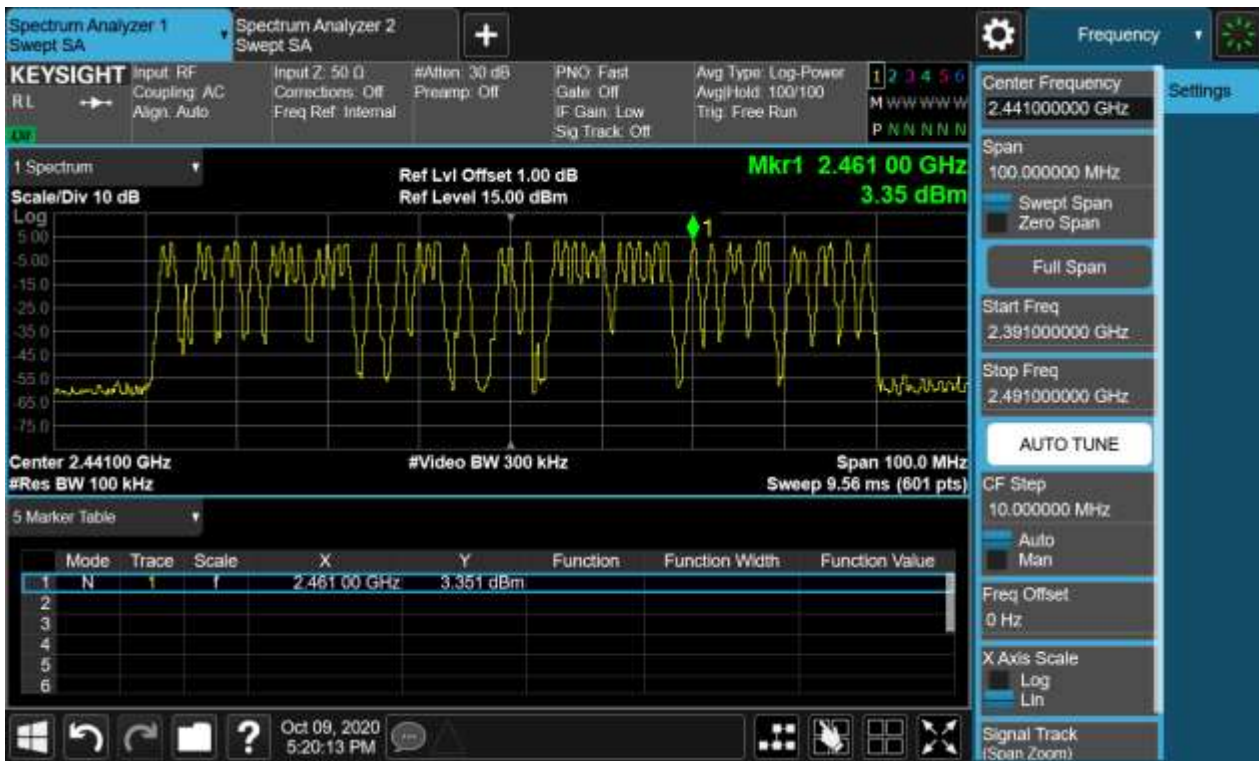
TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 32 of 52

Figure 22: Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, GFSK Carrier Level



Band Edge(Low)



TEST REPORT

Report No.: SHE20090001-02HE

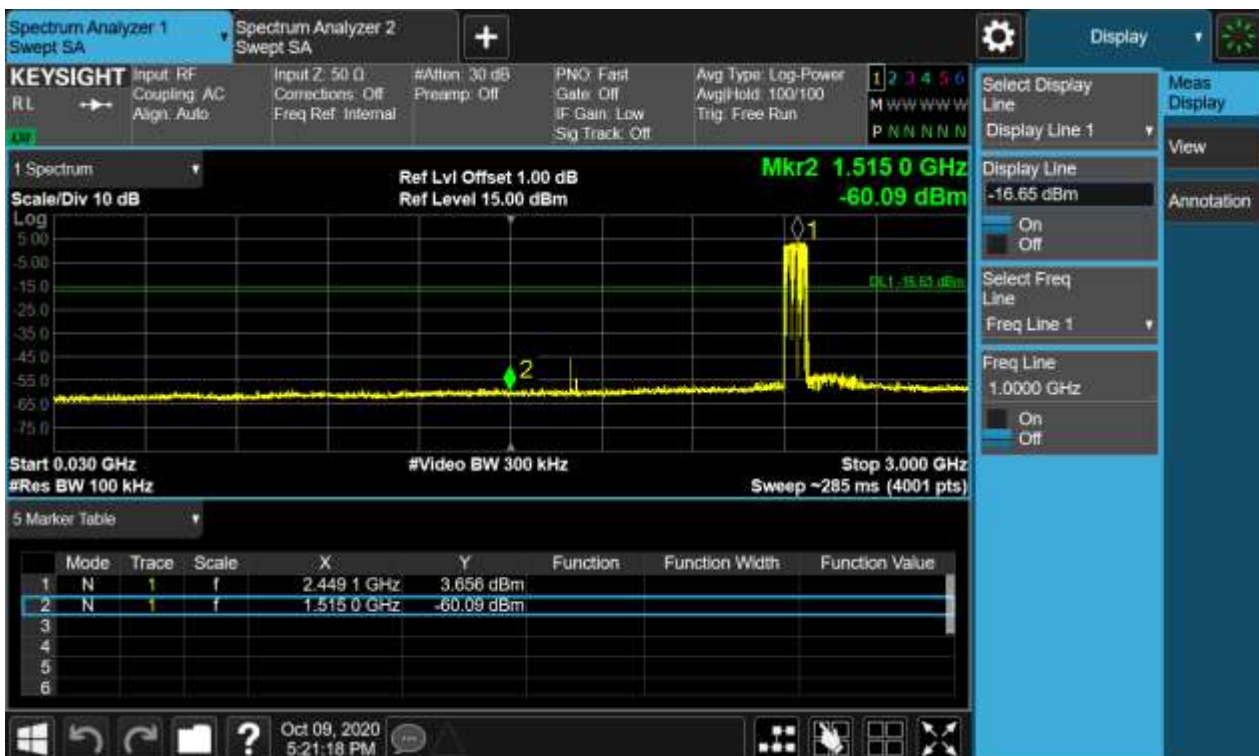
Date: 2020-11-27

Page 33 of 52

Band Edge(High)



Conducted spurious emissions 30MHz-25GHz



TEST REPORT

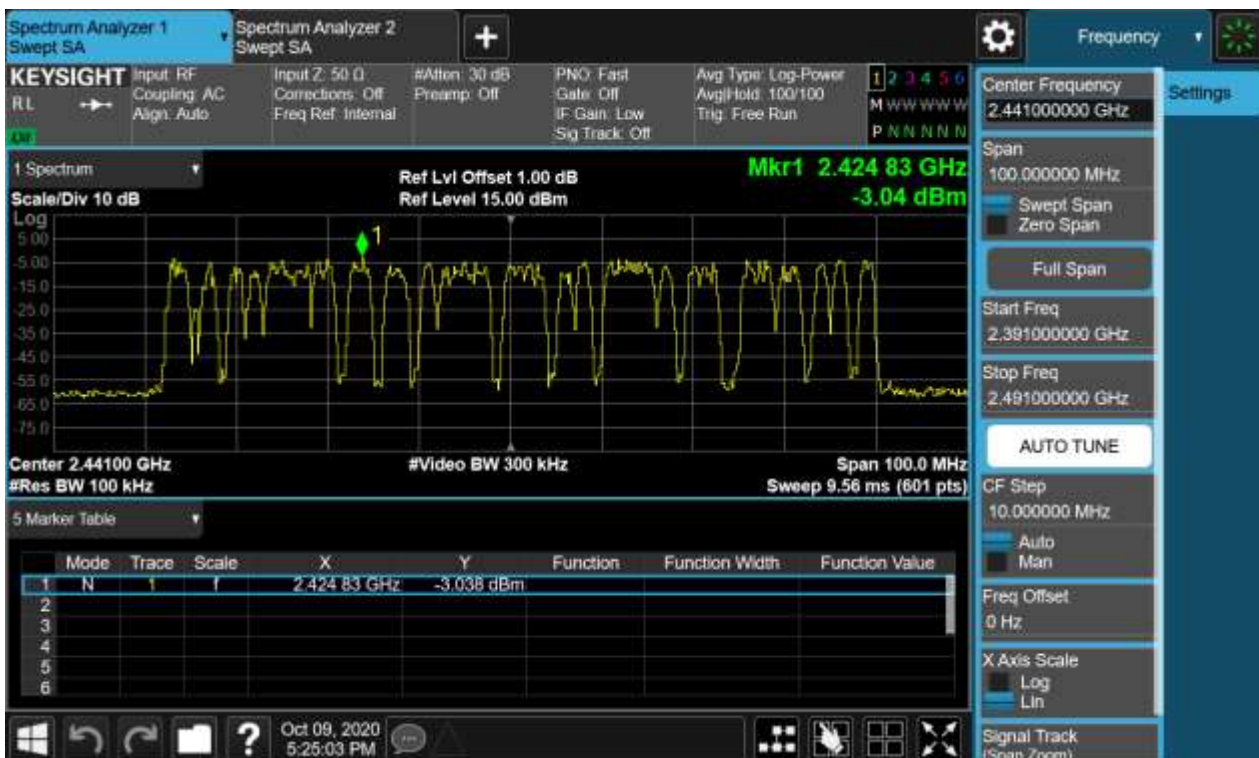
Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 34 of 52



Figure 23: Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, 8-DPSK Carrier Level



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 35 of 52

Band Edge(Low)



Band Edge(High)



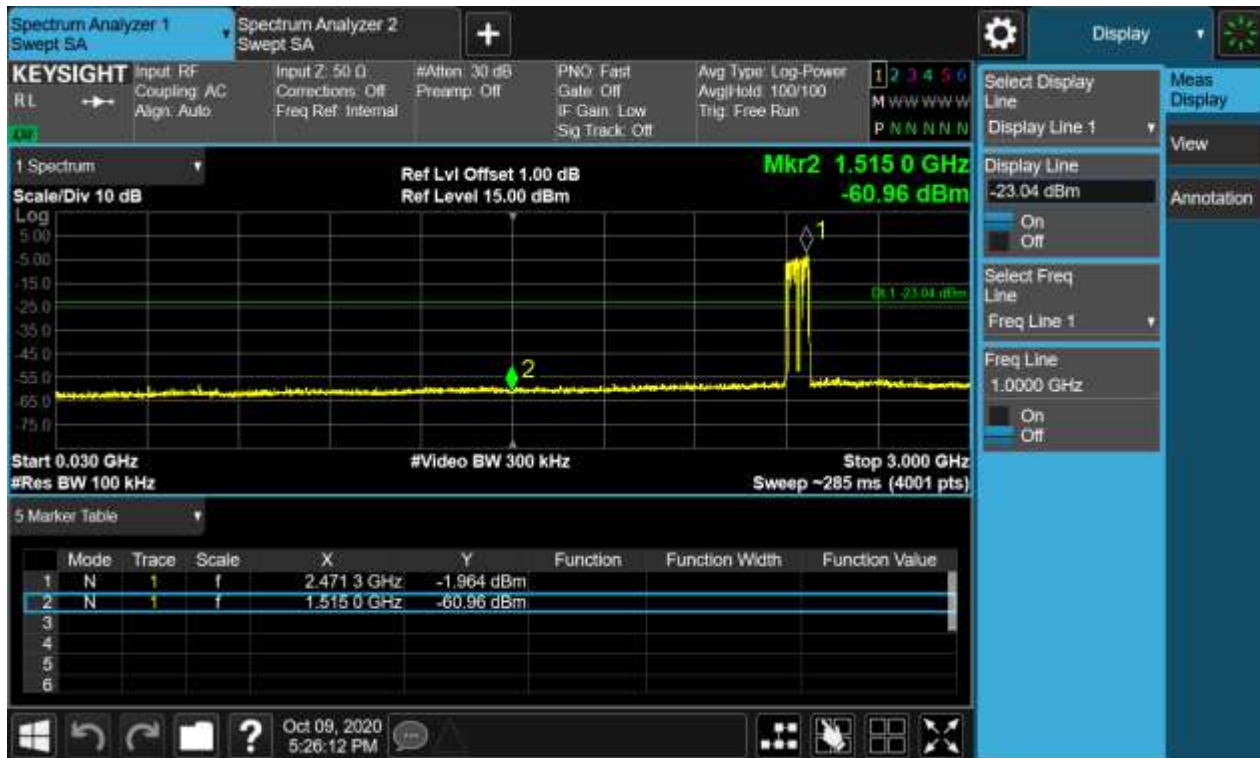
TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 36 of 52

Conducted spurious emissions 30MHz-25GHz



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 37 of 52

4.1.5 Spurious Emission

RESULT:

PASS

Test standard : FCC Part 15.247(d), 15.205, 15.209
RSS-247 5.5
Requirement : ANSI C63.10-2013
Kind of test site : 3m Semi-Anechoic Chamber

Test setup

Test Channel : Low/Middle/High
Operation Mode : A
Ambient temperature : 23°C
Relative humidity : 52%

Notes

Test plots please refer to the annex document "BDEDR-TX EXHIBIT A of SHE20090001-02HE".

1. For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.
2. The spurious above 18GHz is noise only and 20dB below the limit. The value has no need to be reported.
3. The EUT is working in the Normal link mode below 1 GHz.

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 38 of 52

4.1.6 Band Edge (Restricted-band band-edge)

RESULT:

PASS

Test standard	: FCC Part 15.247(d), 15.205, 15.209 RSS-247 5.5
Requirement	: ANSI C63.10-2013
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/Middle/High
Operation Mode	: A.1
Ambient temperature	: 23°C
Relative humidity	: 52%

Notes

Test plots please refer to the annex document "BDEDR-TX EXHIBIT A of SHE20090001-02HE".

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 39 of 52

4.1.7 Hopping Frequency Separation

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)
RSS-247 5.1(2)
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Hopping
Operation Mode : A.1.a.iv
Ambient temperature : 23°C
Relative humidity : 52%

Table 4: Hopping Frequency Separation

Mode	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)
GFSK	2441	1.029	≥ 25kHz or two-thirds of 20dB bandwidth
8-DPSK	2441	0.972	

*Note: The systems operate with an output power no greater than 125mW.

TEST REPORT

Report No.: SHE20090001-02HE

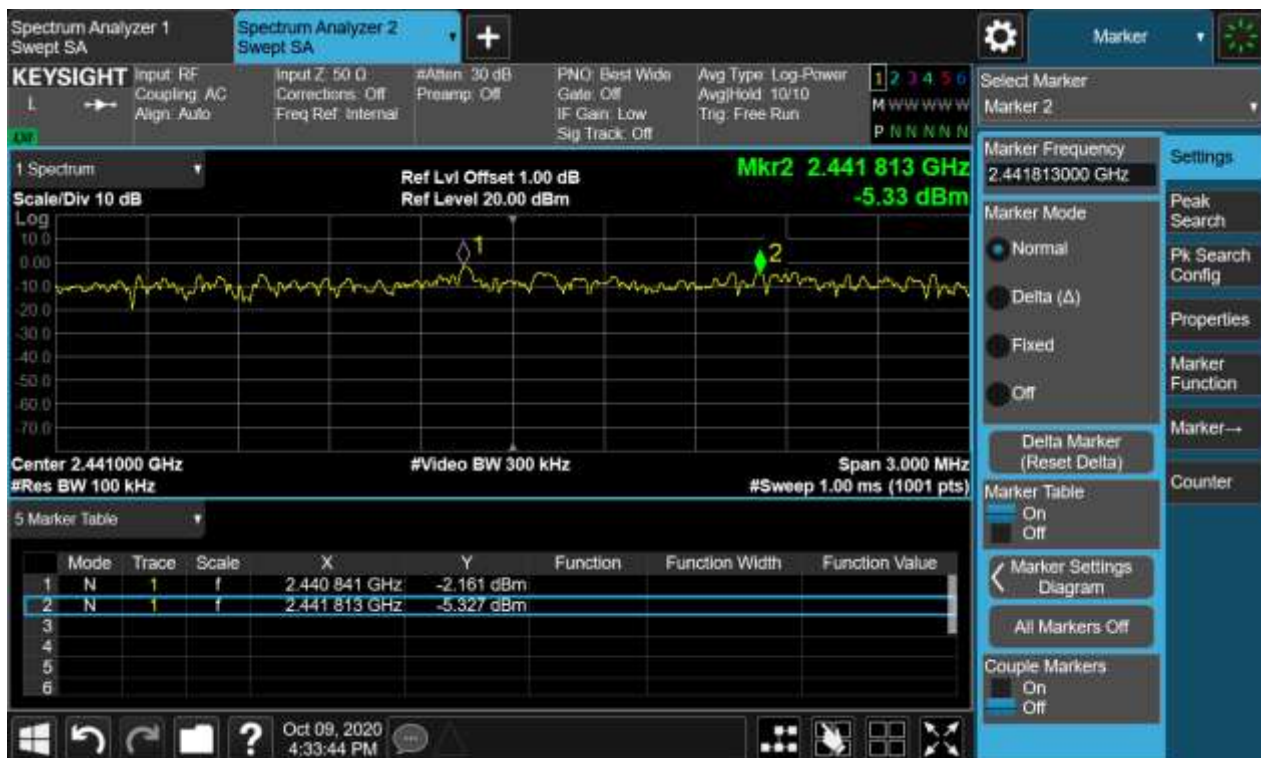
Date: 2020-11-27

Page 40 of 52

Figure 24: Hopping Frequency Separation, Hopping Mode, GFSK



Figure 25: Hopping Frequency Separation, Hopping Mode, 8DPSK



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 41 of 52

4.1.8 Number of Hopping Frequency

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)(iii)
RSS-247 5.1(4)
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Hopping
Operation Mode : A.1.a.iv
Ambient temperature : 23°C
Relative humidity : 52%

Table 5: Number of Hopping Frequency

Mode	Frequency Range	Measured Quantity of Hopping Channel	Limit
GFSK	2400 – 2483.5	79	≥15
8-DPSK	2400 – 2483.5	79	≥15

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 42 of 52

Figure 26: Number of Hopping Frequency, Hopping Mode, GFSK



Figure 27: Number of Hopping Frequency, Hopping Mode, 8-DPSK



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 43 of 52

4.1.9 Time of Occupancy

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)(iii)
RSS-247 5.1(4)
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Middle
Operation Mode : A.1.a
Ambient temperature : 23°C
Relative humidity : 52%

Table 6: Time of Occupancy

Mode	Packet Type	Pulse Time (ms)	Total of Dwell (ms)	Limit (s)
GFSK	DH1	0.3917	125.344	0.4
	DH3	1.6700	267.200	0.4
	DH5	2.9170	311.147	0.4
8-DPSK	DH1	0.4050	129.600	0.4
	DH3	1.6650	266.400	0.4
	DH5	2.9400	313.600	0.4

Note:

For DH1 package type:

Total of Dwell = Pulse Time*(1600/2)/Number of Hopping Frequency*Period

Period = 0.4* Number of Hopping Frequency

For DH3 package type:

Total of Dwell = Pulse Time*(1600/4)/Number of Hopping Frequency*Period

Period = 0.4* Number of Hopping Frequency

For DH5 package type:

Total of Dwell = Pulse Time*(1600/6)/Number of Hopping Frequency*Period

Period = 0.4* Number of Hopping Frequency

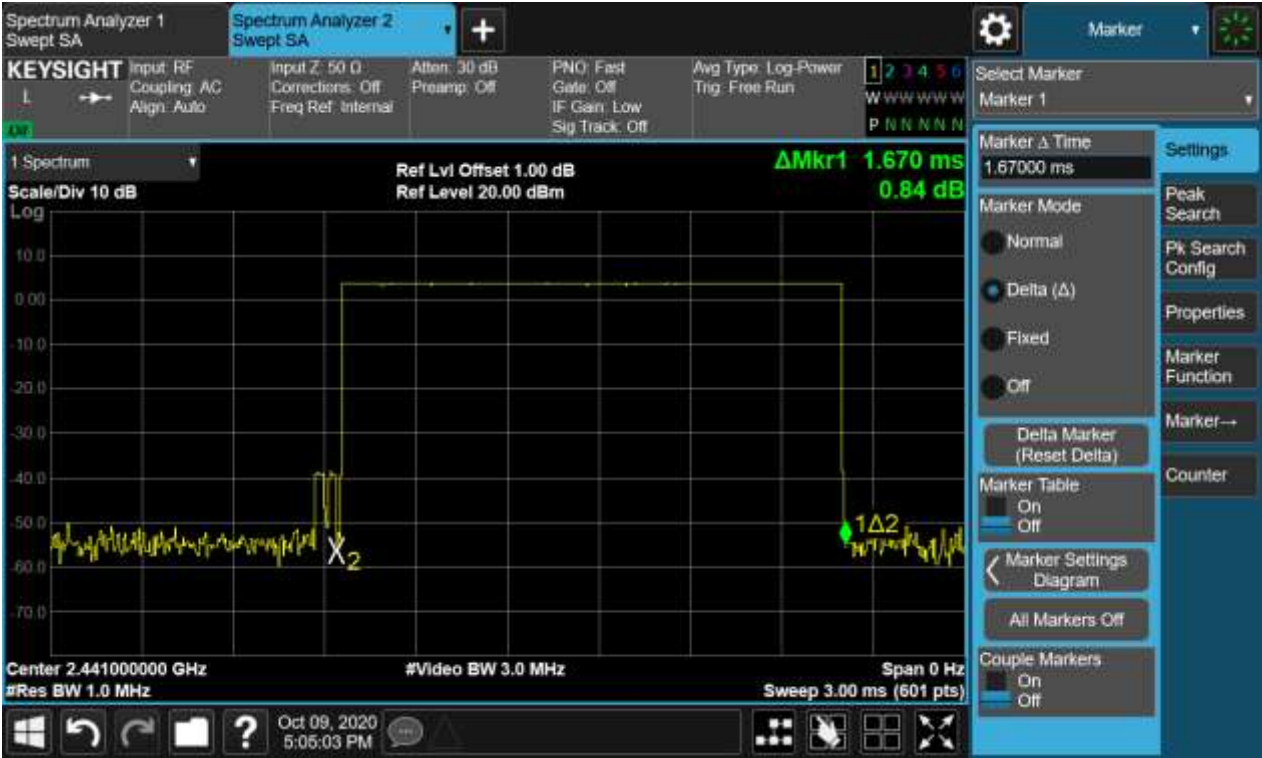
TEST REPORT

Report No.: SHE20090001-02HE Date: 2020-11-27 Page 44 of 52

Figure 28: Time of Occupancy, 2441MHz, GFSK DH1



Figure 26: Time of Occupancy, 2441MHz, GFSK DH3



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 45 of 52

Figure 30: Time of Occupancy, 2441MHz, GFSK DH5



Figure 31: Time of Occupancy, 2441MHz, 8-DPSK DH1



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 46 of 52

Figure 32: Time of Occupancy, 2441MHz, 8-DPSK DH3

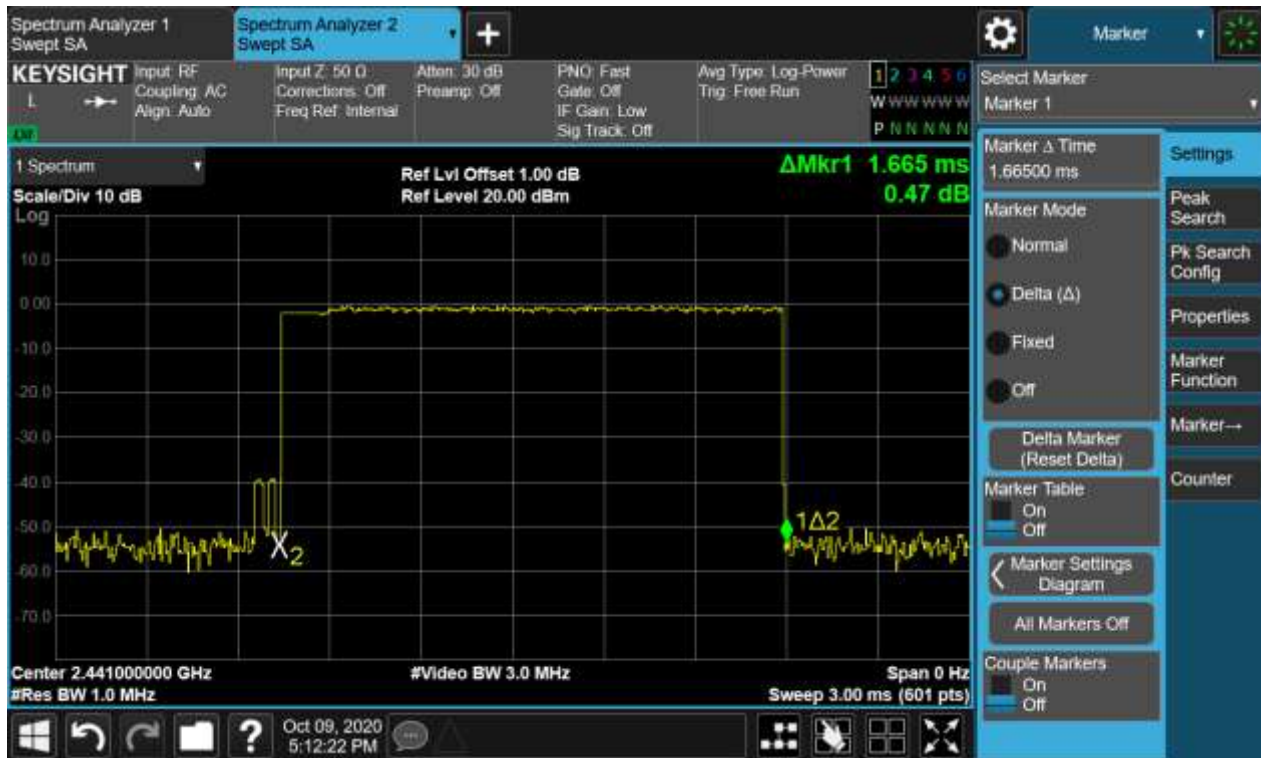
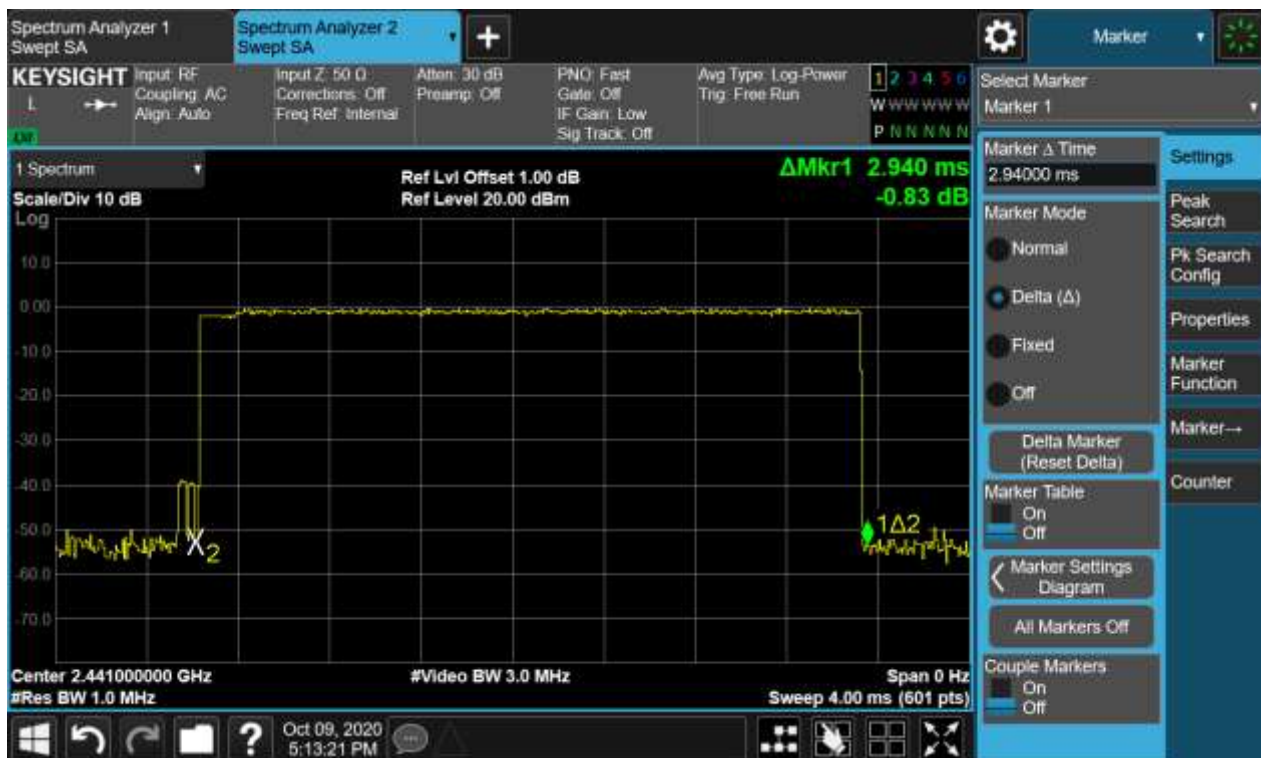


Figure 33: Time of Occupancy, 2441MHz, 8-DPSK DH5



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 47 of 52

4.2 Mains Emissions

4.2.1 Conducted Emission on AC Mains

RESULT:

PASS

Test standard	: FCC Part 15.207(a) RSS-Gen 8.8
Requirement	: ANSI C63.10-2013
Kind of test site	: Shielded room

Test setup

Input Voltage	: AC 120V, 60Hz; AC 240V, 50Hz
Operation Mode	: A.1.a
Earthing	: Not Connected
Ambient temperature	: 23°C
Relative humidity	: 52%

For details refer to following test plot.

TEST REPORT

Report No.: SHE20090001-02HE

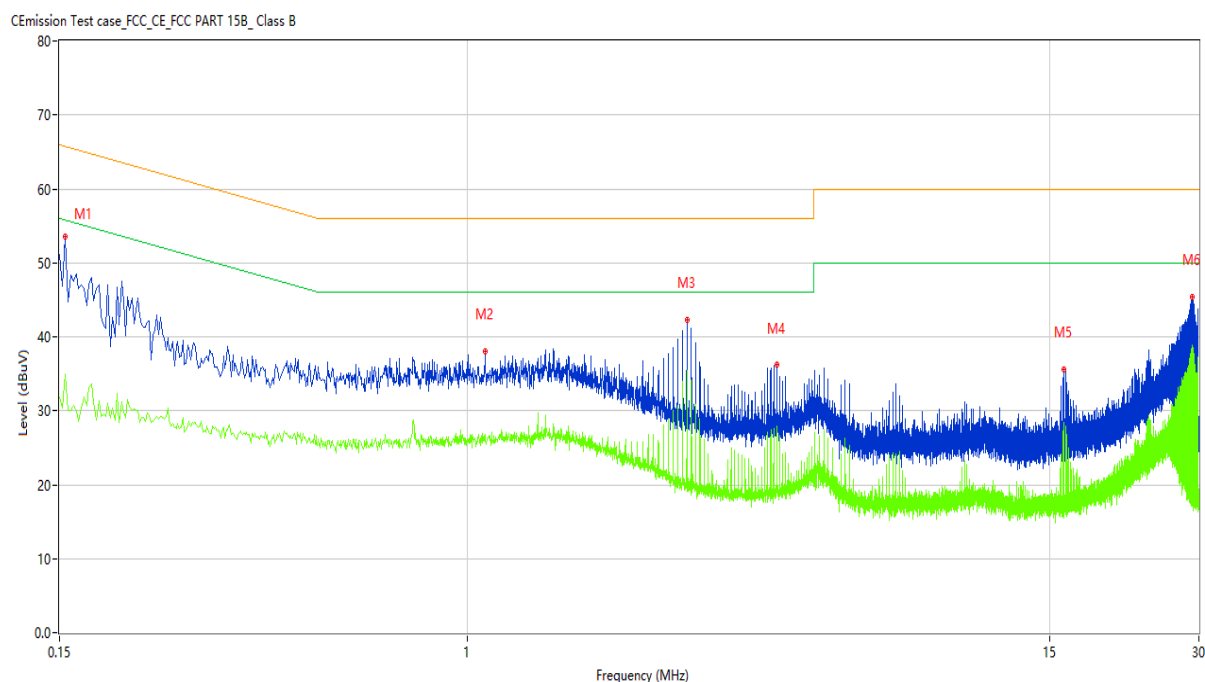
Date: 2020-11-27

Page 48 of 52

Note:

The all configurations were tested respectively, but only the worst configuration shown here.

Figure 34: Conducted Emission on AC Mains, L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.150	53.85	10.15	66.00	-12.15	Peak	L	Pass
1*	0.150	47.67	10.15	66.00	-18.33	QP	L	Pass
1**	0.150	31.80	10.15	56.00	-24.20	AV	L	Pass
2	1.086	33.72	10.16	56.00	-22.28	Peak	L	Pass
2*	1.086	23.63	10.16	56.00	-32.37	QP	L	Pass
2**	1.086	26.56	10.16	46.00	-19.44	AV	L	Pass
3	2.776	41.93	10.21	56.00	-14.07	Peak	L	Pass
3*	2.776	31.22	10.21	56.00	-24.78	QP	L	Pass
3**	2.776	35.47	10.21	46.00	-10.53	AV	L	Pass
4	4.212	35.54	10.25	56.00	-20.46	Peak	L	Pass
4*	4.212	24.40	10.25	56.00	-31.60	QP	L	Pass
4**	4.212	27.85	10.25	46.00	-18.15	AV	L	Pass
5	16.038	34.31	10.44	60.00	-25.69	Peak	L	Pass
5*	16.038	23.28	10.44	60.00	-36.72	QP	L	Pass
5**	16.038	27.58	10.44	50.00	-22.42	AV	L	Pass
6	29.152	28.17	10.63	60.00	-31.83	Peak	L	Pass
6*	29.152	21.77	10.63	60.00	-38.23	QP	L	Pass
6**	29.152	38.51	10.63	50.00	-11.49	AV	L	Pass

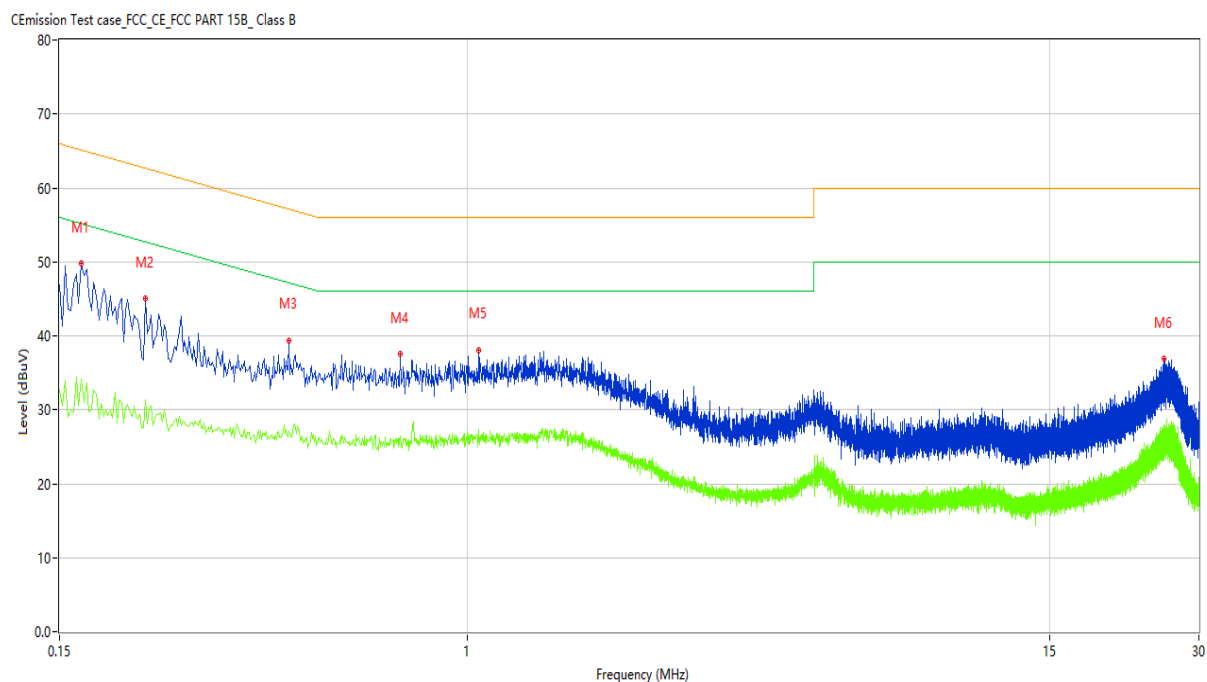
TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 49 of 52

Figure 35: Conducted Emission on AC Mains, N Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.166	51.97	10.15	65.16	-13.19	Peak	N	Pass
1*	0.166	45.44	10.15	65.16	-19.72	QP	N	Pass
1**	0.166	34.14	10.15	55.16	-21.02	AV	N	Pass
2	0.224	46.16	10.14	62.67	-16.51	Peak	N	Pass
2*	0.224	39.01	10.14	62.67	-23.66	QP	N	Pass
2**	0.224	31.32	10.14	52.67	-21.35	AV	N	Pass
3	0.436	36.47	10.15	57.14	-20.67	Peak	N	Pass
3*	0.436	28.13	10.15	57.14	-29.01	QP	N	Pass
3**	0.436	27.15	10.15	47.14	-19.99	AV	N	Pass
4	0.732	32.72	10.15	56.00	-23.28	Peak	N	Pass
4*	0.732	22.53	10.15	56.00	-33.47	QP	N	Pass
4**	0.732	26.45	10.15	46.00	-19.55	AV	N	Pass
5	1.054	34.55	10.15	56.00	-21.45	Peak	N	Pass
5*	1.054	23.81	10.15	56.00	-32.19	QP	N	Pass
5**	1.054	27.19	10.15	46.00	-18.81	AV	N	Pass
6	25.542	36.94	10.52	60.00	-23.06	Peak	N	Pass
6*	25.542	30.89	10.52	60.00	-29.11	QP	N	Pass
6**	25.542	27.50	10.52	50.00	-22.50	AV	N	Pass

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 50 of 52

5 Appendixes

5.1 Photographs of the Sample



Front of the sample



Rear of the sample

TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 51 of 52

5.2 Set-up for Conducted Emissions



5.3 Set-up for Conducted RF test at Antenna Port



TEST REPORT

Report No.: SHE20090001-02HE

Date: 2020-11-27

Page 52 of 52

5.4 Set-up for Spurious Emissions below 1GHz



Below 1 GHz

5.5 Set-up for Spurious Emissions above 1GHz



Above 1GHz

End of the report