

FCC TEST REPORT FCC ID:2A4UH-SRT1

Report Number	: ZKT-220328L1926-1
Date of Test	Feb. 24, 2022 to Mar. 29, 2022
Date of issue	: Mar. 30, 2022
Total number of pages	69
Test Result	: PASS
Testing Laboratory	: Shenzhen ZKT Technology Co., Ltd.
Address	1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China
Applicant's name	: Santos Electronics
Address	: 775 Columbia Street, Brea, CA92821, United States
Manufacturer's name	: Shanghai Liansheng Technology Development Co., Ltd.
Address	: #2131, Building 5, No.397 Jiaozhou Road Jingan District Shanghai
Test specification:	
Standard	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Test procedure	: /
Non-standard test method	: N/A
Test Report Form No	: TRF-EL-111_V0
Test Report Form(s) Originator	: ZKT Testing
Master TRF	: Dated: 2020-01-06
test (EUT) is in compliance with t identified in the report. This report shall not be reproduced	been tested by ZKT, and the test results show that the equipment under the FCC requirements. And it is applicable only to the tested sample d except in full, without the written approval of ZKT, this document may onal only, and shall be noted in the revision of the document.
Product name	: HI-FI DAC MUSIC STREAM MODULE
Trademark	····: OSD BLACK
Model/Type reference	···· [÷] SRT1
Ratings	: DC 5V/1A from adapter
1973	

Shenzhen ZKT Technolgy Co., Ltd.

1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China





Testing procedure and testing location:	
Testing Laboratory	Shenzhen ZKT Technology Co., Ltd.
Address	1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China
Tested by (name + signature):	Alen He
Reviewer (name + signature):	Joe. Lin
Approved (name + signature):	Devleted



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Report No.	Version	Description	Approved
ZKT-220328L1926-1	Rev.01	Initial issue of report	Mar. 30, 2022





Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C						
Standard Section	Test Item	Result	Remark			
15.203/15.247 (c)	Antenna Requirement	PASS				
15.207	AC Power Line Conducted Emission	PASS				
15.247 (b)(1)	Conducted Peak Output Power	PASS				
15.247 (a)(1)	20dB Occupied Bandwidth	PASS				
15.247 (a)(1)	Carrier Frequencies Separation	PASS				
15.247 (a)(1)(iii)	Hopping Channel Number	PASS				
15.247 (a)(1)(iii)	Dwell Time	PASS				
15.205/15.209	Radiated Emission and Restricted Bands	PASS				
15.247(d)	Conducted Unwanted emissions and Bandedge	PASS				

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report







2.1 TEST FACILITY

Shenzhen ZKT Technology Co., Ltd. Add. : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 692225 Designation Number: CN1299 IC Registered No.: 27033 Test lab CAB identifier:CN0110

2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ± U $_{2}$ where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of ~ k=2 $_{2}$ providing a level of confidence of approximately 95 % $_{\circ}$

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power conducted	±0.16dB
3	Spurious emissions conducted	±0.21dB
4	All emissions radiated(<1G)	±4.68dB
5	All emissions radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Product Name:	HI-FI DAC MUSIC STREAM MODULE
Model No.:	SRT1
Sample ID:	ZKT220328L1926-1#
Serial No.:	N/A
Model Different.:	N/A
Hardware Version:	V1.0
Software Version:	V1.0
Sample(s) Status:	Engineer sample
Channel numbers:	79
Channel separation:	2402MHz~2480MHz
Modulation technology:	GFSK, π/4-DQPSK, 8-DPSK
Antenna Type:	Internal antenna
Antenna gain:	0dBi
Power supply:	DC 5V/1A from adapter
Adapter Information	Manufacturer:MERRYKING ENTERPRISES (HK) COMPANY
	LIMITED
	Model: MKS-050100HU
	Input: 100-240V~ 50-60Hz 0.3A
	Output:DC 5V/1000mA

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	21	2422MHz	41	2442MHz	61	2462MHz
2	2403MHz	22	2423MHz	42	2443MHz	62	2463MHz
3	2404MHz	23	2424MHz	43	2444MHz	63	2464MHz
4	2405MHz	24	2425MHz	44	2445MHz	64	2465MHz
5	2406MHz	25	2426MHz	45	2446MHz	65	2466MHz
6	2407MHz	26	2427MHz	46	2447MHz	66	2467MHz
7	2408MHz	27	2428MHz	47	2448MHz	67	2468MHz
8	2409MHz	28	2429MHz	48	2449MHz	68	2469MHz
9	2410MHz	29	2430MHz	49	2450MHz	69	2470MHz
10	2411MHz	30	2431MHz	50	2451MHz	70	2471MHz
11	2412MHz	31	2432MHz	51	2452MHz	71	2472MHz
12	2413MHz	32	2433MHz	52	2453MHz	72	2473MHz
13	2414MHz	33	2434MHz	53	2454MHz	73	2474MHz
14	2415MHz	34	2435MHz	54	2455MHz	74	2475MHz



15	2416MHz	35	2436MHz	55	2456MHz	75	2476MHz
16	2417MHz	36	2437MHz	56	2457MHz	76	2477MHz
17	2418MHz	37	2438MHz	57	2458MHz	77	2478MHz
18	2419MHz	38	2439MHz	58	2459MHz	78	2479MHz
19	2420MHz	39	2440MHz	59	2460MHz	79	2480MHz
20	2421MHz	40	2441MHz	60	2461MHz		

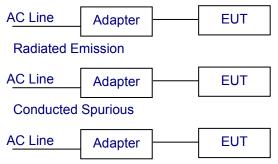
Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency
The lowest channel	2402MHz
The middle channel	2441MHz
The Highest channel	2480MHz

3.2 Test Setup Configuration

Conducted Emission



3.3 Support Equipment

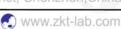
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	HI-FI DAC MUSIC STREAM MODULE	OSD BLACK	SRT1	N/A	EUT
AE	Notebook	lenovo	B40-80	MP07F6JD	AE

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in ^[]Length ^[] column.





Transmitting mode	Keep the EUT in continuously transmitting mode.
	, the test voltage was tuned from 85% to 115% of the nominal rated supply the worst case was under the nominal rated supply condition. So the report n's data.

Test Software	BlueTest3
Power level setup	<7dBm



3.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation & RF Conducted Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	9020A	MY45109572	Sep. 21, 2021	Sep. 20, 2022
2	Spectrum Analyzer (1GHz-40GHz)	Agilent	E4446A	100363	Sep. 21, 2021	Sep. 20, 2022
3	Test Receiver (9kHz-7GHz)	R&S	ESCI7	101169	Sep. 21, 2021	Sep. 20, 2022
4	Bilog Antenna (30MHz-1400MHz)	Schwarzbeck	VULB9168	00877	Sep. 21, 2021	Sep. 20, 2022
5	Horn Antenna (1GHz-18GHz)	SCHWARZBEC K	BBHA9120D	1541	Sep. 21, 2021	Sep. 20, 2022
6	Horn Antenna (18GHz-40GHz)	A.H. System	SAS-574	588	Sep. 21, 2021	Sep. 20, 2022
7	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	N/A	Sep. 21, 2021	Sep. 20, 2022
8	Amplifier (1GHz-40GHz)	全聚达	DLE-161	097	Sep. 21, 2021	Sep. 20, 2022
9	Loop Antenna (9KHz-30MHz)	SCHWARZBEC K	FMZB1519B	014	Sep. 21, 2021	Sep. 20, 2022
10	RF cables1 (9kHz-30MHz)	N/A	9kHz-30MHz	N/A	Sep. 21, 2021	Sep. 20, 2022
11	RF cables2 (30MHz-1GHz)	N/A	30MHz-1GHz	N/A	Sep. 21, 2021	Sep. 20, 2022
12	RF cables3 (1GHz-40GHz)	N/A	1GHz-40GHz	N/A	Sep. 21, 2021	Sep. 20, 2022
13	CMW500 Test	R&S	CMW500	106504	Sep. 21, 2021	Sep. 20, 2022
14	ESG Signal Generator	Agilent	E4421B	GB40051203	Sep. 21, 2021	Sep. 20, 2022
15	Signal Generator	Agilent	N5182A	MY47420215	Sep. 21, 2021	Sep. 20, 2022
16	Power Meter	Anritsu	ML2495A	N/A	Sep. 21, 2021	Sep. 20, 2022
17	D.C. Power Supply	LongWei	TPR-6405D	١	١	١
18	Software	Audix	E3	6.101223a	١	١

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	Sep. 21, 2021	Sep. 20, 2022
2	LISN	CYBERTEK	EM5040A	E1850400149	Sep. 21, 2021	Sep. 20, 2022
3	Test Cable	N/A	C01	N/A	Sep. 21, 2021	Sep. 20, 2022
4	Test Cable	N/A	C02	N/A	Sep. 21, 2021	Sep. 20, 2022
5	EMI Test Receiver	R&S	ESRP3	101946	Sep. 21, 2021	Sep. 20, 2022
6	Absorbing Clamp	DZ	ZN23201	N/A	Sep. 21, 2021	Sep. 20, 2022
7	Software	Audix	E3	6.101223a	١	١











4. EMC EMISSION TEST

4.1 Conducted emissions

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto

4.1.1 POWER LINE CONDUCTED EMISSION Limits

FREQUENCY (MHz)	Limit (Standard	
	Quasi-peak	Average	Stanuaru
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) *Decreases with the logarithm of the frequency.

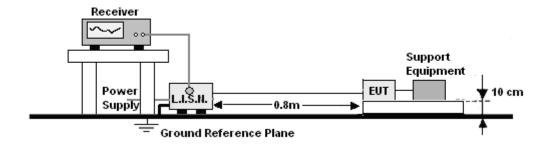
4.1.2 TEST PROCEDURE

- a. The EUT was placed 0.1 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD No deviation







4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

We pretest AC 120V and AC 230V, the worst voltage was AC 120V and the data recording in the report.

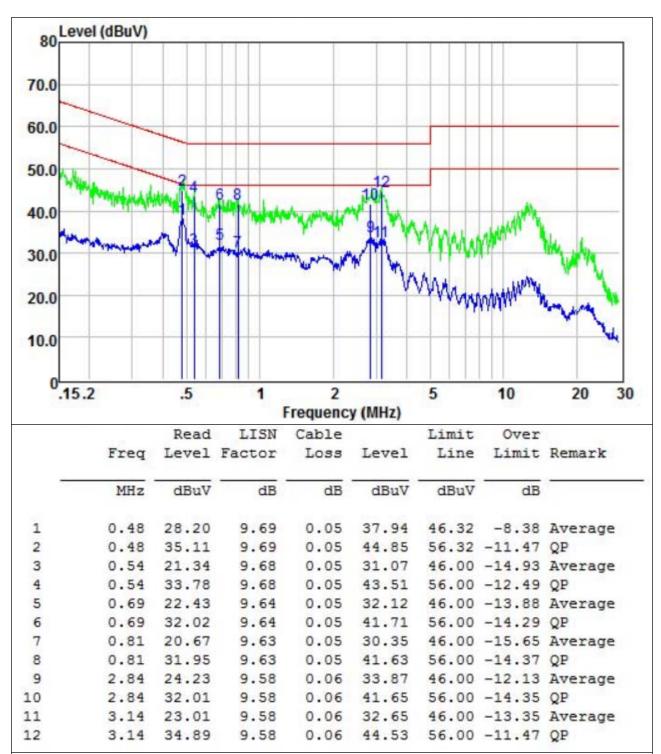






4.1.6 Test Result

Temperature :	26 ℃	Relative Humidity:	54%
Pressure :	101kPa	Phase :	L
Test Voltage :	AC 120V/60Hz		



Notes:

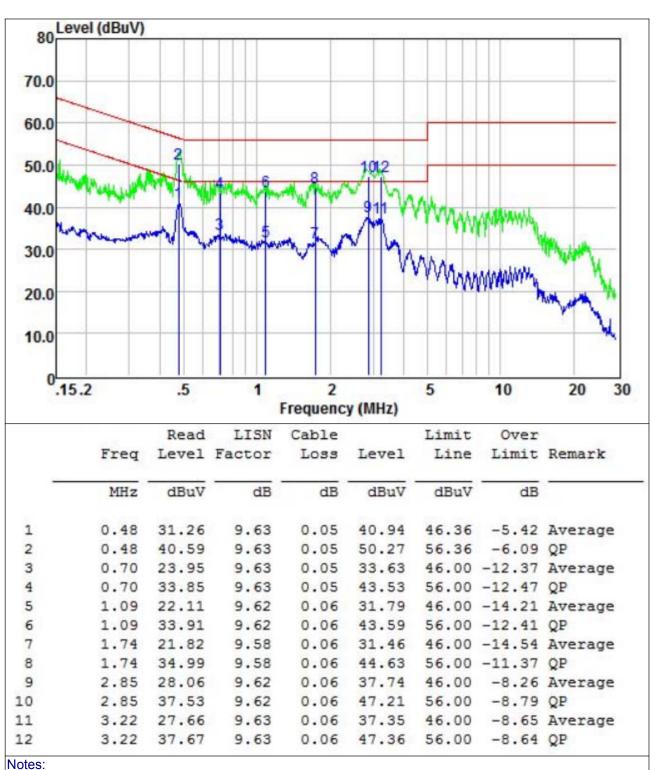
1.An initial pre-scan was performed on the line and neutral lines with peak detector.

2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission. 3.Mesurement Level = Reading level + Correct Factor





Temperature :	26 ℃	Relative Humidity:	54%
Pressure :	101kPa	Phase :	Ν
Test Voltage :	AC 120V/60Hz		



1.An initial pre-scan was performed on the line and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
 Mesurement Level = Reading level + Correct Factor

Shenzhen ZKT Technolgy Co., Ltd. 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

1







4.2 Radiated emissions

FCC Part15 C Section 15.209					
ANSI C63.10:2013					
9kHz to 25GHz					
Measurement Distance: 3m					
Frequency	Detector	RBW	VBW	Value	
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak	
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak	
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak	
Above 1GHz	Peak	1MHz	3MHz	Peak	
	Peak	1MHz	1/T	Average	
	ANSI C63.10:2013 9kHz to 25GHz Measurement Dista Frequency 9KHz-150KHz 150KHz-30MHz	ANSI C63.10:20139kHz to 25GHzMeasurement Distance: 3mFrequencyDetector9KHz-150KHzQuasi-peak150KHz-30MHzQuasi-peak30MHz-1GHzQuasi-peakAbove 1GHzPeak	ANSI C63.10:20139kHz to 25GHzMeasurement Distance: 3mFrequencyDetector9KHz-150KHzQuasi-peak200Hz150KHz-30MHzQuasi-peak30MHz-1GHzQuasi-peak100KHzAbove 1GHz	ANSI C63.10:20139kHz to 25GHzMeasurement Distance: 3mFrequencyDetectorRBWVBW9KHz-150KHzQuasi-peak200Hz600Hz150KHz-30MHzQuasi-peak30MHz-1GHzQuasi-peak100KHz300KHzAbove 1GHzPeak1MHz3MHz	

4.2.1 Radiated Emission Limits

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)		
	PEAK	AVERAGE	
Above 1000	74	54	

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

4.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

- a. The EUT was placed on the top of a rotating table 0.1 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.





- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

- g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
- h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel

Note:

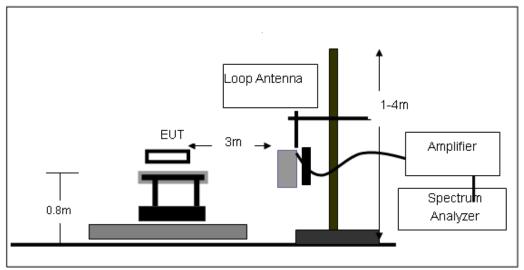
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

4.2.3 DEVIATION FROM TEST STANDARD

No deviation

4.2.4 TEST SETUP

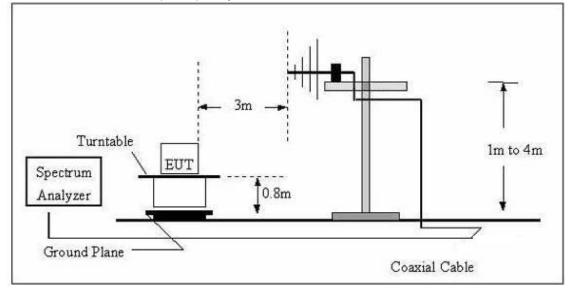
(A) Radiated Emission Test-Up Frequency Below 30MHz



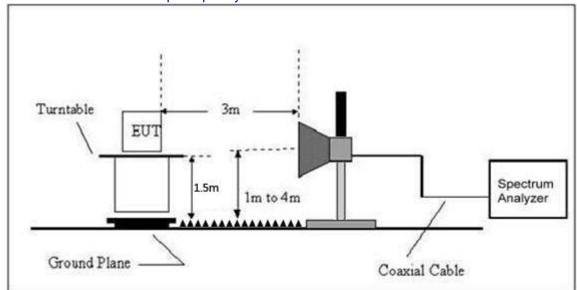




(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.









4.2.6 TEST RESULTS

Between 9KHz – 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

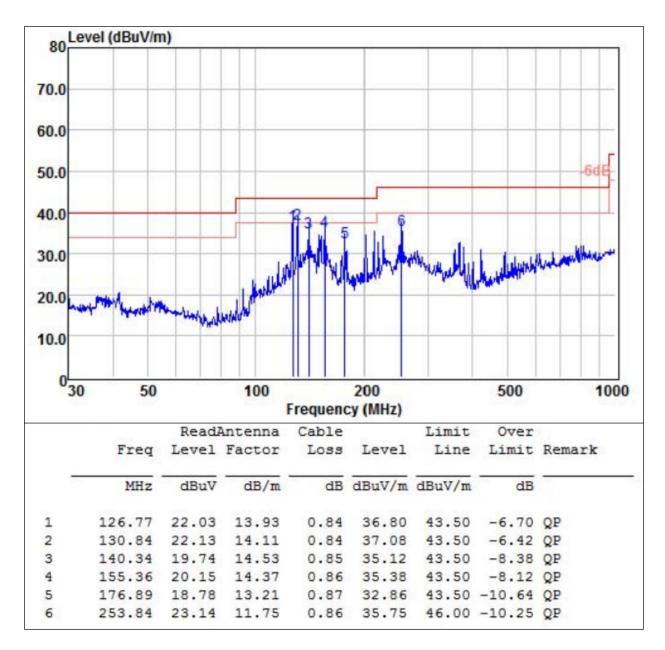






Between 30MHz - 1GHz

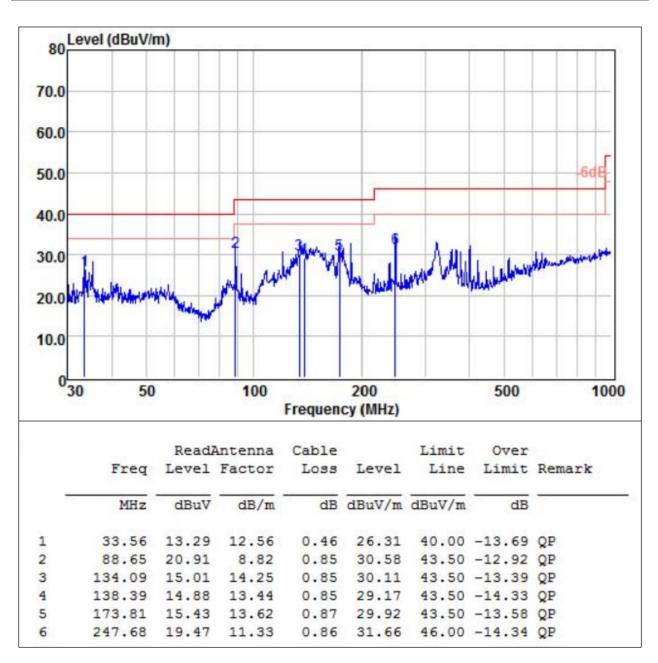
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz		







Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz		



Remarks:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss

2. The emission levels of other frequencies are very lower than the limit and not show in test report.

3. The test data shows only the worst case GFSK mode







Above 1 GHz Test Results (GFSK Worst Case): 1GHz~25GHz

				(GFSK				
Polar	Frequency	Meter Reading	Pre-ampli fier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector
(H/V)	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Туре
				Low Cha	nnel:2402M	Hz			
V	4804.00	59.82	30.55	5.77	24.66	59.7	74.00	-14.3	Pk
V	4804.00	48.36	30.55	5.77	24.66	48.24	54.00	-5.76	AV
V	7206.00	57.89	30.33	6.32	24.55	58.43	74.00	-15.57	Pk
V	7206.00	47.35	30.33	6.32	24.55	47.89	54.00	-6.11	AV
V	9608.00	56.39	30.85	7.45	24.69	57.68	74.00	-16.32	Pk
V	9608.00	45.83	30.85	7.45	24.69	47.12	54.00	-6.88	AV
V	12010.00	54.26	31.02	8.99	25.57	57.8	74.00	-16.2	Pk
V	12010.00	43.19	31.02	8.99	25.57	46.73	54.00	-7.27	AV
Н	4804.00	58.49	30.55	5.77	24.66	58.37	74.00	-15.63	Pk
Н	4804.00	47.29	30.55	5.77	24.66	47.17	54.00	-6.83	AV
Н	7206.00	57.13	30.33	6.32	24.55	57.67	74.00	-16.33	Pk
Н	7206.00	46.96	30.33	6.32	24.55	47.5	54.00	-6.5	AV
H	9608.00	56.39	30.85	7.45	24.69	57.68	74.00	-16.32	Pk
Н	9608.00	45.19	30.85	7.45	24.69	46.48	54.00	-7.52	AV
Н	12010.00	54.21	31.02	8.99	25.57	57.75	74.00	-16.25	Pk
Н	12010.00	43.29	31.02	8.99	25.57	46.83	54.00	-7.17	AV

Polar	Frequency	Meter Reading	Pre-ampli fier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector
(H/V)	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Туре
	•	-	Ν	Aiddle Ch	nannel:2441	MHz			
V	4882.00	58.66	30.55	5.77	24.66	58.54	74.00	-15.46	Pk
V	4882.00	47.82	30.55	5.77	24.66	47.7	54.00	-6.3	AV
V	7323.00	57.49	30.33	6.32	24.55	58.03	74.00	-15.97	Pk
V	7323.00	46.39	30.33	6.32	24.55	46.93	54.00	-7.07	AV
V	9764.00	56.34	30.85	7.45	24.69	57.63	74.00	-16.37	Pk
V	9764.00	45.11	30.85	7.45	24.69	46.4	54.00	-7.6	AV
V	12205.00	54.03	31.02	8.99	25.57	57.57	74.00	-16.43	Pk
V	12205.00	44.17	31.02	8.99	25.57	47.71	54.00	-6.29	AV
Н	4882.00	57.93	30.55	5.77	24.66	57.81	74.00	-16.19	Pk
Н	4882.00	46.83	30.55	5.77	24.66	46.71	54.00	-7.29	AV
Н	7323.00	56.83	30.33	6.32	24.55	57.37	74.00	-16.63	Pk
Н	7323.00	45.12	30.33	6.32	24.55	45.66	54.00	-8.34	AV
Н	9764.00	55.21	30.85	7.45	24.69	56.5	74.00	-17.5	Pk
Н	9764.00	44.16	30.85	7.45	24.69	45.45	54.00	-8.55	AV
Н	12205.00	53.29	31.02	8.99	25.57	56.83	74.00	-17.17	Pk
Н	12205.00	43.12	31.02	8.99	25.57	46.66	54.00	-7.34	AV



Polar	Frequency	Meter Reading	Pre-ampli fier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector
(H/V)	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Туре
	•			High Cha	nnel:2480N	IHz			
V	4960.00	58.69	30.55	5.77	24.66	58.57	74.00	-15.43	Pk
V	4960.00	47.63	30.55	5.77	24.66	47.51	54.00	-6.49	AV
V	7440.00	57.18	30.33	6.32	24.55	57.72	74.00	-16.28	Pk
V	7440.00	46.32	30.33	6.32	24.55	46.86	54.00	-7.14	AV
V	9920.00	56.82	30.85	7.45	24.69	58.11	74.00	-15.89	Pk
V	9920.00	45.63	30.85	7.45	24.69	46.92	54.00	-7.08	AV
V	12400.00	54.86	31.02	8.99	25.57	58.4	74.00	-15.6	Pk
V	12400.00	44.29	31.02	8.99	25.57	47.83	54.00	-6.17	AV
Н	4960.00	57.19	30.55	5.77	24.66	57.07	74.00	-16.93	Pk
Н	4960.00	46.39	30.55	5.77	24.66	46.27	54.00	-7.73	AV
Н	7440.00	56.93	30.33	6.32	24.55	57.47	74.00	-16.53	Pk
Н	7440.00	45.17	30.33	6.32	24.55	45.71	54.00	-8.29	AV
Н	9920.00	55.29	30.85	7.45	24.69	56.58	74.00	-17.42	Pk
Н	9920.00	44.31	30.85	7.45	24.69	45.6	54.00	-8.4	AV
Н	12400.00	53.62	31.02	8.99	25.57	57.16	74.00	-16.84	Pk
Н	12400.00	43.17	31.02	8.99	25.57	46.71	54.00	-7.29	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit

2. If peak below the average limit, the average emission was no test.

3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



5. RADIATED BAND EMISSION MEASUREMENT

5.1 Test Requirement:

Test Requirement:	FCC Part15 C Section 15.209 and 15.205							
Test Method:	ANSI C63.10: 2013							
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.							
Test site:	Measurement Distance: 3m							
Receiver setup:	Frequency	Detector	RBW	VBW	Value			
	Above	Peak	1MHz	3MHz	Peak			
	1GHz	Average	1MHz	1/T	Average			

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)				
	PEAK	AVERAGE			
Above 1000	74	54			

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	2300MHz
Stop Frequency	2520
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 1/T for Average

5.2 TEST PROCEDURE

Above 1GHz test procedure as below:

- a. 1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel,the Highest channel Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

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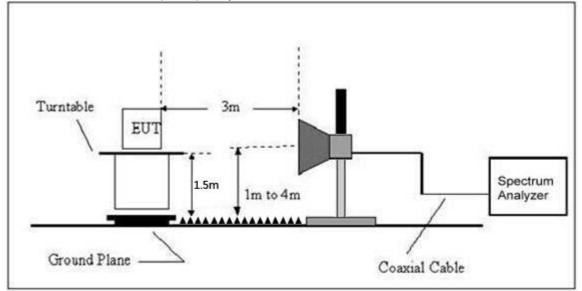




5.3 DEVIATION FROM TEST STANDARD No deviation

5.4 TEST SETUP

Radiated Emission Test-Up Frequency Above 1GHz



5.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.







5.6 TEST RESULT

PASS

Remark: All modes of GFSK, $\pi/4$ DQPSK, 8DPSK were tested, only the worst result of GFSK was reported as below.

	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Detec tor Type	Result	
				Low	Channe	I: 2402MHz	<u>.</u>			•	
	Н	2390.00	57.46	30.22	4.85	23.98	56.07	74.00	PK	PASS	
	Η	2390.00	48.36	30.22	4.85	23.98	46.97	54.00	AV	PASS	
	Н	2400.00	56.72	30.22	4.85	23.98	55.33	74.00	PK	PASS	
	Н	2400.00	47.31	30.22	4.85	23.98	45.92	54.00	AV	PASS	
	V	2390.00	56.93	30.22	4.85	23.98	55.54	74.00	PK	PASS	
	V	2390.00	47.12	30.22	4.85	23.98	45.73	54.00	AV	PASS	
	V	2400.00	55.29	30.22	4.85	23.98	53.9	74.00	PK	PASS	
OFOR	V	2400.00	45.89	30.22	4.85	23.98	44.5	54.00	AV	PASS	
GFSK	High Channel: 2480MHz										
	Н	2483.50	57.18	30.22	4.85	23.98	55.79	74.00	PK	PASS	
	Н	2483.50	47.63	30.22	4.85	23.98	46.24	54.00	AV	PASS	
	Н	2483.50	56.33	30.22	4.85	23.98	54.94	74.00	PK	PASS	
	Н	2483.50	46.59	30.22	4.85	23.98	45.2	54.00	AV	PASS	
	V	2483.50	57.41	30.22	4.85	23.98	56.02	74.00	PK	PASS	
	V	2483.50	48.23	30.22	4.85	23.98	46.84	54.00	AV	PASS	
	V	2483.50	56.03	30.22	4.85	23.98	54.64	74.00	PK	PASS	
	V	2483.50	45.83	30.22	4.85	23.98	44.44	54.00	AV	PASS	





6. CONDUCTED BAND EDGE AND SPURIOUS EMISSION

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D0115.247 Meas Guidancev05r02

6.1 Limit

Regulation 15.247 (d),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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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 §15.205(c)).

6.2 Test Setup



6.3 Test procedure

Using the following spectrum analyzer setting:

- A) Set the RBW = 100KHz.
- B) Set the VBW = 300KHz.
- C) Sweep time = auto couple.
- D) Detector function = peak.
- E) Trace mode = max hold.
- F) Allow trace to fully stabilize.

6.4 DEVIATION FROM STANDARD

No deviation.







6.5 Test Result

Remark: Spurious Emission all modes of GFSK, $\pi/4$ DQPSK, 8DPSK were tested, only the worst result of GFSK

Lowest channel

was reported	as	below:
GFSK mode:		

Test channel:



CH:2402MHz



30MHz~1GHz

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+86-400-000-9970







Keysight Spectrum Analyzer - Swept SA						🗗 💌
M RF 50 Ω AC Start Freq 1.000000000		SENSE:INT	Avg Type: Avg Hold:		06:11:23 PM Mar 15, 2022 TRACE 1 2 3 4 5 TYPE M WWWW	6 Frequency
10 dB/div Ref 20.00 dBm	PNO: Fast IFGain:Low	Atten: 30 dB	Arginola.		cr2 24.592 GHz -36.494 dBm	Auto Tune
10.0 1						Center Freq 13.000000000 GHz
-20.0			Lu A u - molennet	الإستانيارية	DL1 -18.87 dBn	Start Freq 1.000000000 GHz
-50.0	مەدىلىرى _{تە} مەرلىرى مەدىلىرى بىرە مەركىيە 	1444 ¹ 471 ² 412 ¹ 12 ⁴ 12 ⁴ 12 ⁴ 12 ⁴ 12 ⁴ 12 ⁴				Stop Freq 25.000000000 GHz
Start 1.00 GHz #Res BW 1.0 MHz	#VBW	3.0 MHz		Weep 6	Stop 25.00 GHz 0.00 ms (1001 pts	
1 N 1 f 2 N 1 f 3 4 5 6	2.392 GHz 24.592 GHz	3.080 dBm -36.494 dBm				Freq Offset 0 Hz
7 8 9 9 10 11						Scale Type
MSG		III		K STATUS		

1MHz~25GHz



Middle channel





🔤 Keysight Spe	ctrum Analyzer - Swept SA					- 6 -
Start Free	RF 50 Ω AC q 30.000000 MHz	PNO: Fast Trig: Fre	eRun Av	g Type: Log-Pwr g Hold: 68/100	06:09:22 PM Mar 15, 2022 TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P N N N N	Frequency
10 dB/div Log	Ref 20.00 dBm	IFGain:Low Atten: 3	0 dB	М	kr1 120.21 MHz -49.495 dBm	Auto Tune
10.0						Center Freq 515.000000 MHz
0.00 -10.0					DL1 -17.04 dBm	Start Freq 30.000000 MHz
-20.0						Stop Freq 1.000000000 GHz
-40.0	↑1					CF Step 97.000000 MHz <u>Auto</u> Man
-60.0 Minyudwi	an in the management of the second second	ะเปล่างๆและและเปล่างให้สุขากรางสระเห ³ นกูล		kanyddiaedddiad	aghtangahlatahnyangattinan he	Freq Offset 0 Hz
-70.0						Scale Type
Start 0.03 #Res BW		#VBW 300 kHz		Sweep 9	Stop 1.0000 GHz 2.73 ms (1001 pts)	Log <u>Lin</u>
MSG					5	

30MHz~1GHz

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weysight Spectrum Analyzer - Swept SA							- đ ×
₩ RF 50 Ω AC Start Freg 1.000000000 G	17	SENSE:INT		ALIGN AUTO	06:09:50 PM Ma TRACE	r 15, 2022 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 dBm	PNO: Fast IFGain:Low	Trig: Free Run Atten: 30 dB	Avg H	óid: 86/100 MI	TYPE M		Auto Tune
10.0 1 -10.0							Center Freq 13.000000000 GHz
-20.0		رابيهن بالمحمد	and the second	رواليه واليه ومروار الم		2 2	Start Freq 1.000000000 GHz
-50.0 	helden gin gin die der der der der der der der der der de	Lugar Martin					Stop Freq 25.000000000 GHz
Start 1.00 GHz #Res BW 1.0 MHz		3.0 MHz	FUNCTION	Sweep 6	Stop 25.0 0.00 ms (100 FUNCTION V	01 pts)	CF Step 2.400000000 GHz <u>Auto</u> Man
1 N 1 f 2 N 1 f 3 4 5 6	2.440 GHz 9.632 GHz	3.006 dBm 37.424 dBm					Freq Offset 0 Hz
7 8 9 10 11						-	Scale Type
MSG				I o status			

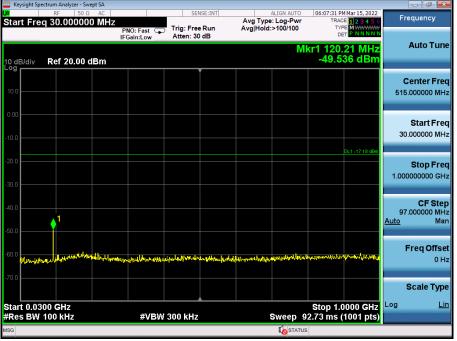
1GHz~25GHz



Highest channel



CH:2480MHz



30MHz~1GHz

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Keysight Spectrum Analyzer - Swept SA					-	
RF 50 Ω AC Start Freq 1.000000000 G		SENSE:II	Avg	ALIGN AUTO Type: Log-Pwr Hold:>100/100	06:08:22 PM Mar 15, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
	PNO: Fast G	Atten: 30 dB			DET	Auto Tupo
0 dB/div Ref 20.00 dBm				MI	r2 21.616 GHz -38.993 dBm	Auto Tune
						Center Fred 13.000000000 GH:
20.0					2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Start Free 1.000000000 GH:
50.0		digitation of the second s	erente operationed			Stop Fre 25.000000000 GH
Start 1.00 GHz Res BW 1.0 MHz	#VB\	N 3.0 MHz	FUNCTION	-	Stop 25.00 GHz 0.00 ms (1001 pts)	CF Stej 2.400000000 GH <u>Auto</u> Ma
1 N 1 f 22 2 N 1 f 21 3 4 5 4 4	.488 GHz .616 GHz	Y 2.963 dBm -38.993 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Freq Offse 0 H
6 7 8 9 9						Scale Type
		m				Log <u>Li</u> i
SG						

1GHz~25GHz

Conducted band edge Test result

Modulation		Frequency Band	Delta Peak to band emission (dBc)	>Limit (dBc)	Result
	Nex berging	Left Band	57.15	20	Pass
OFOK	Non-hopping	Right Band	59.82	20	Pass
GFSK	h a na in a	Left Band	58.47	20	Pass
	hopping	Right Band	61.77	20	Pass
	New howeing	Left Band	51.62	20	Pass
	Non-hopping	Right Band	56.19	20	Pass
π/4DQPSK		Left Band	56.18	20	Pass
	hopping	Right Band	59.12	20	Pass
	New howeing	Left Band	52.00	20	Pass
	Non-hopping	Right Band	56.07	20	Pass
8DPSK	h a na in a	Left Band	53.58	20	Pass
	hopping	Right Band	59.88	20	Pass



GFSK No-hopping Band edge-left side

Keysight Spectrum Analyzer - Sv RF 50 G		SENSE:INT	ALIGN AUTO	05:55:01 PM Mar 15, 2022	
tart Freq 2.310000			Avg Type: Log-Pwr Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	Frequency
) dB/div Ref 20.00			Mk	r1 2.402 2 GHz 3.154 dBm	Auto Tui
0.0 0.0 0.0				1	Center Fr 2.36000000 G
D.0 D.0 D.0				Dự1 -18.85 dBm	Start Fr 2.310000000 G
0.0 0.0 oltostetuseta de staterna era 0.0	ณ _{ูที่ไ} วทร์เป็นสู่ประเทศรีย์สำนุญาณต่างเล่า 	Mine Dry a 199 pijasti in travil operati i navilove	nterdef Mitphone) all and an	monthe mark	Stop Fr 2.410000000 G
tart 2.31000 GHz Res BW 100 kHz		W 300 kHz	Sweep 9	Stop 2.41000 GHz .600 ms (1001 pts)	CF St 10.000000 M <u>Auto</u> M
N 1 f 1 N 1 f 2 N 1 f 3	× 2.402 2 GHz 2.400 0 GHz	3.154 dBm -53.998 dBm	INCTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offs
7 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9					Scale Ty
G		III	I ostatus		

GFSK Hopping Band edge-left side

Keysight Spectrum Analyzer - Swept SA						- 6
₩ RF 50 Ω AC Start Freq 2.310000000 G		SENSE:INT	Aval	ALIGN AUTO	05:56:27 PM Mar 15, 2022 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast IFGain:Low	Trig: Free Run Atten: 30 dB		old:>100/100	TYPE N NNNN DET P NNNNN 1 2.402 2 GHz 3.159 dBm	Auto Tune
10 dB/div Ref 20.00 dBm Log 10.0 0.00 -10.0					1	Center Freq 2.360000000 GHz
-20.0					pų 18.64 džini 2	Start Freq 2.310000000 GHz
-50.0 -60.0	engelangeligenskilverskeren	لىلىرىمىيە مەرىمىيە يەرىلىن	ballan karan kara⊓	مەرام الەمىرالەللى، يورىغۇرىي	and he will	Stop Freq 2.410000000 GHz
Start 2.31000 GHz #Res BW 100 kHz	#VBW	300 kHz		Sweep 9.	Stop 2.41000 GHz 600 ms (1001 pts)	CF Step 10.000000 MHz Auto Man
MKR MODE TRC SCL X 1 N 1 f 2.x 2 N 1 f 2.x 3 - - - - 4 - - - - 5 - - - - 6 - - - -	402 2 GHz 400 0 GHz	3.159 dBm -55.309 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Freq Offset 0 Hz
7 8 9 9 10 10 11 1						Scale Type
MSG		m		K STATUS	4	

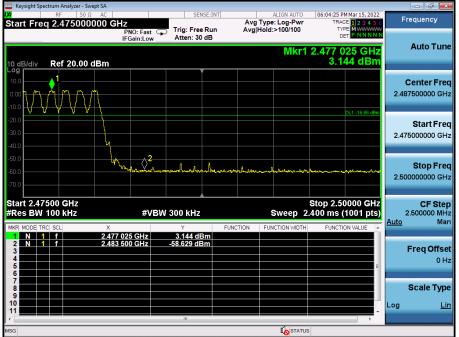




GFSK No-hopping Band edge-right side

Keysight Spec	trum Analyzer - S			SENSE	:INT	ALIGN AUTO	06:05:05 PM M	ar 15, 2022	- 7
tart Freq	2.475000	PN	O: Fast ⊂ ain:Low	Trig: Free R Atten: 30 d	un Av	vg Type: Log-Pwr g Hold:>100/100	TYPE	23456 WWWWW NNNNN	Frequency
0 dB/div	Ref 20.00					Mkr1	2.480 024 3.103	5 GHz dBm	Auto Tur
- og 10.0 0.00 10.0		1							Center Fre 2.487500000 GH
20.0 30.0 40.0							DL1	-16.90 dBm	Start Fre 2.475000000 Gi
50.0 60.0 ******* 70.0	monument	hul	2 minina	montecontrol	manne	and for the second	Mary Mary Mary and		Stop Fre 2.500000000 Gi
Res BW 1	100 kHz	X	#VB\	N 300 kHz	FUNCTION	Sweep 2	Stop 2.500 2.400 ms (10	01 pts)	CF Ste 2.500000 Mi <u>ito</u> Mi
1 N 1 2 N 1 3 4 5 6	f f	2.480 025 2.483 500		3.103 dBn -56.715 dBm	1	FUNCTION WIDTP			Freq Offs 0 F
7 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9									Scale Typ
G				m		K STATL	IS	F	

GFSK Hopping Band edge-right side







$\pi/4\text{-}DQPSK$ No-hopping Band edge-left side

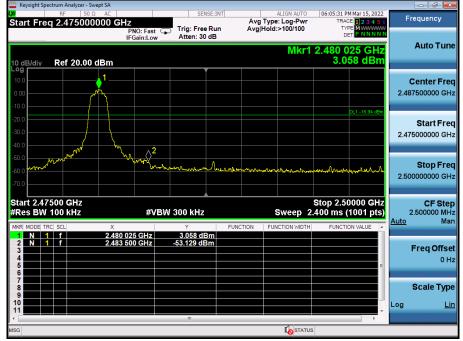
Keysight Spectrum Analyzer - Swept SA				
X RF 50 Ω AC Start Freq 2.310000000 G	SENSE	INT ALIGN AUTO Avg Type: Log-Pwr	05:58:33 PM Mar 15, 2022 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 dBm	PNO: Fast Trig: Free R IFGain:Low Atten: 30 d	в	туре Милини DET P NNNNN (r1 2.402 0 GHz 3.134 dBm	Auto Tune
Log 10.0 0.00 -10.0			1	Center Fred 2.360000000 GH
-20.0				Start Free 2.310000000 GH;
-50.0 -60.0 -70.0			manuel and Volume	Stop Free 2.410000000 GH
Start 2.31000 GHz #Res BW 100 kHz	#VBW 300 kHz	Sweep 9	Stop 2.41000 GHz 600 ms (1001 pts)	CF Step 10.000000 MH <u>Auto</u> Ma
1 N 1 f 2.	402 0 GHz 3.134 dBn 400 0 GHz -48.490 dBn			Freq Offse 0 H
7 8 9 10				Scale Type
A NSG	III	I STATU	s	

$\pi/4\text{-}DQPSK$ Hopping Band edge-left side

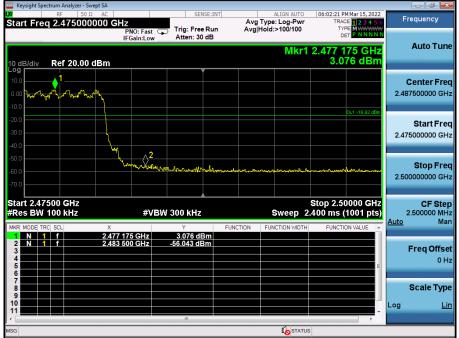
🔤 Keysight Sp	ectrum Analyze									7 ×
I <mark>XI</mark> Start Ere	RF	50 Ω AC	1 7	SENS	SE:INT	ALIGN AUT		M Mar 15, 2022	Frequent	су
Start Fre	q 2.5 IO	00000 G	PNO: Fast (Trig: Free Atten: 30	Run Av	g Hold:>100/100	TY TY	PE MWWWWW		
			IFGain:Low	Atten: 30	aв		-		Auto	Tune
						N	/kr1 2.40	4 0 GHz 61 dBm		
10 dB/div Log	Ref 20.	.00 dBm		_			2.3	отавш		
10.0								1	Center	Fred
0.00								A.A.A.A.A.A.A.A.A.A.A.A.A.A.A.A.A.A.A.	2.36000000	
-10.0								An Adedal		
-20.0								DL1 -17.04 dBm		
										Freq
-30.0									2.31000000	0 GHz
-40.0								2		
-50.0								/	Ston	Freq
-60.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	American	to mark and the second of the second s	رميله برطور سرسين <mark>ال</mark> عز	Marian director Polart		بالحد الم _ف يسيون		2.41000000	
-70.0										
Start 2.3	1000 CH-						Oton 2.4			
start 2.5 #Res BW			#VB	W 300 kHz		Sween	9.600 ms (1000 GHz 1001 pts)	10.00000	Step
MKR MODE T		X		A COC KIL	FUNCTION	FUNCTION WID		ON VALUE	Auto	Man
	1 f		04 0 GHz	2.961 dB		FUNCTION WID	TH FUNCT	UN VALUE		
2 N	1 f		00 0 GHz	-53.214 dB	m				FreqC	Offset
4									11044	0 Hz
5						_		=		
7									Quela	-
8									Scale	Type
10									Log	Lin
11				III						
ISG						I STA	TUS			
						v				_



π/4-DQPSK No-hopping Band edge-right side



π /4-DQPSK Hopping Band edge-right side







8-DQPSK No-hopping Band edge-left side

Keysight Spectrum Analyzer - Swept SA					
RF 50 Ω AC Start Freg 2.310000000	GHz	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	05:59:06 PM Mar 15, 2022 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast File IFGain:Low Att	i: Free Run en: 30 dB	Avg Hold:>100/100	r1 2.402 0 GHz 3.154 dBm	Auto Tun
0 dB/div Ref 20.00 dBm 99 10.0 .000 10.0					Center Fre 2.360000000 GF
				Dt1 18.85 dBm	Start Fre 2.310000000 GH
0.0 Allettercontrations	ana ana ang pangan Bandarda at ana ang at	ffiloustersta ^{nt} erstyss ^{on} terstyst ^o terstyst ^o ter	and and a state of the state of	under Mari	Stop Fre 2.410000000 GH
tart 2.31000 GHz Res BW 100 kHz	#VBW 300		Sweep 9.	Stop 2.41000 GHz 600 ms (1001 pts)	CF Ste 10.000000 MI <u>Auto</u> Mi
IKR MODE TRC SCL 3 1 N 1 f 3 2 N 1 f 3 4 5 5 5 6	2.402 0 GHz 3.1 2.400 0 GHz -48.8	54 dBm 46 dBm	ION FUNCTION WIDTH	FUNCTION VALUE	Freq Offs
7 8 8 9 9 10 1					Scale Typ
G		"	I STATUS	F .	

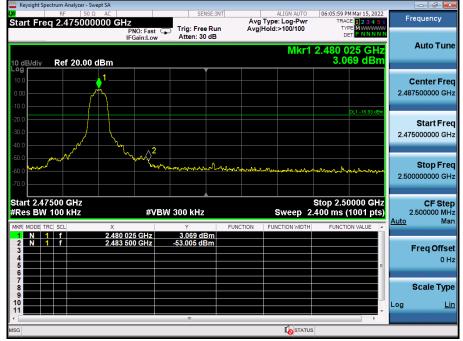
8-DQPSK Hopping Band edge-left side

Keysight Spectrum Analyzer - Swept SA					
M RF 50 Ω AC Start Freq 2.310000000 G	Hz	SENSE:INT	ALIGN AUTO	06:00:04 PM Mar 15, 2022 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast 😱 Trig:		Hold:>100/100	TYPE MWWWWW DET P NNNNN r1 2.409 0 GHz	Auto Tune
10 dB/div Ref 20.00 dBm				3.010 dBm	
10.0 0.00 				PRUMA	Center Freq 2.360000000 GHz
-20.0				DL1 -15.99 dBm	Start Freq 2.310000000 GHz
-50.0 -60.0	ويعمر مهرمور والإفرار ويدور ورساور والم	und now in the set of the set	موران مارور مورور برور مورور مور مورور مورور مور		Stop Freq 2.410000000 GHz
Start 2.31000 GHz #Res BW 100 kHz	#VBW 300		Sweep 9.	Stop 2.41000 GHz 600 ms (1001 pts)	CF Step 10.000000 MHz <u>Auto</u> Man
		FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
2 N 1 f 2.4	400 0 GHz -50.56	i9 dBm		<u>в</u>	Freq Offset 0 Hz
7					Scale Type
MSG	m		I ostatus	4	

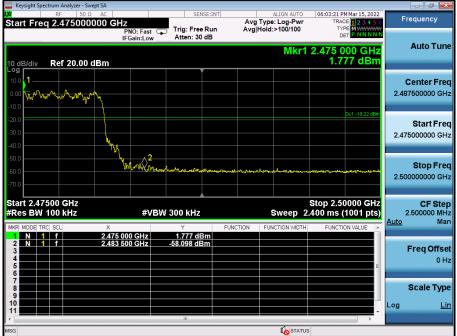




8-DQPSK No-hopping Band edge-right side



8-DQPSK Hopping Band edge-right side









7. 20DB BANDWIDTH

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013

7.1 Test Setup



7.2 Limit

N/A

7.3 Test procedure

- 1. Set RBW = 30 kHz.
- 2. Set the video bandwidth (VBW) \ge 3 x RBW.
- 3. Detector = Peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize.

7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.4 DEVIATION FROM STANDARD

No deviation.







7.5 Test Result

Mode	Test channel	20dB Emission Bandwidth (MHz)	Result
	Lowest	0.917	
GFSK	Middle	0.919	Pass
	Highest	0.917	
	Lowest	1.318	
π/4-DQPSK	Middle	1.318	Pass
	Highest	1.319	
	Lowest	1.265	
8-DPSK	Middle	1.267	Pass
	Highest	1.268	

Test plots

	Gra	SK LOW UNA	annei		
Keysight Spectrum Analyzer - Occupied B\	V				- 6 🔀
Center Freg 2.40200000	CH- Cente	SENSE:INT r Frea: 2.402000000 GH	ALIGN AUTO	05:49:49 PM Mar 15, 2022 Radio Std: None	Frequency
Center Freq 2.40200000	Trig: I	Free Run Avg l	lold:>10/10		
	#IFGain:Low #Atter	n: 30 dB		Radio Device: BTS	-
15 dB/div Ref 20.00 dBr	n	_			
5.00					O
		~~~ l			Center Freq
-10.0		- Andrew - A			2.402000000 GHz
-25.0	~~~~		~~~~		
-40.0					
-55.0				Manna	
-70.0					
-85.0					
-100					
-115					
Center 2.402 GHz				Span 3 MHz	
#Res BW 30 kHz	#	VBW 100 kHz		Sweep 4.133 ms	300.000 kHz
Occupied Bandwid	b	Total Power	9.50	) dBm	<u>Auto</u> Man
			0.00		
8	49.00 kHz				Freq Offset
Transmit Freq Error	5.447 kHz	% of OBW P	ower 90	.00 %	0 Hz
-					
x dB Bandwidth	916.5 kHz	x dB	-20.	00 dB	
MSG			🚺 STATU	S	

# **GFSK Low Channel**





#### **GFSK Middle Channel**

Center Freg 2.441000000 0		SENSE:INT				
		ter Freq: 2.44100000	0 GHz	Radio Std:	Mar 15, 2022 None	Frequency
	Trig	:FreeRun A en:30 dB	vg Hold:>10/10	Dealler Deal		
	#FGain:Low #Att	en: 30 dB		Radio Devi	CE: BIS	
15 dB/div Ref 20.00 dBm						
5.00						
		~~~~~				Center Freq
-10.0						2.441000000 GHz
-25.0						
-40.0			+	~~~~		
-55.0			~		mon	
-70.0						
-85.0						
-100						
-115						
Center 2.441 GHz				Spa	an 3 MHz	
#Res BW 30 kHz		#VBW 100 kHz			4.133 ms	CF Step 300.000 kHz
						Auto Man
Occupied Bandwidth		Total Pow	ver 9.3	5 dBm		
84	7.86 kHz					
						Freq Offset
Transmit Freq Error	4.931 kHz	% of OBW	Power 99	9.00 %		0 Hz
x dB Bandwidth	919.4 kHz	x dB	-20	.00 dB		
	o rost kinz	A GD	-20			
MSG			🚺 STATU	s		

GFSK High Channel









π/4-DQPSK Low Channel

		SENSE:INT	ALIGN AUTO	05:46:51 PM Mar 15, 2022	
Center Freq 2.402000000	GHz	Center Freq: 2.402000		Radio Std: None	Frequency
	_	Trig: Free Run	Avg Hold:>10/10		
	#IFGain:Low	#Atten: 30 dB		Radio Device: BTS	-
15 dB/div Ref 20.00 dBm					
Log					
5.00		\sim			Center Free
10.0			\sim		2.402000000 GH
25.0	<u> </u>				
40.0			$ \land \land \land$		
			Ý	- market and - mar	
55.0					
70.0					
35.0	_				
100					
-115					
-113					
Center 2.402 GHz	_			Span 3 MHz	05.014
Res BW 30 kHz		#VBW_100 k	Hz	Sweep 4.133 ms	
					Auto Ma
Occupied Bandwidth	1	Total Po	ower 9.82	2 dBm	
	818 MH	-			
		Z			Freq Offse
Transmit Freq Error	195 H	z % of OE	W Power 99	9.00 %	0 H
x dB Bandwidth	1.318 MH	lz xdB	-20	.00 dB	
			-		
G				S	

π/4-DQPSK Middle Channel





π/4-DQPSK High Channel

RF 50 Ω AC		SENSE:INT	ALIGN AUTO	05:47:56 PM Mar 15, 202	2
Center Freq 2.48000000 0		enter Freq: 2.48000000) GHz	Radio Std: None	Frequency
		rig: Free Run A Atten: 30 dB	vg Hold:>10/10	Radio Device: BTS	
i	#IFGain:Low #/	Atten: 30 dB		Radio Device: B13	-
5 dB/div Ref 20.00 dBm					
og					
		A			Center Fre
D.0			\sim		2.48000000 GI
5.0			$ \rightarrow $		
				man in	
5.0				- marine	
0.0					
5.0					
100					
15					
enter 2.48 GHz				Span 3 MH	7
Res BW 30 kHz		#VBW 100 kHz		Sweep 4.133 m	
				encep meen	S 300.000 kl
Occupied Bandwidth		Total Pow	er 9.42	dBm	Auto
	832 MHz				
					Freq Offs
Transmit Freg Error	-153 Hz	% of OBW	Power 99	.00 %	01
x dB Bandwidth	1.319 MHz	x dB	-20.	00 dB	
G			STATUS	3	

8-DPSK Low Channel







8-DPSK Middle Channel

Keysight Spectrum Analyzer - Occupied BW					- 6 x
Center Freq 2.441000000		SENSE:INT er Freq: 2.441000000 GHz Free Run Avg Ho	ALIGN AUTO	05:45:10 PM Mar 15, 2022 Radio Std: None	Frequency
		en: 30 dB		Radio Device: BTS	
15 dB/div Ref 20.00 dBm					
5.00 -10.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~		Center Freq 2.441000000 GHz
-25.0					
-55.0					
-85.0					
-115 Center 2.441 GHz				Coop 2 Mila	
#Res BW 30 kHz	\$	#VBW 100 kHz		Span 3 MHz Sweep 4.133 ms	CF Step 300.000 kHz
Occupied Bandwidth		Total Power	9.73	dBm	<u>Auto</u> Man
1. 1	1679 MHz				Freq Offset
Transmit Freq Error	15.698 kHz	% of OBW Pov	ver 99.	00 %	0 Hz
x dB Bandwidth	1.267 MHz	x dB	-20.0	0 dB	
MSG			I STATUS		

8-DPSK High Channel







8. Maximum Peak Output Power

Test Requirement: FCC Part15 C Section 15.247 (b)(1)	
Test Method:	ANSI C63.10:2013
Limit:	20.97dBm(for GFSK), 20.97dBm(for EDR)

8.1 Block Diagram Of Test Setup



8.2 Limit

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 systems in the 2400-2483.5 MHz band: 0.125 watts.

8.3 Test procedure

- 1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
- 2. Set the spectrum analyzer: RBW = 2MHz. VBW = 2MHz. Sweep = auto; Detector Function = Peak.
- 3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

8.4 DEVIATION FROM STANDARD

No deviation.

8.5 Test Result

Mode	Test channel	Peak Output Power (dBm)	Limit (dBm)	Result	
	Lowest	3.001			
GFSK	Middle	2.931	20.97	Pass	
	Highest	2.915			
	Lowest	3.093		Pass	
π/4-DQPSK	Middle	2.928	20.97		
	Highest	2.849			
	Lowest	2.947			
8-DPSK	Middle	2.921	20.97	Pass	
	Highest	2.803			

85







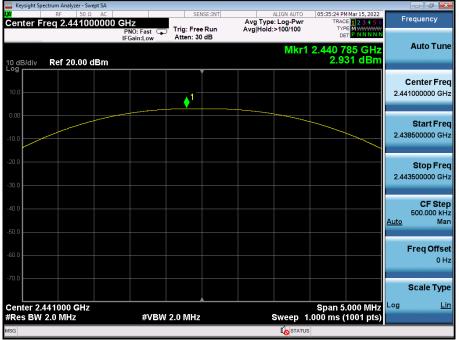


Test plots

GFSK Low Channel

iG				I o statu	S	
	402000 GHz 2.0 MHz	#VBW 2	.0 MHz	Sweep	Span 5.000 MHz .000 ms (1001 pts)	Log <u>Lir</u>
0.0						Scale Type
0.0						0 H:
						Freq Offse
0.0						<u>Auto</u> Mar
0.0						CF Ster 500.000 kH
0.0						2.40400000 011
0.0						Stop Free 2.404500000 GH
0.0						Start Free 2.399500000 GH:
0.0			1			2.402000000 GH;
°g						Center Fred
dB/div	Ref 20.00 dBm			IVIKI	3.001 dBm	
			Atten: 30 dB		2.402 115 GHz	Auto Tun
enter F	req 2.402000000	GHz PNO: Fast	Trig: Free Run	Avg Type: Log-Pwr Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N	Frequency
ricysigne ope	ectrum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	ALIGN AUTO	05:34:19 PM Mar 15, 2022	

GFSK Middle Channel



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GFSK High Channel



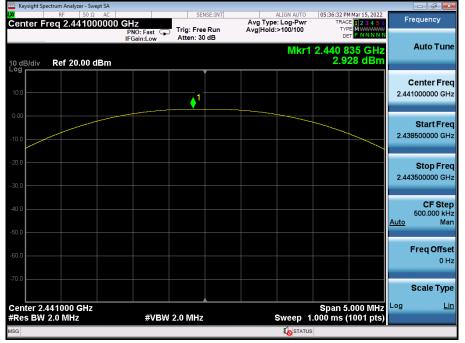
π/4-DQPSK Low Channel

Keysight Spe	ectrum Analyzer - Swept SA					
X Center F	RF 50 Ω AC req 2.402000000	GHz	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	05:36:51 PM Mar 15, 2022 TRACE 1 2 3 4 5 6	Frequency
10 dB/div	Ref 20.00 dBm	PNO: Fast 😱 IFGain:Low	Trig: Free Run Atten: 30 dB	Avg Hold:>100/100	2.402 170 GHz 3.093 dBm	Auto Tune
			1_			Center Freq 2.402000000 GHz
10.00						Start Freq 2.399500000 GHz
30.0						Stop Fred 2.404500000 GHz
40.0						CF Step 500.000 kHz Auto Mar
60.0						Freq Offset 0 Hz
-70.0						Scale Type
Center 2.4 #Res BW	402000 GHz 2.0 MHz	#VBW	2.0 MHz	Sweep 1	Span 5.000 MHz .000 ms (1001 pts)	
ISG					5	





π/4-DQPSK Middle Channel



π/4-DQPSK High Channel







8-DPSK Low Channel



8-DPSK Middle Channel

Keysight Sp	ectrum Analyzer - Swept SA					- 6 -
X Center F	RF 50 Ω AC req 2.441000000	GHz	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	05:37:39 PM Mar 15, 2022 TRACE 1 2 3 4 5 6	Frequency
	•	PNO: Fast IFGain:Low	Trig: Free Run Atten: 30 dB	Avg]Hold:>100/100	2.441 030 GHz 2.921 dBm	Auto Tune
10 dB/div Log	Ref 20.00 dBm		V		2.921 UBIII	
10.0			1			Center Freq 2.441000000 GHz
			\ '			
-10.0						Start Freq 2.438500000 GHz
-20.0						Stop Fred 2.443500000 GHz
40.0						CF Step 500,000 kH
-50.0						Auto Mar
60.0						Freq Offse
						0 H:
-70.0						Scale Type
	441000 GHz		i		Span 5.000 MHz	Log <u>Lir</u>
#Res BW	2.0 MHz	#VBW	2.0 MHz	Sweep 1	.000 ms (1001 pts)	
ISG				uo status		





8-DPSK High Channel

Keysight Sp	ectrum Analyzer - Swept SA				- 6 ×
XI	RF 50 Ω AC	SENSE:II	ALIGN AUTO Avg Type: Log-Pwr	05:37:54 PM Mar 15, 2022 TRACE 1 2 3 4 5 6	Frequency
senter F	req 2.48000000	PNO: East Trig: Free Ru		TYPE M WWWWW	
		IFGain:Low Atten: 30 dB		DET P NNNNN	
			Mkr1	2.479 885 GHz	Auto Tune
10 dB/div	Ref 20.00 dBm			2.803 dBm	
^{-og}					
					Center Fre
10.0		1			2.480000000 GH
0.00					Start Fre
					2.477500000 GH
10.0					2.477500000 GH
20.0					Stop Fre
					2.482500000 GH
30.0					
40.0					CF Ste 500.000 kH
					Auto Ma
50.0					<u>//dro</u>
60.0					Freq Offse
					0 H
70.0					
					Scale Typ
	480000 GHz			Span 5.000 MHz	Log <u>Li</u>
Res BW	2.0 MHz	#VBW 2.0 MHz	Sweep	1.000 ms (1001 pts)	
ISG			I STATU	s	







Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100KHz, VBW=300KHz, detector=Peak
Limit:	GFSK: 20dB bandwidth π /4-DQPSK & 8DPSK: 0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)

9.1 Test Setup

EUT	SPECTRUM
	ANALYZER

9.2 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port

to the spectrum.

2. Set the spectrum analyzer: RBW = 100kHz. VBW = 300kHz , Span = 3.0MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

9.3 DEVIATION FROM STANDARD No deviation.







Modulation	Test Channel	Separation (MHz)	Limit(MHz)	Result
GFSK	Low	1.012	0.917	PASS
GFSK	Middle	0.996	0.919	PASS
GFSK	High	1.180	0.917	PASS
π/4-DQPSK	Low	1.008	0.879	PASS
π/4-DQPSK	Middle	1.004	0.879	PASS
π/4-DQPSK	High	1.014	0.879	PASS
8-DPSK	Low	0.996	0.843	PASS
8-DPSK	Middle	0.992	0.845	PASS
8-DPSK	High	1.000	0.845	PASS

Test plots **GFSK Low Channel**







GFSK Middle Channel



GFSK High Channel









π/4-DQPSK Low Channel



π/4-DQPSK Middle Channel







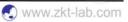


π/4-DQPSK High Channel



8-DPSK Low Channel







8-DPSKMiddle Channel



8-DPSK High Channel



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10.NUMBER OF HOPPING FREQUENCY

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)(iii)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100kHz, VBW=300kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak
Limit:	15 channels

10.1 Test Setup

EUT	SPECTRUM
	ANALYZER

10.2 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 100kHz. VBW = 300kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.

4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.4835GHz. Sweep=auto;

10.3 DEVIATION FROM STANDARD No deviation.

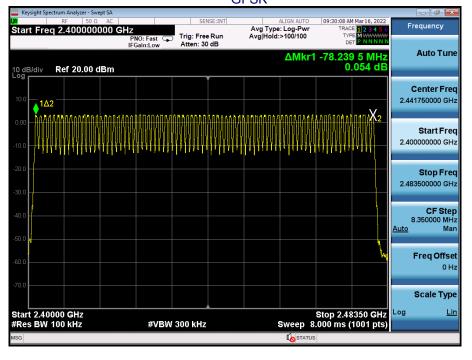




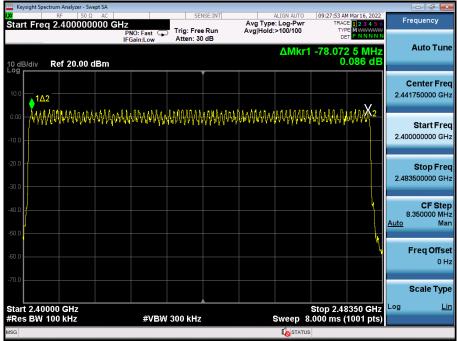


10.4 Test Result

Test Plots: 79 Channels in total GFSK



π/4-DQPSK









			0-DP3r	`		
Keysight Spectrum Analyzer - Swept SA						- 7 ×
ম্চ 50 Ω AC Start Freq 2.400000000	GHz PNO: Fast G	Trig: Free R Atten: 30 dl	Avg T un Avg Ho	ALIGN AUTO ype: Log-Pwr old:>100/100	09:26:21 AM Mar16, 2022 TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P N N N N N	Frequency
dB/div Ref 20.00 dBm				ΔMkr	1 -78.156 0 MHz -1.211 dB	Auto Tune
0.0 • 1Δ2						Center Freq 2.441750000 GHz
	ANA MANA ANA	hhan Mining	MWWWW	YAYAYA	WWWWWX2	Start Freq
10.0						2.400000000 GHz
0.0						Stop Freq 2.483500000 GHz
0.0						CF Step 8,350000 MHz
0.0						Auto Man
0.0					<mark>\</mark>	Freq Offset 0 Hz
70.0						Scale Type
tart 2.40000 GHz Res BW 100 kHz	#VBW	300 kHz		Sweep 8	Stop 2.48350 GHz 3.000 ms (1001 pts)	
G				I STATU	s	

8-DPSK



11. DWELL TIME

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)(iii)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=1MHz, VBW=3MHz, Span=0Hz, Detector=Peak
Limit:	0.4 Second

11.1 Test Setup

EUT	SPECTRUM
	ANALYZER

11.2 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set spectrum analyzer span = 0Hz;

3. Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Set the EUT for DH5, DH3 and DH1 packet transmitting.

4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

11.3 DEVIATION FROM STANDARD No deviation.







11.4 Test Result

GFSK DH5 mode:

Frequency	Packet	Dwell time(ms)	Limit(ms)	Result
2402MHz	DH5	312.85	400	Pass
2441MHz	DH5	315.52	400	Pass
2480MHz	DH5	312.00	400	Pass

Remarks:

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

Test channel: as blow

CH:2402MHz time slot=2.925(ms)*(1600/ (6*79))*31.6=312.00ms

CH:2441MHz time slot=2.958(ms)*(1600/ (6*79))*31.6=315.52ms

CH:2480MHz time slot=2.917(ms)*(1600/ (6*79))*31.6=311.15ms

π /4-DQPSK mode:

Frequency	Packet	Dwell time(ms)	Limit(ms)	Result
2402MHz	2DH5	311.15	400	Pass
2441MHz	2DH5	316.48	400	Pass
2480MHz	2DH5	311.15	400	Pass

Remarks:

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s Test channel: as blow CH:2402MHz time slot=2.917(ms)*(1600/ (6*79))*31.6=311.15ms CH:2441MHz time slot=2.967(ms)*(1600/ (6*79))*31.6=316.48ms CH:2480MHz time slot=2.917(ms)*(1600/ (6*79))*31.6=311.15ms

8-DPSK mode:

Frequency	Packet	Dwell time(ms)	Limit(ms)	Result
2480MHz	3DH5	312.00	400	Pass
2480MHz	3DH5	312.00	400	Pass
2480MHz	3DH5	312.00	400	Pass

Remarks:

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s Test channel: as blow CH:2402MHz time slot=2.925(ms)*(1600/ (6*79))*31.6=312.00ms CH:2441MHz time slot=2.925(ms)*(1600/ (6*79))*31.6=312.00ms CH:2480MHz time slot=2.925(ms)*(1600/ (6*79))*31.6=312.00ms





Test Plots

GFSK 2402MHz

🔤 Keysight Sp	ectrum Analyzer - Swept SA					- 7 -
LXI	RF 50 Ω AC		SENSE:INT	ALIGN AUTO	09:31:32 AM Mar 16, 2022	Frequency
Center F	req 2.40200000	PNO: Fast ++-	Trig: Free Run	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW	
		IFGain:Low	Atten: 30 dB		DET P NNNN	
				Δ	Mkr1 -2.925 ms	Auto Tune
10 dB/div	Ref 20.00 dBm				2.95 dB	
Log						
						Center Freq
10.0						2.402000000 GHz
0.00						
			A		~~	Start Freq
-10.0						2.402000000 GHz
-20.0						
						Stop Freq
-30.0						2.402000000 GHz
-30.0						
						CF Step
-40.0						1.000000 MHz
						<u>Auto</u> Man
-50.0	at a state of the	والمريد والاطرا	<u>1Δ2</u>		بالليار ويواور ويتعال	
^{የኛ} ዚያ ስ	the paper and a start of the second	ha na mana ana ana ana ana ana ana ana an	www.		All the second second	Freq Offset
-60.0					- ^2 · · · ·	0 Hz
-70.0						
						Scale Type
0					0.000	Log <u>Lin</u>
Res BW 1	402000000 GHz	#\/B\A	3.0 MHz	Sween	Span 0 Hz 3.333 ms (1001 pts)	
	1.0 10112	# V D VV	5.0 10112			
MSG				I o statu	S	

GFSK 2441MHz

Keysight Sp	ectrum Analyzer - Swept SA									
(X) Contor E	RF 50 Ω AC req 2.441000000	CH-	SEI	NSE:INT	Ave	ALIGN AUTO		AM Mar16, 2022 CE 1 2 3 4 5 6	F	requency
Center P	req 2.44 100000	PNO: Fast	Trig: Free Atten: 30			, , , po. 20g	T			
10 dB/div Log	Ref 20.00 dBm						∆Mkr1 2	.958 ms 1.13 dB		Auto Tune
10.0										Center Freq 1000000 GHz
-10.0									2.44	Start Freq 1000000 GHz
-20.0									2.44	Stop Freq 1000000 GHz
-40.0									Auto	CF Step 1.000000 MHz Man
-50.0	wyld <mark>rugph</mark> pullphystodd	hadhilden an	<mark>1∕X</mark> 2			Ŵ	142 100-00-00-00-00-00-00-00-00-00-00-00-00-	desponsitive des		Freq Offset 0 Hz
-70.0										Scale Type
Center 2.4 Res BW 1	441000000 GHz I.0 MHz	#VBW	3.0 MHz			Sweep	8.333 ms	Span 0 Hz (1001 pts)	Log	<u>Lin</u>
MSG						I STATU	IS			

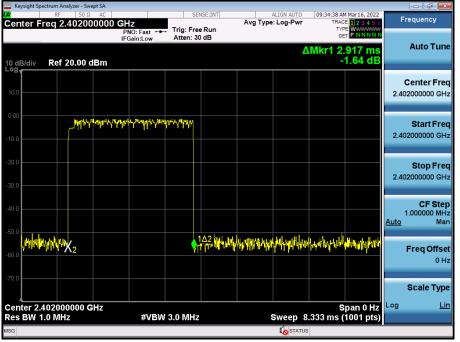




GFSK 2480MHz

🔤 Keysight Sj	pectrum Analyzer - Swep								- 6 -
XI Contor I	RF 50 Ω req 2.480000		1-	SENSE:INT		ALIGN AUTO e: Log-Pwr		Mar 16, 2022	Frequency
Center F	req 2.480000	PI	NO: Fast ↔→ Gain:Low	Trig: Free Run Atten: 30 dB		e. Log-r wi	TYPE	P N N N N N	
10 dB/div	Ref 20.00 dl	Зm				Δ	Mkr1 -2.	917 ms I.26 dB	Auto Tune
10.0									Center Fred 2.480000000 GHz
-10.0				•					Start Freq 2.480000000 GHz
-20.0									Stop Fred 2.480000000 GHz
-40.0		162							CF Step 1.000000 MH: <u>Auto</u> Mar
-60.0	veli-tradition of the second states of the second s	///w			X	hlynnn	uilan taihtai	hhan ana an	Freq Offset 0 Hz
-70.0									Scale Type
Center 2 Res BW	.480000000 GH 1.0 MHz	lz	#VBW	3.0 MHz		Sweep 8	S 333 ms (1	oan 0 Hz 1001 pts)	Log <u>Lir</u>
ISG						STATUS	6		

π/4-DQPSK 2402MHz







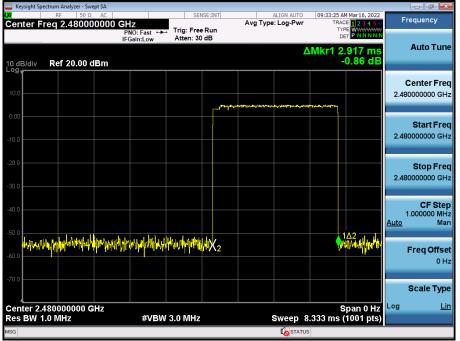




π/4-DQPSK 2441MHz

Keysight Sp	pectrum Analyzer - Swept SA						
X	RF 50 Ω AC		SENSE:INT			AM Mar 16, 2022	Frequency
Center I	req 2.441000000	PNO: Fast ++-	Trig: Free Run	Avg Type: Lo	T		
		IFGain:Low	Atten: 30 dB				Auto Tune
					ΔMkr1 -2		Auto Tune
10 dB/div Log	Ref 20.00 dBm					1.90 dB	
							Center Freq
10.0							2.441000000 GHz
			antena de atantena de atantena de at	-			2.441000000 GH2
0.00							
							Start Freq
-10.0							2.441000000 GHz
-20.0							Stop Freq
							2.441000000 GHz
-30.0							2.441000000 GHZ
-40.0							CF Step 1.000000 MHz
							Auto Man
-50.0	1	142					
1 hills	hethorizater (*1.644.1619), Adal Aleman I			NAME AND A	and the second sec	White Mark	Freq Offset
-60.0	· • • • • • •			Λ <u>2</u> ⁻ ⁻			0 Hz
							0 H2
-70.0							
							Scale Type
Center 2	.441000000 GHz					Span 0 Hz	Log <u>Lin</u>
Res BW		#VBW	3.0 MHz	Sw	veep 8.333 ms	opanonz	_
MSG					STATUS		
					v		

π/4-DQPSK 2480MHz



Shenzhen ZKT Technolgy Co., Ltd. 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen,China

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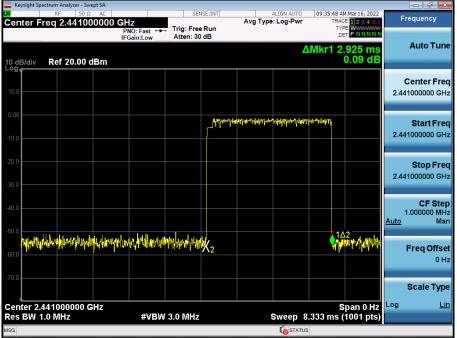




8-DPSK 2402MHz

🔤 Keysight Sp	pectrum Analyzer - Swe	ept SA								
<mark>X/</mark>	RF 50 Ω	AC O		SENSE:INT	Avg Type:	LIGN AUTO		Mar16, 2022	F	requency
Center F	req 2.40200	F	PNO: Fast ↔ Gain:Low	Trig: Free Run Atten: 30 dB	Avg Type.	Log-Pwi	TYP	E WWWWWWW TPNNNN		
10 dB/div	Ref 20.00 d	IBm				Δ		925 ms 2.91 dB		Auto Tune
10.0										Center Free 2000000 GH:
0.00		^M	anyopakil <u>a</u> tyuhak	จังภาพกิษในไหลางที่ระกับประก	**				2.40	2000000 011
-10.0									2.40	Start Free 2000000 GH:
-20.0										
-30.0									2.40	Stop Free 2000000 GH
40.0										CF Stej
50.0									Auto	1.000000 MH Ma
	had the state of the	¢ <mark>nµ</mark> ∦X2				No for the	www.	yligetherdder		Freq Offse
										0 H
-70.0										Scale Typ
Center 2. Res BW	.402000000 G 1.0 MHz	Hz	#VBW	3.0 MHz	s	weep 8	S .333 ms (pan 0 Hz 1001 pts)	Log	Li
ISG						I STATUS				

8-DPSK 2441MHz





8-DPSK 2480MHz

🔤 Keysight Spe	ctrum Analyzer - Swept S	Α				
X	RF 50 Ω A		SENSE:INT	ALIGN AUTO	09:36:07 AM Mar 16, 2022	Frequency
Center Fr	eq 2.4800000	PNO: Fast ++- IFGain:Low	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr	TRACE 123456 TYPE WWWWW DET PNNNN	
10 dB/div	Ref 20.00 dBr	n		Δ	Mkr1 -2.925 ms 2.43 dB	Auto Tune
10.0						Center Free
	- Lybrar - Park	กระจะรุษาณากับเจาเจาไฟ	where the			2.480000000 GH
0.00						Start Free 2.48000000 GH
10.0						2.48000000 GH
20.0						Stop Free 2.48000000 GH
30.0						2.40000000 011
40.0						CF Ste 1.000000 MH
50.0	1Δ2				و ا و ا مراجع المار الم	<u>Auto</u> Ma
60.0	il _q μ γο		X2	ar Andrew Hander An Andrew Prinser	alantha dhaladh	Freq Offse
70.0						
						Scale Typ
Center 2.4 Res BW 1.	80000000 GHz .0 MHz		3.0 MHz	Sweep 8	Span 0 Hz .333 ms (1001 pts)	Log <u>Li</u>
SG						





12. Antenna Requirement

15,000 1 1	
Standard requirement:	FCC Part15 C Section 15.203 /247(c)

15.203 requirement:

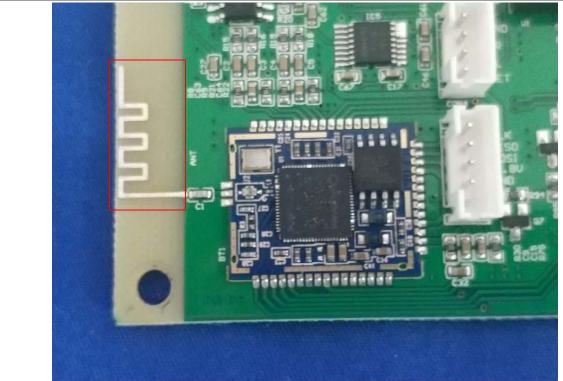
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

EUT Antenna:

The antennas are Internal antenna, the best case gain of the antennas are 0dBi.









Reference to the **appendix I** for details.

14. EUT Constructional Details

Reference to the appendix II for details.

***** END OF REPORT *****

