

# TEST REPORT

Report No.: SHE23060104-02CE

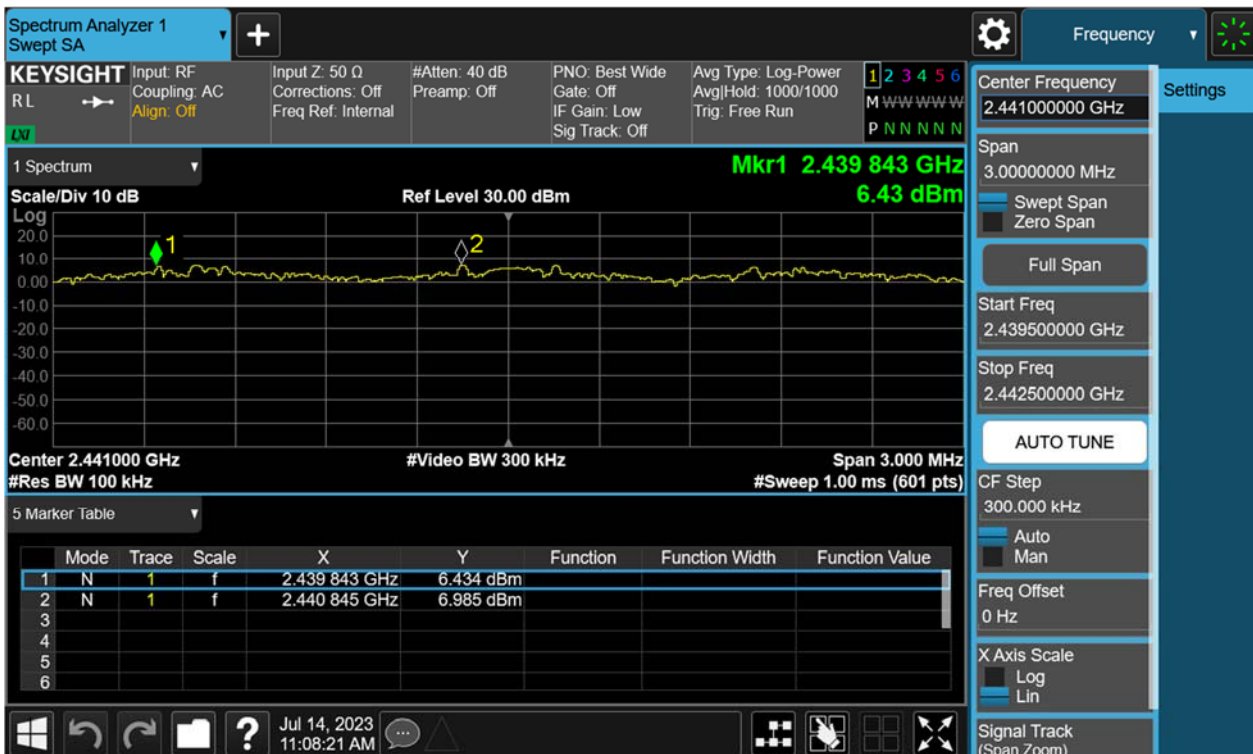
Date: 2023-08-07

Page 51 of 71

Figure 31: Hopping Frequency Separation, Hopping Mode, GFSK



Figure 32: Hopping Frequency Separation, Hopping Mode,  $\pi/4$ -DQPSK



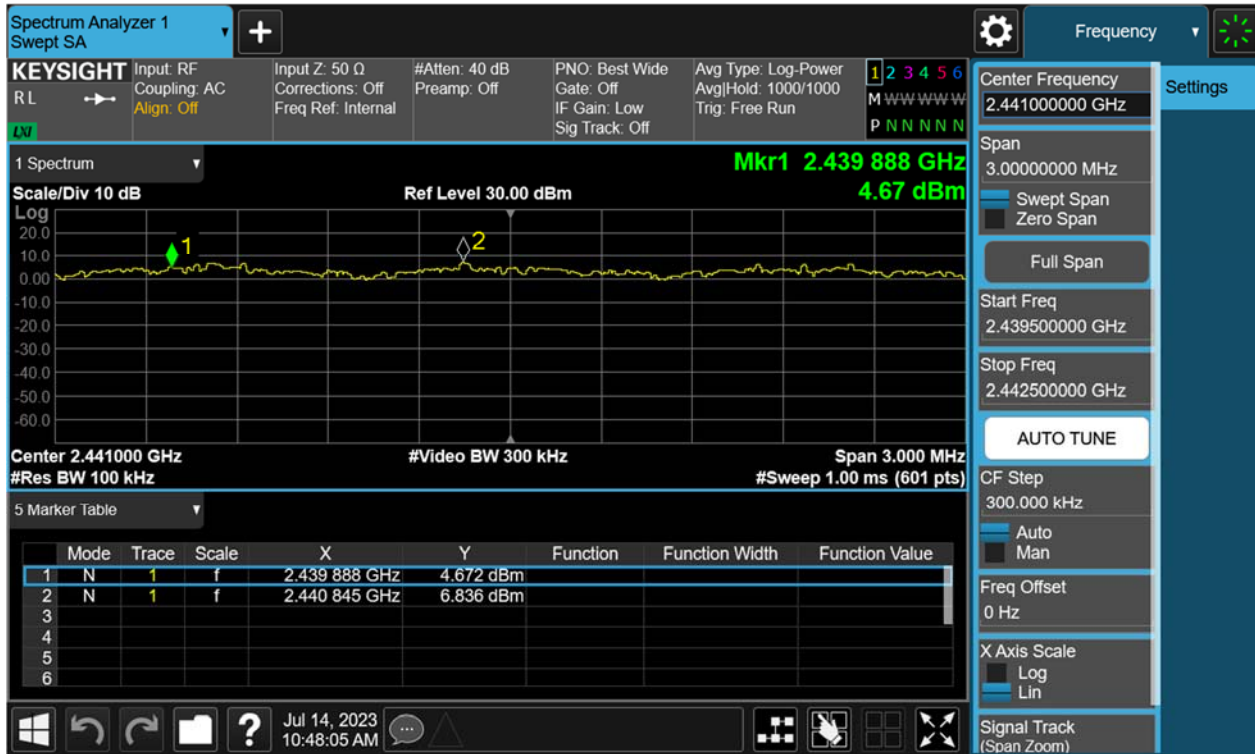
# TEST REPORT

Report No.: SHE23060104-02CE

Date: 2023-08-07

Page 52 of 71

Figure 33: Hopping Frequency Separation, Hopping Mode, 8DPSK



# TEST REPORT

Report No.: SHE23060104-02CE

Date: 2023-08-07

Page 53 of 71

## 4.1.8 Number of Hopping Frequency

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)(iii)

Requirement : ANSI C63.10-2013, Clause 7.8.3  
KDB 558074 D01 v05r02, Clause 2.2

Kind of test site : Shielded room

### Test setup

Test Channel : Hopping

Operation Mode : A.1.a.iv

Ambient temperature : 24.9°C

Relative humidity : 51%

Table 4: Number of Hopping Frequency

Mode	Frequency Range	Measured Quantity of Hopping Channel	Limit
GFSK	2400 – 2483.5	79	≥15
$\pi/4$ -DQPSK	2400 – 2483.5	79	≥15
8-DPSK	2400 – 2483.5	79	≥15

# TEST REPORT

Report No.: SHE23060104-02CE

Date: 2023-08-07

Page 54 of 71

Figure 34: Number of Hopping Frequency, Hopping Mode, GFSK

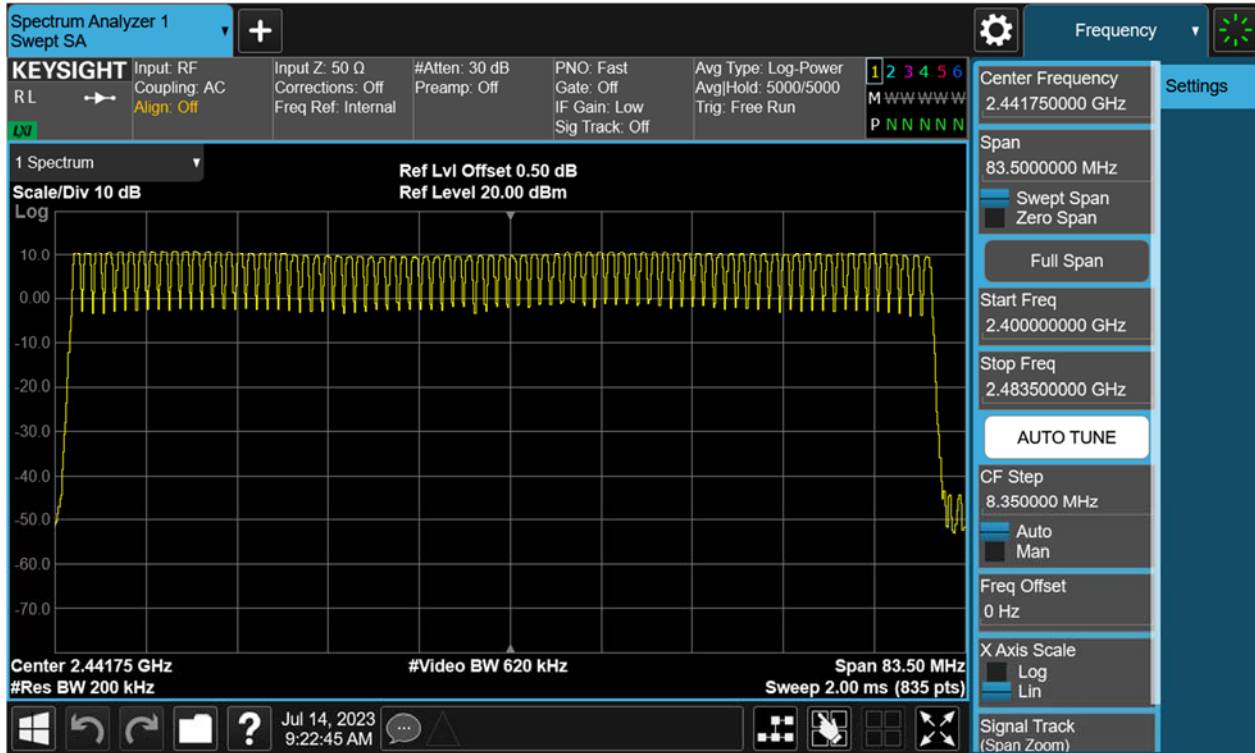
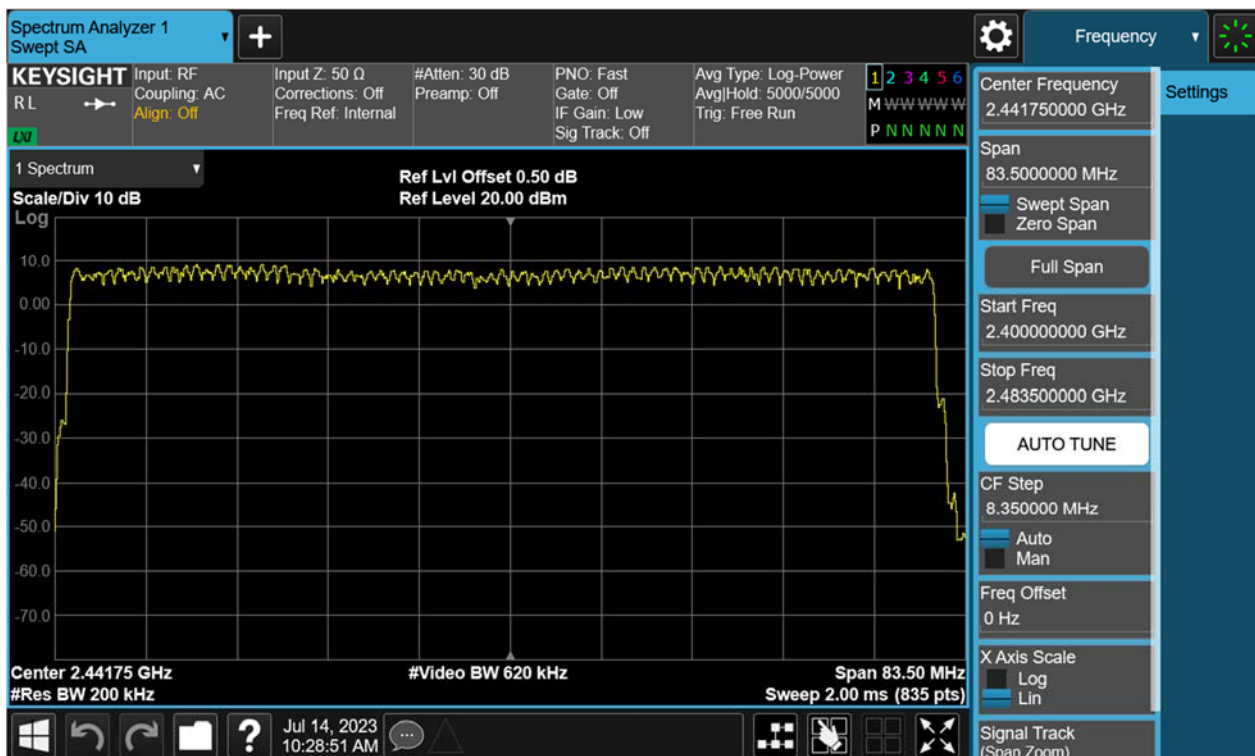


Figure 35: Number of Hopping Frequency, Hopping Mode,  $\pi/4$ -DQPSK



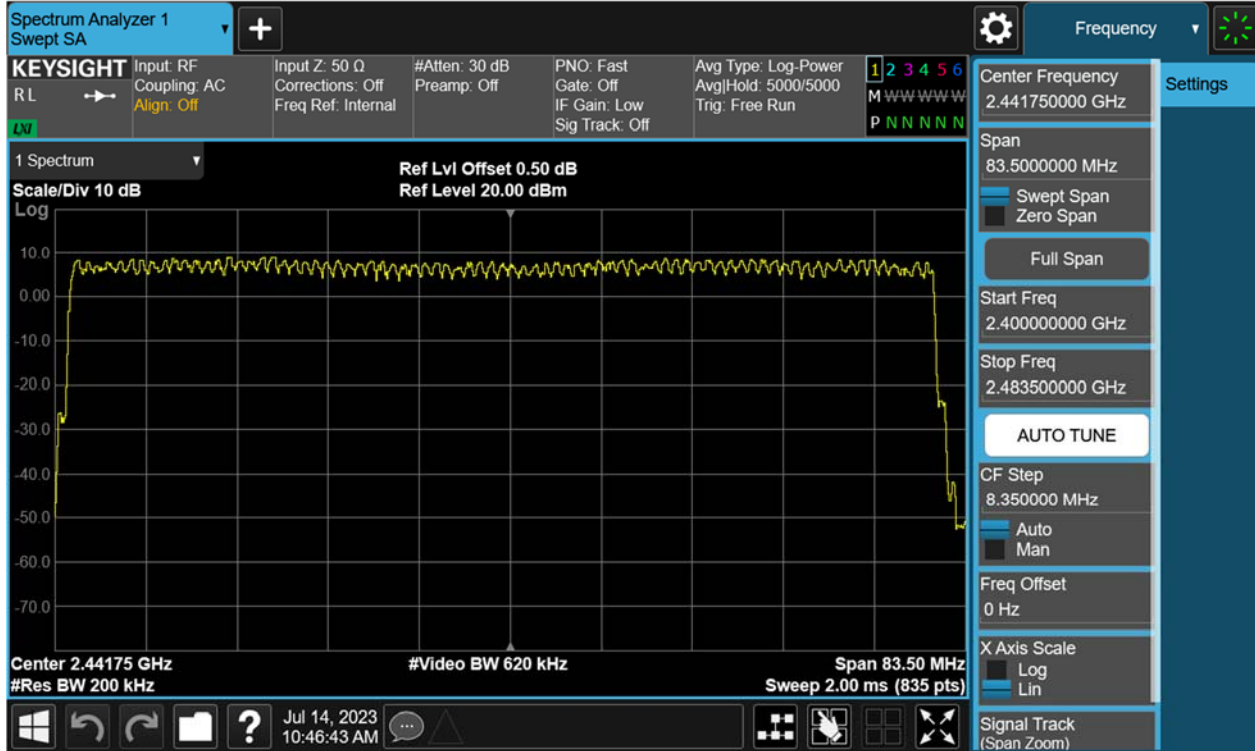
# TEST REPORT

Report No.: SHE23060104-02CE

Date: 2023-08-07

Page 55 of 71

Figure 36: Number of Hopping Frequency, Hopping Mode, 8-DPSK



# TEST REPORT

Report No.: SHE23060104-02CE

Date: 2023-08-07

Page 56 of 71

## 4.1.9 Time of Occupancy

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)(iii)

Requirement : ANSI C63.10-2013, Clause 7.8.4  
KDB 558074 D01 v05r02, Clause 2.2

Kind of test site : Shielded room

### Test setup

Test Channel : Middle

Operation Mode : A.1.a

Ambient temperature : 24.9°C

Relative humidity : 51%

Table 5: Time of Occupancy

Mode	Packet Type	Pulse Time (ms)	Total of Dwell Time (ms)	Total of Dwell Time (s)	Limit (s)
GFSK	DH1	0.3817	122.144	0.1221	0.4
	DH3	1.6350	261.600	0.2616	0.4
	DH5	2.8870	307.947	0.3079	0.4
$\pi/4$ -DQPSK	DH1	0.3867	123.744	0.1237	0.4
	DH3	1.6400	262.400	0.2624	0.4
	DH5	2.8870	307.947	0.3079	0.4
8-DPSK	DH1	0.3867	123.744	0.1237	0.4
	DH3	1.6350	261.600	0.2616	0.4
	DH5	2.8870	307.947	0.3079	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.: SHE23060104-02CE

Date: 2023-08-07

Page 58 of 71

Figure 39: Time of Occupancy, 2441MHz, GFSK DH5

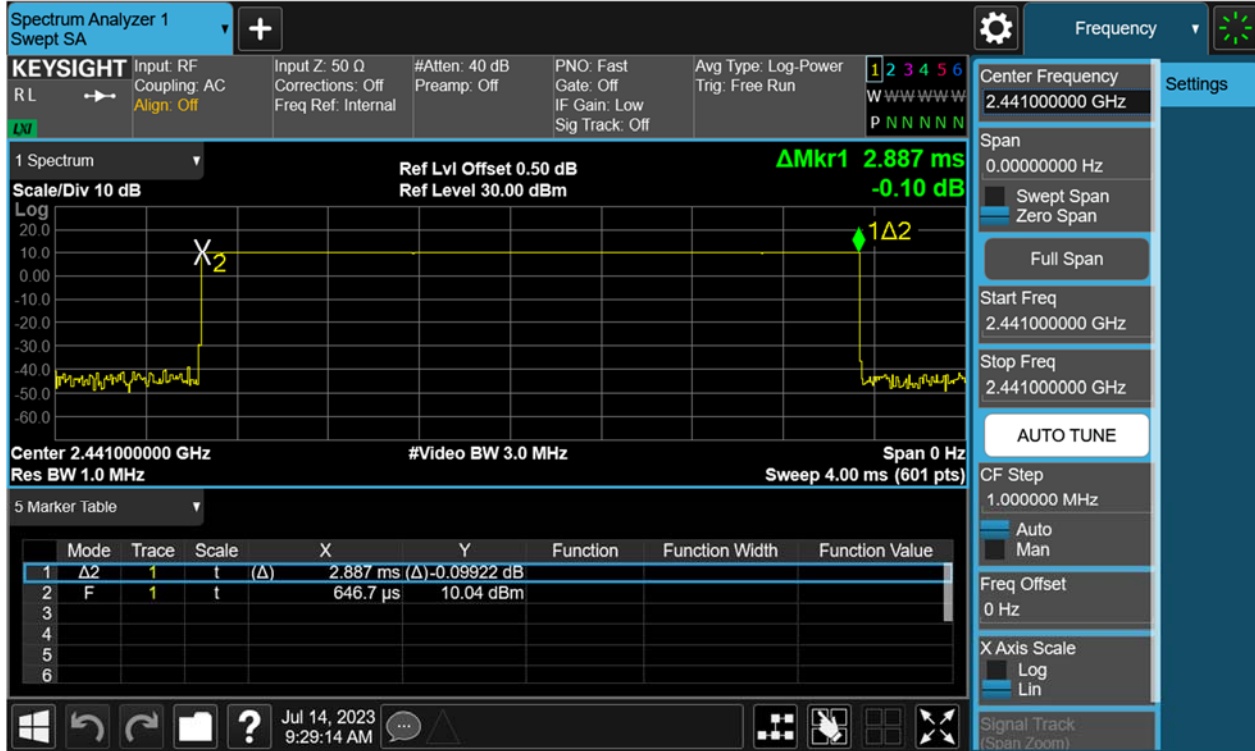
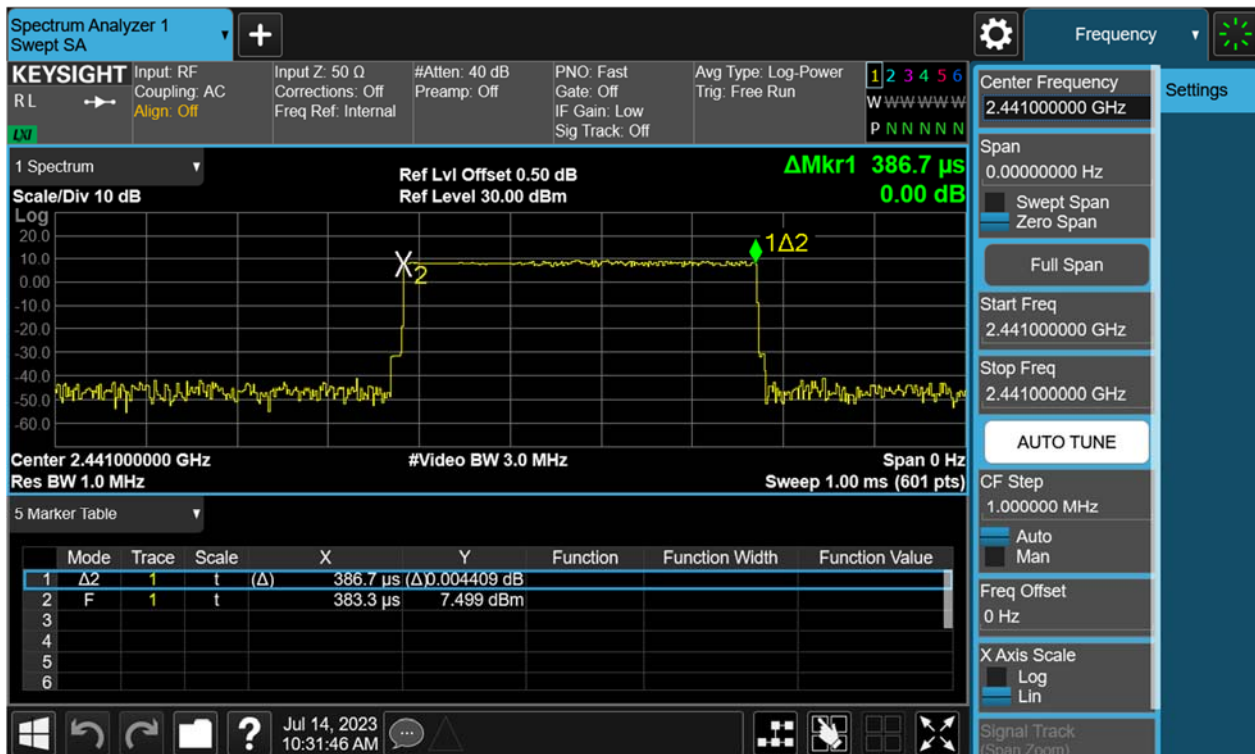


Figure 40: Time of Occupancy, 2441MHz,  $\pi$  /4-DQPSK DH1





# TEST REPORT

Report No.: SHE23060104-02CE

Date: 2023-08-07

Page 59 of 71

Figure 41: Time of Occupancy, 2441MHz,  $\pi/4$ -DQPSK DH3

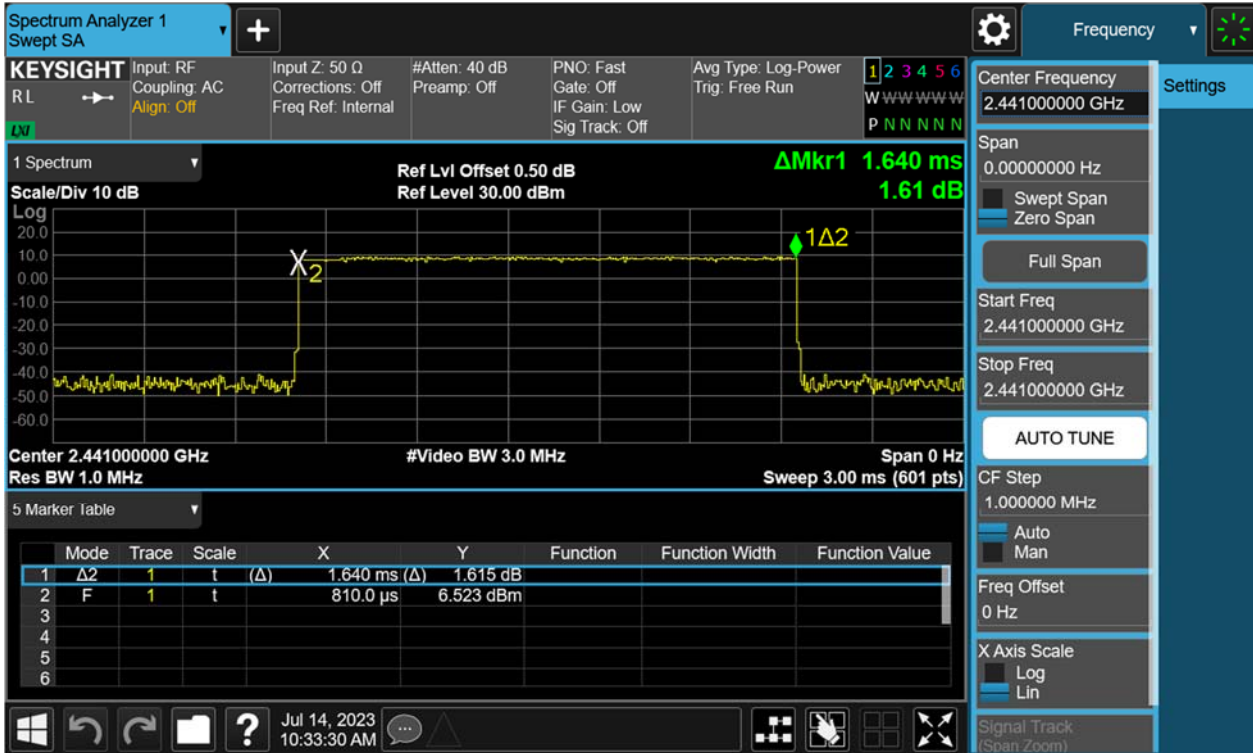


Figure 42: Time of Occupancy, 2441MHz,  $\pi/4$ -DQPSK DH5





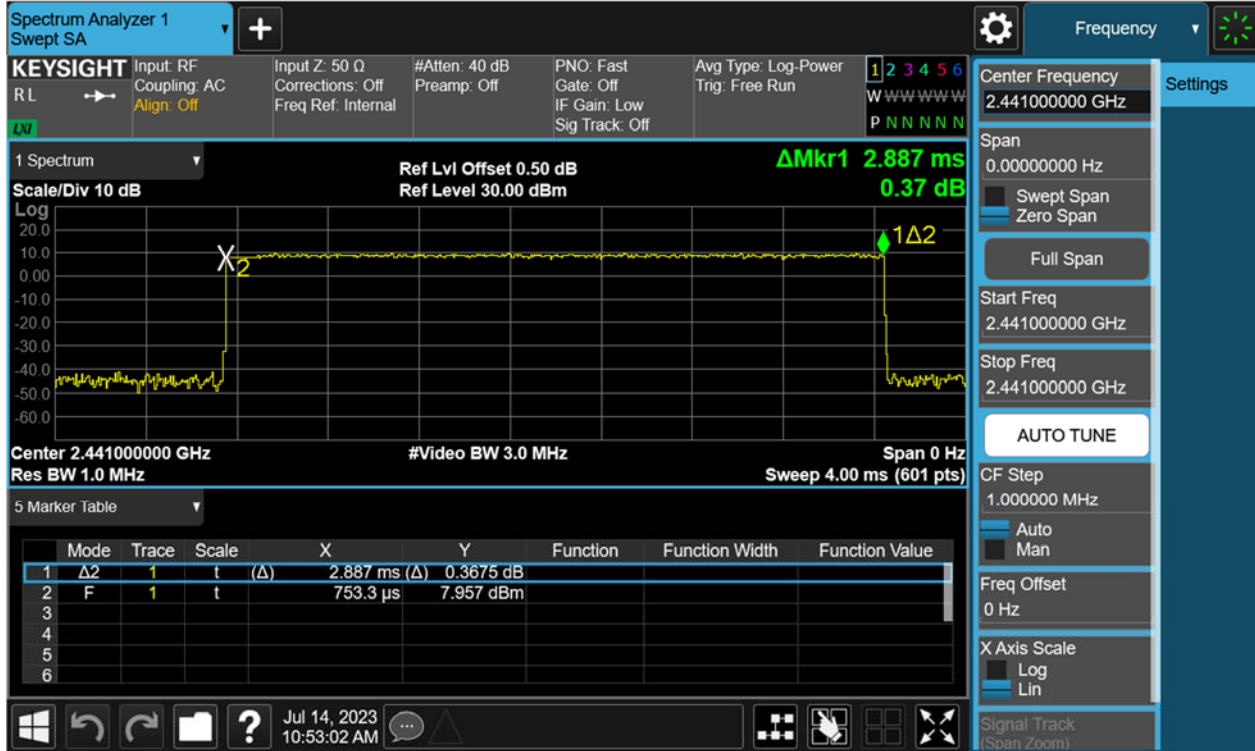
# TEST REPORT

Report No.: SHE23060104-02CE

Date: 2023-08-07

Page 61 of 71

Figure 45: Time of Occupancy, 2441MHz, 8-DPSK DH5



# TEST REPORT

Report No.: SHE23060104-02CE

Date: 2023-08-07

Page 62 of 71

## 4.2 Mains Emissions

### 4.2.1 Conducted Emission on AC Mains

**RESULT:**

**PASS**

Test standard : FCC Part 15.207(a)

Requirement : ANSI C63.10-2013, Clause 6.2

Kind of test site : Shielded room

#### Test setup

Input Voltage : which received AC 120V, 60Hz Power

Operation Mode : A.1.a

Earthing : Connected to GND

Ambient temperature : 23.6°C

Relative humidity : 57%

For details refer to following test plot.

# TEST REPORT

Report No.: SHE23060104-02CE

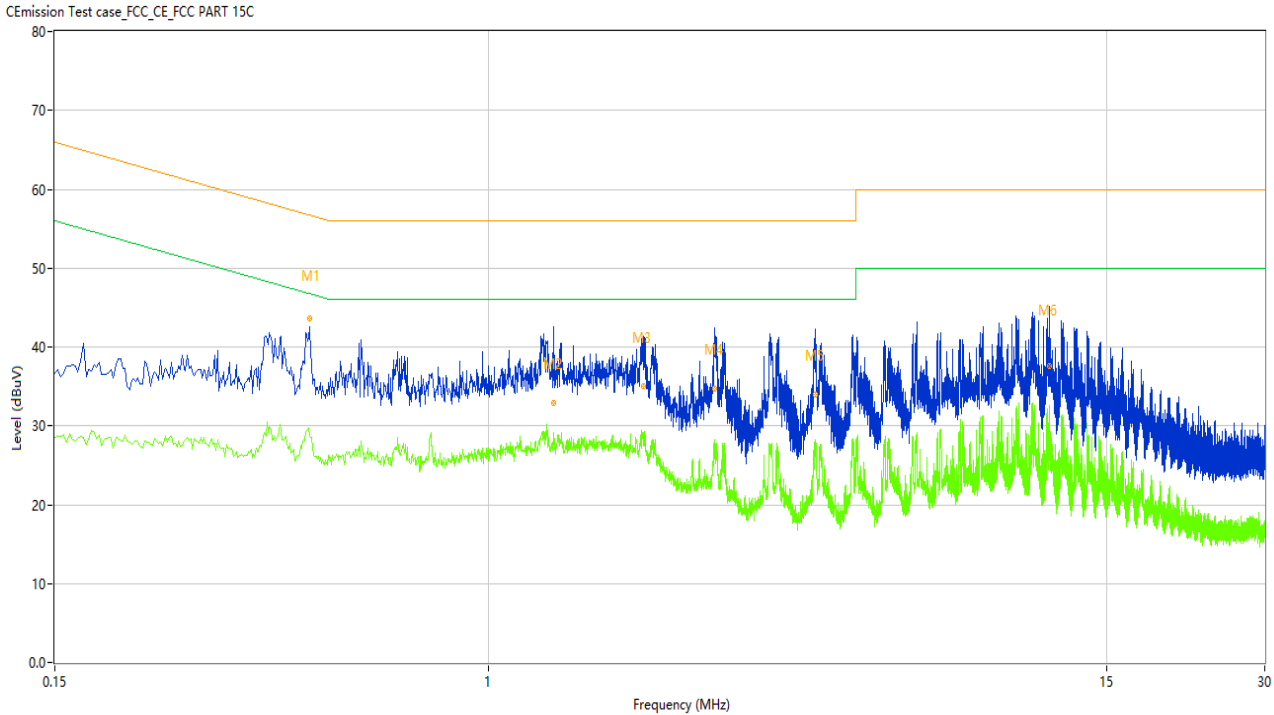
Date: 2023-08-07

Page 63 of 71

**Note:**

The all configurations were tested respectively, Only the worst mode data of GFSK-hopping-DH5 was recorded in the test report.

**Figure 46: Conducted Emission on AC Mains, L Phase**



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.458	50.40	9.96	56.73	6.33	Peak	L	Pass
1*	0.458	43.67	9.96	56.73	13.06	QP	L	Pass
1**	0.458	28.73	9.96	46.73	18.00	AV	L	Pass
2	1.334	40.25	9.84	56.00	15.75	Peak	L	Pass
2*	1.334	32.83	9.84	56.00	23.17	QP	L	Pass
2**	1.334	29.18	9.84	46.00	16.82	AV	L	Pass
3	1.976	41.68	9.85	56.00	14.32	Peak	L	Pass
3*	1.976	34.94	9.85	56.00	21.06	QP	L	Pass
3**	1.976	29.10	9.85	46.00	16.90	AV	L	Pass
4	2.694	41.77	9.84	56.00	14.23	Peak	L	Pass
4*	2.694	34.79	9.84	56.00	21.21	QP	L	Pass
4**	2.694	28.23	9.84	46.00	17.77	AV	L	Pass
5	4.200	42.51	9.82	56.00	13.49	Peak	L	Pass
5*	4.200	33.93	9.82	56.00	22.07	QP	L	Pass
5**	4.200	27.03	9.82	46.00	18.97	AV	L	Pass
6	11.682	44.66	9.64	60.00	15.34	Peak	L	Pass
6*	11.682	37.62	9.64	60.00	22.38	QP	L	Pass
6**	11.682	32.58	9.64	50.00	17.42	AV	L	Pass

# TEST REPORT

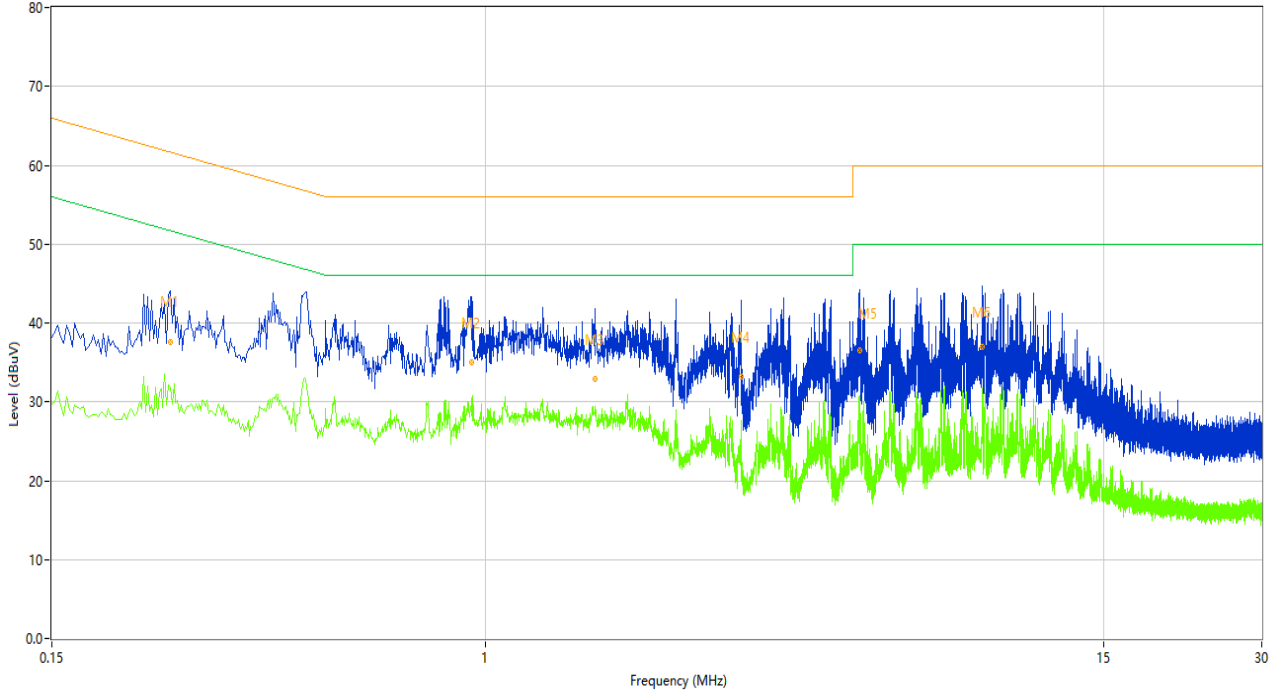
Report No.: SHE23060104-02CE

Date: 2023-08-07

Page 64 of 71

**Figure 47: Conducted Emission on AC Mains, N Phase**

C:Emission Test case\_FCC\_CE\_FCC PART 15C



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.252	43.96	10.06	61.69	17.73	Peak	N	Pass
1*	0.252	37.61	10.06	61.69	24.08	QP	N	Pass
1**	0.252	31.78	10.06	51.69	19.91	AV	N	Pass
2	0.944	43.26	10.04	56.00	12.74	Peak	N	Pass
2*	0.944	35.03	10.04	56.00	20.97	QP	N	Pass
2**	0.944	30.49	10.04	46.00	15.51	AV	N	Pass
3	1.620	44.53	9.94	56.00	11.47	Peak	N	Pass
3*	1.620	32.92	9.94	56.00	23.08	QP	N	Pass
3**	1.620	29.44	9.94	46.00	16.56	AV	N	Pass
4	3.066	43.79	9.91	56.00	12.21	Peak	N	Pass
4*	3.066	33.20	9.91	56.00	22.80	QP	N	Pass
4**	3.066	27.62	9.91	46.00	18.38	AV	N	Pass
5	5.170	44.62	9.73	60.00	15.38	Peak	N	Pass
5*	5.170	36.56	9.73	60.00	23.44	QP	N	Pass
5**	5.170	30.75	9.73	50.00	19.25	AV	N	Pass
6	8.828	45.07	9.79	60.00	14.93	Peak	N	Pass
6*	8.828	37.01	9.79	60.00	22.99	QP	N	Pass
6**	8.828	31.73	9.79	50.00	18.27	AV	N	Pass

# TEST REPORT

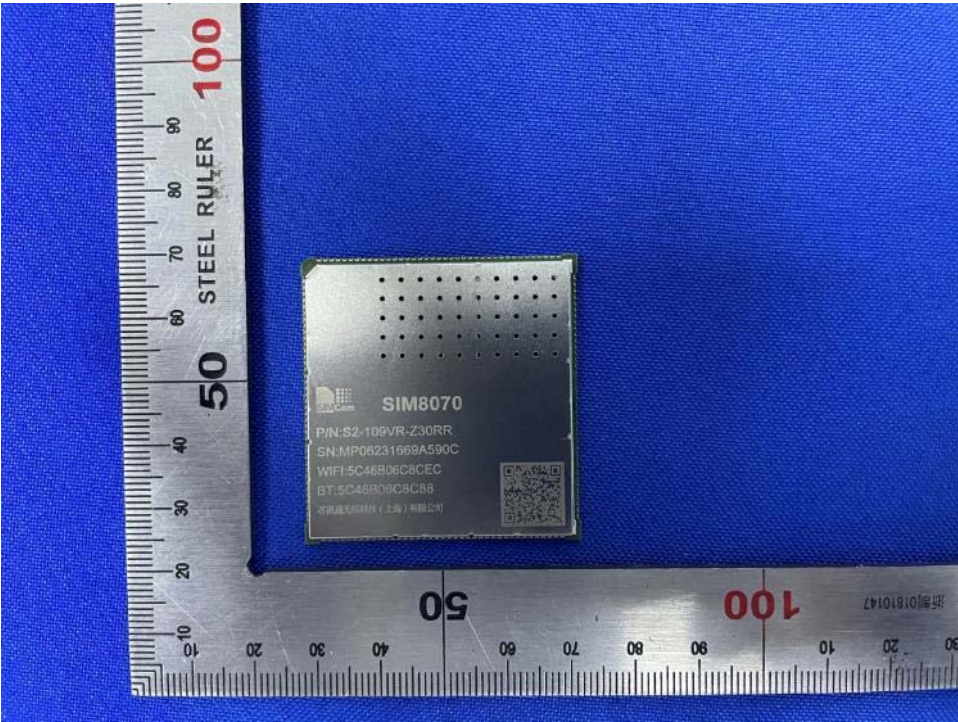
Report No.: SHE23060104-02CE

Date: 2023-08-07

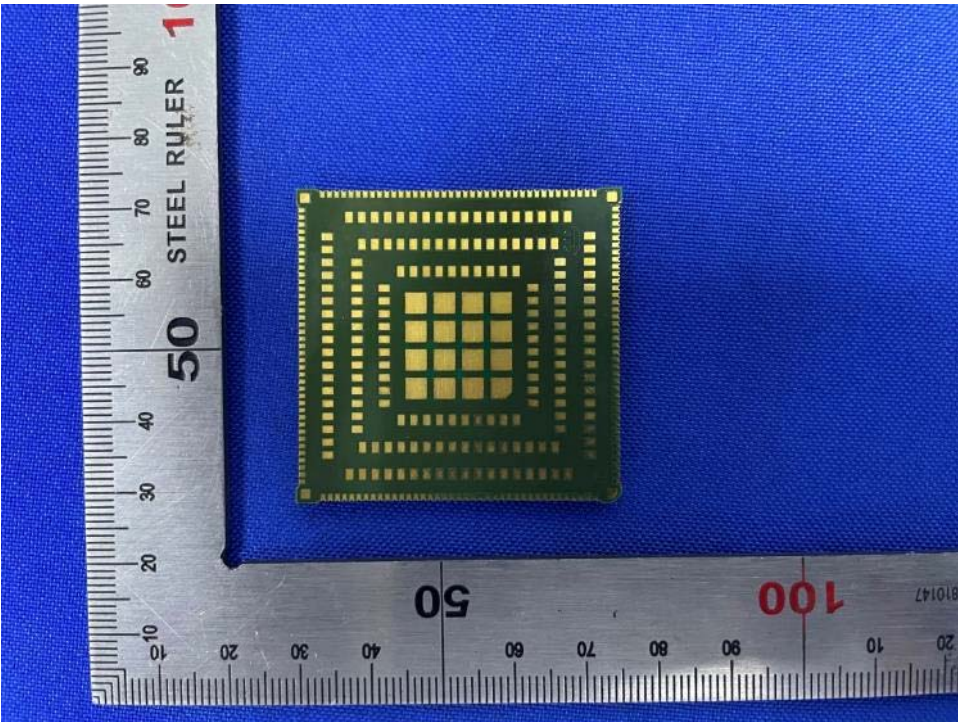
Page 65 of 71

## 5 Appendixes

### 5.1 Photographs of the Sample



Front of the sample



Rear of the sample

# TEST REPORT

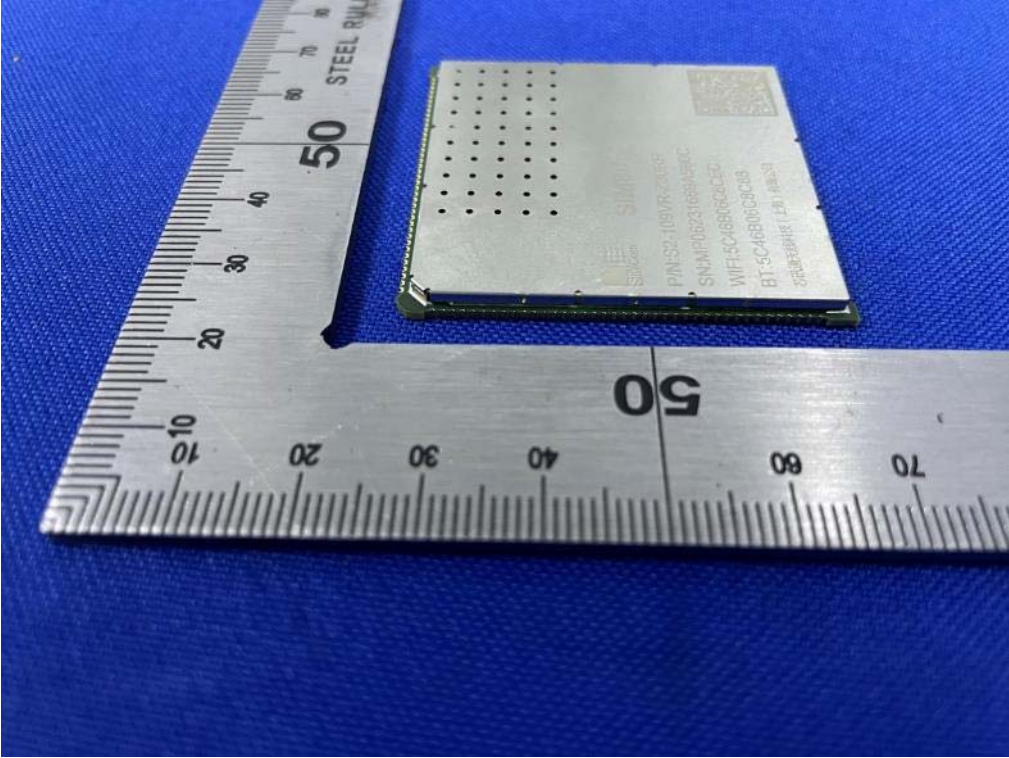
Report No.:

SHE23060104-02CE

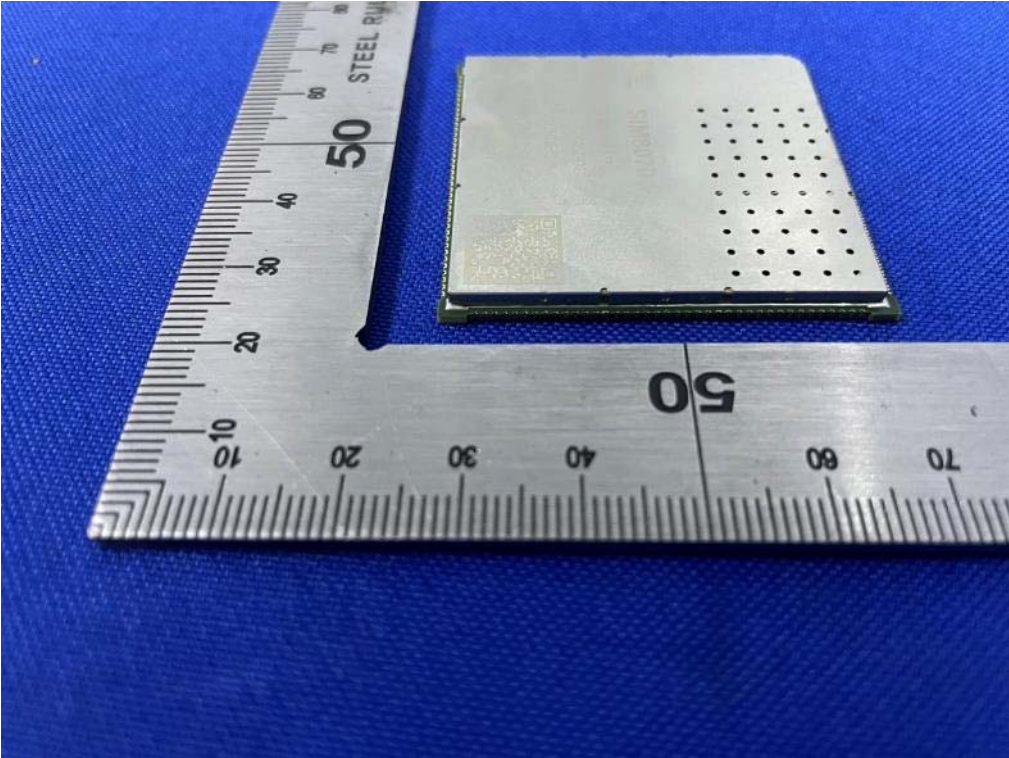
Date:

2023-08-07

Page 66 of 71



Left of the sample



Right of the sample



# TEST REPORT

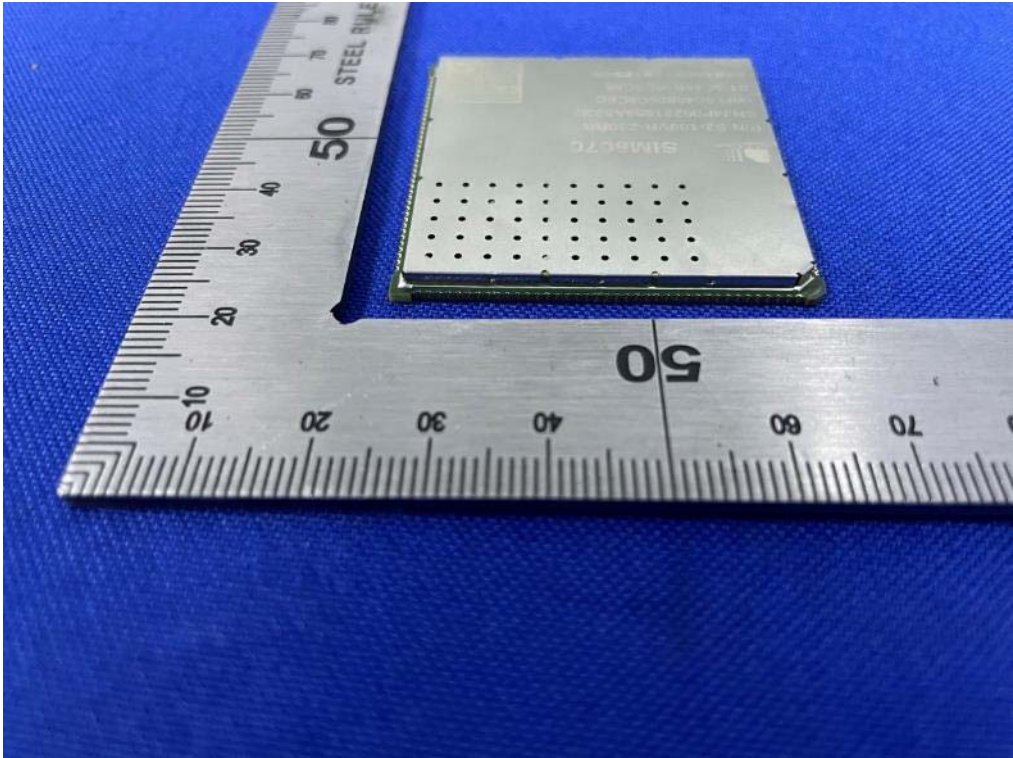
Report No.:

SHE23060104-02CE

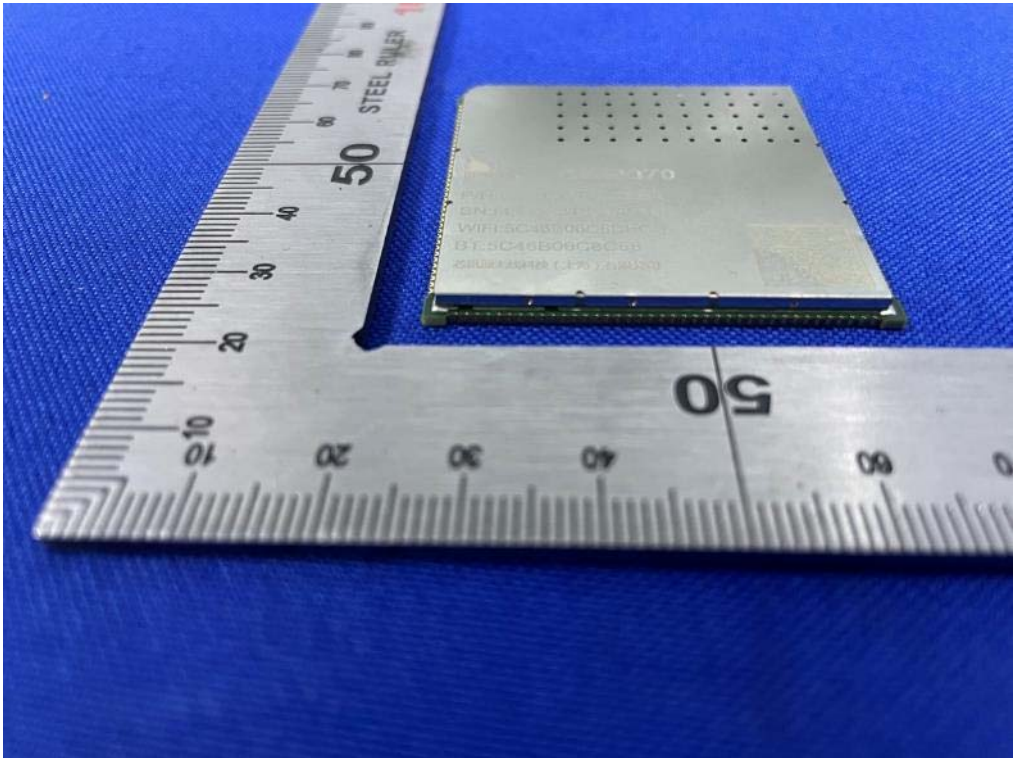
Date:

2023-08-07

Page 67 of 71



Top of the sample



Bottom of the sample

# TEST REPORT

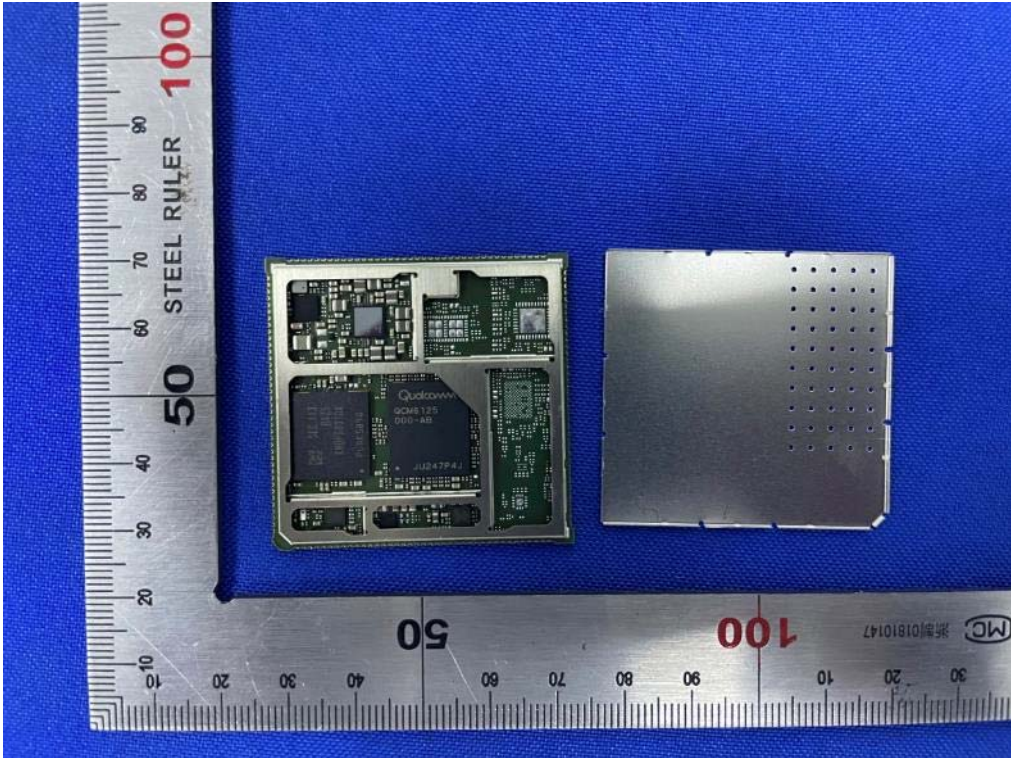
Report No.:

SHE23060104-02CE

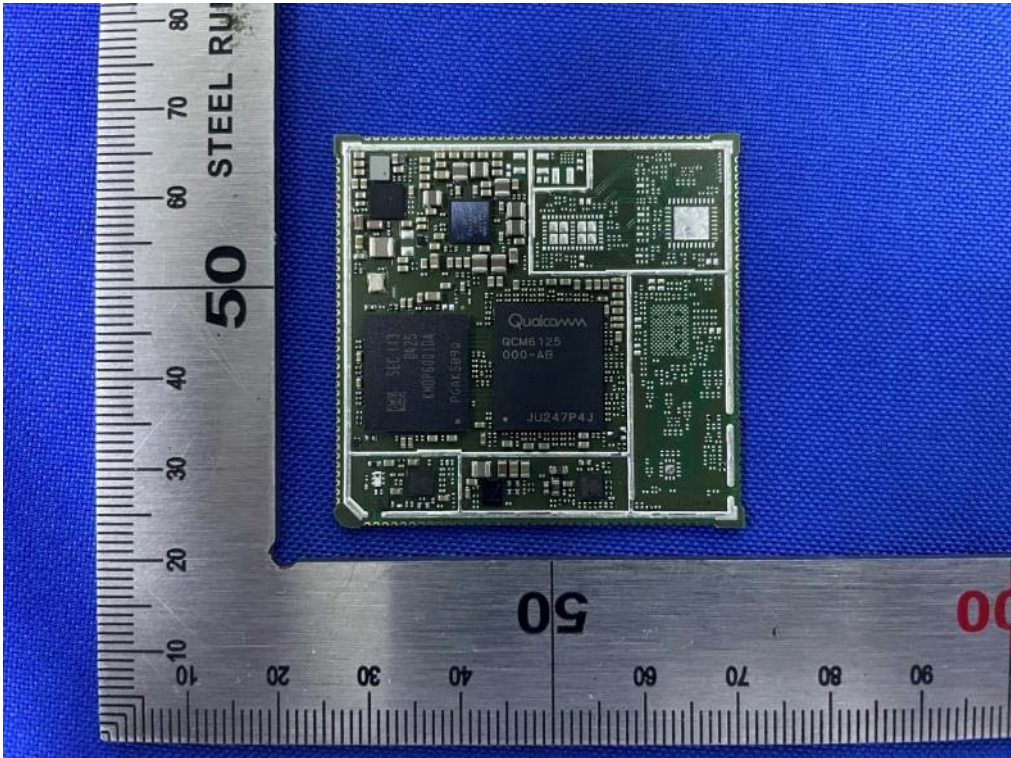
Date:

2023-08-07

Page 68 of 71



Open of the sample



Internal-1 of the sample

# TEST REPORT

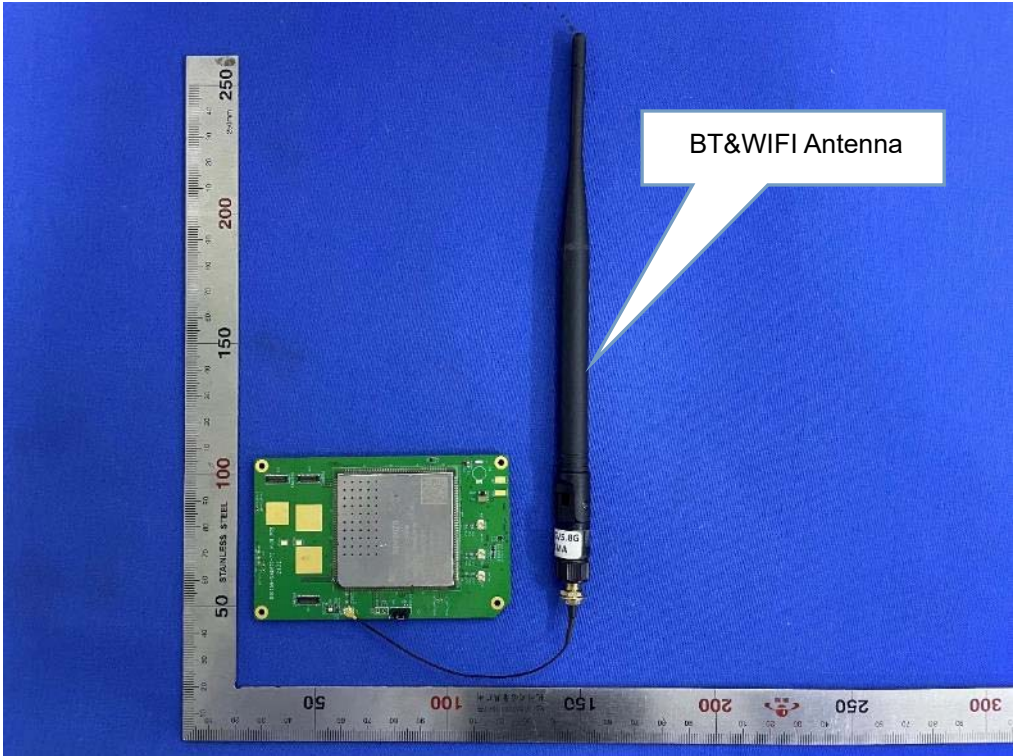
Report No.:

SHE23060104-02CE

Date:

2023-08-07

Page 69 of 71



Antenna Position

# TEST REPORT

Report No.: SHE23060104-02CE

Date: 2023-08-07

Page 70 of 71

## 5.2 Set-up for Conducted Emission on AC Mains



## 5.3 Set-up for Conducted RF test at Antenna Port



# TEST REPORT

Report No.: SHE23060104-02CE

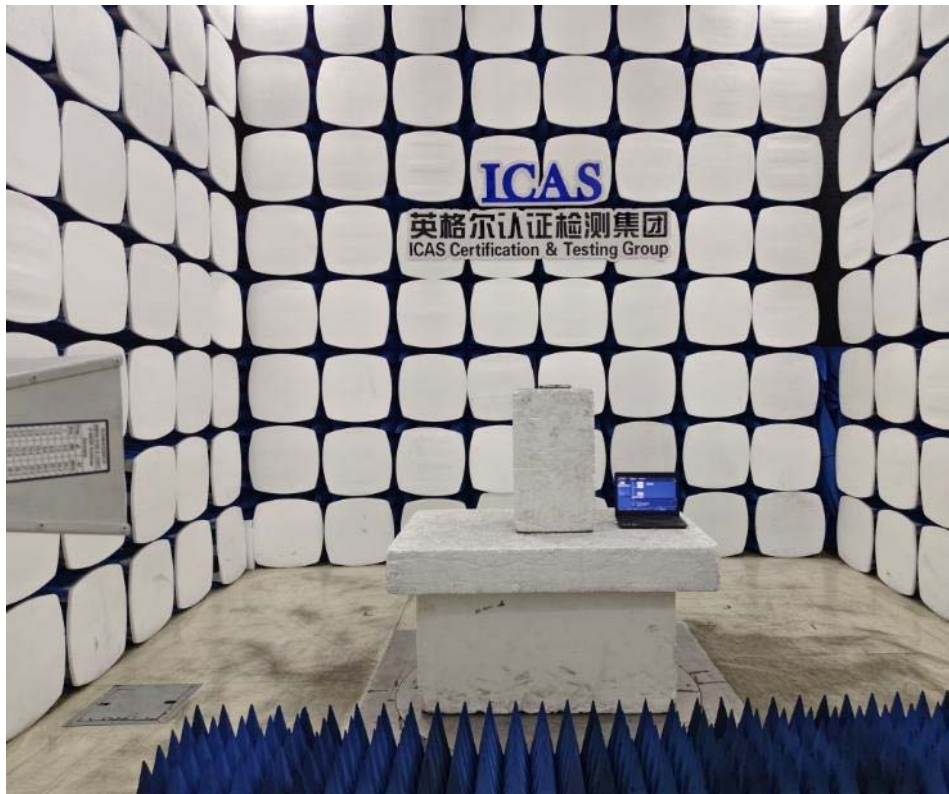
Date: 2023-08-07

Page 71 of 71

## 5.4 Set-up for Radiated Spurious Emissions below 1GHz



## 5.5 Set-up for Radiated Spurious Emissions above 1GHz



\*\*\*End of the report\*\*\*