TEST REPORT On behalf of

Savant Technologies LLC, dba GE Lighting, a Savant company

Product	Model No.
QO FORWARD PHASE DIMMER, PIGTAIL	GPM-Q2FPD05-21
QO FORWARD PHASE DIMMER, PON	GPM-QP2FPD05-21

FCC ID: PUU-QP2FPD05

- Prepared For: Savant Technologies LLC, dba GE Lighting, a Savant company 1975 Noble Road Cleveland Ohio United States 44112
- Prepared By: Audix Technology (Shanghai) Co., Ltd. 3F and 4F, 34Bldg, 680 Guiping Rd., Caohejing Hi-Tech Park, Shanghai 200233, China

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File No.:C1D2110009Report No.:ACI-F22017Date of Test:2021.10.14-2022.01.15Date of Report:2022.01.17

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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TEST REPORT

Applicant	:	Savant Technologies LLC, dba GE Lighting, a Savant company		
EUT Description	:	Refer to Sec.2.1		
		(A) Model No.	:	Refer to Sec.2.1
		(B) Power Supply	:	120V AC 60Hz
		(C) Test Voltage	:	120V/60Hz

Test Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10-2013

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report also shows that the EUT (M/N: Refer to Sec2.1), which was tested is technically compliance with the FCC limits.

This report applies to above tested Sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

Date of Test :	of Test : 2021.10.14-2022.01.15		2022.01.17	
Producer :	Hut Min Yan			
	HUIMIN YAN / Assistant			
	Byron Mu			
Review :	/			
•	BYRON WU/ Deputy Assistant Manager			
AUDIX [®] For and on behalf of				
Audix Technology (Sh	anghai) Co., Ltd.			
	R			
Signatory :	montes			
Authorized Signature(BYRON KWO/Assistant General Manager	r		

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	Test Standard	Results	Meets Limit	
	EMISSION			
Conducted Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.207	
Radiated Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.209(a) 15.205(a)(c)	
6 dB Bandwidth Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(a)(2)	
Maximum Peak Output Power Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(b)(3)	
Emission Limitations Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(d)	
Band Edge Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(d)	
Power Spectral Density Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(e)	
N/A is an abbreviation for Not Applicable.				

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Type of EUT	:	Production	Pre-product	Pro-type
		Product		Model No.
QO FORWA	ARD P	HASE DIMMER,	PIGTAIL	GPM-Q2FPD05-21
QO FORV	VARI	PHASE DIMME	R, PON	GPM-QP2FPD05-21
Note	:	The N wire position the back of the most the bottom of the p	odule, another	
Test Model	:	GPM-Q2FPD05-2	21	
Radio Tech	:	BLE 5.0;		
Note:	:	Bluetooth LE1M o	only.	
Channel Freq.	:	BLE: 2402MHz-2	480MHz;	
Modulation	:	BLE: GFSK;		
Antenna Info.	Antenna Info. : Antenna Type: PCB Antenna Antenna Gain: 1.49 dBi The Antenna was a permanently attached antenna that is comply with 15.203 requirement.			
Test Mode	:	The EUT was set a in the report.	at continuous	TX during all the test
Applicant	:	e	,	GE Lighting, a Savant company io United States 44112
Manufacturer	:	same as Applicant	t	
Factory	:	LEEDARSON LI Xingtai Industrial Changtai County,	Zone, Econor	., LTD. nic Development Zone,

2.2 EUT Specifications Assessed in Current Report

Mode	Modulation	Data Rate(Mbps)
BLE	GFSK	1

Channel List				
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	
00	2402	20	2442	
01	2404	21	2444	
02	2406	22	2446	
		•••		
		•••		
17	2436	37	2476	
18	2438	38	2478	
19	2440	39	2480	

2.3 Test Information

The test software "nRF Connect for Desktop.exe" was used to control EUT work in TX mode, Power Setting and select test channel.

Modulation	data rate (Mbps)	Power Setting	Test C	hannel	Frequency (MHz)
		Default	Low:	00	2402
BLE	1	Default	Middle:	20	2442
		Default	High:	39	2480

2.4 Sample Description

Test Item	Model Number	Sample Number	Date of receipted
Conducted Emission	GPM-Q2FPD05-21	E2121894-03/03	2021.10.11
Radiated Emission	GPM-Q2FPD05-21	E21091543a-01/03	2021.10.11
Conducted RF Test	GPM-Q2FPD05-21	E21091543a-01/03	2021.10.11

2.5 Supported equipment

Brand	:	Acer
Product Name:	:	Notebook PC
Model Name	:	TravelMate P238 series
Model Number	:	N15W8

2.6 Description of Test Facility

Name of Firm	: Audix Technology (Shanghai) Co., Ltd.
Site Location	: 3F and 4F, 34Bldg, 680 Guiping Rd., Caohejing Hi-Tech Park, Shanghai 200233, China.
Accredited by NVLAP, Lab Code	: 200371-0
FCC Designation Number	: CN5027
Test Firm Registration Number	: 954668

3 CONDUCTED EMISSION TEST

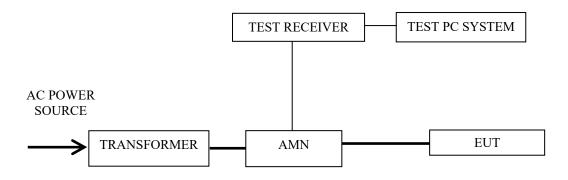
3.1 Test Equipment

The following test equipments are used during the conducted emission test in a shielded room:

Item	Туре	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Test Receiver	R&S	ESCI	101302	2021.04.26	1 Year
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	2021.06.24	1 Year
3.	Software	Audix	e3	6.2009-1-15		

3.2 Block Diagram of Test Setup

3.2.1 Conducted Disturbance Test Setup



— : Signal Line

— : Power Line

3.3 Conducted Emission Limits (§15.207)

3.4 Test Configuration

The EUT (listed in Sec.2.1) was installed as shown on Sec.3.2 to meet FCC requirement and operating in a manner which tends to maximize its emission level in a normal application.

3.5 Operating Condition of EUT

- 3.5.1 Setup the EUT as shown in Sec. 3.2.
- 3.5.2 Turn on the power of all equipment.
- 3.5.3 Turn the EUT on the test mode, and then test.

3.6 Test Procedures

The EUT was placed upon a non-metallic table, which is 0.8 m above the horizontal conducting ground plane and 0.4 m from a vertical reference plane. The EUT was connected to the power mains through an Artificial Mains Network (AMN) to provide a 50 Ω coupling impedance for the measuring equipment. Both sides of AC line (Line & Neutral) were checked to find out the maximum conducted emission according to FCC Part 15 Subpart C and ANSI C63.10: 2013 requirements during conducted disturbance test.

The I.F. bandwidth of Test Receiver ESCI was set at 9 kHz.

The frequency range from 150 kHz to 30 MHz was checked.

Test with a dummy load in lieu of the antenna to determine compliance with Section 15.207 limits within the transmitter's fundamental emission band. (According to KDB 174176 D01 Line Conducted FAQ)

The test modes were done on conducted disturbance test and all the test results are listed in Sec. 3.7

3.7 Test Results

< PASS >

The frequency and amplitude of the highest conducted emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Worst case emission:

No.	Operation	Modulation	Channel	Frequency (MHz)	Data Page
1.	Transmitting				P12

NOTE 1 – Level = Read Level + AMN Factor + Cable Loss

NOTE 2 – "QP" means "Quasi-Peak" values

NOTE 3 – The emission levels which not reported are too low against the official limit.

Worst case emission

EUT	:	QO FORWARD PHASE DIMMER, PIGTAIL	Temperature :	22°C
Model No.	:	GPM-Q2FPD05-21	Humidity :	51%RH
Test Mode	:	Transmitting	Date of Test :	2021.11.23

Polarization	Frequency (MHz)	Meter Reading dB (µV)	AMN Factor (dB)	Cable Loss (dB)	Emission Level dB (µV)	1 1m1fc	Margin (dB)	Remark
	0.1516	47.5	0.2	0.03	47.73	65.91	18.18	QP
	0.1516	32.89	0.2	0.03	33.12	55.91	22.79	Average
	0.4351	52.17	0.2	0.04	52.41	57.15	4.74	QP
	0.4351	41.5	0.2	0.04	41.74	47.15	5.41	Average
	0.6205	43.07	0.2	0.05	43.32	56	12.68	QP
Line	0.6205	32.29	0.2	0.05	32.54	46	13.46	Average
Line	1.082	38.62	0.2	0.06	38.88	56	17.12	QP
	1.082	26.21	0.2	0.06	26.47	46	19.53	Average
	3.547	40.47	0.3	0.12	40.89	56	15.11	QP
	3.547	25.6	0.3	0.12	26.02	46	19.98	Average
	27.127	19.67	0.35	0.32	20.34	60	39.66	QP
	27.127	14.08	0.35	0.32	14.75	50	35.25	Average
	0.1532	47.18	0.2	0.03	47.41	65.82	18.41	QP
	0.1532	32.31	0.2	0.03	32.54	55.82	23.28	Average
	0.4305	52.26	0.2	0.04	52.5	57.24	4.74	QP
	0.4305	41.63	0.2	0.04	41.87	47.24	5.37	Average
	0.614	42.99	0.2	0.05	43.24	56	12.76	QP
Neutral	0.614	32.24	0.2	0.05	32.49	46	13.51	Average
Neutrai	2.261	39.1	0.2	0.1	39.4	56	16.6	QP
	2.261	25.9	0.2	0.1	26.2	46	19.8	Average
	3.881	40.27	0.3	0.12	40.69	56	15.31	QP
	3.881	25.05	0.3	0.12	25.47	46	20.53	Average
	27.127	19.54	0.35	0.32	20.21	60	39.79	QP
	27.127	14.04	0.35	0.32	14.71	50	35.29	Average

4 RADIATED EMISSION TEST

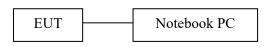
4.1 Test Equipment

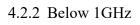
The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

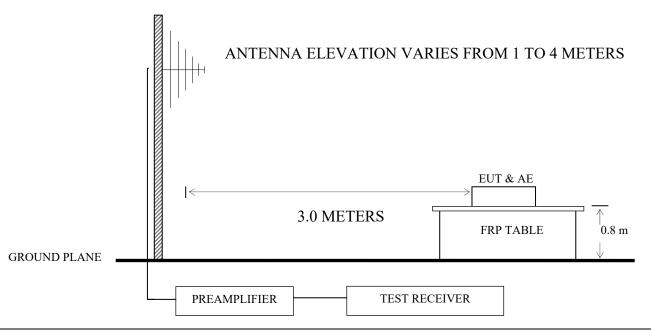
Item	Туре	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Preamplifier	Agilent	8447D	2944A10548	2021.03.08	1 Year
2.	Preamplifier	HP	8449B	3008A00864	2021.03.08	1 Year
3.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2021.09.16	1 Year
4.	Test Receiver	R&S	ESCI	101303	2021.03.08	1 Year
5.	Bilog Antenna+6dB Attenuator	Schwarz beck	VULB 9168+EMCI -N-6-06	707+AT-N0637	2021.03.30	1 Year
6.	Horn Antenna	EMCO	3115	9607-4878	2021.07.27	1 Year
7.	Horn Antenna	EMCO	3116	00062643	2021.10.10	1 Year
8.	Cavity Band Rejection Filter	Microwave	WT-A3882- R10	WT200312-1-1	2021.09.15	1 Year
9.	Software	Audix	e3	SET00200 9912M295-2		

4.2 Block Diagram of Test Setup

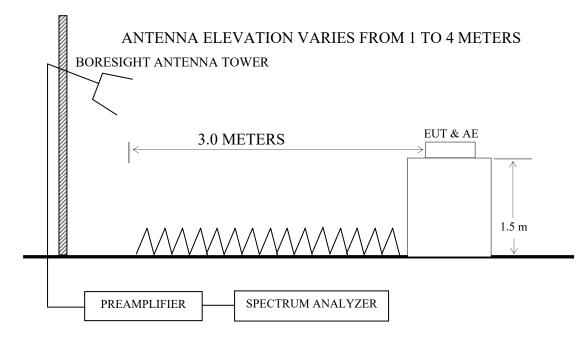
4.2.1 EUT & Peripherals







4.2.3 Above 1GHz



4.3 Radiated Emission Limit (§15.209)

Frequency	Distance	Field strength limits ($\mu V/m$)					
(MHz)	(m)	(µV/m)	dB(µV/m)				
30 ~ 88	3	100	40.0				
88 ~ 216	3	150	43.5				
216 ~ 960	3	200	46.0				
Above 960	3	500	54.0				
Above960350054.0NOTE 1 -Emission Level dB (μV/m) = 20 log Emission Level (μV/m)NOTE 2 -The tighter limit applies at the band edges.NOTE 3 -Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.NOTE 4 -The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz.NOTE 5 -Above 1 GHz, the limit on peak emission is 20 dB above the maximum							

4.4 Test Configuration

The EUT (listed in Sec.2.1) and the simulators (listed in Sec.2.2) were installed as shown on Sec.4.2 to meet FCC requirements and operating in a manner that tends to maximize its emission level in a normal application.

4.5 Operating Condition of EUT

- 4.5.1 Setup the EUT as shown in Sec. 4.2.
- 4.5.2 Turn on the power of all equipment.
- 4.5.3 Turn the EUT on the test mode, and then test.
- 4.6 Test Procedures

Radiated emission test applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A pre-amp is necessary for this measurement. For measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

The EUT was placed on a turntable. Below 1 GHz, the table height is 80 cm above the reference ground plane. Above 1 GHz, the table height is 1.5 m. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or Horn antenna was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.10: 2013 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESCI was set at 120 kHz from 30MHz to 1000MHz.

The bandwidth of Agilent N9010A was set at 1MHz for above 1GHz.

The frequency range from 30 MHz to 25 GHz (Up to 10th harmonics from fundamental frequency) was checked.

All the test results are listed in Sec.4.7.

4.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

- 1	requency range. below refize (worst case enhission)							
	No.	Operation	Modulation	Channel	Frequency	Data Page		
	1.			00	2402 MHz	P17		
	2.	Transmitting	BLE	20	2442 MHz	P17		
	3.	3.		39	2480 MHz	P18		

Frequency range: below 1GHz (Worst case emission)

Frequency range: above 1GHz

No.	Operation	Modulation	Channel	Frequency	Data Page
1.	Transmitting		00	2402 MHz	P19
2.		BLE	20	2442 MHz	P19
3.			39	2480 MHz	P20

Restricted bands:

No.	Operation	Modulation	Channel	Frequency	Data Page
1.	1. 2. Transmitting	BLE	00	2402 MHz	P21
2.			39	2480 MHz	P21

Band-Edge measurement:

No.	Operation	Modulation	Channel	Frequency	Data Page
1.	Then any itting	ЛΓ	00	2402 MHz	P22
2. Trans	Transmitting	DLE	39	2480 MHz	P22

NOTE 1 – Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

- NOTE 2 "QP" means "Quasi-Peak" values
- NOTE $3 0^{\circ}$ was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.
- NOTE 4 The emission levels which not reported are too low against the official limit.
- NOTE 5 The emission levels recorded below is data of EUT configured in Standing direction, for Standing direction was the maximum emission direction during the test. The data of Side & Lying direction are too low against the official limit to be reported.
- NOTE 6 All reading are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz. For above 1GHz test, if the peak measured value complies with the

average limit, it is unnecessary to perform an average measurement.

NOTE 7 – The frequency range 2310-2390MHz & 2483.5-2500MHz were tested for Restricted bands.

Worst case emission < 1GHz

EUT	:	QO FORWARD PHASE DIMMER, PIGTAIL	Temperature :	22°C
Model No.	:	GPM-Q2FPD05-21	Humidity :	51%RH
Test Mode	:	Transmitting	Date of Test :	2021.10.14

BLE CH2402MHz

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	47.994	26.02	19.5	0.73	28.21	18.04	40	21.96	QP
	95.427	31.33	14.43	1.07	28.02	18.81	43.5	24.69	QP
Horizontal	143.33	28.37	18.75	1.29	27.82	20.59	43.5	22.91	QP
Horizoniai	216.02	36.82	15.48	1.58	27.31	26.57	46	19.43	QP
	408.95	32.25	21.27	2.18	27.63	28.07	46	17.93	QP
	798.98	24.43	27.8	3.06	26.9	28.39	46	17.61	QP
	47.994	26.29	19.5	0.73	28.21	18.31	40	21.69	QP
	103.81	32.66	15.67	1.12	27.98	21.47	43.5	22.03	QP
Vartical	160.35	24.24	19	1.36	27.73	16.87	43.5	26.63	QP
Vertical	263.82	25.69	17.84	1.74	27.1	18.17	46	27.83	QP
	399.03	29.86	21.1	2.15	27.58	25.53	46	20.47	QP
	796.18	24.35	27.9	3.06	26.94	28.37	46	17.63	QP

BLE CH2442MHz

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	47.994	25.69	19.5	0.73	28.21	17.71	40	22.29	QP
	96.099	32.01	14.5	1.07	28.02	19.56	43.5	23.94	QP
Horizontal	143.83	29.76	18.8	1.29	27.82	22.03	43.5	21.47	QP
Horizontai	210.79	36.84	15.5	1.58	27.34	26.58	43.5	16.92	QP
	383.93	32	20.9	2.12	27.5	27.52	46	18.48	QP
	851.04	26.1	28.1	3.2	26.6	30.8	46	15.2	QP
	47.492	26.79	19.55	0.73	28.21	18.86	40	21.14	QP
	95.427	28.99	14.43	1.07	28.02	16.47	43.5	27.03	QP
Vertical	152.66	24	19.05	1.32	27.78	16.59	43.5	26.91	QP
vertical	263.82	25.74	17.84	1.74	27.1	18.22	46	27.78	QP
	410.38	32.01	21.3	2.18	27.63	27.86	46	18.14	QP
	796.18	25.63	27.9	3.06	26.94	29.65	46	16.35	QP

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	47.492	26.09	19.55	0.73	28.21	18.16	40	21.84	QP
	96.099	32.54	14.5	1.07	28.02	20.09	43.5	23.41	QP
Horizontal	143.83	28.51	18.8	1.29	27.82	20.78	43.5	22.72	QP
Horizontai	214.51	36.07	15.5	1.58	27.32	25.83	43.5	17.67	QP
	420.58	32.5	21.7	2.22	27.68	28.74	46	17.26	QP
	798.98	25.53	27.8	3.06	26.9	29.49	46	16.51	QP
	47.994	26.18	19.5	0.73	28.21	18.2	40	21.8	QP
	95.427	30.08	14.43	1.07	28.02	17.56	43.5	25.94	QP
Vertical	142.82	28.08	18.7	1.29	27.82	20.25	43.5	23.25	QP
vertical	216.02	33.07	15.48	1.58	27.31	22.82	46	23.18	QP
	411.82	31.25	21.37	2.2	27.65	27.17	46	18.83	QP
	798.98	25.3	27.8	3.06	26.9	29.26	46	16.74	QP

BLE CH2480MHz

Radiated Emission > 1GHz

EUT	:	QO FORWARD PHASE DIMMER, PIGTAIL	Temperature :	22°C
Model No.	:	GPM-Q2FPD05-21	Humidity :	51%RH
Test Mode	:	Transmitting	Date of Test :	2021.10.14

BLE CH2402MHz

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	1765	45.11	26.28	4.65	36.3	39.74	74	34.26	Peak
	3187	43.57	30.58	6.09	35.24	45	74	29	Peak
Horizontal	4627	40.24	32.47	7.36	34.81	45.26	74	28.74	Peak
Horizontal	5986	37.88	34.29	8.35	34.7	45.82	74	28.18	Peak
	7525	37.89	36.84	9.79	34.8	49.72	74	24.28	Peak
	9316	36.04	38.26	10.97	34.67	50.6	74	23.4	Peak
	3187	52.13	30.58	6.09	35.24	53.56	74	20.44	Peak
	3187	39.42	30.58	6.09	35.24	40.85	54	13.15	Average
Vertical	4798	41.53	33.21	7.55	34.75	47.54	74	26.46	Peak
vertical	6076	38.55	34.31	8.43	34.71	46.58	74	27.42	Peak
	7327	37.5	36.4	9.58	34.8	48.68	74	25.32	Peak
	9361	36.96	38.27	10.97	34.66	51.54	74	22.46	Peak

BLE CH2442MHz

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	1369	48.84	24.85	4.07	36.3	41.46	74	32.54	Peak
	3187	46.22	30.58	6.09	35.24	47.65	74	26.35	Peak
Horizontal	4627	40.14	32.47	7.36	34.81	45.16	74	28.84	Peak
Horizoniai	6211	37.71	34.34	8.6	34.72	45.93	74	28.07	Peak
	7876	36.61	37.5	10.11	34.8	49.42	74	24.58	Peak
	9370	36.64	38.27	10.97	34.66	51.22	74	22.78	Peak
	3196	51.68	30.6	6.09	35.23	53.14	74	20.86	Peak
	3196	38.47	30.6	6.09	35.23	39.93	54	14.07	Average
Vertical	4798	39.86	33.21	7.55	34.75	45.87	74	28.13	Peak
vertical	6391	38.89	34.38	8.76	34.74	47.29	74	26.71	Peak
	7732	37.01	37.25	10.01	34.8	49.47	74	24.53	Peak
	9334	37.01	38.27	10.97	34.66	51.59	74	22.41	Peak

BLE	CH2480MHz
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Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	1351	50.88	24.79	4.07	36.3	43.44	74	30.56	Peak
	3187	44.45	30.58	6.09	35.24	45.88	74	28.12	Peak
Horizontal	4798	40.17	33.21	7.55	34.75	46.18	74	27.82	Peak
Horizontai	6193	38.39	34.34	8.52	34.72	46.53	74	27.47	Peak
	7624	37	37.05	9.9	34.8	49.15	74	24.85	Peak
	9208	36.45	38.24	10.88	34.68	50.89	74	23.11	Peak
	3187	50.16	30.58	6.09	35.24	51.59	74	22.41	Peak
	3187	37.22	30.58	6.09	35.24	38.65	54	15.35	Average
Vertical	4798	39.96	33.21	7.55	34.75	45.97	74	28.03	Peak
vertical	6517	37.45	34.45	8.85	34.75	46	74	28	Peak
	8056	36.73	37.83	10.28	34.79	50.05	74	23.95	Peak
	9064	37.56	38.22	10.79	34.69	51.88	74	22.12	Peak

Emissions in restricted frequency bands:

EUT	:	QO FORWARD PHASE DIMMER, PIGTAIL	Temperature :	22°C
Model No.	:	GPM-Q2FPD05-21	Humidity :	51%RH
Test Mode	:	Transmitting	Date of Test :	2021.10.14

BLE CH2402MHz

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	2354.9	44.98	28.12	5.32	35.9	42.52	74	31.48	Peak
Horizontal	2354.9	32.7	28.12	5.32	35.9	30.24	54	23.76	Average
Horizontai	2388.7	59.71	28.21	5.36	35.86	57.42	74	16.58	Peak
	2388.7	42.28	28.21	5.36	35.86	39.99	54	14.01	Average
	2340.8	45.68	28.08	5.29	35.91	43.14	74	30.86	Peak
Vertical	2340.8	33.37	28.08	5.29	35.91	30.83	54	23.17	Average
	2373.4	47.88	28.17	5.32	35.88	45.49	74	28.51	Peak
	2373.4	34.3	28.17	5.32	35.88	31.91	54	22.09	Average

BLE CH2480MHz

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	2489.9	51.06	28.48	5.47	35.76	49.25	74	24.75	Peak
Horizontal	2489.9	36.4	28.48	5.47	35.76	34.59	54	19.41	Average
Horizontai	2494.2	49.29	28.48	5.47	35.76	47.48	74	26.52	Peak
	2494.2	36.63	28.48	5.47	35.76	34.82	54	19.18	Average
	2489.3	57.66	28.48	5.47	35.76	55.85	74	18.15	Peak
Vertical	2489.3	38.46	28.48	5.47	35.76	36.65	54	17.35	Average
	2494.6	55.17	28.48	5.47	35.76	53.36	74	20.64	Peak
	2494.6	37.22	28.48	5.47	35.76	35.41	54	18.59	Average

Band-Edge Measurement:

EUT	:	QO FORWARD PHASE DIMMER, PIGTAIL	Temperature :	22°C
Model No.	:	GPM-Q2FPD05-21	Humidity :	51%RH
Test Mode	:	Transmitting	Date of Test :	2021.10.14

BLE CH2402MHz

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
Horizontal	2390	56.14	28.21	5.36	35.86	53.85	74	20.15	Peak
	2390	39.63	28.21	5.36	35.86	37.34	54	16.66	Average
Vertical	2390	58.01	28.21	5.36	35.86	55.72	74	18.28	Peak
	2390	40.43	28.21	5.36	35.86	38.14	54	15.86	Average

BLE CH2480MHz

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
Horizontal	2483.5	57.24	28.46	5.43	35.76	55.37	74	18.63	Peak
Horizontal	2483.5	35.55	28.46	5.43	35.76	33.68	54	20.32	Average
Vertical	2483.5	63.84	28.46	5.43	35.76	61.97	74	12.03	Peak
	2483.5	40.62	28.46	5.43	35.76	38.75	54	15.25	Average

5 6 dB BANDWIDTH MEASUREMENT

5.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Туре	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2021.09.15	1 Year
2.	Coaxial Cable	WOKEN	SFL402-105F LEX	F02-150819-0 45	2021.03.08	1 Year
3.	10 dB Attenuator	Mini-Circuits	VAT-10W2+	001	2021.08.06	1 Year

5.2 Block Diagram of Test Setup

Spectrum Analyzer	EUT	Notebook PC
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5.3 Specification Limits (§15.247(a)(2))

The minimum 6 dB bandwidth shall be at least 500 kHz.

5.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

5.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with settings: RBW = 100kHz, VBW = 3 RBW.

The 6 dB bandwidth is defined as the total spectrum the power of which is lower than peak power minus 6 dB .

The test procedure is defined in ANSI C63.10-2013 (the 11.8.2 Measurement Procedure "Option 2" was used).

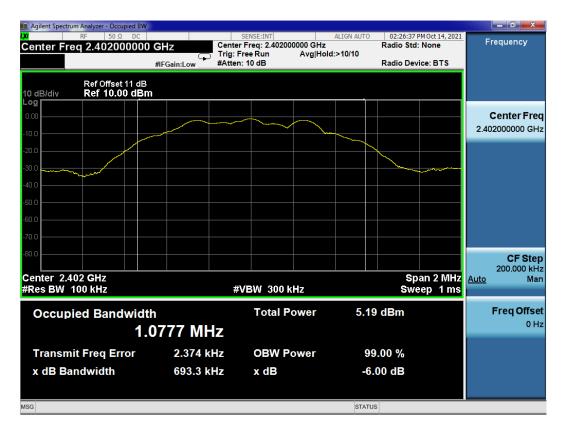
5.6 Test Results **PASSED**.

All the test results are attached in next pages.

(Test Date: 2021.10.14 Temperature: 23°C Humidity: 51 %)

Modulation	Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit
	00	2402	693.3	500 kHz
BLE	20	2442	691.2	500 kHz
	39	2480	688.9	500 kHz

BLE CH2402MHz



BLE CH2442MHz

🔟 Agilent Spectru	m Analyzer - Occupied BW							
Center Fre	RF 50 Ω DC	GHz GHz	SENSE:INT Center Freq: 2.4420		ALIGN AUTO	02:28:58 Radio Std	PM Oct 14, 2021 : None	Frequency
Center I Te	29 2.442000000	φ.	Trig: Free Run #Atten: 10 dB	Avg Hold:	:>10/10	Radio Dev	vice: BTS	
		#IFGain:Low	Attent To dB			Radio Dev	Ace. B13	
10 dB/div	Ref Offset 11 dB Ref 10.00 dBm							
								Center Freq
				\sim				2.442000000 GHz
-10.0				<u>`</u>				
-20.0								
-30.0	~ ~ ~ ~					- mark	www.www.	
-40.0								
-50.0								
-60.0								
-70.0								
-80.0								05.01
								CF Step 200.000 kHz
Center 2.4						Sp	an 2 MHz	<u>Auto</u> Man
#Res BW 1	TUU KHZ		#VBW 300	KHZ		SW	eep 1 ms	
Occup	ied Bandwidtl	า	Total F	ower	4.37	dBm		Freq Offset
	1.0746 MHz							
Transm	it Freq Error	1.485 kH	z OBW F	ower	99	.00 %		
x dB Ba		691.2 kH	z xdB		-6	00 dB		
					071			
MSG					STATUS	5		

BLE CH2480MHz

Agilent Spectrum.	Analyzer - Occupied BV	V						- 0 x
	RF 50 Ω DC 2.48000000	#IFGain:Low	SENSE:INT Center Freq: 2.4800 Trig: Free Run #Atten: 10 dB		ALIGN AUTO :>10/10	02:29:25 Radio Std Radio Dev		Frequency
10 dB/div	Ref Offset 11 dl Ref 10.00 dB							
0.00								Center Freq 2.480000000 GHz
-20.0						hand		
-40.0								
-60.0								
-80.0 Center 2.48 #Res BW 10			#VBW 300	kH7			oan 2 MHz eep 1 ms	CF Step 200.000 kHz <u>Auto</u> Man
	ed Bandwid		Total F	Power	4.28	dBm		Freq Offset 0 Hz
	1.0752 MHz							0 H2
Transmit	Freq Error	1.714	Hz OBW F	Power	99	.00 %		
x dB Ban	dwidth	688.9 k	(Hz x dB		-6.	00 dB		
мsg 🗼 File <24	42_0001.png> sa	ived			STATUS	3		

6 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

6.1 Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Item	Туре	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2021.09.15	1 Year
2.	Coaxial Cable	WOKEN	SFL402-105F LEX	F02-150819-0 45	2021.03.08	1 Year
3.	10 dB Attenuator	Mini-Circuits	VAT-10W2+	001	2021.08.06	1 Year

6.2 Block Diagram of Test Setup

The Same as Section. 5.2.

6.3 Specification Limits ((§15.247(b)(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5 MHz is: 1 Watt. (30 dBm)

6.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

6.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:

- a) RBW DTS Bandwidth.
- b) VBW [3 RBW].
- c) Span [3 RBW].
- d) Sweep time = auto.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

The test procedure is defined in ANSI C63.10-2013 (11.9.1.1 Measurement Procedure "RBW DTS bandwidth" was used).

6.6 Test Results

PASSED.

All the test results are listed below.

(Test Date: 2021.10.14 Temperature: 23°C Humidity: 51 %)

Modulation	Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit
	00	2402	-1.338	30 dBm
BLE	20	2442	-2.059	30 dBm
	39	2480	-2.165	30 dBm

BLE CH2402MHz

	Analyzer - Occupied BW					
	RF 50 Ω DC 401716000000) GHz PNO: Fast IFGain:Low	SENSE:INT Trig: Free Run Atten: 10 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	02:28:11 PM Oct 14, 2021 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	Peak Search
R 10 dB/div R Log	ef Offset 11 dB ef 10.00 dBm	IFGain:Low	Atten: To ub	Mkr1	2.401 716 GHz -1.338 dBm	Next Peak
0.00		1				Next Pk Right
-10.0						Next Pk Left
-30.0						Marker Delta
-50.0						Mkr→CF
-70.0						Mkr→RefLv
-80.0 Center 2.402			2 0 BALL-		Span 2.000 MHz	More 1 of 2
#Res BW 1.0		#VBW	3.0 MHz	Sweep	1.00 ms (1001 pts)	

BLE CH2442MHz

📕 Agilent Spectrum Analyzer - Occupied BW				- 0 ×
x RF 50 Ω DC Marker 1 2.441734000000	SENSE:INT CHZ PNO: Fast IFGain:Low Atten: 10 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	02:28:43 PM Oct 14, 2021 TRACE 123456 TYPE MWWWW DET PNNNN	Peak Search
Ref Offset 11 dB 10 dB/div Ref 10.00 dBm		Mkr1	2.441 734 GHz -2.059 dBm	Next Peal
0.00	↓ 1			Next Pk Righ
-10.0				Next Pk Lef
-30.0				Marker Delt
-50.0				Mkr→C
70.0				Mkr→RefL
-80.0 Center 2.442000 GHz			Span 2.000 MHz	Mor 1 of
#Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep	1.00 ms (1001 pts)	

BLE CH2480MHz

🧵 Agilent Spectrum Analyzer - C								
x ₹5 Marker 1 2.480212	PN	Z O: Fast 😱 ain:Low	SENSE:IN Trig: Free Run Atten: 10 dB	Avg	ALIGN AUTO Type: Log-Pwr Hold:>100/100	02:29:43 PM Oct TRACE 2 TYPE M DET P N	3456	Peak Search
Ref Offset 10 dB/div Ref 10.0	11 dB				Mkr1	2.480 212 -2.165	GHz IBm	Next Pea
0.00				∳1				Next Pk Righ
-10.0								Next Pk Le
30.0								Marker Del
50.0								Mkr→C
70.0								Mkr→RefL
80.0 Center 2.480000 GH						Span 2.000	MHZ	Mo 1 of
#Res BW 1.0 MHz	12	#VBW :	3.0 MHz		Sweep	span 2.000 1.00 ms (100	1 pts)	
ISG					STATUS			

7 EMISSION LIMITATIONS MEASUREMENT

7.1 Test Equipment

The following test equipment was used during the emission limitations test:

Item	Туре	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2021.09.15	1 Year
2.	Coaxial Cable	WOKEN	SFL402-105F LEX	F02-150819-0 45	2021.03.08	1 Year
3.	10 dB Attenuator	Mini-Circuits	VAT-10W2+	001	2021.08.06	1 Year

7.2 Block Diagram of Test Setup

The Same as Section. 5.2.

7.3 Specification Limits (§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)). (% This test result attaching to Section. 3.7)

7.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

7.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

Establish a reference level by using the following procedure:

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW = 100 kHz.
- d) Set the VBW [3 RBW].
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to

establish the reference level.

Establish an emission level by using the following procedure:

a) Set the center frequency and span to encompass frequency range to be measured.

b) Set the RBW = 100 kHz.

c) Set the VBW [3 RBW].

d) Detector = peak.

e) Sweep time = auto couple.

f) Trace mode = max hold.

g) Allow trace to fully stabilize.

h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

Scan up through 10th harmonic.

The test procedure is defined in ANSI C63.10-2013 (11.11.2 Reference level measurement and 11.11.3 Emission level measurement was used).

7.6 Test Results **PASSED**.

The test data was attached in the next pages.

(Test Date: 2021.10.14-2022.01.15 Temperature: 23°C Humidity: 51 %)

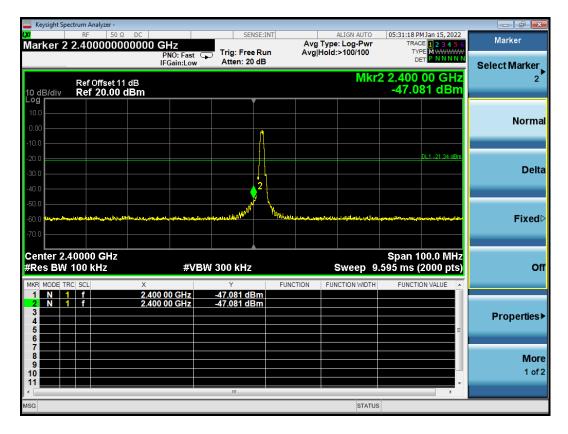
Modulation	Channel	Frequency (MHz)	Data Page
	00	2402	P34-36
BLE	20	2442	P37-38
	39	2480	P39-41

BLE CH2402MHz

Reference level



Emission level



💵 Agilent Spectrum Analyzer - Occupied BW					
RF 50 Ω DC Start Freq 30.000000 MHz		Avg Type	: Log-Pwr TF	02 PM Oct 14, 2021 RACE 1 2 3 4 5 6 TYPE MWWWW	Frequency
Ref Offset 11 dB	PNO: Fast Free IFGain:Low Atten: 10		Mkr1 4.8	03 6 GHz 139 dBm	Auto Tune
0.00					Center Freq 2.515000000 GHz
-10.0				-21.34 dBm	Start Freq 30.000000 MHz
-30.0					Stop Freq 5.000000000 GHz
-50.0				1	CF Step 497.000000 MHz <u>Auto</u> Man
-70.0	anandalintan haliklasin ay dittigi hali Na	Industriation and the state of	in the second	an a	Freq Offset 0 Hz
Start 30 MHz #Res BW 100 kHz	#VBW 300 kHz		Stop Sweep 475 ms	5.000 GHz s (2000 pts)	
MSG			STATUS		

🌉 Agilent Spec	trum Analyzer - Occupie					
<mark>IXI</mark> Marker 1	RF 50 Ω 14.38469234		SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	03:27:34 PM Oct 14, 2021 TRACE 1 2 3 4 5 6	Peak Search
Marker	14.30403234	PNO: Fast IFGain:Low	Trig: Free Run Atten: 10 dB	Avg Hold:>100/100	TYPE MWWWW DET PNNNNN	
10 dB/div	Ref Offset 11 dl Ref 10.00 dB			М	kr1 14.385 GHz -63.830 dBm	Next Peak
0.00						Next Pk Right
-10.0					-21-34 dBm	Next Pk Left
-30.0						Marker Delta
-40.0						Mkr→CF
-60.0 -70.0	eferighand a shiple a	ernijs, jele maag bie bewaard weers	himitess attractions	Uglustitionsproops _{ba} lmeest _a spillettitassaalegus	vije stati je oslik filozofi je vie stati je da u dive	Mkr→RefLvl
-80.0 Start 5.00					Stop 15.000 GHz	More 1 of 2
#Res BW	100 kHz	#VBW	300 kHz	Sweep	956 ms (2000 pts)	
MSG				STATU	3	

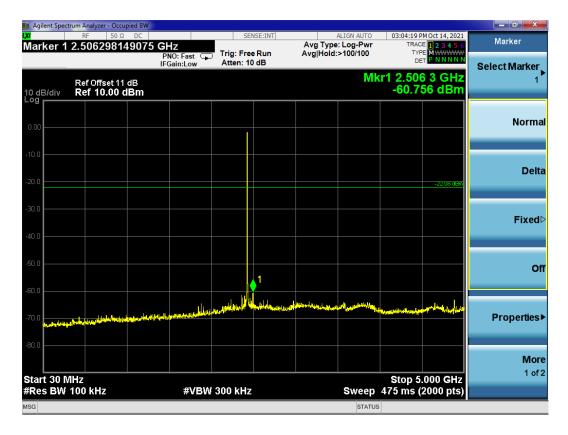
🇾 Agilent Spec	ctrum Analyzer - Occupied BW	1							
<mark>.x</mark> Marker 1	RF 50 Ω DC 23.6143071535	77 GHz PNO: Fast	_			ALIGN AUTO : Log-Pwr :>100/100	TRAC	PM Oct 14, 2021 E 1 2 3 4 5 6 PE M WWWWW	Peak Search
10 dB/div Log	Ref Offset 11 dB Ref 10.00 dBm	IFGain:Low	Atten: 10	dB		М	kr1 23.6	14 GHz 97 dBm	Next Peak
									Next Pk Right
-10.0								-21.34 dBm	Next Pk Left
-30.0									Marker Delta
-50.0							↓ ¹		Mkr→CF
	ginestania.constantes	had the open the state of the s	address and an	all ^a rtean <mark>taintean</mark> t	e _{k de} nkeren gesten i de la	ininterent internet	and a state of the	n an an Anna Anna Anna Anna Anna Anna A	Mkr→RefLv
-80.0 Start 15.0	000 GHz					~	Stop 25	.000 GHz	More 1 of 2
#Res BW		#VBW	300 kHz			Sweep		2000 pts)	
MSG						STATUS	3		

BLE CH2442MHz

Reference level



Emission level



🌉 Agilent Spec	ctrum Analyzer - Occupi									
<mark>(X)</mark> Marker 1	RF 50 Ω 14.4197098		iHz	SEN	ISE:INT		ALIGN AUTO		PM Oct 14, 2021	Peak Search
		PN	IO: Fast 😱 iain:Low	Trig: Free Atten: 10		Avg Hold:		DI	PE MWWWWW T P N N N N N	NextPeak
10 dB/div	Ref Offset 11 c Ref 10.00 di						M	4.4 kr1 14.4 -63.0	20 GHz 98 dBm	Nextreak
										Novt Dk Dight
0.00										Next Pk Right
-10.0										
-20.0									-22.08 dBm	Next Pk Left
-30.0										
-30.0										Marker Delta
-40.0										
-50.0										Mkr→CF
-60.0									1	
-70.0	المحاجبين أوجرته والمتلجز ورواف	مربر به معلم <mark>ارما جا الز</mark>	way of the second second second	haift freehand an Array	مير والارون المرون المدين الم	and a state of the	وداجو فالاسلعام و	is literation of the second	Roman States	Mkr→RefLvl
-70.0										WIKI → KCI L VI
-80.0										More
Start 5.00	00 GHz							Stop 15	.000 GHz	1 of 2
#Res BW			#VBW	300 kHz			Sweep	956 ms (2000 pts)	
MSG							STATUS	3		

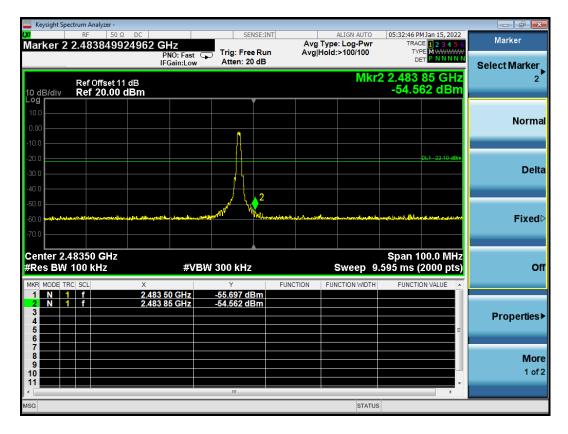
🌉 Agilent Spec	trum Analyzer - Occupied BW								
l <mark>XI</mark>	RF 50 Ω DC 23.57928964482		SEN	SE:INT		ALIGN AUTO		M Oct 14, 2021 E 1 2 3 4 5 6	Peak Search
	Ref Offset 11 dB	PNO: Fast IFGain:Low	Trig: Free Atten: 10		Avg Hold:	>100/100	TYF DE kr1 23.5	79 GHz 75 dBm	NextPeak
10 dB/div Log	Ref 10.00 dBm						-60.0	75 GB M	
0.00									Next Pk Right
-10.0									
-20.0								-22.08 dBm	Next Pk Left
-30.0									Marker Delta
10.0									
-50.0							↓ ¹		Mkr→CF
-60.0	atura data san sa sa san a	والمراويه والمراوية والمراوية والمراجع		وإنقاق وراداه وإرتقاء	مى بىرى بىرى بى بى بى بى بى بى بى بى بى	معينا المعدول الاحصاء	Way Ball Walter	where we have a second	
-70.0									Mkr→RefLvl
-80.0									
									More 1 of 2
Start 15.0 #Res BW		#VBM	/ 300 kHz			Sweep	Stop 25 956 ms (.000 GHz 2000 pts)	
MSG						STATUS			

BLE CH2480MHz

Reference level



Emission level



🌉 Agilent Spec	trum Analyzer - Occupied BW							- 0 X
Marker 1	RF 50 Ω DC 2.35215107553	8 GHz	SENSE:INT	Avg Type	ALIGN AUTO	TRAC	M Oct 14, 2021 E 1 2 3 4 5 6	Marker
		PNO: East () Irig:	Free Run :: 10 dB	Avg Hold:		TYF De		Select Marker
10 dB/div Log	Ref Offset 11 dB Ref 10.00 dBm				Mł	(r1 2.35) -61.9	2 2 GHz 97 dBm	1
0.00								Normal
-10.0								
-20.0							-22.10 dBm	Delta
-30.0								
-40.0								Fixed⊳
-50.0								
-60.0			1					Off
	الحموران المرتبة ومخالف المتحمون عامل الماري	الملحوطان ووجار والمعلومة والمراجع والمراجع والمساحد	all deal bridings with	production in the second public data	in the second	willing and the states of the	فالمعليه فحاط المعيسوني	Properties►
-80.0								
0 4-114 0.00 0	au -					0 4=E		More 1 of 2
Start 30 N #Res BW		#VBW 300 k	Hz		Sweep	stop 5 475 ms (.000 GHz 2000 pts)	
MSG					STATUS	6		

🌉 Agilent Spec	trum Analyzer - Occup	pied BW								
<mark>,x</mark> Marker 1	RF 50 Ω 14.3346673	333667	GHZ NO: Fast	Trig: Free			ALIGN AUTO : Log-Pwr :>100/100	TRAC	MOct 14, 2021 E 1 2 3 4 5 6 PE MWWWWW T P N N N N	Peak Search
10 dB/div	Ref Offset 11 Ref 10.00 d	dB	Gain:Low	Atten: 10	dB		Μ	kr1 14.3	35 GHz 90 dBm	Next Peak
0.00										Next Pk Right
-10.0									-2271 U dBm	Next Pk Left
-30.0										Marker Delta
-40.0										Mkr→CF
-60.0 -70.0	en ant and a start and a start and a start and a start	undang gelendedd	and the state of the	an a	atilitata ang sa	Malar Inio Herlingelini	Negels ^{han} thedhartes	all strong of the second	1 nereitedeineting	Mkr→RefLvl
-80.0										More
Start 5.00 #Res BW			#VBW	300 kHz			Sweep	Stop 15 956 ms (.000 GHz 2000 pts)	
MSG							STATUS			

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🌉 Agilent Spec	ctrum Analyzer - Occupied BW								
<mark>w</mark> Marker 1	RF 50 Ω DC 1 23.57928964482	PNO: Fast 😱	Trig: Free			ALIGN AUTO : Log-Pwr :>100/100	TRAC TYP	M Oct 14, 2021 E 1 2 3 4 5 6 E M WWWWW T P N N N N N	Peak Search
10 dB/div Log	Ref Offset 11 dB Ref 10.00 dBm	IFGain:Low	Atten: 10	dB		Μ	kr1 23.5	79 GHz 75 dBm	Next Peak
0.00									Next Pk Right
-10.0								-22.1U dBm	Next Pk Left
-30.0									Marker Delta
-50.0							↓ ¹		Mkr→CF
-70.0	and and a stand of the second	(Japal 19 Berlin Verley Her Physic	energi kasha da ga afilik da da	ant and an all and all a	n gehin ha fiye an gehin	يصليهما والمراجع المراجعين		han an a	Mkr→RefLvl
-80.0 Start 15.0	000 GHz		^				Stop <u>25</u>	.000 GHz	More 1 of 2
#Res BW		#VBW	300 kHz			Sweep	956 ms (2000 pts)	
MSG						STATUS	5		

8 POWER SPECTRAL DENSITY MEASUREMENT

8.1 Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Туре	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2021.09.15	1 Year
2.	Coaxial Cable	WOKEN	SFL402-105F LEX	F02-150819-0 45	2021.03.08	1 Year
3.	10 dB Attenuator	Mini-Circuits	VAT-10W2+	001	2021.08.06	1 Year

8.2 Block Diagram of Test Setup

The Same as section 5.2.

8.3 Specification Limits (§15.247(e))

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band.

8.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

8.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to 3 kHz \leq RBW \leq 100 kHz.
- d) Set the VBW [3 RBW].
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.

i) Use the peak marker function to determine the maximum amplitude level within the RBW.

j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

The test procedure is defined in ANSI C63.10-2013 (11.10.2 Measurement Procedure "Method PKPSD (peak PSD)" was used).

8.6 Test Results **PASSED**.

All the test results are attached in next pages.

(Test Date: 2021.10.14 Temperature: 23°C Humidity: 51 %)

Modulation	Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limit
BLE	00	2402	-19.2	8 dBm
	20	2442	-19.97	8 dBm
	39	2480	-20.146	8 dBm

BLE CH2402 MHz



BLE CH2442 MHz



BLE CH2480 MHz



9 DEVIATION TO TEST SPECIFICATIONS

None.

10 MEASUREMENT UNCERTAINTY LIST

The measurement uncertainty was estimated for test on the EUT according to CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage of K=2. The uncertainties value is not used in determining the PASS/FAIL results.

Test Items/Facilities	Frequency/Equipment/Unit	Uncertainty
Conducted Emission	9kHz~150kHz	±3.1 dB
No.1 Shielded Room	150kHz~30MHz	±2.6 dB
Conducted Emission	9kHz~150kHz	±3.1 dB
No.3 Shielded Room	150kHz~30MHz	±2.6 dB
	30MHz~200MHz, Horizontal	±3.8 dB
	30MHz~200MHz, Vertical	±4.1 dB
	200MHz~1000MHz, Horizontal	±3.6 dB
Radiated Emission	200MHz~1000MHz, Vertical	±5.1 dB
	1GHz~6GHz	±5.3 dB
	6GHz~18GHz	±5.3 dB
	18GHz~40GHz	±3.5 dB
Output Power Test	50MHz~18GHz	0.77 dB
Power Density Test	9kHz~6GHz	1.08 dB
RF Frequency Test	9kHz~40GHz	6*10 ⁻⁴
Bandwidth Test	9kHz~6GHz	$1.5*10^{-3}$
RF Radiated Power Test	30MHz~1000MHz	3.06 dB
Conducted Output Power Test	50MHz~18GHz	0.83 dB
AC Voltage(<10kHz) Test	120V~230V	0.04 %
DC Power Test	0V~30V	0.4 %
Temperature	-40°C~+100°C	0.52 °C
Humidity	30%~95%	2.6 %